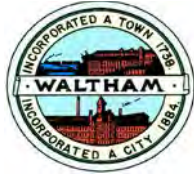


# City of Waltham, Massachusetts



**Invites,  
in accordance with  
the Massachusetts General Law Chapter 30, 39M F-R,  
Interested Parties  
To respond with the best Bid**

**For the:**

## **Mount Feake Cemetery Expansion**

203 Prospect Street, Waltham, MA 02452

**Site Inspection and Briefing: 10:00 AM Thursday March 1, 2018**

(Meet on Site at 203 Prospect Street, Waltham, MA 02452)

**Last Day for written questions: 12:00 Noon Monday March 5, 2018**

(Written questions via email ONLY at [jpedulla@city.waltham.ma.us](mailto:jpedulla@city.waltham.ma.us))

**General Bid Due: 10:00 AM Monday March 12, 2018**

# Mount Feake Cemetery Expansion

203 Prospect Street

Waltham, MA

---

## TABLE OF CONTENTS

Title Page

Table Of Contents

### **DIVISION 00 - Procurement & Contracting Requirements**

00 11 16 Invitation to Bid

00 12 00 Bid Bond

00 21 13 Instructions to Bidders

00 41 13 Form for General Bid

00 43 23 Alternates (see also Sect. 01-23-00)

00 52 00 Agreement

00 53 00 General Conditions

00 61 00 Performance Bond

00 61 50 Payment Bond

00 65 00 Compliance

00 71 00 Prevailing Wage Schedule

00 86 00 Permits

### **Division 01 Technical Specifications /Project Manual**

01 10 00 Summary of Work

01 23 00 Alternates (See also Sect. 00 43 23)

01 31 14 Conduct of Work

01 31 19 Project Meetings

01 33 00 Submittals Procedure

01 45 00 Quality Control

01 52 10 Temporary Facilities

01 74 23 Final Cleaning

01 76 00 Protecting Installed Construction

01 77 00 Project Close Out

01 78 36 Warranties

01 78 39 Record Documents

### **Division 02 -**

02 20 00 Site Requirements

02 61 00 Excavation and Handling of Contaminated Materials

02 81 00 Transportation of Contaminated Materials

### **Division 03**

03 10 00 Concrete

03 20 00 Concrete Reinforced

03 28 24 Columbarium

03 30 00 Cast in Place Concrete

## TABLE OF CONTENTS

**Mount Feake Cemetery Expansion, 203 Prospect Street, Waltham, MA**

*Section  
Number      Title of Document / Section*

**Division 31**

31 10 10 Site Clearing  
31 20 00 Earth Moving  
31 25 00 Erosion and Sediment Control

**Division 32**

32 12 16 Asphalt Paving  
32 90 00 Planting, Seeding and Sodding

**Division 33**

33 11 00 Water Utility Distribution Piping  
33 13 00 Disinfecting of Water Distribution Piping  
33 41 00 Storm Drainage

**DRAWINGS**

**REPORTS**

**END OF TABLE OF CONTENTS**

## **DIVISION 00**

# **Procurement & Contracting Requirements**



SECTION 00 11 16

INVITATION TO BID

In accordance with M.G.L. c.30, §39M, the City of Waltham will receive sealed bids for the MT. FEAKE CEMETERY EXPANSION PROJECT at the CITY OF WALTHAM PROCUREMENT OFFICE until **10:00 a.m. on Monday, March 12, 2018** located at: 610 Main Street, Waltham, MA 02452, at which time they will be publicly opened and read. The MT. FEAKE CEMETERY EXPANSION PROJECT will include the expansion of cemetery burial plot locations to currently undeveloped and operational areas. Additional work to include construction of detention pond, grading, drainage, utilities, and extension of access ways, loaming, seeding, landscaping, and installation of signage and marker. Work is to conform to the order of conditions and superseding order of conditions from DEP.

Copies of the Contract Documents may be obtained on line only by visiting the City web site at [www.city.waltham.ma.us/bids](http://www.city.waltham.ma.us/bids) after 12:00 p.m. on Friday, Feb. 16, 2018

Each bid shall be accompanied by a bid guarantee in the form of a bid bond, issued by a responsible surety company licensed to do business in Massachusetts, or a certified check, or a treasurer's or cashier's check issued by a responsible bank or trust company, made payable to the City of Waltham.

Each bid shall be accompanied by:

1. General Bid Form
2. Bid Bond
3. References for a minimum of Five (5) projects of similar size and scope.
4. Compliance Documents, Section 00 65 00

No bidder may withdraw its bid for at least 60 days after the time and date set for the receipt of General Bids without the consent of the City of Waltham.

The City of Waltham reserves the right to reject any or all bids, if it deems it is in its interest to do so.

END OF SECTION

**5% BID BOND**

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER (*Name and Address*):

SURETY (*Name and Address of Principal Place of Business*):

OWNER (*Name and Address*):

**BID**

Bid Due Date:

Description (*Project Name and Include Location*):

**BOND**

Bond Number:

Date (*Not earlier than Bid due date*):

Penal sum \_\_\_\_\_ \$ \_\_\_\_\_  
(Words) (Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

**BIDDER****SURETY**

\_\_\_\_\_  
Bidder's Name and Corporate Seal (Seal) \_\_\_\_\_  
Surety's Name and Corporate Seal (Seal)

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

By: \_\_\_\_\_  
Signature (Attach Power of Attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_

Attest: \_\_\_\_\_

Signature

Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

*Note: Above addresses are to be used for giving any required notice. Provide execution by any additional parties, such as joint venturers, if necessary.*

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
  - 3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
  - 3.2 All Bids are rejected by Owner, or
  - 3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.

9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

1.01 IDENTIFICATION

- A. Awarding Authority: City of Waltham
  - 1. Joseph Pedulla, MCPPO, Chief Procurement Officer
  - 2. 610 Main Street, Waltham, MA 02452
  - 3. Telephone: 781-314-3244
  - 4. Email: [jpedulla@city.waltham.ma.us](mailto:jpedulla@city.waltham.ma.us)
- B. Owner's Representatives: Nesra Engineering, LLC
  - 1. Address: P.O. Box 533, East Taunton, MA 02718
  - 2. Contact: Arsen Hambardzumian, P.E.
  - 3. Telephone: 617-506-3772
  - 4. Email: [AH@Nesraeng.com](mailto:AH@Nesraeng.com)

1.02 BIDDING DOCUMENTS

- A. This "INSTRUCTIONS TO BIDDERS" contains important information about bidding procedures and is intended to provide guidance and assistance to bidders. This "INSTRUCTIONS TO BIDDERS" does not change or supersede the provisions of Law or the Contract Documents.
- B. Bid Documents consist of one copy of the Contract Drawings and Technical Specifications.
  - 1. Bid Documents are available at the Waltham City Hall, Procurement Office, 610 Main Street, Waltham, MA 02452.
  - 2. Bid sets will be issued only in complete sets.
  - 3. General Bidders may obtain one bid set for a refundable amount of \$150.00.
  - 4. Additional Bid Sets may be purchased for a non-refundable \$150.00 per bid set and must be paid for using a separate check than the bid document deposit.

- C. Bid Documents Deposit will be refunded if documents are returned in full and in satisfactory condition within 15 business days of the opening of the bids.
- D. Bid document deposit shall be in the form of cash, company check or bank check payable to the City of Waltham.
- E. If special mailing or handling is requested by the Bidder, provide a non-refundable company check or bank check separate from the deposit check, in the amount of \$50.00 payable to the City of Waltham. This check must be received prior to shipment of bidding documents.

1.03 PRE-BID CONFERENCE

- A. A pre bid conference is scheduled for **Thursday, March 1, 2018 at 10:00 a.m.** Attendees should meet at MT. FEAKE CEMETERY, Prospect Street entrance. Questions arising from the site visit shall be directed to the Owner's Representative.

1.04 BID DUE DATE

- A. Sealed General Bids are due at or before **10:00 a.m. on Monday, March 12 2018** in the City's Procurement Office, 610 Main Street, Waltham, MA 02452, at which time bids will be opened in public and Bidders may be present. The Bids of the three lowest General Bids may not be withdrawn for 60 days after receipt of General Bids. (Saturdays, Sundays and legal holidays excluded)

1.05 BIDDING REQUIREMENTS

- A. All bids are subject to all applicable provisions of law including, without limitation, M.G.L. Chapter 149, Sections 44A through 44J, and Chapter 30, Section 39 M, as amended.
- B. Each bidder shall visit the site of the proposed work and become fully and completely aware of all existing conditions, existing facilities, and the character of the operations to be carried on under the proposed Contract. Each bidder shall make itself fully understand the facilities, physical conditions, and restrictions attending the work under the Contract. Failure to make such examinations will not relieve the bidder from any obligation under the bidder's bid or sub-bid as submitted, nor shall it serve as the basis for change orders or equitable adjustments.
  - 1. Site visit shall be conducted prior to the completion and submission of the bid.
- C. Each bidder shall thoroughly examine and become familiar with the Contract Documents and the Bidding Documents. Failure to make thorough examinations will not relieve the bidder from any obligation under the bidder's bid as

submitted, nor shall it serve as the basis for change orders or equitable adjustments.

- D. Bidders shall promptly notify the Owner's Representative of questions, ambiguities, inconsistencies, errors, or omissions, which they may discover upon examination of the Contract Documents, the site, and local conditions.
1. Submit written requests for clarification and interpretation to the Owner's Representative by mail or email.
  2. Requests for clarifications and interpretations must be received by the Owner's Representative [REDACTED]
  3. The Awarding Authority's response will be in the form of written Addenda, which shall become part of the Contract Documents. Clarifications and interpretations offered by the Awarding Authority in any form other than formal, written addenda shall be invalid.
  4. Addenda will be issued to every bidder on record as having obtained bid documents. Copies of Addenda will be available at locations where Contract Documents are filed for public inspection as listed in the Advertisement and these "INSTRUCTIONS TO BIDDERS".
    - a. All addenda shall be issued by email with confirmation of receipt by email only unless otherwise requested by the Bidder.
  5. Bidders shall acknowledge Addenda in the space provided on the bid forms. Failure of a bidder to acknowledge Addenda in the spaces provided on the bid form may cause rejection of the bid or lead to a protest. Failure of a bidder to receive any addenda shall not relieve it from any obligation under its bid as submitted.

**1.06 PREPARATION AND SUBMISSION OF BIDS**

- A. Submit one (1) copy of the bid form, bid deposit and all other necessary information outlined in the specifications, in a sealed envelope. Clearly identify envelope with:
1. Name of the Project
  2. The name of the Awarding Authority
  3. The name, business address, and business telephone number of the bidder
- B. If forwarding a bid by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified above.
- C. General Bids must be submitted on the prescribed forms. All blank spaces must be filled in, either in ink or typewritten, both in words and figures. Print "N/A" in



any space not needed or used. Each General Bid shall include all documents required in the "INSTRUCTIONS TO BIDDERS".

- D. Do not alter bid forms. Do not include any recapitulation of the work to be done. Do not provide any information not requested. Do not strike out, line out, white out, or erase any information.
- E. Any bid may be withdrawn prior to the scheduled time of the opening of bids or authorized postponement by written request. Any bid received after the time and date specified for opening of bids shall not be considered.
- F. Each General Bid must be accompanied by a Bid Deposit in the form of a Bid Bond issued by a surety company qualified to do business in the Commonwealth of Massachusetts, in the amount of 5% of the total Bid price. The Bid deposit will be retained from the apparent lowest qualified bidder until a Contract is executed. Bidders other than the apparent lowest qualified bidder will have bid deposits returned within five (5) business days, excluding Saturdays, Sundays and legal holidays, after the opening of the general bids.

#### 1.05 PERFORMANCE AND PAYMENT BONDS

- A. The General Bidder selected as General Contractor shall furnish the Awarding Authority with a Performance Bond and a Labor and Materials Payment Bond in the full amount of the Contract Price including possible add alternates. Bonds shall be issued by a surety company that is licensed to do business in the Commonwealth of Massachusetts, State Division of Insurance. Bond form shall be bound in the Project Manual or other form approved by the Awarding Authority
  - 1. Whenever the Contract Price is adjusted by Change Order, the General Contractor shall adjust the amount of both the Performance Bond and a Labor and Materials Payment Bond to the new full amount of the Contract Price. The cost of this adjustment shall be included in the General Contractor's mark-up of Change Orders.
- B. All Performance Bond and Labor and Materials Payment Bond costs shall be included in the Bid Amount and all premiums for bonds shall be paid by the General Contractor.
- C. With each bond provide certified power of attorney or other certificate of authority where bond is executed by an agent, officer, or other representative of Contractor or surety.

#### 1.06 TAX EXEMPTION

- A. Materials and equipment purchased for permanent installation in the project are exempt from the Massachusetts Sales and United States Tax. Each bidder shall take this exemption into account in calculating its bid for the work. The Awarding Authority will provide the Sales Tax Exemption Number to the successful bidder

upon the bidder's request. In compliance with IRS regulations, the Contractor shall provide the Awarding Authority with copies of all receipts for materials and products used for this Contract purchased using Awarding Authority's Tax Exemption Number.

**1.07 CONTRACT AWARD INFORMATION**

- A. The Awarding Authority reserves the right to waive informalities in any or all bids; reject any or all bids; to revise the Contract Documents and re-bid, if it is in the public interest to do so.
- B. The "Lowest Responsible and Eligible Bidder" means the General Bidder whose bid is the lowest of those General Bidders who demonstrably possess the skill, ability, and integrity necessary for faithful performance of the work, and who certify that they are able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work.
- C. The Contract will be awarded within 30 days after receipt of General Bids (Saturdays, Sundays, and legal holidays excluded) to the lowest responsible and eligible bidder, except in the event of substitution as provided under M.G.L. Chapter 149, Section 44E and 44F, in which case the procedure as required by these Sections of Law shall govern the award of the Contract. No bid shall be considered accepted until the Awarding Authority has issued a written Notice of Award sent by mail or delivered to the address given by the successful bidder on its bid form.

**1.08 LIQUIDATED DAMAGES**

- A. In the event that a successful bidder should fail or refuse to execute and deliver the Contract and Bonds required within ten (10) days after issuance of a Notice of Award by the Awarding Authority, the Contractor shall forfeit its bid deposit as liquidated damages.
- B. If the Contractor fails to satisfactorily complete the work on or before the date of completion fixed herein or as duly extended by written certification of the Owner, the Contractor agrees that the City of Waltham shall deduct from the payments due the Contractor each month the sum of \$500.00 for each calendar day of delay which sum is agreed upon not as a penalty, but as a fixed and liquidated damages for each day of such delay. If after 14 calendar days from the date of completion, the Contractor fails to satisfactorily complete the work, the Contractor agrees that the City of Waltham shall deduct from the payments due the Contractor each month the sum of \$1000.00 for each calendar day of delay which sum is agreed upon not as a penalty, but as a fixed and liquidated damages for each day of such delay. If the payments due the Contractor are less than the amount of such liquidated damages, said damages shall be deducted from any other moneys due or to become due the Contractor, and, in case such damages shall exceed the amount of all moneys due or to become due the Contractor, the Contractor or his Surety shall pay the balance to the City of Waltham.

1.09 PROJECT CONTRACT TIMELINE

- A. All physical construction shall commence as early as weather permits, but no earlier than February 12<sup>th</sup>, 2018 and shall be substantially completed by July 16<sup>th</sup>, 2018 with final completion, including submission of close-out documents, by August 1<sup>st</sup>, 2018.

1.10 PERMITS

- A. All permits and approvals for installation of the work (if any) shall be obtained and paid for by the Contractor.

END OF SECTION

SECTION 00 41 13

GENERAL BID FORM

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

From: (Insert name of General Bidder \_\_\_\_\_)

To: Joseph Pedulla, Chief Procurement Officer, Purchasing Department, City of Waltham

A. The undersigned proposes to furnish all labor and materials required for the MT. FEAKE CEMETERY EXPANSION PROJECT in accordance with the accompanying Plans and Specifications prepared by Nesra Engineering, LLC, for the contract price specified below, subject to additions and deductions according to the terms of the specifications.

B. The bid includes addenda number(s) \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.

C. Base Bid: The proposed Contract Amount to furnish all Base Bid labor, equipment and materials associated with the MT. FEAKE CEMETERY EXPANSION PROJECT, Waltham, Massachusetts in accordance with the Contract Documents is:  
**BASE BID CONTRACT LUMP SUM PRICE**

words \_\_\_\_\_

numbers \$ \_\_\_\_\_

D. Alternates:

1. Alternate 1 –The proposed Contract Amount to furnish all Alternate No. 01 labor, equipment and materials associated with this Alternate as detailed in Section 00 43 23 Alternates and in accordance with the Contract Documents is

\_\_\_\_\_ Dollars,

\$ \_\_\_\_\_

**GRAND TOTAL (c+d)** \$ \_\_\_\_\_

E. The undersigned agrees that, if selected as General Contractor, he will within five (5) days, Saturdays, Sundays, and legal holidays excluded, after presentation thereof by the Awarding Authority, execute a contract in accordance with the terms of this bid and furnish a performance bond and also a labor and materials or payment bond, each of a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the Awarding Authority and each in the sum of the contract price, the premiums for which are to be paid by the General Contractor and are included in the contract price.

F. The Bidder proposes to provide all labor and materials necessary to complete the work, as specified in the Contract Documents, and as is reasonably expected due to existing conditions and required construction, within the completion time specified in the General Bid Form.

*MT. FEAKE CEMETERY  
EXPANSION PROJECT  
WALTHAM, MASSACHUSETTS*

- G. The undersigned hereby certifies that he/she/it is able to furnish labor that can work in harmony with all other elements of the labor employed, or to be employed on the work, and that he will comply fully with all laws and regulations applicable to this award.
- H. The undersigned further certifies under the penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

---

Company Name

---

Name and Title of Person Signing Bid

---

Signature

---

Address

---

Phone/Fax Number/Email

END OF SECTION

SECTION 00 43 23

ALTERNATES FORM

1.1 BID INFORMATION

- A. Bidder: \_\_\_\_\_.
- B. Mt. Feake Cemetery Expansion Project, Waltham, Massachusetts.
- C. City of Waltham.
- D. 610 Main Street, Waltham, MA 02452.

1.2 DESCRIPTION

- A. The undersigned Bidder proposes the amount below be added to or deducted from the Base Bid if particular alternates are accepted by Owner. Amounts listed for each alternate include costs of related coordination, modification, or adjustment.
- B. If the alternate does not affect the Contract Sum, the Bidder shall indicate "NO CHANGE."
- C. If the alternate does not affect the Work of this Contract, the Bidder shall indicate "NOT APPLICABLE."
- D. The Bidder shall be responsible for determining from the Contract Documents the effects of each alternate on the Contract Time and the Contract Sum.
- E. Owner reserves the right to accept or reject any alternate, in any order, and to award or amend the Contract accordingly within sixty (60) days of the Notice of Award unless otherwise indicated in the Contract Documents.
- F. Acceptance or non-acceptance of any alternates by the Owner shall have no effect on the Contract Time unless the "Schedule of Alternates" Article below provides a formatted space for the adjustment of the Contract Time.
- G. SCHEDULE OF ALTERNATES

Alternate I: Pulverize, level, compact and repave Veterans Ave.

1. ADD
  2. \_\_\_\_\_ Dollars  
(\$\_\_\_\_\_).
  3. ADD\_\_\_\_ DEDUCT\_\_\_\_calendar days to adjust the Contract Time for this alternate.
- H. Respectfully submitted this \_\_\_\_ day of \_\_\_\_\_, 2016.
- I. Submitted by: \_\_\_\_\_ (Name of bidding firm or corporation).
- J. Authorized Signature: \_\_\_\_\_ (Handwritten signature).
- K. Signed by: \_\_\_\_\_ (Type or print name).
- L. Title: \_\_\_\_\_ (Owner/Partner/President/Vice President).

END OF DOCUMENT

**Section 00 52 00  
FORM OF CONTRACT**

**AGREEMENT** made between the **CITY OF WALTHAM**, a municipal corporation duly established under the laws of the Commonwealth of Massachusetts, through its Mayor thereunto duly authorized, hereinafter called the OWNER, and \_\_\_\_\_ having a usual place of business at \_\_\_\_\_ hereinafter called the CONTRACTOR.

The CONTRACTOR having accepted the Public Bid terms, condition and specifications for the **Mount Feake Cemetery Expansion** of \_\_\_\_\_ all of which are hereto attached and made a part hereof, hereinafter called the DOCUMENTS, and the CONTRACTOR hereby agrees to provide the labor, materials, services and work in accordance with the quotation, bid, proposal and said DOCUMENTS

If applicable, all contractors must comply with the prevailing wage rate law as required under the provisions of all Massachusetts General Law

All appropriate Bonds and Certificates of Insurance, per specifications, will be submitted before Contract is signed. This Contract shall not be in effect nor any work commenced until the Mayor signs the Contract.

IN WITNESS WHEREOF, the OWNER sets its hand and corporate seal through its Purchasing Agent thereunto duly authorized, and the CONTRACTOR hereunto sets its hand and seal on the day and year first above written.

Bid package and company response are incorporated herewith by reference.

**APPROVED AS TO FORM ONLY**

\_\_\_\_\_  
John Cervone,  
City Solicitor  
Date\_\_\_\_\_

**APPROVED, MAYOR**

\_\_\_\_\_  
Jeannette A. McCarthy,  
Mayor  
Date\_\_\_\_\_

**WALTHAM BUILDING DEPARTMENT**

\_\_\_\_\_  
Michael Chiasson, Director  
Consolidated Public Works .  
Date\_\_\_\_\_

**CITY OF WALTHAM**

\_\_\_\_\_  
Joseph P. Pedulla, CPO  
Purchasing Agent  
Date: \_\_\_\_\_

**FOR THE COMPANY**

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Print Name  
Date \_\_\_\_\_

**AUDITING DEPT.**

\_\_\_\_\_  
Paul G. Centofanti,  
City Auditor  
Date\_\_\_\_\_



## **SECTION 00 53 00**

### **GENERAL CONDITIONS**

#### **1. INFORMATION**

All information shall come from the Office of the City Purchasing Agent. The Contractor shall inquire at this office for any information needed. Wherever the words "or equal as approved" are used, it is to be understood that the opinion of the City Purchasing Agent shall govern.

#### **2. SUITS**

The Contractor shall assume defense of and shall indemnify and hold the City and its agents harmless from all suits and claims against the City and its sub-contractors arising from the use of any invention, patent right labor or employment, or from any act of omission or neglect of the City, its agents, employees or any subcontractor in performing the work, under this contract.

#### **3. LAWS AND REGULATIONS**

The Contractor shall conform to all the applicable rules, regulations, laws and ordinances of the City of Waltham, the Commonwealth of Massachusetts, the United States of America and all agencies having jurisdiction over this contract.

#### **4. PROTECTION OF PROPERTY**

The Contractor shall take all proper precautions to protect the City's property from damage and unnecessary inconvenience. Any City property damaged by the Contractor in carrying out the provisions of this contract shall be restored to its original condition, by and at the expense of the Contractor.

#### **5. PROTECTION OF PERSONS**

The Contractor shall take all proper precautions to protect persons from injury, unnecessary inconvenience, and shall be responsible for his failure to do so. The Contractor agrees to hold the City harmless from any and all liabilities of every nature and description, which may be suffered through bodily injury, including death, to any person, by reason of negligence of the Contractor, his agents or employees, or any subcontractor.

#### **6. INSURANCE**

A. WORKMAN'S COMPENSATION: The Contractor shall provide by insurance for the payment of compensation and furnishing of other benefits under Chapter 152 of the General Laws of the Commonwealth of Massachusetts to all persons to be employed under this contract, the premiums for which shall be paid by the Contractor.

B. COMPREHENSIVE GENERAL LIABILITY

Bodily Injury:	\$1,000,000 Each Occurrence \$2,000,000 Aggregate
Property Damage:	\$1,000,000 Each Occurrence \$2,000,000 Aggregate

C. AUTOMOBILE (VEHICLE) LIABILITY

Bodily Injury \$2,000,000 Each Occurrence

Property Damage \$1,000,000 Aggregate

D. UMBRELLA POLICY

General liability \$2,000,000

Your bid response must include a Certificate of Insurance with the above limits as a minimum. In addition, the Certificate of Insurance must have the following text contained in the bottom left box of the Certificate: **"The City of Waltham is a named Additional Insured for all Insurance"**. The Certificate of Insurance must be mailed directly to:

Office of the Purchasing Agent

Purchasing Department

City of Waltham

610 Main Street

Waltham, MA 02452

**7. LABOR AND MATERIALS BOND**

The Contractor agrees to execute and deliver to the City, a Labor and Materials or Payment Bond equal to 100% of the contract value. This contract shall not be in force until said bond has been delivered and accepted by the City. Bonds shall be issued by a company licensed by the Commonwealth of Massachusetts.

**A LETTER FROM A SURETY COMPANY CERTIFYING THAT THE CONTRACTOR IS QUALIFIED AND CAPABLE OF OBTAINING THE ABOVE BONDS MUST BE INCLUDED WITH HIS/HERS BID.**

**8. PERSONNEL:**

The Contractor shall employ a competent supervisor and all properly licensed personnel necessary to perform the services required in this contract. The City Purchasing Agent shall have the right to require the Contractor to remove and/or replace any of the personnel for nonperformance or for unprofessional behavior. The City Purchasing Agent may require the Contractor to submit a weekly performance record of the areas and of the work performed, on forms approved by the City Purchasing Agent. The Contractor or his supervisor shall be available to inspect such work as required by the City Purchasing Agent.

**9. PREVAILING WAGES**

The Contractor is required to pay the prevailing wages as determined under the provisions of Chapter 149, Sections 26 and 27D of the Massachusetts General Laws, including the submission of weekly payrolls to the awarding authority. Copies of the Prevailing Wage Schedule is found on line at [www.city.waltham.ma.us/open-bids](http://www.city.waltham.ma.us/open-bids)

**10. MATERIALS**

The City or its Agent reserves the right to approve or reject any supplies, material or equipment used by the Contractor. The Contractor agrees to replace any supplies, material or equipment used by the

Contractor. The Contractor agrees to replace any rejected supplies, materials or equipment, to the satisfaction of the City or its Agents.

**11. TERMINATION OF CONTRACT**

This contract may be terminated by the City upon deliverance to the Contractor of a five-day written notice of said termination.

**12. CONTRACT OBLIGATIONS**

Contract obligations on behalf of the City are subject to an annual appropriation to cover the contract obligation.

**13. BIDDER EXPERIENCE EVALUATION**

Each bidder shall submit with his bid, all the information relative to their experience and qualifications in performing the work required under this contract and shall have been in business for a minimum of five (5) years, in order for their bid to be considered.

**14. NOT-TO-EXCEED AMOUNT**

The bid amount proposed in your company's response is a "not-to- Exceed" amount unless the City makes changes, in writing, to the scope of work to be performed. The Change Order must be signed and approved by the City's Purchasing Agent, City Auditor, Law Department and the Mayor prior to the commencement of the change order work. No work is to begin until the proper approvals have been obtained. A change order will be priced at the unit price. Failure to comply with this procedure will result in the cancellation of the contract and the non-payment of services provided

**16. FINANCIAL STATEMENTS.**

The City may require, within five (5) days after the bid opening, a complete and detailed Financial Statement prepared by a Certified Public Account, to determine a bidder's financial stability.

**17 BREACH OF CONTRACT/ NON PERFORMANCE**

If the Contractor shall provide services in a manner, which is not to the satisfaction of the City, the City may request that the Contractor refurnish services at no additional cost to the City until approved by the City. If the Contractor shall fail to provide services, which are satisfactory to the City, the City in the alternative may make any reasonable purchase or Contract to purchase services in substitution for those due from the Contractor. The City may deduct the cost of any substitute Contract for nonperformance of services together with incidental and consequential damages from the Contract price and shall withhold such damages from sums due or to become due to the Contractor. If the damages sustained by the City exceed sums due or to become due, the Contractor shall pay the difference to the City upon demand. The Contractor shall not be liable for any damages sustained by the City due to the Contractor's failure to furnish services under the terms of this Contract if such failure is in fact caused by the occurrence of a contingency the nonoccurrence of which was a basic assumption under which this Contract was made, including a state of war, embargoes, expropriation of labor strike or any unanticipated federal, state or

municipal governmental regulation of order, provided that the Contractor has notified the City in writing of such cause within seven (7) days after its occurrence.

**18 RIGHT TO AUDIT**

The City of Waltham has the right to review and audit documents related to this contract. This right extends to any subcontractor, supplier or other entity used by the prime contractor to fulfill the obligations under this contract.

**19. CITY ORDINANCE. APPROVAL OF CONTRACTS BY MAYOR, SEC. 3-12 OF THE CITY ORDINANCES.**

All contract made by any department, board or commission where the amount involved is two thousand dollars (\$2,000) or more shall be in writing, and no such contract shall be deemed to have been made or executed until the approval of the Mayor is affixed thereto. Any construction contract shall, and all other contracts may, where the contract exceed five thousand dollars (\$5,000) be required to be accompanied by a bond with sureties satisfactory to the Mayor.

**20. BID OPENING INCLEMENT WEATHER**

If, at the time of the originally scheduled bid opening, City Hall is closed to inclement weather or another unforeseeable event, the bid opening will be extended until 2:00 PM on the next normal business day. Bids will be accepted until that date and time.

**21 FUNDS APPROPRIATION.**

THE CONTRACT OBLIGATION ON BEHALF OF THE CITY IS SUBJECT TO PRIOR APPROPRIATION OF MONIES FROM THE GOVERNMENTAL BODY AND AUTHORIZATION BY THE MAYOR.

**22 THE AWARDING AUTHORITY RESERVES THE RIGHT TO REJECT ANY OR ALL BIDS, OR ANY PART OF ANY BID, WHICH IN THE OPINION OF THE AWARDING AUTHORITY, IS IN THE BEST INTERESTS OF THE CITY OF WALTHAM.**

SECTION 00 61 00

PERFORMANCE BOND

CONTRACTOR (*name and address*):

SURETY (*name and address of principal place of business*):

OWNER (*name and address*):

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description (*name and location*):

BOND

Bond Number:

Date (*not earlier than the Effective Date of the Agreement of the Construction Contract*):

Amount:

Modifications to this Bond Form: ☐ None ☐ See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

\_\_\_\_\_  
(seal)

Contractor's Name and Corporate Seal

\_\_\_\_\_  
(seal)

Surety's Name and Corporate Seal

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

By: \_\_\_\_\_  
Signature (*attach power of attorney*)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

**Attest:** \_\_\_\_\_

**Attest:** \_\_\_\_\_

\_\_\_\_\_

Signature

Signature

\_\_\_\_\_

Title

\_\_\_\_\_

Title

***Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.***

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after:

3.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

3.3 The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the

Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the

amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

7.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

7.2 additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall



be construed as a statutory bond and not as a common law bond.

#### 14. Definitions

14.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

14.2 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

14.3 Contractor Default: Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

14.5 Contract Documents: All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

16. Modifications to this Bond are as follows:

**PAYMENT BOND**

CONTRACTOR (*name and address*):

SURETY (*name and address of principal place of business*):

OWNER (*name and address*):

**CONSTRUCTION CONTRACT**

Effective Date of the Agreement:

Amount:

Description (*name and location*):

**BOND**

Bond Number:

Date (*not earlier than the Effective Date of the Agreement of the Construction Contract*):

Amount:

Modifications to this Bond Form: ☐ None ☐ See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

**CONTRACTOR AS PRINCIPAL**

**SURETY**

\_\_\_\_\_  
(*seal*)

Contractor's Name and Corporate Seal

\_\_\_\_\_  
(*seal*)

Surety's Name and Corporate Seal

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

\_\_\_\_\_  
Signature

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

Signature (*attach power of attorney*)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

**Attest:** \_\_\_\_\_

Signature

**Attest:** \_\_\_\_\_

Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

***Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.***

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond shall arise after the following:
  - 5.1 Claimants who do not have a direct contract with the Contractor,
    - 5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
    - 5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).
  - 5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
  - 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and

the basis for challenging any amounts that are disputed; and

- 7.2 Pay or arrange for payment of any undisputed amounts.
- 7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.
8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the

Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be

deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

## 16. Definitions

16.1 **Claim:** A written statement by the Claimant including at a minimum:

1. The name of the Claimant;
2. The name of the person for whom the labor was done, or materials or equipment furnished;
3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
4. A brief description of the labor, materials, or equipment furnished;
5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
7. The total amount of previous payments received by the Claimant; and
8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4 **Owner Default:** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

16.5 **Contract Documents:** All the documents that comprise the

agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

18. Modifications to this Bond are as follows:

## **SECTION 00 65 00**

### **COMPLIANCE FORMS**

**(PLEASE COMPLETE AND SUBMIT THESE FORMS WITH YOUR RESPONSE)**



**NON-COLLUSION FORM AND TAX COMPLIANCE FORM**

**CERTIFICATE OF NON-COLLUSION**

The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word “person” shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity or group of individuals. The undersigned certifies that no representations made by any City officials, employees, entity, or group of individuals other than the Purchasing Agent of the City of Waltham was relied upon in the making of this bid

\_\_\_\_\_, \_\_\_\_\_  
(Signature of person signing bid or proposal)      Date

\_\_\_\_\_  
(Name of business)

---

**TAX COMPLIANCE CERTIFICATION**

Pursuant to M.G.L. c. 62C, & 49A, I certify under the penalties of perjury that, to the best of my knowledge and belief, I am in compliance with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

\_\_\_\_\_, \_\_\_\_\_  
Signature of person submitting bid or proposal      Date

\_\_\_\_\_  
Name of business

**NOTE**

Failure to submit any of the required documents, in this or in other sections, with your bid response package may cause the disqualification of your proposal.

**CERTIFICATE OF VOTE OF AUTHORIZATION**

Date:

I \_\_\_\_\_, Clerk of \_\_\_\_\_ hereby certify that at a meeting of the Board of Directors of said Corporation duly held on the \_\_\_\_\_ day of \_\_\_\_\_ at which time a quorum was present and voting throughout, the following vote was duly passed and is now in full force and effect:

VOTED: That \_\_\_\_\_ (*name*) is hereby authorized, directed and empowered for the name and on behalf of this Corporation to sign, seal with the corporate seal, execute, acknowledge and deliver all contracts and other obligations of this Corporation; the execution of any such contract to be valid and binding upon this Corporation for all purposes, and that this vote shall remain in full force and effect unless and until the same has been altered, amended or revoked by a subsequent vote of such directors and a certificate of such later vote attested by the Clerk of this Corporation.

I further certify that \_\_\_\_\_ is duly elected/appointed \_\_\_\_\_ of said corporation

SIGNED:

(Corporate Seal)

\_\_\_\_\_  
Clerk of the Corporation:

Print Name: \_\_\_\_\_

---

COMMONWEALTH OF MASSACHUSETTS

County of \_\_\_\_\_

Date:

Then personally appeared the above named and acknowledged the foregoing instrument to be their free act and deed before me, \_\_\_\_\_

Notary Public;

My Commission expires: \_\_\_\_\_

**CORPORATION IDENTIFICATION**

The bidder for the information of the Awarding Authority furnishes the following information.

If a Corporation:

Incorporated in what state \_\_\_\_\_

President \_\_\_\_\_

Treasurer \_\_\_\_\_

Secretary \_\_\_\_\_

Federal ID Number \_\_\_\_\_

If a foreign (out of State) Corporation – Are you registered to do business in Massachusetts?

Yes \_\_\_\_\_, No \_\_\_\_\_

If you are selected for this work you are required under M.G.L.ch. 30S, 39L to obtain from the Secretary of State, Foreign Corp. Section, State House, Boston, a certificate stating that you Corporation is registered, and furnish said certificate to the Awarding Authority prior to the award.

If a Partnership: (Name all partners)

Name of partner \_\_\_\_\_

Residence \_\_\_\_\_

Name of partner \_\_\_\_\_

Residence \_\_\_\_\_

If an Individual:

Name \_\_\_\_\_

Residence \_\_\_\_\_

If an Individual doing business under a firm's name:

Name of Firm \_\_\_\_\_

Name of Individual \_\_\_\_\_

Business Address \_\_\_\_\_

Residence \_\_\_\_\_

Date \_\_\_\_\_

Name of Bidder \_\_\_\_\_

By \_\_\_\_\_

Signature \_\_\_\_\_

Title \_\_\_\_\_

Business Address \_\_\_\_\_ (POST OFFICE BOX NUMBER NOT ACCEPTABLE)

City \_\_\_\_\_

State \_\_\_\_\_

Telephone Number \_\_\_\_\_

Today's Date \_\_\_\_\_

## WEEKLY PAYROLL RECORDS REPORT & STATEMENT OF COMPLIANCE

In accordance with Massachusetts General Law c. 149, §27B, a true and accurate record must be kept of all persons employed on the public works project for which the enclosed rates have been provided, A Payroll Form has been printed on the reverse of this page and includes all the information required to be kept by law. Every contractor or subcontractor is required to keep these records and preserve them for a period of three years from the date of completion of the contract. In addition, every contractor and subcontractor is required to submit, on a weekly basis, a copy of his or her weekly payroll records to the awarding authority. For every week in which an apprentice is employed, a photocopy of the apprentice's identification card must be attached to the payroll report. Once collected, the awarding authority is also required to preserve those reports for three years. In addition, each such contractor, subcontractor, or public body shall furnish to the awarding authority directly, within fifteen days after completion of its portion of the work, a statement, executed by the contractor, subcontractor or public body who supervises the payment of wages, in the following form:

---

### STATEMENT OF COMPLIANCE

\_\_\_\_\_, 201\_\_

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

I do hereby state that I pay or supervise the payment of the persons employed by

\_\_\_\_\_ On the \_\_\_\_\_  
(Contractor, subcontractor or public body) (Building or project)

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

Signature \_\_\_\_\_, Title \_\_\_\_\_

Print \_\_\_\_\_, Date \_\_\_\_\_



**RIGHT TO KNOW LAW**

Any vendor who receives an order or orders resulting from this invitation agrees to submit a Material Safety Data Sheet (MSDS) for each toxic or hazardous substance or mixture containing such substance, pursuant to M.G.L. c. 111F, §§8,9 and 10 and the regulations contained in 441 CMR 21.06 when deliveries are made. The vendor agrees to deliver all containers properly labeled pursuant to M.G.L. c. 111F §7 and regulations contained in 441 CMR 21.05. Failure to furnish MSDS and/or labels on each container may result in civil or criminal penalties, including bid debarment and action to prevent the vendor from selling said substances, or mixtures containing said substances within the Commonwealth. All vendors furnishing substances or mixtures subject to Chapter 111F or M.G.L. are cautioned to obtain and read the laws, rules and regulations referenced above. Copies may be obtained from the State House Bookstore, Secretary of State, State House, Room 117, Boston, MA (617) 727-2834.

---

Authorized Signature Indicating Compliance with the Right-to-know laws:

---

Signature

Date

---

Print Name

**NOTE**

Failure to submit any of the required documents, in this or in other sections, with your bid response package may cause the disqualification of your proposal.

**DEBARMENT CERTIFICATION**

In connection with this bid and all procurement transactions, by signature thereon, the respondent certifies that neither the company nor its principals are suspended, debarred, proposed for debarment, declared ineligible, or voluntarily excluded from the award of contracts, procurement or non procurement programs from the Commonwealth of Massachusetts, the US Federal Government and /or the City of Waltham. "Principals" means officers, directors, owners, partners and persons having primary interest, management or supervisory responsibilities with the business entity. Vendors shall provide immediate written notification to the Purchasing Agent of the City of Waltham at any time during the period of the contract of prior to the contract award if the vendor learns of any changed condition with regards to the debarment of the company or its officers. This certification is a material representation of fact upon which reliance will be placed when making the business award. If at any time it is determined that the vendor knowingly misrepresented this certification, in addition to other legal remedies available to the City of Waltham, the contract will be cancelled and the award revoked.

---

Company Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_, State \_\_\_\_\_, Zip Code \_\_\_\_\_

Phone Number (\_\_\_\_) \_\_\_\_\_

E-Mail Address \_\_\_\_\_

Signed by Authorized Company Representative: \_\_\_\_\_

Print name. \_\_\_\_\_, Date \_\_\_\_\_

**10 HOURS OSHA TRAINING CONFIRMATION**

**Chapter 306 of the Acts of 2004**

**CONSTRUCTION PROJECTS**

**AN ACT RELATIVE TO THE HEALTH AND SAFETY ON PUBLIC**

The undersigned hereby certifies that all employees to be employed at a worksite for construction, reconstruction, alteration, remodeling, repair, installation, demolition, maintenance or repair of any public work or any public building estimated to cost more than \$10,000.00 have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first payroll report for each employee and will comply with all laws and regulations applicable to awards of subcontracts subject to section 44F.

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

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

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

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

Print Name \_\_\_\_\_

Date \_\_\_\_\_

*See following Chapter 306 of the Acts of 2004*

**NOTE**

Failure to submit any of the required documents, in this or in other sections, with your bid response package will be cause for the disqualification of your company.



## PROOF OF CONTRACTOR'S RESPONSIBILITY

Before a contract will be awarded to any bidder, he/she will be required to furnish evidence satisfactory to the City that he/she has all of the following qualifications:

- A. Ability, equipment, organization, and financial resources sufficient or enable him/her to construct and complete the work successfully within the time required.
- B. Experience during the past three (3) years in the successful completion of turf restoration projects, the magnitude of which shall be not less than one-half (1/2) the work herein specified. In this connection, the attention of the bidder is directed to the "Bidder's Experience" attached hereto, which shall be used in determining the responsibility of the bidder. The City may require additional information as necessary to determine the responsibility of the bidder.
- C. An experienced bidder shall be construed to mean that the bidder has an individual within his/her organization with the experience to supervise a job of this nature.

In the event the bidder fails, refuses, or neglects to submit any required information within the reasonable time stated in any request or fails to qualify as a responsible bidder, his/her bid guaranty shall be forfeited to the use of the owner, not as a penalty, but as liquidated damages.

The determination of whether a bidder is responsible shall rest solely with the City.

### BIDDER'S EXPERIENCE

The following is a list of the projects similar in character and scope to the work specified under this contract, which have been successfully completed by this bidder during the past three years.

This information must be furnished by each bidder. A completed project is one that has been accepted and the final payment received from the City or authorized representative.

---

Bidder's Signature

---

Date

COMPLETE ONLY IF YOUR COMPANY IS AN LLC

**CERTIFICATE OF AUTHORITY  
LIMITED LIABILITY COMPANY**

**The undersigned**, being (a/the) duly elected, qualified and active (member / manager) of \_\_\_\_\_,  
a Massachusetts limited Liability Company (hereinafter "the Company")

**Does Hereby Certify that**

- 1. The Articles of Organization of the Company were duly filed with the Office of the Secretary of State of the State of Massachusetts on \_\_\_\_\_, and the Articles of Organization have not been (further) amended.
- 2. The Company has complied with the publication requirements contained in Section 67 of the Limited Liability Company Law.
- 3. There exists an Operating Agreement of the Company and that the said Operating Agreement has not been amended or repealed and that the said Operating Agreement remains in full force and effect as of this date.
- 4. Neither the Articles of Organization nor the Operating Agreement (as amended) require any further act to be taken or a meeting to be held by its members other that as follows:
- 5. All said requirements, whether as contained in the Articles of Organization or in the Operating Agreement or by operation of law as to the transaction of \_\_\_\_\_, 20\_\_\_\_ have been met.
- 6. The following person or persons has/have been duly authorized by the Company to execute all documents in connection with said transaction and that the signature appearing to the right of their name(s) is his/her genuine signature.

NAME	OFFICE HELD	SIGNATURE
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

**IN Witness Whereof**, the undersigned has executed this Certificate of Authority this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
(Signature)

STATE OF MASSACHUSETTS, COUNTY OF \_\_\_\_\_

On the \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned personally appeared \_\_\_\_\_, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is (are) subscribed to the within instrument and acknowledged to me that he/she/ they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Notary Public: \_\_\_\_\_

My Commission Expires: \_\_\_\_\_

Notary Stamp:

**Section 00 71 00**

**Massachusetts Prevailing Wage Rates**

Are found at [www.city.waltham.ma.us/bids](http://www.city.waltham.ma.us/bids)

**Section 00 86 00**  
**CONSTRUCTION PERMIT APPLICATIONS AND FEES**

**1.1 GENERAL**

1. The City of Waltham has waived all fees for this Project; Contractor is required to file an Application and obtain all pertinent Permits before construction.
2. Contractor shall be responsible for all costs associated with fire watches and other ancillary fees (other than those waived) required to perform the Contract work.
3. Obtain forms from Building Department.

**END OF DOCUMENT**

# **DIVISION 01**

## **Technical Specifications & Project Manual**

SECTION 01 10 00

SUMMARY OF WORK

PART 1 – GENERAL

1.1 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.2 SITE WORK SCOPE

- A. Project Description: The project site is located at the Mt. Feake Cemetery, 203 Prospect Street, Waltham, Massachusetts.
  - 1. Protection of existing gravestones and monuments, roadways, access ways, walkways, signage, utilities, resource areas, and all other structures as indicated on the Drawings.
  - 2. Protection of all structures and surfaces not specified to be removed.
  - 3. Conduct materials testing as indicated in the specifications including but not limited to soils, asphalt and concrete testing.
  - 4. Install Erosion and Sediment controls in strict conformance with the Order of Conditions and Superseding Order of Conditions, as well as the design plans and specifications. In case of discrepancy, the governing order of requirements shall be
    - 1. Superseding Order of Conditions
    - 2. Order of Conditions
    - 3. Plans and Specifications.
  - 5. Installation of construction fence and construction access.
  - 6. Removal and disposal of existing vegetation, including trees, stumps, shrubs etc.
  - 7. Removal and disposal of existing tailings, as well as tailings and stones produced from screening operations during construction.
  - 8. Within the limits of the proposed plots, soils from finished grade elevation down to 6 feet below finished elevation shall not contain any rocks, boulders or debris larger than 18".

9. Installation of Detention pond and drainage structures.
10. Installation of water lines.
11. Installation of retaining walls and fences.
12. Preparation of sub-grade for access roads and staging/operation area.
13. Paving in two courses the access ways and staging areas.
14. Installation of plot markers and path markers.
15. Installation of columbarium.
16. Installation of walls and stockpile material cover structure in the staging/storage area.
17. Installation of planting materials.
18. Loam and seed the limits of work.
19. Disinfection of water lines.
20. Project closeout through Conservation Commission and obtaining approval for erosion control removal.
21. Removal and disposal of erosion control materials.
22. Submittal of As-Built documentation, warranties, attic stock etc. and project closeout.
23. All work either shown on the Drawings or included in the specifications unless specifically indicated as not to be done.

B. In addition, the Work under the Contract includes:

1. The restoration of any items damaged or destroyed by encroaching upon areas outside the Project Site.
2. Providing and restoring, where appropriate, all temporary facilities.
3. All other work indicated on the contract plans and/or specifications.

1.3 PERMITS AND FEES



*MT. FEAKE CEMETERY  
EXPANSION PROJECT  
WALTHAM, MASSACHUSETTS*

- A. The contractor, at its cost, shall schedule, secure and obtain all permits, approvals, licenses, and inspections necessary for the proper execution of the work under all sections of this project. All city required fees shall be waived.
- B. Contractor shall obtain a National Pollution Discharge Elimination System's (NPDES) Construction General Permit (CGP) and provide a Storm water Pollution Prevention Plan (SWPPP) with the Construction General Permit.
- C. The Contractor shall coordinate all of its work with the appropriate City of Waltham Departments and Agencies as required by the Contract Documents.

1.4 TIME OF COMPLETION

- A. Per front end specifications.

1.5 LIQUIDATED DAMAGES

- A. Per front end specifications.

END OF SECTION

SECTION 01 23 00

ALTERNATES

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 SCOPE

- A. This Section lists the Alternate(s) which appear in the Contract Documents. Consult the individual Sections for requirements to all alternatives.
- B. Bid price for each Alternate shall include overhead, profit, and all other expenses incidental to the Work under each Alternate.
- C. The Contractor and Subcontractors shall be responsible for examining the scope of each Alternate generally defined herein and for recognizing modifications to the Work caused by the Alternates and including the cost thereof in the bid price.

1.03 ALTERNATE NO. 1

- A. Pulverize, level, compact and repave Veterans Ave.

END OF SECTION

SECTION 01 31 14

CONDUCT OF THE WORK

1.01 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 PROJECT MANAGEMENT

- A. The work must be completed in a continuous uninterrupted operation except when noted. The Contractor must use sufficient personnel and adequate equipment to complete all the necessary work requirements within a minimum period of time.
- B. Unless specifically authorized by the Owner, in writing, the work must be conducted between the hours of 7:00 a.m. and 5:00 p.m. on Monday through Friday. No work is to be done on holidays, Saturdays, or Sundays other than for emergencies or as approved by the Owner.
- C. The Contractor is responsible for the security of partially completed work until the Owner accepts the project.
- D. Only materials and/or equipment intended and necessary for immediate use shall be brought onto the sites. At the end of each workday and at the completion of each phase of work, equipment and leftover or unused materials shall be removed from the sites.
- E. The Contractor is responsible for the security of the site.

1.03 SHUTDOWN OF SERVICES

- A. The Contractor's attention is especially called to the fact that the continuous operation of services for the Owner is mandatory. The work cannot result in the shutdown of any major utilities in adjacent City facilities without the Owner's consent in writing. If the Owner will not allow this shutdown, but wants instead a temporary means of supplying said services, the Contractor shall supply all labor, materials or whatever may be required to supply said temporary services at no extra cost to the Owner and in accordance with the state and local regulations on health and safety.

1.04 COORDINATION

- A. The Contractor shall submit at the pre-construction conference for approval to the Owner a detailed operational schedule showing the sequence of operations prior to commencement of any work at the sites. The Owner must approve any

changes to this operational plan, upon written notice, should the project fall behind the approved schedule through no fault of the city.

- B. The Contractor must retain on the Work sites during its progress a competent full time representative, satisfactory to the Owner. This representative shall not be changed, except with the consent of the Owner. The representative shall be in full charge of the work and all instructions given to this person by the Engineer shall be binding.
- C. Any overtime needed to maintain the operational schedule shall be provided by the contractor at no additional cost to the City.
- D. The Contractor must supply to the Owner the home and mobile telephone numbers of responsible persons who may be contacted during non-work-hours for emergencies on the Project.

1.05 CONSTRUCTION MATERIAL AND EQUIPMENT

- A. Furnish construction material and equipment which will be efficient, appropriate and large enough to secure a satisfactory quality of work and a rate of progress which will ensure the completion of the work within the Contract Time. If at any time such construction material or equipment appear to be inefficient, inappropriate or insufficient for securing the quality of work required or for producing the rate of progress aforementioned, Engineer may order the Contractor to increase the efficiency, change the character or increase the equipment and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligation to secure the quality of the work and rate of progress required.

1.06 OTHER OR ADJACENT LAND

- A. All adjacent areas to the LIMIT OF WORK, including all other cemetery sections and access ways will be in use during construction. The Contractor shall take all necessary precautions to ensure the public safety and convenience of the public during construction. Use of any on-site structures by the Contractor, proximate to the site work as a construction office, shall not be used unless the Owner gives express written consent.
- B. Work area shall be restricted to the areas shown on the Drawings and/or specified herein.
- C. There shall be no storage of materials, tools, and/or equipment within any of the occupied buildings. The Owner, in writing, must authorize any storage within City facilities.
- D. Additional work may be completed by another contractor on Owner's property adjacent to the project sites during construction. The Contractor shall make reasonable efforts to avoid conflicts and delays of either project and coordinate as required with other contractors working at the project site. Delays resulting

from failure to properly coordinate with other contractors will not be grounds for a claim for extra time or compensation.

1.07 OPEN EXCAVATIONS

- A. Adequately safeguard all open excavations by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons and damage to property. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, the Engineer may require special construction procedures such as limiting the length of the open trench and requiring that the trench shall not remain open overnight.
- B. Take precautions to prevent injury to the public due to open trenches. Provide adequate light at all open excavations, excavated material, equipment, or other obstacles, which could be dangerous to the public at night.

1.08 CARE AND PROTECTION OF PROPERTY

- A. The Contractor is responsible for the preservation of all public and private property and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, restore such property to a condition similar or equal to that existing before the damage was done, or fix the damage in another manner acceptable to the Engineer.

1.09 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES

- A. Upon execution of the contract and mobilization of the site, the Contractor is in full care and control of the site and assumes all liability for loss.
- B. Assume full responsibility for the protection of all structures, and utilities, public or private, including poles, signs, utilities in the street, gas pipes, water pipes, hydrants, sewers, drains and electrical and telephone cables, whether or not they are shown on the Drawings. Carefully support and protect all such structures and utilities from injury of any kind. Immediately repair any damage resulting from the construction operations.
- C. The Contractor shall bear full responsibility for obtaining all locations of underground structures and utilities, including existing water services, drain lines and sewers. Maintain services and pay costs or charges resulting from damage thereto.
- D. The Contractor shall notify Massachusetts Dig Safe and all non-participating utility companies at least 72 hours prior to start of any construction activity.

1.10 DISPOSAL OF EXCESS MATERIAL AND CLEAN-UP

- A. During the course of work, keep the site as clean and neat as possible. No soil storage is allowed within 100 feet of wetlands, or outside the limits of work. The contractor shall dispose of all existing, concrete, fencing, rock, asphalt, wood, trash, or contractor debris or residue resulting from the construction work and at the conclusion of the work, remove and haul away any surplus materials, broken pavement, lumber, equipment, temporary structures and any other refuse remaining from the construction activity and leave the entire construction site in a neat and orderly condition.
- B. The contractor shall comply with all applicable Federal, State and local laws and regulations concerning waste material disposal, as well as the specific requirements stated in the contract documents.
- C. Disposal of excess excavated material in wetlands, stream corridors and floodplains is strictly prohibited even if the permission of the property owner is obtained. Any violation of this restriction by the Contractor or any person employed by the contractor will be brought to the immediate attention of the responsible regulatory agencies, with a request that appropriate action be taken against the offending parties. The Contractor will be required to remove the fill and restore the area impacted at no additional cost to the Owner, and may be subject to fines by regulatory authorities.
- C. Any excess loam, fill or tailings shall be removed and disposed of properly by the contractor.

1.11 FACILITY LAYOUT AND GRADING

- A. Contractor shall employ a Massachusetts Registered Land Surveyor or Massachusetts Professional Engineer to locate proposed improvements as well as grade stakes. The Professional Land Surveyor or Engineer shall be approved by the Engineer.
- B. Material Testing Lab: Contractor shall employ an independent and qualified testing agency to be approved by the Engineer and Owner.

END OF SECTION

SECTION 01 31 19

PROJECT MEETINGS

PART I – GENERAL

1.01 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.
- B. This Section contains general information that applies to all work performed under the Contract and is inherently made a part of each specification section.

1.02 PROJECT MEETINGS

- A. Preconstruction Conferences: Conduct a preconstruction conference prior to beginning work on site. Require all major subcontractors and suppliers to attend. In general, the meeting shall cover the following subjects:
  - 1. Creation of project team directory listing contact person for each organization.
  - 2. Issuance of Contract Documents.
  - 3. Review of project constraints and work hours.
  - 4. Unloading policies, storage locations, temporary office locations, and temporary facilities.
  - 5. First aid, safety and security procedures.
  - 6. Cleaning, housekeeping and waste removal.
  - 7. Change order requirements.
  - 8. Progress payment requirements.
  - 9. Submittal Requirements, schedules and procedures.
  - 10. Record documents requirements and procedures.
  - 11. Video report of existing conditions prior to construction.
- B. Regular Progress Meetings: Conduct Progress Meetings to aid coordination and planning of the work and to create a forum to resolve coordination and scheduling problems and conflicts. Project meetings will be held as required at the job site but no less than once per week. Special project meetings may be

called at any time by the Owner or Engineer, and shall be attended by the Contractor and any required Subcontractors.

- C. Chairperson and Minutes: The Engineer will chair the meetings and will prepare written meeting minutes.
- D. The Contractor shall require representatives of all major subcontractors and suppliers to attend each Progress meeting as required. Representatives of Contractor, Subcontractor and suppliers who are present at Progress Meetings shall have the full authority to commit their respective organizations to decisions, commitments, and agreements made at Progress Meetings.
- E. Progress Meeting Agenda: Progress Meetings shall have at a minimum the following agenda:
  - 1. Review and approval of minutes and record of previous meeting.
  - 2. Review progress of work, Progress Schedule, and status of Submittals.
  - 3. Identify problems that impede planned progress.
  - 4. Develop corrective measures and procedures to maintain planned schedule.
  - 5. Review apparent conflicts and other problems, and develop corrective measures.
  - 6. Monthly review of payment applications.
  - 7. Pre-installation discussion regarding specific project items.
  - 8. Other current business.

END OF SECTION



SECTION 01 33 00

SUBMITTAL PROCEDURES

PART I – GENERAL

1.01 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 RELATED DOCUMENTS

- A. Consult the individual sections of the specifications for the specific submittals required under those sections and for further details and descriptions of the requirements.

1.03 GENERAL PROCEDURES FOR SUBMITTALS

- A. Submittal Register: Within seven (7) days of receipt of a Notice to Proceed, the Contractor will furnish to the Engineer a complete listing of all submittals (Shop Drawings, Manufacturer's Data, Samples, etc.) required by these specifications in tabular form. This form will include columns sufficient to manage and track the submission and action for each submission. The Contractor will revise and update this form upon request of the Engineer.
- B. Schedule of Values: Within seven (7) days of receipt of a Notice to Proceed, the Contractor will furnish to the Engineer a Schedule of Values for review and approval. The Contractor will revise and update this form upon request of the Engineer.
- C. Timeliness: The Contractor shall transmit each submittal to the Engineer sufficiently in advance of performing related Work or other applicable activities so that the installation is not delayed by processing times, including rejection and re-submittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery, and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals to the Engineer in advance of the Work.
- D. Sequence: The Contractor shall transmit each submittal in a sequence which will not result in the Engineer's approval having to be later modified or rescinded by reason of subsequent submittals which should have been processed earlier or concurrently for coordination.
- E. Contractor's Review and Approval: Only submittals received from and bearing the stamp of approval of the Contractor will be considered for review by the Engineer. Submittals shall be accompanied by a transmittal notice stating name of Project, date of submittal, "To", "From" (Contractor, Subcontractor, Installer, Manufacturer, Supplier), Specification Section, or Drawing No. to which the submittal refers, pur-

SUBMITTAL PROCEDURES

pose (first submittal, re-submittal), description, remarks, distribution record, and signature of transmitter.

- F. Engineer's Action: The Engineer will review the Contractor's submittals and return them with one of the following actions recorded thereon by appropriate markings:
1. Final Unrestricted Release: Where marked "Approved" the Work covered by the submittal may proceed provided it complies with the requirements of the Contract Documents.
  2. Final-But-Restricted Release: When marked "Approved As Corrected" the Work may proceed provided it complies with the Engineer's notations or corrections on the submittal and complies with the requirements of the Contract Documents. Acceptance of the Work will depend on these compliance's.
  3. Returned for Re-submittal: When marked "Revise and Resubmit" or "Rejected", the Work covered by the submittal (such as purchasing, fabrication, delivery, or other activity) should not proceed. The submittal should be revised or a new submittal resubmitted without delay, in accordance with the Engineer's notations stating the reasons for returning the submittal.
- G. Processing: All costs for printing, preparing, packaging, submitting, resubmitting, and mailing, or delivering submittals required by this contract shall be included in the Contract Sum.

#### 1.04 OR EQUALS

- A. Definition: Whenever a specification section names one or more brands for a given item, and the Contractor wishes to submit, for consideration, another brand, the submission shall be considered an "or-equal" or a "material substitution". For the purposes of this Contract, the terms "or-equal" and "material substitution" shall be considered synonymous.
- B. In no case may an item be furnished on the Work other than the item named or described, unless the Engineer, shall consider the item equal to the item so named or described.
- C. The equality of items offered as "equal" to items named or described shall be proved to the satisfaction of the Engineer at the expense of the Contractor submitting the substitution.
- D. The Engineer and/or the Owner may require that full size samples of both the specified and proposed products be submitted for review and evaluation. The Contractor shall bear full cost for providing, delivering, and disposal of all such samples.
- E. The Contractor shall assume full responsibility for the performance of any item submitted as an "Or-Equal" and assume the costs of any changes in any Work which may be caused by such substitution.

- F. Or Equal Approval Process: On the transmittal, or on a separate sheet attached to the submission, the Contractor shall direct attention to any deviations, including minor limitations and variations, from the Contract Documents.
1. The Contractor shall submit to the Engineers for consideration of any or-equal substitution a written point-by-point comparison containing the name and full particulars of the proposed product and the product named or described in the Contract Documents.
  2. Such submittal shall in no event be made later than 14 calendar days prior to the incorporation of the item into the Work. This requirement may be waived by the Engineer upon written request.
  3. Upon receipt of a written request for approval of an or-equal substitution, the Engineer shall investigate whether the proposed item shall be considered equal to the item named or described in the Contract Documents. Upon conclusion of the investigation, the Engineer shall promptly advise the Contractor that the item is, or is not, considered acceptable as an Or-Equal substitution. Such written notice must have the concurrence of the Owner.

#### 1.05 SUBMISSION OF SHOP DRAWINGS

- A. Shop Drawings shall be complete and to scale, giving all information necessary or requested in the individual section of the specifications. They shall also show adjoining Work and details of connection thereto.
- B. Shop Drawings shall be for whole systems. Partial submissions will not be accepted.
- C. The Engineer reserves the right to review and approve shop drawings only after approval of related product data and samples.
- D. Shop drawings shall be properly identified and contain the name of the project, name of the firm submitting the shop drawings, shop drawing number, the specification section relevant to the submittal, date of shop drawings and revisions, Contractor's stamp of approval, and sufficient spaces near the title block for the Engineer's stamp.
- E. The Contractor shall submit to the Engineer two legible, reproducible copies and three (3) black line prints of each shop drawing. Transparency and prints shall be mailed or delivered in roll form. Each individual submittal shall be accompanied by a transmittal notice. After review of the submission, the engineer will retain the two color copies for the Engineer's and Owner's records. The three black line prints will be returned to the Contractor.
- F. When the black line prints are returned by the Engineer with the stamp "Revise and Resubmit", "Submit Specified Items" or "Rejected", the Contractor shall correct the original drawing or prepare a new drawing and resubmit two transparencies and three (3) prints thereof to the Engineer for approval. This procedure shall be

repeated until the Engineer's approval is obtained.

- G. When the prints are acceptable, the Engineer will stamp "Approved" or "Approved as Corrected", retain two (2) color copies, and return (3) copies to the Contractor. The Contractor shall provide and distribute additional copies as may be required to complete the Work.
- H. The Contractor shall maintain one full set of approved shop drawings at the site. The Contractor shall produce a set of coordination drawings before the installation of any electrical work.

#### 1.06 SUBMISSION OF PRODUCT DATA

- A. The Contractor shall submit five (5) copies of Product Data to the Engineer. All such data shall be specific and identification of material or equipment submitted shall be clearly marked in ink. Data of general nature will not be accepted.
- B. Each Product Data shall be accompanied by a transmittal notice. The Contractor's stamp of approval shall appear on the printed information itself, in a location which will not impair legibility.
- C. Product Data returned by the Engineer as "Rejected" shall be resubmitted in five (5) copies until the Engineers approval is obtained.
- D. When the Product Data is acceptable, the Engineer will stamp them "Approved" or "Approved as Noted", retain two (2) copies, and return three (3) copies to the Contractor. The Contractor shall provide and distribute additional copies as may be required to complete the Work.
- E. The Contractor shall maintain one full set of approved, original, Product Data at the site.

#### 1.07 SUBMISSION OF SAMPLES

- A. Unless otherwise specified in the individual section, the Contractor shall submit four (4) specimens of each sample required for submission.
- B. Samples shall be of adequate size to permit proper evaluation of materials. Where variations in color or in other characteristics are to be expected, samples shall show the maximum range of variation. Materials exceeding the variation of approved samples will not be approved on the Work.
- C. Samples which can be conveniently mailed shall be sent directly to the Engineer, accompanied by a transmittal notice. All transmittals shall be stamped with the Contractor's approval stamp of the material submitted.
- D. All other samples shall be delivered at the field office of the Project Representative with sample identification tag attached and properly filled in. Transmittal notice of samples so delivered with the Contractor's stamp of approval shall be mailed to the Engineer.

- E. If a sample is rejected by the Engineer, a new sample shall be resubmitted in the manner specified herein above. This procedure shall be repeated until the sample is approved by the Engineer.
- F. Samples will not be returned unless return is requested at the time of submission and agreed to by the Engineer and/or Owner. The contractor is responsible for charges associated with returning the sample. The right is reserved to require submission of samples whether or not particular mention is made in the specifications, at no additional cost to the Owner.

1.08 RESPONSIBILITIES

- A. The Contractor is responsible for construction delays caused by insufficient time for fabrication, delivery, and/or installation of materials or performance of the Work when approval of the pertinent shop drawing is withheld due to the failure of the Contractor to submit, revise, or resubmit submittals in adequate time to allow for an appropriate review (not to exceed 10 days by Owner/Engineer). The Contractor is responsible for errors and omissions in submittals regardless of the Engineer's review.

1.09 ADDITIONAL SUBMITTALS

- A. If required to clarify intended construction methods, materials, or sequence, the Engineer may request additional submittals for any aspects of the Work not required in the specification, at no additional cost.

END OF SECTION

SECTION 01 45 00

QUALITY CONTROL

PART I – GENERAL

1.01 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 SECTION INCLUDES

- A. Administrative and procedural requirements for quality-control services.
- B. Quality-control services include inspection, tests, and related actions, including reports performed by Contractor, by independent agencies, and by governing authorities. They do not include contract enforcement activities performed by the Engineer.
- C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements.
- D. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.
  - 1. Specific quality-control requirements for individual construction activities are specified in the Section that specifies those activities. Requirements in those Sections may also cover production of standard products.
  - 2. Specified inspections, tests, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with Contract Document requirements.
  - 3. Requirements for Contractor to provide quality-control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.03 RESPONSIBILITIES

- A. Contractor Responsibilities: unless otherwise indicated as the responsibility of another identified entity, Contractor shall provide inspections, tests, and other quality-control services specified elsewhere in the Contract Documents and required by authorities having jurisdiction. Costs for these services are included in the Contract Sum.

- B. Retesting: The contractor is responsible for retesting where results of inspections, tests, or other quality-control services prove unsatisfactory and indicate noncompliance with Contract Document requirements, regardless of whether the original test was Contractor's responsibility.
- C. Associated Services: Cooperate with agencies performing required inspections, tests, and similar services, and provide reasonable auxiliary services as required. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include, but are not limited to, the following:
1. Provide access to the work.
  2. Furnish incidental labor and facilities necessary to facilitate inspections and tests.
  3. Take adequate quantities of representative samples of materials that require testing or assist the agency in taking samples.
  4. Provide facilities for storage and curing of test samples.
  5. Deliver samples to testing laboratories.
  6. Provide the agency with a preliminary design mix proposed for use for material mixes that require control by the testing agency.
  7. Provide security and protection of samples and test equipment at the project site.
- D. Duties of the Testing Agency: The independent agency engaged to perform inspections, sampling and testing of materials and construction specified in the individual Sections shall cooperate with the Owner, Engineer and Contractor in performance of the agency's duties. The testing agency shall provide qualified personnel to perform required inspections and testing.
1. The agency shall notify the Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. The agency is not authorized to release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.
  3. The agency shall not perform any duties of the Contractor.
- E. Coordination: Coordinate the sequence of activities to accommodate required services with a minimum of delay. Coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

1. The Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities.

#### 1.04 SUBMITTALS

- A. Unless the Contractor is responsible for the services, the independent testing agency shall submit a certified written report, in duplicate, of each inspection, test, or similar service to the Engineer. If the Contractor is responsible for the service, submit a certified written report, in duplicate, of each inspection, test or similar service.
  1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.
  2. Report Data: Written reports of each inspection, test, or similar services include, but are not limited to the following:
    - a. Date of issue.
    - b. Project Title and number
    - c. Name, address and telephone number of testing agency.
    - d. Dates and locations of samples and tests or inspections.
    - e. Names of individuals making the inspection or test.
    - f. Designation of the Work and test method.
    - g. Identification of product and Specification Section.
    - h. Complete inspection or test data.
    - i. Test results and an interpretation of test results.
    - j. Ambient conditions at the time of sample taking and testing.
    - k. Comment or professional opinion on whether inspected or tested Work complies with the Contract Document requirements.
    - l. Name and signature of laboratory inspector.
    - m. Recommendations on retesting.

#### 1.05 QUALITY ASSURANCE



- A. Qualifications for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories that are pre-qualified as complying with the American Council of Independent Laboratories' "Recommended Requirements for Independent Laboratory Qualifications" and that specialize in the types of inspections and tests to be performed.
  - 1. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the state of Massachusetts.

1.06 REPAIR AND PROTECTION

- A. Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes.
- B. Protect construction exposed by or for quality-control service activities, and protect repaired construction.
- C. Repair and protection is Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services.

END OF SECTION

SECTION 01 52 00

TEMPORARY FACILITIES

PART I – GENERAL

1.01 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 GENERAL REQUIREMENTS

- A. The Contractor shall be responsible for providing and maintaining all temporary facilities until Substantial Completion. Removal of such prior to Substantial Completion must be with the concurrence of the Engineer. The Contractor bears full responsibility for providing any facility removed prior to Substantial Completion
- B. Removal of all temporary facilities shall be a condition precedent to Substantial Completion unless directed otherwise by the Engineer or specifically noted in the specifications.
- C. The Contractor must comply with all safety laws and regulations of the state of Massachusetts, the United States Government, and local government agencies applicable to Work under this contract. The Contractor's attention is directed to the state of Massachusetts, Department of Labor and Industries Regulations.
- D. Submittals:
  - 1. Within seven (7) days from Notice to Proceed, Contractor will submit for approval of the Engineer a site layout plan indicating the location of all temporary facilities described within this specification.
  - 2. Shop drawings showing proposed project sign.
  - 3. Manufacturer's Data for proposed field offices.

1.03 FIELD OFFICES

- A. A field office is not required for this project.

1.04 TEMPORARY TELEPHONES

- A. The Contractor shall provide a cell phone on site at all times with the same phone number. This shall be the number that the Engineer or Owner may contact in times of emergency.

1.05 TEMPORARY TOILETS

- A. The Contractor shall provide and service an adequate number of toilet booths with chemical type toilets.
- B. The toilets shall be maintained by the Contractor in a clean and orderly condition in compliance with all local and state health requirements.
- C. Under no circumstances will the Contractor's personnel be allowed to use Owner's toilets.
- D. Location of toilets shall be finalized at the pre-construction conference.

1.06 TEMPORARY CONSTRUCTION FENCE

- A. The Contractor shall be responsible for providing and maintaining temporary construction fencing along the limits specified on contract documents. The construction fence shall meet local, state and federal ordinances, laws, codes, or regulations or as required by the Engineer or Owner.

1.07 TEMPORARY STRUCTURES AND MATERIAL HANDLING

- A. The Contractor shall provide such storage sheds, temporary buildings, or trailers as required for the performance of the Contract. Subcontractors shall provide their own temporary buildings and trailers. Location of such to be approved by the Engineer.
- B. Materials shall be handled, stored, installed, cleaned, and protected in accordance with the best practice in the industry and, except where otherwise specified in the Contract Documents, in accordance with manufacturer's specifications and directions.
- C. The Contractor must obtain the permission of the Owner for the use of any storage facilities available on site, but the Owner assumes no responsibility for articles stored.

1.08 HOISTING FACILITIES

- A. Except as otherwise specified, the Contractor shall provide, operate, and remove material hoists, cranes, and other hoisting as required for the performance of the Work by all trades. All such hoisting service shall be without cost to the Subcontractors.

1.09 TEMPORARY WATER

- A. The Contractor may make use of the available water supply at the site for construction purposes, provided the permission of the Owner is obtained

beforehand and only as long as the water is not used wastefully. The Owner requires the use of a water meter and backflow preventer if temporary water is needed.

- B. The Contractor shall provide all necessary piping and hoses to utilize the available sources of water.
- C. The Contractor shall provide an adequate supply of cool drinking water with individual drinking cups for personnel on the job.

#### 1.10 TEMPORARY ELECTRICITY

- A. The Contractor may make use of the electricity as available at the site, metered and paid for by the Owner, provided that the Contractor shall supply proper adapters and extension cords. Power requirements that cannot be met locally by the Owner will be the responsibility of the Contractor.
  - 1. Where heavy duty electric equipment drawing current in excess of 15 amperes is involved, the Contractor shall provide temporary service to supply the power.
  - 2. The temporary electric service shall include, but not be limited to labor, materials, and equipment necessary to supply temporary power of adequate capacity for the project.
  - 3. Transformers and meters, when required by the power company, will be furnished by the power company and the contractor shall pay the costs therefore.
- B. Temporary electrical Work shall be performed under the direct supervision of at least one master electrician, who will be present on the project at all times when such work is being performed.
- C. All temporary work shall be provided in conformity with the National Electric Code, state and local laws, and requirements of the power company.
- D. Dismantle and completely remove from the project site, temporary electrical facilities only when the permanent electrical system is operational and accepted by the Engineer.
- E. Permits shall be the responsibility of the Contractor to obtain.

#### 1.11 WEATHER PROTECTION

- A. It is to be specifically understood that the Contractor shall do no work under any conditions deemed unsuitable by the manufacturer of various materials to be installed or the Engineer and/or Owner for the execution of the Work. This provision shall not constitute any waiver, release, or lessening of the

*MT. FEAKE CEMETERY  
EXPANSION PROJECT  
WALTHAM, MASSACHUSETTS*

Contractor's obligation to bring the Work to Substantial Completion within the period of time set forth in the Contract Documents.

*END OF SECTION*

SECTION 01 74 23

FINAL CLEANING

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 RELATED DOCUMENTS

- A. Consult the individual sections of the specifications for cleaning of Work installed under those sections.

2.01 CLEANING DURING CONSTRUCTION

- A. Conduct cleaning and disposal operations to comply with local ordinances, anti-pollution laws, and the Owner.
  - 1. Do not burn or bury rubbish and waste materials on the site.
  - 2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
  - 3. Do not dispose of wastes into streams or waterways.
- B. Wet down dry materials and rubbish to lay dust and prevent blowing dust.
- C. Maintain the Site free from accumulations of waste, debris, and rubbish.
- D. Provide on-site containers for collection of waste materials and rubbish.
- E. At the end of each day, remove and legally dispose waste materials and rubbish from site.
- F. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted or applied surfaces.
- G. Disposal of materials shall be in compliance with all applicable laws, ordinances, codes, and by-laws.

3.01 FINAL CLEANING

- A. Prior to submitting a request to the Engineer to certify Substantial Completion of the Work, the Contractor shall inspect all interior and exterior spaces and verify that all waste materials, rubbish, tools, equipment, machinery, and surplus

materials have been removed, and that all sight-exposed surfaces are clean. Leave the Project clean and ready for occupancy.

- B. Unless otherwise specified under other sections of the Specifications, the Contractor shall perform final cleaning operations as herein specified prior to final inspection.
- C. Cleaning shall include all surfaces, interior and exterior, which the Contractor has had access to, whether new or existing.
- D. Employ experienced workmen or professional cleaners for final cleaning.
- E. Use only cleaning materials recommended by the manufacturer of the surface to be cleaned.
- F. Use cleaning materials which will not create a hazard to health or property and which will not damage surfaces.
- G. Remove grease, mastic, adhesive, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior surfaces. This includes cleaning of the Work of all finishing trades where needed, whether or not cleaning by such trades is included in their respective specifications.
- H. Repair, patch, and touch up marred surfaces to the specified finish, to match adjacent surfaces.
- I. In cleaning items with manufacturer's finish or items previously finished by a Subcontractor, care shall be taken not to damage such manufacturer's or Subcontractor's finish. Any damage to finishes caused by cleaning operations shall be repaired at the Contractor's expense.
- J. Broom clean exposed concrete surfaces and paved surfaces. Rake clean other surfaces of grounds.
- K. The Owner's responsibility for cleaning commences at Substantial Completion and transfer of occupancy from the Contractor to the Town.

END OF SECTION

SECTION 01 76 00

PROTECTING INSTALLED CONSTRUCTION

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 PROTECTION OF PERSONS & PROPERTIES

- A. All Owner facilities may be occupied during construction. The Contractor shall take all necessary precautions to ensure the public safety and convenience of the occupants during construction.
- B. Any damage to buildings, roads, (public and private), gravestones, monuments, bituminous concrete areas, fences, lawn areas, trees, shrubbery, poles, underground utilities, etc. shall be made good by and at the Contractor's own expense, all to the satisfaction of the Owner.
- C. The Contractor shall patch, repair and/or replace all adjacent materials and surfaces damaged after the installation of new work at no expense to the Owner. All repair and replacement work shall match the existing in kind and appearance.
- D. See Section 5.01 regarding noise and dust control.

2.01 TEMPORARY PROTECTION

- A. The Contractor shall:
  - 1. Protect excavations, trenches, buildings, and materials at all times from rain water, ground water, backing-up, or leakage of sewers, drains, or other piping, or from water damage of any origin. Provide all pumps, piping, coverings, and other materials and equipment as required by job conditions to accomplish this requirement.
  - 2. Protect pavement and slabs to receive work by other trades from any soiling which will prevent proper adhesion of subsequent Work. Pavement and slabs shall be left clean and free of blemishes at the time other trades begin the application of their work.
  - 3. Protect all surfaces to receive work by other trades from any soiling which will prevent proper execution of subsequent work.



4. Protect all existing vegetation to remain that is in proximity to the site work required for completion of the construction project.
  5. Protect the private property of the Owner. Any areas damaged by the Contractor shall be restored to the original condition or compensated at the Contractor's expense.
- B. After the installation of the Work by any Subcontractor is completed, the Contractor shall be responsible for its protection and for repairing, replacing, or cleaning any such Work which has been damaged by other trades or by any other cause, so that all Work is in first class condition at the time of Substantial Completion.

### 3.01 ACCESS

- A. The Contractor shall, at all times, leave an unobstructed way along walks, parking lots and roadways outside the indicated limit of work, and shall maintain barriers and lights for the protection of all persons and property in all locations where materials are stored or work is in progress.

### 4.01 SECURITY

- A. The Contractor shall be responsible for providing all security precautions necessary to protect the Contractor's and Owner's interests.
- B. Where excavation is involved, the Contractor shall be responsible for providing continuous watchmen service as necessary, to insure adequate protection of the general public.

### 5.01 NOISE AND DUST CONTROL

- A. The Contractor shall take special measures to protect the neighbors and general public from noise, dust, and other disturbances as needed and/or directed by the Owner throughout construction by:
1. Keeping common pedestrian and vehicular circulation areas clean and unobstructed.
  2. During funerals adjacent to the construction area, the Contractor may be requested to limit the construction noise generated at the site. The Contractor shall accommodate whenever possible.
  3. Applying water or other dust palliatives as needed for dust mitigation.
  4. Keeping all loose trash picked up and prevent it from blowing outside the limit or work.

### 6.01 FIRE PROTECTION

- A. The Contractor shall take necessary precautions to insure against fire during construction. The Contractor shall be responsible to ensure that the area within contract limits is kept orderly and clean and that combustible rubbish and construction debris is promptly removed from the site.
- B. Installation of equipment suitable for fire protection shall be done as soon as possible after commencement of the Work.

7.01 WIND PROTECTION

- A. Should high wind or severe weather warnings be issued by the U.S. Weather Bureau, the Contractor shall take every precaution to minimize danger to persons, to the Work, and to the adjacent property.

8.01 WEATHER PROTECTION

- A. The Contractor shall provide Weather Protection as required by Specification Section 01500, Temporary Facilities, and any other specific requirements of the Contract Documents.

9.01 COORDINATION - NOTIFICATIONS

- A. The Contractor shall coordinate all work activities with the Owner and Engineer.

END OF SECTION

SECTION 01 77 00

PROJECT CLOSEOUT

PART I – GENERAL

1.1 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.2 RELATED DOCUMENTS

- A. Consult the individual sections of the specifications for specific items required under those sections.

1.3 PERMITS

- A. The Contractor shall coordinate the efforts of all Subcontractors and obtain any final permits that may be required.

1.4 SUBSTANTIAL COMPLETION

- A. Prior to requesting Substantial Completion, the Contractor shall make a thorough inspection of the Work. During this inspection, the Contractor shall prepare a comprehensive list of all items remaining to be completed or corrected. This list shall include all remaining Contractor and Subcontractor items to be provided under the Contract Documents.
- B. Upon completion of the items noted on the Contractor's list, the Contractor shall notify the Engineer that the Work is Substantially Complete. The Engineer shall then conduct a similar thorough inspection. If the Engineer agrees that the Work is Substantially Complete, the Engineer will promptly make a thorough inspection and prepare a punch list, setting forth in accurate detail any items on the Contractor's list and additional items that are not acceptable or incomplete. The Contractor shall coordinate all Subcontractors to achieve prompt completion of the punch list.
- C. The Contractor shall not be relieved of the responsibility to provide Contract items left off the Engineer's punch list.
- D. If the Engineer determines that the Work is not Substantially Complete, the Engineer shall inform the Contractor of those items that must be completed before the Engineer will prepare a punch list. Upon completion of those items, the Contractor shall again request the Engineer to prepare a punch list.
- E. When the punch list has been prepared, the Engineer will arrange a meeting

with the Contractor and Subcontractors to identify and explain all punch list items and answer questions on work which must be done before final acceptance.

- F. The Engineer may revise the punch list, from time to time, to ensure that all items of Work are properly completed.
- G. The Engineer shall prepare the Certificate of Substantial Completion.

#### 1.5 OPERATING AND MAINTENANCE INSTRUCTIONS

- A. Consult the individual sections of the specifications for the specific requirements for those sections and for further details and descriptions of the requirements.
- B. Prior to final payment and completion, the Contractor shall provide all Operating Manuals and Maintenance Instructions as required by the Contract Documents.
- C. Operating Instructions and Manuals
  - 1. Subcontractors, installers, and suppliers shall furnish to the Contractor two sets of operating and maintenance instructions of all mechanical, electrical, and manually operated equipment furnished and installed by them. Mechanical and electrical subcontractors shall furnish instructions as specified in their respective sections.
  - 2. The Contractor shall collect all of the above instructions, bind them into two complete sets, and submit them to the Engineer who will deliver them to the Owner.
  - 3. Submission of operating and maintenance instructions shall be a condition precedent to final payment.
- D. Instruction of Owner's Personnel
  - 1. Where specified in the individual sections of the specifications, the Contractor and Subcontractor shall instruct the Owner's personnel at the site, in the use and maintenance of equipment installed under the Contract.
  - 2. Submission to the Engineer of a Certificate of Compliance to this requirement, signed by the Contractor, shall be a condition precedent to final payment.

#### 1.6 ATTIC STOCK

- A. Provide Attic stock materials as described in the individual specifications sections.

#### 1.7 FINAL COMPLETION

A. Partial Release of Retainage

1. If within 21 days after Substantial Completion, any of the items on the Engineer's punch list are not complete or if the Contractor has not provided the appropriate marked up As-Built Drawings, Operating Manuals, Warranties, Guarantees, or Spare Parts, the Engineer shall not approve any release of Retainage.
2. The Engineer will not prepare a Certificate for Partial Release of Retainage if the Contractor has any remaining Work.
3. Upon completion of all open items, the Release of Retainage shall be processed.

B. Full Release of Retainage

1. Upon completion of all work, and after receipt of all appropriate marked up "As Built" Drawings, Operating Manuals, Warranties, Guarantees, and Spare Parts required by the Contract Documents, the Engineer shall prepare the Certificate of Final Completion.
2. The Contractor's signature on this Certificate shall be notarized.
3. The Contractor shall provide a final Application for Payment to complement the close-out process.

*END OF SECTION*

SECTION 01 78 36

WARRANTIES

PART I – GENERAL

1.01 RELATED DOCUMENTS

- A. All of the Contract Documents, including General Conditions, Supplementary Conditions, and other Division I – General Requirements, apply to the work of this Section.
- B. This Section contains general information that applies to all work performed under the Contract and is inherently made a part of each specification section.

1.02 WARRANTY REQUIREMENTS

- A. Warranties Required: All materials, equipment, and work of the Project shall be covered by comprehensive written warranties. Refer to individual specification sections for additional specific warranty requirements. For work not specified to have additional specific warranty requirements or warranties longer than one year, provide a comprehensive one-year written warranty signed by the contractor and Subcontractor.
- B. Warranty Limitations: Warranties required under the Contract are in addition to and not in lieu of any remedy or warranty to which the Owner is entitled under law. Warranties required under the Contract shall not be interpreted as a waiver of any of the Owner's rights.
- C. Warranty Procurement: Do not purchase or subcontract for materials, equipment or work until it has been verified that parties required to provide and sign warranties are willing to do so and that warranty language, content, and form are approved by the Owner. Special warranty terms, conditions, and requirements are often specified.
- D. Warranties are Irrevocable: After a specific warranty's language, content and form has been approved by the Owner and after the work covered by a specific warranty is subcontracted or purchase order given to a manufacturer, the warrantor shall not revoke or withhold the warranty for any reason including, without limitation, non-payment or incomplete payment by and party other than the Owner, except that if the work has not been installed in compliance with the warrantor's installation requirements, then the warranty may be temporarily withheld until corrections are made and the warrantor's installation requirements have been met.
- E. Warranty Forms: Submit written warranty forms to Owner through Engineer for approval prior to award of subcontract, submission or purchase order, and

execution of warranty. The manufacturer's standard warranty form may not comply with the requirements of the Contract Documents. Special warranty terms, conditions, and requirements are often specified and required.

- F. Work Covered by Warranty: Contractor and warrantor shall remove and replace other work damaged as a result of failure of warranted materials, equipment, or work, and shall remove and replace other work which must be removed and replaced to provide access to and replacement of materials, equipment, or work covered under warranty. Warranties shall include full payment to the Owner for work related to warranty repair or replacement including, without limitation, painting.
- G. Pro-Rated Warranties: Unless otherwise specified or approved in writing by Owner, each warranty shall cover full cost of replacement or repair, and shall not be pro-rated on basis of useful service life or warranty period.
- H. Warranty Extensions: Work repaired or replaced under warranty shall be provided with a new warranty equal to the full length of the original warranty. The new warranty shall begin on the date of Owner's acceptance and use of the replaced or repaired item.
- I. Warranty Effective Starting Date: All warranties shall begin on Date of Final Acceptance of the entire project or Owner's acceptance of the work or item covered by the warranty, whichever is later, and the warranty coverage shall continue for the period specified. If no specific warranty period is specified, the warranty shall extend for one year.
- J. Contractor's Responsibilities for Warranties: The Contractor shall implement and invoke all guarantees and warranties provided by subcontractors, manufacturers, material suppliers, and other parties, including warranties with longer than one-year duration. The Contractor shall make every effort to facilitate, expedite, and aid the Owner in warranty claims the Owner may have throughout the warranty periods.

END OF SECTION

SECTION 01 78 39

RECORD DOCUMENTS

PART I – GENERAL

1.01 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 RECORD DOCUMENTS

- A. Record Documents shall consist of all the Contract Drawings.
- B. From the set of drawings furnished by the Owner, The Contractor shall reserve one set for record purposes. From this set, The Contractor shall detach and furnish, at no charge to all Subcontractors, the drawings of their portion of the Work for the same purpose.
- C. Prior to final payment, the Contractor shall provide an “As-Built” plan of the Site (Access roads, plot markers, row markers, walls, fences, utilities including rims and inverts, etc.) stamped by a Professional Land Surveyor or Professional Engineer registered in the State of Massachusetts demonstrating compliance with all design and regulatory requirements. The “As-Built” plan shall contain elevation contours in a minimum of 1 ft intervals, as well as spot grades. An electronic version of the “As-Built” plan in AutoCAD 2007 or newer format shall also be provided.
- D. The Contractor and the above Subcontractors shall keep their marked up record set on the site at all times and note on it in colored ink or pencil, neatly and accurately, at the end of each working day, the exact location of their work as actually installed. This shall include the location and dimensions of underground and concealed Work, and any architectural, mechanical, or electrical variations from the Contract Drawings. All changes, including those issued by Addendum, Change Order, or instructions by the Engineer shall be recorded. Marked-up record drawings shall be prepared for the entire project and include all Work, including but not limited to:
  - 1. The location of all underground utilities and appurtenances referenced to permanent surface improvements, both horizontally and vertically at ten (10) foot intervals and at all changes of direction.
  - 2. The location of all internal utilities and appurtenances, concealed by finish materials, including but not limited to valves, coils, dampers, vents, cleanouts, strainers, pipes, junction boxes, turning vanes, variable and constant volume boxes, ducts, traps, and maintenance devices.



- a. The location of these items shall be shown by offsets to structure and drawing grid lines.
  - b. The tolerance for the actual location of these items on the marked up record drawings shall be plus or minus two (2) inches.
  - c. Each item shall be referenced by showing a tag number, areas served, and function on the marked up record drawing.
- F. The Engineer may periodically inspect the marked up record drawings at the site. The proper and current maintenance of the information required on these drawings shall be a condition precedent to approval of the monthly applications for payment.
- G. At Substantial Completion, the Contractor shall submit the complete set of marked up "As-Built" drawings to the Engineer. The Contractor shall check all marked up record drawings prepared by subcontractors and certify in writing on the title sheet of the drawings that they are complete and correct prior to submission to the Engineer.
- H. The Engineer shall review the marked up record drawings and verify by letter to the Owner that the Work is complete. The Contractor shall incorporate any and all changes into the "As-Built" drawings.
- I. The Contractor may make a written request for copies of the completed Record Drawings. The Contractor shall reimburse the Owner directly for the cost of printing of any requested Record Drawings.
- J. The Contractor shall provide a certified "As-Built" plan sealed by a Professional Licensed Surveyor showing all sports markings and sufficient elevations to demonstrate compliance with all athletic geometry, slope, planarity, and marking requirements for the intended sports.
- K. Submission of accurate marked up record drawings and "As-Built" drawings, and their approval by the Engineer shall be a condition precedent to final payment.

END OF SECTION

## **DIVISION 02**

SECTION 02 20 00

SITE REQUIREMENTS

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 EXAMINATION OF SITE

- A. Prior to bidding the Contractor shall thoroughly examine the site and the Contract Documents to ensure his knowledge of conditions and requirements affecting the work. No claim for extra compensation or extension of time will be allowed for Contractor's failure to comply with this requirement nor will any condition at the site, whether or not in agreement with conditions shown or called for on the Bid and Contract Documents, be allowed as a basis for such claims, except as otherwise specifically provided for in the General Conditions.

1.03 DISCOVERY

- A. If during the demolition, excavation, disposal, or other work, articles of unusual value, of historical or archeological significance are encountered, the ownership of such articles is retained by the Owner, and information regarding their discovery shall be immediately furnished to the Owner and Engineer. If the nature of the article is such that the work can not proceed without danger of damaging same, work in that area shall be immediately discontinued until the Engineer and or Owner has decided the proper procedure to be followed. Any time lost thereby shall be a condition for which the time of the contractor may be extended. All costs incurred after discovery in the salvaging of such articles shall be borne by the Owner.

1.04 COORDINATION WITH EXISTING UTILITIES

- A. The Contractor shall give all advance notice to public utility companies as required by law, and shall provide proper disposition, subject to Engineer's and or Owner's approval of all existing pipe lines, conduits, sewers, drains, poles, wiring, and other utilities that in any way interfere with the work, whether or not they are specifically shown on the Drawings. He shall immediately notify the Owner and appropriate authorities when coming across any unknown utility line, and wait decision as to how to dispose of same. When an existing utility line must be cut and plugged or capped, moved, or relocated, or has been damaged he shall notify the Owner and the Utility company involved, and assure the protection, support, or moving of utilities to adjust them to the new work. The Contractor shall be responsible for all damage caused to existing, active utilities

under the work of this Contract, whether or not such utilities are shown on the Drawings, including resultant damages or injuries to persons or properties.

- B. Written notice shall be given by the Contractor to all public service corporations owning or having charge of publicly or privately owned utilities of his intention to commence operations affecting such utilities at least one (1) week in advance of the commencement of such operations, and the Contractor shall at that time file a copy of such notice with the Engineer.
- C. Before the Contractor begins any work or operations which might damage any subsurface structures, he shall carefully locate all such structures and conduct his operations so as to avoid any damage to them.
- D. Agents of various public service agencies, municipal and state departments may be entering on the work site to remove existing facilities, to construct or place any facilities or to make alterations to existing facilities.
- E. Prior to starting work or erecting permanent construction signing, the Contractor shall notify the "DIG-SAFE" program with a minimum of 72 hours advance warning. Once located and marked, the Contractor shall maintain such marks and access to installations to permit repairs and maintenance of service if interrupted.
- F. The Contractor shall perform the work in cooperation with the various agencies in a manner that causes the least interference with the operations of the aforementioned agencies and shall have no claim for due to said work of these agencies.

#### 1.05 WARNING

- A. Install warning fencing around all excavations and in all areas designated on the Drawings and as directed. Maintain fencing in place throughout length of construction period as directed by the Engineer. After completion of construction, take down fencing and remove from the site.

#### 1.06 LAYOUT

- A. Contractor shall maintain a level and transit on the job, and shall employ personnel for use thereof trained and registered as a Civil Engineer or as a registered Surveyor by the State of Massachusetts. The Owner shall have reasonable use of these instruments at all times.
- B. Existing survey information on Drawings is for Contractor's use. Contractor shall establish benchmarks in at least two widely separated locations, and shall establish and maintain grades, lines, levels and other dimensional reference guides as required. The Contractor shall annotate project record documents to indicate all modifications of grades, utilities, etc.

- A. The contractor is responsible for complying with governing ADA regulations for walkways, sidewalks, paved surfaces and access ramps.

1.07 PROTECTION OF PROPERTY AND THE PUBLIC

- A. Construct all fences, barricades, and protective facilities required for the protection of the public, and in accordance with local and state regulations. Furnish and install all signs, lights, reflectors, and all such protection facilities as may be required.
- B. Contractor shall hold the Owner harmless from all claims arising from the use of public streets, sidewalks, and adjoining premises for construction purposes.
- C. Keep all access roads and walks clear of debris, materials, construction plans, and equipment, during work operations. Repair streets, drives, curbs, sidewalks, fences, poles and the like, where disturbed by construction. Leave them in as good conditions after completion of the work as before operations started. The Contractor shall contact appropriate City officials concerning hauling of construction materials over City roads and bridges.
- D. Provide ways and means to control the flow of water from every source which may cause delay or damage during the work operations.
- E. The Contractor shall be responsible for the maintenance of construction barriers and traffic barriers in order to maintain traffic, over, through, or around the work included in this Contract with the maximum of safety and practicable convenience to such traffic during the life of the Contract, and whether or not work has been suspended temporarily. He shall take all precautions for preventing injuries to persons or damage to property to or about the work.
- F. The work shall be carried on and barriers erected in such a manner as to provide safe passage at all times for public travel and with least obstruction to traffic. The Contractor shall provide and maintain, at his own expense, in a safe and passable condition, such temporary by-passes as created by the barriers as may be necessary to accommodate both pedestrian and vehicular traffic.
- G. The Contractor shall maintain all legally required means of egress.
- H. Where the new construction or repair work coincides with the presently traveled way, the Contractor shall carry on his work so that travel will not be obstructed.
- I. Whenever gale or high winds are forecasted, take proper measures to secure all loose material, equipment or other items which could blow about and be damaged or cause damage to other work. No such loose items shall be left unsecured at end of working day.

- J. All signs shall conform to local By-Laws and the Manual of Uniform Traffic Control Devices.

1.08 POLICE

- A. Whenever, in the opinion of the Owner or the Engineer, traffic is sufficiently congested or public safety is endangered the Contractor will furnish police officers to direct traffic or to keep traffic off the area affected by construction operations. Such officers shall be in addition to flagmen required under other provisions of the Contractor, and the cost shall be borne by the Contractor.
- B. The employment of traffic flagmen or the presence of police officers shall in no way relieve the Contractor of any responsibilities or liability which is his under the terms of the Contract.

1.9 FIRE ACCESS

- A. The Contractor shall maintain fire lanes as required by the local Fire Department throughout the course of construction.

1.10 SPECIAL SECURITY AND CONTRACTOR'S RESPONSIBILITY FOR THE WORK

- A. The Owner shall not provide security within the storage, staging, or construction areas nor will the owner assume responsibility for acts of vandalism within these areas.
- B. Until written acceptance of the physical work by the Engineer, and/or Owner, the Contractor shall assume full charge thereof and he shall take every necessary precaution against damage to the work by action of the elements, or from any cause whatsoever, arising from the actions of the Contractor or not.
- C. The Contractor shall bear all losses resulting to him on account of vandalism.
- D. The Contractor shall rebuild, repair, restore, and make good all damages to any portion of the work occasioned by any of the above causes before the completion and written acceptance of the physical work, and shall bear the expense thereof.
- E. Should the Contractor fail to take prompt action whenever conditions make it necessary, the Owner shall make emergency repairs or cause the same to be made, with the stipulation that the costs for such repairs shall be charged against the Contractor and deducted from monies due to him.
- F. In case of suspension of work from any cause whatsoever, the Contractor shall be responsible for the project and shall take such precautions as may be necessary to prevent damage to the project, provide for normal drainage and shall erect any necessary temporary structures, signs, or other facilities at his expense. During such period of suspension of work, the Contractor shall

properly and continuously maintain in an acceptable growing condition all living material in newly established plantings, and seeding furnished under this Contract, and shall take adequate precautions to protect new tree growth and other important vegetative growth against injury.

1.11 TEMPORARY BRACING, SHORING, SHEETING, TIE DOWN

- A. Contractor shall provide all sheeting, shoring, bracing, underpinning, reinforcement and other temporary supports as may be required to maintain the integrity of, and prevent damage to, any structure or finish to be subjected to or adjacent to cutting work. Patches to be of sufficient final strength and acceptable appearance, subject to Engineer's and/or Owner's approval.

1.12 SITE DRAINAGE

- A. Contractor shall take over responsibilities for existing site drainage upon entering premises, and maintain such drainage during the life of his Contract in a manner approved by the Engineer and/or Owner and so as not to adversely affect adjacent area.
- B. Keep excavations, pits, trenches and other construction areas free of water at all times, including backing up of drains and sewers. Provide hydraulic equipment to control surface and ground water. Pumping equipment shall be adequate to remove all hydrostatic pressure from structures until sufficient strength as been developed by the structure to protect work from displacement or other damage.
- C. Maintain ground water level where required sufficiently below excavation level at all times to maintain stable working platform. Ground water shall be controlled so as to avoid adverse effects on established ground water elevation of adjacent sites.

1.13 SITE TRENCH AND EXCAVATION

- A. Open excavation adjacent to the traveled way or shoulders shall not remain through the hours of darkness, holiday or periods of shutdown, unless adequately protected and specifically authorized by the Department of Public Works, Engineer, and Owner.
- B. If live service connections are to be interrupted by excavations of any kind, the Contractor shall not break the service until new services are provided. Abandoned services shall be plugged off or otherwise made safe.
- C. Full compensation for furnishing all labor, materials, tools, equipment and incidentals for doing all the work involved in protecting or repairing property as specified in this section, shall be considered included in the Contract price, and no additional compensation will be allowed therefore.

- D. Before starting any work for this Contract, the Contractor shall prepare and submit to the Engineer for approval, a plan which indicates the traffic routing proposed by the Contractor during the various stages and time periods of the work and the temporary barricades, signs, cones, drums and other safety and traffic control devices to be employed during each stage and time period of the work to maintain traffic and access to abutting properties.
- E. Particular care should be taken to establish and maintain methods and procedures which will not create unnecessary or unusual hazards to public safety. Traffic control and safety devices required only during working hour operations shall be removed at the end of each work day.
- F. Signs having messages that are irrelevant to normal traffic conditions shall be removed or properly covered at the end of each work period. Signs shall be kept clean at all times and legends shall be distinctive and unmarred.
- G. All trenches with the right-of-way in pavements to remain shall be hot patched at the end of each work day as directed.
- H. All existing and other materials not required or needed for use on the project, and not required to be removed and stocked, shall become the property of the contractor and shall be removed from the site and legally disposed of. No separate payment will be made for this work, but all costs in connection therewith shall be included in the bid price of this Contract.

1.14 WINTER CONDITIONS

- A. Contractor shall remove snow and ice which may impair progress of work, be detrimental to workmen, or impair trucking, delivery or moving of materials at job site, or prevent adequate drainage at site or adjoining areas.

1.15 COORDINATION

- A. The Contractor shall be responsible for the proper fitting of all work and the coordination of the operations of all trades, subcontractors, or material and equipment engaged upon the work. He shall be prepared to guarantee each of his subcontractors the dimensions which they may require for the fitting of their work to all surrounding work and shall perform or cause the subcontractors to perform all cutting, fitting or adjusting and patching necessary to make all parts of the work come together properly and be fit to receive or be received by that or other Contractors.
- B. Before commencing any work, or any phase of the work, the Contractor shall prepare a sequence of operations for all work under this Division, and shall submit it for approval by the Engineer and/or Owner at the Pre-Construction Conference.



- C. Before commencing any work, the Contractor shall consult with the Owner regarding any use of any facility, including, but not limited to, loading docks, parking areas, storage areas, etc., that may be required to prosecute the work.
- D. If, in the judgment of the Engineer, continued work under the approved sequence of operations may interfere with the operations of any other construction project at any time during the progress of the work, the Engineer may direct the Contractor to accelerate, interrupt, or cease work at particular points. The Contractor will make reasonable changes in the sequence of operations to accommodate these directions, at no additional cost to the Owner.
- E. The Contractor shall give his personal supervision to the work or have a competent superintendent with the authority to act for him on the job at all times during the progress of work. The contractor shall also provide an adequate staff for the proper coordination and expedition of his work.
- F. The Contractor shall lay out his own work and shall be responsible for all lines, elevations, and measurements of the grading, landscaping and other work executed by him under the Contract. He shall exercise proper precaution to verify the dimensions shown on the Drawings before laying out the work, and will be held responsible for any error resulting from his failure to exercise such precaution.
- G. The Contractor's responsibility for the coordination of all work under the Contract shall be complete, and shall extend to all modification in the work, whether or not such modifications entail a change in the Contract price. Where the Contract Documents allow an optional material or method, the Contractor shall provide all other coordination and additional work that such change necessitates, without any additional cost to the Owner.

#### 1.16 MEASUREMENTS

- A. Before ordering any material or doing any work, the Contractor shall verify all measurements and shall be responsible for the correctness of same. No extra charge or compensation will be allowed on account of difference between actual dimensions and the measurements indicated on the Drawings; any difference which may be found shall be submitted to the Engineer and/or Owner, in writing, for consideration before proceeding with the work.

#### 1.17 CONDUCT OF WORK

- A. The Contractor shall coordinate with the Owner and Engineer, work in connection with adjacent occupied buildings or areas, driveways, walks or other facilities which could prevent access thereto or interrupt, restrict or otherwise infringe upon the Owner's use thereof.
- B. Damage to existing work, if caused by Contractor's operations under this Contract, shall be repaired at Contractor's expense.

- C. The Contract Site shall be shown on Drawings, and shall include the entire area bounded by the "Contractor's Work Area" or "Limit of Work" lines when required for performance of work under this Contract.
- D. Any street or other curbs and/or sidewalks damaged as the result of work under this Contract, whether within or outside of the limits of the work, shall be repaired and/or replaced with new matching construction by the Contractor causing such damage, at his expense, and in a manner satisfactory to the Engineer and authorities having jurisdiction over the property.
- E. Where existing curbs or walks are to remain, or after any curbs or walks are constructed and trucking is required over them, they shall be suitably protected in an approved manner.
- F. The Contractor shall provide continuous, lawful, safe, adequate and convenient access to the site. Access to the site shall generally be via existing roadways and paved surfaces which the Contractor shall maintain and restore to original conditions. Contractor shall construct and maintain in good usable condition temporary roads or appurtenances as required, and when no longer required, remove temporary construction and restore such areas to their original condition.

1.18 CLEANING UP

- A. The following specific cleaning work shall be done:
  - 1. Concrete and masonry shall be cleaned free of all foreign matter. If, in opinion of the Engineer, further cleaning of specific areas is required they shall be scrubbed with water or other cleaning agents. Acid cleaners shall not be used, except as may otherwise specifically be permitted in the trade sections.
  - 2. Surfaces with integral finishes shall be washed with clean water, mild soap and soft rags, thoroughly rinsed, and then wiped with clean, soft white rags. Abrasive cleansers shall not be used.
  - 3. Painted surfaces shall be cleaned free of all foreign matter, and if necessary, shall be lightly scrubbed at specific stains with clean water, mild soap, and soft rags thoroughly rinsed, and wiped with clean, soft white rags.
  - 4. Metal surfaces, hardware, equipment, and similar items shall be cleaned free of all foreign matter and if necessary shall be lightly scrubbed at specific stains with clean water, mild soap, and soft rags, thoroughly rinsed and wiped with clean soft, white rags. Abrasive cleaners shall not be used.

5. All advertising matter and temporary instructional material shall be removed from exposed surfaces throughout.

1.19 PROJECT CLOSEOUT

- A. Punch List: When the Engineer and/or Owner inspect the work for substantial Completion, they will prepare and issue to the Contractor a "Punch List" of items to be corrected before final acceptance of work and payment can be made.

END OF SECTION

SECTION 02 61 00

EXCAVATION AND HANDLING OF CONTAMINATED MATERIAL

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and tools necessary for excavation, tracking, handling, segregating, stockpiling, sampling and analysis, and temporary storage of contaminated soil and related material generated during construction activity.
- B. Prior soil characterization efforts resulted in the identification of elevated concentrations of polycyclic aromatic hydrocarbons (PAHs) and metals (i.e., arsenic and lead) in soils associated with the existing staging and maintenance area. Soil analytical data collected to date is attached.
- C. All excess soil will be sampled and analyzed by the contractor for appropriate receiving facility acceptance parameters.

1.03 SECTION INCLUDES

- A. Excavating of contaminated material.
- B. Storage of contaminated material.
- C. Sampling and analyses of contaminated material.
- D. Management of stockpiled material including any required segregation.

1.04 RELATED SECTIONS

- A. Section 02 81 00 – Transportation and Disposal of Contaminated Material
- B. Section 31 25 00 – Erosion and Sedimentation Control
- C. Prior to submitting a bid for the Work, the Contractor shall review and become familiar with the following document(s), which describe site and subsurface conditions at the site. These documents are included in the Appendix of the Project Manual.

1.05 REFERENCE STANDARDS

- A. Mass DEP, 310 CMR 40.0000, MCP, latest version:
  - 1. Management of Remediation Waste: 310 CMR 40.0030
  - 2. Health and Safety Procedures: 310 CMR 40.0018
- B. Mass DEP Policies (most current versions):
  - 1. COMM-97-001, Reuse and Disposal of Contaminated Soil at Massachusetts Landfills.
  - 2. #WSC-00-400. Construction of Buildings in Contaminated Areas (dated January 2000).
  - 3. #WSC-94-400, Interim Remediation Waste Management Policy for Petroleum Contaminated Soils.
- C. Mass DEP, 310 CMR 19.000, Solid Waste Management Facility Regulations, latest version.
- D. Mass DEP, 310 CMR 30.000, Hazardous Waste Management Regulations.
- E. HAZWOPER: OSHA Regulation 29 CFR 1926.65.

1.06 QUALITY ASSURANCE/QUALITY CONTROL

- A. Owner will be the generator and will sign all manifests and Bills of Lading. Except for materials required to be transported under manifest, all contaminated material shall be transported under Bills of Lading signed by the Owner's LSP regardless of the chemical quality of the soils.
- B. The Engineer's duties do not include supervision or direction of the actual work by the Contractor, his employees or agents. Neither the presence of the Engineer nor any observation and testing by the Engineer shall excuse the Contractor from the defects discovered in his Work.

1.07 SUBMITTALS

- A. Submit to the Engineer, for review and approval, contaminated material management plan including a narrative describing the schedule, sequence, and procedures for excavation, on-site stockpiling and off-site disposal of soil. Narrative shall include description and accompanying scale drawing indicating the space to be used for various activities (e.g. storage for soil, space for removal of debris, etc.)

- B. Submit to the Engineer, for review and approval, a work plan outlining the procedures, products, site logistics, and schedule.
- C. Submit to the Engineer, for review and approval, a list of facilities that can accept soil. Provide any limitations or conditions on acceptance along with facility testing requirements.
- D. The Contractor shall submit, in sufficient detail to enable the Engineer to identify the particular product or equipment, and to form an opinion as to its conformity to the Specifications, to the Engineer the following:
  - 1. Name and experience of proposed Supervisors and Foremen.
  - 2. Plan of Action & Standard Operating Procedures: Submit a detailed plan of the procedures and engineering controls proposed for use in complying with the requirements of this Specification. Include in the plan drawings or sketches detailing critical isolation barriers and enclosures.

## PART 2 - PRODUCTS

### 2.01 GENERAL

- A. The Contractor shall provide all employees and subcontractor(s) with personal protective equipment and protective clothing consistent with the level of protection for this Work as indicated in the Contractor's Site Health and Safety Plan.

### 2.02 STORAGE OF EXCAVATED CONTAMINATED MATERIALS

- A. Excavated contaminated materials shall be stockpiled on-site in accordance with the most recent version of Mass DEP guidance policies while samples are analyzed for chemical constituents. Excavated contaminated materials shall be placed on a base lined with 20 mil. (or higher gauge) HDPE liner and be completely and securely covered with 10 mil. Reinforced polyethylene sheeting.
- B. Upon completion of the soil excavation, and off-site transport of all contaminated material, the Contractor shall remove clean and adequately dispose of the HDPE liner. The entire area below the liner system and other areas where spillage occurred while loading transport vehicles, as directed by the Engineer, shall be scraped/swept and loaded into the last transport vehicle.
- C. Stockpiled material will not be permitted to remain on-site for a period greater than 90 days from the start of the stockpile formation.

### 2.03 BACKFILL MATERIAL

- A. Any backfill material shall meet the requirements of Section 31 20 00 for Earth Moving, and shall not contain chemicals in excess of natural background, as defined by Mass DEP.

### PART 3 - EXECUTION

#### 3.01 GENERAL

- A. The Contractor shall, excavate and remove off-site to an approved licensed reuse, recycling or disposal facility all excess construction spoil within the limits of work. The material shall be excavated, stockpiled and characterized on-site for disposal.
- B. The Contractor shall perform all contaminated material screening, excavation and related work in accordance with the Site Health and Safety Plan. Contaminated material excavation work may involve removal of obstructions, and incidental work as directed by the Engineer.
- C. The Contractor shall excavate material to the limits necessary to achieve the required excavation as directed by the Engineer.
- D. The Contractor shall provide all layout field data, including ties, to the Engineer. The Contractor shall maintain all required field controls throughout the performance of the Work.
- E. All site health and safety controls shall be fully established and in operation prior to beginning any contaminated soil excavation. Site controls shall include but not be limited to work zones properly barricaded and all support equipment and supplies including personal protective equipment. All site controls shall be reviewed by the Engineer in the field.

#### 3.02 EXCAVATION OF CONTAMINATED MATERIAL

- A. Work and decontamination procedures shall be performed in accordance with standard engineering practices and project specific health and safety plans and protocols.
- B. The excavation may include removing additional soils found to contain residual contamination as directed by the Engineer/LSP
- C. The Contractor may be required to separate excavated contaminated material into separate stockpiles to meet reuse/disposal facility requirements.

#### 3.03 STORAGE OF EXCAVED MATERIAL

- A. The Contractor may temporarily stock-pile excavated material on-site in stockpiles not exceeding a volume of 250 cubic yards pending material characterization and analytical results. Stockpile locations shall be located in

areas identified in the Contractor's Work Plan and approved by the Engineer. Stockpiling of volumes greater than 250 cubic yards will not be allowed with Engineer approval. Alternative stockpile locations are subject to review and approval.

1. Stockpiled material shall be tracked to provide complete data necessary to easily locate any stockpile within the site. All Work necessary to coordinate stockpiling from placement to disposal shall be included. The Contractor shall provide Owner with copies of all documentation at the time of stockpiling.
  2. The temporary stockpiled material must be removed from the site within 90 days or no later than the completion date of this contract, whichever is less.
  3. The stockpile liner shall be bermed around the edges to prevent any infiltration of stormwater or exfiltration of leachate. The berm height shall be a minimum of 12 inches.
  4. The polyethylene sheeting shall be adequately secured to prevent damage or loss by wind or other weather related events or conditions.
- B. Stockpiles shall be secured barricaded and clearly labeled.
- C. Excavated material shall be suitably dewatered prior to leaving the site, to prevent free water from developing during transport to the disposal facility.
- D. Catch basins within 100 feet of excavation or within limits of work shall be surrounded by hay bales/silt fencing.
- E. Minimum stockpile criteria are as follows:
1. Stockpile areas shall be graded such that storm water runoff is diverted from stockpiled materials. Stockpile slopes shall be no steeper than two horizontal to one vertical (2H:1V).
  2. The area shall be blocked off to minimize the contact of workmen, vehicles and passersby with stockpiled materials.
  3. The first lift of stockpiled material shall be placed on the stockpile base, which will consist of a minimum of 20 mil. HDPE.
  4. The stockpiled material shall be covered prior to inclement weather and at the end of each work day with a 10 mil polyethylene cover overlapped and weighted to form a continuous waterproof barrier over the material. The cover shall be maintained throughout the stockpile prior to prevent water from entering the stockpiled materials and to prevent blowing dust from the stockpile.



- F. The transfer of materials from the excavation to the stockpile area shall be conducted in such a manner as to prevent the spread of contaminated material across the site. Excavation, material handling and stockpiling shall be performed in a manner, which limits the mixing of materials with different levels and types of contamination to the highest degree possible. Disposal of material, which is contaminated as a result of the Contractor's careless or unauthorized procedures for excavation, material handling and/or stockpiling, shall be at Contractor's own expense.
- G. Maintenance of the stockpiles shall be the responsibility of the Contractor.

3.04 SAMPLING AND ANALYSIS OF EXCAVATED MATERIAL

- A. The Contractor shall perform all stockpile sampling as directed. Sampling shall be in the presence of the Engineer/LSP as directed by the Engineer, Owner and LSP.

3.05 MANAGEMENT OF ASPHALT, BRICK AND CONCRETE (ABC)

- A. If large quantities (greater than 20%) of asphalt, brick or concrete (ABC) materials are found co-mingled with soils, the ABC debris shall be segregated and stockpiled for appropriate off-site disposal.

END OF SECTION

SECTION 02 81 00

TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 SCOPE OF WORK

- A. The contractor shall furnish all labor, material, tools and equipment necessary for the transportation and disposal of surplus contaminated material excavated from the site. **Contractor shall provide unit pricing for transportation and disposal of contaminated material to :**
  - 1. Less than RCS-1 Facility described in Article 3.03
  - 2. In-State Landfill Facility described in Article 3.04
  - 3. Out-of-State non-RCRA Landfill information described in Article 3.05
- B. The Contractor, to the extent allowed by the Facilities, Owner and Engineer/LSP, shall reuse contaminated historic fill soil at In-State Landfill facilities or less than RCS-1 reuse facilities. An Out-of-State lined non-RCRA landfill is acceptable should any material be deemed as unacceptable at the specified reuse facilities due to its final classification.
- C. All excess soil will be sampled and analyzed by the contractor for appropriate receiving facility acceptance parameters.

1.03 SECTION INCLUDES

- A. Submittals
- B. Definitions.
- C. Regulatory Requirements
- D. Material Characterization
- E. Soil Reuse at <RCS-1 Facilities
- F. Soil Reuse at in-state Landfill Facilities

- G. Soil Disposal at Out-of-State non-RCRA Landfill Facilities
- H. Waste Profiles and Manifests
- I. Transport of Contaminated Material

1.04 RELATED WORK

- A. SECTION 31 10 10 – Site Clearing
- B. SECTION 02 61 00 – Excavation and Handling of Contaminated Material

1.05 SUBMITTALS

- A. The Contractor shall submit to Owner and the Engineer for review, as a single submittal, all pertinent information relating to the transport and disposal of materials specified herein, within 14 days after issuance of the Notice to Proceed. The information submitted shall include, at a minimum:
  - 3. Name and address of all contaminated material transporters to be used to complete the project.
  - 4. Massachusetts Department of Transportation Transporter Identification Number and expiration date for all hazardous waste transporters.
  - 5. Proof of permit, license, or authorization to transport contaminated material in all affected states.
  - 6. Less than RCS-1 Facility described in Article 3.03
  - 7. In-State Landfill Facility described in Article 3.04
  - 8. Out-of-State non-RCRA Landfill information described in Article 3.05

1.06 DEFINITIONS

- A. In-State less than RCS-1 (<RCS-1) Facility – This type of facility accepts non-regulated material located at or near MCP disposals which is chemically and physically suitable for re-use as fill material. The material must be managed in accordance with the anti-degradation provisions of the MCP with chemical concentrations less than background values established for each particular facility.
- B. In-State Landfill Facility – This type of facility shall be approved by the Commonwealth of Massachusetts to accept soil that is classified as

contaminated (regulated soil, in accordance with MassDEP COMM 97-001, and is adequately regulated and managed under M.G.L. C.21E and 310 CMR 40.0000; and is not classified as a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261.

- C. Out-of-State non-RCRA Lined Landfill – This type of facility shall be state approved or permitted to accept material that exceeds the allowable chemical criteria for in-state recycling, reuse or beneficial reuse or that is defined as a hazardous waste in 310 CMR 30.00, but that is not classified as either a RCRA characteristic waste or RCRA listed waste as defined in 40 CFR Part 261 or a TSCA waste as defined in 40 CFR Part 761.
- D. Material – Soil, pavement, cobblestones, sorptive pads, rocks, concrete, pipes, and miscellaneous structures and debris.

#### 1.07 REGULATORY REQUIREMENTS

- A. The Work of this Section shall be performed in accordance with all applicable federal, State, and local regulations, laws, codes, and ordinances governing the handling, transportation, and disposal of hazardous material.
- B. The Contractor shall obtain all federal, State and local permits required for the transport and disposal of contaminated material. The Contractor shall adhere to all permit requirements.
- C. The Contractor shall document that the disposal facilities proposed have all certifications and permits as required by Federal, State and local agencies to receive and dispose of the contaminated material.

### PART 2 - PRODUCTS

#### 2.01 GENERAL

- A. All Contractor personnel shall wear personal protective equipment and protective clothing consistent with the levels of protection for this Work as indicated in the Site Health and Safety Plan.

### PART 3 - EXECUTION

#### 3.01 GENERAL

- A. Owner will be the generator and will sign all manifests and MADEP Bills of Lading. Except for material transported under a hazardous material manifest, all material shall be transported under MADEP Bills of Lading regardless of the chemical quality of the material. The Contractor shall prepare a summary of analytical data as part of the Bills of Lading package. Bills of Lading will be

prepared by the Contractor. The Engineer will provide LSP services and approve Bills of Lading prior to transport.

- B. Utilization of a hazardous material manifest shall require the use of a licensed hazardous material transporter in conformance with the Massachusetts Hazardous Material Regulations as required by 310 CMR 30.000. A licensed Site Professional Opinion is not required when using a hazardous material manifest when transporting contaminated materials.
- C. Stockpiled soil analyzed for consideration of unlined landfill criteria and exhibiting contaminant concentrations less than S-1/GW-3 criteria of the Massachusetts Contingency Plan will be considered suitable for backfilling for chemical quality considerations.

### 3.02 MATERIAL CHARACTERIZATION

- A. The Contractor shall be responsible for characterizing material for the purposes of obtaining approval for final disposal of contaminated material. The Contractor shall collect samples to perform testing or use existing data (if approved by disposal facility) required by the disposal facility.
  - 1. The Contractor shall be required to submit a copy of all analytical results to the Engineer within 2 days of receipt of the laboratory report. Analytical data shall be kept confidential, and distributed to Owner and the Engineer only. Engineer's review of test results will be within 7 days.
- B. Sampling of contaminated soil shall be at sufficient and adequately distributed locations so that the concentrations of the chemical constituents of concern, which may be present, are appropriately and adequately characterized.
- C. Contractor shall coordinate schedule so that Engineer may observe sample collection.

### 3.03 LESS THAN RCS-1 (<RCS-1) FACILITY

- A. The <RCS facility shall be managed by facility specific Soil Reuse Management Plans. The Facility will be eligible to receive non-regulated material in compliance with the MCP anti-degradation provisions.
- B. The Contractor shall submit to Owner and the Engineer initial approvals or letters of intent and facility information for the <RCS-1 facility selected, within 14 Days of issuance of the Notice to Proceed. The facility information shall include the following:
  - 1. General Information
    - a. Facility Name
    - b. Facility Address
    - c. Name of Contact Person
    - d. Title of Contact Person
    - e. Telephone Number of Contact Person

- f. Email of Contact Person
- 2. The facility shall specify the volume of material that can be accepted from the site on a weekly and total basis.
- 3. The facility shall provide written confirmation that they are permitted to accept and will accept the classified material of the general quality and quantity described by the test results.
- 4. The facility shall provide a listing of all current and valid permits, licenses, letters of approval, and other authorizations to operate that they hold, pertaining to the receipt and management of the soils or materials specified in this contract.
- 5. The Contractor shall submit a complete list of the <RCS-1 facility's permitted allowable contaminant levels and physical characteristic requirements for material.

3.04 SOIL REUSE AT IN-STATE LANDFILL FACILITY

- A. Contaminated soils that exhibit concentrations equal to or below levels listed below and satisfy the physical requirements for landfill reuse as cover material and do not need specific DEP approval, may be transported for reuse at a lined or unlined landfill, using the bill of lading procedures.
- B. The Contractor shall submit to Owner and the Engineer initial approvals or letters of intent and facility information for the in-state landfill facility selected, within 14 Days of issuance of the Notice to Proceed. The facility information shall include the following:
  - 1. General Information
    - a. Facility Name
    - b. Facility Address
    - c. Name of Contact Person
    - d. Title of Contact Person
    - e. Telephone Number of Contact Person
    - f. Email of Contact Person
    - g. Permit Number
  - 2. The facility shall specify the volume of material that can be accepted from the site on a weekly and total basis.
  - 3. The facility shall provide written confirmation that they are permitted to accept and will accept the classified material of the general quality and quantity described by these Specifications.
  - 4. The facility shall provide a list of all current and valid permits, licenses, letters of approval, and other authorizations to operate that they hold,

pertaining to the receipt and management of the soils or materials specified in the Contract.

5. The Contractor shall submit a complete list of the disposal facility's permitted allowable contaminant levels and physical characteristic requirements for material.

C.

Contaminant	Lined Reuse Levels (DEP Policy #97-001) (mg/kg)	Unlined Reuse Levels (DEP Policy #97-001) (mg/kg)
Total Arsenic	40	40
Total Cadmium	80	30
Total Chromium	1,000	1,000
Total Lead	2,000	1,000
Total Mercury	10	10
Total Petroleum Hydrocarbones (TPH)	5,000	2,500
Total PCBs	<2	<2
Total SVOCs	100	100
Total VOCs	10	4
Conductivity (umhos/cm)	8,000	4,000
Listed or Characteristic Hazardous Waste (TCLP)	None	None

### 3.05 OUT-OF-STATE NON-RCRA LANDFILL DISPOSAL

- A. The contractor shall identify one non-RCRA landfill that is permitted to and will accept the type of material specified in this Contract for disposal.
- B. This type of landfill shall be approved or permitted by the State in which it operates and shall be a lined commercial landfill.
- C. The contractor shall select a landfill that is established, fully operational, and in full compliance with all applicable Federal, State, and local regulations.
- D. The contractor shall designate one landfill as the potential receiving facility. However, Owner will not incur any additional costs if an alternate facility is utilized.
- E. The Contractor shall submit to Owner and the Engineer initial approvals or letters of intent and facility information for the landfill selected, within 14 Days of issuance of the Notice to Proceed. The facility information shall include the following:

1. General Information

- a. Facility Name
  - b. Facility Address
  - c. Name of Contact Person
  - d. Title of Contact Person
  - e. Telephone Number of Contact Person
  - f. Email of Contact Person
  - g. Permit Number
2. The landfill shall specify the volume of material that can be accepted from the site on a weekly and total basis.
  3. The landfill shall provide written confirmation that they are permitted to accept and will accept the classified material of the general quality and quantity described by these Specifications.
  4. The landfill shall provide a listing of all current and valid permits, licenses, letters of approval, and other authorizations to operate that they hold, pertaining to the receipt and management of the soils or materials specified in the Contract.
  5. The Contractor shall submit a complete list of the disposal facility's permitted allowable contaminant levels and physical characteristic requirements for contaminated material, and list any required regulatory approvals for individual waste streams.

3.06 WASTE PROFILES AND MANIFESTS

- A. The Contractor shall be responsible for preparing and submitting to the Engineer for review all waste profile applications and questionnaires, and coordination with disposal facilities and all Federal and State Environmental Agencies.
- B. The Contractor shall be responsible for preparing all hazardous material manifests and 21E Bills of Lading with all applicable analytical backup, notification, and control forms. Contractor shall submit Bills of Lading and manifests with appropriate analytical documentation to the Engineer for review at least seven days before planning transport.
- C. The Contractor shall also provide certified tare and gross weight slips for each load received at the designated facility, which shall be attached to each returned manifest and bill of lading.
- D. Owner will be designated as generator and will sign all manifests, bills of lading and waste profile application or questionnaires.



- E. The Contactor shall furnish all generator copies of the hazardous material manifest to the Engineer for submittal to the appropriate State Environmental Agencies and to retain for Owner's records.
- F. The Contractor shall submit to Owner and the Engineer, prior to receiving progress payment, documentation certifying that all materials were transported to, accepted, and disposed of, at the selected disposal facility. The documentation shall include the following, as a minimum.
  - 1. Documentation shall be provided for each load from the site to the disposal facility, including all BOLs, manifests and any other transfer documentation as applicable.
  - 2. All documentation for each load shall be tracked by the original manifest document number that was assigned by the Engineer at the site.

### 3.07 TRANSPORT OF CONTAMINATED MATERIAL

- A. The Contractor shall not be permitted to transport contaminated materials off-site until all disposal, reuse or recycling facility documentation has been received, reviewed, and accepted by Owner and Engineer/LSP.
- B. The Contractor shall transport contaminated materials from the site to the disposal, reuse or recycling facility in accordance with all United States Department of Transportation (DOT), USEPA, MADEP, and other regulations of all affected states.
- C. The Hauler(s) shall be licensed in all states affected by transport.
- D. The Contractor shall provide to the Engineer copies of all weight slips, both tare and gross, for every load weighed and disposed of at the accepted disposal facility. The slip shall be tracked by the original manifest document number that was assigned by the Engineer at the site. Owner shall only make progress payments upon receipt of these weight slips.
- E. The Contractor shall be responsible for ensuring that free liquid does not develop during transport. Wet soils shall not be loaded for transport. The Contractor shall be responsible to properly dispose of any free liquid that may result during transportation.
- F. The temporary stockpiled material must be removed from the site in accordance with applicable regulatory deadlines however no later than the completion date of this contract as may be extended.

### END OF SECTION

## **DIVISION 03**

SECTION 03 10 00

CONCRETE FORMWORK AND ACCESSORIES

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 WORK INCLUDED

- A. The Contractor shall supply all labor, materials, equipment, temporary protection, tools and appliances necessary for the proper completion of the work in this section, as required in the specifications and in accordance with good construction practice. The work under this section generally includes the furnishing, erecting, and removing after use all concrete formwork and accessories as required for concrete work.

1.03 RELATED WORK

- A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:
  - 1. Section 31 20 00 – Earth Moving
  - 2. Section 03 20 00 – Concrete Reinforcing

1.04 REFERENCES

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other requirements, the most restrictive requirements shall govern.

ACI INTERNATIONAL (ACI)

ACI 301                      Specification for Structural Concrete for Buildings

ACI 318/318R              Building Code requirements for Structural Concrete and  
Commentary

ACI 347R                    Guide to Formwork for Concrete

AMERICAN HARDBOARD ASSOCIATION (AHA)

AHA A135.4                (1995) Basic Hardboard

DEPARTMENT OF COMMERCE (DOC)

DOC PS 1                      Construction and Industrial Plywood

MASSACHUSETTS STATE BUILDING CODE

780 CMR                      Massachusetts State Building Code, 7<sup>th</sup> Edition

1.05 SUBMITTALS

The following shall be submitted in accordance with Section 01300 SUBMITTAL PROCEDURES:

- A. Data: Design analysis and calculations for form design and methodology used in the design. Manufacturer's data including literature describing form materials, accessories, and form releasing agents.
- B. Drawings: Drawings showing details of formwork including, joints, supports, studding and shoring, and sequence of form and shoring removal.
- C. Instructions: Manufacturer's recommendation on method and rate of application of form releasing agents.

1.06 DESIGN

- A. Formwork shall be designed in accordance with methodology of ACI 347R for anticipated loads, lateral pressures, and stresses.
- B. Forms shall be capable of producing a surface which meets the requirements of the class of finish specified in Section 03 20 00 CONCRETE REINFORCING.
- C. Forms shall be capable of withstanding the pressures resulting from placement and vibration of concrete.

1.07 QUALITY CONTROL

- A. Unless otherwise specified herein, or indicated on the drawings, concrete formwork construction and materials shall conform to ACI 301, 318, and 347, and the following tolerances:
  - 1. Variations from the plumb, level or from the grades indicated on the drawings shall not exceed ¼ inch in 10 feet of length
  - 2. Variation in the thickness of slabs and walls shall not exceed plus ½ inch minus ¼ inch
  - 3. Variation of dimensions of footings from plan shall not exceed ½ inch.

4. Misplacement of the eccentricity of the footings shall not exceed 2 inches.
  5. Reduction in thickness of footings shall not exceed 5 percent of specified thickness.
- B. Maximum deflection of form facing materials at concrete surfaces exposed to view shall be L/240 of span.

## PART 2 - PRODUCTS

### 2.01 FORM MATERIALS

- A. Forms for Class A and Class B finished surfaces shall be plywood panels conforming to DOC PS 1, Grade B-B concrete form panels, Class I or II. Other form materials or liners may be used provided the smoothness and appearance of concrete produced will be equivalent to that produced by the plywood concrete form panels.
- B. Forms for Class C finished surfaces shall be shiplap lumber; plywood conforming to DOC PS 1, Grade B-B concrete form panels, Class I or II; tempered concrete form hardboard conforming to AHA A135.4; other approved concrete form material; or steel, except that steel lining on wood sheathing shall not be used.
- C. Forms for Class D finished surfaces, except where concrete is placed against earth, shall be wood or steel or other approved concrete form material.
- D. Form ties shall be factory-fabricated metal ties, shall be of the removable or internal disconnecting or snap-off type, and shall be of a design that will not permit form deflection and will not spall concrete upon removal. Solid backing shall be provided for each tie. Except where removable tie rods are used, ties shall not leave holes in the concrete surface less than ¼ inch nor more than 1-inch-deep and not more than 1 inch in diameter. Removable tie rods shall not be more than 1-½ inches in diameter.
- E. Form releasing agents shall be commercial formulations that will not bond with, stain or adversely affect concrete surfaces. Agents shall not impair subsequent treatment of concrete surfaces depending upon bond or adhesion nor impede the wetting of surfaces to be cured with water or curing compounds.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Forms shall be mortar tight, properly aligned, and adequately supported to produce concrete surfaces meeting the surface requirements specified in Section 03 20 00 *CONCRETE REINFORCING*. Forms shall conform to construction tolerances previously stated in this Section.

- B. Where concrete surfaces are to have a Class A or Class B finish, joints in form panels shall be arranged as approved. Where forms for continuous surfaces are placed in successive units, care shall be taken to fit the forms over the completed surface so as to obtain accurate alignment of the surface and to prevent leakage of mortar.
- C. Forms shall not be reused if there is any evidence of surface wear and tear or defects which would impair the quality of the surface. Surfaces of forms to be reused shall be cleaned of mortar from previous concreting and of all other foreign material before reuse.
- D. Form ties that are to be completely withdrawn shall be coated with a non-staining bond breaker.

### 3.02 CHAMFERING

- A. Except as otherwise shown, external corners that will be exposed shall be chamfered, beveled, or rounded by moldings placed in the forms.

### 3.03 COATING

- A. Forms for Class A and Class B finished surfaces shall be coated with a form releasing agent before the form or reinforcement is placed in final position. The coating shall be used as recommended in the manufacturer's printed or written instructions.
- B. Forms for Class C and D finished surfaces may be wet with water in lieu of coating immediately before placing concrete, except that in cold weather with probable freezing temperatures, coating shall be mandatory.
- C. Surplus coating on form surfaces and coating on reinforcing steel and construction joints shall be removed before placing concrete.

### 3.04 REMOVAL OF FORMS

- A. Forms shall be removed in a manner that will prevent damage to the concrete and will ensure the complete safety of the structure. Formwork for footings, walls, and other parts not supporting the weight of concrete may be removed when the concrete has attained sufficient strength to resist damage from the removal operation, but not before at least 24 hours has elapsed since concrete placement.
- B. Supporting forms and shores shall not be removed from walls until the structural units are strong enough to carry their own weight and any other construction or natural loads.
- C. In no case will supporting forms or shores be removed before the concrete strength has reached 70 percent of design strengths as determined by field cured cylinders or other approved methods. This strength shall be

demonstrated by job-cured test specimens, and by a structural analysis considering the proposed loads in relation to these test strengths and the strength of forming and shoring system.

- D. The job-cured test specimens for form removal purposes shall be provided in numbers as directed and shall be in addition to those required for concrete quality control. The specimens shall be removed from molds at the age of 24 hours and shall receive, insofar as possible, the same curing and protection as the structures they represent.

*END OF SECTION*

SECTION 03 20 00

CONCRETE REINFORCING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1, GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 WORK INCLUDED

In general, the Contractor shall supply all labor, materials, equipment, temporary protection, tools and appliances necessary for the proper completion of the work in this section, as required in the specifications and in accordance with good construction practice. The work under this section generally includes the following:

- A. Furnish and install reinforcing bars, tie wires and supports as required.
- B. Furnish and install welded wire fabric as required.
- C. Clean all areas affected by the work.

1.03 RELATED WORK

- A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:
  - 1. Section 03 10 00 – Concrete Forming and Accessories
  - 2. Section 03 30 00 – Cast-in-Place Concrete

1.04 REFERENCES

- A. Comply with applicable requirements of the following standards. Where these standards conflict with other requirements, the most restrictive requirements shall govern.

American Concrete Institute Standards (ACI) latest edition.

- 301 Specifications for Structural Concrete
- 318 Building Code Requirements for Structural Concrete.
- 315 Details and Detailing of Concrete Reinforcement.



- 315R      Manual of Engineering and Placing Drawings for Reinforced Concrete Structures  
  
             American Society for Testing and Materials (ASTM)
- A615      Deformed and Plain Billet Steel Bars for Concrete Reinforcement  
  
             Concrete Reinforcing Steel Institute (CRSI)  
  
             Manual of Standard Practice, Latest Edition  
  
             Placing Reinforcing Bars, Latest Edition.

1.05    SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00, SUBMITTAL PROCEDURES:

A.      Shop Drawings:

Show sizes and dimensions for fabrication and placing of reinforcing steel and bar supports. Indicate bar schedules, stirrup spacing, and diagrams of bent bars.

B.      Certificates:

Mill test certificates identifying chemical and physical analysis of each load of reinforcing steel delivered.

1.06    DELIVERY, STORAGE, AND HANDLING

A.      Deliver reinforcement to project site in bundles marked with metal tags indicating bar size and length.

B.      Handle and store materials to prevent contamination and contact with the ground.

1.07    QUALITY CONTROL

A.      Reinforcing steel shall be fabricated to conform to the required shapes, dimensions and tolerances specified in the CRSI Manual.

B.      Allowable Tolerances:

1.      Fabrication Tolerances:

- a.      Sheared Length: plus or minus 1 inch for bends. Stirrups, ties, and spirals: plus or minus ½ inch.

2.      Placement Tolerances:

- a. Concrete cover to form surface: plus or minus ¼ inch.
- b. Minimum spacing between bars: minus ¼ inch.
- c. Top bars in slabs and beams: Members 8 inches deep or less: plus or minus ¼ inch; members between 8 inches and 2 feet: plus or minus 1 inch; members 2 feet deep or greater: plus or minus 1 inch.
- d. Crosswise of members: spaced evenly within 2 inches.
- e. Lengthwise of members: plus or minus 1 inch.
- f. Maximum bar movement to avoid interference with other reinforcing steel, conduits, or embedded items: 1 bar diameter.

## PART 2 - MATERIALS

### 2.01 MATERIALS

#### A. Reinforcing Bars:

- 1. Deformed billet steel: ASTM A615, Grade 60.
- 2. Bend test: Meet 90° bend test at 60° F minimum temperature around a 10 bar diameter bend without cracking.

#### B. Welded Wire Fabric:

- 1. Size per plans, conform to ASTM A884, Epoxy Coated.
- 2. All welded wire fabric to be provided in flat sheets.

#### C. Tie Wire:

- 1. Annealed Steel - Federal Specification QQ-W-461, 16 gage minimum.

#### D. Bar Supports:

- 1. Conform to "Bar Support Specifications", CRSI Manual of Standard Practice, Class B - Pregalvanized cold-drawn wire.

### 2.02 FABRICATION

- A. In accordance with CRSI Manual of Standard Practice.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Remove all mud, oil, loose rust or mill scale and other foreign materials that may reduce bond prior to placing concrete. "Tight" rust or mill scale will be permissible without cleaning or brushing, provided weights and dimensions are not less than the minimum required by referenced specifications.

3.02 INSTALLATION

A. Reinforcing Bar Placement:

- 1. Conform to CRSI-WCRSI "Placing Reinforcing Steel".
- 2. Position bars in accordance with above tolerances and secure in place.

B. Welded Wire Fabric Placement:

- 1. Install in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
- 2. Fabric shall be wired or clipped together at laps at intervals not to exceed 4 feet. Fabric shall be positioned by the use of appropriate supports suitable for application.

C. Bar Supports:

- 1. Provide minimum number of supports as required by ACI 315.
- 2. Do not use pebbles, pieces of broken stone, brick, or concrete, metal pipe or wood blocks to support reinforcement. Do not use bar supports as support for runways for concrete buggies or similar loads. Do not place bars more than 2 inches beyond the last leg at the end of a run of continuous supports.

D. Concrete Cover:

- 1. Except as otherwise indicated on the construction drawings, provide the minimum clearance for concrete cover in accordance with ACI 318.

E. Reinforcing Adjustment:

- 1. Move only within allowable tolerances to avoid interference with other reinforcing steel, conduits, or embedded items. Do not move bars beyond allowable tolerance without approval of the Engineer.

2. Do not heat, bend, or cut bars without approval of the Engineer.

F. Splices:

1. Do not splice bars except at locations on the details without approval of the Engineer.
2. Minimum lap distance is as shown on the details and as specified in ACI 318. Tie splices securely with wire to prevent displacement during placing of concrete.

END OF SECTION

SECTION 03 28 24

COLUMBARIUM

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.
- B. The Contractor shall provide all labor, plant and equipment as required for furnishing, delivering and installing two (2) columbaria, each with 32 cremation niches.

1.02 THE CONTRACTOR SHALL

- A. Provide shop drawings and material samples to the Engineer and the Owner for review and approval.
- B. Manufacture precast concrete columbaria units, faced with granite, in his facility and must be made of solid stone as per VA standards, refer to concrete interior Mass Law 114 43 M.
- C. Provide two (2) weeks' notice prior to delivery.
- D. Deliver columbaria to the jobsite and install.
- E. Clean up work area and dispose of all trash.

1.04 COORDINATION

- A. Prior to the start of the work, the contractor shall submit data to the Engineer and Owner to demonstrate that the columbaria meet the specification requirements. The following shall be submitted:
  - 1. Shop drawings. These drawings shall show all dimensions and materials required for fabrication of the columbarium units. Details of welded wire mesh placement shall be included. The precast concrete units shall be produced with the approved drawings.
  - 2. One granite sample, at least 4" x 4" with actual proposed thickness.
  - 3. One caulk sample for review and approval.
  - 4. Concrete mix design data, including

- a. Concrete proportions
  - b. Concrete compressive strength
  - c. Water-cement ratio
  - d. Air content
  - e. Slump
  - f. Type and quantity of admixtures
5. Erection drawings showing the orientation and location of each unit and anchorage details of the columbarium to the concrete foundation.
  6. Concrete foundation design, including overall dimensions.
  7. Accessory Items, including but not limited to sealants, gaskets, doors, and other items installed before or after deliver, the contractor shall include proper installation instruction and relevant product data.

## PART 2 - MATERIALS

### 2.01 CONCRETE AND REINFORCEMENT

- A. Except as otherwise specified or approved by the Engineer and Owner, materials shall conform to the following:
  1. Cement
    - ASTM C 150 (Type I, II, III, or V)
    - ASTM C 595 (for blended cements)
  2. Silica Fume
    - ASTM C 1240
  3. Fly Ash and Pozzolans
    - If used, provide data or ASTM standards for review
  4. Aggregates
    - Aggregates shall conform to ASTM C 33.
    - Aggregates shall not contain any substance which may be deleteriously reactive with the cement.
  5. Admixtures and Fiber Mesh – Provide data sheets for review by Engineer and Owner.
  6. Reinforcement
    - ASTM A 1064

### 2.02 INSERTS AND EMBEDDED METALS

- A. All items embedded in concrete shall be of the type required for the intended use and meet the following standards.
  1. Structural Steel Plates, Angles, etc. – ASTM A 36

2. Hot-Dipped Galvanized – ASTM A 152

2.03 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Joint Sealants shall conform to ASTM C 920. Caulking color shall match the granite color.

2.04 GRANITE

- A. Granite shall comply with ASTM C615, "Standard Specification for Granite Dimension Stone" for material characteristics and physical requirements.
- B. All granite shall be of standard architectural grade, free of cracks, seams, or starts, which may impair its structural integrity or function. Color or other visual characteristics indigenous to the particular material and adequately demonstrated in the sample will be accepted provided they do not compromise the structural or durability capabilities of the material. Texture and finish shall be within the range of samples provided.
- C. Niche doors shall be covered with  $\frac{3}{4}$ " granite.
- D. Top and two sides of columbarium shall be finished with 3" thick granite.
- E. Back side of columbarium shall be faced with  $\frac{3}{4}$ " thick granite panels.

2.05 HARDWARE AND HANGERS

- A. Top and side granite trim shall be attached with stainless steel lug bolts and epoxy.
- B. Hanging system to fasten granite shutter doors to each columbarium shall be Sinner Brothers brass hangers or approved equal. Shutter doors shall be secured to brass hangers with bronze rosettes.
- C. Back panels shall be attached to columbarium with galvanized granite retaining clip at top edge and Sika Hi-Mod Epoxy or approved equal.

PART 3 – EXECUTION

3.01 CONFIGURATION OF COLUMBARIUM UNITS

- A. There shall be 32 cremation niches in each of the two (2) columbaria. Columbarium shall be four (4) niches high by eight (8) niches long.
- B. Each niche chamber shall measure 12" square by 15" deep. A 3/16 inch interior privacy door shall be included in each niche.

- C. Niches shall be covered by ¾" thick granite doors. There shall be 32 doors on each unit, with each door covering an individual niche space. 6 spare doors shall be provided for each columbarium unit.
- D. Top and sides shall be finished with 3" granite.
- E. Back side of columbarium shall be covered by ¾" thick granite panels. There shall be 4 vertical panels, each of the same dimensions.

3.02 MANUFACTURE OF PRECAST CONCRETE UNITS

- A. Forms: Forms for manufacturing precast concrete units shall be of the type and design consistent with industry standards and practices. They should be capable of consistently providing uniform products and dimensions.
- B. Reinforcement: Comply with applicable ACI 318 standards for placement and splicing. Positive means shall be taken to assure that the reinforcement does not move significantly during the casting operations.
- C. Embedded Items: Embedded items shall be positioned at locations specified in the shop drawings. Inserts shall be held rigidly in place so that they do not move significantly during casting operations.
- D. Concrete Mixing: Mixing operations shall produce batch-to-batch uniformity of strength, consistency, and appearance.
- E. Concrete Proportions: Concrete shall be proportioned to attain 28-day compressive strength of 5,000 psi.
- F. Concrete Placing: Concrete shall be consolidated in such a manner that segregation of the concrete is minimized and honeycombed areas are kept to a minimum.
- G. Surface Finish: Major imperfections, excessive honeycombing or other major defects shall not be permitted.

3.03 GRANITE FACING

- A. Cut and fit granite units in a manner which will not damage the granite faces.
- B. Granite shall be anchored in accordance with the shop drawings.
- C. Granite shall be installed so that the finished columbarium is plumb, square and level.
- D. Joints between granite panels shall be of uniform width.



- E. Contractor shall clean the granite after installation of the columbarium. Cleaning materials shall be appropriate for the application and shall be used in accordance with the manufacturer's instructions.

3.04 HANDLING, STORAGE AND DELIVERY

- A. Columbarium units shall be handled and transported in a manner to minimize damage. Lifting devices or holes shall be consistent with industry standards.
- B. The Contractor shall schedule and coordinate the work with the Engineer and Owner. Contractor shall notify the Engineer and Owner a minimum of 72 hours in advance of starting the work and upon completion of the work.
- C. Upon delivery to the job site, app precast concrete units shall be inspected by the Engineer and Owner for quality and acceptance.

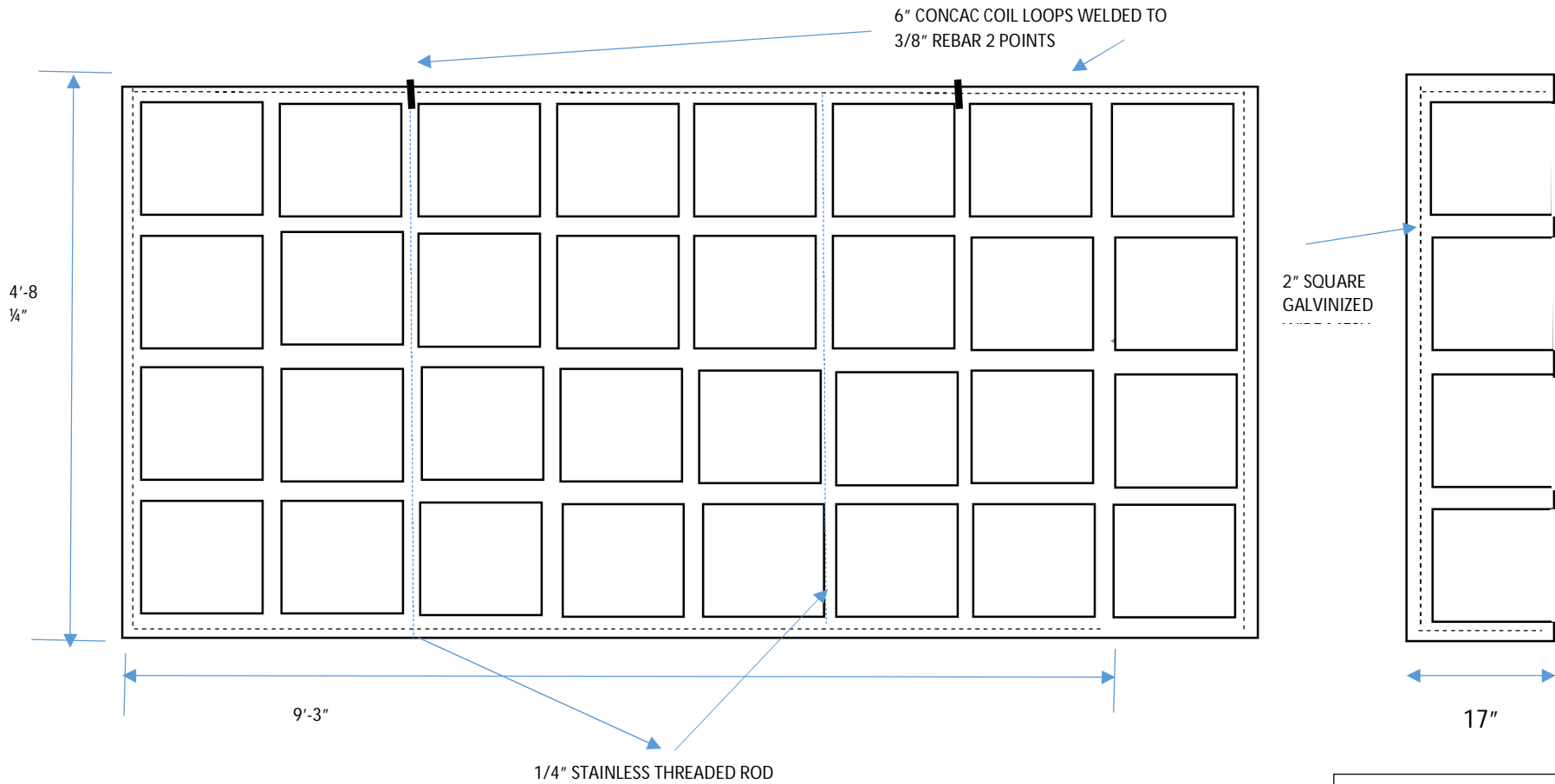
3.05 INSTALLATION

- A. The Contractor shall install the columbaria in accordance with the shop drawings on the concrete foundation.
- B. Columbaria shall be centered on the foundation and set plumb and level.

3.06 CLEAN-UP

- A. Contractor shall clean up the site upon completion of the work, repair any damage to the grounds caused by his operations, legally dispose of his trash, and leave the site in a raked, clean condition.

END OF SECTION



A-2 FRONT SECTION-no scale

A-2 SIDE SECTION-

Concrete Mix Design

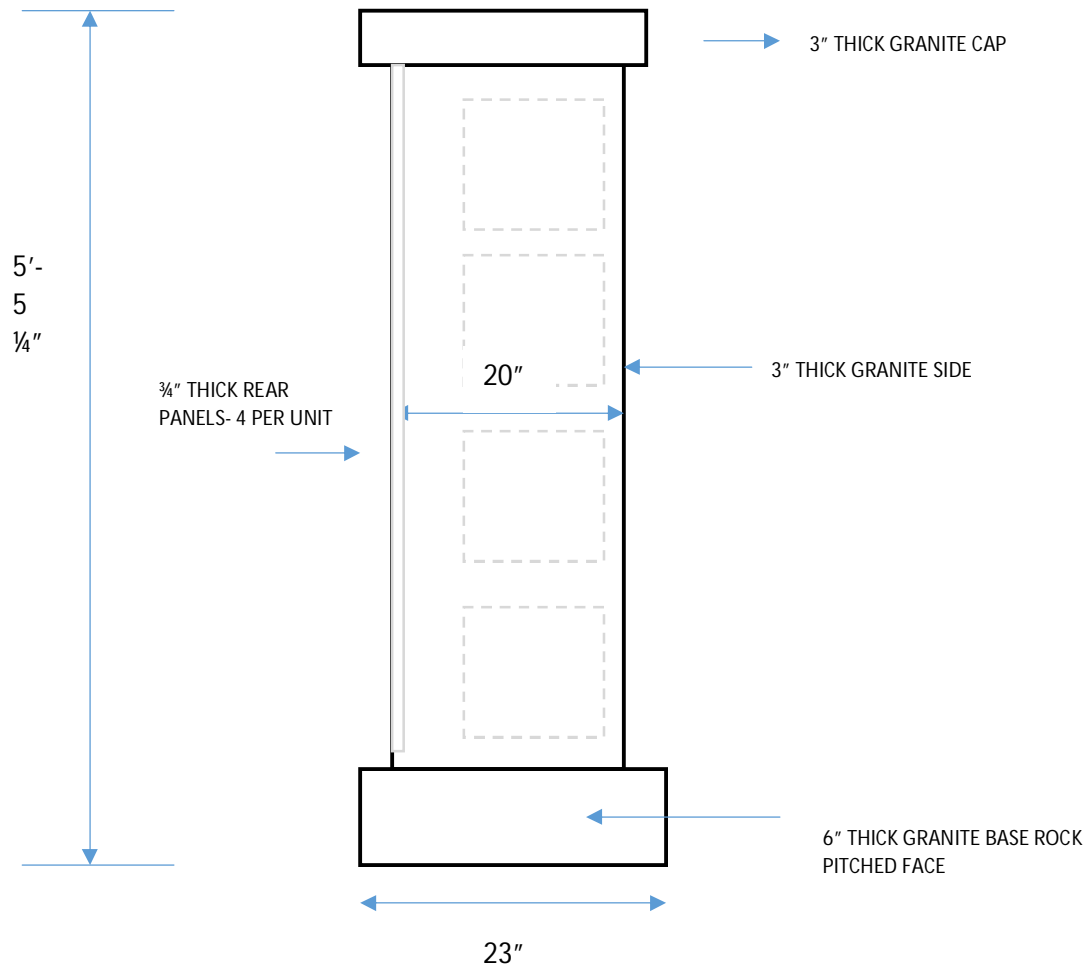
6000 PSI CONCRETE TYPE 3 625lb 1600 lb sand 1300lb 3/8" stone .43 w/c ratio 2% air entrain

40 oz GELENIUUM SCC ADMIX, 3/4" NEURLON FIBER MESH 5LB BAG PER YARD 22inch spread

DRAWING NUMBER

A-2

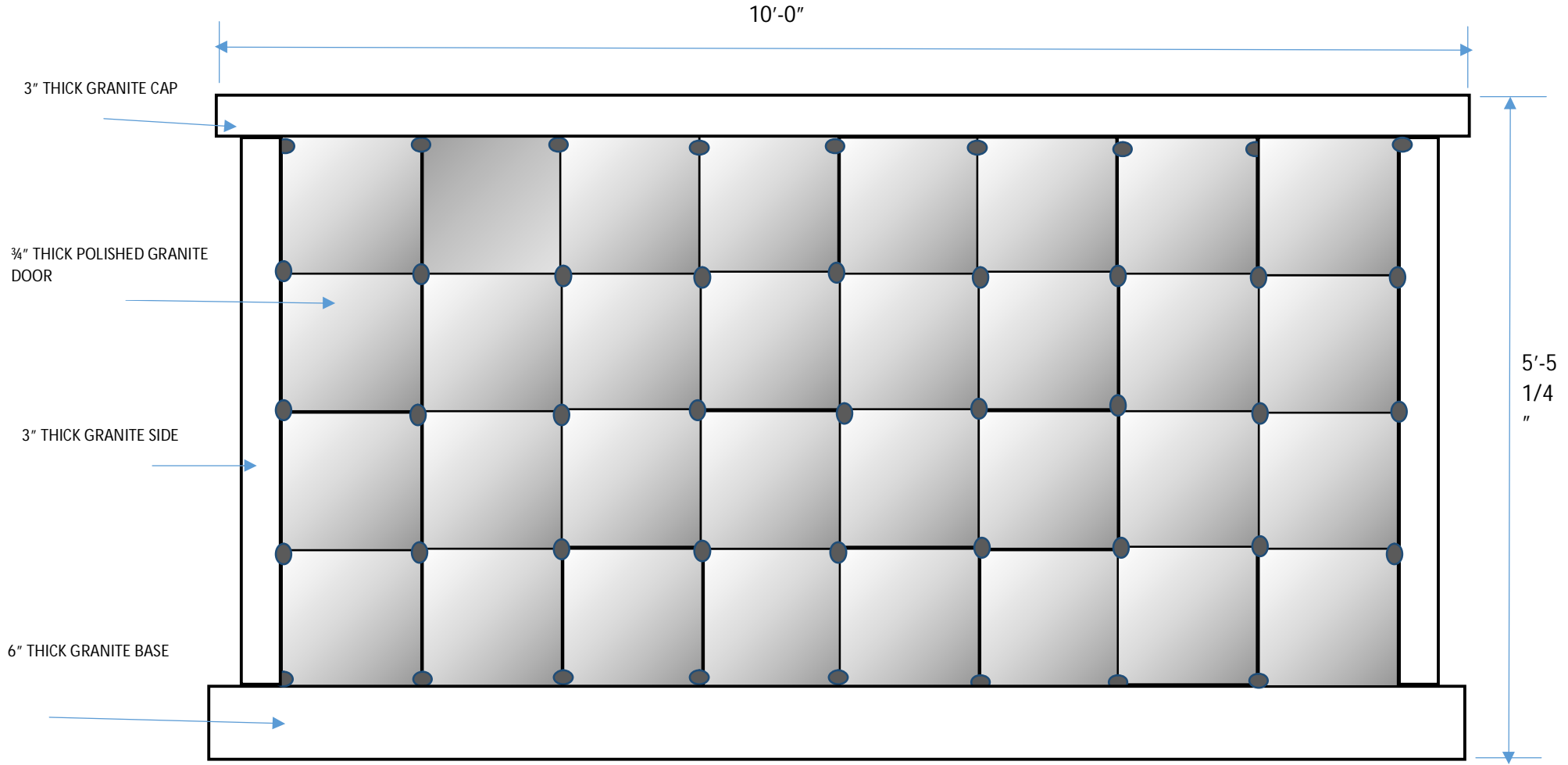
INTERIOR SPECIFICATIONS



DRAWING NUMBER

A-3

END VIEW



DRAWING NUMBER	CITY OF WALTHAM	NOT TO SCALE
<b>A-1</b>		
Individual unit shown	32 UNIT COLUMBARIUM	

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.02 WORK INCLUDED

- A. Perform all work required to complete the work of the Section, as indicated. Such work includes, but is not limited to, the following:
  - 1. Concrete Pads
  - 2. Foundations

1.03 RELATED WORK

- A. SECTION 31 20 00 – Earth Moving
- B. SECTION 03 20 00 – Concrete Reinforcing
- C. SECTION 33 41 00 – Storm Utility Drainage Piping

1.04 REFERENCES

- A. Work shall comply with applicable requirements of the following Standards. Where these standards conflict with other requirements, the most restrictive requirement shall govern.
  - 1. Massachusetts Highway Department Standard Specifications for Highways and Bridges (MHD Specifications)
  - 2. American Concrete Institute (ACI)
  - 3. American Society for Testing and Materials (ASTM)
  - 4. Americans with Disabilities Act (ADA)

1.05 QUALITY ASSURANCE

- A. Unless otherwise specified, work and materials for construction of the Portland Cement Concrete Paving shall conform to ACI 216R.

- B. Paving work, base course etc., shall be done only after excavation of construction work which might injure them has been completed. Damage caused during construction shall be repaired before acceptance.
- C. Existing paving areas shall, if damaged or removed during course of this project, be repaired or replaced under this section of the specification. Workmanship and materials for such repair and replacement, except as otherwise noted, shall match as closely as possible those employed in existing work.
- D. Pavement, base, or sub-base shall not be placed on a muddy or frozen sub-grade.
- E. The Owner reserves the right to retain an independent testing laboratory to perform inspection and testing of paving and associated work.

1.06 SUBMITTALS

- A. Submit manufacturer's product data for the following:
  - 1. Product Data
  - 2. Concrete job mix formula.

PART 2 - PRODUCTS

2.01 DENSE GRADED CRUSHED STONE

- A. Dense Graded Crushed Stone shall be as specified under Section 31 20 00, Earth Moving.
- B. The Contractor shall submit to the Engineer a sieve analysis by an independent recognized testing laboratory of the material he intends to utilize. No material shall be placed until approved by the Engineer in writing.

2.03 PORTLAND CEMENT CONCRETE

- A. Portland cement concrete for pavements and slabs shall be air-entrained type with a maximum water-cement ration of 5.0 conforming to ACI 316R. Minimum compressive strengths at 28 days shall be as follows: Flexural strength with third point loading – 650 psi; compressive strength – 4,000 psi.
- B. Concrete shall be air-entrained type, conforming to ASTM C94. Air content by volume shall be 6% +/- 1%, and shall be tested in accordance with ASTM C 231.

- C. Concrete slump shall be no less than 2 inches nor greater than 4 inches, determined in accordance with ASTM C 143.
- D. Cement shall be Portland cement, conforming to ASTM C 150, Type I or II. Only one color of cement, all of the same manufacturer, shall be used for the work. Type III cement shall be used only with the prior approval of the Engineer.
- E. Fine and coarse aggregate shall conform to ASTM C 33.
- F. Concrete shall contain a water reducing agent to minimize cement and water content of the concrete mix at the specified slump. Water reducing agent shall conform to ASTM C 494.
- G. No calcium chloride or admixtures containing calcium chloride shall be added to the concrete. No admixtures other than those specified shall be used in the concrete without the specific written permission of the Engineer in each case.

#### 2.04 CURING MATERIALS

- A. Curing shall be moist curing or by use of curing compound.
- B. Curing paper shall be non-staining, fiber reinforced laminated Kraft bituminous product conforming to ASTM C 171. Four mil polyethylene sheeting may be substituted for curing paper.
- C. Curing compound shall be a resin-base, white pigmented compound conforming to ASTM C 309, Type 2.

#### 2.05 JOINTS

- A. Joint filler strips shall conform to ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

#### 2.06 BOND BREAKER

- A. Bond breaker shall be asphalt felt conforming to ASTM D 226, Type I or 6 mil polyethylene sheeting.

### PART 3 – EXECUTION

#### 3.01 PREPARATION OF SUBGRADE

- A. Areas to be paved will be compacted and brought to sub-grade elevations under Section 31 10 10, Site Clearing before work of this section is performed. Final fine grading, filling, and compaction of areas to receive paving, as required to form a firm, uniform, accurate, and unyielding sub-grade at required elevations and to required lines, shall be done under this Section.

- B. Existing sub-grade material which will not readily compact as required shall be removed and replaced with satisfactory materials. Additional materials needed to bring sub-grade to required line and grade and to replace unsuitable material removed shall be material conforming to this Section.
- C. Sub-grade of areas to be paved shall be re-compacted as required to bring top 8 inches of material immediately below gravel base course to a compaction at optimum moisture of at least 95% of maximum density, as determined by ASTM D 1557. Sub-grade compaction shall extend for a distance of at least 1 foot beyond pavement edge.
- D. Excavation required in pavement sub-grade shall be completed before fine grading and final compaction of sub-grade are performed. Where excavation must be performed in completed sub-grade, sub-base, base or pavement, subsequent backfill and compaction shall be performed as directed by the Engineer as specified in Section 31 20 00, Earth Moving. Completed sub-grade after filling such areas shall be uniformly and properly graded.
- E. Areas being graded or compacted shall be kept shaped and drained during construction. Ruts greater than or equal to 2 inches deep in sub-grade shall be graded out, reshaped as required, and re-compacted before placing pavement base course.
- F. Materials shall not be stored or stockpiled on sub-grade.
- G. Disposal of debris and other material excavated under this Section, and material unsuitable for or in excess of requirements for completing work of this Section shall be disposed of offsite unless otherwise directed by the Engineer or Owner.
- H. Prepared sub-grade will be inspected by the Engineer. Sub-grade shall be approved by the Engineer before installation of gravel base course. Disturbance to sub-grade caused by inspection procedures shall be repaired under this Section of the specification.

3.02 DENSE GRADED CRUSHED STONE

- A. Dense graded crushed stone base course for paving and the spreading, grading, and compaction methods employed shall conform to standard requirements for usual base course of this type for first class road work, and the following: MHD Specifications Section 402, "Dense Graded Crushed Stone for Sub-Base".
- B. Width of dense graded crushed stone base course shall be greater than or equal to the width of pavement surface, if continuous lateral support is provided during rolling, and shall extend at least 2 times the base thickness beyond edge of the course above, if not so supported.



- C. Dense graded crushed stone material shall be applied in lifts less than or equal to 6 inches thick, compacted measure. Each lift shall be separately compacted to specified density, using a 6-ton steel wheel roller or vibratory roller equivalent to a 6-ton static roller, or an approved equivalent.
- D. Material shall be placed adjacent to wall, manhole, catch basin, and other structures only after they have been set to required grade and level.
- E. Rolling shall begin at sides and progress to center of crowned areas, and shall begin on low side and progress towards high side of sloped areas. Rolling shall continue until material does not creep or wave ahead of roller wheel.
- F. Surface irregularities which exceed ½ inch as measured by means of a 10-foot-long straightedge, shall be replaced and properly re-compacted.
- G. Base course shall be compacted at optimum moisture content to not less than 95% of maximum density as determined by ASTM D 1557.
- H. Sub-grade and base course shall be kept clean and uncontaminated. Less select materials shall not be permitted to become mixed with gravel. Materials spilled outside pavement lines shall be removed and area repaired.
- I. Portions of sub-grade or of construction above which become contaminated, softened, or dislodged by passing of traffic, or otherwise injured, shall be cleaned, replaced, or otherwise repaired to conform to the requirements of this Section before proceeding with next operation.

### 3.03 STEEL REINFORCEMENT

- A. Before being placed in position, reinforcing for reinforced concrete shall be thoroughly cleaned of loose mill and rust scale, dirt, ice, and other foreign material which may reduce the bond between the concrete and reinforcing. Where there is delay in placing concrete after reinforcement is in place, bars shall be re-inspected and cleaned when necessary.
- B. Unless otherwise indicated on the Drawings, reinforcing shall extend within 2 inches of formwork and expansion joints. Reinforcing shall continue through control joints.
- C. After forms have been coated with form release agent, but before concrete is placed, reinforcing steel shall be securely wired in the exact position called for, and shall be maintained in that position until concrete is placed and compacted. Chair bars and supports shall be provided in a number and arrangement satisfactory to the Engineer.

### 3.04 PORTLAND CEMENT CONCRETE PAVING

- A. Paving mix, equipment, methods of mixing and placing, and precautions to be observed as to weather, condition of base etc., shall meet requirements of ACI 316R. Pavement shall be constructed in accordance with the Drawings.
- B. The Engineer shall be notified of concrete placement sufficiently in advance of start of operation to allow his representative to complete preliminary inspection of the work, including sub-grade, forms, and reinforcing steel, if used.
- C. Normal concrete placement procedures shall be followed. Concrete shall arrive at the jobsite so that no additional water will be required to produce the desired slump. When conditions develop that require additional water to produce the desired slump, permission of the Engineer must be obtained. The concrete shall be transported from the mixer to its place of deposit by a method that will prevent segregation or loss of material.
- D. Work shall not be performed during rainy weather or when temperature is less than 40°F (4.4°C).
- E. Adjacent work, etc., shall be protected from stain and damage during entire operation. Damaged and stained areas shall be replaced or repaired to equal their original conditions.
- F. Existing concrete, earth, and other water-permeable material against which new concrete is to be placed shall thoroughly damp when concrete is placed. There shall be no free water on surface.
- G. Concrete which has set or partially set before placing shall not be employed. Re-tempering of concrete will not be permitted.
- H. Concrete shall be thoroughly spaded and tamped to secure a solid and homogeneous mass, thoroughly worked around reinforcement and into corners of forms.
- I. When joining fresh concrete to concrete which has attained full set, latter shall be cleaned of foreign matter, and mortar scum and laitance shall be removed by chipping and washing. Clean, roughened base surface shall be saturated with water, but shall have no free water on surface. A coat of 1:1 cement-sand grout, approximately 1/8-inch thick, shall be well scrubbed into thoroughly dampened concrete base. New concrete shall be placed immediately, before grout has dried or set.

### 3.05 JOINTS

- A. Locate and install Expansion and Control Joints in accordance with the Drawings and as specified herein.

### 3.06 FINISHING

- A. Concrete flatwork surfaces shall be screeded off and finished true to line and grade, and free of hollows and bumps. Surface shall be dense, smooth, and at exact level and slope required.
- B. Finished concrete surface for concrete pads shall be wood-floated and steel troweled to a smooth surface. Surface shall not deviate more than 1/8-inch in 10 feet.
- C. Unless otherwise indicated, horizontal surfaces of concrete surfaces which will be exposed shall be given a light broomed finish, with direction of grooves in concrete surface perpendicular to length of concrete band, slab, or pad. After concrete has set sufficiently to prevent coarse aggregate from being torn from surface, but before it has completely set, brooms shall be drawn across it to produce a pattern of small parallel grooves. Broomed surface shall be uniform, with no smooth, unduly rough or porous spots, or other irregularities. Coarse aggregate shall not be dislodged by brooming operation.
- D. Where finishing is performed before and of curing period, concrete shall not be permitted to dry out, and shall be kept continuously moist from time of placing until end of curing period, or until curing membrane is applied.

### 3.07 CURING

- A. It is essential that concrete be kept continuously damp from time of placement until end of specified curing period. It is equally essential that water not be added to surface during floating and troweling operations, and not earlier than 24 hours after concrete placement. Between finishing operations surface shall be protected from rapid drying by a covering of waterproofing paper. Surface shall be damp when the covering is placed over it, and shall be kept damp by means of a fog spray of water, applied as often as necessary to prevent drying, but not sooner than 24 hours after placing concrete. None of the water so applied shall be troweled or floated into surface.
- B. Concrete surfaces shall be cured by completely covering with curing paper or application of a curing compound.
- C. Concrete cured using waterproof paper shall be completely covered with paper with seams lapped and sealed with tape. Concrete surface shall not be allowed to become moistened between 24 and 36 hours after placing concrete. During curing period surface shall be checked frequently, and sprayed with water as often as necessary to prevent drying, but not earlier than 24 hours after placing concrete.
- D. If concrete is cured with a curing compound, compound shall be applied at a rate of 200 square feet per gallon, in two applications perpendicular to each other.
- E. Curing period shall be seven days minimum.

3.08 COLD WEATHER CONCRETING

- A. Materials for concrete shall be heated when concrete is mixed, placed, or cured when the mean daily temperature is below 40 degrees F. or is expected to fall below 40 degrees F. within 72 hours, and the concrete after placing shall be protected by covering, heat, or both.
- B. Details of handling and protecting of concrete during freezing weather shall be subject to the approval or direction of the Engineer. Procedures shall be in accordance with provisions of ACI 306 R.

3.08 HOT WEATHER CONCRETING

- A. Concrete just placed shall be protected from the direct rays of the sun and the forms and reinforcement just prior to placing shall be sprinkled with cold water. Every effort shall be made to minimize delays which will result in excessive mixing of the concrete after arrival on the job.
- B. During periods of excessively hot weather (95 degrees F, or above), ingredients in the concrete shall be cooled insofar as possible and cold mixing water shall be used to maintain the temperature of the concrete at permissible levels all in accordance with the provisions of ACI 305. Any concrete with a temperature above 95 degrees F, when ready for placement will not be rejected.
- C. Temperature records shall be maintained throughout the period of hot weather giving air temperature, general weather conditions (calm, windy, clear, cloudy, etc.) and relative humidity. Records shall include checks on temperature of concrete as delivered and after placing in forms. Data should be correlated with the progress of the work so that conditions surrounding the construction of any part of the structure can be ascertained.

3.09 PROTECTION OF CONCRETE SURFACES

- A. Concrete surface shall be protected from traffic or damage until surfaces have hardened sufficiently. If necessary ½ inch thick plywood sheets shall be used to protect the exposed surface.

END OF SECTION

## **DIVISION 31**

SECTION 31 10 10

SITE CLEARING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.

1.02 SUMMARY

- A. This Section includes the following:
  - 1. Topsoil and subsoil stripping.
- B. Related Sections include the following:
  - 1. SECTION 31 20 00 – Earth Moving

1.03 DEFINITIONS

- A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; and free of weeds, roots, and other deleterious materials.
- B. Subsoil: Friable soil containing no stone greater than two-thirds (2/3) of the loose lift thickness. The material shall be free of trash, ice, snow, tree stumps, roots and organic materials.

1.04 MATERIALS OWNERSHIP

- A. Except for materials indicated to be stockpiled, reused, or to remain the City's property, cleared materials shall become Contractor's property and shall be properly removed from the site.

1.05 SUBMITTALS

- A. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing, if any.
- B. Record drawings according to Division 1 Section "Project Closeout."

1. Identify and accurately locate capped utilities and other subsurface structural, electrical, and mechanical conditions.

#### 1.06 QUALITY ASSURANCE

- A. Preinstallation Conference: Conduct pre-clearing conference at Project site prior to commencement of clearing operations.

#### 1.07 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, parking lots, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
  1. Do not close or obstruct access ways, streets, walks, parking lots, or other adjacent occupied or used facilities without permission from the authorities having jurisdiction.
  2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- B. Improvements on Adjoining Property: Authority for performing indicated removal and alteration work on property adjoining the City's property (if any) will be obtained by the City before award of Contract.
- C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on the premises where indicated in accordance with demolition plan, or if not indicated then where acceptable to the City.
- D. Notify utility locator service for area where Project is located before site clearing.

#### PART 2 - PRODUCTS (Not Applicable)

#### PART 3 - EXECUTION

##### 3.01 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Provide erosion-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Protect existing site improvements to remain from damage during construction.
  1. Restore damaged improvements to their original condition, as acceptable to the Owner and/or Engineer.

3.02 CLEARING AND GRUBBING

- A. Remove obstructions, trees, grass, and other vegetation to permit installation of new construction. Removal includes digging obstructions and grubbing roots.
  - 1. Completely remove obstructions, and debris extending to a depth of 18 inches (450 mm) below exposed subgrade.
  - 2. All debris to be removed from site and properly disposed of.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
  - 1. Place fill material in horizontal layers not exceeding 8-inch (200-mm) loose depth, and compact each layer to a density equal to adjacent original ground.

3.03 DISPOSAL

- A. Disposal: Remove surplus soil material, unsuitable topsoil, tailings, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off the property.

END OF SECTION



SECTION 31 20 00

EARTH MOVING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.
- B. All excavation, trenching, sheeting, bracing, etc shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926.650 Subpart P) and to the Massachusetts Department of Labor and Industries, Division of Industrial Safety "Rules and Regulations for the Prevention of Accidents in Construction Operations" (Chapter 454 CMR 10.00 et seq.), State and local requirements. Where conflict between OSHA, State and local regulations exists, the most stringent requirements shall apply.
- C. The Contractor shall notify Dig Safe at 1-888-DIG-SAFE (1-888-344-7233) at least 72 hours prior to any excavation activities.

1.02 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and perform all excavation work and grading; place and compact backfill and fill including excavation for new hardscape surfaces and all other items shown, and restoration of surface materials as specified herein, or as directed by the Engineer.
- B. Proof compact the excavated subgrade below all pathways and surfaced areas. Notify Engineer and Owner in advance of these activities for required observation. Contractor shall be responsible for all compaction testing.
- C. The work shall include, but not necessarily be limited to; excavation for concrete footings, paved access ways, pipes, utility structures and all other items shown including all backfilling and fill; embankment preparation and grading; disposal of waste materials; and all related work.
- D. Wherever the requirement for percent compaction is referenced to herein, it shall mean "at least the required percent of maximum density as determined by ASTM D 1557, Method D."
- E. The Contractor shall remove from the excavation all materials which the Engineer may deem unsuitable for backfilling, the bottom excavation shall be firm, dry, and in all respects, acceptable. If conditions warrant, the contractor

may be ordered to deposit sand refill for excavation below grade, directly on the bottom of the excavation immediately after excavation has reached the proper depth and before the bottom of the excavation has become softened or disturbed by any cause whatever.

1.03 SPECIAL REQUIREMENTS

- A. The Contractor shall satisfy him/her as to the character, quantity, and distribution of all material to be excavated. No payment will be made for the placement of any excavated material, which is used for purposes other than those designated and as specified herein.
- B. The Contractor shall be familiar with the locations of all existing utilities, such as electrical conduits and water lines and verify as necessary to protect them.
- C. All exploratory excavation to locate existing subsurface utilities shall be at the Contractor's discretion to assist with the work of this project and no extra payment shall be made for such verification. This does not constitute a waiver of the Contractor's responsibility to verify all utilities and is intended for verification of existing services.

1.04 RELATED SECTIONS AND DOCUMENTS

- A. SECTION 31 10 10 – Site Clearing
- B. SECTION 31 25 00 – Erosion and Sediment Control
- C. SECTION 33 41 00 – Storm Utility Drainage Piping
- D. Carefully examine all of the Contract Documents for requirements which affect the Work of this section.

1.05 DEFINITIONS

- A. Engineer: Authorized Representative(s) of the Owner
- B. Owner: City of Waltham
- C. Contractor: The person or organization identified in the Agreement as being responsible for the work under this Section. The term Contractor shall also refer to an authorized representative of the Contractor.
- D. Earthwork is all excavation, handling, conditioning, and backfilling operations of all soil, boulders, and other materials for new below-grade construction and site development, including obstructions and utility relocation and construction, regardless of the nature of the material encountered, the water content thereof, and type of equipment required for excavation.

- E. Subgrade Elevation or Level is the vertical excavation level and slopes indicated on the Drawings to which the excavation shall be conducted. For foundation bearing subgrades, this level will be to the elevations indicated on the Drawings.
- F. Zone of Influence is the zone beneath a structure or utility defined by imaginary lines extending outward 2-ft laterally beyond the bottom edge of a footing or slab or from the springline of a utility and down on a one horizontal to one vertical slope to the top of the naturally-deposited soils.
- G. Unclassified Bulk Excavation: Removal of all materials for non construction including soil, boulders, obstructions, regardless of the nature of the material encountered, the water content thereof, and type of equipment required for excavation; and the proper disposal of excavated material not required or suitable for use as specified backfill material.
- H. Rock: Rock or Bedrock is defined as naturally occurring, intact material which cannot be broken and removed by large power equipment, and requires the use of hoe rams, impact hammers, systematic drilling and blasting, or other mechanical means to fracture and remove. Rock does not include loose, broken, weathered, fractured, or fragmented rock that can be excavated with a large backhoe or excavator. Rock is not anticipated to be encountered on-site.
- I. Boulders: Boulders encountered in any site excavation, of any dimension, and of any hardness or geometry, are considered part of Unclassified Bulk Excavation. The Contractor is responsible for the means and methods of removal and excavation of boulders, and the proper disposal of boulders not suitable for reuse at the site as determined by the Engineer.
- J. In-the-dry: a soil condition such that the in-place moisture content of the soil at the time is no more than two percentage points above the optimum moisture content of that soil as determined by the laboratory test of the moisture-density relation appropriate to the specified level of compaction.

#### 1.06 REFERENCE STANDARDS

- A. ACI: American Concrete Institute
- B. ASTM: Specifications of the American Society for Testing Materials.
  - 1. ASTM D1557-Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
  - 2. ASTM D 2922 – Density of Soil in Place by Nuclear Methods for shallow depths.
  - 3. ASTM D 3017 – Standard Test Method for Water Content of Soil in Place by Nuclear Methods for shallow depths.
  - 4. ASTM C 136 – Sieve Analysis of Fine and Coarse Aggregates

5. ASTM D 422 – Particle Size Analysis of Soils
  6. ASTM D 698 – Laboratory Compaction Characteristics of Soil Using Standard Effort
  7. ASTM D 1556 Density of Soil in Place by the Sand – Cone Method.
  8. ASTM D 2487 – Classification of Soils for Engineering Purposes (Unified Soil Classification System)
  9. ASTM D 4318 – Liquid Limit, Plastic Limit and Plasticity Index of Soils
  10. ASTM E 329 – Agencies Engaged in Testing and/or Inspection of Materials Used in Construction
  11. ASTM E 548 – General Criteria Used for Evaluating Laboratory Competence.
- C. AASHTO: American Association of State Highway and Transportation Officials
1. T 191 – Density of Soil In-Place by the Sand Core Method
  2. T 239 – Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (shallow depth)
- D. Latest Edition of Massachusetts Highway Department Standard Specifications for Highways and Bridges
- E. Code: Current Edition of Massachusetts State Building Code.
- F. DEP: Massachusetts Department of Environmental Protection
- G. EPA: Environmental Protection Agency
- H. MHD: Massachusetts Highway Department
- I. BOH: Board of Health
- J. OSHA: Occupational Safety and Health Administration
- K. PCI: Prestressed Concrete Institute.
- L. Where reference is made to one of the above standards, the revision in effect at the time of the Bid opening shall apply.

1.07 SUBMITTALS

- A. Submit to the Engineer, in accordance with Section 01300, the proposed methods of construction, including excavation, excavation support systems designs, backfilling and filling and compaction for the various portions of the work. Excavation support system designs shall be prepared by a licensed professional engineer, registered in the state in which the work is located, having a minimum of 5 years of profession experience in the design and construction of excavation support systems. Review will be for information only. Contractor shall remain responsible for adequacy and safety of construction means, methods, and techniques.
- B. Fill Materials: For each off-site source of fill material the Contractor shall notify the Engineer of the source of the material and shall deliver test results and a representative 1-gallon sample at least 14 calendar days prior to the date of anticipated use of such material. All testing shall be performed by an experienced soil testing laboratory approved by Owner at the Contractor's own expense. Contractor shall obtain approval of placement and compaction of all material before next lift is placed.
- C. For each non-structural fill material, the Contractor shall also submit a representative grain size analysis to the No. 200 sieve. All testing shall be performed by an experienced soil testing laboratory at the Contractor's own expense.

1.08 QUALITY ASSURANCE

- A. Perform Work and materials testing in accordance with the Massachusetts Highway Department Standard Specifications for Highway and Bridges (Latest Edition).
- B. Prior to completion of filling, and during such placement, Contractor shall perform soils compaction testing as specified herein. The Engineer may select areas for testing the degree of compaction obtained. The Contractor shall cooperate fully in obtaining the information desired and verify that all areas meet requirement of paver installation.
- C. All testing shall be the responsibility of the Contractor, and results must be submitted to the Engineer for approval. Payment for testing will be made by the Contractor. If test results are unsatisfactory to Owner, or Engineer, all cost involved in correcting deficiencies in compacted materials to the satisfaction of the Engineer will be born by the Contractor.

1.09 CONSTRUCTION CONTROL

- A. Contractor is responsible for all construction layout and reference staking necessary for the proper control and satisfactory completion of all structures, cutting, filling, grading, drainage and utilities installation, fencing, curbing, and all other appurtenances required for the completion of the construction work and acceptance of the Contract as specified and as shown on the Drawings. The

Contractor shall verify that survey bench mark and elevations of existing utilities are as indicated on the Contract Drawings.

- B. All construction layout and staking shall be performed by a Professional Land Surveyor or Professional Engineer registered by the Commonwealth of Massachusetts, experienced and skilled in construction layout and staking of the type required under this Contract, and acceptable to the Engineer and Owner.
- C. The Contractor shall be responsible for the placement and preservation of adequate ties to all control points necessary for the accurate re-establishment of all base lines or center lines shown on the Drawings.
- D. The Engineer or Owner may check the control of the work as established by the Contractor, at any time as the work progresses. The Contractor will be informed of the results of these checks, but in so doing, the Engineer in no way shall relieve the Contractor of responsibility for the accuracy of the layout work.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. All soil materials proposed for importing to the site shall be clean, newly-borrowed mineral soil materials from approved borrow sources, free of any contamination. Materials from construction sites or other non-commercial borrow sources shall not be imported to the site without prior approval of Engineer. All materials being imported to the site shall not contain metals with concentrations above Massachusetts rural background concentrations, nor detectable amounts of oil and/or other hazardous materials as defined by the Massachusetts Contingency Plan.
- B. Common Fill or Ordinary Fill: Common fill shall consist predominately of mineral, granular soil, free of organic materials, loam, trash, wood, snow, ice, frozen soil, clay, bottles, cans, and other compressible, decomposable or deleterious materials. Common Fill shall have physical properties such that it may be readily spread and compacted without excessive weaving or instability. Common Fill shall not contain particles larger than 8-inch size when compacted with heavy self-propelled vibratory compaction equipment, and not larger than 4 inches size when compacted using hand-operated equipment. Common fill shall not contain greater than 10 percent by weight of material passing a No. 200 sieve. On-site excavated fill may be reused as Common Fill provided it is processed to meet the above requirements.
- C. Gravel Borrow: Gravel Borrow shall consist of off-site hard, durable stone and sand, as specified in MHD Standard Specifications for Highways and Bridges Designation M1.03.0, Type b, and shall be well-graded within the following limits:

<u>Sieve (ASTM D422)</u>	<u>Percent Finer by Weight</u>
3 in.	100
½ in.	50 – 100
No. 4	40 – 75
No. 50	8 – 28
No. 200	0 – 8

- D. Structural Fill or Granular Fill or Pipe Bedding: Structural Fill from off-site sources shall consist of suitable natural bank-run sand and gravel. Structural Fill shall be free of organic material, clay, debris, loam, trash, wood, snow, ice, and other compressible, decomposable or deleterious materials or other unsuitable materials and shall be well-graded within the following limits:

<u>Sieve (ASTM D422)</u>	<u>Percent Finer by Weight</u>
3 in.	100
No. 4	30 – 90
No. 40	10 – 50
No. 200	0 – 8

- E. Sand Borrow: Sand Borrow shall consist of clean, inert, hard durable grains of quartz or other hard, durable rock, free from loam or clay, surface coatings and deleterious materials. The maximum size for Sand Borrow shall be ¼ inch. The following amount of material passing a No. 200 sieve shall not exceed 10 percent by weight.

- F. Dense Graded Crushed Stone or Aggregate Base Course: Dense Graded Crushed Stone or Aggregate Base Course shall consist of off-site angular stone material that is hard, durable and free of deleterious materials. Dense graded crushed stone shall conform to MHD Standard Specifications for Highways and Bridges Designation M2.01.7 and the following:

<u>Sieve (ASTM D422)</u>	<u>Percent Finer by Weight</u>
2 in.	100
1-½ in.	70 – 100
¾ in.	50 – 85
No. 4	30 – 55
No. 50	8 – 24
No. 200	3 – 10

- G. Rip Rap or Modified Rockfill: Rip Rap shall consist of hard, durable angular shaped stones which are the product of the primary crushing of a stone crusher. Rounded stone, boulders, sandstone and similar soft stone or relatively thin slabs will not be acceptable. Stone shall be free from overburden, spoil, shale and organic material. Rip Rap shall conform to MHD Standard Specifications for Highways and Bridges Designation M2.02.4 "Modified Rockfill" and meet the following gradation requirements:

<u>Size of Stone</u>	<u>Passing Percentage</u>
8 in	95-100
4 in	0-25
2-½ in.	0-5

### PART 3 - EXECUTION

#### 3.01 GENERAL

- A. The ground adjacent to excavation shall be graded to direct surface water away from excavations. The Contractor shall remove by pumping or other means approved by the Engineer groundwater to a depth of 2-ft below bottom of excavations at all times. Prevent erosion at all times.
- B. Contractor shall provide all bracing, and shoring necessary to perform excavations as required to protect adjacent features, or to conform to governing laws. No extra payment will be made for any bracing, shoring, or underpinning.
- C. Examine the site and all work prepared by others and become familiar with existing site conditions. Report to the Owner in writing any conditions detrimental to the proper and timely completion of the work of this Section. Do not proceed with the work until unsatisfactory conditions have been corrected in an acceptable manner.

#### 3.02 USE OF MATERIALS

- A. Existing on-site Topsoil and subsoil shall be stripped, segregated, screened and stockpiled and tested for reuse as landscape materials as directed by the Engineer or the Owner. Topsoil and subsoils are not suitable bearing materials for site structures. Any excess topsoil or subsoil shall be removed and disposed by the Contractor at no cost to the Owner.
- B. Common Fill: it is anticipated that some existing on-site soils may be suitable for re-use as Common Fill. If deemed suitable by the Engineer, the on-site materials shall be placed and compacted in a manner conforming to the applicable Specifications. For use to raise general grades outside of the hardscape and other structures; in landscaped areas' and as otherwise indicated on the Drawings, provided the material can be readily spread and compacted, without instability. Oversize particles and unsuitable debris shall be removed during or prior to placement.
- C. Gravel Borrow: Use for sidewalk and pavement base course, utility bedding as shown on the Drawings as well as fill areas noted on the Drawings.
- D. Sand Borrow: Use for pipe bedding only as indicated on the Drawings; Depending on the application, filter fabric may be required in conjunction with Sand Borrow placed within a course backfill zone to prevent particle migration.
- E. Dense Graded Crushed Stone: Use as indicated on the Drawings.



- F. Boulders, if encountered, shall be segregated and stockpiled on site for the potential use as landscape features, or for optional on-site crushing. The Contractor shall save, segregate and stockpile such boulders as indicated by the Engineer or Owner and dispose of the remaining boulders as part of this Contract. Unused boulders remain the responsibility of the Contractor, who is responsible for removal and proper disposal away from the job site.
- G. All unsuitable material, and suitable material not required for the proper completion of this Contract, will become the property of the Contractor and shall be removed and properly disposed of away from the job site as part of this Contract.
- H. If contaminated material is suspected or encountered during an excavation, the Contractor shall contact the Owner or Engineer as soon as possible. Direction on how to proceed and disposition of the excavated material will be provided by the Engineer or Owner.

### 3.03 EXCAVATION

- A. Perform all excavations in accordance with OSHA requirements. The Contractor shall be solely responsible for maintaining site safety, in accordance with OSHA, the Contractor's Health and Safety Plan and other applicable regulations.
- B. Excavation shall include the removal of all materials encountered including earth, boulders, rock, pavement, demolition debris, incidental structures, utilities, and other materials as required to complete the Work specified in this Section and as shown on the Drawings.
- C. The Contractor shall handle, segregate to prevent intermixing of materials, protect, and stockpile as required to complete the Work specified in this Section and as shown on the Drawing.
- D. Where soil has been softened, frozen or otherwise disturbed, due to the presence of water or as a result of unfavorable weather, remove the unstable, disturbed material and replace with suitable material as directed by the Engineer, at no additional cost to the Owner.
- E. Where excavation is carried out below indicated grade or beyond the lines of excavation, backfill to the indicated grade and compact with acceptable materials, at no additional cost to the Owner and at the direction of the Engineer.
- F. When excavation has reached required subgrade elevations, notify the engineer who will observe the excavation and bearing conditions. Excavations required to proceed deeper due to disturbance of the subgrade, or variation in subsurface condition shall be completed at no cost to the Owner.

- G. Excavate trenches to the depth indicated or required. Carry the depth of trenches sufficiently deep to install required bedding materials and to establish the indicated flow lines and invert elevations. Maintain all trench excavations in a safe manner and in accordance with applicable laws and regulations. Dimensions of trench excavation shall be maintained as small as practical to safely conduct the work.

### 3.04 SUBGRADE PREPARATION

#### A. General:

- 1. Complete the excavations to the required subgrade elevations.
- 2. All final excavated subgrades shall be proof-rolled prior to placing any fill materials or continuing with construction. Proof-rolling in open areas shall consist of minimum of 6 passes of a suitable sized static, self-propelled roller. Proof-rolling in confined areas such as within trenches shall consist of a minimum of 4 passes of a large vibratory-plate compactor imparting a centrifugal dynamic force of 11,000 lbs.
- 3. Soft or weaving soils or other materials observed during proof-rolling shall be over excavated and replaced with compacted lifts of common fill or other materials as directed by the Engineer.
- 4. Protect all subgrades after final preparation and during filling or other construction. Disturbance to approved subgrades shall be rectified by the Contractor prior to continuing with the work as directed by the Engineer.

#### B. Cold Weather Subgrade Protection:

- 1. When the atmospheric temperature is less than 32 degrees Fahrenheit, the Contractor shall protect excavation subgrades and concrete from freezing. Cold weather subgrade protection may consist of an earth fill cover, hay cover, insulation cover, heating or other means of protecting the subgrade materials from freezing.

#### C. Wet Weather:

- 1. If fill material placement, spreading, rolling, or compaction operations are interrupted by rain or other unfavorable conditions, do not resume such operations until ascertaining that the moisture content and density of the previously-placed soil are as required by these specifications.

### 3.05 SHORING, SHEETING, AND BRACING

- A. Provide shoring, sheeting, and bracing at excavations, as required, to assure complete safety against collapse of earth at sides of excavations or earthen slopes.

- B. If, at any place, sufficient or proper supports have not been provided, additional supports shall be placed at the expense of the Contractor. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed.
- C. All sheeting and bracing not ordered left in place shall be carefully removed in such a manner as not to endanger the construction of other structures, utilities, or property whether public or private. All voids left after withdrawal of sheeting shall be immediately refilled with sand and rammed with tools especially adapted to that purpose or otherwise compacted as directed to achieve the required density.
- D. The portion of sheeting driven below mid-diameter of any pipe shall not be withdrawn and under no circumstances shall any sheeting be cut off at a level lower than one foot above the top of the pipe.
- E. Shoring or sheeting shall not constitute a condition for which an increase may be made in the contract price with the exception that if the Engineer directs in writing that certain shoring or sheeting shall be left in place.
- F. Excavation support system shall be designed to support the earth pressures, hydrostatic pressures, surcharge loads and other forces from existing site conditions stored material and construction equipment.
- G. Shoring and bracing of trenches and other excavations shall, at a minimum, be in accordance with the latest requirements of the Occupational Safety and Health Administration regulations.

### 3.06 PLACEMENT OF BACKFILL MATERIALS

- A. General:
  - 1. Backfilling activities, including placement and compaction, shall not be performed when air temperatures are at or below 32 degrees Fahrenheit.
  - 2. Backfill excavations as promptly as work permits, but not until the subgrade, or below grade construction, is acceptable to the Engineer.
  - 3. Previously placed, and possibly accepted, backfill shall be excavated and replaced at no additional cost if the backfill does not conform to the Contract Documents or is damaged or disturbed by construction activity.
- B. Backfill Materials:
  - 1. All backfill materials brought to the site must be obtained from a borrow source(s) approved by the Engineer.

2. Backfill placed outside the limits of the structure in landscaped areas shall consist of compacted common fill or other materials as indicated on the Drawings.

C. Placement, Compaction and Protection:

1. All backfill material shall be placed "in the dry" on subgrades acceptable to the Engineer. The Contractor shall dewater excavated areas as required to perform the work in such a manner as to preserve the undisturbed state of the approved subgrade material.
2. Backfill materials shall not be placed on snow, ice, frozen subgrades or uncompacted frozen soil.
3. Backfill materials shall not be frozen when placed or be allowed to freeze prior to or after compaction, placement, or curing. At the end of each day's work during freezing weather, the last lift of fill, after compaction, shall be rolled by a smooth-wheeled roller to eliminate ridges of uncompacted soil.
4. Unless otherwise specified herein, place fill materials in layers not exceeding 6 inches in thickness measured prior to compaction in open areas, and 4 inches in thickness in confined areas, such as in trenches. Compact each layer with a minimum of six coverages of the equipment described below to obtain at least 95 percent of maximum dry unit weight as determined by ASTM test D 1557.
5. Maintain the moisture content of the fill material during placement within plus or minus two percent of the material's optimum moisture content per ASTM D 1557, and as required to achieve the specified compaction.
6. Within 3 feet below paved areas such as roadways, sidewalks, parking areas, etc., place required fill materials in layers not to exceed 6 inches in depth measured prior to compaction and compact each layer by suitable compaction equipment to at least 95 percent of the material's maximum dry unit weight as determined by ASTM Test D 1557.
7. Under landscaped areas, place required fill materials in layers not exceeding 12 inches in thickness prior to compaction and compact by suitable compaction equipment to achieve at least 92 percent of the material's maximum dry unit weight, as determine by ASTM D 1557 or as required by the Engineer.
8. The Contractor shall not begin backfilling against concrete until the concrete has sufficiently aged to attain the strength required to resist backfill pressures without damage. The Contractor shall correct any damage to the structures caused by backfilling at no added cost to Owner.

9. Moisture Control: Where exposed subgrades or fill materials must be moisture conditioned before compaction, uniformly apply water to surface soil material, to prevent free water from appearing on the surface during or subsequent to compaction operations.
  - a. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.
  - b. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by disking, harrowing or pulverizing, until moisture content is reduced to a satisfactory value.
10. If weaving or instability is observed during compaction, as judged by the Engineer, compaction efforts shall be discontinued until the Contractor stabilizes the subgrade. If required, the Contractor shall excavate and replace the unsuitable fill material with acceptable compacted material, at no additional cost to the Owner.
11. Compaction by paddling or jetting is prohibited.
12. Control groundwater and surface run-off to minimize disturbance of material being placed. Slope fill surfaces at the end of each day to provide for free surface drainage. Dewater all subgrades prior to filling. Place all fill in a dry state.
13. Provide suitable transition layers or non-woven filter fabric, as required to prevent the migration of fine material into void spaces or coarser fill materials. Transition layers may consist of limited thickness of dense-graded crushed stone, (less than 6 inches thick) lean concrete or other methods approved by the Engineer. Clean crushed stone shall not be placed directly on soil subgrades beneath structures.

D. Trench Backfill

1. Trenches shall be backfilled as soon as practicable.
2. Utility bedding material shall be deposited in the trench, uniformly on both sides of the pipe, for the entire width of the trench as shown on the Drawings. The backfill material shall be placed by hand shovels, in layers not more than 4 inches thick in loose depth, and each layer shall be thoroughly and evenly compacted by tamping on each side of the pipe to provide uniform support around the pipe, free from voids.
3. Trench backfill material above the utility bedding material shown on the Drawings may consist of the excavated soils, provided the excavated soils meet the specific requirements for fill for the intended area (e.g., below slabs, foundations, parking areas, etc.) and can be readily spread and compacted. Landfill debris materials shall not backfill within any

utility trenches. Peat and other organic soils shall not be used as trench backfill. Particles larger than 2 inches shall not be placed within 8 inches of any utility pipe. The maximum particle size within any trench backfill material shall be 6 inches.

4. All trench backfilling shall be done so as not to disturb the work at any time. The moisture content of the backfill material shall be such that proper compaction will be obtained. Puddling of backfill with water will not be permitted.
5. Any trenches or excavations improperly backfilled or where settlement occurs shall be reopened to the depth required for proper compaction, then refilled and compacted with the surface restored to the required grade and condition, at no additional expense to the Owner.
6. During filling and backfilling operations, pipelines may be checked by the Engineer to determine whether any displacement of the pipe has occurred. If the inspection of the pipeline shows poor alignment, displaced pipe or any other defects, the work shall be remedied in a manner satisfactory to the Engineer at no additional cost to Owner.

### 3.07 COMPACTION REQUIREMENTS

- A. Relative compaction is expressed as percentage of the maximum dry density at the optimum moisture content as determined by ASTM Test D 1557, Method C. Compact fill materials in successive lifts in accordance with the following requirements:

<u>Area</u>	<u>Compaction Requirements</u>
Under Paved Areas and sidewalks	92 % up to 3 feet below finished grade
Under Paved Areas and sidewalks	95 % within 3 feet of finished grade
Trench backfill	93 %
Landscape and lawn areas	90 %

- B. Fill placed within landscape islands, in areas abutting pavements, and within 5 feet of pavements shall be compacted according to the compaction requirements for fill below pavements.
- C. The gradation and nature of some on-site materials are such that field unit weight testing methods (sand cone and nuclear density equipment) may not provide representative compaction results. In these cases, the Engineer will use judgment in evaluating if the Contractor achieved the intent of the specification.

### 3.08 TOLERANCES

- A. Top Surface of Proposed Subgrade: Plus or minus ½-inch from finished elevations.

- B. Top Surface of Backfilling Under Paved Areas: Plus or minus one half (1/2) inch from required elevations.
- C. Top Surface of General Backfilling: Plus or minus one (1) inch from required elevations.

3.09 MOISTURE CONTROL AND REUSE OF ON-SITE MATERIALS

- A. Fill that is too wet for proper compaction shall be harrowed or otherwise dried or treated to achieve a proper moisture content to allow compaction to the required density. If fill cannot be dried within 24 hours of placement, it shall be removed and replaced with drier material, at no additional cost to the Owner.
- B. Fill that is too dry for proper compaction shall receive water uniformly applied over the surface of the loose layer. Sufficient water shall be added to allow compaction to the required density.
- C. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, fill operations shall not be resumed until the moisture content and the density of the previously placed fill are as specified.

3.10 PROTECTION OF FILLS AND SUBGRADES

- A. Protect all compacted fills from disturbance and traffic. Repair any subgrades that become disturbed or unstable.
- B. Upon completion of the Work, ground surface shall be left in a firm, stable, unyielding, uniform condition, free of ruts and surface irregularities, in accordance with the grading requirements shown on the Drawings.
- C. Uniformly smooth-grade all areas to be graded, as indicated and as directed, including excavated sections and all areas disturbed as a result of the Contractor's operations.

3.11 DEWATERING

- A. The Contractor shall control the grading in areas under construction on the site so that the surface of the ground will properly slope to prevent accumulation of water in excavated areas and adjacent properties.
- B. The Contractor shall excavate interceptor swales and ditches as necessary prior to the start of major earthmoving operations to insure minimal erosion and to keep areas as free from surface water as possible.
- C. Should surface, groundwater or precipitation be encountered during the operations, the Contractor shall furnish and operate pumps or other equipment, and provide all necessary piping to keep all excavations clear of water at all times and shall be responsible for any damage to work or adjacent properties

from such water. All piping exposed above surface for this use, shall be properly covered to allow foot traffic and vehicles to pass without obstruction.

- D. Presence of groundwater in soil will not constitute a condition for which an increase in the contract price may be made. Under no circumstances place concrete fill, soil fill, lay piping or install appurtenances in excavation containing free water. Keep utility trenches free of water until pipe joint material has hardened and backfilled to prevent flotation.
- E. The Contractor shall verify that the construction and/or operation of a watering system will not adversely affect any well, pond, stream, structure, utility, etc., on or adjacent to the area being dewatered.

### 3.12 EROSION AND SEDIMENTATION CONTROL

- A. Contractor shall be responsible for all control measures necessary to prevent damage resulting from erosion and sedimentation to on-site and off-site areas.
- B. Temporary hay bales or other provisions such as de-silting basins, terraces, contour furrow, channel linings, waterways or other measures shall be installed in a manner satisfactory to the Engineer and maintained in good operating conditions.
- C. Contractors shall provide adequate protection and complete the grading as specified without delay on the areas that may be potential contributor to pollution or natural waterways or cause damage because of sedimentation.

### 3.13 DUST CONTROL

- A. The Contractor shall employ methods and/or materials to prevent spread of dust. Chemical materials may not be used on subgrades of areas to be sodded or planted.

END OF SECTION



SECTION 31 25 00

EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 SUMMARY

- A. This Section specifies equipment and materials for an erosion and sediment control program for minimizing erosion and siltation during the construction phase of the project. The erosion and sediment control provisions detailed on the Drawings and specified herein are the minimum requirements for an erosion control program. The Contractor must review the Order of Conditions and Superseding Order of Conditions for the project to ensure compliance with any orders required above and beyond those described in this specification section.

1.03 RELATED WORK

- A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:
  - 1. SECTION 31 10 10 – Site Clearing
  - 2. SECTION 31 20 00 – Earth Moving
  - 3. Section 33 41 00 – Storm Utility Drainage Piping

1.04 REFERENCES

- A. Commonwealth of Massachusetts highway Department "Standard Specifications for Highways and Bridges" (MHD Specifications).

1.05 SUBMITTALS

- A. Proposed methods, materials to be employed, and schedule for effecting erosion and siltation control and preventing erosion damage shall be submitted for approval. Submittals shall include:
  - 1. List of proposed materials including manufacturer's product data.

2. Schedule of erosion control program indicating specific dates from implementing programs in each major area of work.

B. Samples

The following samples shall be submitted:

<u>Sample</u>	<u>Size</u>
Silt - sock	12 X 12 in.
Filter Fabric	12 X 12 in.

1.06 EROSION CONTROL PRINCIPLES

A. Erosion Control Principles

The following erosion control principles shall apply to the land grading and construction phases:

1. Stripping of vegetation, grading, or other soil disturbance shall be done in a manner which will minimize soil erosion.
2. Whenever feasible, natural vegetation shall be retained and protected.
3. Extent of area which is exposed and free of vegetation and duration of its exposure shall be kept within practical limits.
4. Temporary seeding, mulching, or other suitable stabilization measures shall be used to protect exposed critical areas during prolonged construction or other land disturbance. Prolonged exposure of unstabilized soil shall not exceed 60 days.
5. Drainage provisions shall accommodate increased runoff resulting from modifications of soil and surface conditions during and after development or disturbance. Such provisions shall be in addition to existing requirements.
6. Sediment shall be retained on-site.
7. Erosion control devices shall be installed prior to start of clearing and grubbing operations and excavation work.

- B. Cut and fill slopes and stockpiled materials shall be protected to prevent erosion. Slopes shall be protected with permanent erosion protection when erosion exposure period is expected to be greater than or equal to two months, and temporary erosion protection when erosion exposure period is expected to be less than two months.

1. Permanent erosion protection shall be accomplished by seeding with grass and covering with an erosion protection material, as appropriate for prevailing conditions.
2. Temporary erosion protection shall be accomplished by covering with an erosion protection material, as appropriate for prevailing conditions.
3. Except where specified slope is indicated on Drawings, fill slopes shall be limited to a grade of 2:1 (horizontal: vertical) cut slopes shall be limited to a grade of 2:1.

## PART 2 - PRODUCTS

### 2.01 SILT FENCE

- A. Silt fence shall be made of filter fabric. Fence shall be 2 ft high minimum.
  1. Silt fence shall be Mirafi silt fence or equal.
  2. Silt fence shall be supported by wooden posts, driven a minimum of 1 ft. into the ground. Posts shall be spaced 10 ft. on center maximum.
  3. Fencing other than that specified above shall be subject to review and acceptance by the Town's Representative.

### 2.02 SILT SOCKS

- A. The silt socks for construction of erosion control devices shall be 12" in diameter.
- B. In areas of slopes grater then 2:1 (horizontal: vertical) silt sock must be secured in place by stakes.
- C. Silt socks shall be either lapped or butted at the ends to create a continuous line of defense.

### 2.03 STRAW BALES

- A. Straw bales for construction of erosion control devices shall be new, firm, bound with biodegradable twine.

### 2.04 TEMPORARY SEED COVER

- A. Seed mixture for temporary cover by hydroseeding application shall conform to the following:

Quantity per 1000 sq. ft. Coverage

Material

27-1/2 lb.	Wood Fiber Mulch
4 lb.	Seed
1/2 lb.	Annual Ryegrass
22 lb.	10-6-4 Fertilizer
69 gal.	Water

- B. Hydroseeding equipment may be either portable or truck mounted, with dual agitation, a minimum working volume of 1000 gallons and a minimum spray range of 80 feet.
1. Hydroseeding equipment must be capable of uniformly applying the slurry mix including wood fiber mulch if required, at the specified rate, and at the required locations.
  2. Hydromulching equipment, either trailer or truck mounted, must be capable of uniformly applying straw or hay mulch at a minimum mulching rate of 8 tons per hour, at a distance of not less than 80 ft.

## 2.05 FILTER BASKETS

- A. Filter baskets shall be Metal-Era Inlet Baskets, manufactured by Metal-Era Inc., Wukessa, WI 53186 or equal. Baskets shall be installed at all catch basins in lieu of straw bale catch basin filters. Filter baskets shall include a nonwoven geotextile filter fabric material with a minimum Grab Strength of 45 lb., Mullen Burst Strength of 60 psi minimum, a minimum permeability of 120 gpm/sq. ft., and an opening no greater than No. 20 U.S. Standard Sieve.

## PART 3 - EXECUTION

### 3.01 SILT FENCE

- A. Silt fence shall be constructed and installed as indicated on the Drawings, prior to start of work on the site.
- B. Silt fence shall be installed around all stockpiled soils and catch basins.

### 3.02 SILT SOCKS

- A. Siltation Barrier shall be constructed and installed as indicated on the Drawings prior to start of clearing and grubbing operations.

### 3.03 STRAW BALE DIKE

- A. Bales shall be constructed and installed as indicated on the Drawings or as necessary. Bales shall be placed in a row with ends tightly abutting the adjacent bales. Each bale shall be embedded in the soil a minimum of 4 in. Bales shall be securely anchored in place by wooden stakes driven through the

bales. The first stake in each bale shall be angled toward the previously laid bale to force the bales together.

3.04 STRAW BALE CHECK DAM

- A. Check dams shall be constructed and installed as indicated on the Drawings or as necessary.

3.05 STRAW BALE FILTER

- A. Straw bale filters shall be placed at all inlets to drainage structures or pipes as they are installed. Outlet protection work shall be constructed before runoff is allowed to enter the drainage system. Filters must be inspected regularly and replaced as necessary.

3.06 HYDROSEEDING

- A. Seed for temporary cover shall be spread by the hydroseeding method, utilizing power equipment commonly used for that purpose. Seed, fertilizer, mulch and water shall be mixed and applied to achieve application quantities specified. Material shall be applied in 2 equal applications, with the equipment during the second pass moving perpendicular to direction employed during the first pass. Hydroseeding shall not be done when it is raining or snowing, or when wind velocity exceeds 5 mph.
- B. If the results of hydroseeding application are unsatisfactory, the mixture and/or application rate and methods shall be modified to achieve the required results.
- C. After the grass has appeared, all areas and parts of areas which fail to show a uniform stand of grass, for any reason whatsoever, shall be reseeded and such areas and parts of areas seeded repeatedly until all areas are covered with a satisfactory growth of grass.

3.07 FILTER BASKETS

- A. Baskets may be installed at all catch basins in lieu of Straw Bale Catch Basin Filters. Filter baskets shall be installed in accordance with manufacturer's recommendations. Maintain filter baskets as required and as follows. Baskets shall be inspected within 24 hours after each rainfall or daily during extended periods of precipitation. Repairs shall be made immediately, as necessary, to prevent particles from reaching the drainage system. Sediment deposits shall be removed after each storm event, or more often if the fabric becomes clogged. Clean clogged fabric and repair or replace damaged filter fabric.

3.08 MAINTENANCE AND REMOVAL OF EROSION CONTROL DEVICES

- A. Wetland area, water courses, and drainage swales adjacent to construction activities shall be monitored weekly for evidence of silt intrusion and other

adverse environmental impacts, which shall be corrected immediately upon discovery.

- B. Culverts and drainage ditches shall be kept clean and clear of obstructions during construction period.

C. Erosion Control Devices

1. Sediment behind the erosion control device shall be checked twice each month and after heavy rain. Silt shall be removed if greater than 6 in. deep.
2. Condition of erosion control device shall be checked twice each month or more frequently as required. Damaged and/or deteriorated items shall be replaced. Erosion control devices shall be maintained in place and in effective condition.
3. Straw bales shall be inspected weekly and maintained or replaced as required to maintain both their effectiveness and essentially their original condition. Underside of bales shall be kept in close contact with the earth below at all times, as required to prevent water from washing beneath bales.
4. Sediment deposits shall be disposed of off-site, in a location and manner which will not cause sediment nuisance elsewhere.
5. Maintenance of silt socks are required if:
  - a. Deformation is present.
  - b. Sock is rolling due to hydraulic force
  - c. Loss of ground contact
  - d. Sediment accumulation of  $\frac{1}{2}$  sock height.
6. Repair of silt socks is required if:
  - a. Holes, rips or tears are present.
  - b. Pinch or localized diameter reduction of more than  $\frac{1}{2}$  the original diameter is present.

D. Removal of Erosion Control Devices

1. Erosion control devices shall be maintained until all disturbed earth has been paved or vegetated, at which time they shall be removed. After

removal, areas disturbed by these devices shall be regraded and seeded.

2. Erosion protection material shall be kept securely anchored until acceptance of the entire Project.

*END OF SECTION*

## **DIVISION 32**



SECTION 32 12 16

ASPHALT PAVING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 DESCRIPTION

- A. Work under this section includes the installation of bituminous concrete pavement. All existing pavement damaged or displaced as a result of the construction operations shall be restored in accordance with the requirements for this section.
- B. Related Work Specified Elsewhere:
  - 1. SECTION 31 20 00 – Earth Moving

1.03 QUALITY CONTROL

- A. Submittals: Refer to Section 01 33 99 – Submittal Procedures for submittal procedures. Include data showing gradation and composition of materials proposed. Product pavement slips to include all material by percentage and weight.
- B. Conformance: All work specified in this Section and materials testing shall conform to “Standard Specifications for Highways and Bridges” Department of Transportation, Division of Public Works, State of Massachusetts, 1973 Edition, Revised 1988, including latest supplements, hereinafter called the “Standard Specifications”.

PART 2 - PRODUCTS

2.01 BANK OR CRUSED GRAVEL

- A. Conform to Standard Specifications, subsection M1.03.1.

2.02 MINERAL AGGREGATE

- A. Conform to subsection M3.11.04 of the Standard Specifications.

2.03 BITUMINOUS MATERIALS

- A. Bituminous material shall conform to Subsection M3.1100 of the Standard Specifications.
- B. Proportioning of bituminous Concrete Mixture: The bituminous concrete mixture shall contain from 5.0 to 6.0 percent by weight of bitumen and from 94.0 to 95.0 percent by weight of mineral aggregates. The percentage of bitumen used shall be as directed within the limits specified.

2.04 BITUMINOUS CONCRETE BINDER COURSE

- A. Standard Specifications subsection M 3.11.

2.05 BITUMINOUS TACK COAT

- A. Standard Specifications subsection M 3.03.0.

2.06 BITUMINOUS CONCRETE WEARING COURSE

- A. Standard Specifications subsection M 3.11.

PART 3 -EXECUTION

3.01 SUB-GRADE PREPARATION

- A. Provide sub-grade preparation in accordance with Section 31 20 00 – Earth Moving.

3.02 GRAVEL BASE PLACEMENT

- A. Place Gravel in accordance with Section 31 20 00 - Earth Moving.

3.03 BITUMINOUS CONCRETE BINDER COURSE

- A. On the existing base course shall be provided a bituminous tack coat and plant mixed bituminous concrete binder course in compacted thickness as shown on the plans. Where new bituminous concrete binder course is required, it shall be provided in accordance with the applicable requirements of Massachusetts Standard Specifications Section 420, Subsection 420.40 and Section M.3.11 for “Materials”, and Subsection 420.60 for “Construction methods”. Surface of the binder course as thus compacted shall not vary more than one-quarter (¼”) inch in then (10) feet measured in any direction.

3.04 BITUMINOUS CONCRETE WEARING COURSE

- A. Place bituminous concrete Class I-1 (Hot – Mix) pavement in one (1) course. The course shall have a compacted thickness as shown on the plans. The finished pavement surface shall conform to the proposed slope and shall not vary more than one-eighth (1/8") inch in ten (10) feet measured in any direction. The Contractor will not be allowed to correct areas of pavement failing to meet this specification by patching or use of fillers. Deficient asphalt areas shall be removed and repaved to an extent approved by the Engineer.
- B. The permanent bituminous concrete pavement surface course shall be provided in accordance with details and the applicable requirements of Massachusetts Standard Specifications Section 460, Subsection 460.40 and Section M.3.11 for "Materials" and Subsection 460.60 for "Construction Methods". The surface shall be rolled free of any roller marks, ridges, and voids, and shall be repaired if directed.

END OF SECTION

SECTION 32 90 00

PLANTING, SEEDING AND SODDING

PART 1 - GENERAL

1.01 PROVISIONS INCLUDED

- A. The general provisions of the Contract, including General and Supplementary General Conditions, and Division 1 General Requirements, apply to work specified in this Section.

1.02 SUMMARY

- A. Provide all labor, materials, equipment, services, and perform all operations necessary to complete the work of this section as indicated within the drawings and specified herein which shall include, but is not limited to, the following:
  - 1. Selection, procurement and planting of all plant materials indicated within the Drawings including:
    - a. Trees
    - b. Shrubs
    - c. Perennials, groundcovers and bulbs
  - 2. Seeding and Sodding: lawns
  - 3. Topsoil
  - 4. Planting medium
  - 5. Maintenance
- B. Related Work:
  - 1. Excavation, filling, rough grading and compaction required to establish elevations shown on drawings is specified in Section 31 10 10, Site Clearing.

1.03 REFERENCE

- A. American Association of Nurserymen (AAN): ANSI Z 260.1 "American Standard for Nursery Stock."

- B. Pruning Standards: "Standards for Pruning Shade Trees," by the National Arborist Association, 174 Route 101, Bedford, New Hampshire 03102.
- C. American National Standards Association and National Arborist Association, Inc.: ANSI/ANAA A300 "Tree, Shrub and Other Woody Plant Maintenance - Standard Practices."
- D. Bailey Hortorium of Cornell University, Hortus Third, A Concise Dictionary of Plants Cultivated in the United States and Canada (for nomenclature).

**1.04**     **SUBMITTALS**

- A. Submit the following items, demonstrating complete conformance with the requirements specified for approval by the Landscape Architect prior to ordering or delivering those items to the site:
  - 1. Certificates of Inspection required by governmental authorities.
  - 2. Topsoil analysis with results and amendment recommendations
  - 3. Seed vendors certified statement for each grass seed mixture specified stating botanical and common name, percentages by weight, percentages of purity and percentages of germination.
  - 4. Manufacturer's or vendor's certified analysis for soil amendments including standard and slow release fertilizers.
  - 5. Product information for anti-desiccant material.
- B. Submit samples of the following materials for approval by the Landscape Architect prior to ordering or delivering those items to the site:
  - 1. Topsoil: One (1) pint per sample lot labeled indicating source with analysis and amendment recommendations certified by the testing laboratory.
  - 2. Bark Mulch: One (1) quart bag with label indicating source of supply.
- C. Planting Schedule: Proposed planting schedule, indicating dates for each type of landscape work to be completed, maintenance periods and anticipated Provisional Acceptance date.

**1.05**     **QUALITY ASSURANCE**

- A. Lawn and planting work to be performed only by experienced workers, familiar with planting procedures, and under the full time supervision of a qualified supervisor. The Contractor must show previous evidence of having successfully installed and maintained landscape projects of similar scope to the subject project

*MT. FEAKE CEMETERY  
EXTENSION PROJECT  
WALTHAM, MA*

with regards to quantities and sizes of plants specified, anticipated cost, complexity and a demonstrated minimum of five (5) years experience on similar projects.

1. The Landscape Architect shall have the right to review the qualifications and references of the Contractor for work on this project.
  2. At least ten (10) days in advance of the first day of planting operation, arrange for a preconstruction meeting between the Landscape Architect, General Contractor, and Planting Subcontractor to discuss the proposed planting schedule, source of plants, consideration of proposed substitutions and general review of procedures.
- B. Topsoil and/or Loam Borrow Testing and Analysis: The Contractor shall submit representative samples of topsoil and/or loam borrow to a public extension service agency or a certified private testing laboratory for testing and analysis, in conformance with the Standards of the Association of Official Agricultural Chemicals.
1. Two (2) samples each shall be taken and analyzed from the existing stockpiled topsoil on site and two (2) samples each shall be taken and analyzed from each potential loam borrow pit. Deliver samples to testing laboratory and have testing report sent directly to the Landscape Architect and pay all costs.
    - a. Report shall be submitted at least one (1) month before any material is to be delivered or installed on the project site.
  2. Soil test report which shall include;
    - a. Mechanical sieve analysis with soil classification.
    - b. Organic content.
    - c. Chemical analysis which shall include: pH (1:1 soil-water ratio), buffer pH, Soluble Salts (1:2 soil-water ratio), Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Aluminum, Magnesium, Manganese, Ferric Iron, Sulfate and toxins including but not limited to lead, cadmium, arsenic, and mercury.
    - d. Inform the Soil Testing Laboratory that soil tests are for specific applications, i.e. tree and shrub plantings, turf-grass, wetland restoration and retention areas.

3. Test and analysis reports shall include the laboratory's recommendations for amending the topsoil, if necessary, to meet these Specifications herein for each planting area.
4. Obtain written approval from the Landscape Architect before delivering materials to the site. Do not use topsoil until test results have been received by the Landscape Architect and amendments per specifications and laboratory recommendations required have been completed.
5. The Landscape Architect reserves the right to retest materials and to reject materials not meeting specifications. If the material does not meet the specifications, cost for the tests shall be paid by the Contractor at no additional cost to the Owner.
  - a. The Landscape Architect reserves the right to request topsoil analysis (up to 10 additional tests) after the material has been placed on site.
- C. Certificates: Ship landscape materials with certificates of inspection required by governing authorities. Comply with regulations applicable to landscape materials.
- D. Substitutions: No substitutions shall be made by the Contractor. If the specified plant material is not obtainable, submit proof of non-availability to the Landscape Architect, together with proposal for use of equivalent material, a minimum of one (1) month prior to installation.
- E. Provide trees, shrubs, and plant of quantity, size, genus, species, and variety shown and scheduled for landscape work and complying with recommendations and requirements of ANSI Z60.1 "American Standard for Nursery Stock".
  1. Provide healthy, vigorous stock, grown in recognized nursery in accordance with good horticultural practice and free of disease, insects, eggs, larvae, and defects such as knots, sun-scald, injuries, abrasions, or disfigurement.
  2. Label at least one (1) tree and one (1) shrub of each variety with a securely attached waterproof tag bearing legible designation of botanical and common name.
    - a. Where formal arrangements or consecutive order of trees or shrubs are shown, select stock for uniform height and spread, and label with number to assure symmetry in planting.

1.06 QUALITY CONTROL AT THE SOURCE OF SUPPLY

- A. The Landscape Architect shall have the right to inspect and select all plant materials at the source of supply for compliance with requirements for genus, species, variety, size, and quality. The Landscape Architect further retains the

right to inspect trees and shrubs for size and condition of root balls and root systems, insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work.

1. Plant selection at the source does not affect the Landscape Architect's right of reinspection and rejection of plant material during the progress of the work.
- B. Make pre-selection arrangements at the source to insure a ready supply of materials, equipment, and manpower required for an efficient selection procedure. The Contractor shall pay all Landscape Architect's expenses for all visits to the source beyond a one hundred (100) mile radius from the Landscape Architects office.
  1. Notify the Landscape Architect ten (10) days prior to the scheduled date for plant selection.

#### 1.07 DELIVERY, STORAGE AND HANDLING

- A. Packaged Materials: Deliver packaged materials in manufacturer's original containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site.
- B. Trees and Shrubs: Provide freshly dug trees and shrubs, balled and burlap(B&B) or container grown plant materials (CG) firm in their containers, loose root ball will not be accepted. Do not prune prior to delivery unless otherwise directed by the Landscape Architect. Do not bend or bind-tie trees or shrubs in such manner as to damage bark, break branches, or destroy natural shape. Provide protective covering during delivery. Handle balled and burlapped stock with care; do not drop or handle roughly.
- C. Deliver trees and shrubs only after preparations for planting have been completed. Place plant material in the ground on the same day as it is delivered. If planting is delayed more than 6 hours after delivery, set trees and shrubs in shade, protect from weather and mechanical damage, and keep roots moist by covering with soil, mulch, burlap or other acceptable means of retaining moisture. Do not remove container-grown stock from containers until immediately before setting the plants into the ground.
- D. Herbaceous Plants: Provide only plugs or dormant propagules in sizes noted. No bare root materials will be accepted.

#### 1.08 JOB CONDITIONS

- A. The Contractor shall be solely responsible for judging the full extent of work requirements involved, including but not limited to the potential need for storing



and maintaining plants temporarily and/or rehandling plants prior to final installation.

- B. Utilities: Verify all public and private utility locations and elevations prior to excavation. Contact "DIG SAFE" 1-800-322-4844 seventy-two (72) hours prior to any excavation.
1. Report any discrepancies in writing to the Landscape Architect and receive written instructions prior to proceeding.
  2. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.
  3. Coordinate with Contractor and other trades regarding on site utilities that wrap around building. Review utility plans prior to commencement of work.
- C. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Landscape Architect before planting.

### 1.09 SEQUENCING AND SCHEDULING

- A. Planting Time for Trees, Shrubs and Ground Cover: Proceed with, and complete work as rapidly as portions of site become available, working within planting season as follows:
1. Spring planting: Deciduous materials: April 1 through June 15  
Evergreen materials: April 1 through June 15
  2. Fall planting: Deciduous materials: September 1 through December 1  
Evergreen materials: September 1 through November 15
- B. Seeding: Complete seeding operations within the period noted below, unless the Landscape Architect approves another seeding time in writing.
1. Spring seeding: April 15 through June 15
  2. Fall seeding: August 15 through October 15
- C. Variance: If special conditions exist which may warrant a variance in the above planting dates, a written request shall be submitted to the Landscape Architect stating the special conditions for the proposed variance. Permission for the variance will be given if warranted in the opinion of the Landscape Architect.
- D. Schedule tree selection and digging operations so as to comply with nursery industry recognition of "Spring Dig Only" or "Fall Hazard" plant materials. No substitutions of plant materials will be allowed for fall planting based on

unavailability due to the "Spring Dig Only" or "Fall Hazard" restrictions. Contractor shall have selected and had the material dug during the previous spring.

- E. Coordination between Plants and Lawns: Plant trees and shrubs after final grades are established and before planting lawns, unless otherwise acceptable to Landscape Architect. If planting of trees and shrubs occurs after lawn work, protect lawn areas and promptly repair damage to lawns resulting from planting operations.

#### 1.10 PLANT MATERIAL ACCEPTANCE AND GUARANTEE

##### A. Provisional Acceptance and Instructions to Owner:

1. When all plant material is installed and at the end of the maintenance period specified in Part 3 of this section, the Contractor shall request the Landscape Architect, in writing, to inspect the work for Provisional Acceptance. Notify the Landscape Architect at least ten (10) days prior to the anticipated date of inspection.
  - a. For provisional acceptance, all plantings must be installed as specified in the locations indicated on the plans or as directed in field by the Landscape Architect, they must be in good, living condition, true to name and specified size.
2. Furnish written instructions for maintenance of the planting to the Owner at the time of inspection for Provisional Acceptance. Maintenance instructions shall consist of complete typed instructions indicating specific operations in watering, fertilizing, spraying and pruning that will be necessary to maintain plants and lawn areas in a healthy condition.
3. When the plant material and workmanship are acceptable or upon the completion of the documented corrective work has been completed and maintenance instructions have been received by the Owner the Landscape Architect will certify in writing the Provisional Acceptance of the planting and initiating the beginning date of the Guarantee Period.
4. Retainage: A sum of ten (10) percent of the cost of the planting contract will be retained until the end of the Guarantee Period. This retainage will be released after Final Acceptance.

##### B. Guarantee Period and Replacements:

1. The Guarantee Period shall be one (1) year from the date of Provisional Acceptance. During the Guarantee Period the owner shall maintain the plant materials and it shall be the Contractors obligation to inspect the

plant materials to confirm that they are receiving proper maintenance and care.

2. The Contractor is to perform inspections at frequent intervals so that he may observe problems which can be identified and remedied to maintain healthy plant growth. If the Contractor is of the opinion that the care being given these areas by the Owner is insufficient or may cause them to die prematurely, the Contractor shall immediately notify the Landscape Architect in writing; otherwise no consideration will be given this claim.
  3. Remove and replace trees, shrubs and other plants found to be dead or unhealthy during the Guarantee Period. Remove dead plants immediately. Make replacements during the normal planting season. The replacement plant material shall be guaranteed for an additional period of one (1) year.
    - a. Pay for the cost of replacement, unless it can be definitely shown that the loss resulted from vandalism or Owner's failure to maintain planting as instructed.
    - b. Restore areas damaged or disturbed by replacement operations to their original condition.
    - c. All replacement plant material shall be of the same species; cultivar size as specified in the Plant Schedule. They shall be furnished and planted as specified herein.
- C. At the end of the Guarantee Period or as directed by the Landscape Architect at the Provisional Acceptance, remove and dispose of guys, wires, rubber hose sections, stakes, and tree trunk wrapping off site.
- D. Final Inspection and Final Acceptance:
1. At the end of the Guarantee Period, the Landscape Architect upon written request submitted by the Contractor will make inspection. Notify the Landscape Architect at least 10 days before the anticipated date.
  2. If the plant material and workmanship are acceptable or upon the completion of the documented corrective work including plant replacement, the Landscape Architect will certify in writing the Final Acceptance of the planting.

#### 1.11 SEEDING INSPECTION AND ACCEPTANCE

- A. Inspection of the seeded areas shall be made at the end of the maintenance period specified in Part 3 of this section, and a determination made by the Landscape Architect whether maintenance shall continue. Acceptance shall be granted if a thick, uniform and well developed stand of grass has been developed.

- B. If the work is unsatisfactory, continue the maintenance period until the Landscape Architect determines the work to be acceptable.

## PART 2 – PRODUCTS

### 2.01 TOPSOIL

- A. New Topsoil: Topsoil shall be natural, fertile, friable soil, without admixture of subsoil, clean and reasonably free from clay, lumps, stones, stumps, roots or similar materials one (1) inch or more in diameter and free from debris or other objects which might be a hindrance to planting operations, and as follows:
1. Obtain topsoil from local sources or from areas having similar soil characteristics to that found at the project site. Obtain topsoil only from naturally, well drained sites where topsoil occurs at a depth of not less than four (4) inches.
  2. Texture: Topsoil shall be a “loamy sand” as determined by mechanical analysis and based on the “USDA Textural Classification”. It shall conform to the following grain size distribution for material passing the #4 sieve:
    - a. Percent passing by weight

<u>U.S. Standard Sieve</u>	<u>Minimum</u>	<u>Maximum</u>
#4	100	
#40	60	85
#100	35	60
#200	22	35
#.002 mm	0	5

3. Organic Matter: Portion of the sample which passes 1/4-inch sieve shall contain not less than five (5) percent nor more than twenty (20) percent organic matter, as determined by the wet combustion method on a sample directed at 105°C.
  - a. To adjust organic matter content, the soil may be amended, prior to site delivery, by the addition of composted humus. Use of organic amendments is acceptable only if random soil sampling indicates thorough incorporation.
4. pH value: Portion of the sample that passes a 1/4-inch sieve shall fall within a range of pH 5.5 to pH 7.0.

### 2.02 SOIL AMENDMENTS

- A. Aluminum Sulfate: Commercial grade.

*MT. FEAKE CEMETERY  
EXTENSION PROJECT  
WALTHAM, MA*

- B. Bonemeal: Commercial, raw, finely ground; 4 percent nitrogen and 20 percent phosphoric acid.
- C. Commercial Fertilizer: Provide as follows:
  - 1. Trees and Shrubs: Low nitrogen, slow-release water-soluble fertilizer packets or tablets, designed and certified by the manufacturer to provide controlled release of fertilizer over a minimum three-year period.
  - i Lawns: Fertilizer that conforms to standards of the Association for Official Agricultural Chemists, with at least 50% of the nitrogen content derived from organic nitrogen and the remainder from urea foam or equivalent. Deliver in sealed and labeled bags or in bulk with certification as to quality and analysis. [www.organicinc.com](http://www.organicinc.com)
- D. Compost: Well-composted, stable and weed-free organic matter with the following properties:
  - 1. Screen size less than ½", density =/-1000lbs/cy, ph 8.0, organic matter 63%, TKN nitrogen 1.2%, Organic-N .97%, Carbon /Nitrogen ratio 25:1, total Phosphorous .54%, total Potassium .56%. For topsoil production and plant beds mix 10-30% uniformly by volume. Compost supplier; New England Organics, Earthlife Products, Dartmouth, MA (207) 781-5011, or approved equal.
- E. Lime: Provide natural dolomitic limestone containing not less than 85 percent of total carbonates with a minimum of 30 percent magnesium carbonates, ground so that not less than 90 percent passes a 10-mesh sieve and not less than 50 percent passes a 100-mesh sieve.
- F. Manure: Well-rotted, unleached stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials and containing no chemicals or ingredients harmful to plants.
- G. Peat Humus: Humus shall be natural humus, reed peat or sedge peat, finely divided peat, so completely decomposed and free of fibers that its biological identity is lost. Provided in granular form, free of hard lumps, with pH range approximately 5.5 pH to 7.5 pH and the organic matter shall be not less than 85% as determined by loss on ignition. The minimum water absorbing ability shall be 200% by weight on an oven-dry basis.
- H. Perlite: Horticultural grade, conforming to National Bureau of Standards PS 23.
- I. Sand: Sand shall be clean and washed consisting of clean, inert, hard, durable grains of quartz or other hard durable rock, free from clay or loam, surfacing coatings, and deleterious materials, with the following gradation limitations,

1. Percent passing by weight

<u>U.S. Standard Sieve</u>	<u>Minimum</u>	<u>Maximum</u>
1/2"	100	
3/8"	85	100
#4	60	100
#16	35	80
#50	10	55
#100	2	10

- J. Shredded Bark Mulch: Natural pine, fir, spruce bark mix which has been machine shredded into fibrous, pliable slices generally not exceeding 1/2 inch in width and generally longer than wide, clean, and free of weed seeds.
- K. Super-phosphate: Soluble mixture of treated minerals; 20 percent available phosphoric acid.
- L. Water: Suitable for irrigation and free from ingredients harmful to plant life. Hose and other watering equipment required for the work shall be furnished by the Contractor.
- M. Microbial Soil Conditioner: Provide Microbial Soil Conditioner by Organica Inc. as a beneficial microbial inoculant formulated to enhance soil biology. The soil microbial soil conditioner establishes colonies of beneficial soil microbes. The microbes minimize nutrient leaching, aid in nutrient recycling and absorption, improve soil structure and convert soil elements into plant available form. The Microbial Soil Conditioner will also stimulate root growth and formation, improve nutrient absorption, improve seed germination and viability, naturally accelerate cell division and provide energy for plant metabolism.
- N. Hydrogel: Super absorbent polyacrylamide, non-toxic, biodegradable granules for reducing irrigation frequency, as supplied by Soil Moist (800) 441-2847, or Stockasorb (800) 334-5930, Smyrna GA.
- O. Weed barrier: For controlling weed growth and tree seedlings, contractor may use either Corn Weed Blocker, 9-1-0, a pre-emergent weed blocker and slow release fertilizer, or a weed barrier mat installed under mulch.

2.03 PLANT MATERIALS

- A. A complete list of plants, including a schedule of sizes, quantities and other requirements, shall be shown on the Drawings. In the event that quantity discrepancies or material omissions occur between the plant materials schedule

and the Drawings, the Contractor shall be responsible in providing the higher quantity of plants.

- B. Furnish plants which have been nursery grown in accordance with American Nurserymen's Association and ANSI Z60.1, which have been grown under climate conditions similar to those in the locality of the Project for at least two (2) years, and which have been transplanted or root pruned at least once in the last three (3) years. Furnish freshly dug plants; heeled-in plants and plants from cold storage will not be accepted.
- C. Furnish plants which are sound, healthy, vigorous, have straight trunks, are well branched and densely foliated when in leaf, and which have healthy, well developed root systems. Furnish plants which are typical of their species or variety and which have normal habit of growth. Furnish plants which are free of disease, insect pests, their eggs or larvae and defects such as knots, sun scald, injuries and disfigurement.
- D. All plants shall be balled and burlapped unless otherwise specified and must be moved with the root systems as solid units with balls of earth firmly wrapped with untreated eight-ounce burlap, firmly held in place by a stout cord or wire. The diameter and depth of the balls of earth must be sufficient to encompass the fibrous root feeding system necessary for the healthy development of the plant.
  - 1. No plant shall be accepted when the ball of earth surrounding its roots has been badly cracked or broken preparatory to or during the process of planting or after the burlap, staves, ropes or platform required in connection with its transplanting have been removed. The plants and root balls shall remain intact during all operations.
- E. Measurements:
  - 1. Measure trees and shrubs when branches are in their normal position.
  - 2. Height and spread dimensions specified refer to the main body of the plant and not from branch or root tip to tip.
  - 3. The branching height for shade trees need not be the height specified if the required branching height may be obtained by pruning after delivery without affecting the shape and form of the trees, or causing large, unsightly scars.
  - 4. Measure the caliper of trees up to four (4) inch caliper at six (6) inches above the ground level. Measure trees larger than four (4) inch caliper one (1) foot above ground level.

5. Number of canes specified for shrubs shall be the minimum acceptable. A cane shall be considered a primary stem which starts from or close to the ground, or at a point not higher than one-fourth the height of the plant. No trees which have had their leaders cut, or so damaged that cutting is necessary, will be accepted.
- F. Plants larger than specified in the plant list may be used if approved by the Landscape Architect, but use of such plants shall not increase the contract price. If the use of larger plants is approved, the spread of roots or ball of earth shall be increased in proportion to the size of the plant.
- G. Groundcover: Furnish established plants, well-rooted in removable containers or integral peat pots and with not less than minimum number and length of runners required by ANSI Z60.1 for the pot size shown or listed.

#### 2.04 SEEDING & SOD

- A. Sod shall be a shade tolerant disease-resistant mixture of 50% minimum Kentucky Bluegrass cultivars and 50% Red Fescue or Chewing's Fescue, or as approved by the landscape architect.
  1. Sod shall be at least two years old from time of original seeding.
  2. Sod shall be good quality, of good color and density, and free of weeds, disease and insect. Sod shall be machine cut at a uniform soil thickness necessary for plant viability during the harvest, transportation and installation. Sod shall be machine cut at a uniform soil thickness of 3/4", plus or minus 1/4" at time of cutting; minimum thickness of sod and planting soil shall be 1.5 inches. Individual pieces of sod shall be cut to the supplier's standard width and length; maximum allowable deviation from standard widths and lengths shall be 5%. Standard size sections of sod shall be strong enough to support their size and shape when suspended vertically from a firm grasp on the upper 10% of the section.
  3. Sod shall be harvested, delivered and installed within a period of 36 hours. Soil shall be kept moist at all times.
  4. Stakes for pegging sod shall be sound hardwood about 1" by 2" and long enough to penetrate the grass mat, soil bed and at least 2 inches of subsoil. Stakes shall be free from insects and fungi and capable of remaining in the ground at least 2 years.
- B. Seed mixture shall be fresh, clean, new crop seed. Grass shall be of the previous year's crop and in no case shall weed seed content exceed 1% by weight. The



*MT. FEAKE CEMETERY  
EXTENSION PROJECT  
WALTHAM, MA*

seed shall be furnished and delivered in the proportion specified below in new, clean, sealed and properly labeled containers.

1. All seed shall comply with State and Federal seed laws. Submit manufacturer's certificate of Compliance. Seed, which has become wet, moldy or otherwise damaged will not be acceptable.
2. Seed may be mixed by an approved method on the site or may be mixed by a dealer. If the seed is mixed on site, each variety shall be delivered in the original containers, which shall bear the dealers guaranteed statement of the composition of the mixture.

Seed Mix for Lawns:

Northeast Sun/Shade Mix. 170 lbs./acre of the following seeds thoroughly mixed:

<u>Common Name</u>	<u>Proportion By Weight Min</u>	<u>Germination Min</u>	<u>Purity Min</u>
Sydsport Kentucky Bluegrass	25 %	90	95
Affirmed Perennial Rye	20 %	90	90
Exacta Perennial Rye	20 %	90	90
Chewing's Fescue	25 %	90	90
Churchill Perennial Ryegrass	10 %	90	90

- B. Seed shall be mixed off-site by dealer. Contractor shall submit in accordance with Division 1 with the dealer's certificate of the mixture composition for review and approval before seeding operations begin.

2.05 ACCESSORY MATERIALS

A. Staking and Guying:

1. Stakes for supporting trees: Sound wood, uniform in size, free of knots and holes, nominal two (2) inches by two (2) inches and eight (8) feet long. Stain stakes dark brown.
2. Wire for tree bracing and guying: Pliable No. 12-gauge galvanized steel. Contractors' option; "Deep-root Arbor tie" 1 800-458-7668 or approved equal, installed per manufacturers' recommendations guying system utilizing a water-knot to tie off trees to stalks in place of guying items below.

3. Wire cable for bracing and guying trees: Pliable five strand 3/16-inch galvanized steel cable. Furnish galvanized malleable cable clamps or approved equal to secure ends of cable.
  4. Turnbuckles: 5/16 inch by 4-1/2-inch galvanized steel turnbuckles.
  5. Pedestrian warning flags: Two (2) inch by twelve (12) inch white plastic strips or one half (1/2) inch by three (3) inch by twelve (12) inch marine plywood painted white.
  6. Hose for covering wire: New or used and in good condition, two-ply reinforced black rubber hose not less than 1/2 inch inside diameter.
- B. Anti-desiccant: Anti-desiccant shall be emulsions or other materials which will provide a protective film over plant surfaces permeable enough to permit transpiration and specifically manufactured for that purpose. Deliver in manufacturer's fully identified containers and mix in accordance with manufacturer's instructions.

### PART 3 - EXECUTION

#### 3.01 PROTECTION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
1. Do not drive trucks or other heavy equipment over walks without putting down heavy planking to distribute the load and keep from breaking the edges of walks.
- B. Transport plants to the site in closed or covered trucks, with tarpaulins placed to permit ventilation of the load. Protect roots or balls at all times from sun and/or drying winds. If balled and burlapped plants are not planted immediately upon delivery, set them on the ground and protect the roots or balls with soil, mulch, burlap or other acceptable means of retaining moisture. Take care when binding with wire or rope not to damage the bark or break branches.

#### 3.02 LAYOUT OF PLANTING AREAS

- A. Locate and stake all plants and outlines for planting areas on the ground for approval by the Landscape Architect before any plant pits or plant beds are dug.
1. Notify the Landscape Architect five (5) days prior to the first day of planting operations and after the completion of plant locations.

2. Be prepared to make minor adjustments to the plant arrangements in the field from those indicated on the plans if directed to do so by the Landscape Architect.
- B. In case underground obstructions are encountered, notify the Landscape Architect in writing and obtain direction. Be particularly careful to avoid damaging underground electrical lines and irrigation pipes. If any damage occurs, notify the Owner immediately. The Contractor shall be responsible for all repairs and associated costs to the satisfaction of the Landscape Architect.

### 3.03 PREPARATION OF SUBGRADE

- A. Prior to dumping and spreading topsoil, install grade stakes on a 25-foot grid in open areas, bottom of swales, top of slopes and sufficiently spaced in other areas to insure correct line and grade of subgrade and finished grade. Verify subgrade elevations and grade as necessary to bring the subgrade to a true, smooth slope parallel to the finish grade for all areas to receive topsoil. Remove rocks, boulders, and debris greater than two (2) inches in any dimension which are within the subgrade surface.
1. Request inspection of subgrade and secure the Landscape Architect's written approval before placing and spreading topsoil.
- B. After acceptance of subgrade, loosen the subgrade by discing or by scarifying to a depth of at least four (4) inches to permit bonding of the topsoil to the subsoil.

### 3.04 PLACING TOPSOIL

- A. Place and spread topsoil over approved areas to minimum depth as specified below so that after natural settlement and rolling, the complete work shall be smooth, uniform, and will conform to the lines, grades and elevations indicated on the Drawings.
1. Areas to be seeded: Minimum six (6) inch depth.
  2. Areas to receive shrubs, ground covers, and perennials: Minimum twenty-four (24) inch depth
- B. Place approximately 1/2 of total amount of topsoil required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil.
- C. The entire surface shall then be rolled for compaction, filling all depressions caused by settlements or rolling activities with additional topsoil until it presents a smooth and even finish to the required grade.

- D. No subsoil or planting soil shall be handled in any way if it is in a wet or frozen condition.
- E. Request inspection of the fine grading and bed preparation and secure the Landscape Architect's written approval before commencing any planting or seeding work.

3.05 DIGGING AND HANDLING PLANTS

- A. Dig balled and burlapped (BB) plants with firm, natural balls of earth of sufficient diameter and depth to include all the fibrous and feeding roots. Meet ANSI Z 260.1 standards for nursery stock. Plants will not be accepted if the ball is cracked or broken before or during planting operations. Bind balls with rope or wire cages. Container grown plants shall be firmly rooting within the container and not loose.
- B. Fill excavations for trees and shrubs with water and allow to percolate out before planting. Water thoroughly when excavation is approximately 2/3 full and water again after placing final layer of backfill.
- C. Remove burlap, rope, wires, and other ties from sides and tops of root balls. Do not pull burlap out from underneath root balls.
- D. Backfill: Deliver topsoil mixture ingredients to the site separately. Mix them uniformly on the site. Add soil amendments per testing results and mix in following proportion:
  - 1. Three (3) parts topsoil.
  - 2. One (1) part composed manure, peat humus or compost.
  - 3. Ten pounds of bone meal per cubic yard of mixture.
- E. Prune: Thin out and shape all existing and newly planted trees in accordance with ANSI A300, as directed by the Landscape Architect. Prune trees to retain required height and spread. Unless otherwise directed by the Landscape Architect, do not cut tree leaders, and remove only injured or dead branches from any specified flowering trees. Do not cover wounds with dressing or tree paints.
- F. Anti-desiccant: Apply to plant materials, except grass, to keep them from drying out during the maintenance period. Apply in accordance with manufacturer's instructions for time and rate of application.
- G. Fertilize only at time of planting. Place slow release fertilizer in planting hole prior to placement of plant at a rate as follows:
  - 4. Herbaceous Plants:

- a. Container/peat pot: 1.0 oz. per plant
- b. Plug: 0.5 oz. per plant
- 5. Woody Plants:
  - a. 1-quart container: 1.0 oz. per plant
  - b. 1-gallon container: 3.0 oz. per plant: each additional gallon: 1.0 oz.
  - c. Seedling: 0.5 oz. per plant
- H. Alternatively, topdressing may be applied as follows:
  - 6. When pH is below 4.0 apply lime at a rate of 50 lbs./acre or topdress with Ammonium sulfate at 100 lbs./acre
  - 7. Superphosphate at 100 - 200 lbs./acre
- I. Remove plastic containers from plants. If spiraling of primary woody roots exist on the outside of the soil/root mass upon the removal of the plants from the containers, either cut these roots or separate and spread them out from the soil/root masses prior to planting. Do not remove plants from peat pots prior to planting. Peat pots may be broken slightly, but may not be separated from the roots.

### 3.07 SEEDING

- A. Sow seed within the planting season specified in Part 1, "Sequencing and Scheduling" of this section.
- B. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.
- C. Seeding: Prepare soil, sow seed, rake, roll, weed and water, until acceptable turf is established.
  - 1. Dry method: Sow grass seed uniformly in two directions by means of a mechanical seeder or other method which will sow the seed at the required rate over the entire area to be seeded. The mechanical seeder shall be capable of being operated to avoid the growth of grass in rows and shall be so operated. After seeding, lightly rake by hand to mix the seed and topsoil. Roll lawn areas on the same day as seeding, with a roller weighing not more than 100 pounds per feet of roller width to firm the soil but not to pack it.
  - 2. Hydraulic spray method: Hydraulic spraying of sowing seed may be used where approved by the Landscape Architect. Use an approved machine, capable of distributing seed and fertilizing materials evenly and uniformly on the designated areas at the required rates, operated by a competent crew.

- a. Mix seed and fertilizing materials with water in the tank of the spraying machine and keep the mixture thoroughly agitated so the materials are uniformly mixed and suspended in the water all times during operation.
  - b. If the Landscape Architect finds the application uneven or otherwise unsatisfactory, the Landscape Architect may require the hydraulic spray method to be abandoned and the balance of the work done by the dry method. Lightly rake seed into the surface of the soil unless seeding is to be followed within 24 hours by mulching.
  - c. When the hydraulic method is used, compaction or rolling will not be required.
3. In areas having slopes of 3:1 or steeper, and in drainage swales, overseed with the same mixture in a separate operation immediately after sowing. Apply overseeding mixture at the rate of 3 pounds per 1,000 square feet. Cover areas that require additional erosion control with an approved erosion netting properly anchored. Remove non-degradable netting after an acceptable stand of grass has been achieved.

**3.08 MAINTENANCE FOR TREES, SHRUBS AND OTHER PLANT MATERIAL**

- A. Begin maintenance immediately after each plant is planted. Water, mulch, weed, prune, spray, fertilize, cultivate, and otherwise maintain and protect plants until Provisional Acceptance. Tighten and repair tree turnbuckles and stakes. Correct defective work as soon as possible once weather and season permit. Reset settled plants to proper grade, plumb and position, restore planting saucer, and remove dead material.
1. Maintain all trees, shrubs, and other plants until provisional acceptance, but in no case, less than the following period:
    - a. Sixty (60) days after substantial completion of planting.
- B. Water all plant material by applying water twice within the first twenty-four (24) hours of the time of planting and all plants during the maintenance period shall be watered at least twice each week unless sufficient rainfall has occurred. At each watering the soil around each tree or shrub shall be thoroughly saturated. If sufficient moisture is retained in the soil, as determined by the Landscape Architect, the required watering may be reduced.
1. Trees will require a minimum of ten (10) gallons of water each week
  2. Shrubs will require a minimum of five (5) gallons of water each week.

3.09 MAINTENANCE FOR SEEDED AREAS

- A. Maintenance shall begin immediately after any area is seeded and/or sodded and shall continue until acceptance by the Landscape Architect, but in no case, less than the following period.
  - 1. Ninety (90) days after substantial completion of seeding or sodding operations.
    - a. Seeded lawns shall be maintained until all areas have a close stand of grass which has received a minimum of three (3) mowings, has no bare spots greater than three (3) inches in diameter, and at least 90% of the grass established shall be permanent grass species as determined by the Landscape Architect.
- B. Maintenance shall include but is not limited to; reseeding, mowing, watering, weeding and fertilizing.
  - 1. Weed as necessary to maintain seeded areas ninety-nine (99) percent weed free.
- C. Watering of Seeded Areas:
  - 1. First Week: The Contractor shall provide all labor and arrange for all watering necessary to establish seeded areas. In the absence of an adequate rainfall, watering shall be performed daily or as often as necessary during the first week and in sufficient quantities to maintain moist soil to a depth of at least two (2) inches.
  - 2. Second and Subsequent Weeks: The Contractor shall water the seeded areas as required to maintain adequate moisture, in the upper two (2) inches of soil, necessary for the promotion of deep root growth.
  - 3. Watering shall be done in a manner which will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment.
- D. Protection:
  - 1. Protect seeded areas from trespassing and damage of any kind by the use of temporary fences. Repair any damage including those resulting from erosion and washouts. Replant bare spots with the specified seed mix or sod. Secure orange flagging to the temporary fencing/barriers.

2. Barriers shall be raised immediately after seeding or sodding operations and shall be maintained until acceptance.
- E. Reseeding: After grass in seeded areas has appeared, all areas and parts of areas which, in the opinion of the Landscape Architect, fail to show a uniform stand of grass, for any reason whatsoever, shall be reseeded repeatedly until all areas are covered with a satisfactory growth of grass.
- F. Mowing: The first mowing of seeded areas shall not be attempted until the grass height has reached a minimum of three (3) inches or as directed by the Landscape Architect. Grass height shall be maintained at two and one half (2-1/2) inch height unless otherwise specified. Thereafter grass shall be mowed at least once a week until written acceptance by the Landscape Architect.
- G. Liming: If more than one initial application of limestone is required by the soils analysis to bring the pH of the stockpiled topsoil/loam borrow to a specified range, the Contractor shall be responsible for all additional required lime applications.

### 3.10 CLEANUP AND PROTECTION

- A. During operations, keep pavements clean and work area in an orderly condition. Protect lawns and plant materials from damage by other contractors, trades, and trespassers. Maintain protection during installation and maintenance periods. Clean up debris, materials, and rubbish. Treat, repair, or replace damaged work.
- B. Upon completion of planting, and prior to Provisional Acceptance, remove from site excess soil and debris and repair damage resulting from planting operations.
- C. Restore other work, plants, lawns and property damaged during the course of landscaping work, including, but not limited to, lawn areas inside and outside the contract limit lines, existing trees, walks, and walls.

### END OF SECTION



## **DIVISION 33**

SECTION 33 11 00

WATER UTILITY DISTRIBUTION PIPING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.
- B. All water service materials shall be in conformance with the City of Waltham's Standards and Specifications and as specified herein.

1.02 WORK INCLUDED

- A. Trenching, excavation, bedding and backfill, including compaction and testing, of water pipes and services.
- B. Furnish all labor, materials and equipment required to chlorinate and test water distribution system.

1.03 RELATED WORK UNDER OTHER SECTIONS

- A. SECTION 31 10 10 – Site Clearing
- B. SECTION 31 20 00 – Earth Moving

1.04 REFERENCES

- A. The following standards and definitions are applicable to the work of this Section to the extent referenced herein:
  - 1. ASME B16.18 – Cast Copper Alloy Solder Joint Pressure Fittings.
  - 2. ASTM B88 – Seamless Copper Water Tube.
  - 3. ASTM D 1557 – Test Methods of Moisture-Density Relations of Soils and Soil Aggregate Mixtures Using 10 lb Rammer and 18-inch Drop.
  - 4. AWWA C104 – Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
  - 5. AWWA C111 – Rubber-Gasket Joints for Ductile Iron and Grey-Iron Pressure Pipe and Fittings.

6. AWWA C151 – Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.
  7. AWWA C500 – Gate Valves, 3 through 48 inch NPS, for Water and Sewage Systems.
  8. AWWA C504 – Rubber Seated butterfly Valves.
  9. AWWA C508 – Swing-Check Valves for Waterworks Service, 2 inch through 24 inch NPS.
  10. AWWAC 509 – Resilient Seated Gate Valves 3 inch through 12 inch NPS, for Water and Sewage Systems.
  11. AWWA C600 – Installation of Ductile-Iron Water Mains and Appurtenances.
  12. AWWA C606 – Grooved and Shouldered Type Joints.
- B. All work shall comply with the pertinent standards of the latest editions of the following Codes and Specifications, unless designated otherwise herein:
1. American Society for Testing and Materials (ASTM)
  2. American National Standards Institute (ANSI)
  3. American Association of State Highway and Transportation Officials (AASHTO)
  4. The Commonwealth of Massachusetts, Highway Department, Standard Specifications of Highways and Bridges (MHD Standard Specifications)

1.05 SUBMITTALS

- A. Shop Drawings
1. Submit six (6) sets of shop drawings or descriptive literature, or both, showing dimensions, joint and other details of all materials to be furnished under this Section. Shop Drawings shall be submitted to the Engineer for approval prior to ordering materials.
- B. “As-Built” Drawings
1. Submit one reproducible of As-Built Drawings upon completion and acceptance of work.

2. "As-Built" Drawings shall be complete and shall indicate the true measurement and location, horizontal and vertical, of all new construction.

1.06 QUALITY ASSURANCE

- A. Valves: Manufacturer's name and pressure rating marked on valve body.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under applicable Sections of this Specification.
- B. Delivery and store valves in shipping containers with labeling in place.

1.08 EXAMINATION OF CONDITIONS

- A. The Contractor shall fully inform himself of existing conditions of the site before submitting his bid, and shall be fully responsible for carrying out all site work required to fully and properly execute the work of the Contract, regardless of the conditions encountered in the actual work. No claim for extra compensation or extension of time will be allowed on account of actual conditions inconsistent with those assumed.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Drawing and Specifications are intended to supplement and explain each other. Materials not specifically mentioned in the Specifications shall be as indicated on the Drawings. Where no specific kind of quality of material is given, a first-class standard article shall be furnished.
- B. The Drawings are diagrammatic only and are intended to indicate the extent but not all details of the piping which shall be supplied. All offsets and materials are not shown; however, the Contractor shall furnish these items as if called for or shown.

2.02 DUCTILE IRON PIPE

- A. Ductile iron pipe shall be designed in accordance with ANSI A21.50/AWWA C 150 and manufactured in accordance with ANSI A21.51/AWWA C151.
- B. Ductile iron pipe shall be Pressure Class 52.
- C. Restrained joint piping shall be U.S. Pipe "TR Flex" restrained push-on joint pipe, manufactured in accordance with the requirements of ANSI/AWWA C 141 A21.52, pressure class 35.

- D. Pipe shall be cement-mortar lined in accordance with ANSI A 21.4/AWWA C104, except that the cement lining shall be double thickness.
- E. The exterior of all pipe shall be factory coated, with a double coat of coal tar enamel conforming to ANSI A21.4/AWWA C 104. The interior of all pipes shall have a seal coat of asphaltic material applied in accordance with ANSI A214/AWWA C104.

#### 2.03 FITTINGS

- A. All fittings for use with cast iron or ductile iron pipe shall conform to ANSI/AWWA C110/A21.10.
- B. Type of ends at the fittings in relating to valves and the connection piping shall be determined by the Contractor in accordance with the requirements of the Drawings and Specifications prior to ordering the fittings.
- C. All fittings shall be cement-mortar lined in accordance with ANSI/AWWA C104/A21.4 and given a seal coat of asphaltic material.

#### 2.04 SLEEVE COUPLINGS

- A. Sleeve couplings and accessories shall be pressure rated at least equal to that of the pipe.
- B. Transition couplings for joint pipe of different diameters shall be Dresser Style 162 or approved equal. Couplings shall be provided with corrosion resistant nuts and bolts.
- C. After assembly, all exterior surfaces including the bolts and nuts shall be thoroughly coated with two coats of a heavy-duty protective asphaltic coating. The interior of the coupling shall be epoxy-coated. Epoxy coating shall conform to AWWA C550.

#### 2.05 JOINTS

- A. Joints shall be either push-on or mechanical joints conforming to ANSI A21.11/AWWA C111. Push-on and mechanical joints shall be provided with sufficient quantities of accessories conforming to ANSI A21.11/AWWA C111

#### 2.06 GATE VALVES

- A. Gate valves shall be either resilient seated conforming to the requirements of AWWA C509 or double disk, parallel, inclined or soiled wedge type valves conforming to the requirements of AWWA Standard C500.

- B. Gate Valves shall be cast iron body, bronze mounted, double disk, non-rising stem, O-ring type stuffing box.
- C. Gate valves shall open per City of Everett standards and have mechanical joint ends.
- D. Bolt, studs and nuts shall be made from a corrosion-resistant material such as low-zinc bronze, nickel copper alloy, or stainless steel.
- E. Operating nut shall be 2 inches square at the base, tapering to 1-15/16 inches square at the top.

2.07 VALVE BOXES

- A. Unless otherwise specified, each gate valve shall be provided with a valve box and cover.
- B. Valve boxes shall be of the adjustable, telescoping, heavy-pattern type and shall be so designed and constructed as to prevent the direct transmission of traffic loads to the pipe or valve.
- C. Valve boxes shall be cast iron, tar coated with cast iron covers. The smallest inside diameter of the shaft shall not be less than 5-1/4 inches. The lower section of the box shall be designed to enclose the operating nut and stuffing box of the valve. Provisions shall be made for adjustment through at least 6-inch vertical without reduction of lap between sections.
- D. Covers shall be close fitting and substantially dirt-tight. The top of the cover shall be flush with the top of the box rim. The word "Water" shall be cast in the top cover.

2.08 HYDRANTS

- A. The Contractor shall furnish hydrants of the make and the type specified hereinafter or approved equal.
- B. Make and Model: Mueller Centurion.
  - 1. Type of Thread: National Standard.
  - 2. Number of Outlets:
    - a. Two 2-1/2 inch hose connection.
    - b. One 4-1/2 inch steamer connection.
  - 3. Diameter of Opening: 5-1/4 inch.
  - 4. Size and Type of Inlet Connection: 6-inch mechanical joint.

- 5. Direction of Opening: Open left.
- 6. Depth of Bury: 5'6" with a minimum of 5 feet of cover.
- 7. Size and Shape of Operating Nut: Pentagonal.
- C. Hydrant shall conform to the requirements of ANSI/AWWA C502, latest issue.
- D. Bolts and nuts shall be made from a corrosion-resistant material.

2.09 THRUST BLOCKS

- A. Thrust restraints, cement concrete thrust blocks and/or clamps and tie rods shall be installed in accordance with the relevant provisions of the standard details shown on the Drawings and the directions of the Engineer.
- B. The Contractor shall discuss with the Engineer the method(s) to be utilized to restrain thrust prior to installing bends, tees, hydrants and the like. Test pits may be required in areas of existing utilities to determine the exact location and dimensions of thrust restraint to be installed by the Contractor.
- C. Concrete for thrust blocks shall have a minim 28 day's compressive strength of 4,000 psi.

2.10 CORPORATION STOPS/CURB STOPS

- A. Corporation stops shall be bronze or brass with ground keys, threaded to receive compression-type fittings. The stop shall be of the size shown on the Contract Drawings and shall be as manufactured by Mueller, Red Head, Ford or equal.
- B. Curb stops shall be Mueller Oriseal II curb stop or approved equal, threaded to receive compression-type fittings.

2.11 SERVICE BOXES

- A. Curb boxes shall be cast iron improved extension type with arch pattern base. Covers shall be held in place with bronze bolts and the word "Water" shall be cast into the cover. Curb box shafts shall have a minimum 5-foot curb shut box with 30-inch rod and 2-hole cover. Curb boxes shall be as manufactured by Mueller Corp. or approved equal.

2.12 WATER SERVICE PIPING

- A. Service lines two inches or smaller shall be copper water tubing, Type K, for underground water service and shall be in accordance with ANSI/AWWA C800, latest issue.

- B. Type K copper tubing material shall be in conformance with ASTM B88.
- C. Water service fittings including couplings and adapters, check valves and service saddles shall be in conformance with ANSI/AWWA C800, "Underground Service Line Valves and Fittings."
- D. Joints in copper tubing shall be made with three-part compression couplings, flared tube fittings, or an approved equal.
- E. Service line greater than 2 inches shall be ductile iron pipe.

### PART 3 – EXECUTION

#### 3.01 GENERAL

- A. All water pipes, fittings, valves, hydrants, tapping sleeve and other water line appurtenances shall be installed as shown on the Drawings and City of Everett Water and Sewer Standards. Backfill materials shall be as shown on the Drawings and as specified in Section 02200, Earthwork.
- B. Accurately locate any existing or previously installed utilities before beginning excavation.
- B. Check for conflict with underground utilities or structures. Notify the Engineer immediately of all discrepancies before proceeding with the Work.
- D. Coordinate all water main connections and service instillation with the Owner.

#### 3.02 LAYING DUCTILE IRON PIPE AND FITTINGS

- A. Ductile iron pipe and fitting shall be installed in accordance with the requirements of ANSI/AWWA C600, except as otherwise provided herein.
- B. Each length of pipe shall be laid with firm, full and even bearing throughout its entire length, in a trench prepared and maintained in accordance with Section 31 20 00 - EARTH MOVING of these Specifications. The type of materials to be used in bedding and backfilling and method of placement shall conform to the requirement of Section 31 20 00 - EARTH MOVING of these Specifications and as indicated on the Drawings.
- C. All pipes shall be sound and clean before laying. When laying is not in progress, including lunchtime, the open ends of the pipe shall be closed by watertight plugs or other approved means. If water is in the trench when work is resumed, the plug shall not be removed until the trench has been pumped dry and all danger of water entering the pipe has been eliminated.



- D. Fittings, in addition to those shown on the Drawings, shall be provided if required in crossing utilities which may be encountered upon opening the trench.
- E. When cutting of pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. Cut ends of pipe to be used with a push-on bell shall be beveled to conform to the manufactured spigot end. Cement lining shall be undamaged.
- F. Maximum allowable deflection of pipe laid without fitting shall not exceed allowable established by the pipe manufacturer and shall not exceed those shown in AWWA C600.
- G. The water main shall be laid so as to provide a minimum cover of 5 feet below finished grade.

3.03 JOINTING DUCTILE IRON PIPE (PUSH-ON TYPE)

- A. Push-on joints shall be made in strict accordance with the manufacturer's instructions. A rubber gasket shall be inserted in the groove of the bell end of the pipe and the joint surface cleaned and lubricated using the pipe manufacturer's suggested methods and materials. The plain end of the pipe to be laid shall then be inserted in alignment with the bell of the pipe to which it is to be jointed and pushed home with a jack or by other means. After joining the pipe, a metal feeler gauge shall be used to make certain that the rubber gasket is correctly located.

3.04 JOINTING MECHANICAL JOINT PIPE AND FITTINGS

- A. Mechanical joints shall be made in strict accordance with the manufacturer's instructions. Mechanical joints shall be made by first cleaning the surface against which the gasket will come in contact, with a wire brush. The gasket, bell, and spigot shall be lubricated by washing with soapy water just prior to assembling the joint. After the nuts have been made up finger tight, the bottom nut, then top and then diametrically opposite nuts shall be progressively tightened. Bolts shall be tightened to the torques listed:

<u>Bolt Size in Inches</u>	<u>Range of Torque in Feet Pounds</u>
5/8	45-60
3/4	75-90
1	85-100

- B. Under no conditions shall extension wrenches or a pipe over the handle of an ordinary ratchet wrench be used to secure greater leverage. After installation, a heavy bitumastic coating shall be applied to all bolts and nuts.

- C. Restraining device shall be ductile iron and shall have dimensions such that it can be used with the standardized mechanical joint bell and tee-head bolts conforming to ANSI/AWWA Z21.11 and ANSI/AWWA C 153 latest version.

3.05 CONCRETE THRUST BLOCKS

- A. Where pipes change horizontal and vertical direction, at hydrants, tees and other fittings, and wherever abnormal thrust forces may be developed, the Contractor shall construct thrust and anchor blocks as detailed on the Drawings. They shall be Concrete, of minimum dimensions as detailed on the plans or of adequate additional size to suit actual conditions to withstand pressures anticipated, and shall be founded in virgin soil.
- B. Concrete for thrust blocks shall have a minimum 28 day's compressive strength of 4,000 psi. Transit mix concrete may be used subject to approval of the Engineer.

3.06 RESTRAINED JOINTS

- A. Pie with restrained joints shall be installed at locations shown on the Drawings and as specified. Bends, reducers, tees, valves, dead ends, and hydrants are among the places where thrust forces create unbalanced forces in the piping and where the pipe and fittings shall be restrained. The minimum length of pie to be restrained on either side of the joint shall be as shown on the table below. The fittings of the new piping shall be for restrained joints, as marked on the Drawings.

Number of Joints to Restraint on Either Side of Fitting

<u>Fitting</u>	<u>Based on 18-foot pipe length</u>
90-degree bend	2
45-degree bend	1
22.5-degree bend	1
<u>Tee</u>	
Branch	2
Run	2

- B. No restraining is required in the direction of the existing pipe if only a short length of it is exposed in the trench for making a connection.
- C. Restrained joint assemblies for push-on pipe and fittings shall be made in strict accordance with the manufacturer's recommended installation procedures.
- D. Restrained joint assemblies for mechanical joint pipe shall be EBAA Iron Sales MEGALUG or equal.

### 3.07 HYDRANTS

- A. Hydrants shall be installed as detailed on the Drawings and shall be set at the locations shown on the Drawings or designated by the Engineer.
- B. Each hydrant shall be set in true vertical alignment and shall be properly braced. Concrete thrust blocks shall be placed between the back of the hydrant inlet and undisturbed soil at the end of the trench. Minimum bearing area shall be as shown on the plans. Care shall be taken to ensure the concrete does not plug the drain ports.

### 2.08 WATER SERVICES

- A. Copper Service Pipe: Care shall be exercised in placing and laying of service line to be sure that the pipe does not have kinks or sharp bends and to assure against its being in contact with sharp stones or ledge which would cause damage to the pipe. At least 6 inches of sand shall be placed adjacent to, under and above the pipe, and no stone larger than 2 inches shall be placed over the pipe until the depth of backfill above the pipe is in excess of 1 foot.
- B. Corporation Cock: Corporation cock shall be of a size equal to the size of the service pipe. Taps to the main shall be threaded and shall be made at the horizontal diameter of the main. The tap made in the main by means of a tapping machine manufactured for this purpose and supplied by the Contractor. Corporation cock shall be screwed firmly into the water main with the key upward and the inlet and projecting at least 1/8 inch beyond the inside face of the main. Corporation cock shall be left in the on (open) position.
- C. Curb Stop and Curb Boxes shall be of a size equal to the size of the service pipe and shall be installed in the locations shown on the Drawings or as ordered by the Engineer.
- D. Ductile Iron Service Pipe: Each ductile iron service pipe shall be valved with gate valve where and as directed, and a valve box shall be installed over the valve, all as specified elsewhere in these Sections. Connections of service lines at the main shall be made with appropriate size tees.

### 3.09 PRESSURE TESTING

- A. Hydrostatic and leakage test shall be conducted in accordance with AWWA Standard C600, and as directed by the Engineer. Testing shall be conducted by an independent water testing company other than the contractor who installed the water main.
- B. Conduct piping tests after thrust blocks have sufficiently hardened. Fill pipeline 24 hours prior to testing, and apply test pressure to stabilize system. Use only potable water.

- C. Prior to pressure testing, the entire line shall be flushed or water jetted to remove any rocks or debris which may have inadvertently entered the pipe during construction.
- D. Once the pipeline section has been filled at normal pressure and all entrapped air removed from the line, the Contractor shall raise the pressure to 150 psi by a special pressure pump, taking water from a small tank of proper dimensions for satisfactorily measuring the rate of pumped water into the pipeline. This pressure shall be maintained for a minimum of 2 hours, during which time the line shall be checked for leaks. Measured rate of water leakage shall not exceed the following leakage listed below.
1. Allowable leakage in gallons per hour, per 1,000 feet of exterior pipeline:

Test Pressure in PSI	Nominal Pipe Diameter in inches					
	4	6	8	10	12	16
150	0.36	0.55	0.74	0.92	1.10	1.47
  2. Interior piping in vaults, buildings, etc. shall have zero leakage.
  3. Should leakage exceed this rate, the Contractor shall immediately locate the leak or leaks and repair same at his expense. Pipe shall be accepted only when leakage does not exceed above standard. Approval does not absolve the Contractor from his responsibility if leaks develop with the new main or water services later within the period of warranty.

### 3.10 DISINFECTION OF COMPLETED LINES

- A. Before being placed in service, all new water pipelines shall be chlorinated in accordance with ANSI/AWWA C651 Standard for Disinfecting Water Mains.
- B. The location of the chlorination and sampling points will be determined by the Engineer in the Field. Taps for chlorination and sampling shall be installed by the Contractor. The Contractor shall uncover and backfill the taps as required.
- C. The general procedure of chlorination shall be first to flush all dirty or discolored water from the lines, and then introduce a 24 mg/l chlorine solution in approved dosages through a tap at one end while water is being withdrawn at the other end of the line. The chlorine concentration in the water in the pipe shall be maintained at a minimum of 25 mg/l available chlorine during filling. To assure that this concentration is maintained, the chlorine residual shall be measured at regular intervals in accordance with procedures described in Standard Methods and AWWA M12, Simplified Procedure for Water Examination (section K).
- D. During the application of the chlorine, valves shall be manipulated to prevent the treatment dosage from flowing back into the line supplying the water. Chlorine application shall not cease until the entire main is filled with chlorine solution.

The chlorinated water shall be retained in the main for at least a 24-hour period, the treated water shall contain a chlorine residual throughout the length of the main as indicated in AWWA C651.

- E. Following the chlorination period all treated water shall be flushed from the lines at their extremities and replaced with water from the distribution system. Prior to disposal of treated water, the Contractor shall check with local authorities to determine if the discharge will cause damage to the receiving body of water and, if required to do so, the Contractor shall neutralize the chlorinated water in accordance with Appendix B, AWWA C650. Bacteriological sampling and analysis of the replacement water may then be made by the Contractor in full accordance with AWWA Specification C651. A minimum of 3 samples shall be taken by the Contractor at locations directed by the Engineer along the length of the water main being chlorinated and sent to a State approved private laboratory for analyses. The Contractor will be required to re-chlorinate, if the samples show presence of coli form, and the line shall not be placed in service until all of the repeat samples show no presence of coli form.
- F. Furnish two copies of a Certificate of Disinfection Report to the Engineer.
- G. All costs for water required for all testing, flushing, chlorinating; laboratory analyses, sampling and testing costs shall be the responsibility of the Contractor.

END OF SECTION

SECTION 33 13 00

DISINFECTING OF WATER DISTRIBUTION

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 WORK INCLUDED

- A. Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
  - 1. Disinfection of potable water distribution system.
  - 2. Testing and reporting results.

1.03 SUBMITTALS

- A. Test Reports: Indicate results comparative to specified requirements.
- B. Certificate: Certify that cleanliness of water distribution system meets or exceeds specified requirements.

1.04 PROJECT RECORD DOCUMENTS

- A. Disinfection Report:
  - 1. Type and form of disinfectant used.
  - 2. Date and time of disinfectant injection start and time of completion.
  - 3. Test locations.
  - 4. Initial and 24-hour disinfectant residuals (quantity in treated water) in parts per million (ppm) for each outlet tested.
  - 5. Date and time of flushing start and completion.
- B. Disinfectant residual after flushing in ppm for each outlet tested.
- C. Bacteriological report:

1. Date issued, project name, and testing laboratory name, address, and telephone number.
2. Time and date of water sample collection.
3. Name of person collecting samples.
4. Test locations.
5. Initial and 24-hour disinfectant residuals in ppm for each outlet tested.
6. Coli form bacteria test results for each outlet tested.
7. Certification that water conforms, or fails to conform, to bacterial standards.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with AWWA.
- B. Water Treatment Firm: Company specializing in disinfecting potable water systems specified in this Section with minimum three year documented experience.
- C. Testing Firm: Company specializing in testing of potable water systems, certified by the local authority having jurisdiction.
- D. Submit bacteriologist's signature and authority associated with testing

1.06 REGULATORY REQUIREMENTS

- A. Conform to applicable code or regulation for performing the work of this Section.
- B. Provide certificate of compliance from the local water Department indicating approval of water system.

PART 2 – PRODUCTS

2.01 DISINFECTION CHEMICALS

- A. Chemicals: AWWA B300, Standard for Hypochlorite; AWWA B301, Standard for liquid Chlorine; AWWA B302, Standard for Ammonium Sulfate; and AWWA B303, Standard for Sodium Chlorite.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that piping system has been cleaned, inspected, and pressure tested.
- B. Perform scheduling and disinfecting activity with start-up, testing, adjusting and balancing, demonstration procedures, including coordination with related systems.

3.02 EXECUTION

- A. Provide and attach required equipment to perform the work of this Section.
- B. Introduce treatment into piping system.
- C. Maintain disinfectant in system for 24 hours.
- D. Flush, circulate, and clean until required cleanliness is achieved; use municipal domestic water.
- E. Replace permanent system devices removed for disinfection.
- F. Pressure test system as required by the local Water Department. Repair leaks and retest.

3.03 FIELD QUALITY CONTROL

- A. Test samples in accordance with AWWA C651, Standards for Disinfecting Water Mains.

END OF SECTION



SECTION 33 41 00

STORM UTILITY DRAINAGE PIPING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. The General Conditions of the Contract and all other Sections of Division I, General Requirements apply to this section.

1.02 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the test by basic designation only.

American Society for Testing and Materials (ASTM)

ASTM D 5034 (1995) Breaking Strength and Elongation of Textile Fabrics (Grab Test)

ASTM F 405 (1996) Corrugated Polyethylene (PE) Tubing and Fittings

ASTM F 667 (1985) Large Diameter Corrugated Polyethylene Tubing and Fittings.

Unibell Handbook of PVC Pipe

C32-73 (1984) Sewer and Manhole Brick

C62-85a Building Brick.

C76-85a Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.

C139-73 (1985) Concrete Masonry units for Construction of Catch Basins and Manholes.

C270-86b Mortar for Unit Masonry

C443-85A Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.

C478-85a Precast Reinforced Concrete Manhole Sections.

1.03 SUBMITTALS

- A. The following shall be submitted in accordance with Section 01 33 00 SUBMITTALS:

Filter Fabric, Pipe for Subdrains, Tees and fittings specifications.

Certifications from the manufacturers attesting that materials meet specification requirements and samples are required for filter fabric, drain pipe, and fittings.

- B. Submit shop drawings and manufacturer's specifications and installation instructions for all pipe materials, precast concrete catch basins, manhole frames and covers, and catch basin frames and grates.
- C. Each shipment of pipe, catch basins and metal castings shall be accompanied with the manufacturer's notarized certificate that the materials meet the specification requirements.

#### 1.04 DELIVERY, STORAGE AND HANDLING

##### A. Delivery and Storage

Materials delivered to site shall be inspected for damage, unloaded, and stored with minimum handling. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris. During shipment and storage, filter fabric shall be wrapped in burlap or similar heavy duty protective covering. The storage area shall protect the fabric from mud, soil, dust and debris. Filter fabric materials that are not to be installed immediately shall not be stored in direct sunlight. Plastic pipe shall be installed within 6 months from the date of manufacture unless otherwise approved.

##### B. Handling

Material shall be handled in such a manner as to insure delivery to the trench in sound undamaged condition. Pipe shall be carried and not dragged to the trench.

### PART 2 - PRODUCTS

#### 2.01 PIPE MATERIALS

- A. General: Ells, tees, reducing tees, wyes, couplings, increasers, crosses, transitions and end caps of same type class of materials as piping unless otherwise indicated.
- B. Reinforce Concrete Pipe: ASTM C76, Class III (unless otherwise specified on the project drawings), modified tongue-and-groove compression gasket joints complying with ASTM C443.
- C. Corrugated Polyethylene (HDPE) Pipe and Fittings: Use ASTM F 405 for pipes three (3") to six (6") inches in diameter, inclusive, ASTM F 667 for pipes eight

(8") to twenty-four (24") inches in diameter. Fittings shall be manufacturer's standard type and shall conform to the indicated specification.

#### Pipe Perforations

Water inlet area shall be a minimum of one-half (0.5 in<sup>2</sup>/lf) square inch per liner foot. Manufacturer's standard perforated pipe which essentially meets these requirements may be substituted with prior approval of the Owner's Representative.

1. Slotted Perforations in Plastic Pipe: Circumferential slots shall be cleanly cut so as not to restrict the inflow of water and uniformly spaced along the length and circumference of the tubing. Width of slots shall not exceed 1/8 inch nor be less than 1/32 inch. The length of individual slots shall not exceed 1-1/4 inches on three (3") inch diameter tubing, ten (10%) percent of the tubing inside nominal circumference on four (4") to eight (8") inch diameter tubing, and 2-1.2 inches on ten (10") inch diameter tubing. Rows of slots shall be symmetrically spaced so that they are fully contained in two (2) quadrants of the pipe. Slots shall be centered in the valleys of the corrugations of profile wall pipe.

### 2.02 CONCRETE MANHOLE AND CATCH BASIN MATERIALS

- A. The material to be used in the construction of storm manholes, catch basins, and drop inlets shall conform to MHD Standard Specifications and to the following requirements.
- B. Precast Concrete Manholes and Catch Basins: ASTM C478, eccentric cone, flat slab precast top; precast riser section and monolithic base section with integral floor.
- C. Concrete Compressive Strength: 4000 psi minimum. Type II cement.
- D. Reinforcing Steel: ASTM A185, 0.12 sq. in./linear ft. and 0.12 sq. in. (both ways) base bottom.
- E. Joints sealed with rubber gaskets conforming to ASTM C443.
- F. Steps: Forged 6061B, T6 aluminum or Copolymer Polypropylene Plastic with 1/2-inch Grade 50 steel reinforcement.

### 2.03 CAST IRON FRAMES AND COVERS

- A. Concrete Catchbasins: To be C.I. LeBaron LP246 or approved equal.
- B. Concrete Drain Manholes: To be C.I. LeBaron LBW426 or approved equal. Where plans indicate "watertight" cover, provide inner cover LSW268A and locking bar LSW268B, or approved equal.

2.04 MASONRY MATERIAL

- A. Concrete Masonry Units: ASTM C139.
- B. Brick: ASTM C32, Grade MS or ASTM C62, Grade SW.
- C. Mortar: ASTM C270, Type M.

2.06 PIPE BEDDING AND COVER MATERIALS

- A. Bedding for concrete pipe: as specified in Section 02200-EARTHWORK.
- B. Cover for concrete pipe: as specified in Section 02200-EARTHWORK.
- C. Aggregate Materials
  - 1. Aggregate for embedding and filling trench drains within the synthetic turf field areas, referred to as "washed stone" or "peastone" shall be washed stone fill consisting of washed, durable, crushed rock free from fine sand, silt, or rock flour. Gradation shall conform to the following:

<u>Sieve Size</u>	<u>% Passing by Weight</u>
3/4 in.	100
1/2 in.	90-100
3/8 in.	40-70
No. 4	0-15
No. 8	0-5

2.07 FILTER FABRIC

- A. Filter Fabric for wrapping trenches shall be a non-woven polypropylene fabric made specifically for use in subsurface drainage structures equal to Mirafi 140N, manufactured by Mirafi, Inc., Charlotte, NC 28224.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that the trench cut and excavation base is ready to receive work and excavations, dimensions, and elevations are as indicated on contract drawings.

3.02 PREPARATION

- A. Hand trim excavations to required elevations. Correct over excavation with gravel borrow in accordance with Section 02200-EARTHWORK.
- B. Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.

3.03 EXCAVATION AND BEDDING FOR DRAIN SYSTEMS

- A. All HDPE and Reinforced Concrete piping shall be installed in strict conformance with the Manufacturer's recommendations. If these specifications conflict with the Manufacturer's recommendations, the Contractor shall request direction prior to installation.
- B. Trenching and excavation, including the removal of rock and unstable material, shall be in accordance with Section 02200 - Earthwork. Bedding material shall be placed in the trench as indicated or as required as replacement materials used in those areas where unstable materials were removed. Compaction of the bedding material shall be as specified.

3.04 INSTALLATION OF FILTER FABRIC AND HDPE PIPE FOR SUBDRAINS

A. Installation of Filter Fabric

1. Overlaps on Perforated or Slotted Pipes

One layer of filter fabric shall be wrapped around perforated or slotted collector pipes in such a manner that longitudinal overlaps of fabric are in unperforated or unslotted quadrants of the pipes. The overlap shall be at least two (2") inches. The fabric shall be secured to the pipe in such a manner that backfill material will not infiltrate through any fabric overlaps.

2. Trenching Lining and Overlaps

Trenches to be lined with filter fabric shall be graded to obtain smooth side and bottom surfaces so that the fabric will not bridge cavities in the soil or be damaged by projecting rock. The fabric shall be laid flat but not stretched on the soil, and it shall be secured with anchor pins. Overlaps shall be at least twelve (12") inches, and anchor pins shall be used along the overlaps.

B. Installation of HDPE Pipe for Subdrains

1. Pipelaying

Each pipe shall be carefully inspected before it is laid. Any defective or damaged pipe shall be rejected. No pipe shall be laid when the trench conditions or weather is unsuitable for such work. Water shall be removed from any trenches by sump pumping or other approved methods. The pipe shall be laid to the grades and alignment as indicated. The pipe shall be bedded to the established gradeline. Perforations shall be centered on the bottom of the pipe. Pipes of either the bell-and-spigot type or the tongue-and-groove type shall be laid with the bell or groove ends upstream. All pipes in place shall be approved before backfilling.

2. Jointings

a. Perforated Corrugated Polyethylene Pipe: Perforated corrugated polyethylene drainage pipe shall be installed in accordance with the manufacturer's specifications and as specified herein. A pipe with physical imperfections shall not be installed. No more than five (5%) percent stretch in a section will be permitted.

3.05 INSTALLATION OF REINFORCED CONCRETE PIPE

1. Install pipe, fittings, and accessories in accordance with ASTM D2321 and manufacturer's instructions. Seal joints watertight.
2. Place pipe on minimum six (6) inch deep bed gravel bedding as specified in Section 02200 – EARTHWORK
3. Lay pipe to slope gradients noted on drawings with maximum variation from true slope of 1/8 inch in 10 feet.
4. Install gravel borrow at sides to the midpoint of the pipe. Install gravel borrow from the midpoint of the pipe to the elevations indicated on the Contract Drawings, compacted to 95 percent maximum density at optimum moisture content.
5. Refer to Section 02200 - EARTHWORK for trenching requirements. Do not displace or damage pipe when compacting.
6. Connect to building storm drainage outlet, manholes, through installed sleeves.

3.06 INSTALLATION OF FILTER MATERIAL AND BACKFILLING FOR SUBDRAINS

- A. After pipe for subdrains has been laid, inspected, and approved, filter material shall be placed around and over the pipe to the depth indicated. The filter material shall be placed in layers not to exceed eight (8") inches thick and each layer shall be thoroughly compacted by mechanical tampers or rammers to obtain the required density. Compaction of filter material and the placement and compaction of overlying backfill material shall be in accordance with applicable provisions specified in Section 02200 - Earthwork.

3.07 CONCRETE DRAINAGE STRUCTURES

- A. Form bottom of excavation clean and smooth to correct elevation.
- B. Install and level precast concrete sections with provision for storm drainage pipe and section.
- C. Establish elevations and pipe inverts for inlets and outlets as indicated.

- D. Mount frame and cover level in grout, secured to top cone section to elevations indicated.

### 3.8 TESTS

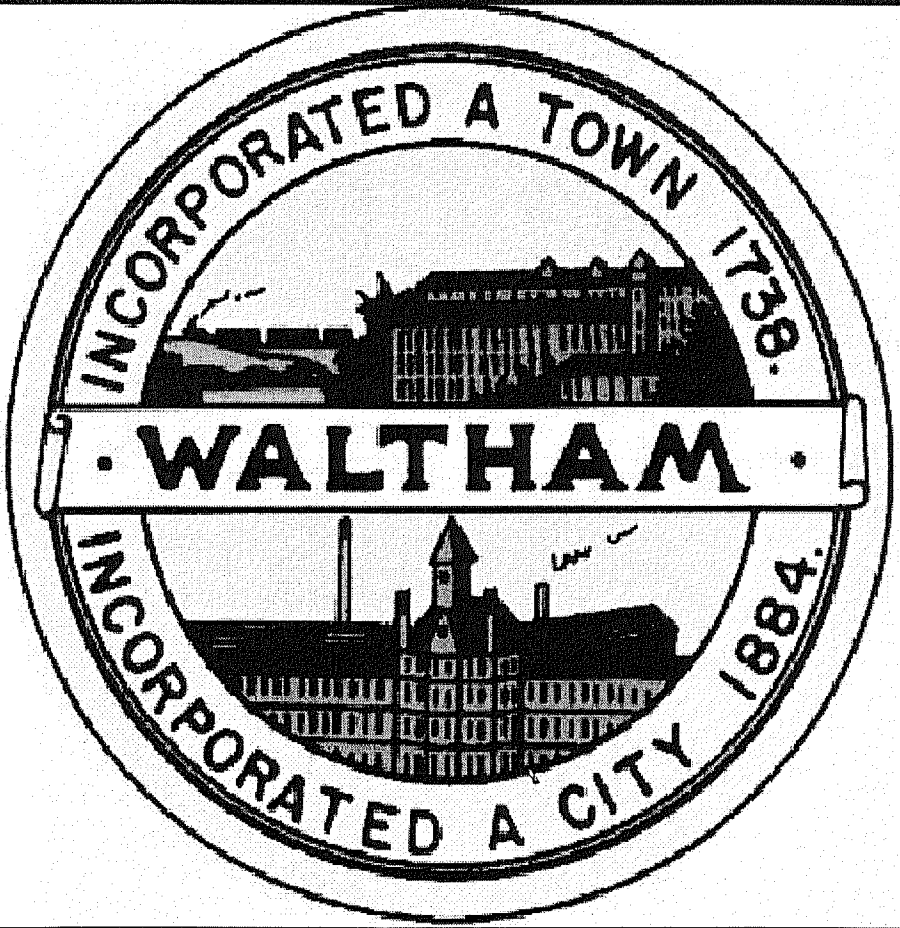
- A. Request inspection prior to and immediately after placing aggregate cover over pipe.
- B. Compaction testing will be performed in accordance with ASTM D1557.
- C. If tests indicate Work does not meet specified requirements, remove work, replace and retest at no cost to the Owner.
- D. Frequency of Tests: As directed by Engineer and/or Owner.
- E. Pipe Test:

Strength tests of pipe shall conform to field service test requirements of Federal Specification, ASTM specification, or AASHTO specification covering the product.

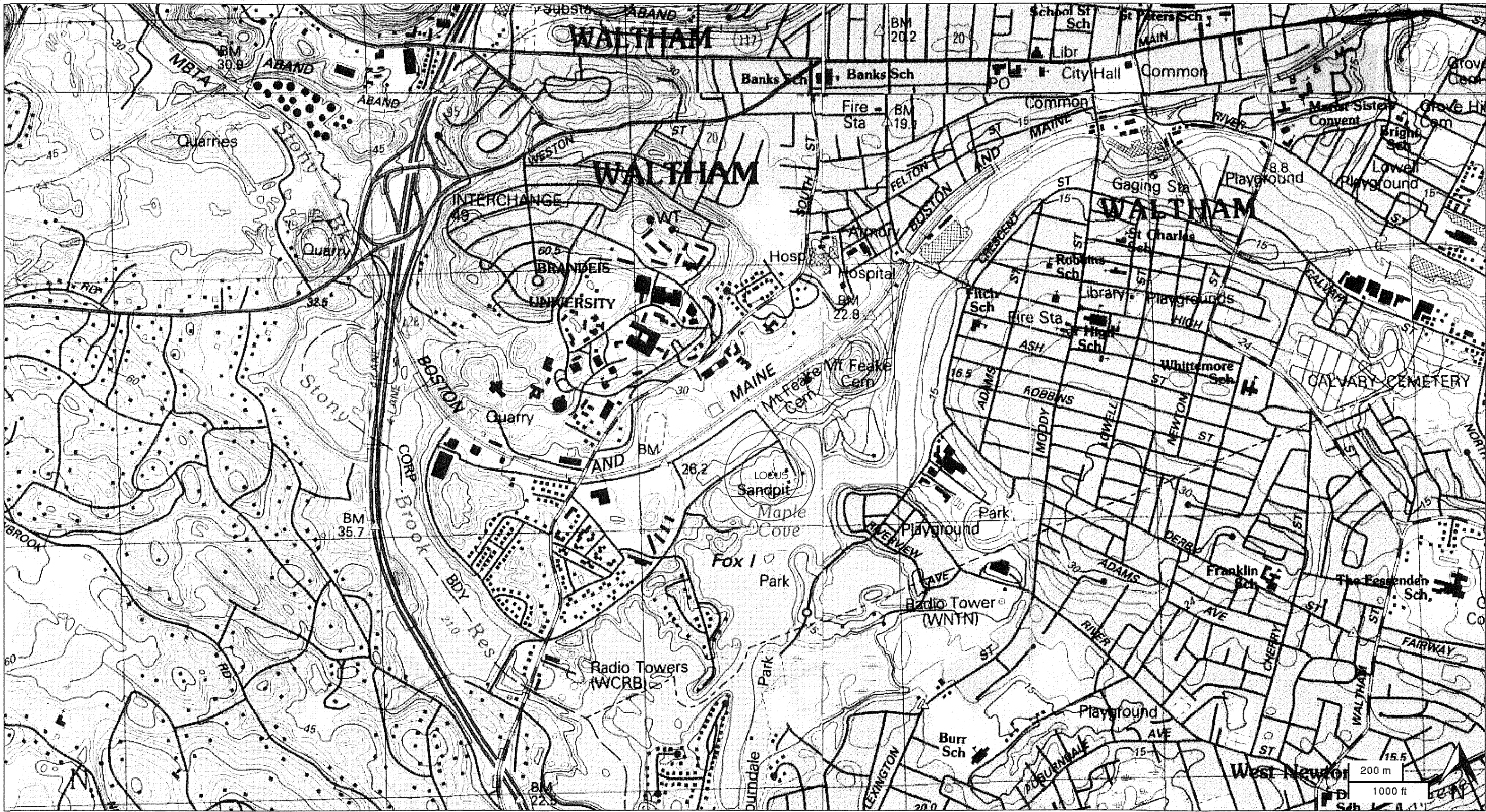
END OF SECTION

# **DRAWINGS**





# MT. FEAKE CEMETERY EXPANSION PROJECT WALTHAM, MA

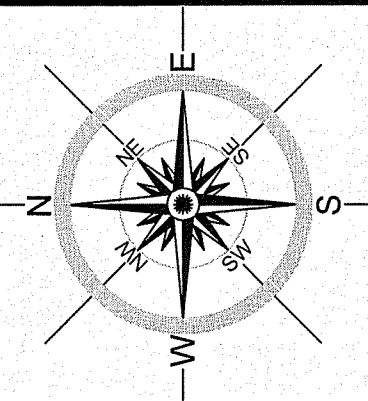


## DRAWING INDEX:

SHEET	DESCRIPTION
CIVIL	
C-1	COVER SHEET
C-2	EXISTING CONDITIONS PLAN
C-3	DEMOLITION & EROSION CONTROL PLAN
C-4	LAYOUT AND MATERIALS PLAN
C-5	GRADING PLAN
C-6	UTILITY PLAN
C-7	CONSTRUCTION DETAILS 1 OF 4
C-8	CONSTRUCTION DETAILS 2 OF 4
C-9	CONSTRUCTION DETAILS 3 OF 4
C-10	CONSTRUCTION DETAILS 4 OF 4
LANDSCAPE ARCHITECTURE	
L-1	PLANTING PLAN
L-2	PLANTING DETAILS 1 OF 2
L-3	PLANTING DETAILS 2 OF 2

NESRA  
ENGINEERING, LLC

P.O. BOX 533  
EAST TAUNTON, MA 02718  
(617) 506-3772  
WWW.NESRAENG.COM



Project

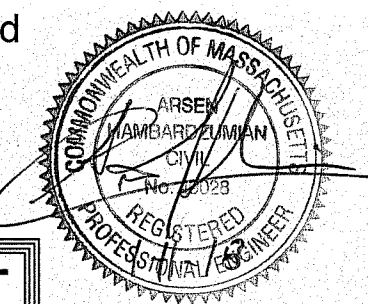
Mt. Feake Cemetery  
Expansion Project  
Waltham, MA

Client

City of Waltham  
Consolidated Public Works  
165 Lexington Street  
Waltham, MA

No. Revision Date

Scale: As Noted  
Date: 9/11/17

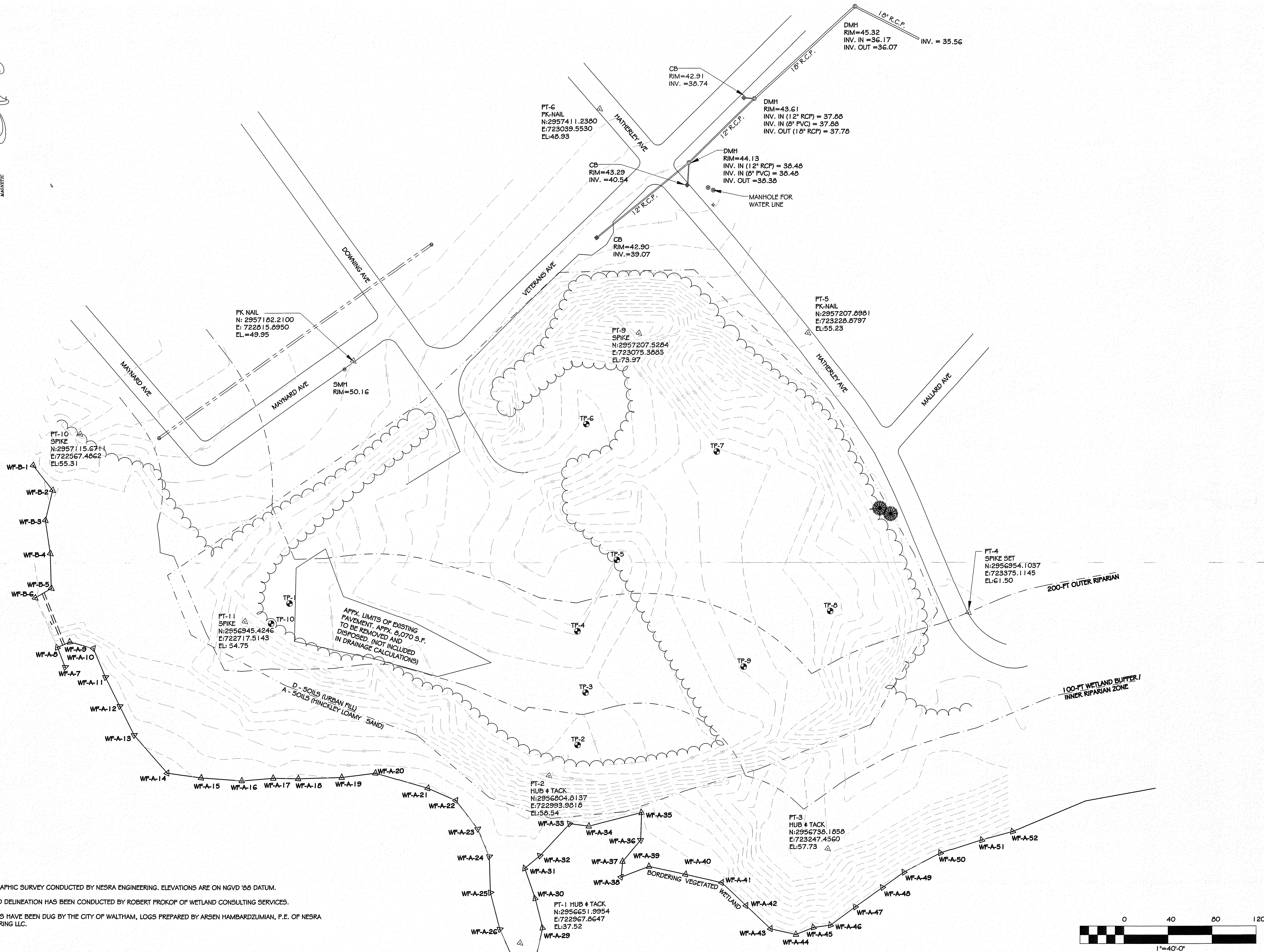


BID SET

COVER SHEET

C-1



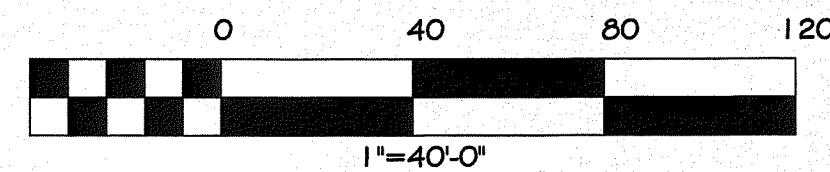


NOTES:

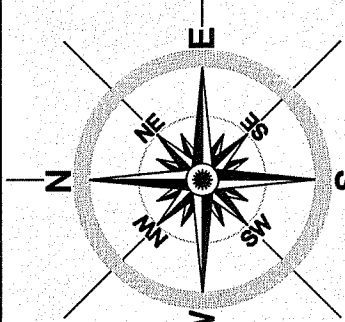
TOPOGRAPHIC SURVEY CONDUCTED BY NESRA ENGINEERING. ELEVATIONS ARE ON NGVD '88 DATUM.

WETLAND DELINEATION HAS BEEN CONDUCTED BY ROBERT PROKOP OF WETLAND CONSULTING SERVICES.

TEST PITS HAVE BEEN DUG BY THE CITY OF WALTHAM, LOGS PREPARED BY ARSEN HAMBARDZUMIAN, P.E. OF NESRA ENGINEERING LLC.



**NESRA  
ENGINEERING, LLC**



P.O. BOX 588  
EAST TAUNTON, MA 02718  
(617) 506-5772  
WWW.NESRAENG.COM

Project

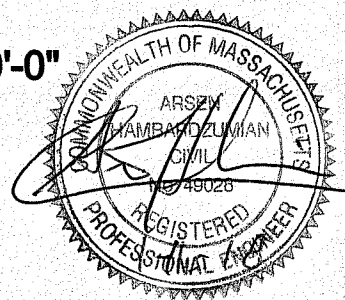
**Mt. Feake Cemetery  
Expansion Project  
Waltham, MA**

Client

**City of Waltham  
Consolidated Public Works  
165 Lexington Street  
Waltham, MA**

1.	Add T.P. 10 Location	2/21/17
No.	Revision	Date

Scale: 1" = 40'-0"  
Date: 4/2/16



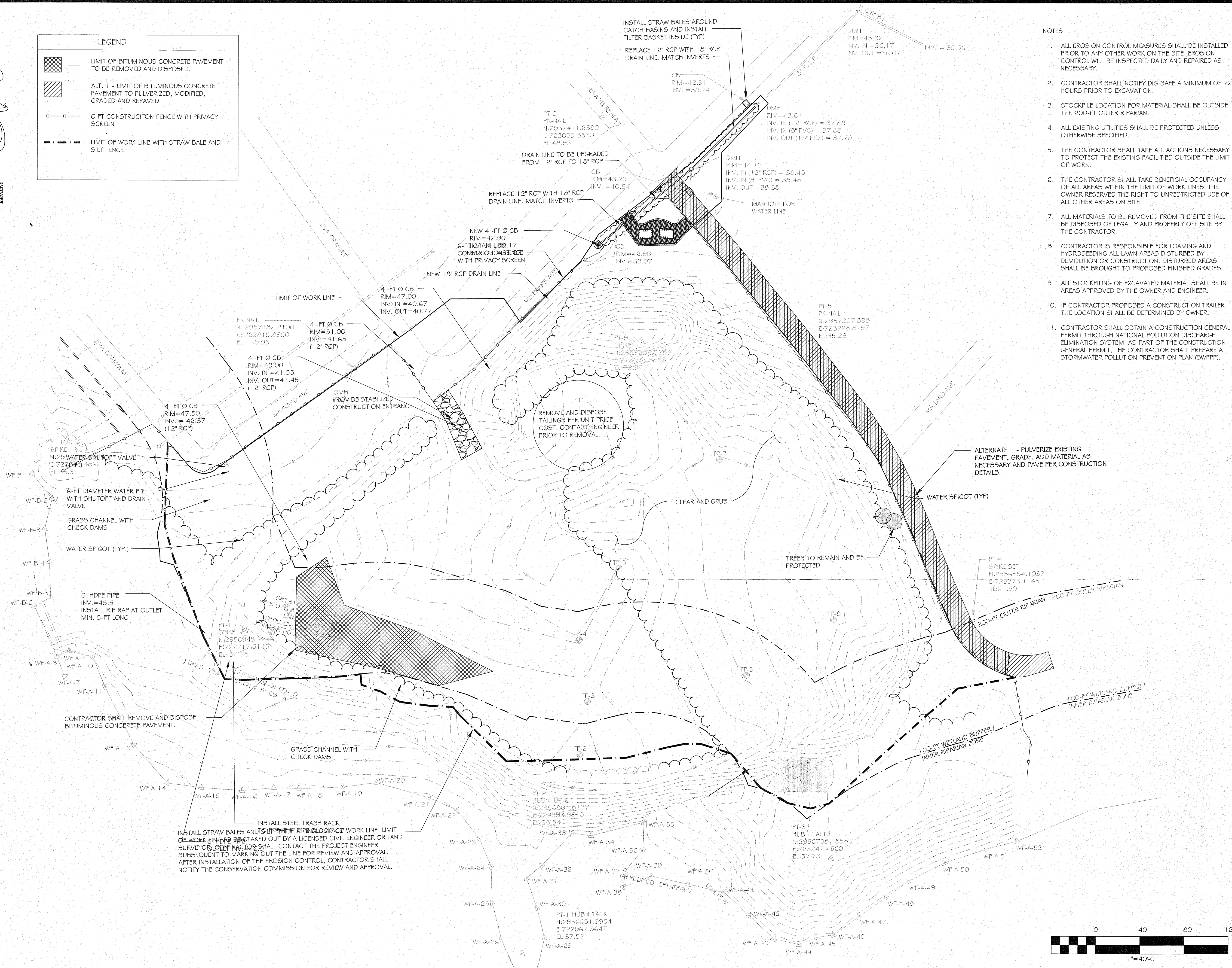
**EXISTING  
CONDITIONS  
PLAN**

**C-2**





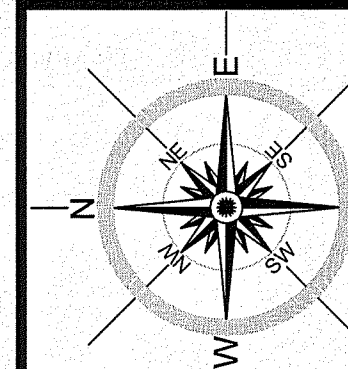
LEGEND	
	LIMIT OF BITUMINOUS CONCRETE PAVEMENT TO BE REMOVED AND DISPOSED.
	ALT. 1 - LIMIT OF BITUMINOUS CONCRETE PAVEMENT TO PULVERIZED, MODIFIED, GRADED AND REPAVED.
	6-FT CONSTRUCTION FENCE WITH PRIVACY SCREEN
	LIMIT OF WORK LINE WITH STRAW BALE AND SILT FENCE.



- NOTES
1. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO ANY OTHER WORK ON THE SITE. EROSION CONTROL WILL BE INSPECTED DAILY AND REPAIRED AS NECESSARY.
  2. CONTRACTOR SHALL NOTIFY DIG-SAFE A MINIMUM OF 72 HOURS PRIOR TO EXCAVATION.
  3. STOCKPILE LOCATION FOR MATERIAL SHALL BE OUTSIDE THE 200-FT OUTER RIPARIAN.
  4. ALL EXISTING UTILITIES SHALL BE PROTECTED UNLESS OTHERWISE SPECIFIED.
  5. THE CONTRACTOR SHALL TAKE ALL ACTIONS NECESSARY TO PROTECT THE EXISTING FACILITIES OUTSIDE THE LIMIT OF WORK.
  6. THE CONTRACTOR SHALL TAKE BENEFICIAL OCCUPANCY OF ALL AREAS WITHIN THE LIMIT OF WORK LINES. THE OWNER RESERVES THE RIGHT TO UNRESTRICTED USE OF ALL OTHER AREAS ON SITE.
  7. ALL MATERIALS TO BE REMOVED FROM THE SITE SHALL BE DISPOSED OF LEGALLY AND PROPERLY OFF SITE BY THE CONTRACTOR.
  8. CONTRACTOR IS RESPONSIBLE FOR LOAMING AND HYDROSEEDING ALL LAWN AREAS DISTURBED BY DEMOLITION OR CONSTRUCTION. DISTURBED AREAS SHALL BE BROUGHT TO PROPOSED FINISHED GRADES.
  9. ALL STOCKPILING OF EXCAVATED MATERIAL SHALL BE IN AREAS APPROVED BY THE OWNER AND ENGINEER.
  10. IF CONTRACTOR PROPOSES A CONSTRUCTION TRAILER THE LOCATION SHALL BE DETERMINED BY OWNER.
  11. CONTRACTOR SHALL OBTAIN A CONSTRUCTION GENERAL PERMIT THROUGH NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM. AS PART OF THE CONSTRUCTION GENERAL PERMIT, THE CONTRACTOR SHALL PREPARE A STORMWATER POLLUTION PREVENTION PLAN (SWPPP).

**NESRA  
ENGINEERING, LLC**

P.O. BOX 533  
EAST TAUNTON, MA 02718  
(617) 506-3772  
WWW.NESRAENG.COM



Project  
**Mt. Feake Cemetery  
Expansion Project  
Waltham, MA**

Client  
**City of Waltham  
Consolidated Public Works  
165 Lexington Street  
Waltham, MA**

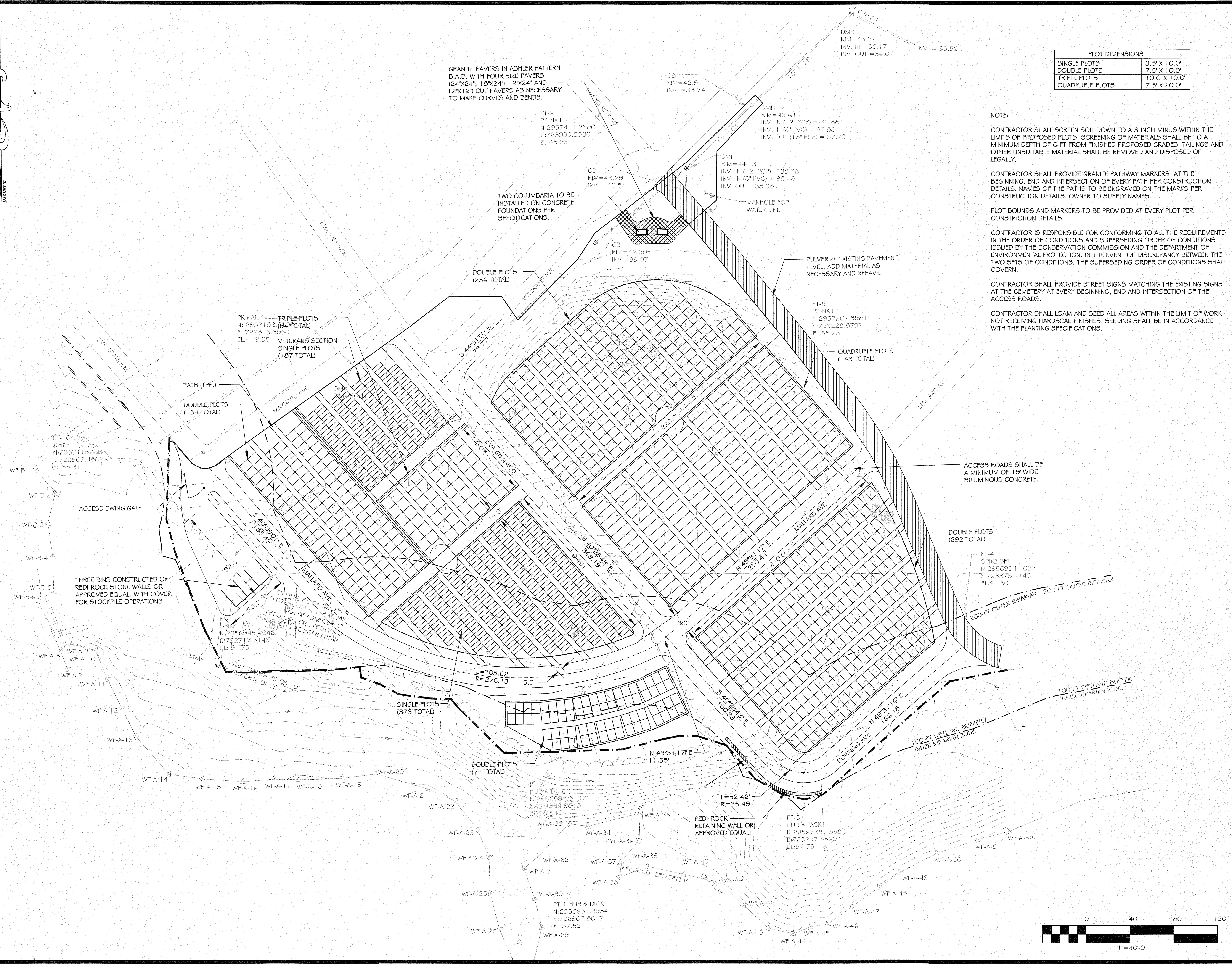
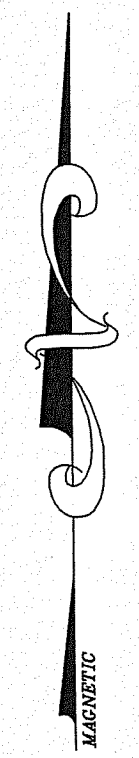
No. Revision Date  
Scale: 1" = 40'-0"  
Date: 9-11-17

**BID SET**

**DEMOLITION AND  
EROSION  
CONTROL PLAN**

**C-3**





PLOT DIMENSIONS	
SINGLE PLOTS	3.5' X 10.0'
DOUBLE PLOTS	7.5' X 10.0'
TRIPLE PLOTS	10.0' X 10.0'
QUADRUPLE PLOTS	7.5' X 20.0'

NOTE:

CONTRACTOR SHALL SCREEN SOIL DOWN TO A 3 INCH MINUS WITHIN THE LIMITS OF PROPOSED PLOTS. SCREENING OF MATERIALS SHALL BE TO A MINIMUM DEPTH OF 6-FT FROM FINISHED PROPOSED GRADES. TAILINGS AND OTHER UNSUITABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF LEGALLY.

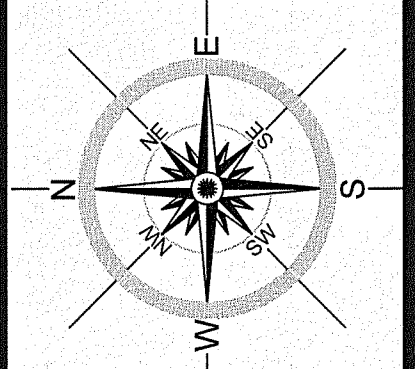
CONTRACTOR SHALL PROVIDE GRANITE PATHWAY MARKERS AT THE BEGINNING, END AND INTERSECTION OF EVERY PATH PER CONSTRUCTION DETAILS. NAMES OF THE PATHS TO BE ENGRAVED ON THE MARKS PER CONSTRUCTION DETAILS. OWNER TO SUPPLY NAMES.

PLOT BOUNDS AND MARKERS TO BE PROVIDED AT EVERY PLOT PER CONSTRUCTION DETAILS.

CONTRACTOR IS RESPONSIBLE FOR CONFORMING TO ALL THE REQUIREMENTS IN THE ORDER OF CONDITIONS AND SUPERSEDING ORDER OF CONDITIONS ISSUED BY THE CONSERVATION COMMISSION AND THE DEPARTMENT OF ENVIRONMENTAL PROTECTION. IN THE EVENT OF DISCREPANCY BETWEEN THE TWO SETS OF CONDITIONS, THE SUPERSEDING ORDER OF CONDITIONS SHALL GOVERN.

CONTRACTOR SHALL PROVIDE STREET SIGNS MATCHING THE EXISTING SIGNS AT THE CEMETERY AT EVERY BEGINNING, END AND INTERSECTION OF THE ACCESS ROADS.

CONTRACTOR SHALL LOAM AND SEED ALL AREAS WITHIN THE LIMIT OF WORK NOT RECEIVING HARDCAPE FINISHES. SEEDING SHALL BE IN ACCORDANCE WITH THE PLANTING SPECIFICATIONS.



**NESRA  
ENGINEERING, LLC**

P.O. BOX 533  
EAST TAUNTON, MA 02718  
(617) 506-3772  
WWW.NESRAENG.COM

Project

**Mt. Feake Cemetery  
Expansion Project  
Waltham, MA**

Client

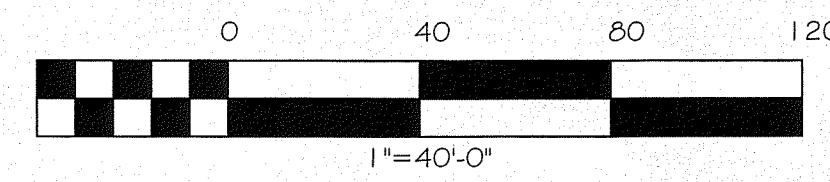
**City of Waltham  
Consolidated Public Works  
165 Lexington Street  
Waltham, MA**

No.	Revision	Date
2	PROVIDE ADDITIONAL INFORMATION PER DEP LETTER DATED 12/15/17	2/21/18
1	REVISE DESIGN TO LIMIT DISTURBANCE IN RIVERFRONT AREA	9/6/16

**BID SET**

**LAYOUT AND  
MATERIALS PLAN**

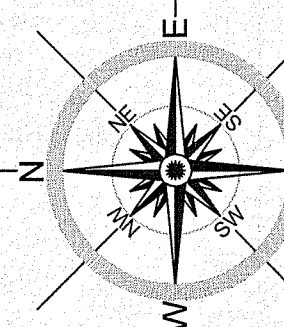
**C-4**





# NESRA ENGINEERING, LLC

P.O. BOX 533  
EAST TAUNTON, MA 02718  
(617) 506-3772  
WWW.NESRAENG.COM



Project

Mt. Feake Cemetery  
Expansion Project  
Waltham, MA

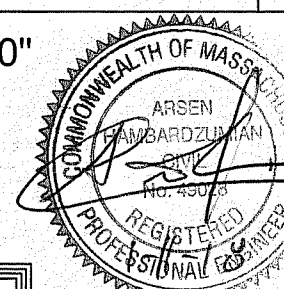
Client

City of Waltham  
Consolidated Public Works  
165 Lexington Street  
Waltham, MA

2	PROVIDE ADDITIONAL INFORMATION PER DEP LETTER DATED 12/15/17	2/21/17
1	REVISE DESIGN TO LIMIT DISTURBANCE IN RIVERFRONT AREA	9/6/16

No. Revision Date

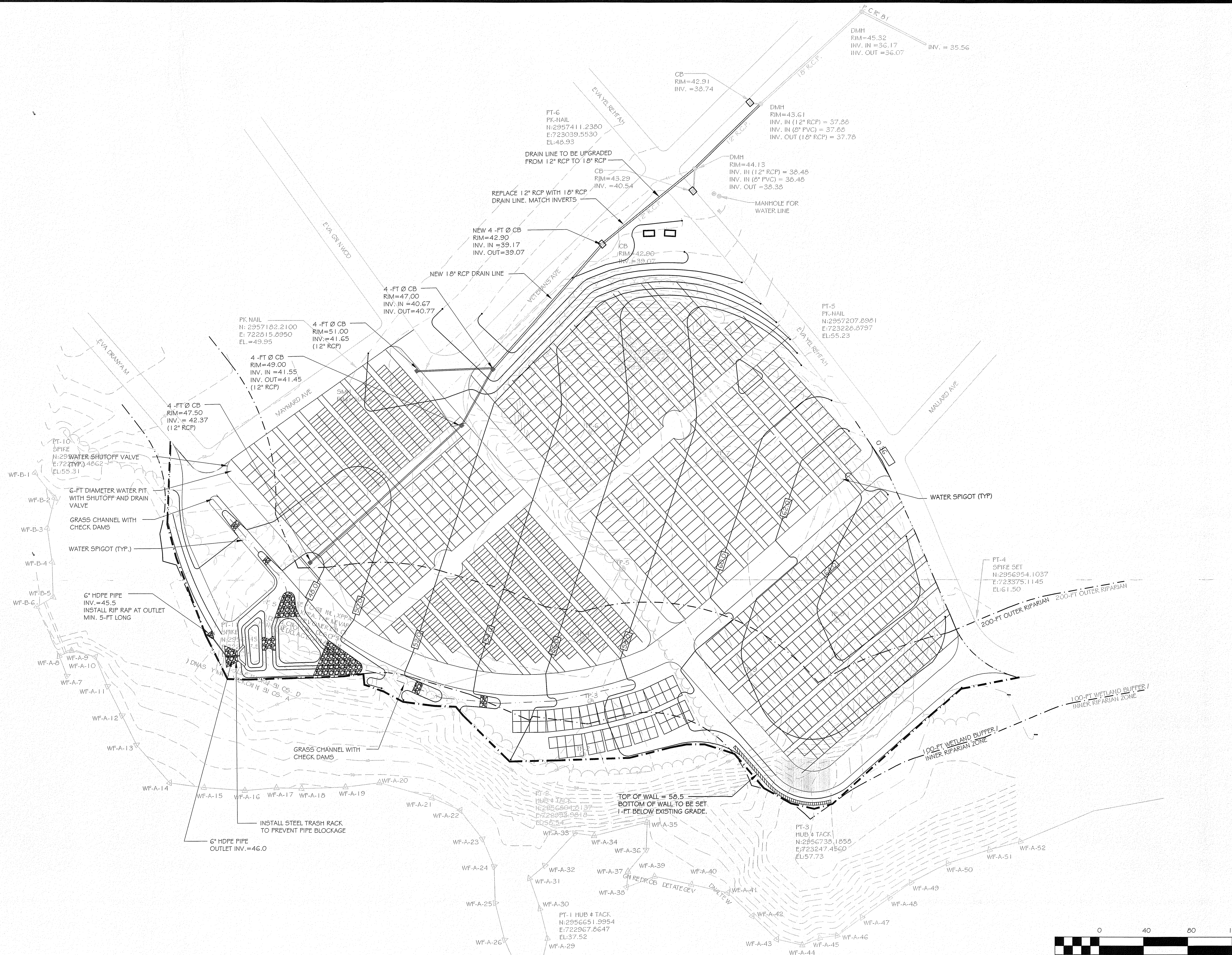
Scale: 1" = 40'-0"  
Date: 4/12/16



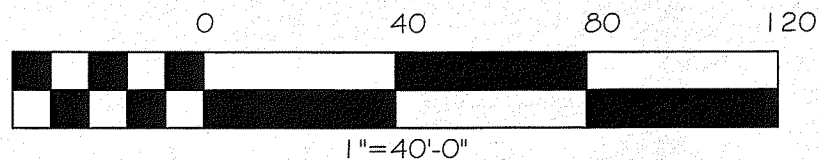
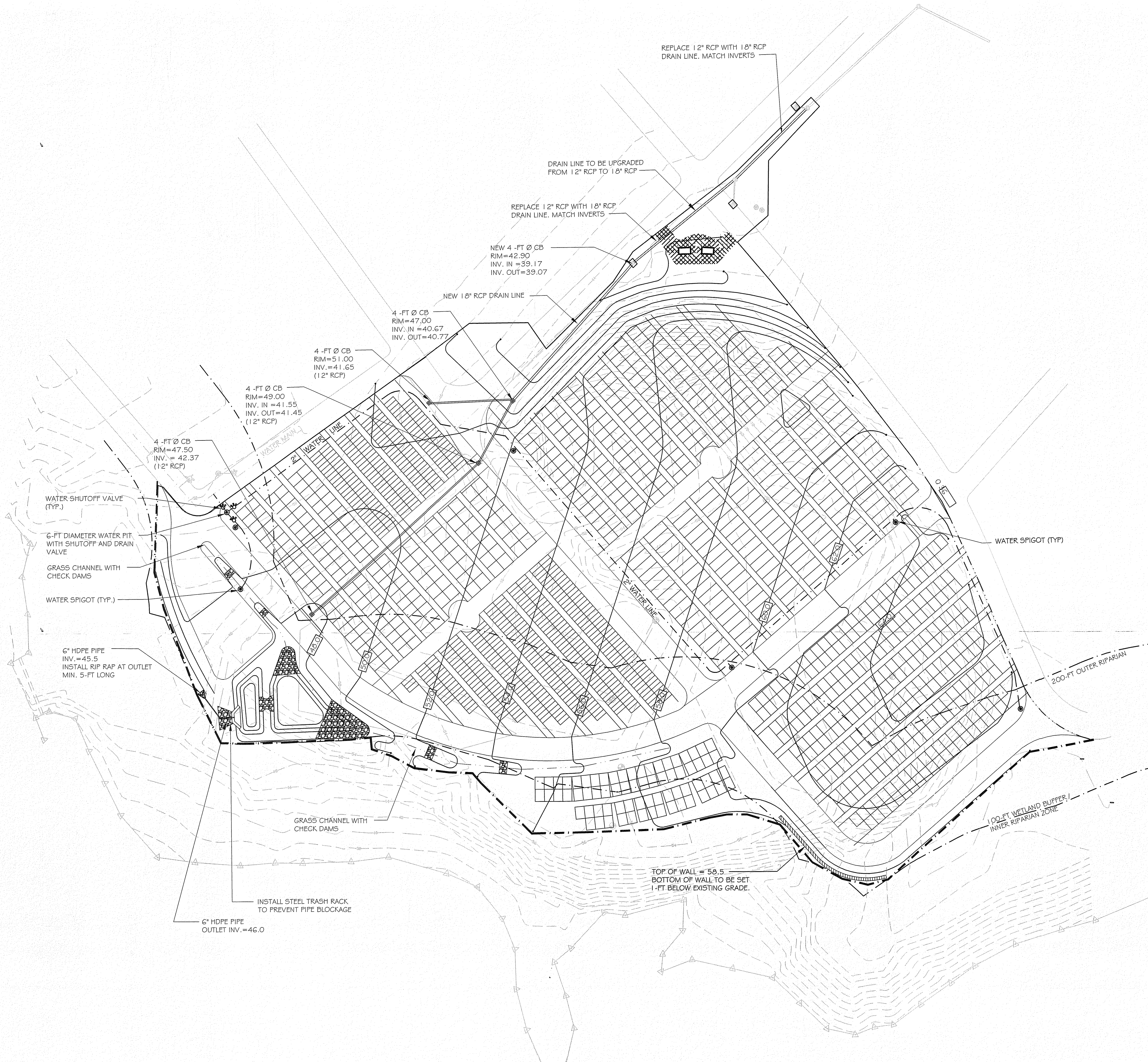
BID SET

GRADING PLAN

C-5

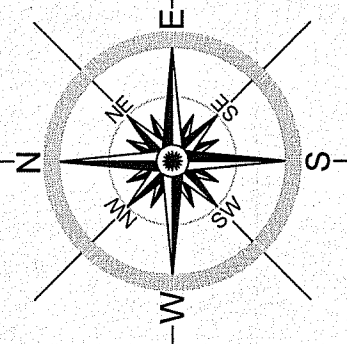






**NESRA  
ENGINEERING, LLC**

P.O. BOX 533  
EAST TAUNTON, MA 02718  
(617) 506-3772  
WWW.NESRAENG.COM



Project

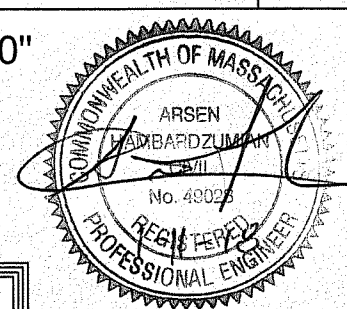
**Mt. Feake Cemetery  
Expansion Project  
Waltham, MA**

Client

**City of Waltham  
Consolidated Public Works  
165 Lexington Street  
Waltham, MA**

2	ADDITIONAL CHANGES PER DEP LETTER DATED 12/15/17	2/21/17
1	REVISE DESIGN TO LIMIT DISTURBANCE IN RIVERFRONT AREA	9/6/16
No.	Revision	Date

Scale: 1" = 40'-0"  
Date: 4/12/16

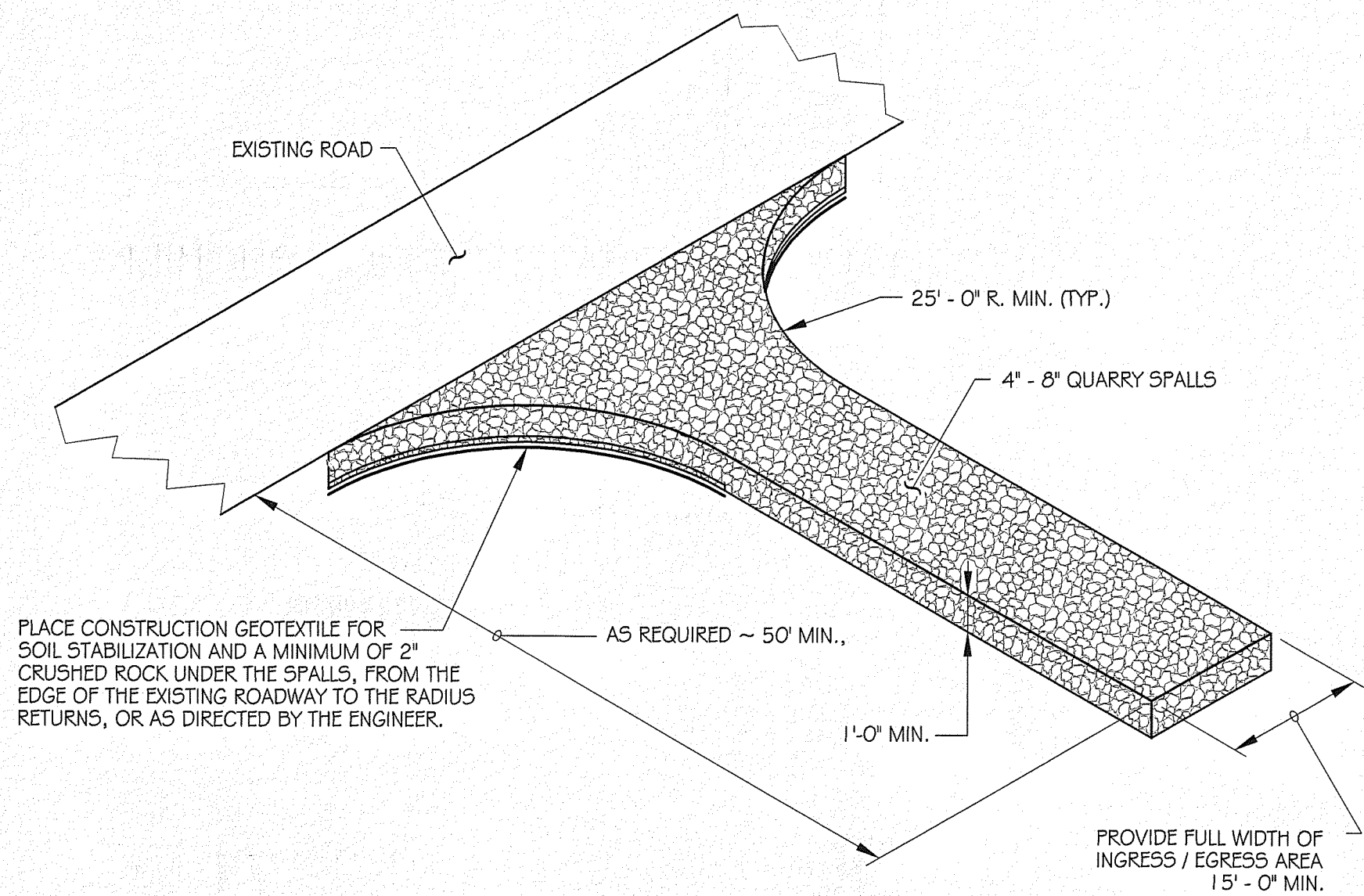


**BID SET**

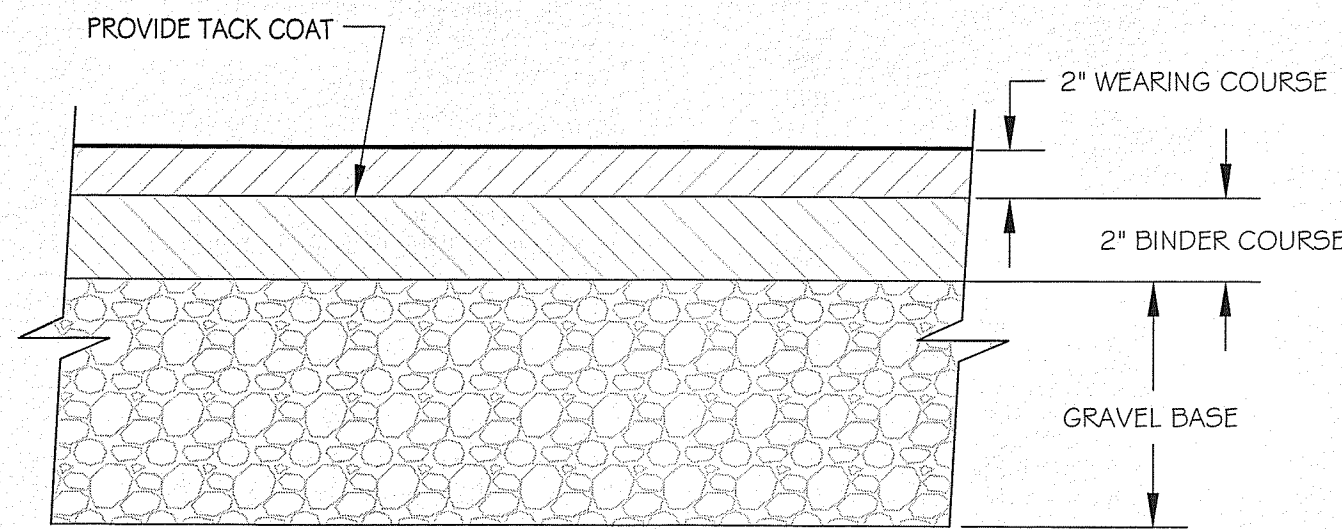
**UTILITY PLAN**

**C-6**

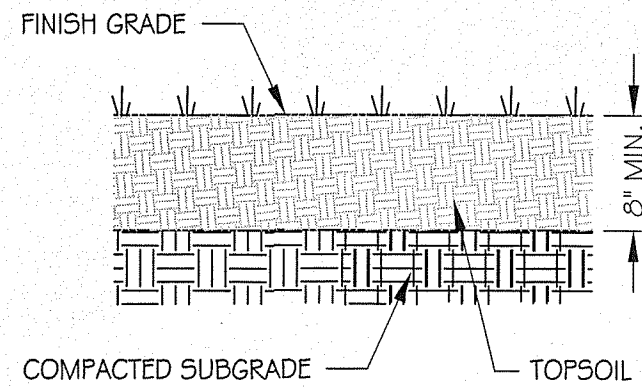




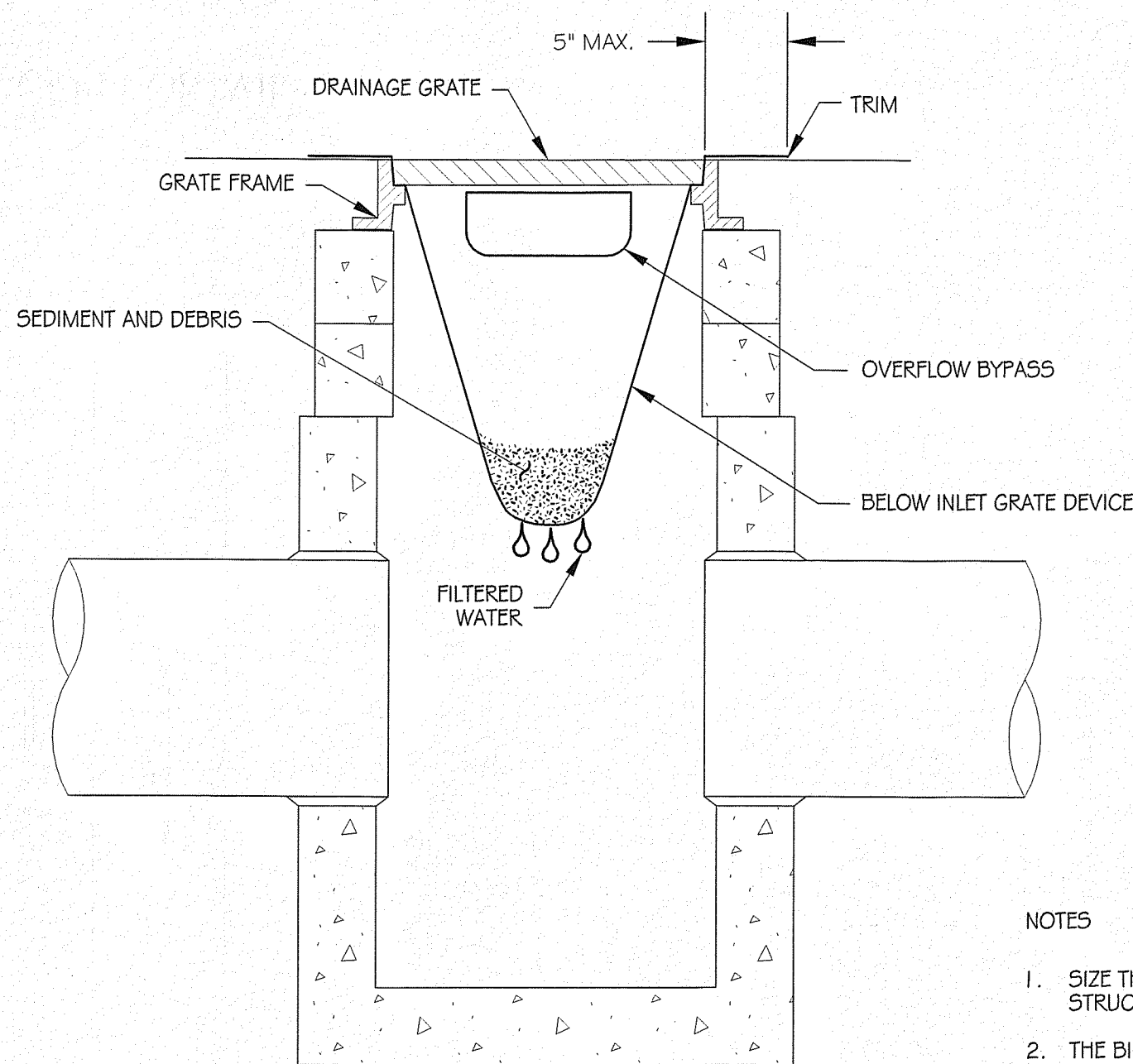
STABILIZED CONSTRUCTION ENTRANCE  
N.T.S.



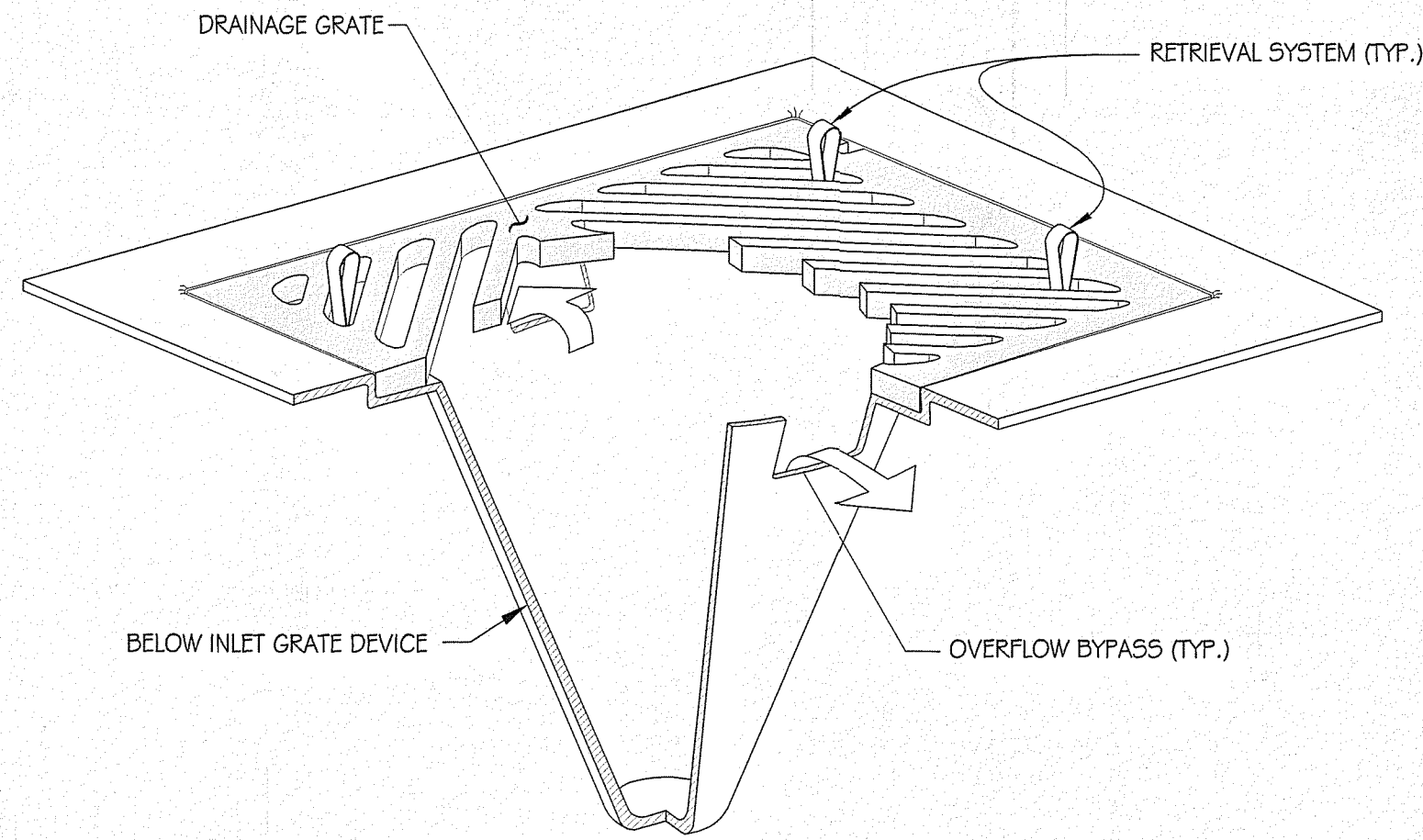
BITUMINOUS CONCRETE PAVEMENT DETAIL  
N.T.S.



LOAM AND SEED DETAIL  
N.T.S.



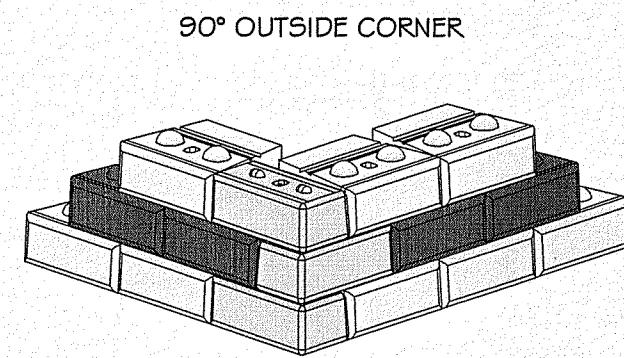
SECTION VIEW



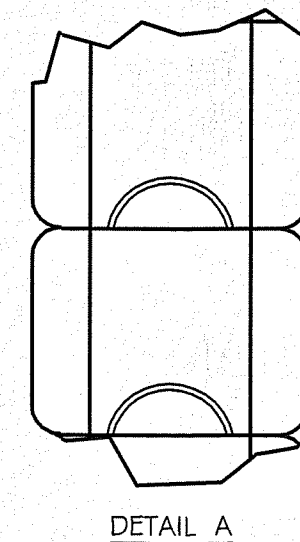
ISOMETRIC VIEW

NOTES

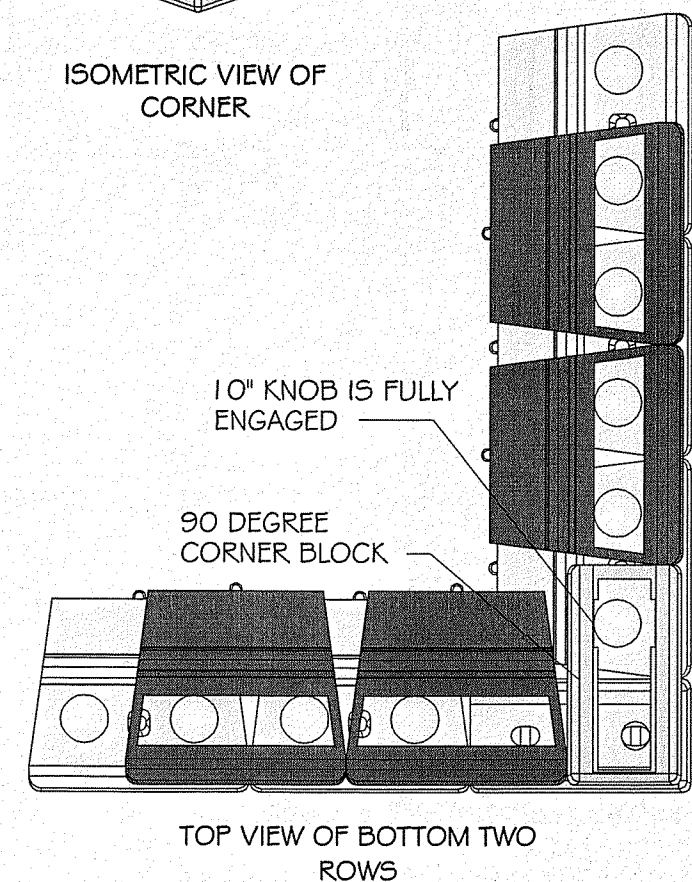
1. SIZE THE BELOW INLET GRATE DEVICE (BIGD) FOR THE STORM WATER STRUCTURE IT WILL SERVICE.
2. THE BIGD SHALL HAVE A BUILT-IN HIGH-FLOW RELIEF SYSTEM (OVERFLOW BYPASS).
3. THE RETRIEVAL SYSTEM MUST ALLOW REMOVAL OF THE BIGD WITHOUT SPILLING THE COLLECTED MATERIAL.
4. PERFORM MAINTENANCE IN ACCORDANCE WITH STORMWATER POLLUTION PREVENTION PLAN, TO BE PREPARED BY THE CONTRACTOR.



ISOMETRIC VIEW OF CORNER

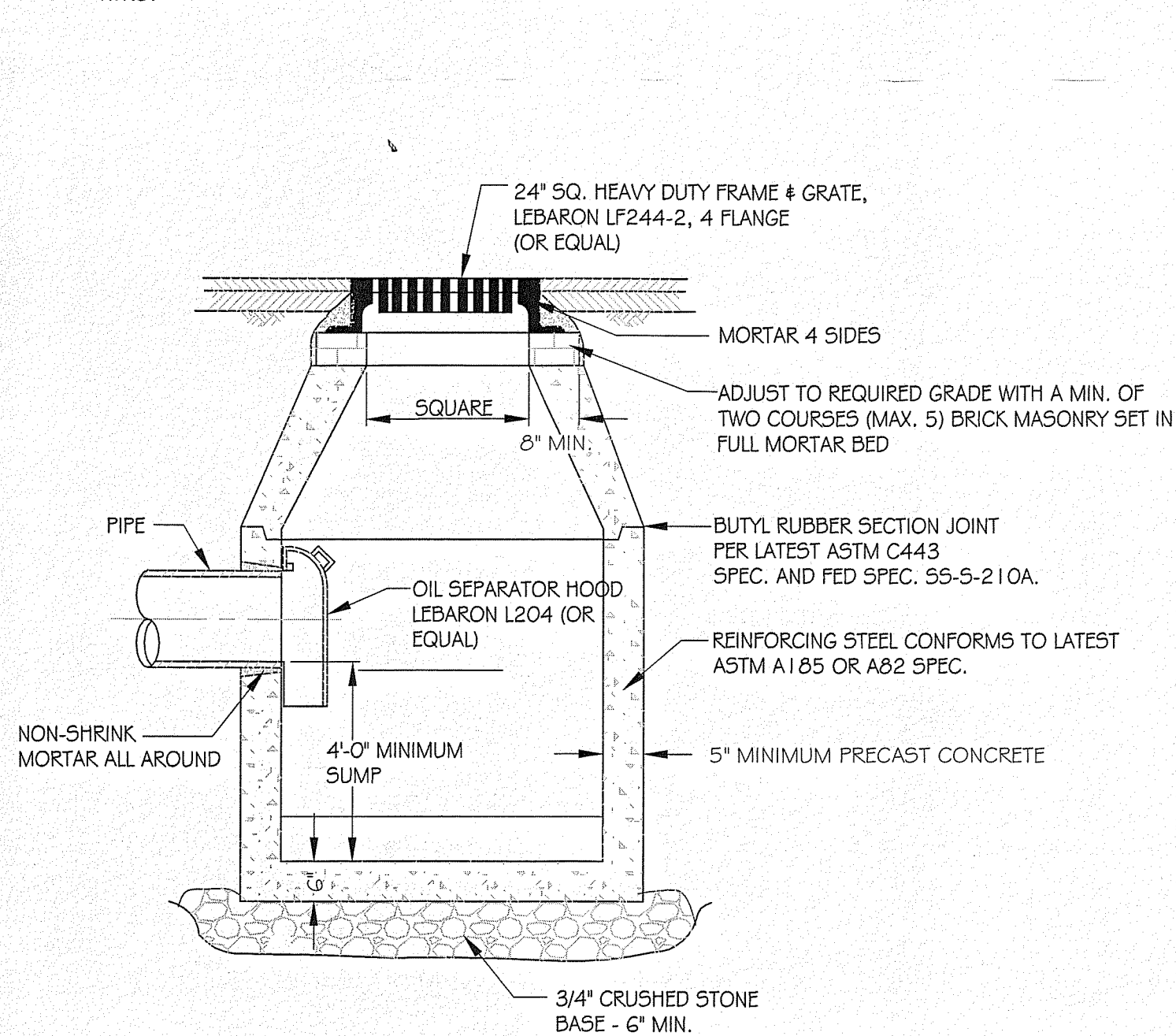


DETAIL A



TOP VIEW OF BOTTOM TWO ROWS

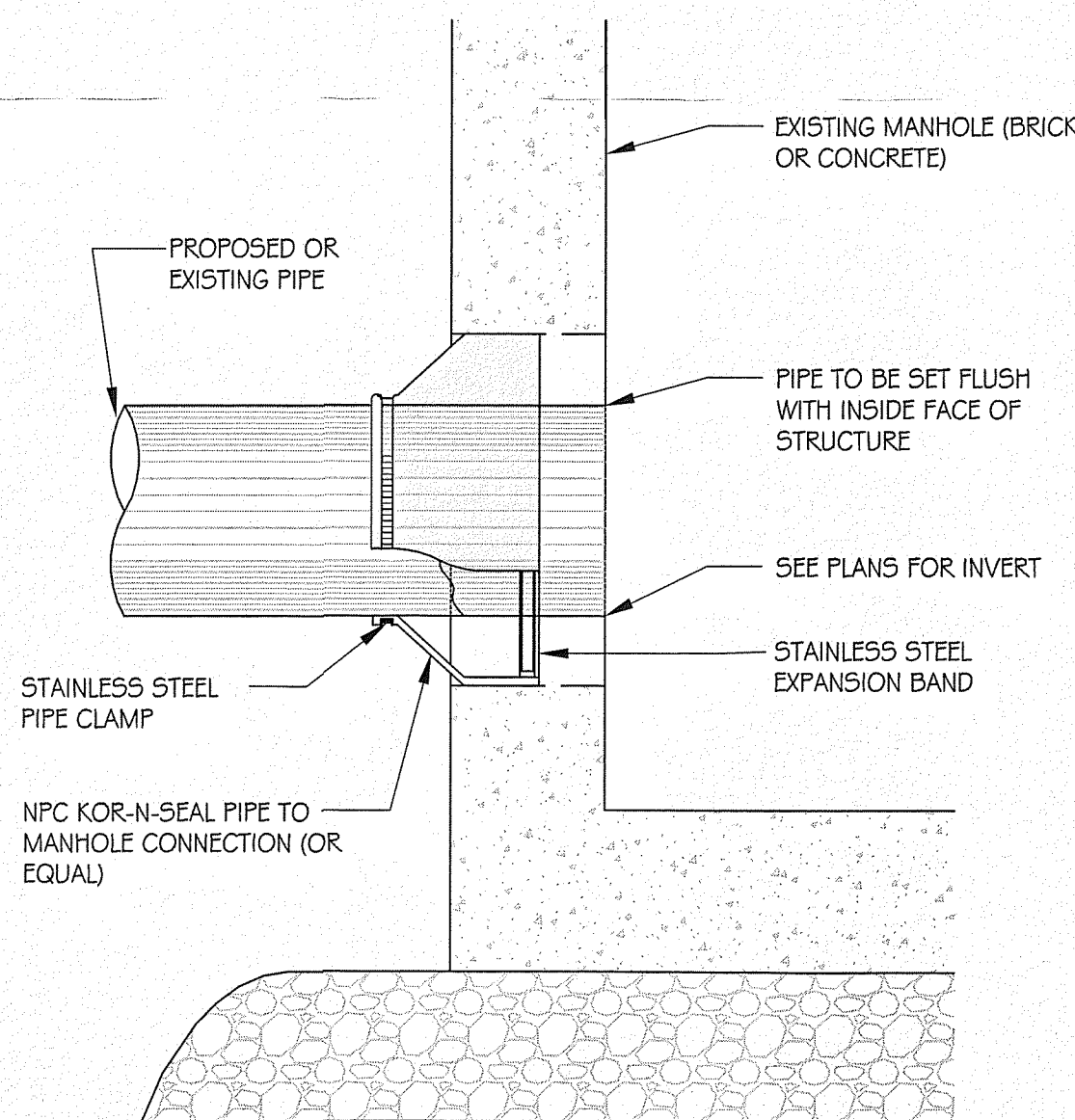
STORM DRAIN INLET PROTECTION  
N.T.S.



NOTES

1. MANHOLE DESIGN TO CONFORM TO LATEST ASTM C-478 SPECIFICATIONS FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS".
2. ALL STRUCTURES SHALL BE SUITABLE FOR H-20 LOADING AND SHALL MEET THE REQUIREMENTS OF ASTM C-478.

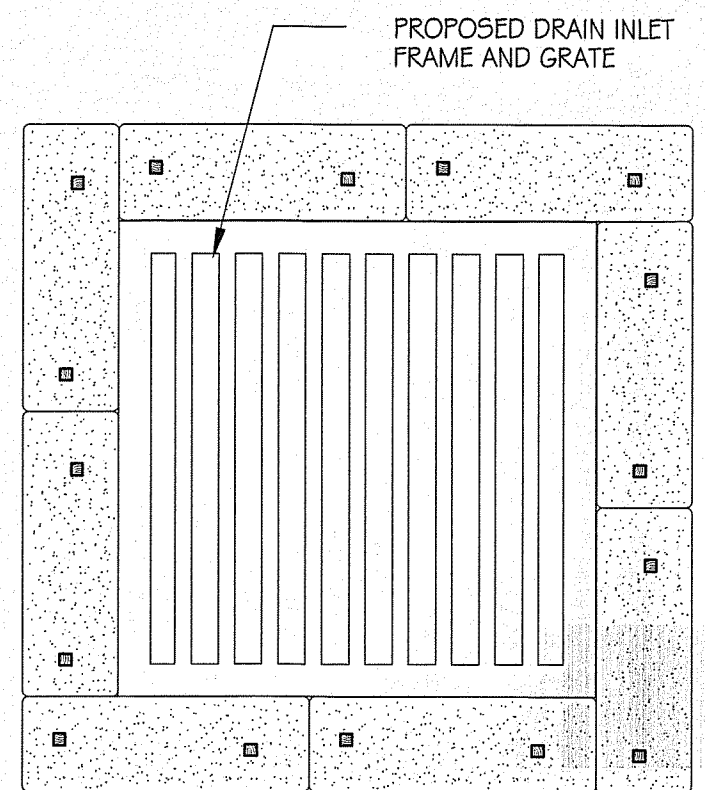
PRECAST CONCRETE CATCH BASIN  
N.T.S.



NOTES

1. ALL METAL FIXTURES SHALL BE STAINLESS STEEL.
2. SERVICE LINE SHALL BE FLUSH WITH THE INSIDE OF THE MANHOLE.
3. FOR PROPOSED MANHOLE INSTALLATION AT EXISTING PIPE, CONTRACTOR SHALL EXTEND PIPE INTO NEW MANHOLE USING A SPOOL PIECE OF SAME PIPE MATERIAL WITH FERRO COUPLES.

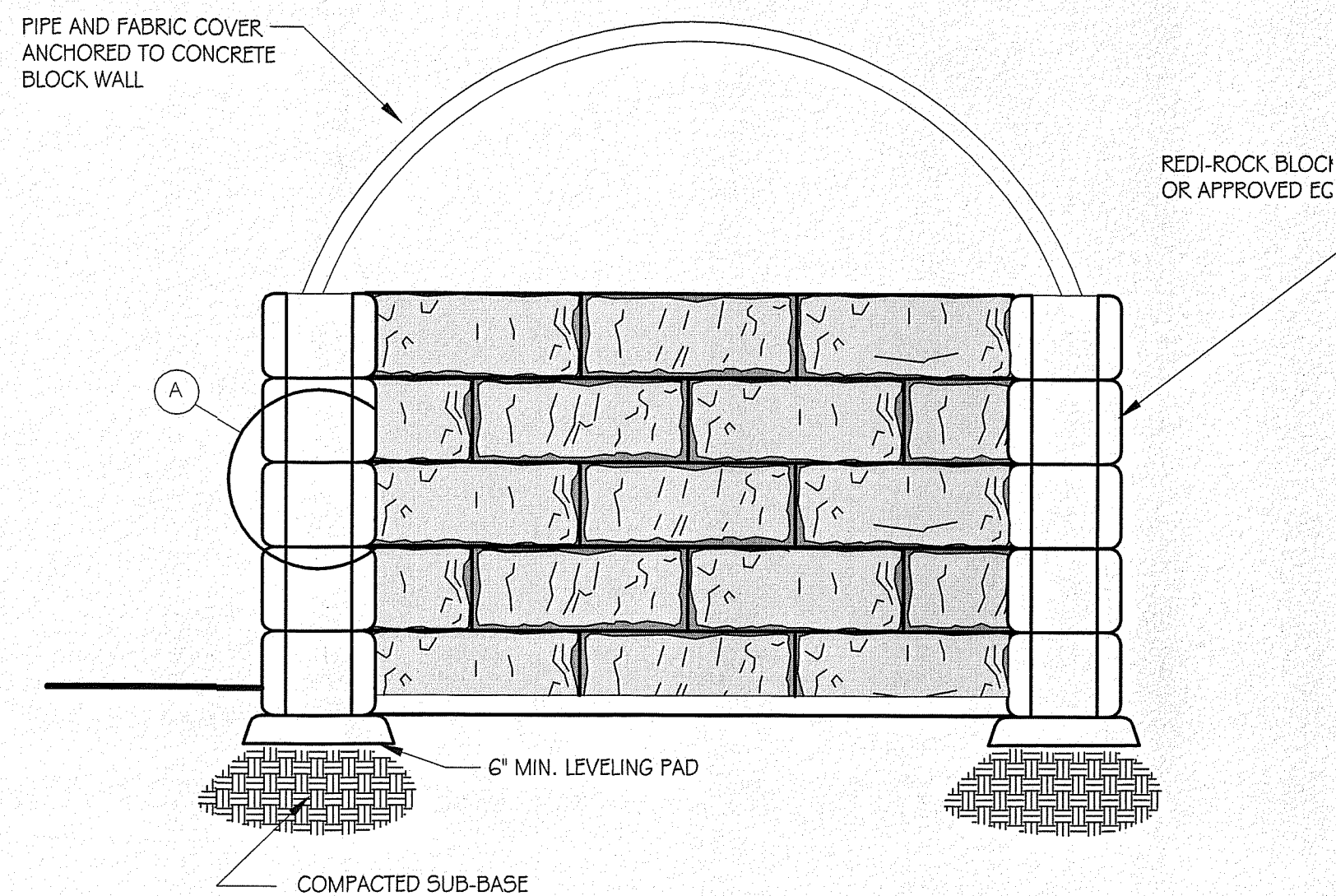
CONNECTION TO EXISTING MANHOLE  
N.T.S.



NOTES

1. BALES SHALL BE PLACED IN A ROW WITH THE ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. BALES SHALL BE SECURELY ANCHORED IN PLACE BY STAKES OR RE-BARS DRIVEN THROUGH THE BALES. THE FIRST STAKE IN EACH BALE SHALL BE ANGLED TOWARD PREVIOUSLY LAID BALE TO FORCE ALES TOGETHER.
3. INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.

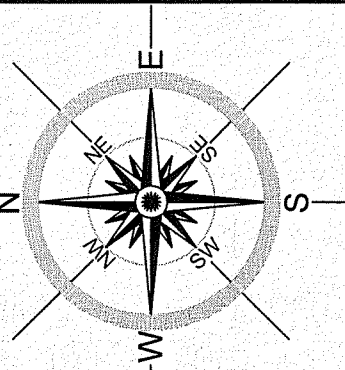
CATCH BASIN HAYBALE FILTER DETAIL  
N.T.S.



MATERIALS STORAGE BIN DETAILS  
N.T.S.

NESRA  
ENGINEERING, LLC

P.O. BOX 533  
EAST TAUNTON, MA 02718  
(617) 506-3772  
WWW.NESRAENG.COM



Project

Mt. Feake Cemetery  
Expansion Project  
Waltham, MA

Client

City of Waltham  
Consolidated Public Works  
165 Lexington Street  
Waltham, MA

No. Revision Date

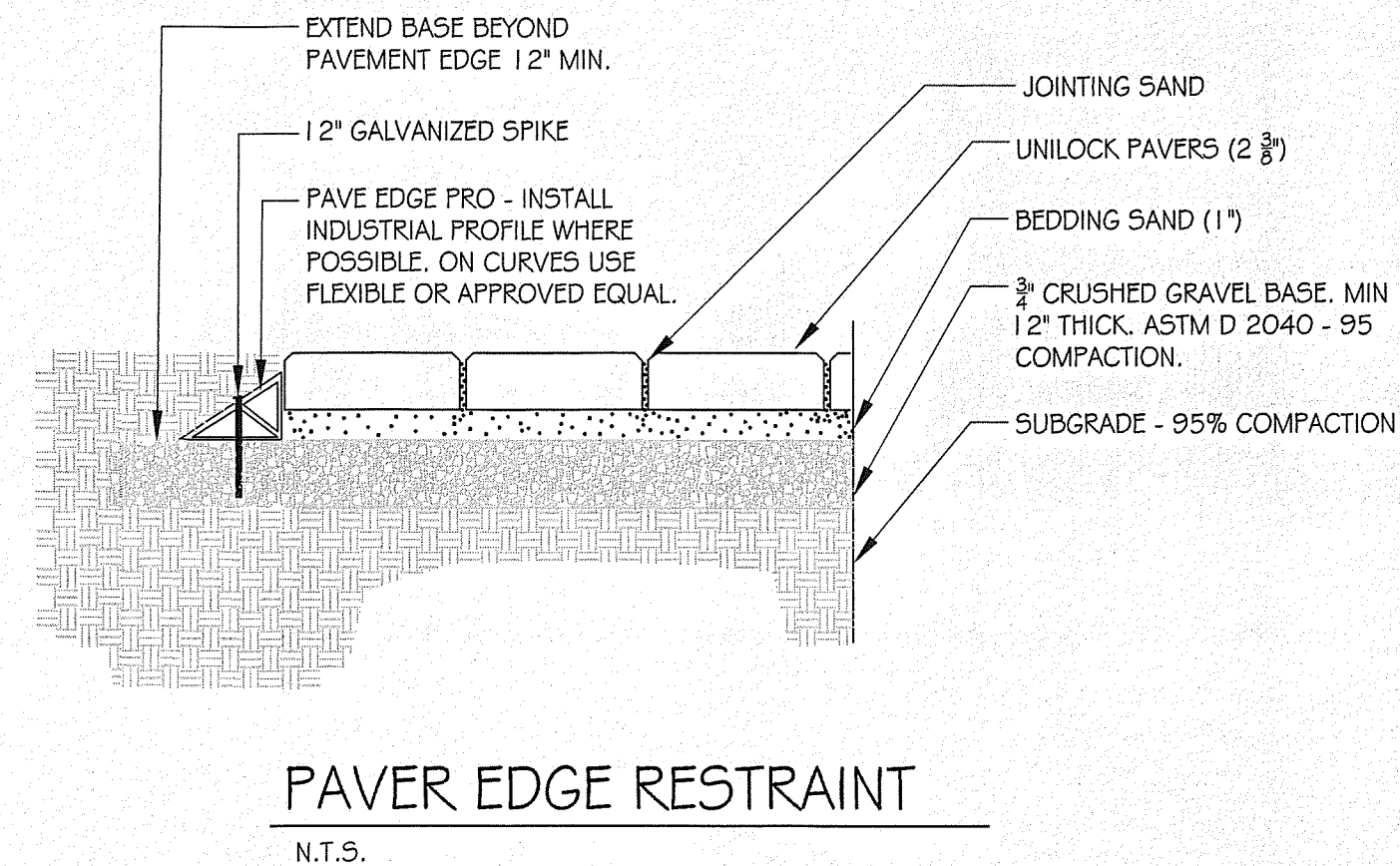
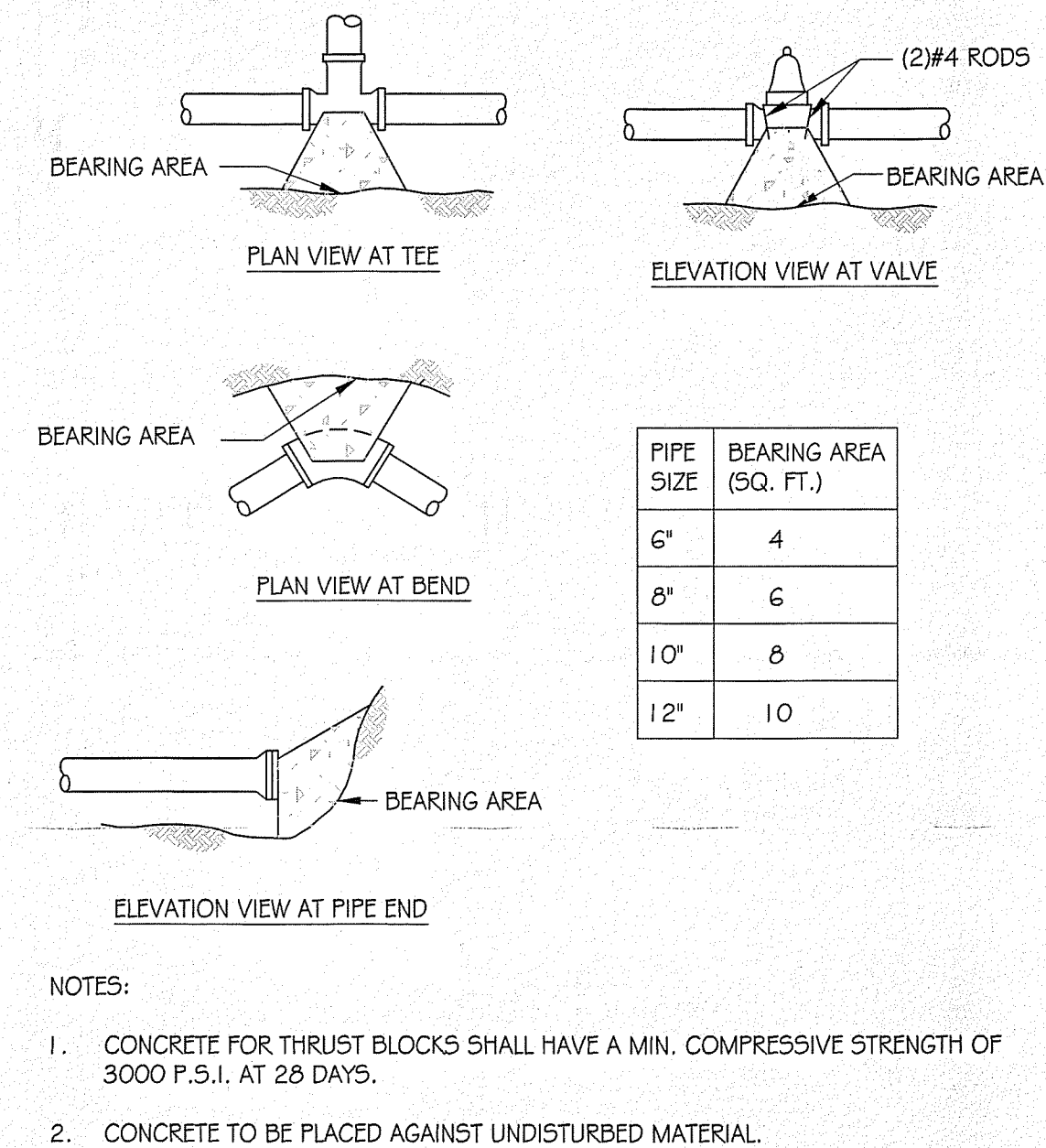
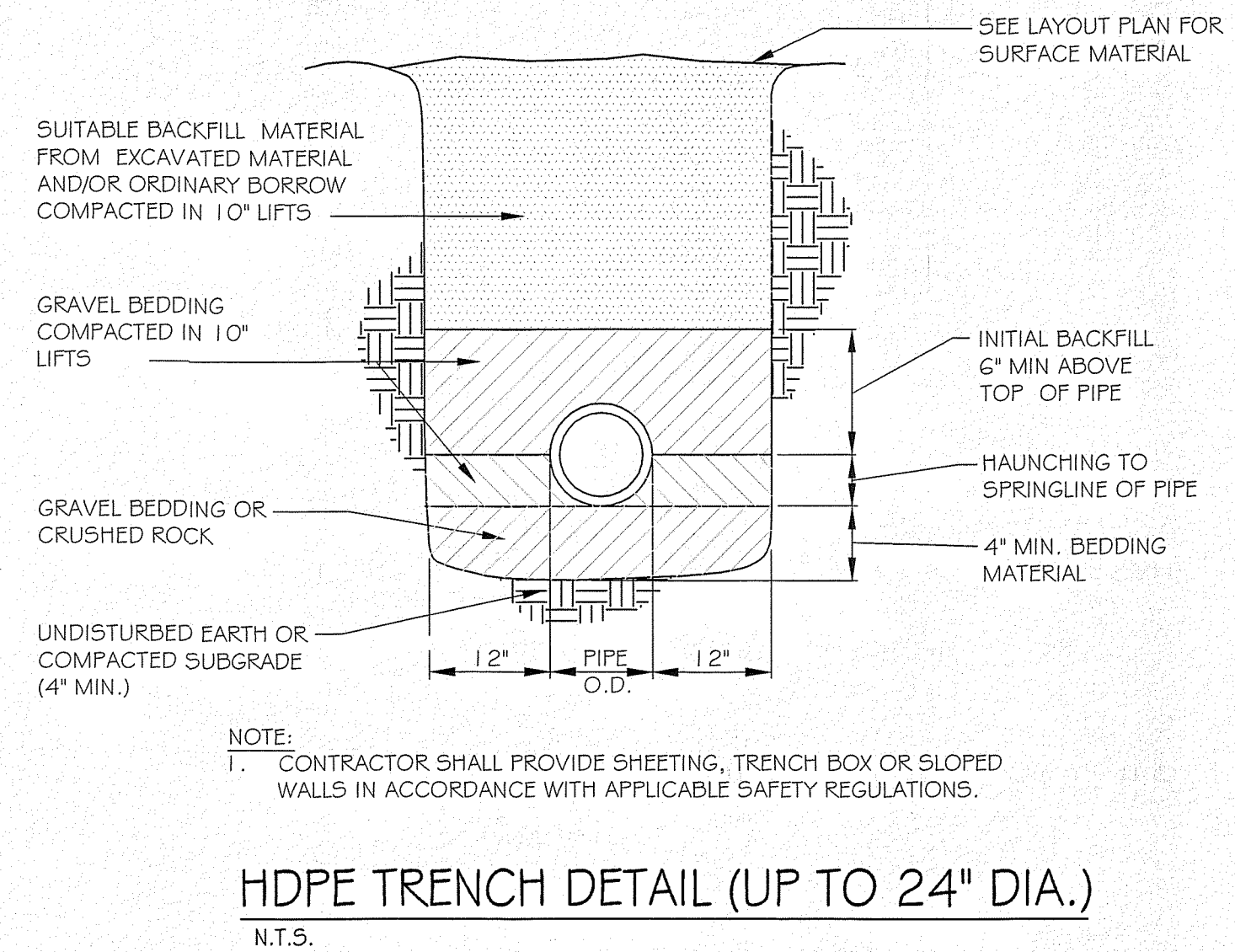
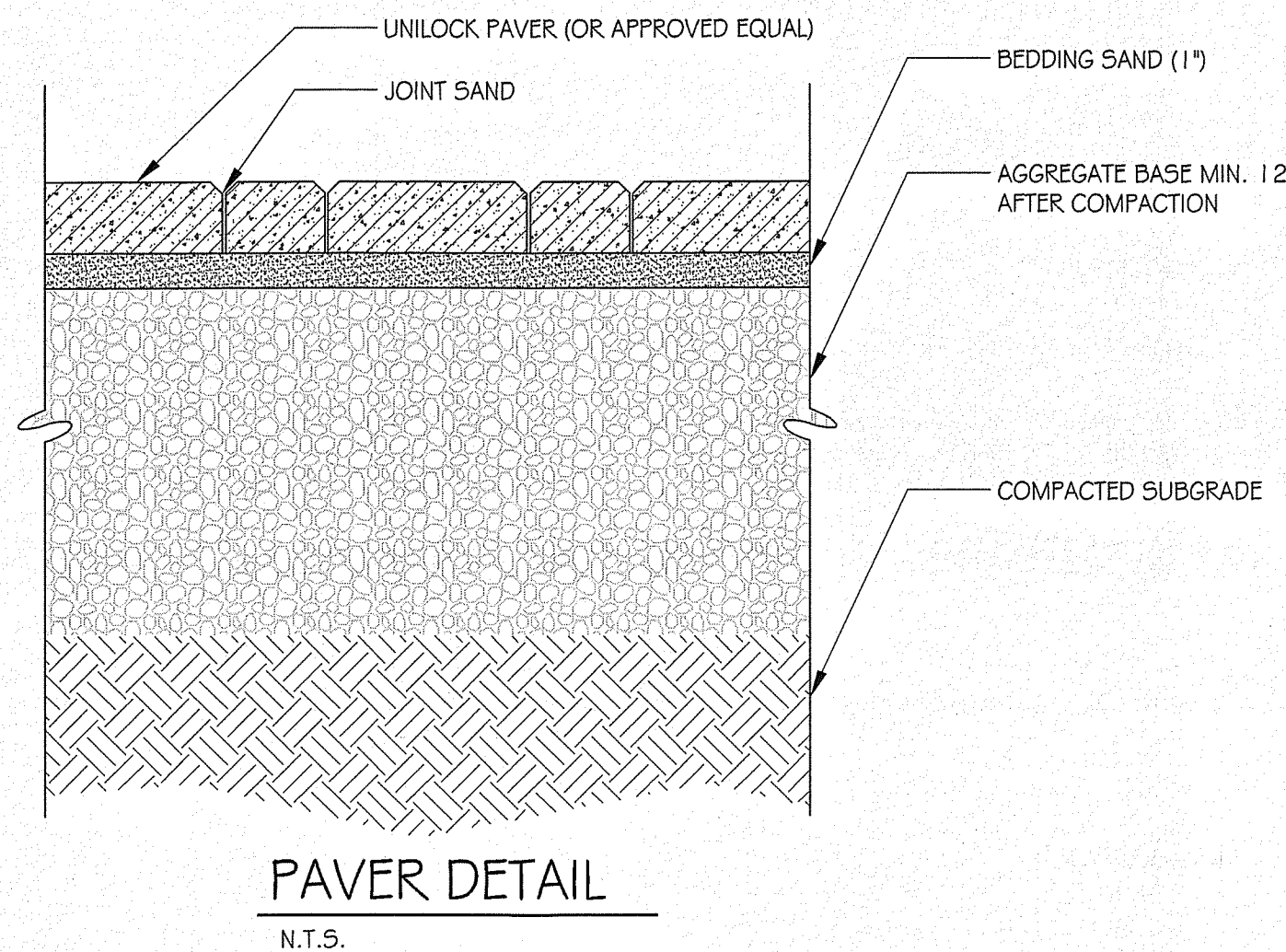
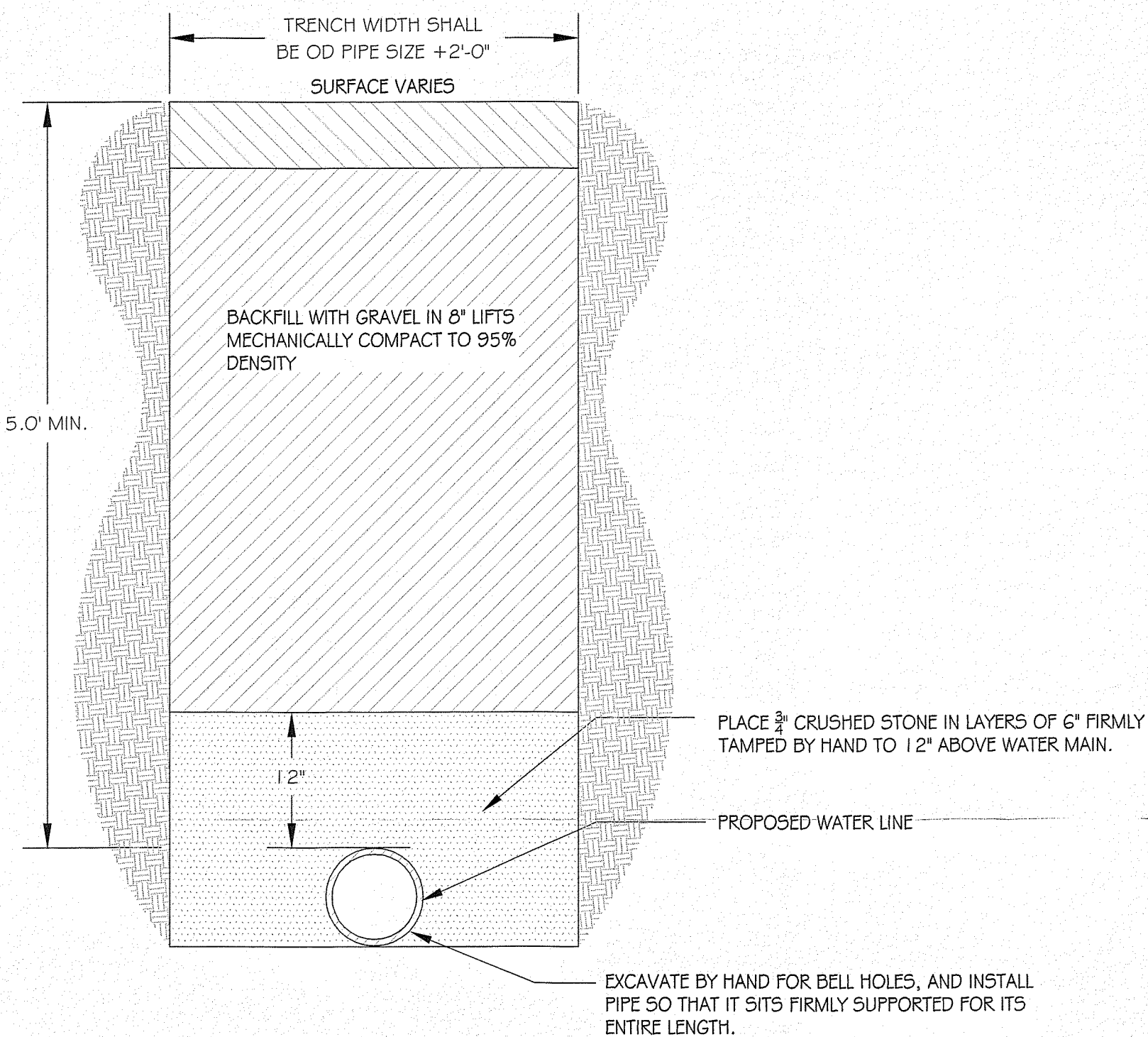
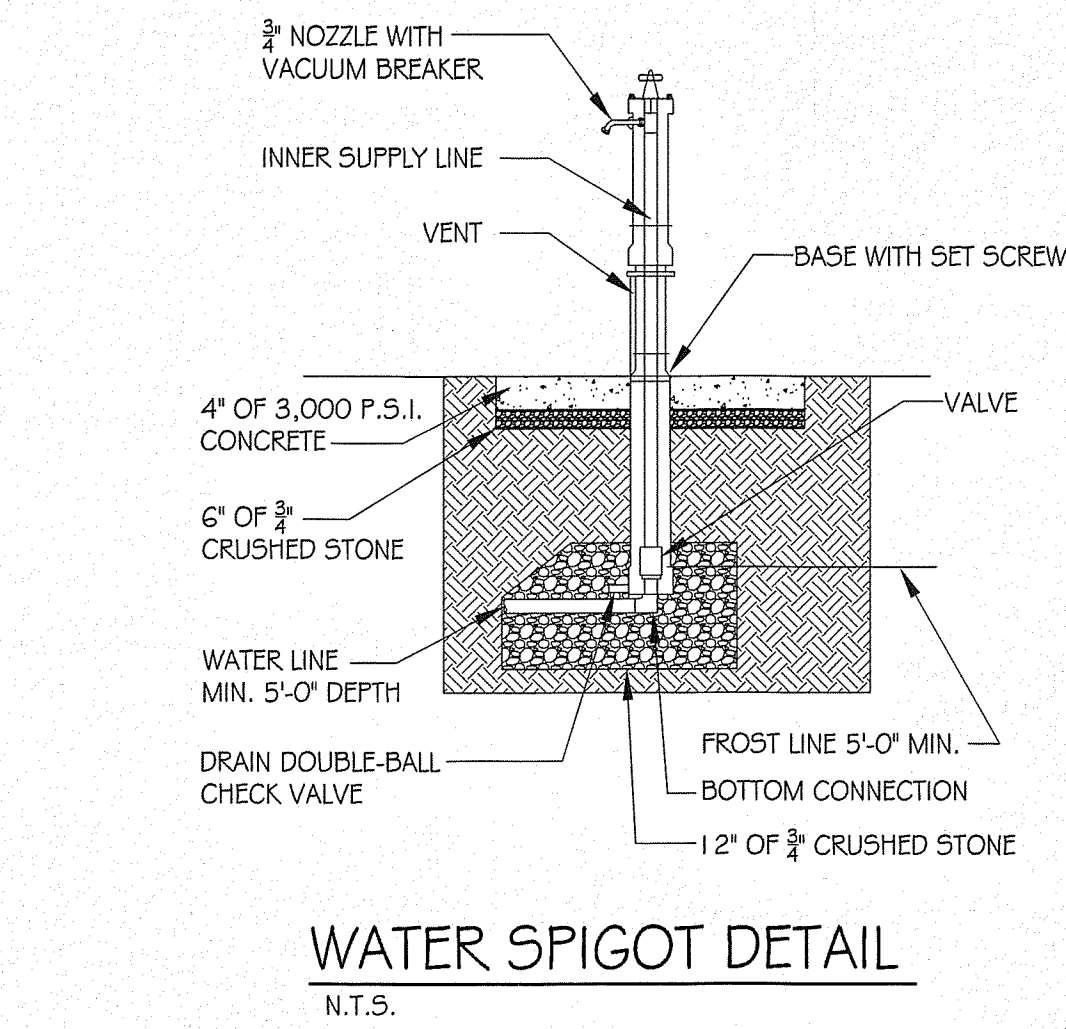
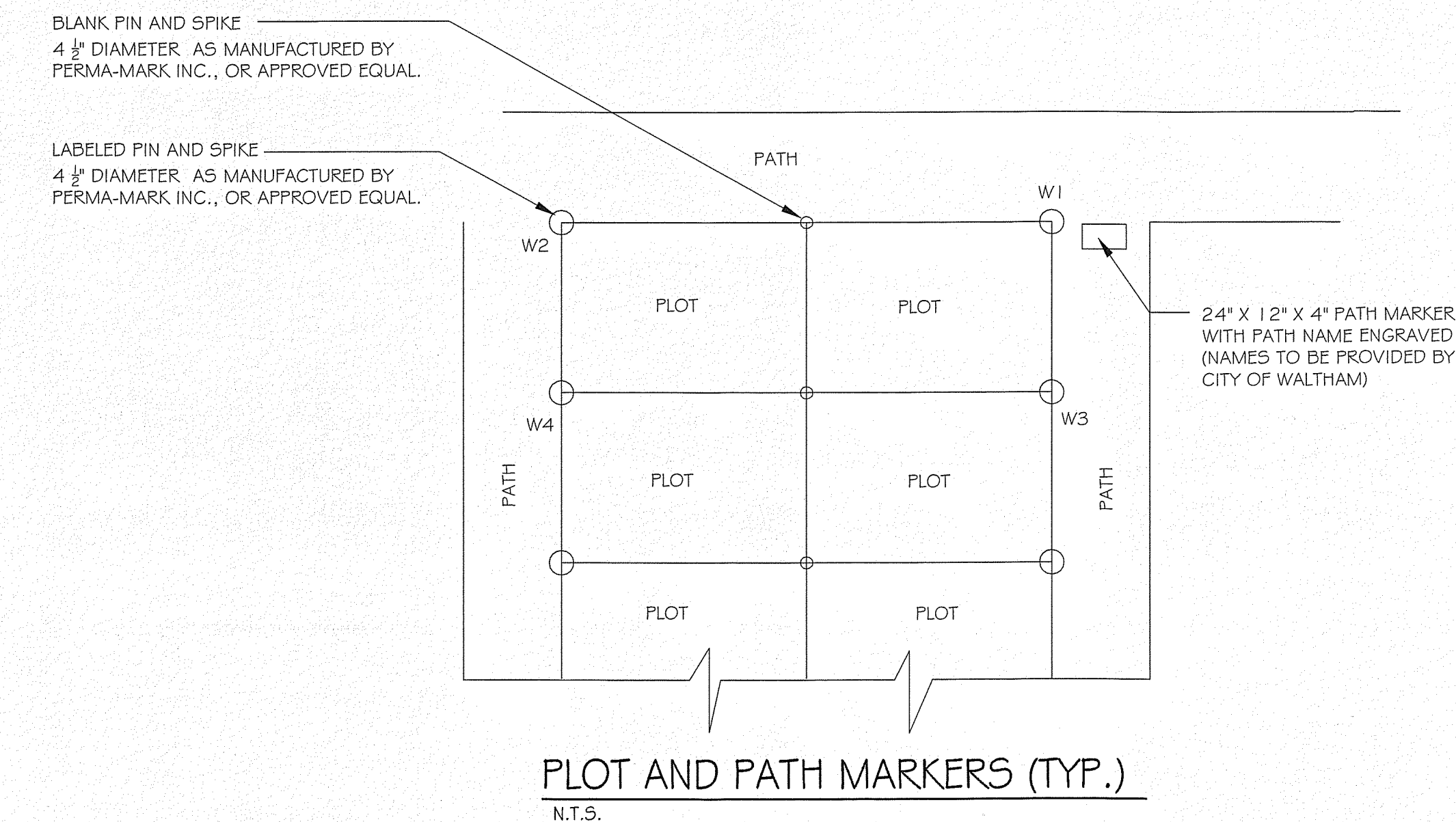
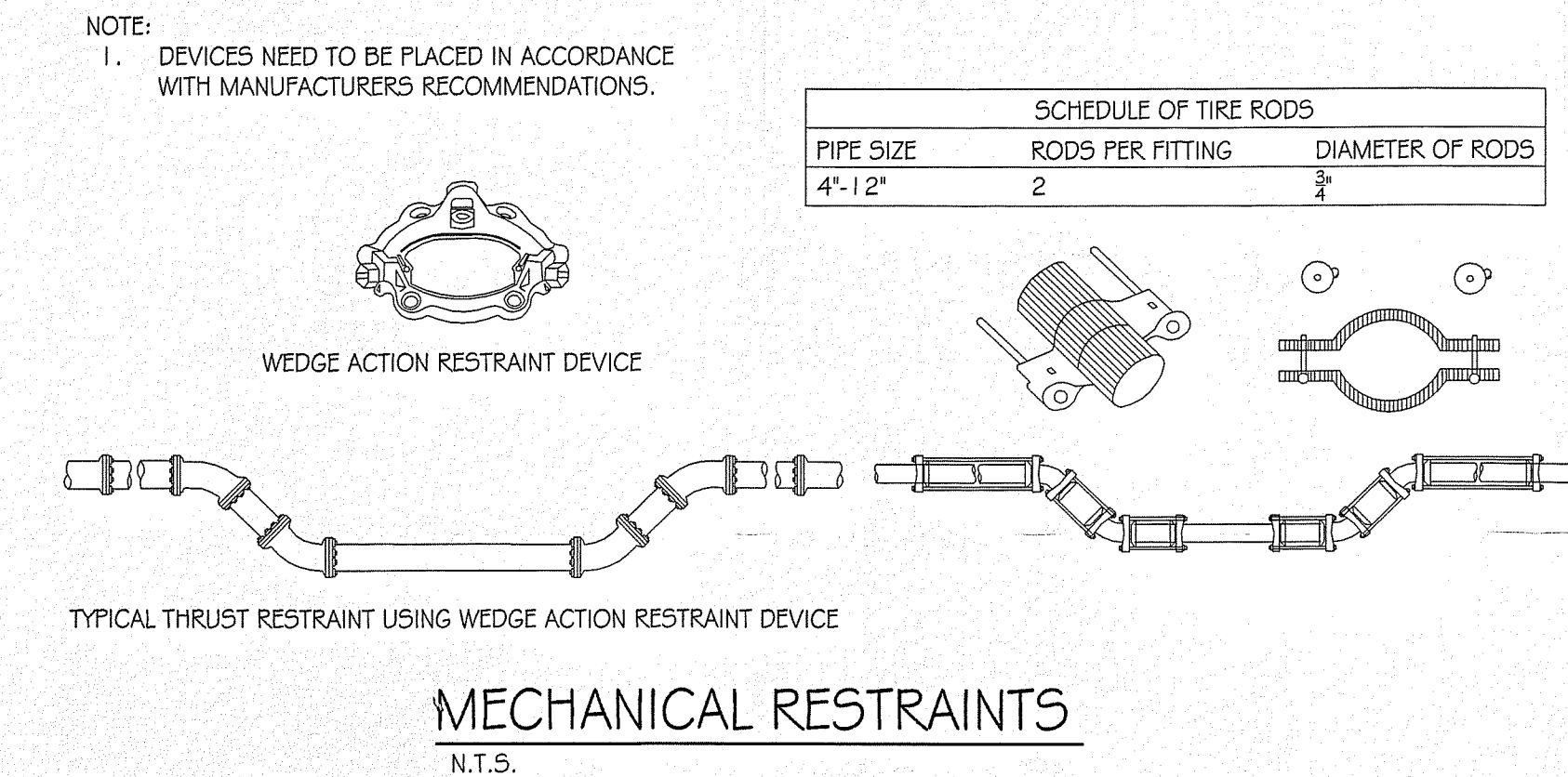
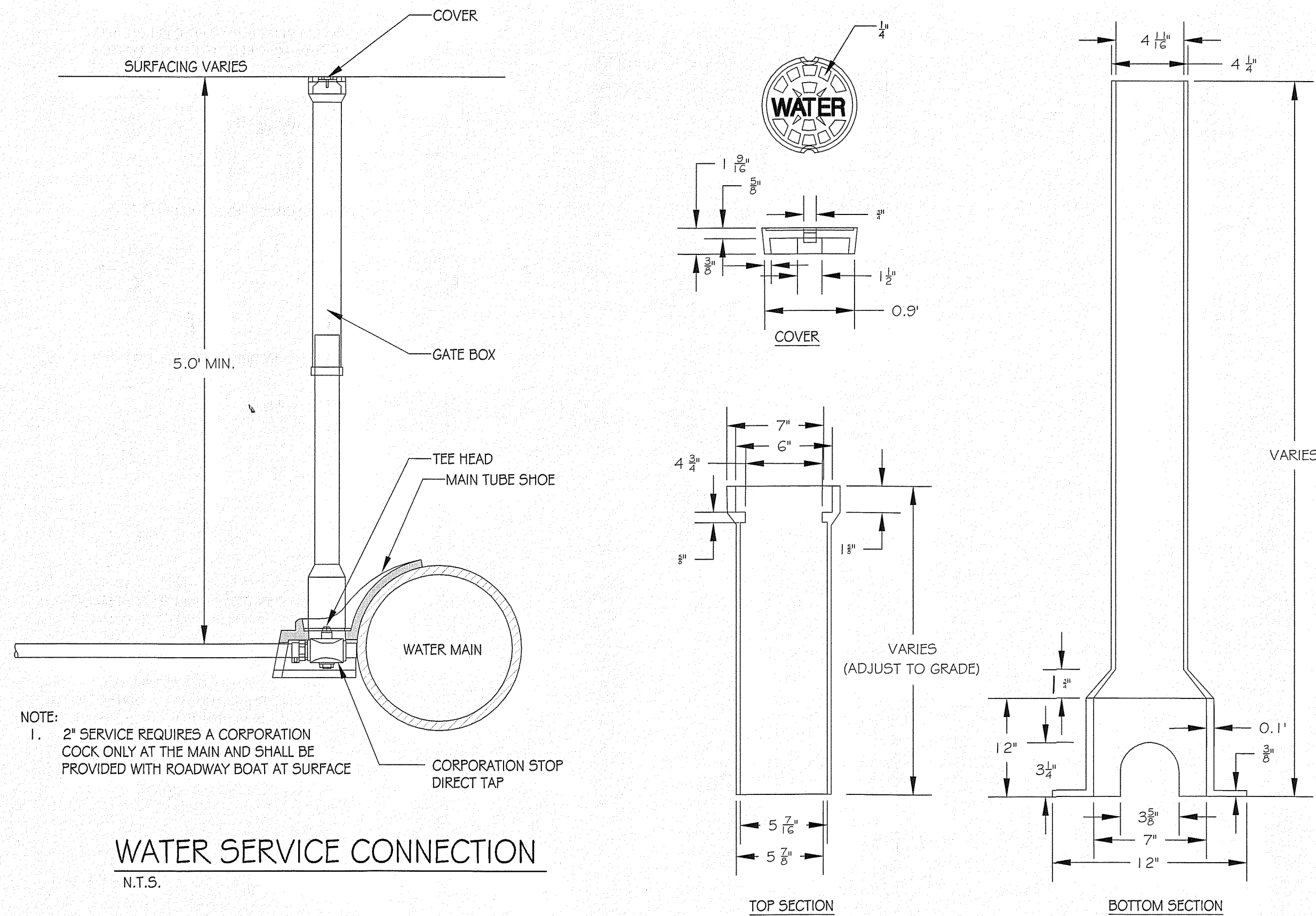
Scale: As Noted  
Date: 4/12/16

BID SET

CONSTRUCTION  
DETAILS  
1 OF 4

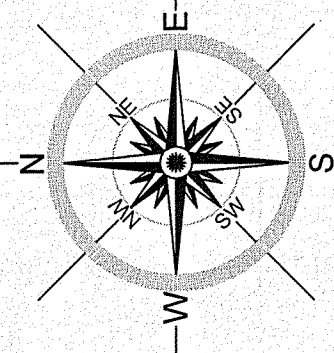
C-7





**NESRA  
ENGINEERING, LLC**

P.O. BOX 533  
EAST TAUNTON, MA 02718  
(617) 506-3772  
WWW.NESRAENG.COM



Project

**Mt. Feake Cemetery  
Expansion Project  
Waltham, MA**

Client

**City of Waltham  
Consolidated Public Works  
165 Lexington Street  
Waltham, MA**

No. Revision Date

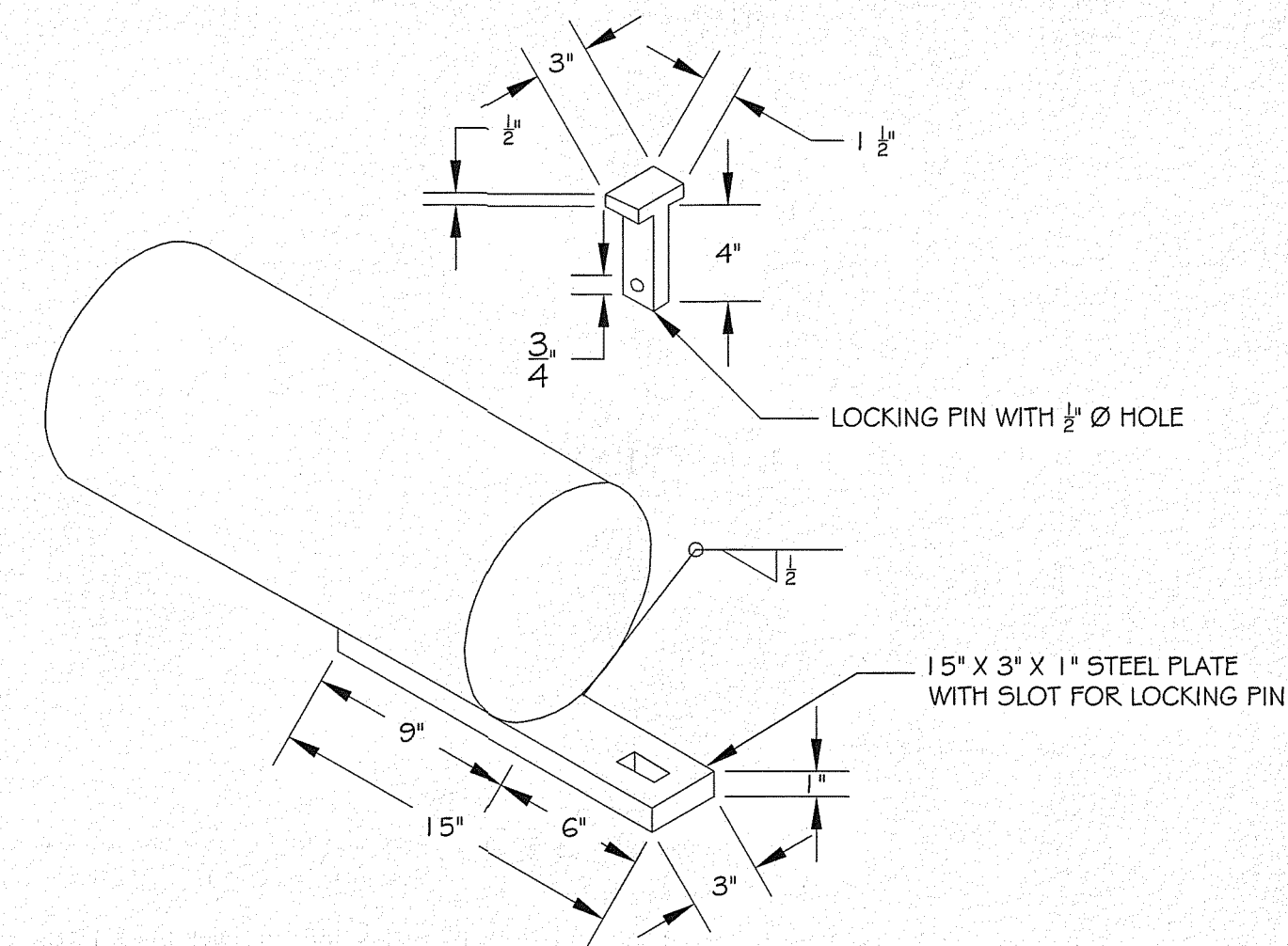
Scale: As Noted  
Date: 4/12/16

**BID SET**

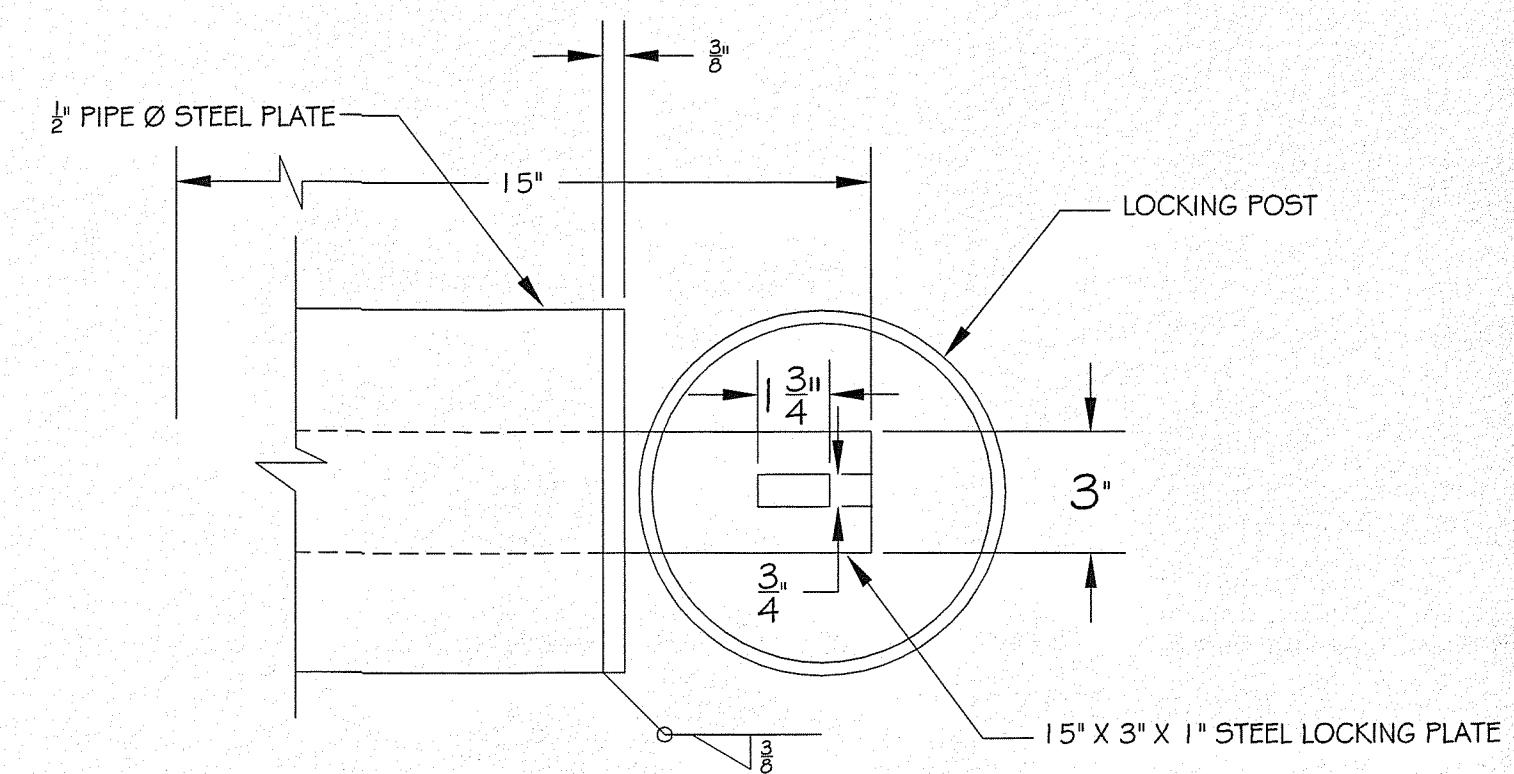
**CONSTRUCTION  
DETAILS  
2 OF 4**

**C-8**

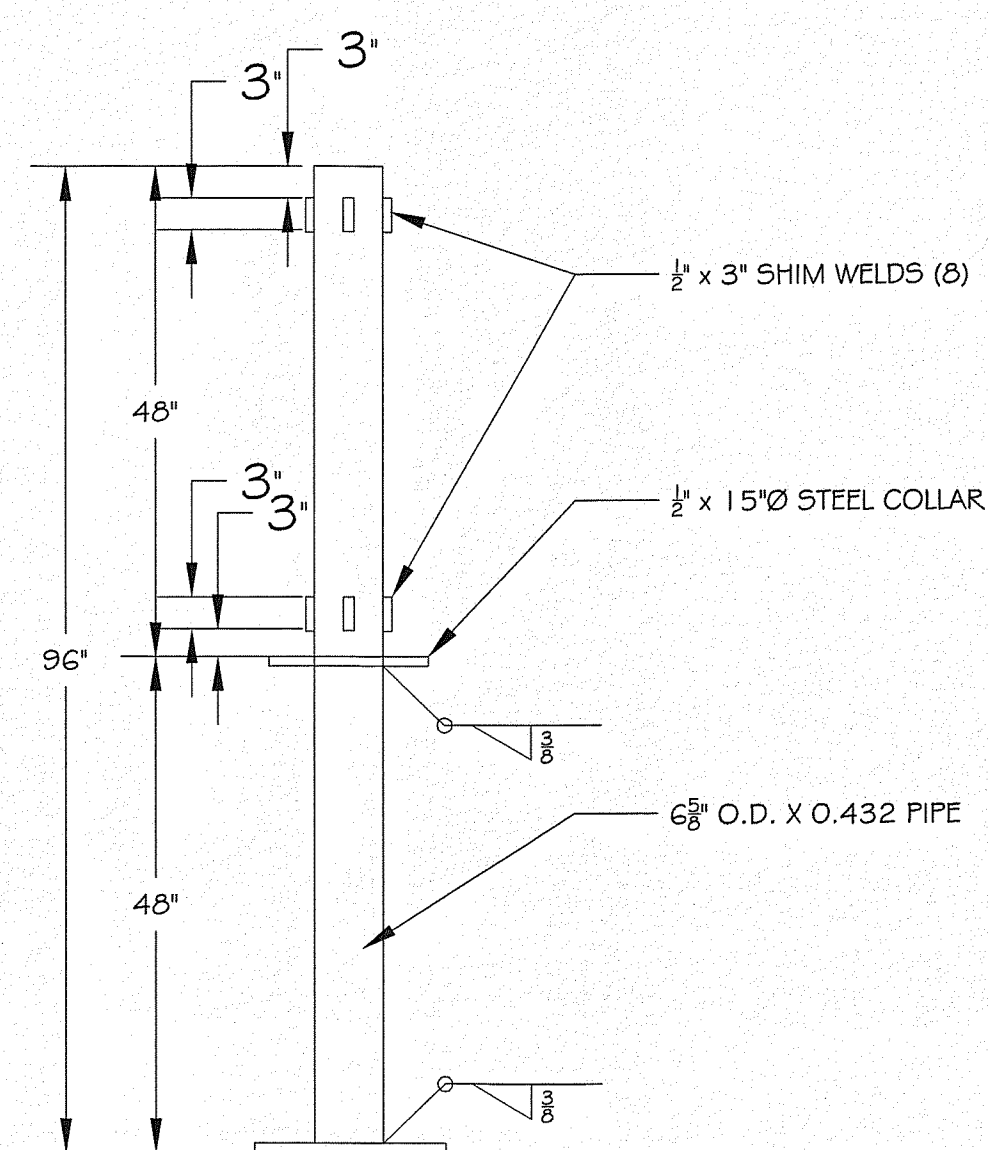




ISOMETRIC VIEW - LOCKING SYSTEM



SECTION THROUGH LOCKING POST



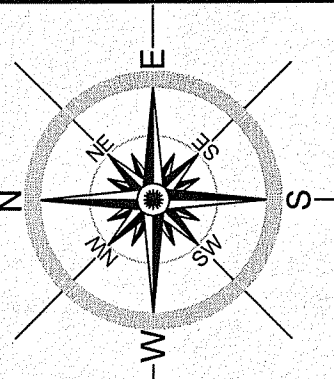
HINGE POST DETAIL

- NOTES:
1. PROVIDE TWO LOCKING POTS, ONE AT THE OPEN AND ONE AT THE CLOSED POSITIONS OF THE GATE.
  2. PIPE SHALL MEET THE REQUIREMENTS OF ASTM A 53, GRADE B. PIPE SIZE SHALL BE AS SHOWN ON THE DRAWINGS.
  3. CONCRETE SHALL BE 4,000 PSI AND IN ACCORDANCE WITH THE CONCRETE SPECIFICATIONS.
  4. GATE AND LOCKING POSITS SHALL BE PRIMED (1 COAT) AND PAINTED (2 COATS), COLOR SHALL BE BLACK.

MAINTENANCE AREA BARRIER  
N.T.S.

**NESRA  
ENGINEERING, LLC**

***P.O. BOX 533  
EAST TAUNTON, MA 02718  
(617) 506-3772  
WWW.NESRAENG.COM***



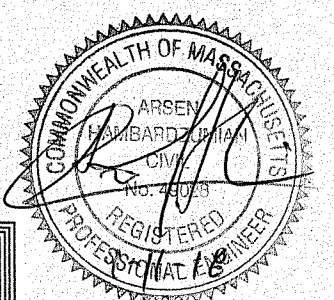
Project

# Mt. Feake Cemetery Expansion Project Waltham, MA

Client

City of Waltham  
Consolidated Public Works  
165 Lexington Street  
Waltham, MA

Scale: As Noted  
Date: 4/12/16

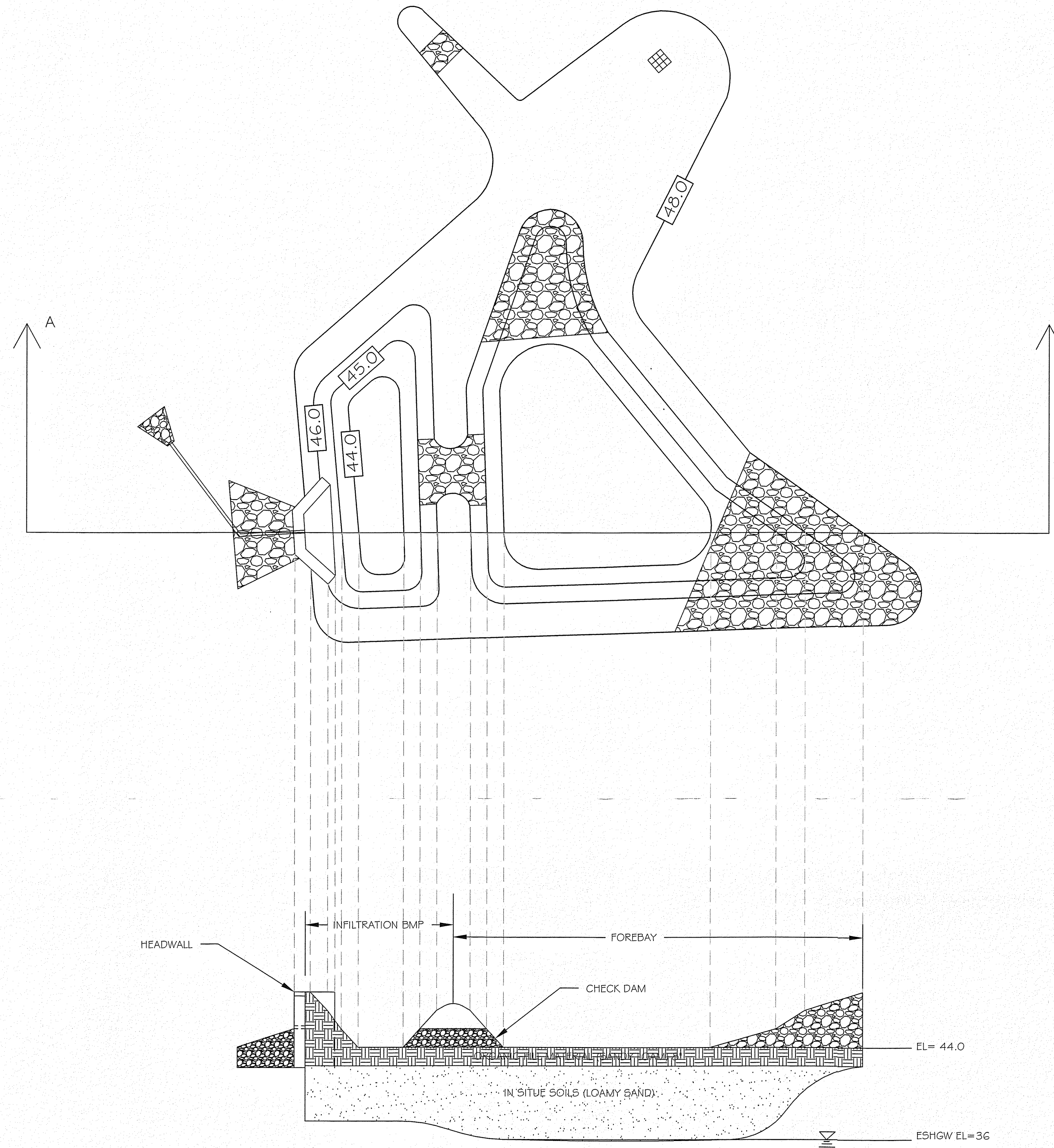
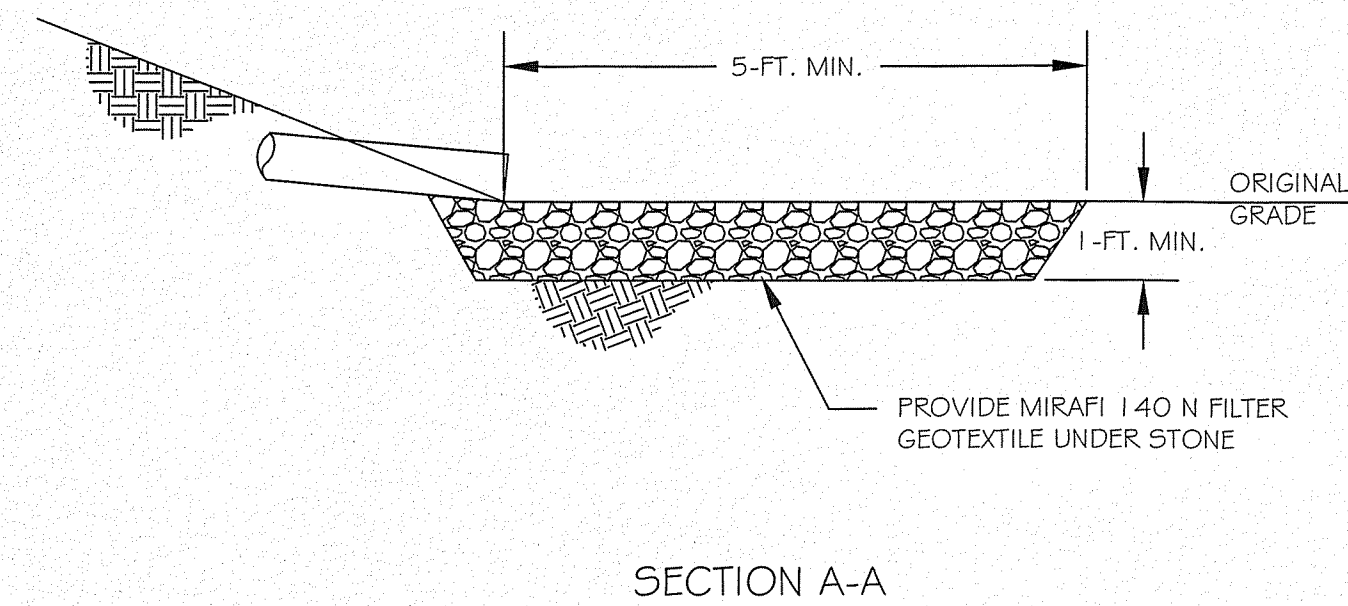
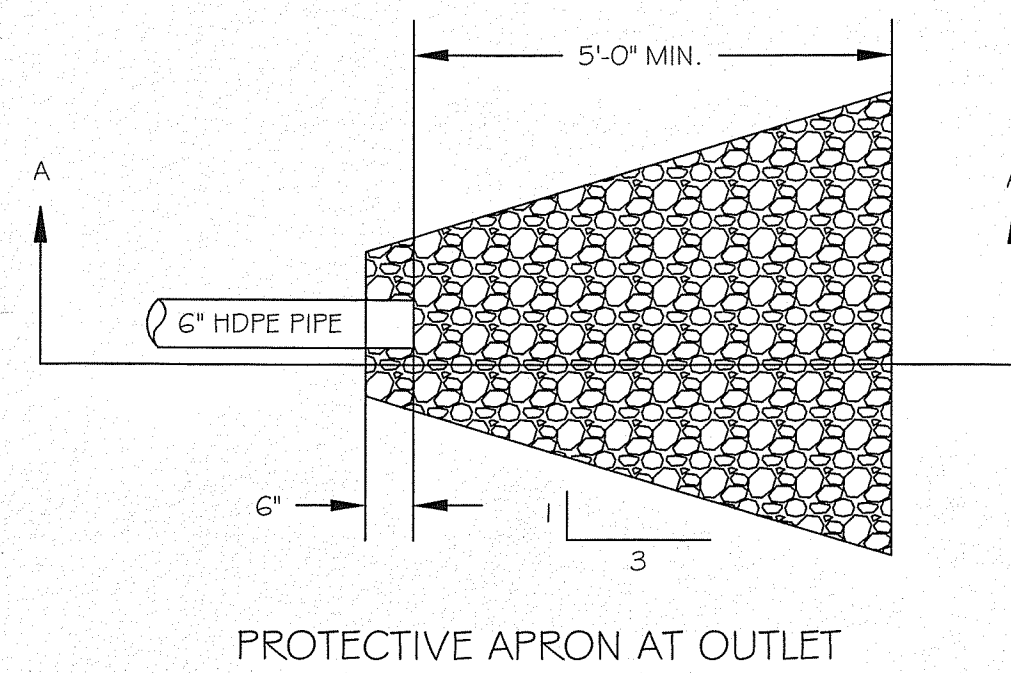
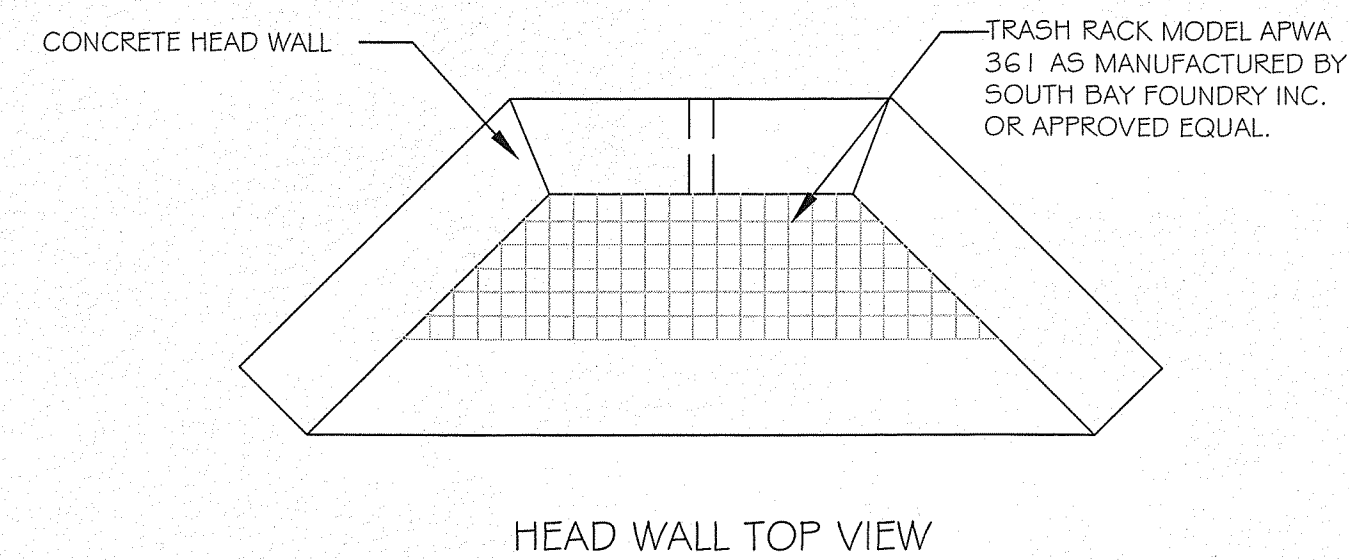
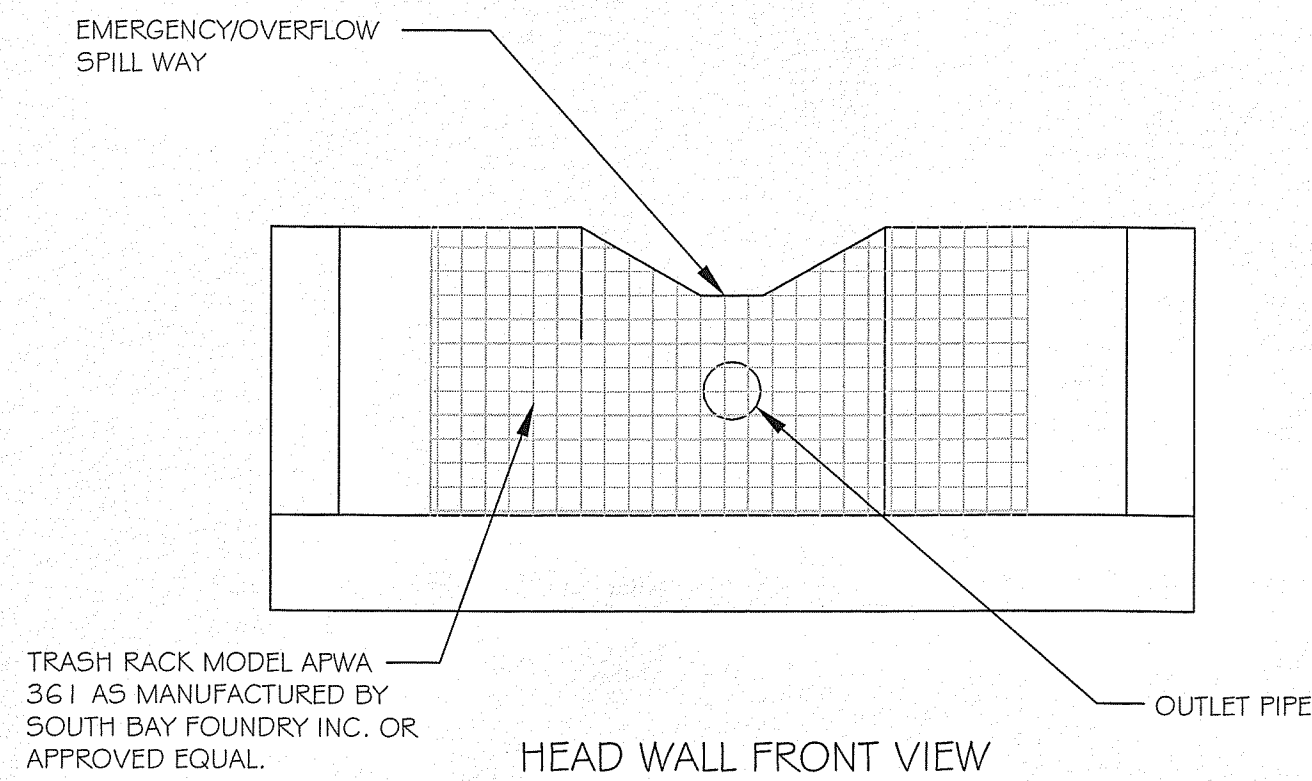


**BID SET**

CONSTRUCTION  
DETAILS  
3 OF 4

C-9

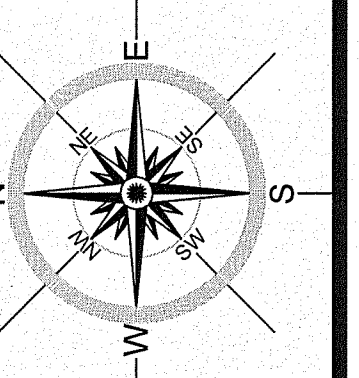




T.P. FINISH ELEVATION = 52.0  
NO GROUNDWATER OBSERVED TO  
BOTTOM OF PIT AT ELEVATION 40.0  
ESTIMATED SEASONAL HIGH GROUND  
WATER ELEVATION = EL. 36 +/-  
NEARBY WATER LEVEL AT ELEVATION 36

**NESRA  
ENGINEERING, LLC**

P.O. BOX 533  
EAST TAUNTON, MA 02718  
(617) 506-3772  
WWW.NESRAENG.COM



Project

Mt. Feake Cemetery  
Expansion Project  
Waltham, MA

Client

City of Waltham  
Consolidated Public Works  
165 Lexington Street  
Waltham, MA

No.	Revision	Date

Scale: As Noted  
Date: 4/12/16

**BID SET**

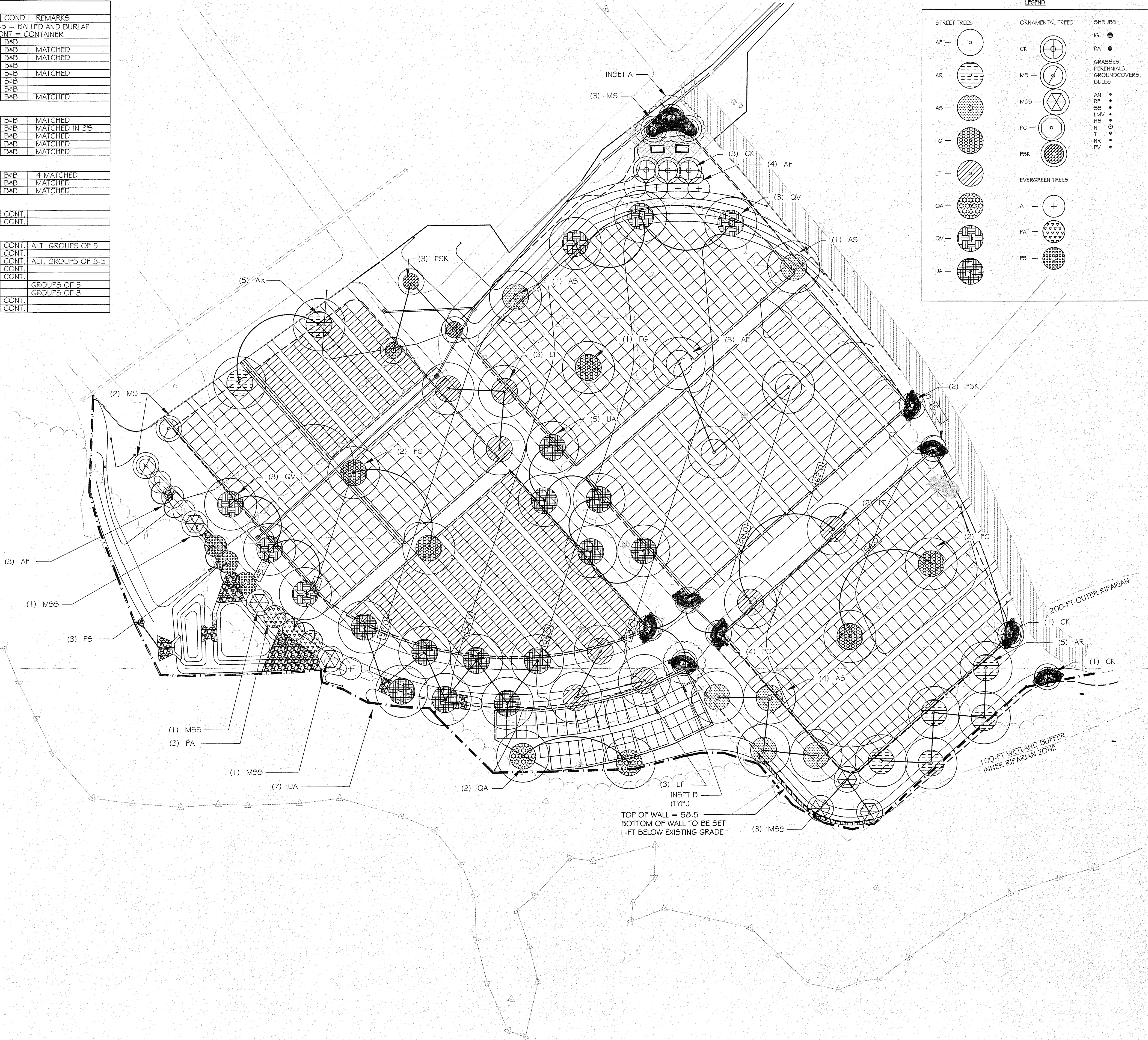
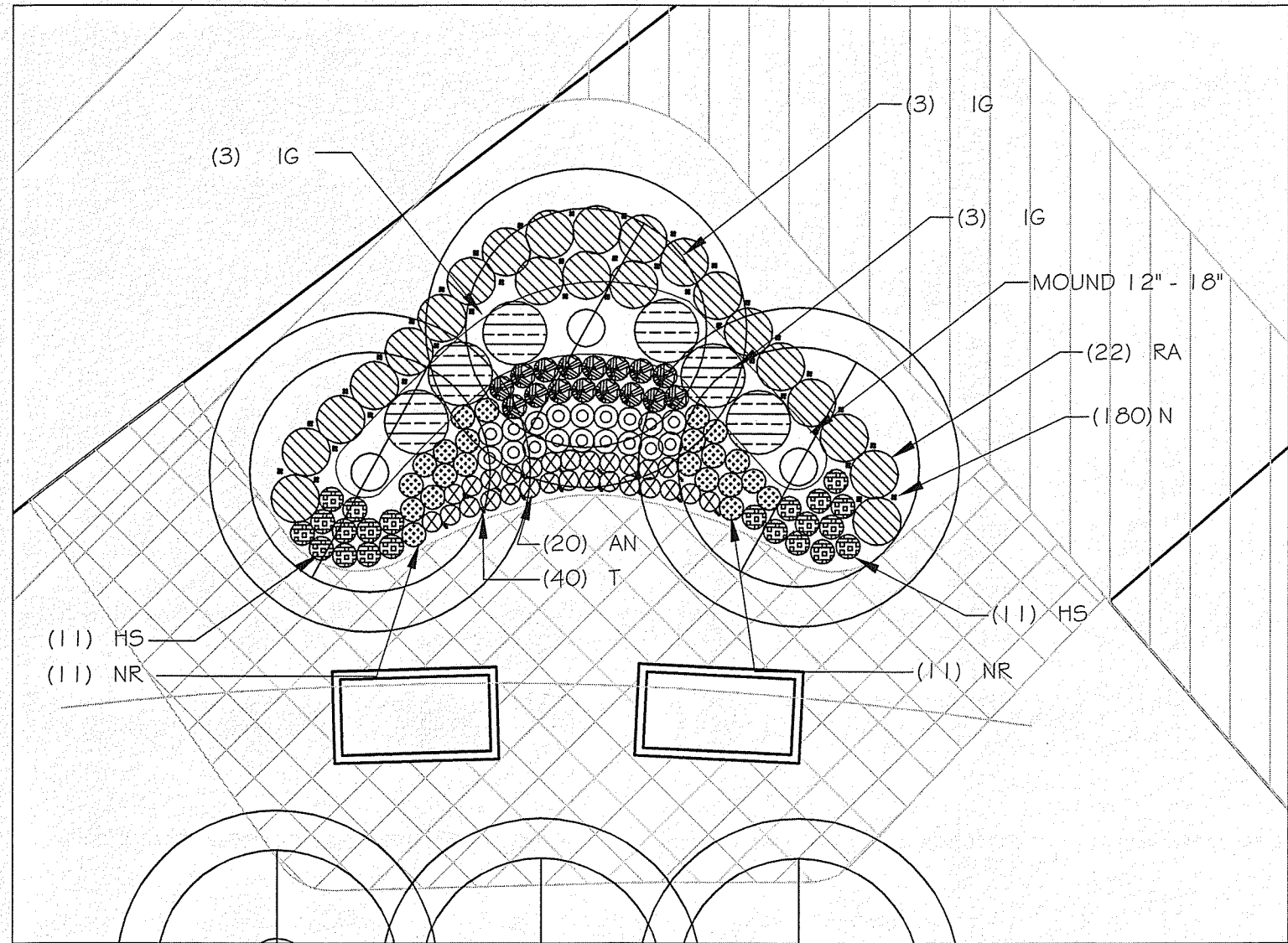
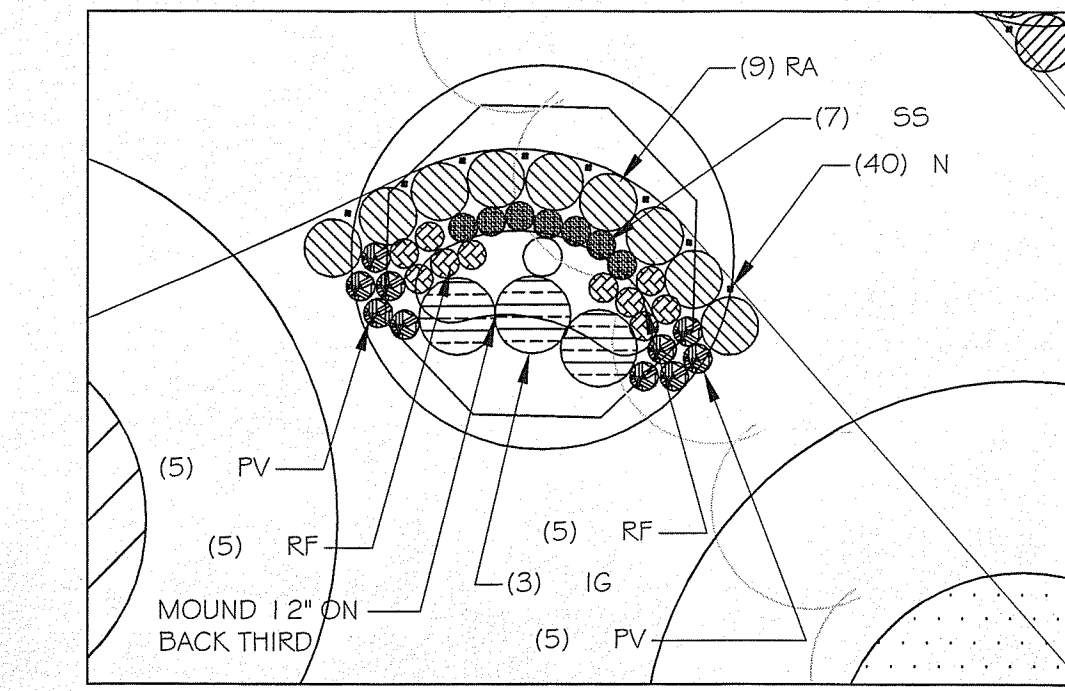
**CONSTRUCTION  
DETAILS  
4 OF 4**

**C-10**



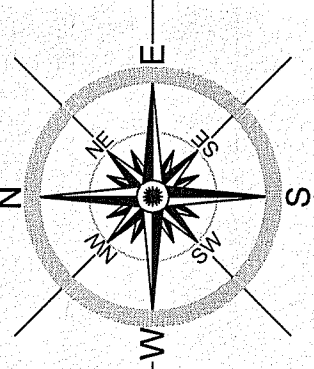
PLANTING SCHEDULE							
ABV	QTY	BOTANICAL NAME	COMMON NAME	SPACING	SIZE	COND	REMARKS
STREET TREES							
AE	3	AESCULUS HIPPOCASTANUM	HORSE CHESTNUT	AS SHOWN	2.5" - 3" CAL.	B4B	
AR	7	ACER RUBRUM 'OCTOBER GLORY'	OCTOBER GLORY RED MAPLE	AS SHOWN	2.5" - 3" CAL.	B4B	MATCHED
AS	6	ACER SACCHARUM	SUGAR MAPLE	AS SHOWN	2.5" - 3" CAL.	B4B	MATCHED
FG	5	FAGUS GRANDIFLORA	AMERICAN BEECH	AS SHOWN	2.5" - 3" CAL.	B4B	
LT	8	LIRIODENDRON TULIPIFERA	TULIP TREE	AS SHOWN	2.5" - 3" CAL.	B4B	MATCHED
QA	2	QUERCUS ALBA	WHITE OAK	AS SHOWN	2.5" - 3" CAL.	B4B	
QV	6	QUERCUS VELUTINA	BLACK OAK	AS SHOWN	2.5" - 3" CAL.	B4B	
UA	12	ULMUS AMERICANA 'NEW HARMONY'	NEW HARMONY AMERICAN ELM	AS SHOWN	2.5" - 3" CAL.	B4B	MATCHED
ORNAMENTAL TREES							
CK	5	CORNUS KOUSA	KOUSA DOGWOOD	AS SHOWN	2" - 2.5" CAL.	B4B	MATCHED
MS	5	MAGNOLIA STELATTA	STAR MAGNOLIA	AS SHOWN	2" - 2.5" CAL.	B4B	MATCHED IN 3'S
MSS	6	MALUS 'SPRING SNOW'	SPRING SNOW CRABAPPLE	AS SHOWN	2" - 2.5" CAL.	B4B	MATCHED
PC	4	PYRUS CALLERYANA 'CHANTICLEER'	CHANTICLEER PEAR	AS SHOWN	2" - 2.5" CAL.	B4B	MATCHED
PSK	5	PRUNUS SERRULATA 'KWANZAN'	KWANZAN CHERRY	AS SHOWN	2" - 2.5" CAL.	B4B	MATCHED
EVERGREEN TREES							
AF	8	ABIES FRASERI	FRASER FIR	20' O.C.	7-8' HGT.	B4B	4 MATCHED
PA	3	PICEA ABIES	NORWAY SPRUCE	20' O.C.	7-8' HGT.	B4B	MATCHED
PS	3	PINUS STROBUS	WHITE PINE	20' O.C.	7-8' HGT.	B4B	MATCHED
SHRUBS							
IG	39	ILEX GLABRA 'SHAMROCK'	SHAMROCK INKBERRY	4' O.C.	24-30" HT	CONT.	
RA	121	RHUS AROMATICA 'GRO-LOW'	GROW LOW FRAGRANT SUMAC	3' O.C.	24-30" WIDTH	CONT.	
GRASSES, PERENNIALS, GROUNDCOVERS, BULBS							
AN	20	ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER	18" O.C.	#1	CONT.	ALT. GROUPS OF 5
RF	110	RUDBECKIA FULGIDA 'GOLDSTRUM'	GOLDSTRUM BLACK EYED SUSAN	18" O.C.	#1	CONT.	
SS	77	SEDUM SPECTIBILE	AUTUMN JOY SEDUM	18" O.C.	#1	CONT.	ALT. GROUPS OF 3-5
LMV	27	LIRIOPE MUSCARI VARIGATA	VARIGATED LILYTURF	15" O.C.	#1	CONT.	
HS	22	HEMEROCALLIS 'STELLA D'ORO'	STELLA D'ORO DAYLILY	18" O.C.	#1	CONT.	
N	620	NARCISSUS - YELLOW NATURALIZING	DAFFADIL BULBS	36" O.C.	2 YR OLD B.		GROUPS OF 5
T	44	TULIP - WHITE	TULIP BULBS	24-30" O.C.	2 YR OLD B.		GROUPS OF 3
NR	22	NEPETA RACEMOSA 'WALKER'S LOW'	WALKER'S LOW CATMINT	18" O.C.	#1	CONT.	
PV	126	PANICUM VIGATUM	SWITCHGRASS	18" O.C.	#1	CONT.	

LEGEND		
STREET TREES	ORNAMENTAL TREES	SHRUBS
AE —	CK —	IG —
AR —	MS —	RA —
AS —	MSS —	GRASSES, PERENNIALS, GROUNDCOVERS, BULBS
FG —	PC —	AN —
LT —	PSK —	SS —
QA —	AF —	LMV —
QV —	PA —	HS —
UA —	PS —	N —
		T —
		NR —
		PV —



NESRA  
ENGINEERING, LLC

P.O. BOX 533  
EAST TAUNTON, MA 02718  
(617) 506-3772  
WWW.NESRAENG.COM



Project

Mt. Feake Cemetery  
Expansion Project  
Waltham, MA

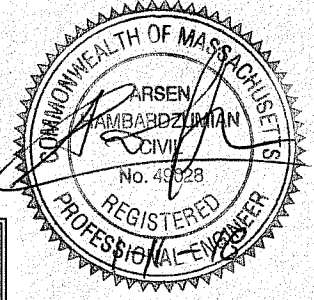
Client

City of Waltham  
Consolidated Public Works  
165 Lexington Street  
Waltham, MA

2	PROVIDE ADDITIONAL INFORMATION PER DEP LETTER DATED 12/15/17 (REMOVE TREES OUTSIDE OF NEW LIMIT OF WORK.)	2/21/17
1	ADD TREES PER CONSERVATION COMMENTS.	6/2/16

No. Revision Date

Scale: As Noted  
Date: 4/12/16



BID SET

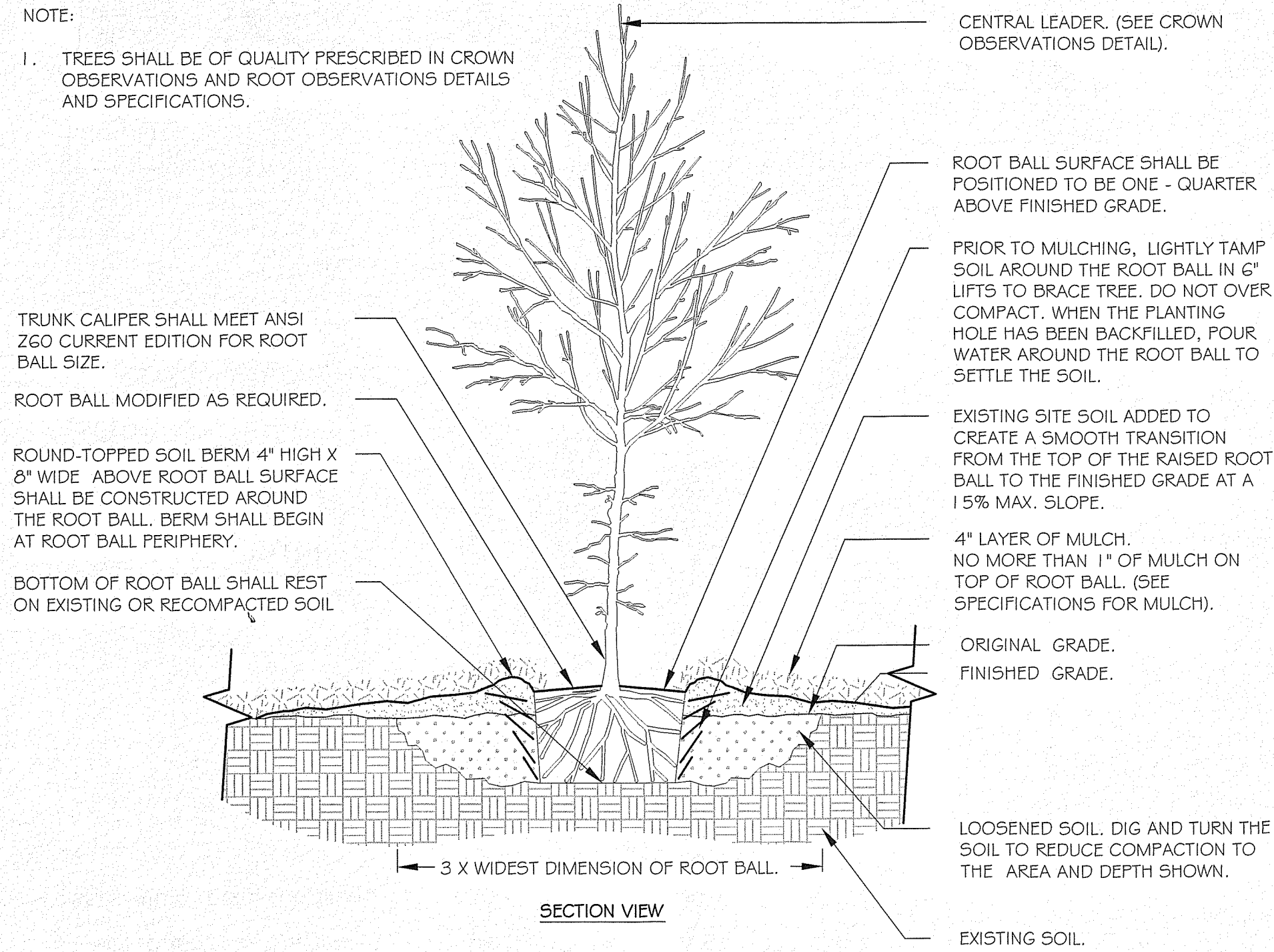
PLANTING PLAN

L-1

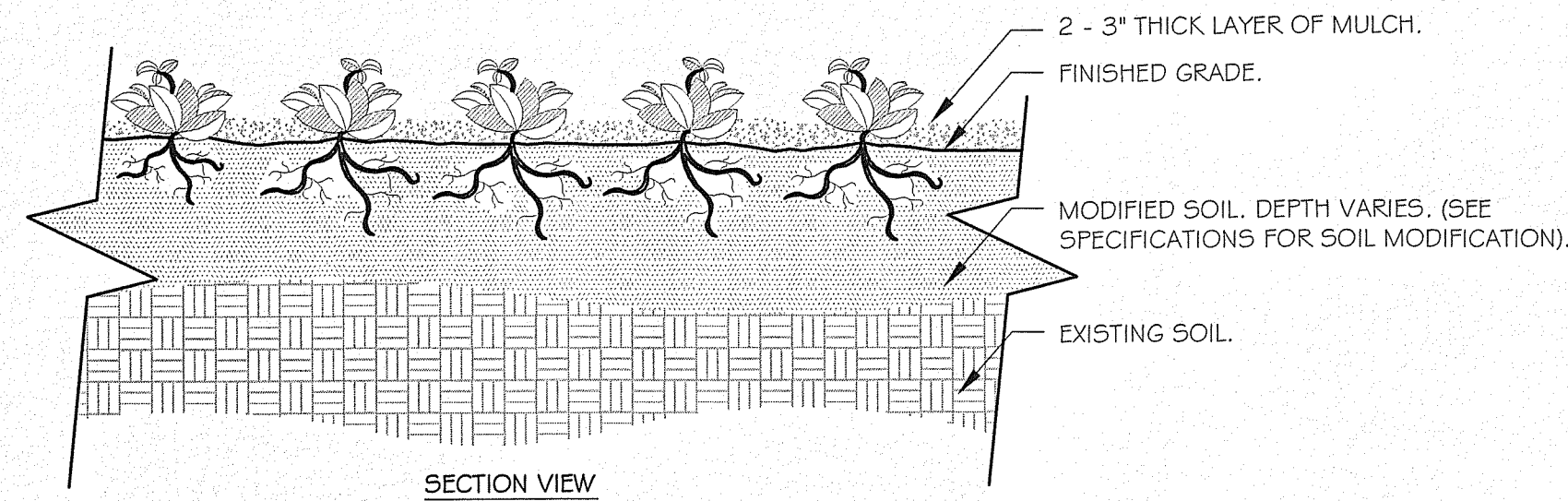


NOTE:

1. TREES SHALL BE OF QUALITY PRESCRIBED IN CROWN OBSERVATIONS AND ROOT OBSERVATIONS DETAILS AND SPECIFICATIONS.



TREE IN POORLY DRAINED SOILS  
N.T.S.



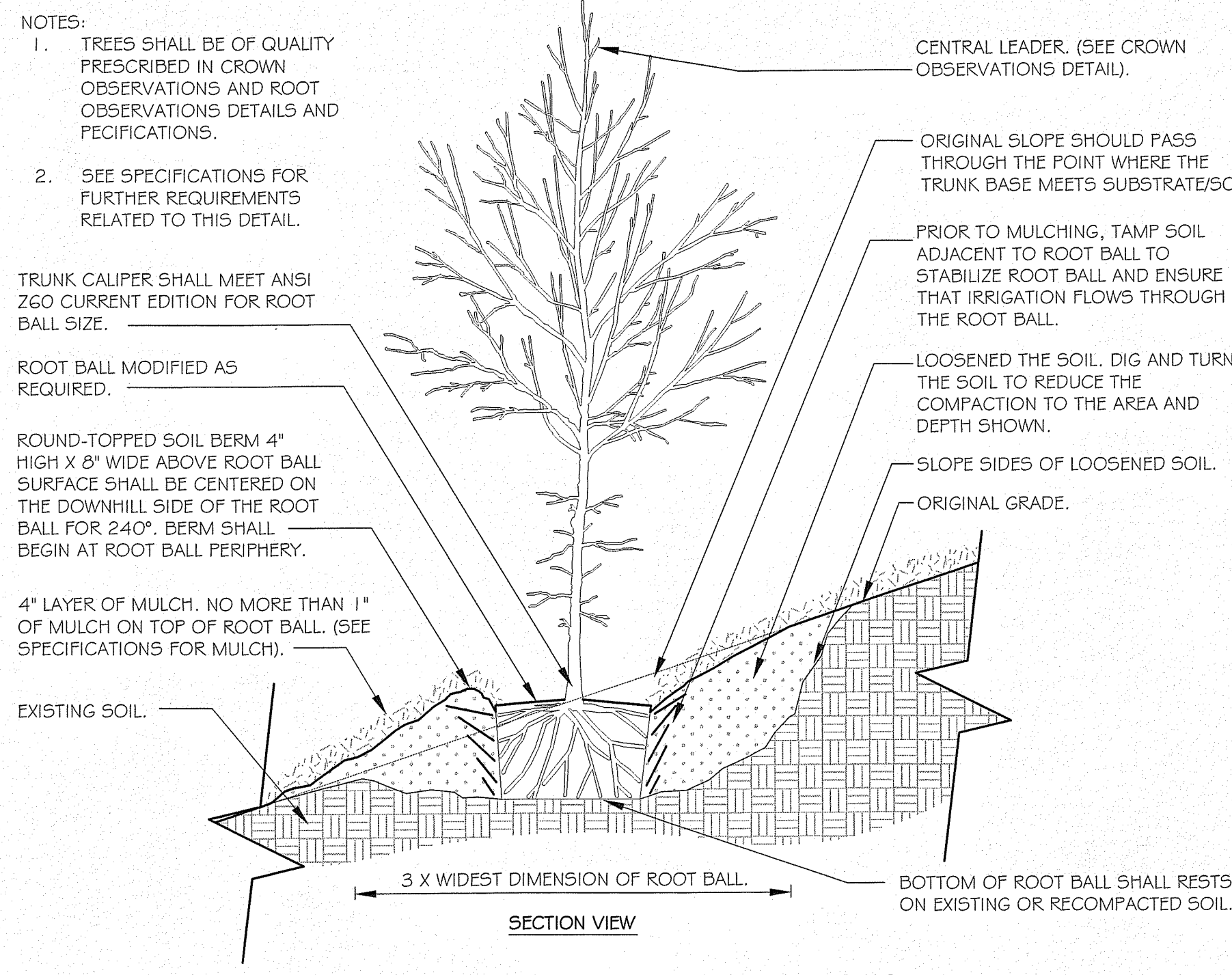
NOTES:

1. SEE PLANTING LEGEND FOR GROUNDCOVER SPECIES, SIZE, AND SPACING DIMENSION.
2. SMALL ROOTS (1/4\"/>
3. SETTLE SOIL AROUND ROOT BALL OF EACH GROUNDCOVER PRIOR TO MULCHING.

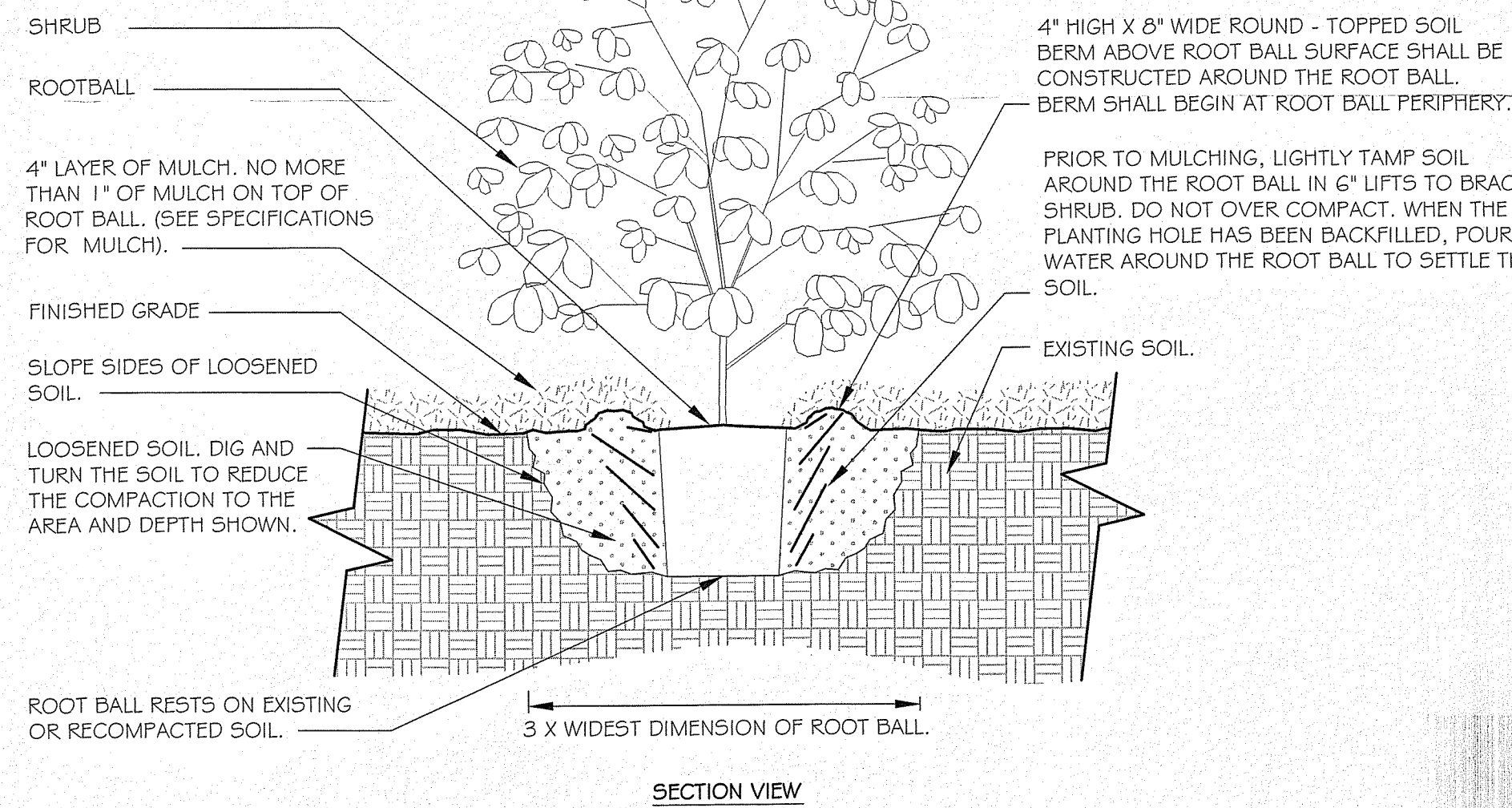
GROUNDCOVER  
N.T.S.

NOTES:

1. TREES SHALL BE OF QUALITY PRESCRIBED IN CROWN OBSERVATIONS AND ROOT OBSERVATIONS DETAILS AND PECIFICATIONS.
2. SEE SPECIFICATIONS FOR FURTHER REQUIREMENTS RELATED TO THIS DETAIL.



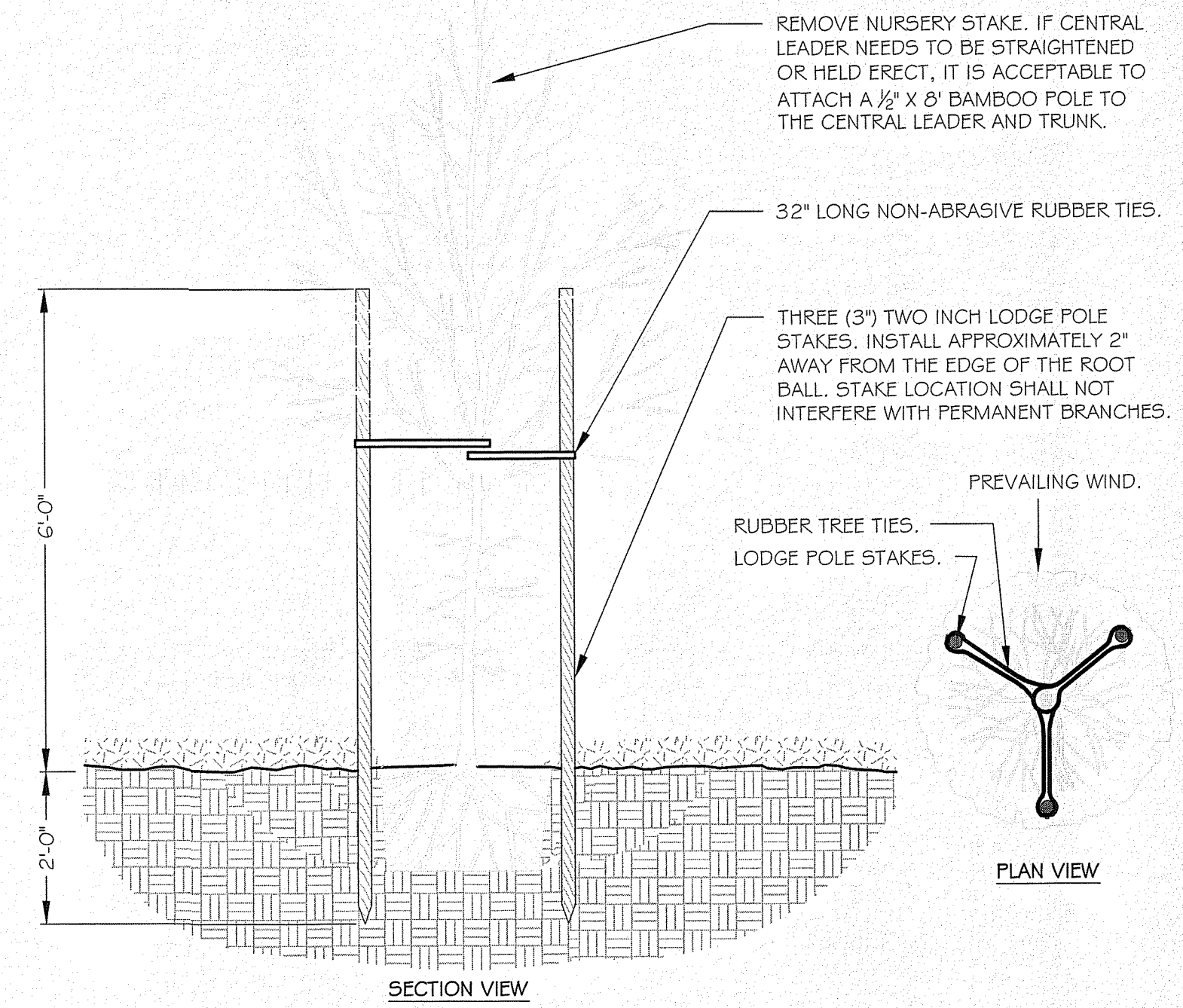
TREE ON SLOPE 5% (20:1) TO 50% (2:1)  
N.T.S.



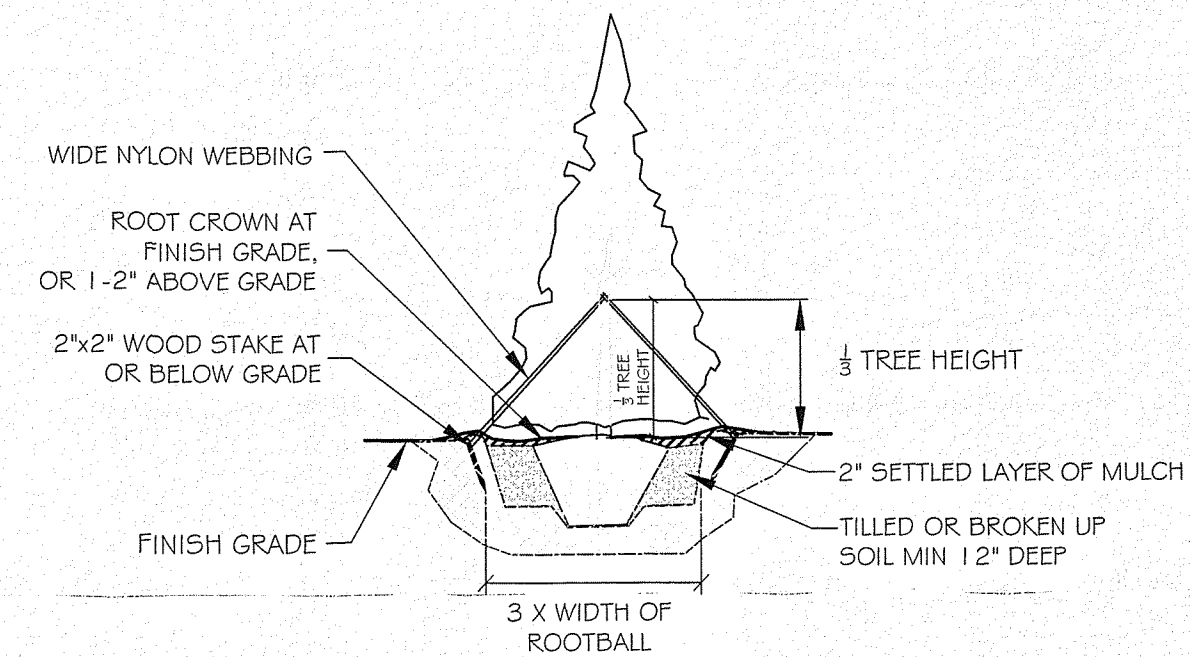
NOTES:

1. SHRUBS SHALL BE OF QUALITY PRESCRIBED IN THE ROOT OBSERVATIONS DETAIL AND SPECIFICATIONS.
2. SEE SPECIFICATIONS FOR FURTHER REQUIREMENTS RELATED TO THIS DETAIL.

SHRUB  
N.T.S.



TREE STAKING - LODGE POLES (3)  
N.T.S.



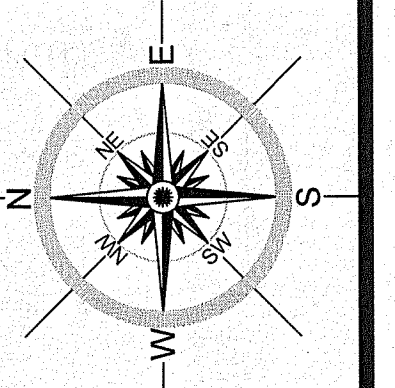
EVERGREEN TREE PLANTING  
N.T.S.

NOTES:

1. ALL PLANT MATERIALS SHALL BE IN ACCORDANCE WITH THE AMERICAN STANDARDS FOR NURSERY STOCK (ANSI Z60.1-2004). PLANT ACCORDING TO ANSI A300 PART 6.
2. DIG THE PLANTING HOLE A MINIMUM OF 3 x WIDTH OF ROOTBALL FOR AT LEAST THE FIRST 12 INCHES OF DEPTH. BELOW 12 INCHES, DIG HOLE WIDE ENOUGH TO PERMIT ADJUSTING. DO NOT DIG THE HOLE DEEPER THAN ROOT BALL DEPTH.
3. SCARIFY THE SUBGRADE AND SIDES OF THE PLANTING HOLE WHEN PLANTING IN CLAY SOILS (MORE THAN 15% CLAY).
4. LIFT AND SET THE TREE BY ROOT BALL ONLY. DO NOT LIFT USING THE TREE TRUNK AND DO NOT USE TREE TRUNK AS A LEVER.
5. SET THE TOP OF THE ROOT BALL LEVEL WITH THE SOIL SURFACE OR SLIGHTLY HIGHER IF THE SOIL IS PRONE TO SETTLING.
6. AFTER THE TREE IS SET IN PLACE, REMOVE BURLAP, WIRE AND STRAPS FROM AT LEAST THE UPPER 1/3 OF THE ROOTBALL.
7. BACKFILL WITH EXISTING SOIL THAT HAS BEEN WELL-TILLED OR BROKEN UP. DO NOT ADD AMENDMENTS TO THE BACKFILL SOIL. AMEND THE SURFACE WITH MULCH.
8. USE THREE 2\"/>
9. ATTACH 3/4\"/>
10. APPLY A 2-3\"/>
11. PRUNING SHALL BE LIMITED TO DEAD, DISEASED, OR BROKEN LIMBS ONLY AND SHALL BE IN ACCORDANCE WITH ANSI A300 SPECIFICATIONS.
12. REMOVE ANY TRUNK WRAP REMAINING AT TIME OF PLANTING. NO WRAPS SHALL BE PLACED ON TRUNK.

NESRA  
ENGINEERING, LLC

P.O. BOX 533  
EAST TAUNTON, MA 02718  
(617) 506-3772  
WWW.NESRAENG.COM



Project

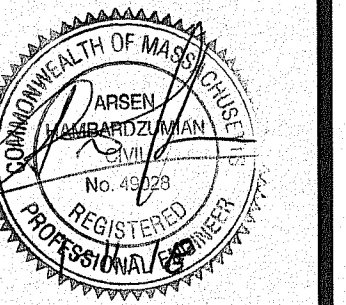
Mt. Feake Cemetery  
Expansion Project  
Waltham, MA

Client

City of Waltham  
Consolidated Public Works  
165 Lexington Street  
Waltham, MA

No. Revision Date

Scale: As Noted  
Date: 4/12/16

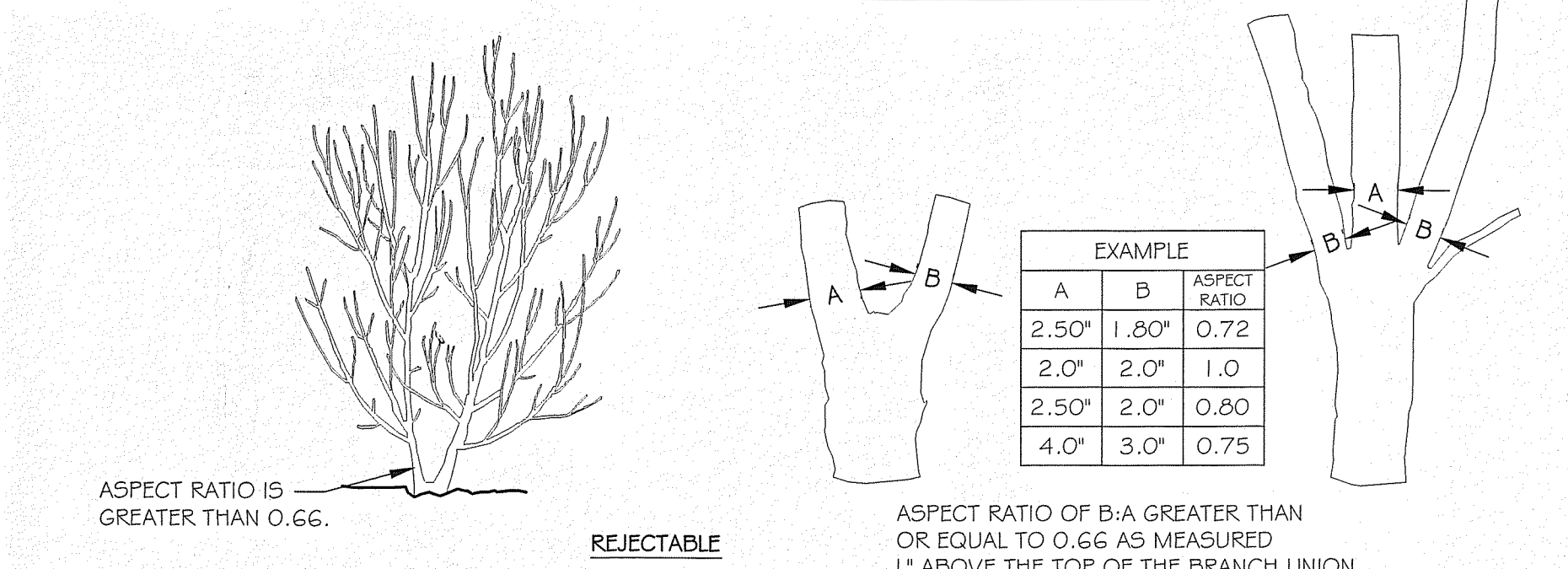
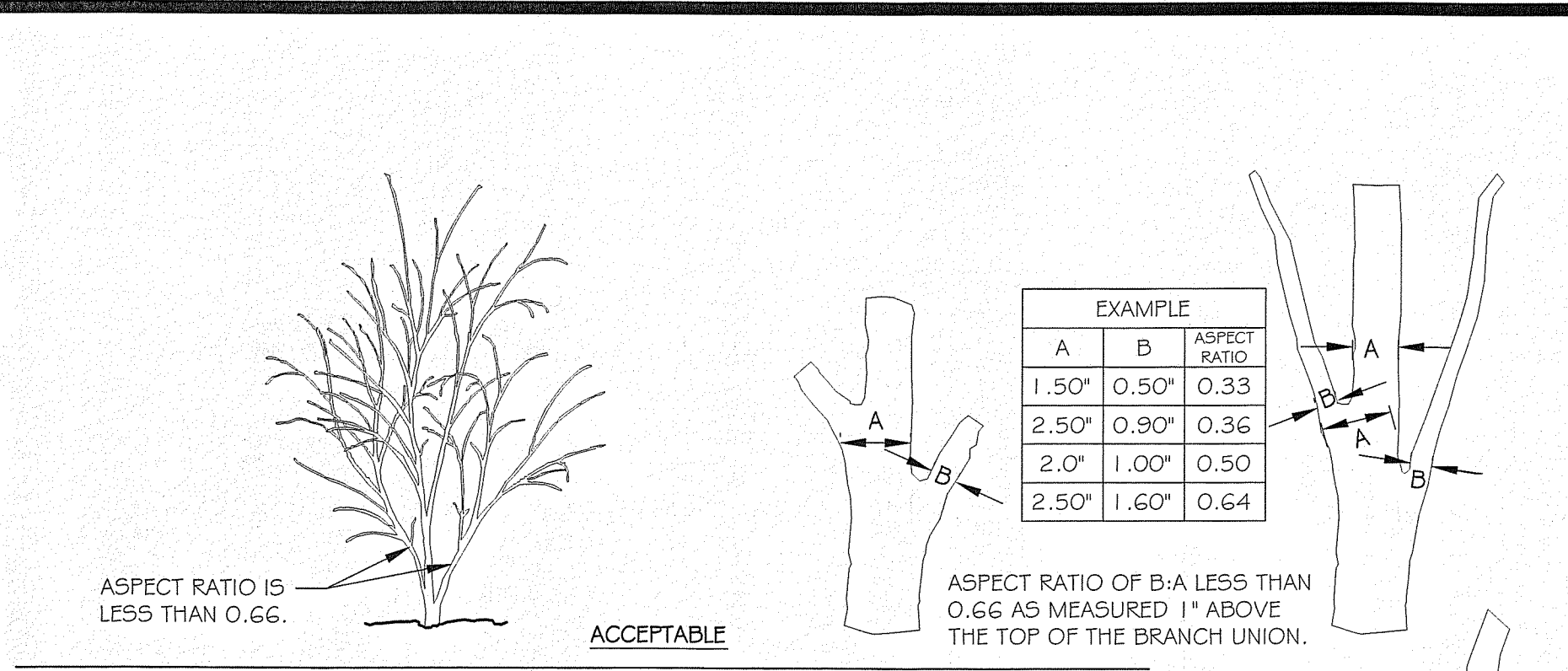


BID SET

PLANTING  
DETAILS  
1 OF 2

L-2

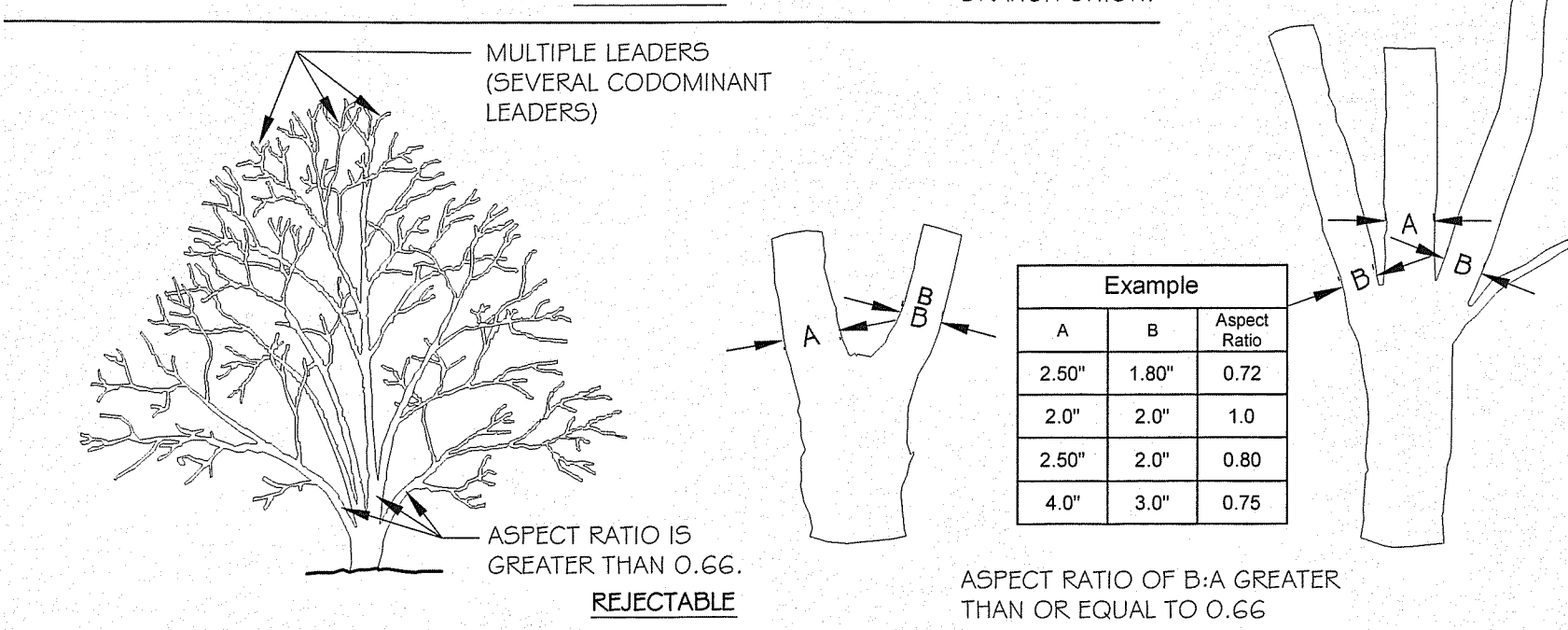
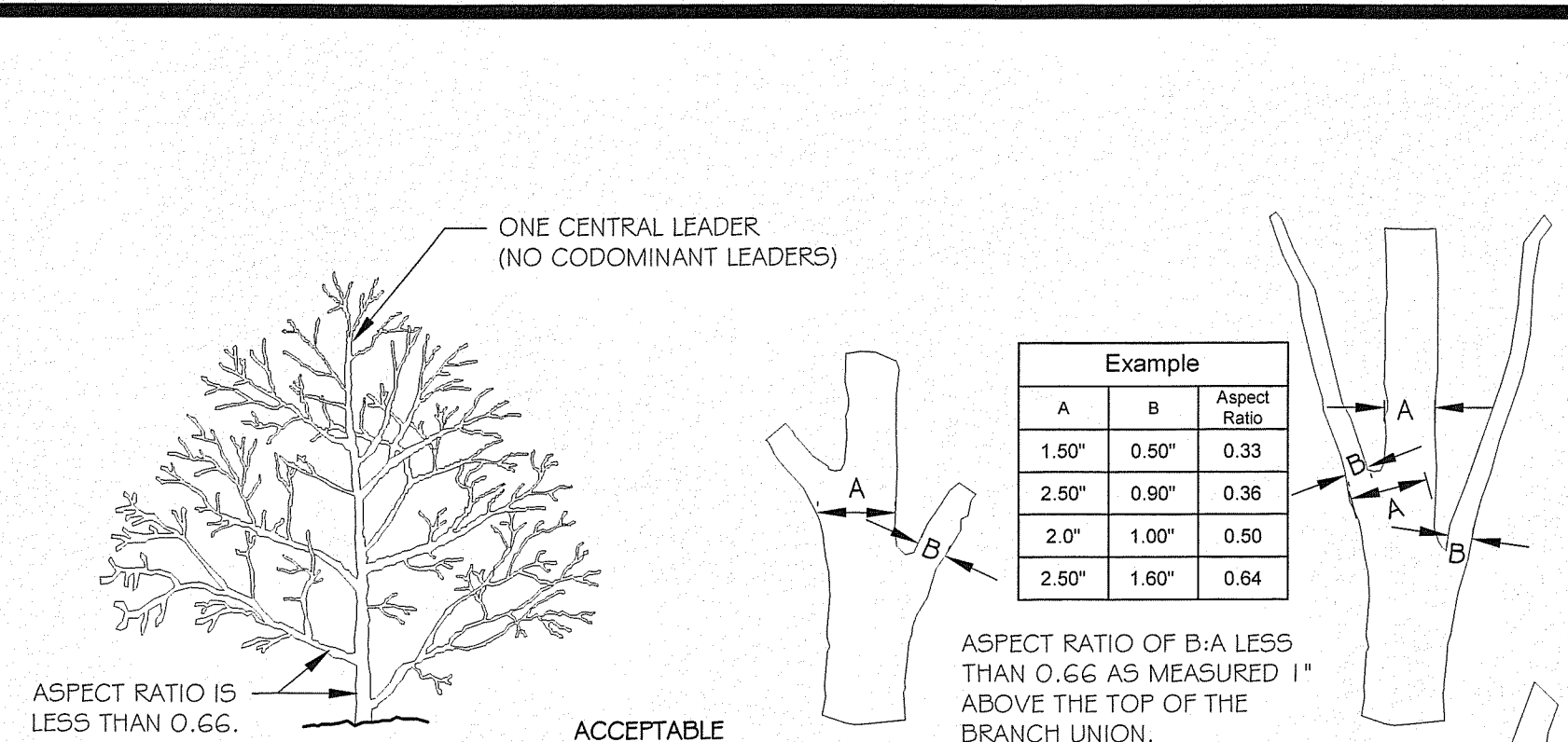




- NOTES:
- ASPECT RATIO SHALL BE LESS THAN 0.66 ON ALL BRANCH UNIONS. ASPECT RATIO IS THE DIAMETER OF BRANCH (B) DIVIDED BY THE DIAMETER OF THE TRUNK (A) AS MEASURED 1" ABOVE THE TOP OF THE BRANCH UNION.
  - ANY TREE NOT MEETING THE CROWN OBSERVATIONS DETAIL MAY BE REJECTED.

#### CROWN OBSERVATION DETAIL - MULTI

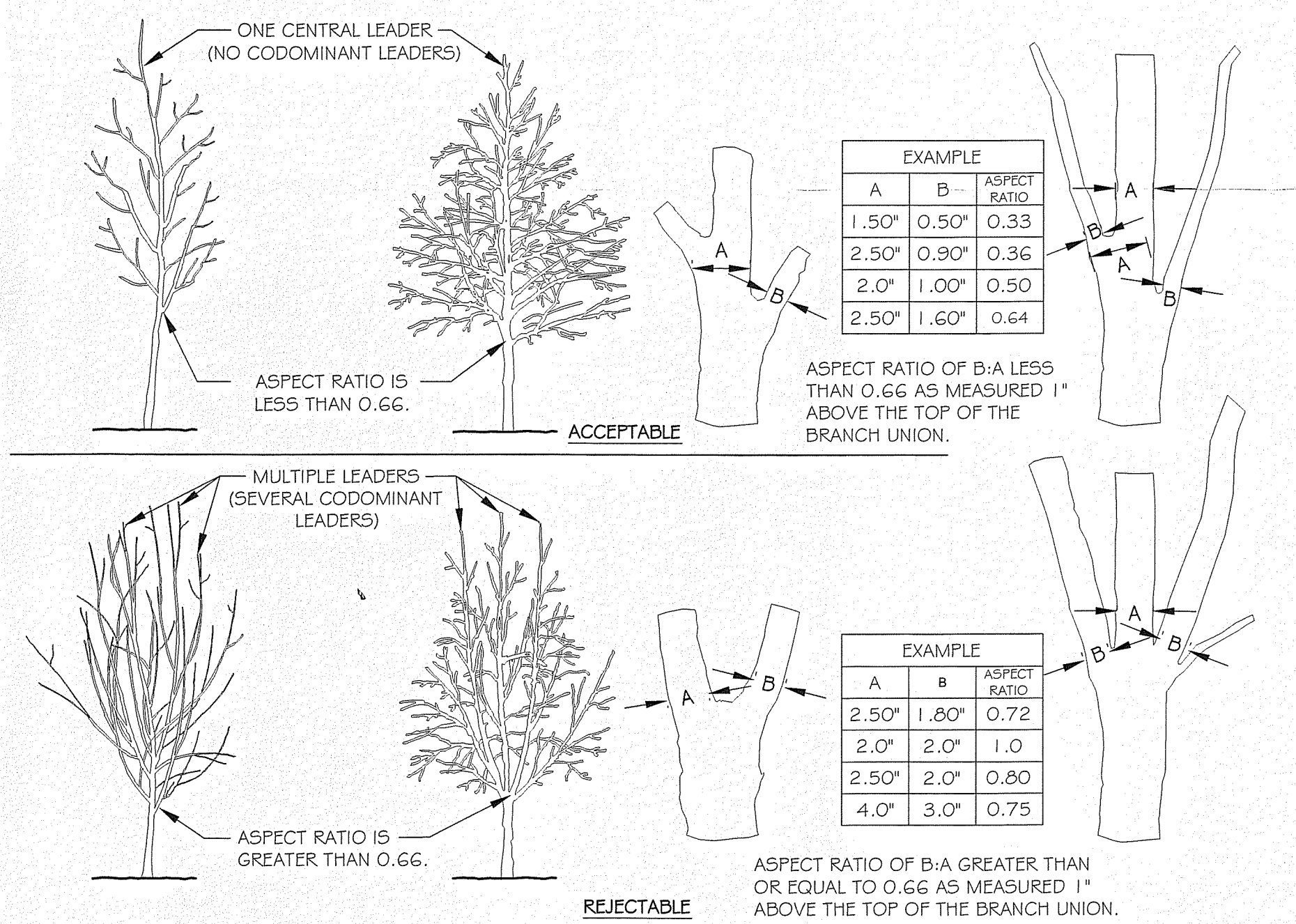
N.T.S.



- NOTES:
- ASPECT RATIO SHALL BE LESS THAN 0.66 ON ALL BRANCH UNIONS. ASPECT RATIO IS THE DIAMETER OF BRANCH (B) DIVIDED BY THE DIAMETER OF THE TRUNK (A) AS MEASURED 1" ABOVE THE TOP OF THE BRANCH UNION.
  - ANY TREE NOT MEETING THE CROWN OBSERVATIONS DETAIL MAY BE REJECTED.

#### CROWN OBSERVATION - LOW BRANCHES

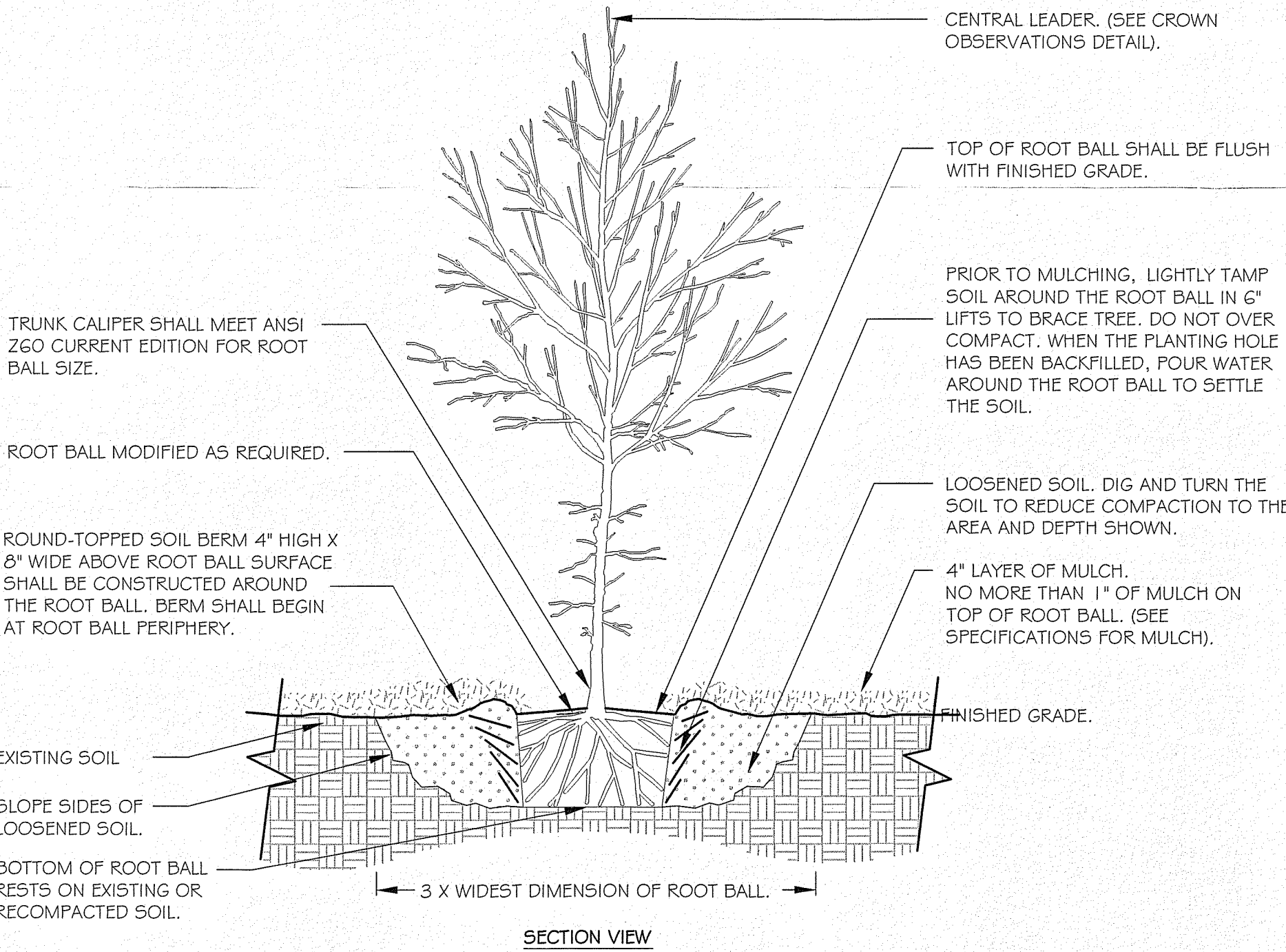
N.T.S.



- NOTES:
- ASPECT RATIO SHALL BE LESS THAN 0.66 ON ALL BRANCH UNIONS. ASPECT RATIO IS THE DIAMETER OF BRANCH (B) DIVIDED BY THE DIAMETER OF THE TRUNK (A) AS MEASURED 1" ABOVE THE TOP OF THE BRANCH UNION.
  - ANY TREE NOT MEETING THE CROWN OBSERVATIONS DETAIL MAY BE REJECTED.

#### CROWN OBSERVATIONS - HIGH BRANCHES

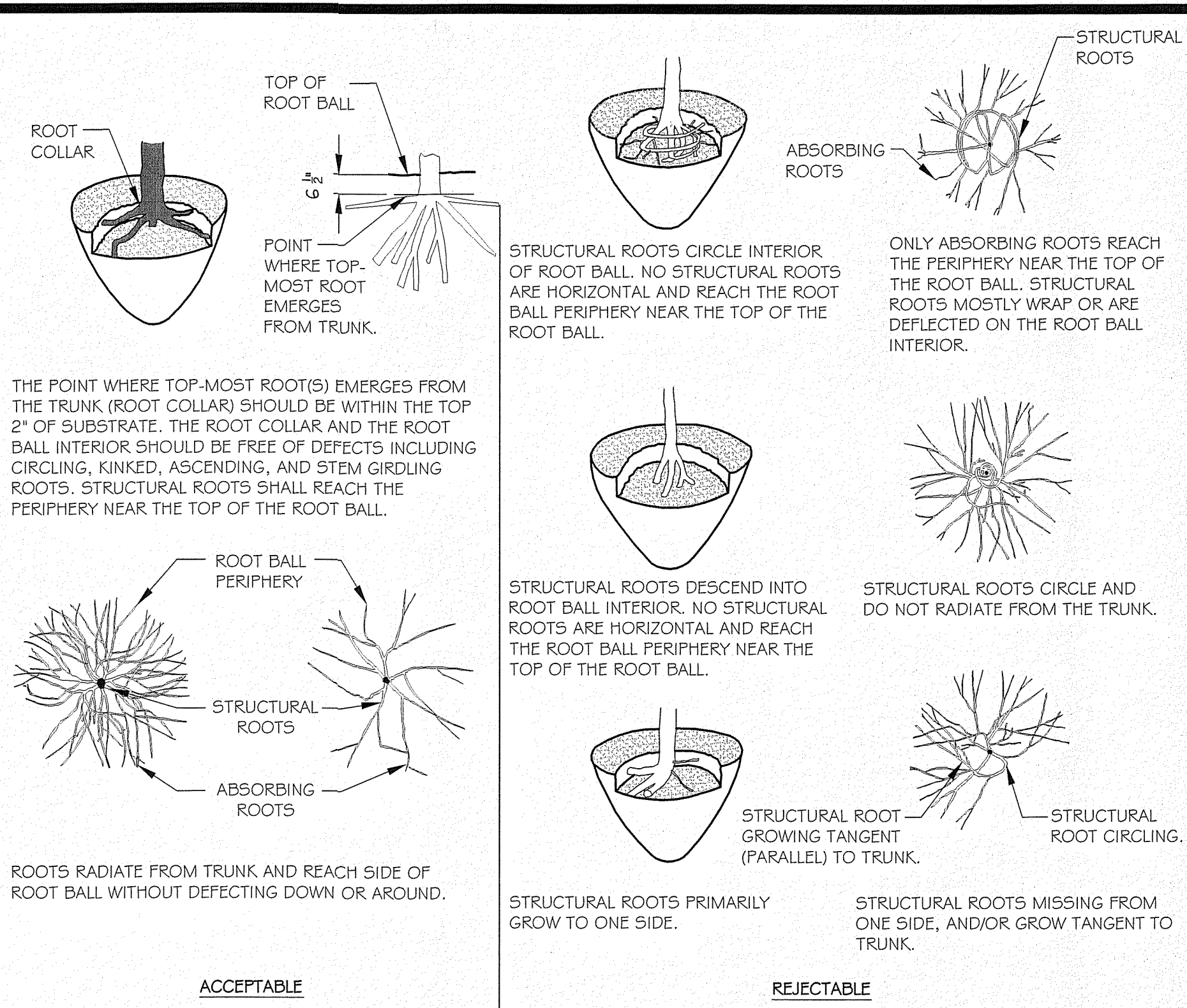
N.T.S.



- NOTES:
- TREES SHALL BE OF QUALITY PRESCRIBED IN CROWN OBSERVATIONS AND ROOT OBSERVATIONS DETAILS AND SPECIFICATIONS.
  - SEE SPECIFICATIONS FOR FURTHER REQUIREMENTS RELATED TO THIS DETAIL.

#### TREE WITH BERM (EXISTING SOILS NOT MODIFIED)

N.T.S.



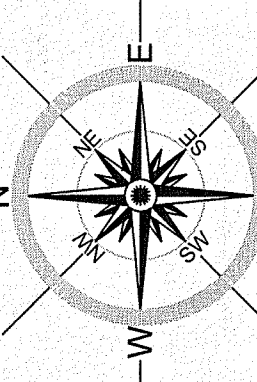
- NOTES:
- OBSERVATIONS OF ROOTS SHALL OCCUR PRIOR TO ACCEPTANCE. ROOTS AND SOIL MAY BE REMOVED DURING THE OBSERVATION PROCESS; SUBSTRATE/SOIL SHALL BE REPLACED AFTER THE OBSERVATIONS HAVE BEEN COMPLETED.
  - SEE SPECIFICATIONS FOR OBSERVATION PROCESS AND REQUIREMENTS.

#### ROOT OBSERVATION DETAIL - BALLED AND BURLAPPED

N.T.S.

NESRA  
ENGINEERING, LLC

P.O. BOX 533  
EAST TAUNTON, MA 02718  
(617) 506-3772  
WWW.NESRAENG.COM



Project

Mt. Feake Cemetery  
Expansion Project  
Waltham, MA

Client

City of Waltham  
Consolidated Public Works  
165 Lexington Street  
Waltham, MA

No. Revision Date

Scale: As Noted  
Date: 4/12/16

BID SET

PLANTING  
DETAILS  
2 OF 2

L-3



## **REPORTS**



Commonwealth of Massachusetts  
Executive Office of Energy & Environmental Affairs

## Department of Environmental Protection

Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

Charles D. Baker  
Governor

Karyn E. Polito  
Lieutenant Governor

Matthew A. Beaton  
Secretary

Martin Suuberg  
Commissioner

JUN 07 2017

Michael Chiasson  
City of Waltham  
Consolidated Public Works  
165 Lexington Street  
Waltham, MA 02452

Re: WETLANDS/WALTHAM  
DEP File # 316-0715  
203 Prospect Street  
**Superseding Order of Conditions**

Dear Mr. Chiasson:

Following an in-depth review of the file referenced above, and in accordance with Massachusetts General Laws, Chapter 131, Section 40, the Northeast Regional Office of the Massachusetts Department of Environmental Protection, Wetlands Program (MassDEP), is issuing the enclosed Superseding Order of Conditions (SOC) allowing the project based upon: 1) information and plans submitted; 2) information gathered during the August 4, 2016 site inspection; and 3) reasons MassDEP has deemed necessary to protect the statutory interests identified in the Wetlands Protection Act (WPA).

The project proposal is for the expansion of Mt. Feake Cemetery that includes the construction of bituminous concrete access roads, burial plots, landscaping improvements and stormwater Best Management Practices (BMPs).

MassDEP's review of the file and site inspection confirms that the project site contains the following resource area subject to protection under the WPA: Riverfront Area (RA) of the Charles River.

The Waltham Conservation Commission (WCC) issued an Order of Conditions (OOC) on June 27, 2016, approving the project. MassDEP appealed the OOC on July 8, 2016 based on its opinion that the project did not meet the performance standards for RA pursuant to 310 CMR 10.58(4)(d). The NOI proposal approved by the WCC allowed the development of approximately 54,362 square feet within the inner riparian area, most of which is forested, and 82,350 square feet within the outer riparian area which, altogether, is approximately 9.35% of the total RA on the cemetery property. The performance standards for RA pursuant to 310 CMR 10.58(4)(d) state in part "...Within 200 foot riverfront areas, the issuing authority may allow the

This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-5751.

TTY# MassRelay Service 1-800-439-2370

MassDEP Website: [www.mass.gov/dep](http://www.mass.gov/dep)

Printed on Recycled Paper

**Waltham, Mt Feake Cemetery**  
**DEP File # 316-0715**  
**Superseding Order of Conditions**  
**Page 2**

*alteration of up to 5000 square feet or 10% of the riverfront area within the lot, whichever is greater on a lot recorded on or before October 6, 1997...provided that :*

- a. *At a minimum, a 100 foot wide area of undisturbed vegetation is provided."*

According to the applicant, the cemetery lot was created prior to August 1, 1996 which entitles the project to alter up to 10% of the total riverfront area on the site. In this case, the applicant has met the allowable amount of alteration but did not provide a 100-foot wide area of undisturbed vegetation in the inner riparian zone. It is for this reason that MassDEP appealed the WCC's OOC.

A site visit was held by MassDEP on August 4, 2016 and was attended by representatives of the cemetery and the WCC. The site inspection showed that the topography of the inner riparian RA slopes steeply to the Charles River and is generally well vegetated with mature trees with the exception of a small area that has been degraded. The outer riparian RA has a fairly flat topography and much of it has been previously disturbed and degraded with pavement, stockpiles of fill and top soil removal.

At the site visit, MassDEP requested that the applicant revise the plan, moving the proposed activities outside the vegetated area of the inner 100-foot riparian zone. The applicant revised the plan complying with MassDEP's request. The total RA on the cemetery property is approximately 1.462 million square feet. The revised project will alter 6.3% of the total RA. Approximately 9,400 square feet of the degraded inner riparian will be developed for grave sites with topsoil, grass and trees placed among and around the burial sites. Approximately 82,000 square feet of the outer riparian will be developed. It is MassDEP's opinion that the proposed project now complies with the Riverfront regulations.

MassDEP, in a letter dated December 12, 2016, requested additional information on the stormwater system including a soil test pit to be dug at the infiltration basin site to provide soil logs and determine the estimated seasonal high water table elevation for stormwater infiltration. The applicant submitted the information and revised plan on February 13, 2017. A final revised plan for erosion controls and the limit of work, dated April 24, 2017, was submitted to MassDEP. The revised stormwater system consists of grass swales leading to a forebay and then into an infiltration basin. It is MassDEP's opinion that the system meets the Stormwater Standards.

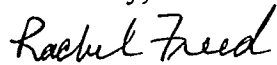
Based on the record, information provided by the applicant, information gathered at the site visit and consideration of all issues raised through the appeal, it is MassDEP's opinion that the project as currently proposed and conditioned in the attached SOC is permissible and serves to protect the interest of the Wetlands Protection Act and Regulations. Please be advised that the MassDEP reserves the right, should there be further proceedings in this matter, to raise additional issues and present further evidence as may be appropriate.



**Waltham, Mt Feake Cemetery**  
**DEP File # 316-0715**  
**Superseding Order of Conditions**  
**Page 3**

If you have any questions concerning this Superseding Order, please contact Gary Bogue at 978-694-3372.

Sincerely,

A handwritten signature in cursive script that reads "Rachel Freed".

Rachel Freed, Deputy Regional Director  
Bureau of Water Resources, NERO

cc: Arsen Hambardzumian, Nesra Engineering, LLC, 40 Tyashk Street, E. Taunton, MA  
02718  
City of Waltham Conservation Commission, 119 School Street, Waltham, MA 02451



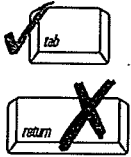
Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands  
**WPA Form 5 – Superseding Order of Conditions**  
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File Number:

316-0715

## A. General Information

**Important:**  
When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. From: Northeast  
Regional Office of the Department of Environmental Protection (MassDEP)
2. This issuance is for (check one): a. ☒ Superseding Order of Conditions b. ☐ Amended Order of Conditions
3. To: Applicant:
- |  |                 |
|--|-----------------|
| <u>Michael</u>                                   | <u>Chiasson</u> |
| a. First Name                                    | b. Last Name    |
| <u>City of Waltham Consolidated Public Works</u> |                 |
| c. Organization                                  |                 |
| <u>165 Lexington Street</u>                      |                 |
| d. Mailing Address                               |                 |
| <u>Waltham</u>                                   | <u>MA</u>       |
| e. City/Town                                     | f. State        |
|  | <u>02452</u>    |
|  | g. Zip Code     |
4. Property Owner (if different from applicant):
- |                    |              |
|--------------------|--------------|
| <u></u>            | <u></u>      |
| a. First Name      | b. Last Name |
| <u></u>            |              |
| c. Organization    |              |
| <u></u>            |              |
| d. Mailing Address |              |
| <u></u>            | <u></u>      |
| e. City/Town       | f. State     |
|                    | g. Zip Code  |
5. Project Location:
- |  |                      |
|--|----------------------|
| <u>203 Prospect Street</u>               | <u>Waltham</u>       |
| a. Street Address                        | b. City/Town         |
| <u>R075</u>                              | <u>004/0001</u>      |
| c. Assessors Map/Plat Number             | d. Parcel/Lot Number |
| <u>Latitude and Longitude, if known:</u> | <u>42d36m20s</u>     |
|  | e. Latitude          |
|  | <u>71d25m26s</u>     |
|  | f. Longitude         |
6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):
- |                        |  |
|------------------------|--|
| <u>Middlesex South</u> | <u></u>                                    |
| a. County              | b. Certificate Number (if registered land) |
| <u></u>                | <u></u>                                    |
| c. Book                | d. Page                                    |
7. Dates: 04/13/2016 06/23/2016
- |                                |                               |                         |
|--------------------------------|-------------------------------|-------------------------|
| a. Date Notice of Intent Filed | b. Date Public Hearing Closed | c. Date of OOC Issuance |
|--------------------------------|-------------------------------|-------------------------|
8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):
- Mt Feake Cemetery Expansion Project
- |                                      |                                |
|--------------------------------------|--------------------------------|
| <u></u>                              | <u></u>                        |
| a. Plan Title                        | b. Prepared By                 |
| <u>Nesra Engineering, LLC</u>        | <u>Arsen Hambardzumian, PE</u> |
| <u>April 24, 2017</u>                | <u>1:40</u>                    |
| d. Final Revision Date               | e. Scale                       |
| <u></u>                              | <u></u>                        |
| f. Additional Plan or Document Title | g. Date                        |



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands  
**WPA Form 5 – Superseding Order of Conditions**  
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File Number:

316-0715

## B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act. Check all that apply:

- |   |  |   |
|---|--|---|
| a. <input checked="" type="checkbox"/> Public Water Supply  | b. <input type="checkbox"/> Land Containing Shellfish          | c. <input checked="" type="checkbox"/> Prevention of Pollution        |
| d. <input checked="" type="checkbox"/> Private Water Supply | e. <input checked="" type="checkbox"/> Fisheries               | f. <input checked="" type="checkbox"/> Protection of Wildlife Habitat |
| g. <input checked="" type="checkbox"/> Groundwater Supply   | h. <input checked="" type="checkbox"/> Storm Damage Prevention | i. <input checked="" type="checkbox"/> Flood Control                  |

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

**Approved** subject to:

- a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

**Denied** because:

- b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect these interests, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**
- c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

**Inland Resource Area Impacts:** Check all that apply below. (For Approvals Only)

3. ☐ Buffer Zone Impacts: Shortest distance between limit of project disturbance and wetland boundary (if available)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. <input type="checkbox"/> Bank	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5. <input type="checkbox"/> Bordering Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6. <input type="checkbox"/> Land Under Waterbodies and Waterways	a. square feet	b. square feet	c. square feet	d. square feet
	e. c/y dredged	f. c/y dredged		



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands  
**WPA Form 5 – Superseding Order of Conditions**  
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File Number:

316-0715

**B. Findings (cont.)**

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
7. <input type="checkbox"/> Bordering Land Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. <input type="checkbox"/> Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. <input checked="" type="checkbox"/> Riverfront area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	9,400	9,400		
Sq ft between 100-200 ft	c. square feet	d. square feet	e. square feet	f. square feet
	82,000	82,000		
	g. square feet	h. square feet	i. square feet	j. square feet

**Coastal Resource Area Impacts:** Check all that apply below. (For Approvals Only)

10. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. <input type="checkbox"/> Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. <input type="checkbox"/> Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. <input type="checkbox"/> Coastal Beaches	a. square feet	b. square feet	c. c/y nourishmt.	d. c/y nourishmt.
14. <input type="checkbox"/> Coastal Dunes	a. square feet	b. square feet	c. c/y nourishmt.	d. c/y nourishmt.
15. <input type="checkbox"/> Coastal Banks	a. linear feet	b. linear feet		
16. <input type="checkbox"/> Rocky Intertidal Shores	a. square feet	b. square feet		
17. <input type="checkbox"/> Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18. <input type="checkbox"/> Land Under Salt Ponds	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
19. <input type="checkbox"/> Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	a. c/y dredged	b. c/y dredged		
21. <input type="checkbox"/> Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		



**Massachusetts Department of Environmental Protection**  
Bureau of Resource Protection - Wetlands  
**WPA Form 5 – Superseding Order of Conditions**  
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File Number:

316-0715

---

**C. General Conditions Under Massachusetts Wetlands Protection Act**

(only applicable to approved projects)

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
  - a. the work is a maintenance dredging project as provided for in the Act; or
  - b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
7. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.
8. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to this Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.
9. A sign shall be displayed at the site not less than two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]

"File Number 316-0715"



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands  
**WPA Form 5 – Superseding Order of Conditions**  
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File Number:

316-0715

---

**C. General Conditions Under Massachusetts Wetlands Protection Act**

10. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.
11. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.
12. The work shall conform to the plans and special conditions referenced in this order.
13. Any change to the plans identified in Condition #12 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.
14. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.
15. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.
16. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.
17. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

**NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS**

18. **The work associated with this Order (the "Project") is (1) ☒ is not (2) ☐ subject to the Massachusetts Stormwater Standards. If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:**
  - a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.



**Massachusetts Department of Environmental Protection**  
Bureau of Resource Protection - Wetlands  
**WPA Form 5 – Superseding Order of Conditions**  
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File Number:

316-0715

---

**C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)**

- b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
- i.* all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
  - ii.* as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
  - iii.* any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;
  - iv.* all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;
  - v.* any vegetation associated with post-construction BMPs is suitably established to withstand erosion.
- c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement") for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMPs Operation and Maintenance Plan ("O&M Plan") and certifying the following: *i.*) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and *ii.*) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.
- d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.
- e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, and acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.
- f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands  
**WPA Form 5 – Superseding Order of Conditions**  
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File Number:

316-0715

---

**C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)**

- g) The responsible party shall:
    - 1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
    - 2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
    - 3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.
  - h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.
  - i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.
  - j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.
  - k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.
  - l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.
- ☒ **SOC** Special Conditions for additional conditions numbered **19 Through 41** .

Brief Project Description: Expansion of cemetery that includes construction of paved roadways ,landscaping, grave sites and stormwater BMPs.

---



---

## D. Findings Under Municipal Wetlands Bylaw or Ordinance

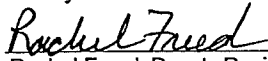
To the extent that the Order is based on a municipal bylaw or ordinance, and not on the Massachusetts Wetlands Protection Act or regulations, the MassDEP has no jurisdiction to supersede the local bylaw order.

---

## E. Issuance

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

Issued by the Massachusetts Department of Environmental Protection:



Rachel Freed, Deputy Regional Director, BWR

Date

JUN 07 2017

This Order is issued to the applicant as follows:

☐ by hand delivery on

Date

☒ by certified mail, return receipt requested, on

Date

JUN 07 2017



Commonwealth of Massachusetts  
Executive Office of Energy & Environmental Affairs

## Department of Environmental Protection

Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

Charles D. Baker  
Governor

Karyn E. Polito  
Lieutenant Governor

Matthew A. Beaton  
Secretary

Martin Suuberg  
Commissioner

JUN 07 2017

Michael Chiasson  
City of Waltham  
Consolidated Public Works  
165 Lexington Street  
Waltham, MA 02452

Re: WETLANDS/WALTHAM  
DEP File # 316-0715  
203 Prospect Street  
**Superseding Order of Conditions**

Dear Mr. Chiasson:

Following an in-depth review of the file referenced above, and in accordance with Massachusetts General Laws, Chapter 131, Section 40, the Northeast Regional Office of the Massachusetts Department of Environmental Protection, Wetlands Program (MassDEP), is issuing the enclosed Superseding Order of Conditions (SOC) allowing the project based upon: 1) information and plans submitted; 2) information gathered during the August 4, 2016 site inspection; and 3) reasons MassDEP has deemed necessary to protect the statutory interests identified in the Wetlands Protection Act (WPA).

The project proposal is for the expansion of Mt. Feake Cemetery that includes the construction of bituminous concrete access roads, burial plots, landscaping improvements and stormwater Best Management Practices (BMPs).

MassDEP's review of the file and site inspection confirms that the project site contains the following resource area subject to protection under the WPA: Riverfront Area (RA) of the Charles River.

The Waltham Conservation Commission (WCC) issued an Order of Conditions (OOC) on June 27, 2016, approving the project. MassDEP appealed the OOC on July 8, 2016 based on its opinion that the project did not meet the performance standards for RA pursuant to 310 CMR 10.58(4)(d). The NOI proposal approved by the WCC allowed the development of approximately 54,362 square feet within the inner riparian area, most of which is forested, and 82,350 square feet within the outer riparian area which, altogether, is approximately 9.35% of the total RA on the cemetery property. The performance standards for RA pursuant to 310 CMR 10.58(4)(d) state in part "...*Within 200 foot riverfront areas, the issuing authority may allow the*

This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-5751.

TTY# MassRelay Service 1-800-439-2370

MassDEP Website: [www.mass.gov/dep](http://www.mass.gov/dep)

Printed on Recycled Paper

**Waltham, Mt Feake Cemetery**  
**DEP File # 316-0715**  
**Superseding Order of Conditions**  
**Page 2**

*alteration of up to 5000 square feet or 10% of the riverfront area within the lot, whichever is greater on a lot recorded on or before October 6, 1997...provided that :*

- a. At a minimum, a 100 foot wide area of undisturbed vegetation is provided."*

According to the applicant, the cemetery lot was created prior to August 1, 1996 which entitles the project to alter up to 10% of the total riverfront area on the site. In this case, the applicant has met the allowable amount of alteration but did not provide a 100-foot wide area of undisturbed vegetation in the inner riparian zone. It is for this reason that MassDEP appealed the WCC's OOC.

A site visit was held by MassDEP on August 4, 2016 and was attended by representatives of the cemetery and the WCC. The site inspection showed that the topography of the inner riparian RA slopes steeply to the Charles River and is generally well vegetated with mature trees with the exception of a small area that has been degraded. The outer riparian RA has a fairly flat topography and much of it has been previously disturbed and degraded with pavement, stockpiles of fill and top soil removal.

At the site visit, MassDEP requested that the applicant revise the plan, moving the proposed activities outside the vegetated area of the inner 100-foot riparian zone. The applicant revised the plan complying with MassDEP's request. The total RA on the cemetery property is approximately 1.462 million square feet. The revised project will alter 6.3% of the total RA. Approximately 9,400 square feet of the degraded inner riparian will be developed for grave sites with topsoil, grass and trees placed among and around the burial sites. Approximately 82,000 square feet of the outer riparian will be developed. It is MassDEP's opinion that the proposed project now complies with the Riverfront regulations.

MassDEP, in a letter dated December 12, 2016, requested additional information on the stormwater system including a soil test pit to be dug at the infiltration basin site to provide soil logs and determine the estimated seasonal high water table elevation for stormwater infiltration. The applicant submitted the information and revised plan on February 13, 2017. A final revised plan for erosion controls and the limit of work, dated April 24, 2017, was submitted to MassDEP. The revised stormwater system consists of grass swales leading to a forebay and then into an infiltration basin. It is MassDEP's opinion that the system meets the Stormwater Standards.

Based on the record, information provided by the applicant, information gathered at the site visit and consideration of all issues raised through the appeal, it is MassDEP's opinion that the project as currently proposed and conditioned in the attached SOC is permissible and serves to protect the interest of the Wetlands Protection Act and Regulations. Please be advised that the MassDEP reserves the right, should there be further proceedings in this matter, to raise additional issues and present further evidence as may be appropriate.

**Waltham, Mt Feake Cemetery**  
**DEP File # 316-0715**  
**Superseding Order of Conditions**  
**Page 3**

If you have any questions concerning this Superseding Order, please contact Gary Bogue at 978-694-3372.

Sincerely,

*Rachel Freed*

Rachel Freed, Deputy Regional Director  
Bureau of Water Resources, NERO

cc: Arsen Hambarzumian, Nesra Engineering, LLC, 40 Tyashk Street, E. Taunton, MA  
02718  
City of Waltham Conservation Commission, 119 School Street, Waltham, MA 02451



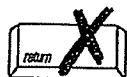
Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands  
**WPA Form 5 – Superseding Order of Conditions**  
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File Number:

316-0715

**A. General Information**

**Important:**  
When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. From: Northeast  
Regional Office of the Department of Environmental Protection (MassDEP)
2. This issuance is for (check one): a. ☒ Superseding Order of Conditions b. ☐ Amended Order of Conditions

3. To: Applicant:

Michael

Chiasson

a. First Name

b. Last Name

City of Waltham Consolidated Public Works

c. Organization

165 Lexington Street

d. Mailing Address

Waltham

MA

02452

e. City/Town

f. State

g. Zip Code

4. Property Owner (if different from applicant):

c. Organization

5. Project Location:

203 Prospect Street

a. Street Address

Waltham

b. City/Town

R075

c. Assessors Map/Plat Number

004/0001

d. Parcel/Lot Number

Latitude and Longitude, if known:

42d36m20s

e. Latitude

71d25m26s

f. Longitude

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

Middlesex South

a. County

b. Certificate Number (if registered land)

d. Page

7. Dates: 04/13/2016

a. Date Notice of Intent Filed

b. Date Public Hearing Closed

06/23/2016

c. Date of OOC Issuance

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):

Mt Feake Cemetery Expansion Project

a. Plan Title

Nesra Engineering, LLC

b. Prepared By

Arsen Hambardzumian, PE

c. Signed and Stamped by

April 24, 2017

1:40

d. Final Revision Date

e. Scale

f. Additional Plan or Document Title

g. Date



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands

**WPA Form 5 – Superseding Order of Conditions**

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File Number:

316-0715

## B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act. Check all that apply:

- a. ☒ Public Water Supply      b. ☐ Land Containing Shellfish      c. ☒ Prevention of Pollution  
d. ☒ Private Water Supply      e. ☒ Fisheries      f. ☒ Protection of Wildlife Habitat  
g. ☒ Groundwater Supply      h. ☒ Storm Damage Prevention      i. ☒ Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

**Approved** subject to:

- a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

**Denied** because:

- b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect these interests, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**
- c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

**Inland Resource Area Impacts:** Check all that apply below. (For Approvals Only)

3. ☐ Buffer Zone Impacts: Shortest distance between limit of project disturbance and wetland boundary (if available)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. <input type="checkbox"/> Bank	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5. <input type="checkbox"/> Bordering Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6. <input type="checkbox"/> Land Under Waterbodies and Waterways	a. square feet e. c/y dredged	b. square feet f. c/y dredged	c. square feet	d. square feet



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands  
**WPA Form 5 – Superseding Order of Conditions**  
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File Number:

316-0715

**B. Findings (cont.)**

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
7. <input type="checkbox"/> Bordering Land Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. <input type="checkbox"/> Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. <input checked="" type="checkbox"/> Riverfront area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	9,400	9,400		
Sq ft between 100-200 ft	c. square feet	d. square feet	e. square feet	f. square feet
	82,000	82,000		
	g. square feet	h. square feet	i. square feet	j. square feet

**Coastal Resource Area Impacts:** Check all that apply below. (For Approvals Only)

10. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. <input type="checkbox"/> Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. <input type="checkbox"/> Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. <input type="checkbox"/> Coastal Beaches	a. square feet	b. square feet	c. c/y nourishmt.	d. c/y nourishmt.
14. <input type="checkbox"/> Coastal Dunes	a. square feet	b. square feet	c. c/y nourishmt.	d. c/y nourishmt.
15. <input type="checkbox"/> Coastal Banks	a. linear feet	b. linear feet		
16. <input type="checkbox"/> Rocky Intertidal Shores	a. square feet	b. square feet		
17. <input type="checkbox"/> Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18. <input type="checkbox"/> Land Under Salt Ponds	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
19. <input type="checkbox"/> Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	a. c/y dredged	b. c/y dredged		
21. <input type="checkbox"/> Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands  
**WPA Form 5 – Superseding Order of Conditions**  
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File Number:

316-0715

---

**C. General Conditions Under Massachusetts Wetlands Protection Act**

(only applicable to approved projects)

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
  - a. the work is a maintenance dredging project as provided for in the Act; or
  - b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
7. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.
8. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to this Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.
9. A sign shall be displayed at the site not less than two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]

"File Number" 316-0715 "





Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands  
**WPA Form 5 – Superseding Order of Conditions**  
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File Number:

316-0715

**C. General Conditions Under Massachusetts Wetlands Protection Act**

10. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.
11. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.
12. The work shall conform to the plans and special conditions referenced in this order.
13. Any change to the plans identified in Condition #12 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.
14. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.
15. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.
16. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.
17. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

**NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS**

18. The work associated with this Order (the "Project") is (1) ☒ is not (2) ☐ subject to the Massachusetts Stormwater Standards. If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:
  - a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands  
**WPA Form 5 – Superseding Order of Conditions**  
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File Number:

316-0715

---

**C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)**

- b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
- i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
  - ii. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
  - iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;
  - iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;
  - v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.
- c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement") for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMPs Operation and Maintenance Plan ("O&M Plan") and certifying the following: i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.
- d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.
- e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, and acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.
- f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.



Massachusetts Department of Environmental Protection  
Bureau of Resource Protection - Wetlands  
**WPA Form 5 – Superseding Order of Conditions**  
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File Number:

316-0715

---

**C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)**

- g) The responsible party shall:
    - 1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
    - 2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
    - 3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.
  - h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.
  - i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.
  - j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.
  - k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.
  - l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.
- ☒ **SOC Special Conditions for additional conditions numbered 19 Through 41 .**

Brief Project Description: Expansion of cemetery that includes construction of paved roadways, landscaping, grave sites and stormwater BMPs.

---

---

## D. Findings Under Municipal Wetlands Bylaw or Ordinance

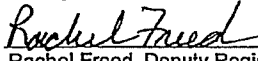
To the extent that the Order is based on a municipal bylaw or ordinance, and not on the Massachusetts Wetlands Protection Act or regulations, the MassDEP has no jurisdiction to supersede the local bylaw order.

---

## E. Issuance

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

Issued by the Massachusetts Department of Environmental Protection:



Rachel Freed, Deputy Regional Director, BWR

Date

JUN 07 2017

This Order is issued to the applicant as follows:

☐ by hand delivery on

Date

☒ by certified mail, return receipt requested, on

Date

JUN 07 2017

**SUPERSEDING ORDER OF CONDITIONS**  
**DEP File Number 316-0715**

**Special Conditions**

19. All work shall conform with the following plans, reports and Special Conditions:

Notice of Intent Application with attachments including Stormwater report: Location: 203 Prospect Street, Waltham, MA; Prepared for City of Waltham Consolidated Public Works; Prepared by Nesra Engineering, LLC, ; Date: April 13, 2016;

Plan entitled "Mt. Feake Cemetery Expansion Project Waltham MA" 10 sheets, dated April 12, 2016, last revised April 24, 2017. Prepared by Nesra Engineering, LLC., signed and stamped by Arsen Hambardzumian, RPE;

Stormwater Report including Operation & Maintenance Plan for 203 Prospect Street, Waltham, MA; Prepared by Nesra Engineering, LLC.; Date: April 13, 2016, last revised February 13, 2017;

Letter from NESRA Engineering, LLC, dated February 13, 2017, responding to a Request for Information by MassDEP, dated December 15, 2016.

**20. No work shall commence on-site until all appeal periods have elapsed and this Superseding Order of Conditions has been recorded with the Registry of Deeds and the MassDEP has been formally notified via the form provided at the end of this Order.**

21. A copy of this Superseding Order shall be included in all construction contracts and shall supersede any conflicting requirements.

22. Any proposed or executed change in the plans approved under this Superseding Order shall require the applicant to file a new Notice of Intent with the Conservation Commission or to inquire of the MassDEP in writing whether the change is substantial enough to require a new filing. A copy shall be sent at the same time to the Conservation Commission.

23. Prior to any earth-moving activities or clearing of vegetation, a row of filter fabric fencing and staked haybales or if applicable, coir logs or straw wattles, shall be installed upgradient of all resource areas along the limit of activity between areas to be disturbed and all downgradient wetlands, as shown on the referenced plan. These erosion controls shall indicate the limit of disturbance. There shall be no activity beyond the erosion control barrier.

24. An Environmental Monitor (EM) shall be designated and identified to MassDEP and the Commission, and will be responsible for insuring that erosion controls on the site are correctly installed and functional during the construction period until the site is stabilized. The EM shall be accessible to MassDEP and the Commission during off-work hours in case of emergencies. The applicant shall provide the name and contact information of the EM to MassDEP and the Conservation Commission prior to the start of work.

25. The applicant shall hold a **preconstruction meeting** at which time erosion controls will be inspected and the proposed construction sequence will be reviewed. At the time of this meeting, limit of work staking shall be in place. The applicant shall schedule the meeting with MassDEP and notify the Conservation Commission of the time and date of this meeting.

26. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited beyond the limit of work.

27. Soil or other materials may be stockpiled within the outer 100 feet of the Riverfront Area. Erosion controls such as waterproof covers or silt fence around the stockpile must be used to prevent erosion.

28. Excess soil, rock and debris excavated or generated during the course of this project shall be removed from the site and disposed of in a legal manner. Records as to the destination of all materials, including excess fill and loam, to be removed from the site shall be kept on file and shall be provided to MassDEP and the Commission upon request.

29. All disturbed slopes shall be 3:1 or flatter except where appropriate rip-rap, sod, erosion control blankets or retaining walls are planned, and all slopes not to be rip-rapped or paved shall be vegetated for stabilization (loamed and seeded).
30. At no time during or after construction shall fill or other materials be placed, slump into or fall beyond the limit of grading as shown on the plan. The applicant shall be responsible for inspecting and maintaining all slopes and shall immediately notify the MassDEP and the Conservation Commission if slumping, erosion or encroachment occurs.
31. The applicant shall immediately control any erosion problems that occur on the site and shall also immediately notify the MassDEP and the Commission. MassDEP reserves the right to require additional erosion and/or damage prevention controls it may deem necessary.
32. During construction, all paved roadways shall be swept monthly with a vacuum sweeper, except when they are covered with snow or ice.
33. Newly planted trees shall be watered as needed through the first planting season. Any trees that die shall be replaced.
34. Snow plowing and snow removal shall be performed in accordance with the MassDEP's Snow Disposal Guidance.
35. The contractor responsible for project completion shall be notified of, and understand the requirements of this Superseding Order. A copy of this Order shall be on-site while activities regulated by this Order are being performed.
36. If any unforeseen problems occur during construction, the applicant shall immediately notify MassDEP and the Waltham Conservation Commission, and the applicant shall propose corrective actions for approval by MassDEP. The applicant shall then immediately act to correct the problems using the corrective measures agreed upon.
37. The owners of the property shall be responsible for maintaining all stormwater drainage structures, including but not limited to catch basins, vegetated swales, forebay and infiltration basin and culverts and outlets located on the site. All structures and facilities shall be managed and maintained in accordance with the project's Operation and Maintenance Plan (dated February 13, 2017) and the conditions contained in this Superseding Order. **This Condition shall remain in effect in perpetuity and shall be recorded on the Certificate of Compliance.**
38. Upon completion of construction, all exposed soils shall be seeded with appropriate vegetation or otherwise stabilized by a method acceptable to the MassDEP.
39. Upon stabilization of the site, all erosion controls shall be removed. A Certificate of Compliance will not be issued until controls are removed.
40. This Order of Conditions supersedes all prior Orders under DEP File # 316-0715.
41. Upon completion of the project, the applicant shall request a Certificate of Compliance from MassDEP and shall submit the following information with the request:
  - a) A written statement by a professional engineer or land surveyor registered in the Commonwealth of Massachusetts certifying compliance with the approved plans referenced above and this Superseding Order of Conditions and setting forth deviations, if any exist.
  - b) An as-built site plan prepared by a registered land surveyor or registered professional engineer showing the location of the roadways, elevations, stormwater BMPs, landscaping and plantings, associated grading, limit of work line, and the delineated Riverfront Area.

---

## F. Appeals

The applicant, the landowner, any person aggrieved by the Superseding Order, Determination or other Reviewable Decision as defined at 310 CMR 10.04, who previously participated in the proceedings leading to this reviewable Decision, the conservation commission, or any ten (10) residents of the city or town where the land is located if at least one resident was previously a participant in the permit proceeding, are hereby notified of their right to appeal this Reviewable Decision pursuant to M.G.L. c.30A, section 10, provided the request is made by certified mail or hand delivery to the Department, along with the appropriate filing fee and a MassDEP Fee Transmittal Form within ten (10) business days of the date of issuance of this superseding Order or Determination, and addressed to:

Case Administrator  
Office of Appeals and Resolution  
Department of Environmental Protection  
One Winter Street, 2<sup>nd</sup> Floor  
Boston, MA 02108

A copy of the request (herein referred to as Appeal Notice) shall at the same time be sent by certified mail or hand delivery to the Conservation Commission, the applicant, the person that requested the Superseding Order or Determination, and the issuing office of the MassDEP at:

Mass. Department of Environmental Protection  
Northeast Regional Office  
Wetlands and Waterways Program  
205B Lowell Street  
Wilmington, MA 01887

In the event that a ten resident group requested the Superseding Order or Determination, the Appeal Notice shall be served on the designated representative of the ten resident group, whose name and contact information is included in this Reviewable Decision (when relevant).

### Contents of Appeal Notice

An Appeal Notice shall comply with the Department's Rules for Adjudicatory Proceedings, 310 CMR 1.01 (6) and 310 CMR 10.05 (7)(j), and shall contain the following information:

- (a) the MassDEP Wetlands File Number, name of the applicant, landowner if different from applicant and address of the project;
- (b) the complete name, mailing address, email address, and fax and telephone numbers of the party filing the Appeal Notice; If represented by consultant or counsel, the name, fax and telephone numbers, email address and mailing address of the representative; If a ten residents group, the same information for the group's designated representative.
- (c) If the Appeal Notice is filed by a ten (10) resident group, then a demonstration of participation by at least one resident in the previous proceedings that led to this Reviewable Decision;
- (d) If the Appeal Notice is filed by an aggrieved person, then a demonstration of participation in the previous proceedings that lead to this Reviewable Decision and sufficient written facts to demonstrate status as a person aggrieved;
- (e) The names, telephone and fax numbers, email addresses, and mailing addresses of all other interested parties, if known;
- (f) A clear and concise statement of the alleged errors contained in the Department's decision and how each alleged error is inconsistent with 310 CMR 10.00 and does not contribute to the protection of the interests identified in the Wetlands Protection Act, M.G.L. c. 131 sect 40, including reference to the statutory or regulatory provisions that the party filing the Appeal Notice alleges has been violated by the Department's decision, and the relief sought, including any specific desired changes to the Department's decision.

- (g) a copy of the Department's Reviewable Decision that is being appealed and a copy of the underlying Conservation commission decision if the Reviewable Decision affirms the Conservation Commission decision;
- (h) a statement that a copy of the request has been sent by certified mail or hand delivery to the applicant and conservation Commission;
- (i) If asserting a matter that is Major and Complex, as defined at 310 CMR 10.04 (1), a statement requesting that the Presiding Officer make a designation of Major and Complex, with specific reasons supporting the request.

Filing Fee and Address

A copy of the Appeal Notice along with a MassDEP Fee Transmittal Form and a valid check or money order payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100) must be mailed to:

Commonwealth of Massachusetts  
Department of Environmental Protection  
Commonwealth Master Lockbox  
P.O. Box 4062  
Boston, Massachusetts 02211

The request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver. The filing fee is not required if the appellant is a city or town (or municipal agency), county, district of the Commonwealth of Massachusetts, or a municipal housing authority. The Department may waive the adjudicatory hearing filing fee pursuant to 310 CMR 4.06 (2) for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file an affidavit setting forth the facts believed to support the claim of undue financial hardship together with the hearing request as provided above.



## G. Recording Information

This Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Northeast

Regional Office of the Department of Environmental Protection

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To: .

Northeast Regional Office, MassDEP, 205B Lowell Street, Wilmington, MA 01887

Regional Office of the Department of Environmental Protection

Please be advised that the Order of Conditions for the Project at:

203 Prospect Street, Waltham

Project Location

316-0715

MassDEP File Number

Has been recorded at the Registry of Deeds of:

County

Book

Page

for:

Property Owner

and has been noted in the chain of title of the affected property in:

Book

Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

# SUPERSEDING ORDER OF CONDITIONS

## DEP File Number 316-0715

### Special Conditions

19. All work shall conform with the following plans, reports and Special Conditions:

Notice of Intent Application with attachments including Stormwater report: Location: 203 Prospect Street, Waltham, MA; Prepared for City of Waltham Consolidated Public Works; Prepared by Nesra Engineering, LLC, ; Date: April 13, 2016;

Plan entitled "Mt. Feake Cemetery Expansion Project Waltham MA" 10 sheets, dated April 12, 2016, last revised April 24, 2017. Prepared by Nesra Engineering, LLC., signed and stamped by Arsen Hambardzumian, RPE;

Stormwater Report including Operation & Maintenance Plan for 203 Prospect Street, Waltham, MA; Prepared by Nesra Engineering, LLC.; Date: April 13, 2016, last revised February 13, 2017;

Letter from NESRA Engineering, LLC, dated February 13, 2017, responding to a Request for Information by MassDEP, dated December 15, 2016.

20. **No work shall commence on-site until all appeal periods have elapsed and this Superseding Order of Conditions has been recorded with the Registry of Deeds and the MassDEP has been formally notified via the form provided at the end of this Order.**
21. A copy of this Superseding Order shall be included in all construction contracts and shall supersede any conflicting requirements.
22. Any proposed or executed change in the plans approved under this Superseding Order shall require the applicant to file a new Notice of Intent with the Conservation Commission or to inquire of the MassDEP in writing whether the change is substantial enough to require a new filing. A copy shall be sent at the same time to the Conservation Commission.
23. Prior to any earth-moving activities or clearing of vegetation, a row of filter fabric fencing and staked haybales or if applicable, coir logs or straw wattles, shall be installed upgradient of all resource areas along the limit of activity between areas to be disturbed and all downgradient wetlands, as shown on the referenced plan. These erosion controls shall indicate the limit of disturbance. There shall be no activity beyond the erosion control barrier.
24. An Environmental Monitor (EM) shall be designated and identified to MassDEP and the Commission, and will be responsible for insuring that erosion controls on the site are correctly installed and functional during the construction period until the site is stabilized. The EM shall be accessible to MassDEP and the Commission during off-work hours in case of emergencies. The applicant shall provide the name and contact information of the EM to MassDEP and the Conservation Commission prior to the start of work.
25. The applicant shall hold a **preconstruction meeting** at which time erosion controls will be inspected and the proposed construction sequence will be reviewed. At the time of this meeting, limit of work staking shall be in place. The applicant shall schedule the meeting with MassDEP and notify the Conservation Commission of the time and date of this meeting.
26. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited beyond the limit of work.
27. Soil or other materials may be stockpiled within the outer 100 feet of the Riverfront Area. Erosion controls such as waterproof covers or silt fence around the stockpile must be used to prevent erosion.
28. Excess soil, rock and debris excavated or generated during the course of this project shall be removed from the site and disposed of in a legal manner. Records as to the destination of all materials, including excess fill and loam, to be removed from the site shall be kept on file and shall be provided to MassDEP and the Commission upon request.

29. All disturbed slopes shall be 3:1 or flatter except where appropriate rip-rap, sod, erosion control blankets or retaining walls are planned, and all slopes not to be rip-rapped or paved shall be vegetated for stabilization (loamed and seeded).
30. At no time during or after construction shall fill or other materials be placed, slump into or fall beyond the limit of grading as shown on the plan. The applicant shall be responsible for inspecting and maintaining all slopes and shall immediately notify the MassDEP and the Conservation Commission if slumping, erosion or encroachment occurs.
31. The applicant shall immediately control any erosion problems that occur on the site and shall also immediately notify the MassDEP and the Commission. MassDEP reserves the right to require additional erosion and/or damage prevention controls it may deem necessary.
32. During construction, all paved roadways shall be swept monthly with a vacuum sweeper, except when they are covered with snow or ice.
33. Newly planted trees shall be watered as needed through the first planting season. Any trees that die shall be replaced.
34. Snow plowing and snow removal shall be performed in accordance with the MassDEP's Snow Disposal Guidance.
35. The contractor responsible for project completion shall be notified of, and understand the requirements of this Superseding Order. A copy of this Order shall be on-site while activities regulated by this Order are being performed.
36. If any unforeseen problems occur during construction, the applicant shall immediately notify MassDEP and the Waltham Conservation Commission, and the applicant shall propose corrective actions for approval by MassDEP. The applicant shall then immediately act to correct the problems using the corrective measures agreed upon.
37. The owners of the property shall be responsible for maintaining all stormwater drainage structures, including but not limited to catch basins, vegetated swales, forebay and infiltration basin and culverts and outlets located on the site. All structures and facilities shall be managed and maintained in accordance with the project's Operation and Maintenance Plan (dated February 13, 2017) and the conditions contained in this Superseding Order. **This Condition shall remain in effect in perpetuity and shall be recorded on the Certificate of Compliance.**
38. Upon completion of construction, all exposed soils shall be seeded with appropriate vegetation or otherwise stabilized by a method acceptable to the MassDEP.
39. Upon stabilization of the site, all erosion controls shall be removed. A Certificate of Compliance will not be issued until controls are removed.
40. This Order of Conditions supersedes all prior Orders under DEP File # 316-0715.
41. Upon completion of the project, the applicant shall request a Certificate of Compliance from MassDEP and shall submit the following information with the request:
  - a) A written statement by a professional engineer or land surveyor registered in the Commonwealth of Massachusetts certifying compliance with the approved plans referenced above and this Superseding Order of Conditions and setting forth deviations, if any exist.
  - b) An as-built site plan prepared by a registered land surveyor or registered professional engineer showing the location of the roadways, elevations, stormwater BMPs, landscaping and plantings, associated grading, limit of work line, and the delineated Riverfront Area.

---

## F. Appeals

The applicant, the landowner, any person aggrieved by the Superseding Order, Determination or other Reviewable Decision as defined at 310 CMR 10.04, who previously participated in the proceedings leading to this reviewable Decision, the conservation commission, or any ten (10) residents of the city or town where the land is located if at least one resident was previously a participant in the permit proceeding, are hereby notified of their right to appeal this Reviewable Decision pursuant to M.G.L. c.30A, section 10, provided the request is made by certified mail or hand delivery to the Department, along with the appropriate filing fee and a MassDEP Fee Transmittal Form within ten (10) business days of the date of issuance of this superseding Order or Determination, and addressed to:

Case Administrator  
Office of Appeals and Resolution  
Department of Environmental Protection  
One Winter Street, 2<sup>nd</sup> Floor  
Boston, MA 02108

A copy of the request (herein referred to as Appeal Notice) shall at the same time be sent by certified mail or hand delivery to the Conservation Commission, the applicant, the person that requested the Superseding Order or Determination, and the issuing office of the MassDEP at:

Mass. Department of Environmental Protection  
Northeast Regional Office  
Wetlands and Waterways Program  
205B Lowell Street  
Wilmington, MA 01887

In the event that a ten resident group requested the Superseding Order or Determination, the Appeal Notice shall be served on the designated representative of the ten resident group, whose name and contact information is included in this Reviewable Decision (when relevant).

### Contents of Appeal Notice

An Appeal Notice shall comply with the Department's Rules for Adjudicatory Proceedings, 310 CMR 1.01 (6) and 310 CMR 10.05 (7)(i), and shall contain the following information:

- (a) the MassDEP Wetlands File Number, name of the applicant, landowner if different from applicant and address of the project;
- (b) the complete name, mailing address, email address, and fax and telephone numbers of the party filing the Appeal Notice; If represented by consultant or counsel, the name, fax and telephone numbers, email address and mailing address of the representative; If a ten residents group, the same information for the group's designated representative.
- (c) If the Appeal Notice is filed by a ten (10) resident group, then a demonstration of participation by at least one resident in the previous proceedings that led to this Reviewable Decision;
- (d) If the Appeal Notice is filed by an aggrieved person, then a demonstration of participation in the previous proceedings that lead to this Reviewable Decision and sufficient written facts to demonstrate status as a person aggrieved;
- (e) The names, telephone and fax numbers, email addresses, and mailing addresses of all other interested parties, if known;
- (f) A clear and concise statement of the alleged errors contained in the Department's decision and how each alleged error is inconsistent with 310 CMR 10.00 and does not contribute to the protection of the interests identified in the Wetlands Protection Act, M.G.L. c. 131 sect 40, including reference to the statutory or regulatory provisions that the party filing the Appeal Notice alleges has been violated by the Department's decision, and the relief sought, including any specific desired changes to the Department's decision.

- (g) a copy of the Department's Reviewable Decision that is being appealed and a copy of the underlying Conservation commission decision if the Reviewable Decision affirms the Conservation Commission decision;
- (h) a statement that a copy of the request has been sent by certified mail or hand delivery to the applicant and conservation Commission;
- (i) If asserting a matter that is Major and Complex, as defined at 310 CMR 10.04 (1), a statement requesting that the Presiding Officer make a designation of Major and Complex, with specific reasons supporting the request.

Filing Fee and Address

A copy of the Appeal Notice along with a MassDEP Fee Transmittal Form and a valid check or money order payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100) must be mailed to:

Commonwealth of Massachusetts  
Department of Environmental Protection  
Commonwealth Master Lockbox  
P.O. Box 4062  
Boston, Massachusetts 02211

The request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver. The filing fee is not required if the appellant is a city or town (or municipal agency), county, district of the Commonwealth of Massachusetts, or a municipal housing authority. The Department may waive the adjudicatory hearing filing fee pursuant to 310 CMR 4.06 (2) for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file an affidavit setting forth the facts believed to support the claim of undue financial hardship together with the hearing request as provided above.

## G. Recording Information

This Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Northeast

Regional Office of the Department of Environmental Protection

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Northeast Regional Office, MassDEP, 205B Lowell Street, Wilmington, MA 01887

Regional Office of the Department of Environmental Protection

Please be advised that the Order of Conditions for the Project at:

203 Prospect Street, Waltham

Project Location

316-0715

MassDEP File Number

Has been recorded at the Registry of Deeds of:

County

Book

Page

for:

Property Owner

and has been noted in the chain of title of the affected property in:

Book

Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

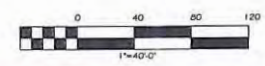
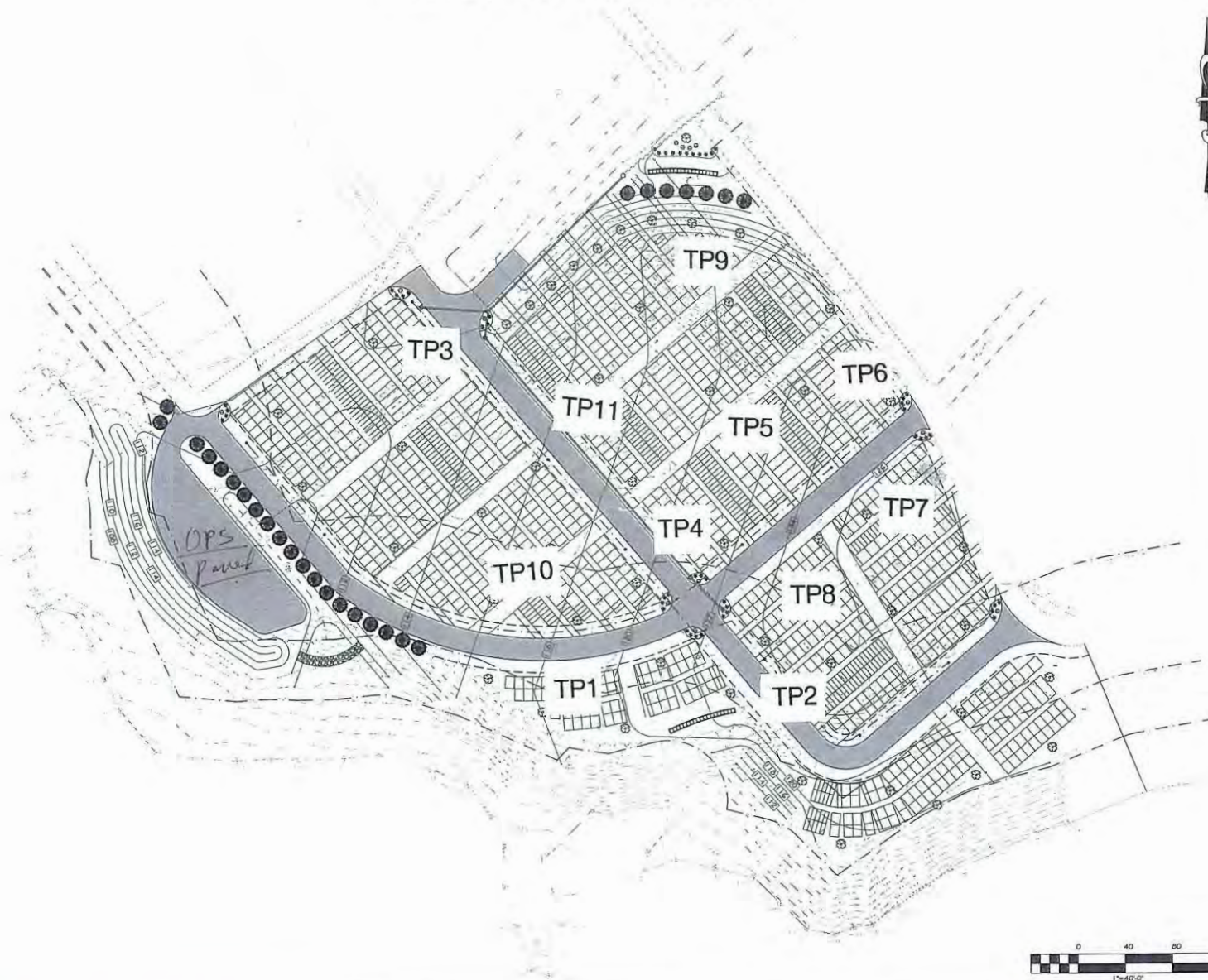
Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

FIGURE 1 TEST PIT LOCATIONS



**NESRA  
ENGINEERING, LLC**

P.O. BOX 533  
EAST TAUNTON, MA 02718  
(617) 506-3772  
WWW.NESRA.ENG.COM



Project  
**MT. FEAKE CEMETERY  
EXTENSION PROJECT  
WALTHAM, MA**

Client  
**CITY OF WALTHAM  
610 MAIN STREET  
WALTHAM, MA**

No.	Revision	Date

Scale: 1" = 40'-0"  
Date: 4/9/15

**GRADING AND  
UTILITY PLAN**

**C-2**





Friday, April 24, 2015

Mr William J. Mallio  
20 Westland Avenue  
Winchester MA 01890

Project ID: MT. FEAKE EXTENSION  
Sample ID#s: BJ02693 - BJ02702

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

A handwritten signature in black ink that reads "Phyllis Shiller".

Phyllis Shiller  
Laboratory Director

NELAC - #NY11301  
CT Lab Registration #PH-0618  
MA Lab Registration #MA-CT-007  
ME Lab Registration #CT-007  
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003  
NY Lab Registration #11301  
PA Lab Registration #68-03530  
RI Lab Registration #63  
VT Lab Registration #VT11301





Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823

## Analysis Report

April 24, 2015

FOR: Mr William J. Mallio  
20 Westland Avenue  
Winchester MA 01890

### Sample Information

Matrix: SOIL  
Location Code: WMJMALL  
Rush Request: Standard  
P.O.#:

### Custody Information

Collected by: WM  
Received by: LB  
Analyzed by: see "By" below

Date	Time
04/14/15	8:50
04/15/15	15:26

### Laboratory Data

SDG ID: GBJ02693  
Phoenix ID: BJO2693

Project ID: MT. FEAKE EXTENSION  
Client ID: TP-1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.45	0.45	mg/Kg	1	04/16/15	EK	SW6010C
Arsenic	5.0	0.9	mg/Kg	1	04/16/15	EK	SW6010C
Barium	60.0	0.45	mg/Kg	1	04/16/15	EK	SW6010C
Cadmium	< 0.45	0.45	mg/Kg	1	04/16/15	EK	SW6010C
Chromium	38.1	0.45	mg/Kg	1	04/16/15	EK	SW6010C
Mercury	0.16	0.03	mg/Kg	1	04/16/15	RS	SW7471B
Lead	100	0.45	mg/Kg	1	04/16/15	EK	SW6010C
Selenium	< 1.8	1.8	mg/Kg	1	04/16/15	EK	SW6010C
Percent Solid	80		%		04/15/15	I	SW846-%Solid
Mercury Digestion	Completed				04/16/15	III	SW7471B
Total Metals Digest	Completed				04/15/15	CB/AG	SW3050B
Extraction of TPH SM	Completed				04/15/15	BC/V	SW3545A

### TPH DRO (C10-C28)

Diesel Range Organics (C10-C28)	ND	61	mg/Kg	1	04/18/15	JRB	SW8015D DRO
---------------------------------	----	----	-------	---	----------	-----	-------------

### QA/QC Surrogates

% n-Pentacosane	69		%	1	04/18/15	JRB	SW8015D DRO
-----------------	----	--	---	---	----------	-----	-------------

Project ID: MT. FEAKE EXTENSION  
Client ID: TP-1

Phoenix I.D.: BJ02693

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
-----------	--------	------------	-------	----------	-----------	----	-----------

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director

April 24, 2015

Reviewed and Released by: Bobbi Aloisa, Vice President



Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823

## Analysis Report

April 24, 2015

FOR: Mr William J. Mallio  
20 Westland Avenue  
Winchester MA 01890

### Sample Information

Matrix: SOIL  
Location Code: WMJMALL  
Rush Request: Standard  
P.O.#:

### Custody Information

Collected by: WM  
Received by: LB  
Analyzed by: see "By" below

<u>Date</u>	<u>Time</u>
04/14/15	9:32
04/15/15	15:26

### Laboratory Data

SDG ID: GBJ02693  
Phoenix ID: BJ02694

Project ID: MT. FEAKE EXTENSION  
Client ID: TP-2

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.42	0.42	mg/Kg	1	04/16/15	EK	SW6010C
Arsenic	5.6	0.8	mg/Kg	1	04/16/15	EK	SW6010C
Barium	92.8	0.42	mg/Kg	1	04/16/15	EK	SW6010C
Cadmium	< 0.42	0.42	mg/Kg	1	04/16/15	EK	SW6010C
Chromium	22.8	0.42	mg/Kg	1	04/16/15	EK	SW6010C
Mercury	0.18	0.03	mg/Kg	1	04/16/15	RS	SW7471B
Lead	121	0.42	mg/Kg	1	04/16/15	EK	SW6010C
Selenium	< 1.7	1.7	mg/Kg	1	04/16/15	EK	SW6010C
Percent Solid	76		%		04/15/15	I	SW846-%Solid
Mercury Digestion	Completed				04/16/15	III	SW7471B
Total Metals Digest	Completed				04/15/15	CB/AG	SW3050B
Extraction of TPH SM	Completed				04/15/15	BC/V	SW3545A

### TPH DRO (C10-C28)

Diesel Range Organics (C10-C28)	120	66	mg/Kg	1	04/18/15	JRB	SW8015D DRO
---------------------------------	-----	----	-------	---	----------	-----	-------------

### QA/QC Surrogates

% n-Pentacosane	109		%	1	04/18/15	JRB	SW8015D DRO
-----------------	-----	--	---	---	----------	-----	-------------



Project ID: MT. FEAKE EXTENSION  
Client ID: TP-2

Phoenix I.D.: BJ02694

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
-----------	--------	------------	-------	----------	-----------	----	-----------

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

This report must not be reproduced except in full as defined by the attached chain of custody.



Phyllis Shiller, Laboratory Director

April 24, 2015

Reviewed and Released by: Bobbi Aloisa, Vice President



Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823

## Analysis Report

April 24, 2015

FOR: Mr William J. Mallio  
20 Westland Avenue  
Winchester MA 01890

### Sample Information

Matrix: SOIL  
Location Code: WMJMALL  
Rush Request: Standard  
P.O.#:

### Custody Information

Collected by: WM  
Received by: LB  
Analyzed by: see "By" below

<u>Date</u>	<u>Time</u>
04/14/15	10:20
04/15/15	15:26

### Laboratory Data

SDG ID: GBJ02693  
Phoenix ID: BJ02695

Project ID: MT. FEAKE EXTENSION  
Client ID: TP-3

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 2.0	2.0	mg/Kg	1	04/16/15	EK	SW6010C
Arsenic	6.6	0.7	mg/Kg	1	04/16/15	EK	SW6010C
Barium	187	0.34	mg/Kg	1	04/16/15	EK	SW6010C
Cadmium	0.47	0.34	mg/Kg	1	04/16/15	EK	SW6010C
Chromium	30.9	0.34	mg/Kg	1	04/16/15	EK	SW6010C
Mercury	0.10	0.03	mg/Kg	1	04/21/15	RS	SW7471B
Lead	412	3.4	mg/Kg	10	04/18/15	LK	SW6010C
Selenium	< 1.4	1.4	mg/Kg	1	04/16/15	EK	SW6010C
Percent Solid	92		%		04/15/15	I	SW846-%Solid
Mercury Digestion	Completed				04/21/15	III	SW7471B
Total Metals Digest	Completed				04/15/15	CB/AG	SW3050B
Extraction of TPH SM	Completed				04/15/15	BC/V	SW3545A

### TPH DRO (C10-C28)

Diesel Range Organics (C10-C28)	820	270	mg/Kg	5	04/21/15	JRB	SW8015D DRO
---------------------------------	-----	-----	-------	---	----------	-----	-------------

### QA/QC Surrogates

% n-Pentacosane	120		%	5	04/21/15	JRB	SW8015D DRO
-----------------	-----	--	---	---	----------	-----	-------------

Project ID: MT. FEAKE EXTENSION  
Client ID: TP-3

Phoenix I.D.: BJ02695

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
-----------	--------	------------	-------	----------	-----------	----	-----------

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

This report must not be reproduced except in full as defined by the attached chain of custody.



Phyllis Shiller, Laboratory Director

April 24, 2015

Reviewed and Released by: Bobbi Aloisa, Vice President





Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823

## Analysis Report

April 24, 2015

FOR: Mr William J. Mallio  
20 Westland Avenue  
Winchester MA 01890

### Sample Information

Matrix: SOIL  
Location Code: WMJMALL  
Rush Request: Standard  
P.O.#:

### Custody Information

Collected by: WM  
Received by: LB  
Analyzed by: see "By" below

Date	Time
04/14/15	9:50
04/15/15	15:26

### Laboratory Data

SDG ID: GBJ02693  
Phoenix ID: BJ02696

Project ID: MT. FEAKE EXTENSION  
Client ID: TP-4

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.39	0.39	mg/Kg	1	04/16/15	EK	SW6010C
Arsenic	4.4	0.8	mg/Kg	1	04/16/15	EK	SW6010C
Barium	63.9	0.39	mg/Kg	1	04/16/15	EK	SW6010C
Cadmium	< 0.39	0.39	mg/Kg	1	04/16/15	EK	SW6010C
Chromium	17.5	0.39	mg/Kg	1	04/16/15	EK	SW6010C
Mercury	0.10	0.03	mg/Kg	1	04/21/15	RS	SW7471B
Lead	48.2	0.39	mg/Kg	1	04/16/15	EK	SW6010C
Selenium	< 1.6	1.6	mg/Kg	1	04/16/15	EK	SW6010C
Percent Solid	83		%		04/15/15	I	SW846-%Solid
Mercury Digestion	Completed				04/21/15	I/I	SW7471B
Total Metals Digest	Completed				04/15/15	CB/AG	SW3050B
Extraction of TPH SM	Completed				04/15/15	BC/V	SW3545A

### TPH DRO (C10-C28)

Diesel Range Organics (C10-C28)	ND	59	mg/Kg	1	04/18/15	JRB	SW8015D DRO
---------------------------------	----	----	-------	---	----------	-----	-------------

### QA/QC Surrogates

% n-Pentacosane	105		%	1	04/18/15	JRB	SW8015D DRO
-----------------	-----	--	---	---	----------	-----	-------------

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
-----------	--------	------------	-------	----------	-----------	----	-----------

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Stillen

Phyllis Shiller, Laboratory Director

April 24, 2015

**Reviewed and Released by: Bobbi Aloisa, Vice President**





Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823

## Analysis Report

April 24, 2015

FOR: Mr William J. Mallio  
20 Westland Avenue  
Winchester MA 01890

### Sample Information

Matrix: SOIL  
Location Code: WMJMALL  
Rush Request: Standard  
P.O.#:

### Custody Information

Collected by: WM  
Received by: LB  
Analyzed by: see "By" below

<u>Date</u>	<u>Time</u>
04/14/15	10:50
04/15/15	15:26

### Laboratory Data

SDG ID: GBJ02693  
Phoenix ID: BJ02697

Project ID: MT. FEAKE EXTENSION  
Client ID: TP-5

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.40	0.40	mg/Kg	1	04/16/15	EK	SW6010C
Arsenic	6.2	0.8	mg/Kg	1	04/16/15	EK	SW6010C
Barium	68.2	0.40	mg/Kg	1	04/16/15	EK	SW6010C
Cadmium	< 0.40	0.40	mg/Kg	1	04/16/15	EK	SW6010C
Chromium	23.7	0.40	mg/Kg	1	04/16/15	EK	SW6010C
Mercury	0.19	0.03	mg/Kg	1	04/21/15	RS	SW7471B
Lead	80.3	0.40	mg/Kg	1	04/16/15	EK	SW6010C
Selenium	< 1.6	1.6	mg/Kg	1	04/16/15	EK	SW6010C
Percent Solid	86		%		04/15/15	I	SW846-%Solid
Mercury Digestion	Completed				04/21/15	III	SW7471B
Total Metals Digest	Completed				04/15/15	CB/AG	SW3050B
Extraction of TPH SM	Completed				04/15/15	BC/D	SW3545A

### TPH DRO (C10-C28)

Diesel Range Organics (C10-C28)	ND	57	mg/Kg	1	04/18/15	JRB	SW8015D DRO
---------------------------------	----	----	-------	---	----------	-----	-------------

### QA/QC Surrogates

% n-Pentacosane	83		%	1	04/18/15	JRB	SW8015D DRO
-----------------	----	--	---	---	----------	-----	-------------

Project ID: MT. FEAKE EXTENSION  
Client ID: TP-5

Phoenix I.D.: BJ02697

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
-----------	--------	------------	-------	----------	-----------	----	-----------

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director

April 24, 2015

Reviewed and Released by: Bobbi Aloisa, Vice President

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Asbestos	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Barium	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Beryllium	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Bismuth	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Boron	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Bromine	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Cadmium	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Calcium	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Chromium	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Cobalt	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Copper	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Fluorine	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Germanium	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Iron	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Lead	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Lithium	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Manganese	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Mercury	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Molybdenum	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Nickel	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Phosphorus	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Potassium	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Selenium	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Silver	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Sulfur	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Tantalum	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Tellurium	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Thallium	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Tin	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Tungsten	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Vanadium	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	
Zinc	ND	ND	mg/kg	1:1	4/24/15	Phyllis Shiller	





Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823

## Analysis Report

April 24, 2015

FOR: Mr William J. Mallio  
20 Westland Avenue  
Winchester MA 01890

### Sample Information

Matrix: SOIL  
Location Code: WMJMALL  
Rush Request: Standard  
P.O.#:

### Custody Information

Collected by: WM  
Received by: LB  
Analyzed by: see "By" below

Date Time

04/14/15 11:05  
04/15/15 15:26

### Laboratory Data

SDG ID: GBJ02693  
Phoenix ID: BJ02698

Project ID: MT. FEAKE EXTENSION  
Client ID: TP-6

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.35	0.35	mg/Kg	1	04/16/15	EK	SW6010C
Arsenic	9.2	0.7	mg/Kg	1	04/16/15	EK	SW6010C
Barium	68.1	0.35	mg/Kg	1	04/16/15	EK	SW6010C
Cadmium	< 0.35	0.35	mg/Kg	1	04/16/15	EK	SW6010C
Chromium	17.0	0.35	mg/Kg	1	04/16/15	EK	SW6010C
Mercury	0.14	0.03	mg/Kg	1	04/21/15	RS	SW7471B
Lead	158	3.5	mg/Kg	10	04/18/15	LK	SW6010C
Selenium	< 1.4	1.4	mg/Kg	1	04/16/15	EK	SW6010C
Percent Solid	87		%		04/15/15	I	SW846-%Solid
Soil Extraction SVOA PAH	Completed				04/15/15	BJ/VH	SW3545A
Mercury Digestion	Completed				04/21/15	III	SW7471B
EPH Extraction	Completed				04/16/15	BC/D	SW3545A
Ext. Petroleum Hydrocarbons	Completed				04/22/15	BB	MADEP EPH-04
Total Metals Digest	Completed				04/15/15	CB/AG	SW3050B

### EPH Diesel PAH Target Analytes

2-Methylnaphthalene	ND	260	ug/Kg	1	04/16/15	DD	MA EPH 5/2004
Acenaphthene	430	260	ug/Kg	1	04/16/15	DD	MA EPH 5/2004
Naphthalene	300	260	ug/Kg	1	04/16/15	DD	MA EPH 5/2004
Phenanthrene	5000	260	ug/Kg	1	04/16/15	DD	MA EPH 5/2004

### EPH Other PAH Target Analytes

Acenaphthylene	340	260	ug/Kg	1	04/16/15	DD	MA EPH 5/2004
Anthracene	1200	260	ug/Kg	1	04/16/15	DD	MA EPH 5/2004
Benz(a)anthracene	2500	260	ug/Kg	1	04/16/15	DD	MA EPH 5/2004
Benzo(a)pyrene	2300	260	ug/Kg	1	04/16/15	DD	MA EPH 5/2004
Benzo(b)fluoranthene	3300	260	ug/Kg	1	04/16/15	DD	MA EPH 5/2004
Benzo(ghi)perylene	830	260	ug/Kg	1	04/16/15	DD	MA EPH 5/2004

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Benzo(k)fluoranthene	1100	260	ug/Kg	1	04/16/15	DD	MA EPH 5/2004
Chrysene	2600	260	ug/Kg	1	04/16/15	DD	MA EPH 5/2004
Dibenz(a,h)anthracene	ND	260	ug/Kg	1	04/16/15	DD	MA EPH 5/2004
Fluoranthene	5300	260	ug/Kg	1	04/16/15	DD	MA EPH 5/2004
Fluorene	480	260	ug/Kg	1	04/16/15	DD	MA EPH 5/2004
Indeno(1,2,3-cd)pyrene	800	260	ug/Kg	1	04/16/15	DD	MA EPH 5/2004
Pyrene	4300	260	ug/Kg	1	04/16/15	DD	MA EPH 5/2004
<b><u>QA/QC Surrogates</u></b>							
% 2-Fluorobiphenyl	76		%	1	04/16/15	DD	30 - 130 %
% Nitrobenzene-d5	74		%	1	04/16/15	DD	30 - 130 %
% Terphenyl-d14	69		%	1	04/16/15	DD	30 - 130 %
<b><u>MA EPH Aliphatic/Aromatic Ranges</u></b>							
C11-C22 Aromatic Hydrocarbons 1,2*	7.8	3.8	mg/Kg	1	04/22/15	BB	MA EPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	ND	3.8	mg/Kg	1	04/22/15	BB	MA EPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	ND	3.8	mg/Kg	1	04/22/15	BB	MA EPH 5/2004
Total TPH 1,2*	10	3.8	mg/Kg	1	04/22/15	BB	MA EPH 5/2004
<b><u>QA/QC Surrogates</u></b>							
% 1-chlorooctadecane (aliphatic)	50		%	1	04/22/15	BB	40 - 140 %
% 2-Bromonaphthalene (Fractionation)	119		%	1	04/22/15	BB	40 - 140 %
% 2-Fluorobiphenyl (Fractionation)	98		%	1	04/22/15	BB	40 - 140 %
% o-terphenyl (aromatic)	65		%	1	04/22/15	BB	40 - 140 %

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

### **Comments:**

MAEPH:

1\* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.

2\* C11-C12 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

This report must not be reproduced except in full as defined by the attached chain of custody.



Phyllis Shiller, Laboratory Director

April 24, 2015

Reviewed and Released by: Bobbi Aloisa, Vice President





Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823

## Analysis Report

April 24, 2015

FOR: Mr William J. Mallio  
20 Westland Avenue  
Winchester MA 01890

### Sample Information

Matrix: SOIL  
Location Code: WMJMALL  
Rush Request: Standard  
P.O.#:

### Custody Information

Collected by: WM  
Received by: LB  
Analyzed by: see "By" below

<u>Date</u>	<u>Time</u>
04/14/15	10:45
04/15/15	15:26

### Laboratory Data

SDG ID: GBJ02693  
Phoenix ID: BJ02699

Project ID: MT. FEAKE EXTENSION  
Client ID: TP-8

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.41	0.41	mg/Kg	1	04/16/15	EK	SW6010C
Arsenic	4.9	0.8	mg/Kg	1	04/16/15	EK	SW6010C
Barium	42.5	0.41	mg/Kg	1	04/16/15	EK	SW6010C
Cadmium	< 0.41	0.41	mg/Kg	1	04/16/15	EK	SW6010C
Chromium	16.3	0.41	mg/Kg	1	04/16/15	EK	SW6010C
Mercury	0.06	0.03	mg/Kg	1	04/21/15	RS	SW7471B
Lead	56.4	0.41	mg/Kg	1	04/16/15	EK	SW6010C
Selenium	< 1.6	1.6	mg/Kg	1	04/16/15	EK	SW6010C
Percent Solid	81		%		04/15/15	I	SW846-%Solid
Mercury Digestion	Completed				04/21/15	II	SW7471B
Total Metals Digest	Completed				04/15/15	CB/AG	SW3050B
Extraction of TPH SM	Completed				04/15/15	BC/D	SW3545A

### TPH DRO (C10-C28)

Diesel Range Organics (C10-C28)	ND	60	mg/Kg	1	04/18/15	JRB	SW8015D DRO
---------------------------------	----	----	-------	---	----------	-----	-------------

### QA/QC Surrogates

% n-Pentacosane	61		%	1	04/18/15	JRB	SW8015D DRO
-----------------	----	--	---	---	----------	-----	-------------

Project ID: MT. FEAKE EXTENSION  
Client ID: TP-8

Phoenix I.D.: BJ02699

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
-----------	--------	------------	-------	----------	-----------	----	-----------

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director

April 24, 2015

Reviewed and Released by: Bobbi Aloisa, Vice President



Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823

## Analysis Report

April 24, 2015

FOR: Mr William J. Mallio  
20 Westland Avenue  
Winchester MA 01890

### Sample Information

Matrix: SOIL  
Location Code: WMJMALL  
Rush Request: Standard  
P.O.#:

### Custody Information

Collected by: WM  
Received by: LB  
Analyzed by: see "By" below

Date Time

04/14/15 11:17  
04/15/15 15:26

### Laboratory Data

SDG ID: GBJ02693  
Phoenix ID: BJ02700

Project ID: MT. FEAKE EXTENSION  
Client ID: TP-9

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.41	0.41	mg/Kg	1	04/16/15	EK	SW6010C
Arsenic	6.9	0.8	mg/Kg	1	04/16/15	EK	SW6010C
Barium	64.7	0.41	mg/Kg	1	04/16/15	EK	SW6010C
Cadmium	< 0.41	0.41	mg/Kg	1	04/16/15	EK	SW6010C
Chromium	20.0	0.41	mg/Kg	1	04/16/15	EK	SW6010C
Mercury	0.26	0.03	mg/Kg	1	04/21/15	RS	SW7471B
Lead	130	0.41	mg/Kg	1	04/16/15	EK	SW6010C
Selenium	< 1.7	1.7	mg/Kg	1	04/16/15	EK	SW6010C
Percent Solid	84		%		04/15/15	I	SW846-%Solid
Mercury Digestion	Completed				04/21/15	III	SW7471B
Total Metals Digest	Completed				04/15/15	CB/AG	SW3050B
Extraction of TPH SM	Completed				04/20/15	BC/V	SW3545A

### TPH DRO (C10-C28)

Diesel Range Organics (C10-C28) ND 59 mg/Kg 1 04/21/15 JRB SW8015D DRO

### QA/QC Surrogates

% n-Pentacosane 108 % 1 04/21/15 JRB SW8015D DRO



Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
-----------	--------	------------	-------	----------	-----------	----	-----------

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

This report must not be reproduced except in full as defined by the attached chain of custody.



Phyllis Shiller, Laboratory Director

April 24, 2015

Reviewed and Released by: Bobbi Aloisa, Vice President

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Asbestos	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Barium	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Beryllium	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Bismuth	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Boron	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Calcium	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Cadmium	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Chromium	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Cobalt	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Copper	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Fluorine	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Gallium	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Germanium	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Gold	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Iron	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Lead	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Lithium	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Magnesium	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Manganese	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Mercury	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Molybdenum	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Nickel	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Phosphorus	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Potassium	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Selenium	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Silver	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Sulfur	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Tantalum	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Tellurium	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Thallium	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Tin	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Vanadium	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	
Zinc	ND		mg/kg	1:10	4/20/15	Phyllis Shiller	





Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823

## Analysis Report

April 24, 2015

FOR: Mr William J. Mallio  
20 Westland Avenue  
Winchester MA 01890

### Sample Information

Matrix: SOIL  
Location Code: WMJMALL  
Rush Request: Standard  
P.O.#:

### Custody Information

Collected by: WM  
Received by: LB  
Analyzed by: see "By" below

Date	Time
04/14/15	9:16
04/15/15	15:26

### Laboratory Data

SDG ID: GBJ02693  
Phoenix ID: BJ02701

Project ID: MT. FEAKE EXTENSION  
Client ID: TP-10

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.44	0.44	mg/Kg	1	04/16/15	EK	SW6010C
Arsenic	4.3	0.9	mg/Kg	1	04/16/15	EK	SW6010C
Barium	85.2	0.44	mg/Kg	1	04/16/15	EK	SW6010C
Cadmium	< 0.44	0.44	mg/Kg	1	04/16/15	EK	SW6010C
Chromium	31.3	0.44	mg/Kg	1	04/16/15	EK	SW6010C
Mercury	0.17	0.03	mg/Kg	1	04/21/15	RS	SW7471B
Lead	238	4.4	mg/Kg	10	04/18/15	LK	SW6010C
Selenium	< 1.8	1.8	mg/Kg	1	04/16/15	EK	SW6010C
Percent Solid	81		%		04/15/15	I	SW846-%Solid
Mercury Digestion	Completed				04/21/15	III	SW7471B
Total Metals Digest	Completed				04/15/15	CB/AG	SW3050B
Extraction of TPH SM	Completed				04/20/15	BC/V	SW3545A

### TPH DRO (C10-C28)

Diesel Range Organics (C10-C28)	ND	60	mg/Kg	1	04/21/15	JRB	SW8015D DRO
---------------------------------	----	----	-------	---	----------	-----	-------------

### QA/QC Surrogates

% n-Pentacosane	114		%	1	04/21/15	JRB	SW8015D DRO
-----------------	-----	--	---	---	----------	-----	-------------

Project ID: MT. FEAKE EXTENSION  
Client ID: TP-10

Phoenix I.D.: BJ02701

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
-----------	--------	------------	-------	----------	-----------	----	-----------

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director

April 24, 2015

Reviewed and Released by: Bobbi Aloisa, Vice President



Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823

## Analysis Report

April 24, 2015

FOR: Mr William J. Mallio  
20 Westland Avenue  
Winchester MA 01890

### Sample Information

Matrix: SOIL  
Location Code: WMJMALL  
Rush Request: Standard  
P.O.#:

### Custody Information

Collected by: WM  
Received by: LB  
Analyzed by: see "By" below

<u>Date</u>	<u>Time</u>
04/14/15	10:15
04/15/15	15:26

### Laboratory Data

SDG ID: GBJ02693  
Phoenix ID: BJ02702

Project ID: MT. FEAKE EXTENSION  
Client ID: TP-11

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.38	0.38	mg/Kg	1	04/16/15	EK	SW6010C
Arsenic	4.9	0.8	mg/Kg	1	04/16/15	EK	SW6010C
Barium	51.7	0.38	mg/Kg	1	04/16/15	EK	SW6010C
Cadmium	< 0.38	0.38	mg/Kg	1	04/16/15	EK	SW6010C
Chromium	18.5	0.38	mg/Kg	1	04/16/15	EK	SW6010C
Mercury	0.11	0.03	mg/Kg	1	04/21/15	RS	SW7471B
Lead	59.1	0.38	mg/Kg	1	04/16/15	EK	SW6010C
Selenium	< 1.5	1.5	mg/Kg	1	04/16/15	EK	SW6010C
Percent Solid	89		%		04/15/15	I	SW846-%Solid
Mercury Digestion	Completed				04/21/15	III	SW7471B
Total Metals Digest	Completed				04/15/15	CB/AG	SW3050B
Extraction of TPH SM	Completed				04/15/15	BC/D	SW3545A

### TPH DRO (C10-C28)

Diesel Range Organics (C10-C28)	ND	56	mg/Kg	1	04/18/15	JRB	SW8015D DRO
---------------------------------	----	----	-------	---	----------	-----	-------------

### QA/QC Surrogates

% n-Pentacosane	97		%	1	04/18/15	JRB	SW8015D DRO
-----------------	----	--	---	---	----------	-----	-------------



Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
-----------	--------	------------	-------	----------	-----------	----	-----------

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

**Comments:**

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

This report must not be reproduced except in full as defined by the attached chain of custody.



Phyllis Shiller, Laboratory Director

April 24, 2015

Reviewed and Released by: Bobbi Aloisa, Vice President



**Environmental Laboratories, Inc.**  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

## QA/QC Report

April 24, 2015

### QA/QC Data

SDG I.D.: GBJ02693

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 304789 (mg/kg), QC Sample No: BJ02545 (BJ02693, BJ02694)													
Mercury - Soil	BRL	0.06	<0.03	<0.03	NC	103	121	16.1	104	106	1.9	75 - 125	20

Comment:

Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 75-125%

QA/QC Batch 304731 (mg/kg), QC Sample No: BJ02695 (BJ02693, BJ02694, BJ02695, BJ02696, BJ02697, BJ02698, BJ02699, BJ02700, BJ02701, BJ02702)

### ICP Metals - Soil

Arsenic	BRL	0.60	6.6	7.14	7.90	97.3	96.0	1.3	96.0	96.3	0.3	75 - 125	30
Barium	BRL	0.30	187	242	25.6	95.0	96.4	1.5	106	>130	NC	75 - 125	30 m
Cadmium	BRL	0.30	0.47	0.57	NC	95.4	97.0	1.7	94.4	94.7	0.3	75 - 125	30
Chromium	BRL	0.30	30.9	41.9	30.2	97.4	97.0	0.4	103	108	4.7	75 - 125	30
Lead	BRL	0.30	425	782	59.2	97.2	97.1	0.1	119	77.6	42.1	75 - 125	30 r
Selenium	BRL	1.2	<1.4	<1.4	NC	90.1	87.9	2.5	82.4	83.6	1.4	75 - 125	30
Silver	BRL	0.30	1.27	0.85	NC	96.8	97.2	0.4	99.9	108	7.8	75 - 125	30

QA/QC Batch 305163 (mg/kg), QC Sample No: BJ03547 (BJ02695, BJ02696, BJ02697, BJ02698, BJ02699, BJ02700, BJ02701, BJ02702)

Mercury - Soil	BRL	0.06	0.07	0.08	NC	115	103	11.0	103	110	6.6	75 - 125	20
----------------	-----	------	------	------	----	-----	-----	------	-----	-----	-----	----------	----

Comment:

Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 75-125%

m = This parameter is outside laboratory ms/msd specified recovery limits.

r = This parameter is outside laboratory rpd specified recovery limits.





**Environmental Laboratories, Inc.**  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

## QA/QC Report

April 24, 2015

## QA/QC Data

SDG I.D.: GBJ02693

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 304261 (mg/kg), QC Sample No: BJ01241 (BJ02698)										
<b>MA EPH Aliphatic/Aromatic Ranges - Soil</b>										
C11-C22 Aromatic Hydrocarbons 1,	ND	3.3	69						40 - 140	25
C19-C36 Aliphatic Hydrocarbons 1*	ND	3.3	70						40 - 140	25
C9-C18 Aliphatic Hydrocarbons 1*	ND	3.3	46						40 - 140	25
Total TPH 1,2*	ND	3.3	65						40 - 140	25
% 1-chlorooctadecane (aliphatic)	48	%	58						40 - 140	25
% 2-Bromonaphthalene (Fractionati	72	%	96						40 - 140	25
% 2-Fluorobiphenyl (Fractionation)	74	%	100						40 - 140	25
% o-terphenyl (aromatic)	72	%	74						40 - 140	25

Comment:

The MS/MSD was not reported due to interference in the sample  
 The LCSD could not be reported for this batch.

Additional EPH fractionation criteria: Breakthrough criteria (BT) is 0 to 5%

QA/QC Batch 304729 (mg/Kg), QC Sample No: BJ02608 (BJ02693, BJ02694, BJ02695, BJ02696)

### TPH by GC (Extractable Products) - Soil

Ext. Petroleum HC	ND	50	63	81	25.0	78	77	1.3	50 - 150	30
% n-Pentacosane	78	%	71	73	2.8	88	86	2.3	50 - 150	30

QA/QC Batch 304739 (mg/Kg), QC Sample No: BJ02784 (BJ02697, BJ02699, BJ02700, BJ02701, BJ02702)

### TPH by GC (Extractable Products) - Soil

Ext. Petroleum HC	ND	50	60			56	58	3.5	50 - 150	30
% n-Pentacosane	56	%	75			58	59	1.7	50 - 150	30

QA/QC Batch 304736 (ug/kg), QC Sample No: BJ02793 (BJ02698)

### Polynuclear Aromatic HC - Soil

2-Methylnaphthalene	ND	230	75	86	13.7	88	87	1.1	40 - 140	30
Acenaphthene	ND	230	80	89	10.7	93	92	1.1	40 - 140	30
Acenaphthylene	ND	230	78	87	10.9	90	89	1.1	40 - 140	30
Anthracene	ND	230	84	93	10.2	97	96	1.0	40 - 140	30
Benz(a)anthracene	ND	230	87	97	10.9	101	101	0.0	40 - 140	30
Benzo(a)pyrene	ND	230	85	94	10.1	98	98	0.0	40 - 140	30
Benzo(b)fluoranthene	ND	230	89	99	10.6	107	106	0.9	40 - 140	30
Benzo(ghi)perylene	ND	230	65	78	18.2	72	75	4.1	40 - 140	30
Benzo(k)fluoranthene	ND	230	89	98	9.6	102	104	1.9	40 - 140	30
Chrysene	ND	230	88	95	7.7	100	100	0.0	40 - 140	30
Dibenz(a,h)anthracene	ND	230	69	82	17.2	77	80	3.8	40 - 140	30
Fluoranthene	ND	230	92	102	10.3	115	108	6.3	40 - 140	30
Fluorene	ND	230	78	88	12.0	89	88	1.1	40 - 140	30
Indeno(1,2,3-cd)pyrene	ND	230	70	83	17.0	79	81	2.5	40 - 140	30
Naphthalene	ND	230	73	82	11.6	84	84	0.0	40 - 140	30
Phenanthrene	ND	230	83	91	9.2	96	94	2.1	40 - 140	30
Pyrene	ND	230	97	104	7.0	122	113	7.7	40 - 140	30



**Environmental Laboratories, Inc.**  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823



## MCP Certification Report

April 24, 2015

SDG I.D.: GBJ02693

---

### QC (Batch Specific)

----- Sample No: BJ02793, QA/QC Batch: 304736 -----

All LCS recoveries were within 30 - 130 with the following exceptions: None.

All LCSD recoveries were within 30 - 130 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



\* SURCHARGE APPLIES



