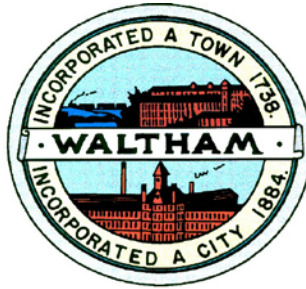


The City of Waltham



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

Willard Street Reclamation

The bid opening will be held: 10:00 AM Thursday December 15, 2016,

A pre-bid meeting: 10:00 AM on Wednesday December 7, 2016

(Meet in the Auditorium of 119 School Street, Waltham, MA 02452)

Last day for written questions: 12 Noon Thursday December 8, 2016.

(Via e-mail only to jpedulla@city.waltham.ma.us)

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SECTION 00100

The City of Waltham

Purchasing Department

INVITATION FOR BID (IFB)

Under the rules of M.G.L. Chapter 30, 39M, the Chief Procurement Officer of the City of Waltham Purchasing Department hereby requests sealed bids for:

Willard Street Reclamation

Price Proposals will be received at the office of the Purchasing Agent, City Hall, 610 Main Street, Waltham MA 02452, until,

Thursday December 15, 2016 at 10 AM

At which time and place the bids will be publicly opened and read.

Pre-bid meeting will be held: **Wednesday Decemeber 7, 2016 at 10 AM**
(Meet in the Auditorium of 119 School Street, Waltham)

Last day for written Questions: **12.00 noon Thursday August 4, 2016**
(Via e-mail ONLY to Jpedulla@city.waltham.ma.us)

Specifications and information available on line by visiting the Waltham Purchasing Department web site at www.city.waltham.ma.us/open-bids

BIDS MUST BE SIGNED AND ENCLOSED IN A SEALED ENVELOPE AND MARKED:

BID FOR: **Willard Street Reclamation**

A 5% Bid Bond or Certified Check must accompany each bid submitted and made payable to, and become the property of the City of Waltham, if the successful bidder refuses or neglects to comply with the terms of the Contract.

If the Bidder is a corporation, state your correct corporate name and State of incorporation. If Bidder is a partnership, state names and addresses of partners. If Bidder is a trust or other legal entity, state correct names and addresses of trustees or names and address of those legally authorized to bid and enter into contracts.

EXCEPTION OR ALTERNATES TO SPECIFICATIONS, TERMS OF SALE, AND DISCOUNTS AVAILABLE, MUST BE INCLUDED IN THE BID PRIOR TO OPENING DATE.

Final Project completion is 90 Calendar days from the date of the Notice-to-Proceed

**SECTION 00200
INSTRUCTIONS FOR BIDDERS**

1. READ ALL DOCUMENTS.

Bidders should familiarize themselves with all the documents contained herein; it is mandatory that all Bids be in compliance with all the provisions contained in said documents.

2. FORMS AND ATTACHMENTS.

Bids are to be completed on the forms provided ONLY and enclosed in a sealed envelope marked on the outside "BID (title)" and the name and address of bidder. Attachments submitted in addition to the Waltham Purchasing Department produced forms may not be considered.

3. PRINTED OR TYPED RESPONSE.

All information must be typewritten or printed in ink, including the price the bidder offers in the space as provided on the bid form.

4. CORRECTIONS.

Bids that are submitted containing cross outs, white outs or erasures, will be rejected. All corrections or modifications to the original bid are to be submitted in a separate envelope, properly marked on the outside, "CORRECTION/ MODIFICATION TO BID (title)" and submitted prior to the bid opening.

ALL DOCUMENTS SUBMITTED WITH YOUR RESPONSE WILL BE INCORPORATED INTO THE CONTRACT.

5. PRICE IS ALL INCLUSIVE.

Bid prices shall encompass everything necessary for furnishing all items, materials, supplies or services as specified, and in accordance with the specifications, including proper packing, cost of delivery, and in the case of services, completion of same, as per specifications.

6. PRICE DISCREPANCY.

In the event of a discrepancy between the Unit Price and the Extension, the Unit Price shall prevail.

7. EXPLANATIONS, EXCEPTIONS

Explanations, exceptions or other information pertinent to the specifications may be made in writing and included in the same envelope with the bid.

8. BID DEPOSITS.

Bid deposits are to be made payable to the City of Waltham. In the event that the successful bidder fails to execute a Contract within (10) days of the receipt of said contract, such security shall be retained by the city as liquidated damages. Unsuccessful bidders' deposits will be returned immediately following the award to said successful bidder.

9. WITHDRAW.

A Bid may be withdrawn by written request prior to the schedule for the Bid Opening. No withdrawals are permitted after the bid opening date and time. Withdrawals after the bid opening date will cause the forfeit of the bid Deposit.

10. AWARD.

Bids will be awarded not later than (90) ninety days after the scheduled bid opening date, unless otherwise stated, in the specifications. Unless otherwise specified, bids will be evaluated on the basis of, completeness of your RFP response, responsiveness, responsibility, best price and experience.

11. AWARD CRITERIA.

Qualified and responsive proposals will be evaluated based on Price, Technical, and Compliance requirements.

12. DISCOUNTS.

Discounts for prompt payments will be considered when making awards.

13. TAX EXEMPT.

Purchases by the City of Waltham is exempt from any Federal, State or Massachusetts Municipal Sales and/or Excise Taxes.

14. SAMPLES (if applicable).

The City of Waltham may require the submission of samples either before or after the awarding of a contract. Samples are to be submitted, at no charge to the City, so as to ascertain the product's suitability. If specifically stated in the Bid that samples are required, said samples must be submitted with the Bid prior to the Official Bid Opening. Failure to submit said samples would be cause for rejection of Bid. All samples must be called for and picked up within (30) thirty days of award or said samples will be presumed abandoned and will be disposed of.

15. ACTIVE VENDOR LIST.

Vendors who wish to remain on the Active Bid List must either submit a Bid, No Bid, or a letter requesting same, no later than the Official Bid Opening. This is applicable to those vendors who have received the Invitation to Bid.

16. FUNDS APPROPRIATION.

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

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

18. THE TAX ATTESTATION CLAUSE, CERTIFICATION OF NON-COLLUSION AND THE CERTIFICATE OF VOTE AUTHORIZATION, are required by statute and are an integral part of the Invitation for Bid and must be completed and signed by the person submitting the Bid, or by the person/persons who are officially authorized to do so. Failure to do so may disqualify the bid.

19. STANDARD OF QUALITY.

Where, in the specifications, one certain kind, type, catalog number, brand or manufacturer of material is named, it shall be regarded as the required standard of quality. Where two or more are named, these are presumed to be equal and the Bidder may select one or the other. If the Bidder proposes to offer a substitute as an equal, he shall so indicate on the Bid Form, the kind, type, catalog number, brand, or manufacturer of material that is offered as an equal, and describe where it differs from the specifications. Substituted items must be capable of performing all the functions and/or operational features described or indicated in the specifications. Failure to indicate the description of any substitute item on the Bid will be interpreted to mean that the Bidder will furnish the item or service as specified.

20. MODIFICATION.

No agreement, understanding, alteration or variation of the agreement, terms or provisions herein contained shall bind the parties, hereto unless made and executed in writing by the parties hereto.

21. ASSIGNMENT.

The final payment for work done under this Contract shall be made only after the Contractor has signed a statement under the penalty of perjury, certifying that he has completed the work described in the final estimate. Neither party hereto shall assign this Contract or sublet it in part or as a whole without the prior written consent of the other party hereto. The Contractor shall not assign any sum or sums due or becoming due to him hereunder without the prior written consent of the City.

22. DELIVERIES:

a) The Contractor shall pay all freight and delivery charges. The Waltham Purchasing Department does not pay for shipping and packaging expenses. Items must be delivered as stipulated in the specifications. All deliveries must be made to the inside of city buildings. Sidewalk deliveries will not be accepted. City personnel are not required to assist in the deliveries and contractors are cautioned to notify their shippers that adequate assistance must be provided at the point of delivery, when necessary.

b) All items of furniture must be delivered inside the building, set up, in place and ready for use. Deliveries are to be made between the hours of 8:30 a.m. and 3:00 p.m., Monday through Friday, except on holidays.

c) All damaged items, or items which do not comply with specifications will not be accepted and title therefore will not vest to the Waltham Purchasing Department until such items are accepted and signed for, in good order, by the receiving department.

d) The contractor must replace, without further cost to the Waltham Purchasing Department, such damaged or non-complying items before payment will be made.

23. GUARANTEES.

Unless otherwise stipulated in the specifications, furniture, equipment and similar durable items shall be guaranteed by the contractor for a period of not less than one year from the date of delivery and acceptance by the receiving department. In addition, the manufacturer's guarantee shall be furnished. Any items provided under this contract which are or become defective during the guarantee period shall be replaced the contractor free of charge with the specific understanding that all replacements shall carry the same guarantee as the original equipment. The contractor shall make such replacement immediately upon receiving notice from the Purchasing Agent.

24. SINGLE VENDOR.

The Waltham Purchasing Department desires to award a single contract based on the Grand Total Price. However, where applicable, the City reserves the right to make multiple awards on a unit price basis if, in the opinion of the Waltham Purchasing Department, it is in the best interest of the Waltham Purchasing Department.

25. CHANGE ORDERS.

Change orders are not effective until, if, as and when signed by the Mayor and no work is to commence until the change orders are fully executed.

26. BID OPENING INCLEMENT WEATHER

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

SECTION 00300

BID FORM

To the City of Waltham, Massachusetts:

Regarding: **Willard Street Reclamation**

The Owner reserves the right to reject any bid in the event that any bid item or items are obviously unbalanced or appear to the Owner to be so unbalanced as to affect or to be liable to affect adversely any interest of the Owner.

The Owner reserves the right to reject any or all bids if it deems it to be in its best interest to do so. The Owner reserves the right to award the Contract based on sufficiency of appropriated funds to complete the work.

The undersigned states that no officer, agent, or employees of the Owner directly or indirectly have a financial interest in this Bid.

The undersigned, as Contractor, declares as follows:

- The only parties interested in this Bid as Principals are named herein
- This Bid is made without collusion with any other person, firm, or corporation
- No officer, agent, or employee of the owner is directly or indirectly interested in this Bid
- The Contractor has carefully examined the proposed Work and fully informed and satisfied himself as to the conditions there existing, the character and requirements of the proposed Work, the difficulties attendant upon its execution and the accuracy of all estimated quantities stated in this Bid, and has carefully read and examined the annexed proposed AGREEMENT and the Specifications and other Contract Documents therein referred to and knows and understands the terms and provisions thereof
- Understands that information relative to subsurface and other conditions, natural phenomena, existing pipes, and other structures (surface and/or subsurface) has been furnished only for his information and convenience without any warranty or guarantee, expressed or implied, that the subsurface and/or other conditions, natural phenomena, existing pipes, and other structures (surface and/or subsurface) actually encountered will be the same as those shown within the Contract Documents and agrees that the Contractor shall not use or be entitled to use any such information made available to him through Contract Documents or otherwise or obtained by him in his own examination of the site, as a basis of or ground for any claim against the Owner of the Engineer arising from or by reason of any variance which may exist between the aforesaid information made available to or acquired by him and the subsurface and/or other conditions, natural phenomena, existing pipes, and other structures (surface and/or subsurface) actually encountered during the construction work, and has made due allowance therefore in this BID

- The Contractor understands that the quantities of work tabulated in this Bid or indicated in the Specifications of other Contract Documents are only approximate and are subject to increase or decrease as deemed necessary by the Engineer
- The Contractor agrees that, if this BID is accepted will contract with the Owner, as provided in the copy of the Contract Documents deposited in the office of the Engineer, this BID from being part of said Contract Documents, and that the Contractor will perform all the work and furnish all the materials and equipment, and provide all labor, services, plant, machinery, apparatus, appliances, tools, supplies, and all other things required by the Contract Documents in the manner and within the time therein prescribes and according to the requirements of the Engineer as therein set forth, and that the Contractor will take in full payment therefore the lump sum or unit price applicable to each item of the Work as states in the schedule below

Contractors must bid on each Item.

Refer to Section 01025 – Measurement and Payment for Item Descriptions.

Final Project Completion is 90 Calendar Days from the date of the Notice-to-Proceed (NTP)

BASE SCOPE OF WORK BID FORM

The Base Bid include all the work of the Contractor, being all work covered by Items 1 through 18, inclusive.

Item No.	Item Description and Unit Price	Units	Estimated Quantity	Unit Price (Figures)	Extended Total (Figures)
1	Mobilization, Demobilization and Site Restoration <hr/> Dollars and Cents	L.S.	1		
2	Roadway Reclamation <hr/> Dollars and Cents	S.Y.	1,650		
3	Fine Grading & Compacting <hr/> Dollars and Cents	S.Y.	1,650		
4	Furnish & Install Roadway Binder Course Pavement (3 in.) <hr/> Dollars and Cents	TON	300		
5	Furnish & Install Roadway Top Course Pavement (1.5 in.) <hr/> Dollars and Cents	TON	150		
6	Furnish & Install Bituminous Concrete Driveway Apron & Walkway (3 in.) <hr/> Dollars and Cents	S.Y.	320		
7	Furnish & Install Cement Concrete Driveway Apron (6 in.) <hr/> Dollars and Cents	S.Y.	35		

BASE SCOPE OF WORK BID FORM

Item No.	Item Description and Unit Price	Units	Estimated Quantity	Unit Price (Figures)	Extended Total (Figures)
8	Furnish & install Cement Concrete Walkway (4 in.) <hr/> Dollars and Cents	S.Y.	15		
9	Remove and Reset Existing Concrete Curb <hr/> Dollars and Cents	L.F.	600		
10	Furnish and Install New Concrete Curb <hr/> Dollars and Cents	L.F.	250		
11	Furnish and Install New Concrete Step for Walkway <hr/> Dollars and Cents	EA.	4		
12	Adjustment of Castings, Frames & Grates <hr/> Dollars and Cents	EA.	14		
13	Adjustment of Gate Boxes <hr/> Dollars and Cents	EA.	10		
14	Furnish & Install Loam & Seed <hr/> Dollars and Cents	S.Y.	500		
15	Unclassified Excavation <hr/> Dollars and Cents	C.Y.	100		

BASE SCOPE OF WORK BID FORM

Item No.	Item Description and Unit Price	Units	Estimated Quantity	Unit Price (Figures)	Extended Total (Figures)
16	Additional Gravel Borrow Fill and/or Refill <hr/> Dollars and Cents	C.Y.	100		
17	Police Details for Traffic Management, Allowance Twenty-six thousand four hundred <hr/> Dollars and Zero Cents	Hr.	600	\$44.00	\$26,400.00
18	Miscellaneous Work & Cleanup <hr/> Dollars and Cents	L.S.	1		

Total Amount of Base Bid (Items 1 through 18, inclusive).

\$ _____
(Amount in figures)

(Amount in words)

Basis of Award: The basis of award shall be at the Owner's sole discretion.

My company acknowledges receipt of addendum #: _____, _____, _____, _____, _____, _____, _____.

The Contractor hereby agrees that he will not withdraw this BID within thirty (30) consecutive calendar days after the actual date of the opening of Bids and that, if the Owner shall accept this BID, the Contractor will duly execute and acknowledge the AGREEMENT and furnish, duly executed and acknowledge, the required CONTRACT BONDS within ten (10) calendar days after notification that the AGREEMENT and other Contract Documents are Ready for signature.

If this BID is accepted by the Owner, the undersigned agrees to complete the entire work provided to be done under the Contract within **90 calendar days**, as stipulated in the AGREEMENT.

A performance bond in an amount equal to 50 percent of the total amount of the bid with a surety company qualified to do business in the Commonwealth of Massachusetts will be required for the faithful performance of the contract, as well as a labor and materials bond in an amount equal to 50 percent of the total bid amount.

This Proposal must bear the written signature of the Contractor or that of his duly authorized agent. If the Contractor is a corporation or a partnership, the Bid must be signed by a duly authorized officer of such corporation or by a Partner and the title of such officer must be stated. Satisfactory completion of the following data is an essential part of submission of this Proposal and is required. Bid must be embossed with corporate seal.

(SEAL)

(Name of Contractor)

By: _____
(Signature and title of authorized representative)

Date: _____

(Telephone Number)

(Business Address)

(Fax Number)

(City and State)

END OF SECTION 00300

GENERAL CONDITIONS

SECTION 00700
GENERAL CONDITIONS

1. INFORMATION

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

2. SUITS

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

3. LAWS AND REGULATIONS

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

4. PROTECTION OF PROPERTY

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

5. PROTECTION OF PERSONS

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

6. CONTRACT DURATION.

This contract is for the period required to complete the project. All guarantees remain in effect.

7. INSURANCE

A. WORKMAN’S COMPENSATION: The Contractor shall provide insurance for the payment of compensation and furnishing of other benefits under Chapter 152 of the General Laws of the Commonwealth of Massachusetts to all persons to be employed under this contract, the premiums for which shall be paid by the Contractor. Contractors shall provide insurance on a primary basis and the contractor’s policy shall be exhausted before resorting to other policies. The contractor’s policy is the primary one not the contributory.

B. COMPREHENSIVE GENERAL LIABILITY

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

C. AUTOMOBILE (VEHICLE) LIABILITY

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

D. UMBRELLA POLICY

General liability	\$2,000,000
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Your bid response must include a Certificate of Insurance with the above limits as a minimum. In addition, the Certificate of Insurance must have the following text contained in the bottom left box of the Certificate: *"The City of Waltham and all the abutters to this site are a named additional insured for all insurances under the contract, excluding Automobile and Workers Compensation coverage"*. Failure by the contractor to provide a current and updated insurance policy, during the entire duration of the contract, may result in additional legal liability. The Certificate of Insurance must be mailed directly to:

Office of the Purchasing Agent
Purchasing Department
City of Waltham
610 Main Street
Waltham, MA 02452

8. **LABOR AND MATERIALS BOND**

The Contractor agrees to execute and deliver to the City, a Labor and Materials or Payment Bond EACH equal to 50% of the contract value. This contract shall not be in force until said bond has been delivered and accepted by the City. Bond to be issued by a company licensed by the Commonwealth of Massachusetts.

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

9. **PERSONNEL:**

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

10. PREVAILING WAGES

The Contractor is required to pay the prevailing wages as determined under the provisions of Chapter 149, Sections 26 and 27D of the Massachusetts General Laws, including the submission of weekly payrolls to the awarding authority. The prevailing wage schedule for this project can be found at www.city.waltham.ma.us/open-bids.

11. MATERIALS

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

12. TERMINATION OF CONTRACT

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

13. CONTRACT OBLIGATIONS

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

14. BIDDER EXPERIENCE EVALUATION

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

15. NOT-TO-EXCEED AMOUNT

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

16. FINANCIAL STATEMENTS.

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

17 BREACH OF CONTRACT/ NON PERFORMANCE

If the Contractor shall provide services in a manner, which is not to the satisfaction of the City, the City may request that the Contractor refurnish services at no additional cost to the City until approved by the City. If the

Contractor shall fail to provide services, which are satisfactory to the City, the City in the alternative may make any reasonable purchase or Contract to purchase services in substitution for those due from the Contractor. The City may deduct the cost of any substitute Contract for nonperformance of services together with incidental and consequential damages from the Contract price and shall withhold such damages from sums due or to become due to the Contractor. If the damages sustained by the City exceed sums due or to become due, the Contractor shall pay the difference to the City upon demand. The Contractor shall not be liable for any damages sustained by the City due to the Contractor's failure to furnish services under the terms of this Contract if such failure is in fact caused by the occurrence of a contingency the nonoccurrence of which was a basic assumption under which this Contract was made, including a state of war, embargoes, expropriation of labor strike or any unanticipated federal, state or municipal governmental regulation of order, provided that the Contractor has notified the City in writing of such cause within seven (7) days after its occurrence.

18 RIGHT TO AUDIT

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

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

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

SECTION 00900

Compliance

(The following documents shall be properly completed and returned with your bid response.)

Compliance

The compliance documents in this section must be completed, signed and returned with your bid package.

Purchasing Department
City of Waltham
610 Main Street
Waltham, MA 02452

Failure to submit the completed documents will cause the disqualification of the proposal.

Section Index

	Check when Complete
• Non-collusion form and Tax Compliance form.....	_____
• Corporation Identification Form.....	_____
• Certificate of Vote Authorization.....	_____
• Certificate of Insurance (showing all limits of WC &GL).....	_____
• Three (3) References.....	_____
• 5% Bid Bond or Certified Check	_____
• Debarment Certificate	_____
• OSHA 10 Certificate for all Assigned Employees (MGL ch30, §39M and Ch 149)	_____

Before the commencement of the Job, the contractor must provide to the above office:

- Performance Bond and Payment Bond each for 100% of the contract value and naming the City of Waltham

Your Company's Name: _____

Service or Product Bid _____

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.

NON-COLLUSION FORM AND TAX COMPLIANCE FORM

CERTIFICATE OF NON-COLLUSION

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

_____, _____
(Signature of person signing bid or proposal) Date

(Name of business)

TAX COMPLIANCE CERTIFICATION

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

_____, _____
Signature of person submitting bid or proposal Date

Name of business

NOTE

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

CERTIFICATE OF VOTE OF AUTHORIZATION

Date:

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

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

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

SIGNED:

(Corporate Seal)

Clerk of the Corporation:

Print Name: _____

COMMONWEALTH OF MASSACHUSETTS

County of _____

Date:

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

Notary Public;

My Commission expires: _____

CORPORATION IDENTIFICATION

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

If a Corporation:

Incorporated in what state _____

President _____

Treasurer _____

Secretary _____

Federal ID Number _____

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

Yes _____, No _____

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

If a Partnership: (Name all partners)

Name of partner _____

Residence _____

Name of partner _____

Residence _____

If an Individual:

Name _____

Residence _____

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

Name of Firm _____

Name of Individual _____

Business Address _____

Residence _____

Date _____

Name of Bidder _____

By _____

Signature _____

Title _____

Business Address _____ (POST OFFICE BOX NUMBER NOT ACCEPTABLE)

City State Telephone Number Today's Date

PROVIDE THREE (3) SERVICE APPROPRIATE REFERENCES

1. Company Name:

Address:

Contact Name:

Phone #

Type of service/product provided to this Company:

Dollar value of service provided to this Company:

2. Company Name:

Address:

Contact Name:

Phone #

Type of service/product provided to this Company:

Dollar value of service provided to this Company:

3. Company Name:

Address:

Contact Name:

Phone #

Type of service/product provided to this Company:

Dollar value of service provided to this Company:

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.

**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

_____, 200____

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 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 _____

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 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.

END OF SECTION 00900

SECTION 00915

AGREEMENT made between the **CITY OF WALTHAM**, a municipal corporation duly established under the laws of the Commonwealth of Massachusetts, through its Mayor thereunto duly authorized, hereinafter called the OWNER, and _____ having a usual place of business at _____ hereinafter called the CONTRACTOR. The OWNER, having by letter dated _____ accepted the proposal of the CONTRACTOR for **"Willard Street Reclamation"** all of which are hereto attached and made a part hereof, hereinafter called the DOCUMENTS, and the CONTRACTOR hereby agrees to provide the labor, materials, services and work in accordance with the quotation, bid, proposal and said DOCUMENTS. If applicable, all contractors must comply with the prevailing wage rate law as required under the provisions of all Massachusetts General Law. All appropriate Bonds and Certificates of Insurance, per specifications, will be submitted before Contract is signed. This Contract shall not be in effect nor any work commenced until the Mayor signs the Contract.

IN WITNESS WHEREOF, the OWNER sets its hand and corporate seal through its Purchasing Agent thereunto duly authorized, and the CONTRACTOR hereunto sets its hand and seal on the day and year first above written. Bid package and company response are incorporated herewith by reference.

FOR THE CITY OF WALTHAM

FOR THE COMPANY

APPROVED AS TO FORM ONLY

John Cervone, City Solicitor
Date _____

Authorized Signature,
Title: _____
Print Name _____
Date: _____

APPROVED, MAYOR

Jeannette A. McCarthy, Mayor
Date _____

ENGINEERING

Stephen Casazza, City Engineer
Date _____

AUDITING DEPT. (certifying to the availability of Funds)

Paul Centofanti, Auditor
Date: _____

PURCHASING AGENT

Joseph Pedulla, Purchasing Agent
Date: _____

DIVISION – 1
General Requirements

SECTION 01000
GENERAL REQUIREMENTS

PART 1 GENERAL

- 1.01 GENERAL
- 1.02 TRAFFIC CONTROL
- 1.03 INTERFERENCE WITH/AND PROTECTION OF STREETS
- 1.04 MAINTAINING SEWAGE FLOWS
- 1.05 HANDLING AND DISTRIBUTION
- 1.06 INSPECTION OF WORK AWAY FROM THE SITE
- 1.07 LINES, GRADES, AND MEASUREMENTS
- 1.08 DIMENSIONS OF EXISTING STRUCTURES
- 1.09 PIPE LOCATIONS
- 1.10 PRECAUTIONS DURING ADVERSE WEATHER
- 1.11 CUTTING AND PATCHING
- 1.12 PROTECTION AGAINST ELECTROLYSIS

PART 1 GENERAL

- 1.01 GENERAL
 - A. The Contractor shall conform to all general requirements as herein specified.
- 1.02 TRAFFIC CONTROL
 - A. For control of moderate traffic, the Contractor shall provide an adequate number of flagmen employed at his own expense.
 - B. Whenever and wherever, in the opinion of the Engineer, traffic is sufficiently congested or public safety is endangered, the Contractor, as required, shall furnish uniformed special officers to direct traffic and keep traffic off the highway area affected by his construction operations. Such officers shall be in addition to the watchmen required under other provisions of the Contract.
- 1.03 INTERFERENCE WITH/AND PROTECTION OF STREETS
 - A. The Contractor shall not close or obstruct any portion of a street, road, or private way without obtaining permits from the proper authorities. If any street or private way shall be rendered unsafe by the Contractor's operations, he shall make such repairs or provide such temporary ways or guards as shall be acceptable to the Engineer.
 - B. Streets, roads, private ways, and walks not closed shall be maintained passable by the Contractor at his expense, and the Contractor shall assume full responsibility for the adequacy and safety of provisions made.
 - C. The Contractor shall, 24 hours in advance of closing any street, notify the police and fire departments in writing, with a copy to the Engineer. He shall cooperate with the police

department in the establishment of alternate routes and, at his own expense, shall provide adequate, plainly marked detour signs.

1.04 MAINTAINING STORMWATER AND SANITARY SEWER FLOWS

- A. It is essential to the operation of the existing drainage system that there is no interruption in the flow of drainage. To this end, the Contractor shall provide, maintain, and operate all temporary facilities such as dams, pumping equipment, sewers, conduits and all other labor and equipment necessary to intercept the flow before it reaches the points where it would interfere with his work, carry it past his work, and return it to the system below his work.

1.05 HANDLING AND DISTRIBUTION

- A. The Contractor shall handle, haul, and distribute all materials and all surplus materials on the different portions of the work, as necessary or required; shall provide suitable and adequate storage room for materials and equipment during the progress of the work, and be responsible for the protection, loss of, or damage to materials and equipment furnished by him, until the final completion and acceptance of the work.
- B. Storage and demurrage charges by transportation companies and vendors shall be borne by the Contractor.

1.06 INSPECTION OF WORK AWAY FROM THE SITE

- A. If work to be away from the construction site is to be inspected on behalf of the Owner during its fabrication, manufacture, testing, or before shipment, the contractor shall give notice to the Engineer of the place and time where such fabrication, manufacture, testing, or shipping is to be done. Such notice shall be in writing and delivered to the Engineer in ample time so that the necessary arrangements for the inspection can be made.

1.07 LINES, GRADES, AND MEASUREMENTS

- A. Reference marks establishing the controlling grades are available from the Engineer. These reference marks shall be replaced at the Contractor's expense if damaged or destroyed by construction operations.
- B. The Contractor shall be responsible for detailed layout, stakeout and grade control required, and shall employ a registered land surveyor or registered professional engineer for this purpose. The Owner will provide engineering inspection.
- C. Construction staking shall consist of construction layout and reference staking necessary for the proper control and satisfactory completion of all structures, grading, paving, drainage and all other appurtenances required for the completion of the Contract and acceptance of the work.

- D. The Owner will furnish the Contractor such control points, bench marks and other data as may be necessary for the construction staking and layout by qualified engineering or land surveying personnel. It shall be the responsibility of the Contractor to verify all such data prior to construction.
- E. Upon request of the Engineer, the Contractor shall furnish copies of all data used in setting and referencing all stakes and other layout markings used by the Contractor. The Contractor shall be responsible for the placement and for the accurate re-establishment of all baselines shown on the Plans, and for the replacement of existing survey points found on the Project and/or noted on the Plans. All brass survey pins in lead plugs and "PK" nails which are to be set or reset and are not to be set in stone bounds installed under this Contract, as noted on the Contract Drawings, are to be set or reset at no additional cost to the Authority. "PK" nails are to be galvanized, 1 ¼ inch minimum, with the letters "PK" on the head, separated by an indentation which marks the actual survey point, and shall be subject to the approval of the Engineer. All stakes, references and batterboards, including original, additional or replacements which may be required for the construction operations, shall be furnished, set and properly referenced by the Contractor. He shall be solely and completely responsible for the accuracy of the line and grade of all features of the work. Any errors or apparent discrepancies found in previous surveys, plans or in these Contract Documents shall be called to the Engineer's attention by the Contractor for correction or interpretation prior to proceeding with the work.
- F. All staking shall be performed by qualified engineering or land surveying personnel, acceptable to the Engineer. These personnel shall perform the staking under the direct supervision of a registered land surveyor or registered professional engineer. All stakes used for control staking shall be of a quality meeting the approval of the Engineer.
- G. When requested by the Engineer, the Contractor shall provide safe and convenient access to control points, batterboards and references. The Owner may make a check of the control of the work, as established by the Contractor, at any time as the work progresses. The Contractor will be informed of the results of these checks, but the Owner by so doing in no way relieves the Contractor of his responsibility for the accuracy of the layout work. The Contractor shall, at his expense, correct or replace, as required, any deficient layout and Construction work which is a result of inaccuracies in his taking operation or of his failure to report inaccuracies. If the Owner is required to make further studies, redesign, or both, all expenses incurred by the Owner due to such inaccuracies will be deducted from any monies due the Contractor.
- H. The Contractor shall furnish all necessary personnel, engineering equipment and supplies, materials, and transportation incidental to the accurate and satisfactory completion of this work. There will be no direct payment for construction staking, or layout, but the cost thereof shall be considered as included in the bid unit prices or the Bid.
- I. The Contractor shall verify dimensions and utility locations shown on the Contract Drawing and if any inconsistencies or discrepancies should be noted on the Contract Drawings, or between the Contract Drawings and actual field conditions, or between

the Contract Drawings and the Specifications, he shall immediately notify the Owner. The Contractor will be held responsible for any errors resulting from his failure to exercise the aforementioned precaution.

1.08 DIMENSIONS OF EXISTING STRUCTURES

- A. Where the dimensions and locations of existing structures are of importance in the installation or connection of any part of the work, the Contractor shall verify such dimensions and locations in the field before the fabrication of any material or equipment which is dependent on the correctness of such information.

1.09 PIPE LOCATIONS

- A. Exterior pipelines will be located substantially as indicated on the Contract Drawings, but the right is reserved to the Owner, acting through the Engineer, to make such modifications in location as may be found desirable to avoid interference with existing structures or for other reasons. Where fittings, etc., are noted on the Contract Drawings, such notation is for the Contractor's convenience and does not relieve him from laying and jointing different or additional items where required.
- B. Small interior piping is indicated diagrammatically on the Contract Drawings, and the exact location is to be determined in the field. Piping shall be arranged in a neat, compact, and workmanlike manner, with a minimum of crossing and interlacing, so as not to interfere with equipment or access way, and, in general, without diagonal runs

1.10 PRECAUTIONS DURING ADVERSE WEATHER

- A. During adverse weather and against the possibility thereof, the Contractor shall take all necessary precautions so that the work may be properly done and be satisfactory in all respects. When required, protection shall be provided by use of tarpaulins, wood and building-paper shelters, or other suitable means.
- B. During cold weather, materials shall be preheated, if required, and the materials and adjacent structure into which they are to be incorporated shall be made and kept sufficiently warm so that a proper bond will take place and a proper curing, aging or drying will result. Protected spaces shall be artificially heated by suitable means that will result in a moist or dry atmosphere according to the particular requirements of the work being protected. Ingredients for concrete and mortar shall be sufficiently heated so that the mixture will be warm throughout when used.

1.11 CUTTING AND PATCHING

- A. The Contractor shall leave all chases or openings for the installation of his own or any other contractor's or subcontractor's work, or shall cut the same in existing work, and shall see that all sleeves or forms are properly set in ample time to prevent delays. He shall see that all such chases, openings, and sleeves are located accurately and are of

proper size and shape and shall consult with the Engineer and the contractors and subcontractors concerned in reference to this work.

- B. In case of his failure to leave or cut all such openings or have all such sleeves provided and set in proper time, he shall cut them or set them afterwards at his own expense, but in so doing he shall confine the cutting to the smallest extent possible consistent with the work to be done. In no case shall piers or structural members be cut without the written consent of the Engineer.
- C. The contractor shall carefully fit around, close up, repair, patch, and point around the work specified herein to the satisfaction of the Engineer.
- D. All of this work shall be done by careful workmen competent to do such work and with the proper small hand tools. Power tools shall not be used except where, in the opinion of the Engineer, the type of tool proposed can be used without damage to any work or structures and without inconvenience or interference with the operation of any facilities. The Engineer's concurrence with the type of tools shall not in any way relieve or diminish the responsibility of the Contractor for such damage, inconvenience, or interference resulting from the use of such tools.
- E. The Contractor shall not cut or alter the work of any subcontractor or any other contractor, nor permit any of his subcontractors to cut or alter the work of any other contractor or subcontractor, except with the written consent of the contractor or subcontractor whose work is to be cut or altered or with the written consent of the Engineer. All cutting and patching or repairing made necessary by the negligence, carelessness, or incompetence of the Contractor or any of his subcontractors shall be done by or at the expense of the Contractor and shall be the responsibility of the Contractor.

1.12 PROTECTION AGAINST ELECTROLYSIS

- A. Where dissimilar metals are used in conjunction with each other, suitable insulation shall be provided between adjoining surfaces so as to eliminate direct contact and any resultant electrolysis. The insulation shall be bituminous impregnated felt, heavy bituminous coatings, non-metallic separators or washers, or other acceptable materials.

END OF SECTION

SECTION 01010

SUMMARY OF WORK

1. GENERAL SCOPE OF WORK

- A. The Work under this Contract includes the reclamation, regrading, and paving of approximately 490 feet of roadway, resetting of concrete curb, and reconstruction of driveway aprons and walkways.
- B. In addition, the Work under this Contract includes but is not limited to:
- Work outside the Project Site as called for in the Contract Documents and as required for the performance of the work.
 - The restoration of any items damaged or destroyed by encroaching upon areas outside the Project Site.
 - Providing and restoring, where appropriate, all temporary facilities.
 - Site clean-up and restoration to its original condition.
 - All work either shown on the Drawing or included in the specifications unless specifically indicated as not to be done.

2. The Work shall start as stated in the Notice to proceed and all items related to the roadway reclamation, placement of binder course, final paving, and site restoration shall be completed within **90 calendar days** from the Notice to Proceed.

END OF SECTION 01010

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 – GENERAL

1.1 SUMMARY

- A. Under the price specified to be paid for each item, the Contractor shall furnish all materials and equipment, furnish all labor and plant and perform all operations to complete all work as indicated and specified. Provide all supervision, overhead items, bond and permit costs, protection and precautions, and all other costs incidental to the construction work, complete, and as specified, are also included. Prevailing wages apply.
- B. A complete, furnished, working job, as intended by the general nature of these Specifications, shall be produced whether or not any particular wording or direction is omitted or inadvertently not clearly stated.
- C. Measurement for payment shall be by the Engineer, except where noted elsewhere in this Specification. Measurement for payment for lump sum items shall be on the basis of percentage of work complete and in place.
- D. Each unit or lump sum price stated in the Bid shall constitute full compensation as herein specified for each item of work completed in accordance with the Drawings and Specifications.
- E. The prices for those items which involve excavation shall include compensation for disposal of surplus excavated material, handling of water, and any required earth support, shoring or bracing for compliance with OSHA regulations, dust control with calcium chloride as required, backfill with suitable materials, compaction and restoration.
- F. In all items involving excavation, the price shall be based on doing the entire excavation in earth. Where rock is excavated, the price thereof shall be in addition to the cost of excavating earth, and no deduction will be made in the amount for earth excavation.
- G. Unit prices submitted for various items of work will be utilized for determining prices of any additional work necessary during construction.

1.2 ITEM DESCRIPTIONS

- A. Item 1 – Mobilization, Demobilization, and Site Restoration (L.S.)
1. Mobilization costs shall be on a lump sum basis. The cost shall not exceed 10% of the total of the other bid items.
 2. The lump sum price bid in the Bid Form for this item shall be full compensation for all costs associated with initiation and closeout of the Contract, exclusive of the cost of materials, with 50% payable on completion of mobilization. Payment shall include compensation for all insurance, 50% payment and performance bonds, site preparation, construction equipment delivery, and in general the costs associated with establishing and terminating the work on site. There shall be no additional costs for any remobilization.
 3. Under the Lump Sum price for this item, the Contractor shall provide general construction services and furnish other appurtenant items necessary to complete all other work identified within this contract, which is not included in Bid Items. This shall include, but not limited to, the following:
 - Field engineering including site layout and control, the establishment of vertical and horizontal site control, construction line and grade, and layout.
 - Attending the pre-construction conference and all required job progress and community meetings, and coordination of all construction activities with the appropriate local authorities and utilities.
 - Submission of all schedules, lists, laboratory test results, materials and sources, survey documentation, and shop drawings, as required, in a timely manner to the Engineer for review and approval.
 - Coordination of all construction activities with the Engineer, owner, Regulatory Agencies, local utilities, and police. Obtaining necessary permits and licenses, and payment of associated fees, as required.
 - Coordination of location for staging and stockpiling of materials and any private agreements and fees that may be associated with the use of said area. The City of Waltham is not responsible for providing a location for staging and stockpiling of materials.
 - Laboratory analyses and field compaction testing for earthwork material and pavement as required by the Engineer.
 - Providing a site-specific Health and Safety Plan for the Contractor's employees, in accordance with the minimum standards set forth in OSHA

29 CFR 1910.120. The Plan and Statement of Certification shall be submitted to the Engineer for their records prior to construction.

- Provide a set of clearly labelled red line as-built drawings at the completion of the project.
- Temporary facilities and providing required bonds and insurance.
- Coordination with utility companies and any payments required for support of utility poles as required to safely perform the work.
- Maintenance and repair of all work for one (1) year period after final payment is issued.
- Providing certificate of design for the support of excavation and equipment, materials, and labor to install, maintain, and remove the support of excavation as required to complete the work.
- All other project related direct and indirect costs not described above.
- Contract closeout.

B. Item 2 – Roadway Reclamation (S.Y.)

1. Measurement for payment under this Item shall be the actual number of square yards of roadway pavement pulverized and reclaimed, measured in the field, as directed by the Engineer and as specified in the Contract Documents.
2. Prices bid under this Item shall be considered full compensation for all labor and equipment, tools, and materials necessary to complete the work as specified, which shall include lowering all utility structures within the roadway to a minimum depth 6” beneath the proposed roadway base, plating structure openings, reclamation of 16” of the existing roadway, accurately locating each utility structure within the roadway and maintaining record of location, raising structures to approximate finish grade, excavation, saw cutting of pavement, handling and stockpiling material, rough grading, compaction, dust control, and all else incidental thereto to complete the work for which pavement is not provided under other items.
3. The unit price for this Item shall be compensation for storing and stockpiling excess reclaimed base material as directed by the Engineer. This stockpiled material shall be used where fill is required before Additional Gravel Borrow (Item 16) at no additional cost.
4. The unit price for this Item shall be considered full compensation for the transportation and disposal of any excess reclaimed material removed from the project site as any excess material will be considered property of the Contractor.

- C. Item 3 – Fine Grading and Compaction (S.Y.)
1. Measurement for payment under this Item shall be the actual number of square yards of roadway base material fine graded and compacted, measured in the field, as specified in the Contract Documents and directed and accepted by the Engineer.
 2. The unit price bid under this Item shall be considered full compensation for all labor, equipment, tools, and materials necessary to complete the work as specified, which shall include all necessary field engineering, grading, adjustment of grades, laboratory testing of base material, compaction of base material to 95% density, compaction testing, dust control, and all else incidental thereto to complete the work for which payment is not provided under other items.
 3. The binder course of asphalt shall be placed no later than 24 hours after the fine grading and compaction of the roadway. If the 24 hour window is missed, the Contractor shall be responsible for additional fine grading and compacting the road base at their own expense, prior to the placement of the binder course of asphalt.
- D. Item 4 & 5 – Furnish and Install Roadway Binder and Top Course Pavement (TON)
1. Measurement for payment under these Items shall be the number of tons of roadway asphalt pavement placed at the direction of the Engineer, calculated as described below.
 - i. Actual widths will be used in computing area wherever the width of pavement removed and replaced is less than the limits indicated on the Drawings.
 - ii. The conversion factor to change volume of bituminous concrete pavement measured in place to tons will be 0.055 tons per square yard per inch of thickness.
 - iii. The thickness of the compacted binder course and top course pavement shall be 3" (placed in 2 lifts) and 1.5" respectively.
 2. The unit price bid under these Items shall be considered full compensation for all labor, equipment, tools, and materials necessary to complete the work as specified, which shall include preparation of base material, application of tack coat, placement of asphalt (both machine and hand method as required), compaction of asphalt course, sanding and sealing joints, and all else incidental thereto to complete the work for which payment is not provided under other items.
- E. Item 6 – Furnish and Install Bituminous Concrete Driveway Apron & Walkway, 3 in. (S.Y.)
1. Measurement for payment under this Item shall be the actual number of square yards of bituminous asphalt driveways and walkways which are removed and replaced, as directed by the Engineer, as shown on the drawings.
 2. The unit price bid under this Item shall be considered full compensation for all labor, equipment, tools, and materials necessary to complete the work as specified, which shall include removal and disposal of existing asphalt, preparation of base material, adjustment of base material necessary to meet proposed grades, compaction of base material, saw cutting existing pavement, placement and compaction of each course of pavement,

application of tack coat, sanding and sealing all joints, and all else incidental thereto for which payment is not provided under other items.

3. The unit price bid under this Item shall be compensation for the placement of both layers of bituminous concrete pavement, 1.5" of binder course pavement and 1.5" of top course pavement.

F. Item 7 – Furnish and Install Cement Concrete Driveway Apron, 6 in. (S.Y.)

1. Measurement for payment under this Item shall be the actual number of square yards of 6 inch thick concrete driveway aprons, placed at the direction of the Engineer, as specified on the drawings.
2. The unit price bid under this Item shall be considered full compensation for all labor, equipment, tools, and materials necessary to complete the work as specified, which shall include removal and disposal of existing concrete, preparation of base material, adjustment of base material to meet proposed grades, compaction of base material, 4,000psi – ¾" aggregate cement concrete, placement of welded wire mesh, saw cutting existing drive, forming, curing, screeding, finishing, testing, form removal, sealing, joints, removal and disposal of existing concrete drive, and all else incidental thereto for which payment is not provided under other items.

G. Item 8 – Furnish and Install Cement Concrete Walkway, 4 in. (S.Y.)

1. Measurement for payment under this Item shall be the actual number of square yards of 4 inch thick concrete walkway placed at the direction of the Engineer, as specified on the drawings.
2. The unit price bid under this Item shall be considered full compensation for all labor, equipment, tools, and materials necessary to complete the work as specified, which shall include the removal and disposal of existing concrete, preparation of base material, adjustment of base material to meet proposed grades, compaction of base material, saw cutting existing walkway, 4,000psi – ¾" aggregate cement concrete, forming, curing, screeding, finishing, testing, form removal, sealing, joints, and all else incidental thereto for which payment is not provided under other items.

H. Item 9 – Remove and Reset Existing Concrete Curb (L.F.)

1. Measurement for payment for this item shall be the actual number of linear feet of concrete curb installed and accepted complete and in place.
2. The unit price bid under this Item shall be considered full compensation for all labor, equipment, and materials necessary to complete this work including carefully removing curb, safely storing curb for reuse, reinstalling curb, subgrade preparation, placement of concrete fill, backfill, compaction, and all labor and appurtenances incidental thereto for which payment is not provided under other items.

- I. Item 10 – Furnish and Install New Concrete Curb (L.F.)
 - 1. Measurement for payment for this item shall be the actual number of linear feet of new, precast concrete curb installed and accepted complete and in place.
 - 2. The unit price bid under this Item shall be considered full compensation for all labor, equipment, and materials necessary to install the curb, including furnishing and installing curbing, transition curb, inlet curb cuts, subgrade preparation, placement of concrete fill, transportation and disposal of old curbing, backfill, and all labor and appurtenances incidental thereto for which payment is not provided under other items.

- J. Item 11 – Furnish and Install New Concrete Step for Walkway (EA.)
 - 1. Measurement for payment under this Item shall be made for each step furnished and installed, in place, as directed by the Engineer.
 - 2. The unit price bid under this Item shall be considered full compensation for all labor, equipment, tools, and material necessary to complete the work as specified, which shall include preparation of base material, adjustment of base material to meet proposed grades, compaction of base material, saw cutting of walkway, instillation of step, grading, and all else incidental thereto for which payment is not provided under other items.

- K. Items 12 & 13 – Adjustment of Castings, Frame & Grates, and Gate Boxes (EA.)
 - 1. Measurement for payment under these Items shall be each utility structures (including private utilities adjusted by the Contractor) brought to final grade as directed by the Engineer which are located within the roadway.
 - 2. The unit prices bid under these Items shall be considered full compensation for all labor, equipment, tools, and materials necessary to complete the work as specified, which shall include cutting of pavement, excavation, all brick and masonry work, concrete collars, concrete, asphalt, compaction, and all else incidental thereto for which payment is not provided under other items.
 - 3. Only gate valve structures located within the roadway and driveway aprons shall be measured for payment under Item 13. Structures located within walkways or landscaped areas shall be adjusted to final grade at no additional expense to the Contract.

- L. Item 14 – Furnish and Install Loam and Seed (S.Y.)
 - 1. Measurement for payment shall be the actual number of square yards of loamed and seeded at a minimum depth of 6 inches as directed by the Engineer.
 - 2. The unit price bid under this Item shall be considered full compensation all labor, equipment, tools, and material necessary to complete the work as specified, which shall include excavation to subgrade for loam and disposal of excess material, furnishing and placing loam (min. 6” of loam) and seed, grading, compacting, and providing establishment of growth as specified.

M. Item 15 – Unclassified Excavation (C.Y.)

1. Measurement for payment under this Item shall be the actual number of cubic yards of material excavated, in place, as directed by the Engineer.
2. The unit price bid under this Item shall be considered full compensation for excavating, placing on site or disposal of surplus or unsuitable materials, backfill, compaction, and all work incidental thereto.
3. Unclassified excavation will be performed at the direction of the Engineer only. The Contractor will not be compensated for any excavation which has not been approved by the Engineer.

N. Item 16 – Gravel Borrow Fill and/or Gravel Borrow Refill of Unsuitable Material (C.Y.)

1. Measurement for payment under this Item shall be the actual number of cubic yards furnished, in place, as directed by the Engineer.
2. The unit price bid under this Item shall be considered full compensation for all labor, equipment, tools, and material necessary for replacing excavated material and furnishing, placing, and compacting new fill material.
3. This Item applies only to the use of borrow refill when stockpiles of excavated suitable backfill materials are insufficient in quantity.
4. All borrow materials shall be sand and gravel Type 3 material.
5. The quantity to be paid for shall be equal to the number of cubic yards of unsuitable material replaced with Type 3 sand or gravel borrow.

O. Item 17 – Police Details for Traffic Management Allowance (Hr.)

1. Measurement for payment under this Item shall be the actual number of hours billed to and paid for by the Contractor as shown on paid invoices from the Police Department.
2. Payment shall be made at the stated allowance in the Bid Form. The police department will bill the Contractor directly and the Contractor shall pay the police department bills within a ten day working period for uniform police officers provided on the job site. The billing shall include a weekly statement outlining the days worked, hours worked, location of the work, and rate for all officers providing service during that billing period.
3. The Contractor will be paid by the Owner for bills paid to the police department. The Contractor shall submit paid bills from the police department, stamped and signed as paid, to the Engineer, with the Contractor's Application for Payment.
4. Uniformed officers required for purposes other than public safety and / or control of traffic shall not be eligible for payment. Details billed to the Contractor due to cancellation of work will not be eligible for payment.

P. Item 18 – Miscellaneous Work and Cleanup (L.S.)

1. Measurement for payment for miscellaneous work and cleanup shall be on a lump sum basis.
2. Payment of the lump sum price under Item 18 shall fully compensate the Contractor for labor, materials, equipment, and incidentals required to do all work specified below, and shown on the Drawings, and any other miscellaneous work obviously necessary to complete the Contract. Payment shall include but not be limited to supporting all existing utilities, modification to existing utilities, maintaining existing drainage flows, removal and resetting of fences, walls, landscape boulders, driveway edging, etc. The contractor shall be responsible for site restoration and cleanup upon completion of the project.

Payment of the lump sum price shall also fully compensate the contractor for Miscellaneous Work including, but not be limited to, the following:

- Removal and resetting of brick walk at #27 Willard Street. This will include all labor and equipment to complete the careful removal and storage of existing brick, the re-grading of the walkway to meet proposed grades, furnishing and placing/compacting stone dust base, laying brick to match existing design, furnishing and installing bricks as required to complete walkway as directed by the engineer.
- Furnishing Cascade grate for catch basin located on Dale Street. Delivering existing grate to Waltham DPW yard.
- Furnishing and Installing proposed R1-1 "STOP" sign at the intersection with Dale Street, including sign post, breakaway bracket, excavation, concrete, and all other equipment, labor, and materials necessary for the successful installation of the sign.
- Placement of 12" wide thermoplastic stop bar at the intersection with Dale Street, including all surface preparation, placement of thermoplastic markings, placement of reflectorizing material, and all other necessary work considered incidental thereto.
- All calcium chloride and water as required to control and maintain dust on site as well as all associated work.
- Coordination with utility companies both Public and Private.
- Furnishing and installing all appropriate erosion control measures, including but not limited to, catch basin silt sacks, hay bales, and straw waddles as directed by the Engineer.
- Obtaining all necessary permits from proper permitting authorities.

- The temporary and permanent relocation and protection of any signs, benches, mailboxes, trash barrels, post office boxes, planters, etc. located along the roadway and the existing sidewalks prior to the reconstruction of the roadway.
 - Furnishing and installing appropriate barricade and protection for the jobsite including barrels and cones for traffic management.
3. The Engineer may authorize a percent (%) complete of this Item for payment if not all of the work has been accomplished. A breakdown of the lump sum price must be submitted to the Engineer at the start of work.

END OF SECTION 01025

SECTION 01050

ABBREVIATIONS

PART 1 GENERAL

1.01 ABBREVIATIONS

PART 1 GENERAL

1.01 ABBREVIATIONS

- A. Where any of the following abbreviations are used in the specification, they shall have the following meaning:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AGA	American Gas Association
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
ANSI	American National Standard Institute
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
OSHA	Occupational Safety and Health Administration
(USASI)	(formerly the United States of America Standard Institute)
USEPA	United States Environmental Protection Agency

END OF SECTION

01050-1

Abbreviations

SECTION 01300

SUBMITTALS

PART 1 GENERAL

- 1.01 INTENT
- 1.02 MATERIALS-SAMPLES-INSPECTION-REVIEW
- 1.03 SHOP AND WORKING DRAWINGS
- 1.04 RECORD OF AS-BUILT DRAWINGS
- 1.05 OPERATION AND MAINTENANCE INSTRUCTIONS

PART 1 GENERAL

1.01 INTENT

- A. The submittals consist of several classes applying to the execution of several or all of the individual Division 2 thru 16 Specifications.

- B. Provisions of this section shall be binding on all applicable work performed under the other detailed specifications and payment for work performed under this section shall be apportioned against each of the payment items listed in the Bid, unless otherwise directed.

1.02 MATERIALS - SAMPLES - INSPECTION - REVIEW

- A. Unless otherwise indicated on the drawings or specified, only new materials and equipment shall be incorporated in the work. All materials and equipment furnished by the Contractor to be incorporated in the work shall be subject to the inspection and review by the Engineer. No material shall be processed for, fabricated for, or delivered to the work without prior review by the Engineer.

- B. As soon as possible after the formal execution of the Contract Agreement, the Contractor shall submit to the Engineer, the names and addresses of the manufacturers and suppliers of all materials and equipment he proposes to incorporate into the work. Where such names have been directly specified in the Bid, or where substitutions have been made in compliance with the INSTRUCTION AND INFORMATION FOR BIDDERS, repetitive submission will not be necessary. When shop and working drawings are required as specified below, the names and addresses of the manufacturers and suppliers shall be submitted prior to the submittal of the drawings so that the Engineer may review the manufacturer and/or supplier as to his or their ability to furnish a product meeting the specifications, subject to final review of the particular material or equipment. As requested, the Contractor shall also submit data relating to the materials and equipment he proposes to incorporate into the work, in sufficient detail to enable the Engineer to identify the particular product in question and to form an opinion as to its conformity to the Contract requirements. Such data shall be submitted in a manner similar to that specified for shop and working drawings.

- C. If the Engineer so requires, either prior to beginning or during the progress of the work, the Contractor shall submit samples of materials for such special tests as may be necessary to demonstrate that they conform to the specifications. Such samples, including concrete test cylinders, shall be furnished, taken, stored, packed, and shipped as directed, at the expense of the Contractor. Except as otherwise specified, tests shall be arranged and paid for in accordance with the General Conditions.
- D. All samples shall be packed so as to reach their destination in good condition, and shall be labeled to indicate the material represented, the name of the building or work and location for which the materials is intended, and the name of the Contractor submitting the sample.
- E. To ensure consideration of samples, the Contractor shall notify the Engineer in writing that the samples have been shipped and shall properly describe the sample using standard submittal forms supplied by the Engineer. In no case shall the letter of notification be enclosed with the samples.
- F. The Contractor shall submit data and samples, or place his orders, sufficiently early to permit consideration, inspection, testing, and approval before the materials and equipment are needed for incorporation in the work. Delay resulting from his failure to do so shall not be used as the basis of a claim against the Owner or the Engineer.
- G. In order to demonstrate the proficiency of workers, or to facilitate the choice among several textures, types, finishes, surfaces, etc., the Contractor shall, at his own expense, provide such samples of workmanship on wall, floor, finish, etc., as may be required.
- H. When required, the contractor shall furnish to the Engineer triplicate sworn copies of manufacture's shop or mill tests (or reports from independent testing laboratories) relative to materials, equipment performance ratings, and concrete data.
- I. After acceptance of the samples, data, etc., the materials and equipment used on the work shall correspond therewith.

1.03 SHOP AND WORKING DRAWINGS

- A. The Contractor shall submit for review shop and working drawings six (6) copies unless otherwise specified) of all materials fabricated especially for this Contract, and of all other equipment and materials except for which such drawings are specifically exempted. Three copies will be returned to the Contractor. Additional copies of shop drawings required by the contractor shall be included in the original submission.

All shop drawings submittals shall be accompanied by a properly completed "Standard Shop Drawing Submittal Form" which will be furnished to the Contractor by the Engineer.

- B. Such drawings shall show the principal dimensions, weight, structural and operating features, performance characteristics and wiring diagrams, space required, clearances, type and/or brand of finish or shop coat, grease fittings, etc., depending on the subject of the drawing. When it is customary to do so, when the dimensions are of particular importance, or when so specified, the drawings shall be certified by the manufacturer or fabricator as correct for this Contract.
- C. When so specified or if considered by the Engineer to be acceptable, manufacture's specifications, catalog data, descriptive matter, illustrations, etc., may be submitted for review in place of shop and working drawings. In such case the requirements shall be specified for shop and working drawings, insofar as applicable.
- D. The Contractor shall be responsible for the prompt submission of all shop and working drawings so that there shall be no delay to the work due to the absence of such drawings.
- E. No material shall be purchased for fabricated especially for this Contract until the required shop and working drawings have been submitted and reviewed as conforming to the Contract requirements. All materials and work involved in the construction shall then be as represented by said drawings.
- F. Only drawings which have been checked and corrected by the fabricator should be submitted to the Contractor by his subcontractors and vendors. Prior to submitting drawings to the Engineer, the Contractor shall check thoroughly all such drawings to satisfy himself that the subject matter thereof conforms to the drawings and specifications in all respects; that the electrical characteristics are correct; and that the dimensions of work submitted fit the available space. Any deviations from the Contract requirements shall be clearly noted on the shop drawings. The Contractor shall stamp each submittal with his firm's name, date, and approval, thereby representing that the above has been complied with. Shop drawings not so checked and stamped will be returned without being examined by the Engineer.
- G. All shop drawings shall be properly identified and indicate the article number of the specifications or the drawing number which applies to the submitted item.
- H. The Engineer's review of shop and working drawings will follow a general check made to ascertain conformance with the design concept and functional result of the project and compliance with the information given in the Contract Documents. The contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

I. The classification of Engineer's review shall be as follows:

<u>Review Code</u>	<u>Action Code</u>
No Exception Taken	-
Note Markings	Confirm
Rejected	Resubmit

1.04 RECORD OR AS-BUILT DRAWINGS

- A. During the progress of the work, each major subcontractor shall keep on file one complete set of red line prints furnished by the Engineer on which shall be accurately and promptly noted, as the work progresses, changes, revisions and additions to the work. Wherever the work is installed otherwise than as shown on the contract Drawings said changes shall be noted. Corrections shall be made in red ink. The above prints upon completion of the work shall be submitted to the Engineer.
- B. Before the Contractor is entitled to receive his final payment under this Contract, he shall submit to the Engineer for transmittal to the Owner the above complete set of annotated plans of his work performed by him indicating in particular the location of covered work, pipes, wires, ducts, etc. All trades must cooperate with the Contractor in preparation of this set of plans to facilitate its accuracy and completeness.

1.05 OPERATION AND MAINTENANCE INSTRUCTIONS

- A. The Contractor shall thoroughly instruct the Owner's representative in the proper operation of all mechanical and electrical systems. Skilled personnel shall be retained as long as necessary for this purpose.
- B. The Contractor shall submit to the Engineer three (3) typed sets, bound neatly in loose leaf binders, of all instructions for the installation, operation, care and maintenance of all equipment, fixtures and systems. Information shall indicate possible problems with equipment and suggested corrective action. The instructions shall include other information deemed necessary by the Engineers.
- C. The Contractor shall furnish three (3) typed sets of instructions for lubricating each piece of equipment. Instructions shall state type of lubricant, where and how frequently lubrication is required.
- D. The Contractor shall submit to the Engineer three (3) typed sets of instructions for the ordering and stocking of spare parts for all equipment. The lists shall include catalog numbers of parts and suggested supplier. Each set shall also include an itemized list of component parts that should be kept on hand with information where such parts can be purchased.

- E. Such instructions and parts lists shall be annotated to indicate only the specific equipment furnished. References to other sizes and types or models or similar equipment shall be deleted or neatly lined out.
- F. Such operating instructions and parts lists shall be delivered to the Engineer at the same time that the equipment to which they pertain is delivered to the site.

END OF SECTION

01300-5

Submittals

SECTION 01500
TEMPORARY PROVISIONS AND PROTECTION
OF UTILITIES AND PROPERTIES

- PART 1 GENERAL
1.01 SCOPE OF WORK
1.02 RELATED WORK SPECIFIED ELSEWHERE

- PART 2 EXECUTION OF WORK
2.01 COORDINATION WITH OTHERS
2.02 PUBLIC SAFETY AND CONVENIENCE

PART 1 GENERAL

- 1.01 SCOPE OF WORK
- A. The Contractor's attention is directed to the location of underground utilities in the proposed area of work.
 - B. The Contract Drawings indicate the approximate location in plan and profile of existing overhead and subsurface utilities in the vicinity of the work.
 - C. Whatever measures are necessary to protect these lines during the work shall be included in the Contract Unit Price for the various items involved.
 - D. In case of damage to utilities, the Contractor shall promptly notify the Owner and shall, if requested, furnish manpower under the Owner's direction in getting access to the utility. Pipes or other structures damaged by the operation of the Contractor may be repaired by the Owner, either the municipality or the utility company. The cost of such repairs shall be borne by the Contractor without compensation.
 - E. The locations of existing underground utilities are shown in an approximate way only. The Contractor shall determine the exact location of all existing utilities before commencing work. He agrees to be fully responsible for any and all damages which might be occasioned by his failure to exactly locate and preserve any and all underground utilities.
 - F. The work to be done under this Contract may necessitate changes in the properties of utility companies or the municipality hereinbefore listed. Immediately after executing the Contract, the Contractor shall confer with the owners of all utilities in order that relocations of mains or services may be made at times consistent with operations of this Contract.
 - G. The rims of all utility manholes and boxes shall be set to conform to the required grades and the Contractor shall see that all such setting or resetting is substantially and

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Temporary Provisions and
Protection of Utilities
and Properties

accurately done in conformity with new grades, whether such setting or resetting is done by him or by companies owner or controlling same, and shall notify the Engineer of any negligence on the part of the owners of the utilities to perform their work promptly.

1.02 RELATED WORK SPECIFIED ELSEWHERE

SECTION 01300 - SUBMITTALS
SECTION 01570 - TRAFFIC CONTROL AND POLICING
DIVISION 2 - SITE WORK - As Appropriate

PART 2 EXECUTION OF WORK

2.01 COORDINATION WITH OTHERS

- A. Before starting any work under this Contract, the Contractor shall submit a Schedule of Operations. The work schedule shall include a plan of his construction procedures and the safety measures he will use during the prosecution of the work.
- B. The Contractor shall coordinate his work with the work to be done by the Public Utilities or other agencies, and he shall so schedule his operations as to cause the least interruption to the normal flow of traffic in existing roads.
- C. The Contractor shall provide, place and erect all necessary barricades and warning signs and maintain adequate lights and illumination. He shall be held responsible for all damage to the work due to any failure of signs and barricades needed to protect the work from traffic, pedestrians or other causes.
- D. The Contractor shall assume full charge of space for the storage of materials of all subcontractors and trucks, confining all apparatus, storage of materials and construction operations to the limits indicated by ordinance or permits. He shall allot space for the storage of materials of subcontractors, facilitate the progress of the work, prevent friction, and maintain order and tidiness throughout the project site. Storage areas within the project are limited. The Contractor may be required to obtain storage areas outside the project limits at his own expense. The Contractor shall enforce any instruction of the Owner or the Engineer regarding signs, advertising, fires, danger signals, barricades, smoking, etc.
- E. Existing property markers shall be tied by the Contractor with respect to the construction and/or base line with such ties being given to the Resident Engineer. Such work shall be considered as part of the Contractor's incidental work for which no payment will be received.
- F. No extra payment shall be made for scheduling the work or for maintenance of traffic; the cost of which shall be included in the various bid items of the Bid.

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Temporary Provisions and
Protection of Utilities
and Properties

- G. The casting of all structures, which are required to be set or reset under the pertinent items of this contract or by others shall not be set complete in place to the established grade until after the bituminous concrete base course has been completed in place as directed.
- H. The Contractor shall not proceed with surfacing operations without the specific written approval of the Engineer.
- I. Wherever it is necessary to meet existing surface, the Contractor shall construct a foundation, base and surface to form a continuous smooth roadway.
- J. The Contractor shall provide for the removal of all dirt spilled from his trucks on existing pavement over which it is hauled, or otherwise deposited thereon whenever, in the judgment of the Engineer, the accumulation is sufficient to cause the formation of mud or dust, or interfere with drainage or create a traffic hazard.
- K. Private Property that is disturbed, outside of the construction limits, shall be repaired by the Contractor at his own expense. No area shall be used for storage without the permission of the Engineer, and the Contractor may be required to obtain storage areas outside the project limits at his own expense.
- L. Particular care shall be taken to establish and maintain methods and procedures which will not create unnecessary or unusual hazards to public safety. The convenience of the general public along and adjacent to the highway shall be provided for in an adequate and satisfactory manner. Adequate access shall be maintained to all buildings in use. Signs are to be kept clean at all times, and legends shall be distinct and unmarred.
- M. The Contractor shall place and erect the necessary detour signs as indicated on the Contract Drawings and under the related sections as specified, and shall maintain said signs for the duration of the project.
- N. The Telephone Company and the Electric Company shall install and/or relocate poles and services as required. The Gas Company shall relocate its service as required. The Contractor shall schedule his operation so as to permit regulated public service corporations to remove and temporarily or permanently relocate their property which conflicts with respect to line and grade of any structure to be constructed under this Contract. All other structures which are owned by public service corporations and are within the limits of work shall be protected by the Contractor. Any public service corporation's property which require temporary supports shall be supported by the respective utilities during the period of construction.
- O. Written notice shall be given by the Contractor to all public service corporations or officials owning or having charge of publicly or privately owned utilities or his intention to commence operations affecting such utilities at least one (1) week in advance of the commencement of such operations that may affect their utilities and the Contractor shall at the same time file a copy of such notice with the Engineer.

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Temporary Provisions and
Protection of Utilities
and Properties

P. The Contractor's attention is called to the completion date opening the road for traffic, which have been established with the intent to complete the project and make it available to the traveling public at the earliest possible date.

Q. For the purpose of observing work that affects their respective properties, inspectors for the municipality, public agencies and the utility companies shall be permitted access to the work, but all official orders and directives to the Contractor shall be issued by the Engineer.

2.02 PUBLIC SAFETY AND CONVENIENCE

A. Trenches shall not be excavated in traveled ways until all materials and equipment required for such work are at the site and available for immediate use. When work is not in progress, trenches in areas subject to public travel shall be covered with steel plates capable of safely sustaining a 20 ton truck load with impact. The work in each trench shall be practically continuous, with the placing of pipe, backfilling and patching of the surface closely following each preceding operation. Payment for steel plates will be included under the unit bid price per linear foot for each respective pipe item regardless of width of trench.

B. The Contractor's attention is directed to the AASHTO Guide on Occupational Safety of Highway Construction Projects, subpart N, 1926.550, relating to construction equipment clearances at overhead electric lines, which states in part "...the minimum clearance between the lines and any part of the crane or load must be at least 10 feet from lines rated 50 KV or below, and greater distances for higher voltage...". For the protection of personnel and equipment, the Contractor should be aware of this regulation especially during paving operations using large semi-trailer vehicles.

END OF SECTION

01500-4

Temporary Provisions and
Protection of Utilities
and Properties

SECTION 01562

DUST CONTROL

- PART 1 GENERAL
1.01 DUST CONTROL OPERATIONS
1.02 REQUIREMENTS

PART 1 GENERAL

1.01 DUST CONTROL OPERATIONS

- A. The Contractor shall perform dust control operations, in an approved manner, whenever necessary or when directed by the Engineer, even though all other work on the project shall be suspended. Dust controlling shall be generally accomplished by the use of water; however, the use of flake calcium chloride may be ordered when necessary to control dust nuisance.

1.02 REQUIREMENTS

- A. The Contractor shall practice dust control to meet all air pollution standards as set forth by federal and state regulatory agencies.

END OF SECTION

01562-1

Dust Control

SECTION 01567

POLLUTION CONTROL & ENVIRONMENTAL PROTECTION

PART 1 GENERAL

- 1.01 SCOPE OF WORK
- 1.02 RELATED WORK SPECIFIED ELSEWHERE

PART 2 MATERIALS

- 2.01 POLLUTION AND EROSION CONTROL MATERIALS

PART 3 EXECUTION

- 3.01 PRECONSTRUCTION CONFERENCE
- 3.02 PROCEDURAL DETAILS
- 3.03 DUST CONTROL
- 3.04 ACCEPTANCE

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. This work shall consist of temporary and permanent control and restoration measures as hereinafter stated or ordered by the Engineer during the life of the Contract to control water pollution and erosion (through use of berms, dikes, dams, sediment basins, fiber mats, netting, gravel, mulches, grasses, slope drains and other erosion and pollution control devices or methods) and to limit disturbance and/or alteration of the natural environmental setting.
- B. The temporary pollution control and environmental protection and restoration provisions contained herein shall be coordinated with detailed construction specifications elsewhere in the Contract to the extent practical to assure economical, effective and continuous pollution and erosion control, and environmental protection and restoration throughout the construction and post construction period.
- C. Payment for this work shall be apportioned against each of the payment items listed in the Bid, unless otherwise specified.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. This is a general section and relates to any and all other sections wherein the work might result in pollution or environmental damage.
- B. SECTION 01710 - CLEANING UP

PART 2 MATERIALS

2.01 POLLUTION AND EROSION CONTROL MATERIALS

- A. Mulches may be hay, straw, fiber mats, netting, wood cellulose, corn or tobacco stalks, bark, corncobs, wood chips, or other suitable material acceptable to the Engineer and shall be reasonably clean and free of noxious weeds and deleterious materials.
- B. Slope drains may be constructed of pipe, fiber mats, riprap, plastic sheets, or other material acceptable to the Engineer that will adequately control pollution.
- C. Grass shall be quick growing species (such as rye grass, Italian rye grass, or cereal grasses) suitable to the area providing a temporary cover which will not later compete with grasses sown later for permanent cover.
- D. Fertilizer and soil conditioners shall be a standard commercial grade acceptable to the Engineer.
- E. Flake calcium chloride shall be used for dust control.

PART 3 EXECUTION

3.01 PRECONSTRUCTION CONFERENCE

- A. At the preconstruction conference or prior to the start of the applicable construction, the Contractor shall submit to the Engineer for acceptance his schedules for accomplishment of temporary and permanent pollution and erosion control and environmental protection and restoration work, as are applicable for clearing and grubbing and general construction. The Contractor shall also submit for approval his proposed method of disposal of unsuitable material and restoration of disturbed land to its original (prior to construction) condition, either at the time of the pre-construction conference or prior to the starting of any work. No work shall be started until schedules and methods of operations have been approved by the Engineer.

3.02 PROCEDURAL DETAILS

- A. The Engineer shall have the authority to limit the area of erodible earth exposed by construction and to direct the Contractor to provide immediate permanent or temporary pollution control and environmental protection measures to prevent contamination of adjacent streams or other watercourses, ponds, or other areas of water impoundment. Such work may involve the construction of temporary mulches, mats, seeding or other control devices or methods as required by the conduct of the work.
- B. The Contractor shall be required to incorporate all permanent pollution control and environmental protection features into the project at the earliest practical time as outlined in his approved schedule. Temporary pollution control and environmental protection measures will be used to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to installation of

permanent pollution control or environmental protection features; or that are needed temporarily.

C. The Contractor shall undertake and comply with the following measures with respect to adverse environmental impacts, resulting from the operations listed below.

1. Clearing Grubbing - Disturbed areas shall be re-grassed at the direction of the Engineer.
2. Tree cutting in undeveloped cross-country or building site areas as designated by the Engineer - Trees within the temporary right-of-way, shall be cut only with the written approval of the property owner. Trees approved for cutting shall be marked with a 2-inch wide paint ring. The Contractor shall furnish the Engineer with sufficient spray paint and shall be present during all tree marking, and shall notify the appropriate property owner, the Owner, and the Engineer, concerning his availability for tree-marking at least ten (10) calendar days prior to the start of the applicable construction. Trees not approved for cutting shall be adequately protected against damage by methods approved by the Engineer. Cut or damaged trees not approved for cutting or outside of the total working right-of-way shall be replaced with trees of similar nature and maturity at the Contractor's expense. When directed, stumps of approved cut trees shall be removed and replaced with seedlings of a similar nature, 6-12 feet in height.
3. Access road construction - Riprap or sodding shall be used to prevent erosion.
4. Material Storage - Materials shall be stored only at approved locations. Petroleum products shall be stored away from wetland areas.
5. Excavation - The Contractor shall use care to contain wet fill where it is dumped. When material is stockpiled next to a trench, the side away from neighboring brooks, swamps, canals, etc., shall be utilized where space conform to the natural angle of repose of the soil. The Contractor shall promptly remove all sediment from brooks and swamp areas, if deposition cannot be avoided during construction. The Contractor shall promptly remove excess fill and regress the work area. Excess fill shall not be disposed of in wetlands, other than in areas defined on the drawings, or areas approved by commissions or authorities having jurisdiction.
6. Water handling - The Contractor shall be required to use crushed stone or plastic sluiceways leading to brooks to filter and pool pumped discharges.
7. Backfilling - The Contractor shall replace unsuitable material with suitable material. He shall also be responsible for surface repairs as required.
8. General - Trash receptacles shall be required on the job site. The Contractor shall perform preliminary clean-up operations as he completes segments of his work.

9. Spillings - Ground Spillings of oil or other petroleum products drained from equipment shall be strictly prohibited. The Contractor shall provide leak proof containers for receiving drained oil and shall properly dispose of such oil away from the site of the job.

3.03 DUST CONTROL OPERATIONS

- A. The Contractor shall perform dust control operations, in an approved manner, whenever necessary or when directed by the Engineer, even though all other work on the project shall be suspended. Dust lying shall be generally accomplished by the use of water; however, the use of flake calcium chloride may be ordered when necessary to control dust nuisance.
- B. The Contractor shall practice dust control to meet all air pollution standards as set forth by federal and state regulatory agencies.

3.04 ACCEPTANCE

- A. Final inspection and acceptance in regard to cleanup, site restoration and pollution control measure areas shall be made in the presence of the Owner and/or commissions or authorities having jurisdiction. The Contractor shall notify the Owner in writing of readiness of the work for final inspection.

END OF SECTION

01567-4

Pollution Control &
Environmental Protection

SECTION 01570

TRAFFIC CONTROL AND POLICING

PART 1 GENERAL

1.01 SCOPE OF WORK

PART 2 MATERIALS

2.01 GENERAL

PART 3 EXECUTION OF WORK

3.01 SCHEDULE OF OPERATIONS

3.02 LOCATION OF SIGNS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. The Contractor shall install construction traffic and pedestrian controls as specified herein and any additional construction and/or detour controls deemed necessary by the Engineer or the Contractor himself, or required by the Manual on Uniform Traffic Control Devices.

- B. Where the roadway under construction is the only means of vehicular or pedestrian access to a particular area, the Contractor must provide continual access to that area for residents and emergency vehicles.

- C. Work under these items shall conform to the relevant provisions of the Massachusetts "Standard Specifications for Highways and Bridges", latest edition, as amended and specified herein.

PART 2 MATERIALS

2.01 GENERAL

- A. All signs, barricades, and drums shall have encapsulated lens and reflective sheeting in accordance with the Massachusetts "Standard Specifications for Highways and Bridges".

PART 3 EXECUTION OF WORK

3.01 SCHEDULE OF OPERATIONS

- A. At a reasonable time in advance of the construction work, the Contractor shall submit to the Engineer for approval a traffic management plan, stamped by a Massachusetts Registered Professional Engineer, showing all construction and/or detour control

devices to be erected. All of the devices shall be moved after each phase of the project and after the project is completed.

3.02 LOCATION OF SIGNS

- A. The detour signs and other control devices shall be located as specified herein.
- B. The construction and/or detour signs as herein specified shall be removed and relocated after each phase of the project.
- C. The Contractor shall notify the responsible heads of the Fire, Police, and Public Works Departments, before beginning each phase of the project.
- D. All signs, barricades, markings and lighting devices shall conform to the Manual on Uniform Traffic Control Devices - latest edition.
- E. The contractor shall submit a Traffic Control Management plan detailing types of signs, detours, and locations of signs for review by the City. The submitted traffic plan shall be stamped by a Massachusetts Registered Professional Engineer.

END OF SECTION

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Traffic Control
and Policing

SECTION 01710
CLEANING UP

PART 1 GENERAL
1.01 SCOPE OF WORK

PART 1 GENERAL

1.01 SCOPE OF WORK

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

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

- C. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary works, tools, and machinery or other construction equipment furnished by him; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by him, shall remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.

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

- E. The Contractor shall thoroughly clean all materials and equipment installed by him and his subcontractors and on completion of the work shall deliver it undamaged and in a fresh and new appearing conditions. All mechanical equipment shall be left fully charged with lubricant and ready for operation.

- F. Payment for cleanup and restoration shall be apportioned against each of the payment items listed in the BID, unless otherwise specified.

END OF SECTION

01710-1

Cleaning Up

SECTION 01720

CONSTRUCTION PERMIT APPLICATIONS AND FEES

1.1 GENERAL

1. The City of Waltham has waived all fees for this Project; Contractor is required to file an Application and obtain all pertinent Permits before construction.
2. Obtain forms from Building Department.

END OF DOCUMENT

DIVISION 2

SECTION 02016

PRE/POST CONSTRUCTION SURVEY

PART 1 GENERAL

- 1.01 SCOPE OF WORK
- 1.02 RELATED WORK SPECIFIED ELSEWHERE

PART 2 MATERIALS - NOT APPLICABLE

PART 3 EXECUTION OF WORK

- 3.01 INVESTIGATIONS CONDUCTED FOR INSURING AGENCIES
- 3.02 EXAMINATION OF EXISTING STRUCTURES
- 3.03 SURVEY OF EXISTING UTILITIES
- 3.04 POST CONSTRUCTION SURVEY

PART 1 GENERAL

- 1.01 SCOPE OF WORK

- A. Work under this section consists of furnishing all labor, materials, equipment and supervision necessary to perform a pre/post construction survey of a designated "blasting area" or area where proposed excavations would influence the condition or alignment of existing structures or appurtenances. Such a study would involve a detailed, descriptive investigation with photographic support of, as minimum, all buildings within 300 feet of anticipated rock blasting or as specified herein.

- 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. DIVISION 2 - As Appropriate

PART 2 MATERIALS - NOT APPLICABLE

PART 3 EXECUTION OF WORK

- 3.01 INVESTIGATION CONDUCTED FOR INSURING AGENCIES

- A. Adequate liability coverage shall be secured by the Contractor for himself, the Owner and the Engineer. Such coverage as applied to this section shall cover all damages resulting from seismic disturbances created by execution of the proposed project. In the event of damage to private property resulting from excavation or blasting operations, the Owner and the Engineer shall be held harmless.
- B. Pre/post construction surveys shall be performed under the supervision of a professional engineer registered in Massachusetts and shall be documented with

photographs. The pre-construction study shall be conducted no more than four weeks prior to commencement of work in the designated area in order to be considered a valid representation of existing conditions.

3.02 EXAMINATION OF EXISTING STRUCTURES

- A. Investigations of area structures shall be conducted with photographic support so as to exactly define the condition of their foundation and supporting columns. This established base shall be later used for comparison with post construction conditions. Deficient and failing structures shall be defined in detail.
- B. Examination of bridges and other roadway structures shall also be conducted with regards to structural integrity, alignment, elevation and with regards to related structures.

3.03 SURVEY OF EXISTING UTILITIES

- A. Examinations shall also be conducted with respect to area utilities. Alignments of utility poles and pipe lines shall be established wherever possible by photographic means. Elevations and conditions of drainage structures to be left-in-place shall also be examined if such information has not already been obtained by the Engineer.

3.04 POST CONSTRUCTION SURVEY

- A. Upon completion of construction operations in a given area, the Contractor shall conduct a final inspection and survey so as to ascertain any damage or non-damage resulting from his operations. The survey shall be fully supported by photographic evidence, and any resulting damage shall be immediately reported to the Owner, the Engineer and the insurance agent for the Contractor.

END OF SECTION

02016-2

Pre/Post Construction
Survey

SECTION 02100

SITE PREPARATION

PART 1 GENERAL

- 1.01 SCOPE OF WORK
- 1.02 RELATED WORK SPECIFIED ELSEWHERE

PART 2 NOT APPLICABLE

PART 3 EXECUTION OF WORK

- 3.01 PROTECTION
- 3.02 PRELIMINARY SITE PREPARATION
- 3.03 EXPLOSIVES
- 3.04 CONSTRUCTION NEAR TREES
- 3.05 DISPOSAL

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, tools, equipment, and service necessary to perform the following items of work which relate to the performance of the construction contract, in accordance with the contract drawings.
- B. Work shall include:
 - 1. Field engineering and grade control.
 - 2. Modifications and/or abandoning or removal of existing utility structures and lines not paid for under other items.
 - 3. Furnish and Install Erosion Control Barriers and remove barrier upon completion of project.
 - 4. Sawcutting of pavement
 - 5. Excavation of pavement and subbase and removal of surplus as specified under Section 02220.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. DIVISION 2 - SITE WORK - As Appropriate

PART 2 NOT APPLICABLE

PART 3 EXECUTION OF WORK

3.01 PROTECTION

- A. Adequate protection measures shall be provided to protect workmen and passersby. Streets, roads, adjacent property, and existing utilities to remain shall be fully protected throughout the construction operations.
- B. This item shall include any additional work required in crossing existing culverts, water courses, catch basins, drains, fire hydrants, gas, water and sewer lines and services, utility poles, and other utilities. Also included in this item is all work required to support existing utilities and structures including, but not limited to, the following: bracing, hand excavation and backfill (except concrete cradles), and any other work required for crossing the utility or obstruction, but included for payment in other items of this Specification.
- C. Fences, trees, signs, traffic islands, guardrails, and utility poles in the vicinity of the work shall be protected from damage under this item. If damaged or removed, they shall be replaced in a condition equal to that existing before construction began.

3.02 PRELIMINARY SITE PREPARATION

- A. Prior to any excavation the Engineer will furnish the following survey work: location of the benchmark(s) at the site and copies of survey notes. The Contractor shall furnish and set, at his own expense, all remaining stakes required for the construction operations and he shall be solely responsible for the accuracy of the line and grade of his work.
- B. The Contractor shall be held responsible for the preservation of all stakes and marks placed by the Engineer. If any of such stakes or marks are disturbed or destroyed by the Contractor, he shall replace them at his expense.

3.03 EXPLOSIVES

- A. Explosives will not be permitted.

3.04 CONSTRUCTION NEAR TREES

- A. When excavation occurs around trees to remain, the tree roots shall not be cut. Excavation shall be accomplished by careful hand digging and without injury to the roots.

3.05 DISPOSAL

- A. All disposal costs are the Contractor's expense.

- B. Material to be removed shall be removed by the end of each day's work, as it accumulates. Should the Contractor elect to continue work beyond normal working hours, material to be removed shall not be allowed to accumulate for more than 36 hours.
- C. Burning on site will not be permitted

END OF SECTION

02100-3

Site Preparation

SECTION 02200

EARTHWORK

PART 1 GENERAL

- 1.01 SCOPE OF WORK
- 1.02 RELATED WORK SPECIFIED ELSEWHERE
- 1.03 SITE INFORMATION
- 1.04 PROTECTION OF EXISTING CONDITIONS

PART 2 MATERIALS - NOT APPLICABLE

PART 3 EXECUTION OF WORK

- 3.01 DESCRIPTION
- 3.02 OPEN EXCAVATION
- 3.03 SEPARATION OF SURFACE MATERIALS
- 3.04 EXCAVATED MATERIAL
- 3.05 DRAINAGE
- 3.06 STRUCTURE EXCAVATION
- 3.07 SLABS ON GRADE
- 3.08 TRENCH EXCAVATION
- 3.09 TRENCH EXCAVATION IN FILL
- 3.10 TRENCH LIMITS
- 3.11 EARTH EXCAVATION BELOW NORMAL GRADE
- 3.12 EXCAVATION NEAR EXISTING STRUCTURES
- 3.13 RELOCATION AND REPLACEMENT OF EXISTING STRUCTURES
- 3.14 CARE AND RESTORATION OF PROPERTY
- 3.15 DUST CONTROL
- 3.16 BACKFILLING - GENERAL
- 3.17 BACKFILLING AROUND STRUCTURES
- 3.18 BACKFILLING IN OPEN TRENCH
- 3.19 MATERIAL FOR FILLING AND EMBANKMENTS
- 3.20 GRADING

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. The Contractor shall make all excavation of normal depth in earth for sites, structures, roads, and trenches in whatever substance encountered, and shall place and compact backfill to the dimensions and levels shown on the plans or as required by the Engineer. The Contractor shall provide all labor, material, equipment, supervision and incidentals to execute the work in strict accordance with these specifications and applicable drawings. Work under this section includes, but is not necessarily limited to, stripping and stockpiling of suitable topsoil, excavation of all materials encountered, trenching, sheeting, shoring, dewatering, blasting, maintenance of excavation, backfill, fill, providing borrow, compaction, and grading. The Contractor shall do layout.

- B. The Contractor is advised that lines and grades, as shown on plans and profiles, are subject to change. Although it is the intention to adhere to that which is shown on the plans, the Engineer reserves the right to make changes in lines and grades of utilities and locations of manholes when such changes may be necessary or advantageous.
- C. The Contractor's particular attention is directed to the related sections of the specifications. Specific information is provided for stockpiling material on-site or off-site and disposal of unsuitable material. Special requirements applicable to excavation to remove soft material, site preparation settlement, and timing of construction are identified.
- D. In open trenching on State, County, or local highways and railroad properties, the Contractor shall be governed by the conditions, restrictions and regulations made by the appropriate body. All such regulations shall be in addition to those set forth in these specifications.
- E. Any excavation, dewatering, sheeting, and bracing shall be carried out in such a manner as to eliminate any possibility of undermining or disturbing the foundations of any existing structures or any work previously completed under this Contract, or as specified herein.
- F. The Contractor shall fill or backfill all excavations as indicated on the Contract Drawings and as specified herein, but is advised that some of the excavated material may not be suitable as backfill material.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. SECTION 02224 - FILL AND BACKFILL MATERIALS
- B. SECTION 02250 - COMPACTION CONTROL AND TESTING
- C. SECTION 02575 - PAVING REPAIR AND REPLACEMENT

1.03 SITE INFORMATION

- A. Existing grades and other site information shown on the applicable Contract Drawings are approximate and have been compiled by field surveys. The Owner does not guarantee that grades shown will not vary from the actual site conditions. The Contractor must make his own field investigations to determine all conditions affecting the work to be done and materials needed and make his bid in sole reliance thereon.

1.04 PROTECTION OF EXISTING CONDITIONS

- A. General: Extreme care shall be exercised to avoid existing trees, shrubs, facilities, utilities, fences, and private property that are to remain and all necessary precautions taken to preclude damage to these items. Any damage to these items as a result of work performed by the Contractor shall be repaired by the Contractor at his own expense.

- B. Utility agencies shall be contacted and advised of proposed work prior to the start of actual excavation. The Contractor shall obtain information from the proper sources and authorities concerning locations of all utilities within the scope of this work, in order that there will be no damage done to such utilities.
- C. If and when encountered, utilities shall be supported and protected, and the Engineer shall be notified. Entrance, opportunity, and ample time shall be allowed for such measures as may be required for the continuance of utility services. Utilities to be abandoned within excavation areas shall be removed, plugged, or capped by the Contractor as directed by the Engineer. Permanent existing utilities near the excavation and/or construction work shall be properly protected during construction work, and any damage to such permanent utilities shall be repaired by the Contractor without expense to the Owner or Engineer.
- D. All utility services shall be supported by suitable means so that the services shall not fail when tamping and settling occurs. No separate item is provided for service supports and the Contractor must cover supports in the unit prices bid for the roadway construction.
- E. The Contractor shall not be compensated for any additional work involved whenever a utility or underground structure is so encountered within the work limits.
- F. The Contractor shall not be compensated for any additional work involved if the utilities or underground structures cross the trench line transversely above or below the proposed work.
- G. Rules and regulations governing the respective utilities shall be observed. Active utilities shall be adequately protected from damage, and shall not be removed or relocated except as indicated or directed.
- H. All existing pipes, poles, wires, fences, curbing, and other structures which, in the opinion of the Engineer, must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from injury by the Contractor, and in case of injury, the Contractor shall notify the appropriate party so that proper steps may be taken to repair any and all damage done. The Contractor shall at his own expense replace, repair, or restore the affected facilities to their original condition or shall reimburse the owner of said facilities for such expenses as the owner may accrue. When the owners do not wish to make the repairs themselves, all damage shall be repaired by the Contractor, or, if not promptly done by him, the Engineer may have the repairs made at the expense of the Contractor.
- I. Survey markers: Any existing property boundary markers, Town bounds, control points, and datum elevations markers or bench marks to be removed and replaced as shown on the Contract Drawings or directed by the Engineer shall be removed and replaced by the Contractor with all expenses for such replacement paid for by the Contractor.

- J. The Contractor shall provide and maintain barricades, signs, lights, etc., required for the protection of personnel, materials and property. Barricades, etc., shall conform with all codes and regulations, and shall be lighted at night with lanterns, and reflectorized paint as directed or required for safety, and shall be removed upon completion of the Contract.

PART 2 MATERIALS - NOT APPLICABLE

PART 3 EXECUTION OF WORK

3.01 DESCRIPTION

- A. The Contractor shall make excavations in such manner and to such width as will give suitable room for building the structures or for constructing the roadways but complying with the limits shown on the Contract Drawings. The Contractor shall furnish and place all sheeting, bracing, and supports; shall do all pumping and draining and any other work necessary for dewatering and shall render the bottom of the excavation firm and dry and in all respects acceptable.
- B. In no case, except as provided for in Part 3.10 titled "Trench Limits", shall the earth be plowed, scraped, or dug by machinery so near to the finished grade as to result in disturbance of material below said grade. The last of the material to be excavated shall be removed with pick and shovel just before placing pipe, masonry, or other structures.
- C. All excavations shall be braced with steel sheeting or steel excavation boxes as specified in the related specifications or as shown on the Contract Drawings.

3.02 OPEN EXCAVATION

- A. All excavation, except as otherwise specified or permitted, shall be open cut. The length of trench open at any one time will be controlled by the Engineer. The Contractor shall not have more than three hundred (300) feet of trench open at any one time during daylight hours.

3.03 SEPARATION OF SURFACE MATERIALS

- A. From areas within which excavations are to be made, loam, topsoil, sand, and gravel shall be carefully removed and separately stored to be used again as directed; or, if the Contractor prefers not to separate materials, he shall furnish as directed and without additional compensation, clean backfill and loam and topsoil at least equal in quantity and quality to that excavated.
- B. When excavations are to be made in paved surfaces, the Contractor shall machine cut the pavement along the proposed trench lines, with either a pneumatic hammer or mechanical saw in such a manner that the edges of the remaining pavement follow clean, trim, straight lines. If pavement is removed, it shall not be mixed with other excavated material, but shall be disposed of away from the site before the remainder of the excavation is made.

3.04 EXCAVATED MATERIAL

- A. Excavated material shall be so placed as not to interfere with travel on the streets and driveways by the occupants of adjoining property, cause undesirable settlement, or obstruct free access to hydrants and gate valves. Access for emergency vehicles shall be maintained at all times. Excavated material shall not be deposited on private property until written consent of owner or owners thereof has been filed with Engineer. Onsite excavated material stockpiles shall be stored as directed by the Engineer. However, if it is impractical or unsafe to stack suitable, excavated, backfill material adjacent to the work, the material shall be hauled and stored at a location provided by the Contractor at no additional expense to the Owner. Excavated material shall not be deposited in brooks or streams. Excavation shall include the removal of unearthed wooden structures.
- B. It is expressly understood that no excavated materials shall be removed from the site of work or disposed of by the Contractor except as directed or approved by the Engineer. All material designated by the Engineer to be removed from the site shall be immediately removed and legally disposed of according to Federal, State and Local codes and regulations. The Contractor will be required to clean any roads and streets of material that is spilled from his operation of hauling and disposing of unsuitable excavated material.
- C. Suitable excavated material may be used for fill or backfill on other parts of the work.
- D. Upon completion of the backfilling, the streets or property shall be cleaned, surplus material removed, and the surfaces restored to the condition in which they were before construction. All materials left over in public highways shall become the property of the Contractor. If the Contractor fails to promptly remove such surplus material, the Engineer may have the work done and charge the cost thereof as money paid to the Contractor.
- E. Material excavated from private property shall belong to the property owner or his representative, and shall be disposed of by the Contractor, as required by said property owner or representative, but the longest haul requested by the Owner shall in no case exceed 5 miles. If the Contractor fails to promptly remove such surplus material, the Engineer may have the same done and charge the cost thereof as money paid to the Contractor.

3.05 DRAINAGE

- A. At all times during construction, the Contractor shall provide, place and maintain ample means and devices with which to intercept and/or remove promptly, and dispose properly all water entering trenches and other excavation, or the water may flow along or across the site of work; and keep said excavations dry until the structures, pipes, and

appurtenances to be built have been completed to such extent that they will not be damaged. At this time the Contractor shall remove such temporary means and devices.

- B. Every precaution necessary to obtain watertight construction of all joints in pipe, manholes, wyes, and drop connections must be taken.
- C. All ground water which may be found in trenches or excavations and any water which get may into them from any cause whatsoever shall be removed.
- D. All water pumped or drained from the work shall be disposed of in a suitable manner, satisfactory to the Engineer, without undue interference with other work or damage to pavements, other surfaces, or property.

3.06 STRUCTURE EXCAVATION

- A. The Contractor shall excavate to the elevations shown on the plans, or as directed by the Engineer. If the Contractor excavates below the elevations specified, he shall bring the excavation back to the proper elevation by backfilling with screened gravel (Type 6 material) and tamping in 6" layers to provide a compact base. The backfill material must be approved by the Engineer before being placed. If the Engineer directs any changes in elevation or dimension of the structure excavations from that shown on the plans, the Contractor shall be paid for work performed under the appropriate bid item. Any increase in cost resulting from backfilling, or increasing the size of the excavation or foundations because of over excavation in depth, shall be borne by the Contractor. Cut slopes shall have a maximum slope of 2:1 if not braced. When excavation has reached specified dimensions, the Engineer shall be notified and he will determine if conditions are satisfactorily met before work is allowed to continue.

3.07 SLABS ON GRADE

- A. Where slabs on undisturbed earth occur, all loams, organic or other undesirable materials shall be removed as required by the Engineer, and the area grubbed to a depth of at least six (6) inches below the finished sub-grade elevation or as indicated on the Contract Drawings. Where slabs on fill occur, the fill will also be compacted in accordance with the related section of the specifications.

3.08 TRENCH EXCAVATION

- A. Excavation shall not commence in any section until the pavement covering the proposed excavation has been properly cut.
- B. In general, trenches shall be excavated to such depth as will permit pipe to be laid at elevations, slopes or depths of cover as indicated on the Contract Drawings. Deeper trenches shall be provided where necessary on account of the conformation of the ground and to permit the alignment of the pipe without undue deflection of joints.
- C. Trenches shall be excavated by hand or machinery to the width and depth indicated on the Contract Drawings and specified herein under Paragraph 3.10 "Trench Limits". All

loose material shall be removed from the bottom of the trench so that the bottom of the trench will be in an undisturbed condition, and so as to provide a proper foundation for pipe bedding material.

- D. Particular care shall be taken that no stone 6 inches or larger in any diameter protrudes more than 3 inches from the bottom or side of the trench. Suitable bell holes shall be made in the trench at joints as required.
- E. At completion of a workday, all excavations shall be covered by backfilling to existing grade or plating to entirely cover the opening or completely enclosing with a 6 foot high temporary chain link fence.
- F. In earth excavation in sections where bedding is excluded, the bottom of the trench shall be shaped so as to conform to the outside of the pipe, particular care being taken to recess the bottom of the trench in such a manner as to relieve the bell of all load.

3.09 TRENCH EXCAVATION IN FILL

- A. If pipe is to be laid in embankments or other recently filled material which are more than 1 foot below the invert of the pipe, the fill material shall be placed and properly compacted to final grade or to a height of at least 3 feet above the top elevation of the pipe, whichever is the lesser, before laying pipe. Particular care shall be taken to ensure maximum consolidation of material under the pipe. The pipe trench shall then be excavated as though in undisturbed material.

3.10 TRENCH LIMITS

- A. The limits of normal trench excavation shall be as shown on the Contract Drawings or specified herein. Trenches shall be excavated to the required depths, adding, however, to such depths the thickness of the pipe and, where applicable, the thickness of the bedding. The width of the trench at the bottom shall always be wide enough to make the joints properly. When, in the opinion of the Engineer, it is necessary to lay a concrete foundation, the excavation shall be made as shown on the details or as ordered by the Engineer.
- B. Where the bottom of the trench, by mistake of the Contractor, has been taken out to a greater depth than above specified, it shall be refilled to the proper grade, using screened gravel material by the Contractor who shall receive no additional compensation whatever therefore. Refilling with earth to bring the bottom of the trench to the proper grade will not be permitted.
- C. The Contractor shall at all time exercise care not to excavate outside the trench limiting lines as shown on the Contract Drawings unless otherwise authorized by the Engineer.
- D. Bedding for pipe will be as detailed on the Contract Drawing and as specified in the related section of the specifications.

3.11 EARTH EXCAVATION BELOW NORMAL GRADE

A. If in the opinion of the Engineer, the material at or below the depth to which excavation for structures and pipes would normally be carried is unsuitable for foundation, it shall be removed to such widths and depths as directed and replaced with suitable material. Such work shall be paid for under appropriate items.

1. Roadway over-excavations shall be backfilled with compacted Type 3 material.
2. Trench over-excavation shall be minimum of 3 feet or as directed by the Engineer and shall be lined with a geotextile fabric.

3.12 EXCAVATION NEAR EXISTING STRUCTURES

- A. Attention is directed to the fact that there are pipes, drains, and other utilities in certain locations. Some of these have been indicated on the Contract Drawings, and an attempt has been made to show all of the lines and services, but the completeness of accuracy of the information given is not guaranteed.
- B. All pipes and other utility conduits shall be located on the ground with pipe finding equipment well ahead of the work at all times. All such locations shall be plainly marked by coded paint symbols on pavement or by marked stakes in the ground. All such location work shall be provided by the Contractor in cooperation with the appropriate utility to the satisfaction of the Engineer at no extra cost.
- C. As the excavation approaches pipes, conduits, or other underground structures, digging by machinery shall be discontinued and the excavation shall be done by means of hand tools, as directed. Such manual excavation when incidental to normal excavation shall be done to the satisfaction of the Engineer at no extra cost.

3.13 RELOCATION AND REPLACEMENT OF EXISTING STRUCTURES

- A. Whenever the Contractor encounters certain existing structures as described below and is so ordered in writing, he shall do the whole or such portions of the work as he may be directed, to change the location or, remove and later restore, or replace such structures, or to assist the Owner thereof in so doing. For all such work, the Contractor shall be paid under such items of work as may be applicable, otherwise as Extra Work.
- B. In removing existing pipes or other structures, the Contractor shall use care to avoid damage to material, and the Engineer shall include for payment only those new materials which, in his judgment are necessary to replace those unavoidably damaged.
- C. The structures to which the provisions of the preceding two paragraphs shall apply include pipes, wires, and other structures which (a) are not indicated on the Contract Drawings or otherwise provided for, (b) encroach upon or are encountered near and substantially parallel to the edge of the excavation, and (c) in the opinion of the Engineer will impede progress to such an extent that satisfactory construction cannot

proceed until they have been changed in location, removed (to be later restored), or replaced.

- D. When fences interfere with the Contractor's operations, he shall remove and (unless otherwise specified) later restore them to at least as good condition as that in which they were found immediately before the work was begun. The restoration of fences shall be done as promptly as possible and not left until the end of the construction period.

3.14 CARE AND RESTORATION OF PROPERTY

- A. Excavation machinery and cranes shall be of suitable type and be operated with care to prevent damage to trees not to be cut and overhanging branches and limbs.
- B. Branches, limbs, and roots shall not be cut except by permission of the Engineer. All cutting shall be smoothly and neatly done without splitting or crushing. In case of cutting or unavoidable damage to branches, limbs, and trunks of trees, the cut or damaged portions shall be neatly trimmed and covered with an application of grafting wax or tree healing paint as directed.
- C. Cultivated hedges, shrubs, and plants which might be injured by the Contractor's operations shall be protected by suitable means or shall be dug up and temporarily replanted and maintained. After the construction operations have been substantially completed, they shall be replanted in their original positions and cared for until growth is reestablished. If cultivated hedges, shrubs, and plants are injured so such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced by items of kind and quality at least equal to the kind and quality existing at the start of the work.
- D. On paved surfaces, the Contractor shall not use or operate tractors, bulldozers, or other power operated equipment, with treads or wheels of which are so shaped to cut or otherwise damage such surfaces. All surfaces which have been damaged by the Contractor's operations shall be restored to a condition at least equal to that in which they were found immediately prior to the beginning of operation. Suitable materials and methods shall be used for such restoration.
- E. The restoration of existing property or structures shall be done as promptly as practicable and shall not be left until the end of the construction period.

3.15 DUST CONTROL

- A. During the progress of the work, the Contractor shall conduct his operations and maintain the area of his activities so as to minimize the creation of dust. If the Engineer decides that it is necessary to use calcium chloride for more effective dust control, the Contractor shall furnish the material, load, deliver, and spread it as directed.

3.16 BACKFILLING - GENERAL

- A. In general, and unless other material is indicated on the Contract Drawings or specified elsewhere, material used for backfilling trenches and excavations around structures shall be suitable material which was removed in the course of construction excavation. Backfilling shall not commence until the Engineer gives permission. Where the trench is in an area to be paved, or in an unpaved vehicular or pedestrian traveled way, or the shoulder of a paved roadway, a suitable pavement base shall be provided to a depth of at least that required in the related sections of the specifications.
- B. Suitable backfill material shall be free from cinders, ashes, refuse, boulders, rocks, or stones greater than 6 inches in any dimension, unsuitable organic material, or other material which, in the opinion of the Engineer, is unsuitable.
- C. Frozen material shall not be placed in the backfill, nor shall backfill be placed upon frozen material. Previously frozen material shall be removed, or shall be otherwise treated as required, before new backfill is placed.

3.17 BACKFILLING AROUND STRUCTURES

- A. The Contractor shall not deposit backfill against structures until the structure has obtained sufficient strength to withstand the earth pressure placed upon it and in no case less than seven days, nor before carrying out and satisfactorily completing the tests specified in the related sections of the specifications. Compaction of backfill against concrete structures shall not be carried out by motorized equipment closer to the structure than the depth of the structure below grade. Such backfilling shall be carried up evenly on all walls of a structure simultaneously with maximum allowable variation of 2 feet in elevation at any point. Unequal soil pressures shall be avoided by depositing the material evenly around the structure.
- B. In addition, where pipe is connected to the structure, the backfilling procedure shall be carried out as specified in "Backfilling in Open Trench".
- C. Measurement of fill material under this work will not include any filling made beyond a vertical plan of one foot outside the footings except as directed.
- D. In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of the day's operations. Prior to terminating work for the day, the final layer of compacted fill shall be rolled or graded to eliminate ridges of soil left by compaction equipment. No fill shall be placed and compacted on snow, ice, or soil that was permitted to freeze prior to compaction.

3.18 BACKFILLING IN OPEN TRENCH

- A. As soon as practical after pipe has been laid in accordance with the appropriate sections and the pipe joints have been properly made, the backfilling shall begin, and shall continue without delay. However, the trench shall be kept open long enough for the Engineer to locate existing utilities uncovered during excavation and to inspect pipe or structure conditions.

- B. If a screened gravel or concrete envelope is not used, the selected material shall be (see Contract Drawings for additional or superseding information) free from large lumps and stones having any dimension greater than 2 inches, and shall be placed simultaneously on both sides of the pipe, so that there will be no tendency to displace the pipe alignment. In placing the material, care shall be taken that stones do not strike the pipe and geotextile fabric shall be installed to the limits shown on the Contract Drawings at the locations specified on the drawings or as directed by the Engineer.
 - C. A sand blanket (Type 2 material) shall be placed at the sides of the pipe up to the top of the pipe and shall be hand-placed and thoroughly compacted using approved hand-operated tampers. Backfilling shall be carried up evenly on both sides of the pipe.
 - D. Type 2 material shall be extended up to a level of 1 foot above the top of the pipe shall be placed in 6 inch layers, leveled along the length and width of the trench and thoroughly compacted with approved tampers.
 - E. The sand blanket (Type 2 material) may be omitted for cast iron, ductile iron and reinforced concrete pipe provided, however, that no stone large than 2 inches is in contact with the pipe.
 - F. The backfill in the remainder of the excavation above the top of the screened gravel or concrete envelope, if used, shall be Type 1, backfilled in approximately 12 inch layers and promptly compacted by mechanical tamping. Material used for backfilling to a point two feet over the pipe shall contain no stones larger than three inches in greatest dimension. Backfilling or tamping with trenching machines is prohibited.
 - G. Care shall be taken in the use of mechanical or other tampers not to injure or move the pipe or cause the pipe to be supported unevenly.
 - H. Large masses of backfilling material shall not be dropped into the trench in such a manner, in the opinion of the Engineer, as to endanger the pipe.
 - I. All backfilled trenches shall be thoroughly surface tamped with a tamping machine approved by the Engineer.
 - J. Whatever method of compacting backfill is used, care shall be taken that stones and lumps shall not become nested and that all voids between stones shall be completely filled with fine material.
 - K. No compacting shall be done when the material is too wet to be compacted properly; at such times the work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compacting, or such other precautions shall be taken as may be necessary to obtain proper compacting.
- 3.19 MATERIAL FOR FILLING AND EMBANKMENTS
- A. Approved selected materials available from the excavations and not required for backfill around pipes or under structures may be used for site preparation except as otherwise

specified. Material needed in addition to that available from construction operations shall be obtained from approved Type 1, 2, 3, or 4 sources.

- B. All material, whether from the excavations or offsite, shall be such nature that after it has been placed and properly compacted in 12-inch layers, it will make a dense, stable fill. It shall not contain vegetation, roots, stones over 6 inches in diameter, or porous material.

3.20 GRADING

- A. Grading, in preparation for placing of paved walks and drives and appurtenances, shall be performed at all places to the lines, grades, and elevations as directed by the Engineer. All unsuitable material encountered, of whatever nature, shall be removed and disposed of as directed. During the process of grading, the sub-grade shall be maintained in such condition that it will be well drained at all times. When directed, temporary drains and drainage ditches shall be installed to intercept or divert surface water which may affect the prosecution or conditions of the work.
- B. The right is reserved to make minor adjustments or revisions in lines or grades if found necessary as the work progresses or in order to obtain satisfactory construction.
- C. All slopes cut during construction shall be uniformly redressed to the slope, cross-section and alignment existing prior to construction as indicated on the Contract Drawings or as directed by the Engineer.

END OF SECTION

02200-12

Earthwork

SECTION 02224

FILL AND BACKFILL MATERIALS

PART 1 GENERAL

- 1.01 SCOPE OF WORK
- 1.02 APPROVAL OF MATERIALS
- 1.03 RELATED WORK SPECIFIED ELSEWHERE

PART 2 MATERIALS

- 2.01 TYPE 1 - COMMON BORROW
- 2.02 TYPE 2 - SAND BORROW
- 2.03 TYPE 3 - SAND AND GRAVEL
- 2.04 TYPE 4 - COARSE GRAVEL
- 2.05 TYPE 5 - LOAM BORROW AND TOPSOIL
- 2.06 TYPE 6 - SCREENED GRAVEL MATERIALS
- 2.07 TYPE 7 - CRUSHED STONE

PART 3 EXECUTION OF WORK

- 3.01 PLACING AND COMPACTING

PART 1 GENERAL

- 1.01 SCOPE OF WORK

- A. The Contractor shall furnish all labor, equipment, fill and backfill material and incidentals for site preparation and to meet finished contours as shown on the Contract Drawing. The use of the fill and backfill material is specified elsewhere. The Engineer may order the use of granular fill materials for purposes other than those specified in other sections, if in his opinion such use is advisable.

- 1.02 APPROVAL OF MATERIALS

- A. The Contractor shall furnish the Engineer with representative samples and a gradation analysis of each type of soil. If the source of materials changes significantly or a different source is used, re-submittals and re-approvals must be made.

- 1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. SECTION 02200 - EARTHWORK
- C. SECTION 02250 - COMPACTION CONTROL AND TESTING

PART 2 MATERIALS

- 2.01 TYPE 1 - COMMON BORROW

02224-1

Fill and
Backfill Material

- A. Common Borrow shall be a granular material obtained from approved on-site or off-site natural deposits and unprocessed except for the removal of unacceptable material and stones larger than six (6) inches. It shall not contain vegetation or roots. It shall be free from loam, clay, fine wood, trash, and other objectionable materials or harmful substances.
- B. Common Borrow shall consist of a material satisfactory to the Engineer and not specified as gravel borrow, sand borrow, special borrow material or another particular kind of borrow. This material shall have the physical characteristics of soils designated as group A-1, A-2 - 4 or A-3, under AASHTO-M145. It shall have properties such that it may be readily spread and compacted for the formation of embankments.

2.02 TYPE 2 - SAND BORROW

- A. Sand Borrow shall consist of clean, inert, hard, durable grains of quartz or other hard durable rock. It shall be free from clay, loam, vegetable or other objectionable matter.
- B. Material for pipe cover, landscaping, or other uses as determined by the Engineer, shall be well graded as follows or as indicated on the Contract Drawings. The allowable amount of material passing a No. 200 sieve as determined by AASHTO-T11 shall not exceed 10 percent by weight.

<u>Sieve Size</u>	<u>Percent by Weight Passing Through</u>
$\frac{3}{8}$ inch	85 - 100
#16	50 - 85
#200	0 - 10

2.03 TYPE 3 - SAND AND GRAVEL

- A. The sand and gravel material for foundation sub-grades or structural fills shall meet AASTHO-M145, for A-1-a, A-1-b, or A-3 soils. The mixture shall consist of clean hard durable particles or fragments. It shall be free from loam, organic or other objectionable matter.
- B. Subgroup A-1-a includes those materials consisting predominantly of stone fragments or gravel, either with or without a well-graded binder of fine material and with 50% maximum passing the No. 10 sieve, 30% maximum passing the No. 40 sieve and 15% maximum passing the No. 200 sieve. The fraction passing the No. 40 shall have a maximum plasticity index of 6.
- C. Subgroup A-1-b includes those materials consisting predominantly of course sand either with or without well-graded soil binder and with 50% maximum passing the No. 40 sieve and 25% maximum passing the No. 200 sieve. The fraction passing the No. 40 shall have a maximum plasticity of 6.

- D. Group A-3 material shall be fine beach sand without silty or clay fines or with a very small amount of non-plastic silt. The group includes also stream deposited mixtures of poorly-graded fine sand and limited amounts of coarse sand and gravel; 51% minimum shall pass the No. 40 sieve, and 10% maximum shall pass the No. 200 sieve.

2.04 TYPE 4 - COARSE GRAVEL

- A. The material shall consist of clean hard, inert, durable particles or fragments. It shall be free from clay, loam, vegetable or other objectionable matter. Materials that break up when alternately frozen and thawed or wetted and dried shall not be used.
- B. Material for foundation under drainage, pavement subbase, or other uses as determined by the Engineer shall be well graded as follows:

<u>SIEVE SIZE</u>	<u>PERCENTAGE BY WEIGHT PASSING</u>
3 inch	100
1 ½ inch	70- 100
¾ inch	50- 85
#4	30- 60
#200	0-12 (based on fraction passing No. 4)

- C. The processed material shall be stockpiled in such a manner to minimize segregation of particle sizes. All processed gravel shall come from approved stockpiles.

2.05 TYPE 5 - LOAM BORROW AND TOPSOIL

- A. Material shall conform to related sections of the specifications.

2.06 TYPE 6 - SCREENED GRAVEL MATERIALS

- A. The gravel shall generally conform to ASTM-C33 and shall consist of clean, hard, inert, durable particles or fragments. It shall be free from clay, loam, organic or other objectionable matter. Crushed rock of suitable size and grading may be used instead of screened gravel. The specifications which follow shall apply to whichever material is used.
- B. Material for trench stone fill shall consist of sound angular stones; 50 to 70 percent of which shall weigh at least 500 pounds and the remainder shall weigh not less than 50 pounds each.
- C. Material for trench bedding shall be well graded from ¾ inch to 2 inch.
- D. Material for stabilizing trench base shall be well graded from ½ inch to 1 ½ inch.

- E. Material for pipe bedding, landscaping, or other uses as determined by the Engineer, shall be well graded as follows:

<u>SIEVE SIZE</u>	<u>PERCENT BY WEIGHT PASSING</u>
1 inch	100
¾ inch	90 - 100
⅜ inch	20 - 55
#4	0 - 10
#8	0 - 5

2.07 TYPE 7 - CRUSHED STONE

- A. The crushed stone shall consist of clean, hard, inert, durable particles or fragments. It shall be free from clay, loam, vegetable or other objectionable matter.
- B. At least 50% of the material passing a one (1) inch sieve shall have a fractured face. The percent of wear of the crushed stone for pavement base coarse shall not exceed 50.

The stone sizes for the crushed stone shall be as follows:

<u>SIEVE SIZE</u>	<u>PERCENT BY WEIGHT PASSING</u>
1 ½ inch	100
1 ¼ inch	85 - 100
¾ inch	10 - 40
½ inch	0 - 8

- C. The equipment for producing crushed stone shall be of adequate size and with sufficient adjustments to produce the required materials without unnecessary waste. The plant shall be capable of removing excess sand. The Engineer may order final screening of crushed stone if flat or elongated pieces are present in objectionable amounts.

PART 3 EXECUTION OF WORK

3.01 PLACING AND COMPACTING

- A. The material shall be placed and compacted as specified in related specification sections.

END OF SECTION

02224-4

Fill and
Backfill Material

SECTION 02250

COMPACTION CONTROL AND TESTING

PART 1 GENERAL

- 1.01 SCOPE OF WORK
- 1.02 RELATED WORK SPECIFIED ELSEWHERE
- 1.03 SUBMITTALS

PART 2 MATERIALS

- 2.01 TEST METHODS

PART 3 EXECUTION OF WORK

- 3.01 COMPACTION EQUIPMENT
- 3.02 COMPACTION REQUIREMENTS
- 3.03 APPROVAL OF FILL OR BACKFILL MATERIAL
- 3.04 FREQUENCY OF COMPACTION TESTING
- 3.05 FAILED TESTS

PART 1 GENERAL

- 1.01 SCOPE OF WORK

- A. The Contractor shall furnish all labor, materials and equipment necessary to place and compact fill or backfill. The Contractor shall furnish all equipment necessary to collect soil samples.
- B. Actual testing of soil samples with the exception of insitu-density determinations shall be done by an independent testing laboratory approved by the Owner. Insitu-density determinations shall be made by the Engineer or his representative. Copies of test results shall be furnished by the test laboratory directly to the Engineer.

- 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. SECTION 02200 - EARTHWORK
- B. SECTION 02224 - FILL AND BACKFILL MATERIALS
- C. SECTION 02226 – SAND BLANKET

- 1.03 SUBMITTALS

- A. Prior to commencement of filling and backfilling operation, the Contractor shall submit for approval a detailed list six (6) copies unless otherwise specified) of the types of compacting equipment to be utilized in the work, and the number of each.

PART 2 MATERIALS

2.01 TEST METHODS

- A. Contractor shall provide heavy-duty sample bags for fill or backfill material to be tested. Soils shall be classified as in the in the related sections of the Specifications which include AASHTO specifications M145 Recommended Practice for Classification of Soils as Soil-Aggregate Mixtures for Highway Construction Purposes.
- B. Soil samples shall be prepared for testing according to ASTM D42 Dry Preparation of Soil Samples for Particle-Size Analysis and Determination of Soil Constants.
- C. Gradation testing shall be done according to ASTM D2216 Particle Size Analysis of Soils and ASTM D1140 test for Amount of Materials in Soils Finer than the No. 200 sieve.
- D. Moisture content of soil shall be determined by ASTM D2216 Laboratory Determination of Moisture Content of Soil.
- E. Liquid Limits and Plasticity Index shall be determined ASTM D423 Liquid Limit of Soils and ASTM D424 by Plastic Limit and Plasticity Index of Soils.
- F. Maximum dry density for each type of fill shall be determined by ASTM D1557 Method D Moisture - Density Relations of Soils using 10-lb. Hammer and 18-in. Drop.
- G. In-place field unit weight shall be determined by ASTM D- 1556 Density of Soil in Place by the Sand-Cone Method.
- H. Maximum dry density at the discretion of the Engineer may be determined in accordance with ASTM D-2049 test for Relative Density of Cohesionless Soils.

PART 3 EXECUTION OF WORK

3.01 COMPACTION EQUIPMENT

- A. No backfilling shall be done until the compacting equipment list has been submitted and approved as conforming to the Contract requirements. Sufficient compacting equipment shall be available at all times, thereafter while backfilling is being conducted.
- B. Each layer of fill shall be inspected prior to compaction. All visible roots, vegetation, or debris shall be removed. Stones larger than 6 inches in diameter shall be removed. The water content of each layer shall be determined to be suitable for compaction or shall be brought to a suitable condition. Material incorporated in the fill which is not in satisfactory condition shall be subject to rejection and removal at the Contractor's expense. Placement of fill on frozen ground or placement of fill material which is frozen will not be permitted.

- C. Previously placed or new materials shall be moistened by sprinkling, if required, to ensure proper bond and compaction. No compacting shall be done when the material is too wet, from either rain or too great an application of water, to compact it properly; at such times the work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compaction, or such other precautions shall be taken as may be necessary to obtain proper compaction.
- D. Filling shall begin in the lowest section of the area. Fill shall be spread in layers as specified. The surface of each layer shall be approximately horizontal but will be provide with sufficient longitudinal and transverse slope to provide for runoff of surface water from every point. Filling shall be conducted so that no obstruction to drainage from other sections of the fill area is created at any time. Sumps, if any, shall be continuously maintained in effective operating condition.
- E. Each layer of material shall be compacted by the use of only approved rollers or other approved means so as to secure a dense, stable, and thoroughly compacted mass. At such points as cannot be reached by mobile mechanical equipment, or where such equipment is not permitted, the materials shall be thoroughly compacted by the use of suitable power-driven tampers.
- F. The compaction equipment shall be operated so as to make a minimum of three passes over each section of each layer of fill. Each successive pass shall overlap the adjacent pass by not less than 10%. Additional passes shall be made to obtain the required compaction, if necessary.
- G. Compaction by water jetting or puddling will be allowed only if the Engineer deems the conditions suitable for this method. Wherever the material contains excessive amounts of clay or loam to prevent satisfactory drying, water-jetting shall not be used.
- H. If the material is allowed to be compacted by water jetting or puddling, it shall be placed in uniform layers not exceeding 4 ft. deep. Each layer shall be thoroughly saturated throughout its full depth and at frequent intervals until all slumping ceases. For water jetting or puddling, the Contractor shall provide one or more jet pipes, each of sufficient length to reach the specified depth and not less than 1 ½ in. in diameter. The jet pipe shall be equipped with a quick-acting valve and sufficient fire hose to connect to a hydrant or pump having adequate pressure and capacity. A hydrant shall be utilized only upon approval of the local Water and/or Fire Departments. The Town requires that all water usage shall be metered. The Contractor shall obtain a meter for hydrant usage at the water department. There will be no additional charge for water used for the project.

3.02 **COMPACTION REQUIREMENTS**

- A. **Pipe Bedding:** Bedding shall be Type 6 fill placed uniformly in 6 inch layers and compacted unless otherwise specified. Compaction shall be accomplished by 20 lb. hand tampers.

- B. Pipe Sand Blanket: Material shall be Type 2 fill placed uniformly in 6 inch layers and compacted to 90% of maximum dry density of the sand. Compaction shall be accomplished by 20 lb. hand tampers.
- C. Trench Cover: Material shall be Type 1, 2, 3 or 4 fill placed uniformly in 12 inch layers and compacted to 95% of maximum dry density for the type of material used. Compaction shall be accomplished by mechanical tampers. Compaction by water-jetting shall be in accordance with the related sections of the specifications.
- D. Catch Basin and Manhole Base Bedding: Material shall be Type 6 fill placed uniformly in 6 inch layers and compacted. Compaction shall be accomplished by 20 lb. hand tampers or pneumatic tampers.
- E. Structural Fill (foundation sub-grade, foundation under drainage, pavement sub-grade, pavement sub-base): Material for foundation sub-grade or pavement sub-grade shall be Type 3 fill. Structural fills shall be placed in 6 inch layers compacted to 95% maximum dry density for a given type of material. Compaction shall be by mechanical power driven vibratory compactors. Pavement sub-grade in cut areas shall be rolled and compacted to 95% density of the in situ material.
- F. Fill around structures shall be Type 1, 2, 3, or 4 material placed in 6 inch layers and compacted to 95% maximum dry density. Compaction shall be accomplished by mechanical power driven vibratory compactors. Compaction of backfill against concrete structures shall not be carried out by motorized equipment closer to the structure than the depth of the structure below grade.
- G. Non Structural Fill (Landscaping and other uses as designated by the Engineer): Material shall be Type 1, 2, 3 or 4 placed in 12" layers and compacted to 45% maximum dry density for the given type of material used. Compaction shall be accomplished by mechanical power-driven vibratory compactors.

3.03 APPROVAL OF FILL OR BACKFILL MATERIAL

- A. Before placing or compacting any on-site or borrow material, the Contractor shall submit a sample of the material for testing. No on-site material shall be placed until approved by the Engineer.
- B. The Engineer may at any time require additional laboratory testing should he observe any changes in gradation of the material being placed. No additional fill shall be placed or compacted until the material has been approved. If the material does not meet the required gradation and Otterburg limits for a given type of fill, the Contractor shall remove it as his expense. The Contractor may use the material for other types of fill providing it meets the required gradation and properties of that type.

3.04 FREQUENCY OF COMPACTION TESTING

- A. The Engineer may perform tests of the degree of compaction obtained, in any area he may select. Payment for performing tests will be made by the Owner. If test results are unsatisfactory, all costs involved in correcting deficiencies in compacted material including retesting, shall be borne by the Contractor. If improper compaction methods are used, the Owner shall have the right to discontinue payments from the Contractor for said payment item until the situation is corrected.

3.05 FAILED TESTS

- A. If the percentage compaction at any point is found to be unacceptable, additional compaction with or without modification of the field moisture content as directed by the Engineer, shall be performed and a second moisture-density determination made. This procedure shall be repeated until satisfactory compaction is obtained. If after five (5) tests any fill or backfill material cannot be compacted to the required density it shall be removed and disposed of at the Contractor's expense.

END OF SECTION

02250-5

Compaction Control
and Testing

SECTION 02270

SLOPE PROTECTION AND EROSION CONTROL

PART 1 GENERAL

- 1.01 SCOPE OF WORK
- 1.02 RELATED WORK SPECIFIED ELSEWHERE

PART 2 MATERIALS

- 2.01 SLOPE PROTECTION AND EROSION CONTROL
- 2.02 SEDIMENTATION POOLS
- 2.03 SILT FENCES
- 2.04 STONE LINED WATERWAYS

PART 3 EXECUTION OF WORK

- 3.01 PRECONSTRUCTION CONFERENCE
- 3.02 PROCEDURAL DETAILS
- 3.03 ACCEPTANCE

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. This work shall consist of temporary and permanent control measures as shown on the Contract Drawings, as required, or as ordered by the Engineer throughout the construction and post-construction period to control erosion and sedimentation by the use of silt fences, sedimentation pools, check dams, filter fabric and other control devices. The erosion and sediment control features installed by the Contractor shall be satisfactorily maintained by the Contractor.
- B. In the event that temporary erosion and sediment control measures are required due to the Contractor's negligence, carelessness or failure to install permanent controls as a part of the work scheduled, and such additional measures are ordered by the Engineer, the work shall be performed by the Contractor at his expense.
- C. Repeated failures by the Contractor to control erosion (pollution/siltation) shall be cause for the Engineer to employ outside assistance or to use his own forces to provide the necessary corrective measures. The cost of such assistance plus Engineering costs will be charged to the Contractor and appropriate deductions made from the Contractor's monthly progress estimate.
- D. The Contractor shall remove sediment from behind silt fences, check dams and from sedimentation pools as necessary or as directed by the Engineer.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. SECTION 1300 - SUBMITTALS
- B. DIVISION 2 - SITE WORK

02270-1

Slope Protection and
Erosion Control

PART 2 MATERIALS

2.01 SLOPE PROTECTION AND EROSION CONTROL

- A. This work shall consist of the design, installation, maintenance and removal of temporary erosion control measures such as mulching slope drains and grasses to control and/or prevent erosion around the construction site during construction. Mulches may be hay, straw, fiber mats, netting or other suitable material acceptable to the Engineer.
- B. Slope drains may be constructed of pipe, fiber mats, or other material acceptable to the Engineer that adequately controls erosion.
- C. Grass shall be a quick growing species (such as rye grass, Italian rye grass, or cereal grasses) suitable to the area providing a temporary cover which will not later compete with the grasses used later for permanent cover.
- D. Fertilizer and soil conditioners shall be a standard commercial grade acceptable to the Engineer.
- E. Hay bales shall be 36" x 18" x 24", or larger, with two 1" x 1" x 48" stakes, per bale, to secure the bale in place.

2.02 SEDIMENTATION POOLS

- A. Sedimentation pools where used shall be constructed to a size and configuration and at locations as approved by the Engineer. The sedimentation pools shall be constructed and operational before excavation, embankment or drainage system construction in the area served by the pool is started. A series of haybales, in a rectangle secured with oak stakes (see attached detail), line with siltation fence, and shall be used to construct a siltation pool. The discharge hose from the trench shall discharge into the pool. Sedimentation pools shall be maintained during and after construction in good hydraulic condition such that function as intended. Pools shall be maintained and kept in operation by the Contractor for the duration of the project. Sediment and other deposits shall be removed when the depth of material reaches 12 inches, or as directed by the Engineer, to ensure satisfactory pool performance. The Contractor shall provide and maintain access to the pools for their maintenance. The pools shall be removed at the completion of the Contract or when directed by the Engineer. All disturbed areas shall be covered with 4 inches of plantable soil borrow and seeded in accordance with the provisions of these Specifications.

2.03 SILT FENCES

- A. This work shall consist of the construction, maintenance and removal of temporary silt fences. The silt fences shall be placed at the location shown on the Contract Drawings or as directed by the Engineer. The silt fences shall be in place before construction in the area begins.

- B. The snow fence should be set in place with a 6" trench on the front side. The filter fabric will be laid loosely on the fence so as not to stretch the material. The panels shall be overlapped a minimum of 12 inches. Suitable tie wire shall be used to secure the cloth to the top of the fence. The bottom of the cloth should be buried in the trench to prevent water from flowing beneath the fence. Fence posts shall be wooden or metal posts set 1 ½ feet into the ground at 6' centers.
- C. The filter fabric shall conform to the following requirements. The yarn shall consist by weight of at least 85 percent vinylidene chloride and shall contain stabilizers added to the base plastic to make the filaments resistant to deterioration due to ultraviolet and/or heat exposure. After weaving, the cloth shall be calendered so that the filaments retain their relative positions with respect to each other. The cloth shall be free of defects or flaws which significantly affect its physical and/or filtering properties. It shall be woven in widths of at least 6 feet and in rolls of not less than 50 linear feet. The sheets of filter cloth shall be sewn together with polypropylene or polyvinylidene chloride at the point of manufacture to form sections not less than 24 feet wide. All edges of the cloth shall be salvaged. During shipment and storage, cloth shall be wrapped with a suitable material for protection against damage.
- D. Should the Contractor desire to use an equal filter fabric sample of the proposed filter fabric shall be furnished 30 days prior to installation of the fabric. Samples, shipping, and cost of testing shall be at the Contractor's expense. A minimum of 5 square yards of cloth a minimum of 36 linear inches of seam, with at least one foot of cloth each side of the seam, shall be furnished for testing. Mill certificates, or affidavits from the manufacturer, shall accompany these samples, citing the trade name and producer of the cloth and certifying that the samples are representative of the material which will be installed on the project and that the cloth meets the requirements stated in this Specification. In addition, a certified copy of permeability and filtration tests from a qualified laboratory showing the performance of filter with various grain size soils and water, giving both particle retentions and permeability, shall be submitted at the request of the Engineer.
- E. Filter fabric shall be handled and placed in accordance with the manufacturer's recommendations. When the fabric is joined by stitching it shall be stitched with a yarn of contrasting color. The size and composition of the yarn shall be as recommended by the fabric manufacturer. The stitches shall number 5 to 7 per inch of seam.
- F. Should the fabric be damaged during placing, the torn or punctured section shall be repaired by placing a piece of fabric that is large enough to cover the damaged area and to meet the overlap requirement.
- G. Damaged sections of the silt fences shall be repaired or replaced by the Contractor for the duration of their use. Sediment shall be removed as directed by the Engineer.

- H. The silt fences shall be removed when adequate vegetative growth insures no further erosion of the slopes or when directed by the Engineer. The filter fabric may be cut at ground level.
- I. All material, including the filter fabric and fence, become the property of the Contractor and shall be disposed of away from the site.

2.04 STONE LINED WATERWAYS

- A. The Contractor shall provide all material, labor, and crushed stone for waterways, consisting of a protective covering of angular shaped stones laid on the waterway to insure protection of the waterway.
- B. The waterway shall be placed to line and grade as shown on the plans or as directed by the Engineer on a prepared bed of crushed stone. Each stone for the waterway shall be carefully placed by hand, normal to the slope and firmly bedded thereon. Each stone shall weigh not less than 50 pounds nor more than 125 pounds and at least 75% of the volume shall consist of stones weighing not less than 75 pounds each. The remainder of the stones shall be so graded that when placed with the larger stones, the entire mass will be compacted with a minimum percentage of voids and a minimum thickness of 6 inches.

PART 3 EXECUTION OF WORK

3.01 PRECONSTRUCTION CONFERENCE

- A. At the preconstruction conference or prior to the start of the applicable construction, the Contractor shall submit to the Engineer for acceptance, his plans and schedules for accomplishment of temporary and permanent slope protection and erosion control and restoration work, as are applicable for clearing and grubbing and general construction and disposal of unsuitable material and restoration of disturbed land to its original (prior to construction) condition. No work shall be started until schedules and methods of operations have been approved by the Engineer.

3.02 PROCEDURAL DETAILS

- A. The Engineer shall have the authority to limit the area of erodible earth exposed by construction and to direct the Contractor to provide immediate permanent or temporary erosion control and slope protection measures to prevent sediment runoff to adjacent streams, ponds, or other areas of water impoundment. Such work may involve the construction of temporary mulches, mats, seeding or other control devices or methods as required by the conduct of the work or as directed by the Engineer.
- B. The Contractor shall be required to incorporate all permanent erosion control measures into the project at the earliest practical time as outlined in the approved schedule. Temporary erosion control and slope protection measures will be used to correct conditions that develop during construction that were not foreseen during the design stage.

C. The Contractor shall undertake and comply with the following measures with respect to adverse environmental impacts, resulting from the operations listed below.

1. Clearing and Grubbing - Disturbed areas shall be re-grassed at the direction of the Engineer.
2. Access Road Construction - Riprap or sodding shall be used to prevent erosion.
3. Material Storage - Materials shall be stored only at approved locations. Petroleum products shall be stored away from wetland areas.
4. Excavation - The Contractor shall use care to contain wet fill where it is dumped. When material is stockpiled next to a trench, the side away from neighboring brooks, swamps, canals, etc., shall be utilized where space is available. Side slopes of stockpiled material shall conform to the natural angle of repose of the soil. The Contractor shall promptly remove all sediment from brooks and swamp areas, if deposition cannot be avoided during construction. The Contractor shall promptly remove excess fill and re-grass the work area. Excess fill shall not be disposed of in wetlands, other than in areas defined on the drawings, or areas approved by commissions or authorities having jurisdiction.
5. Water handling - The Contractor shall be required to use crushed stone or plastic sluiceways leading to brooks to filter pumped discharges.
6. Backfilling - The Contractor shall replace unsuitable material with properly suitable material. He shall also be responsible for surface repairs as required.
7. General - Trash receptacles shall be required on the job site. The Contractor shall perform preliminary clean-up operations as he completes segments of his work.
8. Spillings - Ground spilling of oil or other petroleum products drained from equipment shall be prohibited. The Contractor shall provide leakproof containers for receiving drained oil and shall properly dispose of such oil away from the site of the job.

3.03 ACCEPTANCE

A. Final inspection and acceptance in regard to cleanup, site restoration, erosion control and sloped protection measures shall be made in the presence of the Owner and/or commissions or authorities having jurisdiction. The Contractor shall notify the Owner in writing of the readiness of the work for final inspection.

END OF SECTION

02270-5

Slope Protection and
Erosion Control

SECTION 02525

CURB

PART 1 GENERAL

- 1.01 SCOPE OF WORK
- 1.02 RELATED WORK SPECIFIED ELSEWHERE

PART 2 MATERIALS

- 2.01 PRECAST CONCRETE CURBING
- 2.02 GRANITE CURBING
- 2.03 BITUMINOUS CURBING

PART 3 EXECUTION OF WORK

- 3.01 EXCAVATING TRENCH
- 3.02 PREPARATION OF FOUNDATION
- 3.03 SETTING CURBING
- 3.04 SALVAGING OF CURBING

PART 1 GENERAL

- 1.01 SCOPE OF WORK
 - A. Work under this section consists of furnishing all material, labor, tools, equipment, and supervision necessary to remove and reset (granite only) or install new curb, curb corners, transition curb, and curb inlets.
 - B. The contractor shall be responsible for removing and resetting (granite only) or furnishing and installing new curbing, in accordance with these specifications and in close conformity with the lines and grades shown on the Contract Drawings and as approved by the Engineer.
- 1.02 RELATED WORK SPECIFIED ELSEWHERE
 - A. DIVISION 2 - SITE WORK
 - B. DIVISION 3 - CONCRETE

PART 2 MATERIALS

- 2.01 PRECAST CONCRETE CURB
 - A. New curbing shall meet the requirements of the Massachusetts Highway Department Standard Specifications for Highways and Bridges, Subsection M4.01.14. Curbing shall be as shown on the Contract Drawings. Transition curbing shall be placed at the ends and beginnings of curbing and at handicap ramps.

- B. Joints shall be tight and less than 1/4" and joint sealant shall not be required.

2.02 GRANITE CURB

- C. New granite curbing shall meet the requirements of the Massachusetts Highway Department Standard Specifications for Highways and Bridges, Subsection 501.40. Granite curbing shall be Type VA4 or VA5, as shown on the Contract Drawings. Transition curbing shall be placed at the ends and beginnings of curbing, at drain inlets, and at handicap ramps.
- D. If curb, curb corners, or curb inlets of different quarries is used, curbing of each quarry shall be segregated and set together to give a uniform appearance.

2.03 BITUMINOUS CURB

- A. New bituminous curbing shall meet the requirements of the Massachusetts Highway Department Standard Specifications for Highways and Bridges, Subsection 501.64 and M3.12.0. Curbing shall be as shown on the contract drawings.

PART 3 EXECUTION OF WORK

3.01 EXCAVATING TRENCH

- A. The trench for the curb shall be excavated to a width of eighteen (18) inches. The subgrade of the trench shall be at a depth below the proposed finished grade of the curb equal to six (6) inches plus the depth of the curbstone.

3.02 PREPARATION OF FOUNDATION

- A. The foundation for the curbing shall consist of a cement concrete bed placed on the gravel subbase as shown on the details.
- B. The foundation for curb inlets shall consist of a full bed of Portland cement mortar on the supporting back wall of the catch basin or gutter inlet and with sufficient gravel on each side to support the overhang. The trench for the gravel foundation shall be at least six (6) inches in depth and eighteen (18) inches in width. This trench shall be filled with gravel and thoroughly tamped to the required grade.
- C. The trench for curb corners shall be excavated so that there is a foundation of gravel which, when thoroughly compacted, will be six (6) inches in depth and extending six (6) inches beyond the front and back of the curb corner to the full depth of the foundation.

3.03 SETTING CURB

- A. Curb and curb corners shall be set on a concrete foundation as shown on the Contract Drawings, and shall be fitted together as closely as possible.
- B. All spaces under the curb and curb corners shall be filled with concrete so that the curb and curb corners will be completely supported throughout their lengths. The curb shall be set to the line and grade required as shown on the plans, unless otherwise directed. Concrete shall be flowed to the finished road gravel grade and bottom of the paved binder course.

3.04 SALVAGING OF CURB

- A. The Contractor shall carefully remove, store, and clean all curbing specified for resetting. The Contractor shall replace all existing curbing that is to be reset which is lost, damaged, or destroyed because of his operations, at no expense to the Owner.

END OF SECTION

02525-3

Curb

SECTION 02575

PAVING AND ROAD CONSTRUCTION

PART 1 GENERAL

- 1.01 CONTRACT DOCUMENTS
- 1.02 DESCRIPTION OF WORK
- 1.03 RELATED WORK SPECIFIED ELSEWHERE

PART 2 MATERIALS

- 2.01 GENERAL CRITERIA
- 2.02 SUBGRADE
- 2.03 SUBBASE
- 2.04 TRENCH PAVEMENT
- 2.05 BASE COURSE - PERMANENT PAVEMENT
- 2.06 SURFACE COURSE - PERMANENT PAVEMENT
- 2.07 SIDEWALKS, DRIVEWAYS AND CURBS

PART 3 EXECUTION OF WORK

- 3.01 BITUMINOUS PAVING - GENERAL
- 3.02 CARE AND RESTORATION OF PROPERTY
- 3.03 PREPARATION OF SUBGRADE IN CUT AREAS
- 3.04 PREPARATION OF SUBGRADE IN FILL AREAS
- 3.05 PREPARATION OF SUBBASE
- 3.06 TRENCH PAVEMENT
- 3.07 PERMANENT PAVEMENT
- 3.08 MAINTENANCE OF PAVING
- 3.09 SIDEWALKS, DRIVEWAYS AND CURB CONSTRUCTION

PART 1 GENERAL

1.01 CONTRACT DOCUMENTS

- A. The general provisions of the Contract, including General and Supplemental Conditions and General Requirements, apply to the work specified in this section.
- B. The Contractor shall be responsible for maintaining all pavements and sidewalks placed as part of the Contract, in a safe and satisfactory condition until the project is accepted as complete. For any pavement or sidewalk area damaged, the Contractor shall remove the entire pavement structure in the damaged area and replace it as directed by the Engineer.
- C. Should the application of the wearing surface be delayed for any reason including bad weather, the Contractor shall provide and maintain the base in acceptable condition until the new pavement is placed.

- D. During construction, all existing pavement, not to be removed, shall be protected by the Contractor. Any pavement damaged shall be removed and replaced by the Contractor at the Contractor's expense.

1.02 DESCRIPTION OF WORK

- A. Work under this section consists of furnishing all materials, labor, tools, equipment and supervision necessary to restore existing or construct new pavement sub-grades, subbase, bituminous base courses, tack coats and bituminous surface courses for roadways and all curbs, sidewalks, driveways, and parking areas.
- B. The materials and construction methods used for this work shall conform to the Massachusetts Highway Department, "Standard Specifications for Highways and Bridges", 1988 Edition, and subsequent revisions and addenda.
- C. All temporary construction roads, ditches, and drainage facilities shall be removed and the site restored before completion of the project.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. SECTION 02200 - EARTHWORK
- B. SECTION 02224 - FILL AND BACKFILL MATERIALS
- C. DIVISION 2 - SITE WORK -As Appropriate
- D. DIVISION 3 - CONCRETE - As Appropriate

PART 2 MATERIALS

2.01 GENERAL CRITERIA

- A. The Contractor shall be responsible for obtaining any permits and meeting State requirements for all work within State highways.

2.02 SUBGRADE

- A. Sub-grade shall be either Type 1, 2, 3 & 4 materials in accordance with related specifications.

2.03 SUBBASE

- A. Sub-base shall be Type 6 screened gravel material in accordance with related specifications or reclaimed material.

2.04 TRENCH PAVEMENT – IF REQUIRED

- A. Trench pavement shall be a Class I Bituminous Concrete Pavement surface course as given in the Massachusetts Highway Department Standard Specifications for Highways and Bridges, Section 460.20 to 460.68.

2.05 BASE COURSE - PERMANENT PAVEMENT

- A. Base course shall be the first layer of bitumen and aggregate mixture overlying the screened gravel or reclaim sub-base.
- B. Bituminous base course shall be Class 1 Bituminous Concrete Base Course Type I-1 as given in the Massachusetts Highway Department Standard Specifications for Highways and Bridges.

2.06 SURFACE COURSE - PERMANENT PAVEMENT

- A. Surface course shall be Class I Bituminous Concrete Pavement as given in the Massachusetts Highway Department Standard Specifications for Highways and Bridges, Section 460.20 to 460.68.

2.07 SIDEWALKS, DRIVEWAYS AND CURBS

- A. Bituminous concrete for driveways, sidewalks and curbs shall be in accordance with the appropriate section in the Massachusetts Highway Department Standard Specifications for Highways and Bridges or as noted on the design plans.

PART 3 EXECUTION OF WORK

3.01 BITUMINOUS PAVING - GENERAL

- A. All mixtures delivered to the job site shall be accompanied by a Certificate of Compliance. Deliveries not accompanied by a certificate will not be used in the work.
- B. Construction methods shall conform to the requirements of the Massachusetts Highway Department Standard Specifications for Highways and Bridges, including the following:
 1. Mixtures delivered to the job site shall not possess signs of segregation of ingredients or surface crust.
 2. The temperatures of the mixture when delivered to the spreader will be a minimum of 250 F.
 3. Mixtures shall be placed only upon approved surfaces that are clean from foreign material and are dry; and when weather conditions are suitable. No mixture shall be placed when the weather is foggy or rainy, provided, however, that the Engineer may permit, in the case of sudden rain, the placing of mixture then in transit from the plant, if laid at the proper temperature and if the roadbed is free from pools of water. Such permission shall in no way relax the requirements for the quality of the

pavement and smoothness of the surface. Paving materials shall not be placed upon a frozen base or when ambient air or surface temperature is less than 40 degrees Fahrenheit or when wind conditions are such that rapid cooling will prevent satisfactory compaction.

4. Wherever possible material shall be compacted using steel-wheeled rollers.
5. In areas not accessible to a roller, compaction shall be accomplished by using mechanical compactors or hand tampers, approved by the Engineer.
6. All material place shall receive final compaction before nightfall of the day placed, unless artificial light, satisfactory to the Engineer, is provided.
7. The density of completed paving shall not be less than 95% of the density obtained from laboratory compaction of a mixture composed of the same materials in like proportions.
8. The Engineer may require the Contractor to remove and replace at his own expense, any work deemed defective based on sampling and testing for composition and density, or faulty procedures.

3.02 CARE AND RESTORATION OF PROPERTY

- A. All streets, sidewalks, gutters, driveways and curbs that have been damaged by the Contractor's operations shall be restored to a condition at least equal to that in which they were found immediately prior to the beginning of operations.
- B. Suitable materials and methods shall be used for restoration of curbs and other types of gutters, driveways and sidewalks.
- C. Materials and method of all restoration work shall be subject to approval by the Engineer.
- D. All frames, grates, covers, street boxes, manhole rings and other castings removed or damaged by the Contractor's operations shall be restored to a condition at least equal to that in which they were found immediately prior to the beginning of operations.
- E. All frames, grates, covers, street boxes, manhole rings and other castings within the limits of new paving shall be reset by the Contractor such that they are flush with the new surface.

3.03 PREPARATION OF SUBGRADE IN CUT AREAS

- A. After excavation to the proposed sub-grade elevation the insitu material is determined by the Engineer to be unsuitable, the Contractor shall excavate an additional 1-foot and backfill with Type 3 sand and gravel compacted to 95% of maximum dry density.

Changes in the depths and limits of excavations or fills shall be an appropriate bid adjustment item.

- B. The Contractor shall remove loam and topsoil, loose vegetable matter, stumps, large roots, etc., from areas upon which subbase and pavement material will be placed. The subgrade shall be shaped as indicated on the Contract Drawings and shall be compacted to 95% of maximum dry density.

3.04 PREPARATION OF SUBGRADE IN FILL AREAS

- A. The Contractor shall remove loam and topsoil, loose vegetable matter, stumps, large roots, etc., from areas upon which embankments will be built or material will be placed for grading.
- B. After the area has been stripped and grubbed as herein specified, Type 1, 2, 3 and 4 materials or reclaimed material shall be placed thereon and built up in successive layers until it has reached the required elevation.
- C. Layers shall not exceed 6 inches in thickness before compaction. The layers shall be slightly convex toward the center. Layers shall be compacted to 95% of the maximum dry density of the particular material used.

3.05 PREPARATION OF SUBBASE

- A. Subbase material shall conform to Type 6 Screened Gravel or reclaimed material as described in the related sections of the specifications.
- B. Screened gravel subbase for either permanent paving shall be a minimum of 12 inches in thickness.

3.06 TRENCH PAVEMENT

- A. Trench paving shall be the depth as specified, or as directed by the Engineer.
- B. Prior to placing trench pavement, trenches shall have been backfilled in accordance with related sections of the specifications. The top of the trench shall be backfilled with the specified gravel subbase materials, spread and compacted as specified herein.
- C. Prior to placing trench pavement, the backfilled trenches shall be excavated and compacted to proper depth. The edges of the existing pavement, previously cut for the trenching operations, shall be retrimmed a minimum of 1 foot back along clean, straight, undamaged lines, on each side, as directed by the Engineer, and the gravel base course shall be recompacted to form a satisfactory, stable foundation.
- D. Prior to the placing of trench pavement, the cut edges of existing pavement shall be swept clean and painted with a prime or tack coat of compatible asphalt materials.

- E. Trench pavement shall be furnished, placed and compacted, as specified, to such widths necessary to meet undisturbed existing pavement. The completed pavement shall match the grade and shape of the adjoining existing surfaces.
- F. The Contractor shall continuously maintain trench pavement in good repair, flush with existing pavement, at his own expense. Should soft, damaged or broken areas develop, such areas shall be removed immediately and be replaced with new, properly compacted materials.

3.07 PERMANENT PAVEMENT

- A. Permanent top course paving is to be placed after at least 90 days has elapsed from the installation of the binder course paving for required compaction to have occurred as determined by the Engineer.
- B. Prior to permanent top course paving, the Contractor shall make all final repairs to the previously installed binder course, and raise or cause to be raised, all existing, manhole, catch basin, valve box, curb box, and utility covers, etc., to conform to the final pavement grade. All loose or damaged material on the binder course pavement shall be removed and a leveling course may be installed, as hereinbefore specified. Leveling course shall also be installed at depths and locations, as directed by the Engineer, to fill existing holes and depressions, or to improve roadway crowns. Leveling course quantities used for permanent paving shall be included for compensation under the paving item.
- C. All surfaces to receive permanent paving shall be dry and thoroughly cleaned of foreign or loose material; a compatible prime or tack coat shall be applied to the rate of 0.05 to 0.15 gallons per square yard of pavement, depending upon the condition of the existing surface. All castings and edge stones will be protected from the tack coat.
- D. Prior to the installation of the final top pavement, the binder shall be swept of all debris. A uniform layer of bituminous asphalt emulsion (tack) shall be spread with approved equipment. To achieve the minimum spreading rates for the tack, a tanker truck will be required with spreader bar for uniformity. Slips will be required stating the volume (gallons) of tack spread and the engineer shall verify the spreading rate prior to placement of the final top pavement. A tack wand or wagon will not be acceptable for application of the tack.

3.08 MAINTENANCE OF PAVING

- A. The Contractor shall maintain pavement placed under this Contract until the expiration of the one-year guarantee period and shall promptly fill with similar material all depressions and holes that may occur to keep the pavement in a safe and satisfactory condition for traffic.

3.09 SIDEWALKS, DRIVEWAY AND CURB CONSTRUCTION AND RECONSTRUCTION

- A. All granite curbs, cement concrete sidewalks, and driveways damaged during construction will be reconstructed to their original condition after construction is completed. Granite curbing to be reset shall be removed and reset to proper grade and alignment in accordance with the construction methods of Section 701 of the Massachusetts Highway Department Standard Specifications for Highways and Bridges.

- B. Curbing to be reset shall be carefully removed and stored. The Contractor shall replace any edging damaged or lost due to his negligence. The base upon which the edging is to be set shall be compacted to a firm even surface. Joints shall be pointed with mortar and the exposed portion finished with a jointer. Granite curb inlets shall be set in full mortar beds.

END OF SECTION

02575-7

Paving and
Road Construction

SECTION 02910

ESTABLISHMENT OF GROWTH

PART 1 GENERAL

- 1.01 SCOPE OF WORK
- 1.02 RELATED WORK SPECIFIED ELSEWHERE

PART 2 MATERIALS

- 2.01 LOAM BORROW
- 2.02 TOPSOIL
- 2.03 LIMESTONE
- 2.04 FERTILIZER
- 2.05 GRASS SEED
- 2.06 TREE PAINT
- 2.07 GENERAL PLANTING AND NURSERY STOCK

PART3 EXECUTION OF WORK

- 3.01 PLACING LOAM OF TOPSOIL
- 3.02 TOPSOIL REHANDLED AND SPREAD
- 3.03 PREPARATION OF AREAS ON WHICH LOAM OR TOPSOIL ARE TO BE PLACED
- 3.04 SURFACE DRAINAGE AND SEASONAL LIMITS
- 3.05 ROUGH FINISHED GRADE
- 3.06 APPLICATION OF LIMESTONE
- 3.07 APPLICATION OF FERTILIZER FOR GRASS
- 3.08 SEEDING GRASS
- 3.09 SEEDING GRASS BY SPRAY MACHINE
- 3.10 CARE DURING CONSTRUCTION
- 3.11 REFERTILIZATION AND APPLICATION OF FERTILIZER
- 3.12 PREPARATION FOR MULCHING
- 3.13 PLACING MULCH

PART 1 GENERAL

- 1.01 SCOPE OF WORK
 - A. The Contractor shall furnish all labor, materials, and equipment necessary to do all loaming and seeding and planting, as indicated on the Contract Drawings and as herein specified.
- 1.02 RELATED WORK SPECIFIED ELSEWHERE
 - A. SECTION 01300 – SUBMITTALS
 - B. DIVISION 2 – SITE WORK

PART 2 MATERIALS

2.01 LOAM BORROW

- A. Loam borrow shall consist of a fertile, friable, natural topsoil typical of the locality, without admixture of subsoil, refuse or other foreign materials, and shall be obtained from a well-drained site. It shall be such a mixture of sand, silt and clay particles as to exhibit sandy and clayey properties in and about equal proportions. It shall be reasonably free of stumps, roots, heavy or stiff clay, stones larger than 1 inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other litter.
- B. Prior to stripping, the loam shall have demonstrated by the occurrence upon it of healthy crops, grass or other vegetative growth that it is reasonably well drained and that it does not contain toxic amounts of either acid or alkaline elements.

2.02 TOPSOIL

- A. Topsoil shall consist of fertile, friable, natural topsoil, reasonably free of stumps, roots, stiff clay, stones larger than 1" diameter, noxious weeds, sticks, brush or other litter.
- B. Prior to stripping the topsoil from the construction project, it shall have demonstrated by the occurrence upon it of healthy crops, grass or other vegetative growth, that it is reasonably well drained and capable of supporting plant growth. Material classified as topsoil can only be obtained within the project limits.

2.03 LIMESTONE

- A. Limestone shall consist of pulverized limestone obtained by grinding either calcareous or dolomitic limestone so that 95% of the material will pass a no. 20 sieve and at least 50 % of the material will pass a No. 100 sieve. The limestone shall have a neutralizing value satisfactory to the Engineer.

2.04 FERTILIZER

- A. Fertilizer shall be complete starter fertilizer, at least 70 percent of the nitrogen of which is derived from natural organic sources of ureaform. It shall contain the following percentages by weight:

Nitrogen 15%	Phosphorous 15%	Potash 15%
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Fertilizer shall be delivered mixed as specified above, in standard size, unopened containers showing weight, analysis, and names of manufacturers. They shall be stored in a weatherproof storage place in such a manner that the fertilizer will be kept dry and its effectiveness shall not be impaired. Fertilizer shall be applied at a rate of 800 pounds per acre.

2.05 GRASS SEED

- A. Grass seed shall be of the previous year's crop and in no case shall the weed seed content exceed 1 percent by weight. The grass seed shall conform to the requirements of the following tables:

	<u>Proportion</u>	<u>Germination Minimum</u>	<u>Purity Minimum</u>
-Baron Kentucky Bluegrass	50%	85	98
-Creeping Red Fescue	20%	85	98
-Yorktown Rye	15%	90	98
-Jamestown Fescue	15%	90	98

- B. The mix shall be Loft Seed Company – Turf Supreme or approved equal.

2.06 TREE PAINT

- A. The paint furnished under this specification shall be suitable for application by brushing on sawed, cut or bruised surfaces of living trees, for the purpose of disinfection and protection of these surfaces.

- B. The new materials from which this paint is manufactured shall be as follows:

- 1) Asphalt: Shall conform to the requirements of AASHTO-M 18, Grade A.
- 2) Creosote: Shall be a distillate of coal-gas tar or coke-oven tar.
- 3) Fibrous magnesium silicate pigment: not less than 97% passing through #325 screen.

Composition:

Asphalt	40-70%
Creosote	20-30%
Fibrous Magnesium Silicate	10-15%
Volatile Thinner	0-15%

- C. The proportions of the various ingredients shall be chosen within the above limits to yield a paint of medium brushing consistency.

2.07 GENERAL PLANTING AND NURSERY STOCK

- A. Materials to be used in this work shall conform to "The American Standards of Nursery Stock" as sponsored by the American Association of Nurserymen, Inc. These standards shall determine all requirements of acceptable shrub and seeding nursery stock.
- B. All plants shall be packed so as to arrive at the delivery point in good growing conditions.
- C. Delivery of plants and seedlings shall be made to site, only according to the Contractor's ability to handle and properly care for them.
- D. All nursery stock shall be grown at nurseries in the northern area of the United States.
- E. All nursery stock shall conform to the "American Standards for Nursery Stock" as sponsored by the American Association of Nurserymen, Inc., U.S. Patent Office A60.1-1969.
- F. All plants shall be fully representative of their normal species or varieties unless otherwise specified. All plants must have a good, healthy, well-formed upper growth; a fibrous compact root system; and must be free from disease, injurious insects, mechanical wounds either fresh or healed, broken branches, decay or any other defect; and shall be legible tagged with their proper names.
- G. All plant materials shall be dug with reasonable care and skill immediately previous to shipment. Special precautions shall be taken to avoid any unnecessary injury to or removal of fibrous roots. Each species or variety shall be handled and packed in the approved manner for that particular plant, having regard to the soil and climactic condition at the time and place of digging, transit and delivery, and to the time that will be consumed in transit. All precautions that are customary in good trade practice shall be taken to insure the arrival of the plants at the site of the project in good condition for successful growth.
- H. The roots of bare rooted material shall be carefully protected with wet straw, moss or other suitable material which will insure the arrival of the plants at the site of the work in good condition.
- I. The sizes of these trees shall be as called for on the plans and measurements shall be made by calipering at a point 12 inches above the collar.
- J. Non-flowering trees shall have been transplanted 3 times, the last transplanting within 2 years. With the exception of *Ulmus Americana*, they shall have a single straight leader not cut back. They shall have symmetrical development of strong, healthy branches beginning 5 feet to 6 feet from the ground; and below this point, the trunk shall be clean for street trees, although park trees will be permitted to branch lower.

- K. Flowering trees shall have been transplanted twice, the last transplanting within 2 years. The trunk shall be clean and straight up to the first branch, which shall be about 4 feet from the ground where directed. Flowering trees shall be balled and burlapped and kept moist for delivery.
- L. Deciduous shrubs shall be fully representative of their species and variety. They shall have been transplanted twice; the last transplanting within 2 years. They shall have 4 to 6 branches coming from the roots, and shall have a well-branched root system and shall be a good weight for the height specified.
- M. Evergreen shrubs shall have been transplanted 3 times, the last transplanting within 2 years. They shall have a good colored top growth and shall be balled and burlapped and kept moist for delivery. Pyramidal type evergreen trees shall have a spread equal to $\frac{3}{4}$ of their height.
- N. Evergreen shrubs shall have been transplanted twice and shall be of the size indicated on the plans and, except where noted, each clump shall have not less than 4 stems. Plants shall be balled and burlapped and kept moist for delivery.

PART 3 **EXECUTION OF WORK**

3.01 **PLACING LOAM OR TOPSOIL**

- A. The loam or the topsoil obtained from stacked piles shall be hauled, deposited and spread to the directed depths on the areas shown on the plans or designated by the Engineer. The loam or topsoil shall be spread to a depth of not less than 4 in. All grass and weed growth on the areas designated to be loamed, shall be cut to a maximum height of 2 inches before the loam is placed thereon. After the loam or topsoil has been spread, it shall be carefully prepared by spading or harrowing, and lumps, large stones, brush, roots, stumps, litter and other foreign material shall be removed from the loamed, topsoil or processed planting materials areas and disposed satisfactorily.
- B. The compaction shall be equivalent to that produced by a hand roller weighing from 75 to 100 pounds per foot of width. The compaction may be obtained by rolling, dragging or any method that produces satisfactory results. All depressions caused by settlement or rolling shall be filled with additional materials and the surfaces shall be regraded and rolled until it presents a reasonably smooth and even finish and is up to the required grade.
- C. During hauling operations, the roadway surface shall be kept clean and any loam or other dirt which may be brought upon the surface shall be removed promptly and thoroughly before it becomes compacted by traffic. If necessary, the wheels of all vehicles used for hauling shall be cleaned frequently and kept clean to avoid bringing any dirt upon the surface. The Contractor shall take all reasonable precautions to avoid injury to existing or planted growth.

3.02 TOPSOIL REHANDLED AND SPREAD

- A. Topsoil which is obtained on the site, from piles of topsoil previously excavated and stacked and designated as topsoil to be re-handled and spread, shall be used as required, and as directed by the Engineer, on areas to be seeded. The topsoil must be approved before it is spread and the Contractor will be required, without compensation, to take corrective action as directed, in order to make the topsoil suitable for its intended use.
- B. The Contractor is required to adjust the acidity by the addition of limestone as determined by testing as required and to apply the fertilizer as required.

3.03 PREPARATION OF AREAS ON WHICH LOAM OR TOPSOIL ARE TO BE PLACED

- A. The area upon which the above materials are to be placed shall be raked, harrowed or dragged to form a reasonably smooth surface, all stones larger than 2 inches, undesirable growth over 2 inches and debris shall be removed from the area and disposed of by the Contractor outside the location.
- B. When directed by the Engineer, additional suitable material shall be spread as required to repair gullies or depressions. The labor, equipment and materials necessary to place, compact and grade the additional material shall be paid for under the respective item from which the material is obtained.
- C. The Contractor shall not proceed with the work of seeding until permission of the Engineer has been obtained.
- D. Before the application of limestone, fertilizer and seed, the Contractor shall harrow or roto-till to a depth of 3 inches, when directed, all areas where loam or topsoil has been placed under a previous contract. When loam borrow is placed, or topsoil is re-handled and spread; and they are paid for under the respective items of a contract, they will not require harrowing or rototilling.
- E. The Contractor shall remove all debris and stones having any dimensions greater than 2 inches before the application of limestone, fertilizer and seed.

3.04 SURFACE DRAINAGE AND SEASONAL LIMITS

- A. The Contractor shall provide and maintain uniform grades, slopes, crowns and ditches on all excavations and fills to insure satisfactory drainage at all times during the construction period.
- B. The Contractor shall be responsible for protecting adjacent properties, completed work and work in progress from siltation and mud. Finished grades and surfaces for all work under this heading shall shed water to catch basins as per drawings.

- C. No fill material or topsoil shall be placed, spread or rolled during unfavorable weather conditions such as interruption by heavy rains. Fill operations shall not be resumed until approved by the Engineer.

3.05 ROUGH FINISHED GRADE

- A. Grading shall be accomplished as necessary to bring topsoil and sand surfaces to grades shown on the drawings or to prepare the subgrade to receive paving or construction as specified or shown on drawings.
- B. After completion of pavements and structures, surfaces of earth mounds and planting areas shall be rough finished graded and shaped by blading, dragging or other means. Surfaces shall be uniform and smooth, true to slopes and grades. Soils in plating areas shall be graded level with the edge of headerboards, pavement or walks. Particular attention shall be given to surface drainage around sump catch basins.
- C. The rough finished surface of the grading plane at any point shall not vary more than 0.10 feet above or below the grade indicated on the drawings.
- D. Upon completion of earthwork, the Contractor shall remove all surplus construction materials, earth and debris resulting from his work so that the entire job site is left in a neat and orderly condition.

3.06 APPLICATION OF LIMESTONE

- A. Limestone may be applied in dry form or hydraulically. Limestone where necessary shall be spread and thoroughly incorporated in the layer of loam or topsoil to adjust the acidity of the loam or topsoil. The rate of application of the limestone will vary up to a maximum of 1 pound per square yard depending on the results of laboratory tests performed by an independent professional testing laboratory acceptable to the Engineer, at the Contractor's own expense. The limestone shall be thoroughly incorporated into the layer of loam or topsoil and the upper 1-inch of the underlying subsoil by harrowing or other methods satisfactory to the Engineer so as to provide a layer of thoroughly mixed material for the seedbed.

3.07 APPLICATION OF FERTILIZER FOR GRASS

- A. Fertilizer may be applied in dry form or hydraulically. After the application in dry form or hydraulically and after the application of limestone, if found necessary, on the seed bed, starter fertilizer shall be spread on the top layer of loam or topsoil at the rate of 800 pounds per acre and worked into the seed bed. The full depth of loam or topsoil shall then be spaded or harrowed and graded to the required cross-section.

3.08 SEEDING GRASS

- A. After the loamed or topsoil areas have been prepared and treated as before described, grass seed conforming to the respective formulas before specified shall be carefully sown thereon at the rate of approximately 175 pounds per acre. Seeding shall be done in two directions at right angles to each other. Seeding on level areas and on slopes up to and including 4:1 slopes shall be done by means of an approved seeder that will seed and roll in one operation. On shoulders and other narrow areas, the seeding may be done longitudinally in one application.

3.09 SEEDING GRASS BY SPRAY MACHINE

- A. The spray machine will be restricted for use only on slopes steeper than 4:1. The application of limestone as necessary, fertilizer and grass seed may be accomplished in one operation by the use of limestone as necessary, fertilizer and grass seed may be accomplished in one operation by the use of an approved spraying machine. The materials shall be mixed with water in the machine and kept in an agitated state in order that the materials may be uniformly suspended in the water. The spraying equipment shall be so designed that when the solution is sprayed over an area the resulting deposits of limestone, fertilizer and grass seed shall be equal in quantity to those quantities specified before.
- B. A certified statement shall be furnished, prior to start of work, to the Engineer by the Contractor as to the number of pounds of limestone, fertilizer, and grass seed, per 100 gal. of water.
- C. This statement should also specify the number of square yards of seeding that can be covered with the solution specified above. If the results of the spray operation are unsatisfactory, the Contractor will be required to abandon this method and to apply the limestone, fertilizer and seed as before specified.

3.10 CARE DURING CONSTRUCTION

- A. The Contractor shall be responsible for the watering of all seeded and grassed areas which shall be kept moist. The Engineer's decision will prevail in the event a dispute develops with the Contractor as to whether or not the seeded and grassed areas are moist. Seeded areas on which growth has started shall be watered to a minimum depth of 2 inches to assure continuing growth. Watering shall be done in a manner which will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment to apply one complete coverage to the seeded areas in an 8 hour period.
- B. If necessary, suitable signs and barricades of brush or other materials shall be placed to protect the seeded areas. After the grass has appeared, all areas and parts of areas which fail to show a uniform stand of grass, for any reason whatsoever, shall be reseeded and such areas and parts of areas shall be seeded repeatedly until all areas are covered with a satisfactory growth of grass.

- C. The Contractor shall care for all of the seeded areas until the work has been physically accepted, without compensation in addition to the amount regularly to be paid under this item as hereinafter provided. Care shall include all regrading, refertilizing, reseeding and mowing which may be necessary.
- D. Prior to the acceptance of the project the Contractor will be responsible for mowing the grass when necessary on all flat or rolling slopes from level to and including 4 to 1 slopes to a height of 3 inches when the grass has attained a height of eight inches. The grass on all slopes steeper than 4 to 1 shall be cut when necessary to a height of 3 inches at such a time as a stable turf has been established in the Engineer's judgement.

3.11 REFERTILIZATION AND APPLICATION OF FERTILIZER

- A. This work shall be done in April, May, August or September. No permission will be granted to re-fertilize in months other than herein prescribed. Areas recently seeded shall be re-fertilized only after one season of growth of two months duration.
- B. The fertilizer shall have a composition of 10-10-10 and be applied at a rate of 500 pounds per acre. In addition, organic fertilizer derived from any commercial source shall be applied at the rate of 135 pounds of N per acre. Seed as before specified shall be included with the fertilizer at a rate of 10 pounds per acre.

3.12 PREPARATION FOR MULCHING

- A. The areas upon which mulch is to be spread shall be prepared by raking, harrowing or dragging to form a reasonably smooth surface. All stones larger than 2", undesirable growth over 2' in height and all debris shall be removed from the area and disposed by the Contractor in a satisfactory manner. The disposal area shall be outside the location limits of the project, when required by the Engineer and shall be responsibility of the Contractor.
- B. When required by the Engineer, the Contractor shall spread, compact and grade additional acceptable material to repair gullies or depressions. Such additional material shall be obtained from suitable excavation or furnished by the Contractor.

3.13 PLACING MULCH

- A. Hay mulch shall be loosely spread to a uniform depth over all areas designated on the plans, at the rate of 4 ½ tons per acre. Hay mulch may be applied by mechanical apparatus, if in the judgement of the Engineer the apparatus spreads the mulch uniformly and forms a suitable mat to control slope erosion. The apparatus shall be

capable of spreading at least 80% of the hay or straw in lengths of 6" or more, otherwise it shall be spread by hand.

- B. Wood chip mulch and aged pine bark mulch shall be loosely spread to uniform depth over all acres designated on the plans, at the rate of 390 cubic yards per acre (approximately 3" in depth), or as otherwise directed.
- C. Wood chip mulch and aged pine bark mulch may be applied by mechanical means, except that if the equipment breaks the mulch into small pieces or changes its desired texture, as determined by the Engineer, it shall be spread by hand.

END OF SECTION

02910-10

Establishment
of Growth

SECTION 02995

MISCELLANEOUS WORK

PART 1 GENERAL

- 1.01 SCOPE OF WORK
- 1.02 RELATED WORK SPECIFIED ELSEWHERE

PART 2 MATERIALS

- 2.01 GENERAL

PART 3 EXECUTION OF WORK

- 3.01 INCIDENTAL WORK
- 3.02 RESTORATION OF CROSS COUNTRY AREAS
- 3.03 PRECAUTIONS UNDER ELECTRIC LINES
- 3.04 PUBLIC SAFETY

PART 1 GENERAL

- 1.01 SCOPE OF WORK

- A. The Contractor shall furnish all labor, materials, equipment, and incidentals necessary to complete the miscellaneous work under this Section and as noted on the contract drawings.
- B. When applicable, the Contractor shall perform the work in accordance with other sections of this Specification. When no applicable Specification exists, the Contractor shall perform the work in accordance with the best modern practice and/or as directed by the Engineer.
- C. The work of this Section includes, but is not limited to, any incidental work not specifically identified elsewhere.

- 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. DIVISION 1 THROUGH 16 - As Appropriate

PART 2 MATERIALS

- 2.01 GENERAL

- A. The Contractor shall furnish all materials necessary to remove, replace, and restore the site or structures sufficiently and to the satisfaction of the Engineer.

- B. The materials provided by the Contractor shall meet all requirements as specified herein, of the applicable specification, or to the satisfaction of the Engineer.
- C. All material not furnished, in the opinion of the Engineer, in accordance with the Contract Drawings and Specifications shall be removed immediately. Suitable material, which is satisfactory, shall be furnished at no additional compensation to the Contractor.

PART 3 EXECUTION OF WORK

3.01 INCIDENTAL WORK

- A. The Contractor shall do all incidental work including all work listed under the miscellaneous work item 7B in section 01025 of the contract documents and not otherwise specified, but obviously necessary to the proper completion of the Contract as specified on the Contract Drawings.

3.02 RESTORATION OF CROSS COUNTRY AREAS

- A. The Contractor shall furnish all labor, materials, and equipment to restore all areas disturbed by his operations. The ground surface shall be loamed and seeded as specified in related sections. It shall be maintained as required until the site has been restored to the original condition.

3.03 PRECAUTIONS UNDER ELECTRIC LINES

- A. The bidders' attention is directed to the AASHTO Guide on Occupational Safety and the section on Highway Construction Projects, Subpart N, 1926.550 relating to construction equipment clearances at overhead electric lines. This guide states, "...the minimum clearance between the lines and any part of the crane or load must be at least 10 feet from lines rated 50 kV or below, and greater distances for higher voltage..."
- B. For the protection of personnel and equipment, the Contractor should be aware of this regulation especially during paving operations using large semi-trailer vehicles.

3.04 PUBLIC SAFETY

- A. The Contractor shall furnish all labor, materials, tools, and equipment to provide public safety to vehicular and pedestrian traffic in the vicinity of the construction work. This includes all signs, barriers, warning lights, and any other controls deemed necessary by the Engineer.

END OF SECTION

02995-2

DIVISION 3

SECTION 03300

CAST-IN-PLACE CONCRETE - SIDEWALKS

PART 1 GENERAL

- 1.01 SCOPE OF WORK
- 1.02 RELATED WORK SPECIFIED ELSEWHERE

PART 2 MATERIALS

- 2.01 CEMENT
- 2.02 COARSE AGGREGATE
- 2.03 FINE AGGREGATE
- 2.04 WATER
- 2.05 ADMIXTURES
- 2.06 DESIGN
- 2.07 READY-MIX CONCRETE
- 2.08 INSERTS AND APPURTENANCES
- 2.09 REINFORCEMENT
- 2.10 FORMS
- 2.11 TIE RODS
- 2.12 FORM OIL
- 2.13 JOINT FILLER

PART 3 EXECUTION OF WORK

- 3.01 REINFORCEMENT
- 3.02 FORMS
- 3.03 PLACING CONCRETE
- 3.04 INSERTS AND APPURTENANCES
- 3.05 JOINTS
- 3.06 FINISHING CONCRETE
- 3.07 CURING
- 3.08 TESTS
- 3.09 EXPANSION AND CONSTRUCTION JOINTS

PART 1 GENERAL

- 1.01 SCOPE OF WORK
 - A. The Contractor shall perform all concrete work, including installation of all embedded items as shown on the construction drawings. This requires the furnishing of all labor, equipment, materials, and services necessary for completion.
- 1.02 RELATED WORK SPECIFIED ELSEWHERE
 - A. SECTION 01300 – SUBMITTALS
 - B. SECTION 02224 – FILL AND BACKFILL MATERIALS

03300-1

PART 2 MATERIALS

2.01 CEMENT

- A. Cement shall be an approved brand of domestic Portland cement Type II conforming to "Specification for Portland Cement" (ASTM C150), except where otherwise specified on the plans. Type III shall be used only where specifically designated on the plans or by the Engineer.

2.02 COARSE AGGREGATE

- A. Coarse aggregate shall be hard, washed gravel or crushed stone conforming to "Specification for Concrete Aggregates" (ASTM C33). Use the largest size of aggregate which satisfies the requirements that it shall be no larger than one-fifth of the narrowest dimension between sides of forms of the member, nor larger than $\frac{3}{4}$ of the minimum clear space between reinforcing bars and forms. Upon request from the Engineer, the Contractor shall furnish for approval a standard sample of one cubic foot of coarse aggregate.

2.03 FINE AGGREGATE

- A. Fine aggregate shall be well graded, natural, washed sand conforming to "Specification for Concrete Aggregates" (ASTM C33). Upon request from the Engineer, the Contractor shall furnish for approval a standard sample of one cubic foot of fine aggregate.

2.04 WATER

- A. Water shall be clean, fresh water, suitable for drinking and free from deleterious amounts of acids, alkalis, or organic materials.

2.05 ADMIXTURES

- A. Admixtures shall conform to "Specifications for Air-Entraining Admixtures for Concrete (ASTM C260). No other types of admixtures are allowed unless permission is granted by the Engineer.

2.06 DESIGN

- A. All concrete work shall conform to the "Building Code Requirements for Reinforced Concrete" (ACI 318).
- B. Quality and Proportion Requirements: The Contractor shall design the concrete mix in accordance with these specifications and the "Recommended Practice for Selecting Proportions for Concrete" (ACI 618), and shall submit the design and trial batch test results of the proposed mix design from a laboratory approved by ASTM or ACI to the Engineer for approval prior to construction. Test shall include strength, slump, percent air, weight per cubic foot, and yield.

	<u>Class A</u>	<u>Class B</u>
Minimum Cement Content 94 lb. sacks/cubic yd.	6 ½	5 ½
Maximum Water Cement Ratio (gal/sack)	5 ½	6 ½
Minimum Strength-28 day Cylinder, psi	4,000	3,000

Air Entrainment:

Air Content ± 1% (by vol.)	Maximum Agg. Size
6%	¾ - 1"
5%	1 ½ - 2"
4%	3"

- C. Slumps as defined and determined by "Test for Slump of Portland Cement Concrete" (ASTM C143) shall not exceed 4 inches.

2.07 READY-MIX CONCRETE

- A. The ready-mixed concrete manufacturer is to be approved by the Engineer. The concrete delivered to the job site must conform to "Specifications for Ready-Mixed Concrete" (ASTM C94). The Engineer shall have free access at all times to the batching and mixing plant for sampling of all materials and inspection of work performed for this project.
- B. Delivery of concrete to the site of the work shall be completed within ½ hour after the introduction of the mixing water to the cement and aggregates, or the cement to the aggregate, unless otherwise authorized by the Engineer.

2.08 INSERTS AND APPURTENANCES

- A. No items made of aluminum are allowed in the concrete, unless coated with a heavy coat of bitumastic paint approved by the Engineer.
- B. Flexible water stops shall be of the center bulb type complying with Corps of Engineers CRD-C582 for PVC units. Web thickness shall be not less than 3/8 inch. Width shall be at least 6 inches.

2.09 REINFORCEMENT

- A. Concrete reinforcement in sizes No. 3 (3/8 in.) and larger shall be deformed steel bars of the shapes and sizes indicated on the drawings. The steel shall be newly rolled stock,

substantially free from mill scale, rust, dirt, grease, or other foreign matter. Bars shall be billet steel of intermediate grade conforming to ASTM Specifications for Billet-Steel Bars for Concrete Reinforcement, Designation A615.

- B. Wire mesh shall be electrically welded wire fabric conforming to ASTM Specification A185 and shall be at the size and spacing indicated on the drawings.
- C. Deformations on bars for concrete reinforcement shall conform to the ASTM Specifications for Minimum Requirements for the Deformations of Deformed Billet Steel Bars for Concrete Reinforcement, Designation A615.

2.10 FORMS

- A. Plywood for formwork shall comply with U.S. Products Standard, PS-1, and "B-B (Concrete Form) Plywood, Class 1, Exterior Grade or better and shall be mill-oiled and edge sealed. Each piece shall bear the legible trademark of an approved inspection agency.
- B. Plywood forms to be re-used shall be maintained clean and in good condition as to accuracy, shape, strength, rigidity, tightness, and smoothness of surface. Forms shall be cleaned and checked between each use. Any lumber which is split, warped, bulged, marred, or has defects that will produce work inferior to that resulting from using new material shall not be used.
- C. Prefabricated plastic, metal, or plywood form panels shall be used where required to form a smooth surface, and shall be as approved by the Engineer.

2.11 TIE RODS

- A. Tie rods or other means for holding forms shall be of a type acceptable to the Engineer. They shall be of such type as to leave no metal closer than two inches from the surface.

2.12 FORM OIL

- A. Forms shall be oiled with an approved non-bonding, non-staining oil or liquid form coating before reinforcement is placed.

2.13 JOINT FILLER

- A. Poured joint compound shall be bituminous rubber joint compound equal to Para-Plastic waterproof seal made by Servicized Products Corp., Chicago, Illinois; Carey Co., Inc., Cincinnati, Ohio, or equal. The compound shall be applied in accordance with the instructions of the manufacturer, using a suitable primer if necessary.
- B. Pre-molded mastic joint filler shall be of the thickness indicated on the drawings, shall be of suitable length and width, and shall conform to ASTM Specification D-544. As far as practicable, sheets shall be of correct width so that no longitudinal cutting will be

required in the field. When strips are cut in the field, the cut surface shall be heavily coated with hot asphalt or shall be treated as recommended by the manufacturer.

- C. Bituminous coating shall be equal to Inertol Plastic (Black) made by the Inertol Div., Koppers Company, Carbomastic made by Carboline Corp., or approved equal.
- D. Water-stops for construction and expansion joints shall be 6 inch rubber or plastic water stops of the flat dumbbell or corrugated type with a minimum web thickness of 3/8 inch.
- E. Rubber water-stops shall have the following physical characteristics:

Tensile strength, min. psi	3,000
Elongation at break, min. %	450
Specific gravity	1.15 ± 0.30
- F. Polyvinylchloride water-stops shall be of the types and sizes indicated on the drawings and shall conform to the Corps of Engineers Specification for Polyvinyl-chloride Water stops, Designation CRD-C572-66.

PART 3 EXECUTION OF WORK

3.01 REINFORCEMENT

- A. Reinforcement shall be accurately formed to the dimensions indicated on the drawings. Stirrups and tie bars shall be bent around a pin having a diameter not less than six times the minimum thickness, except for bars larger than 1 inch in which case the bends shall be made around a pin of 8 bar diameters. All bars shall be bent cold.
- B. Bars shall be shipped to the work site with bars of the same size and shape fastened in bundles with securely wired-on metal identification tags giving size and mark.
- C. Before being placed in position, reinforcement shall be thoroughly cleaned of loose mill and rust scale, dirt and other coatings, including ice, that reduce or destroy bond. Where there is delay in depositing concrete after reinforcement is in place, bars shall be re-inspected and cleaned when necessary.
- D. Reinforcement shall be accurately positioned as indicated on the drawings, and secured against displacement by using annealed iron wire ties or suitable clips at intersections. Reinforcement shall be supported by concrete or metal supports, spacers, or hangers; wood blocks, stones, brick chips, etc., shall not be used.
- E. Reinforcement which is to be exposed for a considerable length of time after having been placed shall be painted with a heavy coat of cement if required by the Engineer.

3.02 FORMS

- A. Forms shall be accurately constructed in accordance with “Recommended Practice for Concrete Formwork” (ACI 347). They shall be substantial, tight, unyielding, and so maintained that the finished work which they confine will be as required by the plans and as specified. Wood forms shall be thoroughly wetted prior to placement so as to avoid absorption of water from the concrete mix.
- B. Forms shall not be disturbed until the concrete has adequately hardened. Shoring shall not be removed until the supported member has acquired sufficient strength to support its weight and the load upon it. Members subject to construction loads shall be adequately shored to support both the members and the construction loads in such a manner as will protect the members from damage. Removal of forms shall be accomplished in such a manner that will prevent injury to the concrete.
- C. Formwork may be removed after 72 hours, provided the concrete will not be injured. In no case shall supporting forms or shoring be removed until members have acquired sufficient strength to support their weight and imposed loads safely. When, in the opinion of the Engineer, conditions of the work or weather justify, forms may be required to remain in place for longer periods.

3.03 PLACING CONCRETE

- A. The Contractor shall notify the Engineer at least 24 hours prior to placement of any concrete.
- B. Concrete shall be handled from the mixer to the place of final deposit in a continuous manner that will prevent separation or loss of material, and as rapidly as practicable until the unit of operation is complete. Concrete which has reached an initial set or has contained water for more than one hour shall not be deposited in the work.
- C. Depositing of concrete shall be made as close as practicable to the final position so as to prevent segregation due to re-handling. Concrete shall be compacted immediately after placing by thoroughly agitating the mass in a manner which will force out all air pockets and work the mixture into the corners, around reinforcement and inserts, and prevent the formation of voids. Vibrators shall not be used for the purpose of moving concrete horizontally. Concrete trucks will not be permitted on existing foundations. No concrete shall be deposited in or under water without permission of the Engineer.
- D. Fresh concrete shall not be placed on concrete which has hardened sufficiently to cause formation of cold joints or planes of weakness within the section. If a section cannot be placed continuously, construction joints shall be located at points as provided for on the drawings or as approved by the Engineer. When work is resumed, concrete previously placed shall be thoroughly cleaned of foreign materials and laitance, using a stiff wire brush or other tools, and a stream of water if necessary, and then slushed with grout consisting of 1 part Portland cement and 2 parts sand.

- E. Free drop of concrete for more than 5 feet will not be allowed. Where greater drops are required, a tremie shall be employed. Discharge of the tremie shall be controlled such that the concrete may not be effectively less than 12" in thickness with a minimum of lateral movement.
- F. Hot weather placement of concrete shall be in strict accordance with "Recommended Practice for Hot Weather Concreting" (ACI 605). Sub grades shall be kept moist in hot weather to prevent extraction of water from the concrete.
- G. Cold weather placement of concrete shall be in strict accordance with "Recommended Practice for Cold Weather Concreting" (ACI 306).

3.04 INSERTS AND APPURTENANCES

- A. All necessary curb boxes, hydrants, sign supports, inserts, and other appurtenances shall be set and adjusted in the forms accurately, true, plumb, and in a manner to prevent dislocation during concrete placement.

3.05 JOINTS

- A. Expansion and contraction control joints shall be as indicated on the drawings. Construction joints shall be keyed as shown in the drawings and placed as indicated therein or by the Engineer.
- B. All construction joints shall be treated with a retardant made by Sida Chemical Corporation, Euclid, Co., or equal, to expose aggregate and joints. Apply the retardant in strict accordance with the manufacturer's directions. Remove all unset mortar by wire brushing or with a water jet within the time limit specified by the manufacturer.
- C. Flexible rubber water-stops shall be installed in all construction joints and expansion joints where indicated. They shall be supported during concrete placement so as to maintain their proper position.

3.06 FINISHING CONCRETE

- A. The finish of all concrete surfaces shall be made in accordance with Mass Highway Specifications for sidewalk construction or as directed by the Engineer. The Engineer shall be the sole judge of acceptability of all such concrete finish work.

3.07 CURING

- A. Concrete shall be maintained in a continuously moist condition for at least seven (7) days following placement. Fresh concrete shall be protected from heavy rains, flowing water, freezing temperatures, and mechanical injury. All exposed surfaces of finished or unfinished work shall be kept constantly moist by sprinkling with clean water at short intervals (unless otherwise directed during cold weather) or by covering with moistened burlap, or by such other means as may be approved.

- B. Where wood forms are kept in place, these too shall be kept wet during the period of curing. The Contractor shall not permit walking upon or over the concrete until it has set for a sufficient length of time. The Contractor shall protect steel reinforcement, and protect the concrete from disturbances until the concrete has been satisfactorily cured.

3.08 TESTS

- A. When required by the Engineer, compression tests shall be made of cylinders cast from sample batches of each concrete mix design that the Engineer considers acceptable for approval. Results of these tests will determine criteria for judging the quality of concrete placed during construction. Three test cylinders will be required from each sample batch.
- B. As work progresses, concrete shall be sampled in accordance with "Sampling Fresh Concrete" (ASTM C172). Slump tests shall be made according to "Test for Slump of Portland Cement Concrete" (ASTM C143). Air content of concrete shall be tested according to "Test for Air Content of Freshly Mixed Concrete by the Pressure Method" (ASTM C231).
- C. Compression test specimens shall be made in the presence of the Engineer's representative and cured according to "Making and Curing Concrete Compression and Flexure Test Specimens in the Field" (ASTM C31).
- D. There shall be at least one set of three cylinders made for each type of concrete placed in one day. Additional cylinders shall be made and tested when deemed necessary by the Engineer. Tests shall be in accordance with "Test for Compressive Strength of Molded Concrete Cylinders" (ASTM C39).

3.09 EXPANSION AND CONSTRUCTION JOINTS

- A. Construction and expansion joints shall be of the types indicated on the drawings and shall be constructed wherever and only in such places as are indicated on the drawings or otherwise directed or approved. The Contractor shall plan the work to minimize the use of joints in addition to those indicated.
- B. Slabs shall have no horizontal joints, unless otherwise indicated. All construction joints shall have keyways the widths of which are equal to one-third the thickness of the member in which the keyways are placed.
- C. Concrete to be sealed with poured joint compound shall be clean and dry and, if required, shall be primed. The compound shall be carefully poured to prevent spilling the material over the adjoining surfaces. As the material cools and subsides, additional compound shall be poured until the joint is filled to the required level. Surfaces to which bituminous coating is to be applied shall be prepared and primed, and the coating material shall be applied in accordance with the instructions of the manufacturer.

- D. Mastic sheets shall be placed against the bulkhead form and lightly fastened with brads to the inside to hold the sheets in place when the concrete is poured. Ten penny galvanized nails shall be driven through the sheets with points projecting into the concrete placed against them. Care shall be taken at all times to prevent any disturbance of or damage to mastic sheets or rubber or plastic water-stops.

END OF SECTION

03300-9

DIVISION 4

SECTION 04200

MASONRY WORK

PART 1 GENERAL

- 1.01 SCOPE OF WORK
- 1.02 RELATED WORK SPECIFIED ELSEWHERE

PART 2 MATERIALS

- 2.01 GENERAL
- 2.02 PORTLAND CEMENT
- 2.03 ADMIXTURES
- 2.04 WATER
- 2.05 AGGREGATE
- 2.06 MORTAR MATERIALS
- 2.07 BRICK

PART 3 EXECUTION OF WORK

- 3.01 MIXING
- 3.02 TRIMMING AND CLEANING

PART 1 GENERAL

- 1.01 SCOPE OF WORK
 - A. The Contractor shall furnish all labor, materials, equipment and incidentals for performing all operations required for the masonry work as indicated on the Contract Drawings, as specified hereinafter, and as evidently necessary to complete the work.
- 1.02 RELATED WORK SPECIFIED ELSEWHERE
 - A. SECTION 01300 – SUBMITTALS
 - B. SECTION 02728 – MODIFICATION AND CONNECTIONS TO EXISTING STRUCTURES
 - C. SECTION 03300 – CAST-IN-PLACE CONCRETE
 - D. SECTION 03400 – PRECAST CONCRETE STRUCTURES AND MANHOLES

PART 2 MATERIALS

- 2.01 GENERAL

- A. All concrete shall be site-mixed or ready-mixed as produced by a plant acceptable to the Engineer. Class A and Class B concrete shall be used as indicated by contract drawings or specified herein.

2.02 PORTLAND CEMENT

- A. Portland cement shall be Type II and shall conform to ASTM Standard Specifications for Portland Cement, Designation C150-77.
- B. All cement shall be American made Portland Cement from a reputable manufacturer. Cement shall be supplied from one mill through the construction phase and shall be of uniform color.
- C. Cement shall be free from water-soluble salts or alkalies which may cause efflorescence on exposed surfaces. Cement shall be free from all lumps and from all partially or wholly set cement.
- D. High-early-strength cement may be used only with the permission of the Engineer, but no additional payment will be made to the Contractor for the use thereof. Such cement shall meet all specification of Type III cement.
- E. All cement used by the Contractor shall be subject to testing to determine compliance to specifications. The test methods shall conform to appropriate ASTM methods and specifications; however, the place, time, frequency and method of sampling shall be determined by the Engineer as applicable to site conditions and construction progress.

2.03 ADMIXTURES

- A. Admixtures acceptable to the Engineer shall be added to the concrete as shown by the Contract Drawings or specified herein so as to create air-entrained concrete.
- B. If admixtures are added to the concrete in solution form, the quantity of solution shall be considered in the computation of the water – cement ratio.
- C. Admixtures causing the accelerated setting of cement in concrete shall not be used in any class of concrete.
- D. The use of admixtures to concrete other than concrete exposed to the elements will not be permitted without the written consent of the Engineer.
- E. Combinations of types of cements, admixtures and concrete shall be clean, fresh and free from injurious materials such as oil, acid, alkali, organic matter or deleterious materials. Testing of water shall be in accordance with AASHTO T26.

2.04 WATER

- A. Water use in the mixture of cements, admixtures and concrete shall be clean, fresh and free from injurious materials such as oil, acid, alkali, organic matter or deleterious materials. Testing of water shall be in accordance with AASHTO T26.

Water quality shall be within the following guidelines:

pH	3.0 – 11.7
Total Solids	
Organic	.01 % (Max)
Inorganic	.10 % (Max)
Sulphate	.05 % (Max)

2.05 AGGREGATE

- A. Fine Aggregate –

Fine aggregate for cement mortar shall be well graded and conform to the following sieve analysis:

Sieve Size	% Passing
3/8 "	100
# 4	95 – 100
# 16	55 – 80
# 50	10 – 25
# 100	2 – 8
# 200	0 – 2

- B. Coarse Aggregates

Course Aggregate for cement concrete shall consist of crushed rock or screened gravel and shall be composed essentially of clean, hard, strong and impermeable particles, resistant to wear and frost and free from deleterious amounts of organic matter, loam, clay, salts, mica and soft, thin, elongated, laminated or disintegrated stone, and it shall be inert to water and cement. Coarse aggregate shall consist of well graded gravel and crushed stone conforming to the ASTM Standard Specifications for Concrete Aggregates, Designation C33-77, and then conforming to the following detailed requirements.

NOMINAL SIZE

SIEVE SIZE	1 ½ inches	¾ inches	3/8 inches
1 ½ inch	90 – 100		
¾ inch	35 – 60	90 – 100	
½ inch	--	--	90 – 100
3/8 inch	10 – 25	20 – 50	30 – 70
# 4	0 - 5	0 - 10	0 – 15
# 8		0 - 5	0 - 5

2.06 MORTAR MATERIALS

- A. Portland cement shall conform to all the requirements of ASTM Designation C-150, Type II.
- B. Hydrated lime shall conform to all the requirements of ASTM Designation C-207, Type "S".
- C. Masonry cement shall conform to all the requirements of ASTM Specification C-91, Type II, and with the approval of the Engineer may be used in place of cement and lime mortar. Masonry cement shall be Louisville Cement Company brixment, Lehigh Masonry Cement, or equal. Any lime contained in masonry cement shall be Type "S" only.
- D. Sand shall be clean, hard siliceous, in accordance with ASTM Specification C-144, free from loam, silt or other impurities, composed of grains of varying sizes within the following limits:

PERCENT PASSING

<u>Sieve Size</u>	<u>Natural Sand</u>	<u>Manufactured Sand</u>
No. 4	100	100
No. 8	95 – 100	95 – 100
No. 16	70 – 100	70 – 100
No. 30	40 – 75	40 – 75
No. 50	10 – 35	20 – 40
No. 100	2 – 15	10 – 25
No. 200	--	0 – 10

- E. Mortar specimens made with sand shall have compressive strength at 28 days of not less than 90 percent of the compressive strength of specimens made with Ottawa sand.
- F. Water repellents and other admixtures shall be used only where specified or with written approval of the Engineer. When used, they shall be the product of a manufacturer who can demonstrate successful usage of his product for a period of not

less than 3 years prior to being offered for the work and shall be sued in strict accordance with the printed directions of the manufacturer.

2.07 BRICK

A. Clay brick shall conform to the requirements of AASHO-M91 with the following exceptions:

1. The size of brick furnished shall be 8 inches long by 3 ¾ inches wide by 2 ¼ inches deep.
2. The average absorption of 5 representative samples shall not exceed 15 % and the absorption of any individual sample shall not exceed 17 ½ %.
3. The average compressive strength of 5 representative samples shall not be less than 3000 pounds per square inch and the compressive strength of any individual sample shall not be less than 2500 pounds per square inch.

B. All bricks shall be good, sound, hard and uniformly burned. Under burned or salmon bricks shall not be acceptable. Broken or cracked bricks or bricks which are not regular and uniform in shape and size or otherwise unsatisfactory to the Engineer shall not be accepted. Bricks which are unsatisfactory to the Engineer shall be rejected and immediately removed from the site of the work by the Contractor and replaced with bricks satisfactory to the Engineer all at no additional compensation to the Contractor.

1. Bricks for the channels and shelves shall conform to ASTM C32 Grade specifications for Grade SS, Sewer Brick, except that the mean of five tests for absorption shall not exceed 8 percent and no individual brick exceed 11 percent.
2. Bricks for building up and leveling manhole and catch basin frames shall conform to ASTM C62.

C. The Contractor shall furnish the Engineer with the Manufacturer's Certification that units supplied meet all AASHO and ASTM specifications. Verification by additional testing shall be conducted by the Contractor at no additional cost as deemed necessary by the Engineer.

PART 3 EXECUTION OF WORK

3.01 MIXING

A. Mortar materials shall be measured by weight or by volume and the methods of measurement shall be such that the proportions can be controlled with an error not over 2 percent. One bag of Portland cement weighing not less than 94 pounds shall be considered as one cubic foot. Mortar shall be mixed in a mechanical batch mixer, not less than 3 minutes after all the materials are in the mixer. Hand mixing will be

permitted for small batches provided the quantities of materials and water are accurately controlled and that the method of mixing is approved by the Engineer. Hand mixing for small batches shall be continued until the mortar is completely and uniformly mixed. Mortar shall be used within 30 minutes after it leaves the mixer and no retampering of mortar in which the cement has begun to set will be allowed.

3.02 TRIMMING AND CLEANING

- A. Masonry shall be cleaned with trisodium phosphate and detergent, ½ cup of each to each gallon of water. Before cleaning, all dirt, excess loose mortar shall be scraped or brushed off and masonry saturated on with stiff brushes as required and rinsed off thoroughly with clean water until all mortar, dirt and cleaning solution are removed.
- B. As the cleaning progresses, all joints shall be examined for cracks, holes and imperfect pointing. Defective joints shall be cut out and repaired by tuck pointing.

END OF SECTION

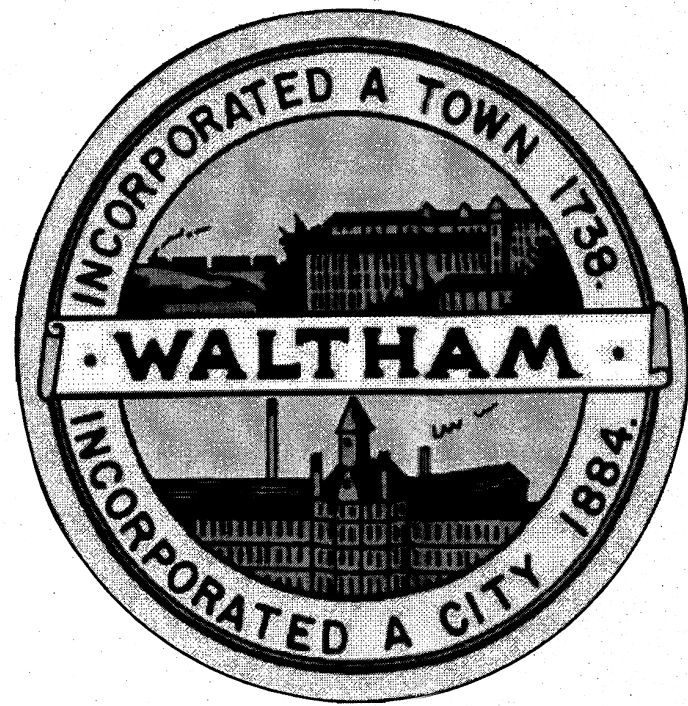
04200-6

Masonry Work

DRAWINGS

PLANS SHOWING
**PROPOSED ROADWAY RECLAMATION OF
 WILLARD STREET**
 IN
CITY OF WALTHAM, MASSACHUSETTS
 OCTOBER 2016

CITY ENGINEER
 STEPHEN A. CASAZZA, PE.



LOCUS PLAN
 SCALE: 1" = 1,000'±

DRAWING INDEX

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	CONSTRUCTION NOTES & LEGEND
3	PLAN AND PROFILE
4	ROADWAY GRADING PLAN
5	INTERSECTION GRADING & DETAILS

Stephen A. Casazza
 11/15/16
 PREPARED BY
 THE CITY OF WALTHAM
 ENGINEERING DEPARTMENT

119 SCHOOL STREET
 WALTHAM, MA 02451

GENERAL NOTES:

1. PLAN INFORMATION IS BASED UPON INFORMATION OBTAINED FROM THE CITY OF WALTHAM'S GIS DATA AND EXISTING RECORD PLANS.
2. ELEVATIONS, IN FEET, ARE ON AN ASSUMED VERTICAL DATUM, AND ARE RELATIVE TO THE BENCHMARK SET AT THE SOUTHERN END OF THE PROJECT AREA, TBM-1 ELEV. = 100.00'.
3. BUILDING LOCATIONS, AS SHOWN, ARE APPROXIMATE AND FOR REFERENCE PURPOSES ONLY.
4. PRIOR TO THE PROPOSED CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE THE ENGINEER AND CITY WITH A CONSTRUCTION SCHEDULE DELINEATING THE SEQUENCE OF WORK AND ESTIMATED TIME OF COMPLETION FOR EACH SEGMENT OF WORK.
5. THE CONTRACTOR SHALL SUBMIT A TRAFFIC MANAGEMENT PLAN TO THE CITY FOR REVIEW AND APPROVAL. THE PLAN SHALL BE IN COMPLIANCE WITH MASSACHUSETTS DEPARTMENT OF TRANSPORTATION (MASSDOT) AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
6. THE CONTRACTOR SHALL MAINTAIN CONTINUOUS TRAFFIC FLOW DURING CONSTRUCTION SATISFACTORILY TO THE THE ENGINEER AND THE CITY OF WALTHAM.
7. ALL CONSTRUCTION SIGNING SHALL CONFORM TO THE REQUIREMENTS OF MASSDOT AND MUTCD.
8. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, PROCEDURES, AND FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH ALL WORK INCLUDED UNDER THIS CONTRACT. THE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ALL SAFETY BARRIERS, WARNING FLASHERS, ETC., AS REQUIRED BY THE CONDUCT OF THE WORK FOR THE PROTECTION OF WORKERS AND NON-WORKERS ALIKE. THE CONTRACTORS ATTENTION IS DIRECTED TO OSHA REQUIREMENTS.
9. THE CITY ENGINEERING DEPARTMENT SHALL LAYOUT THE BASELINE OF THE ROADWAY ONE TIME ONLY PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITY. IT IS THE CONTRACTORS RESPONSIBILITY TO PRESERVE THE LAYOUT AND LOCATIONS OF THE BASELINE AND BENCHMARKS THROUGHOUT THE CONSTRUCTION ACTIVITY. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL FIELD ENGINEERING, INCLUDING SETTING OF GRADES AND LOCATIONS THROUGHOUT THE PROJECT.
10. ALL CONSTRUCTION MATERIAL, DEBRIS, ASPHALT, SOIL, ETC. REMOVED FROM THE SITE SHALL BECOME PROPERTY OF THE CONTRACTOR. THE CONTRACTOR WILL BE RESPONSIBLE FOR TRANSPORTING AND DISPOSING ALL EXCESS MATERIALS IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SITE RESTORATION AND CLEAN UP UPON COMPLETION OF THE PROJECT. DURING THE COURSE OF CONSTRUCTION, ANY DAMAGE BY THE CONTRACTOR TO FENCES, GUARDRAILS, PATHS, STAIRS, PAVEMENT, LANDSCAPING OR VEGETATION SHALL BE REPAIRED OR REPLACED AND RESTORED TO ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE CONTRACT. ANY REPLACEMENT FENCE AND/OR HANDRAILS MUST MATCH EXISTING.
12. ALL CASTINGS, GATE BOXES, HYDRANTS, LIGHT POLES, ETC. DAMAGED DURING CONSTRUCTION SHALL BE SUPPLIED AND REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESETTING ALL EXISTING PROPERTY MONUMENTATION THAT IS DISTURBED BY CONSTRUCTION OPERATIONS AT NO EXPENSE TO THE OWNER. THIS WORK IS TO BE DONE BY A PROFESSIONAL LAND SURVEYOR LICENSED IN THE COMMONWEALTH OF MASSACHUSETTS. PROPERTY BOUNDS FOUND ARE SHOWN ON LAYOUT PLANS, THIS MAY NOT BE INCLUSIVE OF ALL BOUNDS THAT EXIST IN THE PROJECT AREA. IF ANY ADDITIONAL BOUNDS ARE FOUND, THE CONTRACTOR SHALL DOCUMENT THE LOCATION AND CONTACT THE ENGINEER.
14. THE CONTRACTOR SHALL TAKE SPECIAL CARE NOT TO DAMAGE TREES WITHIN THE CONSTRUCTION AREA UNLESS THEY ARE NOTED TO BE REMOVED.
15. POLICE DETAILS SHALL BE COORDINATED BY THE CONTRACTOR.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREVENTING ANY DEBRIS, SEDIMENT, OR SILTY WATER FROM ENTERING ANY DRAINAGE SYSTEM DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR SHALL INSTALL TEMPORARY CATCH BASIN SILT SACKS AS REQUIRED BY THE ENGINEER.
17. CONSTRUCTION HOURS SHALL OCCUR BETWEEN THE HOURS OF 7:00 AM AND 5:00 PM, MONDAY THROUGH FRIDAY. WEEKEND WORK MUST BE APPROVED AT LEAST 48 HOURS IN ADVANCE BY THE CITY.
18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR THE COMPLETION OF THE WORK.
19. THE CONTRACTOR SHALL NOT OPERATE ANY HYDRANTS, VALVES, CURB STOPS, OR CORPORATIONS NOR SHALL THEY DRAW WATER FROM THE SYSTEM, WITHOUT SPECIFIC APPROVAL OF THE OWNER.

ROADWAY RECLAMATION NOTES:

1. PRIOR TO RECLAIMING, THE CONTRACTOR SHALL COMPLETE ALL EXCAVATING AND PREPARING OF SUBGRADE REQUIRED TO PULVERIZE THE PAVEMENT AND SHALL LOWER ALL CASTINGS AS SPECIFIED IN THE CONTRACT SPECIFICATIONS.
2. ALL UTILITY CASTINGS SHALL BE LOWERED OR REMOVED AND PLATED PRIOR TO RECLAIMING THE ROADWAY. ALL STRUCTURES MUST BE LOWERED TO A DEPTH OF 6 INCHES BELOW THE BOTTOM OF THE PROPOSED RECLAIMED SUBBASE COURSE.
3. ALL STRUCTURES SHALL BE LOWERED PRIOR TO RECLAMATION AND RAISED TO FINISHED GRADE AFTER THE BINDER COURSE OF PAVEMENT HAS BEEN PLACED.
4. THE ENTIRE ROADWAY SHALL BE RECLAIMED TO A MINIMUM DEPTH OF 16" WITHIN THE PROJECT LIMITS. THE EXISTING PAVEMENT SHALL BE PULVERIZED TO THE POINT WHERE NO MATERIAL IS GREATER THAN 3".
5. THE CONTRACTOR SHALL RECLAIM THE ENTIRE WIDTH OF EXISTING PAVEMENT AS SHOWN. THE LIMITS (EDGE OF PAVEMENT) OF THE EXISTING ROADWAY ARE SHOWN IN PLAN VIEW OF THESE CONSTRUCTION DRAWINGS.
6. AFTER PULVERIZING THE ROADWAY, THE CONTRACTOR SHALL REMOVE AND STOCKPILE (WINROW) THE RECLAIMED MATERIAL. THE CONTRACTOR SHALL THEN EXCAVATE AND REMOVE THE NECESSARY SUBGRADE MATERIAL IN ORDER TO MEET THE FINAL GRADES OF THE ROADWAY. THE CONTRACTOR SHALL THEN PLACE, GRADE, AND COMPACT THE EXISTING RECLAIMED SUBBASE COURSE TO A 12" DEPTH AS SHOWN ON THE TYPICAL ROADWAY CROSS SECTION. THE SUBBASE SHALL THEN BE FINE GRADED AND COMPACTED TO ALLOW A 3" BASE COURSE (BINDER COURSE PAVEMENT - M3.11.03 - TABLE "A") AND 1 1/2" WEARING COURSE (TOP COURSE PAVEMENT - M3.11.03 - TABLE "A").
7. THE REGRADING OF THE ROADWAY SHALL BE IN ACCORDANCE WITH THE TYPICAL CROSS SECTION DETAIL. ANY GRADING MODIFICATIONS SHALL DIRECT DRAINAGE TOWARDS THE APPROPRIATE AREAS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPACTION TESTING. TESTING SHALL BE PERFORMED AT INTERVALS OF 100 FEET ALONG THE ROADWAY USING A NUCLEAR DENSITY GAUGE TO CONFIRM COMPACTION OF MATERIAL TO A MINIMUM OF 95% OF THE STANDARD PROCTOR DENSITY.
9. PRIOR TO COMPLETING FINAL GRADING OF THE RECLAIMED SUBBASE, THE ENGINEER SHALL REVIEW GRADES TO DETERMINE THAT SUFFICIENT CROSS SLOPES AND POSITIVE DRAINAGE FLOWS HAVE BEEN MAINTAINED. IF GRADES NEED TO BE ADJUSTED, THE CONTRACTOR SHALL REGRADE AS REQUIRED.
10. CROSS SLOPES AT CATCH BASINS SHALL BE ADJUSTED AS NECESSARY TO ASSURE PROPER DRAINAGE.
11. THE CONTRACTOR SHALL CONTROL DUST DURING CONSTRUCTION USING CALCIUM CHLORIDE.
12. STRUCTURES SHALL BE ADJUSTED OR REMODELED AS REQUIRED TO MEET PROPOSED GRADE.
13. ALL PROPOSED CUTS AND FILLS REQUIRED TO GRADE THE RECLAIMED MATERIAL TO A 12" DEPTH SHALL BE INCLUDED FOR PAYMENT UNDER THE ROADWAY RECLAMATION ITEM.
14. THE COSTS ASSOCIATED WITH THE EXCAVATION, PLACEMENT, AND DISPOSAL OF SURPLUS SUBBASE MATERIAL SHALL BE INCLUDED WITHIN THE ROADWAY RECLAMATION ITEM.
15. THE CONTRACTOR SHALL STOCKPILE AND RETAIN SUFFICIENT SURPLUS RECLAIMED PAVEMENT SUBBASE MATERIAL TO USE AS NEEDED IN THE ENTIRE PROJECT AREA. SURPLUS RECLAIMED PAVEMENT SUBBASE MATERIAL SHALL BE USED ONSITE PRIOR TO GRAVEL BORROW MATERIAL.
16. ANY EXCESS RECLAIMED MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS. THE COST FOR THE REMOVAL AND DISPOSAL OF THE EXCESS MATERIAL SHALL BE INCLUDED WITHIN THE ROADWAY RECLAMATION ITEM.

FINE GRADING AND COMPACTING NOTES:

1. THE CONTRACTOR SHALL FINE GRADE AND COMPACT ALL AREAS IN PREPARATION FOR PAVEMENT, INCLUDING, BUT NOT LIMITED TO THE DRIVEWAY AREAS AND TRANSITION AREAS. THE CONTRACTOR SHALL ALSO SAW CUT STRAIGHT ALL EXISTING EDGES AND JOINTS IN PREPARATION FOR FINAL PAVING.
2. ALL SUBBASE MATERIAL SHALL BE COMPACTED TO A MINIMUM OF 95% OF THE STANDARD PROCTOR DENSITY.
3. THE CONTRACTOR SHALL FINE GRADE AND COMPACT THE RECLAIMED SUBBASE COURSE MATERIAL NO MORE THAN 24 HOURS PRIOR TO THE PLACEMENT OF THE 3" BASE COURSE PAVEMENT.

CONCRETE CURBING (RESET) NOTES:

1. THE CONTRACTOR SHALL REMOVE AND RESET EXISTING CONCRETE CURBING AS SHOWN ON PLANS IF DETERMINED TO BE IN GOOD CONDITION BY THE ENGINEER. TO SALVAGE EXISTING CONCRETE CURBING, THE CONTRACTOR SHALL CAREFULLY REMOVE, CLEAN, AND STORE THE UNDAMAGED CURB. ANY DAMAGED CURB OR CURB DEEMED UNFIT BY THE ENGINEER SHALL NOT BE USED AND SHALL BE REMOVED FROM THE PROJECT AREA BY THE CONTRACTOR. NEW CONCRETE CURB SHALL BE USED TO REPLACE DAMAGED OR UNFIT EXISTING CURB.
2. ALL SUPPLEMENTAL CONCRETE CURB SHALL BE AS SPECIFIED BY MASSDOT AND SHALL INCLUDE ALL LENGTHS - STRAIGHT, RADIUS, TRANSITION, AND CURB INLETS.
3. NEW AND/OR SALVAGED CONCRETE CURBING SHALL BE SET IN ACCORDANCE WITH THE CONSTRUCTION DETAIL PROVIDED IN THE SPECIFICATIONS.
4. THE CONTRACTOR SHALL LOAM & SEED ALL DISTURBED AREAS BEHIND RESET CURBING.

PAVING NOTES:

1. THE CONTRACTOR SHALL SAW CUT ALL JOINTS IN THE EXISTING PAVEMENT AREAS WHERE THE PROPOSED PAVEMENT WILL MEET EXISTING PAVEMENT TO REMAIN. ALL JOINTS SHALL PROVIDE A SMOOTH TRANSITION BETWEEN NEW AND OLD PAVEMENTS. IMMEDIATELY AFTER BITUMINOUS CONCRETE PAVING, ALL NEW JOINTS SHALL BE SANDED AND SEALED. THE COST FOR THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE PAVING ITEMS.
2. THE CONTRACTOR SHALL RESET ALL WATER, SEWER, DRAINAGE, GAS, ELECTRIC, AND TELEPHONE CASTINGS AND ANY OTHER STRUCTURES, SIGNS, ETC. NECESSARY TO INSTALL THE PROPOSED PAVEMENT TO FINISH GRADE ELEVATION.
3. ALL CASTINGS, GATE BOXES, ETC. DAMAGED DURING RECONSTRUCTION SHALL BE SUPPLIED AND REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT.
4. PAVEMENT SHALL BE PLACED AND COMPACTED AS SHOWN IN THE TYPICAL ROADWAY CROSS SECTION. PAVEMENT SHALL CONSIST OF A 3" BASE COURSE (BINDER COURSE PAVEMENT - M3.11.03 - TABLE "A") AND 1 1/2" WEARING COURSE (TOP COURSE PAVEMENT - M3.11.03 - TABLE "A"). THE 3" BASE COURSE SHALL BE PLACED AND COMPACTED IN TWO, 1-1/2 INCH LIFTS.
5. PAVING ACTIVITY IS WEATHER DEPENDANT. NO PAVEMENT WILL BE PLACED DURING PERIODS OF PRECIPITATION OR IF THE AIR TEMPERATURE IS BELOW 40° F. PAVING ACTIVITY MUST BE COMPLETED PRIOR TO NOVEMBER 15TH.
6. THE CONTRACTOR SHALL SAND AND SEAL ALL JOINTS.

UTILITY NOTES:

1. PRIOR TO CONSTRUCTION, ALL UTILITIES, PUBLIC AND PRIVATE MUST BE NOTIFIED (SEE MASSACHUSETTS GENERAL LAWS, CHAPTER 82 SECTION 40.) ALL "DIG SAFE" - 811, OR CUSTOMER SERVICE - 1 (888) 344-7233.
2. THE CITY OF WALTHAM IS NOT A PART OF "DIG SAFE". THE CONTRACTOR MUST SEPARATELY CONTACT THE WATER AND SEWER DEPARTMENT FOR APPROPRIATE MARK OUTS. CONTACT: WATER AND SEWER SUPERINTENDENT, 781-314-3820
3. SUBSURFACE UTILITY LINES, AS SHOWN HERON, WERE COMPLIED ACCORDING TO AVAILABLE RECORD INFORMATION. THE LOCATIONS ARE APPROXIMATE ONLY. ACTUAL LOCATIONS MUST BE DETERMINED IN THE FIELD. THE CITY OF WALTHAM ASSUMES NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURATELY SHOWN. THE CONTRACTOR SHALL EXCAVATE TEST PITS TO VERIFY UTILITY LINE LOCATIONS AS NECESSARY.
4. WATER MAINS ARE ASSUMED TO BE 5 FEET BELOW THE EXISTING GROUND SURFACE. GAS LINES ARE ASSUMED TO BE TO BE 3 FEET BELOW THE EXISTING GROUND SURFACE. TELEPHONE AND ELECTRIC CONDUIT ARE ASSUMED TO BE 2 FEET BELOW THE EXISTING GROUND SURFACE.
5. DAMAGE TO ANY UTILITY DURING WORK ACTIVITY WILL BE REPAIRED BY THE CONTRACTOR, AT THE CONTRACTOR'S EXPENSE, IN A TIMELY MANNER SO THAT DISRUPTION OF SERVICE TO ANY UTILITY WILL NOT BE LONGER THAN PRACTICALLY NECESSARY TO REPAIR THE DAMAGE.
6. UTILITY CONTACTS:
 THE CITY OF WALTHAM - WATER/SEWER/DRAIN
 WATER & SEWER SUPERINTENDENT (7AM-3PM): 781-314-3820
 AFTER HOURS EMERGENCY: 781-893-3700
 THE CITY OF WALTHAM - WIRES DEPARTMENT
 TIM KELLY, INSPECTOR OF WIRES: 781-389-6044
 VERIZON - TELEPHONE
 FREDERICK WAGNER, AREA PROJECT COORDINATOR: 781-376-5067
 COMCAST - CABLE
 MANUEL FURTADO, AREA PROJECT COORDINATOR: 774-644-9104
 NATIONAL GRID - GAS
 KEITH WALTERS, AREA PROJECT COORDINATOR: 516-924-4602
 EVERSOURCE - ELECTRIC
 N.E. SERVICE NUMBER: 800-592-2000

DRIVEWAY & WALKWAY RECONSTRUCTION NOTES:

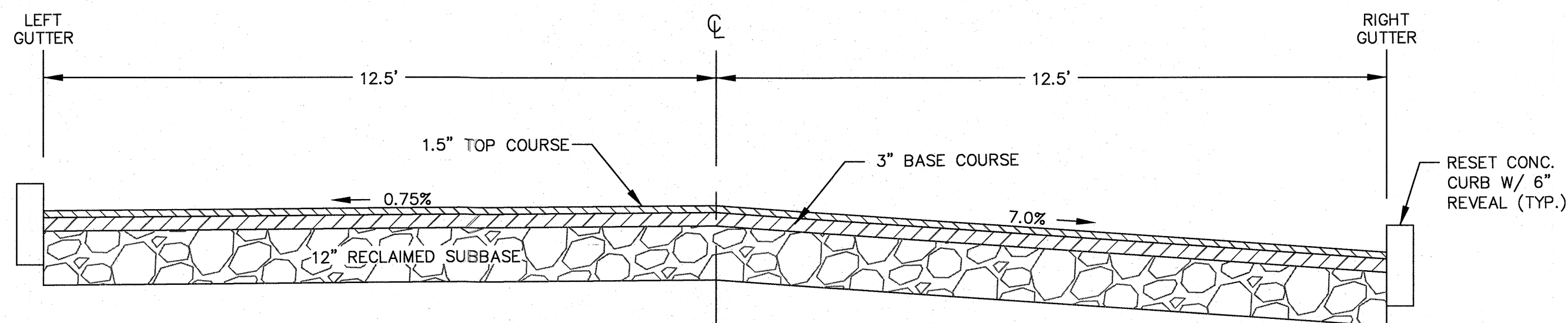
1. THE CONTRACTOR SHALL RECONSTRUCT DRIVEWAYS AND WALKWAYS AS CALLED OUT AND SHOWN IN PLAN VIEW IN THESE CONSTRUCTION DRAWINGS.
2. THE CONTRACTOR SHALL RECONSTRUCT EACH DRIVEWAY AND WALKWAY MATCHING THE EXISTING MATERIAL.
3. BITUMINOUS DRIVEWAY APRONS SHALL HAVE A MINIMUM DEPTH OF 3", CONSISTING OF 1-1/2" BASE COURSE AND 1-1/2" TOP COURSE OF PAVEMENT. CEMENT CONCRETE DRIVEWAY APRONS SHALL BE A MINIMUM DEPTH OF 6", CONSISTING OF 4,000 PSI CONCRETE.
4. BITUMINOUS CONCRETE WALKWAYS SHALL HAVE A MINIMUM DEPTH OF 3", CONSISTING OF 1-1/2" BASE COURSE AND 1-1/2" TOP COURSE. CEMENT CONCRETE WALKWAYS SHALL BE A MINIMUM DEPTH OF 4", CONSISTING OF 4,000 PSI CEMENT CONCRETE. BRICK WALKWAYS SHALL BE LAID IN A PATTERN MATCHING THAT OF EXISTING BRICK WALKWAYS.
5. THE CONTRACTOR SHALL GRADE WALKWAYS AS DIRECTED IN THE CONSTRUCTION DRAWINGS, ANY GRADING MODIFICATIONS SHALL DIRECT DRAINAGE TOWARDS APPROPRIATE AREAS.

STOCKPILED MATERIALS AND EQUIPMENT:

1. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING A LOCATION FOR STAGING AND STORING STOCKPILED MATERIAL AND EQUIPMENT.
2. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF LOCATION AND ANY PRIVATE AGREEMENTS AND ALL FEES THAT MAY BE ASSOCIATED WITH THE USE OF AN AREA FOR STORING STOCKPILED MATERIALS AND EQUIPMENT.
3. THE CITY OF WALTHAM IS NOT RESPONSIBLE FOR PROVIDING A LOCATION FOR STAGING OR THE STORAGE OF STOCKPILED MATERIAL AND EQUIPMENT.
4. MATERIALS SHALL NOT BE STOCKPILED ON THE ROAD OR IN PUBLIC PARKING AREAS.
5. NO EQUIPMENT SHALL BE ALLOWED TO BE PARKED ON THE ROAD WHEN NOT IN USE.
6. SURPLUS MATERIAL FROM THE RECLAIMED ROADWAY SHALL BE STOCKPILED AND USED ONSITE FOR SUITABLE FILL IN AREAS REQUIRING SUITABLE GRAVEL. NO ADDITIONAL PAYMENT SHALL BE MADE FOR THE PLACEMENT OF THIS MATERIAL.
7. ALL SURPLUS EXCAVATED MATERIALS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DISPOSE OF OFFSITE IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

ABBREVIATIONS:

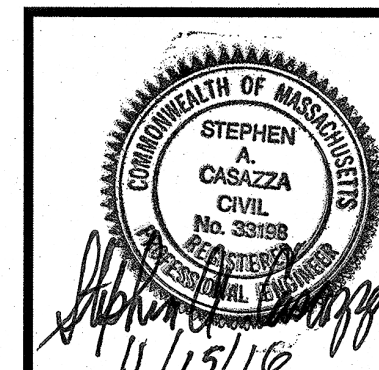
AC	ASBESTOS CONCRETE	MIN	MINIMUM
APPROX	APPROXIMATE	N/F	NOW OR FORMERLY
BIT	BITUMINOUS CONCRETE	NTS	NOT TO SCALE
BM	BENCHMARK	OHW	OVERHEAD WIRE
BLDG	BUILDING	PC	POINT OF CURVATURE
BND	BOUND	PROP	PROPOSED OR PROPERTY
BRK	BRICK	PT	POINT OF TANGENCY
CL	CENTERLINE	PVC	POLYVINYL CHLORIDE
CB	CATCH BASIN	R	RIM OR RADIUS
CI	CAST IRON	RCP	REINFORCED CONCRETE PIPE
CLDI	CEMENT LINED DUCTILE IRON	REC	RECORD
CLF	CHAIN LINK FENCE	RET WALL	RETAINING WALL
CMP	CORRUGATED METAL PIPE	ROW	RIGHT OF WAY
CONC	CONCRETE	SB	STONE BOUND
DH	DRILL HOLE	SMH	SEWER MANHOLE
DI	DUCTILE IRON	SN	SIGN
DMH	DRAIN MANHOLE	STA	STATION
DRV	DRIVEWAY	SW	SIDEWALK
EMH	ELECTRIC MANHOLE	TBM	TEMPORARY BENCHMARK
EX	EXISTING	TMH	TELEPHONE MANHOLE
FNC	FENCE	TOC	TOP OF CURB
FND	FOUND	TP	TEST PIT
EOP	EDGE OF PAVEMENT	TYP	TYPICAL
GG	GAS GATE	UNK	UNKNOWN
GRAV	GRAVEL	UP	UTILITY POLE
GS	GAS SERVICE	VC	VTRIFIED CLAY
HOR	HORIZONTAL	VERT	VERTICAL
HSE	HOUSE	W/	WITH
HYD	HYDRANT	WG	WATER GATE
HW	HEADWALL	WMH	WATER MANHOLE
INV	INVERT	WSO	WATER SHUTOFF
LP	LIGHT POLE		
MB	MAIL BOX		
MH	MANHOLE		



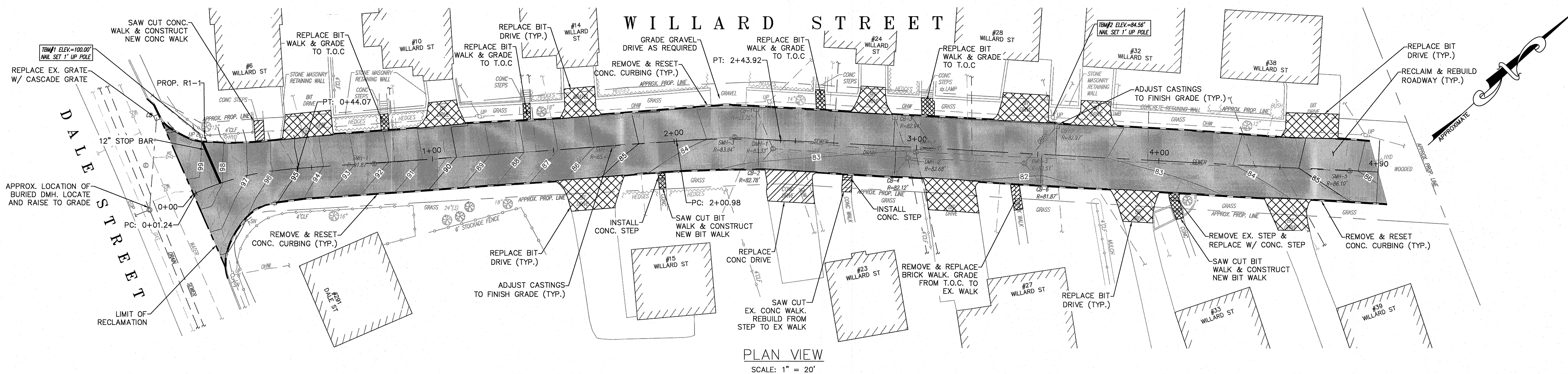
TYPICAL ROADWAY CROSS SECTION
 STA 0+50 - STA 4+90
 SCALE: 1" = 2'

LEGEND:

- EX. CATCH BASIN
- EX. DRAIN MANHOLE
- ⊙ EX. SEWER MANHOLE
- ⊕ EX. ELECTRIC MANHOLE
- ⊙ EX. HYDRANT
- ⊕ EX. WATER GATE
- ⊕ EX. UTILITY POLE
- ⊕ EX. NAME & STRUNK DIA.
- ⊕ EX. TRAFFIC SIGN
- ⊕ EX. BUILDING
- APPROX. PROP LINE
- EX. WOOD FENCE
- EX. CHAIN LINK FENCE
- EX. HEDGE / BUSH

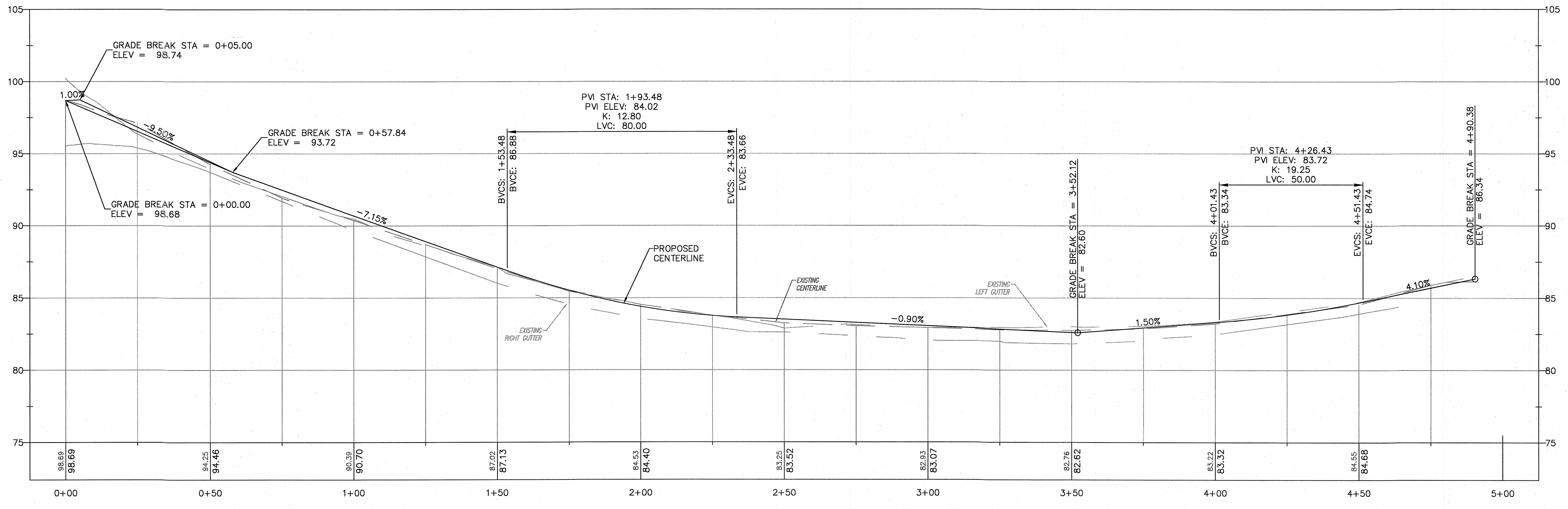


PLAN SHOWING
 PROPOSED ROADWAY RECLAMATION
 OF
WILLARD STREET
 IN
WALTHAM, MASSACHUSETTS
 STEPHEN CASAZZA, P.E., CITY ENGINEER
 DESIGNED BY: J.P.M. OCTOBER, 2016
 DRAWN BY: J.P.M. SCALE: AS NOTED
 CHECKED BY: S.A.C. SHEET 2 OF 5



PLAN VIEW
SCALE: 1" = 20'

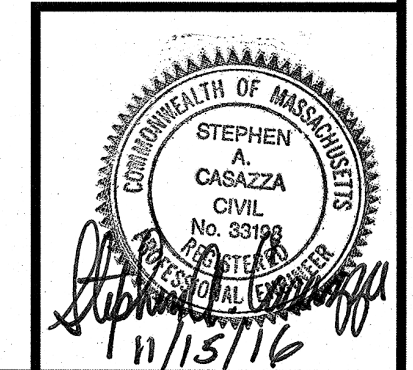
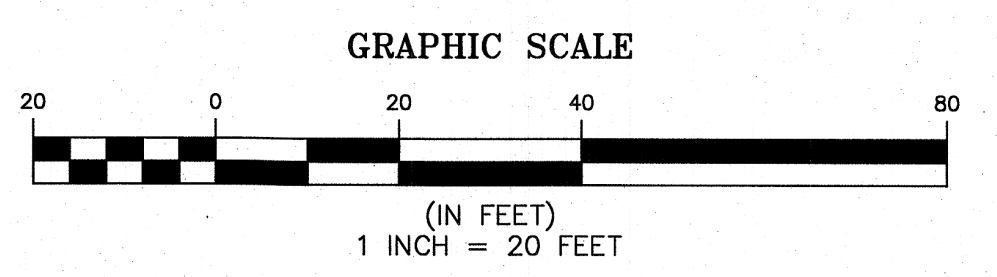
WILLARD STREET PROFILE



PROFILE VIEW
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4'

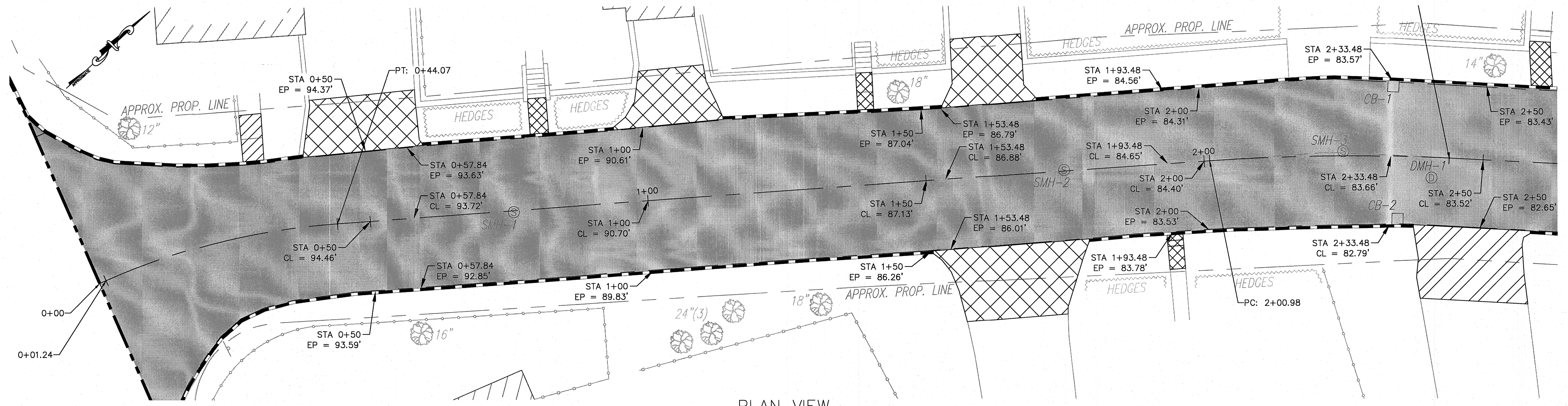
PROPOSED CONSTRUCTION LEGEND:

	PROP. ROADWAY RECLAIM & PAVING		PROP. BIT. CONC. WALKWAY
	PROP. BIT. CONC. DRIVEWAY APRON		PROP. CONC. WALKWAY
	PROP. CONC. DRIVEWAY APRON		PROP. BRICK WALKWAY
	REMOVE & RESET CONC. CURBING		

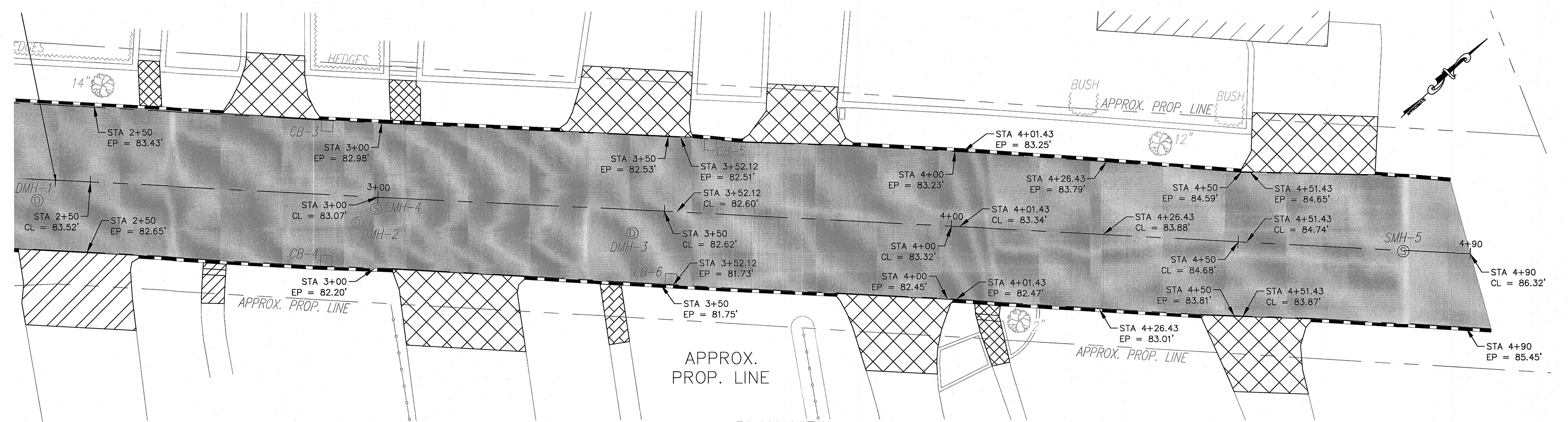


PLAN SHOWING
PROPOSED ROADWAY RECLAMATION
OF
WILLARD STREET
IN
WALTHAM, MASSACHUSETTS
STEPHEN CASAZZA, P.E., CITY ENGINEER
DESIGNED BY: J.P.M.
DRAWN BY: J.P.M.
CHECKED BY: S.A.C.

OCTOBER, 2016
SCALE: 1" = 20'
SHEET 3 OF 5



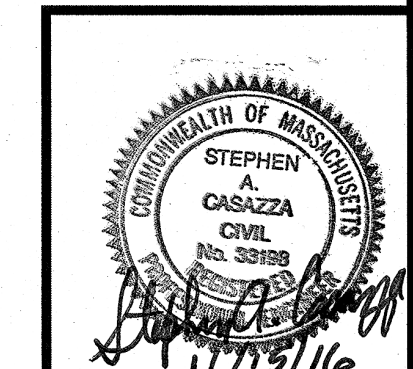
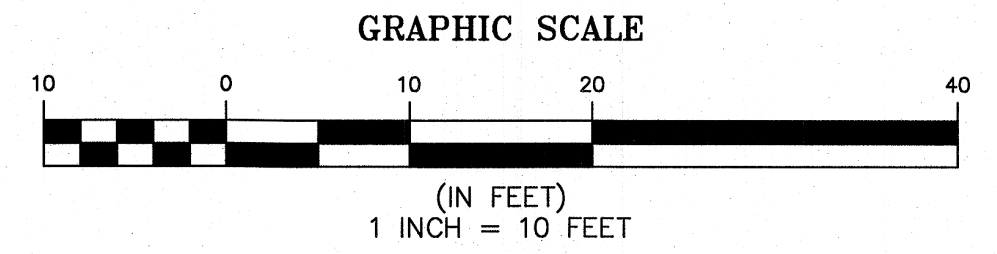
PLAN VIEW
SCALE: 1" = 10'



APPROX. PROP. LINE
PLAN VIEW
SCALE: 1" = 10'

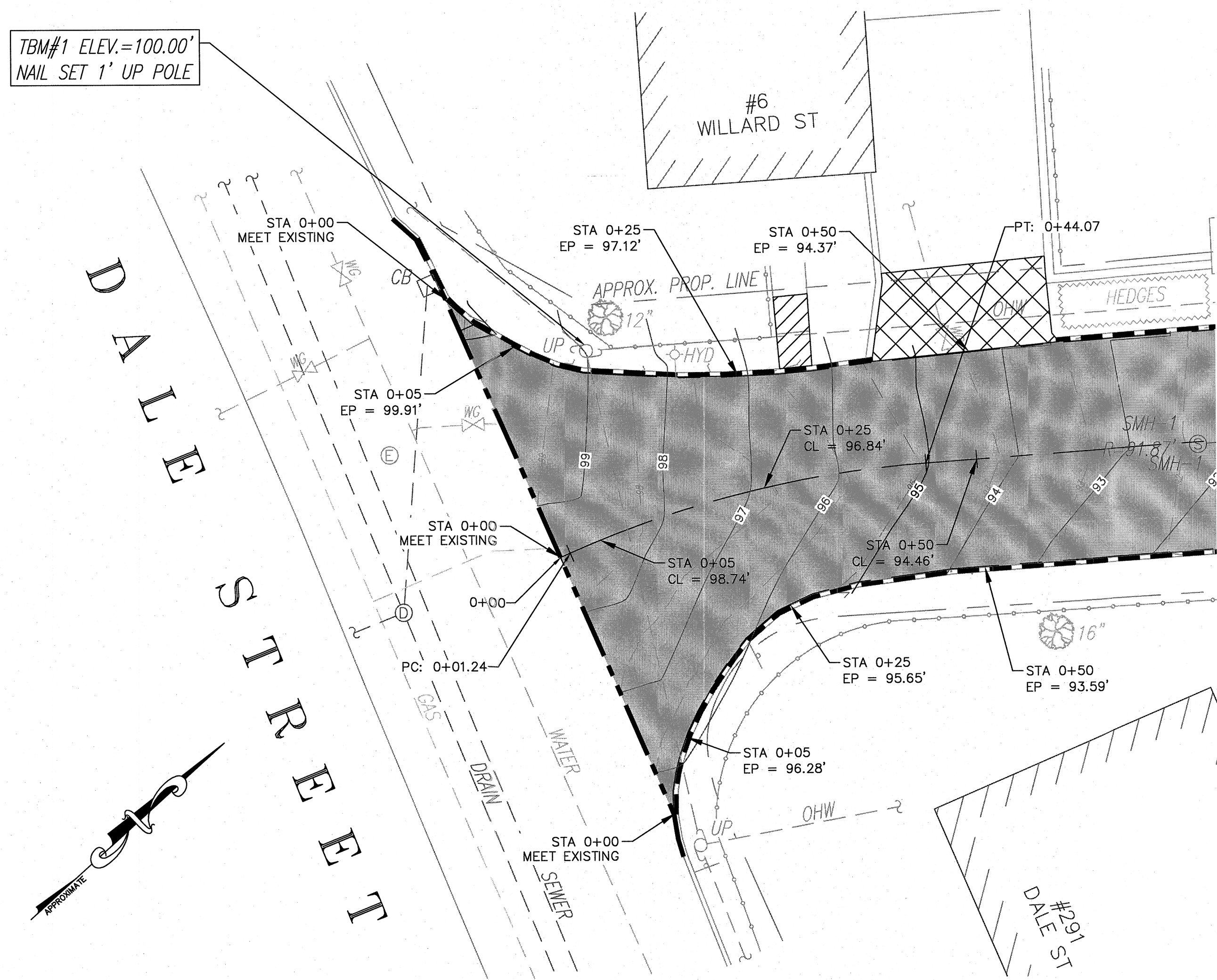
STRUCTURE ELEVATIONS		
STRUCTURE	EX. RIM ELEV.	PROP. RIM ELEV.
SMH-1	91.87'	92.4'±
SMH-2	85.48'	85.5'±
SMH-3	83.84'	83.8'±
SMH-4	82.93'	82.9'±
SMH-5	86.10'	85.9'±
DMH-1	83.33'	83.3'±
DMH-2	82.68'	82.8'±
DMH-3	82.51'	82.4'±
CB-1	83.75'	83.6'±
CB-2	82.78'	82.8'±
CB-3	82.94'	83.1'±
CB-4	82.12'	82.3'±
CB-5	82.97'	82.5'±
CB-6	81.87'	81.7'±

NOTE: PROPOSED RIM ELEVATIONS ARE FOR REFERENCE ONLY. STRUCTURES SHALL BE ADJUSTED IN THE FIELD TO MEET THE FINISHED GRADE AS CONSTRUCTED AND DIRECTED BY THE ENGINEER.

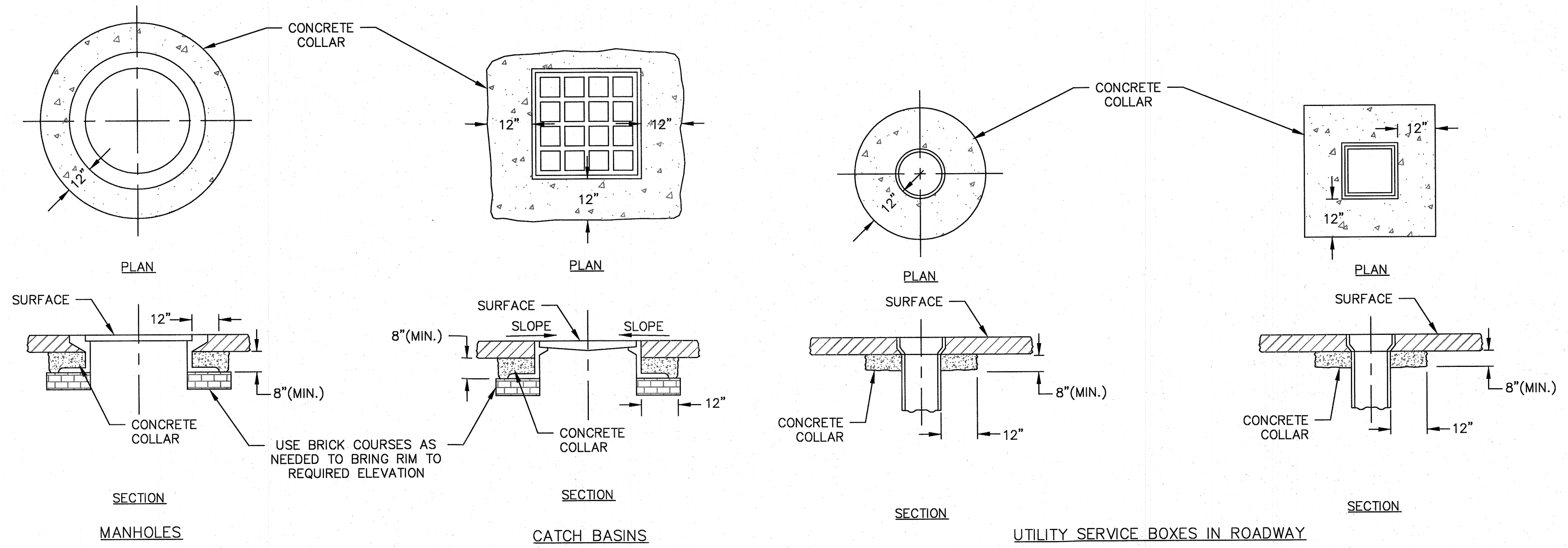


PLAN SHOWING
PROPOSED ROADWAY RECLAMATION
OF
WILLARD STREET
IN
WALTHAM, MASSACHUSETTS
STEPHEN CASAZZA, P.E., CITY ENGINEER
DESIGNED BY: J.P.M. OCTOBER, 2016
DRAWN BY: J.P.M. SCALE: 1" = 10'
CHECKED BY: S.A.C. SHEET 4 OF 5

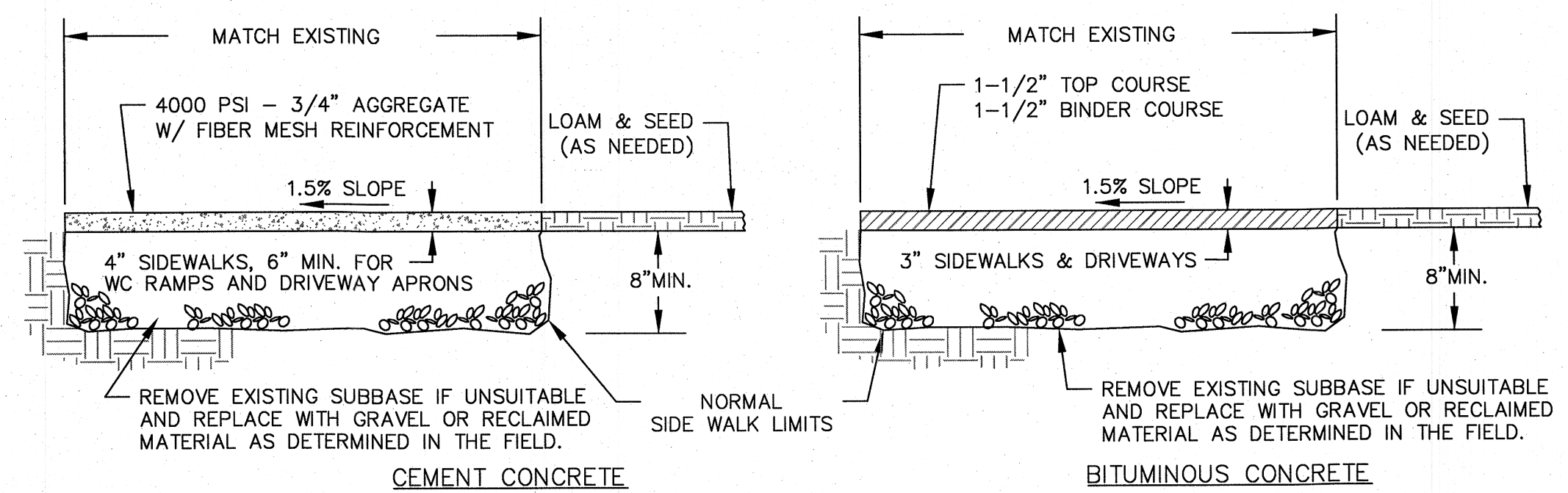
TBM#1 ELEV.=100.00'
NAIL SET 1' UP POLE



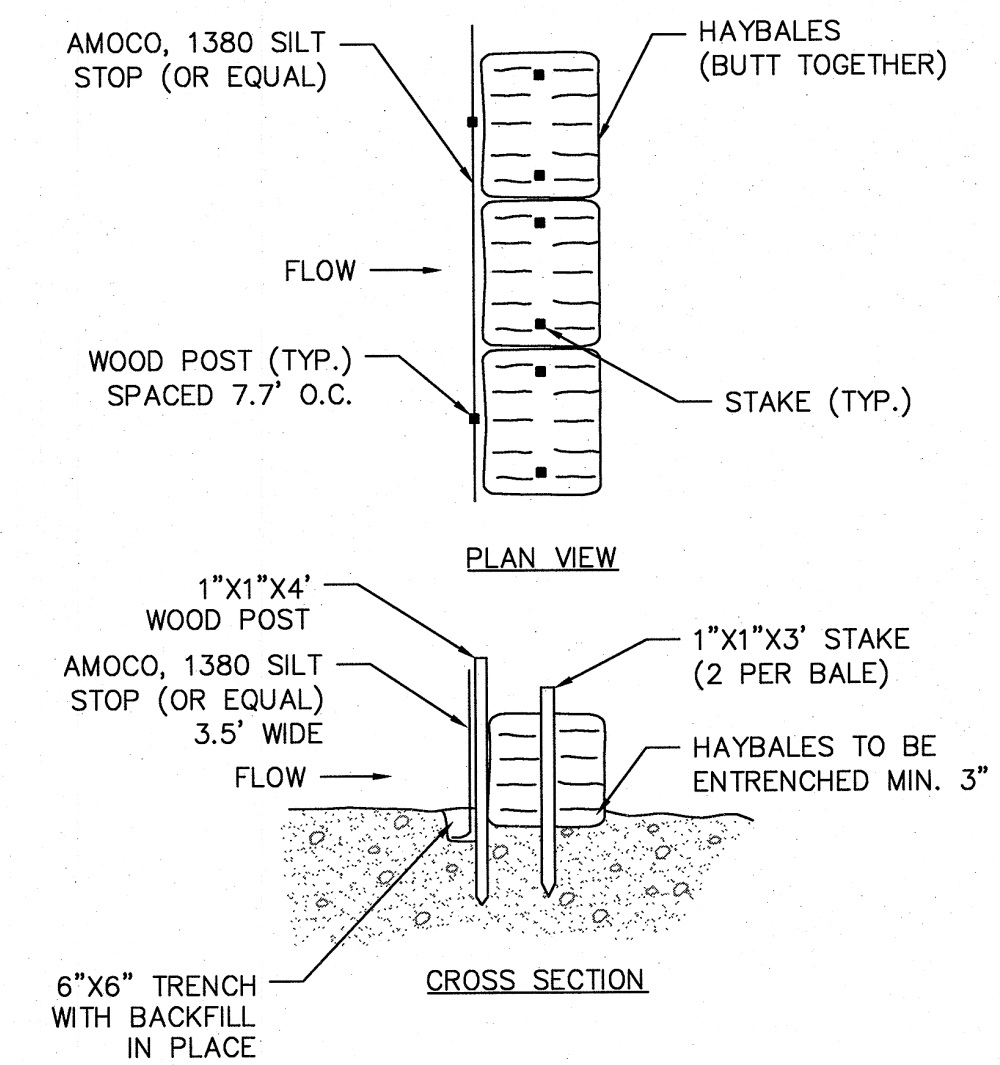
INTERSECTION GRADING PLAN
SCALE: 1" = 10'



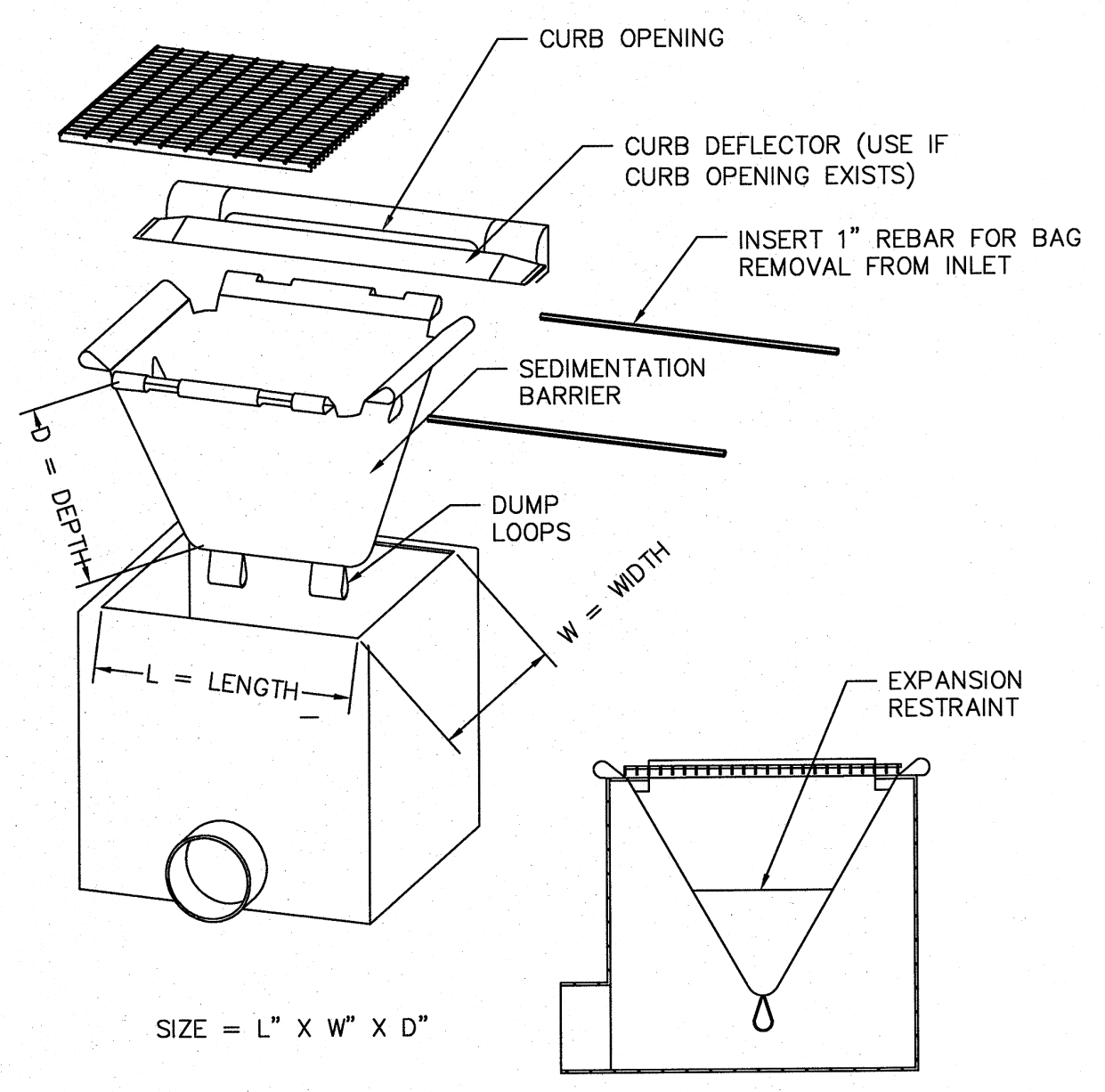
DETAILS FOR RAISING CASTINGS AND VALVE BOXES
NOT TO SCALE



WALKWAY DETAIL
NOT TO SCALE

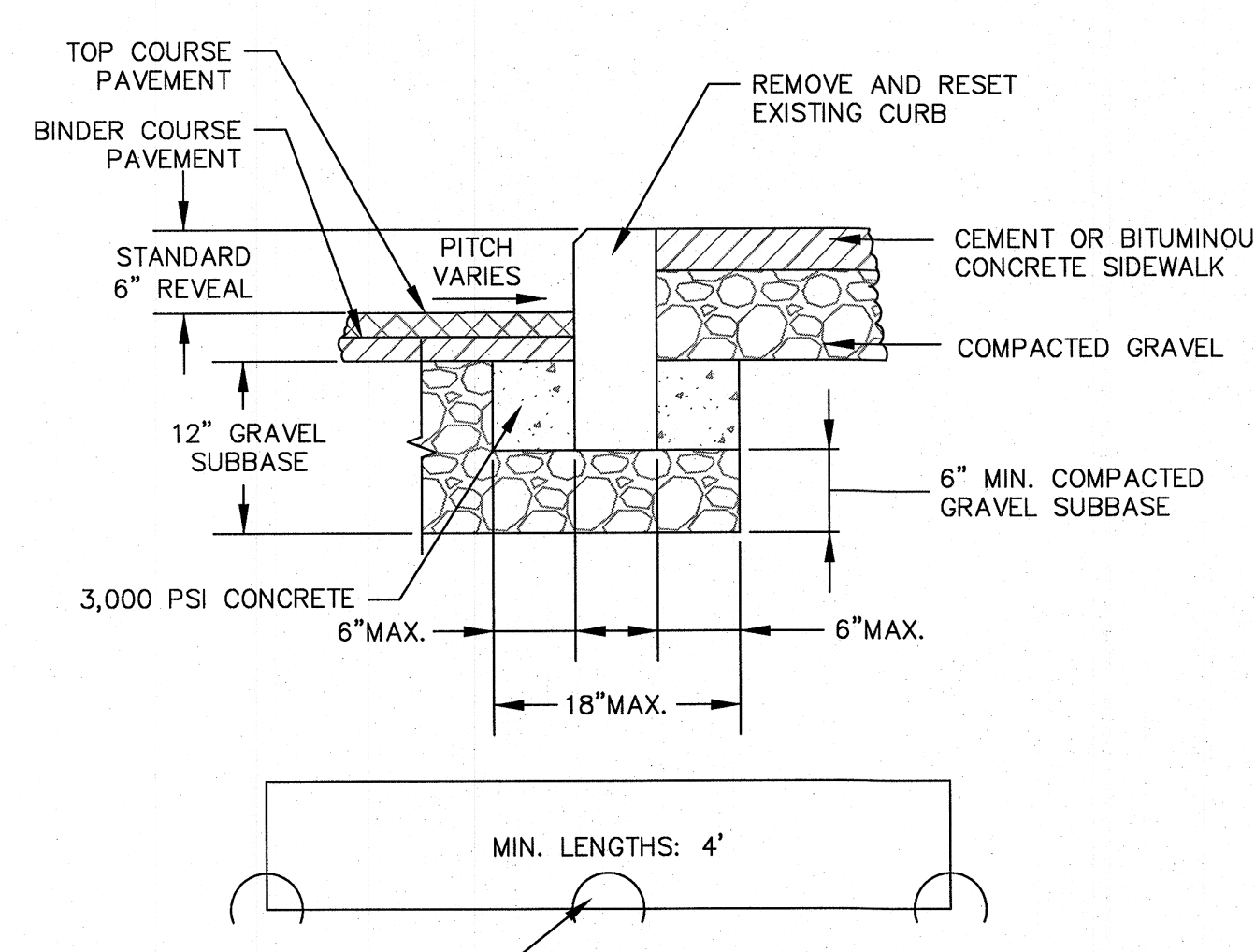


EROSION CONTROL BARRIER - HAYBALE
NOT TO SCALE

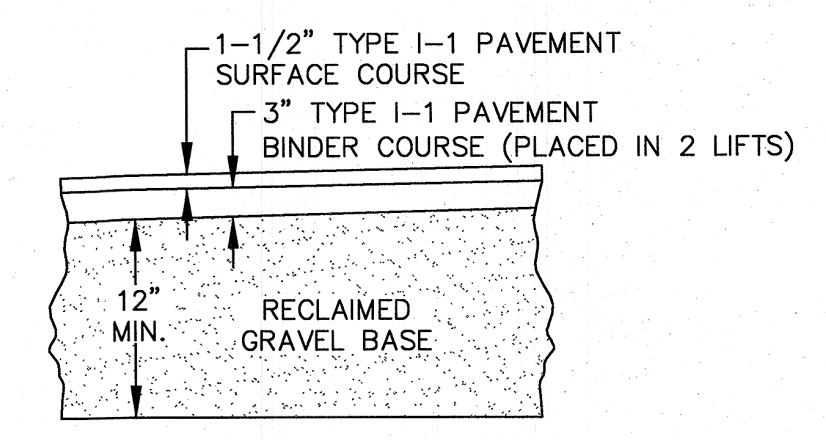


SEDIMENTATION BARRIER SHALL BE MANUFACTURED TO FIT THE OPENING OF THE CATCH BASIN OR DROP INLET. SEDIMENTATION BARRIER SHALL BE MANUFACTURED FROM A WOVEN POLYPROPYLENE GEOTEXTILE WITH AN ALLOWABLE FLOW RATE OF 50 GPM/SF

EROSION CONTROL CATCH BASIN SILT SACK
NOT TO SCALE

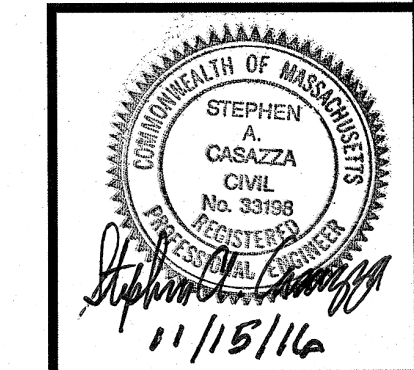


CURB DETAIL
NOT TO SCALE



NOTES:
1. PRIOR TO COMPLETING FINAL GRADING OF THE RECLAIMED BASE COURSE THE ENGINEER SHALL REVIEW GRADES ON THE ROADWAY TO DETERMINE THAT SUFFICIENT DRAINAGE PATTERNS AND CURB REVEAL ARE MAINTAINED. IF GRADES NEED TO BE ADJUSTED, THE CONTRACTOR SHALL REGRADE AS DIRECTED AT NO ADDITIONAL COST TO THE CONTRACT.

TYPICAL ROADWAY SECTION
NOT TO SCALE



PLAN SHOWING
PROPOSED ROADWAY RECLAMATION
OF
WILLARD STREET
IN
WALTHAM, MASSACHUSETTS
STEPHEN CASAZZA, P.E., CITY ENGINEER
DESIGNED BY: J.P.M. OCTOBER, 2016
DRAWN BY: J.P.M. SCALE: AS NOTED
CHECKED BY: S.A.C. SHEET 5 OF 5