



**TOWN OF ARLINGTON, MASSACHUSETTS
SEWER AND DRAIN IMPROVEMENTS
OTTOSON MIDDLE SCHOOL AREA**

BID NO. 13-19

July 2013

**FAY, SPOFFORD & THORNDIKE, LLC
ENGINEERS – PLANNERS - SCIENTISTS
BURLINGTON, MASSACHUSETTS**



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BID NO. 13-19



Robert H. Letourneau
7/26/2013

July 2013

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INVITATION TO BID

For

SEWER AND DRAIN IMPROVEMENTS OTTOSON MIDDLE SCHOOL AREA - BID NO. 13-19 TOWN OF ARLINGTON, MASSACHUSETTS

Sealed bids are invited and will be received by the Town Manager, Town of Arlington, Massachusetts, until **11:00 A.M., Thursday, August 22, 2013** at the Town Manager's Office/Purchasing Department, 730 Massachusetts Avenue, Town Hall Annex, Arlington, Massachusetts, 02476, at which time the bids will be publicly opened and read aloud in the First Floor Conference Room.

Every bid shall be accompanied by a BID DEPOSIT IN THE FORM OF BID BOND, CERTIFIED CHECK, OR TREASURER'S CHECK. The amount of such bid deposit shall be FIVE PERCENT (5%) of the value of the bid. All bids must be in sealed envelopes plainly marked: **BID ON: SEWER AND DRAIN IMPROVEMENTS – OTTOSON MIDDLE SCHOOL AREA - BID # 13-19 THURSDAY, AUGUST 22, 2013, 11:00 A.M.**

The Contract Documents, including Specifications and Drawings, will be available at the office of Fay, Spofford & Thorndike, LLC, 5 Burlington Woods, Burlington, MA on and after July 31, 2013, Monday through Friday, 9:00 A.M. – 3:30 P.M.

There is a \$40.00 Refundable Deposit for each set of Plans and Specifications if returned two weeks after bid opening. Checks shall be made payable to "Fay, Spofford & Thorndike, LLC". If a bidder requests Drawings and Specifications to be mailed out, an additional check in the amount of \$20.00 made payable to "Fay, Spofford & Thorndike, LLC" shall be included. This is to cover the cost of mailing and handling and is not refundable.

The conditions of employment as set forth in Sections 26 to 27D and 27F of Chapter 149 of the General Laws, as amended, shall prevail in the execution of the work under this contract.

Attention is called to the fact that minimum wage rates and health and welfare and pension fund contributions are established for this contract and are a part of the specifications.

Work under this contract shall be governed by M.G.L. Ch. 30, Sec. 39m.

Attestation Forms pursuant to M.G.L. Ch. 62C, Sec. 49A and M.G.L. Ch. 701 of the Acts of 1983 are enclosed and shall be submitted with bids. Proposals are for the Sewer and Drain Improvements, Ottoson Middle School Area, Arlington, MA.

The proposed work includes manhole to manhole CIPP lining of approximately 943 feet of 6-inch and 8-inch sewer; manhole to manhole pipe lining of approximately 567 feet of 18-inch and 24-inch storm drain; reinstatement of about 20 sewer service and drain connections closed by

CIPP lining; chemical root control of 673 feet of 6-inch and 8-inch sewer; internal point repair lining of 18-inch storm drains at 2 locations; excavate and replace about 60 feet of 8-inch sanitary sewer main; repairs to 10 drain manholes and 12 sewer manholes; testing about 240 pipe joints and sealing about 144 pipe joints in 6-inch and 8-inch sewer; and ancillary work including environmental protection, pavement replacement, and earthwork items.

It is the intention of the Owner to award the Contract to the lowest qualified responsive bidder. The bidder must submit a bid on all bid items in the Contract.

All proposals must give prices, both in writing and in figures, and must be signed by the bidder with his business address.

A performance bond and also a labor and materials or payment bond, each equal to 100% of the amount of the contract, will be required for the faithful performance and to guarantee the work for a term of one (1) year from the date of completion.

The Contractor shall complete all work called for under the contract agreement in all parts and requirements within 120 calendar days as specified in the Schedule of Prices except for final infiltration testing which will be conducted toward the end of the warranty period during high groundwater conditions.

No bid may be withdrawn within sixty (60) days (Saturdays, Sundays and legal holidays excluded) after the date of opening thereof.

The contractor to whom the contract may be awarded will be required to appear in this office within ten (10) days, Saturdays, Sundays and Legal Holidays excepted, after presentation thereof by the Town Manager, and execute a contract in accordance with the terms of this bid, with surety offered by him. In case of his failure to do so, his bid deposit shall become the property of the Town as liquidated damages, provided that, in case of death, disability or other unforeseen circumstances his bid deposit may be returned.

An increase or decrease in the quantity of work shall not be regarded as a sufficient ground for an increase or decrease in the unit prices.

To receive consideration, bids must be in the hands of the Purchasing Agent or his authorized representative not later than the day and hour above mentioned. For further information relative to this bid, please confer with Domenic R. Lanzillotti, Director, Purchasing Department, Town Hall, Arlington, Massachusetts, 02476.

OSHA Construction Training Required: As of July 1, 2006, under M.G.L. – Chapter 30, Section 39S, any person, submitting a bid for, or signing a contract to work on, the construction, reconstruction, alteration, remodeling or repair of any public work by the Commonwealth of Massachusetts/Town of Arlington, and estimated by the awarding Authority to cost more than \$10,000, shall certify on the Bid or Contract, under penalty of perjury, that all employees to be employed at the work will have successfully completed a course in construction safety and health

approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration.

The Town Manager reserves the right to cancel any invitation for bids, to reject in whole or in part any and all bids, when it is deemed to be in the best interest of the Town of Arlington to do so.

TOWN OF ARLINGTON

Adam W. Chapdelaine
Town Manager

July 23, 2013

INSTRUCTIONS TO BIDDERS

Sealed proposals for construction of Sewer and Drain Improvements in Ottoson Middle School Area, Bid No. 13-19, for the Town of Arlington, Massachusetts, acting through its Town Manager (hereinafter called the Owner), prepared in accordance with these instructions and other provisions of the Contract Documents, will be received by the Town at the Town Manager's Office/Purchasing Department, Town Hall Annex, First Floor, 730 Massachusetts Avenue, Arlington, Massachusetts 02476, until 11:00 AM, prevailing time, on **Thursday, August 22, 2013**. The bids will then be publicly opened and read aloud in the First Floor Conference Room.

All bids shall be in conformance with the Construction Grants Policy Memorandum No. CG-13, "Bid Opening Procedures", issued by the Massachusetts Department of Environmental Protection and found in the Appendix.

The Town of Arlington is exempt from payment of the Massachusetts sales tax. Therefore, bidders shall make no allowance for said sales tax in the prices bid.

All proposals shall be made as follows -

1. Fill in the number of addenda, if any, in the space provided on page 00339-2.
2. Insert "unit prices bid" in words and figures and "amounts" in all blank spaces provided in the Schedule of Prices in the Proposal (pages 00339-3 and 4). Bidders must quote on all items in the Schedule of Prices in the Proposal. If the unit price for each line item is not written in words, the bid shall be rejected and shall receive no further consideration.
3. For each item fill in the amounts (product of Estimated Quantities and Unit Prices Bid) in the "Amounts" column.
4. Fill in the sum of the figures entered in the column headed "Amounts" opposite the "Total Estimated Contract Price" in the Schedule of Prices in the Proposal (page 00339-4).
5. Fill in all other blank spaces in the Proposal (pages 00339-5 to 00339-7, inclusive).
6. Complete the appropriate Acknowledgment of Principal (page 00339-8, 9 or 10).
7. Fill in the Certification of Bid (page 00339-11), Certificate of Non-Collusion (page 00339-12), Certification as to Compliance with Tax Laws (page 00339-13), and Contractor's Certification (page 00339-14).
8. Submit as the Proposal all Contract Documents intact, without changing any of the text, enclosed in a sealed envelope bearing the name and address of the bidder,

and endorsed "BID ON: SEWER AND DRAIN IMPROVEMENTS – OTTOSON MIDDLE SCHOOL AREA - BID # 13-19, THURSDAY, AUGUST 22, 2013, 11:00 A.M."

9. Submit to the Town of Arlington as bid security a bid bond, certified check, or Treasurer's check, in the amount of five percent of the value of the bid.

Checks shall be made payable to "Town of Arlington, Massachusetts". The bid security deposit shall not be enclosed in the sealed envelope containing the proposal but shall be enclosed in a separate sealed envelope marked "BID SECURITY – BID ON: SEWER AND DRAIN IMPROVEMENTS – OTTOSON MIDDLE SCHOOL AREA - BID # 13-19, THURSDAY, AUGUST 22, 2013, 11:00 A.M." and attached to the bid proposal envelope.

Checks will be returned to all except the three lowest acceptable bidders within five days (Saturdays, Sundays and legal holidays excluded) after the opening of the bids, and the remaining checks will be returned to the three lowest acceptable bidders within 48 hours after the awarding of the contract, or, if no contract is awarded within sixty (60) days (Saturdays, Sundays, and legal holidays excluded) after the date of opening bids, then upon demand of the bidder at any time thereafter so long as he has not been notified of the acceptance of his bid. The successful bidder will be notified by registered mail of the acceptance of his bid.

If a bid bond is used as bid security, it shall be prepared in the form of a bid bond attached hereto (pages 00410-1 and 00410-2), each duly executed by the bidder as principal, and having as security thereon a surety company approved by the Owner. A copy of the form of bid bond will be furnished to the bidder by the Engineer upon request.

The bid and all accompanying documents so required shall be signed by the bidder or its authorized representative before submission.

The proposal shall be filed at the place and within the time specified herein, and no proposal shall be accepted after such time. The time at which a proposal is filed with the Owner shall be time/date stamped or otherwise prominently noted on the proposal envelope.

Bid openings shall be conducted in accordance with the Construction Grants Policy Memorandum No. CG-13, "Bid Opening Procedures", issued by the Massachusetts Department of Environmental Protection and found in the Appendix. Attention shall be paid to the bid opening procedure described therein, particularly in regard to timeliness, bid security, bid signature, addenda and written dollar amounts.

Equal Opportunity Goal Compliance policy of the Town of Arlington contained in Title 1 Article 16 of the Bylaws of the Town of Arlington (found in the Appendix) is applicable to this Contract. The successful bidder shall comply with all applicable laws and regulations pertaining to nondiscrimination, equal opportunity and affirmative action, including without limitation executive orders and rules and regulations of federal and state agencies of competent jurisdiction.

A Performance Bond and a Labor and Materials Payment Bond by a company satisfactory to the Owner, each in an amount equal to one hundred (100) percent of the estimated total Contract Price recorded in the Proposal section of the Contract as executed, will be required from the successful bidder for the faithful performance of the Contract and as security for payment of all persons performing labor and furnishing materials in connection with this contract. The bonds shall be in accordance with the forms attached to the Contract Documents.

No bidder may withdraw his bid for a period of sixty (60) days (Saturday, Sunday and legal holidays excluded) after the date set for the opening thereof.

The estimated quantities involved in the Contract are shown in the Schedule of Prices in the Proposal, and the work is shown and the Contract requirements are stated in the Instructions to Bidders, Proposal, Agreement, Bonds, General Conditions, Supplementary Conditions, Specifications and the Drawings.

In the case of each proposal, the Owner reserves the right to satisfy itself as to the complete responsibility of the bidder, toward which object every bidder is required to furnish all information requested in the Proposal.

Notice of the acceptance of his proposal will be given to the successful bidder by the Owner by posting a registered letter to the bidder's address stated in said Proposal. If, within ten (10) days, Saturdays, Sundays, and legal holidays excluded, immediately after the receipt of notice, the successful bidder shall fail to deliver his bonds properly executed and his contract duly signed, in consideration of such failure the proposal and acceptance, at the option of the Owner, may become null and void and the bid security accompanying his proposal shall become the property of the Owner, which may proceed to accept another of the proposals.

The Contractor shall start work under this contract and shall continue it to completion with all practical dispatch and regularity. The work shall be started and completed within the times required by the Contract.

The sum of seven hundred and fifty (750) dollars is to be agreed upon as liquidated damages, and shall be paid by the Contractor to the Owner for each and every calendar day in which any work of this Contract is uncompleted after the times stipulated for such completion, and the prices bid shall be fixed with regard to this provision, and reductions for liquidated damages will be made from payments due the Contractor.

Workmen's compensation, property damage, public liability, Owner's protective liability, and fire and builder's risk and other insurance requirements are set forth in detail in the General Conditions and Supplementary Conditions.

Whenever it is written that an equipment manufacturer must have a specified period of experience with his product, equipment that does not meet the specified experience period can be considered if the equipment supplier or manufacturer is willing to provide a bond or cash deposit for the duration of the specified time period that will guarantee replacement of that equipment in the event of failure.

Minimum Wage Rates as determined by the Commissioner of the Department of Labor and Industries pursuant to the provisions of M.G.L. c. 149, §26 to 27D as amended, apply to this project. The Massachusetts Wage Determination is attached to these Specifications. It is the responsibility of the Contractor, before bid opening, to request, if necessary, any additional information on Massachusetts Wage Rates for those trades people who are not covered by the applicable Massachusetts Wage Decision, but who may be employed for the proposed work under this Contract.

The Contractor shall keep himself informed fully of, and comply with, all laws, ordinances, and regulations of the federal, state or municipal governments, water districts or other similar agencies that may be in force during the life of the Contract, in any manner affecting his employees or the conduct of work, or the materials used or employed in the work.

Any request from a prospective bidder for the interpretation of meaning of the Drawings, Specifications or other Contract Documents shall be made in writing to the Engineer, Fay, Spofford & Thorndike, LLC, 5 Burlington Woods, Burlington, Massachusetts 01803, and to be given consideration must be received at least ten (10) days prior to the date fixed for the opening of Proposals. Interpretations will be made by the Engineer as requested, and all interpretations will be made in the form of written addenda to the Contract Documents, which addenda will become a part of the Contract. Not later than three (3) days prior to the date fixed for the opening of proposals, the addenda will be faxed to all persons who obtain Contract Documents in the manner described in the Advertisement for Proposals. Failure of any bidder to receive any such addenda shall not relieve any bidder from any obligation under his proposal as submitted.

At the date fixed for the opening of bids, it will be presumed that each bidder has made an examination of the locations and sites of the work to be done under the Contract, has satisfied himself as to the actual conditions, requirements and quantities of work, and has read and become thoroughly familiar with the Contract Documents, including the Drawings, and all addenda to them, if any.

Contracts for work under this Proposal will obligate the Contractors and Subcontractors not to discriminate in employment practices.

Bidders must, if requested, submit a compliance report concerning their employment practices and policies in order to maintain their eligibility to receive the award of the Contract.

The failure or omission of any bidder to receive or examine and become familiar with any form, instrument or document shall in no way relieve the bidder of any obligation with respect to his Proposal.

The Owner reserves the right to waive any informalities in the bids, to reject any or all bids if it is in the public interest to do so. The Contract will be awarded to the lowest responsible and eligible bidder possessing the skill, ability and integrity necessary for the faithful performance of the work, and who shall certify that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work.

Bids for this project are subject to the provisions of M.G.L. C.30, §39M.

This project is subject to the Safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR Part 1926, and to the Massachusetts Department of Labor and Industries, Division of Industrial Safety "Rules and Regulations for the Prevention of Accidents in Construction Operations (Industrial Bulletin No. 12)" (Chapter 454 CMR 10.00, et seq.). Contractors shall be familiar with the requirements of these regulations.

As of July 1, 2006, under M.G.L. – Chapter 30, Section 39S, any person, submitting a bid for, or signing a contract to work on, the construction, reconstruction, alteration, remodeling or repair of any public work by the Commonwealth of Massachusetts/Town of Arlington, and estimated by the awarding Authority to cost more than \$10,000, shall certify on the Bid or Contract, under penalty of perjury, that all employees to be employed at the work will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration.

This project is subject to Chapter 30, Sect. 39L of the M.G.L., which states the following:

"The Commonwealth and every county, city, town, district, board, commission or other public body which, as the awarding authority, requests proposals, bids or sub-bids for any work in the construction, reconstruction, alteration, remodeling, repair or demolition of any public building or other public works (1) shall not enter into a contract for such work with, and shall not approve as a subcontractor furnishing labor and materials for a part of any such work, a foreign corporation which has not filed with such awarding authority a certificate of the state secretary stating that such corporation has complied with sections three and five of chapter one hundred and eighty-one and the date of such compliance, and (2) shall report to the state secretary and to the department of corporations and taxation any foreign corporation performing work under such contract or subcontract, and any person, other than a corporation, performing work under such contract or subcontract, and residing or having a principal place of business outside the Commonwealth".

Applicable provisions of Massachusetts General Laws and Regulations and/or the United States Code and Code of Federal Regulations govern this Contract, and any provision in violation of the foregoing shall be deemed null, void and of no effect.

Town of Arlington, Massachusetts

By

Adam W. Chapdelaine
Town Manager

PROPOSAL

To the Town of Arlington, Massachusetts, acting through its Town Manager, hereinafter called the Owner -

A. The undersigned proposes to furnish all labor and materials required for the construction of Sewer and Drain Improvements in the Ottoson Middle School Area, Bid No. 13-19, Arlington, Massachusetts, in accordance with the accompanying Drawings and Specifications, the Instructions to Bidders, and other Contract Documents bound herewith prepared by Fay, Spofford & Thorndike, LLC, Engineers, for the Estimated Total Contract Prices specified in the Schedule of Prices which follows, increased or decreased in a manner as provided for in the Contract.

The undersigned, hereinafter referred to as singular and masculine, declares that the only persons interested in this Proposal as principals are named herein as such that no official of the Owner and no person acting for or employed by the Owner is interested directly or indirectly in this Proposal, or in any contract that may be made under it, or in any expected profits to arise therefrom - that this Proposal is made in good faith, without fraud, collusion or connection with any other person bidding or refraining from bidding for the same work that he has examined carefully the said instructions and all other documents bound herewith, and the Drawings relating to the contract covered by this Proposal and hereby makes them part of this Proposal; that he has informed himself fully in regard to all conditions pertaining to the work and the place where it is to be done; and that he has made his own examination and estimates of cost and from them makes this Proposal.

The undersigned proposes and agrees that if, within sixty (60) days (Saturdays, Sundays and legal holidays excluded) after the date named in the Instructions to Bidders as that for submitting this Proposal to the Owner, notice that this Proposal has been accepted by the Owner shall be mailed to him at the business address given herein, he will, on one of the ten (10) days, Saturdays, Sundays, and legal holidays excluded, immediately following receipt of such notice of Acceptance of this Proposal, appear at the office of the Purchasing Agent, Town Hall, Arlington, Massachusetts, and deliver to that office a Contract, together with Performance Bond and Labor and Material Payment Bond furnished by a company satisfactory to the Owner, which Contract and Bonds shall be executed in the forms annexed hereto, and which Contract shall provide that the Owner, as full compensation for doing and completing the work of carrying out the requirements of the Agreement, General Conditions, Supplementary Conditions, Specifications and Drawings, including everything furnished or done and for every injury or loss sustained by the Contractor in carrying on the Contract, and for any liability of any nature arising under the Contract, shall pay the Contractor the unit prices and lump sums that he has recorded in the Proposal, or such unit prices and lump sums increased or decreased in a manner as provided for in the Contract.

The undersigned also agrees that the bid security, in the amount of five percent of the value of the bid, which accompanies this Proposal shall become the property of the Owner as compensation for damage suffered by said Owner should the undersigned fail to execute the said Contract and Bonds if notified, as specified above, that this Proposal has been accepted. But if this Proposal is not accepted by the Owner, as specified above, within sixty (60) days of the date set for the submission of the Proposal, (not including Saturdays, Sundays and legal holidays), or if the notice of acceptance is received by the undersigned and he complies with the requirements as to execution of the Contract and Bonds, then the bid security referred to will be returned to him.

The undersigned understands that it is the intention of the Owner not to award a contract for this work under this or any other Proposal if the bidder cannot furnish satisfactory evidence that he has the ability and experience to perform this class of work and that he has sufficient capital and equipment to enable him to prosecute the work successfully and to complete it within the time named in the Contract, and that the Owner reserves the right to reject this or any other Proposal, or to award the Contract as is deemed to be in the best interest of the Owner. The undersigned understands further that the quantities given in the Schedule of Prices in this Proposal are approximate only and are given as a basis for the comparison of the Proposal - that the Owner does not agree, expressly or by implication, that the actual amount of work will correspond even approximately therewith, but reserves the right to increase or decrease the amount of any item of the work listed as may be found desirable or necessary during the carrying out of the construction work, and that the unit prices quoted in the Schedule of Prices shall apply without change to such variation in the quantity of each or all items.

That the Contractor shall give to the Owner, as liquidated damages, for each calendar day lost by the Contractor in the completion of the contract after the time herein stipulated, the sum of seven hundred and fifty (750) dollars.

The undersigned further agrees that he will, upon request, furnish in confidence such information as will enable the Owner to judge the financial responsibility of himself and his proposed subcontractors.

- B. This bid includes addenda numbered _____
- C. The Schedule of Prices referred to herein is as follows on pages 00339-3 and 4.
- D. The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work.
- E. The undersigned offers the following information as evidence of his qualifications to perform the work as bid upon according to all the requirements of the Drawings and Specifications.

SCHEDULE OF PRICES

ARLINGTON, MASSACHUSETTS

BID NO. 13-19 - SEWER AND DRAIN IMPROVEMENTS - OTTOSON MIDDLE SCHOOL AREA

ITEM NO.	ITEM OF WORK	ESTIMATED QUANTITIES	UNITS	UNIT PRICES BID		AMOUNTS*
				WORDS	FIGURES	
1	CHEMICAL ROOT CONTROL (6-INCH & 8-INCH SEWER)	673	L.F.			
2	CLEAN AND CCTV PIPE (6-INCH & 8-INCH SEWER)	212	L.F.			
3	FULL LENGTH CIPP LINING (6-INCH SEWER)	492	L.F.			
4	FULL LENGTH CIPP LINING (8-INCH SEWER)	451	L.F.			
5	FULL LENGTH CIPP LINING (18-INCH DRAIN)	281	L.F.			
6	FULL LENGTH CIPP LINING (24-INCH DRAIN)	286	L.F.			
7	INTERNAL POINT REPAIR CIPP LINER (18-INCH DRAIN)	2	L.F.			
8	REINSTATE SERVICE LATERALS	20	EACH			
9	EXCAVATE AND REPLACE PIPE (8-INCH SEWER)	60	L.F.			
10	TEST JOINTS (6-INCH SEWER)	20	EACH			
11	SEAL JOINTS (6-INCH SEWER)	12	EACH			
12	TEST JOINTS (8-INCH SEWER)	220	EACH			
13	SEAL JOINTS (8-INCH SEWER)	132	EACH			
14	REPLACE MANHOLE FRAME AND COVER	4	EACH			
15	REMOVE & RESET MANHOLE FRAME AND COVER	1	EACH			
16	REPAIR MANHOLE CORBEL	2	EACH			

SCHEDULE OF PRICES

ARLINGTON, MASSACHUSETTS

BID NO. 13-19 - SEWER AND DRAIN IMPROVEMENTS - OTTOSON MIDDLE SCHOOL AREA

ITEM NO.	ITEM OF WORK	ESTIMATED QUANTITIES	UNITS	UNIT PRICES BID		AMOUNTS*
				WORDS	FIGURES	
17	REBUILD MANHOLE SHELF/INVERT	5	EACH			
18	INSTALL PLUGS IN MANHOLE COVERS	7	COVER			
19	REPAIR MANHOLE SHELF/INVERT	7	EACH			
20	RESTORE PIPE OPENINGS IN MANHOLE	1	EACH			
21	CLEAN MANHOLE (WALLS / INVERT / PIPE CONNECTIONS)	11	EACH			
22	REPLACE PAVEMENT AROUND MANHOLE FRAME	24	S.Y.			
23	TEMPORARY BITUMINOUS CONCRETE PAVING	60	S.Y.			
24	PERMANENT BITUMINOUS CONCRETE PAVING	80	S.Y.			
25	MISCELLANEOUS & EXTRA EARTH EXCAVATION	25	S.Y.			
26	MOBILIZATION (Not to exceed 5% of total of Items 1 - 25)	LUMP SUM**				
TOTAL ESTIMATED BASE CONTRACT PRICE						

* The Bidder is requested to fill in the "Amounts"; in case of a discrepancy between Unit Price Bid written in words and Unit Price Bid written in figures, the Unit Price Bid written in words will govern; in case of a discrepancy between the Unit Prices Bid and Amounts, the Unit Prices Bid will govern.

** Write in figures the lump sum bid in the column headed "Amounts".

Important: The Contractor agrees to start work no later than 20 calendar days after executing the Contract, and to complete all work no later than 120 days after starting the work.

The names and addresses of all persons and parties interested in this Proposal as principals are as follows:

(Note: Give first and last names in full. In case of a corporation, give names of officers and directors. In case of a partnership, give names of all partners.)

The undersigned also agrees that all work to be performed by subcontractors and the sums to be paid the subcontractors for the same, by the Contractor, are as follows:

Description of Subcontract Work	Name and Address of Subcontractor	Unit Price	Amounts

The undersigned submits answers to the following questions to enable the Owner to judge of his experience and ability in, and facilities for the work proposed to be done.

1. The work, if awarded to you, will have the resident personal supervision of whom? State his or their special qualifications.

2. Describe equipment you propose to furnish-

(A) Owned Equipment

(B) Rented Equipment

3. How many years has your organization been in business as a general contractor under the name in which you propose to execute this contract?

4. What projects has your present organization completed of character similar to that proposed? Give the information indicated by the following tabulation:

<u>Name and Address of Owner for Whom Work Was Done</u>	<u>Work Done as Contractor or Subcon- tractor</u>	<u>Approx. Description of Work</u>	<u>Approx. Amount of Contract</u>	<u>Approx. Date of Work</u>	<u>Contract Name & Telephone No.</u>
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NOTE: Attach additional information sheets if needed.

5. Has your present organization ever failed to complete any work awarded to it? If so, state when, where, and why.

6. Give the name of one or more banks that have information that would enable them to advise regarding the financial ability of your company.

<u>Name of Bank</u>	<u>Address</u>	<u>Contact Person</u>	<u>Telephone No.</u>
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*IMPORTANT- Execute Acknowledgment of Officer or Agent who signs this document and attach Certificate of Clerk authorizing bid and execution by signing officers. (Use proper form on the next three pages).

(ACKNOWLEDGMENT OF PRINCIPAL, IF A CORPORATION)

STATE OF _____

SS _____

COUNTY OF _____

On this _____ day of _____, 2013, before me personally came and appeared _____ to me known, who, being by me duly sworn, did depose and say that he resides at _____, that he is the _____ of _____, the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that one of the impressions affixed to said instrument is an impression of such seal; that it was so affixed by order of the directors of said corporation, and that he signed his name thereto by like order.

(Notary Public)

(SEAL)

(ACKNOWLEDGMENT OF PRINCIPAL, IF A PARTNERSHIP)

STATE OF _____

SS _____

COUNTY OF _____

On this ____ day of _____, 2013, before me personally came and appeared _____ to me known and known to me to be one of the members of the firm of _____, described in and who executed the foregoing instrument, and he acknowledged to me that he executed the same as and for the act and deed of said firm.

(Notary Public)

(SEAL)

(ACKNOWLEDGEMENT OF PRINCIPAL, IF AN INDIVIDUAL)

STATE OF _____

SS _____

COUNTY OF _____

On this _____ day of _____, 2013, before me personally came and appeared _____, to me known and known to me to be the person described in and who executed the foregoing instrument and acknowledged that he executed the same.

(Notary Public)

(SEAL)

CERTIFICATION OF BID

The bidder by signing the bid, or contract, under penalties of perjury certifies (1) that he is able to furnish labor that can work in harmony with other elements of labor employed or to be employed on the work site; (2) that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work, and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and (3) that all employees to be employed in the work subject to this bid 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. Any employee found on a worksite subject to this section without documentation of successful completion of 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 shall be subject to immediate removal.

(Date)

(Name of General Bidder)

By: _____
(Signature)

(Name & Title of person signing bid)

(Business Address) (City, State, Zip)

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.

(Signature of individual submitting bid or proposal)

(Name of individual submitting bid or proposal)

Name of Business

Date

Pursuant to M.G.L. Chapter 62C, Section 49A, I certify under the penalties of perjury that I have complied with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

Social Security Number or
Federal Identification Number

Signature of Individual or
Responsible Corporate Officer and Title

**NON-COLLUSION FORMS
MUST BE SIGNED AND
SUBMITTED WITH BID**

CERTIFICATION AS TO COMPLIANCE WITH TAX LAWS

I, _____

_____ of, _____

_____ Corporation, and an officer authorized so to do, certify under the pains and penalties of perjury that said corporation has compiled with all the laws of the Commonwealth relating to taxes.

Contractor
By

Signature

Name

Title

Company Name

Date

Attachment A-1

A. Contractor's Certification

A contractor will not be eligible for award of a contract unless such contractor has submitted the following certification, which is deemed a part of the resulting contract:

CONTRACTOR'S CERTIFICATION

Name of the General Contractor

certifies that:

1. It intends to use the following listed construction trades in the work under contract:

2. Will comply with the minority workforce ratio and specific affirmative action steps contained herein; and

3. Will obtain from each of its subcontractors and submit to the contracting or administering agency prior to the award of any subcontract under this contract the subcontractor's certification required by these bid conditions.

Signature of Authorized
Representative of Contractor

** END OF SECTION **

BID BOND

Know all men by these presents, that we, the undersigned, _____ as principal, and _____ as surety, are hereby held and firmly bound unto the Town of Arlington, Massachusetts, in the sum of _____ dollars, lawful money of the United States, as liquidated damages for the payment of which sum, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

Signed this _____ day of _____, 2013.

The condition of the above obligation is such that whereas the principal as submitted to the Town of Arlington a certain bid (Proposal), attached hereto and hereby made a part hereof, to enter into a contract in writing for construction of Sewer and Drain Improvements for Ottoson Middle School Area, Bid No. 13-19, for a complete installation.

Now, therefore,

(A) If said bid shall be rejected, or, in the alternate,

(B) If said bid shall be accepted and the principal shall execute and deliver a contract in the form of contract attached hereto (properly completed in accordance with said bid) and shall furnish a bond for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said bid, then this obligation shall be void, otherwise, the same shall remain in force and effect, it being expressly understood and agreed that the liability of the surety for any and all claims hereunder shall, in no event, exceed the amount of this obligation as herein stated.

The surety, for value received, hereby stipulates and agrees that the obligations of said surety and its bond shall be in no way impaired or affected by any extension of the time within which the principal may accept such bid, and said surety does hereby waive notice of any such extension.

In witness whereof, the principal and the surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed, and these presents to be signed by their proper officers, the day and year first set forth above.

_____(L.S.)
Principal

By_____

Surety

*By_____

(Seal)

*IMPORTANT - Furnish proof of authority of officers or agents of surety to execute this document.

** END OF SECTION **

AGREEMENT

This Agreement, made and executed this ____ day of _____ in the year Two Thousand and Thirteen, by and between the Town of Arlington, Massachusetts, a municipality located within the County of Middlesex in the Commonwealth of Massachusetts, and without personal liability for the individuals signatory hereto, said Town of Arlington, being herein termed the Owner, party of the first part, and _____ of _____ hereinafter termed the Contractor, party of the second part.

Witnesseth, that the parties to this agreement each in consideration of the agreements on the part of the other herein contained have agreed, and by these presents do hereby agree, the Owner for itself, and the Contractor for himself and his heirs, executors, administrators, successors and assigns as follows:

That the Contract Documents consisting of this Agreement, together with the Instructions to Bidders, Proposal, Schedule of Prices, Bonds, General Conditions, Supplementary Conditions and Specifications, hereto attached, the Drawings referred to herein and in the Specifications, and any addenda issued before execution of the Agreement, form the Contract;

That the Contractor has informed himself fully in regard to all conditions pertaining to the place where the work is to be done and other circumstances affecting the work;

That the Contractor has obtained all the information he needs to enable him to estimate fully and fairly the costs of the work herein contemplated;

That the Contractor shall furnish all plant, labor, materials, supplies, tools, equipment and other facilities and things necessary or proper for, or incidental to, the complete construction of the SEWER AND DRAIN IMPROVEMENTS FOR OTTOSON MIDDLE SCHOOL AREA – BID # 13-19, for the party of the first part in accordance with this Contract, commencing the work within the time interval stated in the Schedule of Prices, provided that he shall have been notified by the Owner so to do, and completing everything required of him under this Contract not later than the time stated in the Contract;

That the Owner shall pay and the Contractor shall receive, as full compensation for fulfilling everything required of the Contractor under this Contract, the unit prices and lump sums recorded in the Schedule of Prices in the Proposal;

That the quantities shown in the Schedule of Prices in the Proposal are approximate only and are solely for the purpose of facilitating the comparison of proposals; that the Owner shall not be held responsible if these quantities are not even approximately correct; that for all work upon which unit prices and lump sums are quoted, the Contractor's compensation shall be computed upon the work actually performed, measured by the units of measurements specified, whether greater or less than the quantities shown in the Schedule of Prices, and that the unit prices set against the several work items cover all incidental services required of the Contractor under the Contract;

That the Contractor shall give to the Owner, as liquidated damages, for each calendar day lost by the Contractor in the completion of the work of the Contract after the time herein stipulated, the sum of seven hundred and fifty (750) dollars per day; and

That the Drawings are prints, as listed in the Specifications, two (2) Drawings in a set, and that an official set, in which each print is marked "Original Contract Drawing", has been received by each of the parties hereto.

The work of this Contract shall be started upon notice to proceed and shall be completed within one hundred and twenty (120) calendar days after the date of notice to proceed.

As per Construction Grants Policy Memorandum No. 10, the agreed upon overhead and profit direct labor percentage for change orders shall be 15 percent.

Women Work Force Participation policy of the Town of Arlington contained in Title 1 Article 16 of the Bylaws of the Town of Arlington (found in the Appendix) are applicable to this Contract. The Contractor shall comply with all applicable laws and regulations pertaining to nondiscrimination, equal opportunity and affirmative action, including without limitation executive orders and rules and regulations of federal and state agencies of competent jurisdiction.

The Contractor shall not discriminate against or exclude any person from participation herein on grounds of race, religion, color, sex, age, or national origin; and that it shall take affirmative actions to insure that applicants are employed, and that employees are treated during their employment, without regard to race, religion, color, sex, age, handicapped status, or national origin.

The Contractor shall not participate in or cooperate with an international boycott, as defined in Section 999 (b) (3) and (4) of the Internal Revenue code of 1954, as amended, or engage in conduct declared to be unlawful by Section 2 of Chapter 151E of the Massachusetts General Laws.

Signed, sealed and delivered in quadruplicate the day and year first above written.

Town of Arlington, Massachusetts

By _____
Adam W. Chapdelaine
Town Manager

Contractor

By _____

Name & Title
(Seal)

Approved as to Form

Town Counsel

I hereby certify that the Town of Arlington, Massachusetts has adequate appropriation pursuant to M.G.L. c.44, s.31c.

By _____
Town Accountant

Important – Attach herewith Proof of Authority of officers or agents to sign this document.

** END OF SECTION **

PERFORMANCE BOND

Know all men by these presents,

That we, _____,

organized under the laws of the State of _____,

and having a usual place of business in _____,

_____, as principal, and _____,

organized under the laws of the State of _____,

and having a usual place of business at _____

as surety, are holden and stand firmly bound and obligated unto the Town of Arlington,

Massachusetts, as obligee, in the _____

sum of _____

_____ dollars, lawful money of the United States of America, to and for the true payment whereof, we hereby bind ourselves, and each of us, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Whereas, the said principal has, by means of a written Agreement, dated _____, entered into a Contract with the same obligee for the construction of Sewer and Drain Improvements, Ottoson Middle School Area, Bid No. 13-19, a copy of which Agreement is attached hereto and by reference made a part hereof.

Now, the condition of this obligation is such

That, if the said principal, his heirs, administrators, successors or assigns, shall well and truly keep and perform all the agreements, terms and conditions of said Agreement on his part to be kept and performed, including the guarantee in the General Conditions, then this obligation shall be void; otherwise, it shall remain in full force and virtue.

And the said surety, for value received, hereby stipulates and agrees that no change in, or extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder, or to the Specifications accompanying the same shall in any wise affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the Specifications.

In witness whereof, we have hereunto set our hands and seals

this _____ day of _____ in the year Two Thousand and Thirteen.

Principal

(Seal)

By

Surety

By

(Seal)

IMPORTANT - Attach herewith proof of authority
of officers or agents to sign bonds.

** END OF SECTION **

LABOR AND MATERIAL PAYMENT BOND

Know all men by these presents,

That we, _____, organized under the laws of the State of _____, and having a usual place of business in _____, as principal, and _____ organized under the laws of the State of _____, and having a usual place of business at _____ as surety, are holden and stand firmly bound and obligated unto the Town of Arlington, Massachusetts, as obligee, in the sum of _____ (\$ _____) dollars, lawful money of the United States of America to and for the true payment whereof, we hereby bind ourselves, and each of us, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Whereas, the said principal has, by means of a written agreement, dated _____, 2013 entered into a contract with the same obligee for the construction of Sewer and Drain Improvements, Ottoson Middle School, and appurtenant work, Bid No. 13-19, a copy of which agreement is attached hereto and by reference made a part hereof.

Now, the condition of this obligation is such that, if the said principal, his heirs, administrators, successors, or assigns, shall pay for all labor performed or furnished, all materials, including material so employed that is not incorporated in the construction or repair work and is not wholly or necessarily consumed or made so worthless as to lose its identity, but only to the extent of its purchase price less its fair salvage value, and for the rental or hire of vehicles, power shovels, rollers, concrete mixers, tools and other appliances and equipment employed in the work, all persons who contract with the principal for labor and materials, all insurance premiums on said work, and for the use of all patent rights, used or employed in the carrying out of said Agreement, then this obligation shall be void; otherwise it shall remain in full force and virtue. The obligation shall be in accordance with the Massachusetts General Laws, Chapter 149, Section 29 and Chapter 30, Section 39A.

And the said surety, for value received, hereby stipulates and agrees that no change in, or extension of, time, alteration or addition to the terms of the Contract or to the work to be performed thereunder, or to the Specifications accompanying the same shall in any wise affect its

obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the Specifications.

And that no final settlement between the Owner and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

In witness whereof, we have hereunto set our hands and seals this ____ day of _____ in the year Two Thousand and Thirteen.

Principal

(Seal)

By

Surety

By

(Seal)

IMPORTANT - Attach herewith proof of authority of officers or agents to sign bonds.

** END OF SECTION **

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the Controlling Law.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and



AMERICAN CONSULTING
ENGINEERS COUNCIL

Issued and Published Jointly By



**National Society of
Professional Engineers**
Professional Engineers in Private Practice



AMERICAN SOCIETY OF
CIVIL ENGINEERS

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
a practice division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

AMERICAN CONSULTING ENGINEERS COUNCIL

AMERICAN SOCIETY OF CIVIL ENGINEERS

This document has been approved and endorsed by

The Associated General



Contractors of America

Construction Specifications Institute



These General Conditions have been prepared for use with the Owner-Contractor Agreements (No. 1910-8-A-1 or 1910-8-A-2) (1996 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the EJCDC User's Guide (No. 1910-50). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. 1910-17) (1996 Edition).

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GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Contract Documents and printed with initial or all capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof.

1. *Addenda*--Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the Contract Documents.

2. *Agreement*--The written instrument which is evidence of the agreement between OWNER and CONTRACTOR covering the Work.

3. *Application for Payment*--The form acceptable to ENGINEER which is to be used by CONTRACTOR during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*--Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*--The offer or proposal of a bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidding Documents*--The Bidding Requirements and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

7. *Bidding Requirements*--The Advertisement or Invitation to Bid, Instructions to Bidders, Bid security form, if any, and the Bid form with any supplements.

8. *Bonds*--Performance and payment bonds and other instruments of security.

9. *Change Order*--A document recommended by ENGINEER which is signed by CONTRACTOR and OWNER and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the

Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*--A demand or assertion by OWNER or CONTRACTOR seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*--The entire and integrated written agreement between the OWNER and CONTRACTOR concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*--The Contract Documents establish the rights and obligations of the parties and include the Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR's Bid (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Notice to Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all Written Amendments, Change Orders, Work Change Directives, Field Orders, and ENGINEER's written interpretations and clarifications issued on or after the Effective Date of the Agreement. Approved Shop Drawings and the reports and drawings of subsurface and physical conditions are not Contract Documents. Only printed or hard copies of the items listed in this paragraph are Contract Documents. Files in electronic media format of text, data, graphics, and the like that may be furnished by OWNER to CONTRACTOR are not Contract Documents.

13. *Contract Price*--The moneys payable by OWNER to CONTRACTOR for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*--The number of days or the dates stated in the Agreement to: (i) achieve Substantial Completion; and (ii) complete the Work so that it is ready for final payment as evidenced by ENGINEER's written recommendation of final payment.

15. *CONTRACTOR*--The individual or entity with whom OWNER has entered into the Agreement.

16. *Cost of the Work*--See paragraph 11.01.A for definition.

17. *Drawings*--That part of the Contract Documents prepared or approved by ENGINEER which graphically shows the scope, extent, and character of the Work to be performed by CONTRACTOR. Shop Drawings and other CONTRACTOR submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*--The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *ENGINEER*--The individual or entity named as such in the Agreement.

20. *ENGINEER's Consultant*--An individual or entity having a contract with ENGINEER to furnish services as ENGINEER's independent professional associate or consultant with respect to the Project and who is identified as such in the Supplementary Conditions.

21. *Field Order*--A written order issued by ENGINEER which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

22. *General Requirements*--Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

23. *Hazardous Environmental Condition*--The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

24. *Hazardous Waste*--The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

25. *Laws and Regulations; Laws or Regulations*--Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

26. *Liens*--Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

27. *Milestone*--A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

28. *Notice of Award*--The written notice by OWNER to the apparent successful bidder stating that upon timely compliance by the apparent successful bidder with the conditions precedent listed therein, OWNER will sign and deliver the Agreement.

29. *Notice to Proceed*--A written notice given by OWNER to CONTRACTOR fixing the date on which the Contract Times will commence to run and on which CONTRACTOR shall start to perform the Work under the Contract Documents.

30. *OWNER*--The individual, entity, public body, or authority with whom CONTRACTOR has entered into the Agreement and for whom the Work is to be performed.

31. *Partial Utilization*--Use by OWNER of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.

32. *PCBs*--Polychlorinated biphenyls.

33. *Petroleum*--Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

34. *Project*--The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part as may be indicated elsewhere in the Contract Documents.

35. *Project Manual*--The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

36. *Radioactive Material*--Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

37. *Resident Project Representative*--The authorized representative of ENGINEER who may be assigned to the Site or any part thereof.

38. *Samples*--Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

39. *Shop Drawings*--All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for CONTRACTOR and submitted by CONTRACTOR to illustrate some portion of the Work.

40. *Site*--Lands or areas indicated in the Contract Documents as being furnished by OWNER upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by OWNER which are designated for the use of CONTRACTOR.

41. *Specifications*--That part of the Contract Documents consisting of written technical descriptions of materials, equipment, systems, standards, and workmanship as applied to the Work and certain administrative details applicable thereto.

42. *Subcontractor*--An individual or entity having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the Site.

43. *Substantial Completion*--The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of ENGINEER, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

44. *Supplementary Conditions*--That part of the Contract Documents which amends or supplements these General Conditions.

45. *Supplier*--A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with CONTRACTOR or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by CONTRACTOR or any Subcontractor.

46. *Underground Facilities*--All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases,

steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

47. *Unit Price Work*--Work to be paid for on the basis of unit prices.

48. *Work*--The entire completed construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

49. *Work Change Directive*--A written statement to CONTRACTOR issued on or after the Effective Date of the Agreement and signed by OWNER and recommended by ENGINEER ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

50. *Written Amendment*--A written statement modifying the Contract Documents, signed by OWNER and CONTRACTOR on or after the Effective Date of the Agreement and normally dealing with the nonengineering or nontechnical rather than strictly construction-related aspects of the Contract Documents.

1.02 Terminology

A. Intent of Certain Terms or Adjectives

1. Whenever in the Contract Documents the terms "as allowed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of ENGINEER as to the Work, it is intended that such action or determination will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The

use of any such term or adjective shall not be effective to assign to ENGINEER any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.10 or any other provision of the Contract Documents.

B. *Day*

1. The word "day" shall constitute a calendar day of 24 hours measured from midnight to the next midnight.

C. *Defective*

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it does not conform to the Contract Documents or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents, or has been damaged prior to ENGINEER's recommendation of final payment (unless responsibility for the protection thereof has been assumed by OWNER at Substantial Completion in accordance with paragraph 14.04 or 14.05).

D. *Furnish, Install, Perform, Provide*

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of CONTRACTOR, "provide" is implied.

E. Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 - PRELIMINARY MATTERS

2.01 *Delivery of Bonds*

A. When CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds as CONTRACTOR may be required to furnish.

2.02 *Copies of Documents*

A. OWNER shall furnish to CONTRACTOR up to ten copies of the Contract Documents. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

A. CONTRACTOR shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

A. *CONTRACTOR's Review of Contract Documents:* Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. CONTRACTOR shall promptly report in writing to ENGINEER any conflict, error, ambiguity, or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless CONTRACTOR knew or reasonably should have known thereof.

B. *Preliminary Schedules:* Within ten days after the Effective Date of the Agreement (unless otherwise specified

in the General Requirements), CONTRACTOR shall submit to ENGINEER for its timely review:

1. a preliminary progress schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

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

3. a preliminary schedule of values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

C. *Evidence of Insurance:* Before any Work at the Site is started, CONTRACTOR and OWNER shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which CONTRACTOR and OWNER respectively are required to purchase and maintain in accordance with Article 5.

2.06 *Preconstruction Conference*

A. Within 20 days after the Contract Times start to run, but before any Work at the Site is started, a conference attended by CONTRACTOR, ENGINEER, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in paragraph 2.05.B, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.07 *Initial Acceptance of Schedules*

A. Unless otherwise provided in the Contract Documents, at least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, ENGINEER, and others as appropriate will be held to review for acceptability to ENGINEER as provided below the schedules submitted in accordance with paragraph 2.05.B. CONTRACTOR shall have an additional ten days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to CONTRACTOR until acceptable schedules are submitted to ENGINEER.

1. The progress schedule will be acceptable to ENGINEER if it provides an orderly progression of the Work to completion within any specified Milestones and the Contract Times. Such acceptance will not impose on ENGINEER responsibility for the progress schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve CONTRACTOR from CONTRACTOR's full responsibility therefor.

2. CONTRACTOR's schedule of Shop Drawing and Sample submittals will be acceptable to ENGINEER if it provides a workable arrangement for reviewing and processing the required submittals.

3. CONTRACTOR's schedule of values will be acceptable to ENGINEER as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to OWNER.

C. Clarifications and interpretations of the Contract Documents shall be issued by ENGINEER as provided in Article 9.

3.02 *Reference Standards*

A. *Standards, Specifications, Codes, Laws, and Regulations*

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids),

except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of OWNER, CONTRACTOR, or ENGINEER, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall any such provision or instruction be effective to assign to OWNER, ENGINEER, or any of ENGINEER's Consultants, agents, or employees any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 Reporting and Resolving Discrepancies

A. Reporting Discrepancies

1. If, during the performance of the Work, CONTRACTOR discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, CONTRACTOR shall report it to ENGINEER in writing at once. CONTRACTOR shall not proceed with the Work affected thereby (except in an emergency as required by paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in paragraph 3.04; provided, however, that CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any such conflict, error, ambiguity, or discrepancy unless CONTRACTOR knew or reasonably should have known thereof.

B. Resolving Discrepancies

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

a. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 Amending and Supplementing Contract Documents

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways: (i) a Written Amendment; (ii) a Change Order; or (iii) a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways: (i) a Field Order; (ii) ENGINEER's approval of a Shop Drawing or Sample; or (iii) ENGINEER's written interpretation or clarification.

3.05 Reuse of Documents

A. CONTRACTOR and any Subcontractor or Supplier or other individual or entity performing or furnishing any of the Work under a direct or indirect contract with OWNER: (i) shall not have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of ENGINEER or ENGINEER's Consultant, including electronic media editions; and (ii) shall not reuse any of such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of OWNER and ENGINEER and specific written verification or adaption by ENGINEER. This prohibition will survive final payment, completion, and acceptance of the Work, or termination or completion of the Contract. Nothing herein shall preclude CONTRACTOR from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS

4.01 Availability of Lands

A. OWNER shall furnish the Site. OWNER shall notify CONTRACTOR of any encumbrances or restrictions not of general application but specifically related to use of the Site with which CONTRACTOR must comply in performing the Work. OWNER will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If CONTRACTOR and OWNER are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in OWNER's furnishing the Site, CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.

B. Upon reasonable written request, OWNER shall furnish CONTRACTOR with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and OWNER's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that ENGINEER has used in preparing the Contract Documents; and

2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that ENGINEER has used in preparing the Contract Documents.

B. *Limited Reliance by CONTRACTOR on Technical Data Authorized:* CONTRACTOR may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," CONTRACTOR may not rely upon or make any Claim against OWNER, ENGINEER, or any of ENGINEER's Consultants with respect to:

1. the completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by CONTRACTOR, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any CONTRACTOR interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If CONTRACTOR believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which CONTRACTOR is entitled to rely as provided in paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by paragraph 6.16.A), notify OWNER and ENGINEER in writing about such condition. CONTRACTOR shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *ENGINEER's Review:* After receipt of written notice as required by paragraph 4.03.A, ENGINEER will promptly review the pertinent condition, determine the necessity of OWNER's obtaining additional exploration or tests with respect thereto, and advise OWNER in writing (with a copy to CONTRACTOR) of ENGINEER's findings and conclusions.

C. *Possible Price and Times Adjustments*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in CONTRACTOR's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must meet any one or more of the categories described in paragraph 4.03.A; and

b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of paragraphs 9.08 and 11.03.

2. CONTRACTOR shall not be entitled to any adjustment in the Contract Price or Contract Times if:

a. CONTRACTOR knew of the existence of such conditions at the time CONTRACTOR made a final commitment to OWNER in respect of Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for CONTRACTOR prior to CONTRACTOR's making such final commitment; or

c. CONTRACTOR failed to give the written notice within the time and as required by paragraph 4.03.A.

3. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in paragraph 10.05. However, OWNER, ENGINEER, and ENGINEER's Consultants shall not be liable to CONTRACTOR for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by CONTRACTOR on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated*: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to OWNER or ENGINEER by the owners of such Underground Facilities, including OWNER, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. OWNER and ENGINEER shall not be responsible for the accuracy or completeness of any such information or data; and

2. the cost of all of the following will be included in the Contract Price, and CONTRACTOR shall have full responsibility for:

a. reviewing and checking all such information and data,

b. locating all Underground Facilities shown or indicated in the Contract Documents,

c. coordination of the Work with the owners of such Underground Facilities, including OWNER, during construction, and

d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to OWNER and ENGINEER. ENGINEER will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, CONTRACTOR shall be responsible for the safety and protection of such Underground Facility.

2. If ENGINEER concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that CONTRACTOR did not know of and could not reasonably have been expected to be aware of or to have anticipated. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, OWNER or CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.

4.05 *Reference Points*

A. OWNER shall provide engineering surveys to establish reference points for construction which in ENGINEER's judgment are necessary to enable CONTRACTOR to proceed with the Work. CONTRACTOR shall be responsible for laying out the Work, shall protect and preserve the established reference points and property

monuments, and shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to ENGINEER whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 Hazardous Environmental Condition at Site

A. *Reports and Drawings:* Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the ENGINEER in the preparation of the Contract Documents.

B. *Limited Reliance by CONTRACTOR on Technical Data Authorized:* CONTRACTOR may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," CONTRACTOR may not rely upon or make any Claim against OWNER, ENGINEER or any of ENGINEER's Consultants with respect to:

1. the completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
3. any CONTRACTOR interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

C. CONTRACTOR shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. CONTRACTOR shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by CONTRACTOR, Subcontractors, Suppliers, or anyone else for whom CONTRACTOR is responsible.

D. If CONTRACTOR encounters a Hazardous Environmental Condition or if CONTRACTOR or anyone for whom CONTRACTOR is responsible creates a Hazardous

Environmental Condition, CONTRACTOR shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by paragraph 6.16); and (iii) notify OWNER and ENGINEER (and promptly thereafter confirm such notice in writing). OWNER shall promptly consult with ENGINEER concerning the necessity for OWNER to retain a qualified expert to evaluate such condition or take corrective action, if any.

E. CONTRACTOR shall not be required to resume Work in connection with such condition or in any affected area until after OWNER has obtained any required permits related thereto and delivered to CONTRACTOR written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If OWNER and CONTRACTOR cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by CONTRACTOR, either party may make a Claim therefor as provided in paragraph 10.05.

F. If after receipt of such written notice CONTRACTOR does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then OWNER may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If OWNER and CONTRACTOR cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in paragraph 10.05. OWNER may have such deleted portion of the Work performed by OWNER's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, OWNER shall indemnify and hold harmless CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants and the officers, directors, partners, employees, agents, other consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by CONTRACTOR or by anyone for whom CONTRACTOR is responsible. Nothing

in this paragraph 4.06.E shall obligate OWNER to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, other consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by CONTRACTOR or by anyone for whom CONTRACTOR is responsible. Nothing in this paragraph 4.06.F shall obligate CONTRACTOR to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

I. The provisions of paragraphs 4.02, 4.03, and 4.04 are not intended to apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 - BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. CONTRACTOR shall furnish performance and payment Bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Contract Documents.

B. All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.

C. If the surety on any Bond furnished by CONTRACTOR is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements

of paragraph 5.01.B, CONTRACTOR shall within 20 days thereafter substitute another Bond and surety, both of which shall comply with the requirements of paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

A. All Bonds and insurance required by the Contract Documents to be purchased and maintained by OWNER or CONTRACTOR shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue Bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. CONTRACTOR shall deliver to OWNER, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by OWNER or any other additional insured) which CONTRACTOR is required to purchase and maintain. OWNER shall deliver to CONTRACTOR, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by CONTRACTOR or any other additional insured) which OWNER is required to purchase and maintain.

5.04 *CONTRACTOR's Liability Insurance*

A. CONTRACTOR shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from CONTRACTOR's performance of the Work and CONTRACTOR's other obligations under the Contract Documents, whether it is to be performed by CONTRACTOR, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
2. claims for damages because of bodily injury, occupational sickness or disease, or death of CONTRACTOR's employees;
3. claims for damages because of bodily injury, sickness or disease, or death of any person other than CONTRACTOR's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained: (i) by any person as a result of an offense directly or indirectly related to the employment of such person by CONTRACTOR, or (ii) by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance so required by this paragraph 5.04 to be purchased and maintained shall:

1. with respect to insurance required by paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insureds (subject to any customary exclusion in respect of professional liability) OWNER, ENGINEER, ENGINEER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include completed operations insurance;

4. include contractual liability insurance covering CONTRACTOR's indemnity obligations under paragraphs 6.07, 6.11, and 6.20;

5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least thirty days prior written notice has been given to OWNER and CONTRACTOR and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the CONTRACTOR pursuant to paragraph 5.03 will so provide);

6. remain in effect at least until final payment and at all times thereafter when CONTRACTOR may be

correcting, removing, or replacing defective Work in accordance with paragraph 13.07; and

7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment (and CONTRACTOR shall furnish OWNER and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to OWNER and any such additional insured of continuation of such insurance at final payment and one year thereafter).

5.05 *OWNER's Liability Insurance*

A. In addition to the insurance required to be provided by CONTRACTOR under paragraph 5.04, OWNER, at OWNER's option, may purchase and maintain at OWNER's expense OWNER's own liability insurance as will protect OWNER against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

A. Unless otherwise provided in the Supplementary Conditions, OWNER shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an additional insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by OWNER prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by ENGINEER;

5. allow for partial utilization of the Work by OWNER;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by OWNER, CONTRACTOR, and ENGINEER with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.

B. OWNER shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to OWNER and CONTRACTOR and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with paragraph 5.07.

D. OWNER shall not be responsible for purchasing and maintaining any property insurance specified in this paragraph 5.06 to protect the interests of CONTRACTOR, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by CONTRACTOR, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If CONTRACTOR requests in writing that other special insurance be included in the property insurance policies provided under paragraph 5.06, OWNER shall, if possible, include such insurance, and the cost thereof will be charged to CONTRACTOR by appropriate Change Order or Written Amendment. Prior to commencement of the Work

at the Site, OWNER shall in writing advise CONTRACTOR whether or not such other insurance has been procured by OWNER.

5.07 Waiver of Rights

A. OWNER and CONTRACTOR intend that all policies purchased in accordance with paragraph 5.06 will protect OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. OWNER and CONTRACTOR waive all rights against each other and their respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, ENGINEER, ENGINEER's Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by OWNER as trustee or otherwise payable under any policy so issued.

B. OWNER waives all rights against CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to OWNER's property or the Work caused by, arising out of, or resulting from fire or other peril whether or not insured by OWNER; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by OWNER during partial utilization pursuant to paragraph 14.05, after Substantial Completion

pursuant to paragraph 14.04, or after final payment pursuant to paragraph 14.07.

C. Any insurance policy maintained by OWNER covering any loss, damage or consequential loss referred to in paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against CONTRACTOR, Subcontractors, ENGINEER, or ENGINEER's Consultants and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

A. Any insured loss under the policies of insurance required by paragraph 5.06 will be adjusted with OWNER and made payable to OWNER as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of paragraph 5.08.B. OWNER shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order or Written Amendment.

B. OWNER as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to OWNER's exercise of this power. If such objection be made, OWNER as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, OWNER as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, OWNER as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either OWNER or CONTRACTOR has any objection to the coverage afforded by or other provisions of the Bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by paragraph 2.05.C. OWNER and CONTRACTOR shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the Bonds and insurance required

of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent Bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If OWNER finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. CONTRACTOR shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction, but CONTRACTOR shall not be responsible for the negligence of OWNER or ENGINEER in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents. CONTRACTOR shall be responsible to see that the completed Work complies accurately with the Contract Documents.

B. At all times during the progress of the Work, CONTRACTOR shall assign a competent resident superintendent thereto who shall not be replaced without written notice to OWNER and ENGINEER except under extraordinary circumstances. The superintendent will be CONTRACTOR's representative at the Site and shall have authority to act on behalf of CONTRACTOR. All communications given to or received from the superintendent shall be binding on CONTRACTOR.

6.02 *Labor; Working Hours*

A. CONTRACTOR shall provide competent, suitably qualified personnel to survey, lay out, and construct the Work as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday, or any legal holiday without OWNER's written consent (which will not be unreasonably withheld) given after prior written notice to ENGINEER.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the General Requirements, CONTRACTOR shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of OWNER. If required by ENGINEER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

A. CONTRACTOR shall adhere to the progress schedule established in accordance with paragraph 2.07 as it may be adjusted from time to time as provided below.

1. CONTRACTOR shall submit to ENGINEER for acceptance (to the extent indicated in paragraph 2.07) proposed adjustments in the progress schedule that will not result in changing the Contract Times (or Milestones). Such adjustments will conform generally to the progress schedule then in effect and additionally will comply with

any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the progress schedule that will change the Contract Times (or Milestones) shall be submitted in accordance with the requirements of Article 12. Such adjustments may only be made by a Change Order or Written Amendment in accordance with Article 12.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to ENGINEER for review under the circumstances described below.

1. "Or-Equal" Items: If in ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by ENGINEER as an "or-equal" item, in which case review and approval of the proposed item may, in ENGINEER's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment ENGINEER determines that: (i) it is at least equal in quality, durability, appearance, strength, and design characteristics; (ii) it will reliably perform at least equally well the function imposed by the design concept of the completed Project as a functioning whole, and;

b. CONTRACTOR certifies that: (i) there is no increase in cost to the OWNER; and (ii) it will conform substantially, even with deviations, to the detailed requirements of the item named in the Contract Documents.

2. *Substitute Items*

a. If in ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR does not qualify as an "or-equal" item under

paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. CONTRACTOR shall submit sufficient information as provided below to allow ENGINEER to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by ENGINEER from anyone other than CONTRACTOR.

c. The procedure for review by ENGINEER will be as set forth in paragraph 6.05.A.2.d, as supplemented in the General Requirements and as ENGINEER may decide is appropriate under the circumstances.

d. CONTRACTOR shall first make written application to ENGINEER for review of a proposed substitute item of material or equipment that CONTRACTOR seeks to furnish or use. The application shall certify that the proposed substitute item will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified, and be suited to the same use as that specified. The application will state the extent, if any, to which the use of the proposed substitute item will prejudice CONTRACTOR's achievement of Substantial Completion on time, whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) to adapt the design to the proposed substitute item and whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute item from that specified will be identified in the application, and available engineering, sales, maintenance, repair, and replacement services will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change, all of which will be considered by ENGINEER in evaluating the proposed substitute item. ENGINEER may require CONTRACTOR to furnish additional data about the proposed substitute item.

B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is shown or indicated in and expressly

required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by ENGINEER. CONTRACTOR shall submit sufficient information to allow ENGINEER, in ENGINEER's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The procedure for review by ENGINEER will be similar to that provided in subparagraph 6.05.A.2.

C. *Engineer's Evaluation:* ENGINEER will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to paragraphs 6.05.A and 6.05.B. ENGINEER will be the sole judge of acceptability. No "or-equal" or substitute will be ordered, installed or utilized until ENGINEER's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." ENGINEER will advise CONTRACTOR in writing of any negative determination.

D. *Special Guarantee:* OWNER may require CONTRACTOR to furnish at CONTRACTOR's expense a special performance guarantee or other surety with respect to any substitute.

E. *ENGINEER's Cost Reimbursement:* ENGINEER will record time required by ENGINEER and ENGINEER's Consultants in evaluating substitute proposed or submitted by CONTRACTOR pursuant to paragraphs 6.05.A.2 and 6.05.B and in making changes in the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) occasioned thereby. Whether or not ENGINEER approves a substitute item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER's Consultants for evaluating each such proposed substitute.

F. *CONTRACTOR's Expense:* CONTRACTOR shall provide all data in support of any proposed substitute or "or-equal" at CONTRACTOR's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

A. CONTRACTOR shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to OWNER as indicated in paragraph 6.06.B), whether initially or as a replacement, against whom OWNER may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or

entities to be submitted to OWNER in advance for acceptance by OWNER by a specified date prior to the Effective Date of the Agreement, and if CONTRACTOR has submitted a list thereof in accordance with the Supplementary Conditions, OWNER's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. CONTRACTOR shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued or Written Amendment signed. No acceptance by OWNER of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of OWNER or ENGINEER to reject defective Work.

C. CONTRACTOR shall be fully responsible to OWNER and ENGINEER for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions. Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between OWNER or ENGINEER and any such Subcontractor, Supplier or other individual or entity, nor shall it create any obligation on the part of OWNER or ENGINEER to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

D. CONTRACTOR shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR.

E. CONTRACTOR shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with ENGINEER through CONTRACTOR.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for CONTRACTOR by a Subcontractor or Supplier will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor

or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of OWNER and ENGINEER. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in paragraph 5.06, the agreement between the CONTRACTOR and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against OWNER, CONTRACTOR, ENGINEER, ENGINEER's Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, CONTRACTOR will obtain the same.

6.07 *Patent Fees and Royalties*

A. CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of OWNER or ENGINEER its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by OWNER in the Contract Documents. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees or agents, and other consultants of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall obtain and pay for all construction permits and licenses. OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits

and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto, such as plant investment fees.

6.09 *Laws and Regulations*

A. CONTRACTOR shall give all notices and comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither OWNER nor ENGINEER shall be responsible for monitoring CONTRACTOR's compliance with any Laws or Regulations.

B. If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, CONTRACTOR shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work; however, it shall not be CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve CONTRACTOR of CONTRACTOR's obligations under paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work may be the subject of an adjustment in Contract Price or Contract Times. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in paragraph 10.05.

6.10 *Taxes*

A. CONTRACTOR shall pay all sales, consumer, use, and other similar taxes required to be paid by CONTRACTOR in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

1. CONTRACTOR shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not

unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultant, and the officers, directors, partners, employees, agents, and other consultants of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against OWNER, ENGINEER, or any other party indemnified hereunder to the extent caused by or based upon CONTRACTOR's performance of the Work.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work CONTRACTOR shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work CONTRACTOR shall clean the Site and make it ready for utilization by OWNER. At the completion of the Work CONTRACTOR shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading Structures:* CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

A. CONTRACTOR shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work

Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to ENGINEER for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to ENGINEER for OWNER.

6.13 *Safety and Protection*

A. CONTRACTOR shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;
2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. CONTRACTOR shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property. All damage, injury, or loss to any property referred to in paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of OWNER or ENGINEER or ENGINEER's Consultant, or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them). CONTRACTOR's duties and

responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and ENGINEER has issued a notice to OWNER and CONTRACTOR in accordance with paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. CONTRACTOR shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, CONTRACTOR is obligated to act to prevent threatened damage, injury, or loss. CONTRACTOR shall give ENGINEER prompt written notice if CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If ENGINEER determines that a change in the Contract Documents is required because of the action taken by CONTRACTOR in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. CONTRACTOR shall submit Shop Drawings to ENGINEER for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. All submittals will be identified as ENGINEER may require and in the number of copies specified in the General Requirements. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show ENGINEER the services, materials, and equipment CONTRACTOR proposes to provide and to enable ENGINEER to review the information for the limited purposes required by paragraph 6.17.E.

B. CONTRACTOR shall also submit Samples to ENGINEER for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample

submittals. Each Sample will be identified clearly as to material, Supplier, pertinent data such as catalog numbers, and the use for which intended and otherwise as ENGINEER may require to enable ENGINEER to review the submittal for the limited purposes required by paragraph 6.17.E. The numbers of each Sample to be submitted will be as specified in the Specifications.

C. Where a Shop Drawing or Sample is required by the Contract Documents or the schedule of Shop Drawings and Sample submittals acceptable to ENGINEER as required by paragraph 2.07, any related Work performed prior to ENGINEER's review and approval of the pertinent submittal will be at the sole expense and responsibility of CONTRACTOR.

D. *Submittal Procedures*

1. Before submitting each Shop Drawing or Sample, CONTRACTOR shall have determined and verified:

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

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

c. all information relative to means, methods, techniques, sequences, and procedures of construction and safety precautions and programs incident thereto; and

d. CONTRACTOR shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

2. Each submittal shall bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's obligations under the Contract Documents with respect to CONTRACTOR's review and approval of that submittal.

3. At the time of each submittal, CONTRACTOR shall give ENGINEER specific written notice of such variations, if any, that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, such notice to be in a written communication separate from the submittal; and, in addition, shall cause a specific notation to be made on each Shop

Drawing and Sample submitted to ENGINEER for review and approval of each such variation.

E. *ENGINEER's Review*

1. ENGINEER will timely review and approve Shop Drawings and Samples in accordance with the schedule of Shop Drawings and Sample submittals acceptable to ENGINEER. ENGINEER's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. ENGINEER's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. ENGINEER's review and approval of Shop Drawings or Samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called ENGINEER's attention to each such variation at the time of each submittal as required by paragraph 6.17.D.3 and ENGINEER has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample approval; nor will any approval by ENGINEER relieve CONTRACTOR from responsibility for complying with the requirements of paragraph 6.17.D.1.

F. *Resubmittal Procedures*

1. CONTRACTOR shall make corrections required by ENGINEER and shall return the required number of corrected copies of Shop Drawings and submit as required new Samples for review and approval. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by ENGINEER on previous submittals.

6.18 *Continuing the Work*

A. CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except

as permitted by paragraph 15.04 or as OWNER and CONTRACTOR may otherwise agree in writing.

6.19 *CONTRACTOR's General Warranty and Guarantee*

A. CONTRACTOR warrants and guarantees to OWNER, ENGINEER, and ENGINEER's Consultants that all Work will be in accordance with the Contract Documents and will not be defective. CONTRACTOR's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than CONTRACTOR, Subcontractors, Suppliers, or any other individual or entity for whom CONTRACTOR is responsible; or
2. normal wear and tear under normal usage.

B. CONTRACTOR's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents:

1. observations by ENGINEER;
2. recommendation by ENGINEER or payment by OWNER of any progress or final payment;
3. the issuance of a certificate of Substantial Completion by ENGINEER or any payment related thereto by OWNER;
4. use or occupancy of the Work or any part thereof by OWNER;
5. any acceptance by OWNER or any failure to do so;
6. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by ENGINEER;
7. any inspection, test, or approval by others; or
8. any correction of defective Work by OWNER.

6.20 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them from

and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage:

1. is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom; and
2. is caused in whole or in part by any negligent act or omission of CONTRACTOR, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not caused in part by any negligence or omission of an individual or entity indemnified hereunder or whether liability is imposed upon such indemnified party by Laws and Regulations regardless of the negligence of any such individual or entity.

B. In any and all claims against OWNER or ENGINEER or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of CONTRACTOR, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for CONTRACTOR or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of CONTRACTOR under paragraph 6.20.A shall not extend to the liability of ENGINEER and ENGINEER's Consultants or to the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

ARTICLE 7 - OTHER WORK

7.01 *Related Work at Site*

A. OWNER may perform other work related to the Project at the Site by OWNER's employees, or let other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to CONTRACTOR prior to starting any such other work; and

2. if OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in paragraph 10.05.

B. CONTRACTOR shall afford each other contractor who is a party to such a direct contract and each utility owner (and OWNER, if OWNER is performing the other work with OWNER's employees) proper and safe access to the Site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work and shall properly coordinate the Work with theirs. Unless otherwise provided in the Contract Documents, CONTRACTOR shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of ENGINEER and the others whose work will be affected. The duties and responsibilities of CONTRACTOR under this paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between OWNER and such utility owners and other contractors.

C. If the proper execution or results of any part of CONTRACTOR's Work depends upon work performed by others under this Article 7, CONTRACTOR shall inspect such other work and promptly report to ENGINEER in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of CONTRACTOR's Work. CONTRACTOR's failure to so report will constitute an acceptance of such other work as fit and proper for integration with CONTRACTOR's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

A. If OWNER intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, OWNER shall have sole authority and responsibility for such coordination.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, OWNER shall issue all communications to CONTRACTOR through ENGINEER.

8.02 *Replacement of ENGINEER*

A. In case of termination of the employment of ENGINEER, OWNER shall appoint an engineer to whom CONTRACTOR makes no reasonable objection, whose status under the Contract Documents shall be that of the former ENGINEER.

8.03 *Furnish Data*

A. OWNER shall promptly furnish the data required of OWNER under the Contract Documents.

8.04 *Pay Promptly When Due*

A. OWNER shall make payments to CONTRACTOR promptly when they are due as provided in paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

A. OWNER's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.01 and 4.05. Paragraph 4.02 refers to OWNER's identifying and making available to CONTRACTOR copies of reports of explorations

and tests of subsurface conditions and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by ENGINEER in preparing the Contract Documents.

8.06 Insurance

A. OWNER's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 Change Orders

A. OWNER is obligated to execute Change Orders as indicated in paragraph 10.03.

8.08 Inspections, Tests, and Approvals

A. OWNER's responsibility in respect to certain inspections, tests, and approvals is set forth in paragraph 13.03.B.

8.09 Limitations on OWNER's Responsibilities

A. The OWNER shall not supervise, direct, or have control or authority over, nor be responsible for, CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work. OWNER will not be responsible for CONTRACTOR's failure to perform the Work in accordance with the Contract Documents.

8.10 Undisclosed Hazardous Environmental Condition

A. OWNER's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in paragraph 4.06.

8.11 Evidence of Financial Arrangements

A. If and to the extent OWNER has agreed to furnish CONTRACTOR reasonable evidence that financial arrangements have been made to satisfy OWNER's obligations under the Contract Documents, OWNER's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 OWNER'S Representative

A. ENGINEER will be OWNER's representative during the construction period. The duties and responsibilities and the limitations of authority of ENGINEER as OWNER's representative during construction are set forth in the Contract Documents and will not be changed without written consent of OWNER and ENGINEER.

9.02 Visits to Site

A. ENGINEER will make visits to the Site at intervals appropriate to the various stages of construction as ENGINEER deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of CONTRACTOR's executed Work. Based on information obtained during such visits and observations, ENGINEER, for the benefit of OWNER, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. ENGINEER will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. ENGINEER's efforts will be directed toward providing for OWNER a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, ENGINEER will keep OWNER informed of the progress of the Work and will endeavor to guard OWNER against defective Work.

B. ENGINEER's visits and observations are subject to all the limitations on ENGINEER's authority and responsibility set forth in paragraph 9.10, and particularly, but without limitation, during or as a result of ENGINEER's visits or observations of CONTRACTOR's Work ENGINEER will not supervise, direct, control, or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work.

9.03 Project Representative

A. If OWNER and ENGINEER agree, ENGINEER will furnish a Resident Project Representative to assist ENGINEER in providing more extensive observation of the Work. The responsibilities and authority and limitations thereon of any such Resident Project Representative and assistants will be as provided in paragraph 9.10 and in the Supplementary Conditions. If OWNER designates another

representative or agent to represent OWNER at the Site who is not ENGINEER's Consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Clarifications and Interpretations*

A. ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents as ENGINEER may determine necessary, which shall be consistent with the intent of and reasonably inferable from the Contract Documents. Such written clarifications and interpretations will be binding on OWNER and CONTRACTOR. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a written clarification or interpretation, a Claim may be made therefor as provided in paragraph 10.05.

9.05 *Authorized Variations in Work*

A. ENGINEER may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on OWNER and also on CONTRACTOR, who shall perform the Work involved promptly. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of a Field Order, a Claim may be made therefor as provided in paragraph 10.05.

9.06 *Rejecting Defective Work*

A. ENGINEER will have authority to disapprove or reject Work which ENGINEER believes to be defective, or that ENGINEER believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. ENGINEER will also have authority to require special inspection or testing of the Work as provided in paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.07 *Shop Drawings, Change Orders and Payments*

A. In connection with ENGINEER's authority as to Shop Drawings and Samples, see paragraph 6.17.

B. In connection with ENGINEER's authority as to Change Orders, see Articles 10, 11, and 12.

C. In connection with ENGINEER's authority as to Applications for Payment, see Article 14.

9.08 *Determinations for Unit Price Work*

A. ENGINEER will determine the actual quantities and classifications of Unit Price Work performed by CONTRACTOR. ENGINEER will review with CONTRACTOR the ENGINEER's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). ENGINEER's written decision thereon will be final and binding (except as modified by ENGINEER to reflect changed factual conditions or more accurate data) upon OWNER and CONTRACTOR, subject to the provisions of paragraph 10.05.

9.09 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. ENGINEER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work, the quantities and classifications of Unit Price Work, the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, and Claims seeking changes in the Contract Price or Contract Times will be referred initially to ENGINEER in writing, in accordance with the provisions of paragraph 10.05, with a request for a formal decision.

B. When functioning as interpreter and judge under this paragraph 9.09, ENGINEER will not show partiality to OWNER or CONTRACTOR and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by ENGINEER pursuant to this paragraph 9.09 with respect to any such Claim, dispute, or other matter (except any which have been waived by the making or acceptance of final payment as provided in paragraph 14.07) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such Claim, dispute, or other matter.

9.10 *Limitations on ENGINEER's Authority and Responsibilities*

A. Neither ENGINEER's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by ENGINEER in good faith either to exercise or not exercise such authority

or responsibility or the undertaking, exercise, or performance of any authority or responsibility by ENGINEER shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by ENGINEER to CONTRACTOR, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. ENGINEER will not supervise, direct, control, or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work. ENGINEER will not be responsible for CONTRACTOR's failure to perform the Work in accordance with the Contract Documents.

C. ENGINEER will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. ENGINEER's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.

E. The limitations upon authority and responsibility set forth in this paragraph 9.10 shall also apply to ENGINEER's Consultants, Resident Project Representative, and assistants.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Written Amendment, a Change Order, or a Work Change Directive. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If OWNER and CONTRACTOR are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change

Directive, a Claim may be made therefor as provided in paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A. CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in paragraph 3.04, except in the case of an emergency as provided in paragraph 6.16 or in the case of uncovering Work as provided in paragraph 13.04.B.

10.03 *Execution of Change Orders*

A. OWNER and CONTRACTOR shall execute appropriate Change Orders recommended by ENGINEER (or Written Amendments) covering:

1. changes in the Work which are: (i) ordered by OWNER pursuant to paragraph 10.01.A, (ii) required because of acceptance of defective Work under paragraph 13.08.A or OWNER's correction of defective Work under paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by ENGINEER pursuant to paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, CONTRACTOR shall carry on the Work and adhere to the progress schedule as provided in paragraph 6.18.A.

10.04 *Notification to Surety*

A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be CONTRACTOR's responsibility. The amount of each applicable Bond will be adjusted to reflect the effect of any such change.

10.05 *Claims and Disputes*

A. *Notice:* Written notice stating the general nature of each Claim, dispute, or other matter shall be delivered by the claimant to ENGINEER and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. Notice of the amount or extent of the Claim, dispute, or other matter with supporting data shall be delivered to the ENGINEER and the other party to the Contract within 60 days after the start of such event (unless ENGINEER allows additional time for claimant to submit additional or more accurate data in support of such Claim, dispute, or other matter). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to ENGINEER and the claimant within 30 days after receipt of the claimant's last submittal (unless ENGINEER allows additional time).

B. *ENGINEER's Decision:* ENGINEER will render a formal decision in writing within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any. ENGINEER's written decision on such Claim, dispute, or other matter will be final and binding upon OWNER and CONTRACTOR unless:

1. an appeal from ENGINEER's decision is taken within the time limits and in accordance with the dispute resolution procedures set forth in Article 16; or

2. if no such dispute resolution procedures have been set forth in Article 16, a written notice of intention to appeal from ENGINEER's written decision is delivered by OWNER or CONTRACTOR to the other and to ENGINEER within 30 days after the date of such decision, and a formal proceeding is instituted by the appealing party in a forum of competent jurisdiction within 60 days after the date of such decision or within 60 days after Substantial Completion, whichever is later (unless otherwise agreed in writing by OWNER and CONTRACTOR), to exercise such rights or remedies as the appealing party may have with respect to such Claim, dispute, or other matter in accordance with applicable Laws and Regulations.

C. If ENGINEER does not render a formal decision in writing within the time stated in paragraph 10.05.B, a decision denying the Claim in its entirety shall be deemed to have been issued 31 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.

D. No Claim for an adjustment in Contract Price or Contract Times (or Milestones) will be valid if not submitted in accordance with this paragraph 10.05.

ARTICLE 11 - COST OF THE WORK; CASH ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to CONTRACTOR will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in paragraph 11.01.B.

1. Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by OWNER and CONTRACTOR. Such employees shall include without limitation superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by OWNER.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless OWNER deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to OWNER. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to OWNER, and CONTRACTOR shall make provisions so that they may be obtained.

3. Payments made by CONTRACTOR to Subcontractors for Work performed by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from subcontractors acceptable to OWNER and CONTRACTOR and shall deliver such bids to OWNER, who will then determine, with the advice of ENGINEER, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as CONTRACTOR's Cost of the Work and fee as provided in this paragraph 11.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

a. The proportion of necessary transportation, travel, and subsistence expenses of CONTRACTOR's employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of CONTRACTOR.

c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from CONTRACTOR or others in accordance with rental agreements approved by OWNER with the advice of ENGINEER, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which CONTRACTOR is liable, imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable,

and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by CONTRACTOR in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expressage, and similar petty cash items in connection with the Work.

i. When the Cost of the Work is used to determine the value of a Change Order or of a Claim, the cost of premiums for additional Bonds and insurance required because of the changes in the Work or caused by the event giving rise to the Claim.

j. When all the Work is performed on the basis of cost-plus, the costs of premiums for all Bonds and insurance CONTRACTOR is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnerships and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by CONTRACTOR, whether at the Site or in CONTRACTOR's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 11.01.A.1 or specifically covered by paragraph 11.01.A.4, all of which are to be

considered administrative costs covered by the CONTRACTOR's fee.

2. Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the Site.

3. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.

4. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraphs 11.01.A and 11.01.B.

C. CONTRACTOR's Fee: When all the Work is performed on the basis of cost-plus, CONTRACTOR's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, CONTRACTOR's fee shall be determined as set forth in paragraph 12.01.C.

D. Documentation: Whenever the Cost of the Work for any purpose is to be determined pursuant to paragraphs 11.01.A and 11.01.B, CONTRACTOR will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to ENGINEER an itemized cost breakdown together with supporting data.

11.02 Cash Allowances

A. It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums as may be acceptable to OWNER and ENGINEER. CONTRACTOR agrees that:

1. the allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. CONTRACTOR's costs for unloading and handling on the Site, labor, installation costs, overhead, profit, and other expenses contemplated for the allow-

ances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

B. Prior to final payment, an appropriate Change Order will be issued as recommended by ENGINEER to reflect actual amounts due CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 Unit Price Work

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR will be made by ENGINEER subject to the provisions of paragraph 9.08.

B. Each unit price will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR's overhead and profit for each separately identified item.

C. OWNER or CONTRACTOR may make a Claim for an adjustment in the Contract Price in accordance with paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by CONTRACTOR differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

2. there is no corresponding adjustment with respect any other item of Work; and

3. if CONTRACTOR believes that CONTRACTOR is entitled to an increase in Contract Price as a result of having incurred additional expense or OWNER believes that OWNER is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 - CHANGE OF CONTRACT PRICE;
CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order or by a Written Amendment. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the ENGINEER and the other party to the Contract in accordance with the provisions of paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in paragraph 11.01) plus a CONTRACTOR's fee for overhead and profit (determined as provided in paragraph 12.01.C).

C. *CONTRACTOR's Fee*: The CONTRACTOR's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under paragraphs 11.01.A.1 and 11.01.A.2, the CONTRACTOR's fee shall be 15 percent;

b. for costs incurred under paragraph 11.01.A.3, the CONTRACTOR's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no

fixed fee is agreed upon, the intent of paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and CONTRACTOR will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by CONTRACTOR to OWNER for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in CONTRACTOR's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in CONTRACTOR's fee shall be computed on the basis of the net change in accordance with paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times (or Milestones) may only be changed by a Change Order or by a Written Amendment. Any Claim for an adjustment in the Contract Times (or Milestones) shall be based on written notice submitted by the party making the claim to the ENGINEER and the other party to the Contract in accordance with the provisions of paragraph 10.05.

B. Any adjustment of the Contract Times (or Milestones) covered by a Change Order or of any Claim for an adjustment in the Contract Times (or Milestones) will be determined in accordance with the provisions of this Article 12.

12.03 *Delays Beyond CONTRACTOR's Control*

A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in paragraph 12.02.A. Delays beyond the control of CONTRACTOR shall include, but not be limited to, acts or neglect by OWNER, acts or neglect of utility owners or other contractors performing other work as contemplated by

Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

12.04 *Delays Within CONTRACTOR's Control*

A. The Contract Times (or Milestones) will not be extended due to delays within the control of CONTRACTOR. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of CONTRACTOR.

12.05 *Delays Beyond OWNER's and CONTRACTOR's Control*

A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of both OWNER and CONTRACTOR, an extension of the Contract Times (or Milestones) in an amount equal to the time lost due to such delay shall be CONTRACTOR's sole and exclusive remedy for such delay.

12.06 *Delay Damages*

A. In no event shall OWNER or ENGINEER be liable to CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from:

1. delays caused by or within the control of CONTRACTOR; or
2. delays beyond the control of both OWNER and CONTRACTOR including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God, or acts or neglect by utility owners or other contractors performing other work as contemplated by Article 7.

B. Nothing in this paragraph 12.06 bars a change in Contract Price pursuant to this Article 12 to compensate CONTRACTOR due to delay, interference, or disruption directly attributable to actions or inactions of OWNER or anyone for whom OWNER is responsible.

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which OWNER or ENGINEER has actual knowledge will be given

to CONTRACTOR. All defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

A. OWNER, ENGINEER, ENGINEER's Consultants, other representatives and personnel of OWNER, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. CONTRACTOR shall provide them proper and safe conditions for such access and advise them of CONTRACTOR's Site safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

A. CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. OWNER shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by paragraphs 13.03.C and 13.03.D below;
2. that costs incurred in connection with tests or inspections conducted pursuant to paragraph 13.04.B shall be paid as provided in said paragraph 13.04.B; and
3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, CONTRACTOR shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish ENGINEER the required certificates of inspection or approval.

D. CONTRACTOR shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for OWNER's and ENGINEER's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to CONTRACTOR's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to OWNER and ENGINEER.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by CONTRACTOR without written concurrence of ENGINEER, it must, if requested by ENGINEER, be uncovered for observation.

F. Uncovering Work as provided in paragraph 13.03.E shall be at CONTRACTOR's expense unless CONTRACTOR has given ENGINEER timely notice of CONTRACTOR's intention to cover the same and ENGINEER has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of ENGINEER, it must, if requested by ENGINEER, be uncovered for ENGINEER's observation and replaced at CONTRACTOR's expense.

B. If ENGINEER considers it necessary or advisable that covered Work be observed by ENGINEER or inspected or tested by others, CONTRACTOR, at ENGINEER's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as ENGINEER may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment. If it is found that such Work is defective, CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and OWNER shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, OWNER may make a Claim therefor as provided in paragraph 10.05. If, however, such Work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Times (or Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.

13.05 *OWNER May Stop the Work*

A. If the Work is defective, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, OWNER may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of OWNER to stop

the Work shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

A. CONTRACTOR shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by ENGINEER, remove it from the Project and replace it with Work that is not defective. CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for CONTRACTOR's use by OWNER or permitted by Laws and Regulations as contemplated in paragraph 6.11.A is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER's written instructions: (i) repair such defective land or areas, or (ii) correct such defective Work or, if the defective Work has been rejected by OWNER, remove it from the Project and replace it with Work that is not defective, and (iii) satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom. If CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, OWNER may have the defective Work corrected or repaired or may have the rejected Work removed and replaced, and all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by CONTRACTOR.

B. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that

item may start to run from an earlier date if so provided in the Specifications or by Written Amendment.

C. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

D. CONTRACTOR's obligations under this paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, OWNER (and, prior to ENGINEER's recommendation of final payment, ENGINEER) prefers to accept it, OWNER may do so. CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to OWNER's evaluation of and determination to accept such defective Work (such costs to be approved by ENGINEER as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by CONTRACTOR pursuant to this sentence. If any such acceptance occurs prior to ENGINEER's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and OWNER shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, OWNER may make a Claim therefor as provided in paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by CONTRACTOR to OWNER.

13.09 *OWNER May Correct Defective Work*

A. If CONTRACTOR fails within a reasonable time after written notice from ENGINEER to correct defective Work or to remove and replace rejected Work as required by ENGINEER in accordance with paragraph 13.06.A, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, OWNER may, after seven days written notice to CONTRACTOR, correct and remedy any such deficiency.

B. In exercising the rights and remedies under this paragraph, OWNER shall proceed expeditiously. In

connection with such corrective and remedial action, OWNER may exclude CONTRACTOR from all or part of the Site, take possession of all or part of the Work and suspend CONTRACTOR's services related thereto, take possession of CONTRACTOR's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which OWNER has paid CONTRACTOR but which are stored elsewhere. CONTRACTOR shall allow OWNER, OWNER's representatives, agents and employees, OWNER's other contractors, and ENGINEER and ENGINEER's Consultants access to the Site to enable OWNER to exercise the rights and remedies under this paragraph.

C. All Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by OWNER in exercising the rights and remedies under this paragraph 13.09 will be charged against CONTRACTOR, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, OWNER may make a Claim therefor as provided in paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of CONTRACTOR's defective Work.

D. CONTRACTOR shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to the exercise by OWNER of OWNER's rights and remedies under this paragraph 13.09.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The schedule of values established as provided in paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to ENGINEER. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments*

1. At least 20 days before the date established for each progress payment (but not more often than once a month), CONTRACTOR shall submit to ENGINEER for review an Application for Payment filled out and signed by CONTRACTOR covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that OWNER has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect OWNER's interest therein, all of which must be satisfactory to OWNER.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of CONTRACTOR stating that all previous progress payments received on account of the Work have been applied on account to discharge CONTRACTOR's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications*

1. ENGINEER will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to OWNER or return the Application to CONTRACTOR indicating in writing ENGINEER's reasons for refusing to recommend payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the Application.

2. ENGINEER's recommendation of any payment requested in an Application for Payment will constitute a representation by ENGINEER to OWNER, based on ENGINEER's observations on the Site of the executed Work as an experienced and qualified design professional and on ENGINEER's review of the Application for Payment and the accompanying data and schedules, that to the best of ENGINEER's knowledge, information and belief:

a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under paragraph 9.08, and to any other qualifications stated in the recommendation); and

c. the conditions precedent to CONTRACTOR's being entitled to such payment appear to have been fulfilled in so far as it is ENGINEER's responsibility to observe the Work.

3. By recommending any such payment ENGINEER will not thereby be deemed to have represented that: (i) inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to ENGINEER in the Contract Documents; or (ii) that there may not be other matters or issues between the parties that might entitle CONTRACTOR to be paid additionally by OWNER or entitle OWNER to withhold payment to CONTRACTOR.

4. Neither ENGINEER's review of CONTRACTOR's Work for the purposes of recommending payments nor ENGINEER's recommendation of any payment, including final payment, will impose responsibility on ENGINEER to supervise, direct, or control the Work or for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for CONTRACTOR's failure to comply with Laws and Regulations applicable to CONTRACTOR's performance of the Work. Additionally, said review or recommendation will not impose responsibility on ENGINEER to make any examination to ascertain how or for what purposes CONTRACTOR has used the moneys paid on account of the Contract Price, or to determine that title to any of the Work, materials, or equipment has passed to OWNER free and clear of any Liens.

5. ENGINEER may refuse to recommend the whole or any part of any payment if, in ENGINEER's opinion, it would be incorrect to make the representations to OWNER referred to in paragraph 14.02.B.2. ENGINEER may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests,

revise or revoke any such payment recommendation previously made, to such extent as may be necessary in ENGINEER's opinion to protect OWNER from loss because:

- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
- b. the Contract Price has been reduced by Written Amendment or Change Orders;
- c. OWNER has been required to correct defective Work or complete Work in accordance with paragraph 13.09; or
- d. ENGINEER has actual knowledge of the occurrence of any of the events enumerated in paragraph 15.02.A.

C. *Payment Becomes Due*

1. Ten days after presentation of the Application for Payment to OWNER with ENGINEER's recommendation, the amount recommended will (subject to the provisions of paragraph 14.02.D) become due, and when due will be paid by OWNER to CONTRACTOR.

D. *Reduction in Payment*

1. OWNER may refuse to make payment of the full amount recommended by ENGINEER because:

- a. claims have been made against OWNER on account of CONTRACTOR's performance or furnishing of the Work;
- b. Liens have been filed in connection with the Work, except where CONTRACTOR has delivered a specific Bond satisfactory to OWNER to secure the satisfaction and discharge of such Liens;
- c. there are other items entitling OWNER to a set-off against the amount recommended; or
- d. OWNER has actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.02.B.5.a through 14.02.B.5.c or paragraph 15.02.A.

2. If OWNER refuses to make payment of the full amount recommended by ENGINEER, OWNER must give CONTRACTOR immediate written notice (with a copy to ENGINEER) stating the reasons for such action and promptly pay CONTRACTOR any amount remaining after deduction of the amount so withheld.

OWNER shall promptly pay CONTRACTOR the amount so withheld, or any adjustment thereto agreed to by OWNER and CONTRACTOR, when CONTRACTOR corrects to OWNER's satisfaction the reasons for such action.

3. If it is subsequently determined that OWNER's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by paragraph 14.02.C.1.

14.03 *CONTRACTOR's Warranty of Title*

A. CONTRACTOR warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

A. When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall notify OWNER and ENGINEER in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that ENGINEER issue a certificate of Substantial Completion. Promptly thereafter, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of the Work to determine the status of completion. If ENGINEER does not consider the Work substantially complete, ENGINEER will notify CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers the Work substantially complete, ENGINEER will prepare and deliver to OWNER a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. OWNER shall have seven days after receipt of the tentative certificate during which to make written objection to ENGINEER as to any provisions of the certificate or attached list. If, after considering such objections, ENGINEER concludes that the Work is not substantially complete, ENGINEER will within 14 days after submission of the tentative certificate to OWNER notify CONTRACTOR in writing, stating the reasons therefor. If, after consideration of OWNER's objections, ENGINEER considers the Work substantially complete, ENGINEER will within said 14 days execute and deliver to OWNER and CONTRACTOR a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as ENGINEER believes justified after consideration of any objections from OWNER. At the time of delivery of the tentative certificate of Substantial Completion ENGINEER will deliver to OWNER and CONTRACTOR a written recommendation as to division of responsibility.

ties pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER in writing prior to ENGINEER's issuing the definitive certificate of Substantial Completion, ENGINEER's aforesaid recommendation will be binding on OWNER and CONTRACTOR until final payment.

B. OWNER shall have the right to exclude CONTRACTOR from the Site after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. Use by OWNER at OWNER's option of any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which OWNER, ENGINEER, and CONTRACTOR agree constitutes a separately functioning and usable part of the Work that can be used by OWNER for its intended purpose without significant interference with CONTRACTOR's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following conditions.

1. OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees that such part of the Work is substantially complete, CONTRACTOR will certify to OWNER and ENGINEER that such part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. CONTRACTOR at any time may notify OWNER and ENGINEER in writing that CONTRACTOR considers any such part of the Work ready for its intended use and substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of that part of the Work to determine its status of completion. If ENGINEER does not consider that part of the Work to be substantially complete, ENGINEER will notify OWNER and CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers that part of the Work to be substantially complete, the provisions of paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

2. No occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

A. Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof is complete, ENGINEER will promptly make a final inspection with OWNER and CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. CONTRACTOR shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. *Application for Payment*

1. After CONTRACTOR has, in the opinion of ENGINEER, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents (as provided in paragraph 6.12), and other documents, CONTRACTOR may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by: (i) all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by subparagraph 5.04.B.7; (ii) consent of the surety, if any, to final payment; and (iii) complete and legally effective releases or waivers (satisfactory to OWNER) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in paragraph 14.07.A.2 and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full and an affidavit of CONTRACTOR that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which OWNER or OWNER's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, CONTRACTOR may furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.

B. *Review of Application and Acceptance*

1. If, on the basis of ENGINEER's observation of the Work during construction and final inspection, and ENGINEER's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, ENGINEER is satisfied that the Work has been completed and CONTRACTOR's other obligations under the Contract Documents have been fulfilled, ENGINEER will, within ten days after receipt of the final Application for Payment, indicate in writing ENGINEER's recommendation of payment and present the Application for Payment to OWNER for payment. At the same time ENGINEER will also give written notice to OWNER and CONTRACTOR that the Work is acceptable subject to the provisions of paragraph 14.09. Otherwise, ENGINEER will return the Application for Payment to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application for Payment.

C. *Payment Becomes Due*

1. Thirty days after the presentation to OWNER of the Application for Payment and accompanying documentation, the amount recommended by ENGINEER will become due and, when due, will be paid by OWNER to CONTRACTOR.

14.08 *Final Completion Delayed*

A. If, through no fault of CONTRACTOR, final completion of the Work is significantly delayed, and if ENGINEER so confirms, OWNER shall, upon receipt of CONTRACTOR's final Application for Payment and recommendation of ENGINEER, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by OWNER for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required in paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to ENGINEER with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by OWNER against CONTRACTOR, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from CONTRACTOR's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by CONTRACTOR against OWNER other than those previously made in writing which are still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 *OWNER May Suspend Work*

A. At any time and without cause, OWNER may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to CONTRACTOR and ENGINEER which will fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be allowed an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if CONTRACTOR makes a Claim therefor as provided in paragraph 10.05.

15.02 *OWNER May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. CONTRACTOR's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 2.07 as adjusted from time to time pursuant to paragraph 6.04);

2. CONTRACTOR's disregard of Laws or Regulations of any public body having jurisdiction;

3. CONTRACTOR's disregard of the authority of ENGINEER; or

4. CONTRACTOR's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in paragraph 15.02.A occur, OWNER may, after giving CONTRACTOR (and the surety, if any) seven days written notice, terminate

the services of CONTRACTOR, exclude CONTRACTOR from the Site, and take possession of the Work and of all CONTRACTOR's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the Site or for which OWNER has paid CONTRACTOR but which are stored elsewhere, and finish the Work as OWNER may deem expedient. In such case, CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by OWNER arising out of or relating to completing the Work, such excess will be paid to CONTRACTOR. If such claims, costs, losses, and damages exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such claims, costs, losses, and damages incurred by OWNER will be reviewed by ENGINEER as to their reasonableness and, when so approved by ENGINEER, incorporated in a Change Order. When exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

C. Where CONTRACTOR's services have been so terminated by OWNER, the termination will not affect any rights or remedies of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due CONTRACTOR by OWNER will not release CONTRACTOR from liability.

15.03 *OWNER May Terminate For Convenience*

A. Upon seven days written notice to CONTRACTOR and ENGINEER, OWNER may, without cause and without prejudice to any other right or remedy of OWNER, elect to terminate the Contract. In such case, CONTRACTOR shall be paid (without duplication of any items):

1. for completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. for expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. for all claims, costs, losses, and damages (including but not limited to all fees and charges of

engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. for reasonable expenses directly attributable to termination.

B. CONTRACTOR shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *CONTRACTOR May Stop Work or Terminate*

A. If, through no act or fault of CONTRACTOR, the Work is suspended for more than 90 consecutive days by OWNER or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within 30 days after it is submitted, or OWNER fails for 30 days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven days written notice to OWNER and ENGINEER, and provided OWNER or ENGINEER do not remedy such suspension or failure within that time, terminate the Contract and recover from OWNER payment on the same terms as provided in paragraph 15.03. In lieu of terminating the Contract and without prejudice to any other right or remedy, if ENGINEER has failed to act on an Application for Payment within 30 days after it is submitted, or OWNER has failed for 30 days to pay CONTRACTOR any sum finally determined to be due, CONTRACTOR may, seven days after written notice to OWNER and ENGINEER, stop the Work until payment is made of all such amounts due CONTRACTOR, including interest thereon. The provisions of this paragraph 15.04 are not intended to preclude CONTRACTOR from making a Claim under paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to CONTRACTOR's stopping the Work as permitted by this paragraph.

ARTICLE 16 - DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Dispute resolution methods and procedures, if any, shall be as set forth in the Supplementary Conditions. If no method and procedure has been set forth, and subject to the provisions of paragraphs 9.09 and 10.05, OWNER and CONTRACTOR may exercise such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any dispute.

ARTICLE 17 - MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

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

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

THIS IS SUPPLEMENT TO AND BECOMES PART OF:

SECTION 00800

SUPPLEMENTARY CONDITIONS

NOTE: The following paragraph is modified, corrected, added to, or deleted as follows:

1. On Page 00800-2, in the last line under Article 1, delete the following: Division 1 through Division 3. Replace with the following: Division 1 through Division 3 and Division 13.

SECTION 00800

SUPPLEMENTARY CONDITIONS

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3	CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE
4	AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS
5	BONDS AND INSURANCE
6	CONTRACTOR'S RESPONSIBILITIES
8	OWNER'S RESPONSIBILITIES
9	ENGINEER'S STATUS DURING CONSTRUCTION
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12	CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES
13	TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK
14	PAYMENTS TO CONTRACTOR AND COMPLETION
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SUPPLEMENTARY CONDITIONS

AMENDMENTS TO GENERAL CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (No. 1910-8, 1996 edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

ARTICLE 1. DEFINITIONS AND TERMINOLOGY

Add the following language at the beginning of definition 1.01 A.12 entitled "Contract Documents" in the General Conditions:

"The Advertisement for Bids, Instructions to Bidders, State Regulations, ..."

Delete the words "The individual or entity named as such in the Agreement" in 1.01.A.19 and insert the following in their place:

"The individual or entity duly appointed by the Owner to undertake the duties and powers herein assigned to the Engineer, acting either directly or through duly appointed representatives."

Delete the words "and who is identified as such in the Supplementary Conditions" at the end of definition 1.01 A.20, entitled "ENGINEER'S Consultant."

Delete definition 1.01 A.41 entitled "Specifications" in the General Conditions in its entirety and insert the following in its place:

"Sections included under Division 1 through Division 3 of the Contract Documents."

ARTICLE 2. PRELIMINARY MATTERS

SC-2.03

Add paragraph 2.03B:

Notwithstanding the time limitations provided in paragraph 2.03A, the OWNER may desire to commence the Contract Times later than the sixtieth day after the bid opening. The OWNER and CONTRACTOR, upon mutual agreement, may extend the commencement of the Contract Times to any date that they elect. OWNER must obtain CONTRACTOR's approval for extending the time beyond the dates/times stated in the Contract Documents.

SC-2.05

Delete paragraph 2.05C of the General Conditions in its entirety and insert the following in its place:

"C. Evidence of Insurance: CONTRACTOR shall deliver to OWNER, with a copy to the ENGINEER, Certificates of Insurance within 10 days after receipt of the notice of the acceptance of bid (and other evidence requested by OWNER) which CONTRACTOR is required to purchase and maintain in accordance with the requirements of Article 5."

ARTICLE 3. CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

SC-3.01

Add the following sentence at the end of Paragraph 3.01A of the General Conditions:

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

ARTICLE 4. AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS

SC-4.02

Delete the term "Supplementary Conditions" of paragraph 4.02 A of the General Conditions and replace it with "Contract Documents".

SC-4.04

Change "of" to "or" on line 6 of paragraph 4.04 B.2 of the General Conditions.

Delete the following words from lines 8 and 9 of paragraph 4.04 B.2 of the General Conditions:

"...or not shown or indicated with reasonable accuracy..."

SC-4.05

Add a new paragraph immediately after paragraph 4.05A of the General Conditions which is to read as follows:

"B. ENGINEER may check the lines, elevations and reference marks set by CONTRACTOR, and CONTRACTOR shall correct any errors disclosed by such check. Such a check shall not be considered as approval of CONTRACTOR's work and shall not relieve CONTRACTOR of the responsibility for construction of the entire Work in accordance with the Contract Documents. CONTRACTOR shall furnish personnel to assist ENGINEER in checking lines and grades."

SC-4.06

Delete the term Supplementary Conditions in paragraph 4.06A of the General Conditions and replace it with "Contract Documents".

Add the following sentences at the end of paragraph 4.06A of the General Conditions:

"...Contract Documents. Responsibilities of the CONTRACTOR with regard to removal and disposal of hazardous materials and substances on the project are described in detail in these Contract Documents. The CONTRACTOR, who may act as OWNER'S agent, and all SUBCONTRACTORS are responsible to transport all hazardous materials and to handle and dispose of all such material in accordance with local, state and federal regulations and will ensure proper material disposal at a facility licensed to receive such material."

ARTICLE 5. BONDS AND INSURANCE

NOTICE TO CONTRACTOR:

1. Proof of Insurance coverage shall be furnished to the OWNER in accordance with the schedule for submittal of Bonds and Agreements.
2. Additionally refer to Article 2. PRELIMINARY MATTERS, Paragraph SC-2.05.C

SC-5.01

Insert these sentences following SC-5.01.A: The Surety Company providing the bonds shall have a rating of A or better within the Best Key Rating Guide and be licensed by the Massachusetts Division of Insurance. The Contractor shall pay the premiums for such Bonds.

SC-5.03

Delete the second sentence in paragraph 5.03A of the General Conditions, which begins "OWNER shall deliver to...."

SC-5.04

The limits of liability for the insurance required by paragraph 5.04A of the General Conditions shall provide coverage for not less than the following amounts or greater where required by law:

5.04 A.1 and 5.04 A.2 Workers' Compensation.

- | | | |
|-----|-----------------------------------|-------------------------------|
| (1) | Worker's Compensation per | Statutory Requirements |
| (2) | Coverage B - Employer's Liability | \$100,000/\$500,000/\$100,000 |

5.04 A.3, 5.04 A.4 and 5.04 A.5 Commercial General Liability Limits shall include Coverage for independent Contractors, Personal Injury, Owners and Contractors Protective Liability, Explosion, Underground and Collapse, Broad Form Property Damage, and Blanket Contractual per location/project endorsement

Commercial General Liability	\$1,000,000/\$2,000,000
Products/completed Operations	\$2,000,000 Aggregate

5.04 A.6 Automobile Liability for owned, hired and non-owned vehicles:

(1) Bodily injury:	\$1,000,000	Combined single limit
(2) Property damage	\$1,000,000	Combined single limit

A. Engineer and Owner shall be named as Additional Insured, and so stated on contractors General Liability and Umbrella Liability certificates of insurance.

The Contractual Liability required by paragraph 5.04B.4 of the General Conditions shall provide coverage for not less than the following amounts:

(1) Bodily injury:	\$1,000,000	Each occurrence
	\$1,000,000	Annual aggregate
(2) Property damage, including explosion, collapse and underground coverage:	\$1,000,000	Each occurrence
	\$1,000,000	Annual aggregate

SC-5.04

Add two new paragraphs immediately after paragraph 5.04B of the General Conditions which are to read as follows:

“C. The CONTRACTOR shall also provide:

1. CONTRACTOR shall, as a minimum, purchase and maintain excess liability insurance in the umbrella form with a combined single limit of not less than \$5,000,000 per claim and in the aggregate. Evidence of such excess liability shall be delivered to OWNER in accordance with paragraph 2.05C in the form of a certificate indicating the policy numbers and limits of liability of all underlying insurance.

- A. General Liability, Workers' Compensation, Automobile Liability and Umbrella Liability Policies will contain waivers of subrogation in favor of the Engineer and Owner.
2. If the aggregate limits of liability indicated in CONTRACTOR' insurance provided in accordance with paragraphs 5.03 and 5.04 are not sufficient to cover all claims for damages arising from his operations under this Contract and from any other work performed by him or if policies of insurance do not provide that the aggregate limits of liability for bodily injury and property damage apply to each contract or project separately, CONTRACTOR shall have such policies amended so that the aggregate limits of liability required by this Contract will be available to cover all claims for damages due to operations under this Contract."

SC-5.05

Delete paragraph 5.05 of the General Conditions in its entirety.

SC-5.06

Delete Paragraph 5.06 A of the General Conditions in its entirety and insert the following in its place:

- "A. CONTRACTOR shall purchase and maintain, until final payment, property insurance upon the Work at the site in an amount equal to the total bid price for the completed construction. This insurance shall include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER and ENGINEER'S consultants in the Work, shall insure against the perils of fire and extended coverage, shall include "all risk" insurance for physical loss and damage including theft, vandalism and malicious mischief, collapse and water damage, and shall include damages, losses and expenses rising out of or resulting from any insured loss or incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers, architects, attorneys and other professionals). This insurance shall be provided on the completed value form. If not covered under the "all risk" insurance or otherwise provided in these Supplementary Conditions, CONTRACTOR shall purchase and maintain similar property insurance on portions of the Work stored on and off the site or in transit when such portions of the Work are to be included in an Application for Payment." A \$20,000 deductible shall be acceptable. Any other deductible amount shall be approved in advance by the OWNER and any deductible amount shall be borne by the CONTRACTOR.

Delete paragraph 5.06B of the General Conditions in its entirety.

Delete Paragraph 5.06C of the General Conditions in its entirety and insert the following in its place:

- "C. All the policies of insurance (or the certificates or other evidence thereof) required to be purchased and maintained by CONTRACTOR in accordance with paragraphs 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least thirty days' prior written notice has been

given to OWNER by certified mail and will contain waiver provisions in accordance with paragraph 5.07B. The words "Endeavor to" shall be struck from the Certificate Of Insurance in the Cancellation Statement"

Delete paragraph 5.06D of the General Conditions in its entirety.

Delete paragraph 5.06E of the General Conditions in its entirety.

SC-5.07

Amend the last sentence of paragraph 5.07A of the General Conditions by striking out the words "held by OWNER as trustee or." As so amended, paragraph 5.07A remains in effect.

SC-5.08

Delete paragraph 5.08A of the General Conditions in its entirety.

Delete paragraph 5.08B of the General Conditions in its entirety.

SC-5.09

Delete paragraph 5.09A of the General Conditions in its entirety and insert the following in its place:

"A. If OWNER has any objection to the coverage afforded by or other provisions of the insurance required to be purchased and maintained by CONTRACTOR in accordance with this Article 5 on the basis of its not complying with the Contract Documents, OWNER will notify CONTRACTOR in writing thereof within thirty days of the date of delivery of such certificates to OWNER in accordance with paragraph 2.05C. CONTRACTOR will provide such additional information in respect of insurance provided by him as OWNER may reasonably request."

ARTICLE 6. CONTRACTOR'S RESPONSIBILITIES

SC-6.01

Delete paragraph 6.01B of the General Conditions in its entirety and replace with the following:

"B. At the site of the Work the CONTRACTOR shall employ a full-time construction superintendent or foreman who shall have full authority to act for the CONTRACTOR. It is understood that such representative shall be acceptable to the ENGINEER and shall be one who will be continued in the capacity for the particular job involved unless the representative ceases to be on the CONTRACTOR's payroll. If at any time during the Work the representative is deemed by the ENGINEER to be no longer acceptable, the representative shall be promptly replaced by the CONTRACTOR. All communications to the superintendent shall be as binding as if given to the CONTRACTOR."

SC-6.04

Add the following paragraph after paragraph 6.04A.2 of the General Conditions:

"B. The CONTRACTOR's resident superintendent shall attend monthly progress meetings at the site of the work with the ENGINEER and others as appropriate to review schedule status and such other pertinent subjects as may be listed on the agenda by the ENGINEER."

SC-6.17

In paragraph 6.17 E.1 of the General Conditions, delete the word "timely" from the first line.

SC-6.20

Delete paragraph 6.20A of the General Conditions in its entirety and replace with the following:

"A. To the fullest extent permitted by law, the CONTRACTOR shall indemnify and hold harmless the OWNER, the ENGINEER, ENGINEER's consultants, and any of their officers, directors, employees, agents, affiliates, subsidiaries and partners from and against all claims, damages, losses and expenses, including but not limited to attorney's fees, arising out of or resulting from the performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including loss of use resulting therefrom, but only to the extent caused in whole or in part by acts or omissions of the CONTRACTOR, a subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall apply to any such claims, damages, losses and expenses which arise and/or are incurred by any person or entity either during the performance of the Work and/or after completion of construction. Nothing in this paragraph shall be construed to negate, abridge, or reduce other rights or obligations of indemnity or contribution which would otherwise exist as to a party or person indemnified hereunder. CONTRACTOR hereby assumes the responsibility and liability for injury to or death of any and all persons, including the CONTRACTOR's employees, and for any and all damage to property caused by, resulting from, or arising out of any act, omission or neglect on the part of the CONTRACTOR, or of any Subcontractor or of anyone directly or indirectly employed by any of them or of anyone for whose acts, any of them may be liable. The Contractor hereby acknowledges its obligation under the foregoing paragraph to indemnify the Engineer and Owner against judgements suffered because of the contractor's work and to assume the cost of defending the Engineer and Owner against claims as described in the foregoing paragraph."

Delete paragraph 6.20C of the General Conditions in its entirety.

ARTICLE 8. OWNER'S RESPONSIBILITIES

SC-8.06

Delete paragraph 8.06A of the General Conditions in its entirety.

ARTICLE 9. ENGINEER'S STATUS DURING CONSTRUCTION

SC-9.01

Add a new paragraph 9.01B after paragraph 9.01A of the General Conditions, which is to read as follows:

"B. Nothing contained in the Contract Documents shall be construed to create a contractual relationship of any kind (1) between the ENGINEER and CONTRACTOR, (2) between the OWNER and a Subcontractor or Subcontractors, or (3) between any person or entities other than the OWNER and CONTRACTOR. The ENGINEER shall, however, be entitled to performance and enforcement of obligations under the CONTRACT DOCUMENTS intended to facilitate performance of the ENGINEER'S duties."

ARTICLE 11. COST OF THE WORK; CASH ALLOWANCES; UNIT PRICE WORK

Delete Article 11 of the General Conditions in its entirety and replace with the following:

"A. The unit price of an item of Unit Price work shall be subject to reevaluation and adjustment under the following conditions:

(1) If the total extended bid price [Estimated Quantity times the Bid Unit Price] of a particular item of Unit Price Work amounts to 5 percent or more of the Original Contract Price and the variation in the quantity of the particular item of Unit Price Work performed by CONTRACTOR differs by more than 15 percent from the estimated quantity of such item indicated in the Agreement;
and

(2) If there is no corresponding adjustment with respect to any other item of work; and

(3) If CONTRACTOR believes that CONTRACTOR has incurred additional expense as a result thereof, CONTRACTOR may make a claim for an adjustment in the Contract Price in accordance with Article 11 if the parties are unable to agree as to the effect of any such variations in the quantity of Unit Price Work performed. If OWNER believes that the quantity variation entitles OWNER to an adjustment in the unit price, OWNER shall be entitled to an adjustment in the unit price in an amount determined by the ENGINEER. ENGINEER shall not be liable in connection with any determination relating to adjustments which is rendered in good faith."

ARTICLE 12. CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

SC-12.06

Add the following new paragraphs after paragraph 12.06 of the General Conditions:

"12.07 Liquidated Damages:

05/17/2006

00800-9

- A. If the CONTRACTOR shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the OWNER, then the CONTRACTOR does hereby agree, as a part consideration for the awarding of this Contract, to pay to the OWNER the amount specified in the Contract, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contract shall be in default after the time stipulated in the Contract for completing the work. Such damages may be retained from time to time by the OWNER from progress payments or any amounts owing to the CONTRACTOR, or otherwise collected.
- B. The said amount is fixed and agreed upon by and between the CONTRACTOR and the OWNER because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the OWNER would in such event sustain, and said amount is agreed to be the amount of damages which the OWNER would sustain and said amount shall be retained from time to time by the OWNER from current periodical estimates.
- C. It is further agreed that time is of the essence of each and every portion of this Contract and of the specifications wherein as definite and certain length of times if fixed for the performance of any act whatsoever; and where under the Contract an additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be of the essence of this Contract. Provided that the CONTRACTOR shall not be charged with liquidated damages of any excess cost when the OWNER determines that the CONTRACTOR is without fault and the CONTRACTOR's reasons for the time extension are acceptable to the OWNER; Provided, further, that the CONTRACTOR shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:
- 1) to any preference, priority or allocation order duly issued by the Government;
 - 2) to unforeseeable cause beyond the control and without the fault or negligence of the CONTRACTOR, including, but not restricted to, acts of God, or of the public enemy, acts of the OWNER, acts of another CONTRACTOR in the performance of a contract with the OWNER, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and severe weather; and
 - 3) to any delays of subcontractors or suppliers occasioned by any of the causes specified in subsections C (1) and C (2) above;
- D. Provided, further, that the CONTRACTOR shall, within thirty (30) days from the beginning of such delay, unless the OWNER shall grant a further period of time prior to the date of final settlement of the Contract, notify the OWNER, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the CONTRACTOR within a reasonable time of its decision in the matter."

ARTICLE 13. TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

SC-13.07

Delete paragraph 13.07A of the General Conditions and insert the following in its place:

- “A. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any work is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER's written instructions: (i) correct such defective work, or, if it has been rejected by OWNER, remove it from the site and replace it with work that is not defective, and (ii) satisfactorily correct or remove and replace any damage to other work or the work of others therefrom. If CONTRACTOR does not begin the repairs within ten (10) days of receipt of written notification and promptly comply with the terms of OWNER's written instructions, or in an emergency where delay would cause serious risk, loss or damage, OWNER may have the defective work corrected or the rejected work removed and replaced, and all claims, costs, losses and damages caused by or resulting from such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by CONTRACTOR.”

SC-13.09

Revise paragraph 13.09A of the General Conditions

- A. Delete the word “seven” and replace it with the word “ten” so that it reads “after ten days written notice to CONTRACTOR.”

ARTICLE 14. PAYMENTS TO CONTRACTOR AND COMPLETION

SC-14.02

Delete paragraph 14.02A.3 and insert the following in its place:

- “3. Retainage with respect to progress payments will be five percent or, if stipulated, the maximum allowed by law.”

Add Paragraph 4. to read as follows:

- “4. The CONTRACTOR shall submit Weekly Payroll Records Report and Statement of Compliance verifying compliance with the Minimum Prevailing Wage Law, MGL ch. 149, Sections 26-27H. These Statements of Compliance shall be submitted as a condition of payment for work performed during the period the reports apply.”

SC-14.03

Delete paragraph 14.03A in its entirety and insert the following in its place:

"A. CONTRACTOR warrants and guarantees that title to all work, material and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER no later than at the time of Application for Payment free and clear of all liens. CONTRACTOR shall provide written transfer of title and a certified paid invoice provided by the supplier."

ARTICLE 15. SUSPENSION OF WORK AND TERMINATION

SC-15.02

Add a new paragraph immediately after paragraph 15.02 A.4 of the General Conditions which is to read as follows:

"5. If the Work to be done under this Contract shall be abandoned, or if this Contract or any part thereof shall be sublet, without the previous written consent of OWNER, or if the contract or any claim thereunder shall be assigned by CONTRACTOR otherwise than as herein specified;"

ARTICLE 17. MISCELLANEOUS

SC-17.06, 17.07, 17.08, 17.09

Add the following new paragraphs after paragraph 17.05 of the General Conditions:

"17.06 Assignment:

A. The CONTRACTOR shall not assign the whole or any part of this Contract or any moneys due or to become due hereunder until thirty (30) days prior notice in writing has been given to the OWNER of the intention to assign, which notice shall state the identity and address of the prospective assignee. No assignment shall be made without the OWNER's prior written consent. Such consent shall not be unreasonably withheld. In case the CONTRACTOR assigns all or any part of the moneys due or to become due under this Contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any moneys due or to become due to the CONTRACTOR shall be subject to prior claims of all persons, firms and corporations of services rendered or materials supplied for the performance of the work called for in this Contract."

17.07 Liability

It is understood and agreed that members of the OWNER or the ENGINEER or any agent or employees of the OWNER signing this Agreement shall not be personally liable hereunder for any action incurred in connection with this Agreement.

17.08 State Statutes and Regulations

05/17/2006

00800-12

See Section 00830 for further modifications of the General Conditions due to state statutes and regulations.

17.09 Severability

If any provision of this Agreement shall be invalid or unenforceable to any extent or in any application, then the remainder of this Agreement and of such terms and conditions, except to such extent or in such application, shall not be affected thereby, and each and every term and condition of this Agreement shall be valid and enforced to the fullest extent and in the broadest application permitted by law."

END OF SECTION

O:\Arlington MA\2060467 - YEAR # 1 DESIGN\SPECIFICATIONS\00800 SUPPLEMENTARY CONDITIONS-TOC.doc

THIS IS SUPPLEMENT TO AND BECOMES PART OF:

SECTION 00830

STATE STATUTES AND REGULATIONS
COMMONWEALTH OF MASSACHUSETTS

NOTE: The following paragraph is modified, corrected, added to, or deleted as follows:

1. On Page 00830-7, delete Item 8 - Access to Work in its entirety.

SECTION 00830

STATE STATUTES AND REGULATIONS
COMMONWEALTH OF MASSACHUSETTS

A. REVISIONS TO GENERAL CONDITIONS

1. Definitions
2. Subsurface Conditions Found Different
3. Subcontracting
4. Permits
5. Contractor Records
6. Massachusetts Sales and Use Tax
7. Clarifications and Interpretations
8. Change of Contract Price
9. Payments
10. Suspension of Work and Termination
11. Labor Classification and Minimum Wage Rates

B. OTHER REGULATORY REQUIREMENTS

1. Working Hours
2. Special Provisions for Minority/Women Business Enterprises and Equal Employment Opportunity Anti-Discrimination and Affirmative Action Program.
3. DEP Community Sound Level Criteria
4. OSHA 10 Hour Certification Requirements
- **5. Easements and Right-of-Way
- **6. Record Drawings
- **7. Pipe Testing
- **8. Access to work
- **9. Documentation to Substantiate Quantities
- **10. Payment for Rock Excavation
- **11. Experience of Equipment or Material Manufacturer

** Use only for projects funded (or partially funded) by the Commonwealth.

ATTACHMENT A

Wage Rates

ATTACHMENT B

Excerpts from Chapter 149, Chapter 30 and Chapter 82 of the Massachusetts General Law

ATTACHMENT C

Change Orders

*ATTACHMENT D

Special Provisions for Minority/Women Business Enterprises and the Commonwealth of Massachusetts Supplemental Equal Employment Opportunity Anti-Discrimination and Affirmative Action Program.

A. REVISIONS TO GENERAL CONDITIONS:

1. Definitions

The term "AWARDING AUTHORITY," as used herein, shall be considered to be synonymous with the term "OWNER," described in definition 1.01 A.30.

Delete definition 1.01 A.43 entitled "Substantial Completion" in the General Conditions in its entirety and insert the following in its place:

"Substantial Completion shall be interpreted in accordance with Massachusetts General Law Chapter 30, Section 39G or 39K as appropriate."

2. Subsurface Conditions Found Different

Add the following sentence to the end of paragraph 4.03A of the General Conditions:

"...to do so. Adjustments resulting from subsurface or latent physical conditions will be in accordance with Massachusetts General Law Chapter 30, Section 39N."

3. Subcontracting

Add the following language at the end of paragraph 6.06F of the General Conditions:

"Except as required otherwise by Massachusetts General Law Chapter 149, Section 44F, for Work governed by Chapter 149, sections 44A through 44H.

4. Permits

Delete paragraph 6.08A of the General Conditions in its entirety and insert the following in its place:

"A. The AWARDING AUTHORITY shall be responsible for identifying and obtaining all federal, state, and local permits required by the nature and location of construction, including but not limited to railroad permits, building construction permits, and permits for street and highway cuts and openings. CONTRACTOR shall be responsible for obtaining all permits required of his equipment, work force, or particular operations (such as blasting) in the performance of the Work and not otherwise specified to be obtained by the AWARDING AUTHORITY. These permit fees shall be paid by CONTRACTOR. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of opening of bids, or, if there are no Bids, on the Effective Date of the Agreement."

5. Contractor Records

Add a new paragraph immediately after paragraph 6.09C of the General Conditions, which is to read as follows:

"D. The CONTRACTOR shall comply with all applicable provisions Chapter 30, Section 39R of the Massachusetts General Laws regarding, CONTRACTOR's records."

6. Massachusetts Sales and Use Tax

Add the following paragraph after paragraph 6.10A of the General Conditions:

"B. The materials and supplies to be used by the CONTRACTOR in the Work of this Contract are exempt from the Sales and Use Tax of the Commonwealth of Massachusetts. The AWARDING AUTHORITY tax exemption certificate number will be furnished to the CONTRACTOR."

7. Clarifications and Interpretations

Add the following language at the end of paragraph 9.04A of the General Conditions:

"The ENGINEER'S interpretation will be made in accordance with the requirements of Massachusetts General Law Chapter 30, Section 39P."

8. Change of Contract Price

Delete paragraphs 11.01, 11.02 and 12.01 of the General Conditions, having to do with Change of Contract Price. Changes in contract price will be governed by the section called "Change Orders," in Attachment D, Section 00830 and Article 11 in the Supplementary Conditions.

9. Payments

Delete paragraph 14.02B.1 of the General Conditions in its entirety and insert the following in its place:

"1. Progress Payments will be made in accordance with Massachusetts General Law Chapter 30, Section 39G, or 39K, as applicable."

Add the following new paragraph following paragraph 14.02C.1 of the General Conditions:

"2. The CONTRACTOR shall make payments to Subcontractors in accordance with the requirements of Massachusetts General Law Chapter 30, Section 39F."

Delete paragraph 14.07B of the General Conditions in its entirety and insert the following in its place:

"1. If, on the basis of the ENGINEER's observation of the Work during construction and final inspection and, upon the ENGINEER's review of the final Application for Payment and accompanying documentation, the ENGINEER is satisfied that the Work has been completed and that the CONTRACTOR's other obligations under the Contract Documents have been fulfilled, the ENGINEER will indicate in writing his recommendation of payment and present the Application to the AWARDING AUTHORITY for payment. Thereupon the ENGINEER will give written notice to the AWARDING AUTHORITY and the CONTRACTOR that the Work is acceptable subject to the provisions of paragraph 14.15. Otherwise, the ENGINEER will return the Application to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment. In such case the CONTRACTOR shall make the necessary corrections and resubmit the Application. If the Application and accompanying documentation are appropriate as to form and substance, the AWARDING AUTHORITY shall in accordance with the applicable Massachusetts General Law, pay the CONTRACTOR the amount recommended by the ENGINEER."

10. Suspension of Work and Termination

Delete paragraph 15.01A of the General Conditions in its entirety and insert the following in its place:

"A. The AWARDING AUTHORITY may order, at any time and without cause, the CONTRACTOR to suspend or delay the Work in accordance with Massachusetts General Law Chapter 30, Section 39O."

11. Labor Classifications and Minimum Wage Rates

Add the following paragraphs under the heading "Wage Rates" after paragraph 17.09 of the Supplementary Conditions:

"17.11 Wage Rates

- A. Minimum wage rates as determined by the Commissioner of the Department of Labor and Industries under the provisions of Massachusetts General Laws Chapter 149, Sections 26-27D apply to this project. A copy of the wage schedule is included in Attachment A of Section 00830. If, after the Notice of Award, it becomes necessary to employ any person in a trade or occupation not classified in the wage determinations, such person shall be paid at not less than such rates as shall be determined by the Commissioner. Such approved minimum rate shall be retroactive to the time of the initial employment of such person in such trade or occupation. The CONTRACTOR shall notify the AWARDING AUTHORITY of its intention to employ persons in trades or occupations not classified in the wage determinations as soon as possible in order to allow sufficient time for the AWARDING AUTHORITY to obtain approved rates for such trades or occupations.
- B. The schedule of wages referred to above are minimum rates only, and the AWARDING AUTHORITY will not consider any claims for additional compensation made by CONTRACTOR because of payment by the CONTRACTOR of any wage rate in excess of the applicable rate contained in the Contract. All construction associated with this Contract will be governed by Heavy and Highway Rates.
- C. The said schedule of wages shall continue to be the minimum rates to be paid during the life of this Agreement and a legible copy of said schedule shall be kept posted in a conspicuous place at the site of the Work.
- D. CONTRACTOR and subcontractors shall submit a copy of weekly payroll records to the AWARDING AUTHORITY and the AWARDING AUTHORITY shall retain the records for a minimum of three years."

B. OTHER REGULATORY REQUIREMENTS:

1. Working Hours

No laborer, workman, mechanic, foreman, or inspector, working within the Commonwealth, in the employ of the CONTRACTOR, subcontractor, or other person doing or contracting to do the whole or a part of the work contemplated by this contract, shall be required or permitted to work more than eight hours in any one day or more than forty-eight hours in any one week, or more than six days in any one week, except in cases of emergency.

2. Special Provisions for Minority/Women Business Enterprises and Equal Employment Opportunity Anti-Discrimination and Affirmative Action Program.

The Contractor shall abide by the Special Provisions for Minority/Women Business Enterprises and the Commonwealth of Massachusetts' Supplemental Equal Employment

Opportunity Anti-Discrimination and Affirmative Action Program. The Program is attached in its entirety on pages 00830-C and requires the following reporting system procedures be followed:

- A. Contractors must submit the Contractor's Quarterly Projected Workforce Table (CAD 85-1) prior to the commencement of work and no later than five (5) working days prior to the start of each new quarter to the Contract Compliance Officer.
- B. Contractors must submit the Certificate of Work Start-Up By Minority/Women Business Enterprise (Form EEO-BMF-390) within ten (10) days after work start-up for each minority/women business to the Contract Compliance Officer.
- C. Contractors must submit the Contractor's Weekly Workforce Utilization Report (CAD 85) to the Contract Compliance Officer no later than the following Tuesday of each week.
- D. Contractors must submit the Quarterly Contract Compliance Report (CAD 75) within ten (10) days following the reporting period to the Contract Compliance Officer.
- E. The Contracting/Administering Agency's Contract Compliance Officer must prepare the Agency's Quarterly Contract Compliance Report (CAD 75) for Minority Workforce Utilization and MBE/WBE Contract Activities Report and send them to MCAD no later than the 15th of the month following the end of each quarter.
- F. The Prime Contractor is responsible for the submission of all reports from all of his/her sub-contractors.
- G. The OWNER must submit (within 30 days of submission by the General Contractor of the Final Pay Estimate) the MBE/WBE Contract Completion Verification (form EEO-BMF-590) to the DEP Contract Compliance Officer with a copy to the BMF's MBE/WBE Coordinator.

3. DEP Community Sound Level Criteria

The Community Sound Level Criteria as established by the Commonwealth of Massachusetts' Department of Environmental Protection (DEP) must be conformed to prior to the AWARDING AUTHORITY's acceptance of the structure. The following sound level criteria must be met at the construction site:

- A. The increase in the broadband noise level shall not be in excess of ten (10) dB(A) above ambient at the station boundary. The ambient level is defined as the A-weighted noise level that is exceeded ninety (90) percent of the time measured during the period in question.

B. The primary noise source(s) shall not produce a puretone condition. Puretone is any given octave band center frequency that exceeds the two adjacent center frequencies by three (3) or more decibels.

4. OSHA 10 Hour Certification Requirements

Effective July 1, 2006 all employees of the Contractor who work at the jobsite must have received OSHA 10 Hour safety training, and have proof, at the jobsite, of being certified by OSHA as having received the training. The Contractor must provide proof of this certification for every employee with submission of the first certified payroll report for each employee.

5. Easements and Rights-of-Way

The AWARDING AUTHORITY shall obtain all easements and rights-of-way prior to the award of the Contract, in accordance with the Massachusetts Bureau of Municipal Facilities Policy Memorandum CG-1. See CG-1 in Attachment D.

6. Record Drawings

In accordance with the Massachusetts Bureau of Municipal Facilities Policy Memorandum CG-4, the ENGINEER will provide record drawings to the AWARDING AUTHORITY upon completion of the project.

7. Pipe Testing

In accordance with the Massachusetts Bureau of Municipal Facilities Policy Memorandum CG-9, the following policy shall be followed with regard to pipe testing:

Monthly payment estimates shall be prepared in accordance with the Contract Documents. All sewer pipe shall be tested in accordance with the Contract Documents and sound engineering practice. If, after 60 days following submission of a monthly payment estimate for pipe items, the pipe for which payment is requested has not been successfully tested, the AWARDING AUTHORITY may withhold up to 10% of the amount requested for such pipe items until the pipe has been so tested.

8. Access to Work

This project is funded in part by the Commonwealth of Massachusetts Bureau of Municipal Facilities. Representatives of the Commonwealth shall be authorized access to the work under this contract wherever it is in preparation or progress and shall be provided proper facilities to conduct inspections as they deem necessary.

9. Documentation to Substantiate Quantities

In accordance with the Massachusetts Bureau of Municipal Facilities Policy Memorandum CG-16, the ENGINEER will submit documentation to substantiate quantities with a final payment request or change order request.

10. Payment for Rock Excavation

Payment for excavation and removal of rock will be in accordance with the Massachusetts Bureau of Municipal Facilities Policy Memorandum CG-14. Memorandum CG-14 is included in Attachment D.

11. Experience of Equipment or Materials Manufacturer

Whenever it is written that an equipment or materials manufacturer must have a specified period of experience with his product, equipment which does not meet the specified experience period can be considered if the equipment or materials supplier or manufacturer is willing to provide an efficiency guarantee bond or cash deposit for the duration of the specified time period which will guarantee replacement of the equipment or material in the event of failure.

END OF SECTION

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BY-LAWS OF THE TOWN OF ARLINGTON

TITLE I

ARTICLE 16

CONSTRUCTION PROJECTS

Section 1. Women Work Force Participation

Any Town board or official in charge of a construction or reconstruction project is required to include in the contract documents the following:

- A. Contractor shall maintain as a goal on this project a not less than five percent ratio of women work force to total project hours in both the general contract and each individual filed sub-bid contract, if applicable. The preceding sentence shall be included in all construction contracts whether entered into by the Town pursuant to the provisions of M.G.L. c. 149 or M.G. L. c 30, §39M et. seq. provided however, that if entered into under Chapter 30 same shall not be deemed to apply where the projected bid price as determined by the Director of Public Works is not likely to exceed \$200,000.
- B. A Labor Scheduling Table which will be used as a tool for achieving a range of women work force participation for the entire project in both the general contract and each individual filed sub-bid contract.

Section 2. Equal Opportunity Goal Compliance

Any Town board or official in charge of a construction or reconstruction project is required to include in the contract documents the following:

- A. Before starting work, the contractors (includes the general contractor, for itself and its subcontractors, as well as all filed sub-bid contractors, if applicable) will submit plans for achievement of the equal opportunity goals of the contract. All contractors will be required to make a good faith effort to achieve these goals. The plan will indicate if the contractors expect to achieve the requirements during the first quarter. If there are reasons why the contractors do not expect to achieve the requirements during the first quarter year of the contract construction phase, then the contractors shall provide a plan calculated to address, to the extent reasonably possibly, these obstacles to a good faith effort to achieve such goals.
- B. Not more than ten days following the end of each work quarter, the contractors will report on the achievement of the goals, detailing the good faith efforts that have been made and will continue to be made and any other appropriate efforts not yet undertaken.
- C. All reports will be signed by an officer or principal of the company who has the authority to contractually obligate the company.

Section 3. Recruitment and Training

Any board, officer, committee, or other agency of the Town, which acts on behalf of the Town in making or supervising any contract, in an amount exceeding the sum of \$100,000 for the purchase of goods or services or for the construction, renovation, or repair of buildings or other improvement of real estate, may make arrangements with contractors and other interested agencies for special programs of recruitment and training in connection with the work to be performed on such contract, with the objective of promoting equal employment opportunity for members of minority groups protected by the fair employment laws of the Commonwealth and the United States. Any board, officer, committee or other Town agency may expend Town funds in carrying them out provided that appropriations specifically designed for such purposes have been voted by the Town Meeting.

SECTION 00950 – LIST OF DRAWINGS

SHEET NO.

TITLE

1. LOCATION PLAN, LEGEND, GENERAL NOTES, STORM DRAIN REHABILITATION
2. ACTON STREET, APPLETON STREET, AND FOREST STREET SEWER AND STORM DRAIN REHABILITATION

** END OF SECTION **

SECTION 01010 - SUMMARY OF WORK

PART I GENERAL

1.01 LOCATION OF WORK

- A. The proposed work is located within the Town of Arlington, Massachusetts in public streets and rights-of-way, private property and in easements. More particularly, the work is located on or adjacent to Forest Street, Massachusetts Avenue, Appleton Street, Acton Street and the Ottoson Middle School property.

1.02 DESCRIPTION OF THE WORK

- A. The work to be done under this Contract consists of the following:
1. Full length lining (manhole to manhole) using cured-in-place liner of 492' of 6" diameter sanitary sewer; 451' of 8" diameter sanitary sewer; 281' of 18" diameter storm drain; and 286' of 24" diameter storm drain.
 2. Reinstating about 20 sanitary sewer service and storm drain service connections closed by the cured-in-place pipelining operation.
 3. Internal point repair lining using cured-in-place pipe liner in 18-inch diameter storm drains at 2 locations.
 4. Excavate and replace approximately sixty feet of 8-inch sanitary sewer main and reconnect pipe to existing manholes.
 5. Sewer and drain manhole rehabilitation at 22 manholes identified in the tabulation on pages 01010-3 and 4 of this section.
 6. Chemical root control of 673 feet of 6-inch and 8-inch sewer.
 7. Heavy cleaning and CCTV inspection of about 212 feet of 8-inch sewer.
 8. Testing and sealing of pipe joints in about 714 feet of 6-inch and 8-inch sewer.
 9. Ancillary work including environmental protection, sediment control, MWRA One-Time-Only Discharge Request, paving, curbing, sidewalk, and earthwork.
 10. Refer to the tabulations of work on pages 01010-3 through 7 herein. The work shall include all incidental work shown on the Drawings or Standard Details, specified herein, obviously implied or necessary.

B. GENERAL

1. Protect all equipment, materials, and structures, new and existing, from dust, moisture and physical damage at all times.
2. Materials of demolition shall be removed from the site and disposed of in an acceptable manner.
3. Salvaged material shall remain the property of the Owner and shall be stored as designated by the Engineer.
4. Notify all utilities prior to performing any excavation work. The Dig Safe telephone number is 1-888-344-7233. The Town of Arlington is not a member of Dig Safe and must be notified separately 72 hours in advance at (781) 316-3301. Disconnection of any utilities necessary to complete the work shall be done or paid for by the Contractor in accordance with the requirements of the agency having jurisdiction over the utility.
5. Obtain permits from the MWRA for cured-in-place pipe lining process and root removal process.
6. Maintain safe working conditions at all times.
7. Abandoned underground pipe shall be emptied and plugged with concrete or masonry for a depth equal to twice its diameter.
8. No open fire burning will be allowed.
9. Sewer cleaning debris shall be removed from the site and disposed of in an acceptable manner in accordance with the State's special waste regulations.

1.03 DRAWINGS

- A. The work is located and described further on the Drawings that are listed by number and title in Section 00950 - LIST OF DRAWINGS.

1.04 ORDER OF WORK

- A. The work shall be prosecuted in such order and manner as the Engineer shall approve. Immediately after the award of the Contract, submit a progress schedule covering all parts of the work to the Engineer for approval. The progress schedule shall state the method and shall forecast the date for carrying out each portion of the work to be done. Also submit to the Engineer for approval details of methods to be used for controlling groundwater and sewage flows.

ARLINGTON, MA
Sewer and Drain Improvements
Ottoeson Middle School Area

SEWER & DRAIN MANHOLE REHABILITATION

<u>SEWER MANHOLES</u>							
SMH Number	Street	Install Plugs in Manhole Cover	Rebuild Invert / Shelf	Repair Invert	Restore Pipe Openings	Clean Manhole / Invert / Pipe Conn.	Comments
AC002	Forest Street	1		1		1	4 - 1" holes in cover; debris blocking flow in invert; Clean and inspect invert; plug holes in cover; repoint mortar in invert/shelf and coat with epoxy mortar.
AC001	Forest Street	1					16 - 1" holes in cover; plug holes in cover.
20001	Mass. Ave. at Appleton Place	1					5 - 1" holes in cover; plug holes in cover.
20003	Appleton Street			1			Flow high velocity and overflowing to shelf; repoint mortar joints in invert/shelf and coat with epoxy mortar.
20004	Appleton Street at Appleton Street	1					14 - 1" holes in cover; plug holes in cover.
20005	Acton Street	1					3 - 1" holes in cover; plug holes in cover.
20006	Acton Street	1	1			1	12 - 1" holes in cover; some mortar missing in invert; plug holes in cover; remove and replace brick, repoint mortar joints in invert/shelf and coat with epoxy mortar.
20007	Acton Street			1		1	Debris disrupting flow in invert; clean invert; repoint mortar joints in invert/shelf and coat with epoxy mortar.
20008	Acton Street at School Access Road	1		1	1	1	6 - 1/2" holes in cover; clean and inspect invert; plug holes in cover; restore two pipe opening to full diameter; repoint mortar joints in invert/shelf and coat with epoxy mortar.
20009	Acton Street at School Access Road					1	Debris disrupting flow in invert; clean invert.
	TOTAL	7	1	4	1	5	

ARLINGTON, MA
Sewer and Drain Improvements
Ottoson Middle School Area

SEWER & DRAIN MANHOLE REHABILITATION

<u>DRAIN MANHOLES</u>									
<u>DMH Number</u>	<u>Street</u>	<u>Replace Frame & Cover</u>	<u>Remove & Reset Frame & Cover</u>	<u>Replace Pavement Around Frame</u>	<u>Rebuild Invert / Shelf</u>	<u>Repair Invert</u>	<u>Repair Corbel</u>	<u>Clean Manhole / Invert / Pipe Conn.</u>	<u>Comments</u>
119020	Forest Street						1		Multiple missing bricks
119030	Forest Street							1	Heavy sediment buildup in invert. Clean & inspect sump
119060	Mass. Ave.				1				Erosion causing missing mortar
119120	Mass. Ave.							1	Could not inspect due to standing water, clean & inspect invert
119130	Appleton Street		1	1					Deteriorated pavement around MH is causing damage to corbel
119150	Appleton Street at Acton Street	1		1	1				Hole in invert, gouge on corner of MH Frame
119170	Acton Street							1	Heavy sediment buildup on shelf. Clean & inspect invert
119171	Acton Street				1			1	Heavy sediment, clean and inspect invert
119220	Acton Street At School Access Road	1		1		1			Missing mortar in invert; portion of frame missing
119221	Acton Street At School Access Road					1		1	Missing mortar in invert; sediment buildup on side of invert
119210	Ottoson Middle School Parking Lot	1		1					Bottom of cover missing; portion of frame missing
119211	Ottoson Middle School Parking Lot	1		1	1			1	Invert broken; portion of frame missing; clean invert
	TOTAL	4	1	5	4	3	2	6	

ARLINGTON, MA
Sewer and Drain Improvements
Ottoson Middle School Area

SEWER & DRAIN PIPELINE REHABILITATION

<u>DRAINS - Pipeline Lining</u>						
<u>Upstream DMH</u>	<u>Downstream DMH</u>	<u>Street</u>	<u>Rehabilitation</u>	<u>Pipe Size & Type</u>	<u>Quantity</u>	<u>Units</u>
119030	119020	Forest St.	Full Length CIPP Lining	24-inch VCP	210	feet
119060	119058	Massachusetts Ave.	Full Length CIPP Lining	24-inch VCP	76	feet
119160	119150	Action St. 145' to 151' from 119160	Internal Point Repair Liner	18-inch VCP	1	Location
119160	119150	Action St. 165' to 183' from 119160	Internal Point Repair Liner	18-inch VCP	1	Location
119160	119150	Action St.	Full Length CIPP Lining	18-inch VCP	281	feet
<u>Summary: Drains - Pipeline Lining</u>						
	24-inch VCP Drain		Full Length CIPP Lining		286	location
	18-inch VCP Drain		Full Length CIPP Lining		281	feet
	18-inch VCP Drain		Internal Point Repair Liner		2	locations
<u>SEWERS - Excavate & Replace Pipe</u>						
<u>Upstream SMH</u>	<u>Downstream SMH</u>	<u>Street</u>	<u>Rehabilitation</u>	<u>Pipe Size & Type</u>	<u>Quantity</u>	<u>Units</u>
20001	M4209	Appleton St.	Excavate and replace	8-inch VCP	60	Feet

ARLINGTON, MA

Sewer and Drain Improvements
Ottozon Middle School Area

SEWER & DRAIN PIPELINE REHABILITATION

SEWERS - Pipeline Lining, Testing & Sealing, and Root Removal						
<u>Upstream SMH</u>	<u>Downstream SMH</u>	<u>Street</u>	<u>Rehabilitation</u>	<u>Pipe Size & Type</u>	<u>Quantity</u>	<u>Units</u>
M4207	AC001	Forest St.	Full Length CIPP Lining	8-inch VCP	176	feet
AC001	AC002	Forest St.	Test and Seal	8-inch VCP	173	feet
20003	20001	Appleton St.	Full Length CIPP Lining	8-inch VCP	157	feet
20004	20003	Appleton St.	Test and Seal, Root Removal	8-inch VCP	212	feet
20005	20004	Acton St.	Test and Seal	6-inch VCP	56	feet
20006	20005	Acton St.	Full Length CIPP Lining	6-inch VCP	262	feet
20007	20006	Acton St.	Full Length CIPP Lining, Root Removal	6-inch VCP	230	feet
20008	20007	Acton St.	Test and Seal, Root Removal	8-inch VCP	231	feet
20009	20008	Acton St.	Full Length CIPP Lining	8-inch VCP	118	feet
20012	20009	Acton St.	Test and Seal	8-inch VCP	42	feet
Summary: Sewers - Pipeline Lining						
		6-inch VCP Sewer	Full Length CIPP Lining		492	feet
		8-inch VCP Sewer	Full Length CIPP Lining		451	feet
		6-inch VCP Sewer	Test and Seal		56	feet
		8-inch VCP Sewer	Test and Seal		658	feet
		6-inch & 8-inch VCP Sewer	Root Removal		673	feet

ARLINGTON, MA
Sewer and Drain Improvements
Ottoson Middle School Area

SEWER & DRAIN PIPELINE REHABILITATION

<u>SEWERS - Heavy Cleaning & CCTV Inspection</u>						
<u>Upstream SMH</u>	<u>Downstream SMH</u>	<u>Street</u>	<u>Rehabilitation</u>	<u>Pipe Size & Type</u>	<u>Quantity</u>	<u>Units</u>
AC003	AC002	Forest St. at Peirce St.	Clean and CCTV Pipe	8-inch VCP	55	Feet
AC004	AC003	Peirce St.	Clean and CCTV Pipe	8-inch VCP	115	Feet
20012	20009	Acton St.	Clean and CCTV Pipe	8-inch VCP	42	feet

- B. If the progress of the work has been or will be materially affected by changes in the work, or if the Contractor's performance has materially failed to conform to the approved schedule, the Contractor shall, upon request by the Engineer, submit for approval a revised progress schedule for the balance of the work.
- C. Before beginning any portion of the work, the Contractor shall give the Engineer due notice and ample time for making his necessary preparations.
- D. Generally, no excavation shall be done in streets during the five-month period from November 15 to April 15, unless approval has been granted in writing by the Engineer. When work is interrupted during this winter period, the time originally allowed to complete the Contract will be extended by the number of days lost.
- E. Specific items or locations of work may be directed by the Engineer to be done at specific times in order for additional work to be done on a timely basis.
- F. Sequence of Work. The contractor shall incorporate the following requirements into his work schedule:
 - 1. Pre-construction photographs and videos to document existing conditions shall be done prior to starting any work.
 - 2. Prior to performing chemical root control work, notify the MWRA and provide any documentation required by the Authority. Where sewer or manhole cleaning, grouting, or relining is specified or required, the foaming root control shall be performed a minimum of 60 days in advance of those operations, to maximize the biological decay of the root masses.
 - 3. Install environmental control and sediment control measures and contact the Arlington Conservation Agent at 781-316-3012 for an inspection prior to commencing excavation work.
 - 4. The internal point repair CIPP lining work shall be performed prior to the full length CIPP lining work between manholes DMH-119160 and DMH-119150.

** END OF SECTION **

SECTION 01025 - MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. Measurement. The quantities to be measured under the various items in the Schedule of Prices will be those quantities of work completed in accordance with the Contract Drawings and Specifications. The method of measurement of work completed shall be determined by the Engineer.
1. In the case of quantities paid for on a linear, area or volume basis, unless otherwise provided for, the length, area or volume to be paid for shall be computed using the projection of dimensions upon horizontal and vertical planes.
 2. For the computation of quantities where geometric methods would be laborious, it is understood and agreed that the "Planimeter" shall be considered an instrument of precision acceptable for the measurement of such quantities.
 3. Documentation of quantities shall be, as a minimum, in accordance with Construction Grants Policy Memorandum No. GC-16, dated January 31, 1992, issued by the Massachusetts Department of Environmental Protection and found in the Appendix.
- B. Prices. The unit or lump sum prices for all items in the Schedule of Prices shall be full compensation for the work specified and shall include the cost of furnishing all materials, labor, tools, and equipment, and all work and expenses incidental to and necessary to complete the work in accordance with the Drawings and Specifications.

1.02 WORK NOT PAID FOR SEPARATELY

- A. The Contractor shall take a digital video of all excavation sites, whether in streets or easements, and all other work sites in easements on private property, and furnish two sets of digital video disks (DVDs) to the Engineer prior to mobilization of the project. The Contractor shall retain and make available the digital videos through the duration of the Contract and guarantee period. Payment shall be included in the prices for the various items of work, and no separate payment will be made therefor. The Contractor shall take sufficient video at each site to document existing conditions.
- B. By-Pass Pumping. Payment for all necessary by-pass pumping, or wastewater and drainage flow handling and control, is included in the prices for the various items in the Schedule of Prices, and no separate payment will be made therefor.

- C. Preparatory Cleaning. Payment for preparatory cleaning of pipelines immediately before testing and sealing or lining of sewers and drains is included in the prices for testing and sealing and lining for the various items in the Schedule of Prices, and no separate payment will be made therefor.
- D. Televising. Payment for closed circuit television inspection and recording of pipelines immediately before, during, and after testing and sealing and lining is included in the prices for testing and sealing and lining for the various items in the Schedule of Prices, and no separate payment will be made therefor. Payment for the digital video format recording of the television inspection to be turned over to the Town at the time of payment request is also included in the prices for testing and sealing and lining work.
- E. Bonds. Payment for bonds required by the Contract is included in the prices for the various items of work in the Schedule of Prices, and no separate payment will be made therefor.
- F. Earth Excavation. Payment for earth excavation to the limits indicated on the Drawings or authorized by the Engineer for the construction of all structures, pipe-lines and appurtenances, and pavement construction, including disposal of the excavated materials in fills, backfills, embankments, designated stockpiles, or as spoil, as approved by the Engineer, is included in the prices for the various items of work in the Schedule of Prices, and no separate payment will be made therefor. Only "Miscellaneous Earth Excavation and Extra Earth Excavation" may be paid for under a separate item, as specified hereinafter.
- G. Filling, Backfilling, Embankment, and Disposal of Surplus Materials. Payment for filling and backfilling for all structures, pipelines, appurtenances and pavement construction, and backfilling at the end of each workday, including construction of embankments and disposal of surplus material, is included in the prices for the various items of work in the Schedule of Prices, and no separate payment will be made therefor.
 - 1. Gravel Borrow for Base Course. Payment for gravel borrow for gravel base for roadway patches, or gravel foundation for walks or curbs, is included in the prices for the various items in the Schedule of Prices, and no separate payment will be made therefor.
 - 2. Crushed Stone. Crushed stone used for bedding for miscellaneous structures and for stone envelope to bed pipe in earth and rock trenches excavated to normal depth will not be paid for separately.
- H. Sheeting, Shoring and Bracing. Steel sheeting, shoring, bracing, etc., will be paid for only if indicated on the Drawings or authorized in writing by the Engineer to be left in place. Otherwise, the Contractor may remove steel sheeting or abandon it at his option, provided such materials may be abandoned only to the extent permitted by the Engineer. No wood sheeting shall be left in place.

- I. Topsoiling and Seeding. Payment for topsoiling and seeding is included in the prices for the various items in the Schedule of Prices, and no separate payment will be made therefor.
- J. Silt Fence and Bales of Straw for Silt Control. Use of silt fence and bales of straw for silt control along brooks and wetlands and at catch basins during construction is included in the prices for the various items in the Schedule of Prices, and no separate payment will be made therefor. This also includes straw bale sediment basins and excelsior matting slope protection.
- K. Masonry. Brick masonry, concrete masonry and reinforcing steel indicated on the Drawings and forming parts of structures for which a price is stated in the Schedule of Prices is included in the prices stated for such items. Only additional brick masonry, concrete masonry and reinforcing steel ordered by the Engineer will be paid for separately.
- L. Clearing and Grubbing. Payment for clearing and grubbing to remove vegetation and small- and medium-sized trees to gain access and perform the specified work is included in the prices for the various items in the Schedule of Prices, and no separate payment will be made therefor.
- M. Stripping topsoil or other organic materials. Payment for stripping topsoil, including stockpiling, is included in the prices for the various items of work in the Schedule of Prices, and no separate payment will be made therefor.
- N. Testing pipelines and appurtenances.
 - 1. Payment for the testing of all sewers and appurtenances in accordance with these Specifications or as required by the Engineer, including furnishing all weirs, pumps, gages, hoses, plugs, and other necessary equipment, is included in the prices for the various items of work in the Schedule of Prices, and no separate payment will be made therefor. Water to be used for testing purposes will be provided by the Contractor.
 - 2. If, after 60 days following submission of a monthly payment estimate for pipe items, the pipe for which payment is requested has not been successfully tested, the Owner may withhold up to ten (10) percent of the amount requested for such pipe items until the pipe has been so tested. However, in the case of a major (pipe diameter 24 inches or greater) interceptor pipe installation, sums retained by the Owner pursuant to this policy memorandum shall not exceed two (2) percent of the cost of such pipe items.
- O. Dewatering by pumping, draining, bailing, etc. Payment for all necessary pumping, draining, bailing, siltation control, etc., including the use of well points, stilling wells, etc., is included in the prices for the various items in the Schedule of Prices, and no separate payment will be made therefor.

- P. Fences, Stone Walls and Guard Rails. Payment for fences, stone walls and guard rails indicated on the Drawings for removal and reinstallation is included in the prices for the various items in the Schedule of Prices, and no separate payment will be made therefor.
- Q. Dust Control. Payment for dust control is included in the prices for the various items in the Schedule of Prices, and no separate payment will be made therefor.

PART 2 CONTRACT UNIT PRICE & LUMP SUM ITEMS (ITEMS 1 – 26)

2.01 SEWER LINE CHEMICAL ROOT CONTROL (ITEM 1)

- A. Measurement. The quantity to be paid for under these items shall be the length in linear feet of sewers chemically treated for root control as measured from the centerline of the upstream manhole to the centerline of the downstream manhole.
- B. Payment. The unit price for these items shall be full compensation for all labor, materials, tools and equipment necessary to chemically treat the sewer pipe for root control, including obtaining the MWRA permit.

2.02 CLEANING & CCTV INSPECTION OF SEWERS (ITEM 2)

- A. Measurement. The quantity to be paid for under these items shall be the length in linear feet of 6-inch or 8-inch sewer cleaned and CCTV inspected as indicated on the Drawings or as directed by the Engineer measured from the centerline of the upstream manhole to the centerline of the downstream manhole.
- B. Payment for preparatory cleaning of pipelines immediately before testing and sealing or lining of sewers and drains is included in the prices for testing and sealing and lining for the various items in the Schedule of Prices, and no separate payment will be made therefor. Payment for CCTV inspection in conjunction with CIPP lining and testing and sealing operations is included in the items for that work and no separate payment shall be made.
- C. Payment. The unit price for these items shall be full compensation for all work, labor, materials and equipment for cleaning and CCTV inspection of sewers indicated on the Drawings using any and all methods, removal and legal disposal of debris, by-pass pumping or flow control, and all other work and expense incidental thereto.

2.03 FULL LENGTH SEWER AND DRAIN LINING (ITEMS 3- 6)

- A. Measurement. The quantity of cured-in-place full-length liner to be paid for under these items shall be the length in linear feet of each type (by inside diameter) of

sewers or drains lined as measured from the centerline of the upstream manhole to the centerline of the downstream manhole.

- B. Payment. Payment under these items at the contract unit price shall be full compensation for all materials, labor and equipment required to line the existing sewers and drain, and remove break-in service connections protrusions. Payment will also include preparatory pipeline cleaning, pre-lining TV inspection, removal of all obstructions that may prevent proper installation, flow control, public notification, post-lining TV inspection, and DVDs of the televising (video and log sheets) to be given to the Town at the time of payment request.

2.04 SEWER AND DRAIN INTERNAL POINT REPAIR CIPP LINING (ITEM 7)

- A. Measurement. The quantity to be paid for under this item shall be the number of point repair linings of each type (by inside diameter) made as measured by the Engineer. A point repair lining is defined as a pipe lining repair at a single location of a length 20 feet or less. The defect requiring repair relining is indicated on the Contract Drawings.
- B. Payment. Payment under this item at the contract price per point repair lining shall be full compensation for furnishing of all materials, equipment, tools and labor as required for the installation of a resin-impregnated cured-in-place point repair relining system as described in these specifications, and all other work and expense incidental thereto. Payment shall include preparatory pipeline cleaning, pre-lining TV inspection, removal of all obstructions that may prevent proper installation, flow control, public notification, post-lining TV inspection, and DVDs of the televising to be given to the Town at the time of payment request.

2.05 REINSTATE SERVICE CONNECTIONS (ITEM 8)

- A. Measurement. The quantity to be paid for under this item shall be the number of sewer service connections and drain lateral connections reinstated that were closed by the installation of the CIPP process.
- B. Payment. Payment under this item at the contract unit price shall be full compensation for all materials, labor and equipment required to restore closed sewer service and drain lateral connections with the use of the appropriate size cutter tool fitted with a CCTV camera.

2.06 EXCAVATE AND REPLACE PIPE (ITEM 9)

- A. Measurement. The quantity of pipe replaced with new pipe material to be paid for under this item shall be the length in linear feet of each type (by inside diameter) of sewers or drains replaced as measured from the centerline of the upstream manhole to the centerline of the downstream manhole. No distinction is made for depth.

- B. Payment. Payment under this item at the contract unit price per linear foot shall be full compensation for removing existing vitrified clay pipe and furnishing all new pipe and other materials required to rebuild the pipelines; stockpiling and rehandling pipe; earth excavation to a depth of 6 inches below the sewer pipe; furnishing and placing an envelope of selected material from 6 inches below sewer pipe to 6 inches above top of pipe; laying, setting and jointing all pipe and fittings and making connections to existing pipes and services; pipe connection to a manhole and invert work where necessary; backfilling; maintenance of flow; dewatering; markers; compacting; disposal of surplus excavated materials as directed by the Engineer; temporary sheeting and bracing; couplings; flexible couplings; riprap; topsoiling and seeding or sodding; TV inspection (one month after repair) of pipelines not scheduled for testing and sealing; and all other work and expense incidental thereto.

2.07 TEST PIPE JOINTS (ITEMS 10 & 12)

- A. Measurement. The quantity to be paid for under these items shall be the number of main line sewer pipe joints satisfactorily tested for each size pipe.
- B. Payment. The unit price for these items shall be full compensation for all work, materials, equipment, labor and incidental expenses required to perform testing as specified. Preparatory cleaning, wastewater flow control, and televising (and DVDs of the televising to be given to the Town at the time of payment request) required for this item are included in the unit price for joint testing.

2.08 SEAL PIPE JOINTS (ITEM 11 & 13)

- A. Measurement. The quantity to be paid for under these items shall be the number of main line sewer pipe joints and circular cracks sealed that pass the pressure test following sealing. **Longitudinal and circular cracks that are directed to be sealed by the Engineer will be measured as a joint each time the sealing unit is repositioned and activated and grout injected into the cracks. The estimated quantity in the Schedule of Prices is approximate only, and no adjustment will be allowed on the unit price if actual quantity varies considerably from the estimated quantity.**
- B. Payment. The unit price for these items shall be full compensation for all work, materials, equipment and labor, and incidental expenses required to perform joint sealing as specified, including TV inspection, DVDs of the television inspection, and post-sealing pressure test.

2.09 REPLACE MANHOLE FRAME AND COVER (ITEM 14)

- A. Measurement. The quantity to be paid for under this item shall be the number of manhole frames and covers that are removed and replaced with new frames and

covers. The manhole frames and covers to be replaced are shown on the Contract Drawings.

- B. Payment. The unit price for this item shall be full compensation for all materials, labor and equipment required to replace the existing frames and covers with new frames and covers, including cutting the existing pavement; removal and disposal of the existing frames and covers; removal of loose brick and mortar from manhole corbel, patching of manhole corbel, placing a new bed of mortar, and placing the new frames and covers to grade. Refer to Item 22 for pavement replacement.

2.10 REMOVE & RESET MANHOLE FRAME AND COVER (ITEM 15)

- A. Measurement. The quantity to be paid for under this item shall be the number of existing manhole frames and covers that are removed and reset in the manhole structure. The manhole frames and covers to be replaced are shown on the Contract Drawings.
- B. Payment. The unit price for this item shall be full compensation for all materials, labor and equipment required to remove and reset the existing frame and cover, including cutting the existing pavement; removal and storage of the existing frame and cover; removal of loose brick and mortar on manhole corbel, patching of manhole corbel, placing new bed of mortar, and placing the existing frame and cover to grade. Refer to Item 22 for pavement replacement.

2.11 REPAIR MANHOLE CORBEL (ITEM 16)

- A. Measurement. The quantity to be paid for under this item shall be the number of manhole corbels to be repaired.
- B. Payment. The unit price for this item shall be full compensation for all materials, labor and equipment required to repair corbels, including removal or loose material, surface preparation, and application and curing of patching materials.

2.12 REBUILD MANHOLE SHELF/INVERT (ITEM 17)

- A. Measurement. The quantity to be paid for under this item shall be the number of manholes in which the shelves/inverts are rebuilt.
- B. Payment. The unit price for this item shall be full compensation for all materials, labor and equipment required to repair manhole shelves/inverts including flow control, demolition of existing brick and mortar, and installation of new brick and mortar in the invert channel and shelf.

2.13 INSTALL PLUGS IN MANHOLE COVER (ITEM 18)

- A. Measurement. The quantity to be paid for under this item shall be the number of manhole covers in which the vents holes are filled with the specified plugs.
- B. Payment. The unit price for this item shall be full compensation for all materials, labor and equipment required to furnish and install the plugs in the manhole vent holes, including verification of the size, shape and number vent holes; surface preparation; and installation of the plugs.

2.14 REPAIR MANHOLE SHELF/INVERT (ITEM 19)

- A. Measurement. The quantity to be paid for under this item shall be the number of manholes in which the shelves/inverts are repaired.
- B. Payment. The unit price for this item shall be full compensation for all materials, labor and equipment required to repair manhole shelves/inverts including flow control, removal of existing loose brick and mortar, and installation of new brick and mortar, repointing of mortar joint, and coating invert channel and shelf surfaces with epoxy mortar.

2.15 RESTORE PIPE OPENINGS IN MANHOLE (ITEM 20)

- A. Measurement. The quantity to be paid for under this item shall be the number of manholes in which the pipe openings are reinstated to the full diameter of the pipe diameter. Resealing as a result of test or inspection failure will not be included in the quantity paid for. The manholes to be sealed are shown on the Contract Drawings and identified in the tabulation in Section 01010 – SUMMARY OF WORK.
- B. Payment. The unit price for this item shall be full compensation for all materials, labor, tools, equipment, and cleaning required to satisfactorily enlarge the pipe openings to the full pipe diameter to allow for testing and sealing equipment to be conducted or for CIPP lining operations to be completed, including drilling or cutting of the precast concrete manhole riser section, removal of concrete, cutting and removal of reinforcing steel, bypass pumping or flow control, and manhole cleaning and restoration work.

2.16 CLEAN MANHOLE (WALLS / INVERT / PIPE CONNECTIONS) (ITEM 21)

- A. Measurement. The quantity to be paid for under this item shall be the number of manholes cleaned as shown on the Contract Drawings and identified in the tabulation in Section 01010 – SUMMARY OF WORK.

- B. Payment. The unit price for these items shall be full compensation for all labor, materials, tools and equipment necessary to clean the manholes and properly dispose of the debris.

2.17 REPLACE PAVEMENT AROUND MANHOLE FRAME (ITEM 22)

- A. Measurement. The quantity to be paid for under this item shall be the number of square yards of pavement repaired around manhole frames shown on the Contract Drawings and identified in the tabulation in Section 01010 – SUMMARY OF WORK.
- B. Payment. The unit price for this item shall be full compensation for all materials, labor and equipment required for cutting existing pavement, removal and disposal of waste material, pavement replacement, pavement striping replacement, and all other work and expense incidental thereto. The Engineer shall determine the extent of pavement replacement at each manhole.

2.18 TEMPORARY BITUMINOUS CONCRETE PAVING – (ITEM 23)

- A. Measurement. The quantity of temporary pavement to be paid for under this item shall be the number of square yards of pavement of the thickness specified actually placed and accepted by the Engineer. Temporary pavement to be paid for under this item shall be limited to a width of 6'-6" where the excavation is 8' (feet) or less in depth, 9'-6" where the excavation depth is 8' to 12', and 12'-6" where the excavation depth is 12' to 16'. This item does not include pavement repair associated with replacement of manhole frame and cover (Item 12), or pipeline point repair replacement (Items 6 and 7), payment for which is included in these bid items.
- B. Payment. Payment under this item at the Contract Unit Price per square yard shall be full compensation for saw cutting, excavating, removing and disposing existing pavement; furnishing, placing and compacting all new materials, including gravel for base course; adjusting castings to grade; all labor, transportation and construction equipment, tools, and all other work and expense incidental thereto including for correction of trench settlement. Maintaining trench daily with cold patch when hot bituminous concrete is unavailable shall not be paid for but shall be considered incidental to the work. Filling potholes in the temporary paving shall not be paid for but shall be considered incidental to the work.

2.19 PERMANENT BITUMINOUS CONCRETE PAVING – (ITEM 24)

- A. Measurement. The quantity of permanent pavement to be paid for under this item shall be the number of square yards of pavement of the thickness specified actually placed and accepted by the Engineer. Permanent pavement to be paid for under this item shall be limited to a width of 8'-6" where the excavation is 8' (feet)

or less in depth, 11'-6" where the excavation depth is 8' to 12' and 14'-6" where the excavation depth is 12' to 16'. This item does not include pavement repair associated with replacement of manhole frame and cover (Item 12), or pipeline point repair replacement (Items 6 and 7), payment for which is included in these bid items.

- B. Payment. Payment under this item at the Contract Unit Price per square yard shall be full compensation for saw cutting, excavating, removing and disposing of temporary and existing pavement; furnishing, placing and compacting all materials, including reshaping gravel for base course; adjusting castings to grade; coating cut edges with emulsion; correction of trench settlement; furnishing, placing and compacting bituminous concrete mixture; all labor, transportation and construction equipment, tools, and all other work and expense incidental thereto.

2.20 MISCELLANEOUS AND EXTRA EARTH EXCAVATION (ITEM 25)

- A. Measurement. The quantity of miscellaneous earth excavation to be paid for under this item shall be the number of cubic yards of material so excavated by order of the engineer, for test pits or other purposes, as measured before excavation.
- B. Payment. Payment under this item at the contract unit price per cubic yard shall be full compensation for all excavation including hand excavation and for the disposal of the materials excavated in embankments, fills, backfills, designated stockpiles, or off the site, as directed by the engineer.

2.21 MOBILIZATION (ITEM 26)

- A. Measurement. The work under this item will be measured as a unit.
- B. Payment. The contract lump sum price for this item shall be full compensation for all site preparation work, and includes payment for mobilization, setting up construction plant, offices, shops, storage areas, sanitary and other facilities required by the Specifications or state law or regulations; providing access to the site; environmental controls; obtaining electrical power for dewatering or other construction operations; furnishing, maintaining and removing traffic and pedestrian control and safety signs, lights, barricades and bridges; furnishing, maintaining and removing snow fencing around all excavations as required; obtaining necessary permits (except asbestos handling/disposal permits) and licenses, and payment of fees; general protection; providing shop and working drawings, certificates and schedules; sampling and testing materials; providing required insurance; cleaning up; and all other work regardless of its nature that may not be specifically referred to in the Schedule of Prices but is necessary for complete construction of the project set forth by the Contract. Payment under this item

includes demobilization at the completion of the work and the project rehabilitation report specified in Section 13519 – Sewer and Drain Rehabilitation Report.

The amount of bid under this item shall not exceed five (5) percent of the total bid for all other bid items in this Contract.

Payment under this item shall be made in amounts of 25% of the Lump Sum amount in each of the first three periodical estimates, and shall be limited to 75% of the Lump Sum amount until completion of project demobilization and acceptance of the project rehabilitation report.

**** END OF SECTION ****

SECTION 01062 - REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The following statutes, regulatory programs, and permits regulating construction contracts for public works projects in Arlington, Massachusetts shall apply to this Contract: The Massachusetts General Laws and Regulations; Affirmative Action Requirements; Minority Business Enterprise Requirements; and Street Opening Permits.

1.02 MASSACHUSETTS GENERAL LAWS

- A. The following Massachusetts General Laws regulating construction contracts are specified by reference under this Section:

M.G.L. c.30, § 39F Payment to Subcontractor
c.30, § 39I Deviation from Plans and Specifications
c.30, § 39J No Arbitrary Decisions are Final
c.30, § 39L Construction Work by Foreign Corporations
c.30, § 39M(b) Substitution of Equal Products
c.30, § 39N Differing Site Conditions
c.30, § 39O Equitable Adjustments for Delays
c.30, § 39P Decision on Interpretation of Specifications
c.30, § 39Q Dispute Settlement by Hearing Officers
c.30, § 39R Contractor's Records
c.149, § 34 Limitations on Hours of Work
c.149, § 44J Advertising Invitations to Bid
c.353 Acts of 1983-Notice Requirements for Excavations
in Public Ways

- B. Other Massachusetts General Laws specified in other Sections also apply to this Contract.

1.03 ARTICLE 16 OF TOWN OF ARLINGTON BY-LAWS (See Appendix).

1.04 PERMITS

- A. Local Street Opening Permit. The Contractor will be required to obtain a local street opening permit from the Arlington Engineer's Office, 51 Grove St., Arlington.

- B. WPA Form 2 – Determination of Applicability. The Contractor shall comply with the conditions of the Determination of Applicability found in the Appendix, specifically Part B determination, Negative Determination, Paragraph 3.

**** END OF SECTION ****

SECTION 01070 - ABBREVIATIONS

PART 1 GENERAL

1.01 ABBREVIATIONS

A. Wherever the following abbreviations are used on the Drawings or in these Specifications, they are to be construed the same as the respective expressions represented:

- | | | |
|-----|--------|--|
| 1. | AASHTO | American Association of State Highway and Transportation Officials |
| 2. | ACI | American Concrete Institute |
| 3. | ANSI | American National Standards Institute |
| 4. | APWA | American Public Works Association |
| 5. | ASTM | American Society for Testing and Materials |
| 6. | AWWA | American Water Works Association |
| 7. | CISPI | Cast Iron Soil Pipe Institute |
| 8. | NCPI | National Clay Pipe Institute |
| 9. | NEWWA | New England Water Works Association |
| 10. | UL | Underwriters Laboratories, Inc. |

** END OF SECTION **

SECTION 01300 - SUBMITTALS

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The work to be done under this Section consists of submitting shop and working drawings, product data, certificates, instructional materials, samples, and construction photographs.
- B. Specific requirements are specified in other Sections of these Specifications.

1.02 WORK NOT INCLUDED

- A. The construction schedule is specified in 01010 - SUMMARY OF WORK.

1.03 DRAWINGS, PRODUCT DATA AND CERTIFICATES

- A. The Contractor shall submit so as to avoid delay in his work, or that of any subcontractor, seven copies of all shop, detail or working drawings, production data and certificates required for the work, and the Engineer shall review them noting comments. If required, the Contractor shall make corrections and resubmit seven corrected copies for final review and furnish such other copies as may be needed. The Contractor shall direct specific attention in writing and on resubmitted drawings, data or certificates, to revisions other than those requested by the Engineer on previous submittals. A third submission from the same manufacturer will not be accepted.
- B. The Engineer's review of such drawings, data or certificates shall not relieve the Contractor from responsibility for deviations from the Drawings or Specifications, unless he had in writing called the Engineer's attention to such deviations at the time of submission, and unless the Engineer shall have issued a written waiver of the pertinent Specification, nor shall it relieve him from responsibility for errors of any sort in shop drawings.
- C. Prior to the submission of shop drawings to the Engineer for review, the Contractor shall thoroughly examine the details and check all dimensions. The Contractor shall be fully responsible for the accuracy, proper fit, and coordination of all parts of the work.
- D. All drawings, data and certificates shall be properly identified as the Engineer may require, the Contractor shall stamp each submission with a rubber stamp stating that he has examined and checked the submission as above, and shall date and sign each. Any submission, which, upon examination by the Engineer, shows evidence

of not having been thoroughly checked, will be returned to the Contractor for completion of checking before it will be considered for review.

1.04 SAMPLES

- A. Samples as required by the Specifications shall be submitted after the award of the Contract, to the Engineer at the site. No materials for which samples are required shall be delivered to the site for use until the Engineer has approved representative samples in writing. The Contractor without charge shall furnish such samples.
- B. The Engineer may inspect the material at the source. If approved, such approval shall not preclude a future withdrawal if the material fails to meet the Specifications.

1.05 VIDEOS AND PHOTOGRAPHS

- A. The Contractor shall take digital videos and photographs of all excavation sites whether in streets or easements, and all other work sites in easements on private property, and furnish two sets of DVDs to the Engineer prior to mobilization of the project. Payment shall be included in the prices for the various items of work, and no separate payment will be made therefor. Sufficient photographs shall be taken at each site to document existing conditions.
- B. The Contractor shall take digital videos and photographs of excavated and exposed pipelines to be replaced to document existing conditions, and furnish two sets of DVDs to the Engineer as condition for payment. Payment shall be included in the prices for the various items of work, and no separate payment will be made therefor. Sufficient photographs shall be taken at each site to document existing conditions. No other progress photographs are required for this project.
- C. Refer to Sections 13513, 13516, and 13520 for additional digital video and DVD requirements.

** END OF SECTION **

SECTION 01562 - DUST CONTROL

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The work to be done under this Section consists of furnishing all materials, labor, tools and equipment, and performing all operations necessary to complete all calcium chloride applications for dust control.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Calcium chloride shall conform to AASHTO Standard Specification M 144, Type I or Type II. The calcium chloride shall be packaged in moistureproof bags or in airtight drums with the manufacturer, name of product, net weight, and percentage of calcium chloride guaranteed by the manufacturer legibly marked on each container.
- B. Calcium chloride failing to meet the requirements of the aforementioned specifications, or that, which has become caked or sticky in shipment, may be rejected by the Engineer.

PART 3 EXECUTION

3.01 CONSTRUCTION METHODS

- A. Calcium chloride shall be applied when ordered by the Engineer and only in areas, which will not be adversely affected by the application. See Section 01567 - ENVIRONMENTAL PROTECTION.
- B. Calcium chloride shall be uniformly applied at the rate of 1-1/2 pounds per square yard or at any other rate as directed by the Engineer. Application shall be by means of a mechanical spreader, or other approved methods. The number and frequency of applications shall be determined by the Engineer.
- C. Care shall be taken to avoid application of calcium chloride on any paved surfaces. If calcium chloride is applied to paved surfaces, the affected surfaces shall be immediately cleaned of all calcium chloride.

** END OF SECTION **

SECTION 01567 - ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The work covered by this section of the specifications consists of furnishing all labor, materials, tools and equipment and performing all work required for the prevention of environmental pollution during and as a result of construction operations under this contract.
- B. The requirements set forth in this section of the specifications apply to stream crossings and construction in and adjacent to wetlands, unless otherwise specifically stated.

1.02 NOTIFICATION

- A. The Engineer will notify the Contractor in writing of any non-compliance with the foregoing provisions. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails to act promptly, the Engineer may order stoppage of all or part of the work until satisfactory corrective action has been taken. No claim for an extension of time or for excess costs or damage incurred by the Contractor as a result of time lost due to any stop orders shall be made unless it was later determined that the Contractor was in compliance.

1.03 AREA OF CONSTRUCTION ACTIVITY

- A. Insofar as possible, the Contractor shall confine his construction activities to those areas defined by the plans and specifications. All land resources within the project boundaries and outside the limits of permanent work performed under this contract shall be preserved in their present condition or be restored to a condition after completion of construction at least equal to that, which existed prior to work under this contract.

1.04 PROTECTION OF WATER RESOURCES

- A. The Contractor shall not pollute streams, lakes or reservoirs with fuels, oils, bitumens, calcium chloride, acids or other harmful materials. It is the Contractor's responsibility to comply with all applicable Federal, State, County and Municipal laws regarding pollution of rivers and streams.
- B. Special measures shall be taken to insure against spillage of any pollutants and erosion of soils into public drains and waters.

1.05 PROTECTING AND MINIMIZING EXPOSED AREAS

- A. The Contractor shall limit the area of land, which is exposed and free from vegetation during construction. In areas where the period of exposure will be greater than two (2) months, temporary vegetation, mulching or other protective measures shall be provided as specified.
- B. The Contractor shall take account of the conditions of the soil where temporary cover crop will be used to insure that materials used for temporary vegetation are adaptive to the sediment control. Materials to be used for temporary vegetation shall be approved by the Engineer.

1.06 LOCATION OF STORAGE AREAS

- A. The location of the Contractor's storage areas for equipment and/or materials shall be upon cleared portions of the job site or areas to be cleared, and shall require written approval of the Engineer. Plans showing storage facilities for equipment and materials shall be submitted for approval of the Engineer.
- B. No excavated materials or materials used in backfill operations shall be deposited within a minimum distance of one hundred (100) feet of any watercourse or any drainage facility. Adequate measures for erosion and sediment control such as the placement of baled straw around the downstream perimeter of stockpiles shall be employed to protect any downstream areas from siltation.
- C. There shall be no storage of equipment or materials in areas designated as wetlands.
- D. The Engineer may designate a particular area or areas where the Contractor may store materials used in his operations.

1.07 PROTECTION OF LANDSCAPE

- A. The Contractor shall not deface, injure, or destroy trees or shrubs nor remove or cut them without special authority. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorages unless specifically authorized by the Engineer. The Contractor shall, in any event, be responsible for any damage resulting from such use.
- B. Where, in the opinion of the Engineer, trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment or by his blasting or other operations, the Engineer may direct the Contractor to adequately protect such trees by placing boards, planks, poles or fencing around them. Any trees or landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition at the expense of the Contractor. The Engineer will decide what method of restoration shall be used,

and whether damaged trees shall be treated and healed or removed and disposed of.

1.08 DISCHARGE OF DEWATERING OPERATIONS

- A. Any water that is pumped and discharged from the trench and/or excavation as part of the Contractor's water handling shall be filtered by an approved method prior to its discharge into a receiving water or drainage system.
- B. Under no circumstances shall the Contractor discharge water to the areas designated as wetlands.
- C. The pumped water shall be filtered through baled straw, a vegetative filter strip or a vegetated channel to trap sediment occurring as a result of the construction operations. The vegetated channel shall be constructed such that the discharge flow rate shall not exceed a velocity of more than 1 foot per second. Accumulated sediment shall be cleared from the channel periodically.

1.09 DUST CONTROL

- A. During the progress of the work, the Contractor shall conduct his operations and maintain the area of his activities, including sweeping and sprinkling of streets as necessary, to minimize creation and dispersion of dust. Calcium chloride shall not be used within 100 feet of a wetland.

1.10 BALED STRAW

- A. To trap sediment and to prevent sediment from clogging drainage systems, bales straw shall be used around all catch basins, drainage structures and water courses. Bales of straw for silt control shall consist of rectangular-shaped bales of straw weighing at least 40 pounds per bale. They shall be free from noxious weed seeds and rough or woody materials.
- B. Care shall be taken to keep the bales from breaking apart. The bales should be securely staked to prevent overturning, flotation or displacement. All deposited sediment shall be removed periodically.

1.11 SILT FENCE

- A. Where indicated on the drawings or where directed by the Engineer, the Contractor shall erect and maintain a temporary silt fence. The silt fence shall be used specifically to contain sediment from runoff water and to minimize environmental damage caused by construction. Silt fences shall be installed in addition to straw bales.

- B. Silt fence shall be pre-assembled and factory assembled including filter fabric and posts. Filter fabric for pre-assembled silt fence shall consist of pervious sheets of woven propylene, nylon, polyester, or ethylene yarn. The filter fabric shall have reinforcing mesh behind it and include a top cord. Material shall be certified by the manufacturer to meet the following requirements:

<u>Property</u>	<u>Test Method</u>	<u>Requirement</u>
Grab Tensile Strength	ASTM D4632	100 lbs.
Grab Elongation	ASTM D4632	20%
Apparent Opening Size	ASTM D4751	25 sieve
Mullen Burst	ASTM D3786	280 psi

1. The filter fabric shall contain a stabilizer and/or inhibitors to make the filaments resistant to deterioration resulting from exposure to sunlight or heat, and to provide a minimum of 6 months of expected usable construction life at a temperature range of 0 degrees to 120 degrees F. The filter fabric shall be a minimum of 36 inches wide, cut from a continuous roll to finish fence length to minimize the use of seams. Splice filter fabric together only when absolutely necessary and only at a support post, with a minimum 36-inch overlap and securely sealed. The filter fabric shall be free of defects or flaws, which affect its physical and/or filtering properties.
2. Posts for the pre-assembled silt fence shall be 1 1/2-inch square wood posts, 4 feet 6 inches long and 6 feet on center.
3. Pre-assembled silt fence shall be Model DSF/105 manufactured by LINQ Industrial Fabrics, Inc., or approved equal.

1.12 SEDIMENT CONTROL DEVICES

- A. Sediment control devices such as dewatering pump discharge filter bags and catch basin inserts intended to capture sediment shall be made from non-woven geotextile material sewn with high strength, double stitched "J" type seams. They shall be capable of trapping particles larger than 150 microns, provide a filtered water turbidity of less than 50 NTU, and shall meet the following standards:

<u>Property</u>	<u>Test Method</u>	<u>Requirement</u>
Grab Tensile Strength	ASTM D4632	200 lbs.
Grab Elongation	ASTM D4632	50%
Apparent Opening Size	ASTM D4751	80 sieve
Mullen Burst	ASTM D3786	380 psi
Puncture Strength	ASTM D4833	130 lbs.
Trapezoid Tear Strength	ASTM D4533	80 lbs.

** END OF SECTION **

SECTION 01570 - TRAFFIC CONTROL

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. Furnish, illuminate, and maintain such signs for the safety and/or regulatory convenience of traffic; provide, erect and maintain barricades, warning lights, etc., as needed or as directed to keep people and vehicles from equipment, obstacles, etc; employ watchmen, and take such other reasonable means and precautions as the Engineer or the Owner may direct or as may be needed to prevent damage or injury to persons, vehicles, or other property, and to minimize the inconvenience and danger to the public by his occupancy of the street or highway or other areas of work. Arrange operations and occupied spaces, so far as possible, to provide access to property along the street, particularly driveways and entrances, to fire hydrants, manholes, gate boxes, etc., or other utilities. Whenever any equipment obstructs traffic in or to any public street, private driveway or property entrance, take such means as may be necessary to maintain traffic and access. In so far as the requirements of this article are applicable, they shall also apply to work in private ways and public and private lands other than streets and highways. Confine occupancy of public or traveled ways to the smallest spaces compatible with efficient performance of the work contemplated by the Contract, and particularly to such limits as may be set out in Drawings or Specifications.
- B. Refer to the Appendix for traffic control details.

1.02 TRAFFIC POLICE

- A. Traffic police will be required for work in all of the streets included in this Contract.
1. Notify the Owner and the Police Department at least 24 hours prior to commencing work in these streets to arrange for traffic police details. The Contractor shall be responsible for coordinating traffic police details. Furnish weekly a schedule showing when work will be performed in these streets. Schedule work in a manner to efficiently utilize the traffic police details.
 2. Notify the Owner and the Police Department immediately of changes in the work schedule, which affect traffic police details.
 3. Traffic police details will be billed directly to the Arlington Department of Public Works. The Contractor shall reimburse the Owner for unnecessary traffic police details due to failure to notify the Owner and the Police Department in a timely manner.

** END OF SECTION **

SECTION 01710 - CLEANING UP

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The work to be done under this Section consists of furnishing all materials, labor, tools, and equipment, and performing all operations necessary for cleaning up, during progress of the work, and at completion of the work.

1.02 WORK NOT INCLUDED

- A. Cleaning of specific products or work is specified in other Sections of these Specifications.

1.03 CLEANING UP DURING CONSTRUCTION

- A. Work sites shall be cleaned daily. All waste materials shall be removed from the work sites by the end of the workday. Waste materials may be stored in staging areas in containers and removed when full.
- B. Immediately after unpacking, the Contractor shall collect and remove all packing materials, case lumber, excelsior, wrapping, and other rubbish.
- C. The Contractor shall provide metal containers with tight fitting covers, located where directed or approved by the Engineer, into which all refuse and garbage shall be deposited.

1.04 FINAL CLEAN UP

- A. Upon completion of the work and before acceptance and final payment, the Contractor shall remove, at his own expense, all temporary structures and equipment built or furnished by him, all debris and waste materials, and all surplus materials of all kinds from the site of the work, and dispose of them in a manner approved by the Engineer. The premises shall be left in a neat and orderly condition.

1.05 DISPOSAL

- A. No burning at the site will be permitted.
- B. No disposal in streams or bodies of water will be permitted.
- C. Trucks loaded at the site shall have loads trimmed, and covered as necessary to assure that no material will fall off.

** END OF SECTION **

SECTION 02200 - EARTHWORK

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The work to be done under this Section consists of furnishing all materials, labor, tools and equipment, and performing all operations necessary to complete excavation of all types of material encountered, including placing of excavated material in embankments, riprap or backfill, disposal of unsuitable and/or surplus material, furnishing and placing borrowed materials; all as shown on the Drawings or necessitated by conditions encountered in the course of the work.
- B. The work shall include power and/or hand excavation, stockpiling, rehandling and all incidental work.
- C. The work includes, but is not limited to, the following items:
 - 1. Miscellaneous and extra earth excavation and backfilling.
 - 2. Topsoil removal, stockpiling, and reuse.
 - 3. Trench excavation and backfilling for pipelines, and other utilities.
 - 4. Excavation and backfilling for structures.
 - 5. Excavation of solid rock, boulders, existing paving, foundations, or other underground structures, and pipelines.
 - 6. Control of water by ditching, pumping, well point systems or other methods.
 - 7. Sheet piling, shoring and bracing to support trench walls, sides of excavations, existing structures or utilities.
 - 8. Compaction of embankment, fills, and backfills.
 - 9. Furnishing and placing borrow and/or crushed stone.
 - 10. Disposal of surplus and/or unsuitable materials.
 - 11. Excavation below grades on the Drawings when necessitated by type of material encountered, as ordered by the Engineer.

12. Site grading.
13. Dust control.
14. Silt and erosion control.
15. Furnishing and placement of filter fabric.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. The following items of work are not included under this Section but are specified under other Sections of these Specifications:
1. Replacement of paving excavated for trenches, is specified in Section 02525 - PAVEMENTS, WALKS AND CURBING.
 2. Temporary facilities required for siltation and erosion control are specified in Section 01567 – ENVIRONMENTAL PROTECTION.

1.03 STANDARDS

- A. The following standards form a part of these Specifications:
1. ASTM D 1556. Test for Density of Soil in Place by the Sand-Cone Method.
 2. ASTM D 2922. Test for Density of Soil and Soil Aggregate in Place by the Nuclear Method.
 3. AASHTO T 99. The Moisture-Density Relations of Soils Using a 5.5-lb. Rammer and a 12-in. Drop.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Gravel Borrow. Gravel borrow for roadways, walks, pipe bedding or cover, and for replacement of below grade unsuitable material under structures and pipelines shall be either graded bank-run gravel or screened gravel consisting of hard, durable particles, free from loam or clay, and containing no stone with largest dimension over 4 inches. The borrow material shall meet the following gradation requirements:

Sieve (Square Openings)	Percent Passing (By Weight)
3 inch	100
1/2 inch	50-85
No. 4	40-75
No. 50	8-28
No. 200	0-8

B. Crushed Stone. Crushed stone shall consist of durable crushed rock consisting of the angular fragments obtained by breaking and crushing solid or shattered natural rock and shall be reasonably free from thin, flat elongated or other objectional pieces. The crushed stone shall be free from any organic soil or perishable material, and not more than 1.0 percent by weight of satisfactory material passing a No. 200 sieve will be allowed to adhere to the crushed stone.

1. Crushed Stone - Type A (3/4"). Crushed Stone - Type A shall be used for pipe bedding and cover envelope and shall meet the following gradation requirements:

Sieve (Square Openings)	Percent Passing (By Weight)
1 inch	100
3/4 inch	90-100
1/2 inch	10-50
3/8 inch	0-20
No. 4	0-5

2. Crushed Stone - Type B (1 1/2"). Except as noted above all crushed stone specified shall be crushed stone - Type B, and shall meet the following gradation requirements:

Sieve (Square Openings)	Percent Passing (By Weight)
2 inch	100
1 1/2 inch	95-100
1 inch	35-70
3/4 inch	0-25

C. Selected Material. Selected material referenced in the Standard Details shall be either gravel borrow or crushed stone - Type A, as permitted or as ordered by the Engineer.

D. Suitable Excavated Material. Suitable excavated material shall meet the following gradation requirements:

Sieve (Square Opening)	Percent Passing (By Weight)
3 inch	100
1/2 inch	50-100
No. 4	30-90
No. 40	0-40
No. 200	0-15

- E. Bales of Straw for Silt Control. Bales of Straw for silt control shall consist of rectangular-shaped bales weighing at least 40 pounds per bale. They shall be free from primary noxious weed seeds and rough or woody materials.
- F. Lumber. Lumber used for sheeting, shoring, bracing, and other construction purposes shall be sound, straight grained, free from shakes, loose knots and other defects liable to impair its strength or durability. Lumber and sheeting may be reused, if in good condition. Lumber shall be spruce, fir or approved equal thereto.
- G. Steel Sheeting. Steel sheeting shall be an approved standard section, either new or used, weighing not less than 22 pounds per square foot of wall.
- H. Filter Fabric. Filter fabric used in trench excavation shall meet the following requirements:

<u>Property</u>	<u>ASTM STD.</u>	<u>Requirements</u>
Puncture Strength	ASTM D4833	40 lbs.
Mullen Burst Strength	ASTM D3786	140 psi.
Trapezoid Tear Strength	ASTM D4533	150 lbs.
Grab Strength	ASTM D4632	120 lbs.
Apparent Opening Size (AOS) (US Std. Sieve Size)	ASTM D4751	70

1. All fabric shall be free of any flaws or defects, which will alter its physical properties. Torn or punctured fabric will not be used. Only commercially available fabric that is certified in writing by the manufacturer for the purpose intended shall be used. The Contractor shall submit a two-foot square sample of fabric to be used along with technical data. The Engineer reserves the right to reject any, which he deems unsatisfactory for the specific use. The brand name shall be labeled on the fabric or the fabric container. Fabrics that are susceptible to damage from sunlight or heat shall be so identified by suitable warning information on the packaging material. Fabrics susceptible to sunlight damage shall not be used in any

installation where exposure to light will exceed 30 days, unless specifically authorized in writing by the Engineer.

2. Materials incidental to installation of the filter fabric shall conform to the manufacturer of the filter fabric.
3. The filter fabric shall be placed in accordance with the manufacturer's recommendations and as specified herein or as detailed on the Drawings.

I. Silt Fences. See Section 01567 - ENVIRONMENTAL PROTECTION.

PART 3 EXECUTION

3.01 GENERAL. All equipment and methods for excavation shall be submitted to the Engineer for review, particularly as to adequacy and suitability to accomplish the work in a safe and satisfactory manner.

- A. Grade lines for pipes and masonry shall be 6 inches below the pipe or masonry.
- B. No pipelines or structures shall be constructed in areas to be filled until the fill has been placed to at least 2 feet above the grade line of the pipe or the bottom of the slab of the structure.
- C. Subgrade at the bottom of excavation shall be undisturbed, or restored at the Contractor's expense. Unauthorized overexcavation shall be replaced with compacted gravel borrow as approved by the Engineer.
- D. Crushed stone placed under structures shall be compacted. Compaction effort shall continue until stones are firmly interlocked and the surface is unyielding.
- E. Suitable excavated material may be used for backfill, fill or embankment. Suitability of materials shall be determined by the Engineer. Such use of excavated materials may include stockpiling until needed.
- F. All unsuitable material shall be removed from the site as it is excavated. The Contractor shall be wholly responsible for the disposal of such excavated material. Such disposal shall be in strict compliance with all Town and State rules, regulations, ordinances and laws that regulate and control its disposal.
- G. All disposal of excavated material is included in the prices for the various categories of excavation.
- H. All excavation shall be performed in the dry.

- 3.02 TOPSOIL. Topsoil shall be stripped from all areas to be excavated or filled. Care shall be taken to avoid mixing topsoil with subsoil. Topsoil shall be stockpiled in areas on the site approved by the Engineer, free from brush, trash, large stones and other extraneous material and protected until placed. Any surplus topsoil remaining shall be disposed of by the Contractor where and as designated by the Engineer.
- A. The Engineer has the authority to limit the area to be stripped at any one time in order to prevent erosion.

- 3.03 ROCK EXCAVATION. Rock excavation shall mean boulders exceeding one cubic yard in volume or solid rock that, in the opinion of the Engineer, requires equipment powered by compressed air or drilling or blasting for its removal. No hard pan, no soft or disintegrated rock, no loose or previously blasted rock or broken stone, and no rocks exterior to the maximum limits of excavation which may fall into the excavation, will be allowed as rock excavation. Solid rock is defined as rock, which cannot be removed with normal earth moving machinery such as a tractor-ripper bulldozer.

- A. Blasting. The Contractor shall notify the Engineer and Fire Chief in advance of his intention to store and use explosives. Explosives shall be stored in a secure manner and separate from all tools. Caps or detonators shall be safely stored over 100 feet away from the explosives. When the need for explosives has ended, all remaining explosives and related materials shall be promptly removed from the premises.

All blasting operations shall be conducted by an experienced, licensed blaster in full compliance with the requirements specified herein, and with all local ordinances. In addition, blasting shall be conducted with all possible care to avoid injury to persons and property. For all blasting operations the rock shall be well covered with blasting mats to prevent flying debris. Sufficient warning shall be given to all persons in the vicinity of the work before blasting to permit safe excavation of the blast area.

The Contractor shall control his charge sizes and blasting methods so that air and ground transmitted vibrations within and outside of the property limits are at all times within normally acceptable limits and are of such a level that items under construction and items completed prior to the blast are not adversely affected.

Prior to blasting, the Contractor shall remove all overburden and shall cross section the exposed bedrock surface at intervals and locations to be determined by the Engineer. The cross sections shall be provided to the Engineer prior to blasting, and the Engineer shall be given the opportunity to make his own cross-sections if desired. It is explicitly understood that it is the Contractor's

responsibility to provide an open or supported excavation through the overburden as specified.

The Contractor shall maintain accurate records of each blast. These records shall include:

1. Charge weight per delay used.
2. Plan showing location of all blast points, distance to existing structures, depth of holes and whether loaded or unloaded.
3. Type of explosive used, size, spacing and stemming used.
4. Explosive sequence and delays used.

Any damage to ground, structures, retaining walls, utilities, or any other items that may be directly or indirectly affected by blasting shall be the responsibility and liability of the Contractor. Likewise, any damage or injury to a person directly or indirectly caused by blasting shall be the responsibility and liability of the Contractor.

The Contractor shall adjust blasting operations according to the characteristics and structure of the rock formation to obtain the required rock excavation.

- B. Rock under Structures. Rock encountered in excavation for structures shall be removed to a depth of 6 inches below the bottom of the structure, and the excavated material shall be replaced with gravel borrow compacted to not less than 95 percent of maximum dry density, unless otherwise noted on the Drawings. Rock remaining shall present a firm surface.
- C. Rock in Trenches. Wherever the bottom of trench consists of boulders or solid rock, it shall be excavated to 8 inches below grade and refilled to a depth of 12 inches over the pipe with crushed stone compacted to the satisfaction of the Engineer. Compaction operations shall be continued until stones are firmly interlocked and the surface is unyielding.

3.04 EARTH EXCAVATION BELOW GRADE. Wherever, in the opinion of the Engineer, the material at or below grade line as shown on the Drawings is unsuitable for foundations, it shall be excavated to such additional depths as authorized in writing by the Engineer, and shall be replaced with gravel borrow compacted to not less than 95 percent of maximum dry density determined by AASHTO Standard T 99 Method C.

3.05 MISCELLANEOUS AND EXTRA EARTH EXCAVATION. Wherever authorized by the Engineer, the Contractor shall do excavation and backfilling in

addition to the excavation and backfilling needed to perform the work indicated on the Drawings and the Specifications. Miscellaneous earth excavation and backfilling may be authorized for test pits or for other unforeseen purposes. It may include hand excavation. Extra earth excavation may be authorized because of filling and grading work, which has taken place since completion of the Drawings, or because of design changes. Miscellaneous and extra earth excavation shall be subject to all requirements for other excavation previously stated herein.

- 3.06 EXCAVATION FOR STRUCTURES. Excavation for structures shall conform to the dimensions and elevations shown on the Drawings except as specified for "Earth Excavation Below Grade" and "Rock Excavation". Excavation shall extend a sufficient distance from structures to allow for placing and removal of forms, installation of services, and for inspection. The Contractor shall control the grading in the vicinity of structures so that the surface of the ground will be sloped properly to prevent water from running into excavated areas. Water will not be allowed to accumulate in excavations.
- 3.07 TRENCH EXCAVATION. Trenches and related excavations shall be of sufficient width and depth at all points to allow pipes to be laid, joints to be formed, and appurtenant structures to be built in a workmanlike manner, and when needed, to allow for sheeting and shoring, pumping and draining, and/or for removing and replacing any materials unsuitable for foundations. Trench excavation shall meet the following requirements:
- A. Trenches shall be at least 18 inches wider than the outside dimension of the pipe or structures they are to contain.
 - B. Trenches shall not be unnecessarily wide, so as to increase excessively the load on the pipe resulting from backfill.
 - C. Trenches in areas of paving shall have paving cut before removal to provide a clean, square cut at the trench edge. Where permanent trench paving is to be placed, the paved surfaces shall be recut by power saw, a minimum of 6 inches beyond the start of undisturbed subbase. No separate payment for paving removal will be made.
 - D. Bottom of trenches shall be carried to lines and shapes approved by the Engineer. Bottom of trench shall be excavated to a depth of 6 inches below bottom of pipe to allow for the placement of the bedding material, as directed by the Engineer, around the pipe. Bottoms of trenches shall be shaped to conform to the outside of pipes for continuous bearing support.
 - E. No tunneling shall be permitted in place of open trench construction, unless specifically authorized by the Engineer.

- F. Excavations adjacent to existing underground utility lines and other underground structures shall be done by hand to insure against possible damage.
 - G. Excavation just above the bottom of structures in trenches shall be done by hand so that foundations will rest on undisturbed earth, or disturbed subgrade recompacted to the 95 percent of maximum dry density as determined by AASHTO Standard T 99 Method C.
 - H. All excavation shall be in accordance with the appropriate OSHA Standards.
 - I. Final trimming excavation at bottom of trenches shall not be done until the ground water is at least one foot below exposed subgrade and the Contractor is ready to install pipe or construct foundations of the appurtenant structures.
 - J. Trenches shall only be opened at such times and to such extent as approved by the Engineer.
- 3.08 PAVEMENTS AND WALKS. Excavation for pavements and walks shall be performed as shown on the Drawings and in accordance with this Section of the Specifications.
- 3.09 SHEETING, SHORING AND BRACING. Whenever the depth and/or location of any excavation prevents completion with specified and safe side slopes, the Contractor shall furnish in place, and maintain such temporary wood or steel sheeting, sheet piling, shoring, bracing, and the like, as may be required to support the sides of excavations and prevent any movement which could in any way injure the work, diminish the necessary width of the trench or other excavation, or otherwise delay the work or endanger workmen, adjacent structures, or utility lines.
- A. Such measures shall always be taken where required for the protection of workmen and to conform with all governing safety regulations. The adequacy of the shoring shall be the responsibility of the Contractor. Shoring, bracing, and sheeting shall be removed as the excavation is backfilled, in a manner to avoid damage or disturbance to the work, unless left in place as hereinafter provided. The following detailed requirements shall be met:
 - 1. Sheeting shall be driven and excavation work conducted in such a manner as to prevent the material in back of the sheeting from running under the sheeting and into the excavation.
 - 2. Care shall be taken to prevent voids outside of the sheeting, but, if voids occur, they shall be filled immediately with crushed stone, and well compacted, at the Contractor's expense.

3. Sheeting at manholes shall be driven so as not to interfere with the installation of pipelines connecting to manhole.
4. Special precautions such as sheeting, shoring and bracing, shall be taken to guard against any damage to or settlement of existing storm drains, buildings, walls or other structures adjacent to the work.
5. Sheeting shall not be unnecessarily driven below pipe inverts to necessitate its being left permanently in place.
6. Sheeting, shoring, bracing or parts thereof, shall be left in place after the completion of the work only in locations indicated or where authorized in writing by the Engineer. The Engineer may require sheeting left in place at intervals to support existing structures and other sheeting removed. The Engineer may permit sheeting to be left at the Contractor's option without cost to the Owner.
7. All sheeting left in place, for whatever reason, shall be cut off at least 2 feet below the finished ground surface, unless otherwise approved by the Engineer.

3.10 DEWATERING. The Contractor shall remove by pumping, draining, bailing, or otherwise, any water which may accumulate in trenches and other excavations made under this contract, and shall form all pump wells, sumps, dams, flumes or other works necessary to keep trenches and other excavations entirely clear of water continuously until pipelines and structures and their foundations are being built and backfilled. The following requirements shall be met, as applicable:

- A. The Contractor shall furnish, install and maintain all drainage systems and pumping equipment necessary to keep the ground water level at an elevation at least one foot below excavation. The Contractor shall make all necessary computations for the weights of the structures and pipe during the various stages of construction and be responsible for preventing damage from flotation or uplift.
- B. If a quickening condition occurs at the bottom of the excavation, the Contractor shall lower the ground water level a sufficient depth below the bottom of the excavation to remedy the condition.
- C. Final trimming excavation or grading shall not be done until the Engineer is satisfied that the manner of dewatering meets his approval.
- D. Water from trenches and excavations shall be disposed of in such a manner as will not cause injury to the public health nor to public or private property, nor to the work completed or in progress, nor to the surface of roadways, nor cause any interference with the use of the same by the public, and shall meet the approval of

the Conservation Commission. The turbidity of the discharged water shall not exceed 50 NTUs.

- E. When pumping is performed, whether across the construction area or from the trench or other excavations, pump discharges shall pass through stilling wells prior to discharging onto natural ground or drainage systems. The effluent shall be free from silt. The Contractor shall take special care that the existing surface is not eroded or otherwise damaged by any pumped or natural discharge.
- F. When underdrains are used, pipe shall be of ample size to dewater the areas during the construction work. The underdrain areas shall be excavated to such additional depth as required to lay the pipe in a bed of clean, free-draining gravel or broken stone.
- G. When a well point system is used for dewatering excavations, the well points shall be so spaced and of such depth as to dewater thoroughly all parts of the areas to be excavated.
- H. Pipelines, fresh masonry and other structures shall be protected from damage from dewatering operations by proper covering and other approved methods.

3.11 LENGTH OF TRENCH ALLOWED TO BE OPEN. The length of trench allowed to be open shall be determined by the Engineer in coordination with the Contractor's Traffic Management Plan. The total running length of all work in each section shall be kept as short as is practicable.

- A. In general, the Contractor shall provide and maintain flashing barricades around all open or soft trenches, parked equipment within all Public Rights of Way, in areas where personal injury could result, or as required by the Engineer. In addition, the Contractor shall furnish and maintain detour signs to guide traffic around all streets blocked to through traffic. Detour signs shall be placed at all intersections along the route of each detour and will be lighted at night.
- B. Two lane traffic shall be maintained in areas between open trench sections and one lane traffic shall be maintained where there are open trenches.

3.12 PROTECTING EXISTING UNDERGROUND STRUCTURES. Wherever culverts, sewers, drains, manholes, catch basin connections, water mains, valve chambers, electric conduits, telephone conduits, or any other underground constructions are encountered in excavating, they shall be protected and firmly supported by the Contractor, at his own expense, until the excavation or trench is backfilled and the existing structures are made secure. Injury to any such structures caused by or resulting from the Contractor's operations shall be repaired at the Contractor's expense. The Authority having charge of any particular underground structure shall be notified promptly of injury to its structure.

- A. Whenever approved by the Engineer, pipes or other underground structures encountered in excavating or trenching shall be supported permanently with supports across the excavation or trench. Lumber so used and left in place will be paid for the same as any shoring left in place, as authorized.
- B. If underground utility structures which are not shown on the Drawings are encountered, they shall be reported to the Engineer immediately and to the appropriate authority, if known. The Engineer shall decide whether any change in the work to be done is involved and what measures are required to deal with such unforeseen obstructions.
- C. The Contractor shall be responsible for notifying all utilities prior to performing any excavation work. The DIG SAFE telephone number is 1-800-322-4844. The Town of Arlington is not a Dig Safe member and must be notified 48 hours in advance at (781) 316-3301.

3.13 PLACEMENT OF FILTER FABRIC. Filter Fabric utilized for siltation/erosion control in lieu of or in addition to Straw bales shall be placed in an approved manner and at the locations shown on the Contract Drawings or as specified. Sharp objects shall be removed from the area before placing fabric to avoid fabric punctures. The fabric shall not be laid in a stretched condition, but laid loosely. The panels shall be overlapped by a length of three feet. Filter fabric damaged or displaced before or during placement of overlying layers shall be replaced or repaired at the Contractor's expense.

3.14 BACKFILLING STRUCTURES. After the completion of construction below the elevation of final grades and prior to backfilling, forms shall be removed and the excavation cleaned of trash and debris. Backfill shall consist of suitable excavated materials, meeting common borrow Specifications, and shall be free of trash, frost, lumber or other debris. When sufficient excavated materials are not available, the Contractor shall furnish gravel borrow. Backfill shall be placed to meet the following requirements and the approval of the Engineer:

- A. Backfill shall be placed in horizontal layers not more than 6 inches deep and with proper moisture content to obtain the required degree of compaction.
- B. Each layer shall be compacted by rollers, mechanical tampers, or other suitable equipment to a density approximately that of the adjacent undisturbed soil or to a density of not less than 95 percent.
- C. Backfill shall be brought to a suitable elevation above grade to provide for anticipated settlement and shrinkage thereof.

- D. Backfill shall not be placed against concrete foundation walls prior to 7 days after completion of walls, and then only after approval of the Engineer.
- E. Backfill shall be brought up evenly on both sides of walls, as far as practicable.
- F. Heavy equipment for spreading and compacting backfill shall not be operated closer to walls than a distance equal to the height of the backfill above the top of the footing.

3.15 BACKFILLING TRENCHES. After pipelines and appurtenant structures have been built, the trenches and other areas shall be backfilled with suitable excavated material to the extent available, or with gravel borrow when excavated material is not available. Gravel borrow and crushed stone shall be used in locations stated on the Drawings. All material for backfilling shall be free of roots, stumps, frost and stone weighing over 100 pounds. Backfill shall be placed to meet the following requirements:

- A. Backfill around pipe or over pipe cradle shall be deposited in layers not over 6 inches deep, placed evenly on both sides of pipe, and each layer compacted firmly, compacted by hand tools or mechanical compactors to the satisfaction of the Engineer (See Subparagraph D.). Joints may be left uncovered for inspection or testing as directed by the Engineer, then backfilled like the rest of the line. Pipe shall be backfilled to a depth of at least 3/4 of the pipe diameter before testing and thereafter to a depth of at least one foot above the top of pipe by the same methods. The backfill to one foot above the top of pipe shall be free of all stones and boulders.
- B. For trenches in paved areas, or locations to be paved or landscaped upon completion of trench backfill, the entire depth of trench shall be backfilled and compacted in layers not over 6 inches deep using mechanical compactors to the satisfaction of the Engineer.
- C. For trenches in open areas where no future paving or landscaping/seeding is indicated, backfill shall be placed and compacted by spreading equipment, mechanical compactors, or puddling, to suit the material, and width and depth of trench, and to the approval of the Engineer.
- D. Unless stated otherwise on the Drawings, the above described compaction of trench backfill around pipes and under paved areas will be deemed satisfactory when field density tests show at least 95 percent of maximum dry densities of the same materials, as determined by AASHTO Standard test T99 Method C, except that 2 feet of depth below finished grade shall have 100 percent of maximum density.

- E. Backfill around manholes, pits and other structures in trenches shall be placed and compacted as specified for backfill in trenches. Backfill around concrete or masonry structures shall not be placed until approved by the Engineer and shall be brought up evenly on all sides to prevent excessive pressure or displacement.
- 3.16 DUST CONTROL. The Contractor shall keep the entire construction project free of dust at all times.
- 3.17 GRADING. All areas covered by the project, including excavated and filled sections and adjacent transition areas, shall be uniformly smooth-graded to the elevations shown. The finished surface shall be reasonably smooth, compacted, and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from blade-grader operations.

** END OF SECTION **

SECTION 02452 - SIGNAGE

PART 1 GENERAL

1.01 WORK INCLUDED

- A. This section of the specifications covers furnishing, installing and maintaining all traffic control signs and devices during the construction period.

1.02 SYSTEM DESCRIPTION

- A. The Contractor shall furnish all traffic control signs and other devices that are required by the plans and specifications and are deemed necessary by the Engineer.
- B. The traffic control signs and other devices shall be in accordance with the most recent edition of the Manual on Uniform Traffic Control Devices as published by the United States Department of Transportation.

PART 2 PRODUCTS

2.01 TRAFFIC CONTROL SIGNS

- A. Warning signs shall be diamond-shaped and have minimum dimensions of 48 inches by 48 inches.
- B. Detour and end-of-detour signs shall be rectangular and have minimum dimensions of 30 inches by 24 inches and 24 inches by 18 inches, respectively.
- C. End-of-construction signs shall be rectangular and have minimum dimensions of 60 inches by 24 inches.
- D. All signs shall have a black legend on a reflective orange background.
- E. Lettering on all signs shall be of uniform size and have a minimum height of 5 inches.
- F. Signs shall be mounted on portable supports or barricades.
- G. The bottom of each sign shall be a minimum of 3 feet above the road surface.
- H. The following signs, as a minimum, shall be available for use in sufficient quantities to ensure that they will be available on all necessary streets:

<u>Legend</u>	<u>Location</u>	<u>Comments</u>
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ROAD CONSTRUCTION 1000 FEET	1000 feet prior to the start of work area.	To be moved daily as required.
WORK AREA - BE PREPARED TO STOP	No more than 500 feet prior to the start of work area.	To be moved daily as required.
UNEVEN ROAD SURFACE - PROCEED WITH CAUTION	No more than 500 feet prior to the start of the disturbed surface.	To remain in place until final paving is completed.
SINGLE LANE - BE PREPARED TO STOP	No more than 500 feet prior to lane restriction.	To remain in place for duration of lane restriction.
DETOUR	At end of closed road.	Multiple signs to direct traffic from start to finish of detour.
LOCAL TRAFFIC ONLY	At end of closed road.	Used in conjunction with DETOUR.
END CONSTRUCTION	At the end of the work area.	To be moved daily as required.

2.02 OTHER TRAFFIC CONTROL DEVICES

- A. Barricades, with the exception of those used to mount signs, shall be Type I with a yellow Type A low intensity flashing warning light mounted on top in accordance with the specifications of the Manual on Uniform Traffic Control Devices.
- B. Drums shall have a yellow Type A low intensity flashing warning light mounted on top in accordance with the specifications of the Manual on Uniform Traffic Control Devices.
- C. Barricades and drums shall be reflective orange and white as specified in the Manual on Uniform Traffic Control Devices.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Traffic control signs shall be installed where specified or where required by the Engineer. Refer to the Appendix for traffic control details.
- B. Barricades and/or drums shall be placed to protect the work, workers, traffic, pedestrians and animals. Additional barricades and/or drums shall be placed where directed by the Engineer.
- C. All flashing lights on barricades and drums shall be turned on at least one-half hour before sunset and turned off no less than one-half hour after sunrise. Batteries and/or lights that do not operate shall be promptly replaced.
- D. Barricades and drums shall be placed to provide maximum protection while minimizing the disruption of traffic.
- E. Barricades and drums shall be weighted or otherwise secured to discourage overturning, but shall not be weighted or otherwise secured to the extent that they could be hazardous to motorists, pedestrians or workers.
- F. All traffic control devices shall be maintained and any damages corrected immediately. Traffic control devices that are destroyed or stolen shall be replaced immediately by the Contractor at no additional cost to the Owner.

** END OF SECTION **

SECTION 02525 - PAVEMENTS, WALKS AND CURBING

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The work to be done under this Section consists of furnishing all materials, labor, tools and equipment, and performing all operations necessary to complete replacement of pavements, walks, and curbing removed for trench excavation, as shown on the Drawings or as directed by the Engineer and as specified herein.
- B. Pavements, walks and curbing shall include all base pavement courses above the subgrade prepared under Section 02200 - EARTHWORK.
- C. Trench paving shall include permanent replacement of pavement removed for trench excavation, including base course.
- D. Where required, scarifying existing roadways and placing bituminous concrete pavement shall include removal of excess material and placing, shaping and compacting gravel borrow.
- E. Bituminous concrete overlay in roads shall include any driveway aprons damaged during the work.
- F. All of the above items shall include the shaping of gutters and/or swales, for directing water into catch basins or other drainage structures, where and as ordered by the Engineer.
- G. All work shall be in accordance with the Arlington Street Opening Permit required under Section 01062 – REGULATORY REQUIREMENTS.

1.02 WORK NOT INCLUDED

- A. Excavation is specified under Section 02200 - EARTHWORK.

1.03 STANDARDS

- A. The Commonwealth of Massachusetts Department of Public Works "Standard Specifications for Highways and Bridges", hereinafter referred to as "the Massachusetts Standard Specifications", forms a part of these Specifications to the extent of the references thereto.

PART 2 PRODUCTS

- 2.01 GRAVEL FOR BASE COURSE. Gravel for base course for all pavements and walks shall conform to the requirements for gravel borrow in Section 02200 - EARTHWORK. If approved, existing gravel in roadway may be used.
- 2.02 BITUMINOUS CONCRETE PAVEMENT. Bituminous concrete pavement shall conform to Subsection M3.11.00 of the Massachusetts Standard Specifications.
- A. For roadways, driveways, and parking areas: binder course and top course.
 - B. For walks: binder course and top course.
 - C. For curbing: to match existing curbing.
- 2.03 PORTLAND CEMENT CONCRETE. Portland cement concrete shall be air-entrained 3500 psi concrete conforming to the applicable requirements of Section 03300 - CONCRETE.

PART 3 EXECUTION

- 3.01 GENERAL. Prior to excavating, the existing pavement shall be sawcut. Refer to Section 01025 – MEASUREMENT AND PAYMENT for payment limits.
- 3.02 GRAVEL BASE COURSE. Gravel base course for pavements and walks shall be placed and compacted on approved subgrade to a depth of 16 inches for roadways, 12 inches for driveways and 8 inches for walks. The gravel base shall be compacted to at least 100 percent of maximum dry density as determined by the Standard AASHTO Test T 99. The gravel shall be spread and rolled in layers not exceeding 6 inches in compacted thickness. The surface of the 16-inch gravel base shall be shaped to the cross-section of the road. Gravel base courses shall be placed only after the subbase has been compacted.
- 3.03 BITUMINOUS CONCRETE PAVEMENT. Bituminous concrete pavement for roadways, driveways, and parking areas shall be constructed in accordance with Subsections 460.21, 460.61 and 460.63 of the Massachusetts Standard Specifications.
- 3.04 TRENCH PAVING
- A. Temporary Paving.
 - 1. Town Roads. Not later than 30 days after backfill has been placed and compacted, temporary pavement shall be placed over the trench.

Temporary pavement in Town roads shall consist of a 2-inch course of bituminous concrete, placed on a well-compacted 18-inch gravel base that has been shaped by recutting the edges of the existing pavement, with all broken pavement and gravel removed to make a full butt joint at the edges. Temporary paving shall be laid flush with the adjacent existing pavement. The Contractor is responsible for complete maintenance, including patching of temporary paving until permanent paving is placed.

- a. Temporary paving during winter months. When allowed to work during the winter months, and bituminous concrete specified for temporary paving is not available, the trenches shall be mechanically compacted, and the Contractor must use and maintain cold patch for temporary pavement at his own expense (trenches will not be allowed to be unpaved longer than the 30-day period specified herein).
 - 1) Depth of cold patch shall be a minimum of 2 inches and shall be brought level with adjacent existing pavement surfaces.
 - 2) All cold patch shall be removed in the early spring and replaced with materials specified.

B. Permanent Paving.

1. Town Roads. At such times as determined by the Engineer, temporary trench paving shall be removed and replaced with permanent trench paving. Permanent paving will generally not be done until the end of the contract period to allow maximum time for trench settlement to occur and for testing of pipelines to be completed.
 - a. Trench Patch:
 - 1) After removal of temporary pavement, the trench shall be excavated to the required depth and the original pavement shall be saw cut back 1 foot 6 inches on each side of the trench, and holes in the existing paved surface shall be filled and the road surface broomed clean.
 - 2) All irregular and broken edges shall be squared up by means of power-driven tools to provide a clean edge. The edges shall be painted with bituminous material.
 - 3) Before placing bituminous concrete, all castings shall be adjusted to grade.

- 4) The permanent trench patch shall consist of two courses of machine-laid bituminous concrete: 2 1/2 inches (after compaction) of binder course and 1 1/2 inches (after compaction) of top course.

3.05 WALKS AND DRIVEWAYS

- A. Bituminous Concrete Walks and Driveways. Bituminous concrete walks and driveways shall be constructed in accordance with Subsection 701.62 of the Massachusetts Standard Specifications, except that the number and thicknesses of all courses shall be as follows:
 1. Walks shall have a 1 1/2-inch binder course and a 1-inch top course, and a pitch of 3/16-inch per foot.
 2. Driveways shall have a 2-inch binder course and a 1-inch top course.
- B. Portland Cement Concrete Walks and Driveways. Portland cement concrete walks and driveways shall be constructed in accordance with Subsection 701.61 of the Massachusetts Standard Specifications, except that the thicknesses of all courses shall match existing construction.

3.06 CURBING

- A. Bituminous Concrete Curbing. Bituminous concrete curbing shall be constructed to replace any bituminous curbing removed or damaged by construction. The curbing shall be constructed to the required line and grade. Curbing shall be the same dimensions and material composition as the original curbing. Curbing shall be formed in place, joints between existing and new curbing shall be cut square and the ends painted with bituminous material to improve bond between old and new curbing. Curbing shall be carefully backfilled and tamped to meet the original grade.
- B. Granite Curbing. Granite curbing removed and reset shall conform to Subsection 501 and 580 of the Massachusetts Standard Specifications.
- C. Construction shall be in accordance with Subsections 501.60, 501.61, 501.62 and 501.64 of the Massachusetts Standard Specifications.

** END OF SECTION **

SECTION 02720 – SEWERS, DRAINS AND APPURTENANCES

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The work to be done under this Section consists of furnishing all materials, labor, tools, and equipment, and performing all operations necessary to complete all point repairs, installation of sanitary sewers and storm drains and appurtenances, as shown on the Drawings and as herein specified.
- B. The work includes repairs to or replacement of sewers, drains, and service connections.
- C. The Contractor shall include in his bid all fees paid by him for the necessary permits, authorizations and certificates required for the installation and testing of the work shown on the Drawings and as specified herein.

1.02 WORK NOT INCLUDED

- A. The following items of work are not included in this Section but are specified under other Sections of these Specifications:
 - 1. Excavation of all kinds, embankment and backfill, including all borrow or selected materials.
 - 2. Replacement of paving removed by trench excavation.
 - 3. Televising, cleaning, testing, sealing and retesting of sewer pipe joints.
 - 4. Full-length and point repair lining of sanitary sewers and storm drains.
 - 5. Cleaning and televising of sanitary sewers.

1.03 SHOP DRAWINGS

- A. Shop drawings shall be submitted to the Engineer for review in accordance with Section 01300 - SUBMITTALS.

1.04 STANDARDS

- A. The following Standards and Specifications shall apply to this Section to the extent applicable.

1. American Association of State Highway and Transportation Officials Standards.
 - a. AASHTO M 198 Joints for Circular Sewer and Culvert Pipe Using Flexible Watertight Gaskets.
 - b. AASHTO M294-92I Corrugated Polyethylene Pipe, 12-inch to 36-inch Diameter

2. American Society for Testing and Materials Standards.
 - a. ASTM A 48 Gray Iron Castings.
 - b. ASTM C 32 Sewer and Manhole Brick (made from clay or shale).
 - c. ASTM C 76 Reinforced Concrete Culvert, Storm Drainage and Sewer Pipe.
 - d. ASTM C 139 Concrete Masonry Units.
 - e. ASTM C 150 Portland Cement.
 - f. ASTM C 443 Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
 - g. ASTM C 478 Precast Reinforced Concrete Manhole Sections.
 - h. ASTM D 618 Methods of Conducting Plastics and Electrical Insulating Materials for Testing.
 - i. ASTM D 883 Definitions of Terms Relating to Plastics.
 - j. ASTM D 1248 Polyethylene Plastics Molding and Extrusion Materials
 - k. ASTM D 1784 Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Polyvinyl Chloride (CPVC) Compounds.
 - l. ASTM D 1785 Polyvinyl Chloride (PVC) Plastic Pipe Schedules 40, 80, and 120.

- m. ASTM D 2321 Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.
- n. ASTM D 2412 External Loading Properties of Plastic Pipe By Parallel-Plate Loading.
- o. ASTM D 2444 Impact Resistance of Thermoplastic Pipe and Fittings By Means of a Tup (Falling Weight).
- p. ASTM D 3034 Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings.
- q. ASTM D 3212 Joints for Drain and Sewer Pipes Using Flexible Elastomeric Seals.
- r. ASTM D3350 Polyethylene Plastic Pipe and Fittings Materials

3. American National Standards Institute Standards.

- a. ANSI A21.4 Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
- b. ANSI A21.10 Ductile-Iron and Gray-Iron Fittings, 3-in. through 48-in., for Water and Other Liquids.
- c. ANSI A21.11 Rubber Gasket Joints for Ductile-Iron and Cast-Iron Pressure Pipe and Fittings.
- d. ANSI A21.50 Thickness Design of Ductile-Iron Pipe.
- e. ANSI A21.51 Ductile-Iron Pipe, Centrifugally Cast, in Metal Molds or Sand-Lined Molds for Water or Other Liquids.

PART 2 PRODUCTS

2.01 POLYVINYL CHLORIDE (PVC) PIPE

- A. General. PVC pipe for sewers, sewer services and fittings shall be homogeneous throughout and free from visible cracks, holes, foreign inclusions or other injurious defects. The pipe shall be as uniform as commercially practical in color, opacity, density and other physical properties. Interior surface shall be smooth.

1. Unless otherwise noted, joints shall be bell and spigot. The bell shall consist of an integral wall section with a solid cross-section rubber ring factory-assembled, securely locked or sealed in place to prevent displacement. Joints shall conform to ASTM Standard D 3212, and be assembled in accordance with the manufacturer's recommendations.
- B. Gravity Sewers and Service Connections. PVC sewer pipe and fittings for gravity sewers, service connections and inspection risers shall conform to ASTM Standard D 1784 and D 3034-SDR 35 or ASTM F 789, and shall meet the following specific requirements and exceptions:
1. All fittings and accessories shall have dimensions as recommended by the manufacturer and have bell and/or spigot configurations compatible with that of the pipe. Fittings shall comply with ASTM D-3034 for 4-inch through 15-inch.
 2. Pipe shall pass Impact Resistance Test (210 ft-lbs) in accordance with ASTM D 2444. Minimum Pipe Stiffness at 5% deflection shall be not less than 46 psi (SDR 35) when tested in accordance with ASTM D 2412.
 3. The normal length of 15-inch size and smaller shall be 13 feet.
 4. Pipe and fittings shall be accompanied by the Manufacturer's Certificate of Compliance, in addition to meeting the performance tests specified hereinafter.
 5. Prior to installation, the Contractor shall furnish six specimen lengths each 6 inches long of each size pipe for Impact Resistance Test, and three specimen lengths each 6 inches long of each size pipe for Pipe Stiffness Test. These tests are to be made in accordance with ASTM D 2444 and ASTM D 2412, respectively, at the expense of the Contractor. No pipe shall be accepted if the tests do not meet the test requirements. A certificate of compliance may be used in lieu of this for quantities of less than 1000 linear feet of pipe in each size.
 6. Manning coefficient of friction shall be not less than 0.010.

2.02 HIGH DENSITY POLYETHYLENE PIPE

- A. General. HDPE corrugated drainage pipe and fittings shall be manufactured from virgin high density polyethylene resins that conform with the requirements of cell Class 324420C as defined and described in ASTM D3350, and conform to AASHTO classification "Type S". HDPE corrugated drainage pipe shall be homogeneous throughout and free from visible cracks, holes, foreign inclusions or

other injurious defects; uniform as commercially practical in color, opacity, density and other physical properties, and meet the following requirements:

1. HDPE, sizes 8" thru 24" shall have a full circular cross-section, with an outer corrugated pipe wall and a smooth inner wall (waterway). Corrugations for these sizes shall be either annular or circular. HDPE sizes 8" thru 24" shall be Type N-12, manufactured by Advanced Drainage Systems, Inc. or approved equal.
2. All fittings for corrugated drainage pipe shall be corrugated fittings and have dimensions as recommended by the manufacturer. Fittings shall be supplied by the pipe manufacturer. Rubber gaskets shall be supplied with all fittings.
3. Joints for 6" thru 24" HDPE pipe shall consist of couplings. Couplings shall provide sufficient strength to preserve pipe alignment and prevent separation at the joints.

2.03 DUCTILE-IRON PIPE.

A. Ductile-iron pipe for force mains and gravity sewers shall conform to ANSI Standards A21.50 and A21.51, Thickness Class 52, and shall have either mechanical joint or a type of joint which employs a single, elongated, grooved rubber gasket, unless specifically noted otherwise on the Drawings or required by the Engineer. Rubber gaskets shall be oil-resistant, conforming to ANSI Standard A21.11.

1. Fittings shall be ductile iron, 250-pound pressure rating class, or cast-iron conforming to ANSI Standard A21.10.
2. Pipe shall have normal laying lengths of at least 18 feet.
3. Pipe and fittings shall be cement lined twice the standard thickness in accordance with ANSI Standard A21.4 and coated inside and outside with standard coating. Thickness of cement lining shall conform to Section 4.10.2 of ANSI A21.4 with minimum thickness of 1/8-inch for 3-inch to 12-inch pipe and 3/16 inch for 14-inch to 24-inch pipe.
4. Retaining glands shall be Mega-Lugs Series 1100, manufactured by EBBA iron, or equal.

2.04 TRANSITION OR REPAIR COUPLINGS

A. Repair or transition couplings for joining existing pipe to new pipe where approved by the Engineer shall be wrap-around style 304 stainless steel repair clamps with

integral 304 stainless steel bolt assembly and SBR ASTM D2000 AA415 full-width rubber gasket. Minimum width shall be 12 inches. Additional bushing type gaskets shall be used to match differing pipe outside diameters.

- B. Couplings shall be as manufactured by Cascade Waterworks Manufacturing Company Style CR1 or CR2, or Dresser Industries Inc. Style 364 or 365.

2.05 MANHOLES

- A. Sewer and drain manholes shall be constructed of the materials shown or otherwise approved. Precast concrete manholes may utilize reinforced concrete pipe sections conforming to ASTM Standard C 478. Precast bases shall be as detailed. Shop drawings and design details shall be submitted to the Engineer for approval.
 - 1. The exterior surface of all sewer manholes shall be dampproofed with a semi-mastic fibrated asphalt coating conforming to ASTM Standard D2823, Type 1. Applied rate shall be not less than one gallon per 50 square feet of surface area.
- B. Brick for sewer and drain manhole construction and any miscellaneous brickwork ordered by the Engineer shall conform to ASTM Standard C 32. Brick for inverts and shelves shall be grade SS; all other manhole brick may be grade MS, or better.
 - 1. Tests of brick for conformance with Specifications shall be made at the Contractor's expense, and certified reports thereof shall be sent to the Engineer. Samples for testing will be selected by the Engineer and shall be furnished by the Contractor.
 - 2. Brick masonry shall be laid in portland cement mortar composed of 1 part portland cement and 2 parts sand, measured by volume, to which not more than 10 pounds of lime shall be added for each bag of cement.
 - 3. Portland cement for the mortar shall conform to ASTM Standard C 150, Type II.
 - 4. Sand for the mortar shall be clean and sharp and contain no grains larger than will pass a 1/8-inch mesh screen. Sand shall be of such size that no more than 10 per cent of the total dry weight will pass a sieve of 100 meshes to the linear inch and not more than 35 per cent of the total dry weight will pass a sieve of 50 meshes to the linear inch.
- D. Frames and covers shall be cast-iron of the type shown. The following requirements shall be met:

1. Gasketed covers shall have concealed, non-penetrating pick holes, no vent holes, and a continuous, self-sealing gasket factory cemented in a machined groove on the underside of the lid. Gasketed covers shall be properly sized to provide a watertight seal on the existing frame. Also furnish four (4) lifting tools from the same manufacturer as the gasketed covers.
2. All covers shall be marked "SEWER".
3. All castings shall be of tough, gray cast-iron conforming to ASTM Standard A 48, Class 30, true to pattern and free from flaws.
4. Bearing surfaces of frames and covers shall be machined to give continuous contact over their entire perimeters.
5. All castings shall be cleaned thoroughly and coated with hot coal tar before delivery.
6. Standard manhole frames and covers shall be LeBaron Model LT 103A with "Seal Tite" covers, or comparable models as manufactured by Neenah Foundry Co., or Campbell Foundry Co.

2.06 PLUGS FOR MANHOLE VENT HOLES. Plugs to be installed in manhole vent holes shall be molded, cut or extruded from high quality rubber compounds such as Nitrile, EPDM, Neoprene or a blend thereof. The minimal tensile strength shall be 1500 psi for molded plugs, 800 psi for cut plugs, and 1200 psi for extruded plugs. Plugs shall be secured to the manhole cover by means of a stainless steel bolt and nut that as the nut is tightened, the rubber plug expands to fill the configuration of the vent hole. Plugs shall be Style No. 3 Manhole Lid Plugs as manufactured by Cretex Specialty Products, Waukesha, WI or equal.

2.07 PIPE STUB INSTALLATIONS AT MANHOLE. PVC pipe shall be installed in manholes as shown on the Drawings. After installation of the flexible sleeve with stainless steel strap, an elastomeric o-ring shall be used for filling the annular space between the pipe and manhole wall as shown on the Drawings and as required by the Engineer.

2.08 NON-SHRINK MORTAR. Non-shrink mortar for joints shall be "Embeco", manufactured by Master Builders, "Intraplast", manufactured by Sika Chemical Corporation, "Five Star Grout", manufactured by U.S. Grout Corporation, or approved equal, prepared and used in accordance with manufacturer's recommendations.

2.09 ELASTOMERIC O-RING. The elastomeric o-ring used for filling the annular space between the pipe and the manhole wall shall be flexible, be resistant to sewage, be made of nitrile and PVC, have density of 6.0 lb./cu. ft., withstand

temperatures from 40⁰F to 220⁰F, and have a maximum water absorption of 3.5% by weight. The o-ring shall be the Cavity-O-Ring as manufactured by NPC Systems Inc. of Milford, NH or equal.

PART 3 EXECUTION

3.01 REMOVAL AND REPLACEMENT

- A. Removing Existing Pipes. Existing pipes shall be removed in accordance with these Specifications.
1. Where sewer replacement occurs, service shall be maintained by either bypass pumping or temporary plugging of flow. Whichever technique is used, the Contractor shall insure that no flooding of adjacent, upstream, or downstream buildings or property, or discharge to the ground or water courses, is caused by said bypass pumping or temporary plugging.
 2. Storm drains affected during excavation and repair shall be maintained in service unless directed by the Engineer. Reconnection of storm drains shall be done in anticipation of rainfall or at the Engineer's direction.
 3. Service connections affected by any sewer rehabilitation shall be maintained in service unless specifically exempted by the Engineer. Before any service connection is removed from service, the homeowner or user shall be notified at least 48 hours in advance. Service connections shall not be out of service longer than 12 hours.
 4. Utility locations, such as storm drains, water and gas, are approximate only and need to be verified in the field by the Contractor. Maintaining utilities in service during excavation and backfill is required at all times. Some utilities may not be shown on the Drawings. The Contractor shall be responsible for notifying all utilities prior to performing any excavation work. The DIG SAFE telephone number is 1-800-344-7233. The Town of Arlington is not a member of DIG SAFE and must be notified 72 hours in advance at (781) 316-3301.
 5. Removal and replacement shall be to the extent necessary for correction of the existing defect only. Additional removal and replacement for any reasons, not at the direction of the Engineer, shall be at the expense of the Contractor.
- B. Point Repair Replacements. Point repair replacements made on a sewer main shall be performed by the following methods:

1. Excavate a trench of sufficient depth, width and length to completely uncover the affected sewer, and to perform the specified point repair.
2. Remove any fences, base material, storm drains, etc., that interfere with the repair to be made at each specified point, and restore or replace to a condition at least equal to that existing immediately prior to the beginning of operations.
3. Reshape the bottom of the trench with materials and by methods specified or referenced in these Specifications to eliminate any sags or dips. Replace bedding material to conform to these specifications and standard details.
4. Once the foundation material has been properly prepared, install new pipe as shown on the Contract Drawings or as directed by the Engineer.
5. Repair or replace any service wye or tee encountered within the specified length of uncovered pipe with the properly sized service wye or tee and with enough sewer pipe to reconnect to the service line where it was severed.
6. Connect all newly constructed sewer pipe to existing sewer pipe, main sewer line and service lines, using specified transition couplings, so that no possible source of infiltration or exfiltration (a leak in the line) may be created.
7. Any sewer pipe damaged by the Contractor, within the specified repair length or beyond it, shall be replaced or repaired at no additional cost to the Owner.

C. Replacing Existing Pipes.

1. Pipes or utilities removed during excavation shall be replaced in kind or in accordance with these Specifications.
2. Storm drains removed during excavation shall be reinstalled if in sound condition, in the opinion of the Engineer.
3. Removed pipes, frames and covers, bricks, etc., in good condition shall remain the property of the Owner and stockpiled where directed by the Owner. The Engineer shall direct the Contractor as to which items are in good condition for salvage.

D. Service Connections.

1. When repairing a service connection, pipe shall be removed and replaced only to the extent specified in the Contract Documents or as directed by the Engineer, and any pipe removal greater than specified or so directed shall be done at no additional cost to the Owner.
2. Replacement of service connections shall be done on a timely basis to minimize disruption to the users of said service connections. All affected users must be notified at least 48 hours in advance of replacement.
3. If a service connection is judged by the Engineer to be a source of infiltration or exfiltration, and if authorized by the Engineer, it shall be replaced to the extent determined by the Engineer in accordance with these Specifications. All service connections broken by the Contractor shall be replaced at no additional cost to the Owner.
4. If a service connection is judged by the Engineer to be leaking on private property, the Contractor shall not proceed with any further excavation of the service connection without specific authorization from the Engineer to do so.

E. Frames and Covers

1. Frames and covers for sewer and drain manholes shall be installed in accordance with the Standard Details.
2. Raising and resetting of manhole frames and covers is specified in SECTION 13518 – SEWER MANHOLE REHABILITATION.

3.02 INSTALLATION

A. Laying Pipe. All pipe shall be laid upon a trench bottom prepared as specified under Section 02200 - EARTHWORK, of these Specifications, and as shown, accurately to line and grade. The following requirements shall be met:

1. All pipe shall be laid in accordance with the recommendations or specifications of the manufacturer insofar as they do not conflict with these Specifications.
2. Pipe and appurtenances shall be examined carefully for cracks or other defects.
3. Pipe shall be laid to lines and depths shown or as approved by the Engineer and the work done with suitable tools and appliances specifically designed

for tamping and compacting under, around and above the pipe. An even alignment of the pipes shall be maintained.

4. Groundwater shall be maintained below subgrade level.
5. The subbase shall be compacted prior to placing the pipe bedding material.
6. Excavate holes in trench bedding material for bell-and-spigot pipe so the barrel of the pipe bears on the prepared bed and not the bell.
7. Blocking will not be permitted, except where pipe is laid on piles.
8. Each length of pipe shall be laid to form a tight joint (using appropriate transition or repair couplings where necessary), as hereinafter specified, and to bring the inverts into a continuous line.
9. All pipe shall be clean and free of dirt before laying and open ends shall be kept covered and free of dirt during construction.
10. Each pipe shall be held firmly in position by carefully and thoroughly tamping backfill material around the barrel of the pipe. Tamping irons shall be used.
11. The work shall be conducted in a manner such that no loose excavation or other foreign material can enter the pipes.
12. Whenever it is necessary to cut pipe to fit into the pipeline, or to provide additional couplings or sleeves, this work shall be done and the materials shall be provided by the Contractor. So far as practicable, cut pieces of pipe may be used. Power saws or other method approved by the Engineer shall be used to cut pipe.
13. Where new pipes are to join existing structures, extreme care shall be taken in breaking into the structures, and tight connections shall be made without interrupting service.
14. Ends of completed pipes and branches shall be sealed with tight fitting stoppers.
15. Except as may be necessary in making joints, in placing cradles, and in tamping the backfill material, walking on or working over the pipes after they are laid shall not be permitted until the pipes are covered with earth to a depth of 12 inches above the crown.

16. Where new pipes join existing pipes, all work necessary to make a suitable connection shall be done. Specified transition/repair couplings and bushing gaskets are to be used where necessary to connect similar and dissimilar types of pipe.
 17. At capped ends of sewer service connections and at capped Y-branches that will not be extended under this contract, the Contractor shall leave a steel stake approximately 6 feet long extending to about 12 inches below the ground surface, to facilitate later location of the plugged end.
 18. The Engineer will assist the Contractor in securing and reproducing ties to Y-branches and other pipeline appurtenances, as required.
 19. At manholes short lengths of pipe, not over 4 feet long, shall be used to connect into the structure, as shown in the Standard Details in the Appendix.
- B. Pipe Joints. Pipe joints shall be made for the different kinds of pipe and types of joint in accordance with the following requirements:
1. Compression gasket joints in reinforced concrete pipe shall be made with gaskets installed as recommended by the manufacturer and by filling the joint openings, inside and outside with non-shrink mortar.
 2. Compression gasket joints in PVC services shall be installed in accordance with instructions furnished by the manufacturer.
 3. Flexible couplings, repair couplings, and/or adapters shall be installed as shown and as recommended by the manufacturer.
- C. Concrete Cradle for Pipe. Concrete part-cradle or full cradle, as directed by the Engineer, shall be built to support sewer pipe in designated locations and where depth of cover exceeds the limits provided for the size and type of pipe being laid. Concrete shall conform to requirements shown and to the provisions of these Specifications.
- D. Sewer Service Connections.
1. Sewer service connections extending from sewers to street lines, or otherwise as shown, shall be laid as required by the Engineer in accordance with the details of the Contract Drawings. The ends shall be sealed with stoppers, caps or plugs recommended by the pipe manufacturer and adequately secured to withstand the test pressure applied to the sewer. The Engineer will assist the Contractor in locating all terminal points and service boxes on inspection tees and risers by grades and measurements, and the Contractor shall not cover the lines until such measurements have

been taken. Ends of sewer service connections shall be marked with vertical steel stakes in the same manner as specified hereinbefore for Y-branches.

2. Any service connection replaced during a point repair shall conform to the pipe manufacturer's recommendations and specifications and applicable ASTM Standards, for the service connection and for installation of such. The material of the connection shall be 6" diameter PVC pipe.
3. Cleanouts: Any cleanout replaced during a point repair shall conform to the pipe manufacturer's recommendations and specifications and applicable ASTM Standards for the cleanout and for installation of such.
4. Cleanout Plugs: All cleanout plugs used to seal an open cleanout shall be a cap of similar material to the pipe material of the cleanout. All cleanout plugs shall conform to the manufacturer's recommendations and specifications for the cap or plug and for installation of such.

E. Cleaning Lines. When performing the work, all dirt and foreign material shall be prevented from entering pipelines and appurtenant construction. Upon completing work at each location, any dirt and foreign material shall be removed from pipelines and appurtenances. No excess patching or grouting material shall be left at joints, in inverts, or at pipe connections to impede normal flow. All excess material and debris shall be legally disposed of at the Contractor's expense.

3.03 RECORD PLAN INFORMATION. The Contractor shall furnish assistance to the Engineer in securing ties, depths, distances and/or other reference dimensions for all pipelines, wye branches, service connections and markers to facilitate the Engineer's development of record plan data. Any pipeline or appurtenance that is backfilled prior to obtaining the aforementioned information shall be uncovered by the Contractor at no additional cost to the Owner.

3.04 GUARANTEE. All sewer manhole and pipeline work performed shall be guaranteed against leakage, faulty workmanship and/or materials for a period of 12 months after the established date of completion.

3.05 TESTING AND VERIFICATION

- A. To the extent possible, all work that can be visually inspected shall be so inspected after the work is completed. The Contractor and the Engineer shall be present for the inspection.
- B. During other portions of the sewer rehabilitation work, pipeline sections containing point repairs made may be televised or otherwise inspected (such as during subsequent testing and sealing). If such inspection indicates leakage, faulty

workmanship and/or materials at the point repair location as a result of the point repair work, the Contractor shall repair said leak, faulty workmanship and/or materials in accordance with the products and methods specified in the Contract Documents at no additional cost to the Owner.

C. Leakage Tests and Allowances for Gravity Sewers. The rate of infiltration into or leakage out of all gravity sewers and appurtenant construction shall be tested.

1. Low-pressure air tests shall be used to test the gravity sewer lines. Leakage shall be measured in terms of time for the pressure to drop from 3.5 pounds per square inch gauge to 3.25 pounds per square inch gauge. Allowable time for different size and lengths of pipe shall be in accordance with current accepted standards.

If any section of gravity sewer fails the air test, the Contractor shall repair the sewer to reduce the leakage, and shall perform additional tests until the sewer meets the accepted standard.

2. The Contractor shall make all necessary arrangements for securing the air for test purposes and shall stand the expense of these arrangements.
3. A 5% maximum deflection test is required for PVC pipeline after final trench compaction has taken place, but not sooner than 30 days after installation. The test shall be conducted with a rigid mandrel (go no go) device, cylindrical in shape and constructed with a minimum of nine or ten evenly spaced arms or prongs. The mandrel shall be hand-pulled by the Contractor through all sewer lines. Any section of sewer not passing the mandrel shall be uncovered, and the Contractor shall reround or replace the sewer to the satisfaction of the Engineer and at the Contractor's expense. The excavation shall be mechanically compacted to a minimum 95 percent and the pipe retested.

** END OF SECTION **

SECTION 02736 - WASTEWATER AND DRAINAGE FLOW HANDLING

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The Work described in this section includes furnishing of all labor, tools, equipment, materials, and performing all operations in connection with handling wastewater and drainage flows to undertake the work of this project.
1. As necessary, the Contractor shall provide the labor and equipment for flow diversion or by-pass pumping operations. Pumps shall be of sufficient capacity to handle all flows encountered in the sewer and drain pipelines and manholes to be rehabilitated. Pipelines to handle discharge from the pumps shall be of sufficient size, material and length to convey the flows from the pumps to the satisfactory point of discharge.
 2. The point of discharge shall be a location approved by the Engineer.
 3. The Contractor shall maintain flow diversion or by-pass pumping operations during the entire length of time that flows are disrupted. The Contractor shall provide personnel to maintain the flow diversion or by-pass pumping operations for the same duration. Standby pump units shall be provided on site so that the peak sewage or drainage flow can be pumped with the largest pump unit out of service. The wastewater collection system operates 24 hours/day; 7 days/week.
 4. The design, installation and operation of the temporary bypass pumping system shall be the Contractor's responsibility. The Contractor shall employ the services of a vendor who can demonstrate to the Engineer that he specializes in the design and operation of temporary bypass pumping systems. The vendor shall provide at least five (5) references of projects of a similar size and complexity as this project performed by his firm within the past three years. The bypass pumping system shall meet the requirements of all codes and regulatory agencies having jurisdiction.
- B. The temporary bypass pumping system provided shall meet the specific quality and performance requirements delineated hereinafter and shall be designed and installed by the bypass pumping system vendor in conjunction with the Contractor in accordance with the general layout shown on the Contract Drawings and as herein specified. The temporary bypass pumping system provided shall also be in accordance with the order of work and construction sequence and other requirements outlined in Section 01010 - SUMMARY OF WORK.

1.02 SUBMITTALS

- A. The Contractor shall prepare with the vendor a specific, detailed description of any proposed bypass pumping system and submit it to the Engineer for review and approval.
- B. A method and methodology of flow diversion and/or by-pass pumping operations and schedule of same shall be submitted by the Contractor to the Engineer prior to beginning any construction activities. Standby facilities shall also be included as well as provisions for noise control, fuel and wastewater spill contingency planning, bypass pump field performance testing criteria, performance curves and hydraulic calculations for bypass pump selection.
- C. The Contractor shall submit to the Engineer detailed plans and descriptions outlining all provisions and precautions to be taken by the Contractor regarding the handling of existing wastewater and drainage flows. This plan must be specific and complete, including such items as schedules, locations, elevations, capacities of equipment, materials and all other incidental items necessary and/or required to insure proper protection of the facilities, including protection of the access and bypass pumping locations from damage due to the discharge flows, and compliance with the requirements and permit conditions specified in these Contract Documents. No construction shall begin until all provisions and requirements have been reviewed by the Engineer.
- D. The plan shall include, but not limited to, details of the following:
 - 1. Staging areas for pumps;
 - 2. Plugging method and types of plugs or bulkheads;
 - 3. Number, size, material, location and method of installation of suction piping;
 - 4. Number, size, material, method of installation and location of installation of discharge piping;
 - 5. Bypass pump sizes, capacity, number of each size to be on site and power requirements;
 - 6. Calculations of static lift, friction losses, and flow velocity (pump curves showing operating ranges shall be submitted); system curve with suction lift performance;
 - 7. Standby power generator size, location;
 - 8. Downstream discharge plan;
 - 9. Method of protecting discharge manholes or structures from erosion and damage;
 - 10. Thrust and restraint block sizes and locations;
 - 11. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill;
 - 12. Method of noise control for each pump and/or generator;
 - 13. Any temporary pipe supports and anchoring required;

14. Design plans and computation for access to bypass pumping locations indicated on the Drawings;
 15. Calculations for selection of bypass pumping pipe size;
 16. Schedule for installation of and maintenance of bypass pumping lines;
 17. Plan indicating selection location of bypass pumping line locations. A CAD Drawing to scale shall show the location of the equipment and confirm the data used for hydraulic calculations.
- E. Submittals shall be in accordance with Section 01300.

PART 2 PRODUCTS

2.01 EQUIPMENT

- A. All pumps used shall be centrifugal, end suction, fully automatic self-priming pumps that do not require the use of foot-valves, vacuum pumps, diaphragm pumps, or isolation valves in the priming system. All pumps used must be constructed to allow dry running for long periods of time to accommodate the cyclical nature of influent flows pumped and shall immediately develop 25" Hg vacuum without adjustment or repair or employ level control devices to regulate on/off or variable speed of the pump.
- B. The pumps may be electric or diesel powered. If electric pumps are utilized, provisions must be made for separate standby power, should there be a power failure.
- C. The Contractor shall provide the necessary start/stop controls for each pump. Engine speed of pumps shall be adjustable to operate the pumps between maximum and minimum design operating speeds.
- D. The Contractor shall include one stand-by pump of each size to be maintained on site. Back-up pumps shall be on-line, isolated from the primary system by valves.
- E. Pump shall not be connected by a common suction manifold. The use of PVC or Steel Pipe with Dresser Couplings will not be accepted. All pipe or hose will be rated for 25" Hg Vacuum.
- F. In order to prevent the accidental spillage of flows, all discharge systems must be constructed of high-density polyethylene pipe with fused joints and leak proof connections. The vendor fusing the pipe must have a minimum of five (5) years experience fusing HDPE pipe of the same diameter required for the project. Discharge hose will only be allowed by specific permission of the Engineer. PVC pipe with glued joints, aluminum "irrigation pipe", steel pipe or PVC pipe with Dresser couplings will not be accepted. All joints must be 100% restrained. All discharge pipes must have a minimum working pressure of 50 psi.

- G. The system will be provided with a cellular phone "auto dialer" in a NEMA 4 enclosure and include a 12 volt backup power supply. The auto dialer will notify the Contractor, pump manufacturer and the Town in the event of a high water alarm or other catastrophic failure.

2.02 SYSTEM DESCRIPTION

A. Design Requirements:

1. Bypass pumping systems shall have sufficient capacity to pump peak flows. The Contractor shall provide all pipeline plugs, pumps of adequate size to handle peak flow, and temporary discharge piping to ensure that the total flow can be efficiently and safely handled and delivered without interruption around the work areas. Bypass pumping system will be required to be operated 24 hours per day, 7 days per week.
2. The Contractor shall have adequate standby equipment available and ready for immediate operation and use in the event of an emergency or breakdown. One standby pump for each size pump utilized shall be installed at the mainline flow bypassing locations, ready for use in the event of primary pump failure.

B. Performance Requirements:

1. It is essential to the operation of the municipal sewer and drainage system that there is no interruption in the flow of wastewater or drainage throughout the duration of the project. To this end, the Contractor shall provide, maintain and operate all temporary facilities such as dams, plugs, pumping equipment (both primary and back-up units as required), conduits, all necessary power, and all other labor and equipment necessary to intercept the wastewater and drainage flow before it reaches the point where it would interfere with his work, carry it past his work and discharge it to the designated location approved by the Engineer.
2. The design, installation and operation of the temporary pumping system shall be the Contractor's responsibility. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.
3. The Contractor shall provide all necessary means to safely convey the wastewater and drainage past the work area. The Contractor will not be permitted to stop or impede flows under any circumstances.
4. The Contractor shall maintain sewer flows in a manner that will not cause surcharging of sewers or process upsets and that will protect public and private property from damage and flooding.

5. The Contractor shall protect water resources, wetlands and other natural resources.
6. The Contractor shall be responsible to meet noise requirements (68dbA @ 30'). All diesel driven primary and standby pumps shall be sound attenuated. The use of Critical Silenced Canopy pumps or acoustical Whisper Pac enclosures for sound attenuation are required.
7. Pumps may not be benched down to make the suction lift requirements unless approved by the Engineer.

2.03 FIELD QUALITY CONTROL AND MAINTENANCE

- A. Test: The Contractor shall perform leakage and pressure tests of the bypass pumping suction and discharge piping using clean water prior to actual operation. The Engineer will be given 24 hours notice prior to testing.
- B. Inspection: Contractor shall inspect bypass pumping system every two hours to ensure that the system is working correctly.
- C. Maintenance Service: The Contractor shall insure that the temporary pumping system is properly maintained and a responsible operator shall be on hand at all times when pumps are operating.
- D. Extra Materials:
 1. Spare parts for pumps and piping shall be kept on site as needed to insure uninterrupted bypass pumping of all flows.
 2. Adequate hoisting equipment for each pump and accessories shall be maintained on the site.

2.04 PREPARATION

- A. Precautions
 1. The Contractor is responsible for relocating any existing utilities in the area the Contractor selects to locate the bypass pipelines. The Contractor shall locate his bypass pipelines to minimize any disturbance to existing utilities and shall obtain approval of the pipeline locations from the Owner or the Engineer. All costs associated with relocating utilities and obtaining all approvals shall be paid by the Contractor.
 2. During all bypass pumping operations, the Contractor shall protect the existing wastewater and drainage facilities from damage inflicted by any

equipment. The Contractor shall be responsible for correcting all physical damage to the existing wastewater and drainage facilities and all local sewer and drain lines caused by human or mechanical failure.

3. The Contractor shall maintain all vehicle access within the existing roadways where bypass piping is located. Bypass piping road ramps shall be used only if approved by the Engineer.

2.05 INSTALLATION AND REMOVAL

- A. If necessary, the Contractor shall, with Engineer's approval, remove manhole sections or make connections to the existing facilities and construct temporary bypass pumping structures.
- B. Plugging or blocking of sewage or drainage flows shall incorporate a primary and secondary plugging device. When plugging or blocking is no longer needed for performance and acceptance or work, it is to be removed in a manner that permits the wastewater or drainage flow to slowly return to normal without surcharging or causing other disturbances to normal operations.
- C. When working inside structures or pipelines, the Contractor shall exercise caution and comply with OSHA requirements when working in the presence of sewer gases, combustible or oxygen-deficient atmospheres, and confined spaces.
- D. The installation of the bypass pipelines is prohibited in all saltmarsh/wetland areas. The pipeline must be located off streets and sidewalks and on shoulders of the roadways. When the bypass pipeline crosses local streets and private driveways, the Contractor must place the bypass pipelines in trenches and cover with temporary pavement. Upon completion of the bypass pumping operations, and after the receipt of written permission from the Engineer, the Contractor shall remove all the piping, restore all property to pre-construction condition and restore all pavement. The Contractor is responsible for obtaining any approvals for placement of the temporary pipeline within public ways from the Town.

2.06 BYPASS PORTABLE PUMPING EQUIPMENT

- A. The portable bypass pumps and all appurtenances shall be delivered to the Contractor in accordance with the construction sequence phasing described in Section 01010 - SUMMARY OF WORK and indicated on the Contract Drawings and in the Contractor's Construction Schedule.
- B. The portable pumps specified in this Section must be able to pump raw unscreened and non-degripped wastewater or drainage.
- C. All pumps and accessories shall be supplied by the pump manufacturer.

- D. The pumps shall be fitted with a fully automatic self-priming system incorporating an air compressor, air ejector assembly, and an air/water separation tank. No water shall be required in the pumps to achieve a prime. The air ejector shall operate on the discharge side of the compressor thus allowing no possibility of water being drawn into the air source. The pumps must be capable of running totally dry for extended periods of time.
- E. The bypass pumping system's self-priming system shall not use a vacuum pump nor require the use of a "foot" type valve. It shall contain no moving parts or protective float gear. A demonstration of the pumps' ability to repeatedly cycle from pump/snore/repriming/pump shall be required.
- F. Each pump shall be skid-mounted with central lifting bracket.
- G. Pumps shall be fully automatic, needing no form of adjustment on priming system. The pumps shall be capable of static suction lifts to 28 feet, vertical, at sea level. Pumps shall also be capable of operation using extended suction lines.
- H. Equipment acceptance shall be contingent upon the pumps' ability to run in a completely dry condition for long periods of time. A demonstration will be required by the Engineer.

PART 3 EXECUTION

3.01 GENERAL

- A. The Contractor shall have available, and maintain as required, pumps of sufficient capacity to be able to handle flows entering the sewers and drains to be rehabilitated. The handling of wastewater or drainage flows shall be conducted in a manner that no disruption or surcharging of flow to the upstream or downstream sewers, drains or other facilities.
- B. Since the sewage flows are variable but always present immediately adjacent to the construction activities of this Contract, the Contractor shall be aware that either planned or accidental disruption of these flows require that the bypass pumping facilities be of a size and capacity to adequately convey these flows around the planned or accidental location of disruption to an acceptable discharge point approved by the Engineer.

3.02 INTERFERENCE WITH EXISTING WASTEWATER AND DRAINAGE OPERATIONS

- A. The Contractor shall at all times conduct his operations so as to interfere as little as possible with the existing sewers, drains, other facilities and the designed modifications thereto. The Contractor shall develop a program in cooperation

with the Engineer and the Owner's staff and shall provide for the construction and putting into service of the new work in the most orderly manner possible. This program shall be adhered to, except as deviations are expressly permitted by the Engineer and Owner. All work of connecting with, cutting into, and reconstruction of existing pipe or structures shall be planned to interfere with the operation of the existing facilities for the shortest possible time when the demands on the facilities best permit such interference, even though it may be necessary to work outside of normal working hours to meet these requirements. Before starting work which will interfere with the operation of the existing facilities, the Contractor shall do all possible preparatory work including the construction of temporary connections; structural modifications; the provisions of electricity; portable generators; pumping equipment; and pipe installation as required and shall see that all the materials and equipment are made ready and at hand.

- B. The Contractor shall provide adequate shelter, insulation, heating, ventilation, etc., to insure reliable operation of the bypass pumping system during all possible weather conditions.
- C. The Contractor shall make such minor modifications in the work relating to existing structures as may be necessary, at no additional cost to the Owner.

3.03 MANUFACTURERS' SERVICES

- A. The manufacturer shall furnish the services of a competent factory representative (acceptable to the Engineer) to do the following:
 - 1. Inspect the system prior to delivery, supervise the start up and testing of the system, and certify the system has been properly furnished and is ready for operation.
 - 2. Instruct the Contractor's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day. Provide four (4) complete O&M Manuals for each type of pump installed.

3.04 SPARE PARTS

The manufacturer shall furnish with the portable bypass sewage pumping system spare parts required for normal operation and maintenance during the anticipated period of operation.

** END OF SECTION **

SECTION 02930 - TOPSOILING AND SEEDING

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The work to be done under this Section consists of furnishing all materials, labor, tools and equipment, and performing all operations necessary to complete all topsoiling and seeding.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Non-petroleum tackifier commercially available for spray applications as approved by the Engineer.
- B. Fertilizer. Fertilizer shall be 10-6-4, uniform in composition, free-flowing, and suitable for application with approved equipment. The fertilizer shall be delivered to the site in bags or other convenient containers, each fully labeled, conforming to the applicable State fertilizer laws, and bearing the name, trade name or trademark, and warranty of the producer.
- C. Lime. Lime shall be agricultural grade limestone ground so that 95 percent of the material will pass a No. 20 sieve, and at least 50 percent will pass a No. 100 sieve.
- D. Manufactured Mulch. Cellulose-fiber or wood-pulp mulch with non-toxic temporary green dye for visual metering shall be commercially available for use in spray applications as approved by the Engineer.
- E. Mulch. Mulch shall be threshed straw of cereal grain such as oats, wheat, barley or rye. Materials that contain objectionable weed seeds or other species that might be detrimental to the planting being established or to adjacent farmland will not be acceptable.
- F. Seed mixture shall be fresh, clean, new crop seed. Seed shall be mixed by a dealer. The Contractor shall furnish the Engineer the dealer's guaranteed statement of the composition of the mixture, with the percentage of the purity weed content, and germination, the net weight and date of shipment of each variety. No seed shall be sown until the Contractor has submitted the certificates. Seed that has become moldy or otherwise damaged shall not be acceptable.

G. Seed shall be of the previous year's crop, and in no case shall the weed seed content exceed one (1%) percent by weight. Seed shall conform to the requirements of the following tables:

<u>Species</u>	<u>Percent by Weight</u>	<u>Germination Minimum</u>	<u>Purity Minimum</u>
For Hydroseeding Grass			
Kentucky Bluegrass	10%	85%	90%
Merion Bluegrass	20%	85%	92%
Penlawn Red Fescue	50%	85%	95%
Manhattan Perennial Rye	20%	90%	98%

For Hydroseeding Grass and Legumes

Creeping Red Fescue	20%	85%	90%
Annual Ryegrass	10%	85%	95%
Birdsfoot Trefoil (Lotus corniculatus 'Empire') (Ground Cover)	70%	85%	90%

H. Loam shall be a "fine sandy loam" or a "sandy loam" determined by mechanical analysis and based on the "USDA classification system". It shall be of uniform composition, without admixture of subsoil. It shall be free of stones greater than one inch, lumps, plants and their roots, debris and other extraneous matter over 1/2-inch in diameter, or excess of smaller pieces of the same materials as determined by the Engineer. It shall not contain toxic substances harmful to plant growth. It shall be obtained from naturally well-drained areas that have never been stripped before and have a history of satisfactory vegetative growth. The source of loam must be approved in advance by the Engineer.

I. Loam shall have an acidity range of pH 6.2 to pH 6.5 for lawns and 7.2 for trefoil, and shall contain not less than 5 percent nor more than 12 percent organic matter as determined by the loss on ignition of oven-dried samples. Test samples shall be oven-dried to a constant weight at a temperature of 230 degrees F., plus or minus 9 degrees.

J. Loam stripped from the site may be used and amended as required to satisfy project specifications. Loam borrow from off-site shall be supplied to the extent necessary to complete project requirements.

2.02 INSPECTION AND TESTS

A. Fertilizer and Lime. Duplicate copies of invoices shall be furnished. Invoices shall show quantities of each grade of fertilizer, percentage of calcium carbonate or magnesium carbonate, and the percentages of limestone that pass the sieves. Upon

completion of the project, a final check of total quantities of fertilizer and limestone used will be made against total area treated, and if minimum rates of application have not been met, additional quantities of these materials to make up minimum application specified shall be distributed as directed.

- B. Mulch. The Engineer shall be notified of sources from which mulch materials are available and the quantities thereof, and representative samples of the materials proposed for use shall be submitted for approval.
- C. Seed. The Engineer shall be furnished duplicate signed copies of a statement from the vendor, certifying that each container of seed delivered is labeled in accordance with the Federal Seed Act and is at least equal to requirements previously specified. This certification shall be obtained from the vendor and shall be furnished on or with all copies of seed invoices. Each lot of seed will be sampled and tested, in accordance with the latest Rules and Regulations under the Federal Seed Act, at the discretion of the Engineer.
- D. Topsoil. The Engineer shall be notified of the off-site sources from which topsoil material is to be furnished. The material will be tested by the Contractor and a report sent directly to the Engineer by the testing laboratory.

PART 3 EXECUTION

3.01 Grassed areas disturbed by the Contractor during construction shall be topsoiled and seeded, so as to be similar in all respects to the areas prior to construction to the satisfaction of the Engineer.

3.02 TILLAGE. After the areas required to be seeded have been brought to the final grades, the soil shall be tilled to a depth of at least 4 inches by plowing, discing, harrowing, or other approved operations until the condition of the soil is acceptable. The work shall be performed only during periods when, in the opinion of the Engineer, beneficial results are likely to be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be stopped when directed.

3.03 PLACING TOPSOIL

- A. Wherever the subgrade material is sand, gravel or other pervious material with a percolation rate of less than 30 minutes per inch drop, the Contractor shall place a 4-inch layer of clay or other impervious material on the subgrade material before placing the topsoil. The percolation rate shall be determined in a 12-inch square hole, when such hole shall have been pre-saturated for at least 15 minutes. The impervious material shall be mixed with the subgrade material before placing the topsoil.

- B. Topsoil shall be distributed uniformly and spread and uniformly compacted to a minimum depth of 6 inches. The surface shall be regraded as required to obtain a smooth surface.
- C. Topsoil shall be spread and shaped so that seeding can proceed with little additional soil preparation or tillage. Surface irregularities resulting from topsoiling or other operations shall be leveled to prevent depressions.
- D. Topsoil shall not be placed where the subgrade is frozen, excessively wet, extremely dry, excessively compacted, or in a condition detrimental to the proposed planting or grading.
- E. Soil compacted by construction equipment or soil on compacted cut slopes or grades shall be pulverized to a minimum depth of 4 inches by discing or plowing before applying topsoil.

3.04 LIMING, FERTILIZATION AND SEEDING. The Dry Method, which includes the use of mechanical equipment for application of materials in wet or dry form, shall be used.

- A. The quantities of materials to be used are as follows:

Trefoil Seed	3/4 pound per 100 square feet
Grass Seed	1 pound per 150 square feet
Fertilizer	1 pound per 130 square feet
Lime	As required to obtain a pH value of soil of 6.5 for grass and 7.2 for trefoil areas

- B. Seed shall be sown between April 1 and June 1 or between August 15 and October 15, unless otherwise directed in writing. When conditions are such, by reason of drought, high winds, excessive moisture, or other factors that satisfactory results are not likely to be obtained, work shall be halted as directed and resumed only when conditions are favorable or when approved alternate or corrective measures and procedures have been effected.
- C. Fertilizer and limestone shall not be mixed together prior to their application, but may be worked into the soil together to a depth of at least two inches. Lime and fertilizer shall be mixed into the soil during the tillage operation. At least 24 hours shall elapse between the time fertilizer is incorporated and hydroseeding takes place.
- D. If inspection shows areas that have been left unplanted or have poor growth after two weeks, additional seed shall be sown.

3.05 APPLYING AND ANCHORING MULCH

- A. Oak straw mulch shall be spread uniformly on seeded areas in a continuous blanket, using 2 tons per acre. Mulch shall be spread by hand.
- B. Manufactured mulch, if used, shall be spread uniformly on selected seeded areas at a minimum rate of 1,400 pounds per acre unless otherwise directed. It shall be placed by spraying from an approved spraying machine having pressure sufficient to cover the slopes from bottom to top in one operation. Immediately before spraying, the mulching material shall be mixed with water in the sprayer and kept uniformly suspended in the water by agitation during the spraying operation.

3.06 CARE AND MAINTENANCE

- A. Maintenance of Hydroseeded Areas:
 - 1. Maintenance shall begin immediately after any area is hydroseeded and shall continue until final acceptance of the overall project.
 - 2. Maintenance shall include reseeded or rehydroseeding, refertilizing, remulching of any bare areas, refilling of rainwashed gullies and rutted areas, watering, mowing at least twice, weeding, and chemical treatments as required for fungus and/or pest control in seeded areas.
 - 3. All areas and parts of areas, which in the opinion of the Engineer, fail to show a uniform stand of the desired grass or legumes for any reason whatsoever, shall be reseeded, and such areas and parts of areas shall be reseeded repeatedly until all areas are covered with a satisfactory growth of grass and legumes. Reseeding together with necessary grading, fertilizing, and trimming shall be done at the expense of the Contractor, who shall spread and seed by a method approved by the Engineer.
- B. Mowing:
 - 1. The Contractor shall keep grass-seeded areas mowed to a height of two and one-half (2-1/2) inches whenever the height of grass reaches four (4) inches.
 - 2. The Contractor shall mow areas seeded with trefoil only when directed by the Engineer, and only to a height of six (6) inches when so directed.
- C. Watering of Hydroseeded Areas:
 - 1. First Week: The Contractor shall provide all labor and arrange for all watering necessary to establish acceptable grass or legumes. In the

absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first week and in sufficient quantities to maintain moist soil to a depth of at least two (2) inches.

2. Second and Subsequent Weeks: The Contractor shall water the grass and legume areas to maintain adequate moisture in the upper two (2) inches of soil, necessary for the promotion of deep root growth.
3. Watering shall be done in a manner that 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. The Contractor shall furnish sufficient watering equipment to apply one (1) complete coverage of the seeded areas in an eight (8) hour period.
4. Water may be purchased from the Owner. The Contractor shall notify the Town of Arlington Department of Public Works prior to using any water.

** END OF SECTION **

SECTION 03300 - CONCRETE

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. This section of the Specifications covers concrete and all related items necessary to place and finish the concrete work.
- B. Concrete encasement to be provided where new sewer lines cross under or over and within 18 inches of existing water mains, and at other locations required by the Engineer, shall be installed in accordance with the details shown on the Drawings and as specified in this section.

1.02 STANDARDS

- A. ACI Standards. The following Standards of the American Concrete Institute form a part of these Specifications, and indicate the minimum standards required:

- 1. ACI 211.1 Recommended Practice for Selecting Proportions for Normal Weight Concrete.
- 2. ACI 214 Recommended Practice for Evaluation of Compression Test Results of Field Concrete.
- 3. ACI 304 Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete, including placing concrete by pumping methods.
- 4. ACI 305R Recommended Practice for Hot Weather Concreting.
- 5. ACI 306R Recommended Practice for Cold Weather Concreting.
- 6. ACI 308 Recommended Practice for Curing Concrete.
- 7. ACI 318 Building Code Requirements for Reinforced Concrete.

- B. ASTM Standards. The following Standards of the American Society for Testing and Materials form a part of these Specifications. Unless otherwise specified, materials and methods of testing shall conform to ASTM Standards.

- 1. A 615 Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

2. C 33 Concrete Aggregates.
3. C 94 Ready-Mixed Concrete.
4. C 143 Slump of Portland Cement Concrete.
5. C 150 Portland Cement.
6. C 260 Air-Entraining Admixtures for Concrete.

PART 2 PRODUCTS

2.01 CONCRETE

- A. All concrete, reinforced or non-reinforced, shall have a 28-day compressive strength of 3000 psi unless otherwise noted on the Drawings. A minimum of 5.5 sacks of cement per cubic yard and a maximum water-to-cement ratio of 6.9 gallons per sack shall be used.
- B. Concrete shall conform to ASTM C94. The Contractor shall be responsible for the design of the concrete mixtures. Slump shall be a maximum of 4 inches and a minimum of 2 inches, determined in accordance with ASTM C143.
- C. Admixtures shall be as specified in Subsection 2.05. No additional admixtures shall be used unless approved by the Engineer.
- D. No additional water, except for the amount indicated by the design mix, shall be added to the concrete without the prior permission of the Engineer.

2.02 REINFORCING

- A. Reinforcing as shown on the plans or as directed by the Engineer, shall conform to ACI 318 and ASTM A615 and shall be detailed in accordance with ACI SP-66. All steel reinforcing bars shall be Grade 60.

2.03 CEMENT

- A. The cement shall be an approved brand of American-manufactured Portland Cement, Type II, conforming to the applicable requirements of ASTM C150.

2.04 AGGREGATES

- A. Except as otherwise noted, aggregate shall conform to the requirements of ASTM C33.
- B. Maximum size aggregate shall be 3/4-inch.

2.05 ADMIXTURES

- A. All concrete (unless otherwise directed) shall contain an air-entraining agent. Air-entrained concrete shall have an air content by volume of 4 to 8 percent for 3/4-inch aggregate.
- B. Air-entraining admixtures shall conform to ASTM Standard C 260. They shall be "Darex AEA", "Vinsol NVX", "Airecon", "Sika AER", or approved equal.
- C. Chemical admixtures to act as water-reducing agents, retarders, or accelerators, when required or approved, shall conform to ASTM Standard C 494. Calcium chloride shall not be used as an admixture.

2.06 WATER

- A. Water for concrete shall be potable, free of deleterious amounts of oil, acid, alkali, organic matter and other deleterious substances.

PART 3 EXECUTION

3.01 PREPARATION

- A. Before placing concrete, forms and the space to be occupied by the concrete shall be thoroughly cleaned, and reinforcing steel and embedded metal shall be free from dirt, oil, mill scale, loose rust, paint or any material that would tend to reduce the bond.
- B. Earth, concrete, masonry, or other water-permeable material against which concrete is to be placed shall be thoroughly saturated with water immediately before concrete is placed.
- C. No concrete shall be placed until the consolidation of the ground and the arrangement and details of forms and reinforcing have been inspected and approved by the Engineer.

3.02 CONCRETE PLACING DURING COLD WEATHER

- A. Concrete shall not be placed on frozen ground, and no frozen material or material containing ice shall be used. Materials for concrete shall be heated when temperature is below 40°F, or is expected to fall to below 40°F within 73 hours, and the concrete after placing shall be protected by covering, heating, or both.

- B. All details of Contractor's handling and protecting of concrete during freezing weather shall be subject to the approval and direction of the Engineer. All procedures shall be in accordance with provisions of ACI 306.

3.03 CONCRETE PLACING DURING HOT WEATHER

- A. Concrete just placed shall be protected from the direct rays of the sun, and the forms and reinforcement shall be sprinkled with cold water just prior to placing. The Contractor shall make every effort to minimize delays that will result in excessive mixing of the concrete after arrival on the job.
- B. During periods of excessively hot weather (90°F or above), ingredients in the concrete shall be cooled insofar as possible, and cold mixing water shall be used to maintain the temperature of the concrete at permissible levels, all in accordance with the provisions of ACI 305. Any concrete with a temperature above 90°F, when ready for placement, will not be acceptable, and will be rejected.

** END OF SECTION **

SECTION 13511 - SEWER LINE CLEANING

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The Contractor shall provide all labor, materials, equipment, and supervision necessary for the proper cleaning of the designated sewer lines and storm drains prior to their internal inspection by closed-circuit television, pipe lining, testing and/or chemical sealing operations as shown on the Contract Drawings.
- B. Since the success of the other phases of work depends a great deal on the cleanliness of the lines, the importance of this phase of the operation cannot be stressed too strongly. It is recognized that there are some conditions such as badly broken or eroded pipe or major blockages that prevent cleaning from being accomplished, or where additional sewer line damage would be done if cleaning is attempted or continued. Should conditions of this nature be encountered, the Contractor shall notify the Engineer to have the line televised and/or to remove the blockage prior to cleaning the specific manhole section. If cleaning of an entire section cannot be successfully performed from one manhole, the equipment shall be setup on the other manhole and cleaning again attempted. If, again, successful cleaning cannot be performed or the equipment fails to traverse the entire manhole section, it will be assumed that a major blockage exists, and the cleaning effort shall be abandoned until the cause of blockage can be removed.
- C. The cleaning of sanitary sewer lines shall be performed on all sanitary sewer lines scheduled for televising or grouting within 24 hours prior to these operations, or as directed by the Engineer.

1.02 RELATED WORK

- A. The following items of work are not included in this Section but are specified under other Sections of these Specifications.
 - 1. Mainline chemical root control is specified in Section 13512 - SEWER LINE CHEMICAL ROOT CONTROL.
 - 2. Television inspection is specified in Section 13513 - TELEVISION INSPECTION.
 - 3. Sewage flow control is specified in Section 13514 - SEWAGE FLOW CONTROL.
 - 4. Sewer line testing and sealing is specified in Section 13516 - SEWER LINE TESTING AND CHEMICAL SEALING.

5. Sewer rehabilitation report is specified in Section 13519 – SEWER REHABILITATION REPORT.
6. Pipeline relining is specified in Section 13520 – SANITARY SEWER AND STORM DRAIN LINING.

PART 2 PRODUCTS

This section not used.

PART 3 EXECUTION

3.01 EQUIPMENT. The designated sanitary sewer pipeline sections shall be cleaned using mechanically powered, hydraulically propelled or high velocity sewer cleaning equipment, as specified below, or by other reasonable means acceptable to the Engineer. Selection of the equipment used shall be based on the conditions of the line at the time the work commences. The equipment and method selected shall be satisfactory to the Engineer. The equipment selected for cleaning shall be capable of removing dirt, grease, rocks, sand, and other deleterious materials and obstructions from the sewer lines and manholes. Filling of equipment with water shall be from approved locations only. Prior to withdrawing any water, notify the Town of Arlington Department of Public Works at (781) 316-3301.

- A. Hydraulic Cleaning Equipment: The equipment used shall be of a movable dam type and be constructed in such a way that a portion of the dam may be collapsed at any time during the cleaning operation to protect against flooding of the sewer. The movable dam shall be the same diameter as the pipe being cleaned and shall provide a flexible scraper around the periphery to ensure total removal of grease. If sewer cleaning balls or other such equipment, which cannot be collapsed instantly are used, special precautions against flooding of the sewers in public or private property shall be taken.
- B. High Velocity Hydro-Cleaning Equipment: All high-velocity sewer cleaning equipment shall be constructed for ease and safety of operation. The equipment shall have a minimum of 500' of high-pressure hose with a selection of two or more high-velocity nozzles. The nozzles shall be capable of producing a scouring action from 15 degrees to 45 degrees in all size lines designated for cleaning. Equipment shall also include a high-velocity gun for washing and scouring man-hole walls and floors. The gun shall be capable of producing flows from a fine spray to a long-distance solid stream. The equipment shall carry its own water tank, auxiliary engines, pumps, and hydraulically driven hose reel. All controls shall be located so that the equipment can be operated from above ground.

- C. Mechanical Cleaning Equipment: Bucket machines shall be in pairs with sufficient power to perform the work in an efficient manner. Machines shall be belt-operated or have an overload device. Machines with direct drive that could cause damage to the pipe will not be allowed. A power rodding machine shall be either a sectional or continuous type capable of holding a minimum of 750 feet of rod. The rod shall be specifically treated steel. To ensure safe operation, the machine shall have a fully enclosed body and an automatic safety throw-out clutch or relief valve.
- 3.02 CLEANING PRECAUTIONS: During all sewer cleaning operations, satisfactory precautions shall be taken to protect the sewer lines and service connection laterals from damage caused by the use of cleaning equipment. Whenever hydraulically propelled cleaning tools, which depend upon water pressure to provide their cleaning force, or any tools which retard the flow of water in the sewer line are used, precautions shall be taken to ensure that the water pressure created does not cause any damage or flooding to public or private property being served by the manhole section/service connection involved. No fire hydrant shall be obstructed in case of a fire in the area served by the hydrant, nor shall a hydrant be used for the purpose described unless an air gap or a vacuum breaker is provided. Prior approval from the Owner is required before any hydrant is used.
- 3.03 MATERIAL REMOVAL: All sludge, dirt, sand, rocks, grease and other solid or semi-solid material resulting from the cleaning operation shall be removed at the downstream manhole of the section being cleaned. Passing material from manhole section to manhole section shall not be permitted. Where chemical root control has been performed prior to the cleaning operation, special attention shall be paid to the removal of visible roots from the joints to the extent that is physically possible. Any extensive visible roots that could prevent proper seating of the sealing packer, or could prevent the proper flow of chemicals into and through the joints to obtain a good chemical seal shall be removed. Procedures may include the use of mechanical devices such as hydraulic root cutters and porcupines, hydraulic procedures such as high-pressure jet cleaners, and physical-chemical methods.
- 3.04 DISPOSAL OF MATERIALS: All solids or semi-solids resulting from the cleaning operations shall be removed from the site and disposed of by the Contractor in accordance with the State's special waste regulations. All materials shall be removed from the site no less often than at the end of each workday. Under NO circumstances will the Contractor be allowed to accumulate debris, etc., on the site beyond the stated time.
- 3.05 FINAL ACCEPTANCE: Acceptance of this portion of the work shall be made upon the successful completion of television inspection and upon the satisfaction of the Engineer. In areas where television inspection is not performed, or where cleaning was not found satisfactory during the television inspection, a double squeegee, with each squeegee the same size as the sewer, shall be pulled through

each pipeline section as evidence of being adequately cleaned. If internal sealing is to follow the television inspection phase of the work, then particular attention should be given to the adequacy of the cleaning to insure that proper seating of the sealing packers can be achieved. If proper seating of the sealing packer cannot be achieved due to inadequate cleaning, the sewer line shall be re-cleaned at no additional cost to the Owner until satisfactory results are obtained.

- 3.06 RECORDS: For each section of sewer cleaned, complete, accurate and legible records of the cleaning operation shall be kept on file by the Contractor. Two (2) copies of the original records shall be furnished to the Engineer at the end of each day's operations. The records shall show as a minimum, the date of cleaning, the amount of debris removed from each pipeline section, the sewer sections cleaned, the method and type of cleaning performed, and other pertinent information. Final typed copies shall be submitted with the contractor's Rehabilitation Report as specified in these Specifications. The Contractor shall maintain a log of all water supplied by the Town of Arlington.

**** END OF SECTION ****

SECTION 13512 - CHEMICAL ROOT CONTROL

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The work to be done under this Section consists of furnishing all materials, labor, tools, and equipment, and performing all operations necessary for chemical root control in sewers and manholes as shown on the Contract Drawings and as herein specified. The work shall also include obtaining the MWRA permit for performing the root control process for this contract.

1.02 RELATED WORK

- A. The following items of work are not included in this Section but are specified under other Sections of these Specifications.
1. Cleaning of sewer main and service connection pipelines is specified in Section 13511 – SEWER LINE CLEANING.
 2. Sewage flow control is specified in Section 13514 – SEWAGE FLOW CONTROL.
 3. Television inspection is specified in Section 13513 – TELEVISION INSPECTION.

1.03 GENERAL

- A. Only licensed, experienced contractors or subcontractors who meet the standards set forth herein shall apply chemical root control. The work shall be supervised by a licensed applicator, certified by the state pesticide regulatory agency, and must meet the experience requirements set forth herein:
1. The Contractor shall furnish evidence that the licensed application firm has a minimum of five (5) years direct experience in applying chemical sewer root control of the type specified herein. Such work experience must be direct, and the work must have been performed by the subcontractor's own crews.
 2. The Contractor shall furnish evidence of at least ten (10) projects similar in size and scope to the work specified herein successfully completed by the licensed application firm. Any work performed by subcontractors working for the submitted subcontractor will not be considered direct experience.

3. The Contractor shall furnish evidence that the subcontractor is licensed as a pesticide application business with the state pesticide regulatory agency. The Contractor shall also furnish evidence that the applicator performing the work is a licensed pesticide applicator with the same agency, having a minimum three years of experience and having treated a minimum 250,000 linear feet of sewer as a licensed applicator or under the direct supervision of a licensed applicator.
- B. In addition to all other insurance required under this Contract, the Contractor shall provide pollution and chemical liability insurance as specified hereinafter:
1. The Contractor shall submit insurance certificates as evidence that he and his subcontractor(s) have obtained pollution liability coverage. The coverage shall protect the Contractor and subcontractor, and indemnify the Owner and the Owner's officers, agents, employees, and representatives from claims for damages for bodily or personal injury, sickness or disease, including death, and from claims for damages to property and/or the environment, which may arise directly out of the use of chemicals and/or pollution. The insurance certificate and policy shall list the Owner and their representative as an additional insured.
 2. The minimum amount of such insurance shall be \$1,000,000 total loss. This insurance shall be provided by an insurance company licensed to do business in Massachusetts that holds at least an "A" rating by A.M. Best rating service.
 3. In addition, the subcontractor's commercial general liability limits must be not less than \$3,000,000, total occurrence limit, and include pesticide or herbicide applicator coverage.
 4. Nothing contained in this section shall be construed as limiting the extent of the Contractor's responsibility for payment of damages resulting from his operations under the contract.

1.04 SHOP DRAWINGS

- A. Shop drawings shall be submitted to the Engineer for review in accordance with Section 01300 - SUBMITTALS. At a minimum, the Contractor shall submit specimen product label(s), manufacturer's application instructions, Material Safety Data Sheets for the chemical root control agents that he proposes to use, and the required documentation for the subcontractor he proposes to use. A copy of the MWRA permit application shall be included with the shop drawing submittal. A copy of the approved MWRA permit shall be submitted upon issuance.

1.05 GUARANTEE

- A. For each manhole or sewer section (manhole-to-manhole) that is treated under the Contract, the Contractor shall guarantee the work as follows:
1. At the option of the Owner, the Contractor shall, at his own expense, re-apply the chemical agent to the manhole or sewer section, or refund 100% of the payment received to treat that manhole or section, in the event that: (1) live roots are found in the manhole or section within six months after the application; or, (2) the manhole or section plugs up and floods due to tree root obstructions within a period of two years, beginning with the date of treatment, and ending two years after the date of treatment.
 2. The guarantee applies only to sewer stoppages caused by live tree roots. It does not apply to stoppages caused by grease or other foreign matter; flat, collapsed or deformed pipe, or flooding caused by a surcharged or plugged sewer section downstream from a guaranteed manhole or sewer section. This guarantee applies to manholes, main line sewers and service connections that received direct application of the chemical agent. It will not apply to services along sewer mains that were treated unless the service was directly treated. The Contractor shall not be responsible for damage caused by pipeline stoppages unrelated to root intrusion. The decision of the Owner as to the cause of a stoppage is binding.

PART 2 PRODUCTS

2.01 CHEMICAL ROOT CONTROL AGENT

- A. General. A chemical root control agent designed specifically to control manhole and sewer line tree root intrusions shall be applied to manholes and sanitary sewers according to the following specifications. The chemical root control agent shall kill the root growth present in the manholes and pipelines and inhibit root re-growth without permanently damaging the vegetation producing the roots, and without disrupting wastewater treatment plant processes.
1. The chemical product shall contain an herbicide to destroy root tissue, an herbicide to deter regrowth, and a foaming surfactant to deliver the herbicides to the target root growths. It shall be currently registered with the U.S. EPA and the state pesticide regulatory agency. It shall be labeled for use in sewers and manholes to control tree roots.
 - a. **ROOT KILLING AGENT:** The active component for destroying intruding roots in manholes and sanitary sewer lines shall be a potent, non-systemic toxin that kills contacted roots at low concentrations, but that will not permanently affect parts of the

wastewater treatment plant distant from the treated roots. The active ingredient must be spontaneously detoxified by natural chemical or biochemical processes in a relatively short interval following its use. The active ingredient for destroying root intrusions shall be Sodium Methylthiocarbamate at a concentration not less than 32.7%.

b. **ROOT RE-GROWTH INHIBITOR:** The active ingredient for inhibiting re-growth of root intrusions in manholes and sanitary sewer lines shall inhibit root cell growth on contact, but shall not be transported so as to have a deleterious impact on treatment processes at the wastewater treatment plant. The material shall bind firmly to the soil in the vicinity of openings in manhole walls and pipe joints so as to form a persistent chemical barrier suppressing root tip growth. The material shall be sufficiently stable under the conditions of use to provide protection for twelve months or longer, but shall be subject to decomposition in wastewater treatment plants without disturbing the treatment plant processes. The root cell growth-inhibiting agent shall be 2,6-Dichlorobenzonitrile.

c. **INERT INGREDIENTS:** The root control material shall be formulated with foaming agents and surfactants sufficient to produce a stable, small bubble, dense foam capable of sustaining its shape and remaining on the treated roots for approximately thirty minutes. The foaming surfactants shall strip grease that typically clings to sewer root masses. The foaming agents shall be formulated such that one part of aqueous solution of the mixed material will convert into twenty parts foam.

2. The active ingredients shall not adversely affect the performance of the wastewater treatment plant when applied properly in accordance with manufacturer's recommendations.
3. Compounds containing copper and/or other known priority pollutants, as defined by the U.S. Environmental Protection Agency, shall not be allowed.

PART 3 EXECUTION

3.01 GENERAL

- A. Where sewer or manhole cleaning, grouting, or relining is specified or required, the foaming root control shall be performed a minimum of 60 days in advance of those operations, to maximize the biological decay of the root masses.
- B. No chemical root control agent shall be applied whenever the depth of flow in a sewer is greater than sixty percent of the pipe diameter, or if surcharging is expected within a 12-hour period after a treatment has been made. The Contractor shall reschedule that section of sewer pipe to be treated during a low groundwater period.
- C. If excessive accumulations of dirt, grease, or other debris preclude effective treatment of a sewer line, the Contractor shall clean the sewer pipe as specified in Section 13511 – SEWER LINE CLEANING prior to root control treatment. The Contractor shall wait at least 60 days after any cleaning work is performed on a pipeline scheduled for treatment in order to allow root tissues to recover prior to treating the sewer line.

3.02 INSTALLATION

- A. Application. Application of the chemical root control agent shall be by foaming in accordance with the best recommended practice for conditions present in the pipeline to be treated. Mixing and application procedures shall be in strict accordance with the manufacturer's instructions on the container label.
 - 1. All materials shall be delivered to the site in undamaged, unopened containers bearing the manufacturer's original label. Mixing of the root treatment material shall be done no more than twelve hours prior to use. The water used shall be clear and free of acid, alkali, oxidizing agents, oils, or other organic material. Mixing water temperature shall be between 40°F and 80°F.
 - 2. A foam discharge hose shall be inserted throughout the entire length of the sewer section to be treated.
 - 3. To avoid injury to plant tissue that would reduce the effectiveness of the treatments, hydraulic or mechanical sewer cleaning machines shall not be used on any sewer section scheduled for treatment for a period of at least 60 days prior to the treatment. Hydraulic or mechanical sewer cleaning machines may not be used to convey the foam discharge hose through the sewer section, or to convey ropes or cables through the sewer section.

4. Acceptable methods of conveying the foam discharge hose through the sewer section are: 1) manually or mechanically shoving the foam discharge hose through the section, or 2) floating a rope through the sewer section and using the rope to pull the foam discharge hose into the section.
5. The equipment used shall discharge foam under sufficient pressure (approximately 30 psi) to assure that the entire air space above the flow in the sewer from manhole to manhole is completely filled with foam, and to assure that the foam is forced up connecting lateral sewers approximately 10 to 15 feet. Hose retrieval rates must be timed to evenly distribute the full quantity of foam throughout the entire area of treatment. The quantity of foam (see table below) shall be sufficient to completely fill the entire volume of the main sewer treated, plus an additional 10% to allow for the penetration of material up lateral sewers, and for loss in manholes.

Concentrate, gallons	5	10	15
Solution, gallons	100	200	300
Foam, gallons	2,000	4,000	6,000
6-inch pipe, LF	1,250	2,500	3,750
8-inch pipe, LF	750	1,500	2,250
10-inch pipe, LF	500	1,000	1,500
12-inch pipe, LF	350	700	1,050
15-inch pipe, LF	200	450	650

6. Sewer service to homeowners shall not be interrupted. The Contractor must beware that excessive discharge pressure, and/or excessive quantities of material may cause foam to enter houses or travel up cleanouts onto lawns.
 7. Removal of any remaining root material shall be done after sixty days, immediately prior to lining or testing and sealing of the pipeline.
- B. Should any chemical root control agent spill on the ground, the chemical and affected soil shall be removed and safely and legally disposed of. The area shall be restored to a condition equal to or better than before the spill. Any damage to vegetation resulting from misuse of the chemical root control agent shall be the responsibility of the Contractor.
 - C. The Contractor shall be responsible for any and all damage to structures inside and out, vegetation, and property caused by root control chemicals. The Contractor shall be responsible for the protection of all persons, vegetation, animals, and property.
 - D. The Contractor shall be responsible for insuring that there are no adverse effects on wastewater treatment plant processes, the quality of wastewater treatment plant

effluent, or the water quality of the downstream receiving stream(s) as a result of chemical applications. The Contractor shall take all necessary steps to prevent said adverse effects at no additional cost to the Owner.

- E. Filling of a chemical mixing tank shall be done with an air gap or reduced-pressure- zone backflow prevention device, as approved by the Owner. The Contractor may only draw water from public water supplies at locations and using procedures approved by the Owner.
- F. The Contractor shall keep complete, accurate records of each day's operation. Records shall show date of treatment, sections of line or manholes treated, pipe size and distance, quantity of water used and location obtained, quantity of chemical used, and other pertinent information. Typed log sheets shall be submitted when requesting payment.
- G. The Contractor shall be responsible for insuring that handling, transportation, and use of any hazardous materials, and disposal of all pesticide containers, is according to the State and Federal regulations pertaining thereto.

**** END OF SECTION ****

SECTION 13513 - TELEVISION INSPECTION

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The Contractor shall furnish all necessary labor, materials, supervision, and equipment to satisfactorily inspect specific sanitary sewer lines. This work shall be conducted by means of a closed-circuit color television system as specified below and by personnel who have been properly trained and certified by the manufacturer of the television inspection equipment. The television inspection shall be performed on each pipeline section, including adjoining manholes, designated and with the sewage flow suitably controlled as specified in Section 13514 following satisfactory cleaning as specified in Section 13511.
- B. All videos shall be DVD format. Log sheets shall follow the NASSCO's Pipeline Assessment Certification Program (PACP) format. DVD's and log sheets shall be turned over to the Engineer within fourteen (14) calendar days after completing the television inspection.

1.02 RELATED WORK

- A. The following items of work are not included in this Section, but are specified under other Sections of these Specifications:
 - 1. Pipe cleaning is specified in Section 13511 – SEWER LINE CLEANING.
 - 2. Sewage flow control is specified in Section 13514 –SEWAGE FLOW CONTROL.
 - 3. Testing and sealing operations are specified in Section 13516 - SEWER LINE TESTING AND CHEMICAL SEALING.
 - 4. Pipe relining is specified in Section 13520 – SANITARY SEWER AND STORM DRAIN PIPE LINING.
 - 5. Sewer rehabilitation report is specified in Section 13519 – SEWER REHABILITATION REPORT.

PART 2 PRODUCTS

This Section not used.

PART 3 EXECUTION

3.01 EQUIPMENT

- A. The color television system shall be a self-contained system complete with flexible push rod (where needed for service laterals), winches (power or manual), cable, closed circuit color television camera, color monitor, video recorder, camera, film, and a suitable measuring device to accurately determine the position of the camera at all times, and all necessary equipment for the successful completion of television inspection. The color television system shall be one specifically designed and constructed for such inspection.
- B. The television camera used for the inspection shall be 360° degree tilt-type, specifically designed and constructed for such inspection. Lighting for the camera shall be suitable to allow a clear picture of the entire pipe barrel. The camera shall be operative in 100% humidity conditions and waterproof. The camera, television monitor and other components of the video system shall be capable of producing a minimum 600-line resolution video picture. Picture quality and definition shall be to the satisfaction of the Engineer and if unsatisfactory, equipment shall be removed and no payment shall be made for unsatisfactory inspection. Where sewer lateral lining is specified, the laterals shall be installed with specially designed cameras for that purpose capable of inspection from the main line sewer for the full distance to be lined.

3.02 OPERATION

- A. The camera shall be moved through the line in either direction at a uniform rate, stopping when necessary to insure proper documentation of the sewer's condition, but in no case shall the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable, and power rewinds or other devices that do not obstruct the camera view, or interfere with proper documentation of the sewer conditions, shall be used to move the camera through the sewer line. If, during the inspection operation the television camera will not pass through the entire manhole section, the Contractor shall set-up his equipment in a manner so that the inspection can be performed from the opposite manhole. If, again, the camera fails to pass through the entire manhole section, the inspection shall be considered complete and no additional inspection work will be required, unless the obstruction is removed and the Contractor is ordered to complete the section.
- B. For each pipeline section being televised, both the adjoining upstream and downstream manholes shall be recorded by digital video for condition of invert, walls, etc.

3.03 COMMUNICATIONS: Whenever non-remote controlled power winches are used to pull the television camera through the pipeline, telephones or radios shall be used to insure good communications between members of the crew.

3.04 LOCATION MEASUREMENTS: Measurements for location of defects, house connections, etc., shall be above ground by means of a meter device. Marking on cable, or the like, which would require interpolation for depth of manhole, will not be allowed. Measurement meters shall be accurate to two tenths (0.2) of a foot over the length of the section being inspected. Accuracy of the measurement meters shall be checked daily by use of a walking meter, roll-a-tape or other suitable device.

3.05 RECORDS

- A. Complete records shall be kept of all television inspection performed in each pipeline section. The records will document the location of the manhole section, average depth of the sewer, size of sewer, footage of sewer televised, location of all service connections, defects and all infiltration/inflow sources found within the televised pipeline section and adjoining manholes. Television inspection logs in NASSCO PACP format shall be submitted with the DVDs.
 - 1. Video Recordings: The complete internal inspection by television prior to testing and chemical sealing (see Section 13516 – SEWER LINE TESTING AND CHEMICAL SEALING) shall be recorded in DVD format. Also, each joint sealed shall be recorded by digital video after successful sealing in order to verify condition of joint at a later date. The audio shall be clearly understandable, and manhole numbers and camera position footage shall be clearly visible on the screen. DVDs with audio or video problems will be returned for editing, or the pipelines in question shall be re-televised and taped at no additional cost to the Owner. DVDs shall be submitted to the Engineer within fourteen (14) calendar days of completing the television inspection.
- B. Documentation of television inspection conducted in conjunction with testing and sealing operations shall be as specified in Section 13516 - SEWER LINE TESTING AND CHEMICAL SEALING.

** END OF SECTION **

SECTION 13514 - SEWAGE FLOW CONTROL

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The work to be done under this Section consists of furnishing all materials, labor, tools, and equipment, and performing all operations necessary to keep the existing sanitary sewer system in service during the rehabilitation work.
- B. During sanitary sewer manhole rehabilitation, sanitary sewer pipe inspection, point repairs, lining, spot lining, and testing and sealing operations, the sewage flows at the upstream manhole of the manhole section being worked on shall be maintained below the maximum levels shown in Part 3 below by either plugging/ blocking of the flows or by pumping/bypassing of the flows as specified herein.

1.02 RELATED WORK

- A. The following items of work are not included in this Section but are specified under other Sections of these Specifications.
 - 1. Cleaning of sewer and storm drain main line and service connection pipelines is specified in Section 13511 - SEWER LINE CLEANING.
 - 2. Mainline chemical root control is specified in Section 13512 - SEWER LINE CHEMICAL ROOT CONTROL.
 - 3. Television inspection is specified in Section 13513 - TELEVISION INSPECTION.
 - 4. Sewer line testing and sealing is specified in Section 13516 - SEWER LINE TESTING AND CHEMICAL SEALING.
 - 5. Sewer rehabilitation report is specified in Section 13519 – SEWER REHABILITATION REPORT.
 - 6. Pipe lining is specified in Section 13520 – SANITARY SEWER AND STORM DRAIN PIPE LINING.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.01 MAXIMUM ALLOWABLE LEVELS: Sewage flows shall not exceed those depths of flow shown below for the respective pipe sizes as measured in the upstream manhole when performing television inspection, manhole and pipeline rehabilitation tasks, unless otherwise approved by the Engineer. In regard to television inspection, depths of flow shall be maintained below the level of the lense to provide unrestricted viewing.

A. Maximum Depth of Flow for Television Inspection

Pipe Size	Maximum Depth of Flow
6" - 10" Pipe	20% of pipe diameter
12" - 24" Pipe	25% of pipe diameter

B. Maximum Depth of Flow for Joint Testing/Sealing

Pipe Size	Maximum Depth of Flow
6" - 12" Pipe	25% of pipe diameter
15" - 24" Pipe	30% of pipe diameter

3.02 PLUGGING OR BLOCKING: A sewer line plug may be inserted into the line at a manhole upstream from the section being inspected and/or sealed if required for flow control. The plug shall be designed so that all or any portion of the sewage flows can be released. During the inspection, testing or sealing portion of the operation, flows shall be shut off or reduced to within the maximum flow limits specified above. After the work tasks have been completed, flows shall be restored to normal.

3.03 PUMPING AND BYPASSING. When pumping/bypassing is required for flow control, the Contractor shall supply the necessary pumps, conduits and other equipment to divert the flow of sewage around the manhole section in which work is to be performed. The bypass system shall be of sufficient capacity to handle existing flows plus additional flow that may occur during periods of a rainstorm. The Contractor will be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and bypassing system. If pumping is required on a 24-hour basis, all engines shall be equipped in a manner to keep noise at a minimum and the pumping operation shall be equipped with means for remote monitoring.

3.04 FLOW CONTROL PRECAUTIONS: Whenever flows in a sewer line are blocked, plugged or bypassed, sufficient precautions must be taken to protect the sewer lines from damage that might be caused by excessive sewer surcharging. Further, precautions must be taken to ensure that flow control operations do not cause flooding or damage to public or private property being served by the sewers

upstream of the work. Any damage to public or private property caused by the Contractor in providing flow control shall be the responsibility of the Contractor, and the Owner shall be exempt from any costs of correction as a result of said damages. In any event, the Contractor shall not discharge raw sewage to the ground surface, storm sewer system, natural watercourse, ditch or other place that would cause illegal contamination or pollution.

**** END OF SECTION ****

SECTION 13516 - SEWER LINE TESTING AND CHEMICAL SEALING

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The Contractor shall furnish all labor, materials, supervision, and equipment necessary to satisfactorily test and seal (where required) all sewer line joints, cracks within the sewer pipeline sections and service lateral joints as shown on the Contract Drawings. The work of this section shall be performed by qualified, factory-trained and certified personnel who have had sufficient experience in the proper testing and chemical sealing of various sizes and types of sanitary sewer lines and in the use of chemical grouts. For each grouting operator the Contractor intends to use, evidence of his factory training and references of completed projects shall be submitted for review prior to mobilization.
- B. The Contractor shall furnish with his submittals satisfactory proof of previously completed projects performed successfully by the technicians to be used on this project, and with the materials and equipment to be used on this project. A minimum of three (3) references shall be provided.
- C. The Contractor shall furnish a statement certified by an Officer of the company stating that the technicians to be used on the project shall mix and handle the chemical sealing materials in strict accordance with the recommendations of the manufacturer of the chemical sealing material.
- D. The intent of joint testing is to identify sewer line and sewer service joints that are defective, allowing unreasonable quantities of extraneous water to enter the sewer system and that can be successfully sealed by an internal joint sealing process. Pipe joints that are visibly leaking shall not be tested, but shall be sealed and retested after sealing. In general, unless otherwise directed, joints that show a pressure drop less than 1/2 psi within a 30-second period after the specified pressure is obtained in the void area between the packer and elements (see testing procedure below) will not be considered for sealing. Sewer line joints that have pressure drops equal to or greater than 1/2 psi shall be sealed utilizing the internal joint sealing method. Chemical sealing shall only be used on sewer pipe sections in sound physical condition. Broken pipe will not be sealed. Where non-visible bell cracks or chips are evident from pipe section offset, sealing may be undertaken where the offset is small enough to allow proper seating of the sealing packer on both sections of the pipe. Circular cracks shall be sealed. Longitudinal cracks are to be sealed only at the Engineer's direction, and payment will be based on number of setups to be counted as joints.

- E. Each sewer section (manhole to manhole section) and all sewer service joints to be tested and sealed shall receive a complete internal inspection by closed-circuit color television prior to testing to insure the line is properly cleaned and the joints are suitable for testing and sealing. Upon completion of testing and sealing, each pipeline section shall be immediately reinspected by closed-circuit color television. DVDs of the TV inspection before, during and after testing and sealing will be furnished to the Engineer within 14 calendar days of the TV inspection. The television inspection shall be performed in accordance with Section 13513 - TELEVISION INSPECTION, the cost of which will be included as part of the unit prices stated for Testing and Sealing in the Schedule of Prices.

1.02 RELATED WORK

- A. The following items of work are not included in this Section but are specified under other Sections of these Specifications.
1. Cleaning of sewer and storm drain main line and service connection pipelines is specified in Section 13511 - SEWER LINE CLEANING.
 2. Mainline chemical root control is specified in Section 13512 - SEWER LINE CHEMICAL ROOT CONTROL.
 3. Television inspection is specified in Section 13513 - TELEVISION INSPECTION.
 4. Sewage flow control is specified in Section 13514 - SEWAGE FLOW CONTROL.
 5. Pipe lining work is specified in Section 13520 – SANITARY SEWER AND STORM DRAIN PIPE LINING.
 6. Sewer rehabilitation report is specified in Section 13519 – SEWER REHABILITATION REPORT.

PART 2 PRODUCTS

2.01 CHEMICAL SEALING MATERIALS FOR PIPELINES AND MANHOLES

- A. The actual chemical sealing material used on the project must conform to the following minimum performance standards, or else it shall be rejected:
1. While being injected, the chemical must be able to react/perform in moving water (groundwater).
 2. The final cured chemical must be capable of withstanding submergence in sewage without degradation over the life of the sealant.

3. The resultant sealant formation must render the joint impervious to the infiltration of water over the life of the grout.
 4. The material, after fully curing, must remain flexible over the life of the grout.
 5. The cured material shall be able to withstand freeze-thaw and wet-dry cycles without adversely affecting the seal.
 6. The final sealant formation must not be biodegradable.
 7. The cured material shall be chemically stable and resistant to concentrations of acids, alkalis, and organics found in sewage. In addition, the cured material must be resistant to brackish water.
 8. The chemical grout sealing effectiveness shall meet or exceed that stated in "Chemical Sealants for Elimination of I/I", page 23, published by the U.S. EPA, September 1973 and the 1980 APWA publication "Assessment of Sewer Sealants".
- B. Mixing and handling of all chemical sealing materials shall be in strict accordance with the manufacturer's recommendations. In addition, all chemical sealing materials used shall meet the following minimum application requirements:
1. All component materials should be easily transportable by common carrier.
 2. Packaging of component materials should be compatible with field storage and handling requirements.
 3. Grout components must be packaged in such a fashion as to provide maximum worker safety when handling the materials and minimum spillage when preparing for use.
 4. Mixing of the components shall be compatible with field applications and not require precise measurements.
 5. The chemical curing process shall begin to take place at the point of injection/repair.
 6. Cleanup must be done without inordinate use of flammable or hazardous chemicals.
 7. Materials must be capable of being pumped through a minimum of 500 feet of 1/2-inch to 3/4-inch diameter hose.

8. Residual sealing materials must be removable from the sewer after injection to insure no reduction, restriction or blockage of sewage flows.

C. Chemical Sealing Materials: The following is a generic listing of chemical sealing materials and the basic requirements, properties and characteristics of each:

1. Acrylamide base gel sealing material:
 - a. A minimum of 10% acrylamide base material by weight in the total sealant mix. A higher concentration (%) of acrylamide base material may be used to increase strength or offset dilution during injection.
 - b. The ability to tolerate some dilution and react in moving water during injection.
 - c. A viscosity of approximately 2 centipoise that can be increased with additives.
 - d. A constant viscosity during the reaction period.
 - e. A controllable reaction time from 10 seconds to 1 hour.
 - f. A reaction (curing) that produces a homogeneous, chemically stable, nonbiodegradable, firm, flexible gel.
 - g. The ability to increase mix viscosity, density and gel strength by the use of additives.
 - h. A latex-based gel reinforcement additive shall be used to increase compressive and tensile strength and reduce dehydration. The product shall be AV-257 ICO set from Avanti International, Webster, Texas or equal.
2. Acrylic base gel chemical sealing material:
 - a. A minimum of 10% acrylic base material by volume in the total sealant mix. A higher concentration (%) of acrylic base material may be used to increase strength or offset dilution during injection.
 - b. The ability to tolerate some dilution and react in moving water during injection.

- c. A viscosity of approximately 2 centipoise that can be increased with additives.
- d. A constant viscosity during the reaction period.
- e. A controllable reaction time from 5 seconds to 6 hours.
- f. A reaction (curing) that produces a homogeneous, chemically stable, nonbiodegradable, flexible gel.
- g. The ability to increase mix viscosity, density and gel strength by the use of additives.

3. Polyacrylamide Base Gel Chemical Sealing Material:

- a. A minimum of 10% polyacrylamide base material by volume in the total sealant mix. A higher concentration (%) of polyacrylamide base material may be used to increase strength or offset dilution during injection.
- b. The ability to tolerate some dilution and react in moving water during injection.
- c. A viscosity of 30-35 centipoise at 10% solids as applied. The ability to increase mix viscosity, density and gel strength by the use of additives.
- d. A controllable reaction time from 10 seconds to 5 minutes.
- e. A reaction (curing) that produces a homogeneous, chemically stable, nonbiodegradable, firm, flexible gel.
- f. A resistance to degradation over a pH range of 3 to 10.

4. Urethane base gel chemical sealing material:

- a. 1 part urethane prepolymer thoroughly mixed with between 5 and 10 parts of water by weight. The recommended mix ratio is 1 part urethane prepolymer to 8 parts of water (11% prepolymer).
- b. A liquid prepolymer having a solids content of 77% to 83%, specific gravity of 1.04 (8.65 pounds per gallon), and a flash point of 20°F.

- c. A liquid prepolymer having a viscosity of 600 to 1200 centipoise at 70°F that can be pumped through 500 feet of 1/2-inch hose with a 1000 psi head at a flow rate of 1 ounce per second.
- d. The water used to react with the prepolymer should have a pH of 5 to 9.
- e. A cure time of 80 seconds at 40°F, 55 seconds at 60°F, and 30 seconds at 80°F when 1 part prepolymer is reacted with 8 parts of water only. Higher water ratios give longer cure times.
- f. A cure time that can be reduced to 10 seconds for water temperatures of 40°F to 80°F when 1 part prepolymer is reacted with 8 parts of water containing a sufficient amount of gel control agent additive.
- g. A relatively rapid viscosity increase of the prepolymer/water mix. Viscosity increases from about 10 to 60 centipoise in the first minute for a 1 to 8 prepolymer/water ratio at 50°F.
- h. A reaction (curing) that produces a chemically stable and nonbiodegradable, tough, flexible gel.
- i. The ability to increase mix viscosity, density, gel strength and resistance to shrinkage by the use of additives to the water.

PART 3 EXECUTION

3.01 EQUIPMENT

The basic equipment for the purpose of performing the required work of this section shall consist of a closed-circuit color television system as described in Section 13513 - TELEVISION INSPECTION for the various sizes of sewer pipes, test monitoring equipment, chemical sealant pumps, containers, regulators, valves, hoses, joint sealing packers for appropriate sizes of pipe including service laterals and other related appurtenances, all of which shall be of satisfactory quality and in a condition suitable for use for the intended purposes.

- A. Each packer shall be a cylindrical case of a size less than the pipe size being tested/sealed, with cables at both ends to allow positioning the packer and for pulling through the line. Each packer device shall be constructed in such a manner as to allow a restricted amount of sewage to flow at all times. Generally, the equipment shall be capable of performing the specified operations in sewers where flows do not exceed the maximum depth as specified in Section 13514 - SEWAGE

FLOW CONTROL. When the packer is inflated, two (2) widely spaced annular bladders shall be formed, each having an elongated shape and producing an annular void around the center portion of the packer.

- B. In combination, the equipment shall be constructed in such a way as to provide means for introducing water or an equivalent liquid, not exceeding 2 centipoises under pressure, into the void area created by the expanded ends of the joint testing device. The testing equipment shall also have the means for regulating and continuously measuring the actual static pressure of the water or equivalent liquid at and within the void area only. Void pressure data shall be transmitted electronically and without the use of the test medium (water) or hoses. All test monitoring shall be above ground and in a location to allow for simultaneous observation of the television monitor and test monitoring equipment by the Engineer.

3.02 TESTING PROCEDURE

- A. Following a thorough cleaning and complete television inspection of the designated pipeline sections to be tested and sealed, each sewer line joint shall be individually, hydraulically tested at a test pressure equal to 1/2 psi per vertical foot of depth or 3 psi, whichever is greater, but in no case exceeding a pressure of 10 psi, and in accordance with the following procedures:
1. The packer or testing device shall be positioned within the line in such a manner as to straddle the joint to be tested.
 2. The packer ends or testing device ends shall be expanded so as to isolate the joint from the remainder of the line and create a void area between the packer or testing device and the pipe joint.
 3. Water or an equivalent liquid shall then be introduced into the void area until a pressure, not exceeding 2 psi greater than the required test pressure, is recorded on the void Pressure Gauge.
 4. The flow rate of the test liquid will then be regulated to a flow rate where the VOID Pressure Gauge is recording the required test pressure. After the required test pressure is attained, the pressure source shall be shut off and the pressure within the void allowed to stabilize.
 5. After the pressure has been regulated to the specified void test pressure, a reading of the pressure gage shall be taken. If the pressure drop is equal to or greater than 1/2 psi within a 30 second period, the joint will have failed the test and shall be sealed as specified herein.

3.03 CONTROL TEST

- A. Prior to starting the joint testing phase of the work, a two-part Control Test shall be performed, as follows:
1. To insure the accuracy, integrity and performance capabilities of the testing equipment, a demonstration test shall be performed in a test cylinder above ground. The test cylinder shall be constructed in such a manner that a minimum of two known leak sizes can be simulated. This technique will establish the test equipment performance capability in relationship to the test criteria and insure that there is no leakage of the test medium (water) from the system or other equipment defects that could affect the joint testing results. If this test cannot be performed successfully, the Contractor shall be instructed to repair or otherwise modify his equipment and retest until the results are satisfactory to the Engineer. This test may be required at any time during the joint testing program if the Engineer suspects the testing equipment is not functioning properly.
 2. After entering each pipeline section with the test equipment, but prior to the commencement of joint testing, the test equipment shall be positioned on a section of sound sewer pipe between pipe joints, and a test performed as specified. This procedure will demonstrate the feasibility of the test requirement, as no joint will test in excess of the pipe capability. If the barrel of the sewer pipe does not meet the joint test requirements, then the requirements will be modified to within the pipe integrity limits.

3.04 JOINT SEALING PROCEDURE

- A. Following the testing procedure, each joint showing visible leakage, or joints that have failed the joint test as specified above, shall be sealed as specified herein. Joint sealing shall be accomplished by forcing approved chemical sealing materials through infiltration points into the surrounding soil by the system of pumps, hoses, and sealing packers specified above. No joint shall be considered sealed unless, while under continual pressure, a minimum of 1/4 gallon of grout per inch of pipe diameter is applied. Sealant material shall be pumped at controlled pressures that are in excess of groundwater pressures until refusal is reached. Refusal shall be defined as the point of blow-by on the packer bladders after the minimum amount of sealant has been applied.
- B. In general, the packer shall be positioned over the area of infiltration by means of a metering device and the closed circuit television camera in the line. The Contractor shall position the packer accurately to avoid over-pulling the packer and thus not effectively sealing the intended joint from infiltration. The packer sleeves shall then be expanded using precisely controlled pressures. The pneumatically expanded sleeve or elements shall seal against the inside of the pipe to form a void area at the point of infiltration completely isolated from the

remainder of the pipeline. Sealant materials shall be pumped into this isolated area through the hose system at controlled pressures in excess of groundwater pressures. The pumping, metering, and packer device shall be integrated so that proportions and quantities of materials can be regulated in accordance with the type and size of the leak being sealed.

3.05 JOINT SEALING VERIFICATION

Upon completing the sealing of each individual joint, the packer shall be deflated, with the Void Pressure Gauge reading zero (0) pressure, then reinflated and retested, as specified previously. Should the Void Pressure Gauge not read zero (0), the Contractor shall be instructed to clean his equipment of residual grout material or make the necessary equipment repairs to provide for an accurate Void Pressure reading. Joints that fail to meet the specified test criteria shall be resealed and tested until the test criteria can be met in order to receive payment.

3.06 RESIDUAL GROUT MATERIAL

Any residual sealing materials that extend into the pipe, reduce the pipe diameter, or restrict the flow shall be removed from the joint. The sealed joints shall be left reasonably "flush" in dimension with the existing pipe surface. If excess residual sealing materials accumulate in the line and/or if directed by the Engineer, the entire line section shall be cleaned to remove such excess material at the Contractor's expense.

3.07 INFILTRATION MEASUREMENTS

Measurements for infiltration from each pipeline section designated for testing and chemical sealing shall be made by the Contractor immediately before and after the sewer line is tested and sealed utilizing a V-notch weir designed for measuring flows in pipes. Measurement is to be done while the pipeline section is isolated from the upstream sections or as specified by the Engineer.

3.08 RECORDS

Complete records shall be kept of all joint testing and sealing performed in each pipeline section. The records will document the location of the pipeline section in which the operations were performed, the location of each joint tested and sealed, the test pressures used, pressure drops of the test liquid and the test results, the amount of infiltration removed, the amount of material used to seal the joint, the numbers of injections required to seal the joint and the joint test verification results. A specific statement shall be included to indicate if the referenced joint passed or failed the test and if the joint is to be sealed.

3.09 GUARANTEE

All sewer pipe joint sealing work performed shall be guaranteed against leakage, faulty workmanship and/or materials for a period of one year after the established date of completion.

**** END OF SECTION ****

SECTION 13517 - SEWER MANHOLE SEALING

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The Contractor shall provide all labor, materials, equipment and supervision necessary to properly seal each of the manholes designated on the Contract Drawings and listed in tabular form under Section 01010 - SUMMARY OF WORK. The work of this section includes dewatering by pumping, draining and bailing; bypass pumping or flow control; and patching and plugging of minor holes and cracks, etc., in order to assure proper conditions for sealing of manholes. Sanitary sewer manhole sealing for the purpose of this specification shall include the following types of work:
1. Patching and plugging of minor cracks, holes and defects in inverts, walls, and pipe connections with products specified in Section 13518 – SEWER MANHOLE REHABILITATION, to provide proper substrate for chemical grout.
 2. Chemical sealing of manholes by grout injection through the walls and inverts into the surrounding soil to allow the grout to penetrate back through cracks, defects, etc., into the manhole. See Section 13516 - SEWER LINE TESTING AND CHEMICAL SEALING for chemical sealing material specifications.
 3. Two-coat waterproof cementitious coating to all surfaces with product specified in Section 13518 – SEWER MANHOLE REHABILITATION.
- B. In general, the work of this section shall be performed by personnel with sufficient experience in the sealing of sanitary sewer manholes and with the use of chemical grouts. For each operator the Contractor intends to use, evidence of his factory training and references of completed projects shall be submitted for review prior to mobilizing.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. The basic equipment necessary for chemical sealing and/or grouting of existing sanitary sewer manholes shall consist of properly designed and constructed chemical pumps, chemical containers, injection packers, hoses, valves and all necessary equipment and tools required to seal manholes. The chemical injection

pumping system shall be equipped with pressure gauges that will provide for monitoring pressure during the injection of the chemical sealants. When necessary, fluid bypass lines equipped with pressure regulated bypass valves will be incorporated into the pumping system.

- B. The chemical sealing materials to be used for the chemical sealing of manhole walls shall be as specified in Section 13516 – SEWER LINE TESTING AND CHEMICAL SEALING.

PART 3 EXECUTION

3.01 MANHOLE SEALING BY GROUT INJECTION

A. General:

1. It is the intent of these specifications to prevent extraneous water leakage into manholes that are otherwise structurally sound. No sealing will be attempted in manholes where the leakage is unconfined or where the structural integrity of the manhole has been lost. All manhole sealing shall be done during high groundwater conditions, unless the points of leakage have been previously identified and have been specified herein.
2. Where leakage is unconfined and minor rehabilitation is necessary, plugging and patching with products conforming to this specification section and channeling infiltration through "bleed" pipes at the bottom of the manhole shall be used in conjunction with chemical sealing.

B. Manhole Sealing Procedures:

1. At each point of leakage within the manhole structure, a hole shall be carefully drilled from within the manhole that shall extend through the manhole wall and invert to the surrounding soil. Additional grouting holes may be required to provide a grout curtain surrounding the manhole to stop all leakage. Into the previously drilled holes, chemical sealant injection devices shall be placed in such a way that they will provide a watertight seal between the hole and the injection device. A hose, or hoses, shall be attached to the injection device from an injection pump. A mixture of chemical sealants as specified in Section 13516 – SEWER LINE TESTING AND CHEMICAL SEALING shall then be pumped through the hose until material refusal is recorded on the pressure gauge mounted on the pumping unit, or a predetermined quantity of sealant has been injected. Care shall be taken during the pumping operation to insure that excessive pressures do not develop and cause damage to the manhole structure. Upon completion of injection, the injection devices shall be

removed and the remaining holes filled with mortar and troweled flush with the surface. The mortar used shall be of the "fast set" type and "non-shrinking".

C. Manhole Sealing Verification:

1. After the manhole sealing operation has been completed, the manhole shall be inspected by the Engineer to verify that there is no active infiltration entering the manhole.
2. All manholes that are still leaking shall be corrected according to above specifications.
3. A measurement of the estimated infiltration rate into the manhole shall be made by the Contractor using suitable measuring devices immediately before and after the sealing operation.

3.02 RECORDS: Complete records shall be kept of all manholes being sealed as described above, including the type of sealing received; the materials, products and equipment used in the performance of each sealing; the inspection results; and the amount of initial and final infiltration measured. A copy of these records shall be included in the rehabilitation report specified in Section 13519.

3.03 GUARANTEE: All sewer manhole sealing work performed shall be guaranteed against leakage, faulty workmanship and/or materials for a period of 12 months after the established date of completion.

3.04 RE-INSPECTIONS OF MANHOLES DURING GUARANTEE PERIOD: All manholes sealed by the Contractor will be visually inspected upon the completion of the work, and again visually inspected the following spring during high groundwater. The Contractor shall assist the Engineer by providing all labor, materials, and equipment necessary to open and inspect the sealed manholes during these inspections. The Contractor must be present during both visual inspections. All incoming pipelines contributing flow shall be temporarily plugged by the Contractor. The Contractor shall quantify leaks by means of weirs or other suitable devices. Any manholes found to be leaking during the guarantee period at the time of re-inspection must be repaired by the Contractor at his own expense. The guarantee period shall be extended one year for those manholes found to be leaking during the original one-year guarantee period. The Contractor shall be required to re-inspect those manholes the following (second) spring and make the necessary repairs at his own expense.

3.05 WATER: Town water from hydrants will generally not be available to the Contractor for cleaning, flushing, testing or other uses except from selected locations, and only after prior approval from the Town of Arlington Department of

Public Works. The Contractor will be expected to utilize his own tank trucks as necessary to haul water to where it is needed. It is the responsibility of the Contractor to contact the Department of Public Works with regard to making these arrangements.

The Contractor shall maintain a log of all water supplied from the Town of Arlington.

**** END OF SECTION ****

SECTION 13518 - SEWER AND DRAIN MANHOLE REHABILITATION

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The Contractor shall provide all labor, materials, equipment and supervision necessary for proper structural rehabilitation of each of the manholes designated on the Contract Drawings and listed in tabular form under Section 01010 - SUMMARY OF WORK. The work of this section includes dewatering by pumping, draining, bailing; bypass pumping; cleaning; high pressure washing; chipping, routing and drilling out cracks and holes; etc. in order to assure proper conditions for rehabilitation of manholes. Sanitary sewer and drain manhole rehabilitation for the purpose of this specification shall include the following types of work:
1. Rehabilitation of the manhole structure, including manhole chimney/corbel, cone, wall, invert, base and incoming pipe connections by plugging, patching and coating with mortars, coatings and sealants to improve the structural condition and eliminate infiltration/inflow.
 2. Resetting of manhole frames and covers for grade adjustment.
 3. Inspection and testing of the work to insure compliance.
- B. In general, the work of this section shall be performed by personnel with sufficient experience in rehabilitation of sanitary sewer and drain manholes.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials: The materials used shall be designed, manufactured and intended for sewer manhole rehabilitation and the specific application in which they are used. The materials shall have a proven history of performance in sewer manhole rehabilitation. The materials shall be delivered to the job site in original unopened packages and clearly labeled with the manufacturer's identification and printed instructions. All material shall be stored and handled in accordance with recommendations of the manufacturer and the American Concrete Institute. All materials shall be mixed and applied in accordance with the manufacturer's written instructions. Materials used for specific applications shall be as follows:
1. Stopping active leaks in concrete and masonry manholes:

- a. A premixed fast-setting, volume-stable waterproof cement plug consisting of hydraulic cement, graded silica aggregates, and special plasticizing and accelerating agents. It shall not contain chlorides, gypsums, plasters, iron particles, aluminum powder or gas-forming agents, or promote the corrosion of steel it may come in contact with. Set time shall be approximately 1 minute. Ten-minute compressive strength (ASTM C-109) shall be approximately 500 psi, and the ultimate compressive strength (ASTM C-109) shall be a minimum of 5,000 psi.
 - b. A silicate-based liquid accelerator, field mixed with neat Portland cement. The set time shall be approximately 1 minute.
 - c. The elastomeric polyurethane resin-soaked method, using dry twisted jute oakum, or resin-rod with polyurethane resin (water activated).
2. Patching, repointing, filling, and repairing nonleaking holes, cracks, and spalls in concrete and masonry manholes:

A premixed nonshrink cement-based patching material consisting of hydraulic cement, graded silica aggregates, special plasticizing and accelerating agents, which have been formulated for vertical or overhead use. It shall not contain chlorides, gypsums, plasters, iron particles, aluminum powder, or gas-forming agents, or promote the corrosion of steel it may come in contact with. Set time (ASTM C-191) shall be less than 30 minutes. One-hour compressive strength (ASTM C-109) shall be a minimum of 200 psi, and the ultimate compressive strengths (ASTM C-109) shall be a minimum of 5,000 psi. Bond strengths (ASTM C-882 - Modified) shall be a minimum of 1,700 psi.

3. Coating for waterproofing, concrete, block and brick manholes:

A liquid polymer modified hydraulic waterproof coating that shall provide a secure (mechanical and chemical) bond. The material shall be available in contrasting colors. When fully cured, the two-coat or three-coat system shall be able to withstand a hydrostatic pressure of 7 or 30 psi, respectively, without any visible leaks.

PART 3 EXECUTION

3.01 REHABILITATION OF MANHOLE STRUCTURE

A. Procedures:

1. Safety: The Contractor shall perform all work in strict accordance with all applicable OSHA standards. Particular attention is drawn to those safety requirements regarding confined space entry.
2. Cleaning: All concrete and masonry surfaces to be rehabilitated must be clean. All grease, oil, laitance, coatings, loose bricks, mortar, unsound concrete and other foreign materials must be completely removed. High pressure water blasting at a minimum pressure of 5,000 psi utilizing proper nozzles shall be the primary method of cleaning; however, other methods such as wet or dry sandblasting, acid wash, concrete cleaners, degreasers or mechanical means may be required to properly clean the surface. All surfaces on which these other methods are used shall be thoroughly rinsed, scrubbed, and neutralized to remove cleaning agents and their reactant products.
3. Stopping infiltration: After surface preparation and prior to the application of mortars and coatings, infiltration shall be stopped by chemical grout sealing conforming to Section 13517 – SEWER MANHOLE SEALING. Plugging with products conforming to this section and channeling infiltration through "bleed" pipes installed at the bottom of the manhole may be used in conjunction with chemical grout sealing.
4. Patching: All large holes or voids around steps, joints or pipes, all spalled and honeycomb areas, all exposed rebar, and all holes caused by missing or cracked concrete or brick shall be patched, and all missing mortar repointed using a nonshrink patching mortar, conforming to the requirements of this section. All cracked or disintegrated material shall be removed from the area to be patched or repointed, exposing a sound subbase. All cracks not subject to movement and greater than 1/16 inch in width shall be routed out to a minimum width and depth of 1 inch and patched with nonshrink patching mortar, conforming to the requirements of this section.
5. Coating: Coating of the manholes shall be performed only after the other structural rehab work and the chemical sealing work have been completed and inspected, and all active leaking has been eliminated. A waterproof, cementitious coating conforming to the requirements of this section shall be applied to all surfaces, from and including the manhole bench to the bottom of the frame seal. The material shall be applied in accordance with the

manufacturer's recommendations to surfaces that are free of cracks or voids wider than 1/16 inch. A minimum of two coats (of contrasting colors) of this material shall be applied. When completed, the coating shall be free of any cracks or holes.

6. Brick and mortar shall conform to Section 02720 –SEWERS, DRAINS AND APPURTENANCES.
7. Reinforced concrete shall conform to Section 03300 - CONCRETE.

B. General:

1. Application of the materials shall be in accordance with the material manufacturer's recommendations.
2. After proper curing of the applied materials, all "bleed" pipes that were used shall be removed, and the holes plugged and coated with the specified materials.

3.02 RESET/RAISE MANHOLE FRAME AND COVER

A. Procedures:

1. The Contractor shall remove the existing manhole frame and cover, and any damaged or deteriorated portions of the existing manhole brick chimney/corbel shall be removed and disposed of in accordance with the Contract Documents.
2. The chimney/corbel shall be repaired or rebuilt with new brick and mortar conforming to Section 02720 – SEWERS, DRAINS AND APPURTENANCES, to the height needed for the frame and cover to meet the required grade including situations where mounting of the manhole is required.
3. The existing frames and covers that are to be reused shall be thoroughly cleaned before reinstallation.

B. General

1. All work shall be done in accordance with the standard details found in the Appendix.
2. In Paved Areas:

- a. The removal of the manhole frame shall be accomplished by making a square cut of sufficient size in the pavement.
 - b. Material in the exposed area shall be dug out to a sufficient depth to permit the required repairs. All excess material, including pavement, shall be disposed of as required in the Contract Documents.
 - c. Suitable materials (stockpiled) shall be tamped in place to form the subbase for the pavement. If additional material is needed, suitable material shall be added before the pavement is replaced.
 - d. Pavement replacement shall be in accordance with Section 02525 – PAVEMENTS, WALKS AND CURBING.
3. In Unpaved Areas:
- a. Only necessary excavation around the manhole shall be performed.
 - b. Backfill shall be replaced and compacted to prevent settlement and to restore the setting to a condition equal to or better than that found. Backfill shall not cover the manhole. Mounding shall be done in accordance with the Standard Details found in the Appendix.
 - c. All private property that is removed for access to the manhole shall be replaced by the Contractor in existing or better condition. If this replacement is not to the satisfaction of the Engineer, it shall be redone at no cost to the property owner or the Owner.
4. The Contractor shall prevent falling debris from damaging the manhole trough and/or entering the sewer or drain, and damage to the frame and cover.

3.03 MANHOLE REHABILITATION VERIFICATION

- A. After the manhole sealing operation has been completed and prior to payment, the manhole shall be inspected by the Engineer to verify that there is no active infiltration entering the manhole, that all work has been completed, that injection ports and "bleed" pipes have been removed and the holes plugged, and that all excess material and debris have been removed from the manhole interior and the work site and properly disposed of. All incoming pipelines contributing flow shall be temporarily plugged by the Contractor so that the invert may be inspected.

- B. All manholes that are still leaking shall be corrected according to above specifications at no additional cost to the Owner.
 - C. A measurement of the estimated infiltration rate into the manhole shall be made by the Contractor using suitable measuring devices immediately before and after the accepted sealing operation. All incoming pipelines contributing flow shall be temporarily plugged by the Contractor during measurements so that the inverts can be inspected in a dry state.
 - D. After the manhole sealing and rehabilitation work has been completed, all rehabilitated manholes shall be tested. The test shall be conducted by the Contractor in coordination with and at the direction of the Engineer. Exfiltration testing of manholes shall be accomplished by plugging of lines (flow-thru type plugs may be required). All incoming and outgoing pipelines shall be plugged and the manhole filled with water up to the brick corbel. If the water loss exceeds the maximum allowable as stated below, the manhole shall have failed the test. The Contractor shall make all necessary arrangements for securing the water for test purposes and shall stand the expense of these arrangements and of the water required for leakage tests. All manholes that fail the exfiltration test shall be sealed/rehabilitated until they pass a retest. Manholes shall be tested by water during low groundwater and under a minimum 4-foot head above the groundwater table. Leakage shall not exceed 0.2 gallons per hour. Test water shall be maintained in the circular opening above the cone section.
- 3.04 GUARANTEE: All manhole rehabilitation work performed shall be guaranteed against leakage, faulty workmanship and/or materials for a period of 12 months after the established date of completion.
- 3.05 RECORDS: Complete daily records shall be kept by the Contractor of all manholes being rehabilitated as described above, including the type of rehabilitation received, the materials, products and equipment used at each manhole, the inspection results, and the amount of initial and final infiltration measured. Sample forms shall be submitted for shop drawing review. Forms shall be completed daily and submitted weekly to the Engineer.
- 3.06 REINSPECTIONS OF MANHOLES DURING GUARANTEE PERIOD: All manholes sealed by the Contractor will be visually inspected upon completion of the work, and again visually inspected during the guarantee period under high groundwater conditions (spring). To the extent possible, all work relating to manhole frames and covers, frame joints and brick corbels shall be inspected during wet weather. The Contractor shall assist the Engineer by providing all labor and equipment necessary to open and inspect the sealed manholes during these inspections. All incoming pipelines contributing flow shall be temporarily plugged by the Contractor. The Contractor shall quantify leaks by means of weirs or other suitable device. The Contractor must be present during both visual

inspections. Any manholes found to be leaking during the re-inspection guarantee period must be repaired by the Contractor at his own expense. The guarantee period shall be extended one year for those manholes found to be leaking during the original one-year guarantee period. The Contractor shall be required to re-inspect those manholes the following (second) spring and make the necessary repairs at his own expense.

3.07 TOWN WATER: The Contractor shall utilize his own tank trucks as necessary to haul water to where it is needed. There will be a charge made by the Town for use of Town water.

Town water from hydrants will generally not be available to the Contractor for cleaning, flushing, testing or other uses except from selected locations, and only after prior approval from the Town of Arlington Department of Public Works. It is the responsibility of the Contractor to contact the Department of Public Works with regard to making these arrangements to obtain and purchase water. The Contractor shall maintain a log of all water supplied from the Town.

**** END OF SECTION ****

SECTION 13519 - SEWER AND DRAIN REHABILITATION REPORT

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The Contractor shall prepare and furnish the Engineer upon completion of the rehabilitation work, six (6) bound copies of a Sewer Rehabilitation Report and two (2) copies on DVD that shall include, but not be limited to, the following:
1. A complete record of all pipeline sections internally inspected by closed circuit television as described in Section 13513 – TELEVISION INSPECTION.
 2. A complete record of all pipeline sections cleaned by hydraulic, high-velocity or mechanical equipment in accordance with Section 13511 – SEWER LINE CLEANING.
 3. A complete record of all sewer line joints tested and sealed as described in Section 01010 – SUMMARY OF WORK and Section 13516 – SEWER LINE TESTING AND CHEMICAL SEALING.
 4. A complete record of all full length and point repair sewer and drain linings as described in Section 01010 – SUMMARY OF WORK and Section 13520 – SANITARY SEWER AND STORM DRAIN PIPE LINING.
 5. A complete record of all pipeline replacements and point repair replacements as described in Section 01010 – SUMMARY OF WORK and Section 02720 – SEWERS, DRAIN AND APPURTENANCES.
 6. A complete record of all manhole rehabilitation as described in Section 01010 – SUMMARY OF WORK, Section 02720 – SEWERS, DRAIN AND APPURTENANCES, Section 13517 – SEWER MANHOLE SEALING, and Section 13518 – SEWER AND DRAIN MANHOLE REHABILITATION.
 7. A complete record of all pipeline sections treated for root control in accordance with Section 01010 – SUMMARY OF WORK and Section 13512 – CHEMICAL ROOT CONTROL.
 8. A complete list and description of all materials, products and equipment utilized for the sewer and drain rehabilitation work conducted under this

Contract including sealing chemicals, grout, combination sewer cleaning machine, water supplied by the Town, etc.

1.02 FINAL PREPARATION, REVIEW AND SUBMISSION

- A. The final document shall be bound, indexed and divided into the respective items of work as listed in Section 01010 – SUMMARY OF WORK of these specifications and submitted to the Engineer for approval within sixty (60) days from completion of the field work. All corrections, deletions or additions required by the Engineer following his review shall be made within thirty (30) days of the date of transmittal to the Contractor.

** END OF SECTION **

SECTION 13520 – SANITARY SEWER AND STORM DRAIN PIPE LINING

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The Contractor shall furnish all labor, materials, supervision, and equipment necessary to satisfactorily line sewer and storm drains as shown on the Contract Drawings. Qualified, factory-trained and certified personnel who have had sufficient experience in lining various sizes and types of sewer and storm drain pipe shall perform the work of this section.
- B. The intent of pipe lining is to rehabilitate the existing pipeline (main line sewers, main line drains, and sewer/drain service laterals) by the installation of a resin-impregnated flexible felt tube in a manner that will correct the following deficiencies:
1. Cracked/broken/collapsed pipe caused by poor construction, unstable soil, earth movement, infiltration, root damage, destructive loading, cleaning tool damage, etc.
 2. Infiltration of groundwater and soil through leaking pipe joints, leaking lateral connections, and structural defects.
 3. Exfiltration of sewage through leaking pipe joints and structural defects.

Note: Pipe lining refers to the installation of a structural liner to rehabilitate a fully deteriorated pipeline, as opposed to coatings or membranes for corrosion or infiltration and exfiltration prevention.

- C. The finished pipe in place shall be fabricated from materials which when cured will be chemically resistant to withstand internal exposure to domestic sewage.
- D. The contractor or subcontractor performing the work of this section shall be employees of the company manufacturing the lateral lining system, or shall be licensed by the lateral liner manufacturer to perform the work. The shop drawing submittal shall include documentation to satisfy this requirement and shall include project references.
- E. The work of this section shall include submitting and obtaining the One-Time-Only Discharge Request to discharge from a Cured-in-Place Pipe (CIPP) Lining process as part of a sewer rehabilitation project into the Municipality or Massachusetts Water Resources Authority sewerage system. A copy of this MWRA Request form can be found in the Appendix to these Specifications. The work shall include completing all sections of the form, providing all information requested, obtaining the signature of the authorized municipal agent, and submitting the Request form

and all information to the Massachusetts Water Resources Authority, Toxic Reduction and Control, 2 Griffin Way, Chelsea, MA 02150-3334. The Contractor shall allow a minimum of three weeks in his construction schedule for the MWRA to process this request from the date it is received at the MWRA. A copy of the request form and all information shall be included in the shop drawing package submitted to the Engineer. A copy of the approved request shall be submitted to the Engineer and Owner upon issuance by the MWRA. No lining work shall be performed until the MWRA approval has been submitted to the Owner and Engineer.

- F. Fold and form PVC or polyethylene liners shall not be accepted.

1.02 RELATED WORK

- A. The following items of work are not included in this Section but are specified under other Sections of these Specifications.
 1. Cleaning of sewer and storm drain main line and service connection pipelines is specified in Section 13511 - SEWER LINE CLEANING.
 2. Mainline chemical root control is specified in Section 13512 - SEWER LINE CHEMICAL ROOT CONTROL.
 3. Television inspection is specified in Section 13513 - TELEVISION INSPECTION.
 4. Sewage flow control is specified in Section 13514 - SEWAGE FLOW CONTROL.
 5. Sewer line testing and sealing is specified in Section 13516 - SEWER LINE TESTING AND CHEMICAL SEALING.
 6. Sewer rehabilitation report is specified in Section 13519 – SEWER REHABILITATION REPORT.

1.03 LINER PERFORMANCE REQUIREMENTS

- A. Liner shall be of a type that allows for rehabilitation of clay, concrete, ductile iron, or PVC pipe, or pipe constructed of any other materials.
- B. The tube shall be fabricated to fit tightly in the approximate inside circumference and length of the original pipe. Allowance should be made for circumferential stretching during inversion.

- C. Full length lining shall conform to the distance, opening-to-opening of the pipe to be reconstructed. The length shall be calculated and recorded just prior to insertion. During installation, the liner shall be capable of holding a maximum internal pressure of 20 psi for 12 hours, or until the resin has completely cured.
- D. The pipe lining process shall be "No-Dig Technology". Excavation, pavement cutting, patching and other surface feature disturbances and restoration shall not be required.
- E. Pipe liner materials and components shall be fabricated at a remote location prior to commencement of liner installation.
- F. The pipe liner shall be a cured-in-place polyamide resin system delivered and reinforced using a composite felt and/or fiberglass material, commonly known as a "Felt Resin Impregnated Cured-In-Place" (FRICIP) pipe liner. The resin shall have physical characteristics that allow it to adhere to dry or wet substrates and shall meet the requirements of ASTM F1216, Section 5.2. The composite cured-in-place liner shall be impervious to groundwater infiltration and prevent wastewater exfiltration.
- G. For instances where FRICIP pipe liner cannot be used for service laterals (i.e. 90 degree bends, pipe diameter transitions, or restrictive mainline pipe diameter), a liner material capable of lining 90 degree bends shall be used with a 100% solids epoxy resin designed for cure-in-place liner.
- H. The pipe liner delivery and installation shall be such that after curing, the pipe liner shall become a part of the host pipe with smooth tapering transitions where the repair begins and ends. The cured pipe liner shall be fully structural with excellent chemical and abrasion resistance.
- I. No significant interior pipe volume change shall occur due to the installation of the pipe liner. The pre-cut and assembled liner material shall be constructed to assure conformity to the existing pipe interior.
- J. The wall color of the interior pipe surface of the CIPP after installation shall be a light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be conducted.
- K. The pipe liner shall be installed in such a manner as to force excess resin into any cracks, joints or other surface defects of the existing interior pipe wall surface. The resin and pipe liner material shall be in intimate contact with the pipe surface allowing for a mechanical "Tee" lock bond to the pipe at cracks and joints.
- L. The pipe liner shall be fabricated from materials which, when cured, will be chemically resistant and withstand internal exposure to dilute sulfuric acid and

domestic sewage gasses including hydrogen sulfide, carbon monoxide, carbon dioxide and methane, and external exposure to soil bacteria and any chemical attack that may be due to materials in the surrounding ground.

- M. The outside of the tube shall be marked for distance at regular intervals along its entire length, not to exceed 5-feet. Such markings shall include the Manufacturers name or identifying symbol.
- N. Point repair liner lengths shall conform to the section(s) of deteriorated pipe, plus a minimum of 1-foot (12-inches) in either direction of the last crack, open joint, broken pipe, root-in growth or other deformation. The length of the repair shall be calculated and recorded just prior to insertion.
- O. Point repair liners shall be positioned and cured using an inflatable flow-through mandrel, inflated with superheated water capable of delivering heat to the liner material in order to accelerate the rate of resin cure. Air inflation shall not be an acceptable means of curing or setting the liner material.
- P. Bypass pumping shall not be necessary during installation and cure of the point repair liner. A brief interruption in sewage flow will be permitted during positioning and inflation of the repair mandrel. The contractor shall monitor the upstream wastewater levels and shall take appropriate action to prevent backups and overflows.

PART 2 PRODUCTS

2.01 MATERIALS

A. Full Length Lining

- 1. The material shall be fabricated to a size that when installed will neatly fit the interior of the host pipe. Allowance shall be made for circumferential stretching during inversion.
- 2. The minimum tube length shall be that deemed necessary by the Contractor to effectively span the distance between the access points.
- 3. Unless otherwise specified, the Contractor will use a polyester or vinylester resin and catalyst system compatible with the inversion process having the following minimum physical properties for the cured pipe:

Flexural Stress	Modified ASTM D 790	4,500 psi
Flexural Modulus of Elasticity (short term)	Modified ASTM D 790	250,000 psi

Flexural Modulus of Elasticity (long term)	10,000 Hour Testing	125,000 psi
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4. The wall thickness of the finished product shall be not less than the minimum required by ASTM F-1216, Appendix XI, assuming the following site conditions:
 - a. Soil Cover - Maximum of 15 feet.
 - b. Depth of Groundwater – approx. 3 feet from existing ground grade.
 - c. Type and Unit Weight of Soil - sandy gravel, 120 lbs./cubic foot.
 - d. Superimposed Loads - HS20.
 - e. Pipe Ovality - as determined by the Contractor.
5. Submit for review design calculations to determine wall thickness.
6. The liner shall have the capability to both change wall thickness for variations in design requirements and conform to irregular surfaces and circumferences within the designated pipelines. The liner shall achieve the physical properties and minimum wall thickness specified in 2.01 A.3 and 4 throughout the length of lining.

B. Point Repair Lining

1. The material shall be fabricated to a size that when installed shall neatly fit the interior of the host pipe.
2. The minimum repair length shall be 4' and extend a minimum of 1' in either direction greater than the defect to be repaired, or that deemed necessary by the Contractor to effectively span the distance of the defect to be repaired. The liner shall achieve the physical properties and minimum wall thickness specified in 2.01 B.5 and 6 throughout the repair length.
3. The reinforcement material shall be a composite of two layers of woven glass fabric quilted to each side of a sheet of needled polyester felt.
4. The repair system shall utilize either an epoxy (Bisphenol A system) or a polyester (Isophthalic) resin. The system shall provide a flexural modulus of up to 1.232×10^6 psi, resistance to abrasion at least as good as high density polyethylene, and excellent adhesion.
5. Physical properties of the cured liner shall meet or exceed the following:

ASTM D 638 Tensile Strength.....	24,000 psi
ASTM D 638 E-Mod.....	1,339,500 psi
ASTM D 790 Flexural Strength.	9,000 psi
ASTM D 790 E-Mod.....	950,000 psi

6. The wall thickness of the finished product shall be not less than the minimum required by ASTM F-1216, Appendix XI, assuming the following site conditions:
 - a. Soil Cover - Maximum of 15 feet.
 - b. Depth of Groundwater – approx. 3 feet from existing ground grade.
 - c. Type and Unit Weight of Soil - sandy gravel, 120 lbs./cubic foot.
 - d. Superimposed Loads - HS20.
 - e. Pipe Ovality - as determined by the Contractor.

C. Lateral Lining

1. The lateral lining materials, used for CIPP lining of sewer and drain service laterals including the connection to the mainline pipeline, shall meet the performance and materials criteria specified for full length lining. The lateral liner shall be fabricated with a collar or tubular section that will create a watertight seal at the connection to the mainline pipeline. Collars shall be reinforced with a semi-rigid material and shall be of sufficient size to span voids at break-in taps. Protruding break-in taps shall be trimmed with a robotic cutter prior to liner insertion. Where both the mainline pipeline and a lateral are specified to be lined, the mainline pipeline shall be lined first. The lateral liner system shall seal the connection to the mainline pipeline and the length within the lateral pipeline as specified in the Contract Documents or as identified defects will allow. Lateral lining processes shall be entirely trenchless unless otherwise noted on the Drawings. Lateral liners may be heat cured or ambient cured per the manufacturer's standard installation recommendations. Laterals liners shall be by BLD Services or approved equal.
2. For instances where FRICIP pipe liner cannot be used for service laterals (i.e. 90 degree bends, pipe diameter transitions, or restrictive mainline pipe diameter), a liner material capable of lining up to 90 degree bends shall be used with a 100% solids epoxy resin designed for cured-in-place liner. Lateral liners may be heat cured or ambient cured per manufacturer's standard installation recommendations. Liners shall be manufactured by MaxLiner or approved equal.

2.02 SAFETY: The Contractor shall carry out his operations in strict accordance with all applicable OSHA standards. Particular attention is drawn to those safety requirements involving working with scaffolding and entering confined spaces.

2.03 PREPARATORY PROCEDURES: The following procedures shall be adhered to unless otherwise approved by the Owner's Representative:

- A. Cleaning: It shall be the responsibility of the Contractor to clean the pipeline with a high-pressure water jet of 500 to 1,500 psi maximum capacity and to remove all internal debris out of the pipeline. The Contractor shall provide all water required.
- B. TV Inspection: Experienced personnel shall perform inspection. The interior of the pipeline shall be carefully inspected using closed-circuit television to determine conditions that may prevent proper installation. These conditions shall be noted so that they can be corrected.
- C. Obstruction Removal: The Contractor shall remove obstructions and protruding service connections that may prevent proper installation.
- D. Flow Control: The Contractor shall provide for the bypassing of sewage or stormwater entering or passing through the pipe to be rehabilitated.
- E. Public Notification – The Contractor shall make every effort to maintain service usage throughout the duration of the project. In the event that a service will be out of service, the maximum amount of time of no service shall be 8 hours for any property served by the sewer. A public notification program shall be implemented, and shall as a minimum, require the Contractor to be responsible for contacting each home or business connected to the sanitary sewer and informing them of the work to be conducted, and when the sewer will be off-line. The Contractor shall also provide the following:
 - 1. Written notice to be delivered to each home or business the day prior to the beginning of work being conducted on the section, and a local telephone number of the Contractor they can call to discuss the project or any problems, which could arise.
 - 2. Personal contact with any home or business, which cannot be reconnected within the time stated in the written notice.

PART 3 EXECUTION

3.01 INSTALLATION PROCEDURES

- A. Full Length Lining
 - 1. The Contractor shall designate a location where the tube will be vacuum-impregnated prior to installation. The Contractor shall allow the Owner to inspect the materials and the "wet-out" procedure.
 - 2. The quantity of resin used for impregnation shall be sufficient to fill the volume of air voids in the tube, with additional allowances for polymerization shrinkage and the migration of resin through cracks and irregularities in the

original pipe wall. A vacuum impregnation process shall be used. To assure thorough wet-out, the vacuum application points shall be made, sealed and moved along the length of the tube during the impregnation process. A roller system shall be used to uniformly distribute the resin throughout the tube.

3. A scaffold, elevated platform, or other controlled head inversion process shall be erected at the upstream access point. The tube shall be inverted using an "inversion elbow" at the bottom of the manhole or an "inversion ring" above ground. The tube shall be inverted (turned inside-out) with water pressure.
4. After the inversion is complete, the Contractor shall supply a suitable heat source and water recirculation equipment. The Contractor shall provide all water required. The equipment shall be capable of uniformly raising the water temperature to a level required to effectively cure the resin.
5. The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing water supply. Another gage shall be placed between the tube and the host pipe in the downstream manhole at or near the bottom to determine the temperatures during cure. Water temperature in the pipe during the cure period shall be as recommended by the resin manufacturer.
6. Initial cure shall be deemed complete when inspection of exposed portions of the tube appear to be hard and sound, and the temperature sensor indicates that the temperature is of a magnitude to realize an exotherm. The cure period shall be of a duration recommended by the resin manufacturer and may require continuous recirculation of the water to maintain the temperature.
7. **Cooldown:** The Contractor shall cool the hardened pipe to a temperature below 100°F before relieving the hydrostatic head. Cooldown may be accomplished by the introduction of cool water into the inversion standpipe to replace water being pumped out of the manhole. When the Contractor is lining any storm drain pipes, the inversion water cannot be released into the storm drain system. Inversion water must be removed from the liner and transferred into the sewer system. Any costs associated with this transfer of inversion water will be the responsibility of the Contractor.
8. MWRA approval is required to release inversion water into the storm drain or sanitary sewer systems. The MWRA discharge limit for Styrene is 1.0 mg/l. The Contractor must submit the MWRA One-Time-Only Discharge Request form (found in the Appendix) at least four weeks prior to the scheduled start date of the lining work. No lining work can commence until the approval of the MWRA is received. All costs associated with testing,

treatment, and disposal of the inversion water shall be the responsibility of the Contractor.

9. Finish: The new pipe shall be cut off in the manhole at a suitable location. The finished product shall be continuous over the length of pipe reconstructed and be free from dry spots, delamination and lifts. During the warranty period, any defects that will affect the integrity or strength of the product shall be repaired at the Contractor's expense, in a manner mutually agreed upon by the Owner and the Contractor.
10. After the new pipe has been cured in place, the Contractor shall reconnect the existing service connections as designated by the Owner. If the Owner does not so designate, the Contractor shall reinstate all connections. It is the intent of these specifications that this shall be done without excavation, and in the case of non-man entry pipes, from the interior of the pipeline by means of a remotely controlled cutting device monitored by a television camera. No additional payment will be made for excavation for the purpose of reopening connections and the Contractor will be responsible for all costs and liability associated with such excavation and restoration work.
11. A copy of the final inspection video shall be submitted to the Engineer within fourteen (14) calendar days after completing the work.

B. Point Repair Lining

1. The reinforcement material shall be impregnated with a thermo-setting resin, wrapped around an inflatable packer and secured with ties or elastic bands. The packer shall be winched into position in a conduit and its position verified by CCTV or measurement. Pressurized hot water shall be circulated through the packer to inflate it and maintain the repair material firmly against the conduit wall during curing. When curing is complete the packer shall be deflated and winched from the conduit with a fail-safe release. The finished CIPP liner shall form a watertight connection seal against the host pipeline and extend continuously over the entire length of the repair and be free of dry spots, lifts, delamination, or irregularities that may impede the flow of wastewater and solids.

C. Lateral Lining

1. The reinforcement material shall be impregnated with a thermo-setting or ambient-setting resin, and attached and secured to the packer or installation device. The packer shall be positioned in a pipeline using CCTV. The installation device shall be pressurized by compressed air or hot water and cured per the manufacturer's standard installation instructions. The installation device shall remain pressurized, forcing the repair material firmly against

the conduit wall until the liner is fully cured. When curing is complete the installation device shall be deflated and removed from the conduit with a fail-safe release. The finished CIPP liner shall form a watertight connection seal at the mainline pipeline and extend continuously over the entire length of the repair and be free of dry spots, lifts, delamination, or irregularities that may impede the flow of wastewater and solids.

2. For lateral lining processes installed through a cleanout, or that require the installation of a cleanout, any overlaps in the liner material shall be watertight and be free of all defects. Cleanouts shall also be watertight.

3.02 TESTING AND INSPECTION

- A. Leakage testing of the liner will be accomplished during curing while under a positive head. Liners shall be inspected via CCTV after installation is complete. A copy of the final inspection video shall be submitted to the Engineer within fourteen (14) calendar days after completing the work as a condition for payment.

3.03 CLEANUP

- A. Upon acceptance of the installation work and testing, the Contractor shall restore the project area affected by his operations to a condition at least equal to that existing prior to the work.

3.04 WARRANTY

- A. The Contractor shall warrant all work to be free of defects in workmanship or materials for a period of one year from the date of final completion of construction. The liner manufacturer shall warrant all materials to be free of defects for a period of one year from the date of final completion of construction.

** END OF SECTION **

APPENDIX

MASSACHUSETTS STATE WAGE RATES



DEVAL L. PATRICK
Governor
TIMOTHY P. MURRAY
Lt. Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS

Prevailing Wage Rates

As determined by the Director under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H

JOANNE F. GOLDSTEIN
Secretary
HEATHER E. ROWE
Director

Awarding Authority: Arlington Department of Public Works
Contract Number: 13-19 **City/Town:** ARLINGTON
Description of Work: Ottoson Middle School Area; Excavate and replace pipe, cured-in-place pipe lining, test/seal pipe joints, manhole rehabilitation, replace pavement, site restoration, traffic management, bypass pumping
Job Location: Forest St., Mass. Ave., Appleton St., Acton St.

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2012	\$31.55	\$8.91	\$8.00	\$0.00	\$48.46
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2012	\$31.62	\$8.91	\$8.00	\$0.00	\$48.53
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2012	\$31.74	\$8.91	\$8.00	\$0.00	\$48.65
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2012	\$82.32	\$9.80	\$17.67	\$0.00	\$109.79
	08/01/2013	\$85.47	\$9.80	\$17.67	\$0.00	\$112.94
	08/01/2014	\$88.62	\$9.80	\$17.67	\$0.00	\$116.09
	08/01/2015	\$91.77	\$9.80	\$17.67	\$0.00	\$119.24
AIR TRACK OPERATOR <i>LABORERS - ZONE 1</i>	06/01/2013	\$33.80	\$7.10	\$12.45	\$0.00	\$53.35
	12/01/2013	\$34.55	\$7.10	\$12.45	\$0.00	\$54.10
	06/01/2014	\$35.30	\$7.10	\$12.45	\$0.00	\$54.85
	12/01/2014	\$36.05	\$7.10	\$12.45	\$0.00	\$55.60
	06/01/2015	\$36.80	\$7.10	\$12.45	\$0.00	\$56.35
	12/01/2015	\$37.55	\$7.10	\$12.45	\$0.00	\$57.10
	06/01/2016	\$38.30	\$7.10	\$12.45	\$0.00	\$57.85
	12/01/2016	\$39.30	\$7.10	\$12.45	\$0.00	\$58.85
For apprentice rates see "Apprentice- LABORER"						
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i>	06/01/2013	\$29.88	\$10.40	\$5.95	\$0.00	\$46.23
	12/01/2013	\$30.68	\$10.40	\$5.95	\$0.00	\$47.03
	06/01/2014	\$31.58	\$10.40	\$5.95	\$0.00	\$47.93
	12/01/2014	\$32.48	\$10.40	\$5.95	\$0.00	\$48.83
	06/01/2015	\$33.43	\$10.40	\$5.95	\$0.00	\$49.78
	12/01/2015	\$34.38	\$10.40	\$5.95	\$0.00	\$50.73
ASPHALT RAKER <i>LABORERS - ZONE 1</i>	06/01/2013	\$33.30	\$7.10	\$12.45	\$0.00	\$52.85
	12/01/2013	\$34.05	\$7.10	\$12.45	\$0.00	\$53.60
	06/01/2014	\$34.80	\$7.10	\$12.45	\$0.00	\$54.35
	12/01/2014	\$35.55	\$7.10	\$12.45	\$0.00	\$55.10
	06/01/2015	\$36.30	\$7.10	\$12.45	\$0.00	\$55.85
	12/01/2015	\$37.05	\$7.10	\$12.45	\$0.00	\$56.60
	06/01/2016	\$37.80	\$7.10	\$12.45	\$0.00	\$57.35
	12/01/2016	\$38.80	\$7.10	\$12.45	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2013	\$40.34	\$10.00	\$13.55	\$0.00	\$63.89
	12/01/2013	\$41.12	\$10.00	\$13.55	\$0.00	\$64.67
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2013	\$40.34	\$10.00	\$13.55	\$0.00	\$63.89
	12/01/2013	\$41.12	\$10.00	\$13.55	\$0.00	\$64.67
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 1</i>	06/01/2013	\$33.30	\$7.10	\$12.45	\$0.00	\$52.85
	12/01/2013	\$34.05	\$7.10	\$12.45	\$0.00	\$53.60
	06/01/2014	\$34.80	\$7.10	\$12.45	\$0.00	\$54.35
	12/01/2014	\$35.55	\$7.10	\$12.45	\$0.00	\$55.10
	06/01/2015	\$36.30	\$7.10	\$12.45	\$0.00	\$55.85
	12/01/2015	\$37.05	\$7.10	\$12.45	\$0.00	\$56.60
	06/01/2016	\$37.80	\$7.10	\$12.45	\$0.00	\$57.35
	12/01/2016	\$38.80	\$7.10	\$12.45	\$0.00	\$58.35

For apprentice rates see "Apprentice- LABORER"

BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 1</i>	06/01/2013	\$33.80	\$7.10	\$12.45	\$0.00	\$53.35
	12/01/2013	\$34.55	\$7.10	\$12.45	\$0.00	\$54.10
	06/01/2014	\$35.30	\$7.10	\$12.45	\$0.00	\$54.85
	12/01/2014	\$36.05	\$7.10	\$12.45	\$0.00	\$55.60
	06/01/2015	\$36.80	\$7.10	\$12.45	\$0.00	\$56.35
	12/01/2015	\$37.55	\$7.10	\$12.45	\$0.00	\$57.10
	06/01/2016	\$38.30	\$7.10	\$12.45	\$0.00	\$57.85
	12/01/2016	\$39.30	\$7.10	\$12.45	\$0.00	\$58.85

For apprentice rates see "Apprentice- LABORER"

BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2010	\$37.70	\$6.97	\$11.18	\$0.00	\$55.85
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Apprentice - BOILERMAKER - Local 29

Effective Date - 01/01/2010

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$24.51	\$6.97	\$11.18	\$0.00	\$42.66
2	65	\$24.51	\$6.97	\$11.18	\$0.00	\$42.66
3	70	\$26.39	\$6.97	\$11.18	\$0.00	\$44.54
4	75	\$28.28	\$6.97	\$11.18	\$0.00	\$46.43
5	80	\$30.16	\$6.97	\$11.18	\$0.00	\$48.31
6	85	\$32.05	\$6.97	\$11.18	\$0.00	\$50.20
7	90	\$33.93	\$6.97	\$11.18	\$0.00	\$52.08
8	95	\$35.82	\$6.97	\$11.18	\$0.00	\$53.97

Notes:

Apprentice to Journeyworker Ratio:1:5

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) <i>BRICKLAYERS LOCAL 3 (BOSTON)</i>	02/01/2013	\$47.41	\$10.18	\$17.83	\$0.00	\$75.42
	08/01/2013	\$48.06	\$10.18	\$18.15	\$0.00	\$76.39
	02/01/2014	\$48.62	\$10.18	\$18.15	\$0.00	\$76.95
	08/01/2014	\$49.52	\$10.18	\$18.22	\$0.00	\$77.92
	02/01/2015	\$50.08	\$10.18	\$18.22	\$0.00	\$78.48
	08/01/2015	\$50.98	\$10.18	\$18.29	\$0.00	\$79.45
	02/01/2016	\$51.55	\$10.18	\$18.29	\$0.00	\$80.02
	08/01/2016	\$52.45	\$10.18	\$18.37	\$0.00	\$81.00
	02/01/2017	\$53.02	\$10.18	\$18.37	\$0.00	\$81.57

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Boston

Effective Date - 02/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.71	\$10.18	\$17.83	\$0.00	\$51.72
2	60	\$28.45	\$10.18	\$17.83	\$0.00	\$56.46
3	70	\$33.19	\$10.18	\$17.83	\$0.00	\$61.20
4	80	\$37.93	\$10.18	\$17.83	\$0.00	\$65.94
5	90	\$42.67	\$10.18	\$17.83	\$0.00	\$70.68

Effective Date - 08/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.03	\$10.18	\$18.15	\$0.00	\$52.36
2	60	\$28.84	\$10.18	\$18.15	\$0.00	\$57.17
3	70	\$33.64	\$10.18	\$18.15	\$0.00	\$61.97
4	80	\$38.45	\$10.18	\$18.15	\$0.00	\$66.78
5	90	\$43.25	\$10.18	\$18.15	\$0.00	\$71.58

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER OPERATING ENGINEERS LOCAL 4	06/01/2013	\$39.96	\$10.00	\$13.55	\$0.00	\$63.51
	12/01/2013	\$40.74	\$10.00	\$13.55	\$0.00	\$64.29

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

CAISSON & UNDERPINNING BOTTOM MAN LABORERS - FOUNDATION AND MARINE	06/01/2013	\$34.20	\$7.10	\$12.60	\$0.00	\$53.90
	12/01/2013	\$34.95	\$7.10	\$12.60	\$0.00	\$54.65
	06/01/2014	\$35.70	\$7.10	\$12.60	\$0.00	\$55.40
	12/01/2014	\$36.45	\$7.10	\$12.60	\$0.00	\$56.15
	06/01/2015	\$37.20	\$7.10	\$12.60	\$0.00	\$56.90
	12/01/2015	\$37.95	\$7.10	\$12.60	\$0.00	\$57.65
	06/01/2016	\$38.70	\$7.10	\$12.60	\$0.00	\$58.40
	12/01/2016	\$39.70	\$7.10	\$12.60	\$0.00	\$59.40

For apprentice rates see "Apprentice- LABORER"

CAISSON & UNDERPINNING LABORER LABORERS - FOUNDATION AND MARINE	06/01/2013	\$33.05	\$7.10	\$12.60	\$0.00	\$52.75
	12/01/2013	\$33.80	\$7.10	\$12.60	\$0.00	\$53.50
	06/01/2014	\$34.55	\$7.10	\$12.60	\$0.00	\$54.25
	12/01/2014	\$35.30	\$7.10	\$12.60	\$0.00	\$55.00
	06/01/2015	\$36.05	\$7.10	\$12.60	\$0.00	\$55.75
	12/01/2015	\$36.80	\$7.10	\$12.60	\$0.00	\$56.50
	06/01/2016	\$37.55	\$7.10	\$12.60	\$0.00	\$57.25
	12/01/2016	\$38.55	\$7.10	\$12.60	\$0.00	\$58.25

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CAISSON & UNDERPINNING TOP MAN <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2013	\$33.05	\$7.10	\$12.60	\$0.00	\$52.75
	12/01/2013	\$33.80	\$7.10	\$12.60	\$0.00	\$53.50
	06/01/2014	\$34.55	\$7.10	\$12.60	\$0.00	\$54.25
	12/01/2014	\$35.30	\$7.10	\$12.60	\$0.00	\$55.00
	06/01/2015	\$36.05	\$7.10	\$12.60	\$0.00	\$55.75
	12/01/2015	\$36.80	\$7.10	\$12.60	\$0.00	\$56.50
	06/01/2016	\$37.55	\$7.10	\$12.60	\$0.00	\$57.25
	12/01/2016	\$38.55	\$7.10	\$12.60	\$0.00	\$58.25
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 1</i>	06/01/2013	\$33.30	\$7.10	\$12.45	\$0.00	\$52.85
	12/01/2013	\$34.05	\$7.10	\$12.45	\$0.00	\$53.60
	06/01/2014	\$34.80	\$7.10	\$12.45	\$0.00	\$54.35
	12/01/2014	\$35.55	\$7.10	\$12.45	\$0.00	\$55.10
	06/01/2015	\$36.30	\$7.10	\$12.45	\$0.00	\$55.85
	12/01/2015	\$37.05	\$7.10	\$12.45	\$0.00	\$56.60
	06/01/2016	\$37.80	\$7.10	\$12.45	\$0.00	\$57.35
	12/01/2016	\$38.80	\$7.10	\$12.45	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
CARPENTER <i>CARPENTERS -ZONE 2 (Eastern Massachusetts)</i>	03/01/2013	\$33.92	\$9.80	\$15.61	\$0.00	\$59.33
	09/01/2013	\$34.53	\$9.80	\$15.61	\$0.00	\$59.94
	03/01/2014	\$35.13	\$9.80	\$15.61	\$0.00	\$60.54
	09/01/2014	\$35.90	\$9.80	\$15.61	\$0.00	\$61.31
	03/01/2015	\$36.67	\$9.80	\$15.61	\$0.00	\$62.08

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - CARPENTER - Zone 2 Eastern MA

Effective Date - 03/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$16.96	\$9.80	\$1.57	\$0.00	\$28.33
2	60	\$20.35	\$9.80	\$1.57	\$0.00	\$31.72
3	70	\$23.74	\$9.80	\$10.90	\$0.00	\$44.44
4	75	\$25.44	\$9.80	\$10.90	\$0.00	\$46.14
5	80	\$27.14	\$9.80	\$12.47	\$0.00	\$49.41
6	80	\$27.14	\$9.80	\$12.47	\$0.00	\$49.41
7	90	\$30.53	\$9.80	\$14.04	\$0.00	\$54.37
8	90	\$30.53	\$9.80	\$14.04	\$0.00	\$54.37

Effective Date - 09/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.27	\$9.80	\$1.57	\$0.00	\$28.64
2	60	\$20.72	\$9.80	\$1.57	\$0.00	\$32.09
3	70	\$24.17	\$9.80	\$10.90	\$0.00	\$44.87
4	75	\$25.90	\$9.80	\$10.90	\$0.00	\$46.60
5	80	\$27.62	\$9.80	\$12.47	\$0.00	\$49.89
6	80	\$27.62	\$9.80	\$12.47	\$0.00	\$49.89
7	90	\$31.08	\$9.80	\$14.04	\$0.00	\$54.92
8	90	\$31.08	\$9.80	\$14.04	\$0.00	\$54.92

Notes:

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING	07/01/2013	\$42.68	\$10.90	\$18.71	\$1.30	\$73.59
BRICKLAYERS LOCAL 3 (BOSTON)	01/01/2014	\$43.60	\$10.90	\$18.71	\$1.30	\$74.51
	07/01/2014	\$44.20	\$10.90	\$18.71	\$1.30	\$75.11
	01/01/2015	\$45.14	\$10.90	\$18.71	\$1.30	\$76.05
	07/01/2015	\$45.72	\$10.90	\$18.71	\$1.30	\$76.63
	01/01/2016	\$46.64	\$10.90	\$18.71	\$1.30	\$77.55

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

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

Effective Date - 07/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.34	\$10.90	\$12.21	\$1.30	\$45.75
2	60	\$25.61	\$10.90	\$13.71	\$1.30	\$51.52
3	65	\$27.74	\$10.90	\$14.71	\$1.30	\$54.65
4	70	\$29.88	\$10.90	\$15.71	\$1.30	\$57.79
5	75	\$32.01	\$10.90	\$16.71	\$1.30	\$60.92
6	80	\$34.14	\$10.90	\$17.71	\$1.30	\$64.05
7	90	\$38.41	\$10.90	\$18.71	\$1.30	\$69.32

Effective Date - 01/01/2014

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.80	\$10.90	\$12.21	\$1.30	\$46.21
2	60	\$26.16	\$10.90	\$13.71	\$1.30	\$52.07
3	65	\$28.34	\$10.90	\$14.71	\$1.30	\$55.25
4	70	\$30.52	\$10.90	\$15.71	\$1.30	\$58.43
5	75	\$32.70	\$10.90	\$16.71	\$1.30	\$61.61
6	80	\$34.88	\$10.90	\$17.71	\$1.30	\$64.79
7	90	\$39.24	\$10.90	\$18.71	\$1.30	\$70.15

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

Apprentice to Journeyworker Ratio:1:3

CHAIN SAW OPERATOR LABORERS - ZONE 1	06/01/2013	\$33.30	\$7.10	\$12.45	\$0.00	\$52.85
	12/01/2013	\$34.05	\$7.10	\$12.45	\$0.00	\$53.60
	06/01/2014	\$34.80	\$7.10	\$12.45	\$0.00	\$54.35
	12/01/2014	\$35.55	\$7.10	\$12.45	\$0.00	\$55.10
	06/01/2015	\$36.30	\$7.10	\$12.45	\$0.00	\$55.85
	12/01/2015	\$37.05	\$7.10	\$12.45	\$0.00	\$56.60
	06/01/2016	\$37.80	\$7.10	\$12.45	\$0.00	\$57.35
	12/01/2016	\$38.80	\$7.10	\$12.45	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES OPERATING ENGINEERS LOCAL 4	06/01/2013	\$41.34	\$10.00	\$13.55	\$0.00	\$64.89
	12/01/2013	\$42.12	\$10.00	\$13.55	\$0.00	\$65.67
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR OPERATING ENGINEERS LOCAL 4	06/01/2013	\$28.19	\$10.00	\$13.55	\$0.00	\$51.74
	12/01/2013	\$28.74	\$10.00	\$13.55	\$0.00	\$52.29
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) PAINTERS LOCAL 35 - ZONE 2	01/01/2013	\$45.01	\$7.80	\$15.60	\$0.00	\$68.41

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 01/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.51	\$7.80	\$0.00	\$0.00	\$30.31
2	55	\$24.76	\$7.80	\$3.52	\$0.00	\$36.08
3	60	\$27.01	\$7.80	\$3.84	\$0.00	\$38.65
4	65	\$29.26	\$7.80	\$4.16	\$0.00	\$41.22
5	70	\$31.51	\$7.80	\$13.68	\$0.00	\$52.99
6	75	\$33.76	\$7.80	\$14.00	\$0.00	\$55.56
7	80	\$36.01	\$7.80	\$14.32	\$0.00	\$58.13
8	90	\$40.51	\$7.80	\$14.96	\$0.00	\$63.27

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN LABORERS - ZONE 1 For apprentice rates see "Apprentice- LABORER"	12/01/2011	\$31.80	\$7.10	\$12.45	\$0.00	\$51.35
DEMO: BACKHOE/LOADER/HAMMER OPERATOR LABORERS - ZONE 1 For apprentice rates see "Apprentice- LABORER"	12/01/2011	\$32.80	\$7.10	\$12.45	\$0.00	\$52.35
DEMO: BURNERS LABORERS - ZONE 1 For apprentice rates see "Apprentice- LABORER"	12/01/2011	\$32.55	\$7.10	\$12.45	\$0.00	\$52.10
DEMO: CONCRETE CUTTER/SAWYER LABORERS - ZONE 1 For apprentice rates see "Apprentice- LABORER"	12/01/2011	\$32.80	\$7.10	\$12.45	\$0.00	\$52.35
DEMO: JACKHAMMER OPERATOR LABORERS - ZONE 1 For apprentice rates see "Apprentice- LABORER"	12/01/2011	\$32.55	\$7.10	\$12.45	\$0.00	\$52.10
DEMO: WRECKING LABORER LABORERS - ZONE 1 For apprentice rates see "Apprentice- LABORER"	12/01/2011	\$31.80	\$7.10	\$12.45	\$0.00	\$51.35
DIRECTIONAL DRILL MACHINE OPERATOR OPERATING ENGINEERS LOCAL 4 For apprentice rates see "Apprentice- OPERATING ENGINEERS"	06/01/2013 12/01/2013	\$39.96 \$40.74	\$10.00	\$13.55	\$0.00	\$63.51 \$64.29
DIVER PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2012 08/01/2013 08/01/2014 08/01/2015	\$54.88 \$56.98 \$59.08 \$61.18	\$9.80	\$17.67	\$0.00	\$82.35 \$84.45 \$86.55 \$88.65
DIVER TENDER PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2012 08/01/2013 08/01/2014 08/01/2015	\$54.88 \$56.98 \$59.08 \$61.18	\$9.80	\$17.67	\$0.00	\$82.35 \$84.45 \$86.55 \$88.65

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DIVER TENDER (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2012	\$58.80	\$9.80	\$17.67	\$0.00	\$86.27
	08/01/2013	\$61.05	\$9.80	\$17.67	\$0.00	\$88.52
	08/01/2014	\$63.30	\$9.80	\$17.67	\$0.00	\$90.77
	08/01/2015	\$65.55	\$9.80	\$17.67	\$0.00	\$93.02
DIVER/SLURRY (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2012	\$82.32	\$9.80	\$17.67	\$0.00	\$109.79
	08/01/2013	\$85.47	\$9.80	\$17.67	\$0.00	\$112.94
	08/01/2014	\$88.62	\$9.80	\$17.67	\$0.00	\$116.09
	08/01/2015	\$91.77	\$9.80	\$17.67	\$0.00	\$119.24
DRAWBRIDGE OPERATOR (Construction) <i>ELECTRICIANS LOCAL 103</i>	03/01/2013	\$43.52	\$13.00	\$14.16	\$0.00	\$70.68
	09/01/2013	\$44.20	\$13.00	\$14.18	\$0.00	\$71.38
	03/01/2014	\$44.92	\$13.00	\$14.20	\$0.00	\$72.12
	09/01/2014	\$45.60	\$13.00	\$14.22	\$0.00	\$72.82
	03/01/2015	\$46.32	\$13.00	\$14.24	\$0.00	\$73.56
	09/01/2015	\$47.27	\$13.00	\$14.27	\$0.00	\$74.54
	03/01/2016	\$48.23	\$13.00	\$14.30	\$0.00	\$75.53
For apprentice rates see "Apprentice- ELECTRICIAN"						
ELECTRICIAN <i>ELECTRICIANS LOCAL 103</i>	03/01/2013	\$43.52	\$13.00	\$14.16	\$0.00	\$70.68
	09/01/2013	\$44.20	\$13.00	\$14.18	\$0.00	\$71.38
	03/01/2014	\$44.92	\$13.00	\$14.20	\$0.00	\$72.12
	09/01/2014	\$45.60	\$13.00	\$14.22	\$0.00	\$72.82
	03/01/2015	\$46.32	\$13.00	\$14.24	\$0.00	\$73.56
	09/01/2015	\$47.27	\$13.00	\$14.27	\$0.00	\$74.54
	03/01/2016	\$48.23	\$13.00	\$14.30	\$0.00	\$75.53

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - ELECTRICIAN - Local 103

Effective Date - 03/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$17.41	\$13.00	\$0.52	\$0.00	\$30.93
2	40	\$17.41	\$13.00	\$0.52	\$0.00	\$30.93
3	45	\$19.58	\$13.00	\$10.53	\$0.00	\$43.11
4	45	\$19.58	\$13.00	\$10.53	\$0.00	\$43.11
5	50	\$21.76	\$13.00	\$10.85	\$0.00	\$45.61
6	55	\$23.94	\$13.00	\$11.19	\$0.00	\$48.13
7	60	\$26.11	\$13.00	\$11.51	\$0.00	\$50.62
8	65	\$28.29	\$13.00	\$11.85	\$0.00	\$53.14
9	70	\$30.46	\$13.00	\$12.17	\$0.00	\$55.63
10	75	\$32.64	\$13.00	\$12.51	\$0.00	\$58.15

Effective Date - 09/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$17.68	\$13.00	\$0.53	\$0.00	\$31.21
2	40	\$17.68	\$13.00	\$0.53	\$0.00	\$31.21
3	45	\$19.89	\$13.00	\$10.54	\$0.00	\$43.43
4	45	\$19.89	\$13.00	\$10.54	\$0.00	\$43.43
5	50	\$22.10	\$13.00	\$10.86	\$0.00	\$45.96
6	55	\$24.31	\$13.00	\$11.20	\$0.00	\$48.51
7	60	\$26.52	\$13.00	\$11.53	\$0.00	\$51.05
8	65	\$28.73	\$13.00	\$11.86	\$0.00	\$53.59
9	70	\$30.94	\$13.00	\$12.19	\$0.00	\$56.13
10	75	\$33.15	\$13.00	\$12.53	\$0.00	\$58.68

Notes :
 App Prior 1/1/03; 30/35/40/45/50/55/65/70/75/80

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR ELEVATOR CONSTRUCTORS LOCAL 4	01/01/2012	\$52.45	\$8.78	\$6.96	\$0.00	\$68.19
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Apprentice - ELEVATOR CONSTRUCTOR - Local 4

Effective Date - 01/01/2012

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.23	\$8.78	\$0.00	\$0.00	\$35.01
2	55	\$28.85	\$8.78	\$6.96	\$0.00	\$44.59
3	65	\$34.09	\$8.78	\$6.96	\$0.00	\$49.83
4	70	\$36.72	\$8.78	\$6.96	\$0.00	\$52.46
5	80	\$41.96	\$8.78	\$6.96	\$0.00	\$57.70

Notes:

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

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER <i>ELEVATOR CONSTRUCTORS LOCAL 4</i>	01/01/2012	\$38.59	\$8.78	\$6.96	\$0.00	\$54.33
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FENCE & GUARD RAIL ERECTOR <i>LABORERS - ZONE 1</i>	06/01/2013	\$33.30	\$7.10	\$12.45	\$0.00	\$52.85
	12/01/2013	\$34.05	\$7.10	\$12.45	\$0.00	\$53.60
	06/01/2014	\$34.80	\$7.10	\$12.45	\$0.00	\$54.35
	12/01/2014	\$35.55	\$7.10	\$12.45	\$0.00	\$55.10
	06/01/2015	\$36.30	\$7.10	\$12.45	\$0.00	\$55.85
	12/01/2015	\$37.05	\$7.10	\$12.45	\$0.00	\$56.60
	06/01/2016	\$37.80	\$7.10	\$12.45	\$0.00	\$57.35
	12/01/2016	\$38.80	\$7.10	\$12.45	\$0.00	\$58.35

For apprentice rates see "Apprentice- LABORER"

FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	05/01/2013	\$38.50	\$10.00	\$13.02	\$0.00	\$61.52
	11/01/2013	\$39.26	\$10.00	\$13.02	\$0.00	\$62.28
	05/01/2014	\$40.03	\$10.00	\$13.02	\$0.00	\$63.05

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	05/01/2013	\$39.91	\$10.00	\$13.02	\$0.00	\$62.93
	11/01/2013	\$40.68	\$10.00	\$13.02	\$0.00	\$63.70
	05/01/2014	\$41.45	\$10.00	\$13.02	\$0.00	\$64.47

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	05/01/2013	\$21.17	\$10.00	\$13.02	\$0.00	\$44.19
	11/01/2013	\$21.63	\$10.00	\$13.02	\$0.00	\$44.65
	05/01/2014	\$22.08	\$10.00	\$13.02	\$0.00	\$45.10

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 103</i>	03/01/2013	\$43.52	\$13.00	\$14.16	\$0.00	\$70.68
	09/01/2013	\$44.20	\$13.00	\$14.18	\$0.00	\$71.38
	03/01/2014	\$44.92	\$13.00	\$14.20	\$0.00	\$72.12
	09/01/2014	\$45.60	\$13.00	\$14.22	\$0.00	\$72.82
	03/01/2015	\$46.32	\$13.00	\$14.24	\$0.00	\$73.56
	09/01/2015	\$47.27	\$13.00	\$14.27	\$0.00	\$74.54
	03/01/2016	\$48.23	\$13.00	\$14.30	\$0.00	\$75.53

For apprentice rates see "Apprentice- ELECTRICIAN"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING <i>ELECTRICIANS</i>	03/01/2013	\$32.64	\$13.00	\$12.51	\$0.00	\$58.15
<i>LOCAL 103</i>	09/01/2013	\$33.15	\$13.00	\$12.52	\$0.00	\$58.67
	03/01/2014	\$33.69	\$13.00	\$12.54	\$0.00	\$59.23
	09/01/2014	\$34.20	\$13.00	\$12.56	\$0.00	\$59.76
	03/01/2015	\$34.74	\$13.00	\$12.57	\$0.00	\$60.31
	09/01/2015	\$35.45	\$13.00	\$12.59	\$0.00	\$61.04
	03/01/2016	\$36.17	\$13.00	\$12.62	\$0.00	\$61.79
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2013	\$33.73	\$10.00	\$13.55	\$0.00	\$57.28
	12/01/2013	\$34.39	\$10.00	\$13.55	\$0.00	\$57.94
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER <i>LABORERS - ZONE 1</i>	06/01/2013	\$20.50	\$7.10	\$12.45	\$0.00	\$40.05
	12/01/2013	\$20.50	\$7.10	\$12.45	\$0.00	\$40.05
	06/01/2014	\$20.50	\$7.10	\$12.45	\$0.00	\$40.05
	12/01/2014	\$20.50	\$7.10	\$12.45	\$0.00	\$40.05
	06/01/2015	\$20.50	\$7.10	\$12.45	\$0.00	\$40.05
	12/01/2015	\$20.50	\$7.10	\$12.45	\$0.00	\$40.05
	06/01/2016	\$20.50	\$7.10	\$12.45	\$0.00	\$40.05
	12/01/2016	\$20.50	\$7.10	\$12.45	\$0.00	\$40.05
For apprentice rates see "Apprentice- LABORER"						
FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE 1</i>	03/01/2013	\$38.61	\$9.80	\$16.71	\$0.00	\$65.12
	09/01/2013	\$38.61	\$9.80	\$16.71	\$0.00	\$65.12
	03/01/2014	\$38.61	\$9.80	\$16.71	\$0.00	\$65.12

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - FLOORCOVERER - Local 2168 Zone I

Effective Date - 03/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.31	\$9.80	\$1.79	\$0.00	\$30.90
2	55	\$21.24	\$9.80	\$1.79	\$0.00	\$32.83
3	60	\$23.17	\$9.80	\$11.34	\$0.00	\$44.31
4	65	\$25.10	\$9.80	\$11.34	\$0.00	\$46.24
5	70	\$27.03	\$9.80	\$13.13	\$0.00	\$49.96
6	75	\$28.96	\$9.80	\$13.13	\$0.00	\$51.89
7	80	\$30.89	\$9.80	\$14.92	\$0.00	\$55.61
8	85	\$32.82	\$9.80	\$14.92	\$0.00	\$57.54

Effective Date - 09/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.31	\$9.80	\$1.79	\$0.00	\$30.90
2	55	\$21.24	\$9.80	\$1.79	\$0.00	\$32.83
3	60	\$23.17	\$9.80	\$11.34	\$0.00	\$44.31
4	65	\$25.10	\$9.80	\$11.34	\$0.00	\$46.24
5	70	\$27.03	\$9.80	\$13.13	\$0.00	\$49.96
6	75	\$28.96	\$9.80	\$13.13	\$0.00	\$51.89
7	80	\$30.89	\$9.80	\$14.92	\$0.00	\$55.61
8	85	\$32.82	\$9.80	\$14.92	\$0.00	\$57.54

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2013	\$40.34	\$10.00	\$13.55	\$0.00	\$63.89
	12/01/2013	\$41.12	\$10.00	\$13.55	\$0.00	\$64.67
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2013	\$28.19	\$10.00	\$13.55	\$0.00	\$51.74
	12/01/2013	\$28.74	\$10.00	\$13.55	\$0.00	\$52.29
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) <i>GLAZIERS LOCAL 35 (ZONE 2)</i>	01/01/2013	\$35.51	\$7.80	\$14.60	\$0.00	\$57.91

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - GLAZIER - Local 35 Zone 2

Effective Date - 01/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.76	\$7.80	\$0.00	\$0.00	\$25.56
2	55	\$19.53	\$7.80	\$3.25	\$0.00	\$30.58
3	60	\$21.31	\$7.80	\$3.54	\$0.00	\$32.65
4	65	\$23.08	\$7.80	\$3.84	\$0.00	\$34.72
5	70	\$24.86	\$7.80	\$12.83	\$0.00	\$45.49
6	75	\$26.63	\$7.80	\$13.13	\$0.00	\$47.56
7	80	\$28.41	\$7.80	\$13.42	\$0.00	\$49.63
8	90	\$31.96	\$7.80	\$14.01	\$0.00	\$53.77

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

HOISTING ENGINEER/CRANES/GRADALLS	06/01/2013	\$40.34	\$10.00	\$13.55	\$0.00	\$63.89
OPERATING ENGINEERS LOCAL 4	12/01/2013	\$41.12	\$10.00	\$13.55	\$0.00	\$64.67

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - OPERATING ENGINEERS - Local 4

Effective Date - 06/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$22.19	\$10.00	\$0.00	\$0.00	\$32.19
2	60	\$24.20	\$10.00	\$13.55	\$0.00	\$47.75
3	65	\$26.22	\$10.00	\$13.55	\$0.00	\$49.77
4	70	\$28.24	\$10.00	\$13.55	\$0.00	\$51.79
5	75	\$30.26	\$10.00	\$13.55	\$0.00	\$53.81
6	80	\$32.27	\$10.00	\$13.55	\$0.00	\$55.82
7	85	\$34.29	\$10.00	\$13.55	\$0.00	\$57.84
8	90	\$36.31	\$10.00	\$13.55	\$0.00	\$59.86

Effective Date - 12/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$22.62	\$10.00	\$0.00	\$0.00	\$32.62
2	60	\$24.67	\$10.00	\$13.55	\$0.00	\$48.22
3	65	\$26.73	\$10.00	\$13.55	\$0.00	\$50.28
4	70	\$28.78	\$10.00	\$13.55	\$0.00	\$52.33
5	75	\$30.84	\$10.00	\$13.55	\$0.00	\$54.39
6	80	\$32.90	\$10.00	\$13.55	\$0.00	\$56.45
7	85	\$34.95	\$10.00	\$13.55	\$0.00	\$58.50
8	90	\$37.01	\$10.00	\$13.55	\$0.00	\$60.56

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) 02/01/2013 \$42.32 \$9.82 \$18.24 \$2.11 \$72.49
 SHEETMETAL WORKERS LOCAL 17 - A

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (ELECTRICAL CONTROLS) 03/01/2013 \$43.52 \$13.00 \$14.16 \$0.00 \$70.68
 ELECTRICIANS LOCAL 103
 09/01/2013 \$44.20 \$13.00 \$14.18 \$0.00 \$71.38
 03/01/2014 \$44.92 \$13.00 \$14.20 \$0.00 \$72.12
 09/01/2014 \$45.60 \$13.00 \$14.22 \$0.00 \$72.82
 03/01/2015 \$46.32 \$13.00 \$14.24 \$0.00 \$73.56
 09/01/2015 \$47.27 \$13.00 \$14.27 \$0.00 \$74.54
 03/01/2016 \$48.23 \$13.00 \$14.30 \$0.00 \$75.53

For apprentice rates see "Apprentice- ELECTRICIAN"

HVAC (TESTING AND BALANCING - AIR) 02/01/2013 \$42.32 \$9.82 \$18.24 \$2.11 \$72.49
 SHEETMETAL WORKERS LOCAL 17 - A

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (TESTING AND BALANCING -WATER) 03/01/2013 \$49.34 \$8.75 \$14.39 \$0.00 \$72.48
 PIPEFITTERS LOCAL 537

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

HVAC MECHANIC 03/01/2013 \$49.34 \$8.75 \$14.39 \$0.00 \$72.48
 PIPEFITTERS LOCAL 537

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS LABORERS - ZONE 1	06/01/2013	\$33.80	\$7.10	\$12.45	\$0.00	\$53.35
	12/01/2013	\$34.55	\$7.10	\$12.45	\$0.00	\$54.10
	06/01/2014	\$35.30	\$7.10	\$12.45	\$0.00	\$54.85
	12/01/2014	\$36.05	\$7.10	\$12.45	\$0.00	\$55.60
	06/01/2015	\$36.80	\$7.10	\$12.45	\$0.00	\$56.35
	12/01/2015	\$37.55	\$7.10	\$12.45	\$0.00	\$57.10
	06/01/2016	\$38.30	\$7.10	\$12.45	\$0.00	\$57.85
	12/01/2016	\$39.30	\$7.10	\$12.45	\$0.00	\$58.85

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
INSULATOR (PIPES & TANKS) HEAT & FROST INSULATORS LOCAL 6 (BOSTON)	09/01/2012	\$41.46	\$10.65	\$11.50	\$0.00	\$63.61
	09/01/2013	\$43.06	\$10.65	\$11.50	\$0.00	\$65.21
	09/01/2014	\$45.06	\$10.65	\$11.50	\$0.00	\$67.21

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

Effective Date - 09/01/2012

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.73	\$10.65	\$8.60	\$0.00	\$39.98
2	60	\$24.88	\$10.65	\$9.18	\$0.00	\$44.71
3	70	\$29.02	\$10.65	\$9.76	\$0.00	\$49.43
4	80	\$33.17	\$10.65	\$10.34	\$0.00	\$54.16

Effective Date - 09/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.53	\$10.65	\$8.60	\$0.00	\$40.78
2	60	\$25.84	\$10.65	\$9.18	\$0.00	\$45.67
3	70	\$30.14	\$10.65	\$9.76	\$0.00	\$50.55
4	80	\$34.45	\$10.65	\$10.34	\$0.00	\$55.44

Notes:

Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER IRONWORKERS LOCAL 7 (BOSTON AREA)	03/16/2013	\$40.23	\$7.70	\$18.35	\$0.00	\$66.28
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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - IRONWORKER - Local 7 Boston

Effective Date - 03/16/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$24.14	\$7.70	\$18.35	\$0.00	\$50.19
2	70	\$28.16	\$7.70	\$18.35	\$0.00	\$54.21
3	75	\$30.17	\$7.70	\$18.35	\$0.00	\$56.22
4	80	\$32.18	\$7.70	\$18.35	\$0.00	\$58.23
5	85	\$34.20	\$7.70	\$18.35	\$0.00	\$60.25
6	90	\$36.21	\$7.70	\$18.35	\$0.00	\$62.26

Notes:

** Structural 1:6; Ornamental 1:4

Apprentice to Journeyworker Ratio:**

JACKHAMMER & PAVING BREAKER OPERATOR LABORERS - ZONE 1	06/01/2013	\$33.30	\$7.10	\$12.45	\$0.00	\$52.85
	12/01/2013	\$34.05	\$7.10	\$12.45	\$0.00	\$53.60
	06/01/2014	\$34.80	\$7.10	\$12.45	\$0.00	\$54.35
	12/01/2014	\$35.55	\$7.10	\$12.45	\$0.00	\$55.10
	06/01/2015	\$36.30	\$7.10	\$12.45	\$0.00	\$55.85
	12/01/2015	\$37.05	\$7.10	\$12.45	\$0.00	\$56.60
	06/01/2016	\$37.80	\$7.10	\$12.45	\$0.00	\$57.35
	12/01/2016	\$38.80	\$7.10	\$12.45	\$0.00	\$58.35

For apprentice rates see "Apprentice- LABORER"

LABORER LABORERS - ZONE 1	06/01/2013	\$33.05	\$7.10	\$12.45	\$0.00	\$52.60
	12/01/2013	\$33.80	\$7.10	\$12.45	\$0.00	\$53.35
	06/01/2014	\$34.55	\$7.10	\$12.45	\$0.00	\$54.10
	12/01/2014	\$35.30	\$7.10	\$12.45	\$0.00	\$54.85
	06/01/2015	\$36.05	\$7.10	\$12.45	\$0.00	\$55.60
	12/01/2015	\$36.80	\$7.10	\$12.45	\$0.00	\$56.35
	06/01/2016	\$37.55	\$7.10	\$12.45	\$0.00	\$57.10
	12/01/2016	\$38.55	\$7.10	\$12.45	\$0.00	\$58.10

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - LABORER - Zone 1

Effective Date - 06/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$19.83	\$7.10	\$12.45	\$0.00	\$39.38
2	70	\$23.14	\$7.10	\$12.45	\$0.00	\$42.69
3	80	\$26.44	\$7.10	\$12.45	\$0.00	\$45.99
4	90	\$29.75	\$7.10	\$12.45	\$0.00	\$49.30

Effective Date - 12/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$20.28	\$7.10	\$12.45	\$0.00	\$39.83
2	70	\$23.66	\$7.10	\$12.45	\$0.00	\$43.21
3	80	\$27.04	\$7.10	\$12.45	\$0.00	\$46.59
4	90	\$30.42	\$7.10	\$12.45	\$0.00	\$49.97

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER: CARPENTER TENDER <i>LABORERS - ZONE 1</i>	06/01/2013	\$33.05	\$7.10	\$12.45	\$0.00	\$52.60
	12/01/2013	\$33.80	\$7.10	\$12.45	\$0.00	\$53.35
	06/01/2014	\$34.55	\$7.10	\$12.45	\$0.00	\$54.10
	12/01/2014	\$35.30	\$7.10	\$12.45	\$0.00	\$54.85
	06/01/2015	\$36.05	\$7.10	\$12.45	\$0.00	\$55.60
	12/01/2015	\$36.80	\$7.10	\$12.45	\$0.00	\$56.35
	06/01/2016	\$37.55	\$7.10	\$12.45	\$0.00	\$57.10
	12/01/2016	\$38.55	\$7.10	\$12.45	\$0.00	\$58.10

For apprentice rates see "Apprentice- LABORER"

LABORER: CEMENT FINISHER TENDER <i>LABORERS - ZONE 1</i>	06/01/2013	\$33.05	\$7.10	\$12.45	\$0.00	\$52.60
	12/01/2013	\$33.80	\$7.10	\$12.45	\$0.00	\$53.35
	06/01/2014	\$34.55	\$7.10	\$12.45	\$0.00	\$54.10
	12/01/2014	\$35.30	\$7.10	\$12.45	\$0.00	\$54.85
	06/01/2015	\$36.05	\$7.10	\$12.45	\$0.00	\$55.60
	12/01/2015	\$36.80	\$7.10	\$12.45	\$0.00	\$56.35
	06/01/2016	\$37.55	\$7.10	\$12.45	\$0.00	\$57.10
	12/01/2016	\$38.55	\$7.10	\$12.45	\$0.00	\$58.10

For apprentice rates see "Apprentice- LABORER"

LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER <i>LABORERS - ZONE 1</i>	12/01/2011	\$31.80	\$7.10	\$12.45	\$0.00	\$51.35
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For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: MASON TENDER <i>LABORERS - ZONE 1</i>	06/01/2013	\$33.30	\$7.10	\$12.45	\$0.00	\$52.85
	12/01/2013	\$34.05	\$7.10	\$12.45	\$0.00	\$53.60
	06/01/2014	\$34.80	\$7.10	\$12.45	\$0.00	\$54.35
	12/01/2014	\$35.55	\$7.10	\$12.45	\$0.00	\$55.10
	06/01/2015	\$36.30	\$7.10	\$12.45	\$0.00	\$55.85
	12/01/2015	\$37.05	\$7.10	\$12.45	\$0.00	\$56.60
	06/01/2016	\$37.80	\$7.10	\$12.45	\$0.00	\$57.35
	12/01/2016	\$38.80	\$7.10	\$12.45	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 1</i>	06/01/2013	\$33.05	\$7.10	\$12.45	\$0.00	\$52.60
	12/01/2013	\$33.80	\$7.10	\$12.45	\$0.00	\$53.35
	06/01/2014	\$34.55	\$7.10	\$12.45	\$0.00	\$54.10
	12/01/2014	\$35.30	\$7.10	\$12.45	\$0.00	\$54.85
	06/01/2015	\$36.05	\$7.10	\$12.45	\$0.00	\$55.60
	12/01/2015	\$36.80	\$7.10	\$12.45	\$0.00	\$56.35
	06/01/2016	\$37.55	\$7.10	\$12.45	\$0.00	\$57.10
	12/01/2016	\$38.55	\$7.10	\$12.45	\$0.00	\$58.10
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER <i>LABORERS - ZONE 1</i>	06/01/2013	\$33.05	\$7.10	\$12.45	\$0.00	\$52.60
	12/01/2013	\$33.80	\$7.10	\$12.45	\$0.00	\$53.35
	06/01/2014	\$34.55	\$7.10	\$12.45	\$0.00	\$54.10
	12/01/2014	\$35.30	\$7.10	\$12.45	\$0.00	\$54.85
	06/01/2015	\$36.05	\$7.10	\$12.45	\$0.00	\$55.60
	12/01/2015	\$36.80	\$7.10	\$12.45	\$0.00	\$56.35
	06/01/2016	\$37.55	\$7.10	\$12.45	\$0.00	\$57.10
	12/01/2016	\$38.55	\$7.10	\$12.45	\$0.00	\$58.10
This classification applies to the wholesale removal of standing trees including all associated trimming of branches and limbs, and applies to the removal of branches at locations not on or around utility lines. For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR <i>LABORERS - ZONE 1</i>	06/01/2013	\$33.30	\$7.10	\$12.45	\$0.00	\$52.85
	12/01/2013	\$34.05	\$7.10	\$12.45	\$0.00	\$53.60
	06/01/2014	\$34.80	\$7.10	\$12.45	\$0.00	\$54.35
	12/01/2014	\$35.55	\$7.10	\$12.45	\$0.00	\$55.10
	06/01/2015	\$36.30	\$7.10	\$12.45	\$0.00	\$55.85
	12/01/2015	\$37.05	\$7.10	\$12.45	\$0.00	\$56.60
	06/01/2016	\$37.80	\$7.10	\$12.45	\$0.00	\$57.35
	12/01/2016	\$38.80	\$7.10	\$12.45	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2013	\$36.20	\$10.18	\$16.51	\$0.00	\$62.89
	08/01/2013	\$36.66	\$10.18	\$16.83	\$0.00	\$63.67
	02/01/2014	\$37.11	\$10.18	\$16.83	\$0.00	\$64.12
	08/01/2014	\$37.82	\$10.18	\$16.90	\$0.00	\$64.90
	02/01/2015	\$38.27	\$10.18	\$16.90	\$0.00	\$65.35
	08/01/2015	\$38.98	\$10.18	\$16.97	\$0.00	\$66.13
	02/01/2016	\$39.43	\$10.18	\$16.97	\$0.00	\$66.58
	08/01/2016	\$40.13	\$10.18	\$17.05	\$0.00	\$67.36
	02/01/2017	\$40.59	\$10.18	\$17.05	\$0.00	\$67.82

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

Effective Date - 02/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.10	\$10.18	\$16.51	\$0.00	\$44.79
2	60	\$21.72	\$10.18	\$16.51	\$0.00	\$48.41
3	70	\$25.34	\$10.18	\$16.51	\$0.00	\$52.03
4	80	\$28.96	\$10.18	\$16.51	\$0.00	\$55.65
5	90	\$32.58	\$10.18	\$16.51	\$0.00	\$59.27

Effective Date - 08/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.33	\$10.18	\$16.83	\$0.00	\$45.34
2	60	\$22.00	\$10.18	\$16.83	\$0.00	\$49.01
3	70	\$25.66	\$10.18	\$16.83	\$0.00	\$52.67
4	80	\$29.33	\$10.18	\$16.83	\$0.00	\$56.34
5	90	\$32.99	\$10.18	\$16.83	\$0.00	\$60.00

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS, TILELAYERS & TERRAZZO MECH	02/01/2013	\$47.45	\$10.18	\$17.83	\$0.00	\$75.46
BRICKLAYERS LOCAL 3 - MARBLE & TILE	08/01/2013	\$48.10	\$10.18	\$18.15	\$0.00	\$76.43
	02/01/2014	\$48.66	\$10.18	\$18.15	\$0.00	\$76.99
	08/01/2014	\$49.56	\$10.18	\$18.22	\$0.00	\$77.96
	02/01/2015	\$50.12	\$10.18	\$18.22	\$0.00	\$78.52
	08/01/2015	\$51.02	\$10.18	\$18.29	\$0.00	\$79.49
	02/01/2016	\$51.59	\$10.18	\$18.29	\$0.00	\$80.06
	08/01/2016	\$52.49	\$10.18	\$18.37	\$0.00	\$81.04
	02/01/2017	\$53.06	\$10.18	\$18.37	\$0.00	\$81.61

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

Effective Date - 02/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.73	\$10.18	\$17.83	\$0.00	\$51.74
2	60	\$28.47	\$10.18	\$17.83	\$0.00	\$56.48
3	70	\$33.22	\$10.18	\$17.83	\$0.00	\$61.23
4	80	\$37.96	\$10.18	\$17.83	\$0.00	\$65.97
5	90	\$42.71	\$10.18	\$17.83	\$0.00	\$70.72

Effective Date - 08/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.05	\$10.18	\$18.15	\$0.00	\$52.38
2	60	\$28.86	\$10.18	\$18.15	\$0.00	\$57.19
3	70	\$33.67	\$10.18	\$18.15	\$0.00	\$62.00
4	80	\$38.48	\$10.18	\$18.15	\$0.00	\$66.81
5	90	\$43.29	\$10.18	\$18.15	\$0.00	\$71.62

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2013	\$39.96	\$10.00	\$13.55	\$0.00	\$63.51
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2013	\$40.74	\$10.00	\$13.55	\$0.00	\$64.29
MECHANICS MAINTENANCE <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2013	\$39.96	\$10.00	\$13.55	\$0.00	\$63.51
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2013	\$40.74	\$10.00	\$13.55	\$0.00	\$64.29
MILLWRIGHT (Zone 1) <i>MILLWRIGHTS LOCAL 1121 - Zone 1</i>	04/01/2013	\$34.68	\$9.80	\$15.76	\$0.00	\$60.24
	10/01/2013	\$35.45	\$9.80	\$15.76	\$0.00	\$61.01
	04/01/2014	\$36.23	\$9.80	\$15.76	\$0.00	\$61.79
	10/01/2014	\$37.18	\$9.80	\$15.76	\$0.00	\$62.74
	04/01/2015	\$38.14	\$9.80	\$15.76	\$0.00	\$63.70

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - MILLWRIGHT - Local 1121 Zone 1

Effective Date - 04/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$19.07	\$9.80	\$4.32	\$0.00	\$33.19
2	65	\$22.54	\$9.80	\$13.01	\$0.00	\$45.35
3	75	\$26.01	\$9.80	\$13.80	\$0.00	\$49.61
4	85	\$29.48	\$9.80	\$14.58	\$0.00	\$53.86

Effective Date - 10/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$19.50	\$9.80	\$4.32	\$0.00	\$33.62
2	65	\$23.04	\$9.80	\$13.01	\$0.00	\$45.85
3	75	\$26.59	\$9.80	\$13.80	\$0.00	\$50.19
4	85	\$30.13	\$9.80	\$14.58	\$0.00	\$54.51

Notes:

Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:5

MORTAR MIXER LABORERS - ZONE 1	06/01/2013	\$33.30	\$7.10	\$12.45	\$0.00	\$52.85
	12/01/2013	\$34.05	\$7.10	\$12.45	\$0.00	\$53.60
	06/01/2014	\$34.80	\$7.10	\$12.45	\$0.00	\$54.35
	12/01/2014	\$35.55	\$7.10	\$12.45	\$0.00	\$55.10
	06/01/2015	\$36.30	\$7.10	\$12.45	\$0.00	\$55.85
	12/01/2015	\$37.05	\$7.10	\$12.45	\$0.00	\$56.60
	06/01/2016	\$37.80	\$7.10	\$12.45	\$0.00	\$57.35
	12/01/2016	\$38.80	\$7.10	\$12.45	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
OILER (OTHER THAN TRUCK CRANES,GRADALLS) OPERATING ENGINEERS LOCAL 4	06/01/2013	\$21.17	\$10.00	\$13.55	\$0.00	\$44.72
	12/01/2013	\$21.59	\$10.00	\$13.55	\$0.00	\$45.14
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OILER (TRUCK CRANES, GRADALLS) OPERATING ENGINEERS LOCAL 4	06/01/2013	\$24.57	\$10.00	\$13.55	\$0.00	\$48.12
	12/01/2013	\$25.06	\$10.00	\$13.55	\$0.00	\$48.61
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS II OPERATING ENGINEERS LOCAL 4	06/01/2013	\$39.96	\$10.00	\$13.55	\$0.00	\$63.51
	12/01/2013	\$40.74	\$10.00	\$13.55	\$0.00	\$64.29
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) PAINTERS LOCAL 35 - ZONE 2	01/01/2013	\$45.01	\$7.80	\$15.60	\$0.00	\$68.41

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 01/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.51	\$7.80	\$0.00	\$0.00	\$30.31
2	55	\$24.76	\$7.80	\$3.52	\$0.00	\$36.08
3	60	\$27.01	\$7.80	\$3.84	\$0.00	\$38.65
4	65	\$29.26	\$7.80	\$4.16	\$0.00	\$41.22
5	70	\$31.51	\$7.80	\$13.68	\$0.00	\$52.99
6	75	\$33.76	\$7.80	\$14.00	\$0.00	\$55.56
7	80	\$36.01	\$7.80	\$14.32	\$0.00	\$58.13
8	90	\$40.51	\$7.80	\$14.96	\$0.00	\$63.27

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *	01/01/2013	\$35.91	\$7.80	\$15.60	\$0.00	\$59.31
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* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2

Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - New

Effective Date - 01/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.96	\$7.80	\$0.00	\$0.00	\$25.76
2	55	\$19.75	\$7.80	\$3.52	\$0.00	\$31.07
3	60	\$21.55	\$7.80	\$3.84	\$0.00	\$33.19
4	65	\$23.34	\$7.80	\$4.16	\$0.00	\$35.30
5	70	\$25.14	\$7.80	\$13.68	\$0.00	\$46.62
6	75	\$26.93	\$7.80	\$14.00	\$0.00	\$48.73
7	80	\$28.73	\$7.80	\$14.32	\$0.00	\$50.85
8	90	\$32.32	\$7.80	\$14.96	\$0.00	\$55.08

Notes:

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT)	01/01/2013	\$33.97	\$7.80	\$15.60	\$0.00	\$57.37
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PAINTERS LOCAL 35 - ZONE 2

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint

Effective Date - 01/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$16.99	\$7.80	\$0.00	\$0.00	\$24.79
2	55	\$18.68	\$7.80	\$3.52	\$0.00	\$30.00
3	60	\$20.38	\$7.80	\$3.84	\$0.00	\$32.02
4	65	\$22.08	\$7.80	\$4.16	\$0.00	\$34.04
5	70	\$23.78	\$7.80	\$13.68	\$0.00	\$45.26
6	75	\$25.48	\$7.80	\$14.00	\$0.00	\$47.28
7	80	\$27.18	\$7.80	\$14.32	\$0.00	\$49.30
8	90	\$30.57	\$7.80	\$14.96	\$0.00	\$53.33

Notes:

Apprentice to Journeyworker Ratio:1:1

PAINTER (TRAFFIC MARKINGS) LABORERS - ZONE 1	06/01/2013	\$33.05	\$7.10	\$12.45	\$0.00	\$52.60
	12/01/2013	\$33.80	\$7.10	\$12.45	\$0.00	\$53.35
	06/01/2014	\$34.55	\$7.10	\$12.45	\$0.00	\$54.10
	12/01/2014	\$35.30	\$7.10	\$12.45	\$0.00	\$54.85
	06/01/2015	\$36.05	\$7.10	\$12.45	\$0.00	\$55.60
	12/01/2015	\$36.80	\$7.10	\$12.45	\$0.00	\$56.35
	06/01/2016	\$37.55	\$7.10	\$12.45	\$0.00	\$57.10
	12/01/2016	\$38.55	\$7.10	\$12.45	\$0.00	\$58.10

For Apprentice rates see "Apprentice- LABORER"

PAINTER / TAPER (BRUSH, NEW) *	01/01/2013	\$34.51	\$7.80	\$15.60	\$0.00	\$57.91
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* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2

Apprentice - PAINTER - Local 35 Zone 2 - BRUSH NEW

Effective Date - 01/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.26	\$7.80	\$0.00	\$0.00	\$25.06
2	55	\$18.98	\$7.80	\$3.52	\$0.00	\$30.30
3	60	\$20.71	\$7.80	\$3.84	\$0.00	\$32.35
4	65	\$22.43	\$7.80	\$4.16	\$0.00	\$34.39
5	70	\$24.16	\$7.80	\$13.68	\$0.00	\$45.64
6	75	\$25.88	\$7.80	\$14.00	\$0.00	\$47.68
7	80	\$27.61	\$7.80	\$14.32	\$0.00	\$49.73
8	90	\$31.06	\$7.80	\$14.96	\$0.00	\$53.82

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Painter / Taper (BRUSH, REPAINT) <i>PAINTERS LOCAL 35 - ZONE 2</i>	01/01/2013	\$32.57	\$7.80	\$15.60	\$0.00	\$55.97

Apprentice - PAINTER Local 35 Zone 2 - BRUSH REPAINT

Effective Date - 01/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$16.29	\$7.80	\$0.00	\$0.00	\$24.09
2	55	\$17.91	\$7.80	\$3.52	\$0.00	\$29.23
3	60	\$19.54	\$7.80	\$3.84	\$0.00	\$31.18
4	65	\$21.17	\$7.80	\$4.16	\$0.00	\$33.13
5	70	\$22.80	\$7.80	\$13.68	\$0.00	\$44.28
6	75	\$24.43	\$7.80	\$14.00	\$0.00	\$46.23
7	80	\$26.06	\$7.80	\$14.32	\$0.00	\$48.18
8	90	\$29.31	\$7.80	\$14.96	\$0.00	\$52.07

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PANEL & PICKUP TRUCKS DRIVER <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2012	\$31.38	\$8.91	\$8.00	\$0.00	\$48.29
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2012	\$39.20	\$9.80	\$17.67	\$0.00	\$66.67
	08/01/2013	\$40.70	\$9.80	\$17.67	\$0.00	\$68.17
	08/01/2014	\$42.20	\$9.80	\$17.67	\$0.00	\$69.67
	08/01/2015	\$43.70	\$9.80	\$17.67	\$0.00	\$71.17
PILE DRIVER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2012	\$39.20	\$9.80	\$17.67	\$0.00	\$66.67
	08/01/2013	\$40.70	\$9.80	\$17.67	\$0.00	\$68.17
	08/01/2014	\$42.20	\$9.80	\$17.67	\$0.00	\$69.67
	08/01/2015	\$43.70	\$9.80	\$17.67	\$0.00	\$71.17

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PILE DRIVER - Local 56 Zone 1

Effective Date - 08/01/2012

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.60	\$9.80	\$17.67	\$0.00	\$47.07
2	60	\$23.52	\$9.80	\$17.67	\$0.00	\$50.99
3	70	\$27.44	\$9.80	\$17.67	\$0.00	\$54.91
4	75	\$29.40	\$9.80	\$17.67	\$0.00	\$56.87
5	80	\$31.36	\$9.80	\$17.67	\$0.00	\$58.83
6	80	\$31.36	\$9.80	\$17.67	\$0.00	\$58.83
7	90	\$35.28	\$9.80	\$17.67	\$0.00	\$62.75
8	90	\$35.28	\$9.80	\$17.67	\$0.00	\$62.75

Effective Date - 08/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.35	\$9.80	\$17.67	\$0.00	\$47.82
2	60	\$24.42	\$9.80	\$17.67	\$0.00	\$51.89
3	70	\$28.49	\$9.80	\$17.67	\$0.00	\$55.96
4	75	\$30.53	\$9.80	\$17.67	\$0.00	\$58.00
5	80	\$32.56	\$9.80	\$17.67	\$0.00	\$60.03
6	80	\$32.56	\$9.80	\$17.67	\$0.00	\$60.03
7	90	\$36.63	\$9.80	\$17.67	\$0.00	\$64.10
8	90	\$36.63	\$9.80	\$17.67	\$0.00	\$64.10

Notes:

Apprentice to Journeyworker Ratio:1:3

PIPEFITTER & STEAMFITTER PIPEFITTERS LOCAL 537	03/01/2013	\$49.34	\$8.75	\$14.39	\$0.00	\$72.48
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Apprentice - PIPEFITTER - Local 537

Effective Date - 03/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$19.74	\$8.75	\$6.50	\$0.00	\$34.99
2	45	\$22.20	\$8.75	\$14.39	\$0.00	\$45.34
3	60	\$29.60	\$8.75	\$14.39	\$0.00	\$52.74
4	70	\$34.54	\$8.75	\$14.39	\$0.00	\$57.68
5	80	\$39.47	\$8.75	\$14.39	\$0.00	\$62.61

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

Apprentice to Journeyworker Ratio:**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIPELAYER <i>LABORERS - ZONE 1</i>	06/01/2013	\$33.30	\$7.10	\$12.45	\$0.00	\$52.85
	12/01/2013	\$34.05	\$7.10	\$12.45	\$0.00	\$53.60
	06/01/2014	\$34.80	\$7.10	\$12.45	\$0.00	\$54.35
	12/01/2014	\$35.55	\$7.10	\$12.45	\$0.00	\$55.10
	06/01/2015	\$36.30	\$7.10	\$12.45	\$0.00	\$55.85
	12/01/2015	\$37.05	\$7.10	\$12.45	\$0.00	\$56.60
	06/01/2016	\$37.80	\$7.10	\$12.45	\$0.00	\$57.35
	12/01/2016	\$38.80	\$7.10	\$12.45	\$0.00	\$58.35

For apprentice rates see "Apprentice- LABORER"

PLUMBERS & GASFITTERS <i>PLUMBERS & GASFITTERS LOCAL 12</i>	03/01/2013	\$49.31	\$9.32	\$13.29	\$0.00	\$71.92
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Apprentice - PLUMBER/GASFITTER - Local 12

Effective Date - 03/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$17.26	\$9.32	\$4.97	\$0.00	\$31.55
2	40	\$19.72	\$9.32	\$5.61	\$0.00	\$34.65
3	55	\$27.12	\$9.32	\$7.53	\$0.00	\$43.97
4	65	\$32.05	\$9.32	\$8.81	\$0.00	\$50.18
5	75	\$36.98	\$9.32	\$10.09	\$0.00	\$56.39

Notes:

** 1:2; 2:6; 3:10; 4:14; 5:19/Steps are 1 yr
Step4 with lic\$53.29 Step5 with lic\$59.49

Apprentice to Journeyworker Ratio:**

PNEUMATIC CONTROLS (TEMP.) <i>PIPEFITTERS LOCAL 537</i>	03/01/2013	\$49.34	\$8.75	\$14.39	\$0.00	\$72.48
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For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

PNEUMATIC DRILL/TOOL OPERATOR <i>LABORERS - ZONE 1</i>	06/01/2013	\$33.30	\$7.10	\$12.45	\$0.00	\$52.85
	12/01/2013	\$34.05	\$7.10	\$12.45	\$0.00	\$53.60
	06/01/2014	\$34.80	\$7.10	\$12.45	\$0.00	\$54.35
	12/01/2014	\$35.55	\$7.10	\$12.45	\$0.00	\$55.10
	06/01/2015	\$36.30	\$7.10	\$12.45	\$0.00	\$55.85
	12/01/2015	\$37.05	\$7.10	\$12.45	\$0.00	\$56.60
	06/01/2016	\$37.80	\$7.10	\$12.45	\$0.00	\$57.35
	12/01/2016	\$38.80	\$7.10	\$12.45	\$0.00	\$58.35

For apprentice rates see "Apprentice- LABORER"

POWDERMAN & BLASTER <i>LABORERS - ZONE 1</i>	06/01/2013	\$34.05	\$7.10	\$12.45	\$0.00	\$53.60
	12/01/2013	\$34.80	\$7.10	\$12.45	\$0.00	\$54.35
	06/01/2014	\$35.55	\$7.10	\$12.45	\$0.00	\$55.10
	12/01/2014	\$36.30	\$7.10	\$12.45	\$0.00	\$55.85
	06/01/2015	\$37.05	\$7.10	\$12.45	\$0.00	\$56.60
	12/01/2015	\$37.80	\$7.10	\$12.45	\$0.00	\$57.35
	06/01/2016	\$38.55	\$7.10	\$12.45	\$0.00	\$58.10
	12/01/2016	\$39.55	\$7.10	\$12.45	\$0.00	\$59.10

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWER SHOVEL/DERRICK/TRENCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2013	\$40.34	\$10.00	\$13.55	\$0.00	\$63.89
	12/01/2013	\$41.12	\$10.00	\$13.55	\$0.00	\$64.67
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2013	\$40.34	\$10.00	\$13.55	\$0.00	\$63.89
	12/01/2013	\$41.12	\$10.00	\$13.55	\$0.00	\$64.67
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2013	\$28.19	\$10.00	\$13.55	\$0.00	\$51.74
	12/01/2013	\$28.74	\$10.00	\$13.55	\$0.00	\$52.29
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS LOCAL 25c</i>	05/01/2011	\$31.21	\$7.25	\$6.19	\$0.00	\$44.65
RECLAIMERS <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2013	\$39.96	\$10.00	\$13.55	\$0.00	\$63.51
	12/01/2013	\$40.74	\$10.00	\$13.55	\$0.00	\$64.29
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RESIDENTIAL WOOD FRAME (All Other Work) <i>CARPENTERS -ZONE 2 (Residential Wood)</i>	04/01/2011	\$24.24	\$8.67	\$15.51	\$0.00	\$48.42
RESIDENTIAL WOOD FRAME CARPENTER ** ** The Residential Wood Frame Carpenter classification applies only to the construction of new, wood frame residences that do not exceed four stories including the basement. <i>CARPENTERS -ZONE 2 (Residential Wood)</i>	05/01/2011	\$24.24	\$6.34	\$6.23	\$0.00	\$36.81
As of 9/1/09 Carpentry work on wood-frame residential WEATHERIZATION projects shall be paid the RESIDENTIAL WOOD FRAME CARPENTER rate.						
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 1</i>	06/01/2013	\$33.30	\$7.10	\$12.45	\$0.00	\$52.85
	12/01/2013	\$34.05	\$7.10	\$12.45	\$0.00	\$53.60
	06/01/2014	\$34.80	\$7.10	\$12.45	\$0.00	\$54.35
	12/01/2014	\$35.55	\$7.10	\$12.45	\$0.00	\$55.10
	06/01/2015	\$36.30	\$7.10	\$12.45	\$0.00	\$55.85
	12/01/2015	\$37.05	\$7.10	\$12.45	\$0.00	\$56.60
	06/01/2016	\$37.80	\$7.10	\$12.45	\$0.00	\$57.35
12/01/2016	\$38.80	\$7.10	\$12.45	\$0.00	\$58.35	
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2013	\$39.96	\$10.00	\$13.55	\$0.00	\$63.51
	12/01/2013	\$40.74	\$10.00	\$13.55	\$0.00	\$64.29
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofing Waterproofing &Roofing Damproofing) <i>ROOFERS LOCAL 33</i>	02/01/2013	\$37.41	\$10.50	\$10.70	\$0.00	\$58.61

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - ROOFER - Local 33

Effective Date - 02/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.71	\$10.50	\$3.38	\$0.00	\$32.59
2	60	\$22.45	\$10.50	\$10.70	\$0.00	\$43.65
3	65	\$24.32	\$10.50	\$10.70	\$0.00	\$45.52
4	75	\$28.06	\$10.50	\$10.70	\$0.00	\$49.26
5	85	\$31.80	\$10.50	\$10.70	\$0.00	\$53.00

Notes: ** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1
Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs.

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE ROOFERS LOCAL 33	02/01/2013	\$37.66	\$10.50	\$10.70	\$0.00	\$58.86
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For apprentice rates see "Apprentice- ROOFER"

SHEETMETAL WORKER SHEETMETAL WORKERS LOCAL 17 - A	02/01/2013	\$42.32	\$9.82	\$18.24	\$2.11	\$72.49
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Apprentice - SHEET METAL WORKER - Local 17-A

Effective Date - 02/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$16.93	\$9.82	\$4.00	\$0.00	\$30.75
2	40	\$16.93	\$9.82	\$4.00	\$0.00	\$30.75
3	45	\$19.04	\$9.82	\$8.00	\$1.11	\$37.97
4	45	\$19.04	\$9.82	\$8.00	\$1.11	\$37.97
5	50	\$21.16	\$9.82	\$8.75	\$1.19	\$40.92
6	50	\$21.16	\$9.82	\$9.00	\$1.20	\$41.18
7	60	\$25.39	\$9.82	\$10.24	\$1.36	\$46.81
8	65	\$27.51	\$9.82	\$10.99	\$1.45	\$49.77
9	75	\$31.74	\$9.82	\$12.49	\$1.62	\$55.67
10	85	\$35.97	\$9.82	\$13.49	\$1.78	\$61.06

Notes:
Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

SIGN ERECTOR PAINTERS LOCAL 35 - ZONE 2	06/01/2013	\$25.81	\$7.07	\$7.05	\$0.00	\$39.93
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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - SIGN ERECTOR - Local 35 Zone 2

Effective Date - 06/01/2013

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

Notes:
Steps are 4 mos.

Apprentice to Journeyworker Ratio:1:1

SPECIALIZED EARTH MOVING EQUIP < 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2012	\$31.84	\$8.91	\$8.00	\$0.00	\$48.75
SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2012	\$32.13	\$8.91	\$8.00	\$0.00	\$49.04
SPRINKLER FITTER <i>SPRINKLER FITTERS LOCAL 550 - (Section A)</i>	03/01/2013	\$52.58	\$8.42	\$12.60	\$0.00	\$73.60

Apprentice - SPRINKLER FITTER - Local 550

Effective Date - 03/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$18.40	\$8.42	\$8.00	\$0.00	\$34.82
2	40	\$21.03	\$8.42	\$8.00	\$0.00	\$37.45
3	45	\$23.66	\$8.42	\$8.00	\$0.00	\$40.08
4	50	\$26.29	\$8.42	\$8.00	\$0.00	\$42.71
5	55	\$28.92	\$8.42	\$8.00	\$0.00	\$45.34
6	60	\$31.55	\$8.42	\$8.00	\$0.00	\$47.97
7	65	\$34.18	\$8.42	\$8.00	\$0.00	\$50.60
8	70	\$36.81	\$8.42	\$8.00	\$0.00	\$53.23
9	75	\$39.44	\$8.42	\$8.00	\$0.00	\$55.86
10	80	\$42.06	\$8.42	\$8.00	\$0.00	\$58.48

Notes:
Steps are 850 hours

Apprentice to Journeyworker Ratio:1:1

STEAM BOILER OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2013	\$39.96	\$10.00	\$13.55	\$0.00	\$63.51
	12/01/2013	\$40.74	\$10.00	\$13.55	\$0.00	\$64.29

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN OPERATING ENGINEERS LOCAL 4	06/01/2013	\$39.96	\$10.00	\$13.55	\$0.00	\$63.51
	12/01/2013	\$40.74	\$10.00	\$13.55	\$0.00	\$64.29
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TELECOMMUNICATION TECHNICIAN ELECTRICIANS LOCAL 103	03/01/2013	\$32.64	\$13.00	\$12.51	\$0.00	\$58.15
	09/01/2013	\$33.15	\$13.00	\$12.52	\$0.00	\$58.67
	03/01/2014	\$33.69	\$13.00	\$12.54	\$0.00	\$59.23
	09/01/2014	\$34.20	\$13.00	\$12.56	\$0.00	\$59.76
	03/01/2015	\$34.74	\$13.00	\$12.57	\$0.00	\$60.31
	09/01/2015	\$35.45	\$13.00	\$12.59	\$0.00	\$61.04
	03/01/2016	\$36.17	\$13.00	\$12.62	\$0.00	\$61.79

Apprentice - TELECOMMUNICATION TECHNICIAN - Local 103

Effective Date - 03/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$13.06	\$13.00	\$0.39	\$0.00	\$26.45
2	40	\$13.06	\$13.00	\$0.39	\$0.00	\$26.45
3	45	\$14.69	\$13.00	\$10.77	\$0.00	\$38.46
4	45	\$14.69	\$13.00	\$10.77	\$0.00	\$38.46
5	50	\$16.32	\$13.00	\$11.02	\$0.00	\$40.34
6	55	\$17.95	\$13.00	\$11.27	\$0.00	\$42.22
7	60	\$19.58	\$13.00	\$11.52	\$0.00	\$44.10
8	65	\$21.22	\$13.00	\$11.77	\$0.00	\$45.99
9	70	\$22.85	\$13.00	\$12.02	\$0.00	\$47.87
10	75	\$24.48	\$13.00	\$12.26	\$0.00	\$49.74

Effective Date - 09/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$13.26	\$13.00	\$0.40	\$0.00	\$26.66
2	40	\$13.26	\$13.00	\$0.40	\$0.00	\$26.66
3	45	\$14.92	\$13.00	\$9.79	\$0.00	\$37.71
4	45	\$14.92	\$13.00	\$9.79	\$0.00	\$37.71
5	50	\$16.58	\$13.00	\$10.04	\$0.00	\$39.62
6	55	\$18.23	\$13.00	\$10.29	\$0.00	\$41.52
7	60	\$19.89	\$13.00	\$10.54	\$0.00	\$43.43
8	65	\$21.55	\$13.00	\$10.79	\$0.00	\$45.34
9	70	\$23.21	\$13.00	\$11.04	\$0.00	\$47.25
10	75	\$24.86	\$13.00	\$11.29	\$0.00	\$49.15

Notes:

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TERRAZZO FINISHERS BRICKLAYERS LOCAL 3 - MARBLE & TILE	02/01/2013	\$46.35	\$10.18	\$17.83	\$0.00	\$74.36
	08/01/2013	\$47.00	\$10.18	\$18.15	\$0.00	\$75.33
	02/01/2014	\$47.56	\$10.18	\$18.15	\$0.00	\$75.89
	08/01/2014	\$48.46	\$10.18	\$18.22	\$0.00	\$76.86
	02/01/2015	\$49.02	\$10.18	\$18.22	\$0.00	\$77.42
	08/01/2015	\$49.92	\$10.18	\$18.29	\$0.00	\$78.39
	02/01/2016	\$50.49	\$10.18	\$18.29	\$0.00	\$78.96
	08/01/2016	\$51.39	\$10.18	\$18.37	\$0.00	\$79.94
	02/01/2017	\$51.96	\$10.18	\$18.37	\$0.00	\$80.51

Apprentice - TERRAZZO FINISHER - Local 3 Marble & Tile

Effective Date - 02/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.18	\$10.18	\$17.83	\$0.00	\$51.19
2	60	\$27.81	\$10.18	\$17.83	\$0.00	\$55.82
3	70	\$32.45	\$10.18	\$17.83	\$0.00	\$60.46
4	80	\$37.08	\$10.18	\$17.83	\$0.00	\$65.09
5	90	\$41.72	\$10.18	\$17.83	\$0.00	\$69.73

Effective Date - 08/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.50	\$10.18	\$18.15	\$0.00	\$51.83
2	60	\$28.20	\$10.18	\$18.15	\$0.00	\$56.53
3	70	\$32.90	\$10.18	\$18.15	\$0.00	\$61.23
4	80	\$37.60	\$10.18	\$18.15	\$0.00	\$65.93
5	90	\$42.30	\$10.18	\$18.15	\$0.00	\$70.63

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER LABORERS - FOUNDATION AND MARINE	06/01/2013	\$34.45	\$7.10	\$12.60	\$0.00	\$54.15
	12/01/2013	\$35.20	\$7.10	\$12.60	\$0.00	\$54.90
	06/01/2014	\$35.95	\$7.10	\$12.60	\$0.00	\$55.65
	12/01/2014	\$36.70	\$7.10	\$12.60	\$0.00	\$56.40
	06/01/2015	\$37.45	\$7.10	\$12.60	\$0.00	\$57.15
	12/01/2015	\$38.20	\$7.10	\$12.60	\$0.00	\$57.90
	06/01/2016	\$38.95	\$7.10	\$12.60	\$0.00	\$58.65
	12/01/2016	\$39.95	\$7.10	\$12.60	\$0.00	\$59.65

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TEST BORING DRILLER HELPER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2013	\$33.17	\$7.10	\$12.60	\$0.00	\$52.87
	12/01/2013	\$33.92	\$7.10	\$12.60	\$0.00	\$53.62
	06/01/2014	\$34.67	\$7.10	\$12.60	\$0.00	\$54.37
	12/01/2014	\$35.42	\$7.10	\$12.60	\$0.00	\$55.12
	06/01/2015	\$36.17	\$7.10	\$12.60	\$0.00	\$55.87
	12/01/2015	\$36.92	\$7.10	\$12.60	\$0.00	\$56.62
	06/01/2016	\$37.67	\$7.10	\$12.60	\$0.00	\$57.37
	12/01/2016	\$38.67	\$7.10	\$12.60	\$0.00	\$58.37
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2013	\$33.05	\$7.10	\$12.60	\$0.00	\$52.75
	12/01/2013	\$33.80	\$7.10	\$12.60	\$0.00	\$53.50
	06/01/2014	\$34.55	\$7.10	\$12.60	\$0.00	\$54.25
	12/01/2014	\$35.30	\$7.10	\$12.60	\$0.00	\$55.00
	06/01/2015	\$36.05	\$7.10	\$12.60	\$0.00	\$55.75
	12/01/2015	\$36.80	\$7.10	\$12.60	\$0.00	\$56.50
	06/01/2016	\$37.55	\$7.10	\$12.60	\$0.00	\$57.25
	12/01/2016	\$38.55	\$7.10	\$12.60	\$0.00	\$58.25
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2013	\$39.96	\$10.00	\$13.55	\$0.00	\$63.51
	12/01/2013	\$40.74	\$10.00	\$13.55	\$0.00	\$64.29
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2012	\$32.42	\$9.07	\$8.00	\$0.00	\$49.49
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	06/01/2013	\$45.33	\$7.10	\$13.00	\$0.00	\$65.43
	12/01/2013	\$46.08	\$7.10	\$13.00	\$0.00	\$66.18
	06/01/2014	\$46.83	\$7.10	\$13.00	\$0.00	\$66.93
	12/01/2014	\$47.58	\$7.10	\$13.00	\$0.00	\$67.68
	06/01/2015	\$48.33	\$7.10	\$13.00	\$0.00	\$68.43
	12/01/2015	\$49.08	\$7.10	\$13.00	\$0.00	\$69.18
	06/01/2016	\$49.83	\$7.10	\$13.00	\$0.00	\$69.93
	12/01/2016	\$50.83	\$7.10	\$13.00	\$0.00	\$70.93
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	06/01/2013	\$47.33	\$7.10	\$13.00	\$0.00	\$67.43
	12/01/2013	\$48.08	\$7.10	\$13.00	\$0.00	\$68.18
	06/01/2014	\$48.83	\$7.10	\$13.00	\$0.00	\$68.93
	12/01/2014	\$49.58	\$7.10	\$13.00	\$0.00	\$69.68
	06/01/2015	\$50.33	\$7.10	\$13.00	\$0.00	\$70.43
	12/01/2015	\$51.08	\$7.10	\$13.00	\$0.00	\$71.18
	06/01/2016	\$51.83	\$7.10	\$13.00	\$0.00	\$71.93
	12/01/2016	\$52.83	\$7.10	\$13.00	\$0.00	\$72.93
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	06/01/2013	\$37.40	\$7.10	\$13.00	\$0.00	\$57.50
	12/01/2013	\$38.15	\$7.10	\$13.00	\$0.00	\$58.25
	06/01/2014	\$38.90	\$7.10	\$13.00	\$0.00	\$59.00
	12/01/2014	\$39.65	\$7.10	\$13.00	\$0.00	\$59.75
	06/01/2015	\$40.40	\$7.10	\$13.00	\$0.00	\$60.50
	12/01/2015	\$41.15	\$7.10	\$13.00	\$0.00	\$61.25
	06/01/2016	\$41.90	\$7.10	\$13.00	\$0.00	\$62.00
	12/01/2016	\$42.90	\$7.10	\$13.00	\$0.00	\$63.00
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	06/01/2013	\$39.40	\$7.10	\$13.00	\$0.00	\$59.50
	12/01/2013	\$40.15	\$7.10	\$13.00	\$0.00	\$60.25
	06/01/2014	\$40.90	\$7.10	\$13.00	\$0.00	\$61.00
	12/01/2014	\$41.65	\$7.10	\$13.00	\$0.00	\$61.75
	06/01/2015	\$42.40	\$7.10	\$13.00	\$0.00	\$62.50
	12/01/2015	\$43.15	\$7.10	\$13.00	\$0.00	\$63.25
	06/01/2016	\$43.90	\$7.10	\$13.00	\$0.00	\$64.00
	12/01/2016	\$44.90	\$7.10	\$13.00	\$0.00	\$65.00
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2012	\$31.84	\$8.91	\$8.00	\$0.00	\$48.75
WAGON DRILL OPERATOR <i>LABORERS - ZONE 1</i>	06/01/2013	\$33.30	\$7.10	\$12.45	\$0.00	\$52.85
	12/01/2013	\$34.05	\$7.10	\$12.45	\$0.00	\$53.60
	06/01/2014	\$34.80	\$7.10	\$12.45	\$0.00	\$54.35
	12/01/2014	\$35.55	\$7.10	\$12.45	\$0.00	\$55.10
	06/01/2015	\$36.30	\$7.10	\$12.45	\$0.00	\$55.85
	12/01/2015	\$37.05	\$7.10	\$12.45	\$0.00	\$56.60
	06/01/2016	\$37.80	\$7.10	\$12.45	\$0.00	\$57.35
	12/01/2016	\$38.80	\$7.10	\$12.45	\$0.00	\$58.35
For apprentice rates see "Apprentice- LABORER"						
WASTE WATER PUMP OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2013	\$40.34	\$10.00	\$13.55	\$0.00	\$63.89
	12/01/2013	\$41.12	\$10.00	\$13.55	\$0.00	\$64.67
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER <i>PLUMBERS & GASFITTERS LOCAL 12</i>	03/01/2013	\$49.31	\$9.32	\$13.29	\$0.00	\$71.92
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
Outside Electrical - East						
CABLE TECHNICIAN (Power Zone) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	03/03/2013	\$25.18	\$8.20	\$4.17	\$0.00	\$37.55
	09/01/2013	\$25.66	\$8.70	\$4.48	\$0.00	\$38.84
For apprentice rates see "Apprentice- LINEMAN"						
CABLEMAN (Underground Ducts & Cables) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	03/03/2013	\$35.67	\$8.20	\$4.98	\$0.00	\$48.85
	09/01/2013	\$36.55	\$8.70	\$6.58	\$0.00	\$51.83
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN CDL <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	03/03/2013	\$29.38	\$8.20	\$5.68	\$0.00	\$43.26
	09/01/2013	\$29.94	\$8.70	\$6.05	\$0.00	\$44.69
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	03/03/2013	\$23.08	\$8.20	\$3.94	\$0.00	\$35.22
	09/01/2013	\$23.52	\$8.70	\$5.24	\$0.00	\$37.46
For apprentice rates see "Apprentice- LINEMAN"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
EQUIPMENT OPERATOR (Class A CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	03/03/2013	\$35.67	\$8.20	\$8.98	\$0.00	\$52.85
	09/01/2013	\$36.35	\$8.70	\$9.43	\$0.00	\$54.48
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class B CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	03/03/2013	\$31.48	\$8.20	\$6.19	\$0.00	\$45.87
	09/01/2013	\$32.08	\$8.70	\$6.59	\$0.00	\$47.37
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	03/03/2013	\$23.08	\$8.20	\$3.42	\$0.00	\$34.70
	09/01/2013	\$23.52	\$8.70	\$3.72	\$0.00	\$35.94
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN -Inexperienced (<2000 Hrs.) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	03/03/2013	\$18.89	\$8.20	\$2.61	\$0.00	\$29.70
	09/01/2013	\$19.25	\$8.70	\$2.85	\$0.00	\$30.80
For apprentice rates see "Apprentice- LINEMAN"						
JOURNEYMAN LINEMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	03/03/2013	\$41.97	\$8.20	\$11.26	\$0.00	\$61.43
	09/01/2013	\$42.77	\$8.70	\$11.78	\$0.00	\$63.25

Apprentice - LINEMAN (Outside Electrical) - East Local 104

Effective Date - 03/03/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$25.18	\$8.20	\$3.92	\$0.00	\$37.30
2	65	\$27.28	\$8.20	\$4.36	\$0.00	\$39.84
3	70	\$29.38	\$8.20	\$5.06	\$0.00	\$42.64
4	75	\$31.48	\$8.20	\$5.76	\$0.00	\$45.44
5	80	\$33.58	\$8.20	\$6.46	\$0.00	\$48.24
6	85	\$35.67	\$8.20	\$7.17	\$0.00	\$51.04
7	90	\$37.77	\$8.20	\$8.36	\$0.00	\$54.33

Effective Date - 09/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$25.66	\$8.70	\$4.24	\$0.00	\$38.60
2	65	\$27.80	\$8.70	\$4.71	\$0.00	\$41.21
3	70	\$29.94	\$8.70	\$5.43	\$0.00	\$44.07
4	75	\$32.08	\$8.70	\$6.16	\$0.00	\$46.94
5	80	\$34.22	\$8.70	\$6.88	\$0.00	\$49.80
6	85	\$36.35	\$8.70	\$7.62	\$0.00	\$52.67
7	90	\$38.49	\$8.70	\$8.83	\$0.00	\$56.02

Notes:

Apprentice to Journeyworker Ratio:1:2

TELEDATA CABLE SPLICER <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	07/16/2012	\$26.33	\$4.18	\$2.79	\$0.00	\$33.30
TELEDATA LINEMAN/EQUIPMENT OPERATOR <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	07/16/2012	\$24.78	\$4.18	\$2.74	\$0.00	\$31.70
TELEDATA WIREMAN/INSTALLER/TECHNICIAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	07/16/2012	\$24.78	\$4.18	\$2.74	\$0.00	\$31.70

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TREE TRIMMER <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> This classification applies only to the trimming of branches on and around utility lines.	01/29/2012	\$17.18	\$3.37	\$0.00	\$0.00	\$20.55
TREE TRIMMER GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i> This classification applies only to the trimming of branches on and around utility lines.	01/29/2012	\$15.15	\$3.37	\$0.00	\$0.00	\$18.52

Additional Apprentices Information:

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

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

All steps are six months (1000 hours) unless otherwise specified.

- * Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof.
- ** Multiple ratios are listed in the comment field.
- *** APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.
- **** APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.

**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 a copy of their weekly payroll records to the awarding authority. This is required to be done on a weekly basis. Once collected, the awarding authority is also required to preserve those records for three years from the date of completion of the project.

Each such contractor or subcontractor shall furnish to the awarding authority directly within 15 days after completion of its portion of the work, a statement, executed by the contractor, subcontractor or by any authorized officer thereof who supervised the payment of wages, this form.

STATEMENT OF COMPLIANCE

_____, 20_____

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

do hereby state:

That I pay or supervise the payment of the persons employed by
_____ on the _____
(Contractor, subcontractor or public body) (Building or project)

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

Signature _____
Title _____

MASSACHUSETTS WEEKLY CERTIFIED PAYROLL REPORT FORM

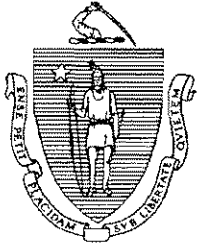


Company's Name:			Address:				Phone No.:			Payroll No.:									
Employer's Signature:			Title:				Contract No.:		Tax Payer ID No.:		Work Week Ending:								
Awarding Authority's Name:			Public Works Project Name:				Public Works Project Location:			Min. Wage Rate Sheet No.:									
General / Prime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

NOTE: Pursuant to MGL Ch. 149 s.27B, every contractor and subcontractor is required to submit a "true and accurate" copy of their weekly payroll records directly to the awarding authority. Failure to comply may result in the commencement of a criminal action or the issuance of a civil citation.

Date recieved by awarding authority / /
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MASSACHUSETTS DEP CONSTRUCTION GRANTS POLICY MEMORANDA



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

ARGEO PAUL CELLUCCI
Governor

JANE SWIFT
Lieutenant Governor

BOB DURAND
Secretary

LAUREN A. LISS
Commissioner

DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF RESOURCE PROTECTION
DIVISION OF MUNICIPAL SERVICES POLICIES

The Division of Municipal Services (DMS) has established the following policies for all Division financially-assisted projects.

POLICY MEMORANDUM NO. CG-1

EASEMENTS AND RIGHTS OF WAY

Prior to the approval of financial assistance for construction, the owner shall obtain and shall thereafter retain, a fee simple or such estate or interest in the site of construction and rights of access as will assure undisturbed use and possession for the purpose of construction and operation for the estimated life of the project. The Division may refuse to approve financial assistance until it has received from the owner sufficient assurances that such interests have been obtained. Unless the Division otherwise notifies the owner, the certificate (under pains and penalties of perjury) of the owner's legal representative shall constitute such sufficient assurance.

Additional cost which result from interruptions of construction or extensions of contract time caused by the owner's failure to obtain the necessary interests in land shall be ineligible for financial assistance, and all such additional costs shall be borne by the owner.

POLICY MEMORANDUM NO. CG-2

PERMITS

The owner shall be responsible for identifying and obtaining all federal, state, local and railroad permits required by the nature and location of construction, including but not limited to building construction permits and permits for street and highway cuts and openings, and all such permits shall be listed in a separate permits section of the contract documents. To the extent possible, such permits shall be obtained by the owner prior to the solicitation of bids for construction, and copies of all permits so obtained shall be included in the said permits section. The status of the application for each permit, including the permit conditions, and costs, not obtained prior to the solicitation of bids shall also be indicated in the contract documents permits section. The Division may refuse to approve financial assistance for construction unless and until it has received from the owner sufficient assurances that all necessary permits have been or will be obtained prior to the commencement of construction.

This information is available in alternate format by calling our ADA Coordinator at (617) 574-6872.

DEP on the World Wide Web: <http://www.state.ma.us/dep>

Printed on Recycled Paper

Policy Memorandum No. CG-2 – Permits (Con't)

The contractor shall be responsible for obtaining all permits required of his equipment, work force, or particular operations (such as blasting) in the performance of the contract and not otherwise specified in the two preceding paragraphs as to be obtained by the owner. These permit fees shall be paid by the contractor.

The owner shall be responsible for the payment of all other permit fees required by the construction.

The following permits shall not be eligible for financial participation by the Department of Environmental Protection (DEP).

- Permits and insurance for construction in railroads' rights of way;
- Building permits;
- Permits for opening public streets and other public or municipal rights of way;
- Permits for the use of explosives;
- Permits for the disposal of waste materials;
- Permits and fees for connecting to municipal utilities.

Permits required by extraordinary circumstances and not specifically excluded from eligibility above may be eligible for DEP participation. For such permits to be so eligible, the owner or his representative must notify the DEP project engineer in advance of obtaining such permit and receive from the engineer specific agreement that such permit will be eligible for DEP participation. Eligibility for such participation will not be made retroactively.

Additional costs which result from interruptions of construction or extensions of contract time resulting from the owner's or the contractor's failure to obtain the necessary permits may be ineligible for participation.

POLICY MEMORANDUM NO. CG-3

FIELD CONTROLS

The Owner shall be responsible for indicating on the contract drawings all easement limits and all property and other control lines for locating the principal component parts of the work together with those elevations and bench marks used in the design of the work, all hereinafter referred to as "field controls". Where easement and property limits have not previously been established in the field, the owner shall be responsible for establishment of such limits. From the information provided by the Owner, unless otherwise specified, the Contractor shall develop and make all layouts required for construction, such as slope stakes, batter boards, stakes for pipe locations and other working points, lines, elevations and cut sheets.

Whenever he has reason to believe that an error exists or whenever he is otherwise unable to locate the field controls, the contractor shall promptly notify the owner and the owner's engineer of such error with appropriate documentation.

POLICY MEMORANDUM NO. CG-4

RECORD DRAWINGS:

The Owner shall be responsible for the preparation of all record drawings required by this contract. This responsibility may be delegated to the Owner's representative. The responsibility for preparation of record drawings shall not be delegated or transferred to the contractor. They may use the contractor's and sub-contractor's certified AS BUILT drawings along with their own marked up set in the preparation of the Record Drawings.

Division approved contract drawings shall be revised upon completion of the contract to reflect any changes made and/or final quantities, as appropriate.

POLICY MEMORANDUM NO. CG-5

PLAN SCALE

Unless otherwise approved in advance by the Division, the horizontal scale for construction plans for non-structural facilities shall be 1" = 40'. A larger horizontal scale shall be used where appropriate to show sufficient detail to construct the project. The vertical scale for construction plans for non-structural facilities shall be 1" = 4'. Based on the best information available at the time of their preparation, the location of underground utilities and support structures for overhead utilities shall be shown on the plans.

Unless otherwise exempted in advance by the Division, construction plans shall be updated whenever the date of the advertisement for bids for the construction of such facilities is more than one year after the date of approval by the Division or EPA; and in the case of approval by both such agencies, the later approval date shall be used in determining the need for update.

The consulting engineer shall receive adequate compensation for updating plans and specifications, and such additional cost shall be eligible for assistance to the extent not otherwise prohibited by USEPA and Division regulations and program guidance.

All revision, or review without need for revision, shall be noted and dated on the plans prior to advertisement of the project for bid.

POLICY MEMORANDUM NO. CG-6

BORINGS LOGS

All soil borings shall be taken as close as practicable to the construction line, and the location of all such borings shall be clearly indicated on the contract drawings. The plan view shall show the location and boring number of each boring. The profile view shall show the location, elevation, and depth of each soil boring, the location of each change in soil stratum, the groundwater level, and the average of blow counts at each five foot interval. As a minimum, boring logs to be submitted with the plans and specifications shall show the name of the company taking the borings, the soil classification, the number of blows per foot of penetration, the groundwater elevation, and the date on which the borings were taken.

As part of the submission of plans and specification for approval, the owner's representative shall include written justification for the lesser frequency and depth of borings where their interval is more than approximately 300' or their depth is less than 50% below depth of pipe invert.

POLICY MEMORANDUM NO. CG-7

BREAKDOWN OF BID ITEMS

The following items shall, where applicable, be listed separately in the bid documents.

- 1. Mobilization
- 2. Pavement
 - a. Municipal
 - i. temporary
 - ii. permanent
 - b. State
 - i. temporary
 - ii. permanent
- 3. Concrete cradle or encasement
(to be identified where applicable)
- 4. Rock-Excavation
- 5. Wood or steel sheeting left in place
- 6. Excavation of unsuitable materials below grade.
- 7. Select and/or borrow material
- 8. Dewatering
- 9. Special Dewatering (coffer dam)

Mobilization costs are the costs of initiating the contract, exclusive of the cost of materials. Payment for mobilization shall be a lump sum at the price bid for this item in the proposal and shall be payable when the contractor is operational on the site. For purposes of this policy, "operational" shall mean the substantial commencement of work on site.

The lump sum price bid for mobilization shall not exceed five per centum (5%) of the total amount of the bid.

POLICY MEMORANDUM NO. CG-8

PAVEMENT

All roads and trenches therein shall be refilled and repaved in accordance with specifications provided by the owner in the contract documents. Please note that this policy may be excludable on Federally assisted projects where bid alternative items may be required (i.e. trench width vs. full width pavement). You are advised to seek project specific clarification.

Loan eligibility shall be limited to the following:

- A. Where the depth of the pipe invert is 0 to 8', the maximum pavement widths which shall be eligible for financial assistance are as follows:

<u>Nominal Pipe Diameter</u>	<u>Maximum Eligible Widths</u>	
	<u>Initial Pavement</u>	<u>Permanent Trench</u>
0-24"	6'-6"	8'-6"

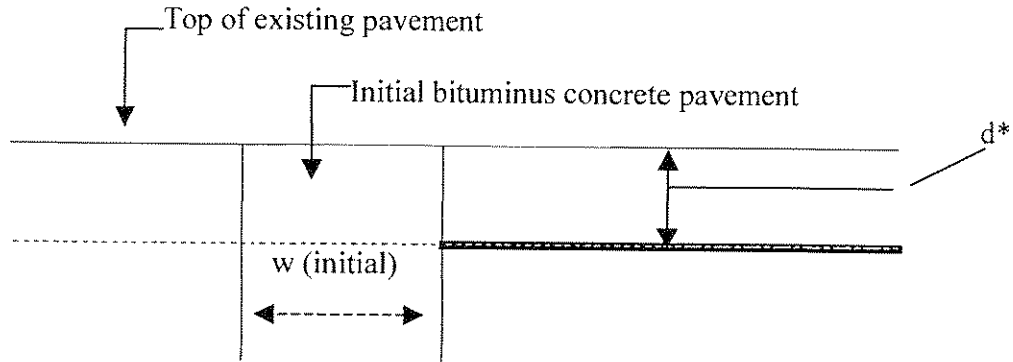
Where the nominal pipe diameter is greater than 24" the maximum eligible width for Initial re-paving shall be the nominal diameter of the pipe plus four (4) feet, and for permanent trench re-paving the maximum eligible width shall be the nominal pipe diameter plus six (6) feet.

- B. For each additional four (4) feet (or fraction thereof) of pipe invert depth, add three feet to the eligible width limits stated in paragraph A.

Policy Memorandum No. CG-8 – Pavement (Con't)

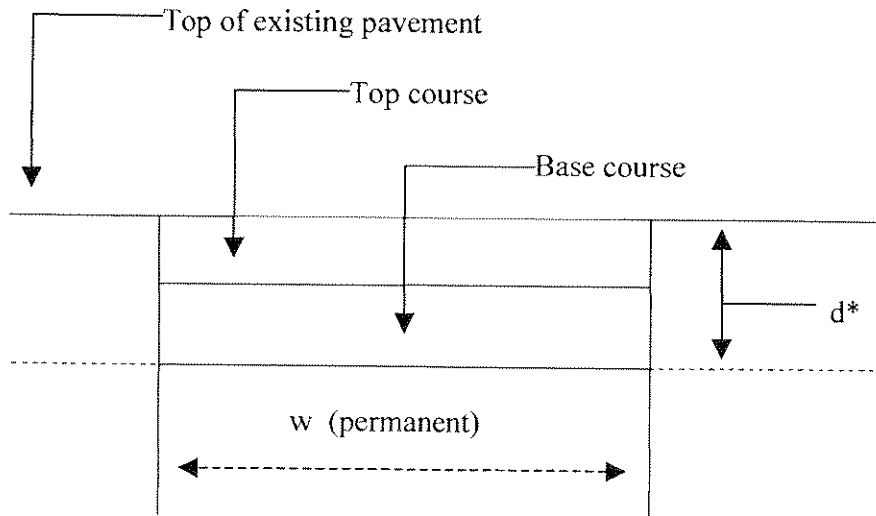
At the design phase of a project the owner has the option to elect either Initial Pavement with Option I (Permanent Trench replacement) or Initial with Option II (curb to curb over initial)

Initial Pavement



d* = depth of existing pavement to a maximum of 3 inches (see general notes #3)
w = maximum eligible Initial pavement width as described in paragraphs "A" & "B" on page DEP-DMS-CG's-P4.

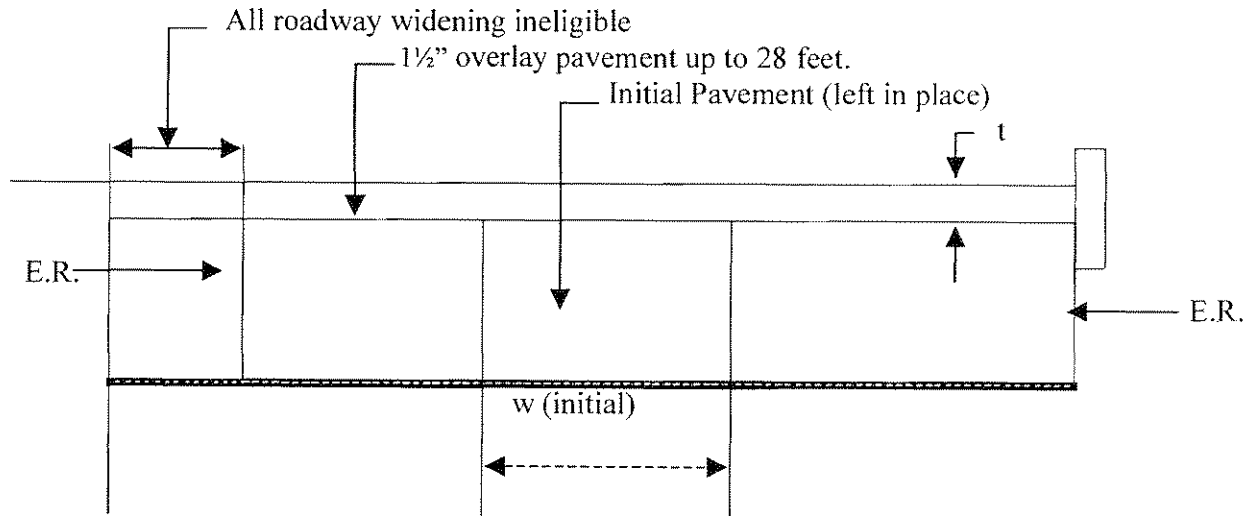
OPTION I Permanent Trench Pavement



d* = depth of existing pavement trench to a maximum of 3 inches (see general notes #3)
w = maximum eligible permanent pavement width as described in paragraphs "A" & "B".
equals initial width plus 2 feet and includes:

- Cutting edges for the permanent trench
- Removal of initial patch plus two feet of existing pavement
- Fine grading/compacting gravel
- Placement of Permanent Trench pavement in two courses.

OPTION II Curb to Curb Pavement (overlay pavement for roadways up to 28 feet)



E.R. = edge of existing paved roadway

t = one and one half inch (1½") overlay of bituminous concrete pavement

GENERAL NOTES:

1. Repavement of settled areas and crown restoration within the trench limits shall be the responsibility of the contractor.
2. Leveling outside the trench limits shall be the responsibility of the owner.
3. Sewer trench re-fill and pavement re-paving on public ways under the jurisdiction of the Massachusetts Department of Public Works, the Metropolitan District Commission, or other such agency shall be in accordance with permit(s) issued therefor by that Department or Commission, as the case may be.
4. The Division will consider requests for increase in the participating pay limits defined in paragraphs A and B, when such increases are, in the Division's opinion, reasonable. Such requests should be documented in writing and submitted to the Division in a timely manner.
5. Projects which deviate from the above options are required to seek Division review and approval.

POLICY MEMORANDUM NO. CG-9

PIPE TESTING

Monthly payment estimates shall be prepared in accordance with contract documents. All pipe shall be tested in accordance with the contract documents and sound engineering practice. If, after 60 days following submission of a monthly payment estimate for pipe items, the pipe for which payment is requested has not been successfully tested, the owner may withhold up to 10% of the amount requested for such pipe items until the pipe has been so tested. However, in the case of a major (pipe diameter 24 inches or greater) interceptor pipe installation, sums retained by the owner pursuant to this policy memorandum shall not exceed two per centum (2%) of the costs of such pipe items.

POLICY MEMORANDUM NO. CG-10

CHANGE ORDERS

Executed change orders submitted to the Division for review and processing for financial assistance must be prepared on the attached Change Order Forms (CG-10, Attachment 1, pages A-1 & A-2) with a duplicate copy, calculation sheet(s) (CG-10, Attachment 2), and all other supporting documentation necessary for evaluation. Failure to comply with these instructions will result in delays in processing the change order and/or limited financial assistance.

M.G.L. c.44, s.31C requires that the auditor, accountant, or other municipal officer having similar duties must certify that adequate funding in an amount sufficient to cover the total cost of the change order has been made. Change orders will not be processed or approved until this certification is made on the face of the Change Order Form (CG-10 Attachment 1).

Payment of Change Orders:

Payment of all change orders shall be in accordance with the relevant provisions of Massachusetts General laws, Chapter 30, Section 39G for non-building construction and Section 39K for building construction.

Payment of change orders shall be made in accordance with one of the following three methods:

- A. Existing unit prices as set forth in the contract; or
- B. Agreed upon lump sum or unit prices; or
- C. Time and materials

A. Payment for work for which there is a unit price in the contract:

Where the contract contains a unit price for work and the Engineer orders a change for work of the same kind as other work contained in the contract and is performed under similar physical conditions, the contractor may accept full and final payment at the contract unit price(s) for the acceptable quantities.

B. Payment for work or materials for which no price is contained in the contract:

If the Engineer directs, the contractor shall submit promptly in writing to the Engineer and offer to do the required work on a lump sum or unit price basis, as specified by the Engineer. The stated price, either lump sum or unit price, shall be divided so as to show that it is the sum of:

- (1) The estimated cost of labor, plus
- (2) Direct Labor Cost, plus
- (3) Material and Freight Costs, plus
- (4) Equipment Costs, plus
- (5) An amount not to exceed 20% of the sum of items (1) through (4) for overhead and profit, plus (if applicable),
- (6) In the case of work done by a subcontractor and amount not to exceed 7 ½ %, for the general contractor of the sum of items (1) through (4) for his overhead and profit, less, if applicable,
- (7) Credits for work deleted from the contract.

C. Payment for work on a time and materials basis:

Unless an agreed lump sum and/or unit price is obtained from above and is so stated in the change price, the contractor shall accept as full payment for which no other agreement is contained in contract, and amount equal to:

- (1) The estimated cost of Labor, plus
- (2) Direct Labor Cost, plus
- (3) Material and Freight Costs, plus
- (4) Equipment Costs, plus
- (5) An amount not to exceed 20% of the sum of items (1) through (4) for overhead and profit, plus (if applicable),
- (6) In the case of work done by a subcontractor and amount not to exceed 7 ½ %, for the general contractor of the sum of items (1) through (4) for his overhead and profit, less, if applicable,
- (7) Credits for work deleted from the contract.

Explanation of items (1) through (7) as outlined in “B” and “C”:

- (1) Labor – Only those workers employed on the project who are doing the extra work, including the foreman in charge, are allowable. General foremen, superintendents, or other supervisory personnel are considered to be included in the overhead markup as provided in items (5) and/or (6). Hourly labor rates in excess of those as listed in the contract wage rates (Federal or State, whichever applies require documentation. As a minimum, an explanation and the appropriate copy of the certified payroll are required.

(2) Direct Labor Costs - These costs are limited to those which are required in the contract document. Coverage in excess of the contract provisions, secured by the contractor/subcontractor(s) at his option, are ineligible for financial assistance. The following list of typical direct labor charges is provided for your assistance and is in no way intended to be complete or all encompassing:

- Workman's Compensation
 - Federal/State: Social Security Tax and Unemployment Tax;
 - Health, Welfare and Pension Benefits; (this cost is included in the wage rates appearing in the Mass. Wage Rates of the contract specifications)
 - Liability Insurance: Bodily Injury;
 Excess Umbrella;
 Property damage;
 Public Liability
 - Blasters Insurance)
 - Builders Risk Insurance)
 - Experience Modification Insurance)
 - Surcharges)
- If applied to any required
direct labor costs.

Following award and prior to execution of a construction contract, the contractor and filed sub-bidders (where applicable) shall submit for review by the owner, documentation to establish the Direct Labor Cost percentage(s) (Direct Labor markup percentage(s)).

The documented direct labor markup for this contract may be adjusted on an annual basis as measured from the date the contract is executed. The contract agreement will provide for the establishment of the Direct Labor Cost percentage.

(3) Material and Freight – Only those materials required as a result of the change order and reasonable freight charges for delivery of same are allowable.

Policy Memorandum No. CG-10 – Change Orders (Con't)

- (4) Equipment – Only the equipment required as a result of the change order is allowable. Equipment rental rates shall be governed by the current Nielson/Dataquest Rental Rate bluebook for Construction Equipment (the “Bluebook”). In determining the rental rate the following shall apply:
- (a) For equipment already on the project – the monthly prorated rental rate by the hourly use shall be applicable;
 - (b) For equipment not on the project the daily rate, the weekly rate, or monthly rate will prevail, whichever will prove to be most cost effective. Small tools and manual equipment are examples of costs not allowable under this item. These costs are considered to be included in the overhead markup as provided in items (5) and/or (6) (1 month (normal use) = 176 hours)
- (5) & (6) Overhead and Profit – All other costs not previously mentioned are considered to be included in this item, be it for the general contractor or subcontractor(s).
- (7) Credits – Work deleted, material and equipment removed from the contractor, stored and/or returned shall be credited to the cost of the change order, less costs.

The Contractor shall furnish itemized statements of the cost of the work ordered and shall give the Engineer access to all accounts, bills and vouchers relating thereto; and unless the Contractor shall furnish such itemized statements, and access to all accounts, bills and vouchers, he shall not be entitled to payment for any items of extra work for which such information is sought by the Engineer. Deviations from any of the above will be reviewed for financial assistance on a case-by-case basis.

The change order will be prepared in such manner as to clearly separate Eligible and Ineligible Costs.

CHANGE ORDER FORM

SRF Number _____
Public Entity _____
Contract Number _____
Change Order Number _____

Contract Amount (As Bid) \$ _____
Net Change in Contract Price (this change order) \$ _____
Total Adjusted Contract Price (including this and all other change orders) \$ _____

This change order extends the time to complete the work by _____ calendar days.

The extended completion date is _____

This change order checked by _____
(Chief) Resident Engineer Date

This change order is requested by: _____

This change order is recommended by: _____

Consultant Engineer P.E. Number Date

The undersigned agree to the terms of the change order.

Contractor Date

Owner Date

Certification of Appropriation under M.G.L. c.44, §31C: Adequate funding in an amount sufficient to cover the total cost of this change order is available.

By: _____
Certification Officer (Auditor, accountant, treasurer) Date

Do not write below: this space reserved for STATE AGENCY APPROVAL

DEP/DMS

CHANGE ORDER FORM (Continued)

Public Entity _____

SRF No: _____ Contract No. _____ Change Order No. _____

Contract Title: _____

Owner's Name: _____

Owner's Address: _____

Contractor's Name: _____

Contractor's Address: _____

Description of Change

Reason for Change

CALCULATION SHEET

(1) Labor

Foreman	10 hrs @ \$10.00/hr.	\$	100.00	
Engineer	10 hrs @ 8.50/hr		85.00	
Operator	10 hrs @ 9.50/hr		95.00	
Laborers	24 hrs @ 7.00/hr		<u>168.00</u>	
				\$448.00

(2) Direct Labor Cost (use the agreed upon Direct Labor Cost)

*	(30)% of \$448			
*	(Used for example purposes only)			134.00

(3) Materials & Freight

150 l.f. of 12" pipe @ \$2.00/l.f.	\$	300.00	
15 v.f. precast SMH		1,700.00	
Freight (slip # _____ Enclosed)		<u>25.00</u>	
			2,025.00

(4) Equipment

1 Backhoe 10 hrs @ \$80.00/hr	\$	800.00	
1 Truck-crane 10 hrs @ \$100.00/hr		<u>1,000.00</u>	
			1,800.00
			<u>4,407.00</u>

Total (Items 1 through 4) 4,407.00

(5) 20% markup for Overhead, Profit

20% of \$4,407	881.00
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(6) 7 1/2% markup for general contractor (if subcontractor is involved)

7 1/2% of \$4,407	331.00
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(7) Credits (deductibles)

- 323.00

Total Cost \$ 5,296.00

Reminder: Provide support documentation as necessary i.e. vouchers, correspondence, Calculation, photographs, reports

POLICY MEMORANDUM NO. CG-11

UTILITY RELOCATION

The construction of treatment facilities, sewers, pumping stations, force mains and appurtenant work can cause the relocation of utilities. Costly relocation can sometimes be minimized by early communication and cooperation of the representatives of the municipality (owner) and the utilities.

Every possible effort should be made by the owner and each utility to establish the location of existing utilities in the vicinity of the proposed construction. The owner or its consulting engineer should make every reasonable effort to design the proposed construction so that relocation of existing utilities is minimized whenever possible. If the proposed construction is in an area of many existing utilities or in an otherwise critical area, the utilities are encouraged to mark the location of their existing utilities at the site during the design phase of the project.

During the design phase of the project, the municipality should provide timely notice to all utilities known or thought to have facilities in or proximate to the site of such future construction.

POLICY MEMORANDUM NO. CG-12

**REFUNDABLE DEPOSITS FOR
PLANS AND SPECIFICATIONS**

For each set of project plans and specifications provided, the owner may require a deposit in form of cash or other appropriate security, in an amount sufficient to cover the costs of production of such plans and specifications.

Upon return of the plans and specifications to the owner within a reasonable time and in good condition, such deposit shall be refunded.

Actual mailing costs, if any, shall be borne by the party requesting such plans and specifications.

POLICY MEMORANDUM NO. CG-13

BID OPENING PROCEDURES

As a minimum, bid documents shall be reviewed/inspected for conformance to the following bid opening procedure in the order presented below. Failure to comply with any of these steps shall render the bid non-responsive and upon determination of such non-responsiveness, such bid shall be rejected immediately, set aside, and shall receive no further consideration.

Bid Opening Procedure

Step #1. Timeliness – The bid must be filed at the place and within the time specified therefore in the invitation to bid, and no bid shall be accepted after such time. The time at which a bid is filed should be time/date stamped or otherwise prominently noted on the bid;

Policy Memorandum No. CG-13 – Bid Opening Procedures (Con't)

Step #2. Bid Security – Properly executed bid security, in the amount and terms specified in the invitation to bid (equal to 5% of Base Bid or Highest Possible Amount considering all alternatives) shall be placed in a seal envelope and attached to the outside of the envelop containing the bid at the time of its submission;

A. Bid Bond

The Bid bond must be dated On or Before the Bid Date;
Issued by a Bonding Company Licensed in Massachusetts;
Accompanied by a Current Power of Attorney;
Signed by Surety;

B. Check

The Check must be a Certified, Cashiers or Bank Treasurer's;
Dated On or Before the Bid Date;

Step #3. Bid Signature – The bid and all accompanying documents so required shall be signed by the bidder or its authorized representative before submission;

Step #4. Addenda – All addenda shall be sent certified mail, return receipt requested, by the owner to all individuals and organizations which have received plans and specifications and shall be mailed not later than five days prior to the date established for submission of bids. All bidders shall include with their bids written acknowledgement of receipt of all addenda, which acknowledgement may be on a form provided therefore by the owner.

Alternates – Any Alternates shall be acknowledged.

Step #5. Written Dollar Amounts – The total dollar amount of each bid shall be read, and the three lowest bids shall be selected for further consideration. The remaining bids shall then be set aside. The three apparent low bids shall be read to determine whether the unit price for each line item of each bid has been written therein in words. If it has not, such bid shall be rejected and shall receive no further consideration. ***Bid amounts shall be consistent (words vs. numbers) and if words and numbers differ, the words govern.*** This procedure shall then be repeated with the next apparent low bid until three are acceptable which have all the unit prices written in words, at which time the lowest bid shall be announced as the apparent low bidder, and the bid opening procedure shall be closed.

The Division recommends that this policy memorandum be included in all contract specifications and that the owner's evaluator(s) use the attached form (CG-13 Attachment #1) for bid opening procedures.

The Contractor's Bid Opening Checklist also attached hereto, is for use by each contractor to assure that his bid conforms with this policy memorandum. It is recommended that the checklist (CG-13 Attachment #2) be included in information for bidders, or at the end of the bid proposal, or in some other prominent part of the bid specifications

FORM FOR BID OPENING PROCEDURES
(to be completed by the owner's evaluator(s))

CONTRACT NO.: _____ DATE: _____

CONTRACT NAME: _____ BID OPENING TIME: _____
 All non-responsive bids shall be rejected forthwith by the awarding authority upon determination of such bids' non-responsiveness at the time bids are opened and read. Failure to comply with any one of the requirements shall render the bid non-responsive, and upon determination of such non-responsiveness such bid shall be rejected and receive no further consideration.

BIDDER	A = Acceptable		N-R = Non-Responsive (explain reasons on supplemental sheet & attach)		COMPLIANCE (CIRCLE ONE)
	1. TIMELINESS	2. BID SECURITY	3. SIGNATURE	4. ADDENDA ALTERNATIVES	
1					YES NO
2					YES NO
3					YES NO
4					YES NO
5					YES NO
6					YES NO
7					YES NO
8					YES NO
9					YES NO
10					YES NO
11					YES NO
12					YES NO

DEP/DMS _____ Evaluator(s)

**BID OPENING PROCEDURES
CONTRACTORS CHECKLIST**

CONTRACT NO.:

BIDDER:

DATE:

All non-responsive bids shall be rejected forthwith by the awarding authority upon determination of such bids' non-responsiveness at the time bids are opened and read. Failure to comply with one or more of the following requirements shall render the bid non-responsive, and upon determination of such non-responsiveness such bid shall be rejected and receive no further consideration.

ITEM	REQUIREMENTS	COMPLIANCE (CIRCLE 1)		REASONS FOR REJECTION
		Yes	No; Rejected	
1. Timeliness	Bid filed w/in time specified	Yes	No; Rejected	
2. Bid Security	Appropriate and properly Executed security w/bid.	Yes	No; Rejected	
3. Signature	Bid signed by authorized Representative	Yes	No; Rejected	
4. Addenda	All addenda acknowledge Any alternative	Yes	No; Rejected	
5. Dollar Amount	Dollar amount in words Specified for each line item in bid	Yes	No; Rejected	

There shall be in the contract documents a separate pay item for rock excavation. For such purposes, "rock" shall mean igneous, sedimentary, metamorphic, and conglomerate rock, which for excavation must be drilled, blasted, broken, or ripped by power tools. Boulders and concrete structures one cubic yard or greater, however removed, are included within this definition of rock for payment purposes. At the option of the owner or his representative a separate pay item for boulders, concrete structures, or concrete road base may be used.

<u>Depth From Ground Surface</u> <u>To Invert Pipe</u>	<u>Pay Width</u> <u>(Nominal Pipe Diameter)</u>	
* 0 – 12'	0-24"	Over 24"
* Over 12' – 20'	5'0"	D+3'0"
	7'0"	D+5'

Engineer's plans and specifications shall establish pay limits below pipe and structures.

- See CG-14 Attachment #1 (typical cross section)

Payment width for depths over twenty feet (20') shall be determined on a case-by-case basis consistent with the foregoing chart.

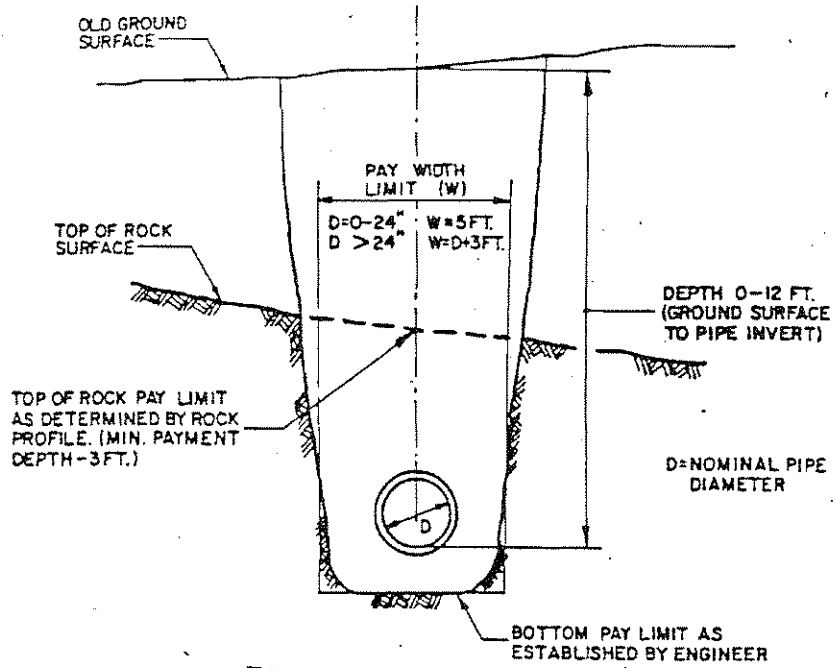
The pay limit for rock removal outside proposed manholes shall commence one foot (1') outside the widest dimension of the structure of shall be the maximum connecting trench width, whichever is greater.

Payment depth for rock which is encountered in a trench shall be no less than three feet (3') when removal can be accomplished only by drilling and blasting or by use of jack (air or hydraulic) hammers.

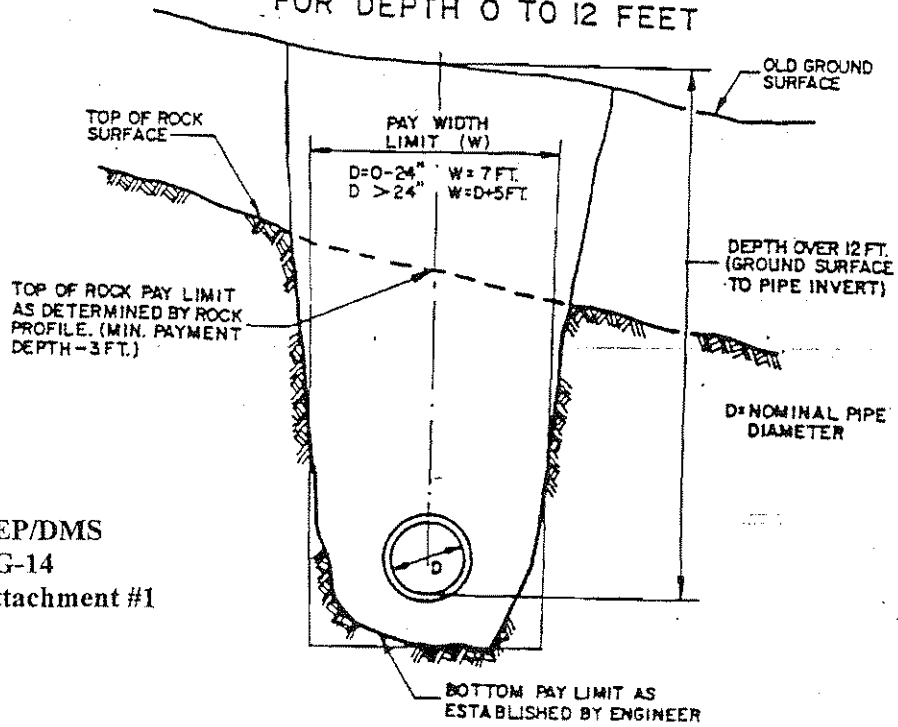
Payment for rock removed, using the same or equal equipment as utilized for normal trench excavation, shall be limited to the actual depth removed within the limits established by the contract documents.

Boulders encountered within the pay limits of excavation, whose volume is one cubic yard or greater, part of which extends outside said limits shall be paid in accordance with the actual volume excavated.

CG-14 ROCK EXCAVATION



FOR DEPTH 0 TO 12 FEET



FOR DEPTH OVER 12 FEET AND UP TO 20 FEET

DEP/DMS
CG-14
Attachment #1

POLICY MEMORANDUM NO. CG-15

TRAFFIC POLICE

The reasonable costs for police details required for traffic control on a construction project which receives financial assistance shall be considered as an eligible administrative cost. A police detail item shall not be included as a bid item in the contract documents.

“Police” as used in this memorandum includes local, county, capital, state, regular and auxiliary police.

Owner’s Responsibility

It shall be the owner’s responsibility to submit in writing the hourly rate of pay to be established for detailed traffic police and each change in rate during the course of the project. It is the owner’s responsibility to arrange, document and pay for such police details. The owner or its representative shall meet with the police chief or other officer in charge of police detail duty to review contract needs. The owner shall maintain a daily record of the following:

- a. Officer’s name
- b. Hours worked
- c. Location of assignment
- d. Hourly rate

POLICY MEMORANDUM NO. CG-16

**DOCUMENTATION REQUIRED TO
SUBSTANTIATE CONTRACT QUANTITIES**

<u>Unit</u>	<u>Documentation required</u>
Acres (A)	Location, station, offset and calculations. Location = Street right-of-way, etc; Station = Point on Baseline; Offset = Distance left or right of Baseline
Cubic Yard (C.Y.)	Location, stations, widths, depths, calculations and Cross sections as necessary
Each (Ea.)	Location, station, and offset.
Gallon (Gal.)	Location, stations, calculations (if appropriate) and delivery slips.
Hour (Hr.)	Hours and location.
Linear Feet (L.F.)	Location, stations, and offsets.
Month (Mo.)	Location, period of time and calculations if applicable.

1000 Foot Board Measure (MFBM)	Location, stations, offset, elevations, grade, and calculations. Attach invoices where applicable.
Pound (Lb.)	Locations, stations, and calculations (if applicable). Attach Delivery weight slips.
Square Feet (S.F.)	Locations, stations and calculations
Square Yard (S.Y.)	Locations, stations and calculations
Ton	Locations, stations and calculations (if applicable). Attach Delivery weight slips.
Vertical Feet (V.F.)	Locations, stations, elevations, and offsets.

Note:

1. All of the above, that apply must be submitted with a final payment request or change order as applicable.
2. Where in place measurement is not possible or practical, delivery slips may be used to substantiate quantities.
3. Change orders – See CG-10 in which some of the above may be applicable in justifying materials, equipment and labor.
4. When necessary, itemized quantities must be separated into eligible and non-eligible units with separate calculations to justify eligible costs.
5. Overruns and underruns of any specific item shall be explained with an appropriate sentence or paragraph.
6. On all quantities, units of payment shall be maintained at the project site and shall be updated daily so that upon field inspection by the C.O.E., EPA or DMS, the quantities paid to date can be substantiated.
7. In the case of unforeseen conditions, photos should be submitted with the applicable item in addition to the recommended documentation.
8. Documentation of units of payment shall be clearly legible and cross referenced to the applicable sheets of the record drawings.
9. For record drawings policy, please see CG-4.

DMS Policies I through 16 Approved By:

Steven J. McCurdy
Division of Municipal Services

DWS POLICY 88-02
DEPARTMENT OF ENVIRONMENTAL PROTECTION
POLICY FOR REVIEW OF SEWER LINE/WATER SUPPLY PROTECTION

The Department of Environmental Protection seeks to protect existing and potential water supplies from the potentially negative effects of leaking sewer lines through the adoption of a Department policy on this subject.

The following restrictions will apply to new sewer construction statewide:

Gravel Packed Wells

- ~ Within the 400 foot radius protective distance around gravel packed wells, all sewer lines and appurtenances are prohibited, unless they are necessary to eliminate existing and/or potential sources of pollution to the well.

Tubular Wells

- ~ Within the 250 foot radius protective distance around tubular wells, all sewer lines and appurtenances are prohibited, unless they are necessary to eliminate existing and/or potential sources of pollution to the well.

Gravel Packed and Tubular Wells

- ~ Within a minimum radius of 2,640 feet or unless otherwise documented by an appropriate study specifically defining the area of influence and approved by the Division of Water Supply, all sewer lines and appurtenances will be designed and constructed for maximum water tightness.
- o Force Mains or Pressure Sewers: shall be tested at 150% above maximum operating pressure or 150 p.s.i. whichever is greater. Testing shall conform to the requirements of the American Water works Association (AWWA) standard c 600.
- o Gravity Sewers: shall be tested by approved methods which will achieve test results for infiltration or exfiltration of less than 100 gallons/inch diameter/mile/24 hours.
- o Manholes: shall be installed with watertight covers with locking or bolted and gasketed assemblies. Testing for infiltration/exfiltration shall conform to the same standards as the maximum allowed for pipes in the manhole as required for gravity sewers, indicated above.
- o Satisfactory test results for Force Mains, Manholes and Gravity Sewers shall be performed prior to the expiration of the contractor's one year guarantee period.
- o All pumping stations within this zone shall have standby power high water alarms telemetered to an appropriated location that is manned at all times. An emergency contingency plan must be developed by the owner and approved by the BRP.

- A minimum of Class B bedding as defined by WPCF-MOP9 must be used for all piping.
- Service connections (laterals and house connections) shall be rigidly inspected by the appropriate municipal official. Certified inspection reports shall be submitted to the BRP.

Bedrock Wells

The above requirements are the same for bedrock wells, with the Department reserving the right to require more stringent controls on a case-by-case basis.

Surface Water Supplies

- ~ Within 100 feet of all surface water supplies and tributaries all sewer lines and appurtenances are prohibited except as required to cross tributaries or to eliminate existing or potential pollution to the water supply. In the latter case, watertight construction methods shall be used.
- ~ Tributary stream crossings shall employ watertight construction methods of sewer lines and manholes. Watertight construction must extend 100 feet to either side of the stream.
- ~ Within 1,000 feet of surface water supplies and tributaries, all pumping stations shall have standby power and high water alarms telemetered to an appropriate location that is manned at all times. An emergency contingency plan must be developed by the owner of the wastewater treatment facility and submitted to the BRP for approval.
- ~ Beyond 1,000 feet and within the watershed of surface water supplies the Department may in specific circumstances after review, require additional controls.

Potential Public Water Supplies

The above requirements also apply to potential public water supplies.

Baseline Data Requirements

Two (2) copies of an appropriately scaled map(s) shall be submitted to the Department which details the proposed sewers and/or appurtenances and also includes the following:

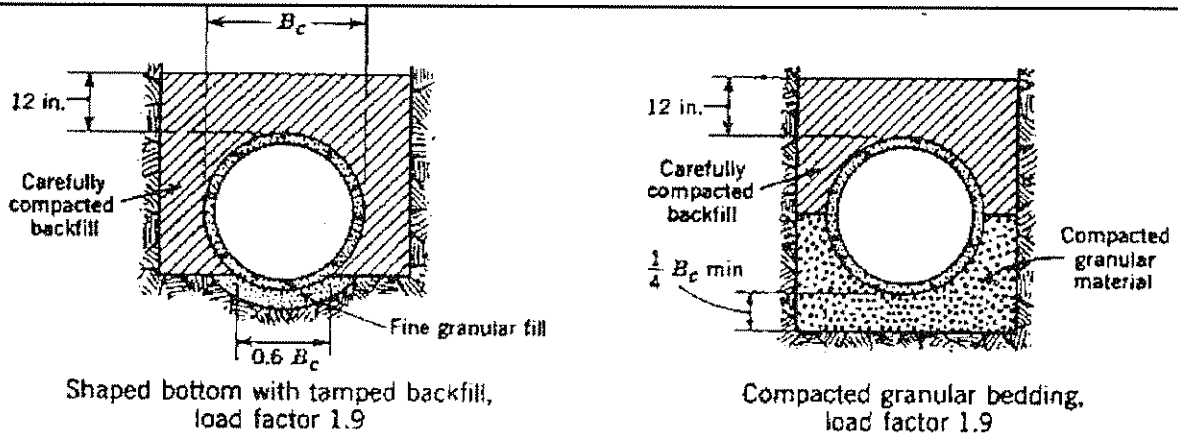
- (1) the location of all nearby existing or potential surface water supplies, tributaries thereto, and watershed boundaries;
- (2) the location of existing and potential public and municipal potable groundwater supply wells.

The Department reserves the right to impose more restrictive measures than those contained in this policy as deemed appropriate.

Definitions

- Appurtenances – all attachments to sewer lines necessary for the transport and operation and maintenance of sewer lines, including manholes, pumping station, siphons, etc.
- Area of influence – that area of an aquifer which contributes water to a well under the most severe recharge and pumping condition that can be realistically anticipated (i.e. pumping at the safe yield of the well for 180 days without any natural recharge occurring). It is bounded by the groundwater divides which result from pumping the well and by the contact of the edge of the aquifer with less permeable materials such as till and bedrock. At some locations, streams and lakes may form recharge boundaries.
- Potential public water supply – areas designated by communities for water supply purposes where land has been set aside and Department approved pump tests conducted and surface water supplies as defined below.
- Surface Water Supply – Waters classified as Class A by the DWPC.
- Public Water Supply Systems – as defined in 310 CMR 22.02 (DEP Drinking Water Regulations).
- Class B Bedding – as defined in WPCF Manual of Practice No. 9.

APPROVED: (Signature on File)



Class B--First-Class Bedding – Class B bedding may be achieved by either of two construction methods:

- a. **Shaped Bottom with Tamped Backfill.** The bottom of the trench excavation shall be shaped to conform to a cylindrical surface with a radius at least 2 in. (5 cm) greater than the radius to the outside of the pipe and with a width sufficient to allow six-tenths of the width of the pipe barrel to be bedded in fine granular fill placed in the shaped excavation. Carefully compacted backfill shall be placed at the sides of the pipe to a thickness of at least 12 in. (30 cm) above the top of the pipe. Shaped trench bottoms are difficult to achieve under current construction conditions.
- b. **Compacted Granular Bedding with Tamped Backfill.** The pipe shall be bedded in compacted granular material placed on a flat trench bottom. The granular bedding shall have a minimum thickness of one-fourth the outside pipe diameter and shall extend halfway up the pipe barrel at the sides. The remainder of the side fills and a minimum depth of 12 in. (30 cm) over the top of the pipe shall be filled with carefully compacted material.

ARTICLE 16 OF TOWN OF ARLINGTON BY-LAWS

BY-LAWS OF THE TOWN OF ARLINGTON
TITLE I
ARTICLE 16

CONSTRUCTION PROJECTS

Section 1. Women Work Force Participation

Any Town board or official in charge of a construction or reconstruction project is required to include in the contract documents the following:

- A. Contractor shall maintain as a goal on this project a not less than five percent ratio of women work force to total project hours in both the general contract and each individual filed sub-bid contract, if applicable. The preceding sentence shall be included in all construction contracts whether entered into by the Town pursuant to the provisions of M.G.L. c. 149 or M.G. L. c 30, §39M et. seq. provided however, that if entered into under Chapter 30 same shall not be deemed to apply where the projected bid price as determined by the Director of Public Works is not likely to exceed \$200,000.
- B. A Labor Scheduling Table which will be used as a tool for achieving a range of women work force participation for the entire project in both the general contract and each individual filed sub-bid contract.

Section 2. Equal Opportunity Goal Compliance

Any Town board or official in charge of a construction or reconstruction project is required to include in the contract documents the following:

- A. Before starting work, the contractors (includes the general contractor, for itself and its subcontractors, as well as all filed sub-bid contractors, if applicable) will submit plans for achievement of the equal opportunity goals of the contract. All contractors will be required to make a good faith effort to achieve these goals. The plan will indicate if the contractors expect to achieve the requirements during the first quarter. If there are reasons why the contractors do not expect to achieve the requirements during the first quarter year of the contract construction phase, then the contractors shall provide a plan calculated to address, to the extent reasonably possibly, these obstacles to a good faith effort to achieve such goals.
- B. Not more than ten days following the end of each work quarter, the contractors will report on the achievement of the goals, detailing the good faith efforts that have been made and will continue to be made and any other appropriate efforts not yet undertaken.
- C. All reports will be signed by an officer or principal of the company who has the authority to contractually obligate the company.

Section 3. Recruitment and Training

Any board, officer, committee, or other agency of the Town, which acts on behalf of the Town in making or supervising any contract, in an amount exceeding the sum of \$100,000 for the purchase of goods or services or for the construction, renovation, or repair of buildings or other improvement of real estate, may make arrangements with contractors and other interested agencies for special programs of recruitment and training in connection with the work to be performed on such contract, with the objective of promoting equal employment opportunity for members of minority groups protected by the fair employment laws of the Commonwealth and the United States. Any board, officer, committee or other Town agency may expend Town funds in carrying them out provided that appropriations specifically designed for such purposes have been voted by the Town Meeting.

**STANDARD DETAILS AND
TRAFFIC MANAGEMENT PLAN DETAILS**

SAW CUT EDGES TO OBTAIN CLEAN FULL THICK BUTT JOINT ON EXISTING BASE AND REMOVE BROKEN PAVEMENT AND GRAVEL TO PROVIDE STRAIGHT EDGE

STREETS, DRIVEWAYS AND WALKS
LAWNS AND CROSS COUNTRY

EXISTING PAVEMENT

PAVEMENT OR GRAVEL AS SPECIFIED

LOAM & SEED AS SPECIFIED

GRAVEL BASE COURSE SEE SPECS.

EXCAVATION—EARTH OR ROCK. ALL ROCK EXCAVATION AND STONES LARGER THAN 6" SHALL BE DISPOSED OF AND REPLACED WITH APPROVED EXCAVATED MATERIAL OR GRAVEL BORROW.

COMPACTED APPROVED BACKFILL

APPROVED BACKFILL

PAY LIMIT FOR SELECTED MATERIAL, GRAVEL BORROW AND EARTH EXCAVATION BELOW GRADE AS FOLLOWS

DEPTH OF INVERT	PAY LIMIT
0-12'	5'
OVER 12'	7'

12" MIN.

18" MAX.

PIPE O.D.

12" MIN.

9" MIN.

SEWER

BELOW GRADE EXCAVATION OF UNSUITABLE MATERIAL WITH COMPACTED SELECTED MATERIAL WRAPPED IN FILTER FABRIC

CAREFULLY COMPACTED GRAVEL BORROW OR SELECTED MATERIAL

CAREFULLY COMPACTED CRUSHED STONE, WRAPPED IN FILTER FABRIC IF REQUIRED

UNDISTURBED FIRM MATERIAL

1/2 O.D.
6" MIN.

UNDISTURBED ROCK SURFACE

EARTH TRENCH

ROCK TRENCH

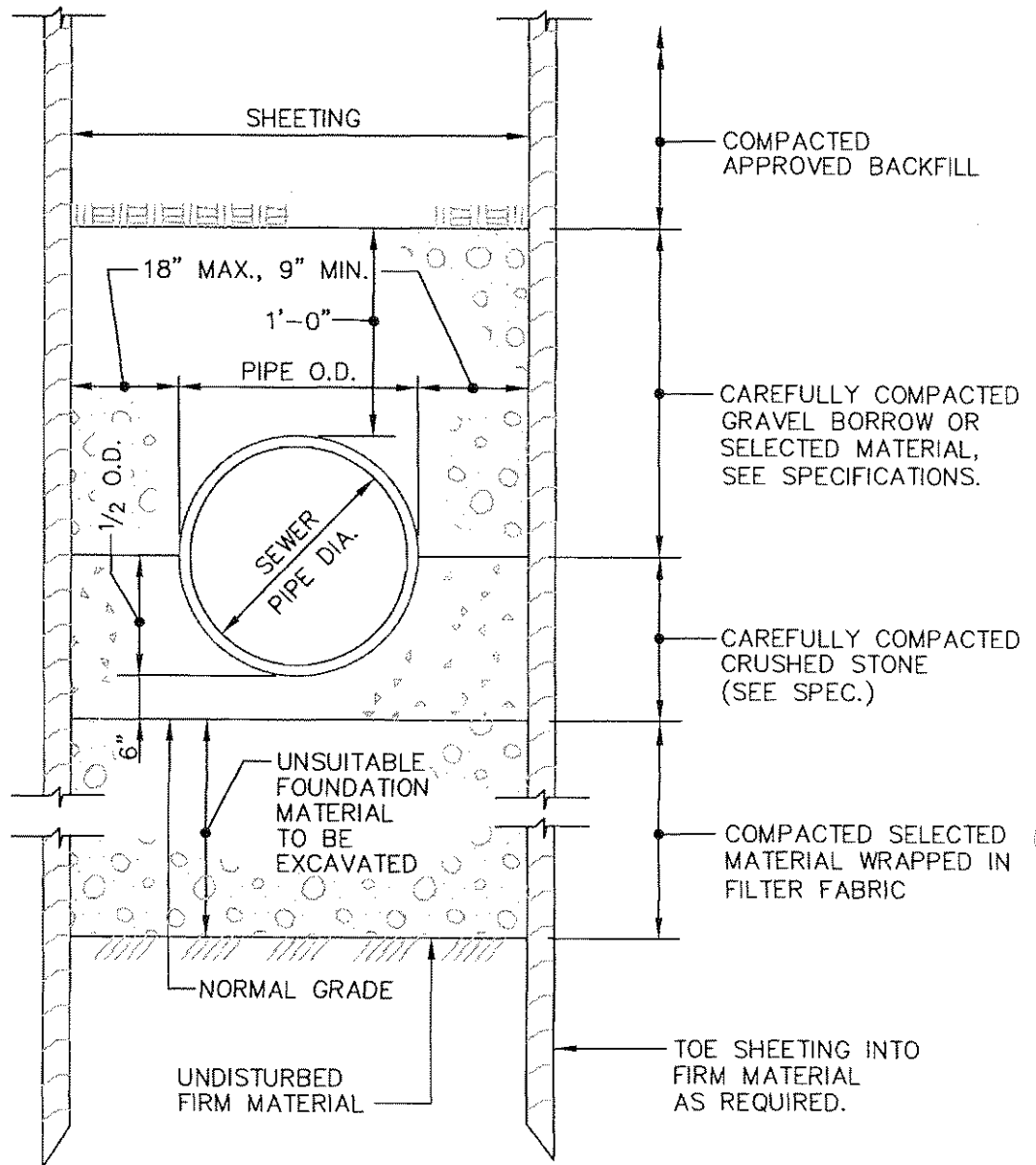
NOTE :
REFER TO SPECIFICATIONS FOR DEWATERING BACKFILLING AND COMPACTION REQUIREMENTS.

SECTION
NOT TO SCALE

SEWER TRENCH—EARTH AND ROCK

FAY, SPOFFORD & THORNDIKE, LLC
ENGINEERS BURLINGTON, MA

SHEETING TO BE LEFT IN PLACE - BOTH SIDES.

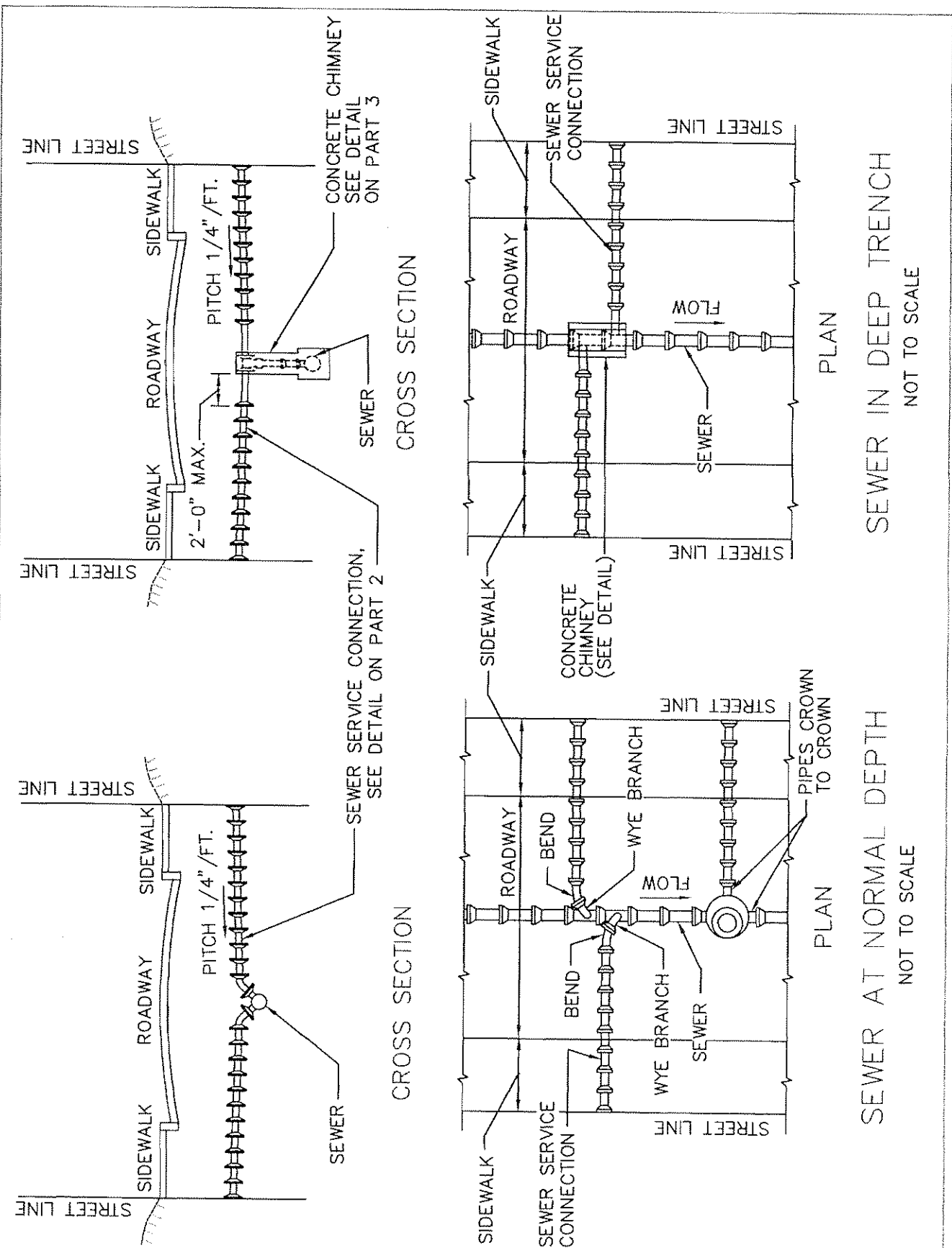


NOTE:
REFER TO SPECIFICATIONS FOR
MATERIAL, BACKFILLING AND
COMPACTION REQUIREMENTS.

SEWER TRENCH SHEETED
NOT TO SCALE

SEWER TRENCH-SHEETED

FAY, SPOFFORD & THORNDIKE, LLC
ENGINEERS BURLINGTON, MA

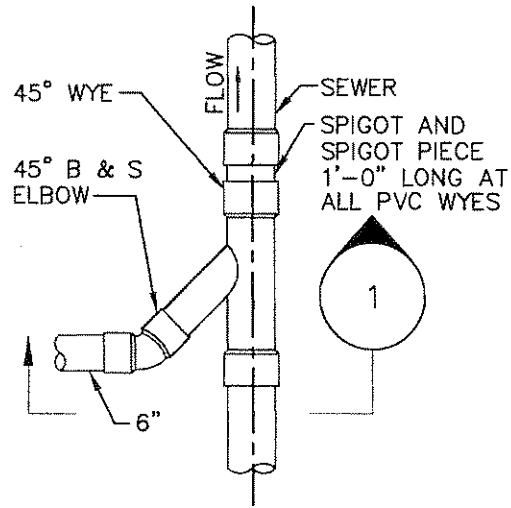


SEWER SERVICE CONNECTIONS PART 1

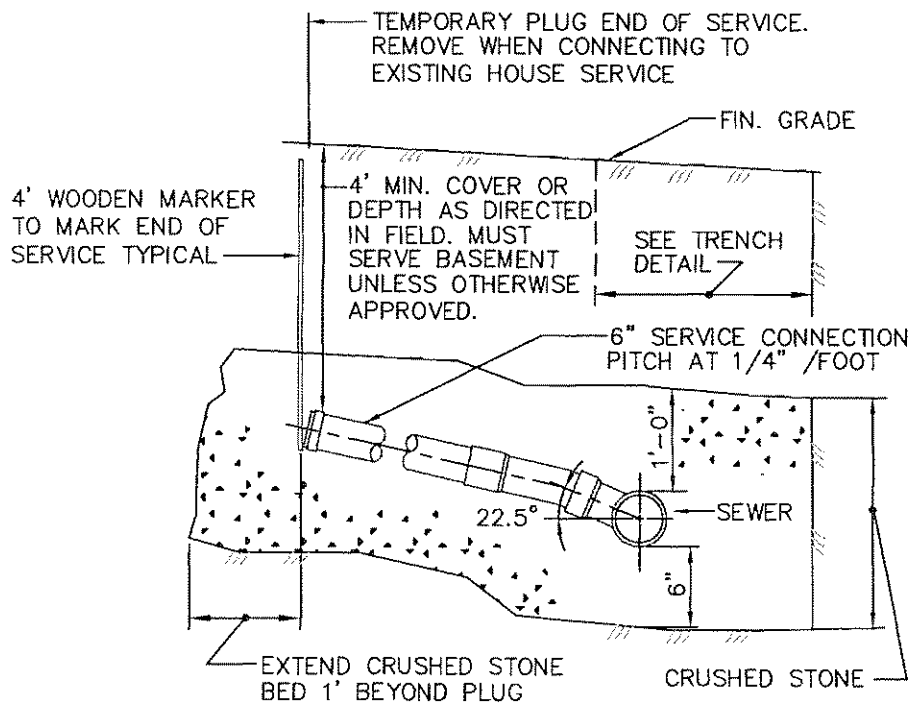
FAY, SPOFFORD & THORNDIKE, LLC
ENGINEERS BURLINGTON, MA.

SEWER AT NORMAL DEPTH
NOT TO SCALE

SEWER IN DEEP TRENCH
NOT TO SCALE



PLAN

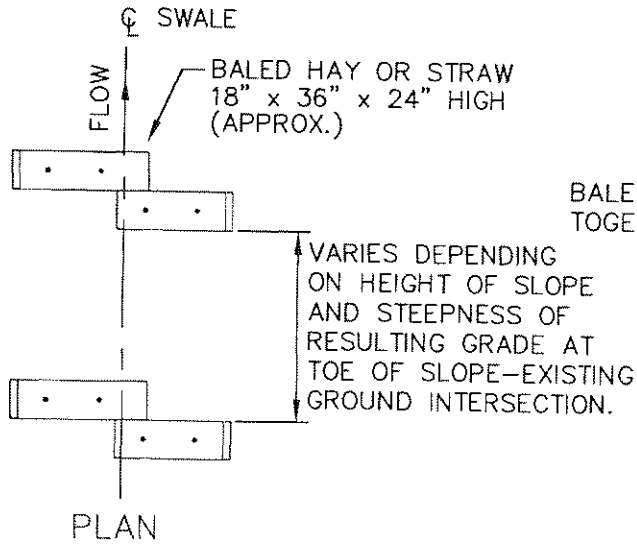


SECTION

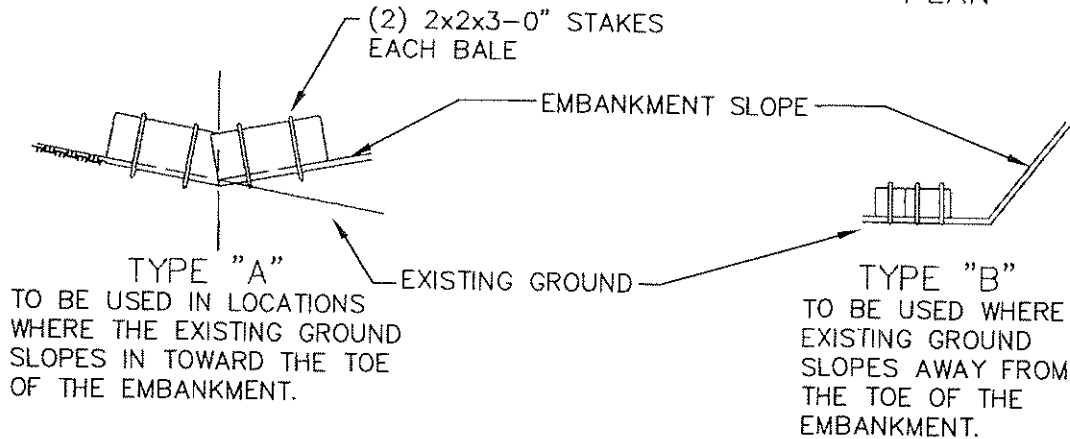
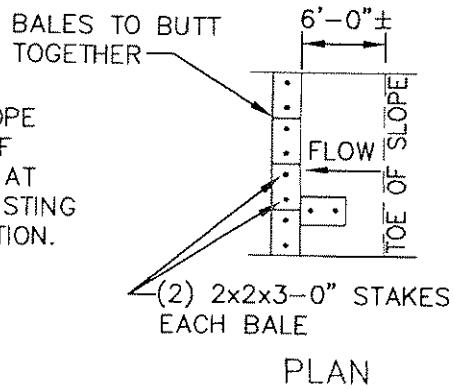
1

DETAIL OF SEWER AT NORMAL DEPTH
NOT TO SCALE

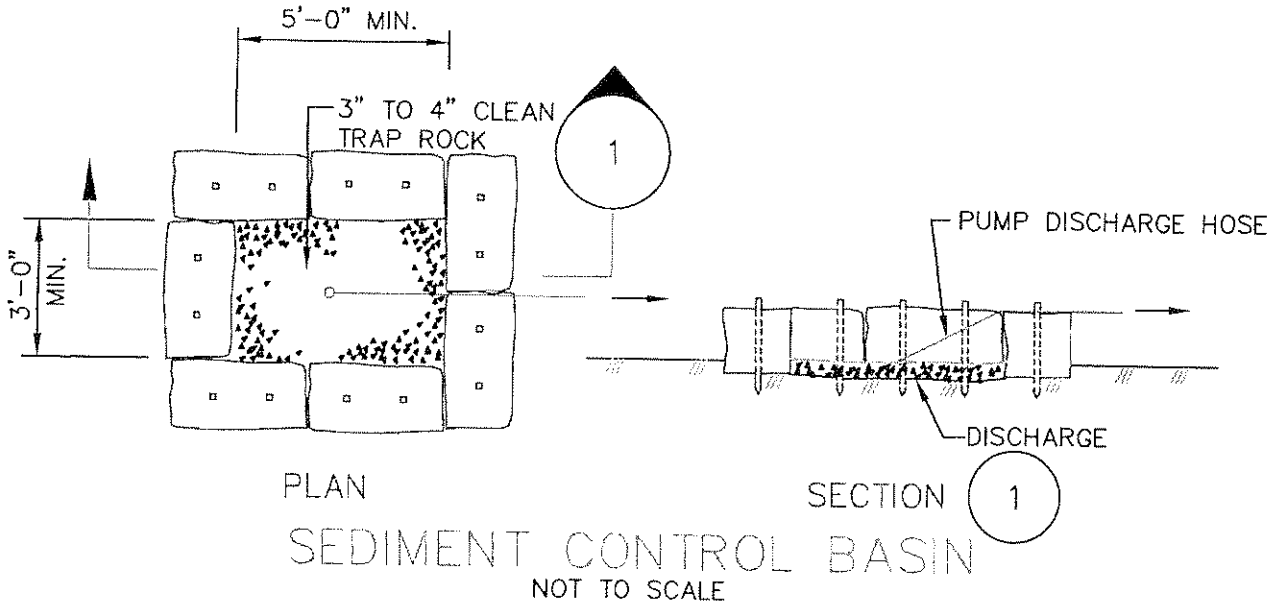
SEWER SERVICE CONNECTIONS
PART 2



NOTE:
ALL SEDIMENT TO BE REMOVED
FROM THE EROSION CHECKS OR
CONTROL BASINS AS APPROVED
BY THE ENGINEER.



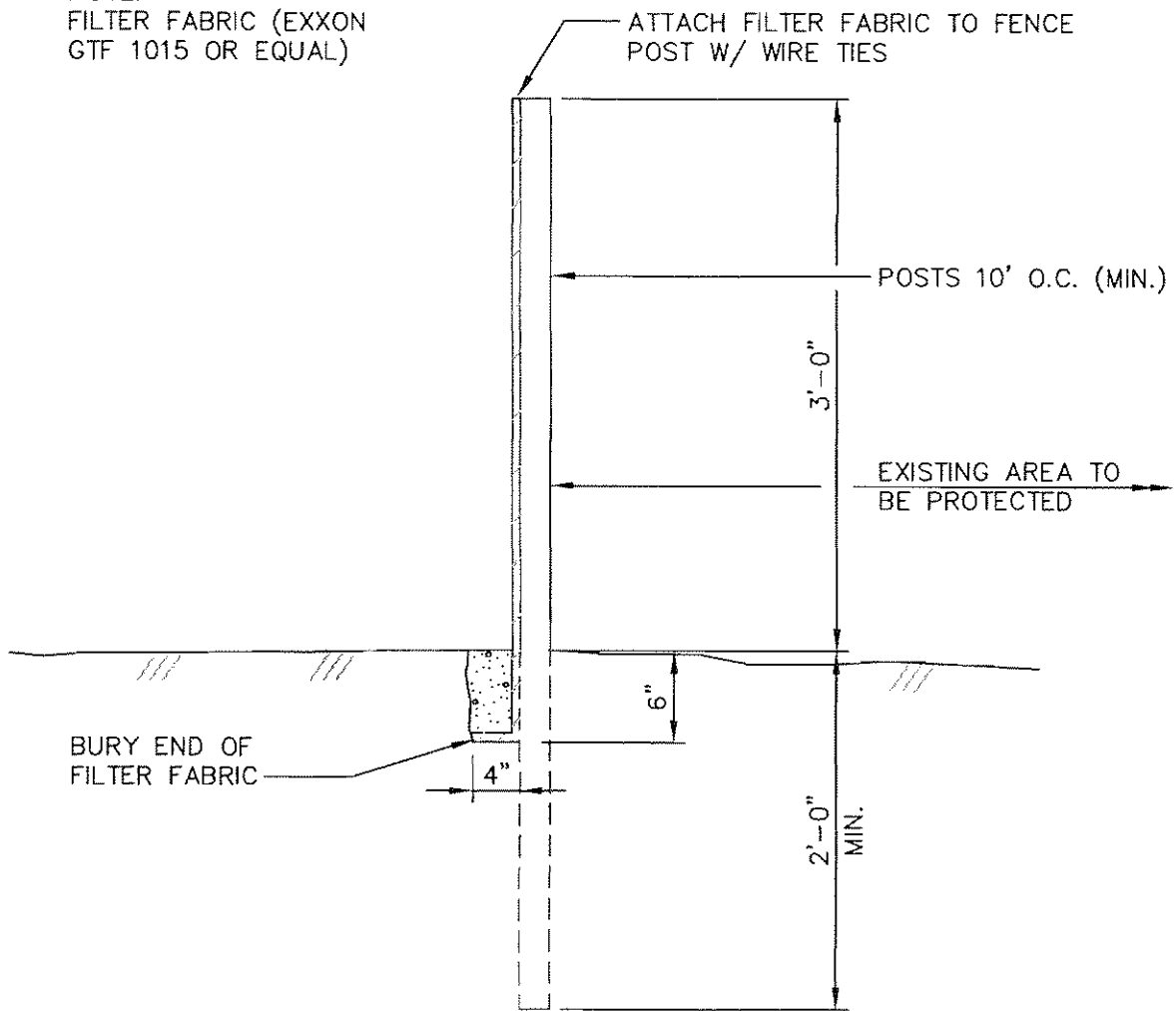
BALED HAY OR STRAW EROSION CHECKS
NOT TO SCALE



EROSION CONTROL

FAY, SPOFFORD & THORNDIKE, LLC
ENGINEERS BURLINGTON, MA

NOTE:
FILTER FABRIC (EXXON
GTF 1015 OR EQUAL)

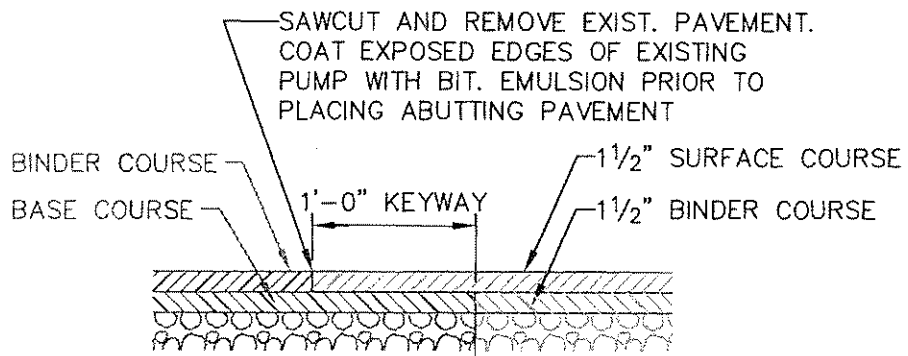


NOTE: SILT FENCES SHALL BE USED IN PLACE OF HAY BALES IN
AREAS WHERE STANDING WATER OF A DEPTH OF GREATER
THAN 6 INCHES IS PRESENT AT THE TIME OF INSTALLATION.
ALL SEDIMENTS TO BE REMOVED FROM THE SILT FENCE AS
APPROVED BY THE ENGINEER.

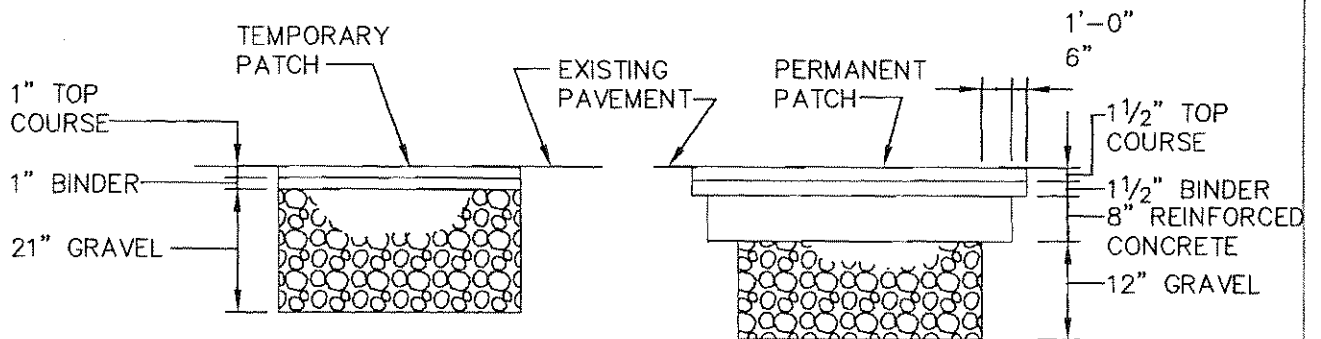
SECTION
NOT TO SCALE

SILT FENCE

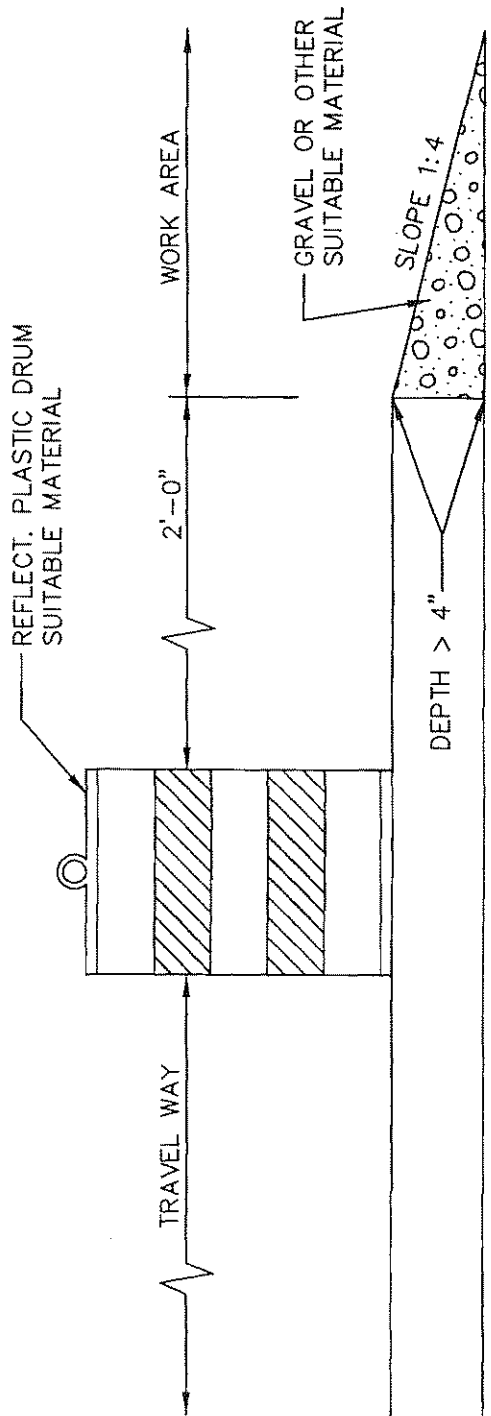
FAY, SPOFFORD & THORNDIKE, LLC
ENGINEERS BURLINGTON, MA



KEYWAY DETAIL FOR CONNECTION
TO EXISTING PAVEMENT
NOT TO SCALE



KEYWAY DETAIL FOR CONNECTION
TO EXISTING PAVEMENT



* 1:8 FOR ABUTTING DRIVEWAYS OR STREETS

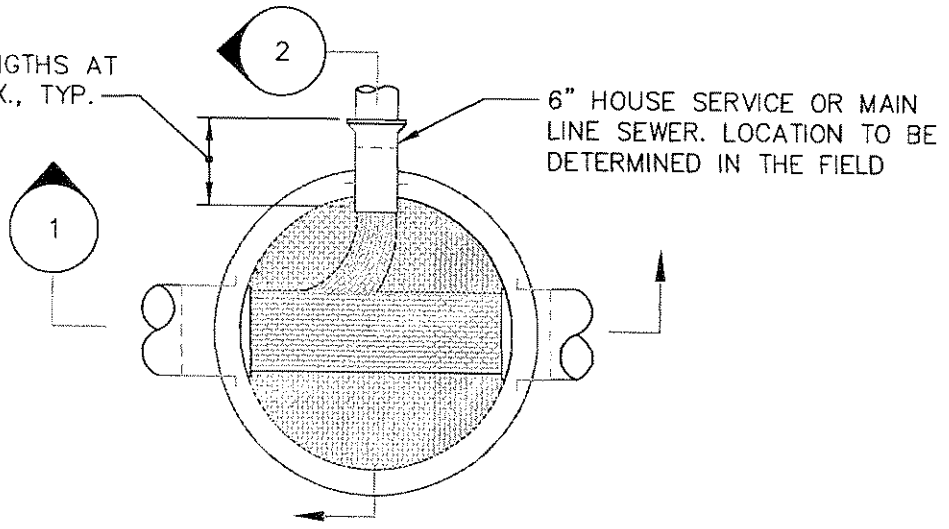
CROSS-SECTION SHOWING TYPICAL TREATMENT OF EDGE OF TRAVELLED WAY AT THE END OF THE WORK DAY WHEN CONDITIONS WARRANT

EDGE OF ROAD TREATMENT AT WORK AREA
NOT TO SCALE

FAY, SPOFFORD & THORNDIKE, LLC
ENGINEERS BURLINGTON, MA

EDGE OF ROAD TREATMENT AT WORK AREA

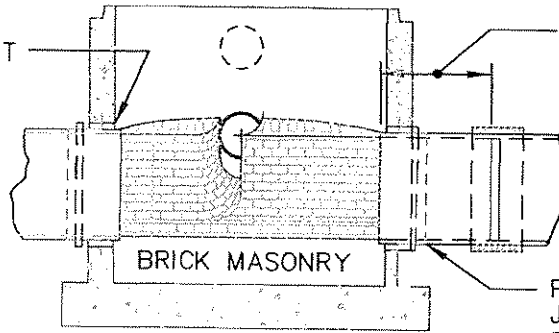
USE 4'-0" LENGTHS AT
MANHOLES MAX., TYP.



6" HOUSE SERVICE OR MAIN
LINE SEWER. LOCATION TO BE
DETERMINED IN THE FIELD

PLAN

ANNULAR SPACE BETWEEN
OUTSIDE OF PIPE AND
MANHOLE TO BE FILLED
WITH NON SHRINK GROUT



4'-0" MAX. DISTANCE

BRICK MASONRY

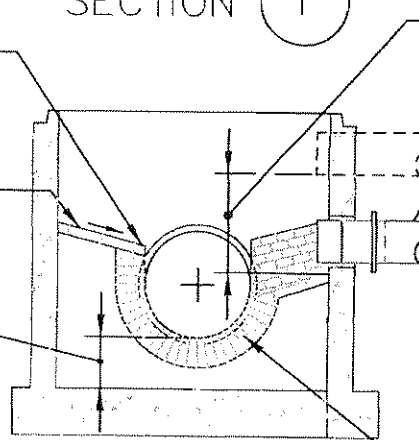
PIPE TO MANHOLE
JOINT SEE STANDARD
SEWER MANHOLE DETAIL

SECTION 1

1" WASH
TOP OF SHELF SHALL
BE 1" ABOVE CROWN
OF HIGHEST PIPE.
SHELF BRICK LAID FLAT

1" WASH

4" MIN.



MUST BE LESS THAN
2 FEET OR A DROP
MH. REQUIRED

6" HOUSE SERVICE
OR MAIN

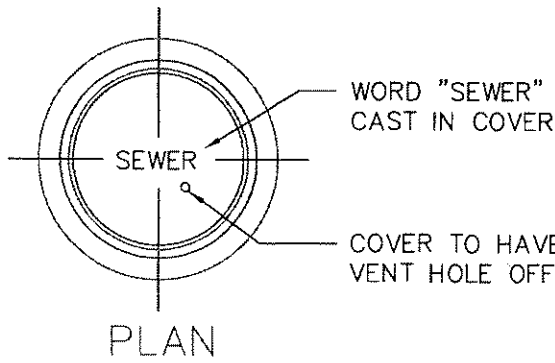
NOTE:
CARE SHALL BE TAKEN
TO ENSURE THAT THE
BRICK INVERT IS A
SMOOTH CONTINUATION
OF THE SEWER INVERT

SECTION 2

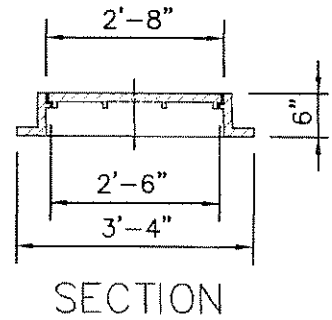
INVERT TO BE INVERTED
ARCH WITH BRICKS LAID
AS STRETCHERS AND
ON EDGE

TYPICAL BRICK INVERT
NOT TO SCALE

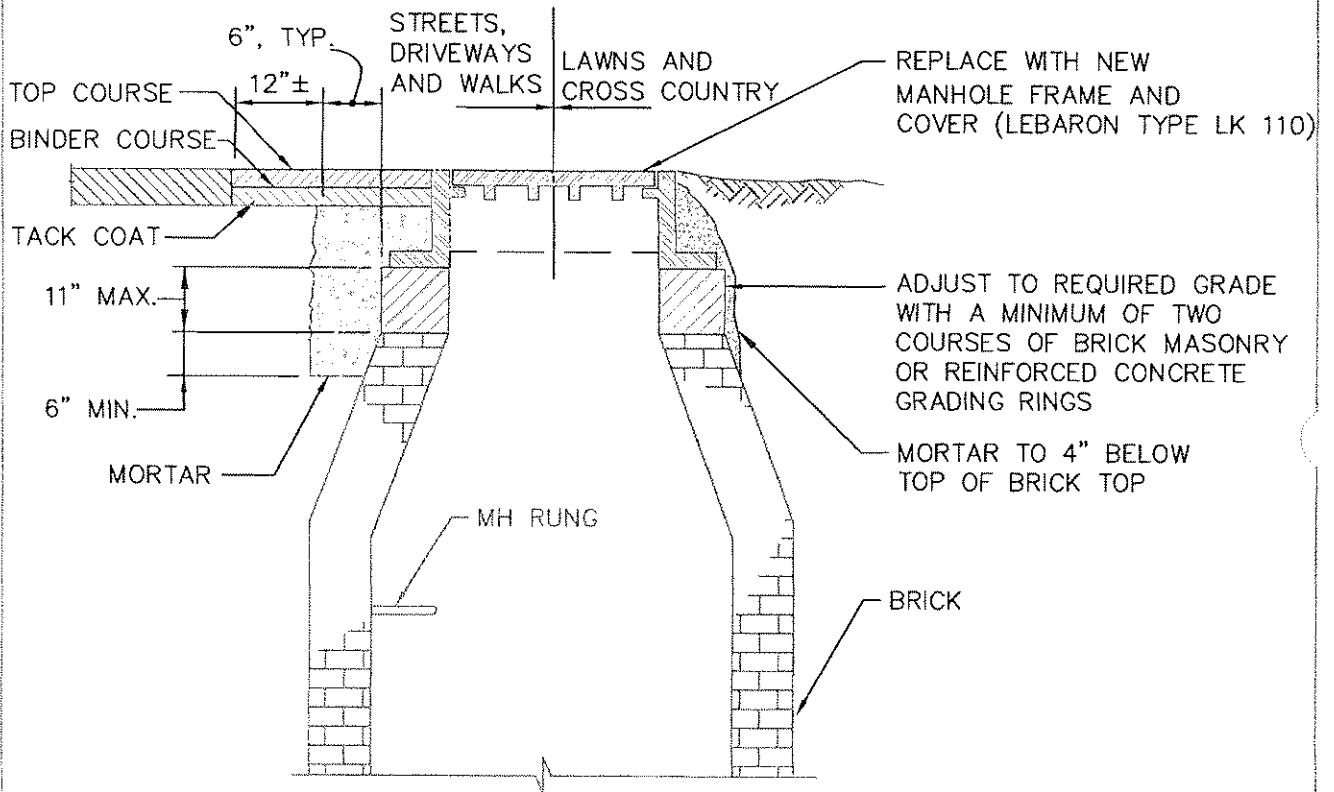
TYPICAL DETAIL OF BRICK INVERT



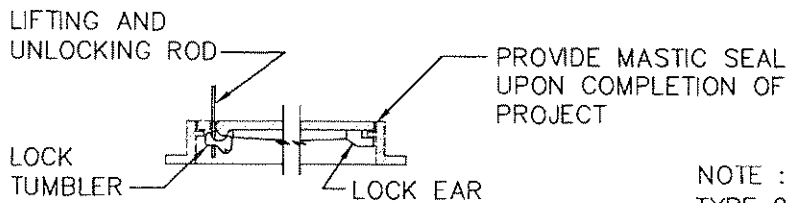
WT. 666 LBS.



STANDARD MANHOLE FRAME AND COVER
NOT TO SCALE



DETAIL FOR REPLACING MANHOLE FRAME AND COVER
NOT TO SCALE

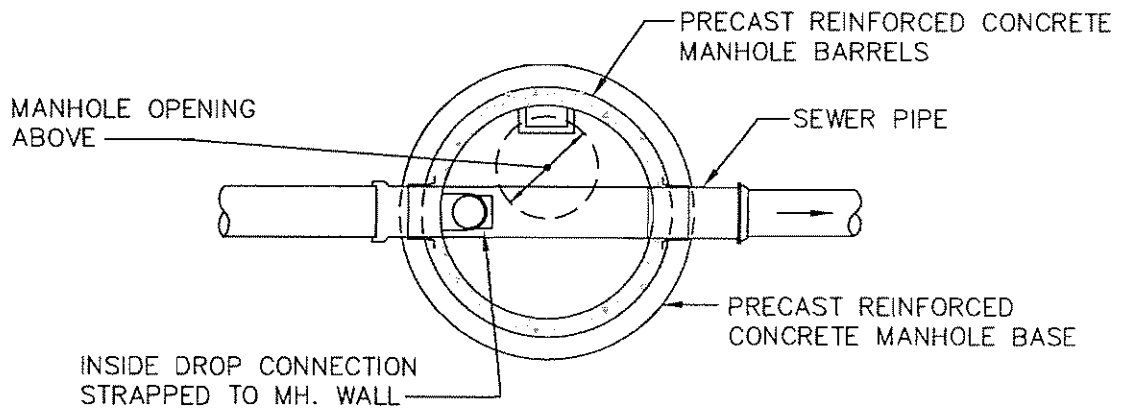


DETAIL OF LOCKING COVER
NOT TO SCALE

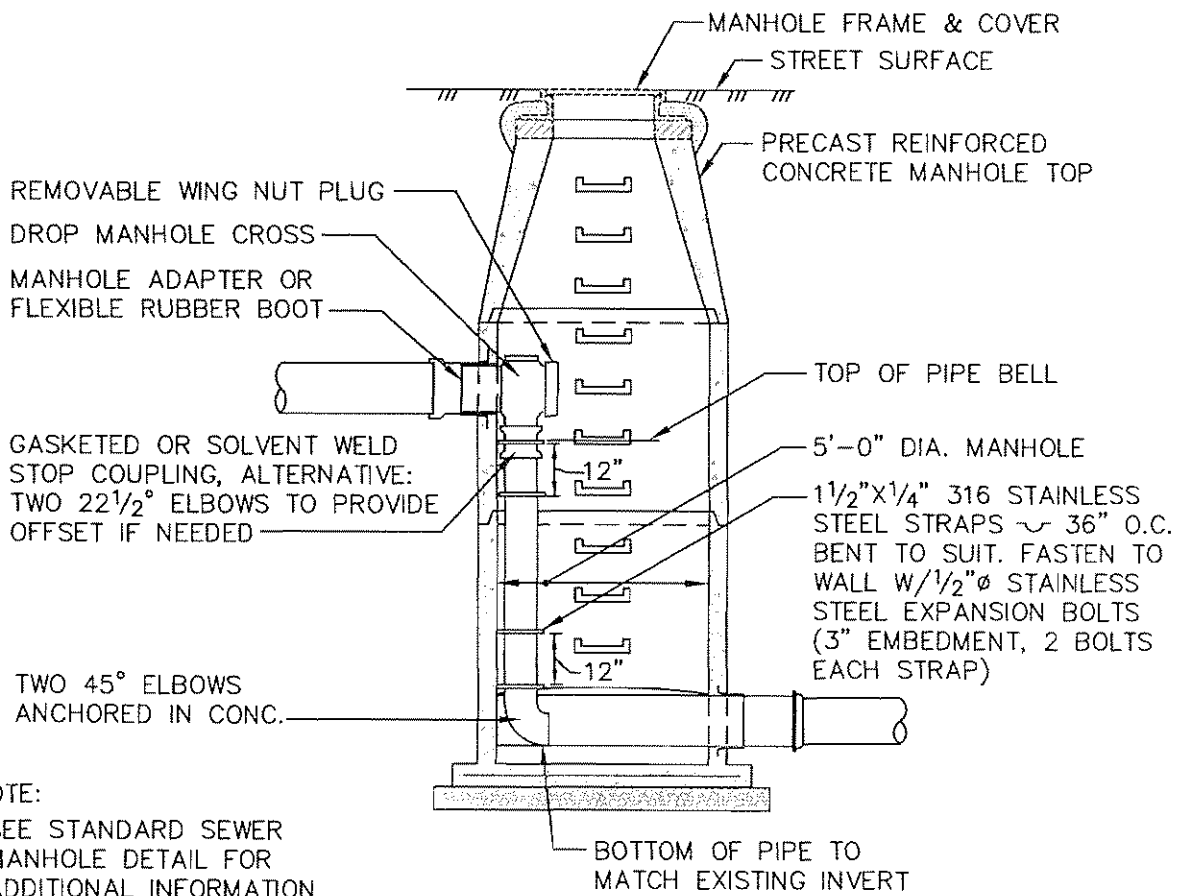
NOTE :
TYPE 2 LOCKING DEVICE WITH STANDARD LOCK EAR. PROVIDE ONE PICK HOLE IN COVER. (TO BE USED IN UNPAVED AREAS OR AS DIRECTED BY THE ENGINEER.)

MANHOLE FRAMES AND COVERS

FAY, SPOFFORD & THORNDIKE, LLC
ENGINEERS BURLINGTON, MA



SECTIONAL PLAN



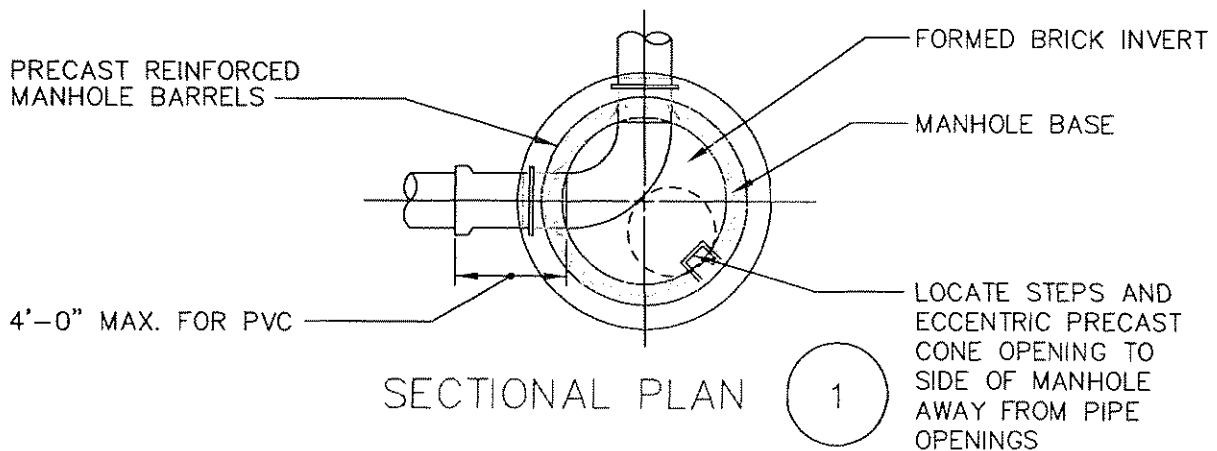
NOTE:
SEE STANDARD SEWER
MANHOLE DETAIL FOR
ADDITIONAL INFORMATION

ILLUSTRATIVE SECTION

INSIDE DROP MANHOLE

NOT TO SCALE

INSIDE DROP MANHOLE



COAT OUTSIDE WITH 1" CEMENT MORTAR TO 4" BELOW TOP OF PRECAST MH. TOP FINISHED GRADE (STREET SURFACE)

FINISH GRADE UNPAVED AREAS OR AS APPROVED BY ENGINEER

ADJUST TO GRADE WITH 2 BRICK COURSES MIN., 4 BRICK COURSES MAX., WITH 3/8" MORTAR JOINTS. BED FRAME IN FULL 3/8" MIN. IN FULL MORTAR BED. (PRECAST CONC. TOP RINGS MAY BE SUBSTITUTED)

MANHOLE JOINT SHALL BE SEALED WITH MASTIC GASKET PER FED. SPEC. SS-SS-210 TYPE 1, 1 1/4" Ø

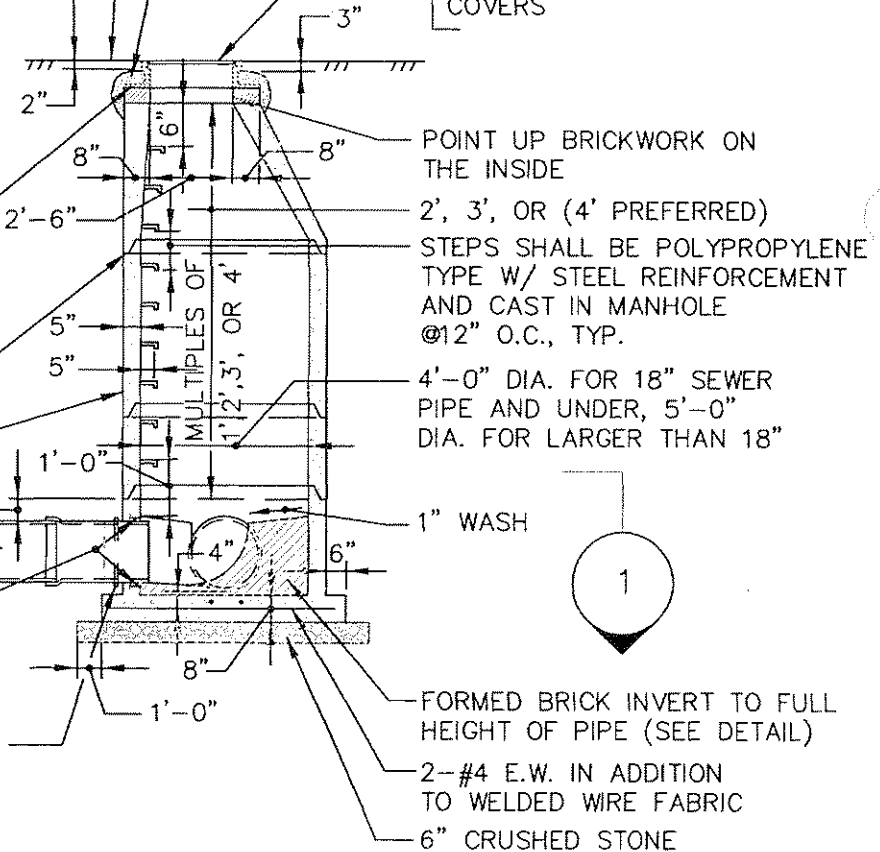
PRECAST REINFORCED CONC. MANHOLE BARRELS PER ASTM C-478

COMPLETELY FILL ANNULAR SPACE WITH NON SHRINK GROUT ON INSIDE OF MANHOLE

PIPE TO MANHOLE JOINT TO BE FLEXIBLE SLEEVE AND STAINLESS STEEL STRAP OR APPROVED EQUAL

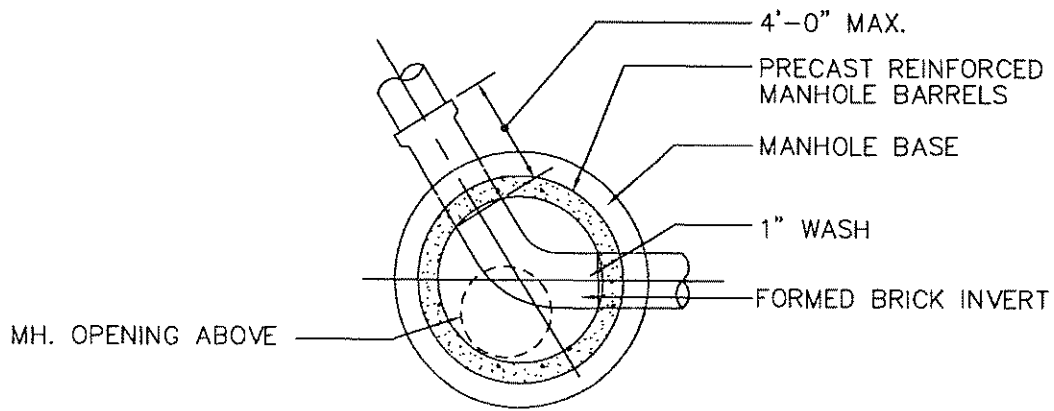
NOTE:
ALL LIFTING HOLES SHALL BE PLUGGED WITH NON SHRINK GROUT

MANHOLES LOCATED IN CROSS COUNTRY SHALL BE EQUIPPED WITH A LOCKING DEVICE. MANHOLES LOCATED IN AREAS SUBJECT TO FLOODING SHALL HAVE WATERTIGHT FRAMES & COVERS



SECTION NOT TO SCALE

STANDARD SEWER MANHOLE



SECTIONAL PLAN 1

COAT OUTSIDE WITH 1" CEMENT MORTAR TO 4" BELOW TOP OF PRECAST MH. TOP

ADJUST TO GRADE WITH 2 BRICK COURSES MIN., 4 BRICK COURSES MAX. WITH 3/8" MORTAR JOINTS. BED FRAME IN FULL 3/8" MIN. MORTAR BED

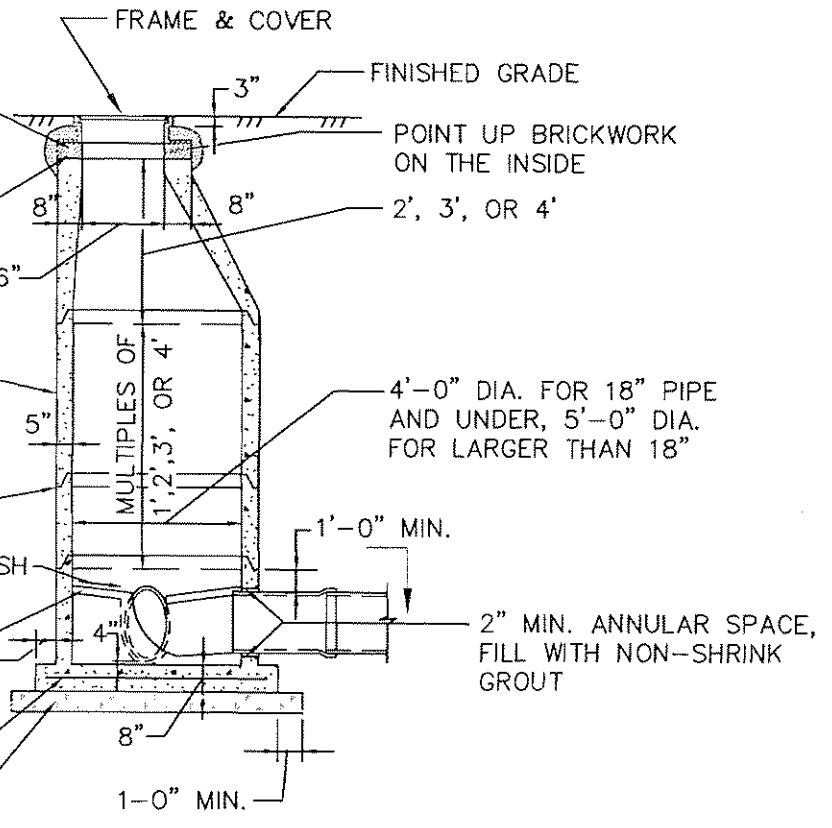
PRECAST REINFORCED CONCRETE MANHOLE BARRELS PER ASTM C-478

MANHOLE JOINT SHALL BE SEALED WITH MASTIC GASKET PER FED. SPEC. SS-SS-210, TYPE 1, 1 1/4" TH.

BRICK INVERT TO FULL HEIGHT OF PIPE

2-#4 E.W. IN ADDITION TO WELDED WIRE FABRIC

6" CRUSHED STONE



SECTION

NOTE:
ALL LIFTING HOLES SHALL BE PLUGGED WITH NON-SHRINK GROUT.

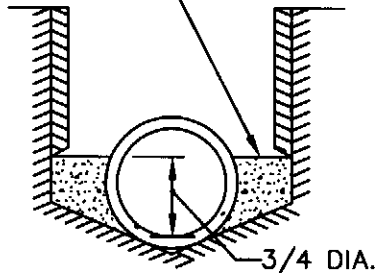
PRECAST CONCRETE DRAIN MANHOLE

PART CRADLE TO BE USED WITH PIPE
FOR DEPTH OF COVER AS FOLLOWS:

PIPE SIZE	V.C. PIPE (CLASS 2200)	PVC PIPE (SDR-35)	R.C. PIPE (CLASS IV)
8"	13'-19'	*	-
10"	(CLASS 2400) 12'-17'	*	-
12"	(CLASS 2600) 11'-17'	*	-
15"	-	*	13'-26'
18"	-	-	18'-30'
24"	-	-	17'-30'

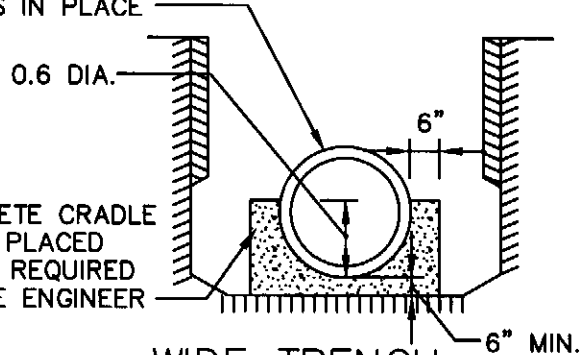
* PART CRADLE NOT REQUIRED UP TO 30' DEPTH OF COVER.

CONCRETE CRADLE BEARING AGAINST THE SIDES OF TRENCH TO BE PLACED WHERE REQUIRED BY THE ENGINEER

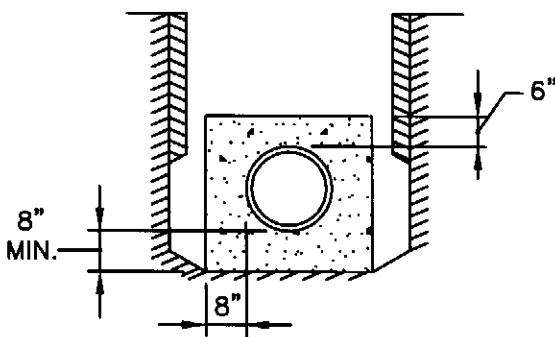


NARROW TRENCH PART CRADLE
NOT TO SCALE

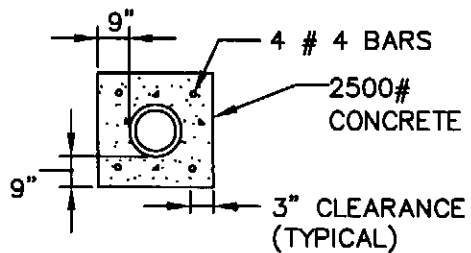
LAY PIPE ON WOOD BLOCKS AND LEAVE BLOCKS IN PLACE



WIDE TRENCH PART CRADLE
NOT TO SCALE



DEEP TRENCH FULL CRADLE
NOT TO SCALE



DETAIL OF PIPE ENCASED IN CONCRETE
NOT TO SCALE

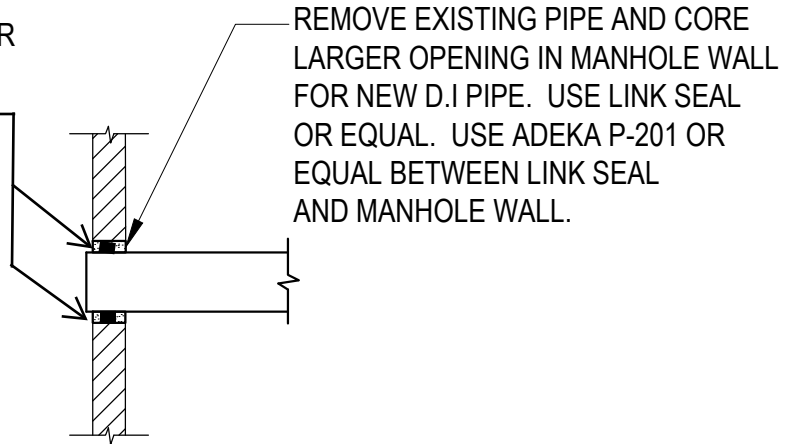
NOTE:
WHERE NEW LINES CROSS UNDER OR OVER, AND WITHIN 18" OF EXISTING WATER MAINS, CONCRETE ENCASEMENT SHALL BE USED AS DIRECTED BY THE ENGINEER.

CONCRETE CRADLE
NOT TO SCALE

CONCRETE CRADLE

C:\JS-144A.PRJ\02730f16.dwg 07/30/99 10:12 [0.17]

FILL ANNULAR SPACE
BETWEEN PIPE AND
MANHOLE ON INTERIOR
AND EXTERIOR WITH
NON-SHRINK GROUT.



REPAIR BRICK INVERT
AS REQUIRED. REFER
TO STANDARD DETAIL.

SECTION

NEW CONNECTION TO EXISTING BRICK STRUCTURE

NOT TO SCALE

FAY, SPOFFORD & THORNDIKE

STANDARD DETAILS LIBRARY

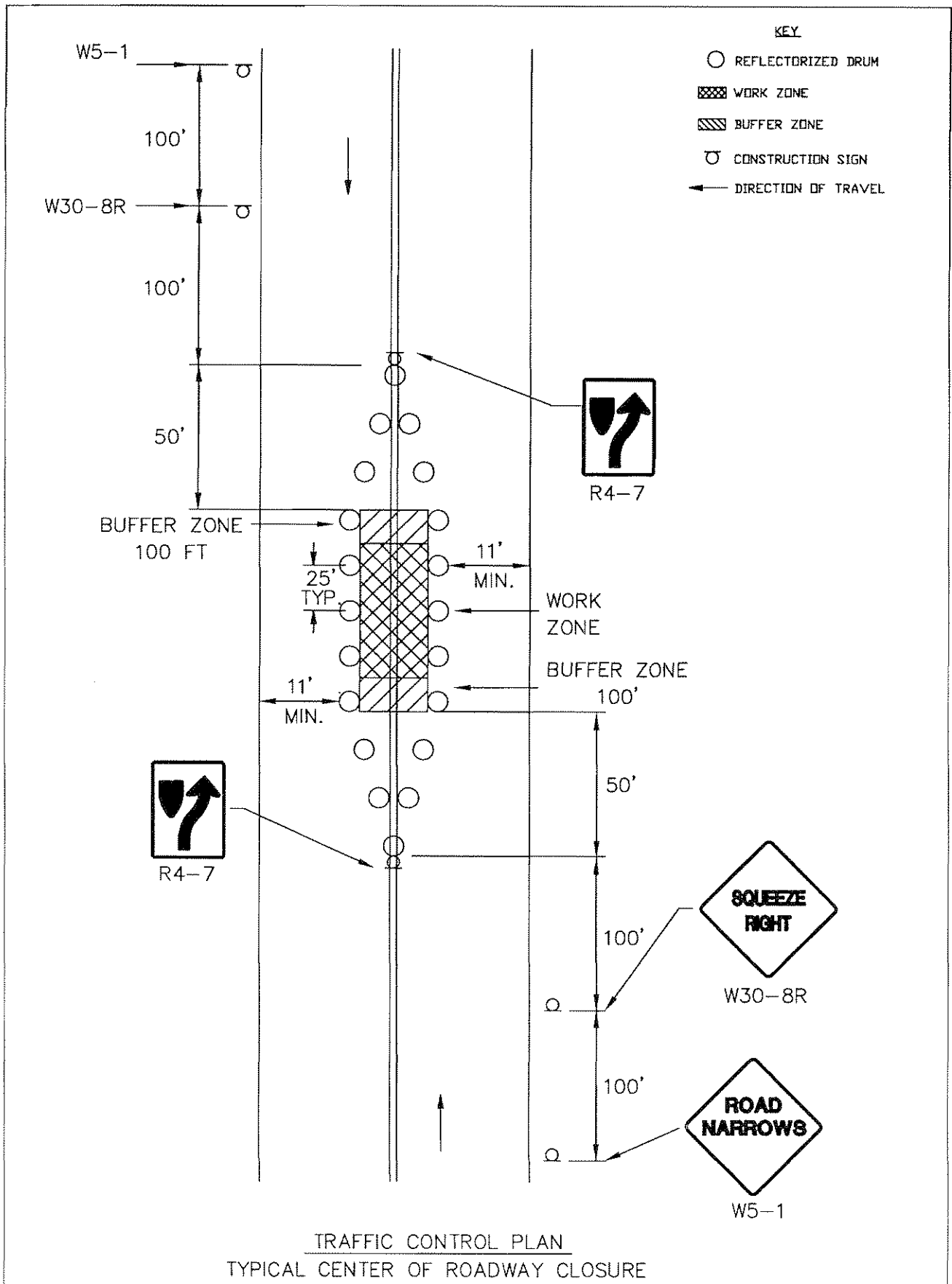
DATE: 7/17/2013

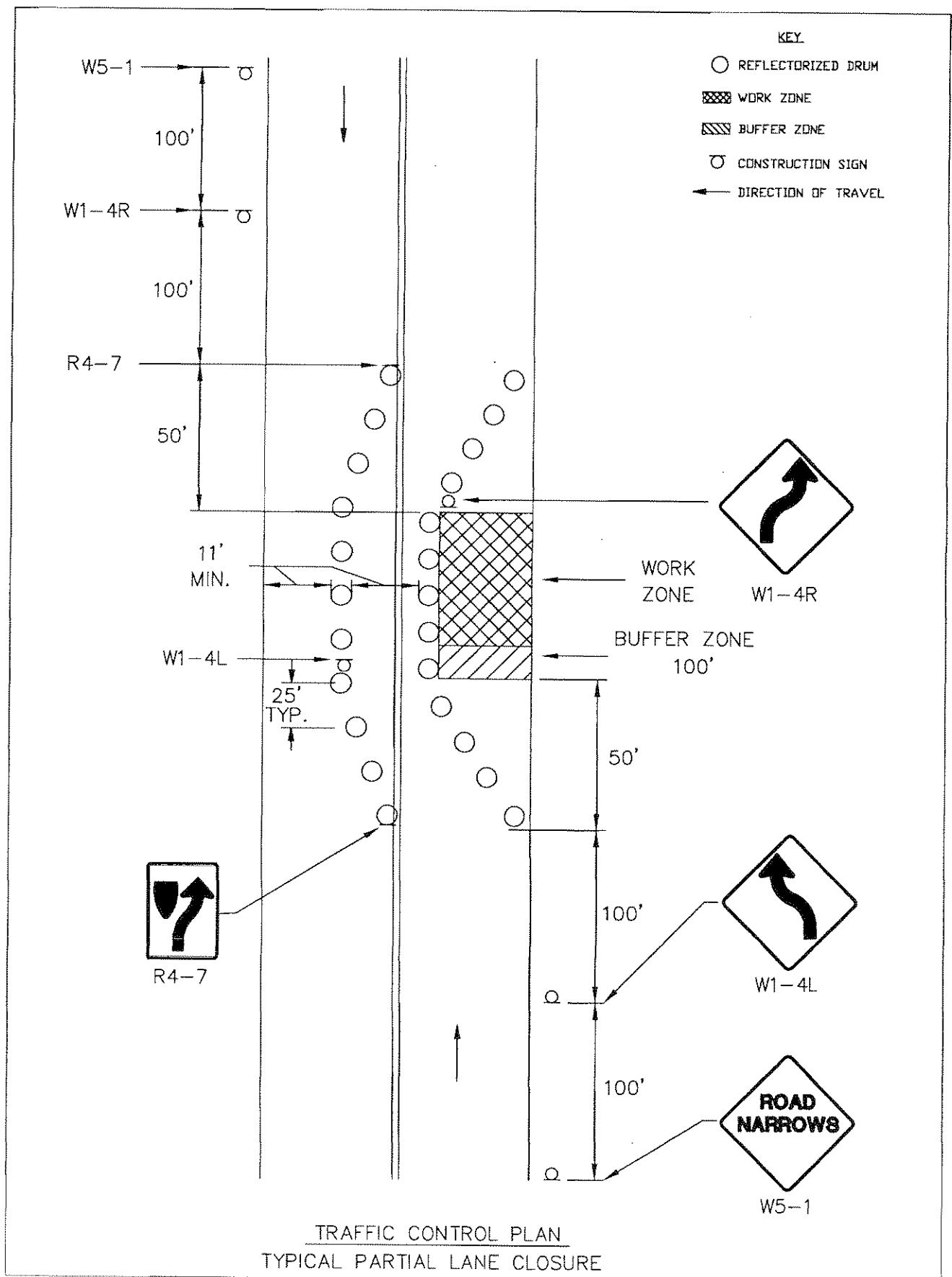
APPROVED BY: R.H.L.

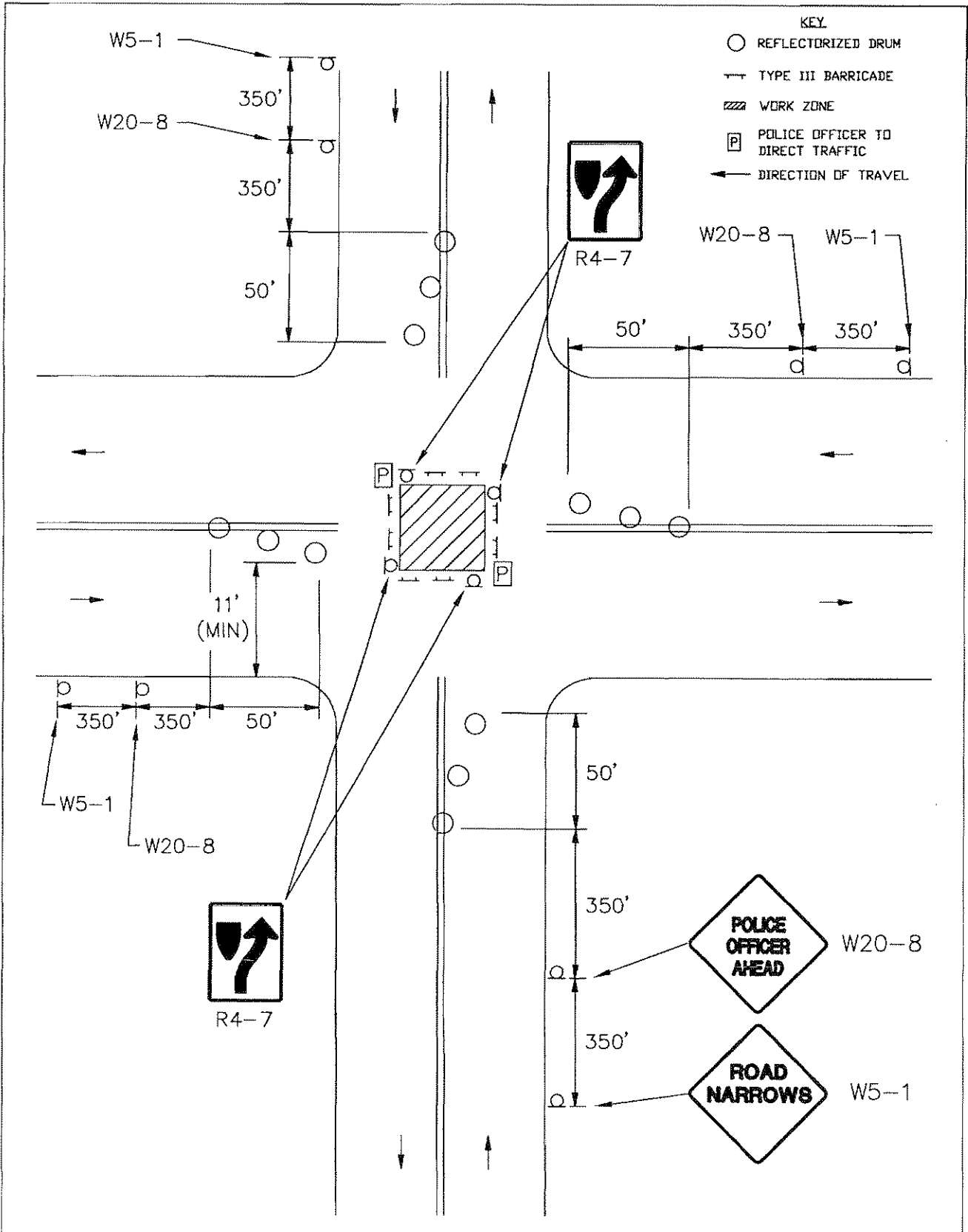
DETAIL NO.

02730 - 4C

NEW CONNECTION TO
EXISTING BRICK STRUCTURE







TRAFFIC CONTROL PLAN
TYPICAL LANE CLOSURE FOR WORK AT INTERSECTION CORNER

**SUMMARY OF OBSERVATIONS FROM
TELEVISED INSPECTION PROGRAM**

NEPCCO Division Heitkamp, Inc
 99 Callender Road
 Watertown CT 06795
 (860) 274-5469 Phone
 (860) 945-3219 Fax



PACP Sewer Report

Surveyors Name: **J. PEROTTI** and Certificate Number: **U-1107-6007** System Owner: **ARLINGTON MA** Drainage Area: **1** Sheet No.: **1**

P/O No.: **ARLINGTON-1** Pipeline Segment Reference: **ARLINGTON-1** Date: **2010/10/07** Time: **16:07** Location (Street Name and Number): **ACTON ST-T.V** Locality: **ARLINGTON 10-04-0003 TK-434**

Further Location Details: Downstream Manhole Number: **20007** Upstream Manhole Number: **20008** Rim to Invert: **U** Direction: **U** Grade to Invert: **U** Rim to Grade: **8**

Width: **C** Shape: **VCP** Material: **VCP** Ln. Method: **3.0** Pipe Joint Length: **231.0** Total Length: **231.0** Length Surveyed: **231.0** Year Laid: **434-1** Year Rehabilitated: **1:45 TO 1:53**

Purpose: **J** Sewer Category: **J** Pre-Cleaning: **J** Cleaned: **J** Weather: **J** Location Code: **J** Additional Information: **J**

Distance (Feet): **2.0** Video Ref: **24** Group/Descriptor: **RFJ** Continuous Defect: **RFJ** Value Inches: **12** Joint: **J** Circumferential Location: **12** Image Ref: **MINOR ROOTS** Remarks: **MINOR ROOTS**

Distance (Feet): **6.0** Video Ref: **62** Group/Descriptor: **RPR** Continuous Defect: **RPR** Value Inches: **12** Joint: **J** Circumferential Location: **12** Image Ref: **PVC REPAIR 9' TO 207' ✓ GOOD.** Remarks: **PVC REPAIR 9' TO 207' ✓ GOOD.**

Distance (Feet): **203.0** Video Ref: **368** Group/Descriptor: **MMC** Continuous Defect: **MMC** Value Inches: **CAST IRON** Joint: **J** Circumferential Location: **CAST IRON** Image Ref: **CAST IRON** Remarks: **CAST IRON**

Distance (Feet): **231.0** Video Ref: **456** Group/Descriptor: **AMH** Continuous Defect: **AMH** Value Inches: **20008** Joint: **J** Circumferential Location: **20008** Image Ref: **20008** Remarks: **20008**

Distance (Feet): **231.0** Video Ref: **456** Group/Descriptor: **AMH** Continuous Defect: **AMH** Value Inches: **20008** Joint: **J** Circumferential Location: **20008** Image Ref: **20008** Remarks: **20008**

Distance (Feet): **231.0** Video Ref: **456** Group/Descriptor: **AMH** Continuous Defect: **AMH** Value Inches: **20008** Joint: **J** Circumferential Location: **20008** Image Ref: **20008** Remarks: **20008**

TYPE MH

3



NEPCO Division Heitkamp, Inc
 99 Callender Road
 Watertown CT 06795
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 (860) 945-3219 Fax

PACP Sewer Report

Surveyors Name: J. PEROTTI
 and Certificate Number: U-11107-6006
 System Owner: ARLINGTON MA
 Drainage Area: ARLINGTON MA
 Sheet No.: 1

P/O No.: ARLINGTON-2
 Pipeline Segment Reference: ARLINGTON-2
 Date: 2010/10/07
 Time: 11:29
 Location (Street Name and Number): ACTON ST-T.V
 Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details: Upstream Manhole Number: 20007
 Rim to Invert: 20007
 Grade to Invert: 20007
 Rim to Grade: 230.0
 Total Length: 230.0
 Length Surveyed: 230.0
 Year Laid: 2007

Downstream Manhole Number: 20006
 Shape: C
 Material: VCP
 Ln. Method: 3.0
 Pipe Joint Length: 3.0
 Rim to Invert: 20007
 Grade to Invert: 20007
 Total Length: 230.0
 Length Surveyed: 230.0
 Year Laid: 2007

Purpose: Sewer Category: J
 Pre-Cleaning: J
 Cleaned: J
 Weather: J
 Location Code: J
 Additional Information: J

Tape/Media Number: 434-1
 Height: 6
 Flow Control: D
 Direction: D
 Year Rehabilitated: 0:17 TO 0:29

Distance (Feet)	Video Ref.	Group/Descriptor	Modifier/Severity	Continuous Defect	S/M/L	Value Inches	1st	2nd	3rd	Joint	Circumferential Location	Image Ref.	Remarks
3.0	26	RMJ								J	12		NO DEFECT
5.0	111	RMJ								J	12		NO DEFECT
13.0	11	RMJ								J	12		MINOR ROOTS
51.0	87	TFA				4					9		GOOD
57.0	115	TBA				4					12	300 CHIMNEY	OK POSSIBLE INFILTRATION
68.0	158	TFC				4					9		CAPPED
97.0	157	TFC				4					9		CAPPED
113.0	261	TFA				6					9		GOOD
144.0	314	TFA				4					9		GOOD
145.0	337	CL									12		MINOR FINE CRACK
174.0	397	TFA				4					9		GOOD

3

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Surveyors Name
J. PEROTTI

System Owner

Date
2010/10/07

Upstream Manhole Number
20007

Pipeline Segment Ref
ARLINGTON-2

Sheet No.
2

Distance (Feet)	Video Ref.	Group/ Descripto	Modify/ Severity	Continuous Defect	S/W/L	Value Inches	1st	2nd	%	Joint	Circumferential Location	at	to	Image Ref.	Remarks
-----------------	------------	------------------	------------------	-------------------	-------	--------------	-----	-----	---	-------	--------------------------	----	----	------------	---------

181' BROKEN PIPE IN INERT MINOR. CAPED; BROKEN SOIL MIDDLE

194.0	441	TFC				4					9				
230.0	494	AMH													MH# 20006

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PACP Sewer Report

Surveyors Name: J. PEROTTI and Certificate Number: U01107-6007 System Owner: ARLINGTON MA Drainage Area: ARLINGTON MA Survey Customer: ARLINGTON MA Sheet No.: 1

P/O No.: ARLINGTON-3 Pipeline Segment Reference: ARLINGTON-3 Date: 2010/10/07 Time: 10:37 Location (Street Name and Number): ACTON ST-T-V Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details: Downstream Manhole Number: 20005 Upstream Manhole Number: 20006 Rim to Invert: Rim to Grade: Rim to Invert: Rim to Grade: Grade to Invert: Grade to Invert: Direction: D Height: 6

Width: C Shape: C Material: VCP Ln. Method: VCP Pipe Joint Length: 3.0 Total Length: 262.0 Length Surveyed: 262.0 Year Laid: Year Rehabilitated: Type/Media Number: 434-1 0:01 TO 0:17

Purpose: J Pre-Cleaning: Cleaned Weather: Location Code: Additional Information: Use of Sewer: Flow Control: Rim to Invert: Rim to Grade: Grade to Invert: Grade to Invert: Direction: D Height: 6

Distance (Feet): 1.0, 32.0, 62.0, 89.0, 92.0, 120.0, 139.0, 147.0, 159.0, 166.0, 182.0

Distance (Feet)	Video Ref.	Group/ Descripto	Modifier/ Severity	Continuous Defect	S/W/L	Valve Inchs	1st	2nd	Joint	Circumferential Location	Image Ref.	Remarks
1.0	25	RFJ							J	12		MINOR FINE ROOT
32.0	90	TFA				4				9		GOOD
62.0	151	TFC				4				9		CAPPED SERVICE
89.0	208	TFC				4				9		CAPPED SERVICE
92.0	252	CL								12		95' TO 100'
120.0	333	TFA				6				9		GOOD: FINE ROOTS @ JOINT. MODERATE CRACK @ 12.00
139.0	384	TFC				4				9		CAPPED SERVICE
147.0	426	TBA				4				12		GOOD. 9.00 SERVICE CHIMNEY
159.0	467	TBA				6				3		GOOD. BREAK-IN (IMPOSSIBLE)
166.0	501	TFC				4				9		CAPPED SERV.
182.0	546	TFC				4				9		CAPPED SERV.



Surveyors Name
J. PEROTTI

System Owner

Date
2010/10/07

Upstream Manhole Number
20006

Pipeline Segment Ref
ARLINGTON-3

Sheet No.
2

Distance (Feet)	Video Ref.	Group/ Descripto	Modifier/ Severity	Continuous Defect	S/W/L	Value Inches	1st	2nd	%	Joint	Circumferential Location	Image Ref.	Remarks
-----------------	------------	------------------	--------------------	-------------------	-------	--------------	-----	-----	---	-------	--------------------------	------------	---------

193.0	600	TFA				6				9			GOOD. ROOTS @ 1st JOINT.
194.0	668	JOM			M								OFFSET 1" OK.
209.0	726	TFC				4				9			CAPPED.
243.0	796	TFC				4				9			CAPPED.
256.0	863	CM								10	4		MINOR CRACK 12:00
262.0	901	AMH											MH# 20005

219' FIVE ROOTS AT JOINT

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1

PACP Sewer Report

Surveyors Name: J. PEROTTI
 and Certificate Number: U-1107-6007
 System Owner: ARLINGTON MA
 Survey Customer: ARLINGTON MA
 Drainage Area: ARLINGTON MA
 Sheet No.: 1

P/O No.: ARLINGTON-4
 Pipeline Segment Reference: ARLINGTON-4
 Date: 2010/10/07
 Time: 10:30
 Location (Street Name and Number): ACTON ST-T.V
 Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details
 Upstream Manhole Number: 20005
 Rim to Invert: []
 Grade to Invert: []
 Rim to Grade: []

Downstream Manhole Number: 20004
 Width: C
 Shape: C
 Material: VCP
 Ln. Method: []
 Pipe Joint Length: 3.0
 Rim to Invert: []
 Grade to Invert: []
 Total Length: 56.0
 Length Surveyed: 56.0
 Year Laid: []
 Year Rehabilitated: []
 Use of Sewer: []
 Direction: D
 Flow Control: []
 Height: 6
 Tape/Media Number: 434-1 0:00 TO 0:01

Purpose: Sewer Category: J
 Pre-Cleaning: []
 Cleaned: []
 Weather: []
 Location Code: []
 Additional Information: []

Distance (Feet)	Video Ref.	Group/Descriptor	Modifier/Severity	Continuous Defect	S/M/L	Value Inches	1st	2nd	%	Joint	Circumferential Location	Image Ref.	Remarks
56.0	83		AMH										MH# 20004

PIPE IN GOOD CONDITION



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PACP Sewer Report

Surveyors Name: **J. PEROTTI** and Certificate Number: **U-1107-6007** System Owner: **ARLINGTON MA** Drainage Area: _____ Sheet No.: **1**
 P/O No.: _____ Pipeline Segment Reference: **ARLINGTON-5** Date: **2010/10/07** Time: **12:23** Location (Street Name and Number): **PARK AVE- T.V** Locality: **ARLINGTON 10-04-0003 TK-434**
 Further Location Details: _____ Upstream Manhole Number: **21009** Rim to Invert: _____ Grade to Invert: _____ Rim to Grade: _____ Height: **8**
 Downstream Manhole Number: **21008** Rim to Invert: _____ Grade to Invert: _____ Rim to Grade: _____ Use of Sewer: _____ Flow Control: _____ Direction: **D**
 Width: **C** Shape: **C** Material: **VCP** Ln. Method: _____ Pipe Joint Length: **3.0** Total Length: **350.0** Length Surveyed: **350.0** Year Laid: _____ Year Rehabilitated: _____ Tape/Media Number: **434-1 0:29 TO 1:16**

Purpose: _____ Sewer Category: **J** Pre-Cleaning: _____ Cleaned: _____ Weather: _____ Location Code: _____ Additional Information: _____
 Video Ref.: _____ V/Geo Ref.: _____ Group/Modify Descripto. Severity: _____ Continuous Defect: _____ S/M/L: _____ Value Inches: _____ %: _____ Joint: _____ Circumferential Location: _____ Image Ref.: _____ Remarks: _____

Distance (feet)	V/Geo Ref.	V/Geo Ref.	Group/Modify Descripto. Severity	Continuous Defect	S/M/L	Value Inches	%	Joint	Circumferential Location	Image Ref.	Remarks
	1st	2nd							at	to	
78.0			RBJ				80	J	12		
79.0		6	TFA						9		
138.0		6	TFA						9		
201.0		6	TFA						9		
258.0			CC						5	8	
259.0		6	TFA						9		
278.0			IR						3		
302.0			CM						12	12	
326.0			CC						5	9	
350.0			AMH								MH# 21008



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PACP Sewer Report

Surveyors Name: J. PEROTTI and Certificate Number: U-1107-6007 System Owner: ARLINGTON MA
 Drainage Area: ARLINGTON MA
 Sheet No.: 1
 P/O No.: ARLINGTON-6 Pipeline Segment Reference: ARLINGTON-6 Date: 2010/10/07 Time: 13:54
 Location (Street Name and Number): APPLETON ST- T.V
 Locality: ARLINGTON 10-04-0003 TK-434
 Further Location Details: Upstream Manhole Number: 20004 Rim to Invert: 20004 Grade to Invert: 20004 Rim to Grade: 20004
 Downstream Manhole Number: 20003 Rim to Invert: 20003 Grade to Invert: 20003 Rim to Grade: 20003
 Width: C Shape: C Material: VCP Ln. Method: Pipe Joint Length: 3.0 Rim to Invert: Grade to Invert: Rim to Grade: Length Surveyed: 212.0 Total Length: 212.0 Year Laid: Year Rehabilitated: Direction: D Flow Control: Height: 8
 Purpose: Sewer Category: J Pre-Cleaning: Cleaned: Weather: Location Code: Additional Information: Tape/Media Number: 434-1 1:16 TO 1:30

Distance (Feet)	Video Ref.	Group/Descriptor	Notifier/Severity	Continuous Defect	S/W/L	Value Inches	1st	2nd	Joint	Circumferential Location	Image Ref.	Remarks
7.0	85		HSV							1		MINOR CRACK SURFACE OF PIPE
32.0	211		CM							12		MINOR CIRCULAR CRACK
51.0	278		TFC			6				3		CAPPED
74.0	332		TFC			6				3		CAPPED
77.0	331		TBA			6				3		GOOD; ROOTS AT CONNECTION
84.0	404		TFA			6				3		GOOD; MODERATE ROOTS IN SERVICE
109.0	462		TFC			6				3		CAPPED
116.0	493		RFJ					J		3		FINE ROOTS MINOR
126.0	544		TFC			6				3		CAPPED
159.0	615		TFC			6				3		CAPPED
194.0	698		CC							10		MINOR CRACK

154' MINOR CRACK @ 2:00

2



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Watertown CT 06795
(860) 274-5459 Phone
(860) 945-3219 Fax

Surveyors Name
J. PEROTTI

System Owner

Date
2010/10/07

Upstream Manhole Number
20004

Pipeline Segment Ref
ARLINGTON-6

Sheet No.
2

Distance (feet)	Video Ref.	Group/ Description	Modify/ Severity	Continuous Defect	S/M/L	Value Inches	1st	2nd	%	Joint	Circumferential Location	Image Ref.	Remarks
-----------------	------------	--------------------	------------------	-------------------	-------	--------------	-----	-----	---	-------	--------------------------	------------	---------

212.0	776	AMH											MH# 20003
-------	-----	-----	--	--	--	--	--	--	--	--	--	--	-----------

208'-212' - CAPE HEAVILY TURBULATED

4



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PACP Sewer Report

Surveyors Name: **J. PEROTTI** and Certificate Number: **U-1107-6007** System Owner: **ARLINGTON MA** Survey Customer: **ARLINGTON MA** Sheet No.: **1**
 P/O No.: **ARLINGTON-7** Pipeline Segment Reference: **ARLINGTON-7** Date: **2010/10/11** Time: **13:24** Location (Street Name and Number): **APPLETON ST - T.V** Locality: **ARLINGTON 10-04-0003 TK-434**
 Further Location Details: **Upstream Manhole Number: 20003** Rim to Invert: **20003** Grade to Invert: **20003** Rim to Grade: **20003** Direction: **U** Flow Control: **8**
 Downstream Manhole Number: **20001** Rim to Invert: **20003** Grade to Invert: **20003** Rim to Grade: **20003** Direction: **U** Flow Control: **8**
 Width: **C** Shape: **C** Material: **VCP** Ln. Method: **VCP** Pipe Joint Length: **3.0** Total Length: **157.0** Length Surveyed: **157.0** Year Laid: **434-1** Year Rehabilitated: **5:09 TO 5:24** Tape/Media Number: **434-1 5:09 TO 5:24**
 Purpose: **Sewer Category: J** Pre-Cleaning: **Cleaned** Weather: **J** Location Code: **J** Additional Information:

Distance (Feet)	Video Ref	Group/Modifier/Descriptor	Continuous Defect	Value Inches	Joint	Circumferential Location	Injate Ref. Location	Remarks
				1st	2nd	at	to	
19.0	147	TFC		6		9		CAPPED
20.0	181	CM				12	12	SEVERE PARTIALLY COLLAPSED
34.0	282	CM				12	12	SEVERE PARTIALLY COLLAPSED
41.0	380	CL				12		MINOR CRACK
49.0	433	HSV			3			MODERATE BAKEN @ SURFACE
71.0	495	BSV			12			SEVERE CRACKS
75.0	581	CM			12	12		SEVERE CRACKS
86.0	655	TFC		6		9		CAPPED
113.0	712	TFC		6		9		CAPPED
118.0	743	BVV				2		OLD POINT REPAIR ROOF
157.0	882	AMH						MH# 20003

47' SERVICE @ 9:00 TAP FACTORY

5

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PACP Sewer Report

Surveyors Name: J. PEROTTI and Certificate Number: U-1107-6007
System Owner: ARLINGTON MA Survey Customer: ARLINGTON MA
Drainage Area: 1 Sheet No.: 1

P/O No.: ARLINGTON-8 Pipeline Segment Reference: ARLINGTON-8
Date: 2010/10/11 Time: 13:42
Location (Street Name and Number): APPLETON ST - T.V
Locality: ARLINGTON 10-4-0003 TK-434

Further Location Details: Upstream Manhole Number: 20001
Rim to Invert: Rim to Invert: Rim to Grade: Rim to Grade

Downstream Manhole Number: M4209
Rim to Invert: Rim to Grade: Use of Sewer: Direction: Flow Control: Height: 8

Width: C Shape: VCP Material: VCP Ln. Method: VCP
Total Length: 58.0 Length Surveyed: 11.0 Year Laid: Year Rehabilitated: Tape/Media Number: 434-1 5:24 TO 5:30

Purpose: Sewer Category: Pre-Cleaning: Cleaned: J Weather: Location Code: Additional Information

Distance (Feet)	Video Ref	Group/Descriptor	Modifier/Severity	Continuous Defect	S/M/L	Value Inches	%	Joint	Circumferential Location	Image Ref	Remarks
						1st	2nd		at	to	

3.0	54	CL							12		MODERATE CRACKS
5.0	94	BVW							11		CONCRETE PROTRUDING
8.0	172	B							12		SEVERE
11.0	244	MSA									UNABLE TO GET THROUGH BROKEN PIPE

ATTEMPTED POINT REPAIRS w/
UNCONVENTIONAL MATERIALS
(CONCRETE & ROCKS.)
REPLACE SECTION

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PACP Sewer Report

Surveyors Name: J. PEROTTI
 and Certificate Number: U-1107-6007
 System Owner: ARLINGTON MA
 Survey Customer: ARLINGTON MA
 Drainage Area: [Blank]
 Sheet No.: 1

P/O No.: [Blank]
 Pipeline Segment Reference: ARLINGTON-8
 Date: 2010/10/11
 Time: 13:52
 Location (Street Name and Number): APPLETON ST - T.V
 Locality: ARLINGTON 10-4-0003 TK-434

Further Location Details:
 Upstream Manhole Number: 20001
 Rim to Invert: [Blank]
 Grade to Invert: [Blank]
 Rim to Grade: [Blank]

Downstream Manhole Number: M4209
 Rim to Invert: [Blank]
 Grade to Invert: [Blank]
 Rim to Grade: [Blank]

Width: [Blank]
 Shape: C
 Material: VCP
 Ln. Method: [Blank]
 Pipe Joint Length: 3.0
 Total Length: 58.0
 Length Surveyed: 47.0
 Year Laid: [Blank]
 Year Rehabilitated: [Blank]
 Direction: U
 Flow Control: [Blank]
 Height: 8
 Tape/Media Number: 434-1 5:30 TO 5:36

Purpose: Sewer Category: J
 Pre-Cleaning: [Blank]
 Cleaned: [Blank]
 Weather: [Blank]
 Location Code: [Blank]
 Additional Information: [Blank]

Distance (Feet)	Video Ref.	Group/Descriptor	Modifier/Severity	Continuous Defect	S/W/L	Value Inches	Joint %	Circumferential Location	Impact Ref.	Remarks
						1st	2nd	at	to	
7.0	115	BVV						4		
12.0	68	CM		S1				12	12	12-25' SEVERE SPOKEN PIPE
15.1	68	CM		F1				12	12	
44.0	351	BSV						12		SEVERE OFFSET
44.0	371	MSA								BROKEN PIPE

REPLACE SECTION

3

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PACP Sewer Report

Surveyor's Name: J. PEROTTI
and Certificate Number: U-1107-6007
System Owner: ARLINGTON MA
Drainage Area: ARLINGTON 10-04 0003 TK-434
Sheet No.: 1

P/O No.: ARLINGTON-9
Pipeline Segment Reference: ARLINGTON-9
Date: 2010/10/07
Time: 15:29
Location (Street Name and Number): ACTON ST-T.V
Upstream Manhole Number: 20009
Rim to Invert: [blank]
Grade to Invert: [blank]
Rim to Grade: [blank]

Further Location Details: [blank]
Downstream Manhole Number: 20008
Material: VCP
Ln. Method: [blank]
Rim to Invert: [blank]
Pipe Joint Length: 3.0
Total Length: 118.0
Length Surveyed: 118.0
Year Laid: [blank]
Year Rehabilitated: [blank]
Direction: D
Flow Control: [blank]
Height: 8
Tape/Media Number: 434-1 1:30 TO 1:41

Purpose: Sewer Category: J
Pre-Cleaning: Cleaned
Weather: [blank]
Location Code: [blank]
Additional Information: [blank]

Distance (Feet)	Video Ref.	Group/Descriptor	Modifier/Severity	Continuous Defect	S/W/L	Value Inches	Joint %	Circumferential Location	Image Ref.	Remarks
						1st	2nd	at	to	
48.0	184	CL						12		MINOR FINE CRACK
67.0	240	CM						12	12	70' TO 82' MODERATE CRACKS
118.0	464	AMH								MH# 20008

OFF SET JOINTS FROM 85'-118'

1



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PACP Sewer Report

Surveyors Name: J. PEROTTI
and Certificate Number: U-1107-6007
System Owner: ARLINGTON MA
Drainage Area: ARLINGTON MA
Sheet No.: 1

P/O No.: ARLINGTON-10
Pipeline Segment Reference: ARLINGTON-10
Date: 2010/10/07
Time: 15:46
Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details: Downstream Manhole Number: 20009
Upstream Manhole Number: 20012
Grade to Invert: [blank]
Rim to Invert: [blank]
Use of Sewer: [blank]
Direction: U
Flow Control: [blank]
Height: 8

Width: C
Shape: VCP
Material: VCP
Ln. Method: [blank]
Pipe Joint Length: 3.0
Total Length: 42.0
Length Surveyed: 42.0
Year Laid: [blank]
Year Rehabilitated: [blank]
Tape/Media Number: 434-1 1:41 TO 1:44

Purpose: Sewer Category: J
Pre-Cleaning: [blank]
Cleaned: [blank]
Weather: [blank]
Location Code: [blank]
Additional Information: [blank]

Distance (Feet)	Video Ref	Video Ref	Group/Descriptor	Modifier/Severity	Continuous Defect	S/W/L	Inches	Value	Joint	Circumferential Location	Image Ref	Remarks
42.0	144	AMH										MH# 20012

PIPE IN GOOD CONDITION.
25% STANDING SEWAGE THROUGHOUT PIPE

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PACP Sewer Report

Surveyors Name <i>J. Perotti</i>	System Owner <i>Arlington Ma.</i>	Drainage Area	Sheet No. 1
P/O No.	Pipeline Segment Reference <i>Arlington - 11</i>	Location (Street Name and Number)	Locality <i>Arlington Ma.</i>
Date 1899/12/30	Time 00:00	Upstream Manhole Number <i>Ottoson Middle School</i>	Rim to Invert Grade to Invert Rim to Grade
Further Location Details <i>Concrete in invert crawler won't go up line</i>	Material <i>VCP</i>	Ln. Method	Flow Control <i>gr.</i>
Downstream Manhole Number <i>20012</i>	Rim to Invert	Grade to Invert	Year Laid 1899
Width	Pipe Joint Length	Total Length	Year Rehabilitated 1899
Purpose	Weather	Location Code	Direction
Pre-Cleaning	Cleaned	1899/12/30	Use of Sewer
			Additional Information

Distance (feet)	Video Ref.	Group/Descriptor	Modifier/Severity	Continuous Defect	S/W/L	Value Inches	Joint	Circumferential Location	Image Ref.	Remarks
						1st		at		
						2nd		to		

DID NOT PUT CAMERA INTO PIPE @ 20012

2



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PACP Sewer Report

Surveyors Name: **J. PEROTTI** and Certificate Number: **U-1107-6007** System Owner: **ARLINGTON MA** Drainage Area: **ARLINGTON MA** Sheet No.: **1**

P/O No.: **ARLINGTON-21** Pipeline Segment Reference: **ARLINGTON-21** Date: **2010/10/08** Time: **08:00** Locality: **ARLINGTON 10-04-0003 TK-434**

Further Location Details: Upstream Manhole Number: **AC002** Rim to Invert: **AC002** Grade to Invert: **AC002** Rim to Invert: **AC002** Direction: **D** Flow Control: **8**

Downstream Manhole Number: **AC002A** Grade to Invert: **AC002** Rim to Grade: **173.0** Length Surveyed: **173.0** Year Laid: **434-1** Type/Media Number: **1:53 TO 2:02**

Purpose: **J** Sewer Category: **J** Pre-Cleaning: **Cleaned** Weather: **Additional Information** Location Code: **Additional Information**

Distance (Feet)	Video Ref.	Group/Descriptor	Modifier/Severity	Continuous Defect	S/M/L	Value Inches	1st	2nd	3rd	Joint	Circumferential Location	Image Ref.	Remarks
1.0	27	TFA				6					9		GOOD
36.0	146	TBI				6	1				9		GOOD; OLD REPAIR @ SERVICE
59.0	228	TBI				6	2				3		GOOD
81.0	279	TBI				6	1				3		GOOD
109.0	377	TFA				6					12		GOOD. UNKNOWN DIRECTION
111.0	398	CC									8		MINOR CRACK
130.0	471	TFA				6					12		GOOD. UNKNOWN DIRECTION
173.0	543	AMH											MH# AC002A

158 SERVICE @ 12:00

3



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 99 Callender Road
 Watertown CT 06795
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 (860) 945-3219 Fax

PACP Sewer Report

Surveyors Name: J. PEROTTI
 and Certificate Number: U-1107-6007
 System Owner: ARLINGTON MA
 Survey Customer: ARLINGTON MA
 Drainage Area: ARLINGTON MA
 Sheet No.: 1

P/O No.: ARLINGTON-12
 Pipeline Segment Reference: ARLINGTON-12
 Date: 2010/10/08
 Time: 08:11
 Location (Street Name and Number): FOREST ST-T.V
 Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details: Upstream Manhole Number: AC002A
 Rim to Invert: Rim to Grade: Rim to Invert: Rim to Grade: Rim to Invert: Rim to Grade

Downstream Manhole Number: M4207
 Width: C
 Shape: C
 Material: VCP
 Ln. Method: VCP
 Pipe Joint Length: 3.0
 Rim to Invert: Rim to Grade: Rim to Grade: Rim to Grade: Rim to Grade: Rim to Grade
 Grade to Invert: Grade to Invert: Grade to Invert: Grade to Invert: Grade to Invert: Grade to Invert
 Total Length: 176.0
 Length Surveyed: 176.0
 Use of Sewer: Use of Sewer: Use of Sewer: Use of Sewer: Use of Sewer: Use of Sewer
 Direction: D
 Direction: D
 Direction: D
 Direction: D
 Direction: D
 Direction: D
 Year Laid: Year Laid: Year Laid: Year Laid: Year Laid: Year Laid
 Year Rehabilitated: Year Rehabilitated: Year Rehabilitated: Year Rehabilitated: Year Rehabilitated: Year Rehabilitated
 Tape/Media Number: 434-1 2:02 TO 2:11
 Height: 8

Purpose: Sewer Category: Pre-Cleaning: Cleaned: Weather: Location Code: Additional Information: J

Distance (Feet): Video Ref: Group/Descriptor: Severity: Continous Defect: S/M/L: Value: Inches: 1st: 2nd: Joint: Circumferential Location: at: to: Image Ref: Remarks:

Distance (Feet)	Video Ref	Group/Descriptor	Severity	Continous Defect	S/M/L	Value Inches	1st	2nd	Joint	Circumferential Location	at	to	Image Ref	Remarks
1.0	48	CC								12	12			MINOR @ INVERT
14.0	124	TFA				6				12	12			GOOD UNKNOWN DIRECTION.
57.0	223	CM								12	12			MINOR CRACKS
60.0	273	TFA				6				9				(90%) HEAVY DEPOSITS REPLACE
65.0	305	TFA				6				12	12			HEAVY DEPOSITS REPLACE
98.0	359	TFA				6				12	12			GOOD UNKNOWN DIRECTION
102.0	395	CC								5	7			MINOR CRACK (INVERT)
176.0	503	AMH												MH# M4207

124' MINOR CRACKS @ INVERT.
 HEAVY GREASE/DEBRIS ON WALLS THROUGHOUT.

ARE THESE ACTIVE?

2

PIPE IN GOOD STRUCTURAL CONDITION
INFILTRATION EVIDENT (M.D. @ JOINTS THROUGHOUT)
ACTIVE @ 73' (0.25 GPM)

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Watertown CT 06795
(860) 274-5469 Phone
(860) 945-3219 Fax



PACP Sewer Report

Surveyors Name: J. PEROTTI
and Certificate Number: U-1107-6007
System Owner: ARLINGTON MA
Survey Customer: ARLINGTON MA
Drainage Area: [Blank]
Sheet No.: 1

P/O No.: ARLINGTON-13
Pipeline Segment Reference: ARLINGTON-13
Date: 2010/10/11
Time: 11:24
Location (Street Name and Number): MASS AVE - T.V
Locality: ARLINGTON 10-04-0003 tk-434

Further Location Details: Downstream Manhole Number: M4208
Upstream Manhole Number: M4209
Rim to Invert: [Blank] Grade to Invert: [Blank] Rim to Grade: [Blank]
Direction: D
Flow Control: [Blank] Height: 12

Width: C
Material: VCP
Ln. Method: [Blank]
Pipe Joint Length: 3.0
Total Length: 207.0
Year Laid: [Blank] Year Rehabilitated: [Blank]
Tape/Media Number: 434-1 4:35 TO 4:51

Purpose: Sewer Category: J
Pre-Cleaning: Cleaned
Weather: [Blank]
Location Code: [Blank]
Additional Information: [Blank]

Distance (feet): 8.0, 12.0, 36.0, 73.0, 104.0, 107.0, 134.0, 137.0, 172.0, 175.0, 207.0
Video Ref.: 171, 213, 287, 361, 442, 614, 666, 698, 1570, 1587, 1641
Group/Modify/Descrpto: TFC, TFC, TFA, TFC, TFC, TFA, TFC, TFA, TFA, TFA, AMH
Continuous Defect Severity: [Blank]

Value: 6, 6, 6, 6, 6, 6, 6, 6, 6, 6, [Blank]
Inches: [Blank]
S/W/L: [Blank]
Joint: [Blank]
Circumferential Migration: [Blank]
Image Ref.: [Blank]
Remarks: [Blank]

Distance (feet)	Video Ref.	Group/Modify/Descrpto	Continuous Defect Severity	Value	Inches	S/W/L	Joint	Circumferential Migration	Image Ref.	Remarks
8.0	171	TFC		6						CAPPED
12.0	213	TFC		6						CAPPED
36.0	287	TFA		6						GOOD
73.0	361	TFC		6						CAPPED INFILTRATION @ (AP 0.25 GPM)
104.0	442	TFC		6						CAPPED: M.D. IN CAP
107.0	614	TFA		6						1" OFFSET @ 1st JOINT & M.D.
134.0	666	TFC		6						CAPPED
137.0	698	TFA		6						OK; MINOR DEBRIS IN SERVICE
172.0	1570	TFA		6						GOOD
175.0	1587	TFA		6						GOOD
207.0	1641	AMH								MH# M4208

MINERAL DIGESTANTS @ 40' & OTHER JOINTS THROUGHOUT

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 (860) 274-5469 Phone
 (860) 945-3219 Fax



PACP Sewer Report

Surveyors Name: **J. PEROTTI** and Certificate Number: **U-1107-6007** System Owner: **ARLINGTON MA** Survey Customer: **ARLINGTON MA** Drainage Area: **ARLINGTON 10-04-0003 TK-434** Sheet No.: **1**

P/O No.: **ARLINGTON-14** Pipeline Segment Reference: **ARLINGTON-14** Date: **2010/10/11** Time: **12:37** Location (Street Name and Number): **MASS AVE**

Further Location Details: Downstream Manhole Number: **M4207** Upstream Manhole Number: **M4208** Rim to Invert: **Grade to Invert** Rim to Invert: **Grade to Invert** Rim to Grade: **Height**

Width: **C** Shape: **C** Material: **VCP** Ln. Method: **3.0** Pipe Joint Length: **118.0** Total Length: **118.0** Length Surveyed: **118.0** Year Laid: **434-1** Year Rehabilitated: **4:51** Direction: **D** Flow Control: **12** Tape/Media Number: **5:09**

Purpose: **J** Sewer Category: **J** Pre-Cleaning: **Cleaned** Location Code: **J** Weather: **J** Additional Information: **J**

Distance (feet)	Video Ref.	Group/Descriptor	Modifier/Severity	Continuous Defect	S/M/L	Value Inches	%	Joint	Circumferential Location	Image Ref.	Remarks
						1st	2nd	at	to		
7.0	54	TFC				6			3		CAPPED
19.0	113	TFC				6			9		CAPPED w/M.D.
90.0	1015	TFC				6			9		CAPPED w/M.D.
118.0	1061	AMH									MH# M4207

63' SERVICE @ 2:00 DID NOT INSPECT. ASSUME ACTIVE.

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PACP Sewer Report

Surveyors Name: J. PEROTTI
 and Certificate Number: U-1107-6007
 System Owner: ARLINGTON MA
 Drainage Area: ARLINGTON MA
 Sheet No.: 1

P/O No.: ARLINGTON-23
 Pipeline Segment Reference: ARLINGTON-23
 Date: 2010/10/08
 Time: 09:46
 Location (Street Name and Number): ACTON ST - T.V
 Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details
 Upstream Manhole Number: 119210
 Rlm to Invert: []
 Grade to Invert: []
 Rlm to Grade: []
 Flow Control: []
 Height: 15

Downstream Manhole Number: 119210A
 Width: C
 Shape: C
 Material: RCP
 Ln. Method: []
 Rim to Invert: []
 Grade to Invert: []
 Rim to Grade: []
 Use of Sewer: []
 Direction: U
 Year Laid: []
 Year Rehabilitated: []
 Length Surveyed: 10.0
 Total Length: 10.0
 Year Laid: []
 Year Rehabilitated: []
 Tape/Media Number: 434-1
 2:27 TO 2:29

Purpose: Sewer Category: J
 Pre-Cleaning: Cleaned
 Weather: []
 Location Code: []
 Additional Information: []

Distance (Feet)	Video Ref.	Group/Describe	Modify/Severity	Continuous Defect	Value	Joint	Circumferential Location	Inch Ref	Remarks
					Inches	%	at	to	
					1st	2nd			

10.0	98	AMH							MH# 119210
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PACP Sewer Report

Surveyors Name: J. PEROTTI
 and Certificate Number: U-1107-6007
 System Owner: ARLINGTON MA
 Survey Customer: ARLINGTON MA
 Drainage Area: [Blank]
 Sheet No.: 1

P/O No.: ARLINGTON-24
 Pipeline Segment Reference: ARLINGTON-24
 Date: 2010/10/08
 Time: 10:09
 Location (Street Name and Number): ACTON ST - T.V
 Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details
 Upstream Manhole Number: 119210A
 Rim to Invert: [Blank]
 Grade to Invert: [Blank]
 Rim to Grade: [Blank]

Downstream Manhole Number: 119200
 Shape: C
 Material: RCP
 Ln. Method: [Blank]
 Rim to Invert: [Blank]
 Grade to Invert: [Blank]
 Rim to Grade: [Blank]

Width: [Blank]
 Total Length: 12.0
 Length Surveyed: 12.0
 Year Laid: [Blank]
 Direction: D
 Flow Control: [Blank]
 Height: 15
 Tape/Media Number: 434-1 2:29 TO 2:32

Purpose: Sewer Category: J
 Pre-Cleaning: Cleaned
 Weather: [Blank]
 Location Code: [Blank]
 Additional Information: [Blank]

Distance (Feet)	Video Ref.	Group/Descriptor	Modifier/Severity	Continuous Defect	Value	Joint	Circumferential Location	Image Ref.	Remarks
					Inches	%	at		
					1st	2nd			

12.0	144	AMH							MH# 119270 119200
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PACP Sewer Report

Surveyors Name: J. PEROTTI and Certificate Number: U-1107-6007
 System Owner: ARLINGTON MA
 Drainage Area: ARLINGTON MA
 Sheet No.: 1

P/O No.: ARLINGTON-15 Pipeline Segment Reference: ARLINGTON-15
 Date: 2010/10/08 Time: 09:10
 Location (Street Name and Number): ACTON ST - T.V
 Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details: Upstream Manhole Number: 119200
 Rim to Invert: Rim to Grade: 15
 Grade to Invert: Flow Control: Year Rehabilitated: 2:11 TO 2:16

Downstream Manhole Number: 119220
 Width: C Shape: RCP Material: RCP Ln. Method: RCP
 Rim to Invert: 8.0 Pipe Joint Length: 102.0 Total Length: 102.0
 Length Surveyed: 102.0 Year Laid: 15
 Height: 15

Purpose: Sewer Category: Pre-Cleaning: J
 Weather: Location Code: Additional Information:

Distance (Feet)	Video Ref.	Group/ Descripto	Modifier/ Severity	Continuous Defect	SM/L	Value Inches	%	Joint	Circumferential Location	Image Ref	Remarks
						1st	2nd		at	to	

102.0	226	AMH									MH# 119200
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PACP Sewer Report

Surveyors Name: J. PEROTTI
 and Certificate Number: U-1107-6007
 System Owner: ARLINGTON MA
 Drainage Area: ARLINGTON MA
 Survey Customer: ARLINGTON MA
 Sheet No.: 1

P/O No.: ARLINGTON-22
 Pipeline Segment Reference: ARLINGTON-22
 Date: 2010/10/08
 Time: 09:26
 Location (Street Name and Number): ACTON ST - T.V
 Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details: Upstream Manhole Number: 119220A
 Rim to Invert: 154.0
 Grade to Invert: 154.0
 Rim to Grade: 154.0

Downstream Manhole Number: 119180
 Shape: C
 Material: RCP
 Ln. Method: RCP
 Pipe Joint Length: 8.0
 Rim to Invert: 8.0
 Total Length: 154.0
 Length Surveyed: 154.0
 Year Laid: 154.0

Width: C
 Purpose: J
 Pre-Cleaning: J
 Cleaned: J
 Weather: J
 Location Code: J
 Additional Information: Pipe Size: 15
 Pipe Type: RCP
 Direction: D - Downstream

Flow Control: D
 Year Rehabilitated: 434-1 2:21 TO 2:27
 Tape/Media Number: 434-1 2:21 TO 2:27
 Height: 15

Distance (Feet)	Video Ref.	Group/Descriptor	Modifier/Severity	Continuous Defect	S/M/L	Value Inches	1st	2nd	%	Joint	Circumferential Location	Image Ref.	Remarks
96.0	226	TFA				6					2		GOOD
106.0	268	TFA				8					12 / 19:00		CHIMNEY GOOD
154.0	353	AMH											MH# 119180

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PACP Sewer Report

Surveyors Name: J. PEROTTI and Certificate Number: U-1107-6007
 System Owner: ARLINGTON MA
 Drainage Area: ARLINGTON MA
 Sheet No.: 1

P/O No.: ARLINGTON-16 Pipeline Segment Reference: ARLINGTON-16
 Date: 2010/10/08 Time: 09:18
 Location (Street Name and Number): ACTON ST - T.V
 Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details: Upstream Manhole Number: 119220
 Rim to Invert: Rim to Invert: Rim to Grade: Rim to Grade

Downstream Manhole Number: 119220A
 Shape: C Material: RCP Ln. Method: RCP
 Width: 24.0 Total Length: 24.0 Length Surveyed: 24.0
 Grade to Invert: 8.0 Pipe Joint Length: 8.0 Year Laid: Year Rehabilitated: 434-1 2:16 TO 2:21

Purpose: Sewer Category: Pre-Cleaning: Cleaned: J
 Weather: Location Code: Additional Information: Direction: D
 Flow Control: Height: 15

Distance (feet)	Video Ref.	Group/Descriptor	Modify/Severity	Continuous Defect	Value Inches	Joint Location	Image Ref	Remarks
24.0	264	AMH						MH# 199220A

1

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PACP Sewer Report

Surveyors Name: J. PEROTTI and Certificate Number: U-1107-6007
System Owner: ARLINGTON MA
Drainage Area: ARLINGTON MA
Survey Customer: ARLINGTON MA
Sheet No.: 1

P/O No.: ARLINGTON-25
Pipeline Segment Reference: ARLINGTON-25
Date: 2010/10/08
Time: 11:00
Location (Street Name and Number): ACTON ST - T.V
Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details: Upstream Manhole Number: 119181
Rim to Invert: Rim to Grade: 18
Grade to Invert: Grade to Invert: 18
Flow Control: Flow Control: D
Year Rehabilitated: Year Laid: 434-1 2:37 TO 2:44

Downstream Manhole Number: 110171
Shape: C
Material: VCP
Ln. Method: VCP
Rim to Invert: Rim to Grade: 137.0
Pipe Joint Length: 2.0
Total Length: 137.0
Length Surveyed: 137.0
Year Laid: 434-1 2:37 TO 2:44

Purpose: Sewer Category: Pre-Cleaning: Cleaned: J
Weather: Location Code: Additional Information

Distance (Feet)	Video Ref.	Group/Descriptor	Modify/Severity	Continuous Defect	S/m/L	Value Inches	Joint	Circumferential Location	Image Ref	Remarks
						1st	2nd	at	To	
78.0	161	TFA				12		3		GOOD
137.0	414	AMH								MH# 110171

82'-102' MATERIAL CHANGE TO RCP.
102'-87' VCP.

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PACP Sewer Report

Surveyors Name: J. PEROTTI and Certificate Number: U-1107-6007
 System Owner: ARLINGTON MA
 Drainage Area: ARLINGTON MA
 Survey Customer: ARLINGTON MA
 Sheet No.: 1

P/O No.: ARLINGTON-18
 Pipeline Segment Reference: ARLINGTON-18
 Date: 2010/10/08
 Time: 11:12
 Location (Street Name and Number): ACTON ST - T.V
 Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details: STORM MAIN
 Upstream Manhole Number: 119171
 Rim to Invert: []
 Grade to Invert: []
 Rim to Grade: 18

Downstream Manhole Number: 119170
 Rim to Invert: []
 Grade to Invert: []
 Rim to Grade: []
 Use of Sewer: []
 Flow Control: []
 Height: 18

Width: C
 Shape: C
 Material: VCP
 Ln. Method: []
 Total Length: 5.0
 Length Surveyed: []
 Year Laid: []
 Year Rehabilitated: []
 Tape/Media Number: 434-1 2:45 TO 2:46

Purpose: []
 Sewer Category: []
 Pre-Cleaning: J
 Cleaned: []
 Weather: []
 Location Code: []
 Additional Information: []

Distance (Feet)	Video Ref	Group/Descriptor	Modifier/Severity	Continuous Defect	Value (Inches)	Joint	Circumferential Location	Image Ref	Remarks
1st	2nd	3rd	4th	%		at	to		

5.0	41	AMH							MH# 119171
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PACP Sewer Report

Surveyor's Name: J. PEROTTI
 and Certificate Number: U-1107-6007
 System Owner: ARLINGTON MA
 Survey Customer: ARLINGTON MA
 Drainage Area: [Blank]
 Sheet No.: 1

P/O No.: [Blank]
 Pipeline Segment Reference: ARLINGTON-17
 Date: 2010/10/08
 Time: 10:52
 Location (Street Name and Number): ACTON ST - T.V
 Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details
 Upstream Manhole Number: 119180
 Rim to Invert: [Blank]
 Grade to Invert: [Blank]
 Rim to Grade: [Blank]

Downstream Manhole Number: 119181
 Rim to Invert: [Blank]
 Grade to Invert: [Blank]
 Rim to Grade: [Blank]

Width: [Blank]
 Shape: C
 Material: RCP
 Ln. Method: [Blank]
 Total Length: 63.0
 Length Surveyed: 63.0
 Year Laid: [Blank]

Purpose: [Blank]
 Sewer Category: J
 Pre-Cleaning: [Blank]
 Cleaned: [Blank]
 Weather: [Blank]
 Location Code: [Blank]
 Additional Information: [Blank]

Distance (feet)	Video Ref.	Group/Descriptor	Modifier/Severity	Continuous Defect	S/M/A	Value Inches	%	Joint	Circumferential Location	Bridge Ref.	Remarks
1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
63.0	228	AMH									MH# 119181

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PACP Sewer Report

Surveyors Name: J. PEROTTI
 and Certificate Number: U-1107-6007
 System Owner: ARLINGTON MA
 Survey Customer: ARLINGTON MA
 Drainage Area: [Blank]
 Sheet No.: 1

P/O No.: ARLINGTON-19
 Pipeline Segment Reference: ARLINGTON-19
 Date: 2010/10/08
 Time: 11:23
 Location (Street Name and Number): ACTON ST - T.V
 Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details:
 Downstream Manhole Number: 119160
 Upstream Manhole Number: 119170
 Rim to Invert: [Blank] Grade to Invert: [Blank] Rim to Grade: [Blank]

Width: C
 Shape: C
 Material: VCP
 Ln. Method: [Blank]
 Pipe Joint Length: 2.0
 Total Length: 274.0
 Length Surveyed: 274.0
 Year Laid: [Blank]

Purpose: [Blank]
 Sewer Category: J
 Pre-Cleaning: [Blank]
 Cleaned: [Blank]
 Weather: [Blank]
 Location Code: [Blank]
 Additional Information: [Blank]

Downstream Manhole Number: 119160
 Grade to Invert: [Blank] Rim to Grade: [Blank] Use of Sewer: [Blank] Direction: D
 Flow Control: [Blank] Height: 18
 Year Rehabilitated: [Blank] Year Laid: [Blank]

Width: [Blank]
 Shape: [Blank]
 Material: [Blank]
 Ln. Method: [Blank]
 Pipe Joint Length: [Blank]
 Total Length: 274.0
 Length Surveyed: [Blank]
 Year Laid: [Blank]

Purpose: [Blank]
 Sewer Category: [Blank]
 Pre-Cleaning: [Blank]
 Cleaned: [Blank]
 Weather: [Blank]
 Location Code: [Blank]
 Additional Information: [Blank]

Downstream Manhole Number: 119160
 Grade to Invert: [Blank] Rim to Grade: [Blank] Use of Sewer: [Blank] Direction: D
 Flow Control: [Blank] Height: 18
 Year Rehabilitated: [Blank] Year Laid: [Blank]

Width: [Blank]
 Shape: [Blank]
 Material: [Blank]
 Ln. Method: [Blank]
 Pipe Joint Length: [Blank]
 Total Length: 274.0
 Length Surveyed: [Blank]
 Year Laid: [Blank]

Purpose: [Blank]
 Sewer Category: [Blank]
 Pre-Cleaning: [Blank]
 Cleaned: [Blank]
 Weather: [Blank]
 Location Code: [Blank]
 Additional Information: [Blank]

Distance (Feet)	Video Ref.	Group/Descriptor	Modifier/Severity	Continuous Defect	S/M/L	Value Inches	1st	2nd	Joint	Circumferential Location	Image Ref.	Remarks
132.0	229	RPR								12		PVC REPAIR GOOD
248.7	378	CM								12		MWORK
274.0	441	AMH										MH# 119160

LONGITUDINAL
 INTERMITTENT FINE V CRACKS THROUGHOUT @ 12:00, 3:00, 6:00 & 9:00
 STILL STRUCTURALLY SOUND.

3



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PACP Sewer Report

Surveyors Name: J. PEROTTI and Certificate Number: U-1107-6007 System Owner: ARLINGTON MA Survey Customer: ARLINGTON MA Drainage Area: ARLINGTON MA Sheet No.: 1

P/O No.: ARLINGTON-20 Pipeline Segment Reference: ARLINGTON-20 Date: 2010/10/08 Time: 11:32 Location (Street Name and Number): ACTON ST - T.V Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details: Downstream Manhole Number: 119150 Upstream Manhole Number: 119160 Rim to Invert: Rim to Grade: Grade to Invert: Grade to Invert: Rim to Grade: Rim to Grade: Height: 18

Width: C Shape: VCP Material: VCP Ln. Method: VCP Pipe Joint Length: 2.0 Rim to Invert: Rim to Grade: Use of Sewer: Direction: D Flow Control: Year Laid: Year Rehabilitated: Total Length: 281.0 Length Surveyed: 281.0 Tape/Media Number: 434-1 2:54 TO 3:00

Purpose: Sewer Category: Pre-Cleaning: Cleaned: Weather: Location Code: Additional Information:

Distance (feet)	Video Ref	Group/ Descripto	Modify/ Severity	Continuous Defect	S/M/L	Value Inches	1st	2nd	Joint %	Circumferential Location	Inage Ref	Remarks
2.0	264	CM								12 12		2' TO END OF LINE NO DEFECT
91.0	136	TFA				6				3		GOOD
122.0	212	TFA				6				3		GOOD
159.0	321	TFA				6				9		GOOD
281.0	519	AMH										MH# 119150

148' MODERATE CRACK @ 1:00 POSSIBLE FUTURE COLLAPSE - POINT REPAIR
168'-183' 5% COLLAPSING PIPE @ 12:00 - POINT REPAIR

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PACP Sewer Report

Surveyors Name: **J. PEROTTI** and Certificate Number: **U-1107-6007** System Owner: **ARLINGTON MA** Survey Customer: **ARLINGTON MA** Drainage Area: **ARLINGTON MA** Sheet No.: **1**

P/O No.: **ARLINGTON-26** Pipeline Segment Reference: **ARLINGTON-26** Location (Street Name and Number): **ACTON ST - T.V** Locality: **ARLINGTON 10-04-0003 TK-434**

Further Location Details: Downstream Manhole Number: **119140** Upstream Manhole Number: **119150** Rim to Invert: **U** Grade to Invert: **30** Height: **30**

Width: **S** Shape: **S** Material: **RCP** Ln. Method: **BRICK & MORTAR** Pre-Cleaning: **Cleaned** Weather: **J** Location Code: **Additional Information**

Purpose: **J** Sewer Category: **J** Rim to Invert: **U** Direction: **U** Flow Control: **30** Year Laid: **434-1** Year Rehabilitated: **3:00 TO 3:05**

Distance (Feet)	Video Ref.	Group/Modify	Continuous Detect	Weather	Location Code	Additional Information	Joint	Circumferential Location	Infrage Joint	Remarks
		Descripto	Severity	S/M/I	1st	2nd	%	at	to	

5.0	46	AMH								MH# 119150
-----	----	-----	--	--	--	--	--	--	--	------------

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2



PACP Sewer Report

Surveyors Name: J. PEROTTI and Certificate Number: U-1107-6007
 System Owner: ARLINGTON MA
 Drainage Area: ARLINGTON MA
 Survey Customer: ARLINGTON MA
 Sheet No.: 1

P/O No.: ARLINGTON-36
 Pipeline Segment Reference: ARLINGTON-36
 Date: 2010/10/11
 Time: 14:18
 Location (Street Name and Number): APPLETON ST - T.V
 Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details: Downstream Manhole Number: 119130
 Upstream Manhole Number: 119150
 Rim to Invert: Rim to Invert: Rim to Grade: Rim to Grade: Height: 18

Width: C
 Shape: C
 Material: VCP
 Ln. Method: VCP
 Pipe Joint Length: 2.0
 Total Length: 177.0
 Length Surveyed: 177.0
 Year Laid: Year Rehabilitated: 434-1 5:36 TO 5:42
 Direction: D
 Flow Control: Height: 18

Purpose: Sewer Category: Pre-Cleaning: Cleaned: J
 Weather: Location Code: Additional Information

Distance (Feet)	Video Ref.	Group/Descriptor	Modifier/Severity	Continuous Defect	S/N/A	Inches	Value	Joint	Circumferential Location	Imagined	Remarks
						1st	2nd		at	to	
58.0	114		TFA			6			3		GOOD
161.0	279		CM						12	12	158'-172' MAINLINE LONGITUDINAL CRACK
177.0	341		AMH								MH# 119130

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PACP Sewer Report

Surveyor's Name: **J. PEROTTI** and Certificate Number: **U-1107-6007** System Owner: **ARLINGTON MA** Drainage Area: **ARLINGTON MA** Sheet No.: **1**

P/O No.: **ARLINGTON-37** Pipeline Segment Reference: **ARLINGTON-37** Date: **2010/10/11** Time: **14:27** Location (Street Name and Number): **APPLRTON ST - T.V** Locality: **ARLINGTON 10-04-0003 TK-434**

Further Location Details: Downstream Manhole Number: **119060** Upstream Manhole Number: **119130** Rim to Invert: Rim to Invert: Rim to Grade: Rim to Grade: **18**

Width: **C** Shape: **C** Material: **VCP** Ln. Method: **2.0** Total Length: **159.0** Length Surveyed: **146.0** Year Laid: **434-1** Year Rehabilitated: **5:42 TO 5:49**

Purpose: **J** Sewer Category: **J** Pre-Cleaning: **J** Cleaned: **J** Weather: **J** Location Code: **J** Additional Information: **J**

Distance (Feet): **7.0** Video Ref: **30** Group/Descriptor: **CL** Continuously Defect: **CL** Severity: **CL** S/M/L: **CL** Valve Inches: **CL** Joint: **CL** Circumferential Location: **CL** Image Ref: **CL** Remarks: **CL**

Distance (Feet)	Video Ref	Group/Descriptor	Continuously Defect	S/M/L	Valve Inches	Joint	Circumferential Location	Image Ref	Remarks
7.0	30	CL	CL				12		MINOR CRACK @ 12:00
128.0	197	CM	CM				12		MINOR CRACKS
132.0	224	RPP	RPP				12		BRICK REPAIR GOOD
143.0	285	TBI	TBI	12	8		2		PROTRUDING-TAP,
143.0	322	MSA	MSA						PSC STUCK IN THE LINETO FAR

2

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PACP Sewer Report

Surveyors Name: J. PEROTTI
 and Certificate Number: U-1107-6007
 System Owner: ARLINGTON MA
 Survey Customer: ARLINGTON MA
 Drainage Area: [Blank]
 Sheet No.: 1

P/O No.: ARLINGTON-37
 Pipeline Segment Reference: ARLINGTON-37
 Date: 2010/10/11
 Time: 14:44
 Location (Street Name and Number): APPLRTON ST - T.V
 Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details
 Downstream Manhole Number: 119060
 Upstream Manhole Number: 119130
 Rim to Invert: [Blank]
 Grade to Invert: [Blank]
 Rim to Grade: [Blank]

Width: C
 Shape: C
 Material: VCP
 Ln. Method: [Blank]
 Pipe Joint Length: 2.0
 Length Surveyed: 13.0
 Year Laid: [Blank]
 Year Rehabilitated: [Blank]
 Flow Control: U
 Height: 18
 Tape/Media Number: 434-1 5:49 TO 5:52

Purpose: [Blank]
 Sewer Category: J
 Pre-Cleaning: [Blank]
 Cleaned: [Blank]
 Weather: [Blank]
 Location Code: [Blank]
 Additional Information: [Blank]

Distance (feet): 10.0
 13.0
 Value: 8
 8
 S/M/L: [Blank]
 Continuous Defect: [Blank]
 Group/Description: TFI
 Severity: MSA
 Remarks: [Blank]

Distance (feet)	Value	S/M/L	Continuous Defect	Group/Description	Severity	Remarks
10.0	8			TFI		
13.0	8			MSA		TVED TO THE POINT I LEFT OFF GOING WITH THE FLOW

PROTRUDING TAP

3

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PACP Sewer Report

Surveyors Name: J. PEROTTI
 and Certificate Number: U-1107-6007
 System Owner: ARLINGTON MA
 Drainage Area: ARLINGTON MA
 Sheet No.: 1

P/O No.: ARLINGTON-38
 Pipeline Segment Reference: ARLINGTON-38
 Date: 2010/10/11
 Time: 14:52
 Location (Street Name and Number): MASS AVE - T.V
 Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details:
 Downstream Manhole Number: 119058
 Upstream Manhole Number: 119060
 Rim to Invert: []
 Grade to Invert: []
 Rim to Grade: []
 Grade to Invert: []
 Rim to Grade: []
 Height: 24

Width: C
 Shape: C
 Material: VCP
 Ln. Method: []
 Pipe Joint Length: 2.0
 Total Length: 76.0
 Length Surveyed: 76.0
 Year Laid: []
 Year Rehabilitated: []
 Tape/Media Number: 434-1 5:52 TO END

Purpose: []
 Sewer Category: J
 Pre-Cleaning: []
 Cleaned: []
 Weather: []
 Location Code: []
 Additional Information: []

Distance (feet)	Video Ref.	Group/Descriptor	Modifier/Severity	Continuous Defect	S/M/L	Value Inches	Joint	Circumferential Location	Image Ref.	Remarks
						1st	2nd	at	to	
1.0	21	CM						12	12	MINOR CRACKS
5.0	97	TFA			8			3		GOOD
37.0	189	CM						12	12	MINOR/MODERATE CRACKS
48.0	241	B						3		BROKEN APPEARS TO BE OLD REPAIR
59.0	302	H						12		MINOR HOLE 1.5"
76.0	353	AMH								MH# 119058

7'-20' MINOR/MODERATE CRACKS

1

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PACP Sewer Report

Surveyors Name J. PEROTTI	and Certificate Number U-1107-6007	System Owner ARLINGTON MA	Drainage Area	Sheet No. 1
P/O No. ARLINGTON-29	Pipeline Segment Reference ARLINGTON-29	Location (Street Name and Number) APPLETON ST - T.V	Locality ARLINGTON 10-08-0003 TK-434	
Date 2010/10/11	Time 08:10	Upstream Manhole Number 119120	Rim to Invert	Rim to Grade
Further Location Details		Grade to Invert	Use of Sewer	Flow Control
Downstream Manhole Number 119058		Rim to Invert	Year Laid	Height 24
Width C	Material RCP	Ln. Method	Total Length 85.0	Year Rehabilitated
Purpose	Pre-Cleaning J	Cleaned	Length Surveyed 51.0	Tape/Media Number 434-1 3:20 TO 3:26
Sewer Category	Weather	Location Code	Additional Information	

Distance (Feet)	Video Ref.	Group/Modifier/Descriptor	Severity	Continuous Defect	S/M/L	Value		Joint	Circumferential Location	Image Ref.	Remarks
						1st	2nd				
48.0	227		AJB								SQUARE BOX
51.0	359		MSA								JUNCTION BOX

1



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PACP Sewer Report

Surveyors Name J. PEROTTI	and Certificate Number U-1107-6007	System Owner ARLINGTON MA	Survey Customer ARLINGTON MA	Drainage Area	Sheet No. 1
P/O No.	Pipeline Segment Reference ARLINGTON-29	Date 2010/10/11	Time 08:30	Location (Street Name and Number) APPLETON ST - T.V	Locality ARLINGTON 10-08-0003 TK-434
Further Location Details	Upstream Manhole Number 119120	Grade to Invert	Rim to Grade	Use of Sewer	Direction U
Downstream Manhole Number 119058	Grade to Invert	Rim to Grade	Length Surveyed 34.0	Year Laid	Year Rehabilitated
Width	Shape C	Material RCP	Ln. Method	Pipe Joint Length 8.0	Total Length 85.0
Purpose	Sewer Category J	Pre-Cleaning	Cleaned	Weather	Location Code
Additional Information	Height 24	Flow Control	Flow Control	Height	Tape/Media Number 434-1 3:26 TO 3:35

Distance (Feet)	Video Ref.	Group/Descriptor	Manhole/Severity	Continuous Defect	S/M/L	Value Inches	Joint	Circumferential Location	Image Ref.	Remarks
						1st	2nd	at	to	

2.0	35		TFA			12		3		
18.0	318		AJB							21' TO 34'
31.0	359		MSA							END OF JUNCTION BOX

①



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PACP Sewer Report

Surveyors Name: J. PEROTTI and Certificate Number: U-1107-6007
 System Owner: ARLINGTON MA
 Drainage Area: ARLINGTON MA
 Sheet No.: 1

P/O No.: ARLINGTON-28
 Pipeline Segment Reference: ARLINGTON-28
 Date: 2010/10/11
 Time: 07:32
 Location (Street Name and Number): APPLETON ST - T.V
 Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details: STORM SEWER
 Upstream Manhole Number: 119135
 Rim to Invert: []
 Grade to Invert: []
 Rim to Grade: []

Downstream Manhole Number: 119120
 Shape: C
 Material: RCP
 Ln. Method: []
 Rim to Invert: []
 Grade to Invert: []
 Rim to Grade: []
 Height: 24

Width: []
 Total Length: 141.0
 Length Surveyed: 141.0
 Year Laid: []
 Year Rehabilitated: []
 Tape/Media Number: 434-1 3:18 TO 3:20

Purpose: Sewer Category: J
 Pre-Cleaning: []
 Cleaned: []
 Weather: []
 Location Code: []
 Additional Information: []

Distance (Feet)	Video Ref.	Group/Descriptor	Modifier/Severity	Continuous Defect	S/M/L	Value Inches	%	Joint	Circumferential Location	Image Ref.	Remarks
						1st	2nd		at	to	
79.0	176	H							11		MODERATE EXPOSED REBAR APPEARS TO BE OLD REPAIR
98.0	259	H							12		CB SERVICE HOLE FOR CATCH BASIN OK
141.0	628	AMH									MH# 119120

①



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PACP Sewer Report

Surveyors Name: **J. PEROTTI** and Certificate Number: **U-1107-6007** System Owner: **ARLINGTON MA** Drainage Area: _____ Sheet No.: **1**
 P/O No.: _____ Pipeline Segment Reference: **ARLINGTON-27** Date: **2010/10/08** Time: **12:07** Location (Street Name and Number): **APPLRTON ST - T.V** Locality: **ARLINGTON 10-04-0003 TK-434**

Further Location Details: Upstream Manhole Number: **119140** Rim to Invert: _____ Grade to Invert: _____ Rim to Grade: _____
 Downstream Manhole Number: **119135** Rim to Invert: _____ Grade to Invert: _____ Rim to Grade: _____

Width: **C** Shape: **C** Material: **RCP** Ln. Method: _____ Pipe Joint Length: **8.0** Rim to Invert: _____ Grade to Invert: _____ Rim to Grade: _____
 Total Length: **189.0** Length Surveyed: **174.0** Year Laid: _____ Use of Sewer: _____ Direction: **D** Flow Control: _____ Height: **24**
 Tape/Media Number: **434-1 3:05 TO 3:15** Year Rehabilitated: _____

Purpose: _____ Sewer Category: _____ Pre-Cleaning: **J** Cleaned: _____ Weather: _____ Location Code: _____ Additional Information: _____

Distance (feet)	Video Ref.	Group/Modifier/Description	Severity	Continuous Defect	S/M/L	Value		Joint	Circumferential	Elevation	Image Ref.	Remarks
						1st	2nd					
174.0	283	OBZ					50		12			LINE BENDS TO THE LEFT 45 DEGREES
174.0	531	MSA										HAVE TO DO A REVERSAL DUE TO BEND

1

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PACP Sewer Report

Surveyors Name: J. PEROTTI
 and Certificate Number: U-1107-6007
 System Owner: ARLINGTON MA
 Survey Customer: ARLINGTON MA
 Drainage Area: [Blank]
 Sheet No.: 1

P/O No.: [Blank]
 Pipeline Segment Reference: ARLINGTON-27
 Date: 2010/10/11
 Time: 07:23
 Location (Street Name and Number): APPLRTON ST - T.V
 Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details
 Downstream Manhole Number: 119135
 Upstream Manhole Number: 119140
 Rim to Invert: [Blank]
 Grade to Invert: [Blank]
 Rim to Grade: [Blank]
 Rm to Grade: 24

Width: [Blank]
 Shape: C
 Material: RCP
 Ln. Method: [Blank]
 Rim to Invert: [Blank]
 Grade to Invert: [Blank]
 Rim to Grade: [Blank]
 Use of Sewer: [Blank]
 Direction: U
 Flow Control: [Blank]
 Height: 24

Purpose: [Blank]
 Sewer Category: J
 Pre-Cleaning: [Blank]
 Cleaned: [Blank]
 Weather: [Blank]
 Location Code: [Blank]
 Additional Information: [Blank]
 Total Length: 189.0
 Length Surveyed: 15.0
 Year Laid: [Blank]
 Year Rehabilitated: [Blank]
 Tape/Media Number: 434-1 3:15 TO 3:18

Distance (Feet)	Video Ref.	Group/Descriptor	Modifier/Severity	Continuous Defect	S/M/L	Value, Inches	%	Joint	Circumferential Location	Image Ref.	Remarks
						1st	2nd		at	to	
12.0	78	LR						45			

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PACP Sewer Report

Surveyors Name: J. PEROTTI
 and Certificate Number: U-1107-6007
 System Owner: ARLINGTON MA
 Drainage Area: ARLINGTON MA
 Sheet No.: 1

P/O No.: ARLINGTON-30
 Pipeline Segment Reference: ARLINGTON-30
 Date: 2010/10/11
 Time: 08:49
 Location (Street Name and Number): MASS AVE - T.V
 Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details:
 Upstream Manhole Number: 119058
 Rim to Invert: []
 Grade to Invert: []
 Rim to Grade: []

Downstream Manhole Number: 119030
 Material: RCP
 Ln. Method: []
 Rim to Invert: []
 Grade to Invert: []
 Rim to Grade: []
 Height: 36

Width: []
 Shape: C
 Total Length: 313.0
 Length Surveyed: 313.0
 Year Laid: []
 Year Rehabilitated: []
 Tape/Media Number: 434-1 3:35 TO 3:56

Purpose: Sewer Category: J
 Pre-Cleaning: Cleaned
 Date: 2010/10/11
 Location Code: []
 Weather: []
 Additional Information: []

Distance (Feet)	Video Ref	Group	Modifier	Continuous Defect	S/W/L	Value Inches	1st	2nd	Joint	Circumferential Location	Image Ref	Remarks
57.0	167	TFA				8				3		GOOD
262.0	675	TFA				12				3		GOOD
282.0	1927	LL						50				45° BEND LEFT
296.0	2001	LL						45				45° BEND LEFT
313.0	2066	AMH										MH# 119030

252 22° BEND LEFT 119040

1



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PACP Sewer Report

Surveyors Name: J. PEROTTI and Certificate Number: U-1107-6007
System Owner: ARLINGTON MA
Drainage Area: ARLINGTON MA
Sheet No.: 1

P/O No.: ARLINGTON-31
Pipeline Segment Reference: ARLINGTON-31
Date: 2010/10/11
Time: 09:40
Location (Street Name and Number): FOREST ST- T.V
Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details
Upstream Manhole Number: ~~119030~~ 119040
Rim to Invert: [] Grade to Invert: [] Rim to Grade: []
Use of Sewer: [] Flow Control: [] Height: 36

Downstream Manhole Number: 120010
Width: [] Shape: C
Material: RCP
Ln. Method: []
Rim to Invert: [] Pipe Joint Length: 8.0
Total Length: 183.0
Length Surveyed: 183.0
Year Laid: [] Year Rehabilitated: [] Tape/Media Number: 434-1 3:56 TO 4:03

Purpose: [] Sewer Category: J
Pre-Cleaning: [] Cleaned: []
Weather: [] Location Code: [] Additional Information: []

Distance (Feet)	Video Ref.	Group/Descriptor	Modify/Severity	Continuous Defect	S/W/L	Value Inches	%	Joint	Circumferential Location	Image Ref.	Remarks
						1st	2nd		at	to	
183.0	387	AMH									MH# 120010

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PACP Sewer Report

Surveyors Name
J. PEROTTI

and Certificate Number
U-1107-6007

System Owner
ARLINGTON MA

Drainage Area

Sheet No.
1

P/O No.
ARLINGTON-32

Pipeline Segment Reference
ARLINGTON-32

Date
2010/10/11

Time
09:51

Location (Street Name and Number)
FOREST ST - T.V

Locality
ARLINGTON 10-04-0003 TK-434

Further Location Details

Upstream Manhole Number
~~119030~~ 119040

Rim to Invert

Grade to Invert

Rim to Invert

Grade to Invert

Rim to Grade

Grade to Invert

Rim to Invert

Rim to Invert

Rim to Invert

Rim to Grade

Downstream Manhole Number
119020

Material
VCP

Ln. Method
VCP

Pipe Joint Length
2.0

Total Length
210.0

Length Surveyed
210.0

Year Laid
4:15

Year Rehabilitated
4:15

Flow Control
D

Height
24

Purpose
J

Pre-Cleaning
Cleaned

Weather
J

Location Code

Additional Information

Distance (Feet)	Video Ref.	Group/Modifier/Describe	Continuous Defect	S/M/L	Value Inches	1st	2nd	Joint	Circumferential Location	Image Ref.	Remarks
1.0	17	CM							12 12		
46.0	248	RPZ							12 12		BRICK REPAIR GOOD
164.0	501	ID							12		INFILTRATION DRIPPINGS
183.0	573	RPP							2		CONCRETE BLOCK REPAIR GOOD
210.0	690	AMH									MH# 119020

MULTIPLE LONGITUDINAL CRACK THROUGHOUT SECTION

2

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PACP Sewer Report

Surveyors Name: J. PEROTTI
 and Certificate Number: U-1107-6007
 System Owner: ARLINGTON MA
 Survey Customer: ARLINGTON MA
 Drainage Area: [Blank]
 Sheet No.: 1

P/O No.: ARLINGTON-33
 Pipeline Segment Reference: ARLINGTON-33
 Date: 2010/10/11
 Time: 10:36
 Location (Street Name and Number): FOREST ST - T.V
 Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details:
 Upstream Manhole Number: 119020
 Rim to Invert: [Blank]
 Grade to Invert: [Blank]
 Rim to Grade: [Blank]

Downstream Manhole Number: 119010
 Box Junction w/o cover
 Shape: C
 Material: VCP
 Ln. Method: [Blank]
 Rim to Invert: [Blank]
 Grade to Invert: [Blank]
 Rim to Grade: [Blank]

Width: [Blank]
 Total Length: 16.0
 Length Surveyed: 16.0
 Year Laid: [Blank]

Purpose: [Blank]
 Sewer Category: J
 Pre-Cleaning: [Blank]
 Cleaned: [Blank]
 Weather: [Blank]
 Location Code: [Blank]
 Additional Information: [Blank]

Height: 24
 Flow Control: [Blank]
 Direction: D
 Year Rehabilitated: [Blank]

Tape/Media Number: 434-1
 4:21 TO 4:25

Distance (Feet)	Video Ref.	Group / Modifiers / Descriptor	Continuous Defect	S/M/I	Valve Inches	Joint	Circumferential Location	Image Ref.	Remarks
					1st	2nd	at	to	
4.0	42	CM					12	12	MINOR CRACKS
16.0	123	AJB							NO MH JUST THIS BOX
16.0	180	AMH							JUNCTION BOX

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PACP Sewer Report

Surveyors Name: **J. PEROTTI** and Certificate Number: **U-1107-6007** System Owner: **ARLINGTON MA** Drainage Area: **ARLINGTON MA** Sheet No.: **1**
 P/O No.: **ARLINGTON-34** Pipeline Segment Reference: **ARLINGTON-34** Date: **2010/10/11** Time: **10:45** Location (Street Name and Number): **RYDER ST - T.V** Locality: **ARLINGTON 10-04 0003 TK-434**
 Further Location Details: Upstream Manhole Number: **119010** Rim to Invert: **Grade to Invert** Rim to Grade: **Height**
 Downstream Manhole Number: **MILL BROOK CULVERT** Rim to Invert: **Grade to Invert** Rim to Grade: **Height**
 Width: **C** Shape: **C** Material: **VCP** Ln. Method: **2.0** Pipe Joint Length: **2.0** Total Length: **114.0** Length Surveyed: **114.0** Year Laid: **434-1** Year Rehabilitated: **4:25 TO 4:35** Use of Sewer: **Flow Control** Direction: **D**

Purpose: **J** Sewer Category: **Pre-Cleaning** Cleaned: **J** Weather: **Additional Information** Location Code: **Joint** Chromatferential Location: **at** to
 Value Inches: **1st** 2nd

Distance (Feet)	Video Ref.	Group/ Descripto	Modifier/ Severity	Continuous Defect	S/M/L	Value Inches	1st	2nd	Joint	Chromatferential Location	at	to	Remarks
18.0	49	CM								9	5		MINOR CRACKS
43.0	71	CL								12			MINOR CRACKS.
49.0	114	CM								12	12		MINOR CRACKS
60.0	202	MMC											CHANGES TO RCP ✓
114.0	619	AMH											MH# MILL BROOK CULVERT

119000



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PACP Sewer Report

Surveyors Name: J. PEROTTI and Certificate Number: U-1107-6007 System Owner: ARLINGTON MA Drainage Area: ARLINGTON MA Sheet No.: 1

P/O No.: ARLINGTON-35 Pipeline Segment Reference: ARLINGTON-35 Date: 2010/10/11 Time: 10:24 Location (Street Name and Number): RYDER ST - T.V Locality: ARLINGTON 10-04-0003 TK-434

Further Location Details: Upstream Manhole Number: 120010 Rim to Invert: Rim to Grade: Grade to Invert: Rim to Grade: Height: 36

Downstream Manhole Number: MILL BROOK CULVERT Rim to Invert: Rim to Grade: Use of Sewer: Direction: Flow Control: Year Laid: Year Rehabilitated: Tape/Media Number: 434-1 4:15 TO 4:21

Width: C Shape: RCP Ln. Method: RCP Pipe Joint Length: 8.0 Total Length: 142.0 Length Surveyed: 142.0

Purpose: Sewer Category: Pre-Cleaning: J Weather: Location Code: Additional Information:

Distance (Feet)	Video Ref	Group/Descriptor	Modifier/Severity	Continuous Defect	S/(b)/L	Value Inches	%	Joint	Circumferential Location	Image Ref	Remarks
142.0	282	AMH									MH# MILL BROOK CULVERT

**MWRA ONE-TIME-ONLY
DISCHARGE REQUEST**



**MASSACHUSETTS WATER RESOURCES AUTHORITY
TOXIC REDUCTION AND CONTROL
2 GRIFFIN WAY
CHELSEA, MASSACHUSETTS 02150-3334**

**One-Time-Only Discharge Request
To discharge from a Cured-in-Place Pipe (CIPP) Lining process as part of a
sewer rehabilitation project into the Municipality or Authority sewerage
system**

Please, allow three weeks for processing this request

Name of Municipality: Town of Arlington, Massachusetts

Project Name: Bid No. 13-19 Sewer & Drain Improvements - Ottoson Middle School Area

Name of the person from the Municipality to contact concerning the information provided herein. *(Please, sign the signature page of this questionnaire, without a signature from the Municipality the MWRA will not be able to process this request.)*

Name: _____

Title: _____

Address: _____

Telephone No.: _____ Facsimile No.: _____

E Mail: _____

Contractor designated by the Municipality to conduct the project.

Name: _____

Title: _____

Company: _____

Address: _____

Telephone No.: _____ Facsimile No.: _____

E Mail: _____

MWRA Permit Number: _____

Person designated by the Municipality to receive correspondence from the MWRA regarding this project.

Name: _____

Title: _____

Company: _____

Address: _____

Telephone No.: _____ Facsimile No.: _____

GENERAL INFORMATION:

Please answer all of the questions

(If more space is needed, attach additional pages).

a) Cured-in-Place Pipe (CIPP)Liner is defined as a woven or non-woven or combination of woven and non-woven material surrounded or impregnated with resin which when installed and processed, forms to the shape and size of the interior walls of the host conduit as defined in ASTM Standard F1216.

b) Host Conduit is defined as the existing pipeline to be rehabilitated by CIPP Lining. The host conduit for this project must be indicated on the Contract Drawings.

1. Indicate the project scope. Provide pipe location and pipe length and diameter of each pipe to be treated. Use a pipe identification naming scheme that references the drawings and that will be recognizable by all parties. Identify all of the connection (using the name provide in Attachment A of the MWRA Municipal Discharge Permit) of the receiving MWRA interceptor and submit a diagram and drawing that will trace the flow from the project pipe to the MWRA interceptor.

Project scope and location: _____

Pipe Location Sewer Connection of the receiving MWRA interceptor <i>(Provide name in Attachment A of the MWRA Municipal Discharge Permit)</i>	Pipe Length (Feet)	Pipe Diameter (Inches)
_____ _____	_____ _____	_____ _____
_____ _____	_____ _____	_____ _____
_____ _____	_____ _____	_____ _____
_____ _____	_____ _____	_____ _____
_____ _____	_____ _____	_____ _____

2. Indicate how you will conduct the pipe cleaning process prior to the lining process.

3. Indicate the proposed installation method that you will employ for the CIPP liner into the existing pipe.

4. Indicate all of the appropriate Federal, state, and local permits and approvals obtained for this CIPP project.

5. Submit the Materials Safety Data Sheet(s) for the CIPP lining materials.

6. Indicate all source(s) of wastewater curing\lining process wastewater, cooling water, rinse water, pre-clean water, post-clean water, and, etc to be discharged into MWRA sewer system from this project.

Wastewater Type(s)	Source(s)
Curing water	<hr/> <hr/>
Cooling water	<hr/> <hr/>
Rinsing water	<hr/> <hr/>
Pre-cleaning water	<hr/> <hr/>
Post-cleaning water	<hr/> <hr/>
Other (Describe) <hr/> <hr/> <hr/> <hr/>	<hr/> <hr/>
Other (Describe) <hr/> <hr/>	<hr/> <hr/>

7. Describe the proposed pretreatment for the wastewater curing\lining process wastewater, cooling water, rinse water, pre-clean water, post-clean water, and, etc and provide equipment/flow diagram(s).

8. Indicate the storage method for treated and/or untreated curing\lining process wastewater, cooling water, rinse water, pre-clean water, post-clean water, etc, and provide its capacity in gallons prior to discharge into the MWRA sanitary sewer system.

Wastewater Type(s)	Storage method prior to discharge into MWRA sanitary sewer system.	Storage capacity (gallons)
Curing\lining process water		
Cooling water		
Rinsing water		
Pre-cleaning water		
Post-cleaning water		
Other (<i>Describe</i>) _____ _____		

9. Indicate proposed volume of wastewater (curing\lining process wastewater, cooling water, rinse water, pre-clean water, post-clean water, and, etc..) flow into the MWRA sewer system per day gallons per day (GPD).

Wastewater Type(s)	Volume(GPD) Discharge into MWRA sanitary sewer system	Pretreatment Yes/No	Pretreatment Type(s)
Curing\lining process water		Yes <input type="checkbox"/> No <input type="checkbox"/>	
Cooling water		Yes <input type="checkbox"/> No <input type="checkbox"/>	
Rinsing water		Yes <input type="checkbox"/> No <input type="checkbox"/>	
Pre-cleaning water		Yes <input type="checkbox"/> No <input type="checkbox"/>	
Post-cleaning water		Yes <input type="checkbox"/> No <input type="checkbox"/>	
Other (<i>Describe</i>) <hr/> <hr/>		Yes <input type="checkbox"/> No <input type="checkbox"/>	

10. Describe other method(s) for the collection and disposal for the curing\lining process wastewater, cooling water, and/or rinse water if pretreatment is not viable, and the discharge to the MWRA sanitary sewer system is not authorized.

11. Indicate if solids will be generated from the treatment process, including solidified styrene and other solid byproducts. All solids must be removed from the cure water and subsequent cooling and rinsing operations, prior to discharge into MWRA sewer system, pursuant 360 C.M.R. 10.023(8).

12. Indicate proposed date(s) of discharge into the MWRA sewer system.

Anticipated first day of discharge: _____

Anticipated last day of discharge: _____

Proposed hours of discharge into MWRA sewer system: _____

13. Provide the construction schedule for the project including specific proposed date(s) and start and end times. If specific dates are not known, please use Day 1 (one) for taking the pipe out of service and count forward from there. If individual operating time will take less than twenty-four hours, specify start and end times in military time.

Action(s)	Date (mm/dd/yyyy)	Operating Time (hrs:min:sec)	Comments(s)
Taking pipe out of service			
Pre-cleaning of pipe (Start)			
Pre-cleaning of pipe (End)			
Line installation (Start)			
Line installation (End)			
Curing process (Start)			
Curing process (End)			
Cooling process (Start)			
Cooling process (End)			
Rinsing (Start)			
Rinsing (End)			
Return pipe to service			
Other (Describe)			

14. Indicate how you will ensure that sufficient capacity (gallons) at the construction zone in the event of a storm event. Describe how flow through the pipe will be diverted around the construction zone and provide rerouting plans, and pipe blockage techniques that you will employ. Specify materials that will be used and storage measures that will be employed.

15. CERTIFICATION STATEMENT AND SIGNATURE:

The questionnaire for a One-Time-Only Discharge Request must be signed and dated by an authorized representative. If an authorization is no longer accurate because a different individual or position has responsibility for the overall operation of the sewer system, a new authorization satisfying the requirements of this section must be submitted to the MWRA prior to or together with any reports to be signed by an authorized representative.

An authorized representative of a municipality includes:

- a) a responsible public official, including a Mayor, City Manager, Town Administrator, Chair of the Board of Selectman, District Manager, or any other person who performs similar policy or decision-making functions for the municipality, or the director, manager, or superintendent of the department responsible for operating or overseeing the operation of the sewer system, if authority to sign documents has been assigned or delegated to the individual in accordance with the municipality’s procedures.
- b) the duly authorized representative of the individual designated in (a) of this section if:
 - i) the authorization is made in writing by the individual described in (a);
 - ii) the authorization specifies either an individual or a position having responsibility for the overall operation of the sewer system from which the discharge originates, such as the position of superintendent, or a position of equivalent responsibility, or having overall responsibility for environmental matters for the municipality;
 - iii) the written authorization is submitted to the MWRA.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the sewer system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature of Authorized Representative

Please Print Name of Authorized Representative

Title

Date

PLEASE, ALLOW THREE WEEKS FOR PROCESSING THIS REQUEST
Do not alter this form

To discharge wastewater from a sewer pipe lining/curing project into the Authority sewer system, submit the completed form to:

Massachusetts Water Resources Authority
Toxic Reduction and Control
2 Griffin Way, Chelsea MA 02150-3334
Attention: Kattia Thomas, Project Manager, Permitting

If you have any questions regarding the approval process, you may contact Kattia Thomas, at 617-305-5667.

