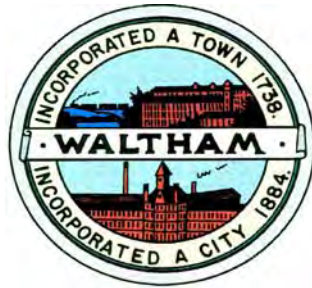


# The City of Waltham



**Invites  
Interested Parties  
To propose the best offer and or bid  
For the service or product herewith described:**

**WALTHAM KENNEDY MIDDLE SCHOOL  
ATHLETIC FIELD RESTORATION**

**The bid opening will be held: 10:00 AM on Friday June 7, 2013,  
Pre-bid conference and site inspection: 10:00 AM on Monday June 3, 2013  
(Meet at the Kennedy Middle School 655 Lexington Street, Waltham, MA.)**

*Phone: 781-314-3244, Fax: 781-314-3245*

**SECTION 00050  
CITY OF WALTHAM  
MASSACHUSETTS**

**NOTICE TO BIDDERS, INCLUDING SUB-BIDDERS**

**WALTHAM KENNEDY MIDDLE SCHOOL  
ATHLETIC FIELD RESTORATION  
WALTHAM, MASSACHUSETTS**

The City of Waltham, Massachusetts invites sealed bids from Contractors for the **WALTHAM KENNEDY MIDDLE SCHOOL ATHLETIC FIELD RESTORATION** Waltham, Massachusetts. The work of this contract includes Site preparation as well as sod and vegetation removal, deep tining, tilling and fine grading of existing loam area, installation of an irrigation system, seeding and maintenance of prepared field, installation of a curb cut and bituminous pathway. This bid also includes optional alternates for the installation of a chain link fence and amendment of existing loam sand.

**PLANS, SPECIFICATIONS** and other Contract Documents may be obtained after 4:00 pm May 22, 2013 by visiting the City's web Site at [www.city.waltham.ma.us/open-bids](http://www.city.waltham.ma.us/open-bids) Copies of Addenda will be e-mailed to the registered Bidders without charge. Addenda will also be posted in the same web site listed above.

Sealed **GENERAL BIDS** for this project will be accepted from eligible bidders to Joseph Pedulla, Chief Procurement Officer, Purchasing Department, Waltham City Hall, 610 Main Street, Waltham, MA 02452 until **10:00 AM on Friday June 7, 2013**, at which place and time they shall be publicly opened, read aloud and recorded for presentation to the Awarding Authority.

A **PRE-BID CONFERENCE and SITE INSPECTION** will be held for all interested parties at **10:00 AM on June 3d 2013 at the Kennedy Middle School 655 Lexington Street, Waltham, MA.** Attendance at this pre-bid conference is strongly recommended but not mandatory for parties submitting a bid. It will be the only opportunity to visit the site prior to the bid opening.

Each general bid, and each sub-bid shall be accompanied by a bid deposit in the form of a bid bond, certified check, or a treasurer's or cashier's check issued by a responsible bank or trust company, payable to the City of Waltham in the amount of five percent (5%) of the value of the bid. Bid deposits will be dealt with as provided in Massachusetts General Laws.

Bids shall be made on the basis of the Prevailing Wage Rates as determined by the Commissioner of Labor and Industries, Pursuant to the Provisions of the Massachusetts General Laws, a copy of which is available in the City web site at [www.city.waltham.ma.us/open-bids](http://www.city.waltham.ma.us/open-bids) and is made a part of the Contract.

Bidders' selection procedures and contract award shall be in conformity with applicable statues of the Commonwealth of Massachusetts.

Performance and Labor and Materials payment bonds for 50% of amount of the contract price will be required from the successful bidder.

The Awarding Authority reserves the right to reject any or all general bids, if it be in the public interest to do so, and to reject any sub-bid on any sub-trade if it determines that such sub-bid does not

represent the sub-bid of a person competent to perform the work as specified or that less than three such sub-bids were received and that the prices are not reasonable for acceptance without further competition.

The successful bidder will be required to furnish a Certificate of Insurance, with the following verbatim text included in the description of services: **“The City of Waltham is a named additional insured for General Liability under the contract”** in the amount of \$500,000 per occurrence and \$1,000,000 in the aggregate and Worker’s Compensation Insurance as prescribed by law.

In accordance with governing Massachusetts general Laws., the undersigned certifies that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by OSHA that is at least 10 hours in duration at the time the employee begins work and shall furnish documentation of successful completion of said course with the first certified payroll report for each employee.

**CONTRACT TIME.** The time for Substantial Completion of the work is **60 calendar days** from the Contractor’s receipt of the Notice to Proceed.

CITY OF WALTHAM

Joseph Pedulla, MCPPO, Chief Procurement Officer  
Purchasing Department  
City Hall, 610 Main Street  
Waltham, MA 02452

**END OF SECTION**

**SECTION 00100 - INSTRUCTION TO BIDDERS**

PART 1 - GENERAL

1.01 SCHEDULE OF DATES

- A. Deadline for Advertisement for Bids: Central Register – May 14, 2012 4:00 P.M.
- B. Advertisement appears in Central Register, Plans and Specifications ready for Bidders at the Offices of the Waltham Purchasing Agent **10:00 AM on May 22, 2013.**
- C. **Pre-bid walkthrough on Monday June 3, 2013, at 10:00 A.M.** at the Kennedy Middle School 655 Lexington Street Waltham, MA.
- D. **All Questions** and requests for interpretations may be submitted in writing to [Jpedulla@city.waltham.ma.us](mailto:Jpedulla@city.waltham.ma.us) up to and including: **Monday June 4, 2013, 12:00 noon**
- E. Addenda will be issued to all registered contractors and copies will be posted on the city web site.
- F. General Bids Deadline: **10:00 A.M. on Friday June 7, 2013**, in the Purchasing Department, City Hall, 610 Main Street, Waltham, MA 02452, Attn: J. Pedulla, CPO, where the bids will be publicly open and read.

1.02 BIDDING PROCEDURE

- A. Bids for the work are subject to the provisions of General Laws, Chapter 30, §39M. Regulations governing the bidding procedures as set forth in the above mentioned amended General Laws must be followed.
- B. In the event of any inconsistencies between any of the provisions of these Contract Documents and of the cited statute, anything herein to the contrary notwithstanding, the provisions of the said statute shall control.
- C. No General Bid received by the Awarding Authority after the time respectively established herein for the opening of General Bids will be considered, regardless of the cause for the delay in the receipt of any such bid.

1.03 WITHDRAWAL OF BIDS

- A. Bids may be withdrawn prior to the time respectively established for the opening of General Bids only on written request to the Awarding Authority.

1.04 INTERPRETATION OF CONTRACT DOCUMENTS

- A. No oral interpretation will be made to any bidder. All questions or requests for interpretations must be made in writing to the Architect.
- B. Every interpretation made to a bidder will be in the form of an Addendum to the drawings and/or specifications, which will be made available to all persons to whom Contract Documents have been issued.
- C. Failure of the Awarding Authority to send or of any bidder to receive any such Addendum shall not relieve any bidder from obligation under his bid as submitted.
- D. All such Addenda shall become a part of the Contract Documents.

1.05 EXAMINATION OF SITE AND CONTRACT DOCUMENTS

- A. Each bidder shall visit the site of the proposed work and fully acquaint himself with conditions as they exist, and shall also thoroughly examine the Contract Documents. Failure of any bidder to visit the site and acquaint himself with the Contract Documents shall not relieve any bidder from any obligation with respect to his bid.
- B. By submitting a bid, the bidder agrees that the Contract Documents are adequate and that the required result for a full and complete installation can be produced. The successful bidder shall furnish any and all labor, materials, insurance, permits and all other items needed to produce the required result to the satisfaction of the Awarding Authority.

1.06 BID SECURITY

- A. The General Contractor's bid must be accompanied by bid security in the amount of five percent (5%) of the bid.
- B. At the option of the bidder, the security may be bid bond, certified, treasurer's or cashier's check issued by a responsible bank or trust company. No other type of bid security is acceptable.

Bid Bonds shall be issued by a Surety Company qualified to do business under the laws of the Commonwealth of Massachusetts.

- C. Certified, Treasurer's or Cashier's check shall be made payable to the City of Waltham, Massachusetts.
- D. The bid security shall secure the execution of the Contract and the furnishing of a 50% Performance and Payment Bond by the successful General Bidder.
- E. Should any General Bidder to whom an award is made fail to enter into a contract therefore within fifteen (15) days, Saturdays, Sundays and Legal Holidays, excluded,

after notice of award has been mailed to him or fail within such time to furnish a Performance Bond and also a Labor and Materials or Payment Bond as required, the amount so received from such General Bidder through his Bid Bond, Certified, Treasurer's or Cashier's check as bid deposit shall become the property of the City of Waltham, Massachusetts as liquidated damages; provided that the amount of the bid deposit, which becomes the property of the City of Waltham, Massachusetts, shall not in any event exceed the difference between his bid price and the bid price of the next lowest responsible and eligible bidder; and provided further that, in case of death, disability, bona fide clerical error or mechanical error of a substantial nature, or other unforeseen circumstances affecting the General Bidder, his deposit shall be returned to him.

**1.07 BID FORM**

- A. General Bids shall be submitted on the **"Form for General Bid" Section 00300** - enclosed. Erasures or other changes must be explained or noted over the signature of the bidder.
- B. Bid forms must be completely filled in. Bids which are incomplete, conditional, or obscure, or which contain additions not called for will be rejected.
- D. General Bidders shall submit one set of executed bid forms to the Awarding Authority.

**1.08 SUBMISSION OF BIDS AND BID SECURITIES**

- A. Each bid submitted by a General Contractor shall be enclosed in a sealed envelope that shall be placed with the bid security in an outer envelope. The outer envelope shall be sealed and clearly marked as follows:

(Firm Name): \_\_\_\_\_  
General Bid and Bid Security for:  
**Kennedy Athletic Field restoration**

**1.09 AWARD OF CONTRACT**

- A. The Contract shall be awarded to the lowest responsible and eligible General Bidder on the basis of competitive bids in accordance with the procedure set forth in the provision of Chapter 30, §39M of the General Laws of the Commonwealth of Massachusetts.
- B. If the bidder selected as the General Contractor fails to perform his agreement to execute a contract in accordance with the terms of his General Bid, and furnish a Performance Bond and also a Labor and Materials or Payment Bond, as stated in his General Bid in accordance with Section 44F, an award shall be made to the next lowest responsible and eligible bidder.
- C. The words "lowest responsible and eligible bidder" shall be the bidder whose name is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the work and who shall certify that he is able to furnish labor

that can work in harmony with all other elements of labor employed, or to be employed, on the work. Essential information in regard to such qualifications shall be submitted in such form as the Awarding Authority may require.

- D. Action on the award will be taken within sixty (60) days, Saturdays, Sundays and Legal Holidays excluded after the opening of the bids.

1.10 SECURITY FOR FAITHFUL PERFORMANCE

- A. The successful bidder must deliver to the Awarding Authority simultaneously with his delivery of the executed contract, an executed Performance Bond, and also a Labor and materials or Payment Bond, each issued by 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 One Hundred Percent (100%) of the Contract Price, as surety for the faithful performance of his contract, and for the payment of all persons performing labor or furnishing materials in connection therewith. Said bonds shall provide that, if the General Contractor fails or refuses to complete the Contract, the Surety Company will be obligated to do so.
- B. Premiums are to be paid by the General Contractor, and are to be included in the Contract Price.

1.11 EQUAL OPPORTUNITY

- A. The City of Waltham is an Equal Opportunity employer and will require compliance with the minority business enterprise plan (MBE) on file in the Purchasing Department.

1.12 PRE-BID WALK-THRU

- A. A pre-bid conference will be held at the site **on Monday June 3, 2013, at 10:00 A.M.** at site of the project – **Kennedy Middle School 655 Lexington Street, Waltham.** Interested parties are encouraged to attend given that this will be the only time the building is open prior to the submission of bids. Further, prior to the bid opening, potential bidders may not go onto the site any time other than the aforementioned pre-bid conference.

1.13 SITE VISITS

- A. Prospective bidders are prohibited from going onto the site prior to the Bid Opening or any time other than the pre-bid walk-thru.

1.14 SECTION LEFT BLANK

1.15 EQUALITY

- A. Except where otherwise specifically provided to the contrary, the words “or approved equal” are hereby inserted immediately following the name or description of each article, assembly, system, or any component part thereof in the Contract Documents. It

is the Contractor’s responsibility to provide all the research and documentation that would prove a product or assembly is “equal”. Failure to provide research or documentation does not alleviate the Contractor’s responsibility to meet the schedule.

**1.16 TAX FREE NUMBER**

- A. The City of Waltham has a tax-free number.

**1.17 SCHEDULE**

- A. The work of the Contract shall be Substantially Complete in **60 calendar days** after the date of commencement and following the receipt of the Notice-to-Proceed.

**1.18 LATE FEES**

- A. If the work is not Substantially Complete as specified in 1.17, the Contractor shall be charged a maximum of Five Hundred Dollars (\$500.00) per day to pay for consulting and testing fees required to manage and arrange for the completion of the project. Late fees will be deducted from the Contract via Change Order.

**1.19 WEEKLY JOB MEETINGS**

- A. There will be a weekly job meeting at the site on the same agreed-upon day and time. Time will be provided to discuss and view the progress of the work and to answer questions. The Contractor’s job Superintendent and Project Manager shall attend each meeting. The City reserves the right to have job meetings conducted in location of its choosing.

**1.20 PROJECT SUPERINTENDENT**

- A. The Contractor shall provide the same person as Superintendent for the entire duration of the project. Failure to maintain the same person in this position shall result in a One Thousand Dollar (\$1,000.00) penalty per incident which shall cover the Architect’s time to re-orient new personnel.

**1.21 AWARD**

- A. The Awarding Authority reserves the right to reject any or all bids if it be in the public interest to do so, and to act upon the bids and make its award in any lawful manner.

**1.22 PREVAILING WAGE SCHEDULE**

- A. Bids shall be made on the basis of the Prevailing Wage Schedule, as determined by the Commissioner of Labor and Industries, pursuant to the provision of Chapter 30, §39M, of the Massachusetts General Laws. A copy of which is available at [www.city.waltham.ma.us/open-bids](http://www.city.waltham.ma.us/open-bids) and is made a part of the Contract.



1.23 CONFLICT OF INTEREST

- A. A bidder filing a proposal thereby certifies that the proposal is made in good faith, without fraud, collusion, or connection of any kind with any other bidder for the same work, and that the bidder is competing solely on its own behalf without connection with, or obligation to, any undisclosed person or firm.

1.24 PROCEED ORDERS

- A. No bidder is to proceed without a proceed order as set out in the contract.

1.25 SECTION LEFT BLANK

1.26 COMPLIANCE WITH MASSACHUSETTS GENERAL LAWS

- A. Before a contract may be executed by the City, the successful Bidder will be required, in accordance with the provisions of M.G.L. Chapter 62C, Section 49A, to execute and file with the City the certificates in the Compliance Section.
- B. Pursuant to Massachusetts General Laws, Chapter 62C, Section 49A, I certify under the penalty of perjury that I, to the best of my knowledge and belief have filed all state tax returns and paid all the state taxes required under law.

1.27 CONSTRUCTION BARRICADES/FENCING

- A. The General Contractor shall provide all barricades/fencing to enclose the work area to prevent unauthorized access to the site.
  - 1. The barricades/fencing shall provide enough room for all construction activities to be performed while separated from pedestrians, students, and staff on site.
  - 2. Safety is the sole responsibility of the Contractor and any barricades/fences necessary to protect the work and the public shall be provided.

1.28 INSURANCE

- A. The contractor shall purchase and maintain, at his expense all insurance required by the Contract. Documents and all insurance required by the applicable laws of Massachusetts, including but not limited to, General Laws, Chapter 146, in connection with all hoisting equipment.
- B. The Contractor shall purchase and maintain such insurance as will protect him from claims under workmen's compensation acts and from claims for damages because of bodily injury, including death and all property damage including, without limitation, damage to buildings and adjoining the site of construction which might arise from and during operations under this contract, whether such operations be by himself or by any subcontractor or anyone directly or indirectly employed by either of them including:

1. Statutory Worker's Compensation and Employer's Liability

The contractor shall provide insurance for the payment of compensation and the furnishing of other benefits under Chapter 152 of the General Laws (so-called Worker's Compensation Act) to all persons to be employed under this contract and shall continue in force such insurance as aforesaid shall be deemed a material breach of this Contract and shall operate as an immediate termination thereof. The contractor shall, without limiting the generality of the foregoing, conform to the provisions of Section 34A of Chapter 149 of the General Laws, which Section is incorporated herein by reference and made a part of hereof.

2. Comprehensive General Liability Insurance

Minimum bodily injury limits of \$ 500,000 per person and \$ 1,000,000 per accident, and property damage limits of \$ 500,000 per accident and \$ 1,000,000 aggregate during any 12 month period, shall include the following:

- a. Public liability (bodily injury and property damage)
- b. X.C.U. (explosion, collapse, and underground utilities)
- c. Independent contractor's protective liability.
- d. Products and completed operations.

3. Comprehensive All Risk Motor Vehicle Liability Insurance

Minimum bodily injury limits of \$ 500,000 per person, \$ 1,000,000 per accident, and property damage limit of \$ 1,000,000 per accident.

4. All Risk Insurance covering all Contractors' equipment with a provision for Waiver of Subrogation against the Owner.

5. Excess Liability Insurance in Umbrella Form with combined Bodily Injury and Property Damage Limit of \$ 1,000,000.

6. The Certificate of Insurance shall read in the description of services as follows:  
**The City of Waltham is a named Additional Insured for General Liability as required by contract.**

1.29 SITE ACCESS

A. The General Contractor shall gain access to the site via routes approved by the Owner.

1. The General Contractor as part of the bid price will restore all roads, curbs, driveways, walks and grassed or landscaped areas damaged during construction.

**KENNEDY MIDDLE SCHOOL**

Athletic Field Restoration  
Waltham, MA

Carolyn Cooney & Associates Inc.  
Milford, MA

**1.30 CONSTRUCTION TRAILER**

- A. The General Contractor shall locate the construction trailer at locations approved by the Owner.
- B. The General Contractor shall locate all on site stored or staged materials within the enclosed area designated by the Owner.

**1.31 BUILDING PERMIT FEES**

- A. Building permit fees will be waived for this project. However the contractor shall apply for every permit as required by City Ordinances.

**1.32 COMPLETE BID FORMS**

- A. Please Note: Each bidder must fill in all the blanks on all the bid forms, even if the information is “zero dollars” or “not applicable”. Also, please acknowledge all Addenda even if they do not pertain to your trade.

Signature of Individual or Corporate Name By:

\_\_\_\_\_  
(Signature of Corporate Officer if applicable)

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

Social Security Number or Federal Identification Number: \_\_\_\_\_

END OF SECTION

**SECTION 00300**

**FORM FOR GENERAL BID**

**KENNEDY MIDDLE SCHOOL ATHLETIC FIELD RESTORATION**  
**655 Lexington Street**  
**Waltham, MA 02452**

**General Bid Opening Date: 10:00 AM, Friday June 7, 2013**

Joseph Pedulla, Chief Procurement Officer  
Purchasing Department  
City of Waltham  
610 Main Street  
Waltham, MA 02452

**A. Basic Price**

The undersigned:

---

(Please type or print the business name of the bidding firm)

having visited the site of the above project and having familiarized myself with the local conditions affecting the cost of the work and with the contract documents, including Amendments and Addenda No's. \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_, hereby proposes to furnish all labor, materials, tools, equipment, insurance, permits and taxes, and to do and lawfully perform all things as provided in the specifications, all in accordance with the contract documents, for the sum of:

**Base Bid (in words)** \_\_\_\_\_ **Dollars, \$** \_\_\_\_\_

**Price for Alternate 1** \$ \_\_\_\_\_  
(Chain Link Fence at Service Drive as described in Sect. 01030 & 02825)

**Price for Alternate 2** \$ \_\_\_\_\_  
(Chain Link Fence at Tree Line as described in Sect. 01030 & 02825)

**Price for Alternate 3** \$ \_\_\_\_\_  
(Course Sand Top Dress with Topsoil as described in Sect. 01030 & 02150)

- A. The undersigned agrees that, if s/he is selected as General Contractor, s/he will within five days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the Awarding Authority, execute a contract in accordance with the terms of this bid and furnish a performance bond and also a labor and materials or payment bond, each issued by 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.

- B. The undersigned certifies that s/he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work and that s/he will comply fully with all laws and regulations applicable to awards made.
- C. The undersigned as Bidder certifies that if this proposal is accepted, s/he will furnish to the City of Waltham with the invoice for the material or equipment supplied two copies of any and all Material Safety Data Sheets applicable to such material or equipment, as required by M.G.L. Chapter 111F, so called "Right to Know Law".
- D. The undersigned certifies under penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. The word "person" shall mean any natural person, joint venture, partnership, corporation, or other business or legal entity.
- E. Substantial Completion
  - 1. The work of the Contract shall be Substantially Completed in **Sixty (60) calendar days from the date of the Notice to Proceed (NTP)**.
- H. In accordance with all Massachusetts Laws, the undersigned certifies that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by OSHA that is at least 10 hours in duration at the time the employee begins work and shall furnish documentation of successful completion of said course with the first certified payroll report for each employee.

Sincerely,

\_\_\_\_\_  
(Bidder)

\_\_\_\_\_  
(Address of Bidder)

By: \_\_\_\_\_  
(Title - Owner\*, Partner\*)

(Seal, if Corporation)

By: \_\_\_\_\_  
(If Corporation - Name and Office)

\* If the business owned by the individual or partnership is conducted under a trade or assumed name, a certified copy of doing business under an assumed name should be annexed.

## **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)

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

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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 \_\_\_\_\_

WEEKLY PAYROLL REPORT FORM

Company Name: \_\_\_\_\_  
Project Name: \_\_\_\_\_  
Awarding Auth.: \_\_\_\_\_  
Work Week Ending: \_\_\_\_\_  
 Prime Contractor  
 Subcontractor  
List Prime Contractor: \_\_\_\_\_  
Employer Signature: \_\_\_\_\_  
Print Name & Title: \_\_\_\_\_  
 Final Report

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

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

**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.

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

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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

## SECTION 01010

### SUMMARY OF WORK

#### PART 1- GENERAL

##### 1.01 PROJECT DESCRIPTION

- A. The project is the renovation of Kennedy School Field, 655 Lexington Street, Waltham, MA 02452, as described in the Contract Documents.

##### 1.02 WORK TO BE DONE

- A. The work of this Contract includes, but is not limited to:
  - 1. Site preparation to include removal of existing sod and vegetation in the project area.
  - 2. Deep tining, tilling, and fine grading of existing loam layer.
  - 3. Installation of an irrigation system.
  - 4. Seeding and maintenance of prepared field to provide new athletic field with natural turf surface.
  - 5. Installation of a curb cut and bituminous pathway to provide an accessible entrance to the field.
- B. Alternates include installation of chain link fencing, and amendment of existing loam with sand.

##### 1.03 CONTRACT TIME

- A. The time for Substantial Completion of the work is 60 calendar days from the Contractor's receipt of the Notice to Proceed.
- B. The Contractor shall submit shop drawings, data and samples and place his/her order sufficiently early to permit consideration and approval by the Landscape Architect before materials are necessary for incorporation into the Work. Any delay resulting from the Contractor's failure to do so shall not be used as a basis of a claim against the Owner.

##### 1.04 CONTRACT DOCUMENTS

- A. The Contract Documents are enumerated in the Agreement, and include these



Specifications and the Drawings, for the City of Waltham, by Carolyn Cooney & Associates, Landscape Architects, 13 Elm Street, Milford, MA 01757.

#### 1.05 INSPECTION OF THE SITE

- A. It is a requirement of the Contract that the Contractor and his/her subcontractors shall have thoroughly inspected the site during the bidding period. By submitting a bid they confirm that they are thoroughly familiar with the site and all existing conditions which impact and affect their work. Requests for extra compensation will not be considered for any work which could have been foreseen by a visual inspection of the site.

#### 1.06 CONTRACTOR'S USE OF THE SITE

- A. The contractor will have full access to the site within the Contract Limit of Work Line.
- B. The Contractor, his/her Subcontractors, and their employees may park on the site inside the Contract Limit of Work Line, given that no such on-site parking interferes with the site work or causes damage.
- C. The Contractor shall furnish his/her own toilet facilities on-site.
- D. The Contractor shall take all precautions necessary to protect the abutting properties during construction. Any and all damage caused by construction operations shall be repaired.
- E. The project site shall be kept clean and free from accumulation of waste material and debris.
  - 1. The Contractor, his/her Subcontractors, and their employees shall be respectful and courteous of the neighborhood while working on site.

#### 1.07 CITY OF WALTHAM NOISE ORDINANCE

- A. The Contractor is advised that the City of Waltham has a Noise Ordinance, Section 10-6, which has the authority to regulate the noise generating activities of this Contract. In general the Ordinance prohibits excessive noise created by construction, building, remodeling, excavating, land clearing, or by any of the equipment associated with such work. The Police Department considers the startup or idle running of truck engines and/or equipment prior to 7:00 AM a violation.

#### 1.08 ENCLOSURES

- A. Provide at the earliest practical time temporary enclosure of materials, work in progress and completed portions of the work to provide protection to the work and the employees.

#### 1.09 SAFETY AND SECURITY

- A. The Contractor shall be responsible for the safety and security of the site within the Contract Limit of Work Line and for the safety of all persons who enter within the Contract Limit of Work Line.
  - 1. Particular attention is called to the existing school and the necessity of preventing the access of children to the construction site.
- B. The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions & programs in connection with the work. He/she shall promulgate safety regulations and shall notify the Owner of particular hazards.
- C. The Contractor shall erect and maintain, as required by existing conditions and progress of work, all reasonable safeguards for safety and security. This includes the construction of barriers and the posting of danger signs and other warnings against hazards. By these and other necessary methods the Contractor shall stop unauthorized entry within the Contract Limit of Work Line.
- D. The Contractor shall cooperate with and maintain a close liaison with the School Department, Police Department, and Fire Department, and he/she shall abide by safety or security related requests from any of these authorities.

END OF SECTION

## SECTION 01025

### MEASUREMENT AND PAYMENT

#### PART 1- GENERAL

##### 1.01 BASE BID & ALTERNATES

###### A. Measurement & Payment

1. Measurement for payment for the renovation of Kennedy Athletic Field shall be on a lump-sum basis.
2. Payment of the lump-sum price under the Base Bid of the Proposal adjusted for accepted Alternates, shall fully compensate the Contractor for furnishing all labor, materials, equipment and incidentals required for work described in Section 01010, Summary of Work of this Specification.

##### 1.02 PAYMENT PROCEDURES

- A. Contractor shall submit substantiated monthly estimates for progress payments. The period covered by each Application for Payment shall be one (1) calendar month ending on the last day of the month.
- B. Payment will be made in accordance with the requirements of Section 39K, M.G.L.
- C. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
  1. List of subcontractors.
  2. Schedule of Values.
  3. Contractor's Construction Schedule (preliminary if not final).
  4. Products list.
  5. Submittals Schedule (preliminary if not final).
  6. Copies of permits.
  7. Initial progress report.
  8. Certificates of insurance and insurance policies.
- D. Refer to Section 01700 - Project Close-out for additional requirements for payments at Substantial Completion and Final Completion.

##### 1.03 ADDITIONAL WORK

- A. Additional Work, if any, shall be performed at a mutually satisfactory price agreed upon between the Contractor and the Owner through the process described in Section 01028 - Change Order Procedure.

END OF SECTION

Measurement and Payment  
01025-2

SECTION 01028

CHANGE ORDER PROCEDURE

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to Attachment A and D of the Contract, concerning Change Orders. All Change Orders must be signed and approved by the Chief Procurement Officer and the City Auditor prior to execution of the Work.

1.02 SCOPE OF WORK

- A. Work included: Make such changes in the Work, in the Contract Sum, in the Contract Time of Completion, or any combination thereof, as are described in written Change Orders signed by the Owner and issued after execution of the Contract, in accordance with the provisions of this Section.

1.03 SUBMITTALS

- A. Make submittals directly to the Landscape Architect at the address shown on the Project Manual.
- B. Prepare in accordance with change order format in Appendix A of the Contract.

1.04 PRODUCT HANDLING

- A. Maintain a "Register of Proposal Requests and Change Orders" at the job Site, accurately reflecting current status of all pertinent data.
- B. Make the Register available to the Landscape Architect/Engineer for review at his/her request.

1.05 CHANGES INITIATED BY THE OWNER

- A. Should the City contemplate making a change in the Work or a change in the Contract Time of Completion, the Landscape Architect will issue a "Proposal Request" to the Contractor.
  - 1. Proposal Requests will be dated and will be numbered in sequence.
  - 2. The Proposal Request will describe the contemplated change, and will carry one of the following instructions to the Contractor:
    - (a) Make the described change in the Work at no change in the Contract Sum and no change in the Contract Time of Completion.

- (b) Make the described change in the Work, credit or cost for which will be determined in accordance with pertinent paragraphs of Appendix D Change Orders.

#### 1.06 CHANGES INITIATED BY THE CONTRACTOR

- A. Should the Contractor discover a discrepancy among the Contract Documents, a concealed condition, or other cause for suggesting a change in the Work, a change in the Contact Sum, or a change in the Contact Time of Completion, he shall notify the Landscape Architect.
- B. Upon agreement by the Landscape Architect that there is reasonable cause to consider the Contractor's proposed change, the Landscape Architect will issue a Proposal Request in accordance with the provisions described in Article 1.05 above.

#### 1.07 PROCESSING PROPOSAL REQUESTS

- A. In response to each Request for Proposal, the Contractor shall:
  - 1. Submit to the Landscape Architect for review one copy of completed Change Order Form (Appendix A of the Contract).
  - 2. Meet with the Landscape Architect as required to explain costs and, when appropriate, determine other acceptable ways to achieve the desired objective.
  - 3. Alert pertinent personnel and subcontractors as to the impending change and, to the maximum extent possible, avoid such work as would increase the Owner's cost for making the change, advising the Landscape Architect in writing when such avoidance no longer is practicable.
- B. Upon the signature of the Chief Procurement Officer and the City Auditor, the Landscape Architect will issue a "Change Order" to the Contractor.

#### 1.08 CHANGE ORDERS

- A. Change Orders will be dated and will be numbered in sequence.
- B. The Change Order will describe the change or changes and will refer to the Proposal Request(s) involved.
- C. The Landscape Architect will issue four copies of each Change Order to the Contractor.
  - 1. The Contractor promptly shall sign all four copies and return three copies to the Landscape Architect.

END OF SECTION

SECTION 01030

ALTERNATES

PART 1- GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the General Conditions of the Contract, all Divisions of the Specifications, and the Drawings, all of which apply to work of this section.

1.02 ALTERNATE BIDS

- A. General Bidders shall insert in the space provided on the bid forms the amounts to be added to their respective Base Bids for the following Alternates. Each proposal amount shall include the entire cost of the alternate portion of the work including overhead, profit, and other costs to furnish and install the alternate complete-in-place, including the cost of interfacing and coordinating the alternate with related and adjacent work. All work shall be done in conformance with the relevant plans, specifications, and details. The following Alternates are ADD ALTERNATES, which if accepted by the Owner, shall directly increase the Contractor's base bid contract price and lump sum bid.

**ADD ALTERNATE NO. 1:**

Furnish and install new 4'ht. galvanized chain link fence in the amount and location shown on the Drawings for Alternate 1. New fencing shall conform to Specifications Section 02825 – Chain Link Fence.

**ADD ALTERNATE NO. 2:**

Furnish and install new 4' ht. galvanized chain link fence in the amount and location shown on the Drawings for Alternate 2. Price for this alternate shall include demolition of existing fence including footings. New fencing shall conform to Specifications Section 02825 – Chain Link Fence.

**ADD ALTERNATE NO. 3:**

Amend field with sand incorporated into existing loam, as indicated on the Drawings and described in Specification Section 02150 – Field Renovation.

END OF SECTION



## SECTION 01040

### CONTROL OF WORK

#### PART 1 - GENERAL

##### 1.01 GENERAL PROVISIONS

- A. Attention is directed to the General Conditions of the Contract, all Divisions of the Specifications and the Contract Drawings, all of which apply to this section.

##### 1.02 EQUIPMENT

- A. The Contractor shall furnish equipment which will be efficient, appropriate, and of sufficient quantity to secure a satisfactory quality of work and a rate of progress which will insure the completion of the Work within the time stipulated in the Contract Documents. If at any time such equipment appears to the Owner to be inefficient, inappropriate or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character, or equipment and the Contractor shall conform to such order. Failure of the Owner to give such order shall in no way relieve the Contractor of his obligations to secure the quality of work and rate of progress required. In addition, the Contractor shall maintain his equipment, including mufflers, oil seals or gaskets, and air pollution control devices, in proper working order.

##### 1.03 PROJECT MANAGEMENT

- A. The Work must be completed in a continuous uninterrupted operation. The Contractor must use sufficient labor and equipment to complete all the necessary work requirements within a minimum period of time and as stated in the Contract Documents.
- B. Prior to the start of work, the Contractor shall submit a Progress Schedule in a bar chart form at the preconstruction meeting to the Landscape Architect for completing the Work. See Section 01300 - Submittals of this Specification.
- C. The Contractor is fully responsible for the security and safety of partially completed work until the Project is finally accepted by the Owner and the Landscape Architect.
- D. Hours of work for construction activities are limited to 8:00 AM to 4:00 PM Monday through Friday. Any changes to the work schedule must be authorized by

the Landscape Architect and School Department Officials.

- E. All work areas shall be secured, and materials and equipment shall be removed at the end of each work day.
- F. The Contractor shall retain on the Project during its progress, a competent full-time representative. This representative shall not be changed except with the consent of the Owner and Landscape Architect. The representative shall be in full charge of the Work and all instructions given to him shall be binding.

#### 1.04 CITY OF WALTHAM NOISE ORDINANCE

- A. The Contractor is advised that the City of Waltham has a Noise Ordinance, Section 10-6, which has the authority to regulate the noise generating activities of this Contract. In general the Ordinance prohibits excessive noise created by construction, building, remodeling, excavating, land clearing, or by any of the equipment associated with such work. The Police Department considers the startup or idle running of truck engines and/or equipment prior to 7:00 AM a violation. Permits to waive the noise ordinance must be approved and issued by the Chief of Police.

#### 1.05 SITE INVESTIGATION OF EXISTING CONDITIONS

- A. The Contractor acknowledges that he/she has satisfied him/herself as to the conditions existing at the Site of the Work, the type of equipment required to perform the Work, the quality and the quantity of the materials to be furnished insofar as this information is reasonably ascertainable from an inspection of the Site, as well as from information presented by the Specifications made a part of the Contract. Any failure of the Contractor to acquaint himself/herself with available information will not relieve him from the responsibility for estimating properly the difficulty or cost of successfully performing the Work.
- B. No claim for extra compensation or extension of time will be allowed due to the Contractor's failure to estimate properly the quantities, locations and measurements of all items required to complete the Work.
- C. Report any discrepancies to the Landscape Architect and request her/his interpretation.

#### 1.06 PROTECTION OF WORK AREA

- A. The Contractor shall secure all work areas by 4:00 PM each work day.

- B. All of the Contractor's equipment, supplies, etc. left on-site, shall be secured daily. In no case will the Owner assume responsibility for damage or loss of materials and equipment left on-site.
- C. The Contractor shall take precautions to prevent injury to the public due to open excavations or excavated materials. All trenches, excavated materials, equipment, or other obstacles which could be dangerous to the public shall be secured in an agreed upon staging area.

#### 1.07 LAWS AND REGULATIONS

- A. The Contractor shall keep himself fully informed of all State and Federal laws and Municipal ordinances and regulations in any manner affecting those engaged or employed in the Work, or the materials used in the Work, or in any way affecting the conduct of the Work, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same.
- B. If any discrepancy or inconsistency is discovered in the Plans, Specifications, or Contract for the Work in relation to any such laws, ordinances, regulations, orders or decrees, the Contractor shall forthwith report the same to the Landscape Architect in writing. He/she shall at all times himself/herself observe and comply with, and shall cause all his/her agents and employees to observe and comply with all such laws, ordinances, regulations, orders, and decrees, and shall protect and indemnify the Owner and its officers, agents and servants against any claim or liability arising from or based on the violation of any such laws, ordinances, regulations, and orders or decrees, whether by himself/herself or his/her employees or subcontractors.

#### 1.10 PERMITS AND CODES

- A. Under this Contract, all work shall be as shown in the Contract Drawings and Specifications and shall comply with applicable codes and regulations at the local, county, state, and federal levels. All labor, materials, equipment and services necessary to make the Work comply with such requirements shall be provided without additional cost to the Owner.
- B. Do not close any street, sidewalk, alley, or passageway. Conduct operations as to interfere as little as possible with the use ordinarily made of roads, driveways, alleys, sidewalks, or other facilities near enough to the Work to be affected thereby.
- C. Where code references are given, the latest issue of that Code in effect at the time of bidding shall be used. Code references are given to indicate the minimum

quality and performance acceptable. Where Specifications and/or Contract Drawings indicate more stringent requirements, the Specifications or Contract Drawings shall govern.

D. The Contractor, under this Contract shall be responsible for providing and filing all Plans, Specifications and other documents, pay all requisite fees and secure all permits, inspections and approvals necessary for legal installation and operation of the systems and or equipment furnished under this Contract, except as otherwise specified.

1. Fees for City of Waltham permits will be waived by the City.

E. Comply also with applicable provisions of American National Standard Code for Building Construction ANSI A10.6.

#### 1.11 INSPECTION AND TESTS

A. Testing shall be as specified in Section 01400-Quality Control.

B. All material and workmanship shall be subject to inspection and examination by the Landscape Architect at any and all times during construction.

C. All work that is unsatisfactory, or fails to comply with the Specifications in the opinion of the Landscape Architect or City Officials, shall be corrected by the Contractor at his own expense to the satisfaction of the Landscape Architect.

#### 1.13 COORDINATION WITH UTILITIES

A. The Contractor shall coordinate his/her Work with the utility companies to prevent damages or disruption to existing equipment and to coordinate new utility installations. The Contractor shall contact the utility companies owning underground equipment in the area of his work prior to commencing excavation. Contact with the utility companies shall be made sufficiently in advance so they can properly locate their equipment.

B. The contractor shall be responsible for locating all site items such as utilities which could be affected by this Contract prior to the start of construction. The Contractor shall contact Dig-Safe (1-888-344-7233) prior to the start of construction, and obtain a Certificate verifying that the location work has been completed. Contact the City of Waltham Engineer to verify the location of additional on-site utilities. Contact telephone and communications companies to verify location of cables.

- C. All right-of-way and site utilities (water, sewer, drainage) shall be inspected and approved by the City Engineer's Office.
- D. Site information: No representations are made indicating subsurface conditions. It is expressly understood that the Owner/Landscape Architect will not be responsible for interpretations or conclusions drawn therefrom by the Contractor.

#### 1.14 FIRE PROTECTION

- A. Gasoline and other flammable liquids shall not be stored on site. They shall be dispensed from a UL listed safety containers in conformance with the National Board of Fire Underwriters recommendations. Do not store flammables near buildings.

#### 1.15 CLEANUP

- A. During the course of the Work, the Contractor shall keep the Site in as clean and neat a condition as possible. He/she shall dispose of all residue resulting from the work. At the conclusion of the day's work, the Contractor shall leave the entire Site of the Work in a neat and orderly condition.

END OF SECTION

## SECTION 01050

### FIELD ENGINEERING

#### PART 1 - GENERAL

##### 1.01 GENERAL PROVISIONS

- A. Attention is directed to the General Conditions of the Contract, all Divisions of the Specifications and the Contract Drawings, all of which apply to this section.
- B. Examine and coordinate all Contract Drawings and other section of the Specifications for requirements which affect work of this section whether or not such work is specifically mentioned in this section. Coordinate work with other trades to assure the steady progress of all work under the Contract.

##### 1.02 SCOPE OF WORK

- A. The Work under this Section consists of field staking the horizontal and vertical alignment of all site improvements.

#### PART 2 - MATERIALS

##### 2.01 LAYOUT AND STAKING

- A. The Contractor shall be responsible for furnishing all stakes, pins, and grade markings as required to implement the work of layout and staking and shall make all field adjustments ordered by the Landscape Architect at no extra cost to the Owner.
- B. Upon request by the Landscape Architect, the Contractor shall make available to the Owner survey instruments necessary to check proposed vertical and horizontal alignments at no extra cost.

#### PART 3 - EXECUTION

##### 3.01 SURVEY LAYOUT

- A. The Contractor shall use the alignments shown on the Plans to obtain the alignment which shall be approved subject to field adjustments as ordered by the Landscape Architect.
- B. The Contractor shall lay out the necessary grades and locations of the field and

fencing, and all other proposed site improvements.

- C. The Contractor shall inform the Landscape Architect when the general layout is completed and shall not begin excavation until the various alignments are approved by the Landscape Architect. Any discrepancies encountered in field conditions shall be reported to the Landscape Architect immediately.
- D. The Contractor shall be responsible for maintaining the correct vertical and horizontal alignment of all elements, which responsibility shall not be waived by the Landscape Architect's approval of the basic layout and stakeout.

END OF SECTION

## SECTION 01200

### PROJECT MEETINGS

#### PART 1 - GENERAL

##### 1.01 GENERAL PROVISIONS

- A. Attention is directed to the General Conditions of the Contract, all Divisions of the Specifications, and the Contract Documents, all of which apply to work of this section.

##### 1.02 SCOPE OF WORK

- A. Attend project meetings to enable orderly review during progress of the Work, and to provide for systematic discussion of problems, as long as deemed necessary by the Landscape Architect throughout the construction period.
- B. The Contractor's relations with his subcontractors and materials suppliers, and discussion relative thereto, are the Contractor's responsibility and normally are not part of Project Meetings content.

##### 1.03 QUALITY ASSURANCE

- A. For those persons designated by the Contractor to attend and participate in Project Meetings, provide required authority to commit the Contractor to solutions agreed upon in the Project Meetings.

##### 1.04 MEETING NOTES

- A. The Landscape Architect will compile minutes of each Project Meeting and furnish copies to the attendees, Contractor, and Owner before the next scheduled meeting.

#### PART 2 - NOT USED

#### PART 3 - EXECUTION

##### 3.01 PRECONSTRUCTION MEETING

- A. The Contractor shall arrange for a Preconstruction Meeting within 5 days after the award of contract, prior to commencing any work on site, in order to coordinate between him/herself, his/her Subcontractors, the Owner, and the Landscape Architect the procedures to be followed on the project.



- B. Contractor is to coordinate attendance by authorized representatives of the Owner, the Contractor, site work subcontractors, and the Landscape Architect.
- C. Minimum agenda: Data will be distributed and discussed on at least the following items:
  - 1. Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, materials suppliers and Owner.
  - 2. Channels and procedures for communication.
  - 3. Construction schedule, including sequence of critical work.
  - 4. Contract Documents and revisions.
  - 5. Processing of Shop Drawings and other data submitted to the Owner for review, including the process for reviewing water, sewer and drainage submittals.
  - 6. Processing of Bulletins, field decisions, and Change Orders.
  - 7. Procedures for safety, first aid, security, quality control, housekeeping, and related matters.
  - 8. Submittal of Construction Fence layout.
  - 9. Submittal of Progress Schedule, Tabulation of Submittals and Schedule of Values.

### 3.02 PROJECT MEETINGS

- A. Frequency: Project Meeting shall in general be held at regular intervals not less frequently than once a week. Meetings will be chaired by the Landscape Architect.
- B. Location: Project meetings will be held at the job site.
- C. Attendance:
  - 1. To the maximum extent practicable, assign the same person or persons to represent the Contractor at Project Meetings throughout the progress of the work.
  - 2. Site work subcontractors, material suppliers, and others may be invited to attend those Project Meetings in which their aspect of the Work is involved.
- D. Minimum Agenda:
  - 1. Review progress of the Work since last meetings, including status of submittals for approval.

2. Identify problems which impede planned progress.
  3. Develop corrective measures and procedures to regain planned schedule.
  4. Complete other current business.
- E. Revision to Minutes:
1. Unless published minutes are challenged in writing prior to the next regularly scheduled Project Meeting, they will be accepted as properly stating the activities and decisions of the meeting.
  2. Persons challenging published minutes shall reproduce and distribute copies of the challenge to all indicated recipients of the particular set of minutes.
  3. Challenge to minutes shall be settled at the start of the next regularly scheduled meeting.

END OF SECTION

## SECTION 01300

### SUBMITTALS

#### PART 1- GENERAL

##### 1.01 GENERAL PROVISIONS

- A. Attention is directed to the General Conditions of the Contract, all Divisions of the Specifications, and the Contract Drawings, all of which apply to this section.
- B. Consult the individual Sections of the Specifications for the specific submittals required under those sections and for further details and descriptions of the requirements.

##### 1.02 SCOPE OF WORK

- A. The scope of the work under this Specification section, without limiting the generality thereof, includes the furnishing of all labor material, equipment, services and incidentals necessary to complete all the work in accordance with the contract documents, which are intended to describe and provide for a finished piece of work.
- B. The type of work includes the following without limiting the generality thereof:
  - 1. Progress Schedules.
  - 2. Schedule of Values.
  - 3. Shop drawings.
  - 4. Product Data.
  - 5. Samples.

##### 1.03 QUALITY ASSURANCE

- A. Coordination of submittals:
  - 1. Prior to each submittal, carefully review and coordinate all aspects of each item being submitted.
  - 2. Verify that each item and the associated submittal conform in all respects with the specified requirements.
  - 3. By affixing the Contractor's signature to each submittal, certify that this coordination has been performed.

- B. Timeliness - The Contractor shall transmit each submittal to the Landscape Architect well in advance of performing related Work or other applicable activities, so that the installation shall not be delayed by processing times, including disapproval and re-submittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery, and similar sequenced activities. **Items with long lead times for orders such as site furnishings need to be submitted immediately.** No extension of time will be authorized because of the Contractor's failure to transmit submittals to the Landscape Architect in advance of the Work.
1. Sequence - The Contractor shall transmit each submittal in a sequence which will not result in the approval having to be later modified or rescinded by reason of subsequent submittals which should have been processed earlier or concurrently for coordination.
- C. 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 Landscape Architect. Submittals shall be accompanied by a transmittal notice stating name of Project, date of submittal, "To" or "From" (Contractor, Subcontractor, Installer, Manufacturer, Supplier), Specification Section or Drawing No. to which the submittal refers, purpose (first submittal, re-submittal), description, remarks, distribution record, and signature of transmitter.
- D. "Or-Equals", "or equal as approved" or "or approved equal" - On the transmittal, or on a separate sheet attached to the transmittal, the Contractor shall direct attention to any deviations including minor limitations and variations, from the Contract Documents. Do not assume that the materials, equipment, or methods will be approved as equal unless the item has been specifically so approved for this Work by the Owner.
1. The Contractor and all Subcontractors shall submit to the Landscape Architect for consideration of any Or-Equal substitution, a written point by point comparison containing the name and full particulars of the proposed product to the product named or described in the Contract Documents.
  2. Such submittal shall in no event be made later than 30 calendar days prior to the incorporation of the item into the Work. In any case in which the time period specified in the Contract Documents from the Notice to Proceed to Substantial Completion is less than 30 days, this requirement can be waived by the Landscape Architect.
  3. Upon receipt of a written request for approval of an Or-Equal substitution, the Landscape Architect 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 Landscape Architect shall promptly advise that the item is, or is not, considered acceptable as an Or-Equal substitution. Such written notice must have the concurrence of the Owner.

4. In no case may an item be furnished on the Work other than the item named or described, unless the Landscape Architect, with the Authority's concurrence, shall consider the item equal to the item so named or described, as provided by M.G.L. c.30 § 39M.
  5. The equality of items offered as "equal" to items named or described shall be proved to the satisfaction of the Landscape Architect at the expense of the Contractor or Subcontractor submitting the substitution.
  6. The Landscape Architect and/or the Authority may require that full size samples of both the specified and proposed products be submitted for review and evaluation. The Contractor or Subcontractor, as the case may be, shall bear full cost for providing, delivering, and disposal of all such samples.
  7. The Contractor or Subcontractor, as the case may be, 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 due to such substitution.
- E. Processing - All costs for printing, preparing, packaging, submitting, resubmitting, handling, inspecting and mailing, or delivering submittals required by this contract shall be included in the Contract Sum.
- F. Unless otherwise indicated on the Contract Drawings, or specified, only new materials and equipment shall be incorporated into the Work. All materials and equipment furnished by the Contractor shall be subject to the inspection and approval of the Owner. No materials shall be delivered to the work without prior approval of the Owner.
- G. By approving and submitting shop drawings, product data, and samples, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the contract documents.
- H. The inspection and approval by the Landscape Architect of shop drawings, product data, and samples is general and does not relieve the Contractor from

responsibility for compliance with the requirements of the Contract or for proper dimensions, fitting, construction, and construction sequencing.

- I. The Contractor or Subcontractors shall not be relieved of responsibility for any deviation from the Contract Drawings or Specifications unless the Contractor has specifically informed the Landscape Architect in writing of such deviation, and the Landscape Architect has given specific written approval thereof.
- J. The Contractor shall submit to the Landscape Architect data relating to materials and equipment he proposes to furnish for the Work. Such data shall be in sufficient detail to enable the Landscape Architect to identify the particular product and to form an opinion as to its conformity to the Specifications. Submittals shall, at minimum, include the following:
  - 1. Name of Manufacturer.
  - 2. Dimensional requirements for the material.
  - 3. Class and/or type of material.
  - 4. Strength requirements for the material.
  - 5. Sieve analysis of fill materials.
  - 6. And any other information that is required in determining conformance of the submittal with the Specifications or the Contract Drawings.

#### 1.04 LANDSCAPE ARCHITECT'S ACTION

- A. The Landscape Architect 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 Noted" the Work may proceed provided it complies with the Landscape Architect's notations or corrections on the submittal and complies with the requirements of the Contract Documents. Acceptance of the Work will depend upon these compliances.
  - 3. Returned for Resubmittal: When marked "Revise & Resubmit" or "Disapproved", the Work covered by the submittal (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 Landscape Architect's notations stating the reasons for returning the submittal.

## 1.05 PROGRESS SCHEDULES

- A. At the Preconstruction Meeting, the Contractor shall submit a progress schedule in bar chart form. Indicate a time bar for each major category or unit of work to be performed, properly sequenced and coordinated with other elements of the work.
- B. With the progress schedule, submit a tabulation of all submittals which will clearly show: the submittal name and section, date to Landscape Architect for review, date required back to Contractor to maintain the orderly progress of the work, and those submittals required early because of long lead time for ordering, manufacture or fabrication. The Contractor shall submit shop drawings, data and samples or place his/her order sufficiently early to permit consideration and approval by the Landscape Architect before materials are necessary for incorporation into the Work. Any delay resulting from the Contractor's failure to do so shall not be used as a basis of a claim against the Owner.
- C. Monthly, as the job progresses, submit updates of the original progress schedule to show actual progress on the job and any revisions to the projected completion date.

## 1.06 SCHEDULE OF VALUES

- A. With the progress schedule, submit a schedule of values on an AIA "Request for Payment" form which breaks down the contract price by specification sections. This schedule of values shall be in reasonable correspondence with the Contractor's actual costs for each Subcontract or trade, and it shall serve as the basis for the evaluation and approval of monthly requests for Payment as they are submitted.

## 1.07 SHOP DRAWINGS

- A. Shop drawings shall be complete. Give 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 Landscape Architect reserves the right to review and approve shop drawings only after approval of related product data and samples. Shop drawings for water, sewer, and drainage will require review by the City Engineer.
- 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, date of

shop drawings and revisions, Contractor's stamp of approval, and sufficient spaces near the title block for the Landscape Architect's stamp.

- E. The Contractor shall submit to the Landscape Architect one legible original and two copies of each shop drawing. Transparency and prints shall be mailed or delivered in roll form. Each submittal shall be accompanied by a transmittal notice.
- F. When the original is returned by the Landscape Architect with the stamp "Revise and Resubmit" or "Disapproved", the Contractor shall correct the original drawing or prepare a new drawing and resubmit the original and two copies thereof to the Landscape Architect for approval. This procedure shall be repeated until the Landscape Architect's approval is obtained.
- G. When the original is returned by the Landscape Architect with the stamp "Approved" or "Approved as Corrected", the Contractor shall provide and distribute the copies for all Contractor and Subcontractors use, and in addition submit, within 10 calendar days after approval, 3 prints to the Landscape Architect.
- H. The Contractor shall maintain one full set of approved shop drawings at the site.

#### 1.08 SUBMISSION OF PRODUCT DATA

- A. The Contractor shall submit 6 copies of Product Data to the Landscape Architect. 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. 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 mar legibility.
- C. Product Data returned by the Landscape Architect as "Disapproved" shall be resubmitted in 6 copies until the Landscape Architects approval is obtained.
- D. When the Product Data are acceptable, the Landscape Architect will stamp them "Approved" or "Approved as Corrected," retain 3 copies, and return 4 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.



#### 1.09 SUBMISSION OF SAMPLES

- A. Unless otherwise specified in the individual section, the Contractor shall submit two specimens of each sample.
- 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 in the Work.
- C. Samples which can be conveniently mailed shall be sent directly to the Landscape Architect, 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 to the project site 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 Landscape Architect.
- E. If a sample is rejected by the Landscape Architect, a new sample shall be resubmitted in a manner specified hereinabove. This procedure shall be repeated until the sample is approved by the Landscape Architect.
- F. Samples will not be returned unless return is requested at the time of submission. The right is reserved to require submission of samples whether or not particular mention is made in the Specifications.

END OF SECTION

## SECTION 01400

### QUALITY CONTROL

#### PART 1 - GENERAL

##### 1.01 GENERAL PROVISIONS

- A. Attention is directed to the General Conditions of the Contract, all Divisions of the Specifications and the Drawings, all of which apply to this section.

##### 1.02 SCOPE OF WORK

- A. The scope of the work under this Specification section, without limiting the generality thereof, includes the furnishing of all labor, materials, equipment, services, and incidentals necessary to complete all of the work in accordance with the Contract Documents, which are intended to describe and provide for a finished piece of work.
- B. The work includes the following, without limiting the generality thereof;
  - 1. The Contractor shall be responsible for paying for compaction testing specified in Section 02200 - Earthwork.
  - 2. The Contractor shall make available to the Owner's testing laboratory any samples or specimens which the laboratory may require to perform quality control testing on concrete, fill materials, or other material as the Owner may elect to provide additional testing for.
  - 3. The coordinating and scheduling of work and the giving of timely notice so as to afford the Owner's testing laboratory the opportunity to take samples and make observations or tests.

##### 1.03 TESTING LABORATORY

- A. The Owner may select, engage, and pay for the services of an independent testing laboratory to perform structural tests on concrete and such other materials as the Landscape Architect/Engineer may deem appropriate.
- B. Retesting of materials which fail the original test shall be paid for by the Contractor.

END OF SECTION

Quality Control  
01400-1

## SECTION 01500

### TEMPORARY FACILITIES & CONTROLS

#### PART 1- GENERAL

##### 1.01 GENERAL PROVISIONS

- A. Attention is directed to the General Conditions of the Contract, all Divisions of the Specifications and the Contract Drawings, all of which apply to this section.

##### 1.02 SCOPE OF WORK

- A. The scope of the work under this Specification section, without limiting the generality thereof, includes the furnishing of all labor, materials, equipment, services, and incidentals necessary to complete all of the work in accordance with the Contract Documents, which are intended to describe and provide for a finished piece of work.
- B. The work includes the following, without limiting the generality thereof;
  - 1. Temporary utilities.
  - 2. Field equipment.
  - 3. Barriers and enclosures.
  - 4. Safety and security.
  - 5. Project identification.

##### 1.03 TEMPORARY UTILITIES

- A. The Contractor is responsible for all temporary electrical distribution, lighting, and water distribution from existing sources.
- B. The Contractor shall provide and pay for his own temporary telephone service within the Contract Limit Line.

##### 1.04 FIELD EQUIPMENT

- A. The Contractor shall provide a transit, rod and level on site for checking layouts and installations.

##### 1.05 BARRIERS AND ENCLOSURES

- A. The Contractor shall provide and maintain sufficient fencing and warning signs around the work area to limit unauthorized entry within the Contract Limit Line.

- B. At the earliest practical time provide temporary enclosure of materials, equipment, work in progress and completed portions of the work to provide protection to the work and employees.

#### 1.06 SAFETY AND SECURITY

- A. The Contractor shall be responsible for the safety and security of the site within the Contract Limit Line, and for the safety of all persons who enter within the Contract Limit Line.
  - 1. Gates or other temporary openings in the fencing used to allow construction personnel or equipment access shall be maintained closed at all times to prevent access by the public.
- B. The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work.
- C. The Contractor shall erect and maintain, as required by existing conditions and progress of the work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying the Owner of particular hazards.
- D. The Contractor shall cooperate with and maintain a close liaison with the Police Department and Fire Departments, and he shall abide by safety-related requests from any of these agencies.

END OF SECTION

SECTION 01571

ORDER OF CONDITIONS

PART I - GENERAL

1.01 SUMMARY

- A. The work of this project lies within the 100-foot buffer zone of Bordering Vegetated Wetlands and Bank under the jurisdiction of the Waltham Conservation Commission and The Massachusetts Department of Environmental Protection. The Waltham Conservation Commission has issued an Order of Conditions which conditions the work of this project, a copy of which is included as a Special Condition of the Contract as Appendix A.
  - 1. The Contractor shall be responsible for reading the Order of Conditions and being familiar with each and every condition which has been set forth.
  - 2. The Contractor shall be responsible for satisfying the provisions of the Order of Conditions including but not limited to the following:
    - (a) Signage requirements
    - (b) Erosion, drainage and sedimentation controls
    - (c) Cooperation with the Conservation Commission inspections.
      - (1) Designation of a person responsible for supervising and inspecting drainage and erosion controls available on a 24-hour basis to communicate with the Conservation Commission.

PART II - PRODUCTS (Not Used)

PART III - EXECUTION (Not Used)

END OF SECTION

SECTION 01700

PROJECT CLOSE-OUT

PART 1- GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the General Conditions of the Contract, all Divisions of the Specifications and the Drawings, all of which apply to this section.
- B. Project close-out procedures are subject to the requirements of M.G.L. Chapter 30, Section 39G, excerpted in Division 0, Section 00830.

1.02 SCOPE OF WORK

- A. The scope of work under this Specification section, without limiting the generality thereof, includes the furnishing of all labor, materials, equipment, services, incidentals necessary to complete all of the work in accordance with the Contract Documents, which are intended to describe and provide for a finished piece of work.
- B. The type of work includes the following, without limiting the generality thereof:
  - 1. Final Cleaning.
  - 2. Substantial Completion
  - 3. Recording as-built information and coordination with others to produce final As-Built Drawings.
  - 4. Warranties.
  - 5. Operating and Maintenance Manuals: Provide one copy to City of Waltham School Department personnel.
  - 6. Final Completion.

1.03 FINAL CLEANING

- A. Immediately prior to Substantial Completion of the work, the Contractor shall perform all cleanup work as follows:
  - 1. Remove all waste materials and rubbish from the site and legally dispose of it.
  - 2. Remove all tools, equipment, machinery, surplus material, temporary enclosures, and any other material belonging to the Contractor or his Subcontractors.

3. Clean all surfaces, fixtures, and equipment within the work areas, and any surfaces outside the work area which have been made dirty by the work of the contract. Leave the entire site clean and ready for use.

#### 1.04 SUBSTANTIAL COMPLETION

- A. Related Requirements: The Contractor's attention is directed to the General and Supplementary Conditions of the Contract and M.G.L. Chapter 30, Section 39G for additional information covering substantial completion procedures and payments.
  1. Substantial Completion is defined in MGL 149 Section 39G, excerpts of which are included in Attachment B, Section 00830 of Division 0.
- B. Upon Substantial Completion of the project, the Contractor shall present written certification that the work is substantially complete. The Landscape Architect will promptly, and in no case later than 21 days after the Contractor's certification, respond in writing declaring the work has reached Substantial Completion, or he shall provide an itemized list of incomplete or unsatisfactory items that must be completed to achieve Substantial Completion.
- C. Within 65 days after the effective date of a declaration of substantial completion, the Landscape Architect will send the Contractor a Substantial Completion estimate, which will be the balance of the Contract price minus a one percent retention for final completion, amounts to cover any outstanding claims, any amounts estimated to cover incomplete or unsatisfactory work, and the sum of all demands for direct payment made by Subcontractors.
  1. Refer to MGL 149 Section 39G for additional information concerning payment, excerpted in Division 0, Section 00830-B.

#### 1.05 AS-BUILT RECORD DRAWINGS

- A. General: Do not use As-Built Record Drawings for construction purposes. Protect As-Built Record Drawings from deterioration and loss. Provide access to As-Built Record Drawings for Architect's and Owner's reference during normal working hours.
  1. As-Built Record Drawings: Maintain and submit one set of black-line white prints of As-Built Record Contract Drawings and Shop Drawings.
    - (a) Mark As-Built Record Prints to show the actual installation where installation varies from that shown originally. Require individual

or entity who obtained record data, whether individual or entity is Installer, Subcontractor, or similar entity, to prepare the marked-up As-Built Record Prints.

- (1) Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
  - (2) Accurately record information in an understandable drawing technique.
  - (3) Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
  - (4) Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.
- (b) Mark as-built record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
  - (c) Mark important additional information that was either shown schematically or omitted from original Drawings.
  - (d) Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
  - (e) Identify and date each As-Built Record Drawing; include the designation "PROJECT AS-BUILT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
- (a) Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  - (b) Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
  - (c) Note related Change Orders, As-Built Drawings, and Product Data, where applicable.



3. Record Product Data: Submit one copy of each Product Data submittal. Mark one set to indicate the actual product installation where installation varies substantially from that indicated in Product Data.
  - (a) Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  - (b) Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
  - (c) Note related Change Orders, As-Built Drawings, and Record Specifications, where applicable.

#### 1.06 WARRANTIES

- A. Submittal Time: Submit written warranties on request of the Landscape Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
  1. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
    - (a) Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
    - (b) Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
    - (c) Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
  2. Provide additional copies of each warranty to include in operation and maintenance manuals. At Substantial Completion of the project, the Contractor shall deliver to the Landscape Architect copies of all warranties for the various materials and pieces of equipment included in the project. These warranties shall be submitted in duplicate and shall be bound together with the operating and maintenance data called for above.

#### 1.07 OPERATION AND MAINTENANCE MANUALS

- A. Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual

Specification Sections and as follows:

1. Operation Data:

- (a) Emergency instructions and procedures.
- (b) System, subsystem, and equipment descriptions, including operating standards.
- (c) Operating procedures, including startup, shutdown, seasonal, and weekend operations.
- (d) Description of controls and sequence of operations.
- (e) Piping diagrams.

2. Maintenance Data:

- (a) Manufacturer's information, including list of spare parts.
- (b) Name, address, and telephone number of Installer or supplier.
- (c) Maintenance procedures.
- (d) Maintenance and service schedules for preventive and routine maintenance.
- (e) Maintenance record forms.
- (f) Sources of spare parts and maintenance materials.
- (g) Copies of maintenance service agreements.
- (h) Copies of warranties and bonds.

- B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.

1.08 FINAL COMPLETION

- A. Related Requirements: The Contractor's attention is directed to the General and Supplementary Conditions of the Contract and M.G.L. Chapter 30, Section 39G covering closeout and final payment procedures.
- B. Final Completion:
- 1. Within fifteen (15) days of the effective declaration of Substantial Completion, the Landscape Architect will send the Contractor by certified mail, return receipt requested, a complete final punch list of all incomplete or unsatisfactory work items necessary to achieve Final Completion.

- (1) If the Contractor fails to complete such work within forty-five (45) days after receipt of the list, or by the contractual completion date, whichever is later, the awarding authority may, subsequent to seven (7) days written notice to the Contractor, terminate the Contract and complete the incomplete or unsatisfactory work items and charge the cost of same to the Contractor.
2. The Contractor shall notify the Landscape Architect when the work is completed. The Landscape Architect will promptly make an inspection, and in no case later than thirty (30) days after notification by the Contractor that the work is complete, send the Contractor a final estimate for the Contract balance due, holding back any amount estimated to cover work which is still incomplete or unsatisfactory.
3. Upon completion of all remaining items, and after receipt of all appropriate Record Specifications, Record Product Data, Operating and Maintenance Manuals, Warranties, Guarantees and any Spare Parts as required by the Contract Documents, the Contractor shall provide a notarized Contractor's Certificate and Release and a final Application for Payment to the Owner to complete the close-out process.

END OF SECTION

## SECTION 02100

### SITE PREPARATION AND DEMOLITION

#### PART 1 - GENERAL

##### 1.01 GENERAL PROVISIONS

- A. All of the Contract Documents, including the Contract Form, General Provisions, General Conditions, Supplemental Conditions, and all Attachments to the General Provisions, and Division 1 - General Requirements, apply to the work of this Section.
- B. Contact Dig-Safe (1-888-344-7233) seventy-two hours prior to the start of any removals or excavation work, and obtain a Certificate verifying that marking the location of utilities has been completed. Coordinate demolition work with utility companies. Dig-safe does not locate telephone and cable lines; contact the specific utilities involved for this information.

##### 1.02 SPECIAL CONDITIONS OF THE PROJECT

- A. The work of this project lies within the 100-foot buffer zone of Bordering Vegetated Wetlands and Bank under the jurisdiction of the Waltham Conservation Commission and The Massachusetts Department of Environmental Protection. The Waltham Conservation Commission has issued an Order of Conditions which conditions the work of this project, a copy of which is included as a Special Condition of the Contract. Refer to Section 01571 – Order of Conditions and Appendix A.
- B. Straw wattles and any other required erosion control devices shall be in place prior to any earth disturbing activities.
- C. DEP filing identification sign shall be in place prior to any work commencing.
- D. After installing signage and erosion controls, the Contractor shall obtain written approval for these installations from the Waltham Conservation Commission prior to proceeding.

##### 1.03 SCOPE OF WORK

- A. Provide all equipment and do all work necessary to prepare the site complete, as indicated on the Drawings and as specified.
- B. The work shall include, but is not limited to, the following:
  - 1. Installation of erosion controls.
  - 2. Marking the location of utilities within the Limit of Work Line.

3. Protection of existing site elements to remain.
4. Installation of DEP sign.
5. Installation of temporary construction fence and stabilized construction entrance.
6. Demolition work and site preparation work as shown on the Drawings including but not limited to removal of existing turf and portions of existing fencing.
7. Cutting back of vegetation overgrowth at fence line as shown on the Drawings.
8. Removal of incidental items, not shown on the Drawings, but necessary to perform the work of the Contract.
9. Legal off-site disposal of demolished items.

#### 1.04 RELATED WORK

- A. Examine the Contract Documents for requirements that affect work of this Section. Other specification Sections that directly affect the work of this Section include, but are not limited to:
  1. Section 01050 - Field Engineering: Layout of site improvements.
  2. Section 01500 - Temporary Facilities and Controls.
  3. Section 02150 - Field Renovation.
  4. Section 02200 - Earthwork.

#### 1.05 SUBMITTALS

- A. Copies of required permits.
- B. Provide certificate verifying marking of utilities thru Dig-safe.

#### 1.06 REFERENCES

- A. All work shall comply with the minimum standards of the latest editions of the following codes and specifications, subject to modifications and amendments outlined herein.
  1. MHD: "Standard Specifications for Highways and Bridges", Department of Public Works, Commonwealth of Massachusetts, latest edition.
  2. Federal, State and/or Municipal Codes.
  3. Americans with Disabilities Act Guidelines (ADAAG) for Building and Facilities, 36 CFR Parts 1191.
  4. OSHA Construction Regulations Title 29 CFR Part 1926.

#### 1.07 EXAMINATION OF SITE AND DOCUMENTS

- A. The Contractor shall inform him/herself of existing conditions of the site before submitting his/her bid. No claim for extra compensation or extension of contract time will be allowed on account of conditions which are apparent from a thorough

visual examination of the site.

#### 1.08 PROTECTION OF EXISTING SITE IMPROVEMENTS TO REMAIN

- A. Prevent movement, settlement or collapse of adjacent services, pavements, utilities and structures. The Contractor shall assume liability for such movement, settlement, or collapse. Promptly repair any damage identified by the Landscape Architect at no cost to the Owner.
- B. The Contractor shall prevent damage to all pipes, conduits, wires, walls, cable or structures above or below ground. No land monuments, property markers, or official datum points shall be damaged or removed until an authorized agent has witnessed or otherwise referenced their location and approved their removal.

#### 1.09 MAINTENANCE OF ACCESS TO SCHOOL

- A. Streets and sidewalks shall be maintained passable by the Contractor and the Contractor shall assume full responsibility for the adequacy and safety of provisions made. He shall conduct construction operations such that interference with the flow of vehicular and pedestrian traffic is held to a minimum, and does not at any time block fire access.

#### 1.10 PERMITS AND CODES

- A. All work shall be as shown in the Contract Drawings and Specifications and shall comply with applicable codes and regulations at the local, county, state, and federal levels. All labor, materials, equipment and services necessary to make the Work comply with such requirements shall be provided without additional cost to the Owner.
- B. The Contractor, under this Section, shall be responsible for providing and filing all Plans, Specifications and other documents, pay all requisite fees and secure all permits, inspections and approvals necessary for legal installation and operation of the systems and or equipment finished under this Section.

#### 1.11 CONDITIONS OF WORK

- A. The Work of this Project is subject to the restrictions of the City of Waltham Noise Ordinance. Refer to Section 01010 - Summary of Work, Section 1.06.
- B. Conduct the work giving consideration to protection of the public, protection of the existing work from weather; control of noise, shocks, and vibration; control of dirt and dust; orderly access and storage of materials; protection of existing buildings; protection of adjacent buildings and property. Coordinate work and cooperate with the Owner and Landscape Architect at all times.
- C. Schedule site preparation and removal work in connection with the progress

schedule required by the General Conditions.

- D. The Site Preparation / Demolition Plan endeavors to describe the scope and intent of Work. No guarantee is expressed or implied that the Site Preparation and Demolition Plan describes the full extent of objects to be removed in order to facilitate construction. Site Preparation operations not specifically identified on the Contract Drawings shall be considered as part of the basic lump sum contract and do not qualify as extra work.
- E. All other work requiring removal, such as fence, tree roots and former buried footings shall be removed and discarded as required for proper construction of new work without additional cost to the Owner.
- F. No extra demolition shall be performed without first notifying and obtaining written approval of the Landscape Architect.
- G. All apparatus, storage and the operation of work people in connection with activities under this Section shall be confined to the area within the Contract Limit of Work Line as shown on the Contract Drawings and shall not encumber areas outside the site.

#### 1.12 DRAINAGE AND EROSION CONTROL

- A. Upon entry to the site, the Contractor shall assume responsibility for site drainage from and on the project area. It shall be the responsibility of the Contractor to render the site erosion-free, at all times during the Contract period. At all times, the adjacent areas shall be protected and maintained in their existing conditions.

### PART 2 - PRODUCTS

#### 2.01 LAYOUT AND STAKING

- A. Refer to Section 01050 - Field Engineering for layout and staking requirements.

#### 2.02 DUST CONTROL

- A. Water for dust control shall be free from contaminants hazardous to human health and plant growth. No calcium chloride may be used.

#### 2.03 SIGNAGE

- A. Provide DEP File number identification sign. Refer to Section 01571 – Order of Conditions for sign description and requirements.

#### 2.04 CONSTRUCTION FENCING

- A. Temporary chain link construction fencing be the height and located as shown on the Drawings.

## 2.05 EROSION CONTROL

- A. Straw wattles shall be cylinders of compressed 100% agricultural straw, wrapped in tubular, UV-stabilized synthetic netting Straw Wattle as manufactured by American Green, or approved equal, sized 12" diameter by 25' length, staked in place as indicated on the Drawings.
- B. Gravel for stabilized construction entrance shall be crushed stone, sized as indicated on the drawings, conforming to M2.01.0 Crushed Stone of the MHD Standard Specifications for Highways and Bridges.
- C. Filter fabric for stabilized entrance shall conform to M9.50.0 Geotextile Fabric of the MHD Standard Specifications for Highways and Bridges, Table III-Type III.

## PART 3 - EXECUTION

### 3.01 LOCATING UTILITIES & SITE ITEMS AFFECTING THE WORK

- A. Prior to site preparation and removals operation, the Contractor shall locate and mark all site items such as utilities which could be affected by site preparation and removals.
- B. Contact Dig-Safe (1-888-344-7233) seventy-two hours prior to the start of any removals or excavation work, and obtain a Certificate verifying that marking the location of utilities has been completed. Contact the City of Waltham Engineering Department to verify the location of additional on-site utilities. Coordinate demolition work with utility companies. Dig-safe does not locate telephone and cable lines; contact the specific utilities involved for this information.

### 3.02 PROJECT CONDITIONS

- A. All existing items to remain which are damaged by the Contractor will be repaired or replaced at the Contractor's expense. Replacement or repaired items shall be equal to new items as specified.
- B. The Contractor shall be responsible for the methods used in this work including properly protecting against damage to existing and proposed site improvements, structures, site features, utility lines, trees, lawns, etc. Check with municipality and local utility companies for locations of existing utilities which may be in use or abandoned. Investigate and ascertain that underground utilities are correctly located and that they have been shut off and/or abandoned before disturbing them.

### 3.03 PROTECTION



- A. The Contractor shall assume complete responsibility and liability for the safety and structural integrity of all work and utilities to remain during the performance of all work.
- B. The Contractor shall provide safeguards including, but not limited to, warning signs, barricades, temporary construction fences, warning lights and other items required for protection of personnel and the general public during the performance of all work.
- C. The Contractor shall provide barricades for substantial construction in accordance with safety regulations of authorities having jurisdiction and insurance requirements.
- D. All features related to protection shall be maintained until that unit of work has been completed to the point that the danger no longer exists.

### 3.04 PAVING

- A. The line between existing pavement to be removed and existing pavement to remain shall be cut neatly saw-cut through full depth of pavement section so as to leave a smooth, straight and vertical edge. Cut to the dimensions given or directed. Remove the portion behind the cut with proper tools.
  - 1. Existing pavement which is damaged, disturbed or settled by construction operations shall be cut back by the same method and replaced as directed by the Landscape architect at no additional cost to the Owner.

### 3.05 FOOTINGS & MISCELLANEOUS SITE ITEMS

- A. Footings & miscellaneous site items shall be removed in their entirety and legally disposed of. Holes resulting from demolition shall be backfilled and compacted in accordance with Section 02200 Earthwork.

### 3.06 REMOVAL OF EXISTING FIELD VEGETATION IN

- A. Remove and dispose of existing grass sod and other vegetation within the field to a depth of 3" to 4".

### 3.09 CLEANUP

- A. Keep work areas free from accumulation of debris during the work under this Section and leave the premises in a clean condition after completion of the Work of this Section.
- B. At the completion of the work of this Section, properly and legally dispose of all items removed and not scheduled to remain, including surplus soil material,

unsuitable topsoil, demolished materials, and waste materials including trash and debris, and any other waste materials in connection with the work under this Section and leave the premises in a clean condition.

END OF SECTION

SECTION 02150

FIELD RENOVATION

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies the scope of work, materials and methods to be used to prepare the site for the work indicated on the Drawings and specified herein.

1.02 SCOPE OF WORK

- A. The work of this Section includes but is not necessarily limited to:
  - 1. Deep Tine Ripping
  - 2. Tilling and stone removal
  - 3. Tilling in sand overlay (Alternate)

1.03 RELATED WORK IN OTHER SECTIONS

- A. Section 02100 - Site Preparation & Demolition: Complete removal of existing sod to specified depth as described in Section 02100, "SITE PREPARATION", prior to commencing the work of this section.
- B. Section 02200 - Earthwork
- C. Section 02900 - Seeding

PART 2 - PRODUCTS

2.01 SAND

- A. Additional sand shall match the particle size distribution of the existing sand subgrade, which is as follows:

<b>Fraction Size/Name</b>	<b>U.S. Standard Sieve</b>	<b>Diameter of Sieve (mm)</b>	<b>% Retained on Sieve</b>
Gravel	10	2.00	-
Very Coarse	18	1.00	13.95%*
Coarse	35	0.50	36.10%
Medium	60	0.25	35.64%
Fine	100	0.15	9.68%
Very Fine	270	0.106	3.53%
Silt		0.053	1.11%
Clay		<0.002	-

## PART 3 - EXECUTION

### 3.01 DEEP TINE RIPPING & TILLING

- . The entire field shall be ripped using a Deep Tine Ripper, or "S" Tine Field Cultivator to a depth of approximately 12".
- . Tilling shall be accomplished using a Reverse-Tine Rotary Tiller, or Gear Driven Rotary Tiller to a depth of 6" to 8".

### 3.02 STONE REMOVAL

- A. Remove all stones over 1- ½" in dimension using a rock rake, legally dispose of off-site.

### 3.03 ADDITION AND INCORPORATION OF SAND OVERLAY

- A. After tilling and stone removal, rake to smooth surface contoured as shown on the Drawings. Cover surface with ½" of specified sand.
- B. Mix sand into in-situ topsoil in-place using a Reverse-Tine Rotary Tiller, or Gear Driven Rotary Tiller (available through Northern Tool + Equipment, 800-221-0516, [www.northerntool.com](http://www.northerntool.com)) or approved equal to a minimum depth of 6 to 8 inches. Complete the blending process by making a minimum of four passes in four directions.
- C. Testing of Blended Soils
  - 1. At the completion of blending and tilling of sand and topsoil, the soil shall be tested by mechanical analysis of particle size, and shall be of uniform composition.

### 3.04 FINE GRADING & COMPACTION

- A After ripping and tilling, field shall be fine graded and compacted as described in Section 02200 Earthwork.

END OF SECTION 02150

## SECTION 02200

### EARTHWORK

#### PART 1 - GENERAL

##### 1.01 GENERAL PROVISIONS

- A. All of the Contract Documents, including the Contract Form, General Provisions, General Conditions, Supplemental Conditions, and all Attachments to the General Provisions, and Division 1 - General Requirements, apply to the work of this Section.
- B. Contact Dig-Safe (811) seventy-two hours prior to the start of any removals or excavation work.

##### 1.02 SPECIAL CONDITIONS

- A. The work of this project lies within the 100-foot buffer zone of Bordering Vegetated Wetlands and Bank under the jurisdiction of the Waltham Conservation Commission and The Massachusetts Department of Environmental Protection. The Waltham Conservation Commission has issued an Order of Conditions which conditions the work of this project, a copy of which is included as a Special Condition of the Contract. Refer to Section 01571 – Order of Conditions and Appendix A.

##### 1.03 SCOPE OF WORK

- A. Work under this Section shall include all labor, materials, services, equipment, transportation and accessories and the performance of all operations necessary to complete the work of this Section, as indicated on the Contract Drawings and as specified herein.
- B. The work shall include, but is not limited to, the following:
  - 1. Compaction and fine grading of field after tilling.
  - 2. Installation of base course under new walkway to field and concrete slab.

##### 1.04 RELATED WORK

- A. Section 02100 - Site Preparation & Demolition
- B. Section 01571 - Order of Conditions
- C. Section 02900 - Seeding

##### 1.05 REFERENCES

- A. All work shall comply with the minimum standards of the latest editions of the

following codes and specifications, subject to modifications and amendments outlined herein.

1. MHD: "Standard Specifications for Highways and Bridges", Department of Public Works, Commonwealth of Massachusetts, Latest Edition.
2. ASTM: American Society of Testing Materials.
3. AASHTO: American Association of State Highway and Transportation Officials.

#### 1.06 EXAMINATION OF SITE AND DOCUMENTS

- A. By submitting a bid the Contractor affirms that he/she has carefully examined the site and conditions affecting Work under this Section. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions which can be reasonably inferred from visual inspection of the site.

#### 1.09 PERMITS AND CODES

- A. All work shall be as shown in the Contract Drawings and Specifications and shall comply with applicable codes and regulations at the local, county, state, and federal levels. All labor, materials, equipment and services necessary to make the Work comply with such requirements shall be provided without additional cost to the Owner.
  1. OSHA Construction Regulations Title 29 CFR Part 1926.

#### 1.10 COMPACTION TESTING

- A. The Contractor shall pay for an independent laboratory, subject to the approval of the Landscape Architect, to provide testing of compaction as follows:
  1. Maximum density and optimum water content determination by the ASTM D-1557-09 or AASHTO T-180 Modified Proctor laboratory test for field compaction.
  2. On-site: Provide one field density test of the existing loam after ripping and tilling, and one field density test in 6 separate locations. Locations shall be chosen by the Landscape Architect.

#### 1.11 DISPOSITION OF EXISTING UTILITIES

- A. Site information: No representations are made indicating subsurface conditions. It is expressly understood that the Owner/Landscape Architect will not be responsible for interpretations or conclusions drawn therefrom by the Contractor.
- B. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, notify the Landscape Architect and Owner, and consult utility

Owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility Owner.

## 1.12 DEFINITIONS

- A. Fill and backfill shall be, for the purpose of this Specification, considered interchangeable terms and shall mean material to be used to bring existing or construction grades up to finish subgrade levels.
- B. The words “finish grade” as used herein mean the required final grade elevations indicated on the Contract Drawings. Where not otherwise directed, areas outside buildings shall be given uniform slopes between points for which finish grades are shown, or between such point and existing grade, except that vertical curves or roundings shall be provided at abrupt changes in slope.
- C. The word “subgrade” as used herein, means the required surface of subsoil, borrow fill or compacted fill.
- D. “Trench shall be defined as an excavation of any length where the width is less than twice the depth. All other excavations shall be classified as open.
- B. “Unsuitable Materials” shall include the following:
  - 1. Pavements, utility structures, building foundations and other manmade structures.
  - 2. Peat, muck, organic silt and other organic materials subject to decomposition, consolidation or decay.
  - 3. Miscellaneous fill including cinders, ash, glass, wood, masonry and metal.
  - 4. Ledge and boulders except as specified herein for fills.

## PART 2 - PRODUCTS

### 2.01 SOIL MATERIALS

- A. Suitable Backfill
  - 1. Suitable backfill shall be used whenever indicated on the Drawings, and for general grading.
  - 2. “Suitable Backfill” shall be natural soil, well-graded and free from all organic weak, compressible, and frozen materials, and shall contain no stone larger than two (2) inches in maximum dimension. It shall be of such nature and character that it can be dried and compacted and shall be

free of all expansive materials (such as high plastic clays) and of materials subject to decay, decomposition, or dissolution, and shall conform to the following gradations:

<u>U.S. Sieve No.</u>	<u>% Passing by Weight</u>
2 inch	100%
#4	20-75%
#40	0-25%
#200	0-5%

3. Material from excavation on the site meeting the above requirements as evidenced by testing may be used as “Suitable backfill” provided it has not been contaminated with unsuitable material.

B. Aggregate Base Course, Aggregate Backfill, Gravel Backfill & Gravel:

1. Where Aggregate Base Course, Aggregate Backfill or Gravel is indicated on the Drawings, this material shall conform to the requirements of M1.03.0 Gravel Borrow, Type C of the MHD Standard Specifications except that the largest stone dimension shall be one (1) inch. Gravel shall consist of inert material which is hard durable stone and coarse sand; free from loam, clay, organic material, surface coatings, trash, frozen materials and deleterious materials. Gradation requirements are as follows:

<u>Sieve Designation</u>	<u>Percent Passing</u>
1 inch	100
½ inch	50-85
No. 4	30-60
No. 50	8-28
No. 200	0-10

- C. Crushed Stone shall conform to the requirements of M2.01.0 Crushed Stone of the MHD Standard Specifications, sized as indicated on the Drawings, with gradation for size as required by the Standard Specifications.

PART 3 - EXECUTION

3.01 LAYOUT

- A. Layout site improvements as required in Section 01050 - Field Engineering.
- B. The Contractor shall inform the Landscape Architect when the general layout is completed and shall not begin excavation until the various alignments are approved by the Landscape Architect. Any discrepancies encountered in field conditions shall be reported to the Landscape Architect immediately.



- C. The Contractor shall be responsible for maintaining the correct vertical and horizontal alignment of all elements, which responsibility shall not be waived by the Landscape Architect's approval of basic layout and stakeout.

### 3.02 PROTECTION

- A. The Contractor shall assume complete responsibility and liability for the safety and structural integrity of all work and utilities to remain during the performance of all work.
- B. The Contractor shall provide safeguards including, but not limited to, warning signs, barricades, temporary construction fences, warning lights and other items required for protection of personnel and the general public during the performance of all work.
- C. The Contractor shall provide barricades for substantial construction in accordance with safety regulations of authorities having jurisdiction and or insurance requirements.
- D. All features related to protection shall be maintained until that unit of work has been completed to the point that the danger no longer exists as approved by the Landscape Architect.

### 3.03 EXCAVATION

- A. Excavation is "Unclassified", and shall include excavation to subgrade elevations indicated on the Drawings, or required to accommodate new construction, regardless of the character of materials and obstructions encountered and shall be understood to include rock and boulders, shale, boulders, earth, hardpan, fill, foundations, pavements, curbs, piping and debris, except as follows:
  - 1. Notify the Landscape Architect prior to proceeding if materials greater than 1 cubic yard in size are encountered.
  - 2. Excavation of unanticipated materials encountered which are greater than 1 cubic yard in size and which could not be reasonably inferred from surface inspection will be paid for as an adjustment to the Contract Price due to unanticipated subsurface conditions, or adjustment may be made to the layout to avoid excavation of same.
- B. Unauthorized Excavation: When suitable bearing material is encountered at subgrade elevations shown and excavation is made to greater depth, bring grade back to elevation required by providing appropriate fill material at no additional cost.

- C. When excavation has reached required subgrade elevations, notify the Landscape Architect.
- D. If the “assumed” bearing materials are not encountered at the subgrade elevations indicated, additional excavation work may be authorized by the Owner. Do not perform additional excavation unless directed by the Landscape Architect in writing. Removal of unsuitable material and its replacement with proper backfill, if directed in writing by the Landscape Architect, will be paid for as an adjustment of the Contract price due to unanticipated subsurface conditions.
- E. During excavation, do not damage roots of trees which are to remain. When excavating or trenching within the branch spread of trees scheduled to remain, hand dig in a manner which will cause minimum damage to root systems. Do not leave surface roots exposed. Prune injured roots clean and backfill as soon as possible to the satisfaction of the Landscape Architect and Owner.
- F. Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions, stability of material excavated, or depth of excavation.
- G. Dewatering: Prevent water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area. Under no circumstances lay pipe or install appurtenances in water. Keep all trenches free from water until they have been backfilled.
- H. Materials Storage: Stockpile satisfactory excavated materials where directed until required for backfill or fill. The Landscape Architect shall approve the location of all stockpiles prior to placement. Place, grade and shape stockpiles for proper drainage.
  - 1. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees to remain.
  - 2. Legally dispose of excess soil material and waste materials off-site.
- I. Frost Protection
  - 1. Make no excavations to fill depth indicated when freezing temperature may be expected unless intended improvements can be accomplished immediately after the excavations have been completed. Protect bottom so excavated from frost if progress is delayed. Should protection fail, remove frozen materials and replace with gravel as directed at no cost to the Owner.
  - 2. Keep the site clear and free of accumulations of snow within the limit of

the Contract lines as necessary to carry out the work of the Contract.

3. Fill materials containing frost shall not be utilized, nor shall filling be done over frozen materials.

### 3.04 BACKFILL AND FILL

- A. Backfill excavations as promptly as work permits, but not until completion of the following:
  1. Acceptance of construction below finish grade by Landscape Architect.
  2. Inspection, testing, approval and recording locations of underground utilities to the satisfaction of the Landscape Architect.
  3. Compaction testing of subgrade if required at that location.

### 3.05 PLACEMENT OF FILL

- A. Placement: Place backfill and fill materials in uniform lifts of not more than 12 inches in loose depth for ordinary fill and 8 inches in loose depth for other materials compacted by heavy compaction equipment and not more than 6 inches in loose depth for material compacted by hand operated tampers.
  1. Coordinate backfilling with the installation of the work of all trades.
  2. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
  3. Place backfill and fill materials evenly adjacent to structures, piping or conduit to required elevations. Take care to prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping or conduit to approximately the same elevation in each lift.
  4. Backfill by hand around pipe and for a depth of one (1) foot above the pipe. Use earth without rock fragments or large stones and tamp firmly in layers not exceeding 6 inches in thickness, taking care not to disturb the pipe. Compact the remainder of the backfill thoroughly with a rammer of suitable weight or with an approved mechanical tamper, or if the soil is granular, by flooding, provided that under pavements, walks and other surfacing, the backfill shall be tamped solidly in layers not exceeding 6

inches in thickness.

5. Compact backfill to match adjacent areas as specified above. Correct settlement of fill by filling to subgrade levels in all areas where settlement occurs.

### 3.06 COMPACTION – GENERAL

#### A. COMPACTION EQUIPMENT

1. Compaction equipment used for the Work is subject to approval by the Landscape Architect. Any equipment not originally manufactured for compaction purposes and equipment which is not in proper working order will not be approved.

#### B. Compact soil to not less than the following percentages of maximum density of soils in accordance with ASTM D1557, Method C or AASHTO T-180).

1. Subgrade and base courses for pavements, utility trench backfill, and footings: Compact each layer of backfill or fill material to 95 percent of maximum dry density.
2. Planting beds, lawn and native grass areas: Compact subgrade and loam to 85 percent of maximum dry density.

#### C. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material, to prevent free water from appearing on surface during or subsequent to compaction operations. Remove and replace soil material that is too wet to permit compaction to specified density.

### 3.07 SUBGRADE PREPARATION AND GRAVEL PLACEMENT FOR PAVEMENTS

- A. Clean the rough subgrade of all loose, soft, foreign or other unsuitable material and reshape as required. Add suitable fill material to meet required grade.
- B. Compact to required grades and sections for paving. Tamp traces of trenches. Remove spongy or otherwise unsuitable material and replace with approved material. Loosen exceptionally hard spots and re-compact. Take every precaution to obtain a foundation of uniform bearing power. In absence of specific requirement, compact foundation by such means as will provide firm base and insurance against settlement of superimposed work.
- C. Roll longitudinally at sides, overlapping each pass by one-half of rear wheel. Fill all depressions or settlements which occur. Continue until all stones are firmly

interlocked and surface is true and unyielding. After final rolling, surface is to be free of depressions or irregularities greater than 3/8 inch in ten (10) feet.

- D. Construct base course as detailed on the Contract Drawings for all areas of new paved surfaces in this Section. Placement of gravel base course shall conform to the requirements of MHD except as herein modified.
- E. Spread gravel from self-spreading vehicles, approved type of power grader or by hand upon prepared sub-grade. Spread evenly in layers so as to avoid separation of aggregates. Layers shall not exceed six (6) inches in depth after compaction. Remove stones larger than four (4) inches. When spread and rolled on the prepared surface, it shall form a stable surface. Compaction shall have a density of not less than 95% of maximum density determined in accordance with ASSHTO-T-180 Method D. All rolling shall be done with a roller weighing 8 to 10 tons. Compact any portion which is not accessible to a roller by mechanical or hand tamper.
- F. Final rolled surface shall be true to the lines and grades indicated on the Contact Drawings or as directed by the Landscape Architect. Fill any depression that may appear during and after rolling with gravel and re-roll until the surface is true and even. Tolerance shall be 3/8 inch maximum above or below the cross-section grades and 3/8 inch maximum under a 10 foot line longitudinally.
- G. Maintain the surface of any layer in its finished condition until succeeding layer is placed. Properly drain the sub-base at all times.

### 3.08 ATHLETIC FIELD

- A. Under no circumstances will loaded rubber tired vehicles in excess of 1 ton be allowed on the field.
- B. Fine grade site. Roll with one ton static roller behind a turf tired tractor.
- C. The finish grade shall conform exactly to the grades as indicated on the Construction Documents. When the field has been shaped to conform to the lines and grades on the plan, and is smoothly contoured creating a uniform surface over the field, operate the irrigation system as necessary to settle and compact the mix to a final uniform depth. Compaction shall be 82 to 85 percent maximum, areas which are compacted in excess of 85% shall be retilled, recompacted, and / or deep tine heaving action aerated using a Verti-Drain aerator or approved equal capable of deep tine heaving action aeration to depths shown on the Drawings until the compaction meets, but does not exceed these specifications.
- D. Contractor shall provide compaction testing of graded field at 6 locations. If compaction tests are not within the specified range of 82-85%, the contractor shall

retill, recompact, and / or deep tine heaving action aerated using a Verti-Drain aerator or approved equal, retest until the compaction meets the specified range at 6 different locations chosen by the Landscape Architect.

- E. Remove any stones greater than ½” from the finished surface.

### 3.08 GRADING

- A. The Contact Drawings indicate, in general, alignment and finish grade elevations. The Landscape Architect, however, may make such adjustments in grades and alignments as are found necessary in order to avoid interference with any special conditions encountered.
- B. Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.
- C. Grade areas to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface changes, and as follows:
  - 1. Paved areas: Shape surface of areas under paved surfaces to line, grade and cross section to provide finished grades of pavements within tolerances specified.
- D. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.
- E. Complete grading operations after utilities have been installed, site improvements included under this Contract have been completed and all rubbish, materials and debris have been properly disposed of.
- F. Do all cutting, filling, reshaping, re-grading and re-compacting as necessary to meet the requirements of the Contract Drawings and this Section of the specifications. Maintain sub-grades at the levels specified until turned over to subsequent construction. Bring to required sub-grade levels any areas where settlement, erosion or other grade changes occur.

### 3.09 PROTECTION AND REPAIR

- A. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- B. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape and compact to required

density prior to further construction.

- C. Whenever streets, lawns, sidewalks or improvements outside the Contract Limit of Work Line have been excavated in fulfilling the work required under this Contract, the Contractor shall furnish and install all material necessary to bring finish surfaces level with the existing conditions in accordance with the governing authority. Notify the proper authorities prior to restoring surfaces outside the Contract Limit of Work.
- D. Do all repairs and restoration to pavements, curbs, and other work inside and outside of the project site damaged by the work under this Contract and restore all existing work to a condition at least equal to the condition specified for this Contract for such improvements.

### 3.10 FINISHED FIELD REQUIREMENTS

- A. The finished field shall have smooth gradients free from depressions and bumps and shall exhibit positive drainage to the edge of the field and drainage structures.
- B. Finished field shall be inspected and approved by the Landscape Architect, prior to proceeding with seeding.
- C. Settlement top-dressing: The contractor shall fill or top dress any areas of observed settlement that occur in the first year of the installation.

### 3.11 CLEANUP

- A. Keep all work areas free from accumulation of debris during the course of work under this Section.
- B. At the completion of the Work of this Section, properly and legally dispose of all excavated materials, all rubbish, debris, waste materials from, and about the site, building, and structures, including tools, scaffolds, apparatus and appliances used in connection with work under this Section and leave the premises in a clean condition.

END OF SECTION

## SECTION 02510

### BITUMINOUS CONCRETE PAVING

#### PART 1 - GENERAL

##### 1.01 GENERAL PROVISIONS

- A. Attention is directed to the General Conditions of the Contract, all Divisions of the Specifications and the Contract Drawings, all of which apply to this section.
- B. Examine and coordinate all Contract Drawings and other section of the specifications for requirements which affect work of this section whether or not such work is specifically mentioned in this section. Coordinate work with other trades to assure the steady progress of all work under the Contract. The Contractor shall refer to the Contract Documents for all new work and coordinate how it relates to the paving.

##### 1.02 SCOPE OF WORK

- A. Work under this Section shall include all labor, materials, services, equipment, transportation and accessories and the performance of all operations necessary to complete the work of this Section, as indicated on the Contract Drawings and/or as specified herein.
- B. The work shall include, but is not limited to, the following:
  - 1. Installation of new bituminous concrete pavement

##### 1.03 RELATED WORK

- A. Section 02100 - Site Preparation and Demolition
- B. Section 02200 - Earthwork: Aggregate Base Course

##### 1.04 REFERENCE STANDARDS

- A. Work shall comply with the minimum standards of the latest editions of the following codes and specifications, subject to modifications and amendments outlined herein.
  - 1. MHDSS: Standard Specifications: Commonwealth of Massachusetts, Department of Public Works, Standard Specifications for Highways and Bridges, latest edition.
  - 2. ASTM: American Society for Testing and Materials.
  - 3. AASHTO: American Association of State Highway and Transportation Officials.
  - 4. Federal, State and/or Municipal Codes



5. Public Safety Codes
6. U.S. Public Health Service
7. National Electric Manufacturers Association
8. American National Standards Institute
9. American Society of Mechanical Engineers
10. Commercial Standards
11. Federal Specifications
12. Occupational Safety and Health Regulations
13. ADA: Americans with Disabilities Act

#### 1.05 QUALIFICATIONS

- A. Installer: Company specializing in performing the work of this section with documented experience on at least two similar projects.

#### 1.06 EXAMINATION OF SITE AND DOCUMENTS

- A. By submitting a bid the Contractor affirms that he/she has carefully examined the site and all conditions affecting Work under this Section. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions.
- B. Plans, surveys, measurements and dimensions under which the work is to be performed are believed to be correct, but the Contractor shall have to examine them for him/herself during the bidding period, as no additional compensation will be made for errors or inaccuracies that may be found therein.

#### 1.07 SUBMITTALS

- A. The Contractor shall provide the following submittals for approval in conformance with requirements of SECTION 01300, SUBMITTALS. Do not order materials until Landscape Architect's approval of submittals, certifications or test results have been obtained. Delivered materials shall closely match the approved submittals.
  1. Submit the bituminous concrete design mix for each application, indicating aggregate sizes and proportions.
  2. Manufacturer's literature for tack coat demonstrating compliance with the specifications.

#### 1.08 PERMITS AND CODES

- A. All work shall be as shown in the Contract Drawings and Specifications and shall comply with applicable codes and regulations at the local, county, state, and federal levels. All labor, materials, equipment and services necessary to make the Work comply with such requirements shall be provided without additional cost to the Owner.

- B. The Contractor, under this Section, shall be responsible for providing and filing all Plans, Specifications and other documents, pay all requisite fees and secure all permits, inspections and approvals necessary for legal installation and operation of the systems and or equipment finished under this Section.

#### 1.09 CONDITIONS OF WORK

- A. Conduct the work giving consideration to protection of the public, protection of the existing work from weather; control of noise, shocks, and vibration; control of dirt and dust; orderly access and storage of materials; protection of existing buildings; protection of adjacent buildings and property. Coordinate work and cooperate with the Owner and Landscape Architect at all times.
- B. Schedule paving in connection with the progress schedule required by the General Conditions.

### PART 2 - PRODUCTS

#### 2.01 BITUMINOUS CONCRETE PAVEMENT

- A. Bituminous concrete shall be Class I, Type I-1, furnished and laid in accordance with Section 420 and 490 of the MHD Standard Specifications except as modified herein.
- B. Aggregate Base course for bituminous concrete shall be Compacted Aggregate Base Course as specified in Section 02200 - Earthwork.
  - 1. Subgrade and aggregate base course shall be installed and compacted as required in Section 02200 - Earthwork.
- C. Aggregate sizes and gradation for bituminous mixes shall be as follows:
  - 1. Bituminous concrete base course shall conform to MHD Standard Specifications, Section M3, Table A Job Mix Formula for "Base Course".
  - 2. Binder course shall conform to MHD Standard Specifications, Section M3, Table A Job Mix Formula for "Binder Course."
  - 3. Wearing course for bituminous concrete walkways shall be equivalent to MHD Standard Specifications, Section M3, Table A Job Mix Formula for "Surface Treatment" with a maximum aggregate size of 3/8".

#### 2.02 TACK COAT

- A. Tack Coat shall be bitumen Grade, AC-10, or AC-20 asphalt cement conforming to Section M3 of the Standard Specifications.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Make any corrections necessary to base material furnished and placed under SECTION 02200, EARTHWORK, to bring base course materials to sections and elevations shown on the Contract Drawings.
- B. The contact surfaces of curbs, walls, manholes, catch basins or other appurtenant structures in pavement shall be painted thoroughly with a thin uniform coating of tack coat just before any bituminous mixture is placed against them.

3.02 PATCHES AND NEW PAVING ABUTTING EXISTING

- A. Where the line of demarcation between new and existing paving occurs, the existing paving shall be saw-cut to provide a clean sharp joint. The pavement shall be sawn by an approved machine to a depth which will permit the cutting of the pavement without damage to the pavement left in place.
  - 1. Protect sawn edges of paving from damage until new paving is placed against it. Existing pavement which is damaged, disturbed or settled, shall be cut back by the same method and replaced as directed by the Landscape Architect without additional cost to the Owner.
- B. Where new bituminous paving meets existing paving the finish grades in the new work shall be adjusted if necessary, to blend smoothly with the existing pavement. Seal joint at saw-cut line with an approved bituminous emulsion. Notify the Landscape Architect of discrepancies before preceding with the work.

3.03 PLACEMENT

- A. The mixtures shall be placed and compacted only at such times which permit the proper inspection and checking by the Landscape Architect.
- B. The mixtures shall be placed only upon approved surfaces that are clean and dry, and when weather conditions are suitable. No bituminous material shall be applied when the temperature is below 32 F.
- C. The temperature of bituminous concrete mixture when delivered to the site shall conform to the following, with a tolerance of plus or minus 20 F.

<u>Air Temperature</u>	<u>Project Delivery Temperatures</u>
35F	300F
40F	290F
6SF	280F
90 F, or over	270F

- D. Place courses of bituminous concrete in conformance to application and depth requirements shown on the Contract Drawings and specified herein. Depths referenced shall be compacted thicknesses. Bituminous concrete for binder course and wearing or top course shall be furnished and laid in accordance with Section 460 of the Standard Specifications, and as directed herein and by the details.

### 3.04 SPREADING

- A. The equipment for spreading and finishing shall be mechanical, self-powered pavers, capable of spreading and finishing the mixture true to lines, grade, width and crown by means of fully automated controls for both longitudinal and transverse slope.
- B. Mixtures shall be deposited in a mechanical spreader and immediately spread thereby, and then struck off in a uniform layer to the full width required and of such depth that each course, when compacted, shall have the required thickness and shall conform to the grade and cross section contour specified.
- C. Hand Spreading: Spreading by hand methods will be permitted only for particular locations in the work which because of irregularity, inaccessibility or other unavoidable obstacles do not allow mechanical spreading and finishing.
- D. Compaction:
  - 1. After the paving mixture has been properly spread, compaction shall be obtained by the use of power rollers of approved design and weight per inch of roller. The rollers shall be steel wheeled supplemented with pneumatic-tired rollers where required.
  - 2. Along curbs, structures and places not accessible with a roller, the mixture shall be thoroughly compacted with mechanical tamping devices. The surface of the mixture after compaction shall be smooth and true to the established line and grade.
  - 3. The densities of the completed pavement shall be not less than 95% of the density obtained from laboratory compaction of a mixture composed of the same materials in like proportions.
- E. All areas of finished paving on which water stands or which are found excessively uneven shall be promptly brought to the correct grade and line.
- F. When tested with a ten (10) foot straightedge there shall be no deviation from true surface planes represented by the grade elevations shown on the Contract Drawings in excess of one-quarter ( $\frac{1}{4}$ ) inch.
- G. Do any repair or patching to pavements outside the project site damaged by work

of the contract. All patching work required shall be in accordance with requirements for new construction.

- H. No vehicular traffic of any kind shall be allowed to pass over the newly finished surface until it has had time to set. Twenty-four (24) hours will be considered sufficient time for the pavement to set in most cases, but this period may be extended by the Landscape Architect/Engineer as required by weather or other reasons.
- I. Install frames and rims after installation of binder course for bituminous concrete pavement. Install wearing course after the installation of the frames and rims. Frames and rims shall have the same grade and slope as adjacent construction.

### 3.05 QUALITY ASSURANCE

- A. The Landscape Architect may require the Contractor to remove and replace at the Contractor's expense any defective mix not conforming to the specified job mix formula.
- B. If, at any time before the final acceptance of the work, any soft, imperfect places or spots shall develop in the surface, all such places shall be removed and replaced with new materials and then compacted until the edges at which the new work connects with the old become invisible, at no additional expense to the Owner.

### 3.06 CLEAN-UP

- A. Keep all work areas free from accumulation of debris during the course of work under this Section.
- B. At the completion of the paving, all rubbish, debris, waste materials from, and about the site, building, and structures, including tools, scaffolds, apparatus and appliances used in connection with work under this Section shall be legally disposed of and the premises shall be left in a clean condition.

END OF SECTION

## SECTION 02667

### WATER SERVICE SYSTEMS

#### PART 1 - GENERAL

##### 1.01 GENERAL PROVISIONS

- A. All of the Contract Documents, including the Contract Form, General Provisions, General Conditions, Supplemental Conditions, and all Attachments to the General Provisions, and Division 1 - General Requirements, apply to the work of this Section.
- B. Examine and coordinate all Contract Drawings and other sections of the specifications for requirements which affect work of this section whether or not such work is specifically mentioned in this section. Coordinate work with other trades to assure the steady progress of all work under the Contract. The Contractor shall refer to the Contract Documents for all new work and coordinate how it relates to the installation of water service systems.

##### 1.02 SCOPE OF WORK

- A. Work under this section shall include tapping into the existing 8" water main and the installation of a two inch diameter on-site water service to support the new irrigation system, as indicated on the drawings.
- B. Responsibilities will include furnishing and installing a two (2) inch type "K" copper piping, tapping sleeves, corporation stops and boxes, curb stops and boxes, PVC service pipe, thrust blocks, straps and clamps for pipe restraints, strainers, backflow preventer, testing and disinfection (sterilization) of mains, installation of a one and one-half (1-1/2) inch water meter, and two (2) inch backflow preventer, and all other specified work and connections as shown on the plans and details. The work by the Contractor shall be performed in accordance with the recognized plumbing standards and all applicable standards. The work shall include all fittings and piping and other appurtenances necessary for complete and proper installation of the work, including connections to the existing work. All lines shown are approximate and must be coordinated with other utilities or site improvements to be installed.
- C. All work herein described and/or shown on the Plans shall be in strict accordance with the best-recognized practices for water service installations. The standards set forth in the selection of materials and supplies are intended to conform to those adopted by the City of Waltham, and the Contractor shall further familiarize himself with the Municipality's requirements when the occasion or choice of materials or supplies so demand.

- D. Per Municipality regulations and requirements, the Contractor performing the work of this section shall be a MA licensed master plumber.
- E. The Municipality, through their authorized agents, reserves the right to make inspections of the work during its manufacture or progress.
- F. Sheeting, shoring and bracing, excavation and backfill shall be accomplished in accordance with Section 02200 - Earthwork, the applicable provisions of the Standard Specifications, and OSHA Construction Regulations Title 29 CFR Part 1926. The cost of the sheeting, shoring and bracing, unclassified excavation and backfill shall be included under the Lump Sum Bid.

### 1.03 RELATED WORK

- A. Section 02100 - Site Preparation and Demolition
- B. Section 02200 - Earthwork
- C. Section 02810 - Irrigation System.
- D. Section 03300 - Cast-in-Place Concrete
- E. Section 16000 - Electrical Service Improvements

### 1.04 REFERENCES

- A. The following standards and definitions are applicable to the work of this Section to the extent referenced herein:
  1. Standard Specifications: Commonwealth of Massachusetts Standard Specifications for Highways and Bridges, latest edition.
  2. OSHA Construction Regulations Title 29 CFR Part 1926.
  3. ASME B16.1 Cast Copper Alloy Solder Joint Pressure Fittings.
  4. ASTM B88 Seamless Copper Water Tube.
  5. ASTM D1557 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
  6. AWWA C500 Gate Valves, 3 through 48 in NPS, for Water and Sewage Systems.
  7. AWWA C504 Rubber Seated Butterfly Valves.
  8. AWWA C507 Ball Valves
  9. AWWA C508 Swing-Check Valves for Waterworks Service, 2 in through 24 in NPS.
  10. AWWA C509 Resilient Seated Gate Valves 3 in through 12 in NPS, for Water and Sewage Systems.
  11. AWWA C800 Ball Valve Curb Stops and Corporation Stops
  12. ASTM B-62 Ball Valve Curb Stops
  13. ASTM D2241 Poly (VinylChloride) (PVC) Plastic Pipe(SDR-PR).
  14. ASTM D2466 Poly (VinylChloride) (PVC) Plastic Pipe Fittings, Schedule 40.

15. ASTM D2855 Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.

#### 1.05 SUBMITTALS FOR REVIEW

- A. Product Data: Provide data on pipe materials, pipe fittings, valves, hydrants and accessories.

#### 1.06 SUBMITTALS AT PROJECT CLOSEOUT

- A. Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations.
- B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

### PART 2 - MATERIALS

#### 2.01 MATERIALS

- A. Gate Valves: Gate valves for water lines shall be a resilient wedge gate valves with iron body meeting the latest edition of AWWA C509 with mechanical joint ends. Gate valves shall turn right to open and be designed for 200 psi working pressure and 350 psi test pressure. Valves shall be Mueller Co., or approved equal.
- B. Ball Valve Curb Stop: Curb stops shall meet the most recent version of AWWA C800. Curb stop shall be Mueller, model H10284 with drain, or approved equal. Curb stop shall be lead-free. Curb stop shall open Right.
- C. Service Clamps and Corporation Stops: Complete assembly, including service clamp, corporation stop, and bolts and nuts. Include service clamp and stop compatible with drilling machine.
1. Service Clamp: Cast iron or ductile iron with gasket and AWWA C800 threaded outlet for corporation stop, and threaded end straps
  2. Corporation Stop: Corporation stop shall meet the most recent version of AWWA C800. Corporation stop shall be Mueller, model H-15008, or approved equal. Corporation stop shall be lead-free.
- D. Tapping Sleeve and Tapping Valve: Complete assembly, including tapping sleeve, tapping valve, and bolts and nuts. Use sleeve and valve compatible with tapping machine.
1. Tapping Sleeve: Cast- or ductile-iron, 2-piece bolted sleeve with flanged



outlet for new branch connection. Sleeve may have mechanical-joint ends with rubber gaskets or sealing rings in sleeve body. Include sleeve matching size and type of pipe material being tapped and of outlet flange required for branch connection

E. Copper Tubing

1. Copper pipe for buried service two (2) inch diameter and smaller, as required, shall be soft, annealed, seamless copper tubing conforming to Federal Specification WW-T-799E or ASTM Standard B88-76, Type "K".
2. Copper service pipe for installation in meter pits, valves, manholes, and backflow preventer cabinets, 1-1/2 inch diameter and smaller, shall be ASTM B88, Type "K", hard copper tubing.
3. The Contractor shall furnish the Owner with satisfactory evidence that the copper tubing meets the requirements of these Specifications.
4. Joints in the copper service shall be kept to a minimum.
  - a) For buried application, joints shall be made with cast brass three-part compression couplings or flared tube fittings conforming to ANSI Standard Specifications B 16.26, latest issue. Bends in copper service pipe, particularly gooseneck bends, shall be made with a tool especially designed for the purpose.
  - b) Pipe joints inside meter vaults and backflow preventer cabinets shall be fittings conforming to ANSI B 16.18 cast bronze solder fittings, or ANSI B 16.22 wrought copper solder fittings and couplings. Solder shall be ASTM B32, Grade 95 TA, up to 250 degrees. Solder threaded bronze fittings will be used for connections of pipe to meters, strainers, valves, backflow preventers and pipe nipples.
5. PVC Piping
  - a) PVC pipe shall be as sized on the drawings and details, Class 200, SDR 21, solvent weld PVC, ASTM No. D1784 as manufactured by Cresline or approved equal.
  - b) Fittings for all PVC piping shall be Schedule 40 solvent weld PVC as manufactured by Dura, Lasco, or approved equal.
  - c) PVC solvent shall conform to ASTM and be NSF approved. Solvent shall be appropriate for gluing of pipes and fittings up to 6 inches in size. Solvent shall be as manufactured by IPS, Rectorseal, Uni Weld, or approved equal and shall be used in

conjunction with an appropriate primer.

6. Water Meters

- a) Water meter shall be furnished and installed by the Contractor.
- b) Water meter shall be installed as indicated on the plans within the designated backflow preventer above ground cabinet. D. Water Meter: The water meter shall be a 1-1/2" Sensus SR, or approved equal, with provisions for a remote AMR reading system and reading device to be mounted to the backflow preventer cabinet.

7. Backflow Preventer

- a) Backflow preventer shall be a 2" Reverse Principle Backflow Prevention Device (or Assembly), Watts #009-M2Q2, or approved equal and shall come complete with strainers, ball valves, and threaded couplings.. Final approval of device selection will be based on submittal of design data sheet to Waltham Water Department, Cross Connection Program.
- b) Supply one complete rubber parts kit, item number RK009RT 009 which shall include diaphragm, two disc assemblies, stem O-rings, cover O-ring, two seat O-rings and RV seat O-ring, and shall be stored in the backflow assembly cabinet.

8. Concrete for Thrust Restraints: Concrete type specified in Section 03300.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Refer to Section 02200 - Earthwork and the Drawings for excavation, backfill, compaction, and other trenching requirements.

### 3.02 PIPE AND FITTINGS

- A. All pipe, fittings and such other items shall be carefully examined for defects immediately before lowering into the trench and no pipe or fittings shall be laid which is known to be defective in anyway. Any pipe or fitting discovered as defective after laying shall be promptly removed and replaced. Proper and suitable tools and appliances for the safe and convenient handling and laying of the pipe, fittings and appurtenances shall be used, and great care shall be taken to prevent damage to the pipe coating and lining. Pipe and fittings shall be thoroughly cleaned before being lowered into the trench and shall be kept clean until accepted in the completed work. Open ends shall be closed with wooden or

other suitable bulkheads at all times when pipe laying is not actually in progress. Pipes shall be carefully lowered into trenches with rope slings or other mechanical means. Rolling or dropping the pipe into trenches will not be permitted. Whenever the pipe requires cutting to fit the line, the work shall be done only by experienced persons and in such a manner as to leave a smooth end at right angles to the axis of the pipe.

- B. Each length of pipe, fitting or valve shall be firmly supported for its entire length upon original undisturbed trench bottom. Permanent blocking will not be permitted. Where temporary blocking is used, it shall be removed. The underside of the pipe, fittings or valve shall be completely filled and thoroughly compacted with bank gravel before refilling trenches. Fittings and valves shall be carefully set in the line, plumb and true to grade and thoroughly compacted to a firm and uniform bearing.

### 3.03 JOINTING

- A. Jointing shall be in strict accordance with the manufacturer's recommendation for the type of joint being made. Jointing of pipe or fittings shall be made only by persons thoroughly skilled in this work.

### 3.04 ROUGHING-IN FOR WATER METERS

- A. Rough-in piping and specialties for water-meter installation according to manufacturer's written instructions and requirements.

### 3.05 BACKFLOW PREVENTER, METERS AND RELATED APPURTENANCES

- A. The installation of all new backflow preventer and meter and related valves, strainers, hangers, straps, clamps and other appurtenances shall be accomplished in a safe, and complete manner by licensed plumbers.
- B. All work in this regard shall be completed in compliance with City of Waltham standards and industry requirements and to the satisfaction of the project representatives.
- C. Immediately after installation, the Contractor shall complete the "Installation Completed Form" (Appendix C) and contact the City of Waltham Cross Connection Inspector to arrange a test of the Backflow Preventer.
- D. Contractor to install test fittings on Backflow Preventer.

### 3.06 CONDUCTING TEST FOR LEAKAGE

- A. Description

1. Test for leakage shall be conducted on all portions of completed water work. In trenches, the testing shall be conducted with partial backfilling over the barrel of the pipe, but all joints between the pipe, fittings and valves shall be left exposed for the duration of the tests. At the Engineer's direction, temporary backfilling of certain portions of the completed work may be required prior to conducting leakage tests.
2. All air shall be released and the mains completely filled with water, and after allowing twenty-four (24) hours for absorption, the internal pressure shall be built up to an equivalent hydrostatic head of three hundred-fifty (350) feet of water of one hundred-fifty (150) pounds per square inch, and so maintained for the full period of tests.
3. All visible leaks in the joints shall be stopped, and any cracks or defective pipe, fitting or valve shall be removed and replaced.
4. The test shall be conducted for a period of at least sixty (60) minutes after all visible leaks have been stopped, and the inflow of water from a force pump to maintain the required pressure shall not exceed seventy (70) gallons per inch of internal diameter per mile of pipe per day.
5. In case the specified rate of leakage is exceeded, the leaks shall be found and repaired, and the mains shall be re-tested until the required conditions are met.

### 3.07 DISINFECTION OF NEW MAINS

A. Upon completion, all water mains shall be disinfected as follows:

1. Pipes shall be completely filled with water; all air released, and then thoroughly flushed out in the amount twice the capacity of the section to be treated. A disinfecting solution of sodium hypochlorite shall be introduced into the main near the point of water supply, in the concentration of one hundred (100) parts of available chlorine per million parts of water. The main shall then be washed or bled from the extreme end opposite to the point of application of the disinfecting supply, and the washing continued until tests indicate the disinfecting solution has reached the end opposite to the point of application in the concentration of not less than fifty (50) parts available chlorine.
2. All gates shall then be closed, and the disinfecting solution left in the mains under full pressure for a period of not less than forty-eight (48) hours. The entire section shall then be repeatedly and thoroughly flushed out until all traces of chemicals are removed.

3. Samples of water shall then be taken by the Contractor and laboratory analysis made by him to determine the effectiveness of treatment.
4. Any main or section of pipe failing to meet laboratory standards for disinfecting shall be repeatedly treated until the desired results are obtained. A COPY OF LABORATORY REPORTS SHALL BE PROVIDED TO THE OWNER BY THE CONTRACTOR WITHIN FIVE (5) DAYS AFTER TESTING IS COMPLETED.
5. Particular attention is directed to the requirement that a double check valve installation shall be made in the water supply to the main under treatment, to prevent possible backflow or siphonage of treated solution into the distribution system in service.

### 3.08 OTHER DATA

- A. All iron castings shall conform to the latest revisions of ASTM Designation A126 for physical and chemical requirements.
- B. All ironwork shall be thoroughly cleaned and painted with two coats of asphaltum or other varnish or paint that the Engineer may approve. After the valves are assembled and tested, a third coat shall be applied to the exterior. All composition tool-finished work shall be left bright and unpainted.
- C. All connections shall be made permanently watertight.
- D. All other work required to complete the improvements listed in the Contract Documents shall be accomplished in accordance with the requirements of the City of Waltham.

END OF SECTION

## SECTION 02670

### BACKFLOW PREVENTER CABINET

#### PART 1 - GENERAL

##### 1.01 GENERAL PROVISIONS

- A. All of the Contract Documents, including the Contract Form, General Provisions, General Conditions, Supplemental Conditions, and all Attachments to the General Provisions, and Division 1 - General Requirements, apply to the work of this Section.
- B. Examine and coordinate all Contract Drawings and other sections of the specifications for requirements which affect work of this section whether or not such work is specifically mentioned in this section. Coordinate work with other trades to assure the steady progress of all work under the Contract. The Contractor shall refer to the Contract Documents for all new work and coordinate how it relates to the installation of backflow preventer cabinets

##### 1.02 SCOPE OF WORK

- A. Provide equipment and materials, and do all work necessary to furnish and install one (1) Backflow Preventer Cabinet complete in place on a concrete pad as indicated on the Drawings and as specified.
- B. Service lines, internal cabinet features and other related water work shall be accomplished in accordance with the applicable sections of these Specifications.

##### 1.03 RELATED WORK

- A. Section 02100 - Site Preparation and Demolition.
- B. Section 02200 - Earthwork.
- C. Section 02667 - Water Service Systems.
- D. Section 02810 - Irrigation System.
- E. Section 16100 - Electrical Service Improvements.

##### 1.04 REFERENCE STANDARDS AND SPECIFICATIONS

- A. Reference to specific standards, specifications and tests of the following technical societies, organizations, and governmental bodies may be made in the contract documents.
- B. AASHTO - American Association of State Highway and Transportation Officials (tests or specifications). AASHTO or AASHO

- C. ASTM - American Society for Testing and Materials.
- D. Mass. Standard Specs. - Latest edition of the Standard Specifications for Highways, Bridges and Waterways, 1988 Edition, the Commonwealth of Massachusetts, Department of Public Works, hereinafter referred to as “the Massachusetts Standard Specifications.”
- E. AWWA - American Waterworks Association.

#### 1.05 SHOP DRAWINGS/MANUFACTURER’S CUTS AND SPECIFICATIONS

- A. The Contractor shall submit to the Landscape Architect for approval six (6) copies of all materials and equipment proposed for use indicating manufacturers’ names and addresses, identifying data and expected delivery dates. No consideration will be given to partial lists submitted from time to time. Intention of using specified materials and equipment shall not relieve the Contractor from submitting the above list, nor shall submission of the list relieve him from submission of shop drawings. Any item of material or of equipment not submitted for approval on the list will not be approved unless of the exact make and characteristics specified.
- B. If the material or equipment is installed before it is approved, the Contractor shall be liable for the removal and replacement at no extra charge to the Owner, if, in the opinion of the Landscape Architect, the material or equipment does not meet the intent of the Contract Documents.
- C. The Contractor shall submit the following information with all equipment shop drawings:
  1. Manufacturer’s certified scale drawings, cuts or catalogs, including installation details.
  2. Manufacturer’s specifications, including certified performance characteristics and capacity ratings, if applicable.

### PART 2 - MATERIALS

#### 2.01 BACKFLOW PREVENTER CABINET

- A. The backflow preventer cabinet shall be a standard manufactured item or custom built, conforming to the Contract details and requirements herein. Local sources manufacturers of cabinets are Mass Electrical Apparatus, 42 Oakville Street, Lynn, MA 01905, phone 781-592-0410, fax 781-592-0986 or approved equal.
  1. Material: 0.125 5052-H32 Aluminum.
  2. Subpanel: 12 gauge steel painted white.
  3. Hinge: Stainless steel continuous.

Backflow Preventer Cabinet  
02670-2

4. Main Door: Stainless steel drop handle with 3 point latching and padlock ready.
5. Welding: All seams are continuous weld ground smooth.
6. Door: Gasketed with 1/4" x 1" closed cell neoprene gasket PSA one side to obtain a weather tight seal.
7. Finish: Smooth black powder coat inside and out.

## 2.02 CEMENT CONCRETE

- A. Forms, reinforcing, and cement concrete cast in place for the backflow preventer cabinet shall conform to Section 03300 - Cast-in-Place Concrete of these Specifications.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Include all necessary transportation, shipping and handling as necessary to properly and completely install the specified cabinets.

### 3.02 CONCRETE BASE

- A. Install concrete base as indicated on the Drawings. The concrete base shall be six inches larger than the specified cabinet, all around, and pitched at edges for positive drainage.

### 3.03 TOUCH-UP

- A. Any surfaces of the specified cabinets that are chipped or scratched shall be wire brushed, primed and painted or otherwise restored to a flawless condition in a manner that is acceptable to the City Representative.

END OF SECTION



## SECTION 02810

### IRRIGATION SYSTEM

#### PART 1 - GENERAL

##### 1.01 GENERAL REQUIREMENTS

- A. All of the Contract Documents, including the Contract Form, General Provisions, General Conditions, Supplemental Conditions, and all Attachments to the General Provisions, and Division 1 - General Requirements, apply to the work of this Section.
- B. Coordinate work of this Section with other underground utilities and with trades responsible for their installation. Refer to respective Drawings pertaining to other work.

##### 1.02 SCOPE OF WORK

- A. The irrigation system shown on the Drawings and described within these Specifications represents an addition/modification to a single controller, turf and landscape irrigation system supplied from municipal water. The system is designed for 50 gallons per minute. Minimum 55-psi dynamic pressure at full system flow is required from the irrigation contractor's point of connection.
- B. Work to be done includes furnishing all labor, materials, equipment and services required to complete all irrigation work indicated on the Drawings, as specified herein, or both.
- C. The mechanical point of connection for the irrigation system piping, generally where shown on the drawings.
- D. The electrical point of connection for the irrigation system shall be to a new controller to be located in the new electrical enclosure.
- E. The Drawings and Specifications must be interpreted and are intended to complement each other. The Contractor shall furnish and install all parts, which may be required by the Drawings and omitted by the Specifications, or vice versa, just as though required by both. Should there appear to be discrepancies or question of intent, the Contractor shall refer the matter to the Owner's Representative for decision, and his interpretation shall be final, conclusive and binding.
- F. Changes to the Drawings necessary to avoid any obstacles shall be made by the Contractor with the approval of the Owner's Representative.

- G. Trench excavation, back filling and bedding materials, together with the testing of the completed installation shall be included in this work.
- H. The work shall be constructed and finished in every workmanlike and substantial manner, to the full intent Drawings and Specifications. All parts necessary for the respect in a good. and meaning of the proper and complete execution of the work, whether the same may have been specifically mentioned or not, or indicated on the Drawings, shall be done or furnished in a manner corresponding with the rest of the work as if the same were specifically herein described.
- I. Record Drawing as well as Operating & Maintenance Manual generation, in accordance to these specifications shall also be included in this work.

### 1.03 RELATED WORK

- A. Carefully examine all of the Contract Documents for requirements that affect the Work of this Section.
  - 1. Section 02200 - Earthwork.
  - 2. Section 02950 - Seeding.
  - 3. Section 03300 - Cast-In-Place Concrete
  - 4. Section 16100 - Electrical Service Improvements.

### 1.04 ORDINANCES, PERMITS AND FEES

- A. The Work under this Section shall comply with all ordinances and regulations of authorities having jurisdiction.
- B. The Contractor shall obtain and pay for any and all permits, tests and certifications required for the execution of Work under this Section.
- C. Furnish copies of Permits, Certifications and Approval Notices to the Owner's Representative prior to requesting payment.
- D. The Contractor shall include in their bid any charges by the Water Department, Utility Company, or other authorities for work done by them and charged to the Contractor.

### 1.05 EXAMINATION OF CONDITIONS

- A. The Contractor shall fully inform himself of existing conditions on the site before submitting his bid, and shall be fully responsible for carrying out all 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, except those conditions described in the GENERAL CONDITIONS.

## 1.06 QUALITY ASSURANCE

- A. Installer: A firm which has at least five (5) years experience in work of the type and size 'required by this Section and which is acceptable to the Owner's Representative.
- B. References: The Contractor must supply three references for work of this type and size with their bid including names and phone numbers of contact person(s).
- C. Applicable requirements of accepted Standards and Codes shall apply to the Work of this Section and shall be so labeled or listed:
  - 1. ASTM D P1784 Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
  - 2. ASTM D 1785 Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and C1200.
  - 3. ASTM D P2464 Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
  - 4. ASTM D 2466 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
  - 5. ASTM D 2564 Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems..
  - 6. ASTM D P2737-99 Polyethylene (PE) Pressure rated tube.
  - 7. National Plumbing Code (NPC)
  - 8. National Electric Code (NEC)
  - 9. National Sanitary Foundation (NSF)
  - 10. American Society of Agricultural Engineers (ASAE)
  - 11. Underwriters Laboratories, Inc. (UL)
  - 12. Occupational Safety and Health Regulations (OSHA)

## 1.07 TESTS

- A. Observation: The Owner's Representative will be on site at various times to insure the system is being installed according to the Specifications and Drawings.
- B. Coverage Test: After completion of the system, test the operation of entire system and adjust sprinklers as directed by the Owner's Representative. Demonstrate to the Owner's Representative that all irrigated areas are being adequately covered. Furnish and install materials required to correct inadequacies of coverage due to

deviations from the Drawings or where the system has been willfully installed when it is obviously inadequate or inappropriate without bringing it to the attention of the Owner. See Part 3 - Execution.

- C. The Owner's Representative shall be notified 48 hours in advance for observations.
- D. During final observation, the contractor shall be responsible for having two-way communication and sufficient personnel to provide instantaneous communication between the observation area and the controller for the system.

#### 1.08 SHOP DRAWINGS

- A. The Contractor shall provide copies of product specification sheets on all proposed equipment to be installed to the Owner's Representative for approval prior to the start of work, in accordance with the parameters of Division-i. Work on the irrigation system may not commence until product sheets are submitted and approved. Submittals shall be marked up to show proper nozzles, sizes, flows, etc. Equipment to be included:

- 1. Sprinkler Heads.
- 2. Valves: Manual and Automatic.
- 3. Valve Boxes.
- 4. Pipe and Fittings.
- 5. Wire and Connectors.
- 6. Automatic Controller.
- 7. Quick Coupling Valves.
- 8. Miscellaneous Materials.

- B. Project Record Documents:

- 1. The Contractor shall provide and keep up-to-date a complete redlined Record Set of Drawings of the system as the project proceeds. Drawings shall be corrected daily, showing every change from the original Drawings and Specifications. Record Drawings shall specify and exactly locate sprinkler type; pop up height and nozzle for each sprinkler installed. Each valve box location to be referenced by distance from a minimum of two permanent locations. Controller(s), rain sensor(s), quick coupling valves, water meters, back flow prevention device and all other equipment shall be indicated on the drawings. All wire routing, wire size and splices shall be indicated. Main line pipe and wire route shall have two (2) distinctly different graphic symbols (line types). Prints for this purpose may be obtained from Owner's Representative at cost. This redlined record set of drawings shall be kept at job site and shall be used only as a record set.
- 2. This redlined set of documents shall also serve as work progress sheets

and shall be the basis for measurement and payment for work completed. This record set of drawings shall be available at all times for observation and shall be kept in a location designated by Owner's Representative. Should this record set of drawings not be available for review or not be up-to-date at the time of the observation, it will be assumed no work has been completed. Provide copies of the redlined record set of drawings for Owner's Representative review on a monthly basis.

3. Make neat and legible notations on this record set of drawings daily as the work proceeds, showing the work as actually installed. For example, should a piece of equipment be installed in a location that does not match the plan, indicate that equipment in a graphic manner in the location of installation and so as to match the original symbols as indicated in the irrigation legend. Should the equipment be different from that specified, indicate with a new graphic symbol both on the drawings and the irrigation legend. The relocated equipment dimensions and northing and easting coordinates should then be transferred to the appropriate drawing in this record set of drawings at the proper time.
4. On or before the date of final field observation, deliver corrected and completed AutoCAD computer plots of "record drawings" on vellum and AutoCAD electronic files on disk to Owner's Representative as part of contract closeout. Delivery of plots will not relieve Contractor of the responsibility of furnishing required information that may have been omitted from the prints.

- C. At the end of each segment of the project the contractor shall submit the following to the Owner's Representative.
1. Plumbing permits: If none required, so state.
  2. Material approvals.
  3. Pressure line tests: By whom approved and date.
  4. Materials furnished: Recipient and date.

#### 1.09 DELIVERY, STORAGE AND HANDLING

- A. Store and handle all materials in compliance with manufacturer instructions and recommendations. Protect from all possible damage. Minimize on-site storage.

#### 1.10 GUARANTEE

- A. The Contractor shall obtain in the Owner's name the standard written manufacturer's guarantee of all materials furnished under this Section where such guarantees are offered in the manufacturer's published product data. All these guarantees shall be in addition to, and not in lieu of, other liabilities that the Contractor may have by law.

- B. In addition to the manufacturers guarantees the Contractor shall warrant the entire irrigation system, both parts and labor for a period of one (1) year from the date of acceptance by the Owner.
- C. As part of the one-year warranty the Contractor shall perform the first year-end winterization and spring start-up for the irrigation system.
- D. Should any problems develop within the warranty period because of inferior or faulty materials or workmanship, they shall be corrected to the satisfaction of the Owner's Representative at no additional expense to the Owner.
- E. A written warranty showing date of completion and period of warranty shall be supplied upon completion of each segment of the project.

#### 1.11 COORDINATION

- A. The Contractor shall at all times coordinate his work closely with the Owner's Representative to avoid misunderstandings and to efficiently bring the project to completion. The Owner's Representative shall be notified as to the start of work, progression and completion, as well as any changes to the drawings before the change is made. The Contractor shall also coordinate his work with that of his sub-contractors.
- B. The Contractor shall be held responsible for and shall pay for all damage to other work caused by his work, workmen or sub-contractors. Repairing of such damage shall be done by the Contractor who installed the work, as directed by the Owner's Representative.

#### 1.12 MAINTENANCE AND OPERATING INSTRUCTIONS

- A. Contractor shall include in their Bid an allowance for four (4) hours of instruction of Owner and/or Owner's personnel upon completion of check/test/start-up/adjust operations by a competent operator (The Owner's Representative office shall be notified at least one (1) week in advance of check/test/start-up/adjust operations).
- B. Upon completion of work and prior to application for acceptance and final payment, a minimum of three (3) three ring, hard cover binders titled "MAINTENANCE AND OPERATING INSTRUCTIONS FOR THE KENNEDY SCHOOL IRRIGATION SYSTEM", shall be submitted to the Owner's Representative office. After review and approval, the copies will be forwarded to the Owner. Included in the Maintenance and Operating binders shall be:
  - 1. Table of Contents
  - 2. Written description of Irrigation System.
  - 3. System drawings:
    - a. One (1) copy of the original irrigation plan;

- b. One (1) copy of the Record Drawing;
- c. One (1) reproducible of the Record Drawing;
- d. One (1) copy of the controller valve system wiring diagram
- 4. Listing of Manufacturers.
- 5. Manufacturers' data where multiple model, type and size listings are included; clearly and conspicuously indicating those that are pertinent to this installation.
  - a. "APPROVED" submittals of all irrigation equipment.
  - b. Operation.
  - c. Maintenance: including complete troubleshooting charts.
  - d. Parts list.
  - e. Names, addresses and telephone numbers of recommended repair and service companies. A copy of the suggested "System Operating Schedule" which shall call out the controller program required (zone run time in minutes per day and days per week) in order to provide the desired amount of water to each area under "no-rain" conditions.
- 6. Winterization and spring start-up procedures.
- 7. Guarantee data.

### 1.13 PROCEDURE

- A. Notify all city departments and/or public utility owners concerned, of the time and location of any work that may affect them. Cooperate and coordinate with them in the protection and/or repairs of any utilities.
- B. Provide and install temporary support, adequate protection and maintenance of all structures, drains, sewers, and other obstructions encountered. Where grade or alignment is obstructed, the obstruction shall be permanently supported, relocated, removed or reconstructed as directed by the Architect.

## PART 2 - PRODUCTS

### 2.01 GENERAL

- A. All materials to be incorporated in this system shall be new and without flaws or defects and of quality and performance as specified and meeting the requirements of the system. All material overages at the completion of the installation are the property of the Contractor and shall be removed from the site.
- B. No material substitutions from the irrigation products described in these specifications and shown on the drawings shall be made without prior approval and acceptance from the Owner's Representative.

### 2.02 PVC IRRIGATION PIPE

- A. All pipe shall bear the following markings: Manufacturer's name, nominal pipe size, schedule or class, pressure rating in psi, and date of extrusion.
- B. All pipe in sizes 2-1/2 inches and smaller shall be PVC, Class 200, Type 1120, SDR 21, Solvent-Weld PVC, conforming to ASTM No. P2241 as manufactured by Certainteed, Cresline, JM or equal.

### 2.03 PVC IRRIGATION FITTINGS

- A. Fittings for solvent weld PVC pipe, 2-1/2 inch and smaller in size, shall be Schedule 40 solvent weld PVC fillings as manufactured by Dura, Lasco, Spears or equal.
- B. Fillings shall bear manufacturer's name or trademark, material designation, size, and applicable I.P.S. schedule.
- C. All PVC threaded connections in and out of valves shall be made using Schedule 80 toe nipples and Schedule 40 couplers or socket fittings. Schedule 40 threads will not be approved for installation.
- D. PVC solvent shall be NSF approved, for Type I and Type II PVC pipe, and Schedule 40 and 80 fillings. Cement is to meet ASTM P2564 and FF493 for potable water pipes. PVC solvent cement shall be Rectorseal Gold, IPS Weld-ON 711, Oatey Heavy Duty Cement or equal, and shall be used in conjunction with the appropriate primer. Primer shall be NSF approved, and formulated for PVC and CPVC pipe applications. Primer is to meet ASTM F 656. Primer shall be Rectorseal Jim PR-2, IPS Weld-ON P-68 Clear, Oatey Clear Primer for PVC and CPVC, or equal.
- E. All nipples to be schedule 80 PVC.

### 2.04 GEAR DRIVEN SPRINKLERS

- A. The sprinkler shall be of the gear-driven, rotary type, capable of covering a 45 foot radius at 50 PSI with a discharge rate of 10.3 GPM. The sprinkler shall be available with six (6) nozzles discharging 7.0 GPM to 28.2 GPM. The sprinkler shall have radius adjustment capabilities by means of a stainless-steel nozzle retainer/radius adjustment screw.
- B. The sprinkler shall be both full-circle and adjustable part-circle operation in a single unit. The sprinkler shall be minutely adjustable from 50° to 360°. It shall be adjustable in all phases of installation (i.e., before installation, after installation while static, and after installation while in operation). The sprinkler shall be equipped with a self-adjusting stator to ensure constant rotation speed regardless of nozzle installed.



- C. The sprinkler shall have a non-strippable drive mechanism that allows the nozzle turret to be turned during operation, without damage. It shall also have an automatic arc return feature that returns the nozzle turret to its proper orientation if it is turned outside its intended arc of coverage.
- D. The sprinkler shall be equipped with a drain check valve to prevent low head drainage, and be capable of checking up to 15 feet (4.5 m) in elevation change. The sprinkler shall have a minimum of 3-1/2-inch (9 cm) pop-up stroke to bring the rotating nozzle turret into a clean environment. The sprinkler shall be available as an a 6-inch (15cm) pop-up (I-40-06). The sprinkler shall have a rubber cover firmly attached to the top of the riser. When specified, the sprinkler shall have a cover molded of purple Alcryn rubber to indicate the use of reclaimed water. The rubber cover shall be surrounded by a protective rubber boot when sprinkler is in the retracted position.
- E. The sprinkler shall have an exposed surface diameter after installation of 2 inches (5 cm) and have an overall height of 7-7/8 inches (20 cm). The unit shall have a 1-inch Female National Pipe Thread (FNPT) inlet. When specified, the unit shall have a 1-inch Female British Standard Pipe Thread inlet.
- F. The sprinkler shall be serviceable after installation by unscrewing the body cap, removing the riser assembly, and extracting the inlet filter screen. The sprinkler shall have an optional turf-cup kit that, once installed, provides the means to grow living turf on top of the sprinkler riser.
- G. The body of the sprinkler shall be constructed of corrosion resistant, impact resistant, heavy-duty A.B.S. It shall have a stainless steel spring for positive retraction of the riser when irrigation is complete. The riser and nozzle-turret assembly shall be encased in stainless steel. The sprinkler shall carry a five-year, exchange warranty (not prorated).

## 2.05 ELECTRIC CONTROL VALVES

- A. Electric control valves shall be one-inch remote control, diaphragm type, fiber-glass or reinforced nylon body plastic valves with manual flow control, manual bleed screw and 200 psi pressure rating.
- B. Valves shall be manufactured by Rain Bird model PEB, Hunter Industries model ICV or approved equal.

## 2.06 VALVE BOXES

- A. All valve boxes shall be manufactured from unformed resin with a tensile strength of 3,100-5,500 psi conforming to ASTM P63 8. All boxes shall be green in color. Covers shall be green in color unless otherwise specified.

- B. Valve boxes for single valves, isolation valves and quick coupling valves shall be 10-inch round valve boxes with metal detection and bolt down covers.
- C. Valve boxes for dual electric valves shall be 12-inch standard valve boxes with metal detection and bolt down covers. When multiple electric valves are installed in the same area, they are to be installed two (2) valves per box in a 12-inch standard box.
- D. Valve box extensions shall be provided and installed as required for proper box depth. Valve box extensions shall be made by the same manufacturer.
- E. Valve boxes shall be manufactured by Armor, Carson Specification Grade or approved equal.

## 2.10 QUICK COUPLING VALVES

- A. The valve body shall be of cast brass construction with a working pressure of 125 psi. The valve seat disc plunger body shall be spring loaded so that the valve is normally closed under all conditions when the key is not inserted.
- B. The top of the valve body receiving the key shall be equipped with ACME threads and smooth face to allow the key to open and close the valve slowly. The quick coupling valve shall be equipped with a vinyl cover.
- C. The valve body construction shall be such that the coupler seal washer may be removed from the top for cleaning or replacement without disassembling any other parts of the valve.
- D. Keys shall be ACME with 1-inch male thread and 3/4-inch female thread at the top.
- E. Contractor shall provide two (2) keys for quick couplers and two (2) 1-inch x 3/4-inch swivel hose ends.
- F. Quick coupling valves, keys and swivels shall be manufactured by Hunter Industries, model HQ-44RC-AW, HK-44 and HS-1 or approved equal.

## 2.11 AUTOMATIC CONTROL SYSTEM

- A. The controller shall be of a fixed-station design that is provided and shall have 12 stations. It shall have a UL listed, NEMA 3R rated cabinet for use in the outdoor models. The front panel of the controller shall be removable to allow for remote programming.
- B. The controller shall have three independent programs (A, B,C) with 4 start times per program for a total of up to 12 start times per zone. Watering times for each

station shall be available from 1 minute to 120 minutes in 1-minute increments and in 10 minute increments from 120 minutes up to 6 hours. The controller shall have 4 weekly schedule options to choose from: 7-day calendar, 31-day interval calendar, odd day programming and even day programming. It shall also have a 365-day calendar clock to accommodate true odd-even watering. The controller shall be capable of determining and displaying the total run time input for each program. It shall have the capability to store a program in backup memory for easy retrieval, and also have a test program for quick system checks. The controller shall also provide the user with a diagnostic function to assist in identifying field wiring problems. Operation shall be available in automatic, semi-automatic and manual modes. All programming shall be accomplished by use of a programming dial and selection buttons with user feed back provided by a LCD display.

- C. The controller shall be equipped with a rain sensor on-off switch that allows the user to override a sensor that has suspended watering. The controller shall have a programmable rain delay that turns off the controller for a predetermined period of time, from 1 to 7 days, and shall allow the sensor input to be programmed by station. The controller shall also have a seasonal adjust feature that allows for station run times to be changed from 0% to 300% in 10% increments to compensate for weather changes.
- D. The controller shall be equipped with a programmable event day off to prevent watering on a selected day of the week. It shall also have a programmable delay between valve stations. Delays between stations shall be programmable in 5 second increments from 0 to 60 seconds and in 1-minute increments from 60 seconds up to 4 hours. A pump start/master valve circuit shall be included, and shall be programmable by station.
- E. Transformer input shall be 120 VAC, 60Hz or 230 VAC 50Hz depending on requirements. Transformer output shall be 24 VAC, 1.0A. Maximum output per station shall be 24 VAC, 0.56A. Program backup shall be provided by a non-volatile memory circuit that will hold the program data indefinitely. It shall also track time of day, and date indefinitely. The controller shall have Metal Oxide Varistors (MOVs) on the power input portion and the secondary output portion to help protect the micro-circuitry from power surges. The secondary MOVs shall be enclosed in the station modules for easy servicing. The controller shall have electronic short circuit protection that protects the controller from faulty field wiring or damaged solenoids. Electronic short circuit protection shall also allow zones that are not faulty to be operated as programmed. An indication of a fault shall be provided to the user on the LCD display. The controller shall also provide a user-initiated diagnostic function to assist in identifying field wiring problems.
- F. The controller shall have 2 options for remote control use, the ROAM remote control package that enables remote operation of the controller up to 1000 feet away and the ICR remote control package that enables remote operation of the

controller up to 2 miles away. Connection of remotes to the controller shall be provided through the SmartPort® outlet. The controller shall have central control capability through the Irrigation Management and Monitoring System (IMMS ).

- G. The controller shall be installed in accordance with the manufacturer's published instructions. The controller shall carry a conditional two-year exchange warranty.

## 2.12 CONTROLLER GROUNDING EQUIPMENT

- A. Grounding shall be as shown on the drawings, and as Specified in Section 16100 Electrical Service Systems.

## 2.13 RAIN SHUT OFF-WIRELESS RAIN-CLICK

- A. Rain shut-off shall be plastic in construction with adjustable interruption point and attached mounting bracket. Rain shut-off shall be wireless Rain-Click as manufactured by Hunter Industries or equal.
- B. One rain sensor shall be supplied for each controller. Install the receiver unit next to the irrigation controller, with the transmitter anywhere that the device can receive representative rainfall.
- C. Mount unit within 300' from the receiver unit with built in bypass switch on received panel.
- D. Sensor Dimensions: 3.25" diameter x 4" high; Wiring: normally closed or normally open; Operational Temperature: 32°F - 130°F; Receiver Power: 22-28 VAC/VDC, 100 mA (from timer transformer); Switching capabilities: Single Pole Double throw - 24 volts 3 amps.

## 2.14 WIRE

- A. All valve control wire shall be minimum #14-awg, common #12-awg, single strand, solid copper, UL- approved direct burial AWG-U.F. 600V and shall meet all state and local codes for this service. Individual wires must be used for each zone valve. Common wire shall be white in color, control wire shall be red in color. White color shall be used for common wire only.
- B. In ground wire connections shall be UL listed, manufactured by 3M, model DBY6 splice kits. All wire splices shall be made in valve boxes, at controller, or at valves.
- C. Wire type and method of installation shall be in accordance with local codes for NEC Class II circuits of 30-volt A.C. or less.

## 2.15 ISOLATION VALVES

- A. Isolation valves 2-1/2 inches and smaller in size shall be gate type, of bronze construction, US Manufacture, 200 WOG with steel cross handle and 200 psi rating. Gate valves to be as manufactured by Nibco, model T- 113-K, or approved equal.

#### 2.16 SWING JOINTS

- A. Gear driven rotary sprinklers shall be installed on pre-assembled swing joints, minimum length 12 inches, maximum 18 inches.
- B. Standard configuration has swivel ells on both ends for maximum versatility.
- C. Pressure rated to 150 PSI.
- D. Quick coupling valves to be installed on 1-inch prefabricated PVC unitized swing joint assemblies with double O-ring seals, minimum 315 psi rating and minimum length of 12 inches with brass insert and stabilizer (unless stabilizer is an integral part of the quick coupling valve).

#### 2.17 CRUSHED STONE

- A. Crushed stone shall be as specified in Section - 02200 Earthwork. Crushed stone shall be used under valve boxes.

#### 2.18 SAND

- A. Sand used for backfilling of trenches; under, around and over PVC lines shall be as specified in Section 02200 - Earthwork.

#### 2.19 SPARE PARTS

- A. Contractor shall supply the following tools and equipment to the Owner's Representative before final observation:
  - 1. Two (2) wrenches for disassembling and adjusting each type of sprinkler head provided.
  - 2. One (1) quick coupler key assembly for every five or fraction thereof of each type of quick coupling valve provided.
  - 3. One (1) of each type of gate valve used in the project.
  - 4. Two (2) of each type sprinkler head and pattern (PC & FC) used in the project.
  - 5. Two (2) of each type nozzle used in the project.
- B. Before final observation can occur, written evidence that the Owner's Representative has received the tools and equipment must be shown to the Owner.

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. Before work is commenced, hold a conference with the Owner's Representative to discuss general details of the work.
- B. Examine all contract documents applying to this Section noting any discrepancies and bringing the same to the attention of the Owner's Representative for timely resolution.
- C. All work indicated on Drawings shall be provided whether or not specifically mentioned in the Specifications.
- D. If there are ambiguities between Drawings and Specifications, and specific interpretation or clarification is not issued prior to bidding, the interpretation or clarification will be made only by Owner's Representative, and Contractor shall comply with the decisions. In the event the installation contradicts the directions given, the installation shall be corrected by Contractor at no additional cost to Owner.
- E. Verify dimensions and grades at job site before work is commenced. Do not proceed with installation of the landscape irrigation system when it is apparent that obstructions or grade differences exist or if conflicts in construction details. Legend or specific notes are discovered. All such obstructions, conflicts, or discrepancies shall be brought to the attention of the Owner's Representative.
- F. Make all field measurements necessary for the work noting the relationship of the irrigation work to the other trades. Coordinate with other trades (landscaping and other site work trades). Project shall be laid out essentially as indicated on the Irrigation Plans, making minor adjustments for variations in the planting arrangement. Major changes shall be reviewed with the Owner's Representative prior to proceeding.
- G. Layout of sprinkler lines indicated on Drawings is diagrammatic only. Location of sprinkler equipment is contingent upon and subject to integration with all other underground utilities. Contractor shall employ all data contained in the Contract Documents and shall verify this information at the construction site to confirm the manner by which it relates to the installation.
- H. Coordinate installation of all sprinkler materials, including pipe, to avoid conflict with the trees, shrubs, or other plantings.
- I. During progress of work, a competent superintendent and all assistants necessary shall be on site. All shall be satisfactory to the Owner's Representative. The superintendent shall not be changed, except with the consent of the Owner's

Representative, unless that person proves unsatisfactory and ceases to be employed. The superintendent shall represent the Contractor in his absence and all directions given to the superintendent shall be as binding as if given to the Contractor.

- J. At all times, protect existing irrigation, landscaping, paving, structures, walls, footings, etc. from damage. Any inadvertent damage to the work of another trade shall be reported at once.
- K. Replace, or repair to the satisfaction of the Owner, all existing paving disturbed during course of work. New paving shall be the same type, strength, texture, finish, and be equal in every way to removed paving.

### 3.02 PIPE AND FITTINGS INSTALLATION

- A. Using proper width trencher chain, excavate a straight (vertical) and true trench to a depth of 2-inch of pipe invert elevation.
- B. Loam or topsoil encountered within the limits of trench excavation for irrigation mains and branch lines shall be carefully removed to the lines and depths as shown on the Drawings and stockpiled for subsequent replacement in the upper 6 inches of the trench from which it is excavated. Such removal and replacement of the quantities of loam shall be considered incidental to the irrigation system and no additional compensation will be allowed therefore.
- C. Pipe shall be laid on undisturbed trench bottom provided suitable base is available - no rock larger than 1-inch or sharp edges; if not, excavate to 2-inch below pipe invert and provide and install sand base or crushed stone upon which to lay pipe.
- D. Back filling shall be accomplished as follows: the first 10-inch of backfill material shall contain no foreign matter and no rock larger than 1-inch in diameter. Carefully place material around pipe and wire and tamp in place. Remainder of backfill shall be laid-up in 6-inch (maximum) lifts and tamped to compaction with mechanical equipment. Compact backfill in trenches to dry density equal to the adjacent undisturbed soil, and conform to adjacent grades without dips, sunken area, humps, or other irregularities. Frozen material shall not be used for backfill
- E. Do backfilling when pipe is cool. During hot weather cool pipe by operating the system for a short period, or by backfilling in the early part of the morning before the heat of the day.
- F. Do not, under any circumstances, use truck wheels for compacting soil.
- G. Where feasible, Owner's Representative may authorize the use of flooding in lieu of tamping.

- H. Restore grades and repair damage where settling occurs.
- I. Make all solvent-weld joints in strict accordance with manufacturer's recommendations, making certain not to apply an excess of primer or solvent, and wiping off excess solvent from each connection. Allow welded joints at least 15 minutes set-up/curing time before moving or handling. When the temperature is above 80° F, allow connections to set minimum 24 hours before pulling or pressure is applied to the system. When temperature is below 80° F, follow manufacturer's recommendations. Provide and install for expansion and contraction as recommended. Wire shall be laid in same trench as mainline and at pipe invert (see Wire Installation).
- J. Mainline pipe shall have minimum 18 inches of COVER (excavate to invert as required by pipe size). Lateral pipe shall have minimum 16 inches of COVER for PVC and 12 inches of cover for Polyethylene (excavate to invert as required by pipe size).
- K. Cut plastic pipe with handsaw or pipe-cutting tool, removing all burrs at cut ends. All pipe cuts are to be square and true. Bevel cut end as required to conform to Manufacturer's Specifications.
- L. Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the trench. At times, when installation of the piping is not in progress, the open end(s) of the pipe shall be closed by a watertight plug or other means. All piping, which cannot temporarily be joined, shall be sealed to make as watertight as possible. This provision shall apply during the lunch hour as well as overnight. Pipe not to be installed that day shall not be laid out. Should water enter the trench during or after installation of the piping, no additional piping may be installed or back filled until all water is removed from the trench. Pipe shall not be installed when water is in the trench, when precipitation is occurring, or when the ambient temperature is at 40° F or below. Pipe installed at temperatures below 40° F shall be removed and replaced at no cost to the Owner. PVC pipe shall be snaked in the trench to accommodate for expansion and contraction due to changes in temperature.
- M. In installing irrigation pipe the Contractor shall route the pipe as necessary to prevent damage to tree roots. Where trenching must occur near trees, the Contractor shall provide proper root pruning and sealing methods to all roots 1-inch and larger.
- N. Maintain 6-inch minimum clearance between sprinkler lines and lines of other trades. Do not install sprinkler lines directly above another line of any kind.
- O. Maintain 1-inch minimum between lines which cross at angles of 45 to 90 degrees.



- P. Exercise care when excavating, trenching and working near existing utilities.
- Q. Throughout the guarantee period it will be the responsibility of the Contractor to refill any trenches that have settled due to incomplete compaction.
- R. Pulling of pipe will be allowed provided soil is suitable and specified depth of bury can be maintained.

### 3.03 ISOLATION VALVE INSTALLATION

- A. Install isolation valves per detail where indicated on the Drawings. Install all isolation valves on a level crushed stone base so that they can be easily opened or closed with the appropriate valve wrench. Install specified valve box over each isolation valve.
- B. Check and tighten valve bonnet packing before valve box and backfill installation.

### 3.04 VALVE BOX INSTALLATION

- A. Furnish and install a valve access box for each electric valve, quick coupling valve, isolation valve and wire splice.
- B. All valve access boxes shall be installed on a minimum 4-inch crushed stone base. Finish elevation of all boxes shall be at grade. All crushed stone to be supplied by the Contractor and installed before valve box. Crushed stone shall not be poured into previously installed valve boxes.

### 3.05 24 VOLT CONTROL VALVE INSTALLATION

- A. Control valves shall be installed on a level crushed stone base. Grade of bases shall be consistent throughout the project so that finish grades fall within the limits of work. Valves shall be set plumb with adjusting handle and all bolts, screws and wiring accessible through the valve box opening. Valves shall be set in a plumb position with 24-inch minimum maintenance clearance from other equipment.
- B. Install at sufficient depth to provide more than 6-inch, nor less than 4-inch cover from top of valve to finish grade.
- C. Adjust zone valve operation after installation using flow control device on valve.

### 3.06 AUTOMATIC CONTROL SYSTEM INSTALLATION

- A. Controller Installation:
  - 1. Contractor to install controller in enclosure. Contractor to wire valves into

controller and set proper program. Controller to be mounted on panelboard in enclosure.

2. Wire all controller to 120-volt electrical supplies provided for the controller as indicated on the Drawings, and in accordance with Section 16100 - Electrical Service Improvements.
3. Contractor to install controller in specified enclosure, as shown on the drawings. Contractor to wire valves into controller and set proper program.
4. Keys shall be turned over to the City of Waltham.

B. Control Wiring:

1. Wiring shall be installed along with the main line. Multiple wire bundles shall be cinched together at maximum 12-foot centers using plastic cable cinches and shall be laid beside, and at the same invert as, the irrigation lines. Sufficient slack for expansion and contraction shall be maintained and wiring shall at no point be installed tightly. Provide an additional 8 inches to 12 inches slack at all changes of direction. Wiring in valve boxes shall be a sufficient length to allow the valve solenoid, splice, and all connections to be brought above grade for servicing. This additional slack shall be coiled for neatness in the valve box. Each valve shall have a separate wire back to the controller.
2. Power wire shall be installed in 1000 foot lengths. No splicing shall be allowed on circuits from power source to controller and from controller to controller below 1000 feet of power wire laid. Minimum burial depth shall be 14 inches.
3. Wire shall not be installed directly off the roll. Wire must be first laid out and then installed. Specified depth of burial is to be maintained.
4. All in-ground wire connections shall be waterproofed with 3M DBY-6, DBR-6 or 82-A Scotch Pak splice kits of the appropriate size for the voltage being carried and the wire sizes involved. All splices shall be made in valve boxes (wire runs requiring splices between valve locations shall be provided in splice box--valve box shall be used). Splice locations shall be shown on the Record Drawings.
5. All power wire (1 20v) shall be installed with no in-ground splices. All splices shall be in valve boxes (black covers) or field controllers. Wire splices shall not be in the same valve box with isolation valves and valve covers to be marked "Electrical".
6. All wire shall be laid in trenches and shall be carefully back-filled to avoid

any damage to the wire insulation or wire conductors themselves. In areas of unsuitable material, the trench shall have a 2 inches layer of sand or stone dust on the bottom before the wires are laid into the trench and back-filled. The wires shall have a minimum of 12 inches of cover. Wire not to be installed that day shall not be laid out.

7. Control wiring located beneath paved areas shall be installed in a separate schedule 80 PVC sleeve.
8. Wiring shall occupy the same trench and shall be installed along the same route as pressure supply or lateral lines wherever possible to the side of pipeline. Control wires shall be laid loosely in trench without stress or stretching to allow for contraction of wires. Where more than one (1) wire is placed in a trench, the wiring shall be taped together at intervals of ten(10) feet.
9. An expansion curl shall be provided within three(3) feet of each wire connection. Expansion curl shall be of sufficient length at each splice connection at each electric control valve, so that in case of repair, the valve bonnet may be brought to the surface without disconnecting the control wires. An expansion curl shall be provided every 100 feet on runs of more than 100 feet in length. Provide looped slack at valves and changes in direction of 90 degrees.

### 3.07 CONNECTIONS

- A. Connect piping to sprinklers, devices, valves, control valves, specialties, and accessories to provide a fully operational irrigation system as part of this work.
- B. Connect water supply to irrigation system.
- C. Electrical Connections: Connect to power source, controllers, rain sensor, and automatic control valves to provide a fully operational irrigation system as part of this work.
- D. Ground systems according to Section 16100 - Electrical Service Improvements.

### 3.08 CONTROLLER GROUNDING INSTALLATION

- A. Ground controller to Cu grounding bus bar in electrical enclosure.

### 3.09 WIRING INSTALLATION

- A. Wiring shall be installed along with the main line. Multiple wire bundles shall be cinched together at maximum 12-foot centers using plastic cable cinches and shall be laid beside, and at the same invert as, the irrigation lines. Sufficient slack for

expansion and contraction shall be maintained and wiring shall at no point be installed tightly. Provide and install an additional 8 inches to 12 inches slack at all changes of direction. Wiring in valve boxes shall be a sufficient length to allow the valve solenoid, splice, and all connections to be brought above grade for servicing. This additional slack shall be coiled for neatness in the valve box. Each valve shall have a separate wire back to the controller.

- B. All wire shall be laid in trenches and shall be carefully back-filled to avoid any damage to the wire insulation or wire conductors themselves. In areas of unsuitable material, the trench shall have a 2 inches layer of sand or stone dust on the bottom before the wires are laid into the trench and back-filled. The wires shall have a minimum of 12 inches of cover. Wire not to be installed that day shall not be laid out.
- C. An expansion curl shall be provided and installed within 6 inches of each wire connection to a solenoid and at least every 100 feet of wire length on runs more than 100 feet in length. Expansion curls can be formed by wrapping five (5) turns of wire around a 1-inch diameter or larger pipe and then withdrawing the pipe.
- D. Provide and install a common ground wire of white color. No white color shall be used for power wire. Control wire shall be red.
- E. Service wiring in connection with Drawings and local codes for 24-volt service. All in-ground wire connections shall be waterproofed with 3M DBY-6 splice kits. All splices shall be made in valve boxes (wire runs requiring splices between valve locations shall be provided and installed in splice box-valve box shall be used). Splice locations shall be shown on the Record Drawings.
- F. Contractor shall provide a complete wiring diagram showing wire routing for the connections between the controller and valves. See section one for the inclusion of wiring diagram in operation and maintenance manuals.

### 3.10 SPRINKLER INSTALLATION

- A. Spray sprinklers, small rotary sprinklers and medium rotary sprinklers shall be installed flush (perpendicular) to grade on swing pipe assemblies, minimum length 6 inches, maximum 18 inches.
- B. Sprinklers shall not exceed maximum spacing indicated.
- C. Adjust sprinkler zone after installation using flow control device on valve.

### 3.11 QUICK COUPLING VALVE INSTALLATION

- A. Provide and install quick coupling valves where indicated on the Drawings.

- B. Quick coupling valves to be mounted on 1-inch prefabricated PVC unitized swing joint assemblies with integral o-rings, minimum length 12 inches with brass insert and stabilizer as per details.

### 3.12 CHECK/TEST/START-UP/ADJUST

#### A. Flushing:

1. After all piping, valves, sprinkler bodies, pipe lines and risers are in place and connected, but prior to installation of sprinkler internals, open the control valves and flush out the system under a full head of water.
2. Sprinkler internals, flush caps and riser nozzles shall be installed only after flushing of the system has been accomplished to the full satisfaction of the Owner's Representative.
3. Contractor shall be responsible for flushing the entire system after installation is complete and will be responsible for any clogged nozzles for thirty (30) days after substantial completion of this portion of the landscape irrigation system.

#### B. Testing:

1. Leakage test: test all lines for leaks under operating pressure. Repair all leaks and re-test.
2. Coverage test: perform a coverage test in the presence of the Owner's Representative (notify Architect at least seven (7) days in advance of scheduled coverage test). Representative will determine if the water coverage is complete and adequate. Readjust heads and/or head locations as necessary or directed to achieve proper coverage.
3. All testing shall be at the expense of the Contractor.

### 3.13 CLEANING AND ADJUSTING

- A. At the completion of the work, all parts of the installation shall be thoroughly cleaned. All equipment, pipe, valves and fittings shall be cleaned of grease, metal cuttings and sludge which may have accumulated by the operation of the system for testing.
- B. Adjust sprinkler heads, valve boxes, and quick coupling valves to grade as required, so that they will not be damaged by mowing operations.
- C. Continue sprinkler coverage adjustment as required by settlement, etc., throughout the guarantee period.

- D. Each control zone shall be operated for a minimum of 5 minutes and all heads checked for consistency of delivering water. Adjustments shall be made to sprinklers that are not consistent to the point that they match the manufacturer's standards. All sprinklers, valves, timing devices or other mechanical or electrical components, which fail to meet these standards, shall be rejected, replaced and tested until they meet the manufacturer's standards.

### 3.14 ACCEPTANCE AND OPERATION BY OWNER

- A. Upon completion of the work and acceptance by the Owner, the Contractor shall be responsible for the training of the Owner's Representative(s) in the operation of the system (provide minimum 48 hours written notice in advance of test). The Contractor shall furnish, in addition to the Record Drawings and operational manuals, copies of all available specification sheets and catalog sheets to the Owner's personnel responsible for the operation of the irrigation system. The Contractor shall guarantee all parts and labor for a minimum period of one (1) year from date of acceptance.
- B. Conditions for acceptability of work for start of maintenance by Owner issued by Owner or Owner's Representative shall include but not be limited to:
  - 1. Punch list items complete and approved by Owner or Owner's Representative.
  - 2. Landscape irrigation system complete and in place.
  - 3. Record drawings complete.
  - 4. Maintain installation and watering schedules until all conditions noted above have been completed.

### 3.15 CLEANUP

- A. Upon completion of all installation work, Contractor shall remove all leftover materials and equipment from the site in a safe and legal manner.
- B. Contractor shall remove all debris resulting from work of this section.
- C. Contractor shall regrade, lightly compact, and replant around sprinkler heads where necessary to maintain proper vertical positioning in relation to established grade.
- D. Contractor shall fill all depressions and eroded channels with sufficient soil mix to adjust grade to ensure proper drainage. Compact lightly, and replant filled areas in accord with Drawings requirements.

END OF SECTION

## SECTION 02825

### CHAIN LINK FENCING

#### PART 1 - GENERAL

##### 1.01 GENERAL PROVISIONS

- A. Attention is directed to the General Conditions of the Contract, all Divisions of the Specifications and the Contract Drawings, all of which apply to this section.
- B. Examine and coordinate all Contract Drawings and other sections of the specifications for requirements which affect work of this section whether or not such work is specifically mentioned in this section. Coordinate work with other trades to assure the steady progress of all work under the Contract.

##### 1.02 SCOPE OF WORK

- A. Work under this Section includes furnishing and installation of a new galvanized chain link fence as followings:
  - 1. Alternate #1 - see Drawings for Location.
  - 2. Alternate #2 - see Drawings for Location.

##### 1.03 RELATED WORK

- A. Section 02100 - Site Preparation and Demolition
- B. Section 02200 - Earthwork
- C. Section 03300 - Cast-in-Place Concrete

##### 1.04 REFERENCE STANDARDS

- A. Comply with standards of the Chain Link Fence Manufacturer's Institute.

##### 1.05 SUBMITTALS

- A. Submit manufacturer's product literature for all new items demonstrating compliance with the Specifications.

##### 1.06 DELIVERY, STORAGE AND HANDLING

- A. Packaged materials shall be delivered to the site in original, unopened and unaltered containers clearly indicating the manufacture, brand name, lot or serial number and other identifying information.

- B. Materials shall be stored in a dry location, off the ground and in such manner as to prevent damage, intrusion of foreign matter and weather. All materials which have become damaged or otherwise unfit for use during delivery or storage shall be replaced at the expense of the Contractor.
- C. The Contractor shall be responsible for timing the delivery of items so as to minimize onsite storage time prior to installation. Stored materials and items must be protected from the weather, careless handling and vandalism.
- D. Contractor shall handle, pack and transport in a manner to minimize damage to the finish of materials. Upon arrival at the job site, it is the responsibility of the contractor to take equal precautions. Should minor damage occur to the finish the contractor shall restore damaged finishes and test for proper function. Clean and protect work from further damage.
- E. Handle and store salvaged chain link fence components in a way to prevent damage and deterioration.

## PART 2 - PRODUCTS

### 2.01 Galvanized Chain Link Fence

- A. Fabric shall meet the following requirements as a minimum:
  1. Wire shall be 9 gauge (.148") .
  2. Wire finish shall be zinc coated, ASTM A 392 - 1.2 oz./sf.
  3. Top and bottom selvages shall be knuckled.
- B. Framework (Posts, Rails, and Gate Frame)
  1. Steel parts shall be hot-dipped galvanized inside and out. Hot-dip galvanizing shall have a minimum average of 1.8 oz/s.f. (550 g/sm) of coated surface area. Pipe shall be Type 1, ASTM F 1083 round cold-formed steel standard weight Schedule 40, Minimum yield strength shall be 25,000 psi. Galvanizing shall conform with ASTM A-120 standard weight Schedule 40 except the hydrostatic testing requirement is waived.
  2. Sizes for fence posts, gate frames and other framework members shall be as shown on the Drawings.
    - a) Weights for posts shall be as follows:



Outside Diameter (Inches)	Minimum Pounds per Foot Tolerance $\pm 5\%$
1.66	2.27
2.375	3.65
2.875	5.79
4.00	9.11

3. Provide continuous top rails in manufacturer's longest lengths, with expansion type couplings for each joint. Provide necessary fittings for attaching top rail to each gate, corner, pull and end post.

C. Hardware and accessories: Provide galvanized (ASTM A153) accessories

1. Post Tops: Galvanized, pressed steel or malleable iron, weather tight closure caps, 1 top for each post. Where top rail is used, provide tops with openings to accommodate top rails. Provide one (1) rounded cap for each end, corner or gate post.
2. Stretcher Bars - One piece lengths with minimum cross section of 3/16" x 3/4". Provide one (1) cross stretcher bar for each end post and two (2) for each corner and pull post.
3. Stretcher Bar Bands - Heavy pressed steel or malleable iron of 1/8" x 3/4" minimum cross section and be of sufficient size to secure stretcher bars to end, corner and pull posts.
4. Rail clamps to be standard clamps (boulevard clamps) furnished complete with fasteners with ASTM Designation A153.
5. Rail brace ends: Formed steel, malleable or cast iron, for connection of rail and brace to posts.
6. Ties - Shall be 6 gauge galvanized steel wire for attachment of fabric to line posts. Double wrap 13 gauge for rails and braces. Hog ring ties of 12-1/2 gauge for attachment of fabric to tension wire.

D. Concrete for footings shall conform to the requirements of Section 03300-Cast-in-Place Concrete. Compressive strength shall be 4,000 psi minimum.

2.02 Concrete footings

- A. Provide cast-in-place concrete footings of size and strength indicated on the

Drawings.

### PART 3 - EXECUTION

#### 3.01 General

- A. Install and fasten materials and systems in proper relation with adjacent construction and with uniform appearance. Items shall be installed in a level, plumb condition, true to the lines and grades shown on the Contract Drawings. Coordinate with work of other sections or trades.

#### 3.02 Fence Installation

- A. Rails - All rails, top, bottom, middle (where required) shall form a continuous brace from end to end of each fence run. Couplings shall be located a maximum of 12" from line posts. All end and corner posts shall be braced to the nearest line post with center brace rails.
- B. Fabric - Where fencing occurs outside of the Buffer Zone, leave approximately 2" between finish grade and bottom selvage. **Where fencing occurs within the buffer zone, leave 4" between finish grade and bottom selvage.** Pull fabric taut and tie to posts and rails.
- C. Stretcher Bars - Thread through fabric and secure to posts with tension bands spaced as shown on the Drawings.
- D. Tie Wires - Wire shall be spaced as shown on the drawings and securely fastened by twisting around pipe to which attached, clasping and fasten firmly. Bend twisted ends of wire to minimize hazard to persons or clothing.
- E. Fasteners - Install nuts for tension band and hardware bolts on side of fence opposite fabric side.

#### 3.03 GUARANTEE

- A. The Contractor shall cover the replacement of any damaged items or components, at no extra charge for the period of one year.

END OF SECTION

## SECTION 02900

### SEEDING

#### PART 1 - GENERAL

##### 1.01 SUMMARY

- A. The Contractor shall provide all labor, materials, equipment and services necessary for, and incidental to, preparation of ground surfaces, fertilizing, seeding, mulching, and maintenance of seeded areas as shown on the Drawings or as specified herein.
- B. The work of this section consists of amending soils with lime and fertilizer, fine grading, fall seeding, maintenance, and over-seeding in the early spring.

##### 1.02 SPECIAL CONDITIONS

- A. A portion of the field lies within the 100-foot buffer zone of Bordering Vegetated Wetlands under the jurisdiction of the Waltham Conservation Commission and the Massachusetts Department of Environmental Protection. The Waltham Conservation Commission has issued an Order of Conditions which conditions the work of this project, a copy of which is included as a Special Condition of the Contract. Refer to Section 01571 – Order of Conditions. Where the Order of Conditions and these Specifications are in conflict, the Order of Conditions shall take precedence in the area within the buffer zone.

##### 1.03 SUBMITTALS

- A. Submit vendor's certified analysis for each grass seed mixture required, stating botanical and common name, percentages by weight, percentages by purity, germination, and weed seed.
- B. Submit manufacturer's or vendor's certified analysis for soil amendments and fertilizers and literature demonstrating compliance with the Specifications.
- C. Submit the following material samples:
  - 1. Seed.

##### 1.04 COORDINATION AND SCHEDULING

- A. It is the intention of this specification that lawn be seeded between the dates of August 20<sup>th</sup> and September 20<sup>th</sup>. Coordinate all aspects of the project to achieve this date.

- B. Seeding is to be performed only after installation and full operation of the irrigation system.
- C. Weather Limitations: No fertilizer shall be applied during the rain, or when rain is predicted, or upon frozen ground. No fertilizer shall be applied between the dates of November 1<sup>st</sup> and April 1<sup>st</sup>.

#### 1.05 QUALITY ASSURANCE

- A. All landscaping work shall be performed by one (1) Contractor, with proven experience in this field.
- B. Package standard products with the manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.
- C. The Contractor shall provide any pay for all costs in connection with an approved independent testing facility to determine conformance of the installation of the materials with the specifications.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver seed and fertilizer materials in original unopened containers, showing weight, analysis, and name of manufacturer. Store in a manner to prevent wetting and deterioration.
- B. Deliver packaged materials in containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site.

#### 1.07 PROJECT CONDITIONS

- A. Work notification: Notify Landscape Architect at least 7 working days prior to start of seeding operations..
- B. Perform seeding work only after other work affecting ground surface has been completed.
- C. Restrict traffic from lawn areas until grass is established. Erect signs and barriers as required.
- D. The irrigation system will be installed prior to seeding. Locate, protect, and maintain the irrigation system during seeding operations.
- E. Do not fertilize in the rain, or when rain is forecast.

## 1.08 WARRANTY

- A. Provide a uniform stand of grass by watering, mowing, and maintaining seeded areas until final acceptance. Reseed areas, with specified materials, which fail to provide a uniform stand of grass until all affected areas are accepted by the Landscape Architect.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Soil Amendments:
  - 1. Lime: Natural limestone containing not less than 85% of total carbonates, ground so that not less than 90% passes a 10-mesh sieve and not less than 50% passes a 100-mesh sieve.
  - 2. Fertilizer:
    - a) Starter Fertilizer shall be a commercial fertilizer (5-10-5) containing not less than five (5) percent nitrogen, ten (10) percent available phosphoric acid, and five (5) percent water soluble potash. At least 50% of the nitrogen shall be slow-release nitrogen.
    - b) Maintenance Fertilizer shall be at a custom mixed fertilizer based on soil testing recommendations. Nitrogen in fertilizer shall be a minimum of 70% controlled release polymer coated nitrogen, Polyon or equal.
  - 2. Seed shall be fresh, clean, new-crop seed mixed in the proportions specified for species and variety, conforming to Federal and State Standards.
  - 3. Seed Mix shall be Triple A Tall Fescue Blend as supplied by Jacklin Seed or equal, consisting of 3 Tall Fescue named varieties equivalent in performance to 45% Inferno, 28% Arid and 27% Quest.
  - 3. Weed seed content shall not exceed 0.01%.
- C. Water: Clean, potable.

### 2.02 MECHANICAL EQUIPMENT REQUIRED

- A. Seeding shall be performed using a mechanical slit or drill (eg. Brillion) type

seeder which places the seed beneath the soil. Slit seeders shall have a 1.5" spacing maximum. Hand broadcast or hydroseeding is not acceptable.

- B. Only rubber-tired low compaction turf-tired or track equipment may be used in seeding operations.

## PART 3 - EXECUTION

### 3.01 INSPECTION

- A. Examine finish surfaces, grades, topsoil quality, and depth. Do not start seeding work until unsatisfactory conditions are corrected.

### 3.02 PREPARATION

- A. Limit preparation to areas which will be immediately seeded.
- B. Loosen topsoil to a minimum depth of 4". Remove stones over 1" in any dimension and sticks, roots, rubbish, and extraneous matter.
- C. Clean topsoil of roots, plants, stones, clay lumps and other extraneous materials harmful or toxic to plant growth.
- D. Grade field area to a smooth, free draining even surface with a loose, moderately coarse texture. Roll and rake, remove ridges, and fill depressions as required to drain.

### 3.03 LIMING

- A. Apply limestone in two separate applications of 25 pounds/1000 square feet to achieve a final amendment rate of 50 pounds/1000 square feet. Distribute evenly by machine and incorporate thoroughly into the top 6" of soil.

### 3.04 INITIAL FERTILIZATION

- A. Apply fertilizer according to manufacturer's directions.
- B. Apply starter fertilizer at 40 lbs/1000 square feet (2 lbs/nitrogen per 1000 sf) and mix into to the top 3-4" of soil.
  - 1. Do not fertilize when weather is rainy, or when rain is forecast.
  - 2. Do not allow fertilizer to spill onto pavements or hard surfaces.

### 3.05 SEEDING

- A. Water dry topsoil to depth of 4 inches at least 48 hours prior to seeding to obtain a loose friable seed bed.
- B. Apply seed only when wind velocities are less than five (5) miles per hour.
- C. Sow half the seed with mechanical seeder.
- D. Sow remaining half of seed at right angles to first seeding pattern, using the same method.
- E. Apply seed at 5 lbs. per 1000 square feet.
- F. Roll seeded area with roller weighing no more than 150 lbs. per foot of roller width.
- G. Water seeded areas to a depth of four (4) inches.

### 3.06 PROTECTION

- A. Immediately after seeding and sodding, erect barricades and warnings to protect seeded areas from traffic until grass is established.
- B. Repair or replace damaged landscape work as directed by Engineer.

### 3.07 MAINTENANCE

- A. Begin maintenance immediately after seed placement.
- B. Watering:
  - 1. Keep soil moist during seed germination period.
  - 2. Supplement rainfall to produce a total depth penetration of 2 inches per day after germination.
- C. Mowing:
  - 1. When grass reaches 4 inches in height, mow to 2-1/2 inches in height.
  - 2. Maintain grass between 2" to 3" inches in height.
  - 3. Do not cut off more than 40% of grass leaf in a single mowing.
    - a. If grass has become too long between mowings, raise the mower height, mow and gradual lower mower height over a span of

several mowings to reduce shock to the grass.

4. Do not remove grass clippings.
  - a. If grass clippings are too long, mow over a second time to shred.

D. Reseed and mulch spots larger than 1 square foot not having uniform coverage.

E. Maintain lawns by watering, weeding, mowing, trimming, and other operations such as rolling, regrading and replanting as required to establish a smooth, acceptable lawn, free of eroded or bare areas.

F. Provide final mowing in late November.

### 3.08 SPRING OVERSEEDING

A. Overseed the field in early spring. Use the specified seed mix and rate of application.

### 3.10 SPRING FERTILIZATION

A. Perform one fertilization during the period May 1 to June 10<sup>th</sup>. Apply 1.0 lb nitrogen. Apply phosphate, and potassium only as recommended by soils test.

### 3.11 FINAL ACCEPTANCE

A. These procedures shall be observed in field, and inspected by the Landscape Architect or Owner's representative to verify compliance with the specifications.

B. It is the responsibility of the Contractor to deliver a lawn of a uniform stand of specified grass exhibiting a vigorous, healthy, uniformly green appearance, relatively free from insects, grubs, and other pests, free from excessive accumulation of thatch and consisting of a population of at least 90 percent permanent grass. The Contractor shall also deliver a lawn free of weeds, bare spots exceeding 4" diameter maximum, and surface irregularities. Such bare spots shall not constitute more than 2% of the total lawn area.. Maintain and protect all seeded areas until final acceptance of the Contract.

END OF SECTION 02900



## SECTION 03300

### CAST-IN-PLACE CONCRETE

#### PART 1- GENERAL

##### 1.01 RELATED DOCUMENTS

- A. All of the Contract Documents, including the Contract Form, General Provisions, General Conditions, Supplemental Conditions, and all Attachments to the General Provisions, and Division 1 - General Requirements, apply to the work of this Section.

##### 1.02 SCOPE OF WORK

- A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mix design, placement procedures, and finishes. The work shall include, but is not limited to, the following:
  - 1. Footings.
  - 2. Slabs.

##### 1.03 RELATED WORK

- A. Section 02200 - Earthwork.
- B. Section 02667 - Water Service Systems.
- C. Section 02670 - Backflow Preventer Cabinet.
- D. Section 02825 - Chain Link Fence.
- E. Section 16100 - Electrical Service Improvements

##### 1.04 SUBMITTALS

- A. Concrete mix design.

##### 1.05 REFERENCE STANDARDS

- A. All work shall comply with the minimum standards of the latest editions of the following codes and specifications, subject to modifications and amendments outlined herein.
  - 1. American Concrete Institute (ACI)
    - (a) ACI 117 Specifications for Tolerances for Concrete Construction and Materials
    - (b) ACI 212 Guide for the Use of Admixtures in Concrete
    - (c) ACI 301 Specification for Structural Concrete

- (d) ACI 305 Hot Weather Concreting
- (e) ACI 306 Cold Weather Concreting
- (f) ACI 347 Recommended Practice for Concrete Formwork

- 2. Standard Specifications: Commonwealth of Massachusetts, Department of Public Works, Standard Specifications for Highways and Bridges, latest edition, Construction and Materials Specifications for Concrete.

#### 1.06 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed concrete Work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

#### 1.07 PROJECT CONDITIONS

- A. Establish and maintain required lines, surfaces, and elevations.
- B. Do not install concrete work over wet, saturated, muddy, or frozen subgrade.
- C. Do not install concrete when air temperature is below 40 degrees F.
- D. Calcium chloride, salt, or any other admixture to prevent concrete from freezing is prohibited.

#### 1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle steel reinforcement to prevent bending and damage.

### PART 2 - PRODUCTS:

#### 2.01 BASE COURSES

- A. Base material under slabs shall be as specified under Section 02200, Earthwork.

#### 2.02 CONCRETE MIX

- A. Provide ASTM C94 ready-mixed concrete or batch mixed concrete. Use ACI 301 Method 1 or Method 2 to determine mix proportions.
- B. Unless other indicated on the Drawings, minimum 28 day compressive strength shall be 4,000 psi for all footings and slabs.
- C. Concrete slump shall be no less than 2" nor greater than 4" determined in accordance with ASTM C143.

#### 2.03 CEMENT

- A. Cement shall be Portland Cement conforming to ASTM C150, Type II, Dark Color.

#### 2.04 AGGREGATE

- A. Except as otherwise noted, aggregate shall conform to ASTM C33.
  - 1. Maximum size of aggregate shall be 3/4".

#### 2.05 WATER

- A. Water shall conform to ASTM C94.

#### 2.06 CONCRETE REINFORCEMENT

- A. Steel reinforcing bars shall conform to ASTM A615, Grade 60.

#### 2.07 FORMWORK

- A. Concrete slab shall be formed.
- B. The form facing materials shall produce a smooth, hard, uniform texture on the concrete to match finish of existing wall to remain.
- C. Form material shall be plywood, tempered concrete-form grade hardboard, or metal, capable of producing the required finish.
- D. Forms shall be true to line and free of warp and shall be of sufficient strength when braced to resist the pressure of concrete during placement within the allowable tolerances.
- E. Surfaces of the forms to be in contact with concrete shall be coated with non-staining form release compound, free of kerosene, oil and wax. Wetting or coating with grease or oil will not be accepted as a substitute.
- F. Exposed concrete arises shall be chamfered. Chamfer shall be mitered at changes of direction.

#### 2.08 FORM RELEASE AGENT

- A. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

#### 2.11 CURING MATERIALS

- A. Curing paper shall be a nonstaining, fiber reinforced laminated draft bituminous product conforming to ASTM C 171. Four mil polyethylene sheeting may be substituted for curing paper. Curing compound shall be a resin-based white pigmented clear curing compound conforming to ASTM C 309, Type 2, Class B.

## PART 3 - EXECUTION

### 3.01 GRADING

- A. Make any corrections necessary to base course material furnished and installed under SECTION 02200, Earthwork, to bring base material to the sections and elevations shown on the Contract Drawings.
- B. Existing subgrade material which will not readily compact as required shall be removed and replaced with satisfactory materials. Additional materials needed to bring subgrade to required line and grade and to replace unsuitable material shall be material conforming to Section 02200 Earthwork.

### 3.02 FORMWORK

- A. Formwork shall be constructed, braced and tied so that the formed surfaces of the concrete will be perfectly true, smooth and to the dimensions shown on the Drawings within the tolerances for formed surfaces as specified in ACI 301.
- B. Forms shall not be moved for seventy-two (72) hours after the Cement concrete has been placed, or for a longer period if directed by the Landscape Architect/Engineer. Extreme care shall be taken in removing forms in order that no damage will be done to the Cement concrete. Under no condition shall any bar, pick or other tool be used which depends upon leverage on the Cement concrete for removal of the forms.

### 3.03 REINFORCEMENT

- A. Reinforcing bars showing cracks after bending shall be discarded and replaced with new material conforming to this Section at no additional cost to the Owner.
- B. Reinforcing shall be thoroughly cleaned of loose mill and rust, scale, dirt, ice, and other foreign materials which may reduce the bond between concrete and reinforcing. Where there is a delay in placing concrete after reinforcement is in place, bars shall be reinspected and cleaned when necessary.
- C. After forms have been coated with form release agent, but before concrete is placed, reinforcing steel shall be securely wired in exact position call for, and shall be maintained in that position until concrete is placed and compacted.
- C. Except as otherwise noted, reinforcing steel shall be spliced by lapping bar ends,

placing bars in contact, and tightly wiring. Minimum lap of spliced bars shall conform to ACI 318.

- D. Unless otherwise indicated on the Drawings, reinforcing shall extend within 2 inches of formwork and expansion joints. Reinforcement shall continue through construction joints.

### 3.04 HOT WEATHER CONCRETING

- A. Procedures shall be in accordance with provisions of ACI 305. 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.

### 3.05 COLD WEATHER CONCRETING

- A. Procedures shall be in accordance with provisions of ACI 306.

### 3.06 CONCRETE PLACEMENT

- A. Before placing concrete, forms and space to be occupied by concrete shall be thoroughly cleaned and reinforcing steel and embedded metal shall be free from dirt, oil, mill scale, loose rust, paint and other material which might tend to reduce bond.
- B. Existing concrete, earth and other water permeable material against which new concrete is to be placed shall be thoroughly damp when concrete is placed. There shall be no free water on the surface.
- C. Concrete which has set or partially set before placing shall not be employed. Retempering of concrete will not be permitted.
- D. Segregation of the concrete shall be prevented during handling; should any segregation occur, the concrete shall be re-mixed before it is placed. Concrete shall not be allowed to drop freely more than 4 feet. If the free drop to the point of placement must exceed 4 feet, the Contractor shall obtain the approval of the Engineer for the proposed method of depositing the concrete. The concrete shall not be required to flow over distances greater than 3 feet in any direction in the forms or on the ground, unless otherwise permitted by the Landscape Architect.
- E. Concrete shall be thoroughly spaded, and tamped, and vibrated to secure a solid homogenous mass, thoroughly worked around reinforcement and into corners of forms.

### 3.07 CURING AND PROTECTION

- 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 during, 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 by use of a curing compound.
  - 1. Concrete cured using curing paper shall be completely covered with paper with seams lapped at least 2 in. and sealed with tape. Concrete surface shall not be allowed to become moistened with 24 hours of placing concrete. During curing period surface shall be checked frequently, and sprayed with water or curing compound, as applicable, as often as necessary to prevent drying, but not earlier than 24 hours after placing concrete.
  - 2. Concrete cured with a curing compound shall have curing compound applied at a rate of 200 sq. ft. per gallon in two applications perpendicular to each other.
  - 3. Concrete surfaces to receive paint, waterproofing, damproofing, thin-set adhesives and coatings, and similar applied materials which require bond and adhesion to concrete surfaces shall be cured using curing paper. The use of curing compounds on these surfaces will not be permitted.
- C. Footings and slabs where exposed shall be provided with continuous moist curing for at least seven (7) days regardless of ambient air temperatures.

### 3.08 FINISHING OF EXPOSED SURFACES

- A. Formed concrete surfaces which will be visible after completion of the structure shall have a “smooth form” finish, as defined by ACI 301.
  - 1. At formed surfaces exposed to view, chip off fins and other projections and trowel patch all voids, honeycombs and air pockets exceeding ½" in any dimension.

### 3.09 PROTECTION OF CONCRETE SURFACES

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

### 3.10 CLEAN-UP

- A. At the completion of the work of this section, all rubbish, debris, waste materials from, and about the site, including tools, scaffolds, apparatus and appliances used in connection with work under this Section shall be legally disposed of and the premises shall be left in a clean condition.

END OF SECTION

## SECTION 16100

### ELECTRIC SERVICE IMPROVEMENTS

#### PART 1 - GENERAL

##### 1.01 GENERAL PROVISIONS

- A. All of the Contract Documents, including the Contract Form, General Provisions, General Conditions, Supplemental Conditions, and all Attachments to the General Provisions, and Division 1 - General Requirements, apply to the work of this Section.
- B. Examine and coordinate all Contract Drawings and other sections of the specifications for requirements which affect work of this section whether or not such work is specifically mentioned in this section. Coordinate work with other trades to assure the steady progress of all work under the Contract. The Contractor shall refer to the Contract Documents for all new work and coordinate how it relates to electric service improvements.
- C. The Contractor shall furnish a complete finished product, which meets all applicable codes and standards, and the intent and specific requirements of the Drawings and specifications for this project. It is the intent of these specifications that the electrical system shall be suitable in every way for the service (and use) required. All materials and all work, which may be reasonably implied as being incidental to the work of this Section, shall be furnished at no extra cost to the Owner.
- D. As used in this Section, “*provide*” means “furnish and install”, “*furnish*” means “to purchase and deliver to the project site complete with every necessary appurtenance and support”, and “*install*” means “to unload at the delivery point at the site and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project”.
- E. Perform work and provide (furnish and install) material and equipment as shown on Drawings and as specified, or indicated, in this Section of the specifications. Completely coordinate work of this Section with work of other trades and provide a complete and fully functional installation. Drawings and specifications form complimentary requirements; provide work specified and not shown, and work shown and not specified as though explicitly required by both. Although work is not specifically shown or specified, provide supplementary or miscellaneous items, appurtenances, devices and materials obviously necessary for a sound, secure and complete installation.
- F. Remove all debris caused by Contractors’ work.



- G. Provide demolition and relocation of existing electrical items as shown on the drawings.

## 1.02 SCOPE OF WORK

- A. Under this Section, the Contractor shall furnish all labor, materials, equipment and transportation necessary to install the following:
  - 1. New underground electrical service from mechanical room at school building. Electrical service to be 60A, single-phase 120/240V, installed in 1-1/4" conduit, installed into new 60A, main service panelboard installed in new outdoor NEMA 3R electrical cabinet. Work shall include all conduit, cable, excavation, backfill, surface restoration, concrete foundation, grounding and all associated equipment necessary for a complete installation.
  - 2. Provide power to irrigation controller, duplex receptacles, light in new electrical cabinet and other equipment as shown on Contract Drawings.
  - 3. The Waltham School Department will pull the wire. The Contractor is responsible for all other aspects of the work.
- B. The Contractor shall provide any additional labor and materials required by the utility companies to complete the work of this Section, at no additional cost to the Owner.
- C. All work performed under this Section shall be performed by a MA licensed Electrician.
- D. The Contractor is required to apply and obtain all permits required for this work. The City of Waltham will waive all fees associated with these applications.

## 1.03 COORDINATION

- A. Coordinate all work with representatives of the City of Waltham Wiring Department Electrical Inspector and City of Waltham School Department as required and applicable at no additional cost to the Owner.
- B. The Contractor shall be responsible for arranging for all inspections required by the City or the Utility companies involved. Contact Person: Tim Kelly, City of Waltham Wiring Department (781-314-3175).

## 1.04 REFERENCES

- A. The following standards and definitions are applicable to the work of this Section to the extent referenced herein:

ANSI/NEMA FB 1 Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.

ANSI/NFPA 70 National Electrical Code, with state amendments where applicable.

NECA "Standard of Installation."3

NEMA RN 1 Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.

NEMA TC 2 Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).

NEMA TC 3 PVC Fittings for Use with Rigid PVC Conduit and Tubing.

#### 1.05 STANDARDS AND REQUIREMENTS

- A. All electrical equipment required under this section shall comply with the latest requirements and standards of the National Electric Code, Federal Specifications, the National Electrical Manufacturer\*s Association, the Underwriters Laboratories, Inc., the ASTM, ANSI, and the American Institute of Electrical Engineers.

#### 1.06 SUBMITTALS

- A. Submit shop drawings and manufacturer\*s specifications for all materials to be furnished under this Section including:
  - 1. Conduits and Wiring.
  - 2. Panelboards.
  - 3. Service Cabinets and Equipment.
  - 4. Circuit Breakers.
  - 5. Lighting and Bracket Assemblies.
  - 6. Wiring Devices and Receptacles.
  - 7. Grounding
- B. Submit samples of materials for use under this Section as directed by the Owner or Owner\*s Representative.
- C. The Engineer\*s review shall be only for conformance with the design concept of the project and compliance with the specifications and Drawings. The responsibility of, and the necessity of, furnishing materials and workmanship required by the specifications and Drawings which may not be indicated on the shop drawings is included under the work of this Section.

## 1.07 INSPECTIONS AND FEES

- A. Obtain all necessary permits and licenses, and pay all fees for permits and inspections. Permit fees are the responsibility of the Contractor as part of his bid.

## 1.08 ELECTRIC UTILITY

- A. The Electric Utility for this project is NSTAR Electric. All coordination with the Electric Utility is the responsibility of the Contractor. All work and materials for the electric service shall be in accordance with the requirements of the Electric Utility, and are to be met under this Section and included in the bid price of the Contractor. Contractor shall adhere to NSTAR\*s *“Information and Requirements for Electric Service (2008 or later)”*.

## 1.09 AS-BUILT DRAWINGS

- A. After completion of the electrical installation, the Contractor shall furnish “As-Built” drawings showing all conduits, cables, cabinets, light fixtures, etc. to scale with dimensions where required. Instruction sheets and parts lists covering all operating equipment will be bound into a folder and furnished to the Owner in duplicate.

## PART 2 - MATERIALS

### 2 .01 GOVERNING SPECIFICATIONS FOR ALL MATERIALS

- A. Unless stipulated otherwise, all materials shall be furnished in accordance with the State and Local Building Codes and the requirements of NSTAR.

### 2 .02 CONDUIT AND WIRES

- A. Conduit shall be as required and meet all Federal, State and Local electric codes. Conduit shall be gray heavy wall rigid plastic conduit of homogenous polyvinyl chloride construction with standard wall thickness, or rigid steel conduit with standard wall thickness. Conduit shall conform to the NEMA Standards Publication TC-2 for Schedule 40 type EPC Conduit.
- B. All conduit shall comply with ASTM D1784 and all solvent cements shall comply with ASTM D2564.
- C. Use wires in the quantities, sizes and types to meet code requirements.
- D. Use a 3/8” polypropylene pullrope within the required conduit run for pulling of electrical wiring.
- E. Unless otherwise noted, conductors for power, lighting, and grounding *above grade* shall be No. 12 through No. 8 AWG, NEC type THWN/THHN, meeting

the requirements of UL 83. Conductors for power and lighting shall be no smaller than No. 12 AWG.

- F. Conductors for power, lighting, grounding, and control *below grade* (and in wet locations) shall be No. 2 AWG and larger, NEC type XHHW (or XHHW-2), meeting the requirements of NEMA WC7 and ICEA S-66-524.
- G. All conductors shall be annealed copper, 98% conductivity, Class B stranded, except conductors used for power and lighting circuits No. 10 AWG and smaller which may be solid. All conductors should be rated for 600 volts or less, with a thermal rating of 90° C.
- H. The outside covering of all wiring for power, lighting, grounding, and control uses shall be color coded to identify polarity as follows:

	208Y/120 V 3 Phase	240D/120 V 3 Phase	480Y/277 V 3 Phase
Phase A	Black	Black	Brown
Phase B	Red	Red	Orange
Phase C	Blue	Orange	Yellow
Neutral	White	White	Gray
Ground	Green	Green	Green

2 .03 PULLBOXES

- A. Pullboxes shall be in accordance with the City of Waltham Wiring Department and as otherwise designated on the contract drawings.
- B. A cast iron frame and steel cover shall also be used in conjunction with the precast concrete pullbox installation, in compliance with the referenced specifications.

2 .04 WIRE AND CABLE CONNECTORS AND DEVICES

- A. Wire and cable connectors and devices shall meet the requirements of UL 486. Connectors, including miscellaneous nuts, bolts, and washers shall be silicon bronze. Ferrous materials shall not be used.

2 .05 BOXES

- A. Outlet and Switch Boxes: NEMA OS 1.
- B. Weatherproof Outlet Boxes: NEMA 3R, NEC 410-57, UL 498 & 514 Outdoor Outlet Boxes for receptacles shall be weatherproof, NEMA 3R rated, and

manufactured of stainless steel or aluminum. All hardware (screws, etc.) shall be stainless steel. Covers for outdoor outlet receptacles shall be weatherproof, polycarbonate bubble-type, allowing use of the receptacle with the cover in the “closed” position. Gaskets shall be made of ethylene propylene rubber, or approved equal.

- C. Pull Boxes, Junction Boxes, and Equipment Enclosures: NEMA ICS 6.
- D. Pull boxes, junction boxes, and equipment enclosures shall be of NEMA Type 1 construction for indoor use, and NEMA Type 3R construction for outdoor or wet location use, unless otherwise noted.
- E. Box sizes shall not be less than that required by the Massachusetts Electrical Code.

## 2 .06 WIRING DEVICES

- A. Wiring Devices: NEMA WD 1.
- B. Wiring devices for shall be specification grade, 20 ampere, ivory with Type 302 stainless steel plates. Ground fault current interrupting (GFCI) devices shall be provided where specified and/or required by applicable codes.

## 2 .07 PANELBOARDS

- A. Panelboards: NEMA PB1, and UL 67.
- B. Provide new 60A, 120/240V single-phase panelboard with 60A main circuit breaker and branch feeder breakers as listed on panel scheduled provided with Contract Drawings.
- C. Panelboards shall be door-in-door construction with copper bus. Circuit breakers shall be molded case, thermal magnetic, plug-in type rated as noted, and rated to match panelboard voltage and interrupting rating (22 kA). All panelboard doors shall open full 90 degrees without conflict with cabinets and other equipment. No modifications to panelboards or doors shall be made to accommodate installation or removal inside of Electrical Cabinet.

## 2 .08 WARNING TAPE

- A. Warning tape shall be six (6) inches wide, polyethylene not less than 3.5 mil thick with a minimum strength of 1,500 psi and shall be manufactured by W.H. Brady Co., Panduit Corp., or approved equal. Tape shall be red for electric conduit, and red or yellow for communication conduit. Tape shall have black lettering on two lines as indicated below:

CAUTION CAUTION CAUTION

Electric Service Improvements  
16100-6

## BURIED ELECTRIC LINE BELOW

### 2.09 ELECTRIC CONTROL CABINET

- A. Outdoor weatherproof electrical equipment enclosure: NEMA 3R.
- B. Electric Control Cabinet shall be new aluminum enclosure cabinet, 55 9/16" height x 44" width x 26" width, constructed of aluminum, .125" thick, painted with an approved black powder coating and mounted on a concrete pad. Cabinet to be Model Number MEA554426 as Manufactured by Mass Electrical Apparatus, 42 Oakville Street, Lynn, MA or approved equal, with 12 gauge steel panel. Cabinet shall be factory painted powder-coat black; field painting is not acceptable. Contractor is responsible for sizing cabinet and shall propose a cabinet that can include all of the required equipment, meeting the spacing requirements if the NEC. Cabinet dimensions listed are typical.
  - 1. Material: 0.125 5052-H32 Aluminum.
  - 2. Ventilation on roof and door.
  - 3. Open bottom.
  - 4. Stainless Steel full length piano hinge.
  - 5. Single door design with captive door restraint.
  - 6. Stainless steel padlockable handle, 3 point latching mechanism with nylon rollers at top and bottom.
  - 7. Door frame double flanged on all four sides.
  - 8. 3/4" Plywood back panel treated with (2) coats clear polyurethane.
  - 9. Cabinet shall be smooth black powder coat inside and out; field painting is not acceptable.
- C. The cabinet shall be mounted on a cement concrete base as indicated in the Drawings. Forms, reinforcing, and cement concrete cast in place for all cabinets shall conform to Section 03300 - Cast-in-Place Concrete.
- D. Provide grounding in the form of two (2) 5/8" diameter x 8'-0" long copperweld ground rods for each foundation, connected with a loop of #1/0-#4/0 Awg bare copper stranded ground wire (as shown on the Drawings), leaving a 6 foot long tail to ground the enclosure. Buried loop for Electrical Cabinet to be buried approx. 6"-8" below finished grade, offset approximately 12-inches from the edge of concrete foundation on all four sides.
- E. Provide in the electrical enclosure cabinet on the concrete pad, a 0.25 x 2" x 24" copper grounding bus bar with 2 UL recognized standoff insulators, 2 stainless steel mounting brackets, and 4 stainless steel assembly bolts and lock washer.

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. This Section covers the requirements for installation of materials, proper workmanship, testing, cleaning, grounding, and work methods to be followed by the Contractor. This Section also includes specific instructions and to be used in conjunction with the contract Drawings. Any discrepancies noted between the specification, Drawings, and actual installation shall be reported immediately to the Owner, Engineer, and Architect. Failure on the part of the Contractor to report discrepancies immediately will be considered negligent.
- B. Contractor is responsible for coordinating work with other trades, Owner, and Architect\*s schedule. Work will be coordinated such that systems can be properly located, and conflicts and delays are avoided. Contractor shall consider commencement of work acceptance of existing conditions.

### 3.02 MATERIALS AND WORKMANSHIP

- A. Work shall be executed in workmanlike manner and shall present neat, rectilinear and mechanical appearance when completed. Do not run raceway exposed unless shown exposed on Drawings. Material and equipment shall be new and installed according to manufacturer\*s recommended best practice so that complete installation shall operate safely and efficiently.

### 3.03 CONTINUITY OF SERVICES

- A. Do not interrupt existing services without Owner\*s, Utilities, Engineer\*s and Architect\*s approvals.

### 3.04 TESTING, INSPECTION AND CLEANING

- A. Test wiring and connections for continuity and grounds before fixtures are connected; demonstrate insulation resistance by megger test as required at not less than 500 volts. Insulation resistance between conductors and grounds for secondary distribution systems shall meet National Electrical Code (NEC) and International Electrical Testing Association (NETA) requirements.
- B. Verify and correct as necessary: voltages, tap settings, trip settings and phasing on equipment from secondary distribution system to point of use. Test secondary voltages at transformers, bus in panelboards, and at other locations on distribution systems as necessary. Test secondary voltages under no-load and full-load conditions.
- C. Test lighting fixtures with specified lamps in place for 100 hours. Replace lamps that fail within 90 days after acceptance by Owner at no extra cost to Owner (no exceptions).
- D. Provide necessary testing equipment and testing services.
- E. Failures or defects in workmanship or materials revealed by tests or inspection

shall be corrected promptly and retested. Replace defective material.

- F. Clean panels and other equipment. Panelboard interiors shall be cleaned and vacuumed. Equipment with damage to painted finish shall be repaired to Engineer\*s or Architect\*s satisfaction. After completion of project, clean exterior surfaces of electrical equipment.

### 3.05 WIRING METHODS

- A. Install wire and cables in approved raceways as specified and as approved by authorities that have jurisdiction.
- B. Follow homerun circuit numbers and/or notes as shown on Drawings to connect circuits to panelboards. Where homerun circuit numbers are not shown on Drawings, divide similar types of connected loads among phase buses so that currents are approximately equal in normal usage.
- C. Run concealed conduit in as direct lines as possible with a minimum number of bends of longest possible radius. Bends shall be free from dents or flattening. The exact locations and routing of conduit shall be determined by the Contractor subject to the approval of the Owner and Engineer.
- D. Polarity of all electrical connections shall be observed in order to preserve phase relationship in all feeders and equipment.
- E. Splices shall be made in neat, workmanlike manner using approved mechanical connectors. After splicing, insulation equal to that on the spliced wires shall be applied at each splice. Splices are permitted only in junction boxes, outlet boxes, or other permanently accessible locations. Splices installed in electric handholes shall be weather and waterproof, pre-molded polymer splices. Hand taping of splices below-grade is not acceptable.

### 3.06 GROUNDING

- A. Bond and ground equipment and systems connected under this Section in accordance with standards of the NEC and other applicable regulations and codes.
- B. Conduit system shall be electrically continuous throughout, grounded at service entrance. Equipment frames, enclosures, boxes, etc. shall be grounded by use of green-jacketed (or bare copper) ground, sized as per Table 250-95 of the NEC.
- C. Green bonding jumper shall be installed in flexible conduits.
- D. Copper fittings for ground connections shall conform to the requirements of ASTM B 30. All bolts, u-bolts, cap screws, nuts, and lock washers for copper fitting shall be of approved corrosion-resisting material. Compression connectors required for all below grade grounding connections.



- E. Ground Rods shall be 5/8" diameter and 8' in length, copperweld as required by applicable codes (NEC, NESC). Bonding connections to ground rods shall be permanent, welded or crimped, with copper connectors. All wire used for grounding shall be no smaller than #4 Awg copper, stranded conductor.

### 3.07 ELECTRIC SERVICE INSTALLATIONS

- A. Install all equipment required under this Section in accordance with all requirements of the City of Waltham Wiring Department, all governing codes, and as applicable, in accordance with all the requirements of NSTAR.

### 3.08 ELECTRIC SERVICE INSTALLATIONS SPECIAL INSTRUCTIONS

- A. Contractor shall provide new underground single-phase (120/240 volt), 3-wire electric service from school building mechanical room to new outdoor electric control cabinet.
- B. Service cable shall be 3-#6AWG type XHHW (or XHHW-2), 600 V, and meet all requirements of the NEC, Massachusetts Electrical Code, and the City of Waltham Wires Department.
- C. Contractor shall provide new outdoor NEMA 3R electric control cabinet. Cabinet enclosure shall be by Mass Electrical Company or approved equal.
- D. Panelboard shall have 2-pole main breaker, rated 60A (22 kA), and three (3) 20A (22kA) branch circuit breakers, and five (5) spare 20A (22kA) circuit breakers.
- E. Install 120V GFCI receptacle, porcelain light bulb socket, 15W Compact Fluorescent bulb, and electrical switch in electrical enclosure on panelboard.
- F. Install 120V, 20A single-phase feed from service panel to 120V GFCI receptacle, electrical switch, and porcelain light bulb socket, typically 2w-#12Awg w/ground.
- G. Install 120V, 20A single-phase feed from service panel to irrigation controller, typically 2w-#12Awg w/ground..

### 3.09 INSPECTIONS

- A. The Contractor shall contact the City (refer to paragraph 1.03 B) to arrange for inspection prior to filling any electrical trenches.

END OF SECTION



**Massachusetts Department of Environmental Protection**  
**Bureau of Resource Protection - Wetlands**  
**WPA Form 5 – Order of Conditions**  
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:  
 316-0663  
 MassDEP File #

eDEP Transaction #  
 Waltham  
 City/Town

**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: City of Waltham  
 Conservation Commission

2. This issuance is for (check one):  
 a.  Order of Conditions b.  Amended Order of Conditions

3. To: Applicant:

John Pinzone  
 a. First Name b. Last Name

Waltham Public Schools  
 c. Organization

617 Lexington Street  
 d. Mailing Address

Waltham MA 02452  
 e. City/Town f. State g. Zip Code

4. Property Owner (if different from applicant):

a. First Name b. Last Name

c. Organization

d. Mailing Address

e. City/Town f. State g. Zip Code

5. Project Location:

655 Lexington Street Waltham  
 a. Street Address b. City/Town

Map 33 R033003001A Block 3 Lot 1  
 c. Assessors Map/Plat Number d. Parcel/Lot Number

Latitude and Longitude, if known: d m s d m s  
 d. Latitude e. Longitude



**Massachusetts Department of Environmental Protection**  
**Bureau of Resource Protection - Wetlands**  
**WPA Form 5 – Order of Conditions**  
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:  
 316-0663  
 MassDEP File #

eDEP Transaction #  
 Waltham  
 City/Town

**A. General Information (cont.)**

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):  
 Middlesex
- |           |  |
|-----------|--|
| a. County | b. Certificate Number (if registered land) |
| 11326     | 420  |
| c. Book   | d. Page                                    |
7. Dates:      3/28/13                      4/11/13                      4/25/13  
                     a. Date Notice of Intent Filed      b. Date Public Hearing Closed      c. Date of Issuance
8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):  
 Kennedy Middle School Athletic Field Renovation
- |                                      |                          |
|--------------------------------------|--------------------------|
| a. Plan Title                        |                          |
| Carolyn Cooney & Associates          | Carolyn Cooney           |
| b. Prepared By                       | c. Signed and Stamped by |
| 04/01/13                             | 1"=20'                   |
| d. Final Revision Date               | e. Scale                 |
| f. Additional Plan or Document Title | g. Date                  |

**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 (the Act). Check all that apply:
- |  |   |  |
|--|---|--|
| a. <input type="checkbox"/> Public Water Supply  | b. <input type="checkbox"/> Land Containing Shellfish | c. <input checked="" type="checkbox"/> Prevention of Pollution |
| d. <input type="checkbox"/> Private Water Supply | e. <input type="checkbox"/> Fisheries                 | f. <input type="checkbox"/> Protection of Wildlife Habitat     |
| g. <input type="checkbox"/> Groundwater Supply   | h. <input type="checkbox"/> Storm Damage Prevention   | i. <input 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.



Massachusetts Department of Environmental Protection  
 Bureau of Resource Protection - Wetlands  
**WPA Form 5 – Order of Conditions**  
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:  
 316-0663  
 MassDEP File # \_\_\_\_\_

eDEP Transaction # \_\_\_\_\_  
 Waltham  
 City/Town \_\_\_\_\_

**B. Findings (cont.)**

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 the interests of the Act, 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).**
3.  Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) \_\_\_\_\_ a. linear feet

**Inland Resource Area Impacts:** Check all that apply below. (For Approvals Only)

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		
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 type="checkbox"/> Riverfront Area	_____ a. total sq. feet	_____ b. total sq. feet		
Sq ft within 100 ft	_____ c. square feet	_____ d. square feet	_____ e. square feet	_____ f. square feet
Sq ft between 100-200 ft	_____ g. square feet	_____ h. square feet	_____ i. square feet	_____ j. square feet



Massachusetts Department of Environmental Protection  
 Bureau of Resource Protection - Wetlands  
**WPA Form 5 – Order of Conditions**  
 Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:  
 316-0663

MassDEP File # \_\_\_\_\_

eDEP Transaction # \_\_\_\_\_

Waltham

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**B. Findings (cont.)**

**Coastal Resource Area Impacts:** Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
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	_____	_____	_____ cu yd	_____ cu yd
	a. square feet	b. square feet	c. nourishment	d. nourishment
14. <input type="checkbox"/> Coastal Dunes	_____	_____	_____ cu yd	_____ cu yd
	a. square feet	b. square feet	c. nourishment	d. nourishment
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		



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**B. Findings (cont.)**

\* #22. If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

22.  Restoration/Enhancement \*:

a. square feet of BVW \_\_\_\_\_

b. square feet of salt marsh \_\_\_\_\_

23.  Stream Crossing(s):

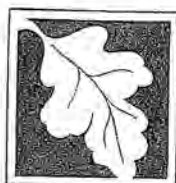
a. number of new stream crossings \_\_\_\_\_

b. number of replacement stream crossings \_\_\_\_\_

**C. General Conditions Under Massachusetts Wetlands Protection Act**

The following conditions are 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. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on \_\_\_\_\_ unless extended in writing by the Department.
7. 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.
8. 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.



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**C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)**

9. 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 the 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.
10. 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            316-0663            "
11. 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.
12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.
13. The work shall conform to the plans and special conditions referenced in this order.
14. Any change to the plans identified in Condition #13 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.
15. 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.
16. 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.
17. 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.



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**C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)**

18. 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

19. **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.

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.





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**C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)**

- 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 BMP 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, 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.



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**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.

Special Conditions (if you need more space for additional conditions, please attach a text document):

**See Attached**

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**D. Findings Under Municipal Wetlands Bylaw or Ordinance**

1. Is a municipal wetlands bylaw or ordinance applicable?  Yes  No
2. The \_\_\_\_\_ Conservation Commission hereby finds (check one that applies):

- a.  that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

1. Municipal Ordinance or Bylaw \_\_\_\_\_ 2. Citation \_\_\_\_\_

Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

- b.  that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

1. Municipal Ordinance or Bylaw \_\_\_\_\_ 2. Citation \_\_\_\_\_

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

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 City/Town \_\_\_\_\_

**E. Signatures**

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

4/25/13

Please indicate the number of members who will sign this form.

1. Date of Issuance

This Order must be signed by a majority of the Conservation Commission.

4  
 2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signatures:

*[Handwritten signatures]*  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

by hand delivery on

by certified mail, return receipt requested, on

Date

4/26/13

Date

**F. Appeals**

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request of Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.



**Massachusetts Department of Environmental Protection**  
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eDEP Transaction # \_\_\_\_\_  
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**G. Recording Information**

Prior to commencement of work, 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.

City of Waltham  
 Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

City of Waltham  
 Conservation Commission

Please be advised that the Order of Conditions for the Project at:

655 Lexington Street  
 Project Location

316-0663  
 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 \_\_\_\_\_



**Waltham Conservation Commission**  
119 School Street  
Waltham, MA 02451

**SPECIAL ORDERS OF CONDITIONS (V1.2)**  
**AS ISSUED BY THE WALTHAM CONSERVATION COMMISSION**

**DEP File Number: 316-0663**

**Applicant:** Waltham Public Schools

**Location:** Kennedy Middle School-655 Lexington Street

**Date of Issuance:** April 25, 2013

**19. RECORDING AND ADMINISTRATION**

- A. Prior to any work on the site, or within six (6) weeks of the date of this Order, whichever comes first, this Order of Conditions shall be recorded at the Middlesex Registry of Deeds or Land Court and notice filed with the Commission pursuant to Condition 8. Failure to do so shall be deemed cause to revoke this Order.
- B. In advance of any work on this project the applicant shall notify the Commission, and at the request of the Commission, shall arrange an on-site conference among the Commission, the contractor and the applicant to ensure that all of the conditions of this Order are understood.
- C. This Order shall be made a part of all contracts and subcontracts dealing with the work proposed, and shall supersede all other conflicting contract requirements.
- D. This Order shall apply to and be binding upon the applicant, its employees and all successors and assigns in interest or control.
- E. Prior to any work being done on the project site, the applicant shall inform the Waltham Conservation Commission in writing of the names, addresses, business and home phone numbers of both the project supervisor who will be responsible for ensuring on-site compliance with this order and his/her alternate. The applicant shall also notify the Commission in writing of any changes in this information.
- F. Members of the Commission or their agents shall have the right to enter upon and inspect the premises to evaluate compliance with this Order of Conditions.
- G. Any changes differing from the aforementioned conditions must be submitted to the Commission for approval prior to their implementation. If the Commission finds, by majority vote, said changes to be significant and/or deviate from the original plans, Notice of Intent, or the Order of Conditions, then the Commission may require a new

Notice of Intent or call for another public hearing within 21 days, at the expense of the applicant, in order to take testimony from all interested parties. Within 21 days of the close of said public hearing, the Commission will issue an amended or new Order of Conditions.

H. Any errors found in the plans or information submitted by the applicant shall be considered as changes, and the procedures outlined in Condition "G" above shall be followed.

I. In conjunction with the sale of any portion of the site covered by this Order of Conditions, the applicant shall submit to the Commission a signed statement by the buyer that he/she is aware of outstanding Orders of Conditions.

J. The Commission may authorize its designated agent to act on its behalf in determining preconstruction compliance.

K. Special Conditions 21B, 22G, 23A, 23B, 23C, 23D, and 23E shall apply in perpetuity and shall not expire with the issuance of a Certificate of Compliance for this project.

## **20. PRIOR TO COMMENCEMENT OF WORK**

A. Prior to any work on the project site, the proposed limit of work shall be clearly marked with stakes, flags or fencing and shall be approved in writing by the Commission. Such markers will be maintained until all construction on the site's perimeter is complete. All workers shall be informed that no construction activity is to occur beyond this line at any time.

B. Prior to any work on the project site, all trees greater than six (6) inches in diameter that are to be saved shall be protected from inadvertent damage by strapping boards around the trunk from ground level to a height of at least eight (8) feet. Completion of this project measure shall be approved in writing by the Commission. Such measures shall be maintained until all earth work and grading is complete and then shall be removed. Trees that are not to be saved shall be cut and stumps removed.

C. Prior to any construction on the site, an erosion control barrier of a filter fabric fence backed by a row of double-staked straw bales shall be placed between all construction activities and wetland areas, in accordance with Erosion and Sedimentation Guidelines for Urban and Suburban Areas, Mass. DEP, March 1997. Where appropriate, straw wattles or other suitable materials may be used in place of bales. This barrier shall be inspected and approved in writing by the Commission. Upon completion of the project the applicant shall remove and discard to a suitable area, all straw bales and other materials determined to be detrimental to the resource areas.

D. The applicant shall have on hand at the start of any soil disturbance, removal or stockpiling, a minimum of 20% additional straw bales, in good condition and sufficient stakes for double staking these bales. Said bales shall be used only for the control of emergency erosion problems and shall not be used for the normal control of erosion, as described in Condition "C".

## **21. LIMITS OF WORK/EROSION CONTROL**

- A. There shall be no activity (i.e. filling, alteration, regrading, removal of vegetation, etc.) related to this project within 50 feet of any resource area unless otherwise described in these orders and on the referenced plans.
- B. As soon as possible during construction, all disturbed upland areas in the resource area or buffer zone shall be brought to final finished grade and stabilized permanently against erosion. This shall be done either by sodding, or by loaming, seeding, and mulching according to Natural Resources Conservation Service (formerly UDA) Soil Conservation Service Guidelines. If the latter course is chosen, stabilization will be considered completed once the surface shows complete vegetative cover. Bare ground that can not be permanently stabilized within thirty (30) days shall be stabilized by temporary measures.

## **22. DURING WORK**

- A. Accepted engineering and construction standards and procedures shall be followed in the completion of this project.
- B. A copy of this Order of Conditions, as well as all construction and wetland replication plans, shall be on site upon commencement of any site work and made available to any person doing work on the site.
- C. Site grading and construction shall be scheduled to avoid periods of high water. Once begun, grading and construction shall move uninterrupted to completion to avoid erosion and sedimentation of wetlands.
- D. Any dewatering or drawdown activities on the project in which water will be released into a resource area or storm drain shall make use of a sedimentation tank or similar device to remove sediment before the water is released.
- E. No earthen embankment in the buffer zone shall have a post construction slope steeper than 2:1.
- F. There shall be no stockpiling of soil or other materials within fifty (50) feet of any resource area, except as described in the NOI and shown on the referenced plan.
- G. During and after work on this project, there shall be no discharge or spillage of fuel, oil, or other pollutants into any resource area or buffer zone. The applicant shall take all reasonable precautions to prevent the release of pollutants by ignorance, accident, or vandalism.



## **23. UPON COMPLETION OF WORK**

### A. Storage of Petroleum Products

- i. No underground storage of fuel oils shall be allowed within the resource area or buffer zone.
- ii. There shall be no storage of petroleum products (e.g. motor oil, gasoline, diesel fuel, etc.) within the resource area or buffer zone on the site at any time, except for quantities commensurate with maintaining a single family home.

### B. Fertilizer, Pesticides and Herbicides

- i. Fertilizers shall not be used within a resource area or fifty (50) feet from a resource area.
- ii. Pesticides and herbicides shall not be used with a resource area or buffer zone.

C. Sodium chloride shall not be used for de-icing on the site. Signs of a minimum of two square feet stating such restriction shall be posted at all vehicle entrances.


D. Sand used in deicing shall be removed periodically during the winter and by May 1<sup>st</sup> of each year. Records of cleaning shall be maintained on site and mailed annually to the Commission by May 1<sup>st</sup>.

E. The storm drainage system shall be equipped with gas and oil traps. Catch basins shall be cleaned and maintained by the applicant every 3 months. Records of said cleaning shall be maintained on site and mailed annually to the Commission by May 1st.

## Test Pit Log

Client: <u>Waltham Public Schools</u>	Contractor: <u>none</u>	Test Pit No. <u>1</u>
Project Name: <u>Kennedy School</u>	Equipment: <u>hand spade and hand auger</u>	Logged By: _____
Project Location: <u>Waltham, MA</u>	Depth to Water: <u>not observed</u>	Date: <u>4.27.2012: 9:30 AM</u>
Project Number: _____	Ground Surface <u>152</u>	Page: _____ of _____

DEPTH (feet)	Soil Horizon	Soil Depth (inches)	Matrix Color	Soil Texture (USDA)	SOIL DESCRIPTION	EXCAV. EFFORT
1	Fill	0"-17"	10YR 3/1	sandy loam	Sod with 2" deep roots; some chards	
				sandy loam	of glass	
2	A <sub>bd</sub>	17"-24"	10YR 3/1	sandy loam	desnse	
	B <sub>w</sub>	16"-20"	10yr 3/3	coarse sand	dense till	
		bottom of excav.			terminated at 26"	
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						


<b>T.P. DIMENSIONS</b> Width (ft): _____ Length (ft): _____ Depth (ft): _____ Vol (ft <sup>3</sup> ): _____	<b>TEST PIT PLAN</b>  	<b>BOULDER COUNT</b> 6 in-12 in: _____ 12 in-18 in: _____ 18 in-24 in: _____ 24 in-30 in: _____
		<b>EXCAVATION EFFORT</b>  E : Easy M : Moderate D : Difficult
		<b>DESCRIPTION</b> and : 35 to 50 % some : 20 to 35 % little : 10 to 20 % trace : 1 to 10 %

Remarks:

## Test Pit Log

Client: <u>Waltham Public Schools</u>	Contractor: <u>none</u>	Test Pit No. <u>2</u>
Project Name: <u>Kennedy School</u>	Equipment: <u>hand spade and hand auger</u>	Logged By: _____
Project Location: <u>Waltham, MA</u>	Depth to Water: <u>not observed</u>	Date: <u>4.27.2012: 10:45 AM</u>
Project Number: _____	Ground Surface <u>152</u>	Page: _____ of _____

DEPTH (feet)	Soil Horizon	Soil Depth (inches)	Matrix Color	Soil Texture (USDA)	SOIL DESCRIPTION	EXCAV. EFFORT
1	Fill	0"-12"	10YR 3/1	sandy loam	Sod with 2" deep roots; some chards of glass	
2	A <sub>b</sub>	12" -15" + bottom of excav.	10YR 3/3	sandy loam	dense terminated at 15"; dense	
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

<p><b>T.P. DIMENSIONS</b>          Width (ft): _____          Length (ft): _____          Depth (ft): _____          Vol (ft<sup>3</sup>): _____</p>	<p><b>TEST PIT PLAN</b></p> 	<p><b>BOULDER COUNT</b></p> 6 in-12 in: _____ 12 in-18 in: _____ 18 in-24 in: _____ 24 in-30 in: _____	<p><b>EXCAVATION EFFORT</b></p> <p>E : Easy          M : Moderate          D : Difficult</p>
<p><b>DESCRIPTION</b>          and. : 35 to 50 %          some : 20 to 35 %          little : 10 to 20 %          trace : 1 to 10 %</p>			

Remarks: \_\_\_\_\_

## Test Pit Log

Client: <u>Waltham Public Schools</u>	Contractor: <u>none</u>	Test Pit No. <u>3</u>
Project Name: <u>Kennedy School</u>	Equipment: <u>hand spade and hand auger</u>	Logged By: _____
Project Location: <u>Waltham, MA</u>	Depth to Water: <u>not observed</u>	Date: <u>4.27.2012: 11:15 AM</u>
Project Number: _____	Ground Surface <u>152</u>	Page: _____ of _____

DEPTH (feet)	Soil Horizon	Soil Depth (inches)	Matrix Color	Soil Texture (USDA)	SOIL DESCRIPTION	EXCAV. EFFORT
1	Fill	0"-10" bottom of excav.	10YR 3/1	sandy loam	Sod with 2" deep roots terminated at 18": dense	
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

**T.P. DIMENSIONS**  
 Width (ft): \_\_\_\_\_  
 Length (ft): \_\_\_\_\_  
 Depth (ft): \_\_\_\_\_  
 Vol (ft<sup>3</sup>): \_\_\_\_\_



**BOULDER COUNT**

6 in-12 in: \_\_\_\_\_  
 12 in-18 in: \_\_\_\_\_  
 18 in-24 in: \_\_\_\_\_  
 24 in-30 in: \_\_\_\_\_

**DESCRIPTION**  
 and : 35 to 50 %  
 some : 20 to 35 %  
 little : 10 to 20 %  
 trace : 1 to 10 %

**EXCAVATION EFFORT**

E : Easy  
 M : Moderate  
 D : Difficult

Remarks:

SOIL ANALYSIS REPORT FOR NEW LAWN

05/29/12

SOIL AND PLANT TISSUE TESTING LAB  
 WEST EXPERIMENT STATION  
 UNIVERSITY OF MASSACHUSETTS  
 AMHERST, MA 01003

LAB NUMBER: S120517-111  
 BAG NUMBER: 109361

SOIL WEIGHT: 4.48 g/5cc  
 CROP: NEW LAWN (UNPLANTED)

CDM SMITH - LANDGREN  
 50 HAMPSHIRE ST  
 CAMBRIDGE, MA 02139

COMMENTS: LANDGRENSW@CDMSMITH.COM

SAMPLE ID: CDM-A

-----  
 LIMESTONE AND FERTILIZER RECOMMENDATIONS FOR NEW LAWN CONSTRUCTION

Apply 50 lb of limestone/1000 sq ft.  
 Incorporate lime thoroughly into top 6 inches of soil.

Fertilizer (per 1000 sq ft): 1-2 lbs N, 4 lbs P2O5, and 2 lbs K2O.

Many fertilizer sources and rates may combine to provide acceptable turfgrass establishment either from seed or sod. One or two options based on this soil test follow:

Incorporate EITHER a 5-10-5 fertilizer at 40 lbs/1000 sq ft,  
 OR a 15-25-10 starter lawn fertilizer at 15 lbs/1000 sq ft plus  
 0-0-60 (muriate of potash) fertilizer at 1 lb/1000 sq ft into the  
 top 3 to 4 inches of soil. Retest one year after turf establishment.

PLEASE read the enclosed fact sheets for more specific information on fertilization and liming procedures.

MICRONUTRIENT	PPM	SOIL RANGE	MICRONUTRIENT	PPM	SOIL RANGE
Boron (B)	0.2	0.1-2.0	Copper (Cu)	0.8	0.3-8.0
Manganese (Mn)	0.9	3 - 20	Iron (Fe)	11.7	1.0- 40
Zinc (Zn)	2.1	0.1- 70	Sulfur (S)	19.5	1.0- 40

SOIL pH 6.3  
 BUFFER pH 6.9

ORGANIC MATTER: 4.7 % (Desirable range 4-10%)

NUTRIENT LEVELS: PPM	Low	Medium	High	Very High
Phosphorus (P) 3	XXXX			
Potassium (K) 84	XXXXXXXXXXXXXXXXXXXXXX			
Calcium (Ca) 997	XXXXXXXXXXXXXXXXXXXXXX			
Magnesium (Mg) 60	XXXXXXXXXXXXXX			

CATION EXCH CAP  
 7.8 Meq/100g

PERCENT BASE SATURATION  
 K= 2.8 Mg= 6.4 Ca=64.5

MICRONUTRIENT LEVELS  
 ALL NORMAL

EXTRACTABLE ALUMINUM: 84 ppm (Soil range: 10-250 ppm)  
 SOLUBLE SALTS: 0.06 dS/M (Soil Range: 0.08-0.50 dS/M)  
 The lead level in this soil is low.

VISIT [www.umass.edu/soiltest](http://www.umass.edu/soiltest) FOR FURTHER INFORMATION ON SOIL TESTING AT UMASS.

# UMass Extension

CENTER FOR AGRICULTURE

05/25/12

Agriculture and Landscape Program  
Soil and Plant Nutrient Testing Laboratory

West Experiment Station  
682 North Pleasant Street  
University of Massachusetts  
Amherst, MA 01003-9302  
Phone: 413.545.2311  
Fax: 413.545.1931  
www.umass.edu/soiltest/

## TEXTURAL ANALYSIS RESULTS

Customer Name: CDM Smith - S Landgren  
50 Hampshire St  
Cambridge, MA 02139

Sample ID: S120517-111

Customer Designation: CDM-A

### USDA SIZE FRACTIONS

Main Fractions	Size (mm)	Percent
Sand	0.05-2.0	58.0
Silt	0.002-0.05	32.7
Clay	< 0.002	9.3
Total	< 2.0	100.0

Sand Fractions	Size (mm)	Percent
Very Coarse	1.0-2.0	9.1
Coarse	0.5-1.0	13.0
Medium	0.25-0.5	14.4
Fine	0.10-0.25	12.8
Very Fine	0.05-0.10	8.6
		58.0

Silt Fractions	Size (mm)	Percent
Coarse	0.02-0.05	16.1
Medium	0.005-0.02	12.0
Fine	0.002-0.005	4.6
		32.7

### PERCENT OF WHOLE SAMPLE PASSING

Size (mm)	Sieve #	%
2.00	#10	73.4
1.00	#18	66.8
0.50	#35	57.2
0.25	#60	46.6
0.10	#140	37.2
0.05	#270	30.9
0.02	20 um	19.1
0.005	5 um	10.2
0.002	2 um	6.9

USDA Textural Class = sandy loam

Gravel Content = 26.6%

COMMENTS:

SOIL ANALYSIS REPORT FOR NEW LAWN

05/29/12

SOIL AND PLANT TISSUE TESTING LAB  
 WEST EXPERIMENT STATION  
 UNIVERSITY OF MASSACHUSETTS  
 AMHERST, MA 01003

LAB NUMBER: S120517-113  
 BAG NUMBER: 109361

SOIL WEIGHT: 4.71 g/5cc  
 CROP: NEW LAWN (UNPLANTED)

CDM SMITH - LANDGREN  
 50 HAMPSHIRE ST  
 CAMBRIDGE, MA 02139

COMMENTS: LANDGRENSW@CDMSMITH.COM

SAMPLE ID: CDM-B

-----  
 LIMESTONE AND FERTILIZER RECOMMENDATIONS FOR NEW LAWN CONSTRUCTION

Apply 50 lb of limestone/1000 sq ft.  
 Incorporate lime thoroughly into top 6 inches of soil.

Fertilizer (per 1000 sq ft): 1-2 lbs N, 6 lbs P2O5, and 4 lbs K2O.

Many fertilizer sources and rates may combine to provide acceptable turfgrass establishment either from seed or sod. One or two options based on this soil test follow:

Incorporate a 5-10-10 fertilizer at 40 lbs/1000 sq ft plus 0-45-0 (triple superphosphate) fertilizer at 4 lbs/1000 sq ft into the top 3 to 4 inches of soil. Retest soil one year after establishment.

PLEASE read the enclosed fact sheets for more specific information on fertilization and liming procedures.

MICRONUTRIENT	PPM	SOIL RANGE	MICRONUTRIENT	PPM	SOIL RANGE
Boron (B)	0.1	0.1-2.0	Copper (Cu)	0.7	0.3-8.0
Manganese (Mn)	1.2	3 - 20	Iron (Fe)	7.2	1.0- 40
Zinc (Zn)	1.0	0.1- 70	Sulfur (S)	13.0	1.0- 40

SOIL pH 6.5  
 BUFFER pH 7.1

ORGANIC MATTER: 2.2 % (Desirable range 4-10%)

NUTRIENT LEVELS: PPM	Low	Medium	High	Very High
Phosphorus (P) 2	XX			
Potassium (K) 56	XXXXXXXXXXXXXX			
Calcium (Ca) 558	XXXXXXXXXXXXXXXXXX			
Magnesium (Mg) 40	XXXXXXXXXX			

CATION EXCH CAP  
 3.3 Meq/100g

PERCENT BASE SATURATION  
 K= 4.4 Mg=10.1 Ca=85.7

MICRONUTRIENT LEVELS  
 ALL NORMAL

EXTRACTABLE ALUMINUM: 73 ppm (Soil range: 10-250 ppm)  
 SOLUBLE SALTS: 0.04 dS/M (Soil Range: 0.08-0.50 dS/M)  
 The lead level in this soil is low.

VISIT [www.umass.edu/soiltest](http://www.umass.edu/soiltest) FOR FURTHER INFORMATION ON SOIL TESTING AT UMASS.

# UMass Extension

CENTER FOR AGRICULTURE

05/25/12

Agriculture and Landscape Program  
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Phone: 413.545.2311  
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www.umass.edu/soiltest/

## TEXTURAL ANALYSIS RESULTS

Customer Name: CDM Smith - S Landgren  
50 Hampshire St  
Cambridge, MA 02139

Sample ID: S120517-113

Customer Designation: CDM-B

### USDA SIZE FRACTIONS

Main Fractions	Size (mm)	Percent
Sand	0.05-2.0	65.7
Silt	0.002-0.05	27.1
Clay	< 0.002	7.2
Total	< 2.0	100.0

Sand Fractions	Size (mm)	Percent
Very Coarse	1.0-2.0	12.2
Coarse	0.5-1.0	13.9
Medium	0.25-0.5	16.1
Fine	0.10-0.25	15.0
Very Fine	0.05-0.10	8.5
		65.7

Silt Fractions	Size (mm)	Percent
Coarse	0.02-0.05	12.7
Medium	0.005-0.02	10.5
Fine	0.002-0.005	3.9
		27.1

### PERCENT OF WHOLE SAMPLE PASSING

Size (mm)	Sieve #	%
2.00	#10	55.7
1.00	#18	48.9
0.50	#35	41.2
0.25	#60	32.3
0.10	#140	23.9
0.05	#270	19.1
0.02	20 um	12.0
0.005	5 um	6.2
0.002	2 um	4.0

USDA Textural Class = gravelly coarse sandy loam

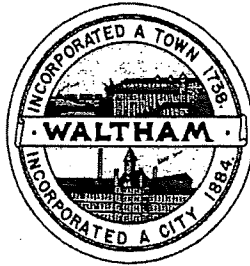
Gravel Content = 44.3%

COMMENTS:

UMass Extension is an equal opportunity provider and employer, United States Department of Agriculture cooperating. Contact your local Extension office for information on disability accommodations. Contact the State Extension Director's Office if you have concerns related to discrimination, 413-545-4800 or see [www.extension.umass.edu/civilrights](http://www.extension.umass.edu/civilrights).



CITY OF WALTHAM  
Water & Sewer Division  
Office of the City Engineer



Jeannette A. McCarthy  
Mayor

Mark Mancuso  
Asst. Superintendent

CROSS CONNECTION CONTROL PROGRAM  
DESIGN DATA SHEET AND PLUMBING PLAN

I. **NAME:** Carolyn Cooney Associates  
Address: 13 Elm Street, Milford, MA 01757  
Control Number: \_\_\_\_\_

II. **FACILITY**

Name: Kennedy Middle School Athletic Field Restoration  
Address: 655 Lexington Street, Waltham, MA 02452  
Contact Person: Darrell R. Bird Phone: 508-478-8426  
New or Existing Facility: Existing  
General description of Facility: Athletic Field

III. **DESIGN DATA**

Manufacturer: Watts Model: Series 009QTS  
Type: X RPZ \_\_\_\_\_ DCVA \_\_\_\_\_ PVB \_\_\_\_\_  
Size: 2" Gate Type: Existing  
Elevated Temperature Device (Y/N): No  
Location: Reduce Pressure Backflow Preventer Cabinet  
Location of Potable Water Line: Behind School in Service Drive  
By-pass Arrangement (Y/N): No  
From What Type of Contamination is the Water Supply  
Protected? Athletic Field  
How Many Other RPZ, DCVA or PVB Backflow Devices are  
Located in this Building? Four

**IV. DEVICE MAINTENANCE AND TESTING SCHEDULES**

Describe the maintenance and testing schedule of the above device(s). Please refer to 310 CMR 22.22

Within 14 days after installation of the device, then annually for all devices used less than six months of the year.

**V. CROSS CONNECTION PLAN SUBMITTAL REQUIREMENTS**

Details must be provided to include at a minimum the following criteria:

A. Plumbing Plan:

1. Completed Title Block (name, address, date, preparer, scale, etc.)
2. Schematic of plumbing system (at least 8 1/2" by 11") showing accepted symbols and nomenclature, detailing:
  - a. Clearances of device installation
  - b. Location of upstream and downstream shutoff valves
  - c. Make, model, size and alignment of Device
  - d. Location of Potable Water lines
  - e. System, source, or equipment fed downstream of device, complete with information on the secondary system (operating pressure, chemicals, etc.)

Submitted By: Carolyn Cooney Associates

Address: 13 Elm Street, Milford, MA 01757

Date: April 29, 2013

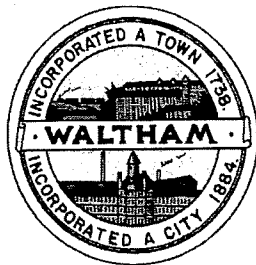
Phone: 508-478-8426

Owner/Agent Signature: \_\_\_\_\_

**SEND COMPLETED APPLICATION TO:**

**WALTHAM WATER DEPARTMENT  
CROSS CONNECTION CONTROL  
163 LEXINGTON ST  
WALTHAM, MA 02452**

CITY OF WALTHAM  
Water & Sewer Division  
Office of the City Engineer



*Jeannette A. McCarthy*  
Mayor

*Mark Mancuso*  
Asst. Superintendent

Dear Customer:

Enclosed please find your approval for the installation of the appropriate backflow preventer(s) for your facility.

When the installation is complete please fill out this form and return to:

CROSS CONNECTION CONTROL DEPT.  
WALTHAM WATER DEPARTMENT  
163 LEXINGTON ST  
WALTHAM, MA. 02452

FACILITY NAME: \_\_\_\_\_

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

CITY/TOWN: \_\_\_\_\_ ZIP: \_\_\_\_\_

CONTROL NUMBER: \_\_\_\_\_

BACKFLOW DEVICE INFORMATION:

DEVICE LOCATION: \_\_\_\_\_

DEVICE MAKE: \_\_\_\_\_ MODEL: \_\_\_\_\_

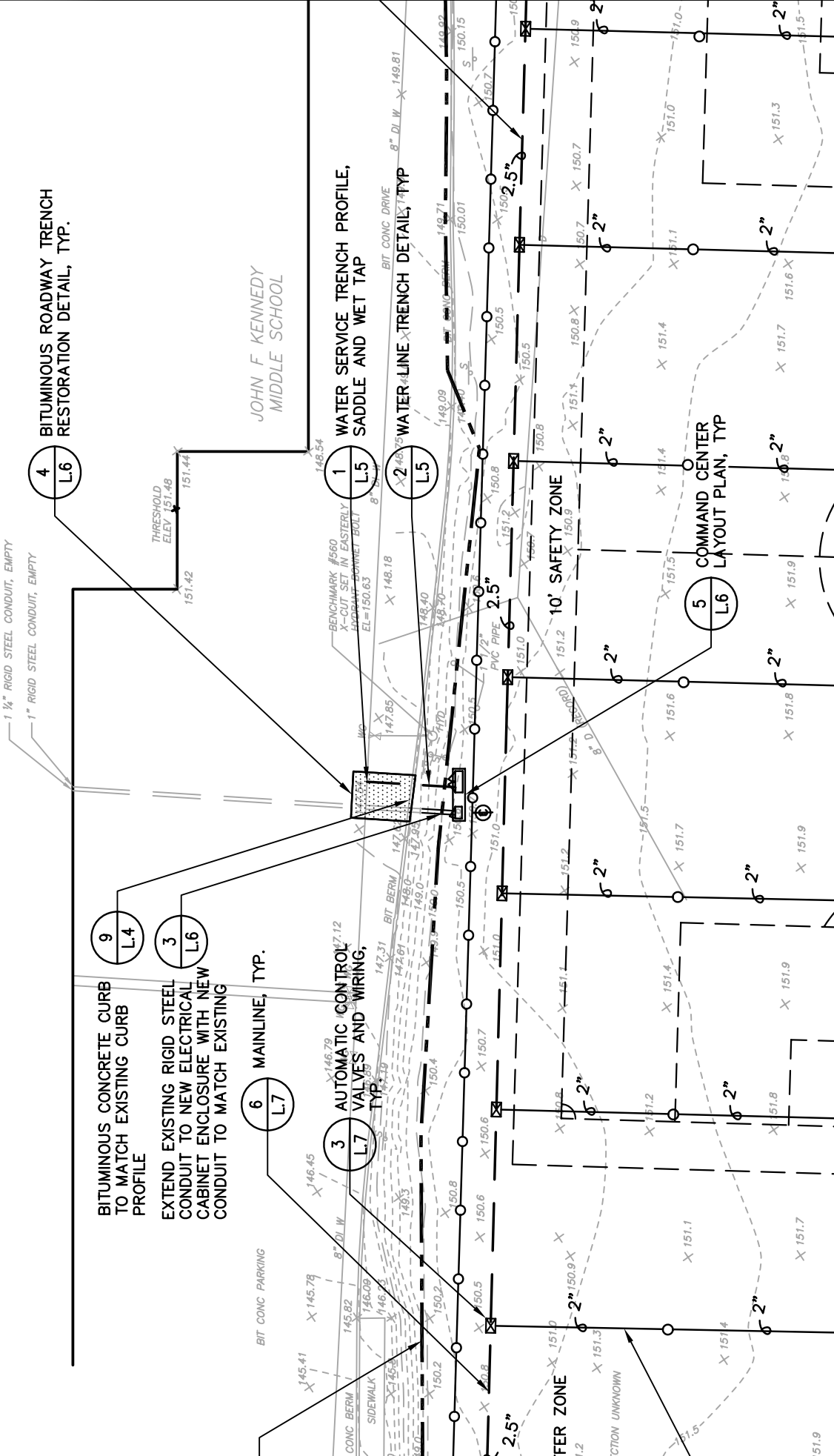
DEVICE SIZE: \_\_\_\_\_ SERIAL #: \_\_\_\_\_

GATE TYPE: \_\_\_\_\_

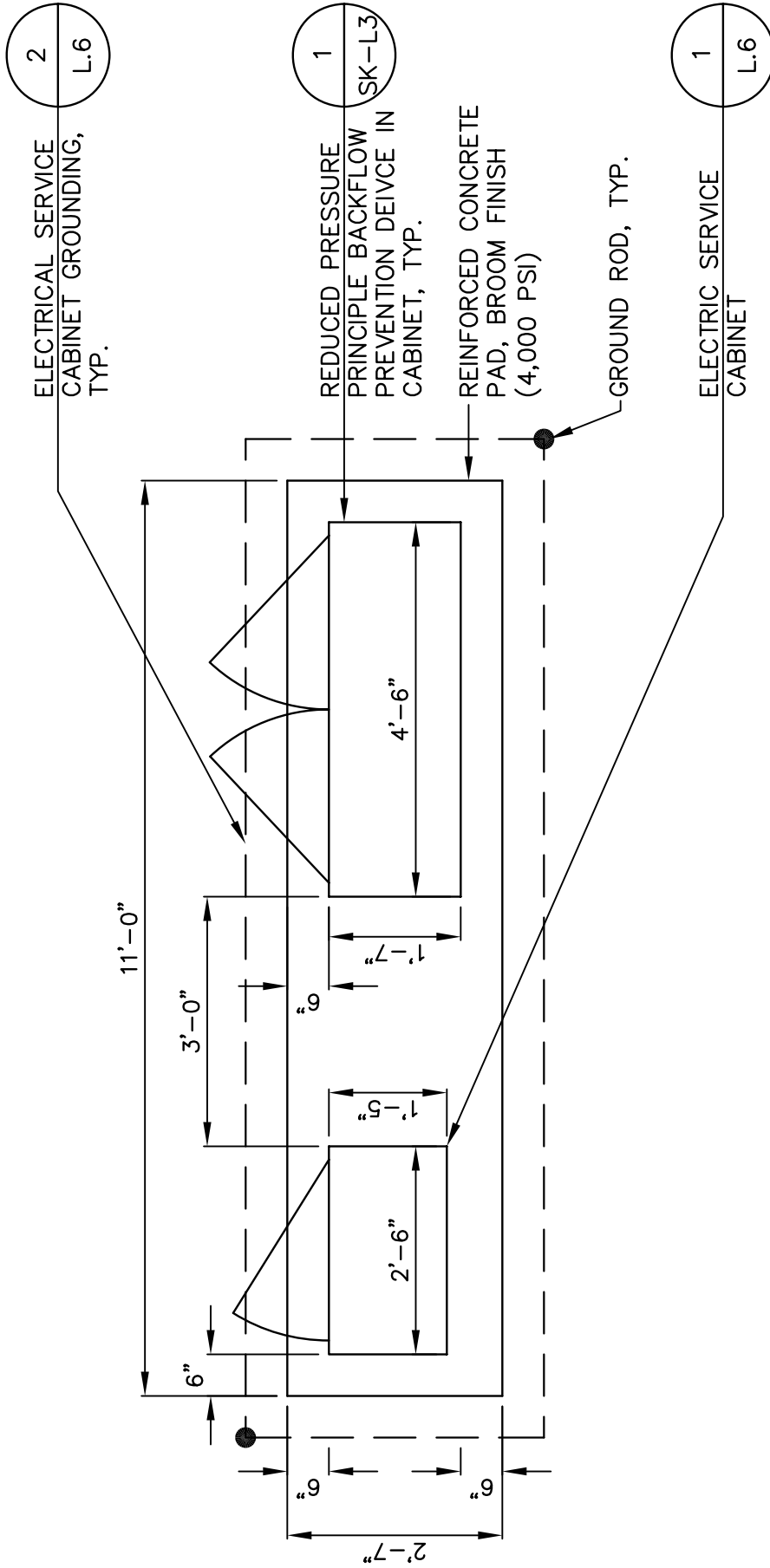
INSTALLATION  
PERFORMED BY: \_\_\_\_\_

DATE COMPLETED: \_\_\_\_\_

MECHANICAL ROOM



SKETCH NUMBER <b>SK-L3</b>		SKETCH TITLE: <b>WATER SERVICE, REDUCED PRINCIPLE                  PRESSURE BACKFLOW PREVENTER</b>	
REFERENCE DRAWING:		DRAWN BY: <b>DRB</b>	
CAROLYN COONEY & ASSOCIATES 13 ELM STREET MILFORD, MA		SCALE: 1"=30' DATE: 4/29/13	
JOHN F KENNEDY MIDDLE SCHOOL		JOB #: <b>CCA 1303.00</b>	
BITUMINOUS ROADWAY TRENCH RESTORATION DETAIL, TYP.		KENNEDY MIDDLE SCHOOL ATHLETIC FIELD RESTORATION	
WATER SERVICE TRENCH PROFILE, SADDLE AND WET TAP		WALTHAM PUBLIC SCHOOLS FACILITIES 617 LEXINGTON STREET WALTHAM, MASSACHUSETTS 02452	
WATER LINE TRENCH DETAIL, TYP.		172	
COMMAND CENTER LAYOUT PLAN, TYP.		P 508-478-8426 F 508-478-8607	



SKETCH NUMBER  
**SK-L2**

REFERENCE DRAWING:

CAROLYN COONEY & ASSOCIATES  
 13 ELM STREET  
 MILFORD, MA  
 P 508-478-8426  
 F 508-478-8607

SKETCH TITLE:  
**COMMAND CENTER LAYOUT PLAN**

DRAWN BY: **DRB**

SCALE: **1/2"=1'-0"**

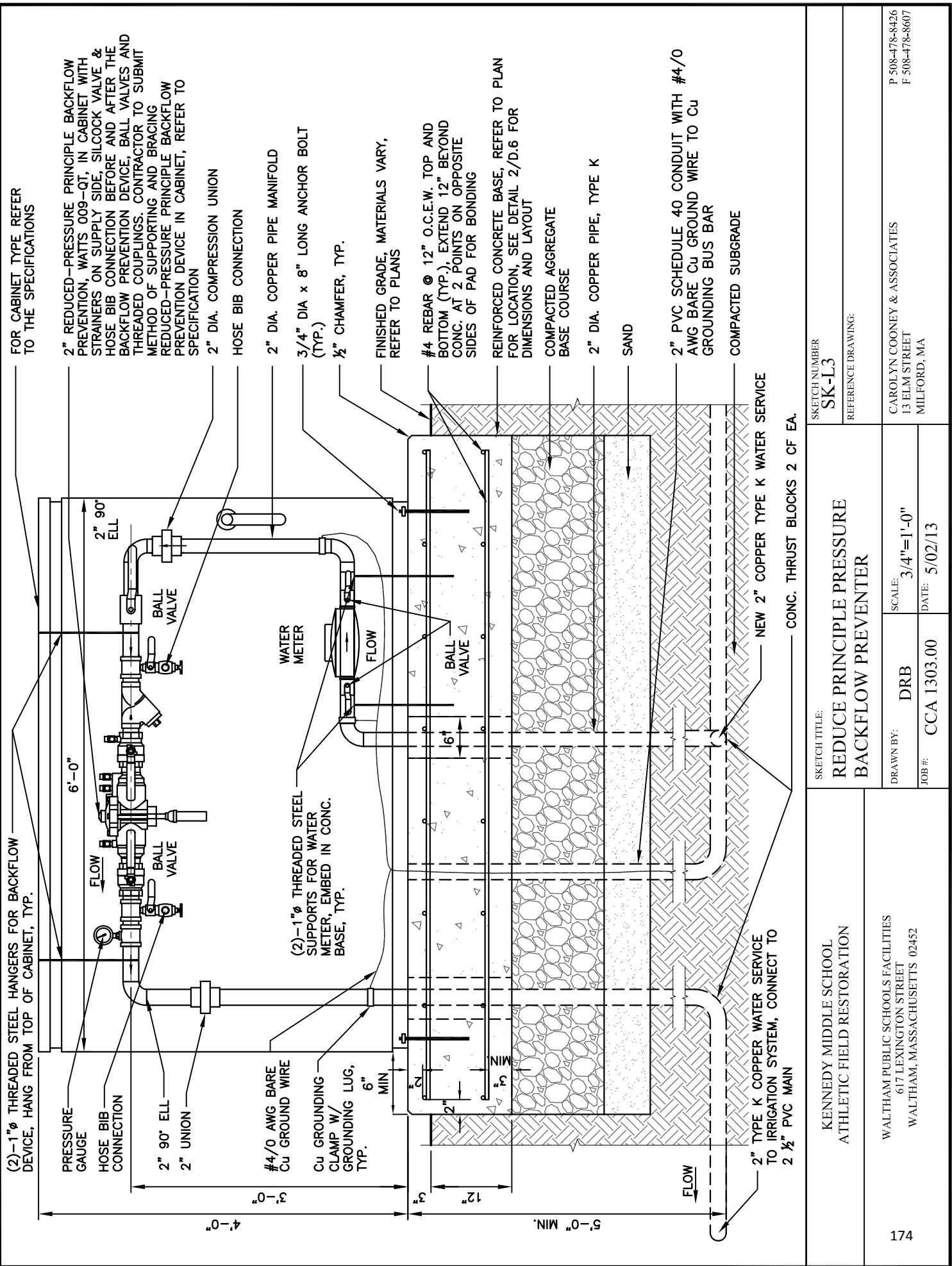
JOB #: **CCA 1303.00**

DATE: **4/29/13**

KENNEDY MIDDLE SCHOOL  
 ATHLETIC FIELD RESTORATION

WALTHAM PUBLIC SCHOOLS FACILITIES  
 617 LEXINGTON STREET  
 WALTHAM, MASSACHUSETTS 02452

173



FOR CABINET TYPE REFER TO THE SPECIFICATIONS

2" REDUCED-PRESSURE PRINCIPLE BACKFLOW PREVENTION, WATTS 009-QT, IN CABINET WITH STRAINERS ON SUPPLY SIDE, SILCOCK VALVE & HOSE BIB CONNECTION BEFORE AND AFTER THE BACKFLOW PREVENTION DEVICE. BALL VALVES AND THREADED COUPLINGS. CONTRACTOR TO SUBMIT METHOD OF SUPPORTING AND BRACING REDUCED-PRESSURE PRINCIPLE BACKFLOW PREVENTION DEVICE IN CABINET, REFER TO SPECIFICATION

2" DIA. COMPRESSION UNION

HOSE BIB CONNECTION

2" DIA. COPPER PIPE MANIFOLD

3/4" DIA x 8" LONG ANCHOR BOLT (TYP.)

1/2" CHAMFER, TYP.

FINISHED GRADE, MATERIALS VARY, REFER TO PLANS

#4 REBAR @ 12" O.C.E.W. TOP AND BOTTOM (TYP.), EXTEND 12" BEYOND CONC. AT 2 POINTS ON OPPOSITE SIDES OF PAD FOR BONDING

REINFORCED CONCRETE BASE, REFER TO PLAN FOR LOCATION, SEE DETAIL 2/D.6 FOR DIMENSIONS AND LAYOUT  
COMPACTED AGGREGATE  
BASE COURSE

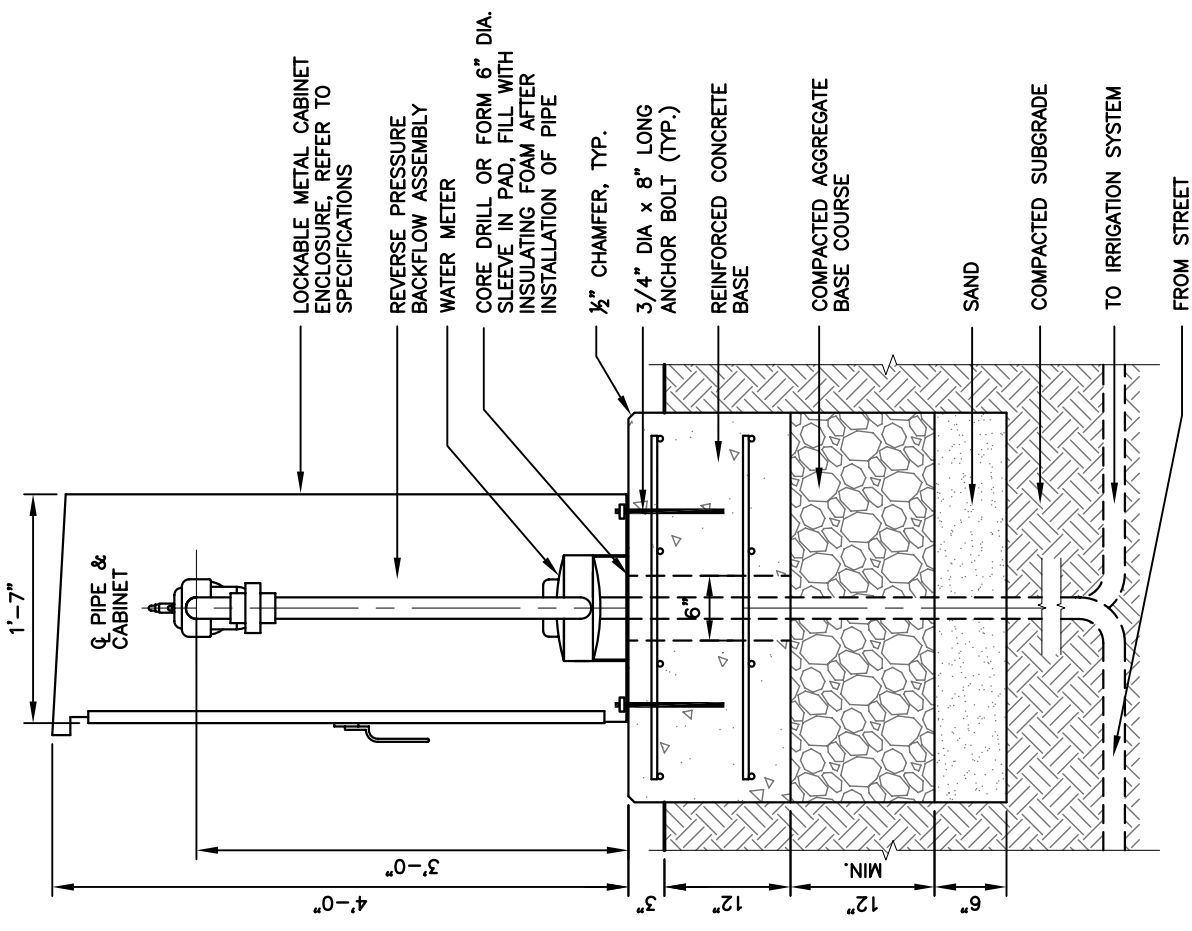
2" DIA. COPPER PIPE, TYPE K

SAND

2" PVC SCHEDULE 40 CONDUIT WITH #4/0 AWG BARE Cu GROUND WIRE TO Cu GROUNDING BUS BAR  
COMPACTED SUBGRADE

CONC. THRUST BLOCKS 2 CF EA.

KENNEDY MIDDLE SCHOOL ATHLETIC FIELD RESTORATION		SKETCH TITLE: <b>REDUCE PRINCIPLE PRESSURE BACKFLOW PREVENTER</b>		SKETCH NUMBER <b>SK-L3</b>	
WALTHAM PUBLIC SCHOOLS FACILITIES 617 LEXINGTON STREET WALTHAM, MASSACHUSETTS 02452		DRAWN BY: <b>DRB</b>	SCALE: <b>3/4"=1'-0"</b>	REFERENCE DRAWING:	
174		JOB #: <b>CCA 1303.00</b>	DATE: <b>5/02/13</b>	CAROLYN COONEY & ASSOCIATES 13 ELM STREET MILFORD, MA P 508-478-8426 F 508-478-8607	



SKETCH NUMBER  
**SK-L4**

REFERENCE DRAWING:

P 508-478-8426  
F 508-478-8607

CAROLYN COONEY & ASSOCIATES  
13 ELM STREET  
MILFORD, MA

SKETCH TITLE:  
**REDUCE PRINCIPLE PRESSURE  
BACKFLOW PREVENTER**

DRAWN BY: **DRB**

SCALE: **3/4"=1'-0"**

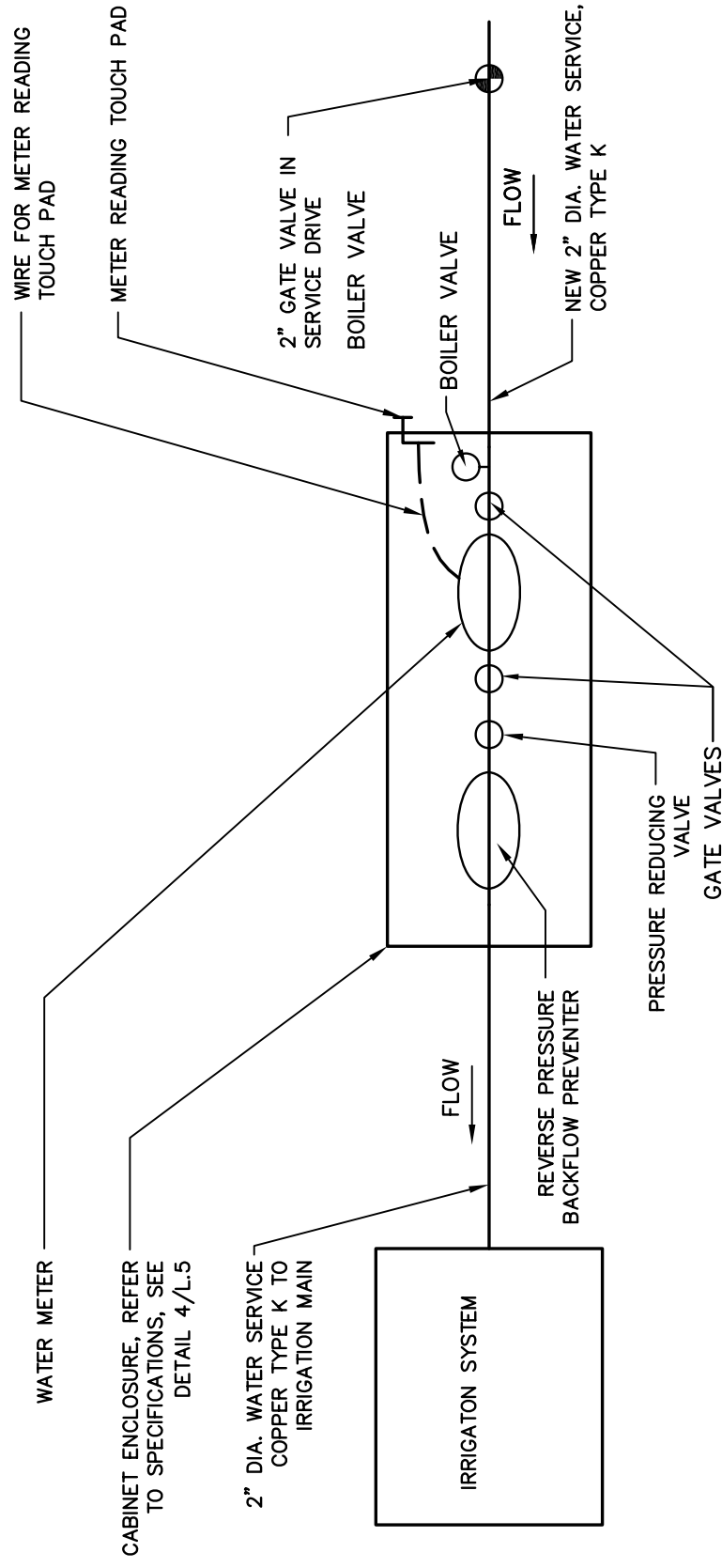
DATE: **5/02/13**

JOB #: **CCA 1303.00**

**KENNEDY MIDDLE SCHOOL  
ATHLETIC FIELD RESTORATION**

WALTHAM PUBLIC SCHOOLS FACILITIES  
617 LEXINGTON STREET  
WALTHAM, MASSACHUSETTS 02452

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KENNEDY MIDDLE SCHOOL ATHLETIC FIELD RESTORATION  WALTHAM PUBLIC SCHOOLS FACILITIES 617 LEXINGTON STREET WALTHAM, MASSACHUSETTS 02452	SKETCH TITLE: <b>WATER SERVICE ONE-LINE          SCHEMATIC</b>		SKETCH NUMBER <b>SK-L5</b>	P 508-478-8426 F 508-478-8607
	DRAWN BY: <b>DRB</b>	SCALE: <b>NTS</b>	REFERENCE DRAWING: CAROLYN COONEY & ASSOCIATES 13 ELM STREET MILFORD, MA	
	JOB #: <b>CCA 1303.00</b>	DATE: <b>4/29/13</b>		



## For Health Hazard Applications

Job Name \_\_\_\_\_  
 Job Location \_\_\_\_\_  
 Engineer \_\_\_\_\_  
 Approval \_\_\_\_\_

Contractor \_\_\_\_\_  
 Approval \_\_\_\_\_  
 Contractor's P.O. No. \_\_\_\_\_  
 Representative \_\_\_\_\_

# Series 009

## Reduced Pressure Zone Assemblies

**Sizes: 1/4" – 3" (8 – 80mm)**

Series 009 Reduced Pressure Zone Assemblies are designed to protect potable water supplies in accordance with national plumbing codes and water authority requirements. This series can be used in a variety of installations, including the prevention of health hazard cross connections in piping systems or for containment at the service line entrance.

This series features two in-line, independent check valves, captured springs and replaceable check seats with an intermediate relief valve. Its compact modular design facilitates easy maintenance and assembly access. Sizes 1/4" – 1" (8 – 25mm) shutoffs have tee handles.

### Features

- Single access cover and modular check construction for ease of maintenance
- Top entry - all internals immediately accessible
- Captured springs for safe maintenance
- Internal relief valve for reduced installation clearances
- Replaceable seats for economical repair
- Bronze body construction for durability 1/4" – 2" (8 – 50mm)
- Fused epoxy coated cast iron body 2 1/2" and 3" (65 and 80mm)
- Ball valve test cocks — screwdriver slotted 1/4" – 2" (8 – 50mm)
- Large body passages provides low pressure drop
- Compact, space saving design
- No special tools required for servicing

### Specifications

A Reduced Pressure Zone Assembly shall be installed at each potential health hazard location to prevent backflow due to backsiphonage and/or backpressure. The assembly shall consist of an internal pressure differential relief valve located in a zone between two positive seating check modules with captured springs and silicone seat discs. Seats and seat discs shall be replaceable in both check modules and the relief valve. There shall be no threads or screws in the waterway exposed to line fluids. Service of all internal components shall be through a single access cover secured with stainless steel bolts. The assembly shall also include two resilient seated isolation valves, four resilient seated test cocks and an air gap drain fitting. The assembly shall meet the requirements of: USC Manual 8th Edition†; ASSE Std. 1013; AWWA Std. C511; CSA B64.4. Shall be a Watts Regulator Co. Series 009.

†Does not indicate approval status. Refer to Page 2 for approved sizes & models.

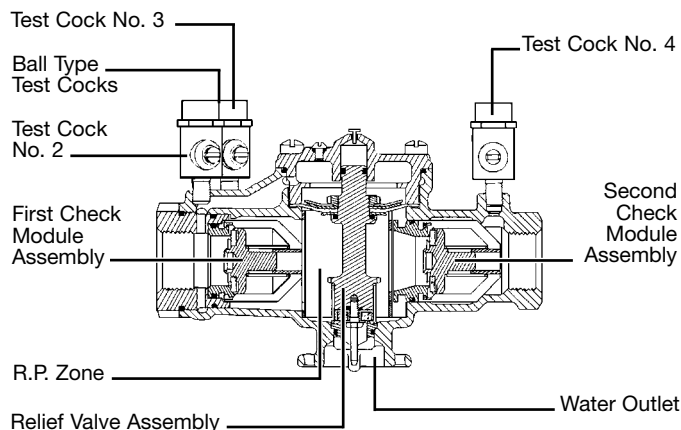
Watts product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact Watts Technical Service. Watts reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on Watts products previously or subsequently sold.



1/2" 009QT



2" 009M2QTHC



**Now Available**  
**WattsBox Insulated Enclosures.**  
 For more information, send for literature ES-WB.

**IMPORTANT: INQUIRE WITH GOVERNING AUTHORITIES FOR LOCAL INSTALLATION REQUIREMENTS**



**USA:** 815 Chestnut St., No. Andover, MA 01845-6098; [www.wattsreg.com](http://www.wattsreg.com)  
**Canada:** 5435 North Service Rd., Burlington, ONT L7L 5H7; [www.wattscanada.ca](http://www.wattscanada.ca)

## Available Models: 1/4" – 2" (8 – 50mm)

### Suffix:

- QT – quarter-turn ball valves  
 S – bronze strainer  
 LF – without shutoff valves  
 AQT – elbow fittings for 360° rotation  
 3/4" – 2" (20 – 50mm) only  
 PC – internal Polymer Coating  
 LH – locking handle ball valves (open position)  
 SH – stainless steel ball valve handles  
 HC – 2 1/2" inlet/outlet fire hydrant fitting (2" valve)

### Prefix:

- C – clean and check strainer  
 3/4" – 1" (20 – 25mm) only  
 U – union connections (see ES-U009)

## Available Models: 2 1/2" – 3" (65 – 80mm)

### Suffix:

- NRS – non-rising stem resilient seated gate valves  
 OSY – UL/FM outside stem and yoke resilient seated gate valves  
 S-FDA – FDA epoxy coated strainer  
 QT-FDA – FDA epoxy coated quarter-turn ball valve shutoffs  
 LF – without shutoff valves  
 S – cast iron strainer

**Note: The installation of a drain line is recommended. When installing a drain line, an air gap is necessary (see ES-AG).**

## Materials: 1/4" – 2" (8 – 50mm)

Bronze body construction, silicone rubber disc material in the first and second check plus the relief valve. Replaceable polymer check seats for first and second checks. Removable stainless steel relief valve seat. Stainless steel cover bolts.

Standardly furnished with NPT body connections. For optional bronze union inlet and outlet connections, specify prefix U (1/2" – 2" (15 – 50mm)). Series 009QT furnished with quarter turn, full port, resilient seated, bronze ball valve shutoffs.

## Air Gaps and Elbows

MODEL	DRAIN OUTLET	DIMENSIONS				WEIGHT			
		A		B		lbs.	kgs.		
	for 909, 009 and 993 sizes	in.	mm	in.	mm	in.	mm		
909AG-A	1/4"-1/2" 009, 3/4" 009M2/M3	1/2	13	2 3/8	60	3 1/8	79	.625	.28
909AG-C	3/4"-1" 009/909, 1"-1 1/2" 009M2	1	25	3 1/4	83	4 7/8	124	1.50	.68
909AG-F	1 1/4"-2" 009M1, 1 1/4"-3" 009/909, 2" 009M2, 4"-6" 993	2	51	4 3/8	111	6 3/4	171	3.25	1.47
909AG-K	4"-6" 909, 8"-10" 909M1	3	76	6 3/8	162	9 5/8	243	6.25	2.83
909AG-M	8"-10" 909	4	102	7 3/8	187	11 1/4	394	15.50	7.03
909EL-A	1/4"-1/2" 009, 3/4" 009M2/M3	-	-	-	-	-	-	-	-
909EL-C	3/4"-1" 009/909	-	-	2 3/8	60	2 3/8	60	.38	.17
* 909EL-F	1 1/4"-2" 009M1, 1 1/4"-2" 009/909, 2" 009M2, 4"-6" 993	-	-	3 5/8	92	3 5/8	92	2	.91
* 909EL-H Vertical	2 1/2"-3" 009/909	-	-	-	-	-	-	-	-

## Materials: 2 1/2" and 3" (65 – 80mm)

- (FDA approved) Epoxy coated cast iron unibody with bronze seats
- Relief valve with stainless steel seat and trim
- Bronze body ball valve test cocks

## Pressure / Temperature

**Series 009 1/4" – 2" (8 – 50mm)** Suitable for supply pressure up to 175psi (12 bar). Water temperature: 33°F – 180°F (-3°C – 75°C).

**Sizes 2 1/2" and 3" (65 and 80mm)** are suitable for supply pressures up to 175psi (12 bar) and water temperature at 110°F (43°C) continuous, 140°F (60°C) intermittent.

## Standards

- USC Manual 8th Edition†  
 ASSE No. 1013  
 AWWA C511-92  
 CSA B64.4  
 IAPMO File No. 1563.

†Does not indicate approval status. See below for approved models.



## Approvals

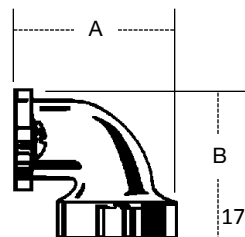
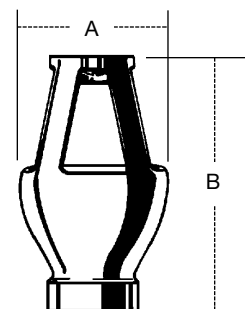
ASSE, AWWA, CSA, IAPMO

Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California.

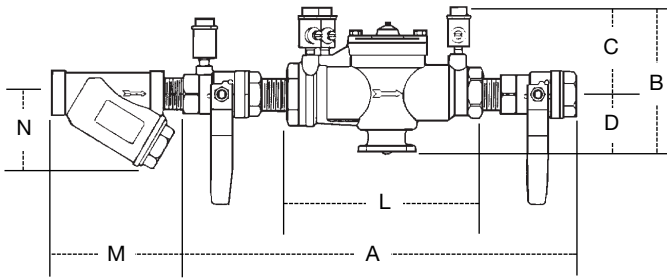
Approval models QT, AQT, PC, NRS, OSY.

UL Classified 3/4" – 2" (20 – 50mm) (LF models only)

2 1/2" and 3" (65 and 80mm) with OSY gate valves.



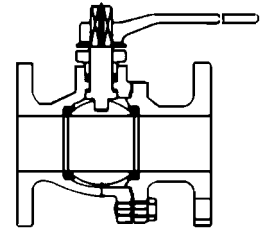
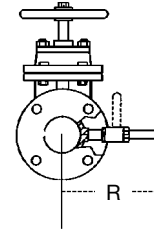
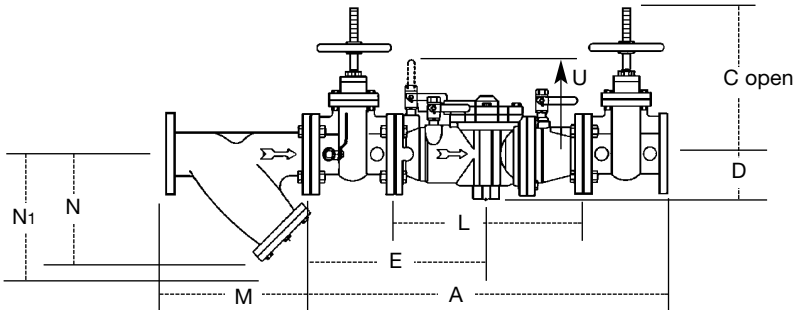
Dimensions and Weight: 1/4" – 2" (8 – 50mm) 009



Suffix HC – Fire Hydrant Fittings dimension 'A' = 25" (637mm)  
009 1/4" – 2"

SIZE (DN)		DIMENSIONS (APPROX.)										STRAINER DIMENSIONS		WEIGHT			
in.	mm	A		B		C		D		L		M		N		lbs.	kg.
1/4	8	10	250	4 5/8	117	3 3/8	86	1 1/4	32	5 1/2	140	2 3/8	60	2 1/2	64	5	2
3/8	10	10	250	4 5/8	117	3 3/8	86	1 1/4	32	5 1/2	140	2 3/8	60	2 1/2	64	5	2
1/2	15	10	250	4 5/8	117	3 3/8	86	1 1/4	32	5 1/2	140	2 3/4	70	2 1/4	57	5	2
3/4	20	10 3/4	273	5	127	3 1/2	89	1 1/2	38	6 3/4	171	3 3/16	81	2 3/4	70	6	3
1	25	16 3/4	425	5 1/2	140	3	76	2 1/2	64	9 1/2	241	3 3/4	95	3	76	12	5
1 1/4	32	17 3/8	441	6	150	3 1/2	89	2 1/2	64	11 3/8	289	4 7/16	113	3 1/2	89	15	6
1 1/2	40	17 7/8	454	6	150	3 1/2	89	2 1/2	64	11 1/8	283	4 7/8	124	4	102	16	7
2	50	21 1/8	543	7 3/4	197	4 1/2	114	3 1/4	83	13 1/2	343	5 15/16	151	5	127	30	13

Dimensions and Weight: 2 1/2" and 3" (65 and 80mm) 009



Watts G-4000 Series  
QT – Ball Valves

STRAINER SIZE		DIMENSIONS (approx.)						WEIGHT	
in.	mm	M		N		N <sub>1</sub> †		lbs.	kg.
2 1/2	65	10	254	6 1/2	165	9 3/4	248	28	12.7
3	80	10 1/8	257	7	178	10	254	34	15.4

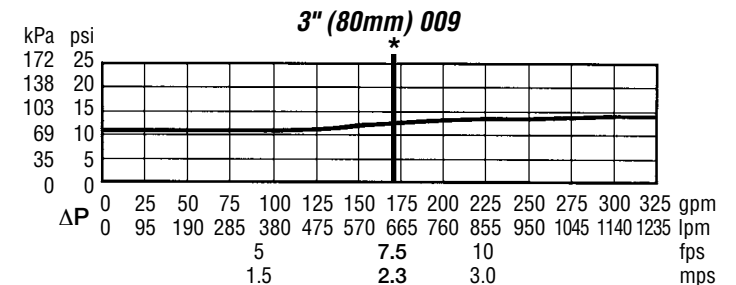
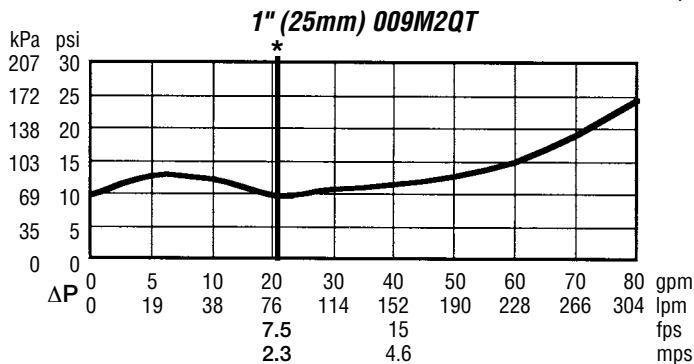
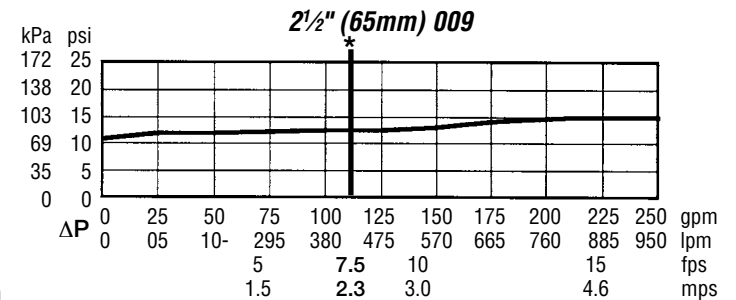
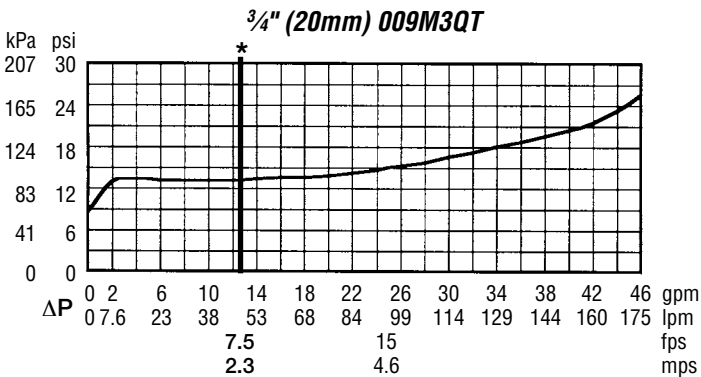
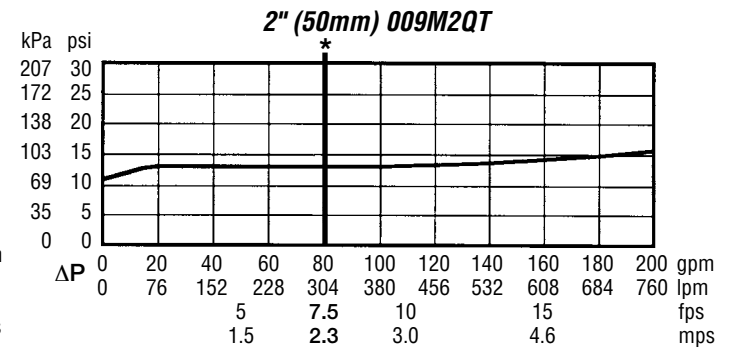
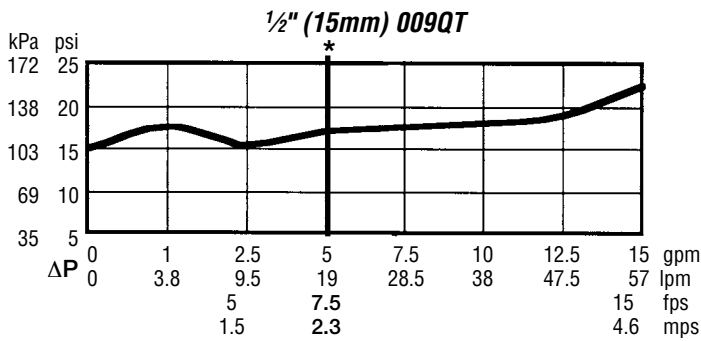
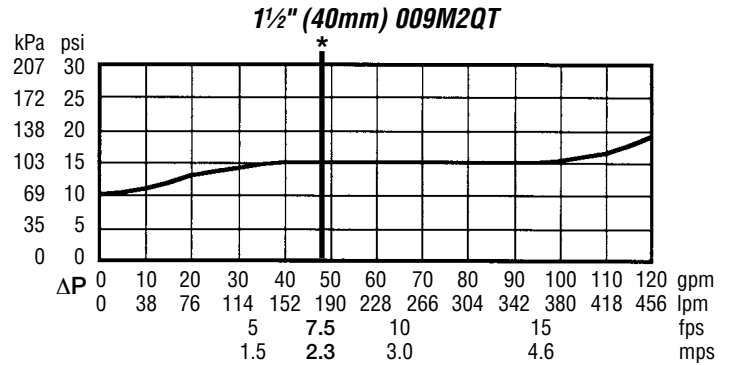
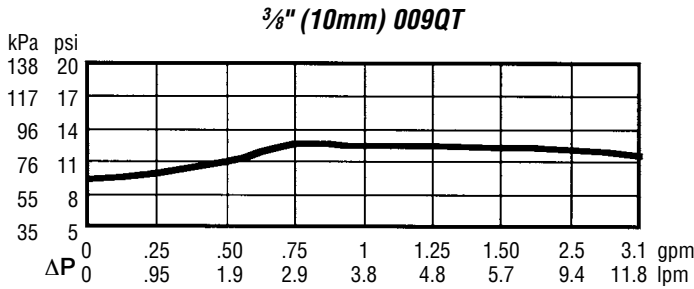
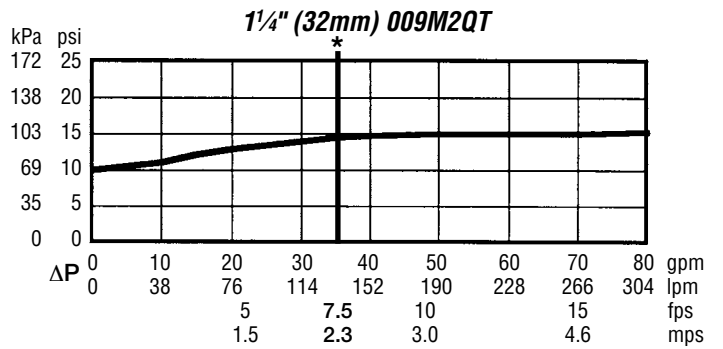
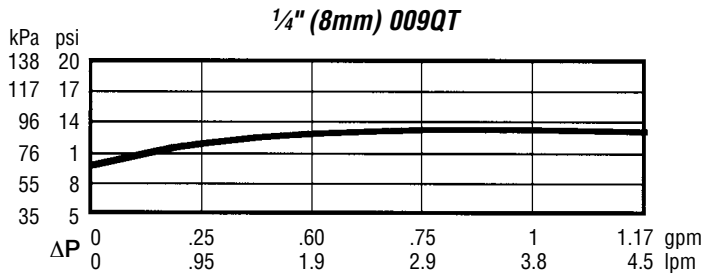
†Clearance for servicing

MODEL	SIZE DN		DIMENSIONS (APPROX.)										WEIGHT					
	in.	mm	A		C		D		E		L		R		U		lbs.	kg.
009LF	2 1/2	65	—	—	—	—	4 1/2	114	—	—	18 1/8	460	—	—	10 5/8	270	76	34.5
0090SY	2 1/2	65	33 1/4	845	15 7/8	403	4 1/2	114	16 3/8	416	18 1/8	460	7 3/4	197	10 5/8	270	166	75.3
009NRS	2 1/2	65	33 1/4	845	11 3/8	289	4 1/2	114	16 3/8	416	18 1/8	460	7 3/4	197	10 5/8	270	161	73.0
009QT	2 1/2	65	33 1/4	845	6	152	4 1/2	114	16 3/8	416	18 1/8	460	7 3/4	197	10 5/8	270	150	68.0
009LF	3	80	—	—	—	—	4 1/2	114	—	—	18 1/8	460	—	—	10 5/8	270	76	34.5
0090SY	3	80	34 1/4	870	18 1/2	470	4 1/2	114	16 5/8	422	18 1/8	460	8 3/4	222	10 5/8	270	198	89.8
009NRS	3	80	34 1/4	870	12 3/4	324	4 1/2	114	16 5/8	422	18 1/8	460	8 3/4	222	10 5/8	270	191	86.6
009QT	3	80	34 1/4	870	7	178	4 1/2	114	16 5/8	422	18 1/8	460	8 3/4	222	10 5/8	270	158	71.7

# Capacity

Performance as established by an independent testing laboratory.

\*Typical maximum system flow rate (7.5 feet/sec., 2.3 meters/sec.)



Construction Bid Documents

# KENNEDY MIDDLE SCHOOL ATHLETIC FIELD RESTORATION

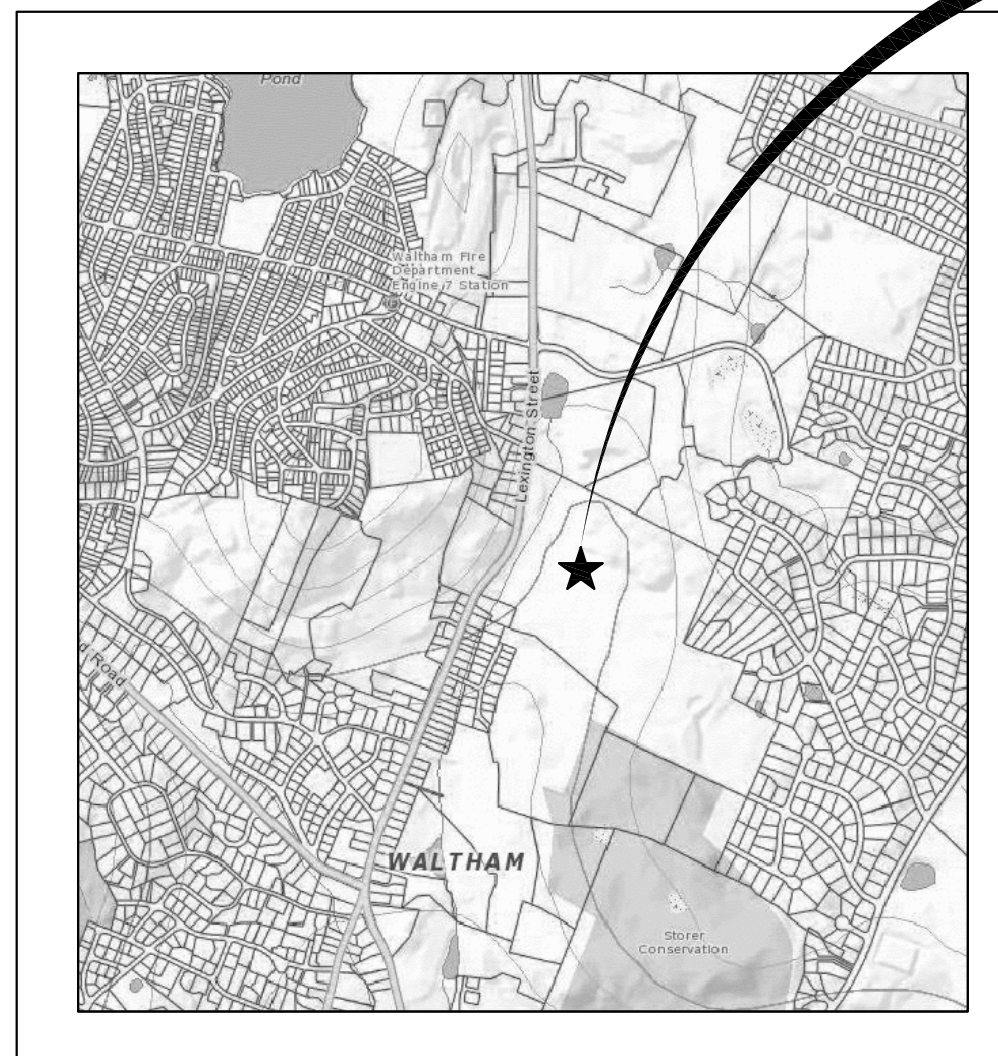
**655 LEXINGTON STREET  
WALTHAM, MASSACHUSETTS 02452**

**MAYOR JEANNETTE A. McCARTHY  
CITY OF WALTHAM**

WALTHAM PUBLIC SCHOOLS FACILITIES  
617 LEXINGTON STREET  
WALTHAM, MASSACHUSETTS 02452

MAY 14, 2013

## Locus Plan



PROJECT SITE

LANDSCAPE ARCHITECT:  
CAROLYN COONEY & ASSOCIATES

13 ELM STREET  
MILFORD, MASSACHUSETTS 01757  
TEL: (508) 478-8426 FAX: (508) 478-8607

## Index of Drawings

G.1	GENERAL NOTES
EX.1	TOPOGRAPHIC SURVEY
L.1	SITE PREP & DEMOLITION PLAN
L.2	FIELD RESTORATION PLAN
L.3	IRRIGATION PLAN
L.4	FIELD DETAILS
L.5	UTILITY DETAILS
L.6	ELECTRICAL & GROUNDING DETAILS
L.7	ELECTRICAL & GROUNDING DETAILS
L.8	IRRIGATION DETAILS

**Carolyn Cooney & Associates**

Landscape Architecture / Planning

19 Elm Street, Milford, MA 01757  
 Telephone 508 478 8426, Facsimile 508 478 8607

**GENERAL NOTES:**

1. ANY DISCREPANCIES OR CONFLICTS BETWEEN THE LANDSCAPE ARCHITECTURE DRAWINGS AND SPECIFICATIONS, SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT AND THE WALTHAM PUBLIC SCHOOLS FACILITIES DEPARTMENT BEFORE PROCEEDING.
2. THE CONTRACTOR SHALL VERIFY EXISTING FIELD CONDITIONS, SHOULD DISCREPANCIES EXIST BETWEEN FIELD CONDITIONS AND THOSE SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT PRIOR TO PROCEEDING.
3. LOCATIONS OF ALL UNDERGROUND UTILITIES AS SHOWN ON THIS PLAN ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES AND REPAIRING ANY DAMAGE DONE DURING CONSTRUCTION.
5. THE CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF THE EXISTING STORM DRAINAGE SYSTEM AT ALL TIMES.
4. NOTIFY ALL CORPORATIONS, COMPANIES, INDIVIDUALS OR LOCAL AUTHORITIES OWNING, OR HAVING JURISDICTION OVER, UTILITIES RUNNING TO, THROUGH OR ACROSS AREAS DISTURBED BY EXCAVATION OPERATIONS. THE CONTRACTOR SHALL NOTIFY DIGSAFE (1-888-344-7233) A MINIMUM OF 72 HOURS PRIOR TO BEGINNING OPERATIONS.
5. REMOVAL OF ANY EXISTING PAVEMENT AT LOCATIONS WHERE EXISTING AND NEW PAVEMENT MEET SHALL BE DONE ON A "LINE" OF SAW CUT TO A FULL CONSTRUCTION DEPTH.
6. ALL AREAS OUTSIDE THE LIMIT OF WORK SHALL BE LEFT UNDISTURBED. AREAS OUTSIDE THE LIMIT OF WORK DISTURBED BY CONTRACTOR SHALL BE RESTORED BY THE CONTRACTOR AT THE CONTRACTORS EXPENSE.
7. THE CONTRACTOR SHALL PROTECT EXISTING TREES WHEN DIRECTED BY THE LANDSCAPE ARCHITECT. THE CONTRACTOR SHALL ERECT TEMPORARY BARRIERS FOR THE PROTECTION OF EXISTING TREES DURING CONSTRUCTION AS DIRECTED. UNDER NO CIRCUMSTANCES SHALL EQUIPMENT, VEHICLES, AND MATERIALS BE "STORED BENEATH" OR IN ANY WAY COME IN CONTACT WITH EXISTING TREES.
8. REFER TO IRRIGATION DRAWINGS FOR IRRIGATION LAYOUT AND DETAILING.
9. TOPOGRAPHIC INFORMATION OBTAINED FROM SURVEY CONDUCTED BY SURVEYING AND MAPPING CONSULTANTS.

**LAYOUT NOTES:**

1. ALL DIMENSION LINES ARE EITHER PARALLEL OR PERPENDICULAR TO LINES FROM WHICH THEY ARE DRAWN, UNLESS OTHERWISE INDICATED ON DRAWINGS.
2. DIMENSIONS SHOWN ON DRAWINGS AND DETAILS SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OF ANY DISCREPANCIES AND FOR CLARIFICATION AS REQUIRED. DO NOT SCALE DRAWINGS.
3. DIMENSION LINES ARE DRAWN FROM EDGE OF PAVEMENT UNLESS OTHERWISE NOTED.
4. LAYOUT WORK REQUIRED BY THE DRAWINGS AND SPECIFICATIONS SHALL BE LAID OUT AND STAKED (AND RE-STAKED AS REQUIRED BY FIELD CONDITIONS) IN THE FIELD BY THE CONTRACTOR FOR REVIEW BY THE LANDSCAPE ARCHITECT PRIOR TO COMMENCING WORK. PROVIDE GRADE STAKES TO INDICATE DEPTH OF MATERIALS AND FINISH GRADES.

**GRADING NOTES:**

1. NEW GRADING HAS BEEN DESIGNED WITH AVAILABLE SURVEY INFORMATION, IF FIELD CONDITIONS VARY, THE CONTRACTOR SHALL BRING THEM TO THE IMMEDIATE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING.
2. TILLED SOILS SHALL BE TESTED FOR CONFORMANCE WITH SPECIFICATIONS BEFORE FINISHED GRADING IS BEGUN. DO NOT COMPACT SOILS BEYOND SPECIFIED MAXIMUM RATES. DO NOT WORK WHEN WET.
3. SUFFICIENT GRADE STAKES SHOWING DEPTH OF VARIOUS MATERIALS SHALL BE REVIEWED BY LANDSCAPE ARCHITECT IN FIELD BEFORE FINAL GRADING CAN COMMENCE.
4. ALL LANDSCAPE GRADING IS TO BE SMOOTH AND CONTINUOUS. CREST OF EARTH SLOPES SHALL BE CONVEX AND PARABOLIC.

**ABBREVIATIONS:**

- |                                   |                              |
|-----------------------------------|------------------------------|
| V.I.F. – VERIFY IN FIELD          | TW – TOP OF WALL             |
| NOM. – NOMINAL                    | BW – BOTTOM OF WALL          |
| DWGS. – DRAWINGS                  | TS – TOP OF STEPS            |
| TYP. – TYPICAL                    | BS – BOTTOM OF STEPS         |
| BIT. – BITUMINOUS                 | PED. – PEDESTRIAN            |
| CONC. – CONCRETE                  | PSI – POUNDS PER SQUARE INCH |
| O.C. – ON CENTER                  | SQ. – SQUARE                 |
| O.D. – OUTSIDE DIAMETER           | DIA. – DIAMETER              |
| I.D. – INSIDE DIAMETER            | CL – CENTER LINE             |
| CB – CATCH BASIN                  | GA – GAUGE                   |
| AD – AREA DRAIN                   | CAL – CALIPER                |
| TG – TOP OF GRATE                 | HT. – HEIGHT                 |
| B&B – BALLED AND BURLAP           |                              |
| CONT – CONTAINER                  |                              |
| PC – POINT OF CURVATURE           |                              |
| PCC – POINT OF COMPOUND CURVATURE |                              |


No.	Description	Date
-----	-------------	------

REVISIONS



Project:  
**KENNEDY MIDDLE SCHOOL  
 ATHLETIC FIELD RENOVATION  
 655 LEXINGTON STREET  
 WALTHAM, MA 02452**

Prepared For:  
**WALTHAM PUBLIC  
 SCHOOLS FACILITIES  
 617 LEXINGTON STREET  
 WALTHAM, MA 02452**

TITLE:  
**GENERAL NOTES &  
 ABBREBIATIONS**

Scale AS NOTED Date MAY 14, 2013  
 Drawn By DRB  
 Checked By CCC  
 Approved By CCC  
 Project No. 1303.00

DWG No. **G.1**

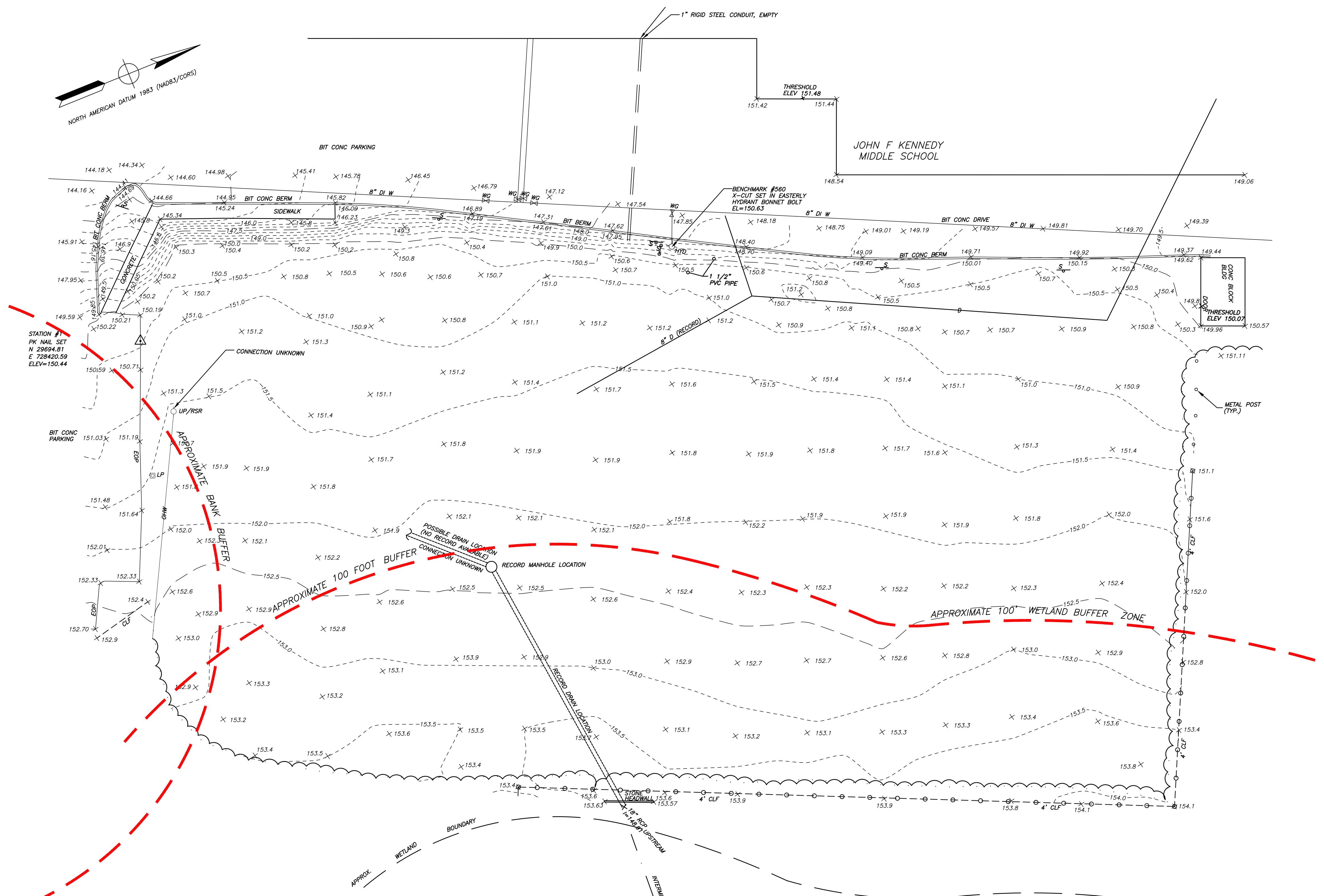
**LEGEND**

FND	FOUND
PK	PARKER KAYLON
W/	WITH
	TREE LINE
	CHAIN LINK FENCE
CLF	CHAIN LINK FENCE CURBING(TYPE)
	BITUMINOUS CONCRETE
CONC	CONCRETE
EOP	EDGE OF PAVEMENT
	SIGN
	GUY WIRE
Ø UP#	UTILITY POLE
Ø UP/LP	UTILITY POLE/LIGHT POLE
LPB	LIGHT POLE BASE
R=	RIM
I=	INVERT
RCP	REINFORCED CONCRETE PIPE
DI	DUCTILE IRON
HYD	HYDRANT
W	WATER LINE
D	DRAIN LINE
RSR	RISER
+200.15	SPOT ELEVATION
-200	INTERMEDIATE CONTOUR
-200	INDEX CONTOUR

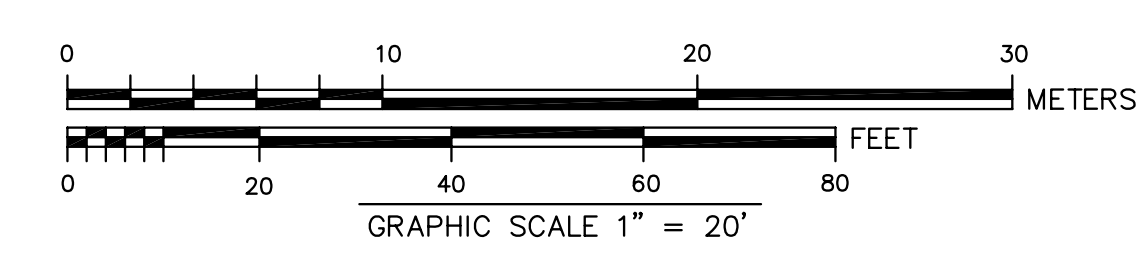
**NOTES**

- COORDINATES, IN U.S. SURVEY FEET, ARE REFERENCED TO THE MASSACHUSETTS COORDINATE SYSTEM, MAINLAND ZONE, REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83/CORS), AS DEFINED KeyNetGPS
- ELEVATIONS, IN U.S. SURVEY FEET, ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), USING KeyNetGPS VRS.
- UNDERGROUND IRRIGATION SYSTEM WITHIN FIELD IS ABANDONED
- SUBSURFACE UTILITY LINES AND FEATURES, AS SHOWN HEREON, WERE COMPILED FROM EVIDENCE AND AVAILABLE RECORD INFORMATION FROM PUBLIC AND PRIVATE UTILITY PROVIDERS, AND THEIR LOCATIONS ARE ONLY APPROXIMATE. ACTUAL LOCATIONS MUST BE DETERMINED IN THE FIELD.

SMC ASSUMES NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURATELY SHOWN. BEFORE CONSTRUCTION, ALL UTILITIES, PUBLIC AND PRIVATE, MUST BE NOTIFIED (SEE MASSACHUSETTS GENERAL LAWS, CHAPTER 82 SECTION 40.) CALL "DIG SAFE" 1 (888) 344-7233 HTTP://WWW.DIGSAFE.COM.



Date:	MAY 3, 2012
Job No.:	W118.00
Drawn By:	EK
Checked By:	KH
Calc'd By:	CD
Drawing No.:	W11800FP.DWG
Sheet:	1 OF 1



KEVIN HANLEY, PLS  
MASSACHUSETTS REG. No. 31313

325 WOOD ROAD  
SUITE 109  
BRAintree MA 02184  
(781)380-7766  
FAX (781)380-7757

**SMC** SURVEYING AND MAPPING CONSULTANTS

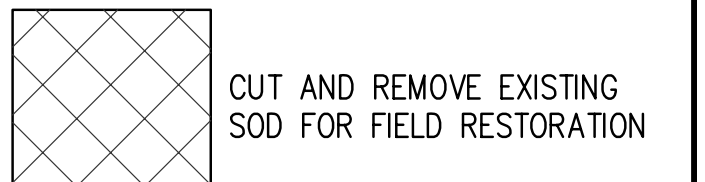
**TOPOGRAPHIC SURVEY  
KENNEDY SCHOOL  
WALTHAM, MA**

PREPARED FOR: CDM SMITH, INC.

SCALE: 1" = 20'      DATE: MAY 4, 2012

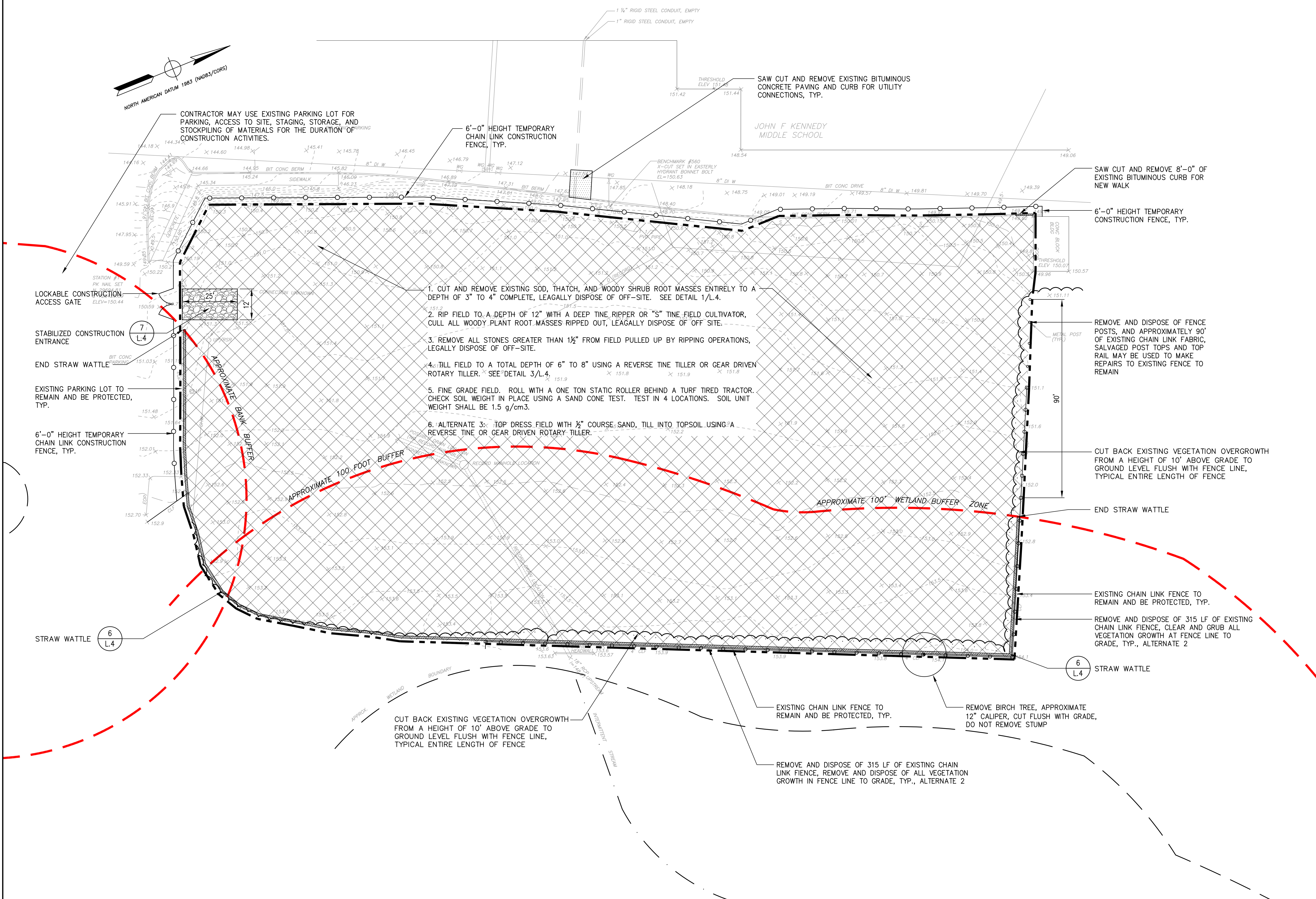
SMC DWG. NO. W11800FP.DWG      SHEET 1 OF 1

LEGEND



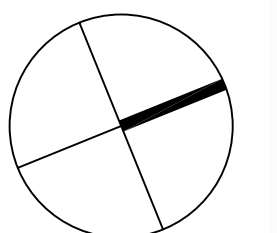
NOTE:


THE CONTRACTOR MUST HAVE APPROVAL BY THE ARCHITECT AND OWNER FOR ALL MATERIALS STORED ON SITE. A STORAGE AREA SHALL BE DESIGNATED AND APPROVED BY THE ARCHITECT AND SCHOOL DEPARTMENT FOR STORAGE OR STOCK PILE OF MATERIALS ON SITE FOR THE EXECUTION OF THIS CONTRACT.



1. CUT AND REMOVE EXISTING SOD, THATCH, AND WOODY SHRUB ROOT MASSES ENTIRELY TO A DEPTH OF 3" TO 4" COMPLETE, LEGALLY DISPOSE OF OFF-SITE. SEE DETAIL 1/L.4.
2. RIP FIELD TO A DEPTH OF 12" WITH A DEEP TINE RIPPER OR "S" TINE FIELD CULTIVATOR, CULL ALL WOODY PLANT ROOT MASSES RIPPED OUT, LEGALLY DISPOSE OF OFF SITE.
3. REMOVE ALL STONES GREATER THAN 1 1/2" FROM FIELD PULLED UP BY RIPPING OPERATIONS, LEGALLY DISPOSE OF OFF-SITE.
4. TILL FIELD TO A TOTAL DEPTH OF 6" TO 8" USING A REVERSE TINE TILLER OR GEAR DRIVEN ROTARY TILLER. SEE DETAIL 3/L.4.
5. FINE GRADE FIELD. ROLL WITH A ONE TON STATIC ROLLER BEHIND A TURF TIED TRACTOR. CHECK SOIL WEIGHT IN PLACE USING A SAND CONE TEST. TEST IN 4 LOCATIONS. SOIL UNIT WEIGHT SHALL BE 1.5 g/cm<sup>3</sup>.
6. ALTERNATE 3: TOP DRESS FIELD WITH 1/2" COURSE SAND, TILL INTO TOPSOIL USING A REVERSE TINE OR GEAR DRIVEN ROTARY TILLER.

No.	Description	Date
REVISIONS		

  
North



Project:  
**KENNEDY MIDDLE SCHOOL  
 ATHLETIC FIELD RENOVATION  
 655 LEXINGTON STREET  
 WALTHAM, MA 02452**

Prepared For:  
**WALTHAM PUBLIC  
 SCHOOLS FACILITIES  
 617 LEXINGTON STREET  
 WALTHAM, MA 02452**

TITLE:  
**SITE PREP &  
 DEMOLITION PLAN**

Scale 1"=20' Date MAY 14, 2013  
 Drawn By DRB  
 Checked By DRB  
 Approved By CCC  
 Project No. 1303.00

DWG No. **L.1**



**GRADING AND UTILITY NOTES:**

1. REFER TO EXISTING CONDITIONS PLAN AND SITE PREP AND DEMOLITION PLAN FOR SURVEY NOTES AND LEGEND.
2. IT IS THE INTENT OF THE GRADING PLAN TO GRADE THE FIELD AT A CONSTANT UNIFORM SLOPE OF 1.75% BY CUTTING ALL HIGH AREAS, AND FILLING ALL DEPRESSIONS TO CREATE A UNIFORMLY GRADED FIELD AT A CONSTANT GRADIENT. THE FINISHED GRADE OF THE FIELD IS APPROXIMATE, AND WILL BE ADJUSTED TO FINAL ELEVATIONS AFTER STRIPPING THE FIELD IS COMPLETE.
3. ALL WORK RELATING TO INSTALLATION OF THE IRRIGATION SYSTEM SHALL BE PERFORMED IN ACCORDANCE WITH THE STANDARDS OF THE CITY OF WALTHAM ENGINEERING DEPARTMENT AND WATER AND SEWER DEPARTMENT.
4. ALL WORK RELATING TO INSTALLATION, RENOVATION OR MODIFICATION OF ELECTRICAL SERVICES SHALL BE PERFORMED IN ACCORDANCE WITH THE STANDARDS OF THE CITY OF WALTHAM WIRING DEPARTMENT.
5. ALL PROPOSED PAVEMENTS SHALL MEET THE LINE AND GRADE OF EXISTING ADJACENT PAVEMENT SURFACES.
6. ALL WALKWAYS SHALL MAINTAIN A CROSSPITCH OF NOT MORE THAN 2%.
7. WHERE A SPECIFIC LIMIT OF WORK LINE IS NOT OBVIOUS OR IMPLIED, BLEND GRADES TO EXISTING CONDITIONS WITHIN 10 FEET OF PROPOSED CONTOURS.
8. RESTORE ALL DISTURBED AREAS AND LIMITS OF ALL REMOVALS TO TURF UNLESS OTHERWISE NOTED.

**Carolyn Cooney & Associates**

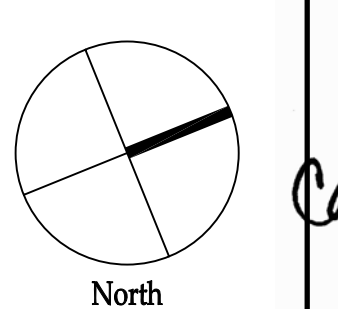
Landscape Architecture / Planning  
13 Elm Street, Milford, MA 01757  
Telephone 508 478 8426, Facsimile 508 478 8607

**LEGEND**

- SEEDED ATHLETIC FIELD
- BITUMINOUS WALK PAVEMENT
- ATHLETIC FIELD LINING

No.	Description	Date

REVISIONS



Project:

**KENNEDY MIDDLE SCHOOL  
ATHLETIC FIELD RENOVATION  
655 LEXINGTON STREET  
WALTHAM, MA 02452**

Prepared For:

**WALTHAM PUBLIC  
SCHOOLS FACILITIES  
617 LEXINGTON STREET  
WALTHAM, MA 02452**

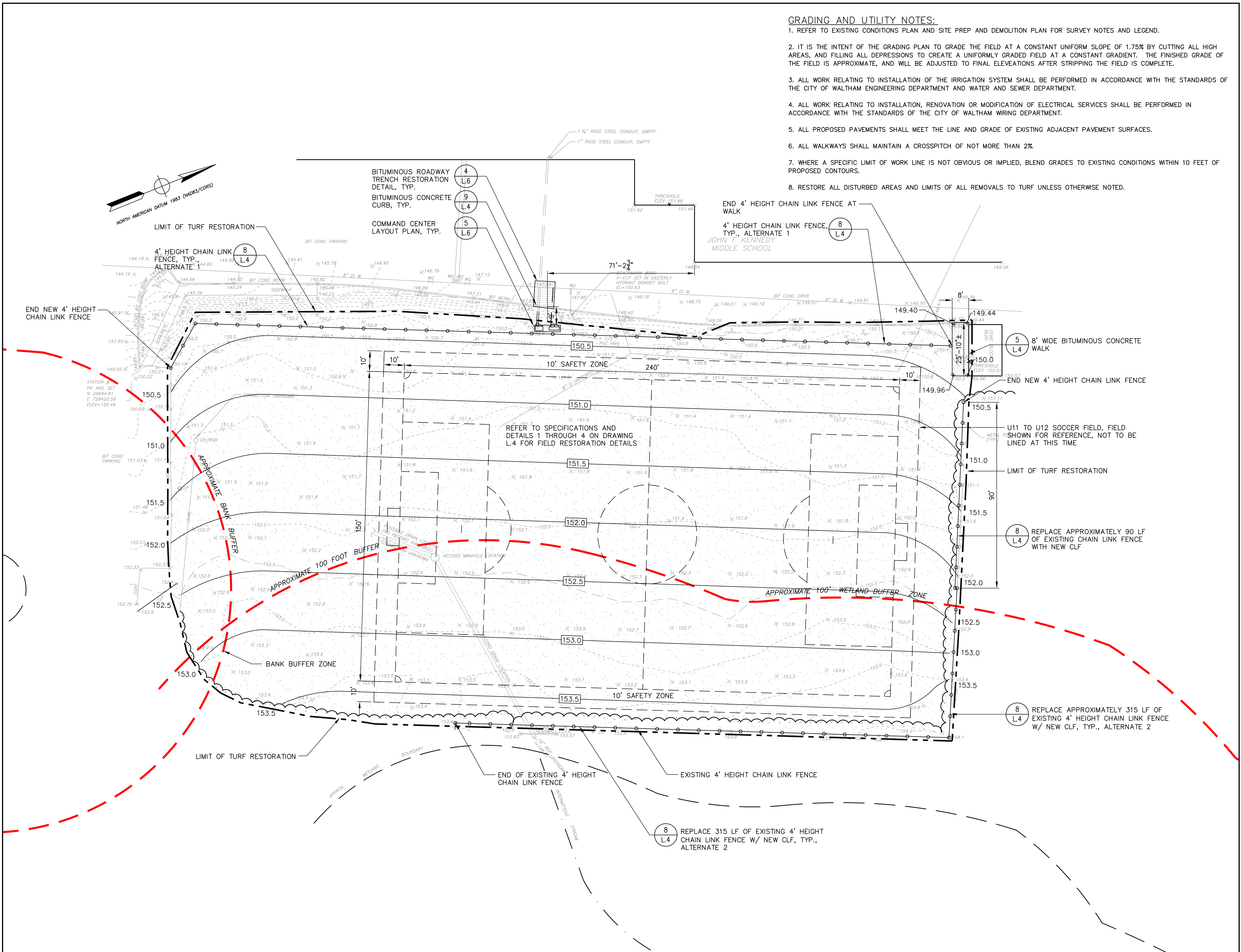
TITLE:

**FIELD RESTORATION  
PLAN**

Scale 1"=20' Date MAY 14, 2013  
Drawn By DRB  
Checked By DRB  
Approved By CCC  
Project No. 1303.00

DWG No.

**L.2**



**LEGEND**

- HUNTER I-40-36S-10 FULL CIRCLE ROTARY SPRINKLER, OR EQUAL
- HUNTER I-40-ADS-7 ADJUSTABLE PART CIRCLE ROTARY SPRINKLER, OR EQUAL
- HUNTER QCV-100 MANUAL QUICK COUPLING VALVE, OR EQUAL
- Ⓢ HUNTER PCC-1200 IRRIGATION SYSTEM CONTROLLER IN ELECTRICAL ENCLOSURE, OR EQUAL

NOTE:  
 SCHOOL TO PROVIDE NEW 60 AMP SERVICE TO NEW SUB-PANEL,  
 CONTRACTOR TO PROVIDE ALL OTHER ELECTRICAL AND GROUNDING  
 REQUIREMENTS PER PLANS AND SPECIFICATIONS.

**LEGEND**

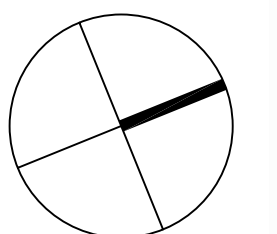
- FULL CIRCLE ROTARY SPRINKLER
- ADJUSTABLE PART CIRCLE ROTARY SPRINKLER
- MANUAL QUICK COUPLING VALVE
- Ⓢ SOLENOID VALVE

**NOTES:**


FULL FUNCTIONALITY OF ALL AUTOMATIC CONTROL VALVES SHALL BE VERIFIED BY THE CONTRACTOR AND ANY AND ALL DEFICIENCIES SHALL BE CORRECTED AND MADE PART OF THIS CONTRACT. CONTROL VALVES WHICH ARE DAMAGED OR BROKEN SHALL BE REPLACED AT NO ADDITIONAL COST.

No.	Description	Date

**REVISIONS**



North



**Project:**

**KENNEDY MIDDLE SCHOOL  
 ATHLETIC FIELD RENOVATION  
 655 LEXINGTON STREET  
 WALTHAM, MA 02452**

**Prepared For:**

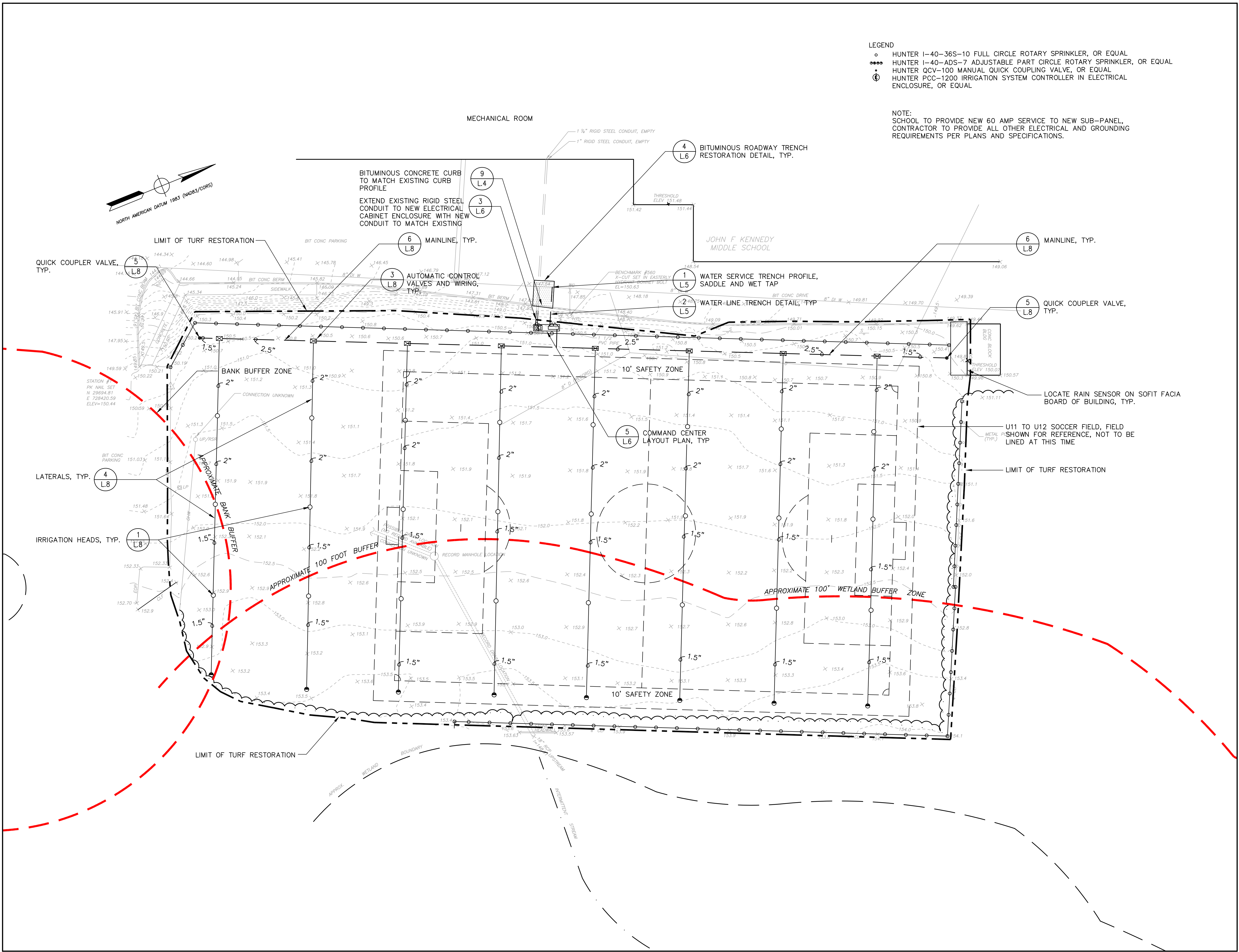
**WALTHAM PUBLIC  
 SCHOOLS FACILITIES  
 617 LEXINGTON STREET  
 WALTHAM, MA 02452**

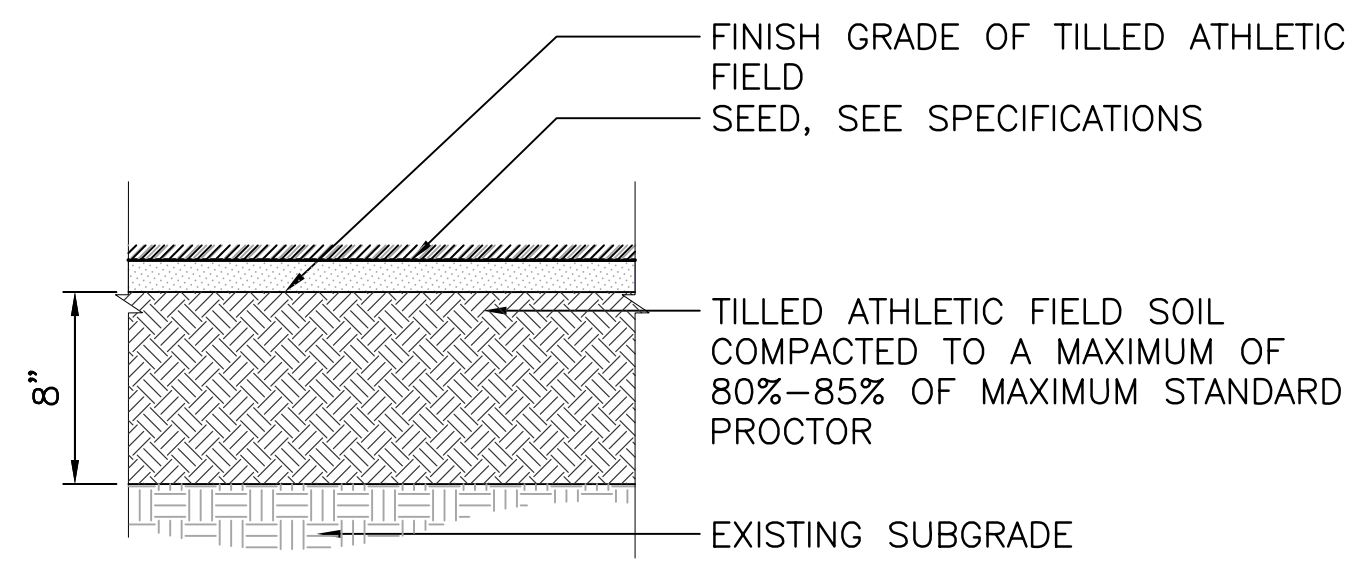
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**IRRIGATION PLAN**

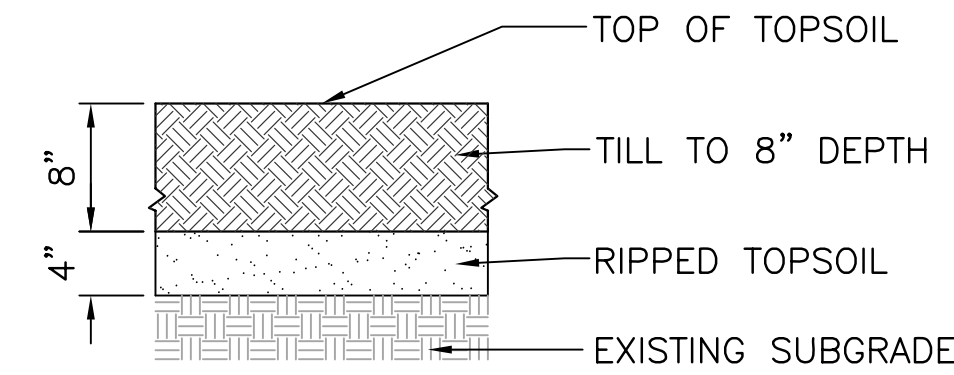
Scale 1"=20' Date MAY 14, 2013  
 Drawn By DRB  
 Checked By DRB  
 Approved By CCC  
 Project No. 1303.00

DWG No. **L.3** 188

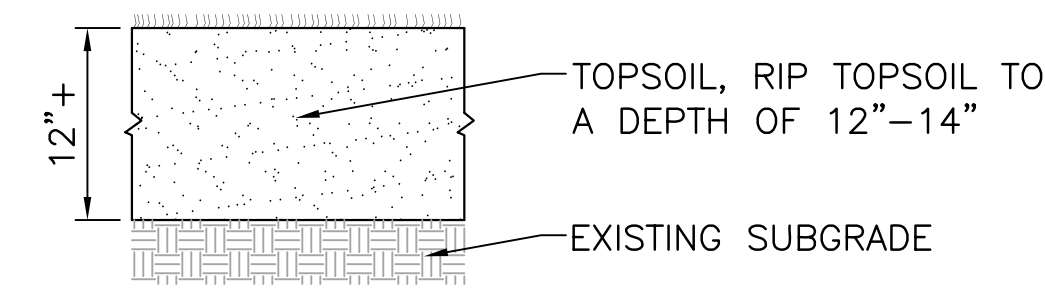




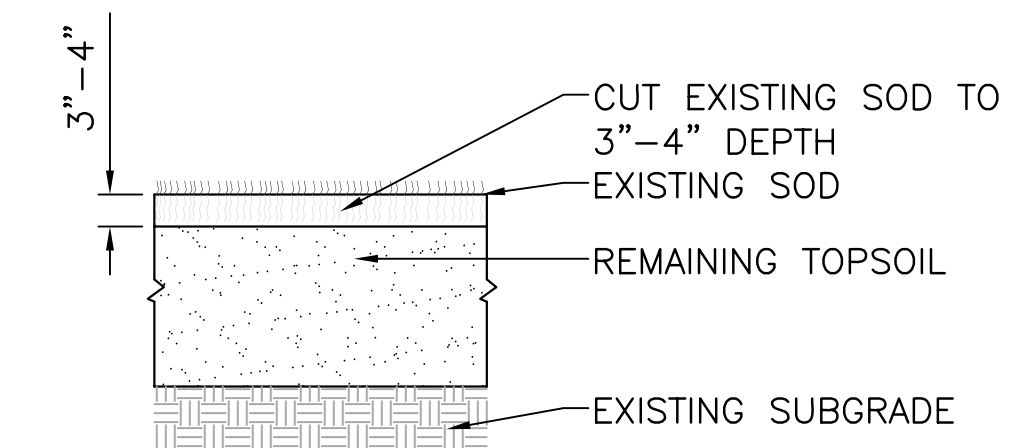
**4 SEEDED ATHLETIC FIELD SECTION**  
NTS



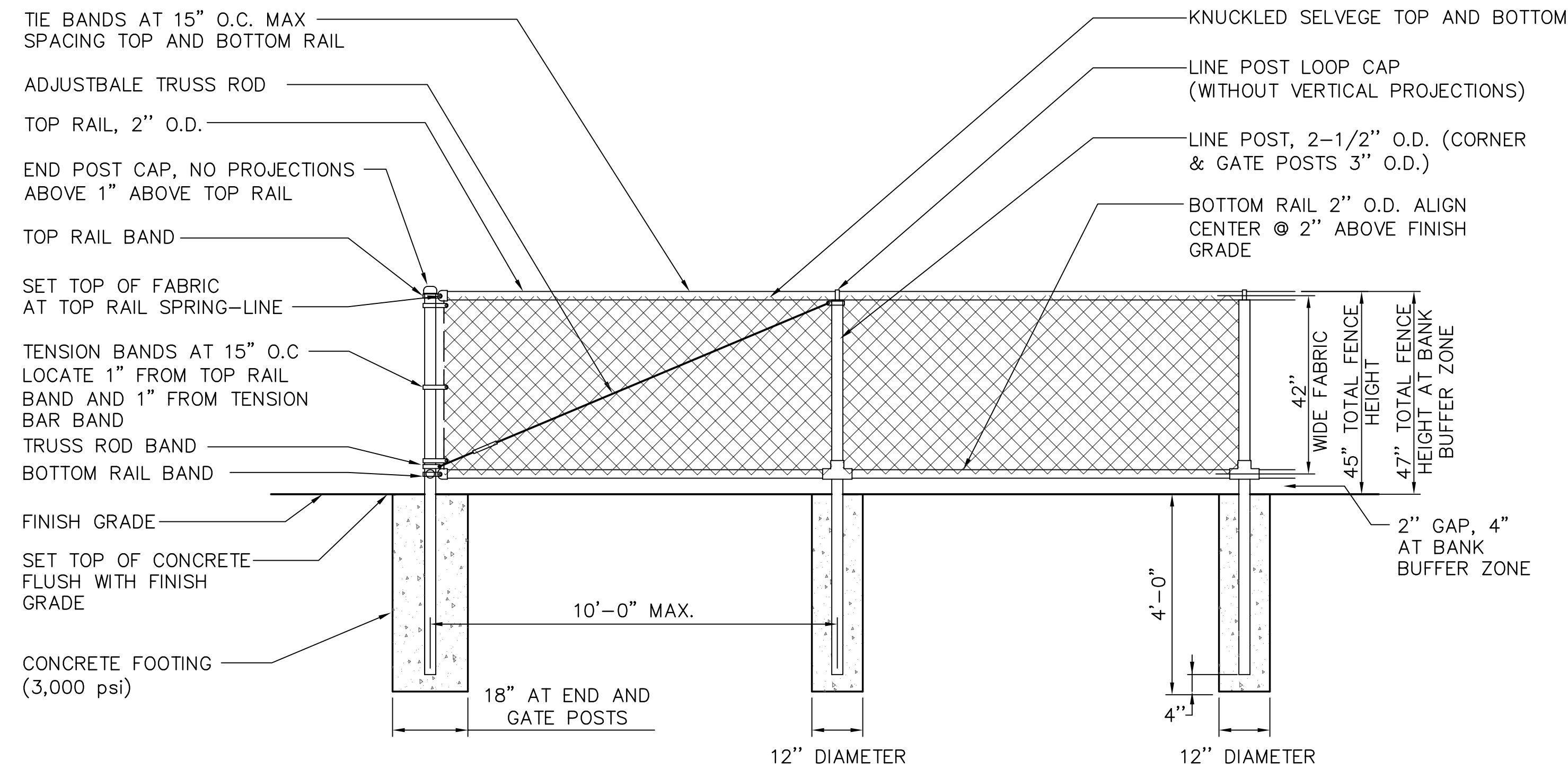
**3 TILLED ATHLETIC FIELD SOIL SECTION**  
NTS



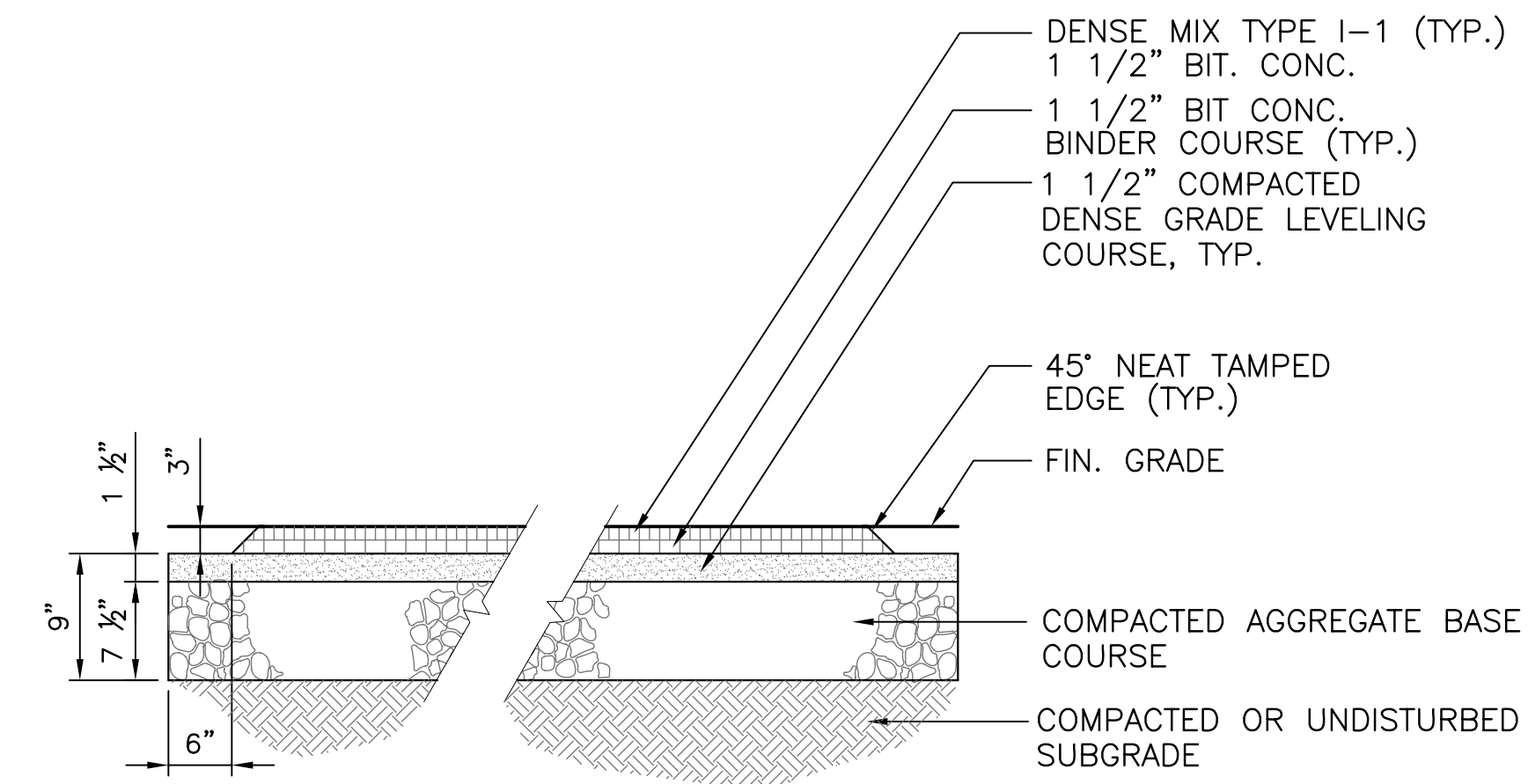
**2 EXISTING SOIL SECTION**  
NTS



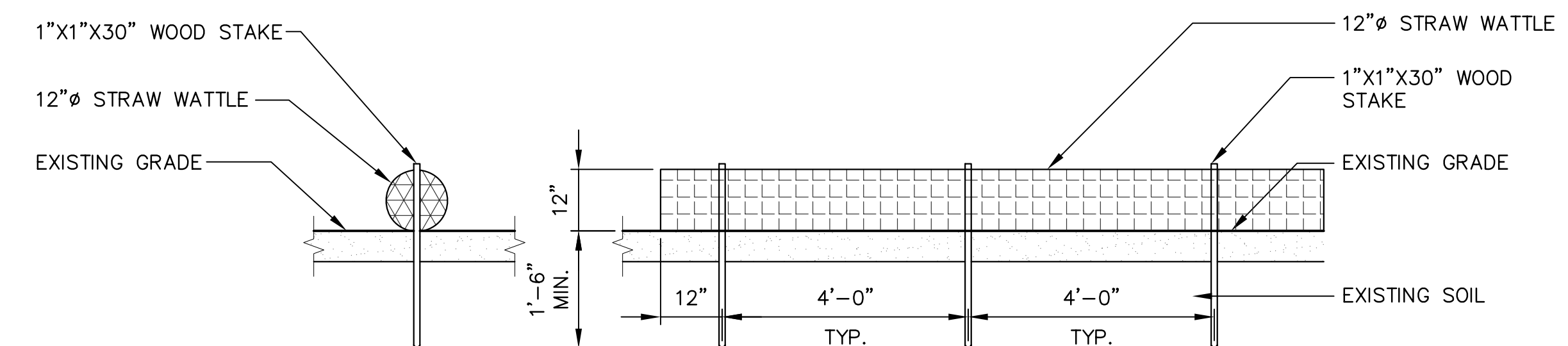
**1 SOD REMOVAL DETAIL**  
NTS



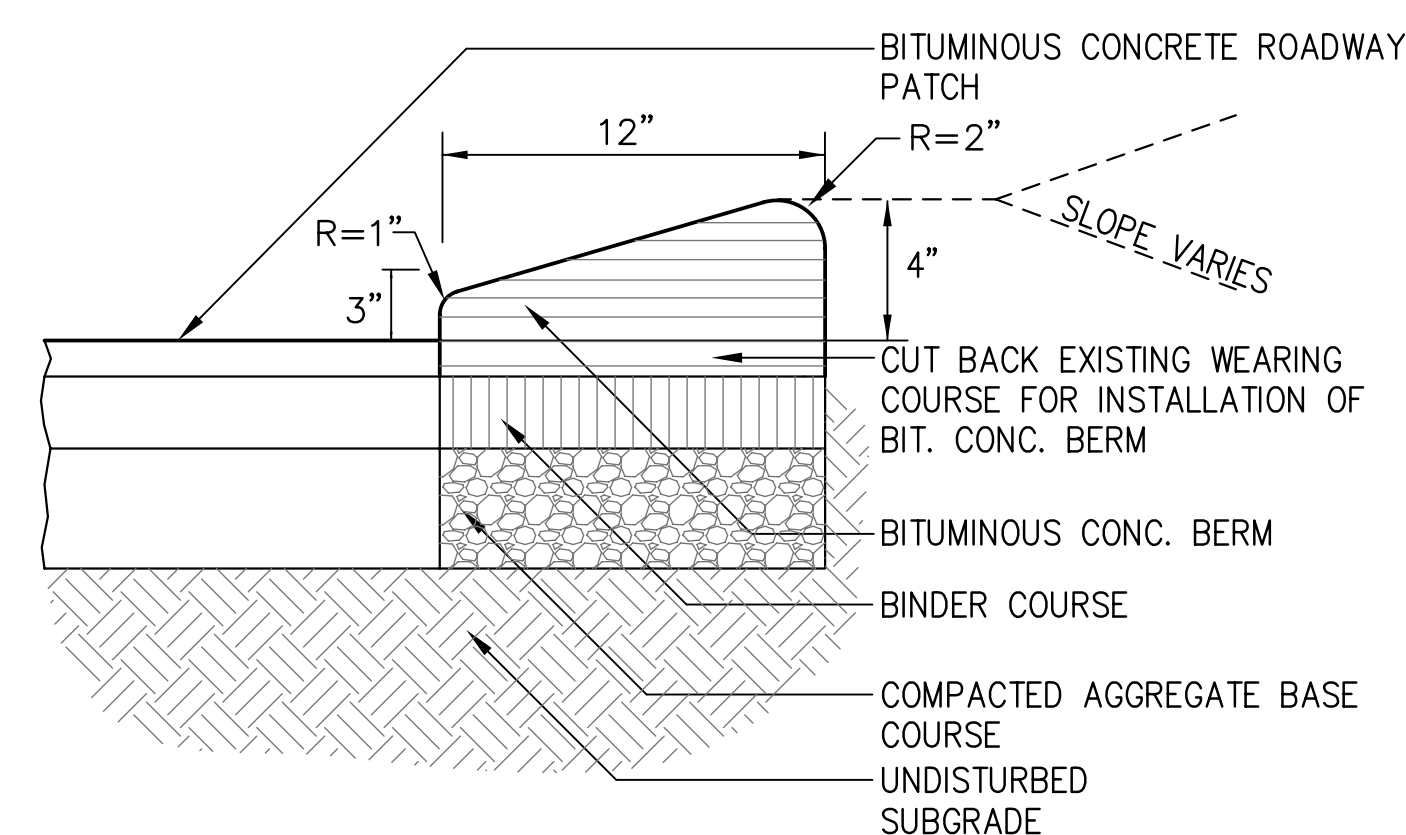
**8 CHAIN LINK FENCE - ELEVATION (TYPICAL)**  
NOT TO SCALE



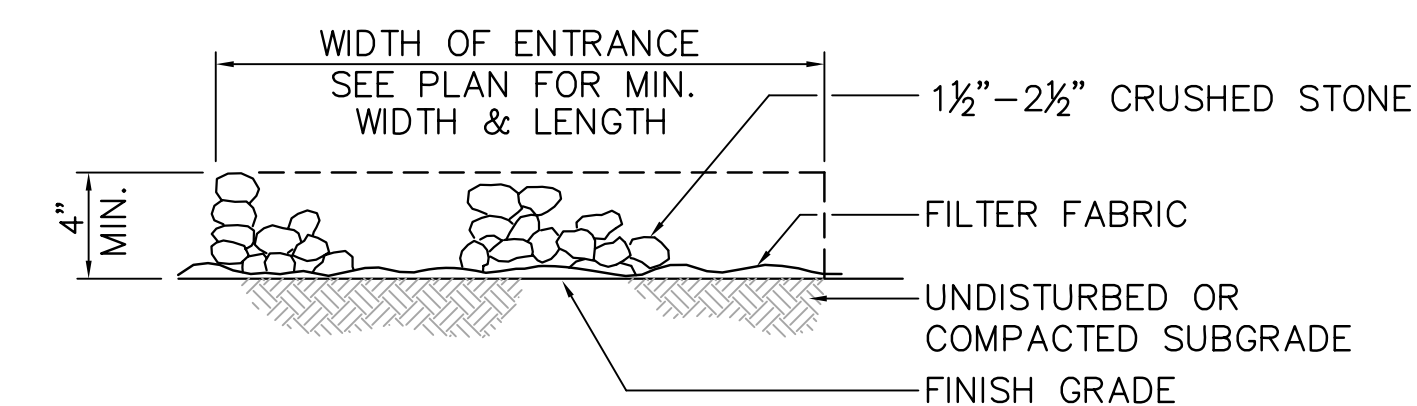
**5 BITUMINOUS CONCRETE PAVEMENT, TYP.**  
N.T.S.



**6 STRAW WATTLE DETAIL**  
N.T.S.



**9 BITUMINOUS CONCRETE BERM DETAIL - TYP.**  
N.T.S.



**7 STABILIZED CONSTRUCTION ENTRANCE DETAIL**  
N.T.S.

No.	Description	Date

REVISIONS



Project:

**KENNEDY MIDDLE SCHOOL  
ATHLETIC FIELD RENOVATION  
655 LEXINGTON STREET  
WALTHAM, MA 02452**

Prepared For:

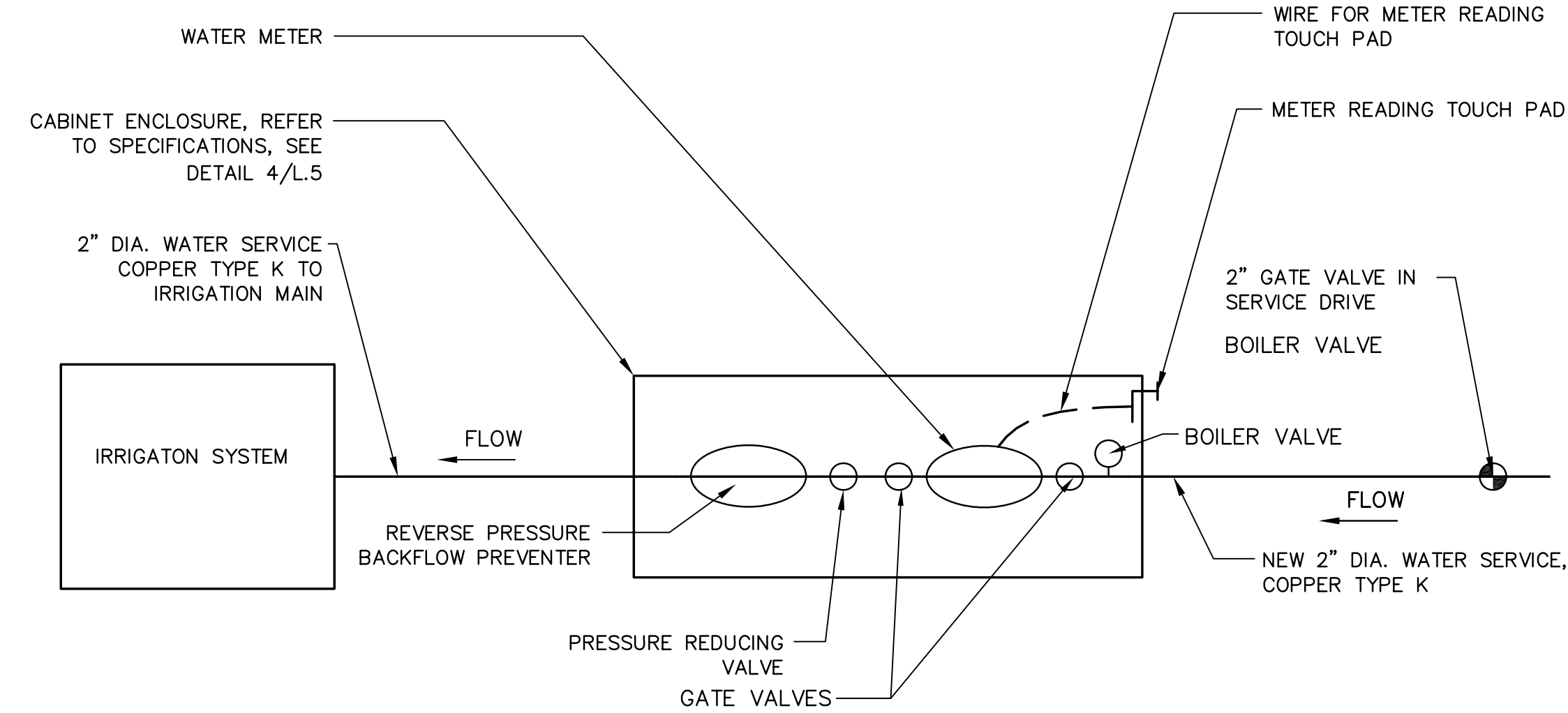
**WALTHAM PUBLIC  
SCHOOLS FACILITIES  
617 LEXINGTON STREET  
WALTHAM, MA 02452**

TITLE:

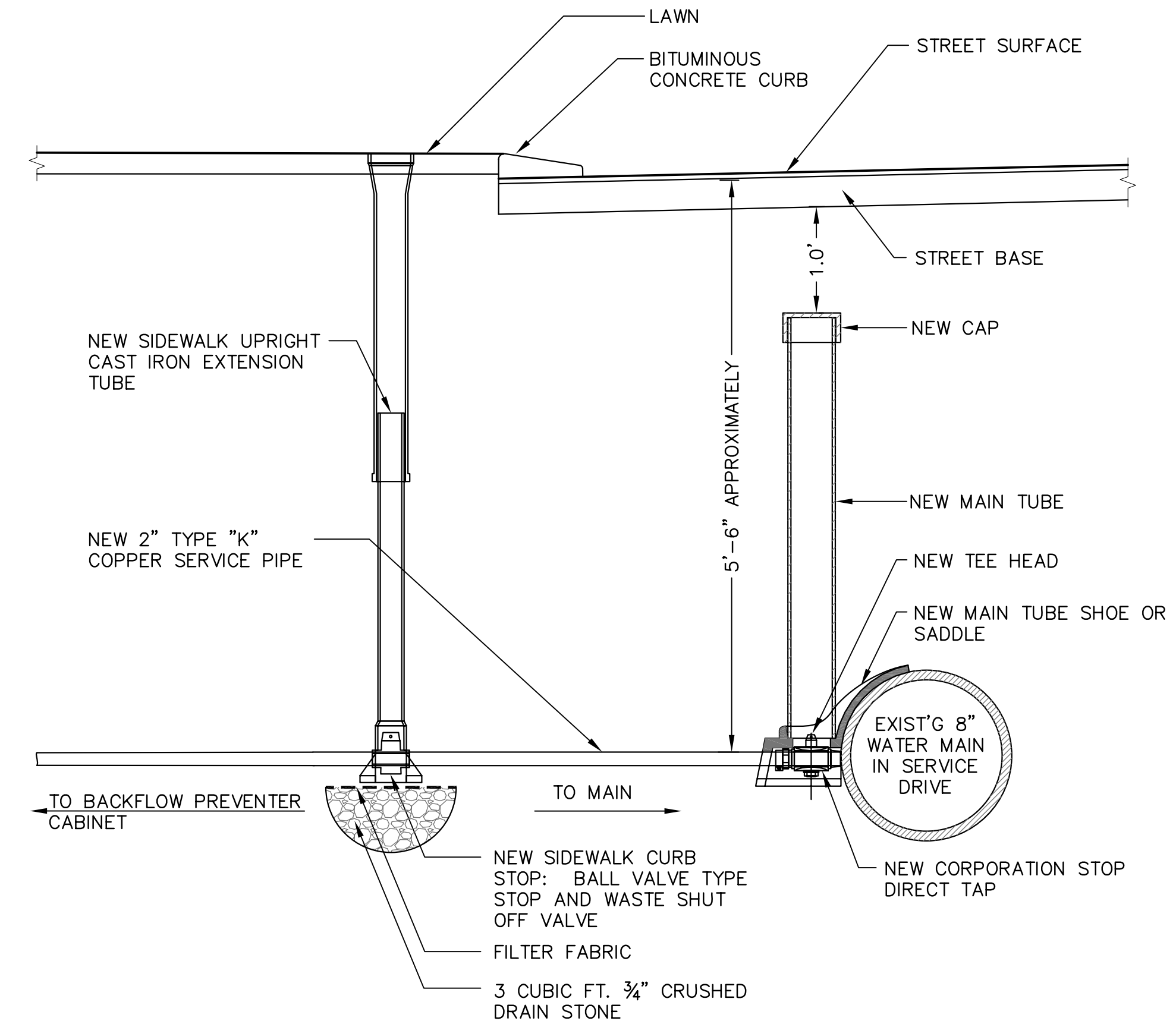
**FIELD DETAILS**

Scale AS NOTED Date MAY 14, 2013  
Drawn By DRB  
Checked By CCC  
Approved By CCC  
Project No. 1303.00

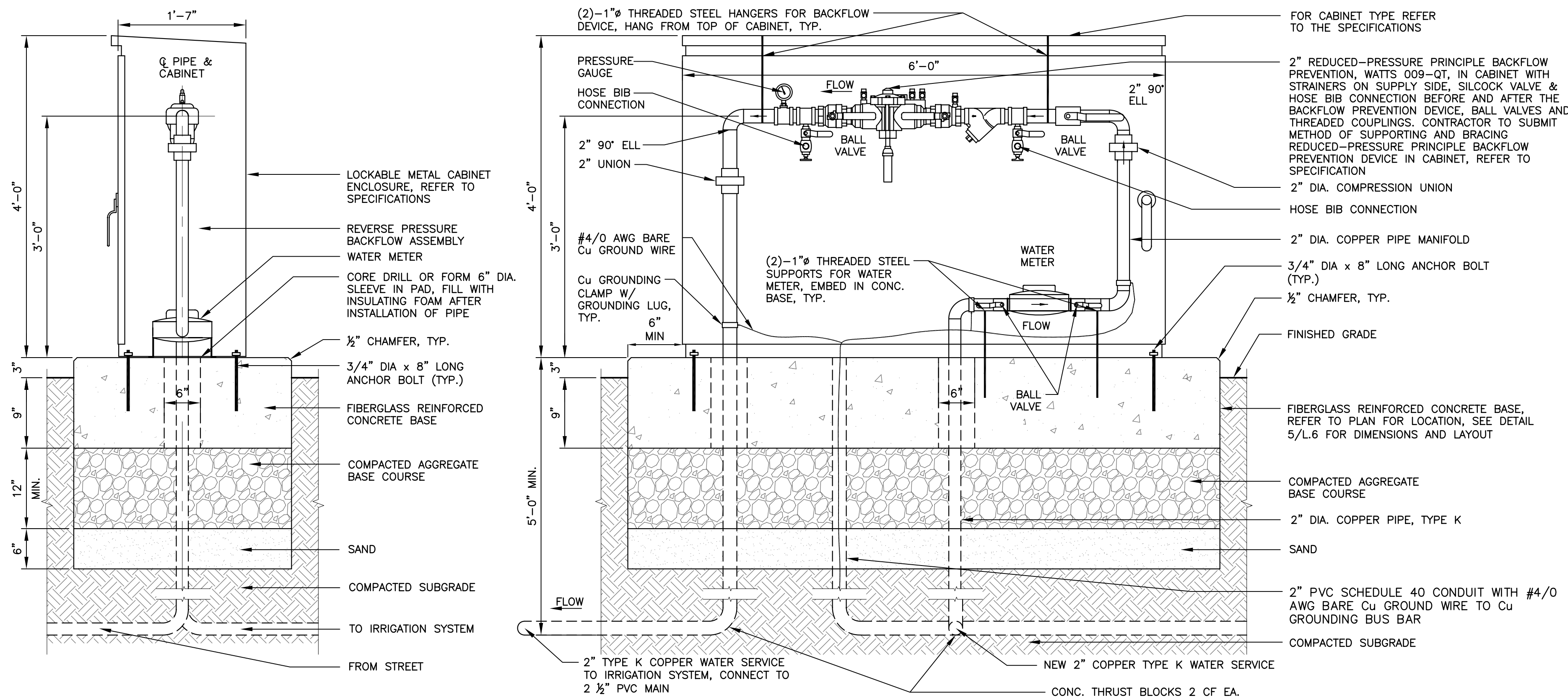
DWG No. **L.4**



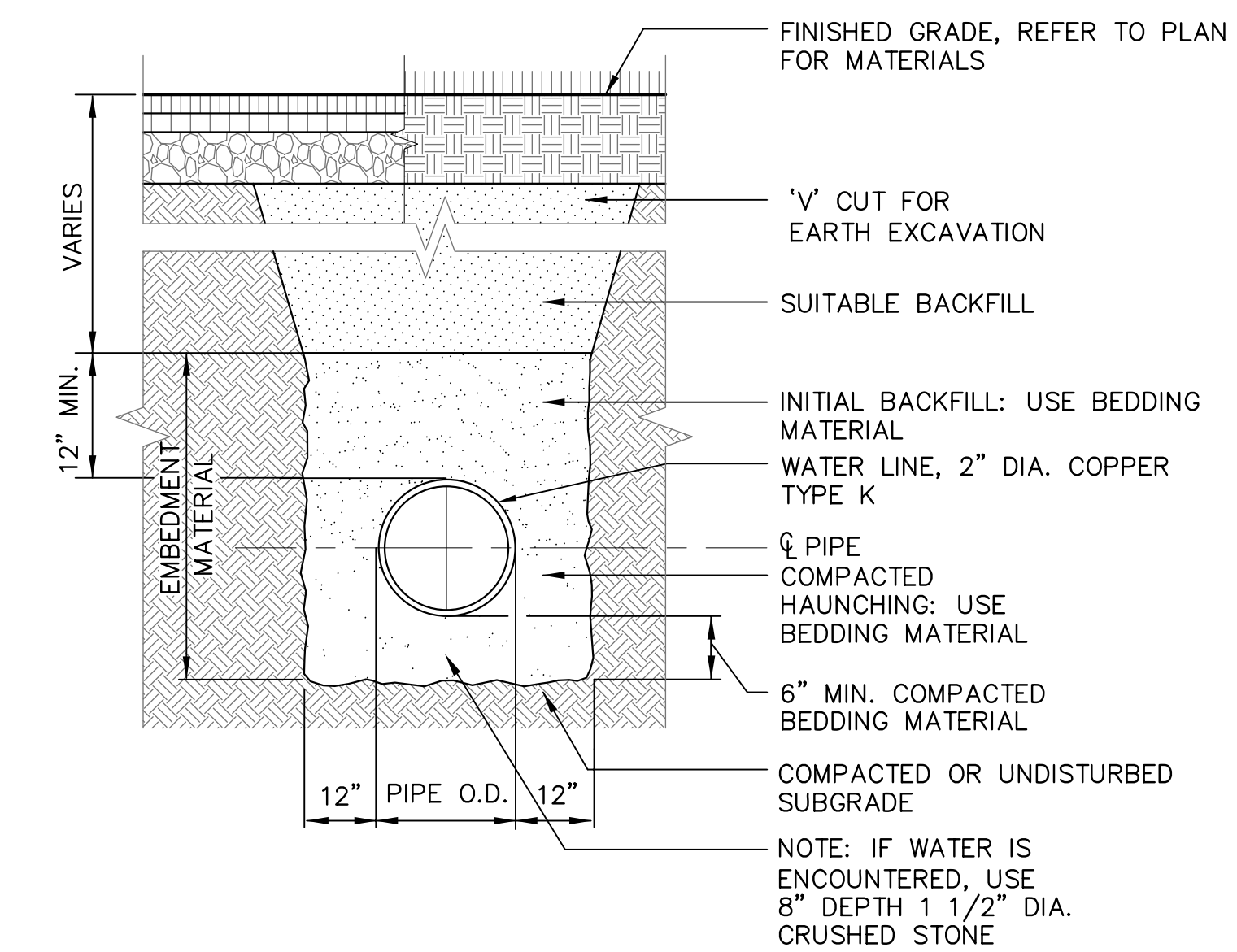
**3 WATER SERVICE ONE LINE SCHEMATIC**  
 N.T.S.



**1 WATER SERVICE TRENCH PROFILE**  
 N.T.S.



**4 REDUCED-PRESSURE PRINCIPLE BACKFLOW-PREVENTION DEVICE IN CABINET, TYP.**  
 N.T.S.



**2 WATER LINE TRENCH DETAIL**  
 N.T.S.

No.	Description	Date

REVISIONS



Project:

**KENNEDY MIDDLE SCHOOL  
 ATHLETIC FIELD RENOVATION  
 655 LEXINGTON STREET  
 WALTHAM, MA 02452**

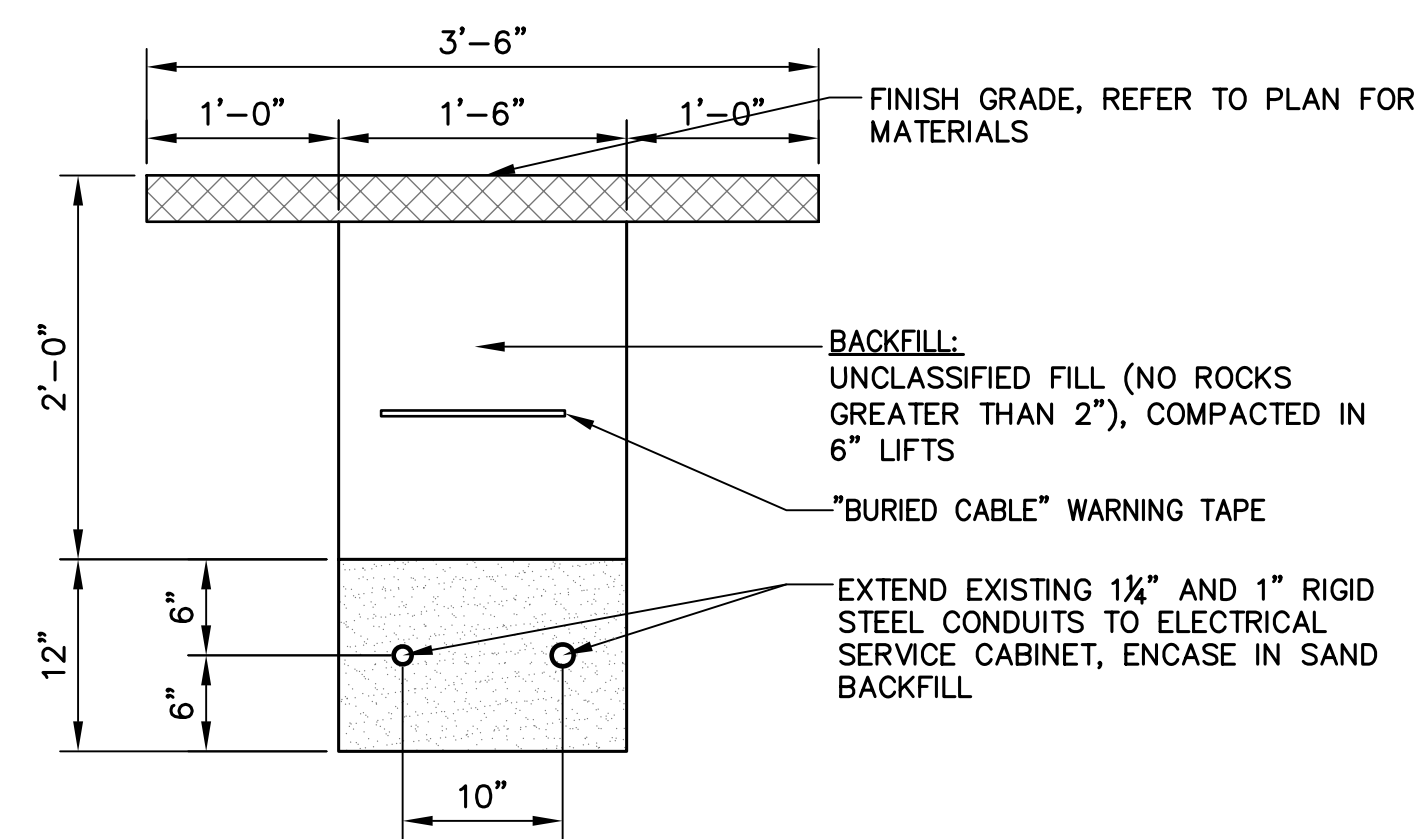
Prepared For:

**WALTHAM PUBLIC  
 SCHOOLS FACILITIES  
 617 LEXINGTON STREET  
 WALTHAM, MA 02452**

TITLE:  
**UTILITY DETAILS**

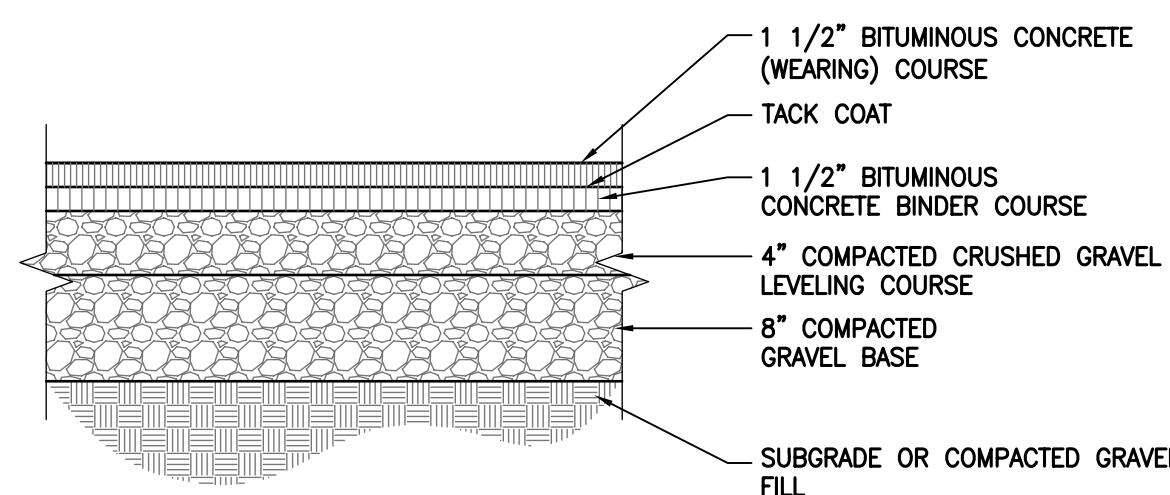
Scale AS NOTED Date MAY 14, 2013  
 Drawn By DRB  
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 Project No. 1303.00

DWG No. **L5**



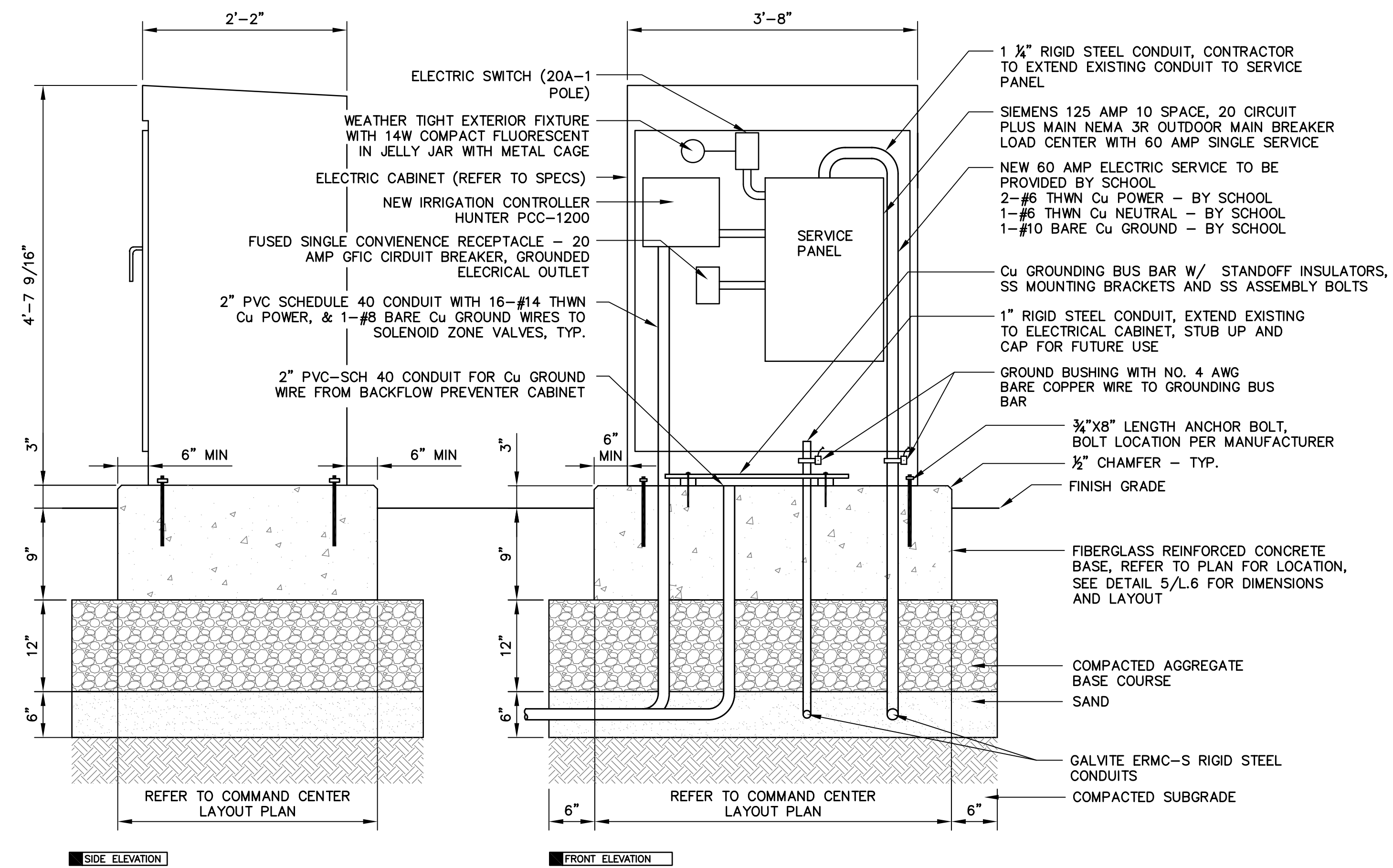
**3 RIGID CONDUIT DUCTBANK CROSS-SECTION DETAIL**

N.T.S.



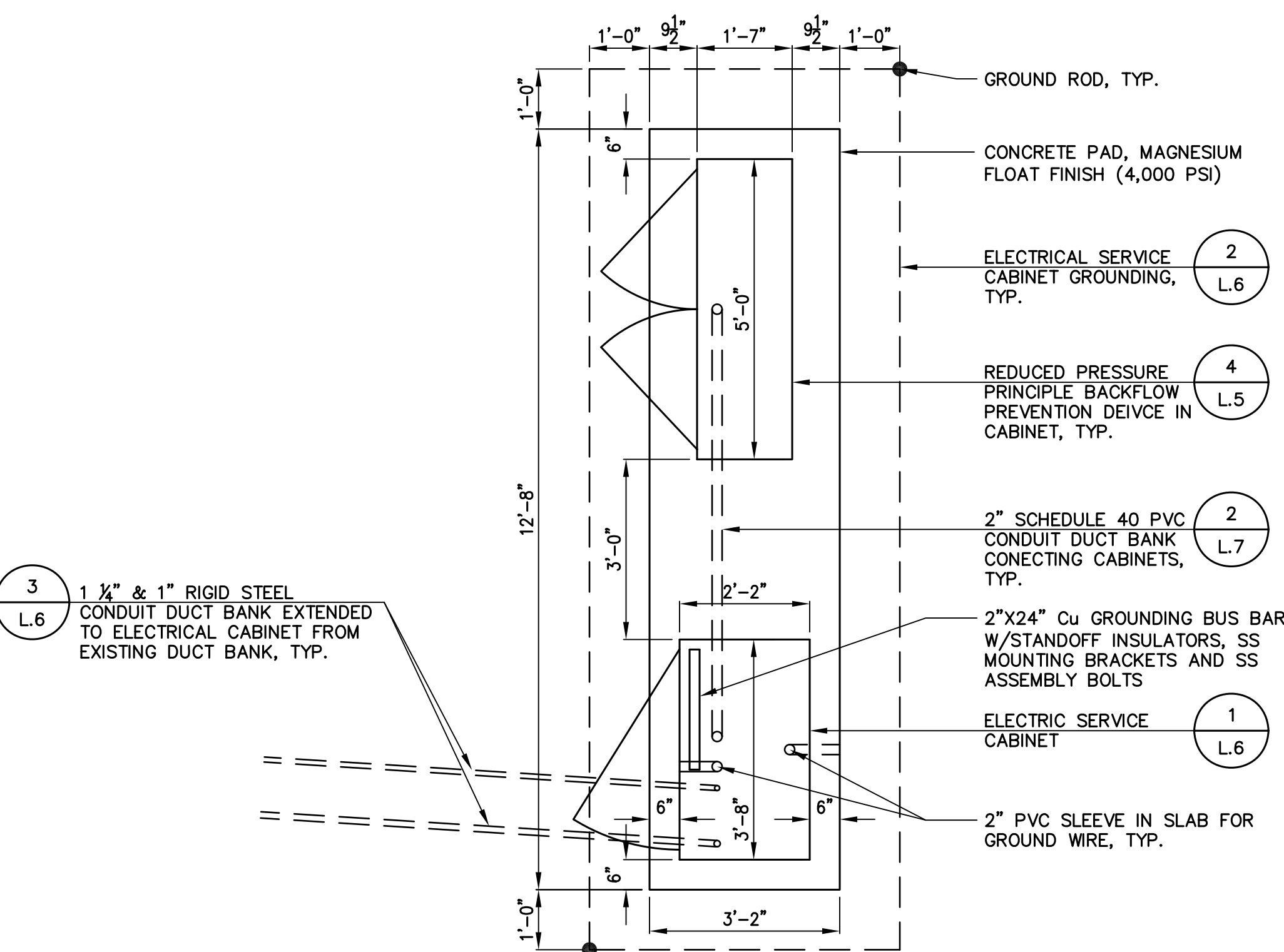
**4 BITUMINOUS ROADWAY TRENCH RESTORATION DETAIL**

N.T.S.



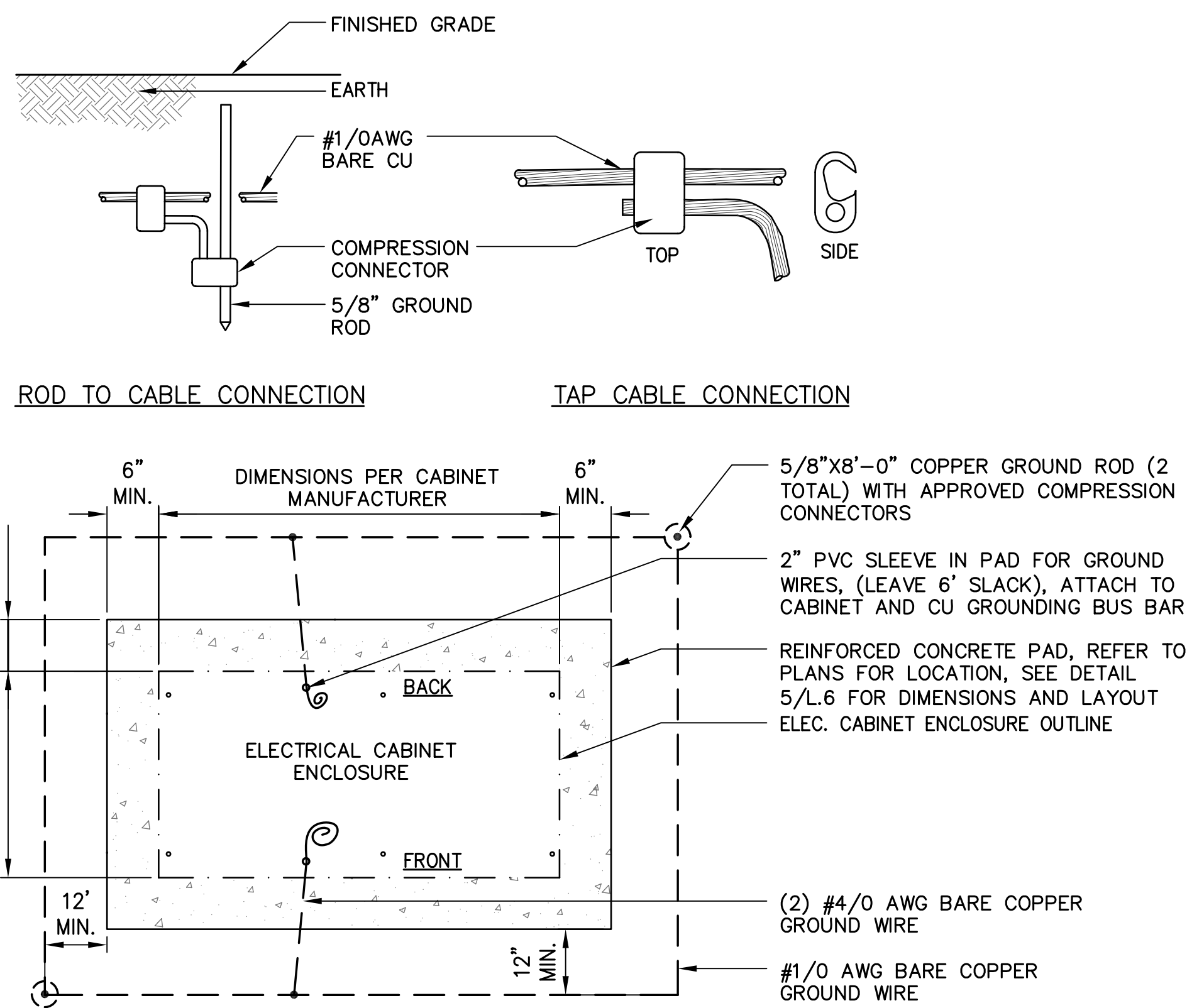
**1 ELECTRICAL SERVICE CABINET DETAIL**

N.T.S.



**5 COMMAND CENTER LAYOUT PLAN**

SCALE 1/2"=1'-0"



**2 ELECTRICAL SERVICE CABINET GROUNDING PLAN**

N.T.S.

No.	Description	Date

REVISIONS



Project:

**KENNEDY MIDDLE SCHOOL  
ATHLETIC FIELD RENOVATION  
655 LEXINGTON STREET  
WALTHAM, MA 02452**

Prepared For:

**WALTHAM PUBLIC  
SCHOOLS FACILITIES  
617 LEXINGTON STREET  
WALTHAM, MA 02452**

TITLE:  
**ELECTRICAL &  
GROUNDING DETAILS**

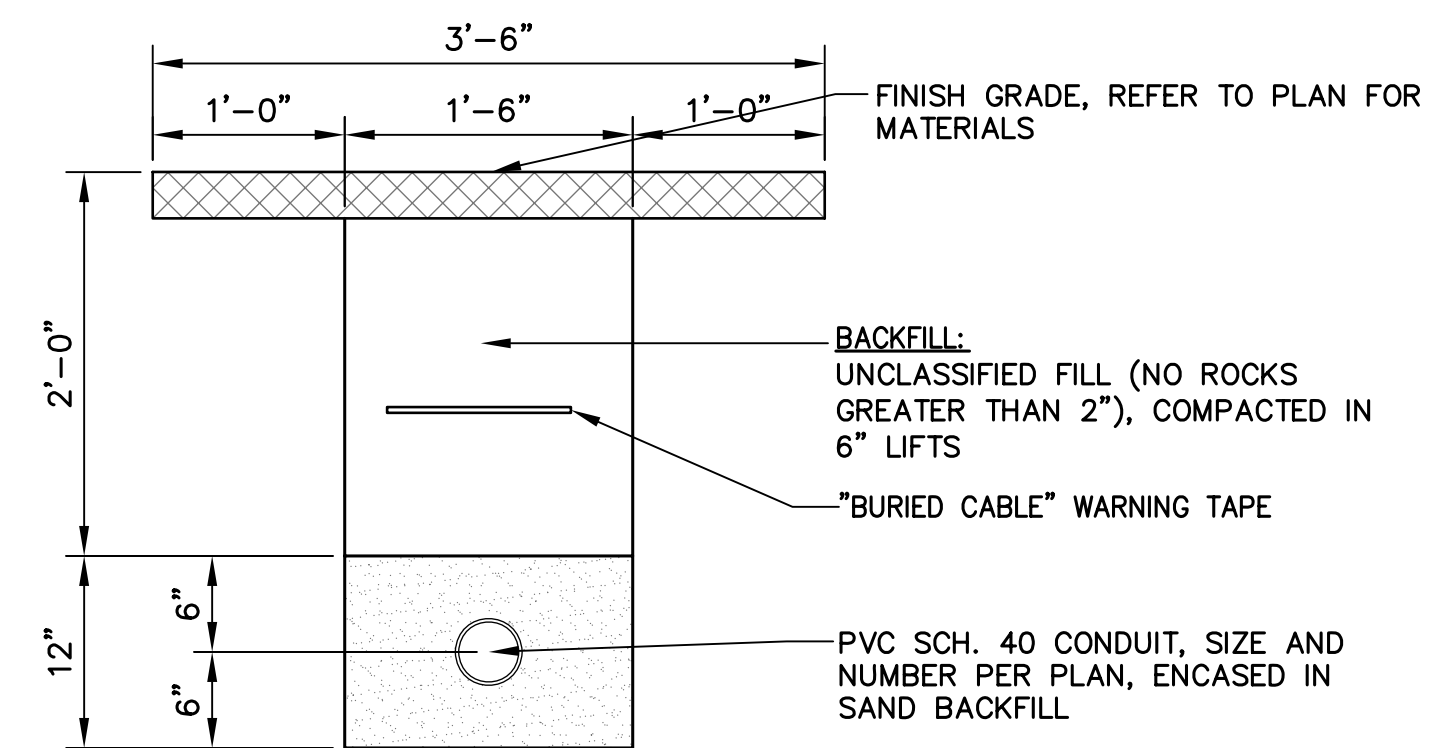
Scale AS NOTED Date MAY 14, 2013  
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Project No. 1303.00

DWG No. **L.6**

NEW SERVICE PANELBOARD - IN CABINET							
PHASE: 1		WIRES: 3		VOLTAGE: 120/240V		MAINS: 100A. MAIN C.B. (22KA - 18 CIRCUIT PANEL)	
CIRCUIT	BREAKER			DESCRIPTION OF LOAD	CABLE	CONDUIT	REMARKS
	FRAME	POLES(N-NEUTRAL)	TRIP				
M	60	2P	60	MAIN CIRCUIT BREAKER	3W#6 AWG CU & #10 GND	1-1 1/2" EMC	EXTEND EXISTING
1	20	1P	20	CONTROLLER	2W#12 AWG & #12 GND	1-1" PVC	
2	20	1P	20	DUPLEX RECEPTACLE IN CABINET	2W#12 AWG & #12 GND	1-1" PVC	
3	20	1P	20 GFIC	SWITCH AND SERVICE LIGHT IN CABINET	2W#12 AWG & #12 GND	1-1" PVC	
4	20	1P	20	SPARES 1P/20A (5 TOTAL)			
5	-	1P	-	SPACES 1P (12 TOTAL)			

BRANCH CIRCUITS SCHEDULE	
120 OR 277 VOLT 1Ø, 2W. CIRCUITS	
CIRCUIT BREAKER	CONDUCTOR
30A-1P	2#10+1#10 GND. - 1" C
40A-1P	2#8+1#10 GND. - 1" C
50A-1P	2#6+1#10 GND. - 1" C
60A-1P	2#6+1#10 GND. - 1" C
208 VOLT 1Ø, 2W. CIRCUITS	
CIRCUIT BREAKER	CONDUCTOR
20A-2P	2#12+1#12 GND. - 1" C
30A-2P	2#10+1#10 GND. - 1" C
40A-2P	2#8+1#10 GND. - 1" C
50A-2P	2#6+1#10 GND. - 1" C
60A-2P	2#6+1#10 GND. - 1" C

**1 PANELBOARD SCHEDULE & ELECTRICAL NOTES**  
 N.T.S.



**2 PVC CONDUIT DUCTBANK CROSS-SECTION DETAIL**  
 N.T.S.

No.	Description	Date

REVISIONS

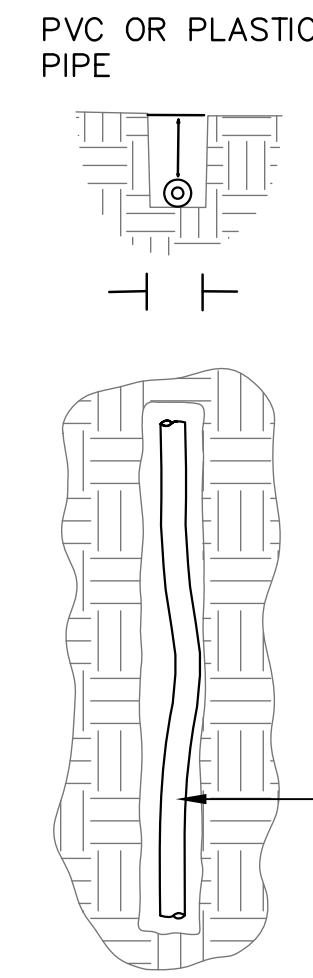
Project:  
**KENNEDY MIDDLE SCHOOL  
 ATHLETIC FIELD RENOVATION  
 655 LEXINGTON STREET  
 WALTHAM, MA 02452**

Prepared For:  
**WALTHAM PUBLIC  
 SCHOOLS FACILITIES  
 617 LEXINGTON STREET  
 WALTHAM, MA 02452**

TITLE:  
**ELECTRICAL &  
 GROUNDING DETAILS**

Scale AS NOTED Date MAY 14, 2013  
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 Project No. 1303.00

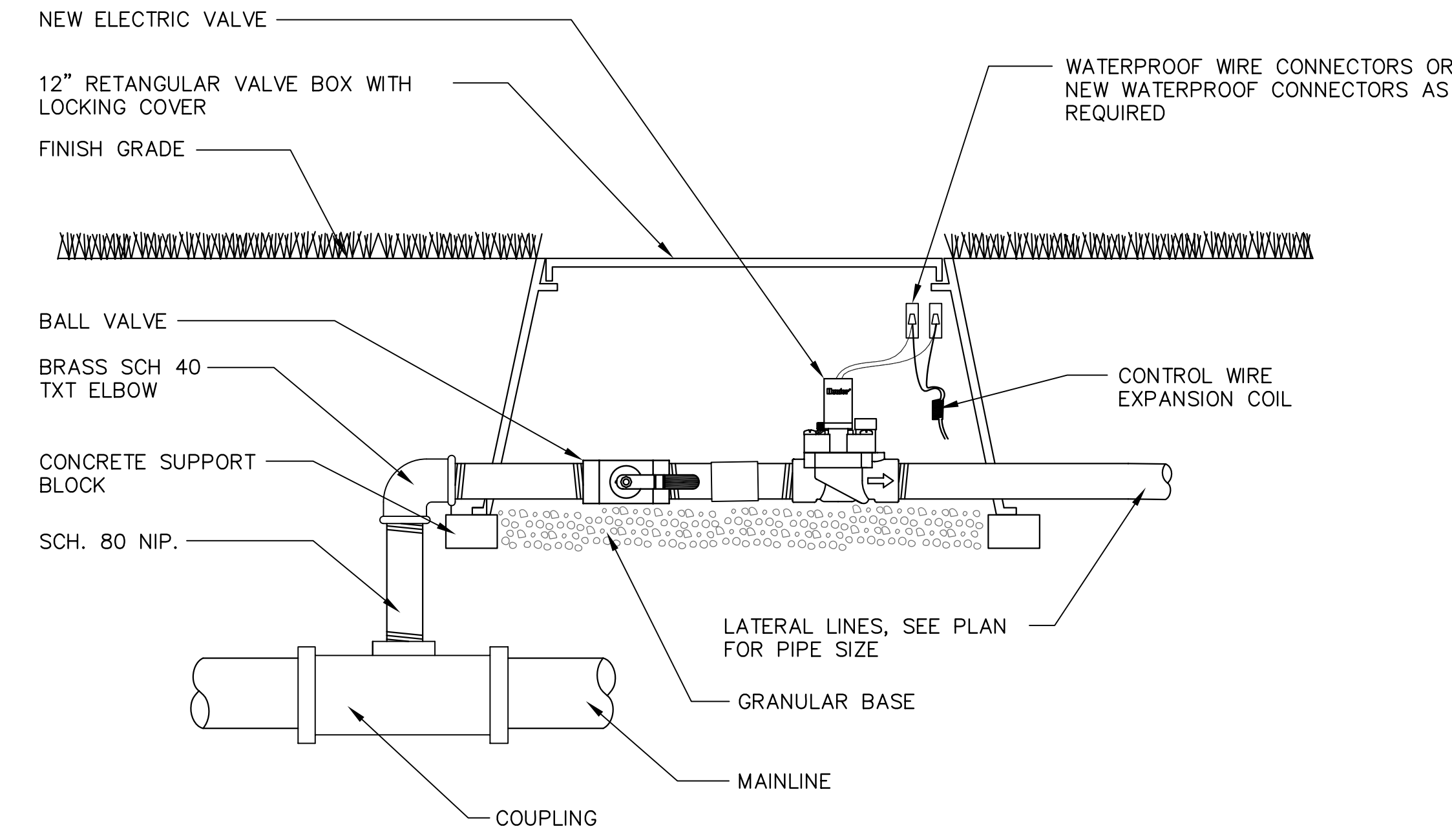
DWG No. **L.7**



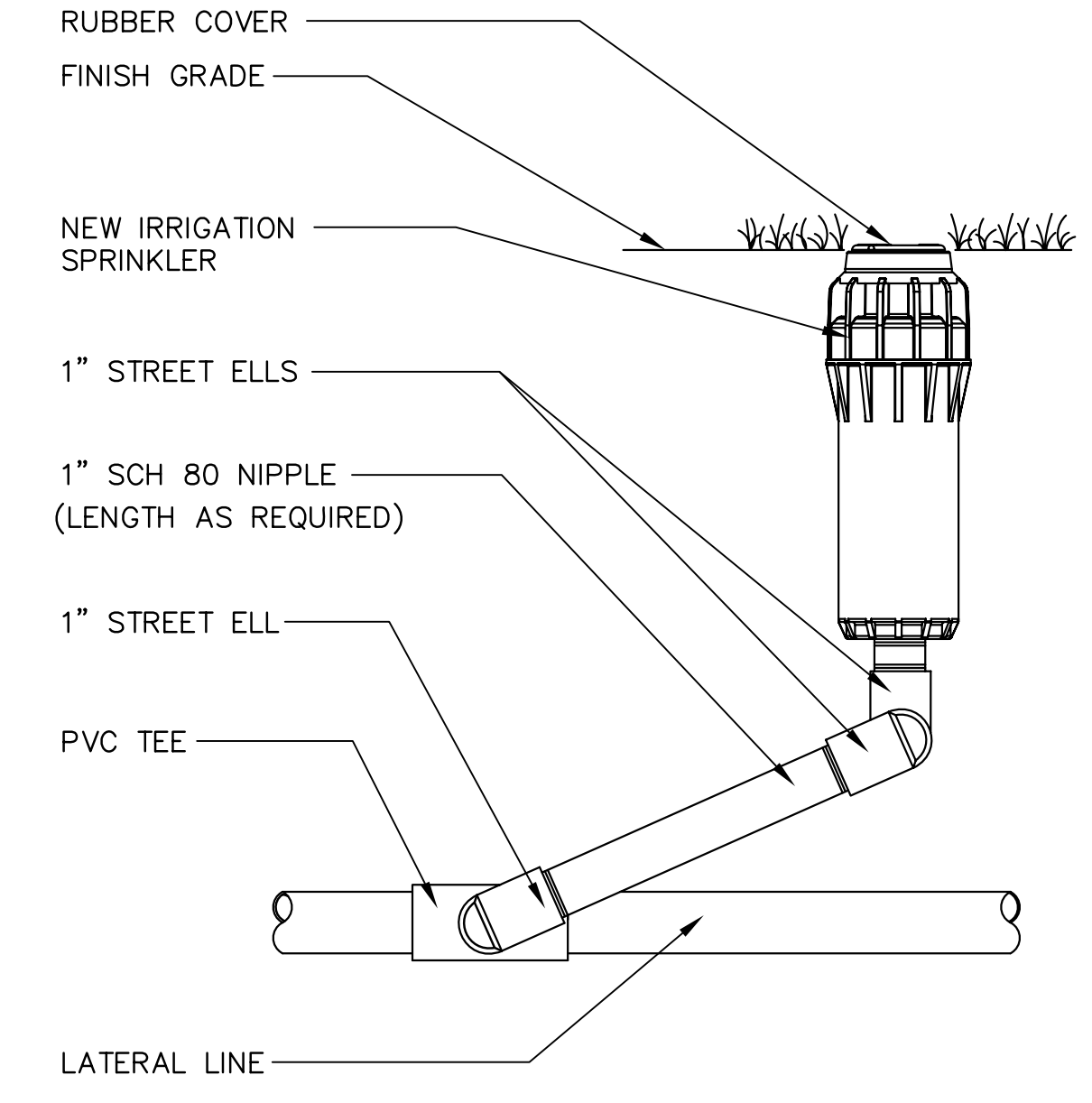
ALL PIPE TO BE INSTALLED IN TRENCHES AS SHOWN

NOTE:  
 ALL OF THE PIPE DEPTHS ARE BASED ON THE INDIVIDUAL PIPE SIZES. REFER TO THE SPECIFICATIONS FOR THE MINIMUM DEPTH OF COVER FOR EACH SIZE OF PIPE.

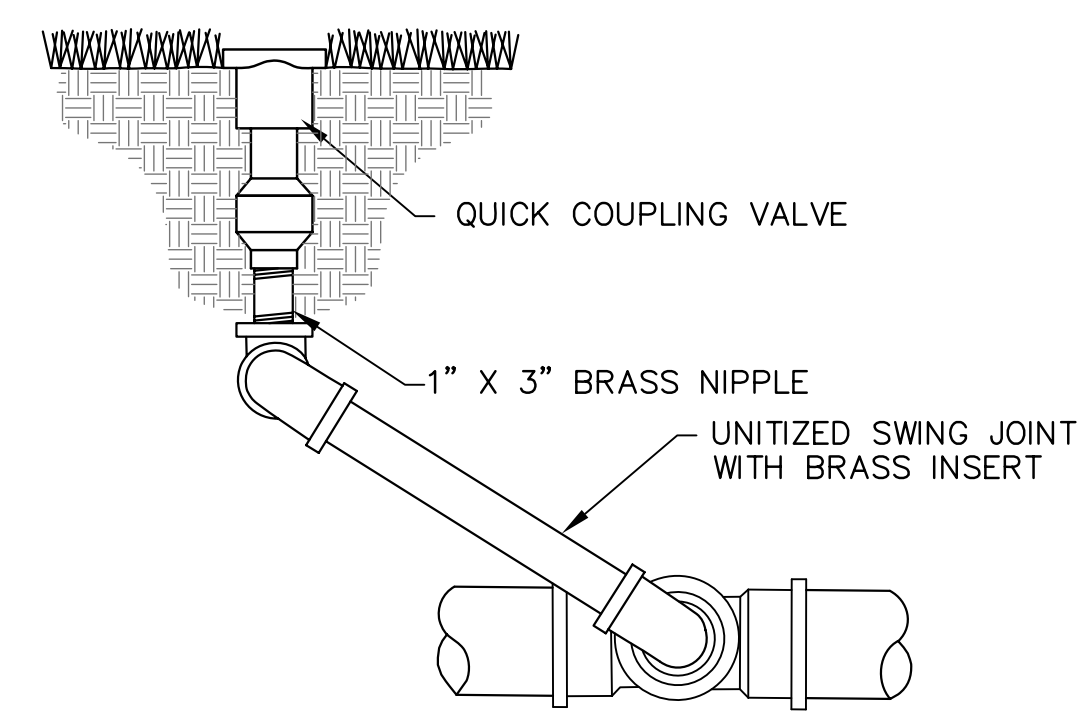
**4 TRENCH DETAIL (TYPICAL)**  
 NOT TO SCALE



**3 AUTOMATIC CONTROL VALVE (TYPICAL)**  
 NOT TO SCALE



**1 GEAR DRIVEN ROTARY IRRIGATION SPRINKLER INSTALLATION DETAIL (TYPICAL)**  
 NOT TO SCALE



**5 QUICK COUPLING VALVE DETAIL (TYPICAL)**  
 NOT TO SCALE

PROVIDE THRUST BLOCKS AT ALL CHANGES IN SIZE OR DIRECTION, ELBOWS, REDUCERS, PLUGS, VALVES, AND THE OPPOSITE SIDE OF TEE BRANCHES.

THE SIZES OF THE BLOCK IS DETERMINED BY THE WORKING PRESSURE, THE SIZE AND TYPE OF FITTING, AND SOIL CONDITIONS AT THE JOB SITE. TO CALCULATE THE AREA OF CONTACT WITH THE SOIL, FOLLOW THESE STEPS:

- CALCULATE THE THRUST BY SELECTING THE VALVE BY SIZE AND TYPE OF FITTING (TABLE 1), AND MULTIPLYING THAT VALUE BY THE MAXIMUM WORKING PRESSURE AT THE FITTING.
- DIVIDE THE TOTAL THRUST BY BEARING CAPACITY OF THE SOIL IN EXCAVATION (TABLE 2).
- THE RESULT IS THE TOTAL AREA (IN SQUARE FEET) OF THRUST BLOCK REQUIRED TO BE IN CONTACT WITH THE UNDISTURBED SOIL OF THE TRENCH WALL.

Table 1  
 Fitting Thrust Factors

Size	Tee, Cap or Valve	90° Elbow	45° Elbow	22.5° Elbow
1 1/2	2.94	4.16	2.25	1.15
2	4.56	6.45	3.50	1.78
2 1/2	6.65	9.40	5.10	2.60
3	9.80	13.90	7.51	3.82
4	16.20	23.00	12.40	6.31
6	34.80	49.20	26.70	13.60
8	59.00	83.50	45.20	23.00
10	91.50	130.00	70.00	35.80
12	129.00	182.00	98.50	50.30

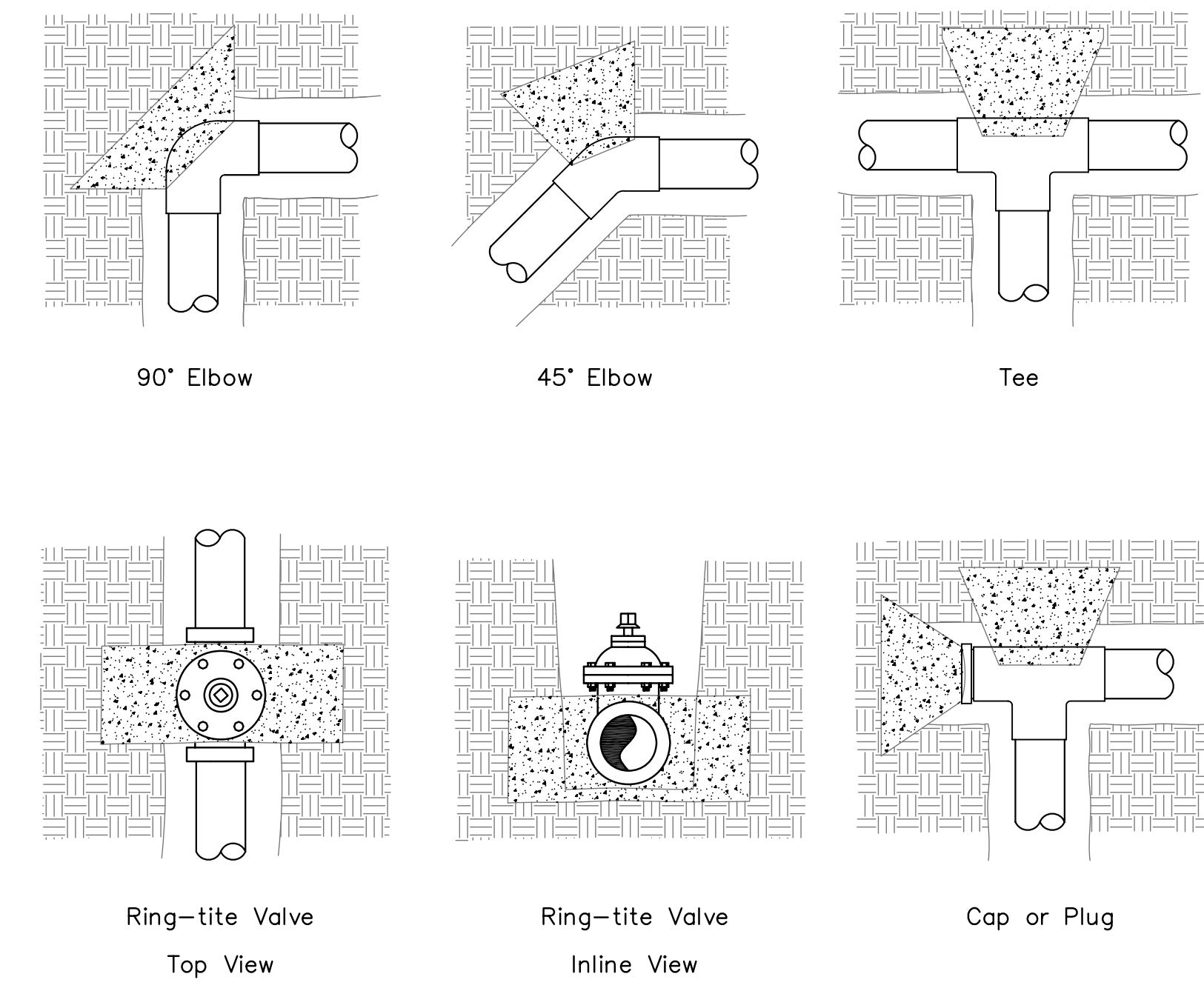
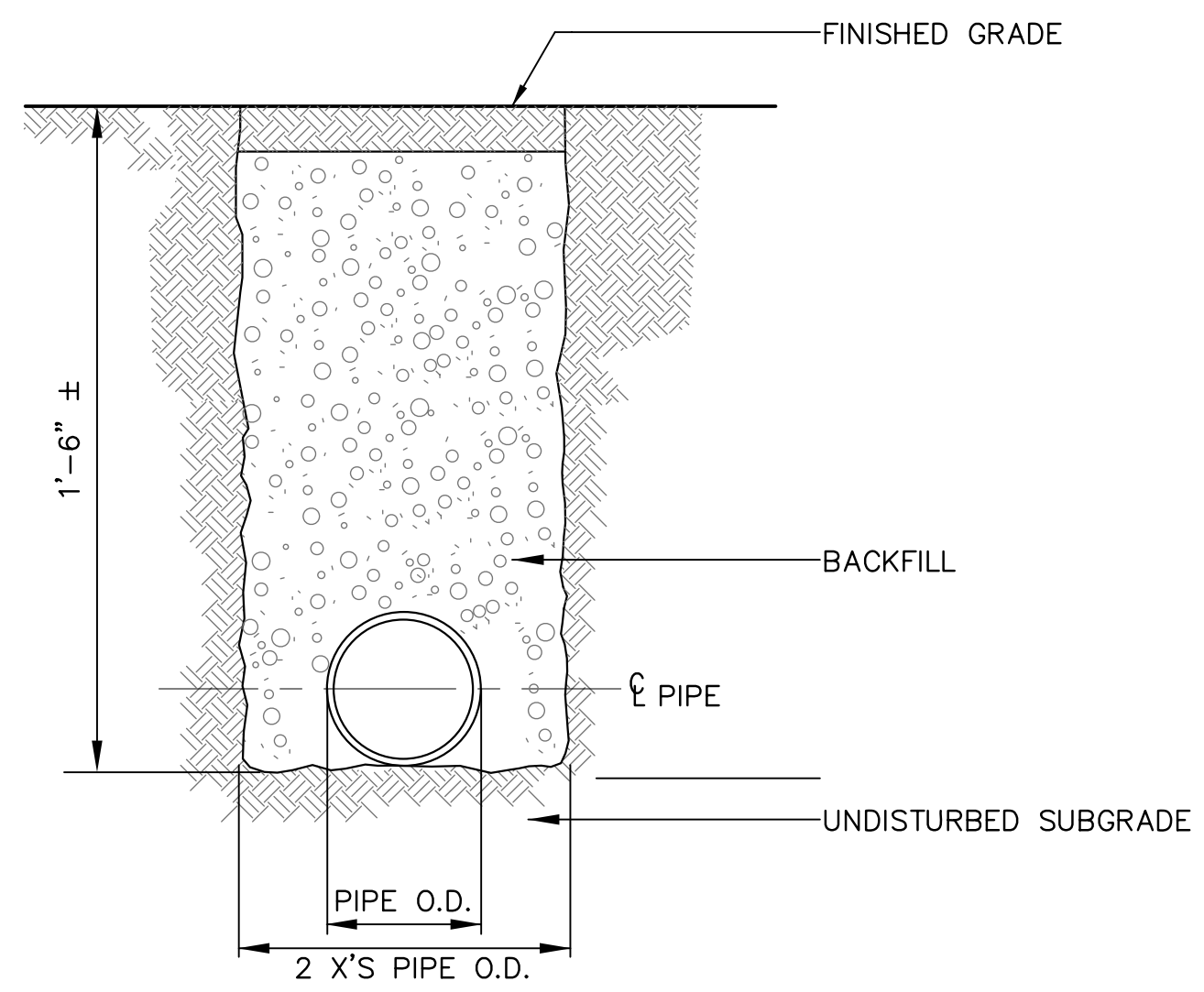


Table 2  
 Soil Bearing Loads

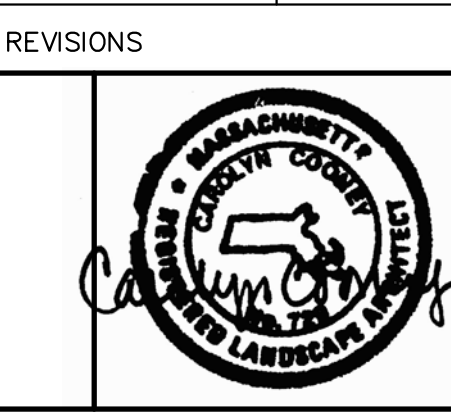
SOIL TYPE	SAFE BEARING LOAD LBS PER SQ FT
Muck, peat, etc.	0
Soft Clay	500
Medium Clay	1,000
Sand	1,000
Sand & Gravel	1,500
Compact Sand	3,000
Sand & Gravel cemented w/Clay	4,000
Hard Pan Clay	5,000
Sound Shale	10,000



**6 TRENCH SECTION PVC MAIN (TYPICAL)**  
 NOT TO SCALE

**2 THRUST BLOCKING DETAIL (TYPICAL)**  
 NOT TO SCALE

No.	Description	Date



Project:  
**KENNEDY MIDDLE SCHOOL  
 ATHLETIC FIELD RENOVATION  
 655 LEXINGTON STREET  
 WALTHAM, MA 02452**

Prepared For:  
**WALTHAM PUBLIC  
 SCHOOLS FACILITIES  
 617 LEXINGTON STREET  
 WALTHAM, MA 02452**

TITLE:  
**IRRIGATION DETAILS**

Scale AS NOTED Date MAY 14, 2013  
 Drawn By DRB  
 Checked By CCC  
 Approved By CCC  
 Project No. 1303.00

DWG No. **L.8**

Construction Bid Documents

# KENNEDY MIDDLE SCHOOL ATHLETIC FIELD RESTORATION

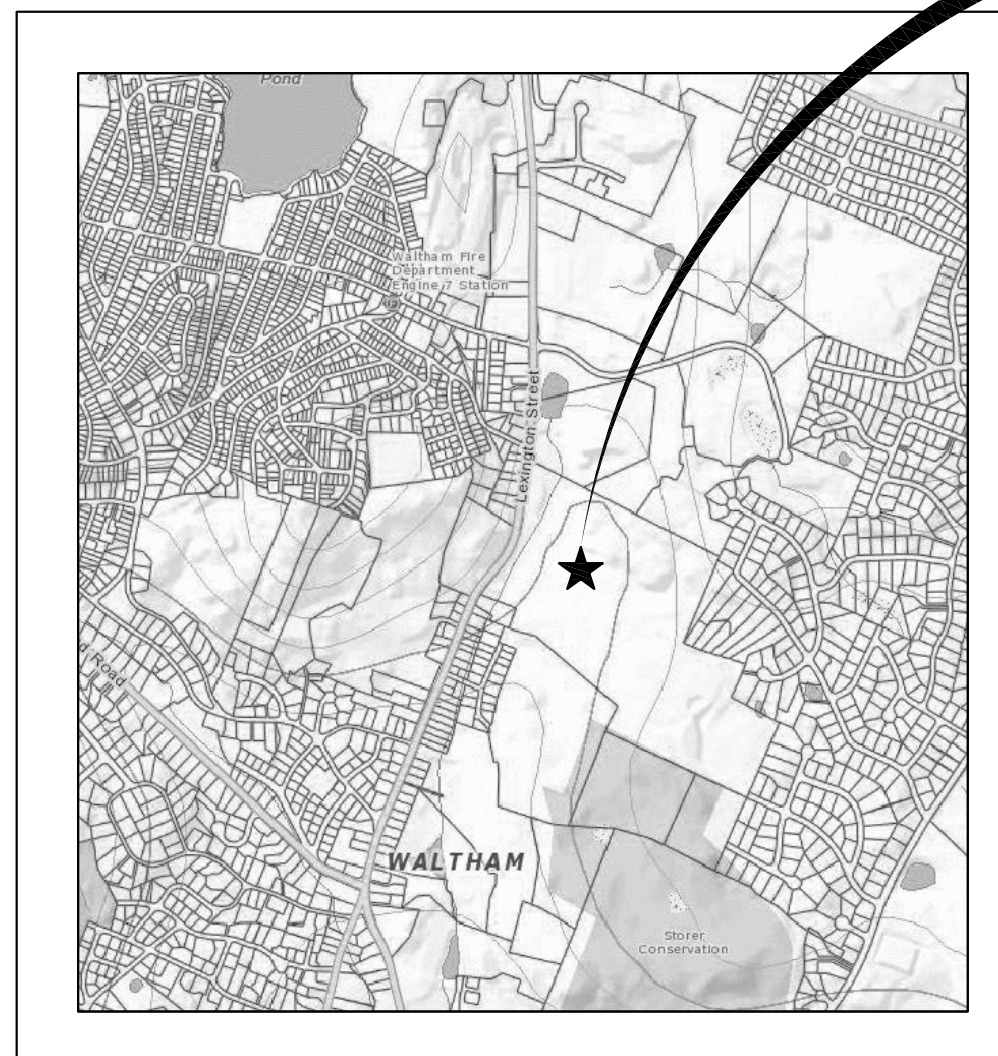
**655 LEXINGTON STREET  
WALTHAM, MASSACHUSETTS 02452**

**MAYOR JEANNETTE A. McCARTHY  
CITY OF WALTHAM**

WALTHAM PUBLIC SCHOOLS FACILITIES  
617 LEXINGTON STREET  
WALTHAM, MASSACHUSETTS 02452

MAY 14, 2013

## Locus Plan



PROJECT SITE

LANDSCAPE ARCHITECT:  
CAROLYN COONEY & ASSOCIATES

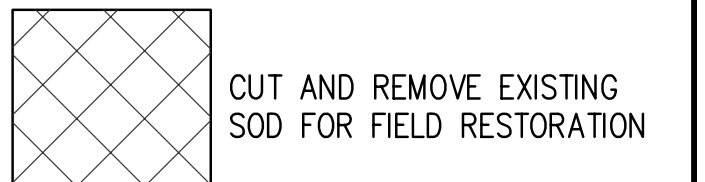
13 ELM STREET  
MILFORD, MASSACHUSETTS 01757  
TEL: (508) 478-8426 FAX: (508) 478-8607

## Index of Drawings

G.1	GENERAL NOTES
EX.1	TOPOGRAPHIC SURVEY
L.1	SITE PREP & DEMOLITION PLAN
L.2	FIELD RESTORATION PLAN
L.3	IRRIGATION PLAN
L.4	FIELD DETAILS
L.5	UTILITY DETAILS
L.6	ELECTRICAL & GROUNDING DETAILS
L.7	ELECTRICAL & GROUNDING DETAILS
L.8	IRRIGATION DETAILS



**LEGEND**



**NOTE:**

THE CONTRACTOR MUST HAVE APPROVAL BY THE ARCHITECT AND OWNER FOR ALL MATERIALS STORED ON SITE. A STORAGE AREA SHALL BE DESIGNATED AND APPROVED BY THE ARCHITECT AND SCHOOL DEPARTMENT FOR STORAGE OR STOCK PILE OF MATERIALS ON SITE FOR THE EXECUTION OF THIS CONTRACT.

No.	Description	Date

**REVISIONS**



Project:

**KENNEDY MIDDLE SCHOOL  
ATHLETIC FIELD RENOVATION  
655 LEXINGTON STREET  
WALTHAM, MA 02452**

Prepared For:

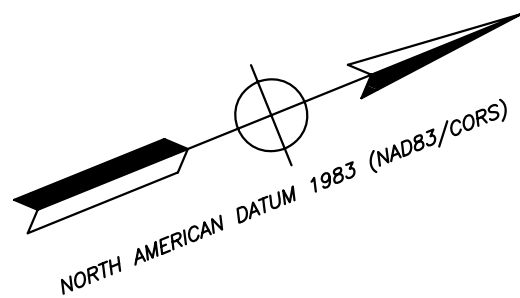
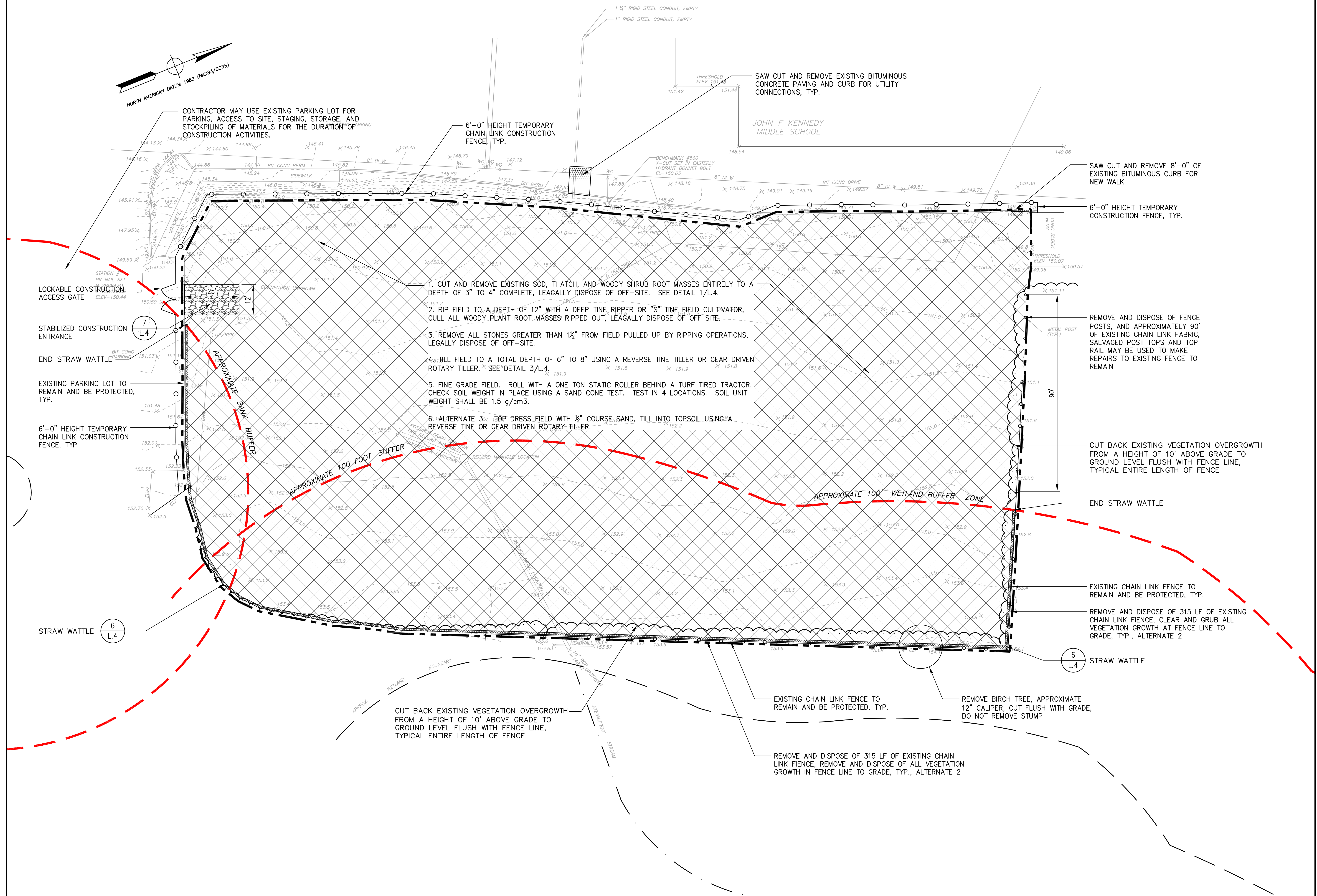
**WALTHAM PUBLIC  
SCHOOLS FACILITIES  
617 LEXINGTON STREET  
WALTHAM, MA 02452**

TITLE:

**SITE PREP &  
DEMOLITION PLAN**

Scale 1"=20' Date MAY 14, 2013  
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Project No. 1303.00

DWG No. **L.1** 195



CONTRACTOR MAY USE EXISTING PARKING LOT FOR PARKING, ACCESS TO SITE, STAGING, STORAGE, AND STOCKPILING OF MATERIALS FOR THE DURATION OF CONSTRUCTION ACTIVITIES.

6'-0" HEIGHT TEMPORARY CHAIN LINK CONSTRUCTION FENCE, TYP.

JOHN F KENNEDY MIDDLE SCHOOL

SAW CUT AND REMOVE EXISTING BITUMINOUS CONCRETE PAVING AND CURB FOR UTILITY CONNECTIONS, TYP.

SAW CUT AND REMOVE 8'-0" OF EXISTING BITUMINOUS CURB FOR NEW WALK

6'-0" HEIGHT TEMPORARY CONSTRUCTION FENCE, TYP.

REMOVE AND DISPOSE OF FENCE POSTS, AND APPROXIMATELY 90' OF EXISTING CHAIN LINK FABRIC, SALVAGED POST TOPS AND TOP RAIL MAY BE USED TO MAKE REPAIRS TO EXISTING FENCE TO REMAIN

CUT BACK EXISTING VEGETATION OVERGROWTH FROM A HEIGHT OF 10' ABOVE GRADE TO GROUND LEVEL FLUSH WITH FENCE LINE, TYPICAL ENTIRE LENGTH OF FENCE

END STRAW WATTLE

EXISTING CHAIN LINK FENCE TO REMAIN AND BE PROTECTED, TYP.

REMOVE AND DISPOSE OF 315 LF OF EXISTING CHAIN LINK FENCE, CLEAR AND GRUB ALL VEGETATION GROWTH AT FENCE LINE TO GRADE, TYP., ALTERNATE 2

STRAW WATTLE

EXISTING CHAIN LINK FENCE TO REMAIN AND BE PROTECTED, TYP.

REMOVE BIRCH TREE, APPROXIMATE 12" CALIPER, CUT FLUSH WITH GRADE, DO NOT REMOVE STUMP

REMOVE AND DISPOSE OF 315 LF OF EXISTING CHAIN LINK FENCE, REMOVE AND DISPOSE OF ALL VEGETATION GROWTH IN FENCE LINE TO GRADE, TYP., ALTERNATE 2

CUT BACK EXISTING VEGETATION OVERGROWTH FROM A HEIGHT OF 10' ABOVE GRADE TO GROUND LEVEL FLUSH WITH FENCE LINE, TYPICAL ENTIRE LENGTH OF FENCE

1. CUT AND REMOVE EXISTING SOD, THATCH, AND WOODY SHRUB ROOT MASSES ENTIRELY TO A DEPTH OF 3" TO 4" COMPLETE, LEGALLY DISPOSE OF OFF-SITE. SEE DETAIL 1/L.4.
2. RIP FIELD TO A DEPTH OF 12" WITH A DEEP TINE RIPPER OR "S" TINE FIELD CULTIVATOR, CULL ALL WOODY PLANT ROOT MASSES RIPPED OUT, LEGALLY DISPOSE OF OFF SITE.
3. REMOVE ALL STONES GREATER THAN 1 1/2" FROM FIELD PULLED UP BY RIPPING OPERATIONS, LEGALLY DISPOSE OF OFF-SITE.
4. TILL FIELD TO A TOTAL DEPTH OF 6" TO 8" USING A REVERSE TINE TILLER OR GEAR DRIVEN ROTARY TILLER. SEE DETAIL 3/L.4.
5. FINE GRADE FIELD. ROLL WITH A ONE TON STATIC ROLLER BEHIND A TURF TIED TRACTOR. CHECK SOIL WEIGHT IN PLACE USING A SAND CONE TEST. TEST IN 4 LOCATIONS. SOIL UNIT WEIGHT SHALL BE 1.5 g/cm3.
6. ALTERNATE 3: TOP DRESS FIELD WITH 1/2" COURSE SAND, TILL INTO TOPSOIL USING A REVERSE TINE OR GEAR DRIVEN ROTARY TILLER.

**GRADING AND UTILITY NOTES:**

1. REFER TO EXISTING CONDITIONS PLAN AND SITE PREP AND DEMOLITION PLAN FOR SURVEY NOTES AND LEGEND.
2. IT IS THE INTENT OF THE GRADING PLAN TO GRADE THE FIELD AT A CONSTANT UNIFORM SLOPE OF 1.75% BY CUTTING ALL HIGH AREAS, AND FILLING ALL DEPRESSIONS TO CREATE A UNIFORMLY GRADED FIELD AT A CONSTANT GRADIENT. THE FINISHED GRADE OF THE FIELD IS APPROXIMATE, AND WILL BE ADJUSTED TO FINAL ELEVATIONS AFTER STRIPPING THE FIELD IS COMPLETE.
3. ALL WORK RELATING TO INSTALLATION OF THE IRRIGATION SYSTEM SHALL BE PERFORMED IN ACCORDANCE WITH THE STANDARDS OF THE CITY OF WALTHAM ENGINEERING DEPARTMENT AND WATER AND SEWER DEPARTMENT.
4. ALL WORK RELATING TO INSTALLATION, RENOVATION OR MODIFICATION OF ELECTRICAL SERVICES SHALL BE PERFORMED IN ACCORDANCE WITH THE STANDARDS OF THE CITY OF WALTHAM WIRING DEPARTMENT.
5. ALL PROPOSED PAVEMENTS SHALL MEET THE LINE AND GRADE OF EXISTING ADJACENT PAVEMENT SURFACES.
6. ALL WALKWAYS SHALL MAINTAIN A CROSSPITCH OF NOT MORE THAN 2%.
7. WHERE A SPECIFIC LIMIT OF WORK LINE IS NOT OBVIOUS OR IMPLIED, BLEND GRADES TO EXISTING CONDITIONS WITHIN 10 FEET OF PROPOSED CONTOURS.
8. RESTORE ALL DISTURBED AREAS AND LIMITS OF ALL REMOVALS TO TURF UNLESS OTHERWISE NOTED.

**LEGEND**

- SEEDED ATHLETIC FIELD
- BITUMINOUS WALK PAVEMENT
- ATHLETIC FIELD LINING

No.	Description	Date

**REVISIONS**

 North	
-----------	--

Project:

**KENNEDY MIDDLE SCHOOL  
 ATHLETIC FIELD RENOVATION  
 655 LEXINGTON STREET  
 WALTHAM, MA 02452**

Prepared For:

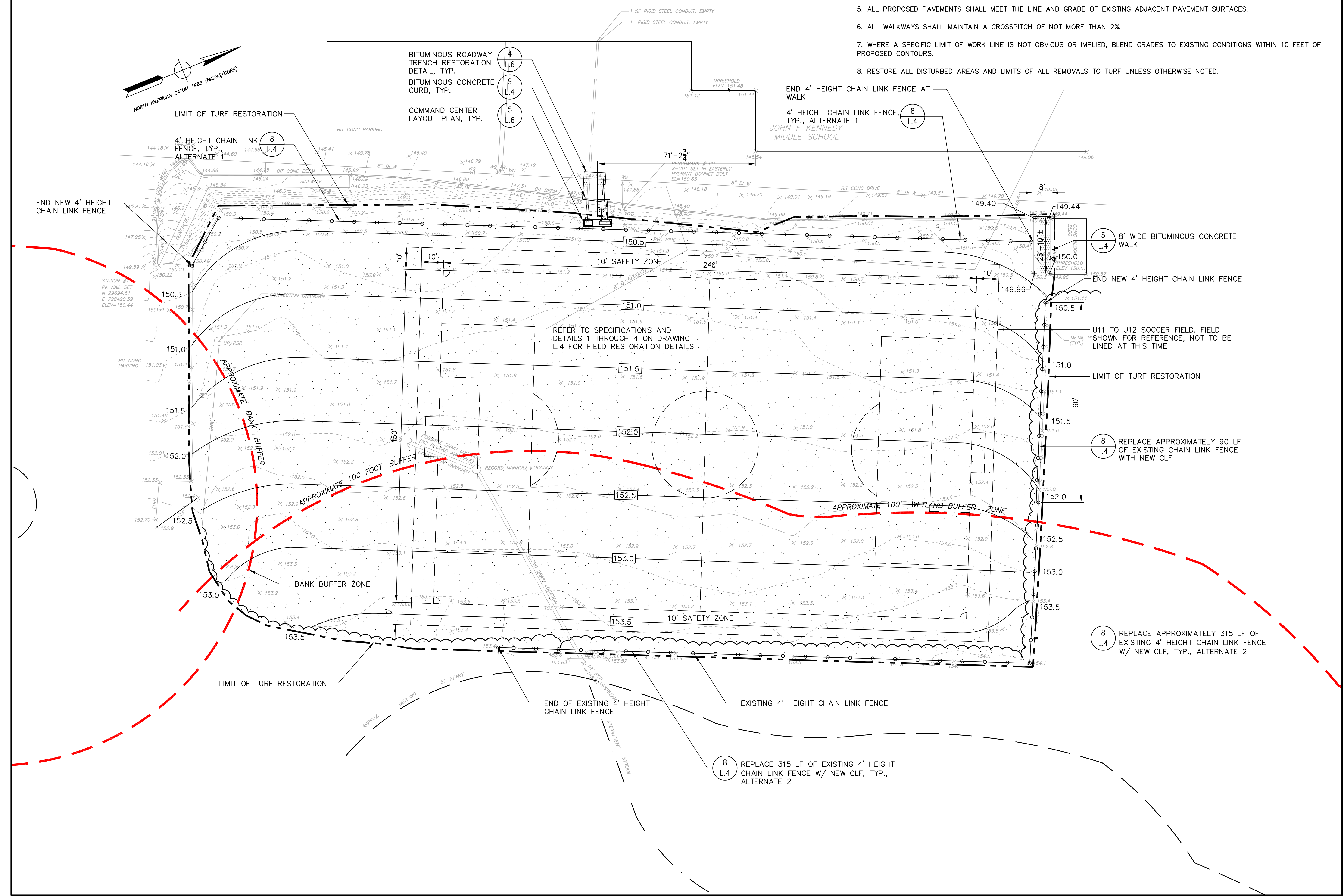
**WALTHAM PUBLIC  
 SCHOOLS FACILITIES  
 617 LEXINGTON STREET  
 WALTHAM, MA 02452**

TITLE:

**FIELD RESTORATION  
 PLAN**

Scale 1"=20' Date MAY 14, 2013  
 Drawn By DRB  
 Checked By DRB  
 Approved By CCC  
 Project No. 1303.00

DWG No. **L.2**



**LEGEND**

- HUNTER I-40-36S-10 FULL CIRCLE ROTARY SPRINKLER, OR EQUAL
- HUNTER I-40-ADS-7 ADJUSTABLE PART CIRCLE ROTARY SPRINKLER, OR EQUAL
- HUNTER QCV-100 MANUAL QUICK COUPLING VALVE, OR EQUAL
- Ⓢ HUNTER PCC-1200 IRRIGATION SYSTEM CONTROLLER IN ELECTRICAL ENCLOSURE, OR EQUAL

NOTE:  
 SCHOOL TO PROVIDE NEW 60 AMP SERVICE TO NEW SUB-PANEL,  
 CONTRACTOR TO PROVIDE ALL OTHER ELECTRICAL AND GROUNDING  
 REQUIREMENTS PER PLANS AND SPECIFICATIONS.

**LEGEND**

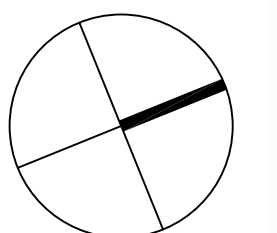
- FULL CIRCLE ROTARY SPRINKLER
- ADJUSTABLE PART CIRCLE ROTARY SPRINKLER
- MANUAL QUICK COUPLING VALVE
- Ⓢ SOLENOID VALVE

**NOTES:**


FULL FUNCTIONALITY OF ALL AUTOMATIC CONTROL VALVES SHALL BE VERIFIED BY THE CONTRACTOR AND ANY AND ALL DEFICIENCIES SHALL BE CORRECTED AND MADE PART OF THIS CONTRACT. CONTROL VALVES WHICH ARE DAMAGED OR BROKEN SHALL BE REPLACED AT NO ADDITIONAL COST.

No.	Description	Date

**REVISIONS**



North



**Project:**

**KENNEDY MIDDLE SCHOOL  
 ATHLETIC FIELD RENOVATION  
 655 LEXINGTON STREET  
 WALTHAM, MA 02452**

**Prepared For:**

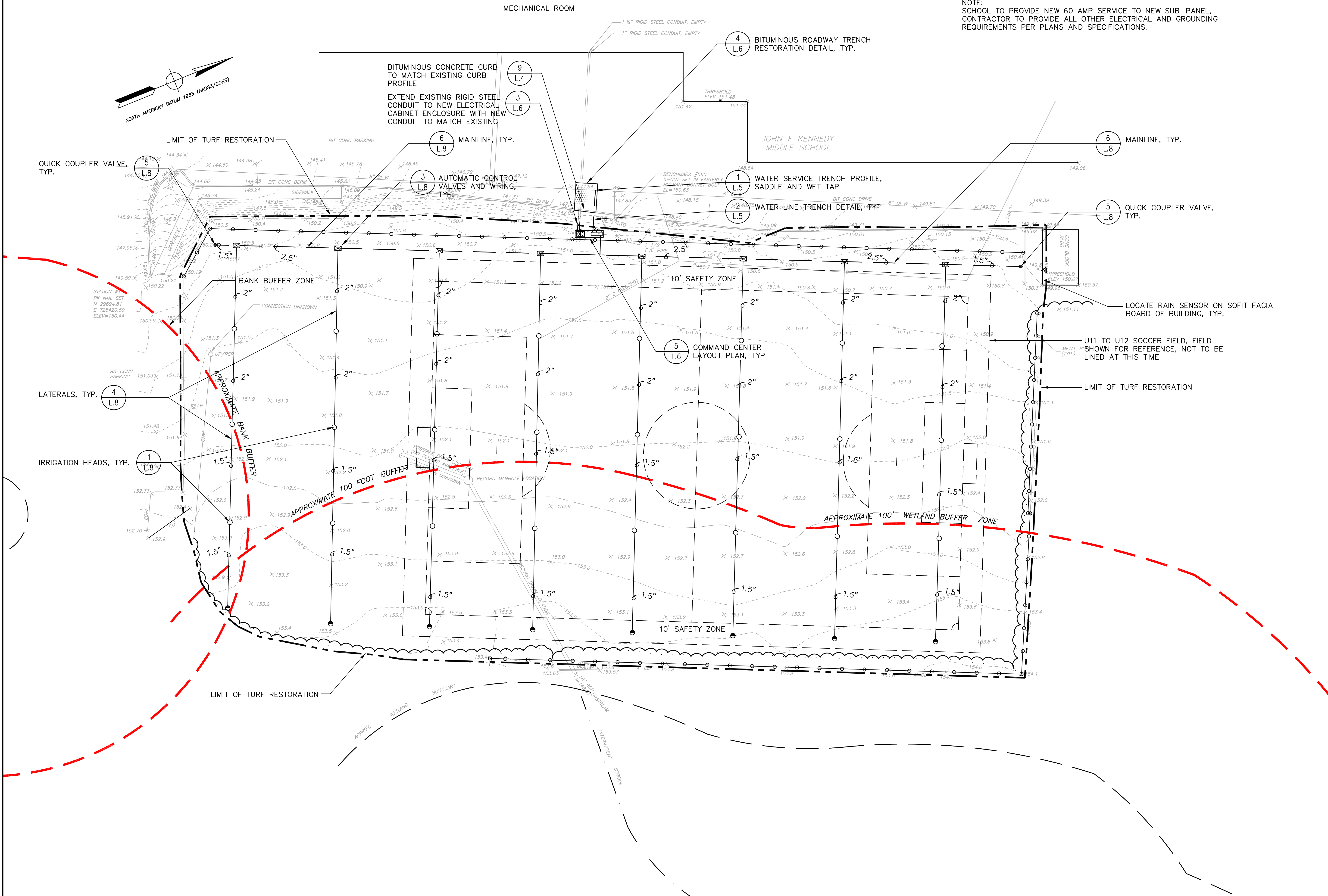
**WALTHAM PUBLIC  
 SCHOOLS FACILITIES  
 617 LEXINGTON STREET  
 WALTHAM, MA 02452**

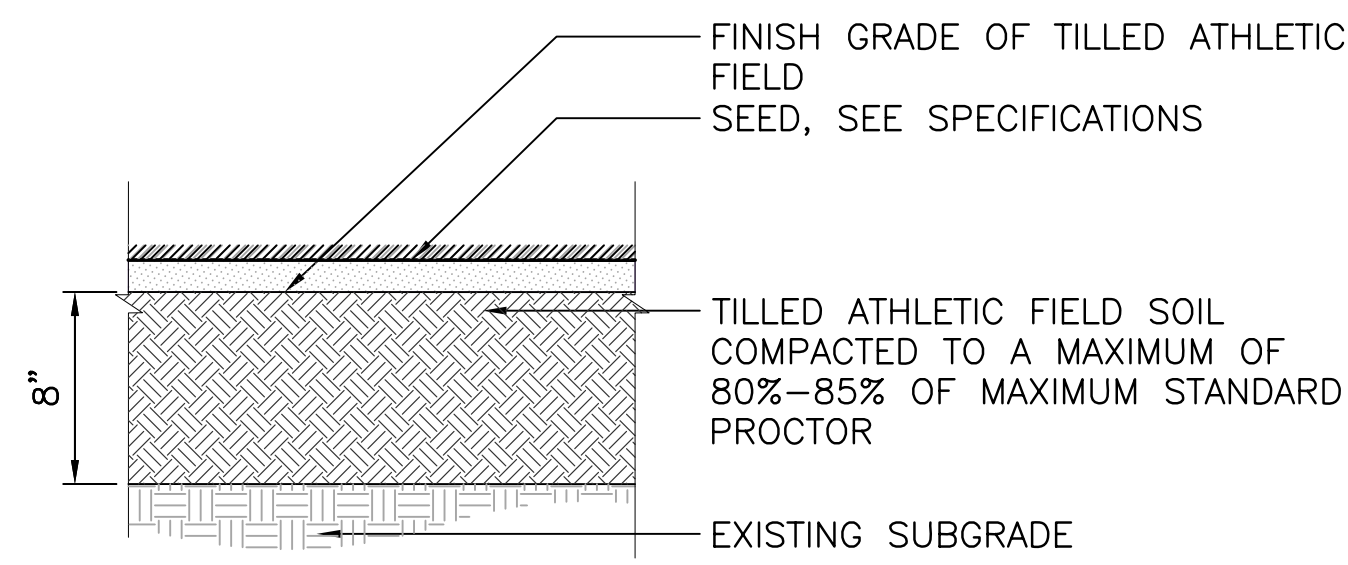
**TITLE:**

**IRRIGATION PLAN**

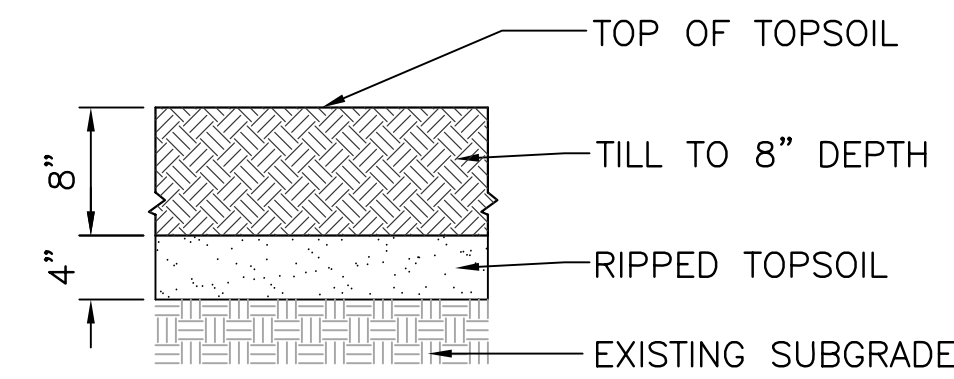
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 Drawn By DRB  
 Checked By DRB  
 Approved By CCC  
 Project No. 1303.00

DWG No. **L.3** 197

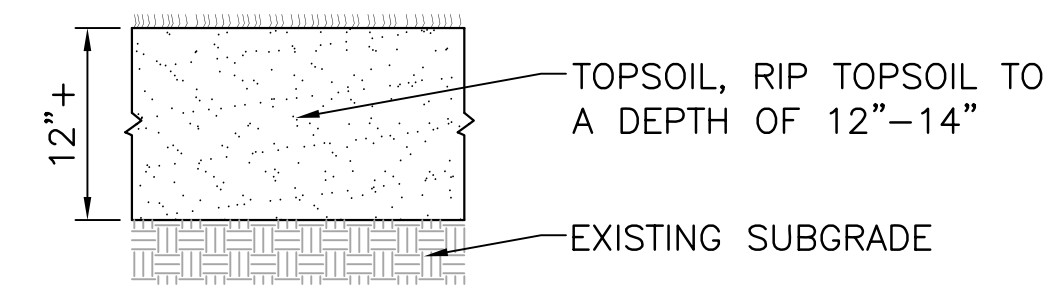




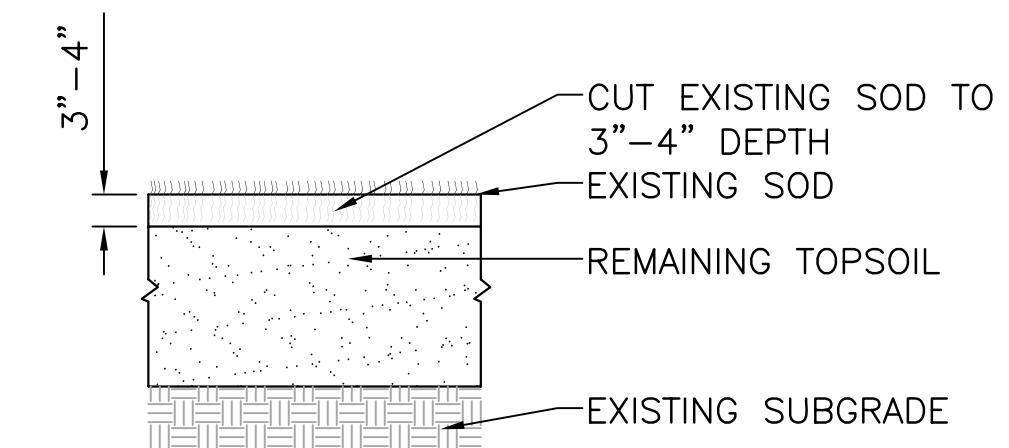
**4 SEEDED ATHLETIC FIELD SECTION**  
NTS



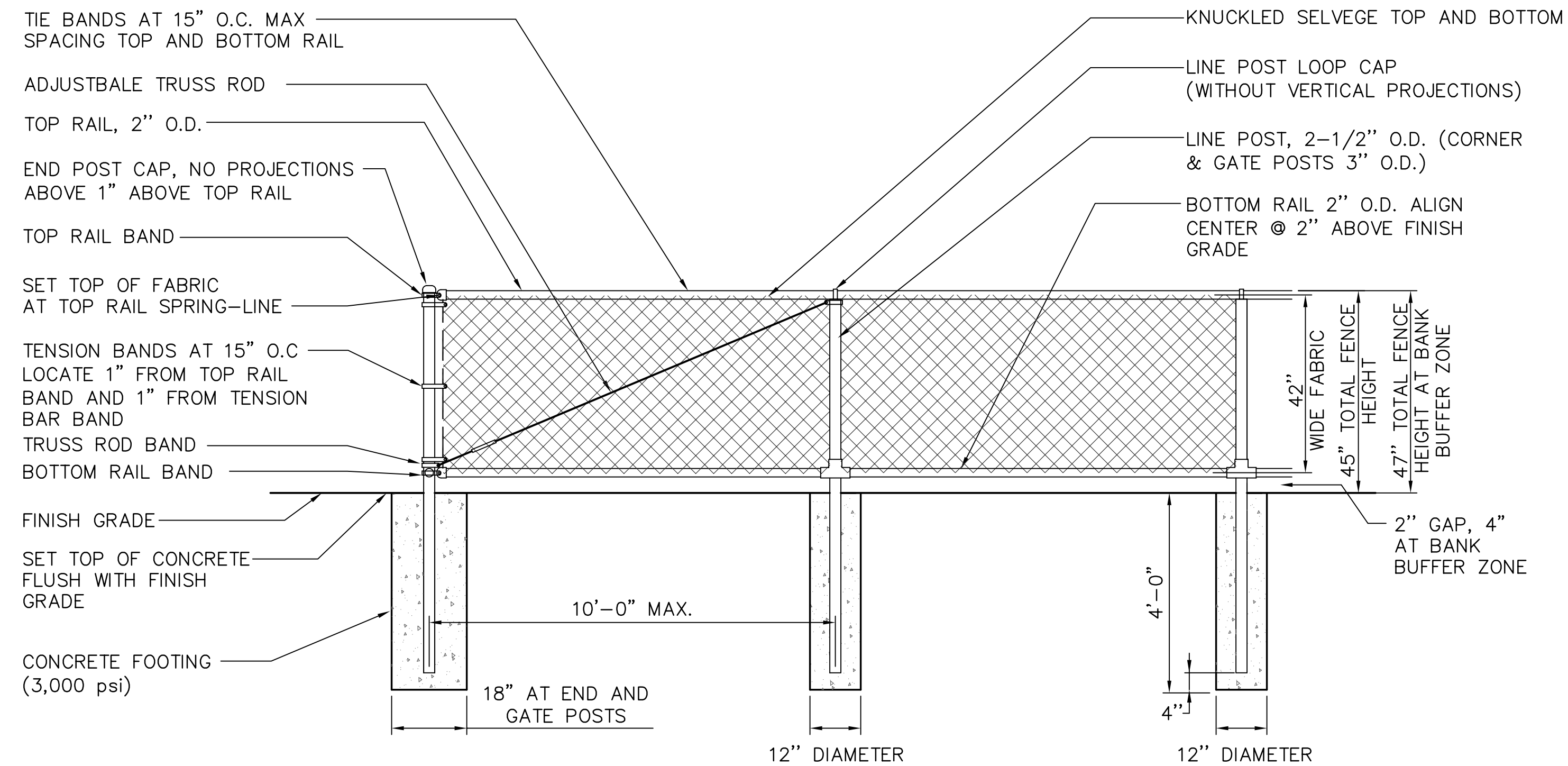
**3 TILLED ATHLETIC FIELD SOIL SECTION**  
NTS



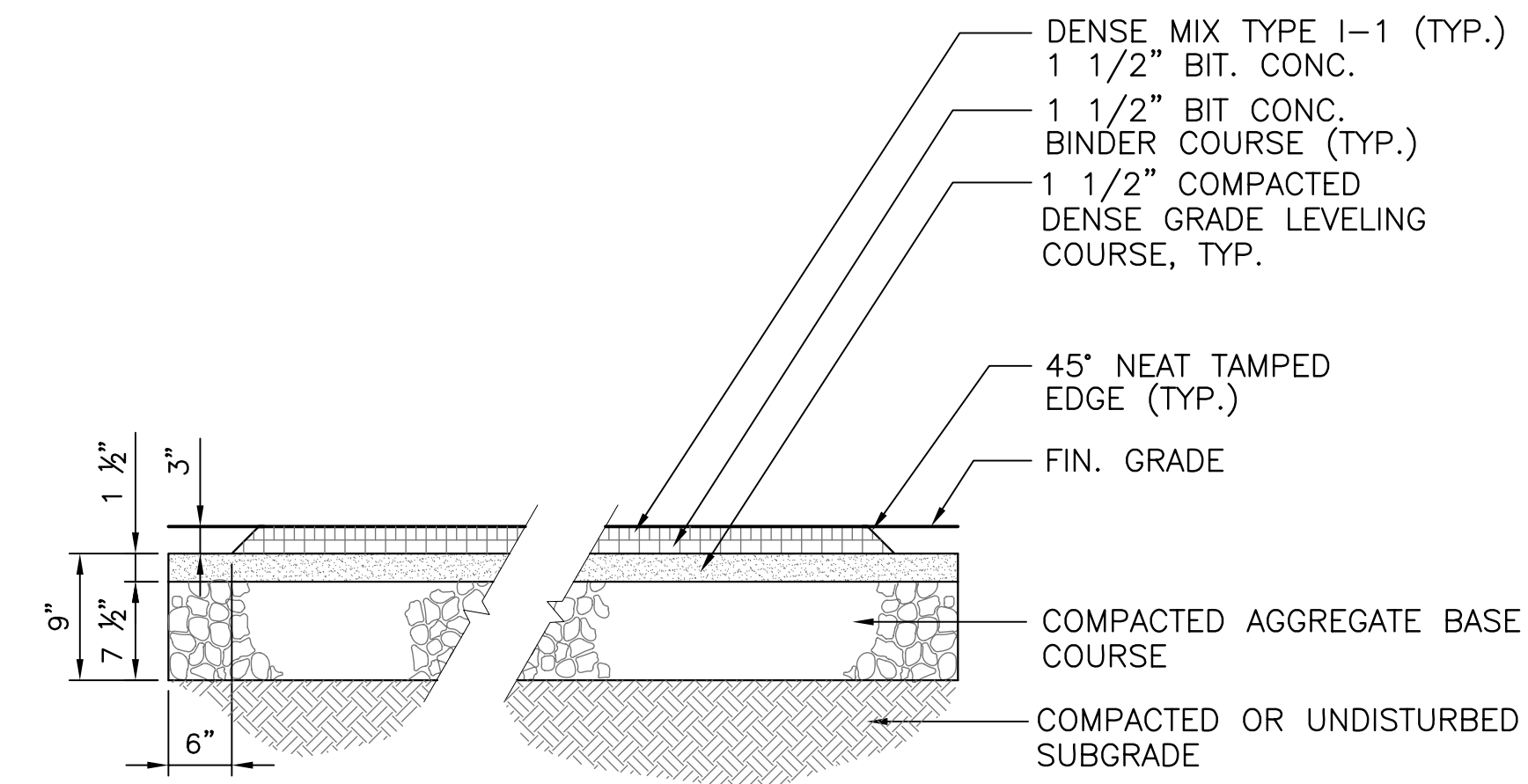
**2 EXISTING SOIL SECTION**  
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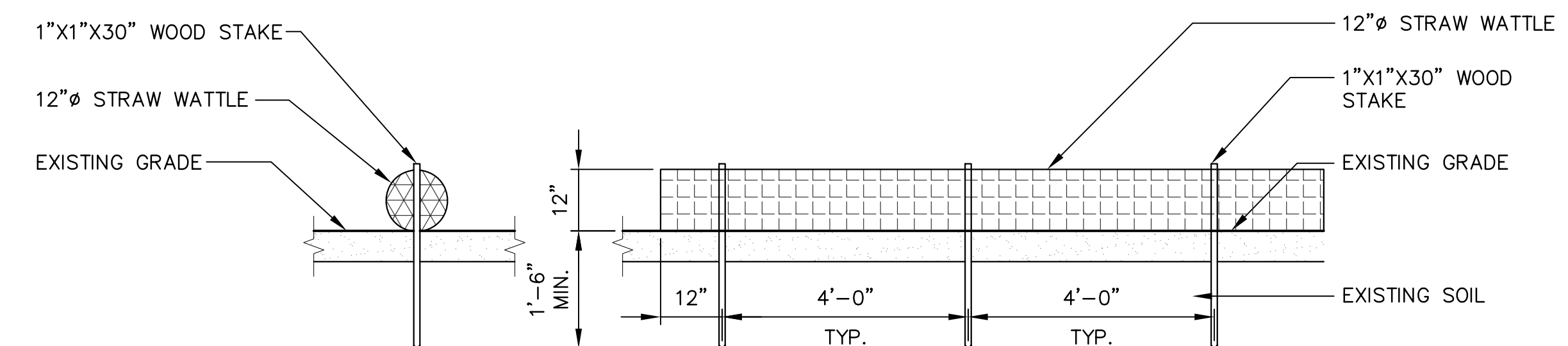
**1 SOD REMOVAL DETAIL**  
NTS



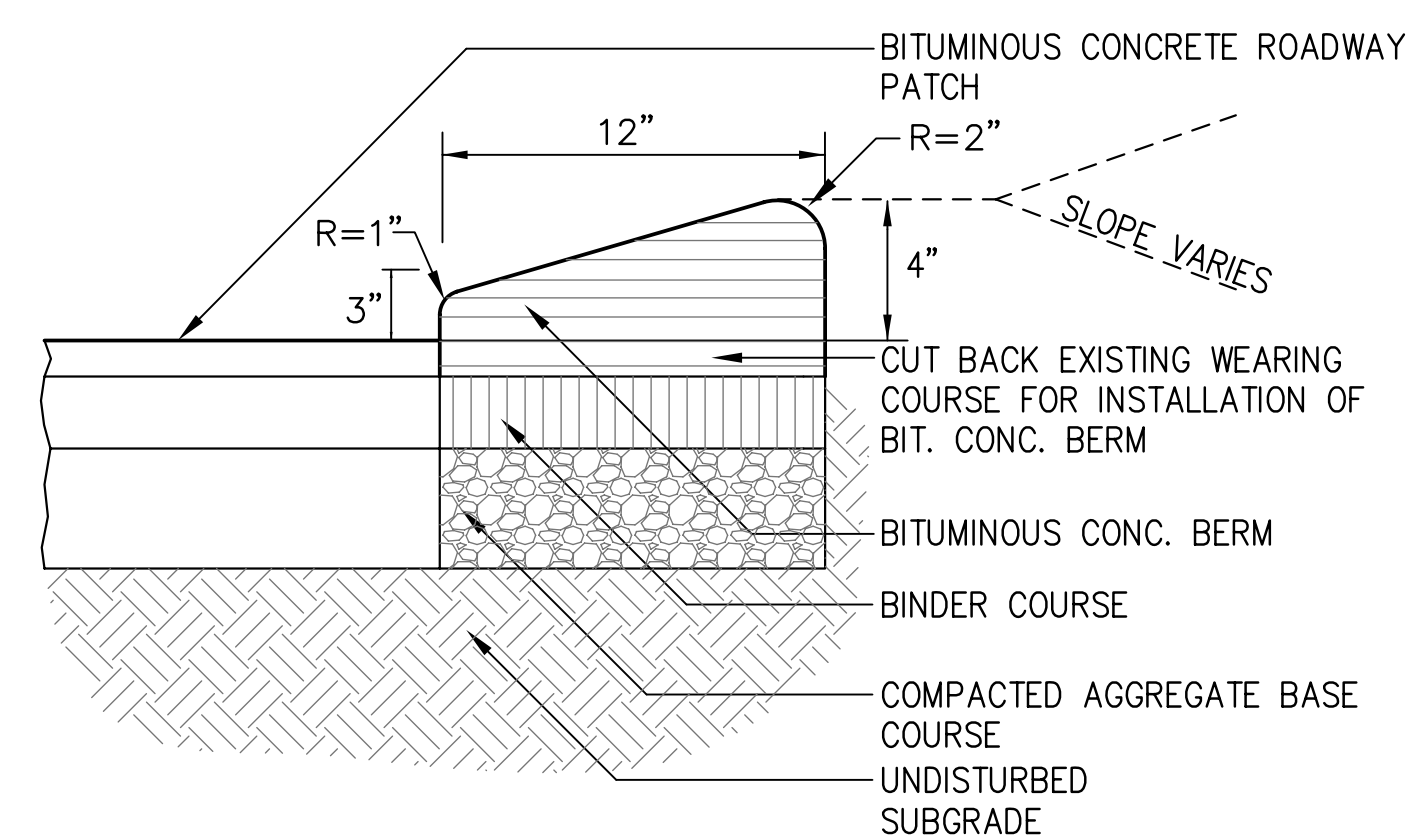
**8 CHAIN LINK FENCE - ELEVATION (TYPICAL)**  
NOT TO SCALE



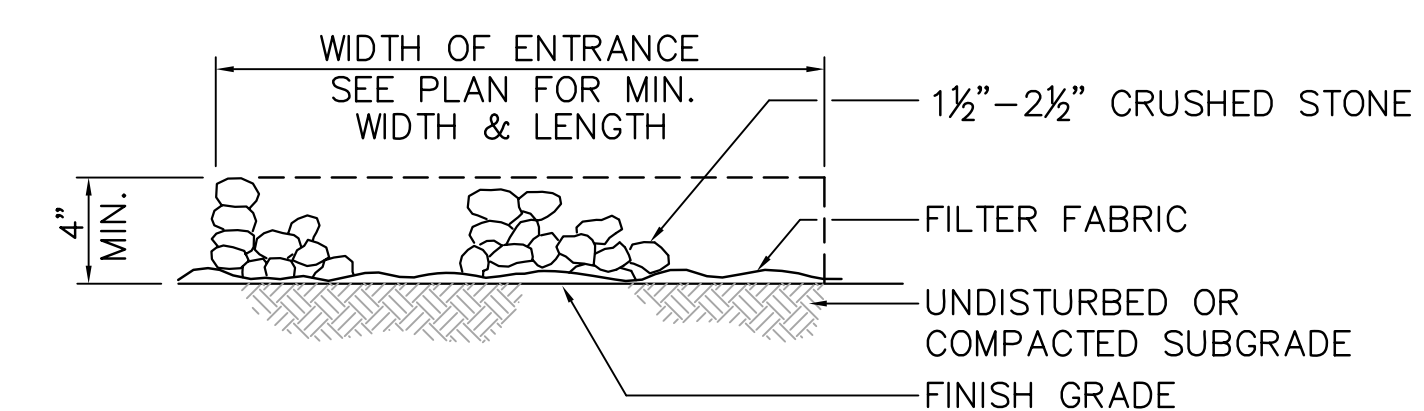
**5 BITUMINOUS CONCRETE PAVEMENT, TYP.**  
N.T.S.



**6 STRAW WATTLE DETAIL**  
N.T.S.



**9 BITUMINOUS CONCRETE BERM DETAIL - TYP.**  
N.T.S.



**7 STABILIZED CONSTRUCTION ENTRANCE DETAIL**  
N.T.S.

No.	Description	Date

REVISIONS



Project:

**KENNEDY MIDDLE SCHOOL  
ATHLETIC FIELD RENOVATION  
655 LEXINGTON STREET  
WALTHAM, MA 02452**

Prepared For:

**WALTHAM PUBLIC  
SCHOOLS FACILITIES  
617 LEXINGTON STREET  
WALTHAM, MA 02452**

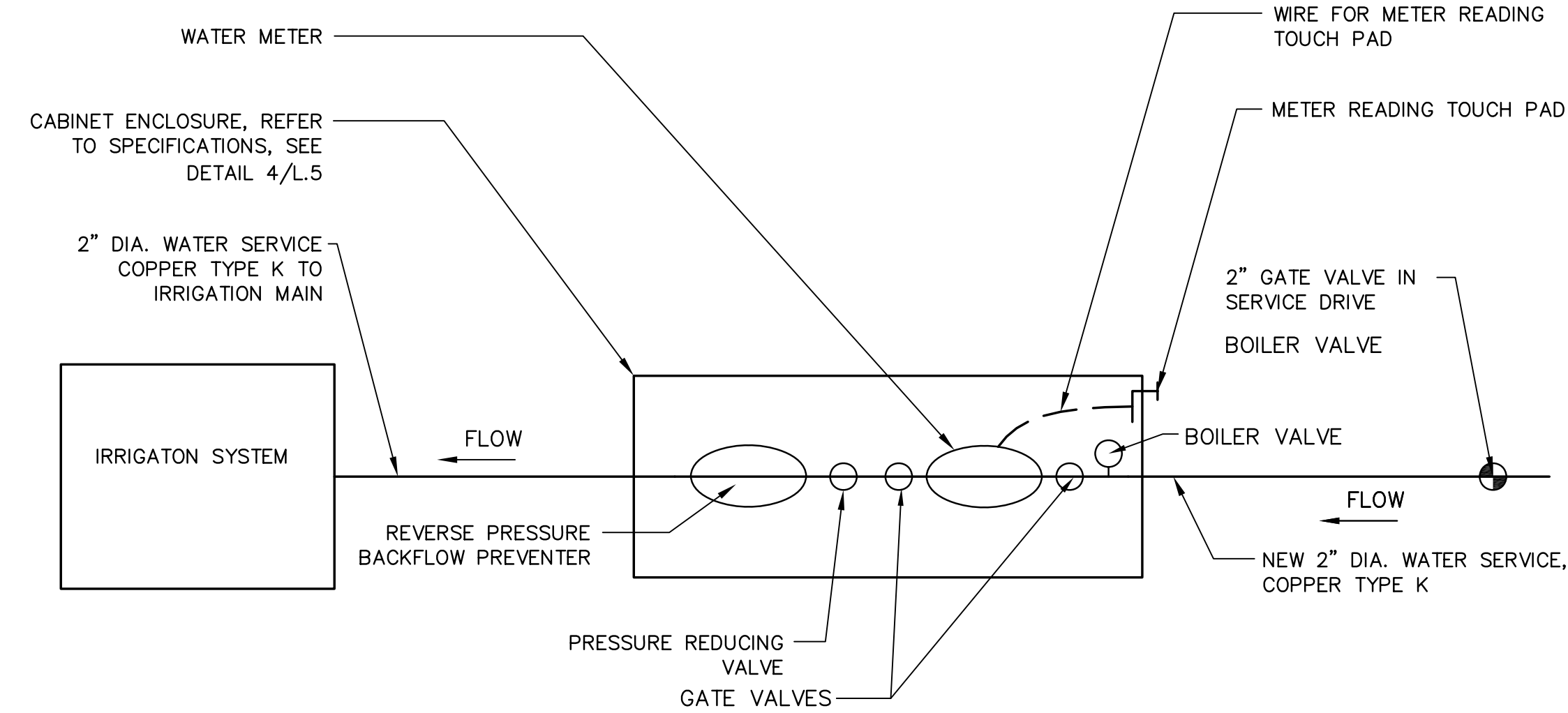
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**FIELD DETAILS**

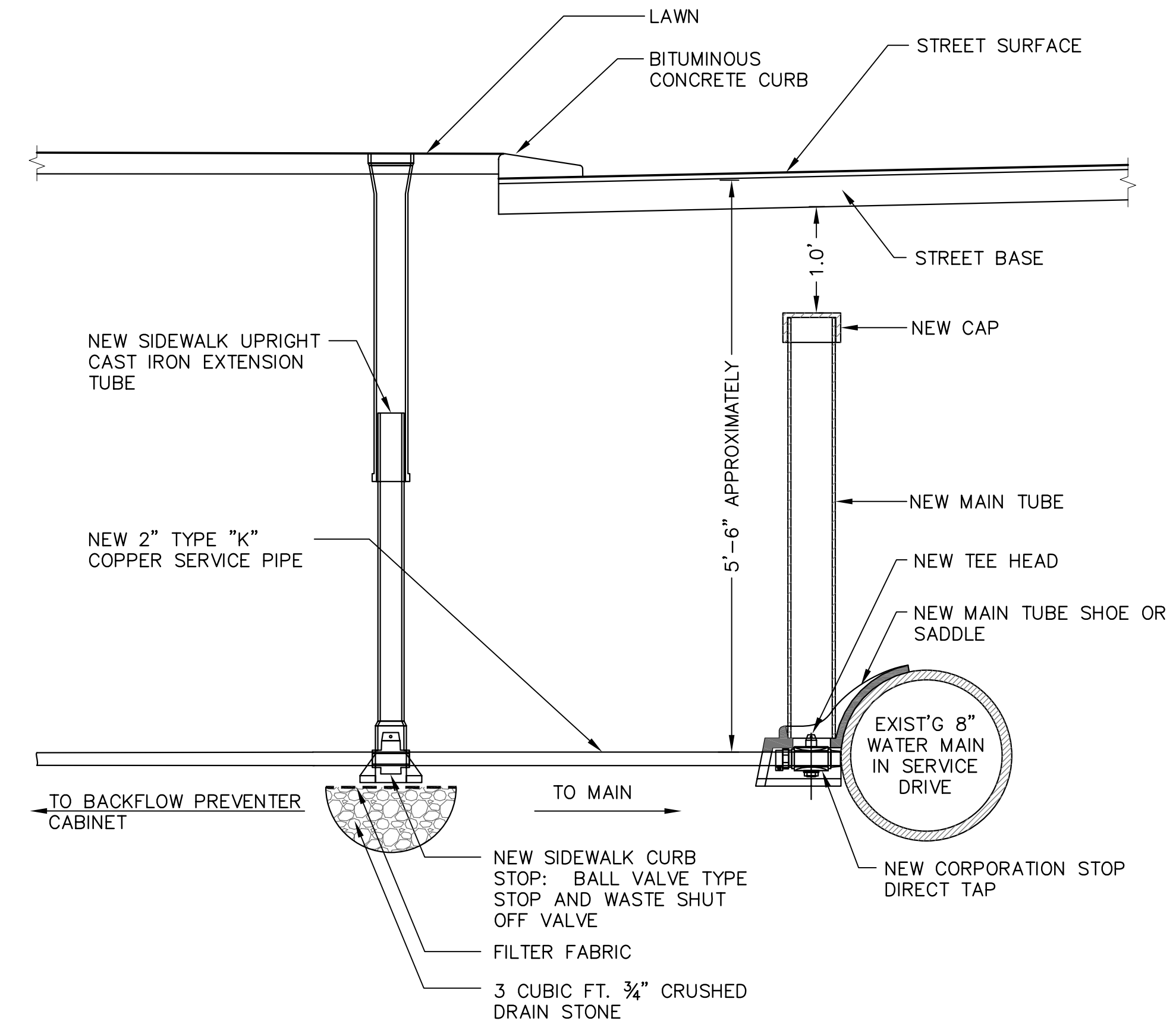
Scale AS NOTED Date MAY 14, 2013  
Drawn By DRB  
Checked By CCC  
Approved By CCC  
Project No. 1303.00

DWG No.

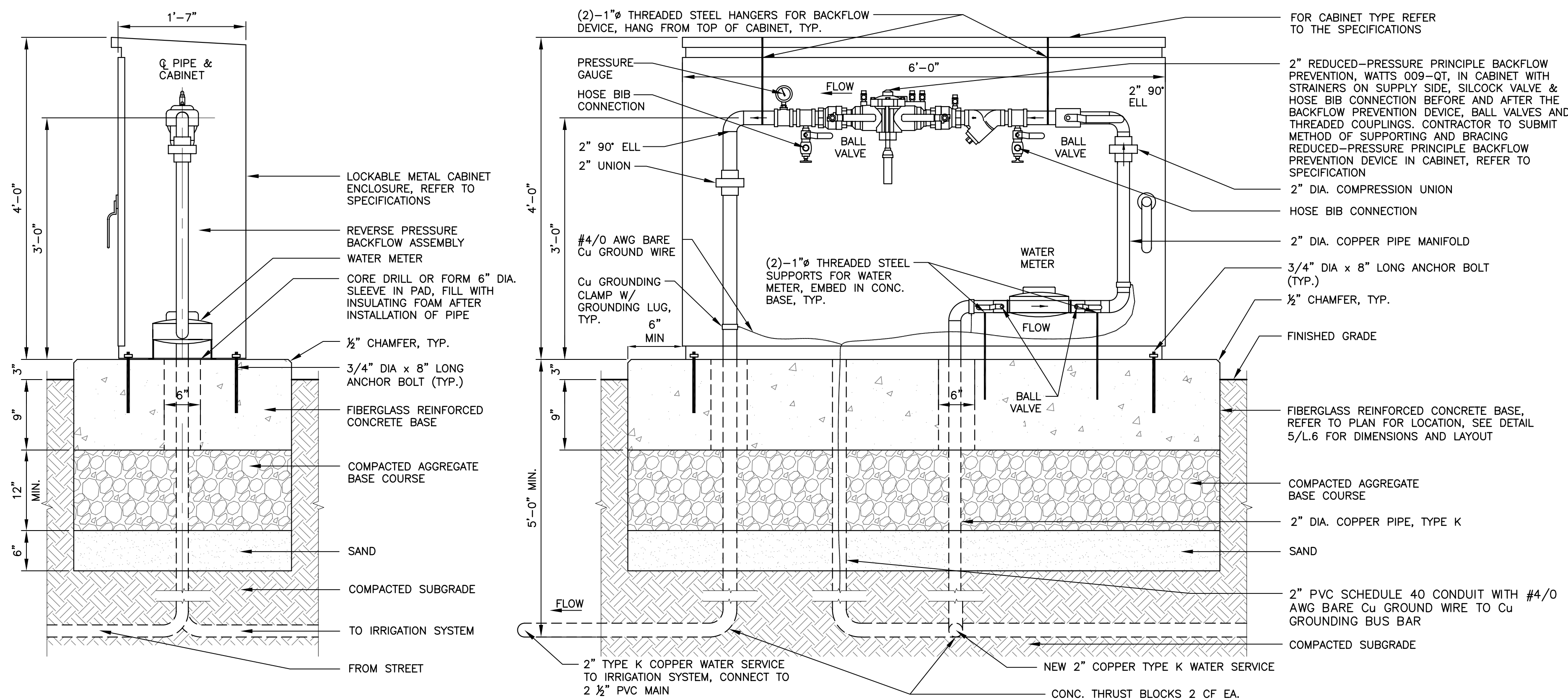
**L.4**



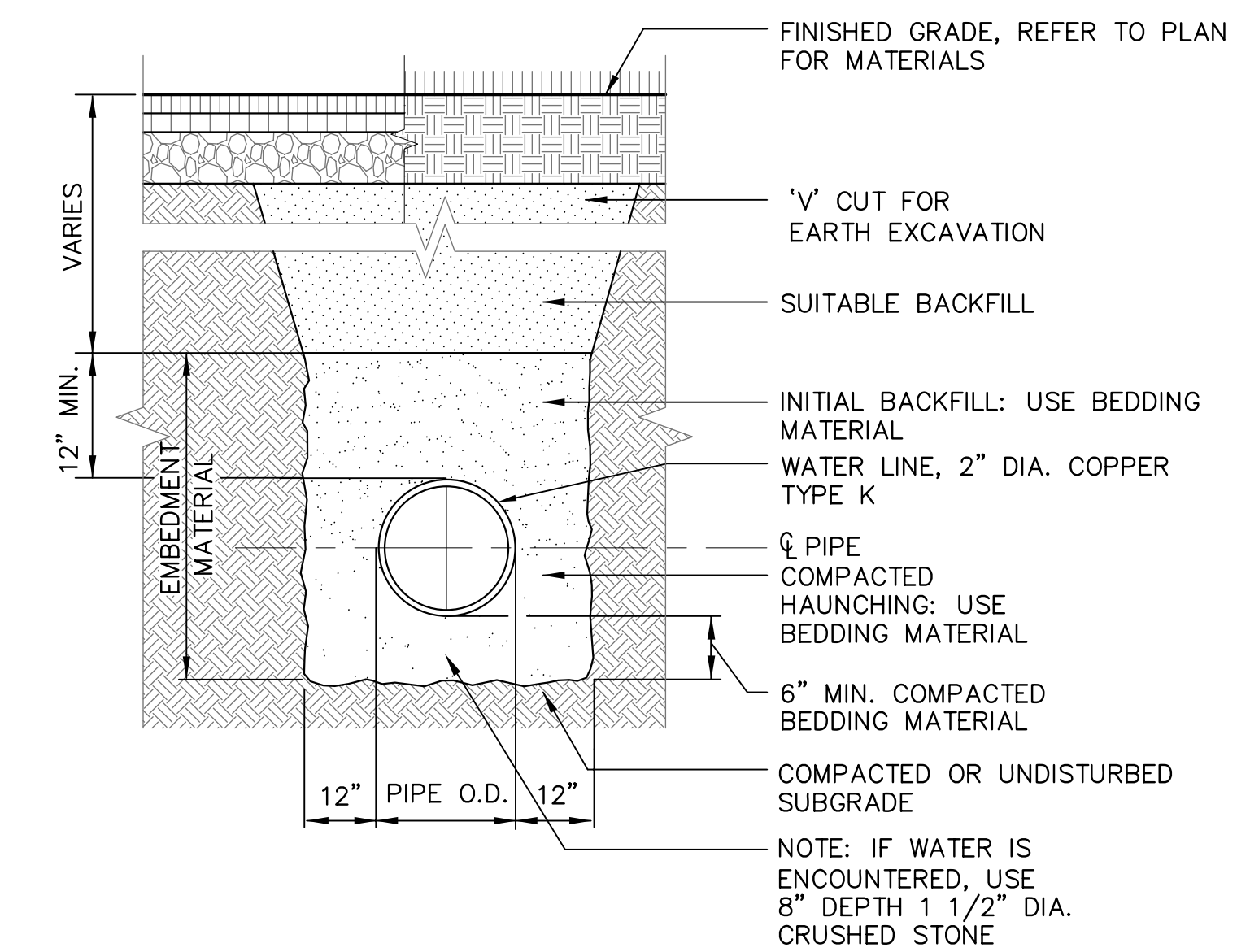
**3 WATER SERVICE ONE LINE SCHEMATIC**  
 N.T.S.



**1 WATER SERVICE TRENCH PROFILE**  
 N.T.S.



**4 REDUCED-PRESSURE PRINCIPLE BACKFLOW-PREVENTION DEVICE IN CABINET, TYP.**  
 N.T.S.



**2 WATER LINE TRENCH DETAIL**  
 N.T.S.

No.	Description	Date

REVISIONS



Project:

**KENNEDY MIDDLE SCHOOL  
 ATHLETIC FIELD RENOVATION  
 655 LEXINGTON STREET  
 WALTHAM, MA 02452**

Prepared For:

**WALTHAM PUBLIC  
 SCHOOLS FACILITIES  
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 WALTHAM, MA 02452**

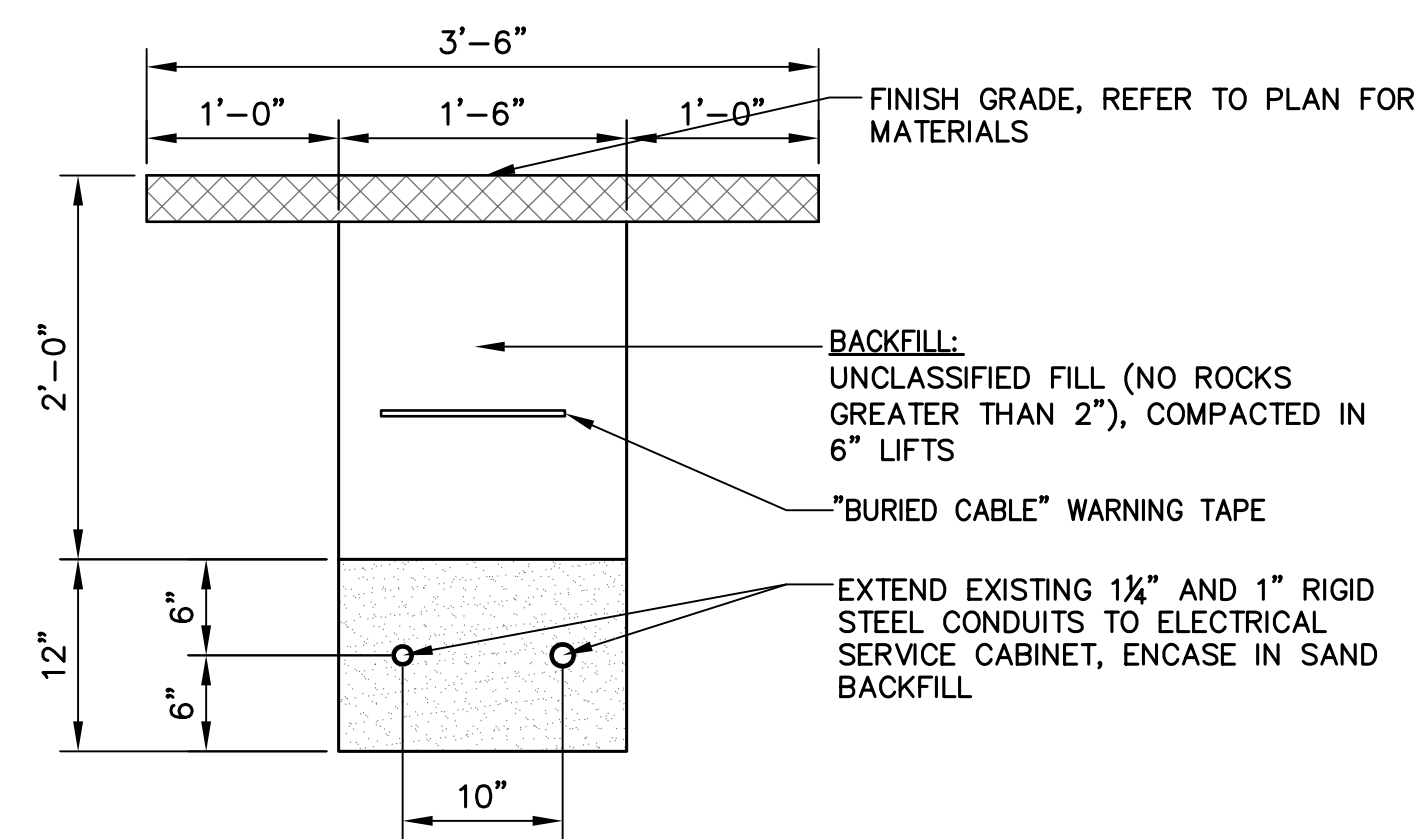
TITLE:

**UTILITY DETAILS**

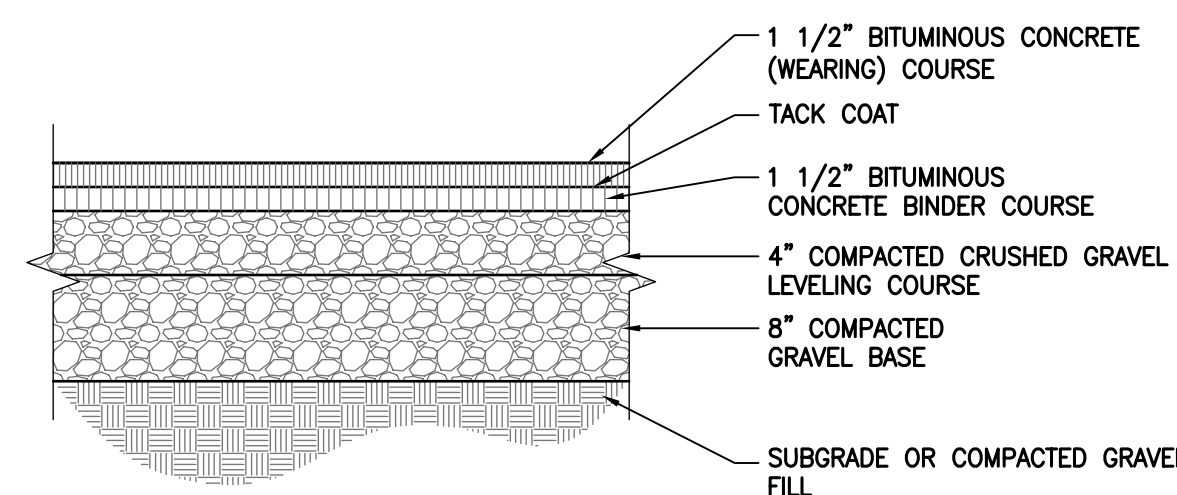
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DWG No.

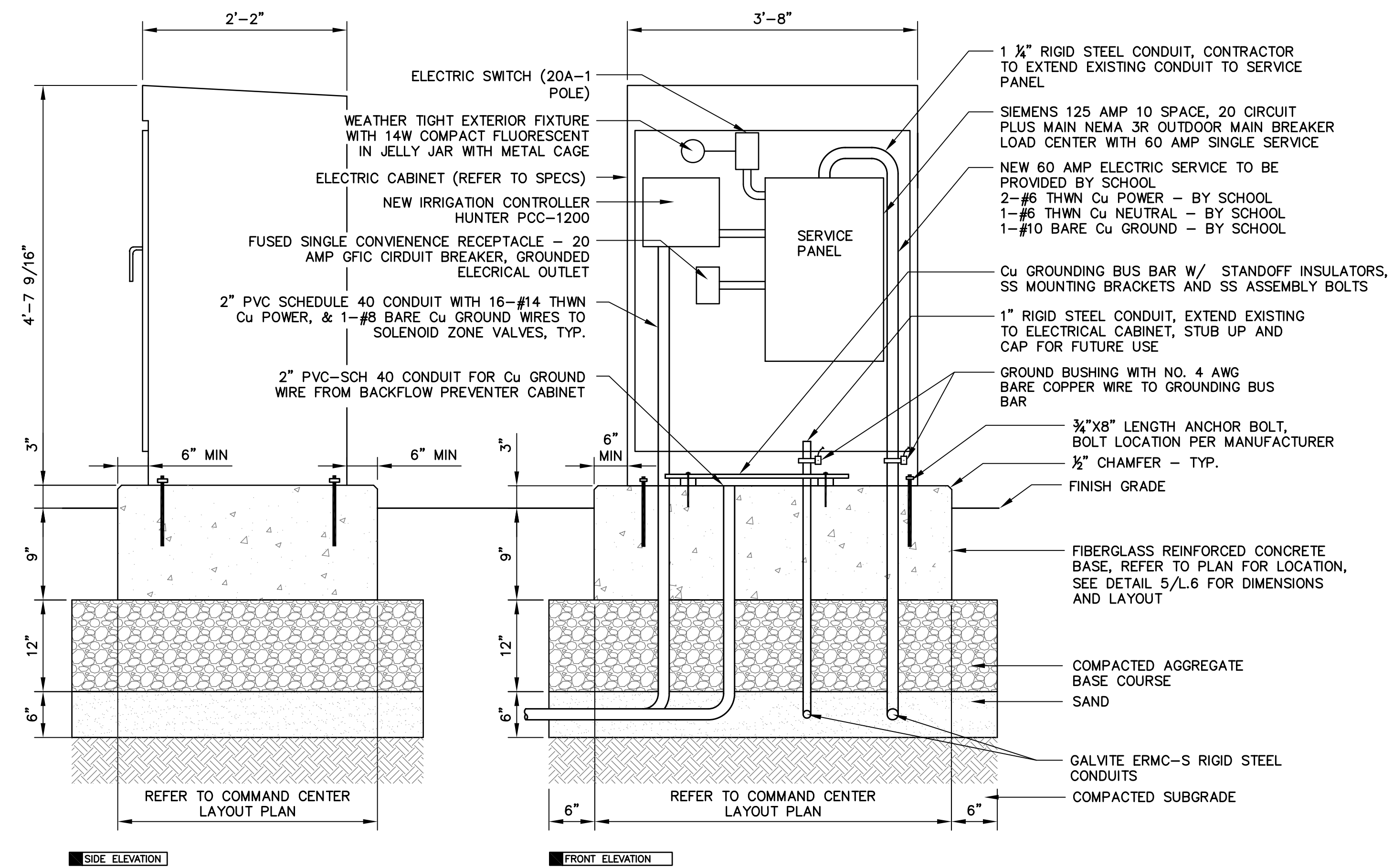
**L5**



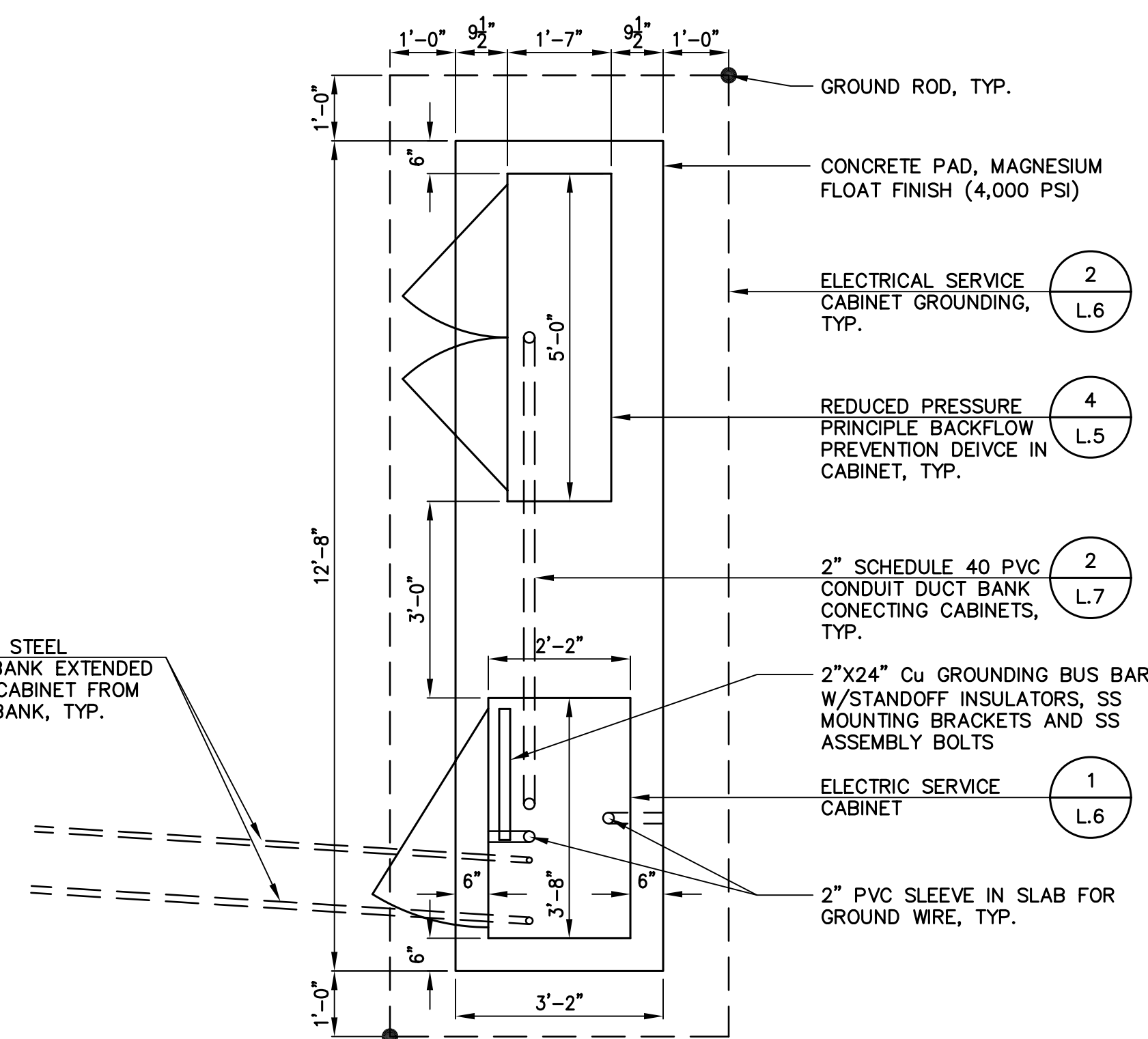
**3 RIGID CONDUIT DUCTBANK CROSS-SECTION DETAIL**  
 N.T.S.



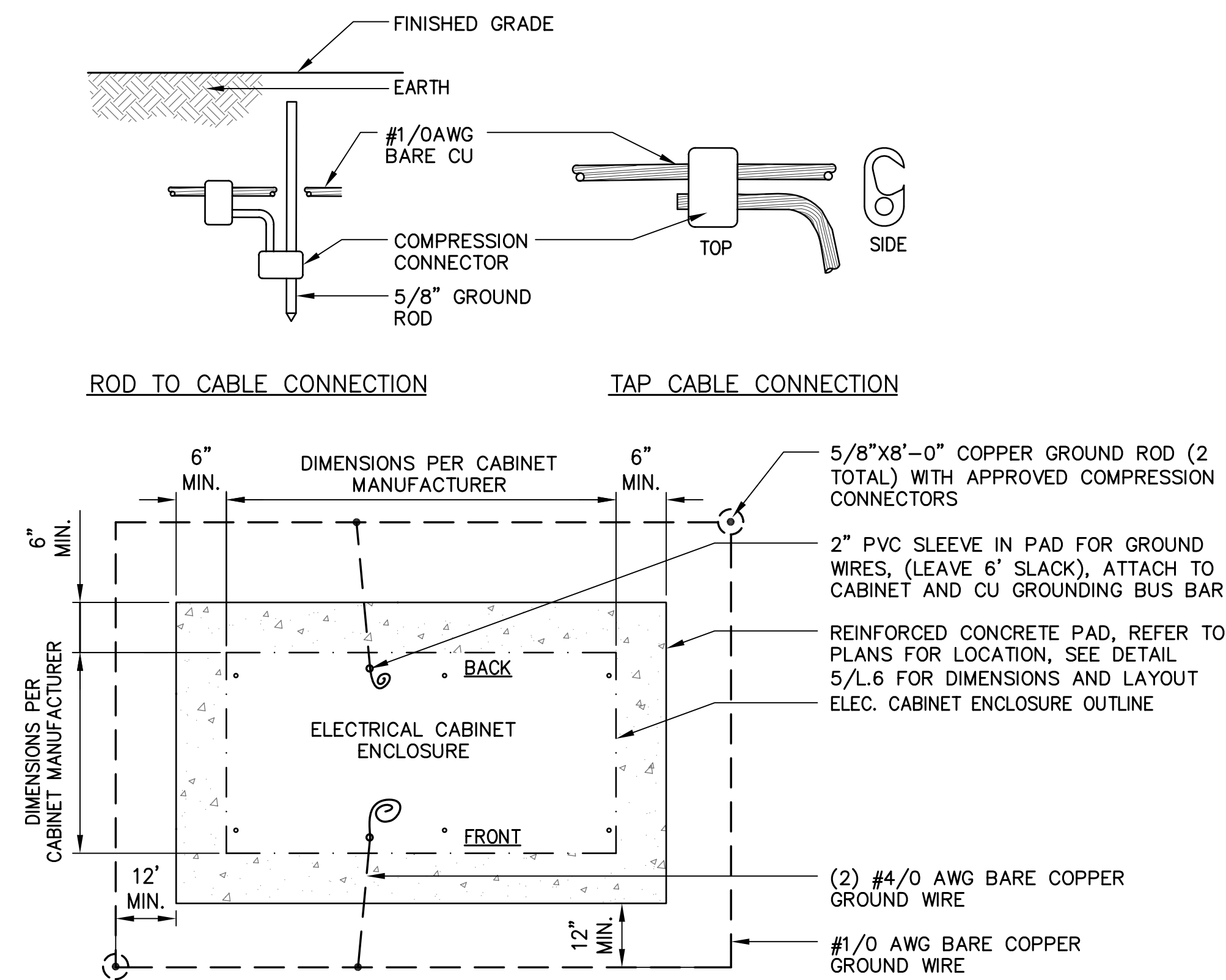
**4 BITUMINOUS ROADWAY TRENCH RESTORATION DETAIL**  
 N.T.S.



**1 ELECTRICAL SERVICE CABINET DETAIL**  
 N.T.S.



**5 COMMAND CENTER LAYOUT PLAN**  
 SCALE 1/2"=1'-0"



**2 ELECTRICAL SERVICE CABINET GROUNDING PLAN**  
 N.T.S.

No.	Description	Date

REVISIONS



Project:  
**KENNEDY MIDDLE SCHOOL  
 ATHLETIC FIELD RENOVATION  
 655 LEXINGTON STREET  
 WALTHAM, MA 02452**

Prepared For:  
**WALTHAM PUBLIC  
 SCHOOLS FACILITIES  
 617 LEXINGTON STREET  
 WALTHAM, MA 02452**

TITLE:  
**ELECTRICAL &  
 GROUNDING DETAILS**

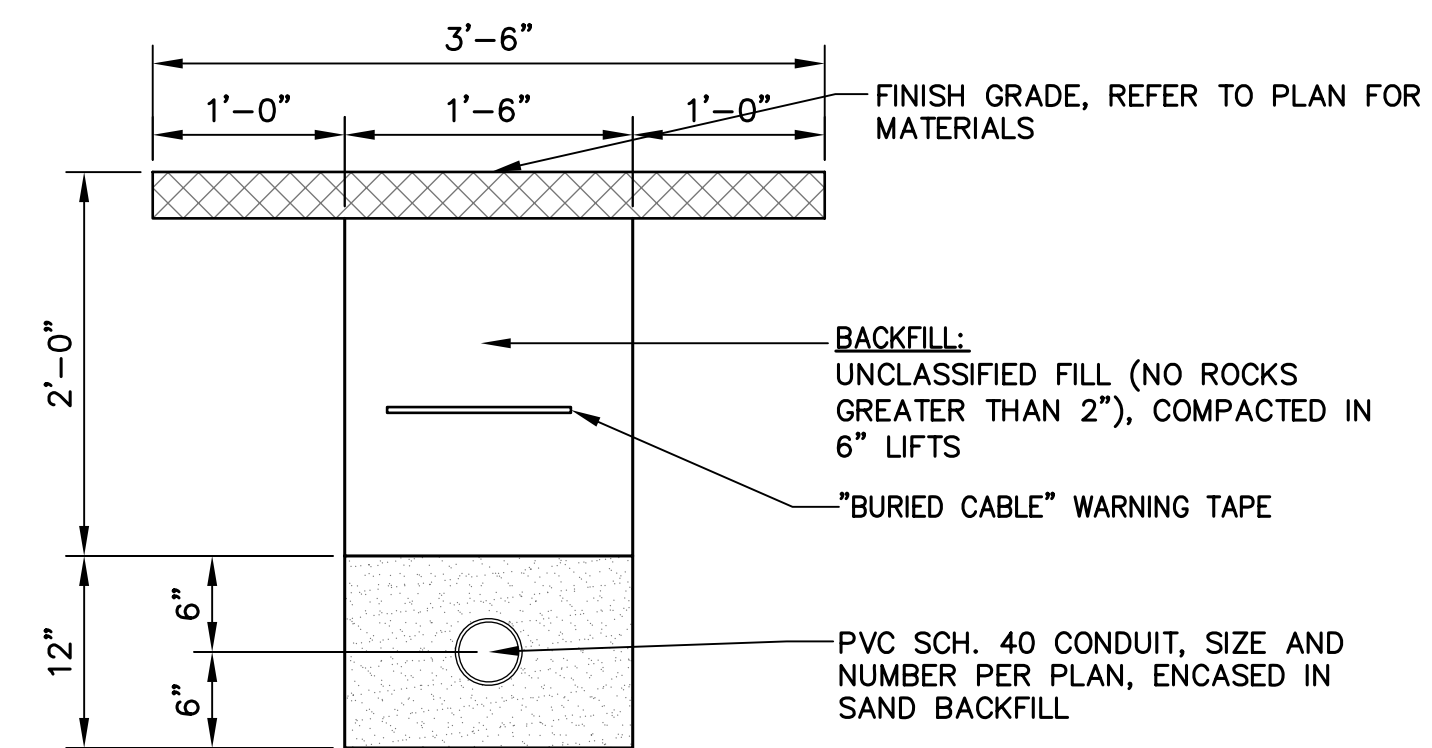
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DWG No. **L.6**

NEW SERVICE PANELBOARD - IN CABINET							
PHASE: 1		WIRES: 3		VOLTAGE: 120/240V		MAINS: 100A. MAIN C.B. (22KA - 18 CIRCUIT PANEL)	
CIRCUIT	BREAKER			DESCRIPTION OF LOAD	CABLE	CONDUIT	REMARKS
	FRAME	POLES(N-NEUTRAL)	TRIP				
M	60	2P	60	MAIN CIRCUIT BREAKER	3W#6 AWG CU & #10 GND	1-1 1/2" EMC	EXTEND EXISTING
1	20	1P	20	CONTROLLER	2W#12 AWG & #12 GND	1-1" PVC	
2	20	1P	20	DUPLEX RECEPTACLE IN CABINET	2W#12 AWG & #12 GND	1-1" PVC	
3	20	1P	20 GFIC	SWITCH AND SERVICE LIGHT IN CABINET	2W#12 AWG & #12 GND	1-1" PVC	
4	20	1P	20	SPARES 1P/20A (5 TOTAL)			
5	-	1P	-	SPACES 1P (12 TOTAL)			

BRANCH CIRCUITS SCHEDULE	
120 OR 277 VOLT 1Ø, 2W. CIRCUITS	
CIRCUIT BREAKER	CONDUCTOR
30A-1P	2#10+1#10 GND. - 1" C
40A-1P	2#8+1#10 GND. - 1" C
50A-1P	2#6+1#10 GND. - 1" C
60A-1P	2#6+1#10 GND. - 1" C
208 VOLT 1Ø, 2W. CIRCUITS	
CIRCUIT BREAKER	CONDUCTOR
20A-2P	2#12+1#12 GND. - 1" C
30A-2P	2#10+1#10 GND. - 1" C
40A-2P	2#8+1#10 GND. - 1" C
50A-2P	2#6+1#10 GND. - 1" C
60A-2P	2#6+1#10 GND. - 1" C

**1 PANELBOARD SCHEDULE & ELECTRICAL NOTES**  
N.T.S.



**2 PVC CONDUIT DUCTBANK CROSS-SECTION DETAIL**  
N.T.S.

No.	Description	Date

REVISIONS



Project:

**KENNEDY MIDDLE SCHOOL  
ATHLETIC FIELD RENOVATION  
655 LEXINGTON STREET  
WALTHAM, MA 02452**

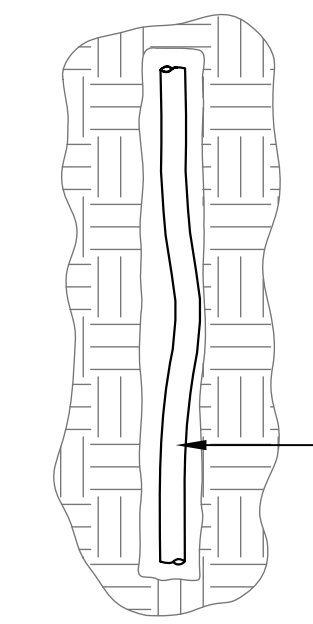
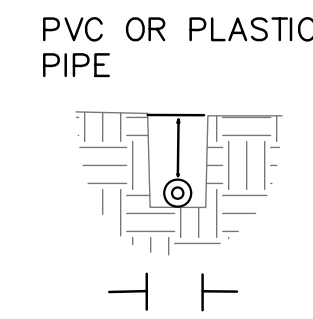
Prepared For:

**WALTHAM PUBLIC  
SCHOOLS FACILITIES  
617 LEXINGTON STREET  
WALTHAM, MA 02452**

TITLE:  
**ELECTRICAL &  
GROUNDING DETAILS**

Scale AS NOTED Date MAY 14, 2013  
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Approved By CCC  
Project No. 1303.00

DWG No. **L.7**

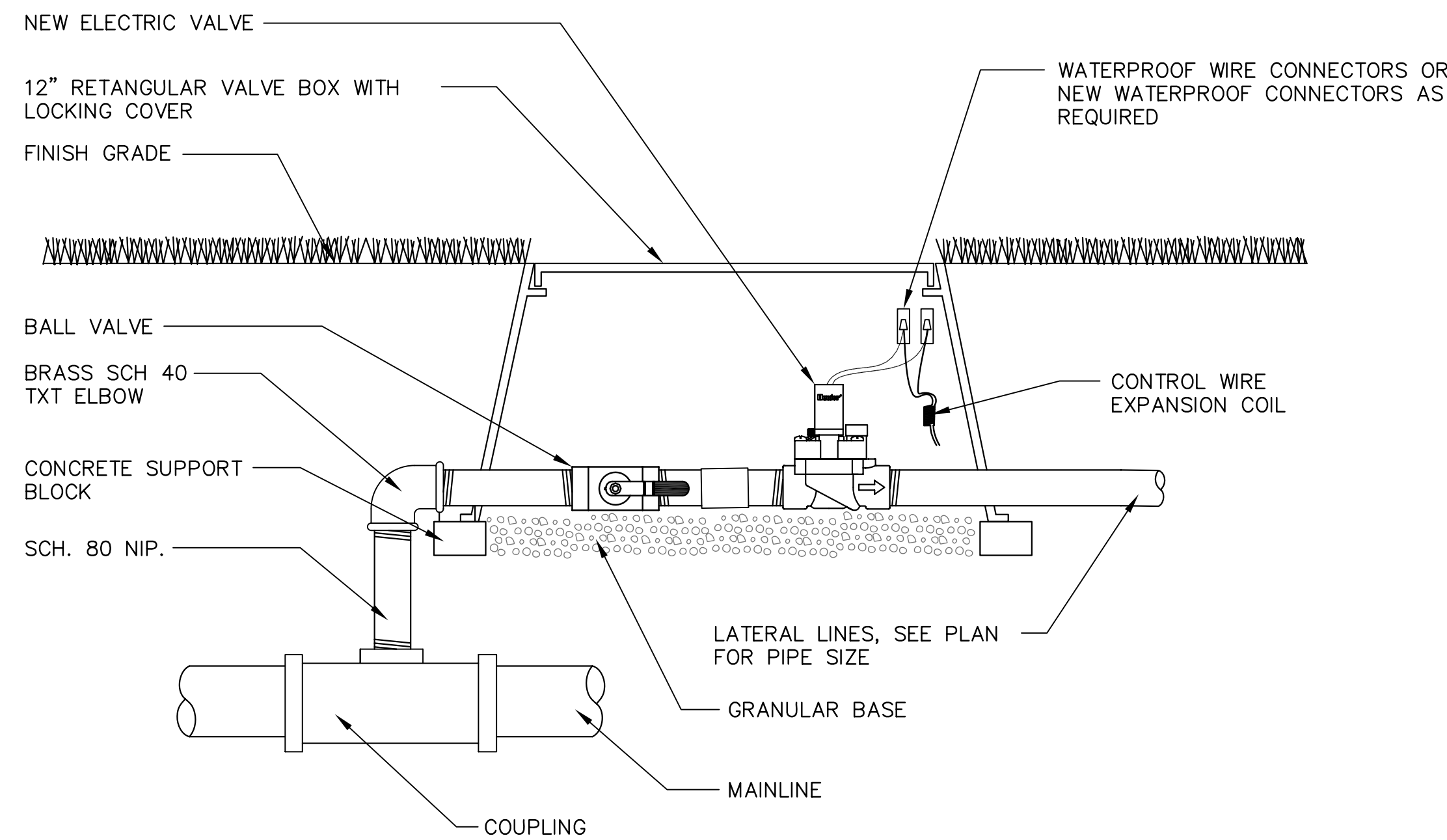


ALL PIPE TO BE INSTALLED IN TRENCHES AS SHOWN

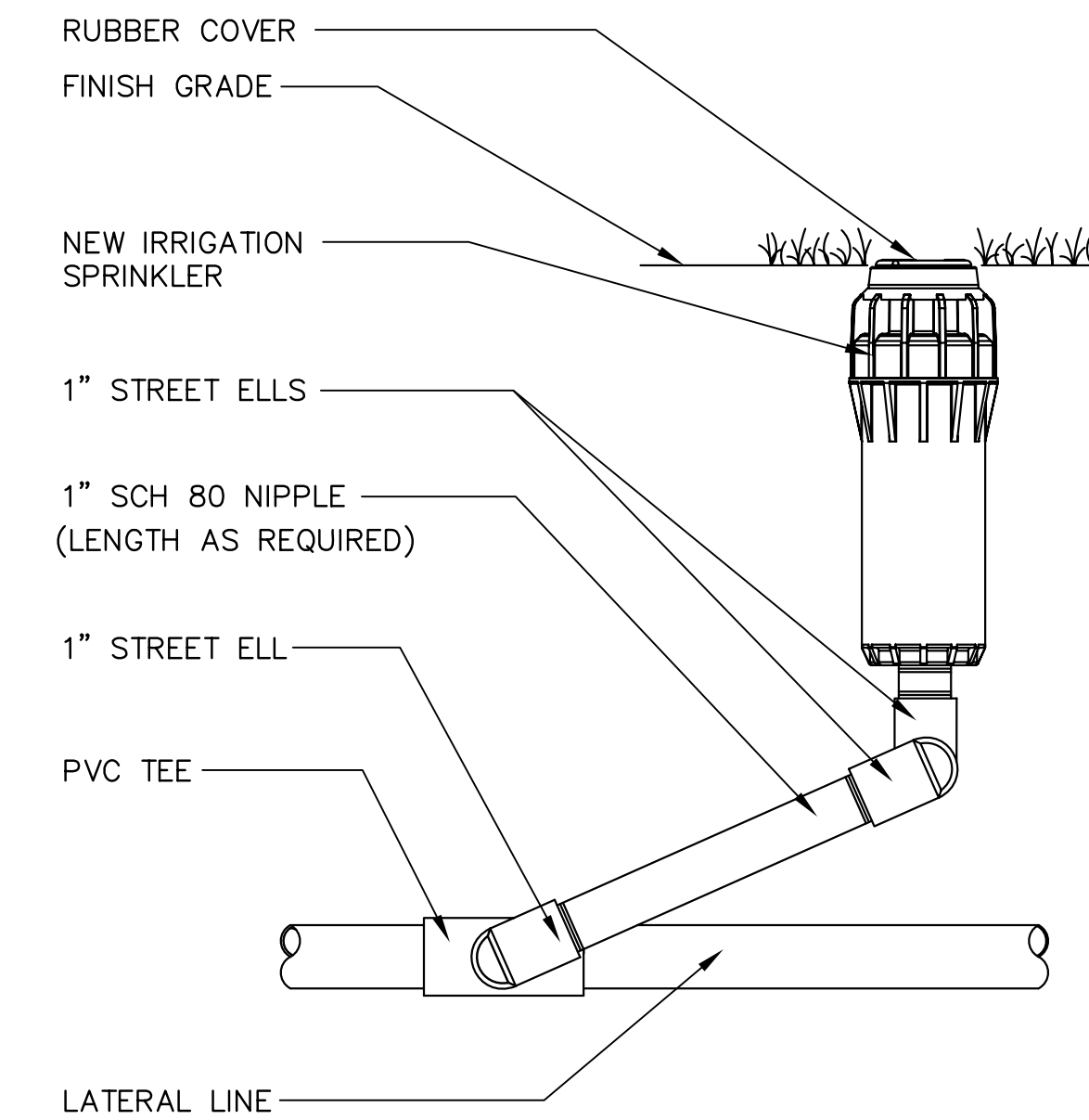
NOTE:

ALL OF THE PIPE DEPTHS ARE BASED ON THE INDIVIDUAL PIPE SIZES. REFER TO THE SPECIFICATIONS FOR THE MINIMUM DEPTH OF COVER FOR EACH SIZE OF PIPE.

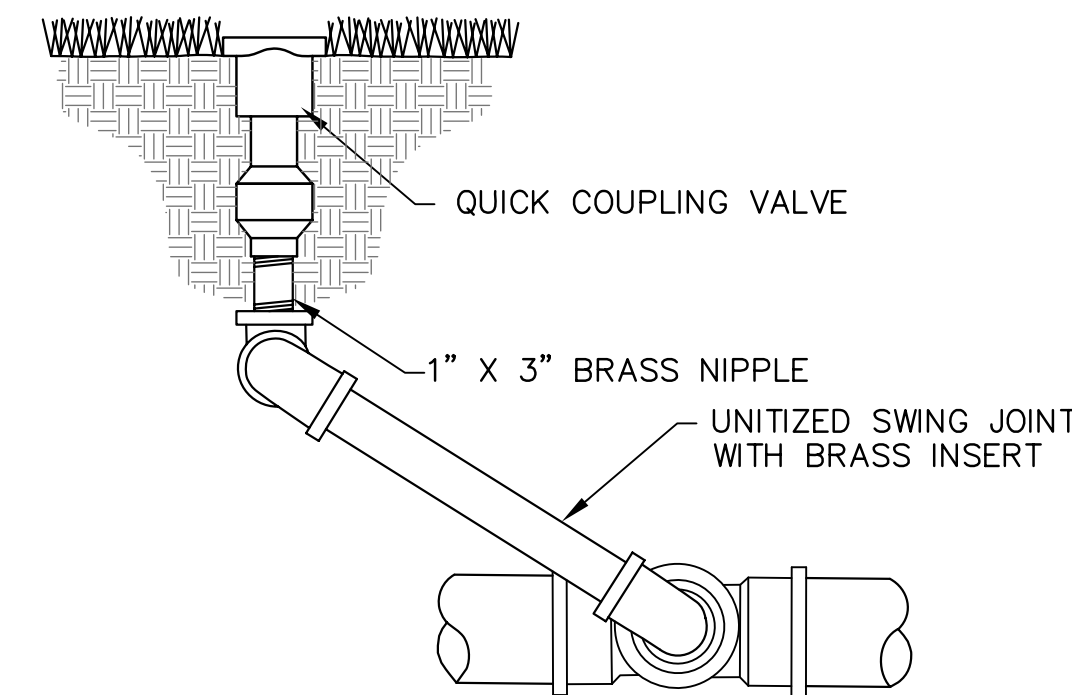
**4 TRENCH DETAIL (TYPICAL)**  
NOT TO SCALE



**3 AUTOMATIC CONTROL VALVE (TYPICAL)**  
NOT TO SCALE



**1 GEAR DRIVEN ROTARY IRRIGATION SPRINKLER INSTALLATION DETAIL (TYPICAL)**  
NOT TO SCALE



**5 QUICK COUPLING VALVE DETAIL (TYPICAL)**  
NOT TO SCALE

PROVIDE THRUST BLOCKS AT ALL CHANGES IN SIZE OR DIRECTION, ELBOWS, REDUCERS, PLUGS, VALVES, AND THE OPPOSITE SIDE OF TEE BRANCHES.

THE SIZES OF THE BLOCK IS DETERMINED BY THE WORKING PRESSURE, THE SIZE AND TYPE OF FITTING, AND SOIL CONDITIONS AT THE JOB SITE. TO CALCULATE THE AREA OF CONTACT WITH THE SOIL, FOLLOW THESE STEPS:

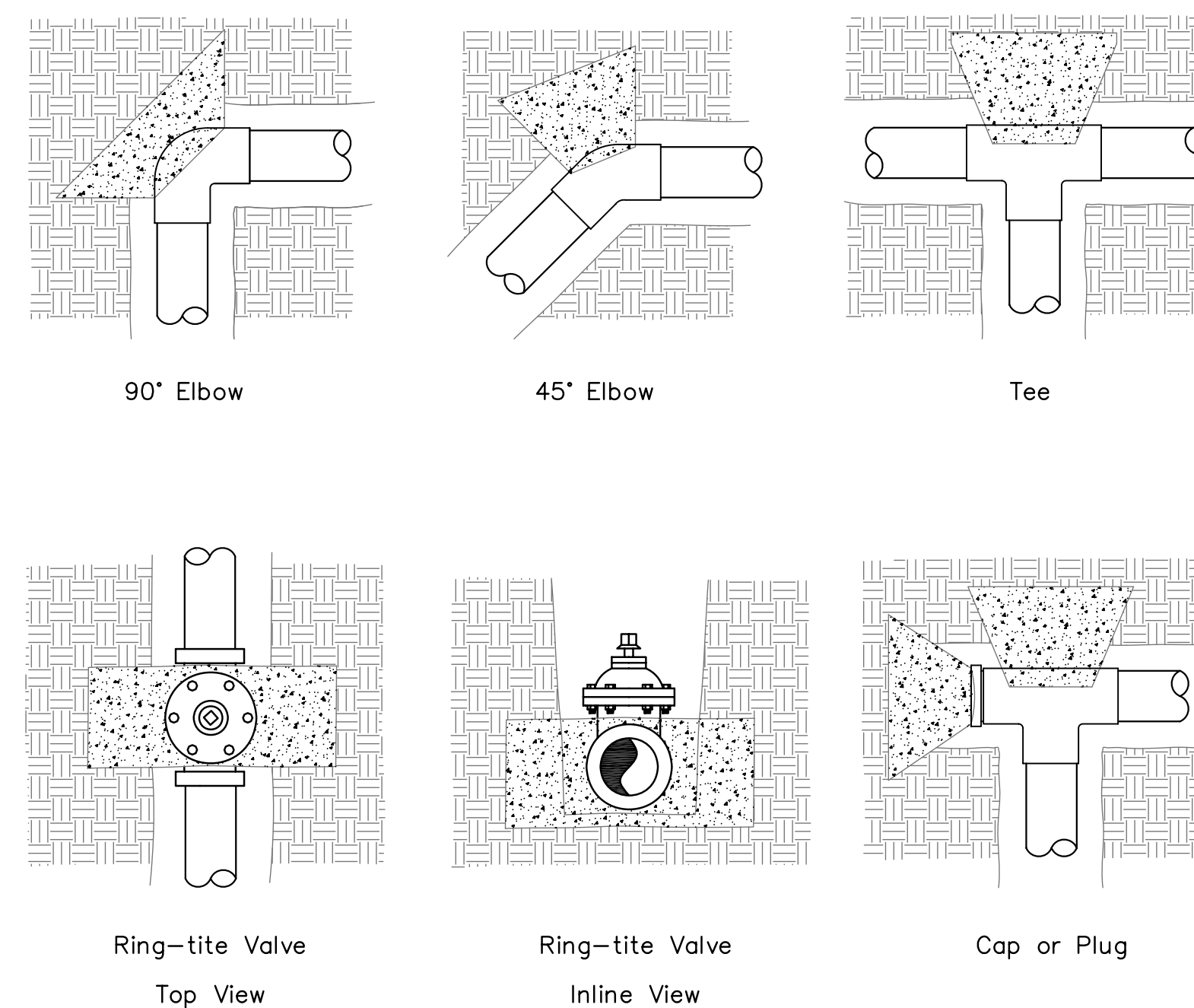
- CALCULATE THE THRUST BY SELECTING THE VALVE BY SIZE AND TYPE OF FITTING (TABLE 1), AND MULTIPLYING THAT VALUE BY THE MAXIMUM WORKING PRESSURE AT THE FITTING.
- DIVIDE THE TOTAL THRUST BY BEARING CAPACITY OF THE SOIL IN EXCAVATION (TABLE 2).
- THE RESULT IS THE TOTAL AREA (IN SQUARE FEET) OF THRUST BLOCK REQUIRED TO BE IN CONTACT WITH THE UNDISTURBED SOIL OF THE TRENCH WALL.

Table 1  
Fitting Thrust Factors

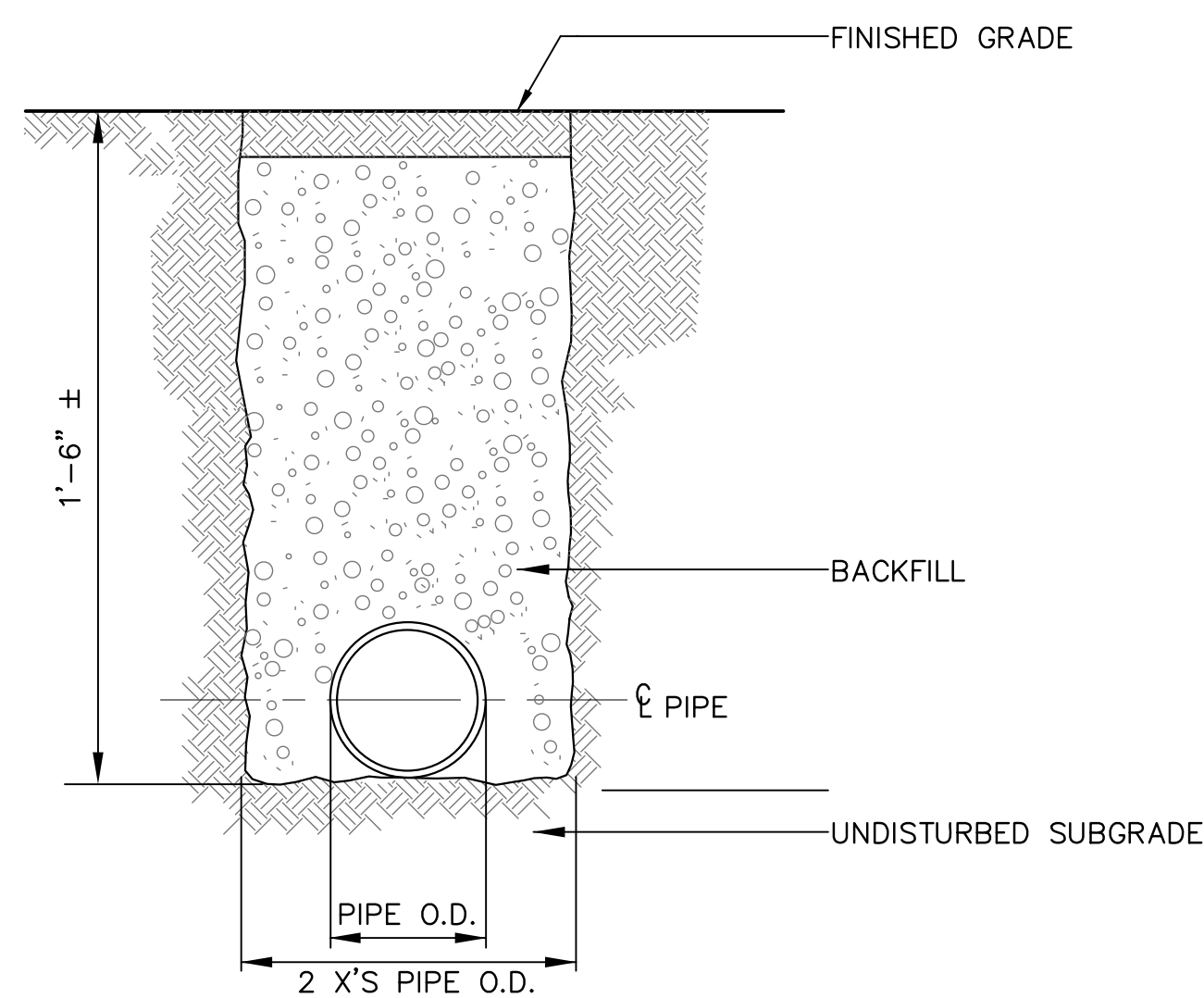
Size	Tee, Cap or Valve	90° Elbow	45° Elbow	22.5° Elbow
1 1/2	2.94	4.16	2.25	1.15
2	4.56	6.45	3.50	1.78
2 1/2	6.65	9.40	5.10	2.60
3	9.80	13.90	7.51	3.82
4	16.20	23.00	12.40	6.31
6	34.80	49.20	26.70	13.60
8	59.00	83.50	45.20	23.00
10	91.50	130.00	70.00	35.80
12	129.00	182.00	98.50	50.30

Table 2  
Soil Bearing Loads

SOIL TYPE	SAFE BEARING LOAD LBS PER SQ FT
Muck, peat, etc.	0
Soft Clay	500
Medium Clay	1,000
Sand	1,000
Sand & Gravel	1,500
Compact Sand	3,000
Sand & Gravel cemented w/Clay	4,000
Hard Pan Clay	5,000
Sound Shale	10,000

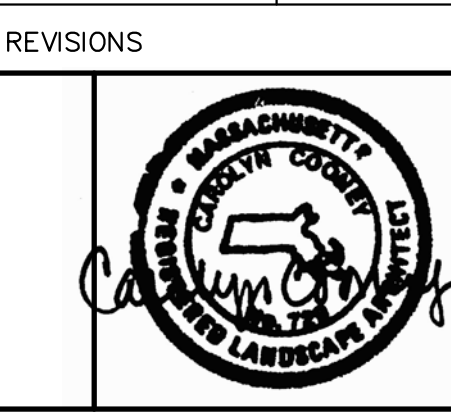


**2 THRUST BLOCKING DETAIL (TYPICAL)**  
NOT TO SCALE



**6 TRENCH SECTION PVC MAIN (TYPICAL)**  
NOT TO SCALE

No.	Description	Date



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Prepared For:  
**WALTHAM PUBLIC  
 SCHOOLS FACILITIES  
 617 LEXINGTON STREET  
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TITLE:  
**IRRIGATION DETAILS**

Scale AS NOTED Date MAY 14, 2013  
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DWG No. **L.8**