MAINE TURNPIKE AUTHORITY

MAINE TURNPIKE

CONTRACT DOCUMENTS

CONTRACT 2022.14

WEST GARDINER
WATERLINE REPLACEMENT

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SPECIFICATIONS

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

The Specifications are divided into three parts:
Part I, Supplemental Specifications, Part II, Special Provisions, and Part III, Appendix.

The Maine Turnpike Supplemental Specifications are additions and alterations to the 2014 Maine Department of Transportation Standard Specifications. See Subsection 100.1.

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ARRANGEMENT OF SPECIFICATIONS

MAINE TURNPIKE AUTHORITY

NOTICE TO CONTRACTORS

Sealed Proposals will be received by the Maine Turnpike Authority for:

CONTRACT 2022.14

WEST GARDINER
WATERLINE REPLACEMENT

at the office of the Maine Turnpike Authority, 2360 Congress Street, Portland, ME, until 11:00 a.m., prevailing time as determined by the Authority on May 17, 2022 at which time and place the Proposals will be publicly opened and read. Bids will be accepted from Contractors **who can demonstrate successful completion of a minimum of five (5) similar water main installation projects in the last five (5) years.** All other bids may be rejected. This Project includes a wage determination developed by the State of Maine Department of Labor.

The work consists of replacing a waterline at the West Gardiner Service Plaza in the Town of West Gardiner, Maine. The work includes waterline replacement, valve and fitting installations, installing corrosion protection for existing pipe and fixtures, testing and disinfection, existing waterline shutdown, capping, and abandoning, and all other work incidental thereto in accordance with the Plans and Specifications.

Plans and Contract Documents may be examined by prospective Bidders weekdays between 8:00 a.m. and 4:30 p.m. at the office of the Maine Turnpike Authority, 2360 Congress Street, Portland, Maine. **The half size Plans** and Contract Documents may be obtained from the Authority upon payment of Fifty ($50.00) Dollars for each set, which payment will not be returned. Checks shall be made payable to: Maine Turnpike Authority. The Plans and Contract Documents may also be downloaded from a link on our website at http://www.maineturnpike.com/project-and-planning/Construction-Contracts.aspx.

For general information regarding Bidding and Contracting procedures, contact Nate Carll, Purchasing Manager, at (207)482-8115. For information regarding Schedule of Items, plan holders list and bid results, visit our website at **http://www.maineturnpike.com/project-and-planning/Construction-Contracts.aspx** . For Project specific information, fax all questions to Nate Carll, Purchasing Manager, at (207) 871-7739 or email ncarll@maineturnpike.com. Responses will not be prepared for questions received by telephone. Bidders shall not contact any other Authority staff or Consultants for clarification of Contract provisions, and the Authority will not be responsible for any interpretations so obtained.

All work shall be governed by the Specifications entitled "State of Maine, Department of Transportation, Standard Specifications, Revision of November 2014", "Standard Details, Revision of March 2020" and "Best Management Practices for Erosion and Sediment Control", latest issue. Copies and recent updates to these publications can be downloaded at: http://www.maine.gov/mdot/contractors/publications/ .

Proposals must be accompanied by an original bid bond, certified or cashier's check payable to the Maine Turnpike Authority in an amount not less than Five (5%) Percent of the Total Amount in the Proposal, but not less than $500.00. The Bidder to whom a Contract is awarded will be required to furnish a Surety Corporation Bond, satisfactory to the Authority, on the standard Contract Bond form of the Authority, for a sum not less than the Total Amount of the Proposal.

Proposals must be made upon the Proposal Forms furnished by the Authority separately with the Contract Documents, and must be enclosed in the sealed special addressed envelope provided therefore bearing the name and address of the Bidder, the name of the Contract, and the date and time of Proposal opening on the outside.

A pre- bid conference will be held on May 10, 2022 at 10:00 a.m. at the West Gardiner Service Plaza, 288 Lewiston Road, West Gardiner, Maine.

The Authority reserves the unqualified right to reject any or all Proposals and to accept that Proposal which in its sole judgment will under all circumstances serve its best interest.

MAINE TURNPIKE AUTHORITY

Nate Carll
Purchasing Manager
Maine Turnpike Authority
Portland, Maine

Maine Turnpike Authority

MAINE TURNPIKE

PROPOSAL

CONTRACT 2022.14

WEST GARDINER
WATERLINE REPLACEMENT

MAINE TURNPIKE AUTHORITY

PROPOSAL

CONTRACT 2022.14

WEST GARDINER
WATERLINE REPLACEMENT

TO MAINE TURNPIKE AUTHORITY:

The work consists of replacing a waterline at the West Gardiner Service Plaza in the Town of West Gardiner, Maine. The work includes waterline replacement, valve and fitting installations, installing corrosion protection for existing pipe and fixtures, testing and disinfection, existing waterline shutdown, capping, and abandoning, and all other work incidental thereto in accordance with the Plans and Specifications.

This Work will be done under a Contract known as Contract 2022.14 according to the Plans and Specifications which are on file in the office of the Maine Turnpike Authority, 2360 Congress Street, Portland, Maine.

On the acceptance of this Proposal for said Work, the undersigned will give the required bond with good security conditioned for the faithful performance of said Work, according to said Plans and Specifications, and the doing of all other work required by said Specifications for the consideration herein named and with the further condition that the Maine Turnpike Authority shall be saved harmless from any and all damages that might accrue to any person, persons or property by reason of the carrying out of said Work, or any part thereof, or by reason of negligence of the undersigned, or any person or persons under his employment and engaged in said Work.

The undersigned hereby declares that he/she has carefully examined the Plans, Specifications and other Contract Documents, and that he/she will contract to carry out and complete the said Work as specified and delineated at the price per unit of measure for each scheduled item of Work stated in the Schedule of Prices as follows:

It is understood that the TOTAL AMOUNT stated by the undersigned in the following Schedule of Prices is based on approximate quantities and will be used solely for the comparison of bids, and that the quantities stated in the Schedule of Prices for the various items are estimates only and may be increased or decreased all as provided in the Specifications.

SCHEDULE OF BID PRICES
CONTRACT NO. 2022.14
WEST GARDINER WATERLINE REPLACEMENT MILE 101.7

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
629.05	HAND LABOR, STRAIGHT TIME	Hour	20				
631.12	ALL PURPOSE EXCAVATOR (INCLUDING OPERATOR)	Hour	10				
631.172	TRUCK-LARGE (INCLUDING OPERATOR)	Hour	10				
631.36	FOREMAN	Hour	10				
655.501	CORRTECH CATHODIC PROTECTION ALLOWANCE	Lump Sum	1	17,600	.00	17,600	.00
655.502	PASSIVE CATHODIC PROTECTION AT NEW PIPE INTERCONNECTIONS	Lump Sum	1				
655.503	PASSIVE CATHODIC PROTECTION ALONG EXISTING PIPE	Each	7				
656.632	30 INCH TEMPORARY SILT FENCE	Linear Foot	1,200				
659.10	MOBILIZATION	Lump Sum	1				
803.01	TEST PIT EXCAVATION AND BACKFILL	Each	3				
823.3251	8-INCH GATE VALVE AND VALVE BOX	Each	1				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
			BROUGHT FORWARD:				
825.3221	2-INCH CORPORATION	Each	1				
825.332	2-INCH CURB STOPS	Each	1				
825.422	2-INCH POLYETHELYENE SERVICE PIPE	Linear Foot	25				
825.61	10-INCH HDPE WATER PIPE	Linear Foot	800				
827.33	TRENCH INSULATION	Linear Foot	20				
					TOTAL:		

Acknowledgment is hereby made of the following Addenda received since issuance of the Plans and Specifications: _____

_____

_____

Accompanying this Proposal is an original bid bond, cashiers or certified check on _____ Bank, for _____, payable to the Maine Turnpike Authority. In case this Proposal shall be accepted by the Maine Turnpike Authority and the undersigned should fail to execute a Contract with, and furnish the security required by the Maine Turnpike Authority as set forth in the Specifications, within the time fixed therein, an amount of money equal to Five (5%) Percent of the Total Amount of the Proposal for the Contract awarded to the undersigned, but not less than $500.00, obtained out of the original bid bond, cashier's or certified check, shall become the property of the Maine Turnpike Authority; otherwise the check will be returned to the undersigned.

The performance of said Work under this Contract will be completed during the time specified in Subsection 107.1.

It is agreed that time is of the essence of this Contract and that I (we) will, in the event of my (our) failure to complete the Work within the time limit named above, pay to Maine Turnpike Authority liquidated damages in the amount or amounts stated in the Specifications.

The undersigned is an Individual/Partnership/Corporation under the laws of the State of _____, having principal office at _____, thereunto duly authorized.

_____ *(SEAL)*

_____ *(SEAL)*

Affix Corporate Seal
or Power of Attorney
Where Applicable

_____ *(SEAL)*

By: _____

Its: _____

Information below to be typed or printed where applicable:

INDIVIDUAL:

_____	_____
(Name)	(Address)

PARTNERSHIP - Name and Address of General Partners:

_____	_____
(Name)	(Address)
_____	_____
(Name)	(Address)
_____	_____
(Name)	(Address)
_____	_____
(Name)	(Address)

INCORPORATED COMPANY:

_____	_____
(President)	(Address)
_____	_____
(Vice-President)	(Address)
_____	_____
(Secretary)	(Address)
_____	_____
(Treasurer)	(Address)

STATEMENT OF QUALIFICATION

The undersigned, under the pains and penalty of perjury, offers the following information as evidence of his qualifications to perform the Work as bid upon according to all the requirements of the Plans and Specifications.

1. How long have you been in business under present business name? _____ Years

2. Have you ever failed to complete any work awarded? _____ Yes _____ No

   If Yes, provide explanation: _____

   _____

   _____

3. Bank Reference: _____

   _____

   _____

4. History of Contracts: On the following "History of Contracts" sheet, provide full information about all of your Contracts similar to this Contract.

5. Status of Contracts on Hand: On the following "Status of Contracts on Hand" sheet, provide full information about all of your Contracts.

_____
(Date)

_____
(Name of Bidder as appearing in submitted Proposal)

HISTORY OF CONTRACTS

PROJECT NAME:

OWNER:

LOCATION:

DESCRIPTION:

CONTRACT AMOUNT:

NAME OF SUBCONTRACTOR(S):

SUBCONTRACTOR'S CONTRACT AMOUNT(S):

CONTRACT COMPLETION DATE:

ACTUAL COMPLETION DATE:

LIST OF OTHER CONTRACTORS WORKING ON A PROJECT FOR THE OWNER AT THE SAME TIME:

STATUS OF CONTRACTS ON HAND

OWNER	CONTACT NAME & TELEPHONE NO.	LOCATION OF WORK	DESCRIPTION OF WORK	GENERAL CONTRACTOR OR SUBCONTRACTOR	CONTRACT AMOUNT	BALANCE TO BE COMPLETED	ESTIMATED DATE OF COMPLETION

MAINE TURNPIKE AUTHORITY

MAINE TURNPIKE

YORK TO AUGUSTA

CONTRACT AGREEMENT

This Agreement made and entered into between the Maine Turnpike Authority, and sometimes termed the "Authority", and _____

_____

herein termed the "Contractor":

WITNESSETH: That the Authority and the Contractor, in consideration of the premises and of the mutual covenants, considerations and agreements herein contained, agree as follows:

FIRST: The parties hereto mutually agree that the documents attached hereto and herein incorporated and made a part hereof collectively evidencing and constituting the entire Contract to the same extent as if herein written in full, are the Notice to Contractors, the Accepted Proposal, the Specifications, the Plans, this Agreement, the Contract Bond and all Addenda to the Contract Documents duly issued and herewith enumerated:

_____

_____

SECOND: The Contractor for and in consideration of certain payments to be made as hereafter specified, hereby covenants and agrees to perform and execute all of the provisions of this Contract and of all documents and parts attached hereto and made a part thereof, and at his own cost and expense to furnish and perform everything necessary and required to construct and complete, ready for its intended purpose, in accordance with the Contract and such instructions as the Engineer may give, acceptable to the Authority, in the times provided, all of the Work covered and included under Contract No. _____ covering _____ as herein described.

THIRD: In consideration of the performance by the Contractor of his covenants and agreements as herein set forth, the Authority hereby covenants and agrees to pay the Contractor according to the Schedule of Prices set forth in the Proposal with additions and deductions as elsewhere herein provided in the times and in the manner stated in the Specifications. This Agreement shall insure to the benefit of, and shall be binding upon the parties hereto, and upon their respective successors and assigns; but neither party hereto shall assign or transfer his interest herein in whole or in part without the consent of the other, except as herein provided.

IN WITNESS WHEREOF the parties to this Agreement have executed the same in quintuplicate.

AUTHORITY -

MAINE TURNPIKE AUTHORITY

By: _____

Title: CHAIRMAN

Date of Signature: _____

ATTEST:

_____
Secretary

CONTRACTOR -

_____
CONTRACTOR

By: _____

Title: _____

Date of Signature: _____

WITNESS:

_____

CONTRACT BOND

KNOW ALL MEN BY THESE PRESENTS that _____

of _____ in the County of _____ and State of _____

as Principal, and _____ a Corporation duly organized under the

laws of the State of _____ and having a usual place of business in _____

_____

As Surety, are held and firmly bound unto the Maine Turnpike Authority in the sum of _____Dollars ($_____.___), to be paid to said Maine Turnpike Authority, or its successors, for which payment, well and truly to be made, we bind ourselves, our heirs, executors, successors and assigns jointly and severally by these presents.

The condition of this obligation is such that the Principal, designated as Contractor in the foregoing Contract No. _____ shall faithfully perform the Contract on his part and satisfy all claims and demands incurred for the same and shall pay all bills for labor, material, equipment and all other items contracted for, or used by him, in connection with the Work contemplated by said Contract, and shall fully reimburse the Obligee for all outlay and expense which the Obligee may incur in making good any default of said Principal, then this Obligation shall be null and void; otherwise it shall remain in full force and effect.

Signed and sealed this _____ day of _____, A.D., 202___

Witnesses: CONTRACTOR

_____ _____ *(SEAL)*

_____ _____ *(SEAL)*

_____ _____ *(SEAL)*

SURETY

_____ _____ *(SEAL)*

_____ _____ *(SEAL)*

_____ _____ *(SEAL)*

(Surety must attach copy of Power of Attorney showing authority of Office or Agent to execute bonds)

FINAL LIEN AND CLAIM WAIVER AND AFFIDAVIT

Upon receipt of the sum of _____, which sum represents the total amount paid, including the current payment for work done and materials supplied for Project No. _____, in _____, Maine, under the undersigned's Contract with the Maine Turnpike Authority.

The undersigned, on oath, states that the Final Payment of _____ is the final payment for all work, labor, materials, services and miscellaneous (all of which are hereinafter referred to as "Work Items") supplied to the said Project through _____and that no additional sum is claimed by the undersigned respecting said Project.

The undersigned, on oath, states that all persons and firms who supplied Work Items to the undersigned in connection with said Project have been fully paid by the undersigned for such Work Items or that such payment will be fully effected immediately upon receipt of this payment.

In consideration of the payment herewith made, the undersigned does fully and finally release and hold harmless the Maine Turnpike Authority, and its Surety, if any, from any and all claims, liens or right to claim or lien, arising out of this Project under any applicable bond, law or statute.

It is understood that this Affidavit is submitted to assure the Owner and others that all liens and claims relating to the Work Items furnished by the undersigned are paid.

_____
(Contractor)

By: _____

Title: _____

State of MAINE

County of _____

I, _____, hereby certify on behalf of _____
(Company Officer) *(Company Name)*

its _____, being first duly sworn and stated that the foregoing representations are
(Title)

are true and correct upon his own knowledge and that the foregoing is his free act and deed in said capacity and the free act and deed of the above-named

_____

.

(Company Name)

The above-named, _____, personally appeared before me this ____ day of _____ and swears that this is his free act and deed.

(SEAL)

_____
Notary Public

My Commission Expires: _____

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

PART I – SUPPLEMENTAL SPECIFICATIONS

(Rev. November 10, 2016)

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

PART II – SPECIAL PROVISIONS

PART II - SPECIAL PROVISIONS

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

PART II - SPECIAL PROVISIONS

All work shall be governed by the Maine Department of Transportation Standard Specifications, Revision of November 2014, except for that work which applies to sections of the Maine Department of Transportation Standard Specifications which are amended by the Maine Turnpike Supplemental Specifications and the following modifications, additions and deletions.

General Description of Work

The work consists of replacing a waterline at the West Gardiner Service Plaza in the Town of West Gardiner, Maine. The work includes waterline replacement, valve and fitting installations, installing corrosion protection for existing pipe and fixtures, testing and disinfection, existing waterline shutdown, capping, and abandoning, and all other work incidental thereto in accordance with the Plans and Specifications.

Plans

The drawings included in these Contract Documents, and referred to as the Plans, show the general character of the work to be done under this Contract. They bear the general title "Maine Turnpike – Contract 2022.14 – West Gardiner Waterline Replacement". The right is reserved by the Resident to make such minor corrections or alterations in the Plans as he deems necessary without change in the unit prices on the Schedule of Prices of the Proposal.

101.2 Definition

Holidays

The following is added after Memorial Day in the Supplemental Specifications:

Juneteenth National Independence Day (June 19, 2022)	6:00 p.m. preceding Saturday to 6:00 a.m. the following Tuesday
Independence Day 2022 (Fourth of July)	12:01 p.m. preceding Friday to 6:00 a.m. the following Tuesday.
Christmas 2022	6:00 p.m. preceding Friday to 6:00 a.m. the following Monday
New Years	6:00 p.m. preceding Friday to 6:00 a.m. the following Monday

103.4 Notice of Award

The following sentence is added:

The Maine Turnpike Authority Board is scheduled to consider the Contract Award on May 26, 2022.

104.3.8 Wage Rates and Labor Laws

Section 104.3.8 Wage Rates and Labor Laws has been amended as follows:

The fair minimum hourly rates determined by the State of Maine Department of Labor for this Contract are as follows:

THIS DOCUMENT MUST BE CLEARLY POSTED AT ALL CONSTRUCTION SITES FUNDED IN PART WITH STATE FUNDS

State of Maine
Department of Labor
Bureau of Labor Standards
Augusta, Maine 04333-0045
Telephone (207) 623-7906

Wage Determination - In accordance with 26 MRS §1301 et. seq., this is a determination by the Bureau of Labor Standards, of the fair minimum wage rate to be paid to laborers and workers employed on the below titled project.

2022 Fair Minimum Wage Rates
Highway & Earth Kennebec County

Occupational Title	Minimum Wage	Minimum Benefit	Total
Carpenter	$21.13	$1.39	$22.52
Cement Masons And Concrete Finisher	$20.00	$0.00	$20.00
Commercial Divers	$28.00	$2.50	$30.50
Construction And Maintenance Painters	$23.34	$2.53	$25.87
Construction Laborer	$21.25	$1.65	$22.90
Control And Valve Installers And Repairers - Except Mechanical Door	$26.00	$5.49	$31.49
Conveyor Operators And Tenders	$18.00	$2.71	$20.71
Crane And Tower Operators	$31.54	$6.68	$38.22
Crushing Grinding And Polishing Machine Operators	$20.22	$3.89	$24.11
Earth Drillers - Except Oil And Gas	$23.25	$5.53	$28.78
Electricians	$39.54	$18.92	$58.46
Excavating And Loading Machine And Dragline Operators	$25.73	$5.26	$30.99
Fence Erectors	$18.00	$0.72	$18.72
Flaggers	$16.50	$0.00	$16.50
Heating And Air Conditioning And Refrigeration Mechanics And Installers	$26.33	$4.06	$30.39
Heavy And Tractor - Trailer Truck Drivers	$22.00	$2.12	$24.12
Highway Maintenance Workers	$22.13	$2.10	$24.23
Industrial Machinery Mechanics	$26.00	$5.19	$31.19
Industrial Truck And Tractor Operators	$24.00	$5.61	$29.61
Light Truck Or Delivery Services Drivers	$20.00	$0.99	$20.99
Millwrights	$25.13	$3.51	$28.64
Mixing And Blending Machine Operators	$24.71	$8.59	$33.30
Mobile Heavy Equipment Mechanics - Except Engines	$26.13	$4.06	$30.19
Operating Engineers And Other Equipment Operators	$26.00	$6.73	$32.73
Paving Surfacing And Tamping Equipment Operators	$26.00	$4.92	$30.92
Pipelayers	$28.00	$7.20	$35.20
Plumbers Pipe Fitters And Steamfitters	$26.00	$2.93	$28.93
Reinforcing Iron And Rebar Workers	$48.58	$0.00	$48.58
Structural Iron And Steel Workers	$27.98	$4.69	$32.67

Welders are classified as the trade to which welding is incidental (e.g. welding structural steel is Structural Iron and Steel Worker)

Apprentices – The minimum wage rate for registered apprentices are those set forth in the standards and policies of the Maine State Apprenticeship and Training Council for approved apprenticeship programs.

For any other specific trade on this project not listed above, contact the Bureau of Labor Standards for further clarification.

Title 26 §1310 requires that a clearly legible statement of all fair minimum wage and benefits rates to be paid the several classes of laborers, workers and mechanics employed on the construction on the public work must be kept posted in a prominent and easily accessible place at the site by each contractor and subcontractor subject to sections 1304 to 1313.

Appeal – Any person affected by the determination of these rates may appeal to the Commissioner of Labor by filing a written notice with the Commissioner stating the specific grounds of the objection within ten (10) days from the filing of these rates.

A true copy

Attest: Scott R. Cotnoir
Scott R. Cotnoir
Wage & Hour Director
Bureau of Labor Standards

Expiration Date: 12-31-2022

THIS DOCUMENT MUST BE CLEARLY POSTED AT ALL CONSTRUCTION SITES FUNDED IN PART WITH STATE FUNDS

State of Maine
Department of Labor
Bureau of Labor Standards
Augusta, Maine 04333-0045
Telephone (207) 623-7906

Wage Determination - In accordance with 26 MRS §1301 et. seq., this is a determination by the Bureau of Labor Standards, of the fair minimum wage rate to be paid to laborers and workers employed on the below titled project.

2022 Fair Minimum Wage Rates
Heavy & Bridge Kennebec County

Occupational Title	Minimum Wage	Minimum Benefit	Total
Carpenter	$29.00	$5.33	$34.33
Cement Masons And Concrete Finisher	$20.04	$1.02	$21.06
Commercial Divers	$28.00	$0.48	$28.48
Construction And Maintenance Painters	$33.75	$31.25	$65.00
Construction Laborer	$21.00	$2.36	$23.36
Conveyor Operators And Tenders	$16.50	$0.00	$16.50
Crane And Tower Operators	$30.00	$7.42	$37.42
Crushing Grinding And Polishing Machine Operators	$21.00	$4.38	$25.38
Earth Drillers - Except Oil And Gas	$23.25	$5.53	$28.78
Electrical Power - Line Installer And Repairers	$43.55	$23.26	$66.81
Electricians	$29.63	$14.80	$44.43
Excavating And Loading Machine And Dragline Operators	$28.00	$4.44	$32.44
Flaggers	$21.00	$0.65	$21.65
Heating And Air Conditioning And Refrigeration Mechanics And Installers	$26.33	$4.06	$30.39
Heavy And Tractor - Trailer Truck Drivers	$23.00	$3.60	$26.60
Highway Maintenance Workers	$21.66	$3.22	$24.88
Industrial Machinery Mechanics	$30.00	$7.45	$37.45
Industrial Truck And Tractor Operators	$24.00	$5.61	$29.61
Ironworker - Ornamental	$25.00	$3.32	$28.32
Light Truck Or Delivery Services Drivers	$24.50	$6.23	$30.73
Millwrights	$32.28	$22.86	$55.14
Mobile Heavy Equipment Mechanics - Except Engines	$29.75	$7.69	$37.44
Operating Engineers And Other Equipment Operators	$34.82	$32.39	$67.21
Paving Surfacing And Tamping Equipment Operators	$35.11	$2.28	$37.39
Pile-Driver Operators	$30.54	$8.93	$39.47
Pipelayers	$28.50	$7.20	$35.70
Plumbers Pipe Fitters And Steamfitters	$32.86	$18.00	$50.86
Radio Cellular And Tower Equipment Installers	$27.00	$0.00	$27.00
Reinforcing Iron And Rebar Workers	$34.83	$14.47	$49.30
Riggers	$25.25	$9.62	$34.87
Sheet Metal Workers	$24.00	$5.48	$29.48
Structural Iron And Steel Workers	$26.97	$4.50	$31.47
Telecommunications Line Installers And Repairers	$24.00	$3.88	$27.88

Welders are classified as the trade to which welding is incidental (e.g. welding structural steel is Structural Iron and Steel Worker)

Apprentices – The minimum wage rate for registered apprentices are those set forth in the standards and policies of the Maine State Apprenticeship and Training Council for approved apprenticeship programs.

For any other specific trade on this project not listed above, contact the Bureau of Labor Standards for further clarification.

Title 26 §1310 requires that a clearly legible statement of all fair minimum wage and benefits rates to be paid the several classes of laborers, workers and mechanics employed on the construction on the public work must be kept posted in a prominent and easily accessible place at the site by each contractor and subcontractor subject to sections 1304 to 1313.

Appeal – Any person affected by the determination of these rates may appeal to the Commissioner of Labor by filing a written notice with the Commissioner stating the specific grounds of the objection within ten (10) days from the filing of these rates.

A true copy

Attest: Scott R. Cotnoir
Scott R. Cotnoir
Wage & Hour Director
Bureau of Labor Standards

104.4.6 Utility Coordination

This Subsection is amended by the addition of the following:

These Special Provisions outline the arrangements which have been established by the Authority for coordination of the work to be accomplished by the utilities. The scope and schedule of utility relocation work is noted herein. The Contractor shall plan and conduct his work accordingly.

General

Utility working days are Monday through Friday, conditions permitting. Times are estimated on the basis of a single crew for each utility. Any times and dates mentioned are estimates only and are dependent upon favorable weather, working conditions, and freedom from emergencies. The Contractor shall have no claim against the Authority if they are exceeded.

The Contractor shall plan and conduct his operations in accordance with the following utility schedule. The Contractor must comply with all OSHA regulations pertaining to work adjacent to utility wires. The Contractor shall plan and conduct his work accordingly.

The following utilities are located within the Project limits. The Contractor shall ascertain the location of the existing utilities and any other necessary information by direct inquiry at the office of the following utility owners:

AERIAL UTILITIES

COMMUNICATION:

Consolidated Communication

5 Davis Farm Road, Floor 2
Portland, ME, 04103
ATTN: Marty Pease
Tel: 207-535-4208
Cell: 207-272-7993
Email: martin.pease@consolidated.com

ELECTRIC:

Central Maine Power Company (CMPCo)
160 Canco Road
Portland, ME 04103
ATTN:
Ted Getchell
Theodore.Getchell@cmpco.com
Tel:207-242-4755

Aaron T Grenier
Aaron.Grenier@cmpco.com
Tel: 207-530-0866
Sam Webber
Tel: 207-441-8360

The Contractor shall provide notice to Consolidated Communication and CMPCo a minimum of ten (10) working days prior to any excavation to determine if temporary holding of utility poles is required. Proposed trench widths and locations shall be layed out in the field for the utilities to review.

The Contractor shall contact Consolidated communications and CMPCo a minimum of two (2) working days prior to utility pole holds being required. Contact Theodore Getchell at Theodore.Getchell@cmpco.com and Brian Beaulieu at Brian.beaulieu@consolidated.com to coordinate these holds.

All utility pole holds shall be limited to 8 hours in duration and the contractor shall phase their work as to limit consecutive holds to the extent practical. Maintenance of traffic as determined by the resident, to accomplish these holds will be the responsibility of the contractor and be considered incidental to the contract.

UNDERGROUND UTILITIES

SEWER:
Maine Turnpike Authority
2360 Congress Street, Portland, Maine
ATTN: Shawn Laverdiere
Tel: 207-240-7686
Email: slaverdiere@maineturnpike.com

The Maine Turnpike Authority Owns a 4" PVC force main within the project limits. No work to their facility is expected during this contract. New waterline will cross the sewer force main. Contractor shall notify Resident 10 days before excavation near sewer line.

The Contractor is responsible for the protection of the sewer force main, and shall be responsible for all costs associated with repair of the force main and maintaining flows if damage occurs. The contractor shall notify the Maine Turnpike Authority Director of Building Maintenance 5 days before beginning work around the force main.

The contractor shall submit for review and approval a contingency plan for emergency repairs of the waterline and sewer line. These plans shall include coordination of parts, labor and general timeline of repairs. Weekend construction of the waterline replacement shall not be allowed.

104.4.7 Cooperation With Other Contractors

This Subsection is amended by the addition of the following:

Adjacent contracts currently scheduled for the 2022 construction season include:
ChargePoint – Electric Vehicle Chargers
Applegreen – Internal Building Renovations

107.1 Contract Time and Contract Completion Date

This Subsection is amended by the addition of the following:

All work shall be completed on or before May 31, 2023. The construction shall be substantially complete by November 1, 2022.

107.1.1 Substantial Completion

This Subsection is amended by the addition of the following:

Substantially complete shall be defined by the Authority as the following:

- New waterline is installed, successfully tested and disinfected, interconnected, and fully operational.
- Existing waterline is properly taken out of service, capped, and abandoned in place.
- All disturbed slopes loamed, seeded and mulched, temporary erosion control mix and/or blanket installed where necessary.

Supplemental Liquidated damages on a calendar day basis in accordance with Subsection 107.8 shall be assessed for each calendar day that substantial completion is not achieved.

107.4.7 Limitations of Operations

The following limitations apply to this contract:

- Water supply to the Service Plaza shall be maintained at all times for the entirety of the project duration.
- Water supply to the Toll Plaza shall not be shut off from 5am to 9pm daily. Temporary shut-offs may be approved for a period not to exceed four (4) hours in length with a minimum 14-day notice to the Resident.
- Water supply to the MTA Maintenance Facility shall not be shut off from 5am to 9pm daily. Temporary shut-offs may be approved for a period not to exceed four (4) hours in length with a minimum 14-day notice to the Resident.

- Water supply to the C.N. Brown Gas Station Facility shall not be shut off from 5am to 9pm daily. Temporary shut-offs may be approved for a period not to exceed four (4) hours in length with a minimum 14-day notice to the Resident.
- Temporary water shut-offs shall not affect more than two fire-hydrants at a time. A 14-day notice and map of affected fire hydrants shall be given to the local fire department in advance of all temporary water shut-offs.
- Contractor shall provide a 21 day notice to the Resident of temporary shutdown of the existing waterline to allow MTA to coordinate setup of portable toilets and bottled water.
- Excavation for waterline replacement shall not begin until September 07, 2022.
- The contractor shall maintain access to the service plaza, parking areas, and fueling stations at all times. The perimeter road shall not be closed at any time except as may be required for the utilities to temporarily hold a utility pole as the waterline trench excavation is completed adjacent to the pole. Temporary holds, and therefore perimeter road closure, shall be limited to maximum 4 hour duration and shall be accompanied by detour signage and flaggers as directed by the Resident.

SPECIAL PROVISION

SECTION 203

EXCAVATION AND EMBANKMENT

203.01 Description

The following paragraph is added:

This work shall consist of cutting, removing and disposing of the full depth of existing bituminous concrete pavement at the approaches to the bridge structures within the limits of work as shown on the Plans or as approved by the Resident. The pavement shall be sawcut to the full depth of pavement at the limits of the excavation to provide a clean, vertical cut surface.

203.04 General

The following sentence is added to the end of the third paragraph.

There are no approved waste storage areas or waste areas within the Project limits unless shown on the Plans. Unsuitable materials shall be disposed of off-site in accordance with Subsection 203.06.

All excavations shall be accomplished in accordance with the applicable OSHA Standards. The Resident reserves the right to request the Contractor to prepare an excavation plan. This plan shall include, but not necessarily be limited to, the limit and depth of excavation, side slope, shoring, trench box and utility support.

203.10 Embankment Construction - General

The thirteenth and fourteenth paragraphs are deleted and replaced with the following:

All portions of the embankment shall be compacted in accordance with the designated embankment compaction requirements specified for the Project.

The existing slopes should be benched as shown on the drawings prior to placing additional fill. Embankment fill should be placed in lifts which extend laterally beyond the limits of the design side slopes such that the specified degree of compaction is achieved within the limits of the completed embankment. The slopes should then be trimmed back to design dimensions.

203.16 Winter Construction of Embankments

The word “core” is deleted from the first and second sentences in the first paragraph.

203.18 Method of Measurement

The following paragraphs are added:

There will be no additional payment for the required excavation plan. Excavation for the waterline trench will not be measured for payment but will be incidental to the Waterline pay item.

SPECIAL PROVISION

SECTION 613

EROSION CONTROL BLANKET

613.01 Description

This work shall also include seeding, mulching and watering the disturbed area of swale and/or longitudinal flow line to the limits and width as shown on the Plans or as directed by the Resident.

613.02 Materials

The following sentences are added:

Seeding shall meet the requirements of Section 618, Seeding, Method Number 2.

Mulch shall meet the requirements of Section 619.

The following Subsection is added:

613.041 Maintenance and Acceptance

See Section 618.10 for maintenance and acceptance of seeding.

613.042 Mulch

All mulch shall be placed after the area has been seeded and prior to the installation of the Erosion Control Blanket.

613.08 Method of Measurement

Erosion control blanket will not be measured for payment but shall be incidental to the Contract.

SPECIAL PROVISION

SECTION 619

MULCH

(Mulch – Plan Quantity)
(Temporary Mulch)

619.01 Description

The first paragraph is modified by the addition of the following:

"as a temporary or permanent erosion control measure" after the word "mulch".

Add the following sentence at the end of the first paragraph:

Refer to Section 656 Temporary Soil and Water Pollution Control, for more information on Temporary Mulch.

619.03 General

The first paragraph is deleted and replaced with the following:

Cellulose fiber mulch shall not be used within 200 feet of a wetland or stream. The limits shall be 200 feet up station and down station of the wetland or streams as well as the slopes adjacent to the stream. The application of hay or straw mulch with an approved binder shall be used at these locations to prevent erosion.

The use of cellulose fiber mulch will only be allowed at other areas with the approval of the Resident. The Contractor may be required to demonstrate that the material may be applied in a manner that will prevent erosion and will aid in the establishment of permanent vegetation. The Resident reserves the right to require the use of hay or straw mulch at all locations if he determines that the cellulose mulch is ineffective. Cellulose fiber mulch is not acceptable for winter stabilization.

619.06 Method of Measurement

The following sentence is added:

Temporary Mulch will be paid for by the lump sum.

619.07 Basis of Payment

The following sentence is added:

Temporary Mulch will be paid for at the Contract price per lump sum which shall be full

compensation for furnishing and spreading the Temporary Mulch as many times as necessary as determined by the Contractor's operations and staging. The price shall also include the additional mulch netting and snow removal necessary during the winter months.

Payment will be made under:

Pay Item		Pay Unit
619.1201	Mulch – Plan Quantity	Unit
619.1202	Temporary Mulch	Lump Sum

SPECIAL PROVISION

SECTION 652

MAINTENANCE OF TRAFFIC

(Specific Project Maintenance of Traffic Requirements)

This Specification describes the specific project maintenance of traffic requirements for this Project.

The following minimum traffic requirements shall be maintained. These requirements may be adjusted based on the traffic volume when authorized by the Authority.

Local Road Traffic Control Requirements

All work shall be completed from the MTA Service Plaza property, including access to the work. Lane and shoulder closures are not allowed on Route 126. The contractor shall set up drums, spaced at 40’ maximum, behind the curb along Rt 126 from the Service Plaza exit to the guardrail terminal when construction vehicles or persons are within 50’ of Rt 126.

The contractor shall maintain access to the service plaza, parking areas, and fueling stations at all times. The perimeter road shall not be closed at any time except as may be required for the utilities to temporarily hold a utility pole as the waterline trench excavation is completed adjacent to the pole. Temporary holds, and therefore perimeter road closure, shall be limited to maximum 4 hour duration and shall be accompanied by detour signage and flaggers as directed by the Resident.

The contractor shall provide a minimum 10-day notice of all planned temporary holds (closure to perimeter road) for review and approval.

All maintenance of traffic, traffic control devices, and flaggers required as determined by the resident, shall not be measured for payment but shall be incidental to the Contract.

All traffic control devices shall meet current MUTCD requirements.

SPECIAL PROVISION

SECTION 655

ELECTRICAL WORK

(CorrTech Cathodic Protection Allowance)
(Passive Cathodic Protection at New Pipe Interconnections)
(Passive Cathodic Protection along Existing Pipe)

655.01 Description

This Specification describes the work to install Passive Cathodic Protection.

655.02 General

Passive Cathodic Protection shall be installed as shown on the plans, including at both ends of the replacement water line and on the waterline between the Service Plaza perimeter road and I-295. The work generally consists of two elements, one is securing the services of CorrTech to provide cathodic protection materials and training, and the other is installation of cathodic protection (uncovering the pipes to receive the cathodic protection, installing the cathodic protection, and covering the pipes back up).

655.03 Method of Measurement

CorrTech Cathodic Protection Allowance will be measured by the Lump Sum as noted in the Proposal form. This item consists of acquiring the materials and services from CorrTech as described in Appendix B.

Cathodic Protection at New Pipe Interconnections will be measured by the Lump Sum, installed as directed, complete in place, and accepted. This item consists of installing the cathodic protection system at two locations, one at each end of the replaced waterline as shown on the plans.

Cathodic Protection along Existing Pipe will be measured by the Each, installed as directed, complete in place, and accepted for each location of the installation. Each location consists of a single pit excavation and installation of the cathodic protection system to two abutting pipe ends as indicated on the plans between station 10+00 and 12+50, estimated as seven anode pit locations.

655.04 Basis of Payment

The accepted quantity of CorrTech Cathodic Protection Allowance, specifically Cathodic protection materials and engineering support by CorrTech, shall be paid for by contract allowance. Services and materials provided by CorrTech under the allowance are detailed in appendix B. These generally include but are not limited to;

1. Cathodic Protection Materials
    a. 40 count zinc anodes, 24-pounds

b. 40 count Thermite Weld Shots and (1) mold
c. 200 feet – AWG 10 HMWPE Cable for Anode Bonding
d. 200 feet – AWG 6 HMWPE Cable for Pipe Bonding
e. 2 count – flush mount test stations
f. 2 gallons – bitumastic pipe coating (for termite weld coating)

2. CorrTech oversight of one excavation installation
3. Testing and Final Report by CorrTech

The accepted quantity of Cathodic Protection at New Pipe Interconnections shall be paid for at the contract unit price per lump sum which shall be full compensation for Passive Cathodic Protection at interconnections and appurtenances. The lump sum shall be full compensation for but not limited to excavation, cleaning pipe surface, installing all materials provided under Item No. 655.501 CorrTech Cathodic Protection Allowance, labor, and equipment necessary to install a passive cathodic protection anode system to the exposed ductile iron pipe at each interconnection trench location including 6 zinc anodes, 24 lbs. each, thermite welded to the pipe, CP test stations, site excavation and connection to existing mains; restoration; and for all other work and expenses incidental thereto.

The accepted quantity of Cathodic Protection along Existing Pipe shall be paid for at the contract unit price per each which shall be full compensation for but not limited to excavation, cleaning pipe surface, installing all materials provided under Item No. 655.501 CorrTech Cathodic Protection Allowance, labor, and equipment necessary to excavate trench/pit for anode installation, install four (4) packaged zinc anodes by CAD weld to pipes at alternating joints (every 36') as indicated in plans with anodes and welder supplied by CorrTech, backfill and surface restoration, coordinate final testing (to be performed by CorrTech) upon cathodic protection system installation and for all other work and expenses incidental thereto.

Payment will be made under:

Pay Item		Pay Unit
655.501	CorrTech Cathodic Protection Allowance	Lump Sum
655.502	Passive Cathodic Protection at New Pipe Interconnections	Lump Sum
655.503	Passive Cathodic Protection along Existing Pipe	Each

APPENDIX A

WEST GARDINER

WATER LINE REPLACEMENT

MTA CONTRACT 2022.14

MAINE TURNPIKE AUTHORITY

WEST GARDINER, MAINE

TECHNICAL SPECIFICATIONS

APRIL 2022

21009

WRIGHT-PIERCE
Engineering a Better Environment

MAINE TURNPIKE AUTHORITY

WEST GARDINER, MAINE

BIDDING/CONTRACT DOCUMENTS AND TECHNICAL SPECIFICATIONS

FOR

WEST GARDINER WATERLINE REPLACEMENT

APRIL 2022

Prepared By:

Wright-Pierce
11 Bowdoin Mill Island, Suite 140
Topsham, Maine 04086
Phone: 207-725-8721

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END OF SECTION

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: replacing the buried water main adjacent to the West Gardiner Service Plaza.

1. Construction of approximately 800 feet of new 10-inch buried HDPE water main. The work will also include:
    a. Connections to the existing buried 8-inch water main at the Northern end of the plaza and the existing 10-inch DI water main adjacent to the highway crossing.
    b. Temporary filling and flushing connections.
    c. Passive cathodic protection installation on existing water main connections and on ductile iron water main toward the Interstate 295 highway crossing.
    d. Abandonment of the existing 8-inch water main.
    e. Other appurtenances as shown on the Drawings and specified herein.
2. Remove and/or relocate equipment as indicated on the Drawings.

B. Removals, Relocations and Rearrangements

1. Examine the existing site for the work of all trades which will influence the cost of the work under the bid. This work shall include removals, relocations and rearrangements which may interfere with, disturb, or complicate the performance of the work under the bid involving systems, equipment and related service lines, which shall continue to be utilized as part of the finished project. The Contractor is responsible for all coordination in this regard.
2. Provide in the bid sufficient amount to include all removals, relocations, rearrangements and reconnections herein specified, necessary or required to provide approved operation and coordination of the combined new and existing systems and equipment.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 MAINTAIN EXISTING WORKS

A. Water Main:

1. The Maine Turnpike Authority relies on the existing 8-inch water main to serve the plaza gas station, Maine Turnpike Authority garage, and toll plaza. The Contractor shall implement all construction methods, planning, and precautions as required for the duration of the project to preserve the operation of this line throughout the course of construction. The Contractor shall protect this existing main while working around it. This water main must remain in service (operation) throughout the course of construction until which time service can be transferred to the new water main.

B. Existing Operations:
   1. Refer to construction sequence below. Uninterrupted service shall be provided at all times during construction except for planned shutdown events.

C. Minimize Interference
   1. The Contractor shall at all times conduct their operations so as to interfere as little as possible with existing works. The Contractor shall develop a program, in cooperation with the Owner, Wright-Pierce, and HNTB which 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 therefrom are expressly permitted.

3.2 CONSTRUCTION SEQUENCE

A. Water Main Installation
   1. Install buried water main from STA 100+35 +/- to STA 108+00 +/-. Install temporary filling/flushing connections.
   2. Flush, pressure test, and disinfect water main from STA 100+35 to STA 108+00. Highly chlorinated water shall be dechlorinated prior to discharge. Flushing water will be supplied from the hydrant on the northern end of the project at Route 126.
   3. Remove temporary flushing/filling connection and install interconnecting piping and fittings from STA 108+00 +/- to STA 108+10 +/-. All interconnecting piping and fittings will be installed, cleaned, and swab disinfected prior to connection. Contractor shall note that shutdown is limited to 4-hours with a minimum of 72-hours' notice to the MTA and Wright-Pierce.
   4. Install passive cathodic protection on existing water main connection at Station 108+15 +/-.
   5. Connect 2" service
   6. Remove temporary flushing/filling connection and install interconnecting piping and fittings from STA 100+25 to STA 100+30 +/-. All interconnecting piping and fittings will be installed clean, and swab disinfected prior to connection. Contractor shall note that shutdown is limited to 4-hours with a minimum of 72-hours' notice to the MTA and Wright-Pierce.
   7. Open isolation valves and commission water main.
   8. Install passive cathodic protection on existing water main connection at Station 100+20 +/-.
   9. Cut, cap and abandon existing water main.
   10. Install passive cathodic protection on existing 10-inch ductile iron water main from STA 10+00 to STA 12+50.

B. The Contractor shall submit to the MTA for review and acceptance a complete schedule of his proposed sequence of construction operations prior to commencing any work. This schedule shall include the Contractor's plans for doing the work.

C. The Contractor must submit to the Engineer a written request to deviate from the above sequences, provided he can demonstrate to the Engineer that the continuity and water supply will not be adversely affected.

END OF SECTION

SECTION 01150

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 DESCRIPTION

A. For lump sum items, payment shall be made to the Contractor in accordance with an accepted Progress Schedule and Schedule of Values on the basis of actual work completed.

B. For unit-price items, payment shall be based on the actual amount of work accepted and for the actual amount of materials in place, as shown by the final measurements.

1. All units of measurement shall be standard United States convention as applied to the specific items of work by tradition and as interpreted by the Engineer.
2. At the end of each day's work, the Contractor's Superintendent or other authorized representative of the Contractor shall meet with the Utilities' Project Representative and determine the quantities of unit price work accomplished and/or completed during the work day.
3. The Utilities' Project Representative will then prepare two "Daily Progress Reports" which shall be signed by both the Utilities' Project Representative and Contractor's Representative.
4. Once each month the Utilities' Project Representative will prepare two "Monthly Progress Summation" forms from the month's accumulation of "Daily Progress Reports" which shall also be signed by both the Utilities' Project Representative and Contractor's Representative.
5. These completed forms will provide the basis of the Engineer's monthly quantity estimate upon which payment will be made. Items not appearing on both the Daily Progress Reports and Monthly Progress Summation will not be included for payment. Items appearing on forms not properly signed by the Contractor will not be included for payment.
6. After the work is completed and before final payment is made there for, the Engineer will make final measurements to determine the quantities of various items of work accepted as the basis for final settlement.
7. As administrator to the construction contract, MTA's on-site Resident shall be responsible for authorizing all payments relating to the Utility Work, issuing all directives to the Project's Contractor and making the final determination in the event of any disagreements. The Project Representative shall provide Daily Progress Reports of completed and accepted utility work, as well as Monthly Progress Summation Reports. The reports will be used by MTA to authorize payment to the project Contractor.

1.2 SCOPE OF PAYMENT

A. Payments to the Contractor will be made for the actual quantities of the Contract items performed and accepted in accordance with the Contract Documents. Upon completion of the construction, if these actual quantities show either an increase or

decrease from the quantities given in the Bid Form, the Contract unit prices will still prevail as per MTA Standard Specifications.

B. The Contractor shall accept compensation, as herein provided, in full payment for furnishing all materials, labor, tools, equipment, and incidentals necessary to the completed work and for performing all work contemplated and embraced by the Contract; also for all expenses incurred in consequence of the suspension of the work as herein authorized.

C. The payment of any partial estimate or of any retained percentage except by and under the approved final invoice, in no way shall affect the obligation of the Contractor to repair or renew any defective parts of the construction or to be responsible for all damage due to such defects.

1.3 INCIDENTAL WORK

A. Incidental work items for which separate payment is not made include (but are not limited to) the following items:

1. Pre-Construction photographs or videos.
2. Project Record Documents
3. Traffic control plan and traffic regulation.
4. Signs
5. Clean-up and restoration of property.
6. Cooperation and coordination with other Contractors and utility companies including related inspection costs and other costs
7. Utility crossings and relocations, unless otherwise paid for.
8. Temporary utility services to buildings, as required to maintain service during construction.
9. Minor Items such as relocation of signposts, guard rails, rock wall, mailboxes, curbs, traffic loop detectors, pavement markings, fences, etc., damaged as a result of construction activities.
10. Trench boxes, steel and/or wood sheeting as required, including that left in place.
11. Temporary Construction Dewatering as necessary.
12. Dust control.
13. Erosion control.
14. Quality assurance testing.
15. Clearing, grubbing, and stripping.
16. Loam, seeding, grading, liming, fertilization, mulching, and watering.
17. Routine flagging services.
18. Construction schedules, bonds, insurance, shop drawings, warranties, guarantees, certifications and other submittals required by the Contract Documents.
19. Repair and replacement of water lines under 2-inches in size, culverts, underdrains, rock lined drainage trenches in streets and other utilities damaged by construction activities and corresponding proper disposal of removed materials unless otherwise paid for.
20. Temporary construction necessary for construction sequencing and other facilities not permanently incorporated into the work.
21. Weather protection.
22. Permits not otherwise paid for or provided by the Owner.

23. Visits to the project site or elsewhere by personnel or agents of the Contractor, including manufacturer's representatives, as may be required.
24. All excavation except the test pits specifically shown or ordered by the Resident to establish sewer line and water line locations
25. Contract administration and insurance
26. Pipe markings
27. Replacement of unsuitable material, if required, above pipe bedding and backfill
28. Test Pits for the Contractor's Benefit
29. Disinfection cleaning and testing of installed water mains and blow offs where show on plans
30. Locating and verifying the locations of water and sewer services within the limits of work. Capping or plugging existing underground utilities as shown on the plans
31. Pipe abandonment
32. Ledge removal
33. Temporary filling connection
34. Temporary flushing connection
35. Concrete thrust restraint

1.4 DESCRIPTION OF PAY ITEMS

A. The following sections describe the measurement of and payment for the work to be done under the respective items listed in the Bid Form.
B. Each unit or lump sum price stated in the Bid Form shall constitute full compensation, as herein specified, for each item of the work completed.

Item No. 803.01 – Test Pit Excavation and Backfill

A. Method of Measurement: The quantity to be paid for under Item No. 803.01 shall be the actual number of exploratory excavations as authorized by the Engineer.
B. Basis of Payment; Test pit excavations shall be paid for at the unit price per each as stated in the Bid Schedule. Said unit price shall be full compensation for furnishing all labor, tools, and equipment; for backfilling and compacting; for temporary pavement; and for all other work and expenses incidental thereto.

Item No. 823.3251– 8-inch Gate Valve and Valve Box

A. Method of Measurement: The quantity of gate valves to be paid for under Item No. 823.3251 shall be defined as the actual number of valves and valve boxes installed complete in place.
B. Basis of Payment: Installation of gate valves shall be paid for at the unit price per each stated in the Bid Schedule. Said unit price shall be full compensation for installing all materials, polyethylene encasement, labor, equipment, and tools; for excavating, dewatering, installing, setting, and jointing; for restraining joints; for testing, furnishing and installing valves and valves boxes; and for all other work and expenses incidental thereto.

Item No. 825.3221 – 2-inch Corporation Stops

A. Method of Measurement: The quantity of corporation stops to be paid for under Item No. 825.3221 shall be the actual number furnished and installed for service connections.
B. Basis of Payment: Corporation stops shall be paid for at the unit price per each stated in the Bid Schedule. Said unit price shall be full compensation for all fittings, labor, equipment, and tools necessary for the installation of the corporation stops; tapping the main; and for all the work and expenses incidental thereto.

Item No. 825.332 – 2-inch Curb Stops

A. Method of Measurement: The quantity of curb stops to be paid for under Item No. 825.332 shall be defined as the actual number of curb stops furnished and installed complete in place.
B. Basis of Payment: Curb stops and boxes shall be paid for at the unit price per each stated in the Bid Schedule. Said unit price shall be full compensation for all fittings, saddles, labor, equipment, tools and other materials required for the installation of the curb stop and box; for trench dewatering; for excavating and backfilling; for replacing or rebuilding shrubs, fences, lawns, trees, and other materials except other such items specifically included in the Bid Schedule; and for all other work and expenses incidental thereto.

Item No. 825.422 – 2-inch Polyethylene Service Pipe

A. Method of Measurement: The quantity of polyethylene service pipe to be paid for under Item No. 825.422 shall be the actual length in feet as measured along the center line of the pipe as laid including all fittings.
B. Basis of Payment: Installation of polyethylene service pipe shall be paid for at the unit price per linear foot stated in the Bid Schedule. Said unit price shall be full compensations for installing all pipes, fittings of all sizes (except valves), caps, solid sleeves/couplings, mechanical joint restrainer glands; labor, equipment, tools, and other materials required for the installation of the pipelines; for clearing and grubbing, cutting trees; for dewatering; for installing the pipelines; for excavating, removing, and disposal of the existing water mains where required; laying, setting, and jointing all pipes and fittings; for furnishing and placing all temporary sheeting and bracing; for rigid board insulation (use of at the owner's direction only); furnishing and installing all pipe bedding, blanket, and backfill; for compaction of trenches; for cleaning, testing, and disinfecting water mains; connections to existing water mains and abandoning existing water mains; for all labor, tools, and construction equipment; and for all other work and expenses incidental thereto.

Item No. 825.61– 10-inch HDPE Water Pipe

A. Method of Measurement: The quantity of High Density Polyethylene (HDPE) water main to be paid for under Item No. 825.61 shall be the actual length in feet as measured along the center line of the pipe as laid including all fittings.

B. Basis of Payment: Installation of HDPE water main shall be paid for at the unit price per linear foot stated in the Bid Schedule. Said unit price shall be full compensations for installing all pipes, fittings of all sizes (except valves), caps, solid sleeves/couplings, mechanical joint restrainer glands; concrete anchor restraint, labor, equipment, tools, and other materials required for the installation of the pipelines; for clearing and grubbing, cutting trees; for dewatering; for installing the pipelines; for excavating, removing, and disposal of the existing water mains where required; laying, setting, and jointing all pipes and fittings; for furnishing and placing all temporary sheeting and bracing; for rigid board insulation (use of at the owner's direction only); furnishing and installing all pipe bedding, blanket, and backfill; for compaction of trenches; for cleaning, testing, and disinfecting water mains; connections to existing water mains and abandoning existing water mains; for all labor, tools, and construction equipment; and for all other work and expenses incidental thereto.

Item No 827.33 – Trench Insulation

A. Method of Measurement: The quantity to be paid for under Item No. 827.33 shall be the actual number of linear feet.

B. Basis of Payment: Rigid insulation shall be paid for at the unit price as stated in the Bid Schedule. Said unit price shall be full compensation for furnishing all labor, tools, equipment, and other materials necessary to provide and install 2-inch rigid foam insulation including, excavation, dewatering, installation, bedding, backfill, compaction as directed by the Engineer and all other work and expenses incidental thereto, except that work included for payment under other items.

END OF SECTION

SECTION 01340

SUBMITTALS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included:

1. Submit to the Resident, Shop Drawings, Operation and Maintenance Manuals, Manufacturers' Certificates, Project Data, and Samples required by the Specification Sections.

B. Related Work Specified Elsewhere:

1. Project Record Documents: Section 01720

1.2 SHOP DRAWINGS

A. Shop Drawings are required for each and every element of the work. Each shop drawing shall be assigned a sequential number for purposes of easy identification, and shall retain its assigned number, with appropriate subscript, on required resubmissions.

B. Shop Drawings are generally defined as all fabrication and erection drawings, diagrams, brochures, schedules, bills of material, manufacturers data, spare parts lists, and other data prepared by the Contractor, his subcontractors, suppliers, or manufacturers which illustrate the manufacturer, fabrication, construction, and installation of the work, or a portion thereof.

C. The Contractor shall submit to the Engineer one electronic copy of Shop Drawings and approved data. The Engineer will distribute digital copies (for Owner's, Engineer's and Field Representative's files) and the Contractor. It's the contractor's responsibility to distribution to subcontractors, suppliers and manufacturers. If the Contractor requires hardcopies, that shall be coordinated with the Engineer accordingly. All shop drawing comments will be summarized on the Submittal Review Form.

D. The Contractor shall provide a copy of the completed Submittal Certification Form (copy provided for Contractor's use at the end of this Specification Section) which shall be attached to every copy of each shop drawing. Shop Drawings shall show the principal dimensions, weight, structural and operating features, space required, clearances, type and/or brand of finish or shop coat, grease fittings, etc., depending on the subject of the drawing. When it is customary to do so, when the dimensions are of particular importance, or when so specified, the drawings shall be certified by the manufacturer or fabricator as correct for the work.

1. Each shop drawing submittal shall include a complete copy of the relevant specification section markup up to reflect "compliance" or "deviation" on an item-by-item basis.

E. Shop Drawings shall be submitted as a complete package by specification section, unless otherwise reviewed and approved by the Engineer. It is the intent that all information, materials and samples associated with each specification section be included as a single submittal for the Engineer's review. Any deviation from this

requirement, such as submitting miscellaneous metals grouped by structure, shall be requested in writing with an anticipated shop drawing breakdown/schedule prior to any associated submittal.

F. The Contractor shall be responsible for the prompt and timely submittal of all shop and working drawings so that there shall be no delay to the work due to the absence of such drawings.

G. No material or equipment shall be purchased or fabricated especially for the Contract until the required shop and working drawings have been submitted as hereinabove provided and reviewed for conformance to the Contract requirements. All such materials and equipment and the work involved in their installation or incorporation into the Work shall then be as shown in and represented by said drawings.

H. Until the necessary review has been made, the Contractor shall not proceed with any portion of the work (such as the construction of foundations), the design or details of which are dependent upon the design or details of work, materials, equipment or other features for which review is required.

I. All shop and working drawings shall be submitted to the Engineer by and/or through the Contractor, who shall be responsible for obtaining shop and working drawings from his subcontractors and returning reviewed drawings to them. Shop drawings shall be of standardized sizes to enable the Owner to maintain a permanent record of the submissions. Approved standard sizes shall be: (a) 24 inches by 36 inches; (b) 11 inches by 17 inches, and (c) 11 inches by 8-1/2 inches. Provision shall be made in preparing the shop drawings to provide a binding margin on the left-hand side of the sheet. Shop drawings submitted other than as specified herein may be returned for resubmittal without being reviewed.

J. Only drawings which have been checked and corrected by the fabricator should be submitted to the Contractor by his subcontractors and vendors. Prior to submitting drawings to the Engineer, the Contractor shall check thoroughly all such drawings to satisfy himself that the subject matter thereof conforms to the Drawings and Specifications in all respects. All drawings which are correct shall be marked with the date, checker's name, and indication of the Contractor's approval, and then shall be submitted to the Engineer.

K. If a shop drawing shows any deviation from the Contract requirements, the Contractor shall make specific mention of the deviations in his letter of transmittal. Shop Drawings that contain significant deviations that are not brought to the attention of the Engineer may be subject to rejection.

L. Should the Contractor submit equipment that requires modifications to the structures, piping, electrical conduit, wires and appurtenances, layout, etc., detailed on the Drawings, he shall also submit details of the proposed modifications. If such equipment and modifications are accepted, the Contractor, at no additional cost to the Owner, shall do all work necessary to make such modifications.

M. A maximum of two submissions of each Shop Drawing will be reviewed, checked, and commented upon without charge to the Contractor. Any additional submissions which are ordered by the Engineer to fulfill the stipulations of the Drawings and Specifications, and which are required by virtue of the Contractor's neglect or failure to comply with the requirements of the Drawings and Specifications, or to make those modifications and/or corrections ordered by the Engineer in the review of the first two submissions of each Shop Drawing, will be reviewed and checked as deemed necessary by the Engineer and the cost of such review and checking, as determined

by the Owner, and based upon Engineer documentation of time and rates established for additional services for this Project, may be deducted from the Contractor to make all modifications and/or corrections as may be required by the Engineer in an accurate, complete, and timely fashion. Resubmittals for the sole purpose of providing written responses to review comments will not be considered a resubmittal counting towards the two-submission limit.

Shop Drawings that include drawings or other material that is illegible or too small may be returned without review.

1.3 SAMPLES

A. The Contractor shall submit samples when requested by the Engineer to establish conformance with the specifications, and as necessary to define color selections available.

1.4 MANUFACTURER'S CERTIFICATES

A. Prior to accepting the installation, the Contractor shall submit manufacturer's certificates for each item specified.

B. Such manufacturer's certificates shall state that the equipment has been installed under either the continuous or periodic supervision of the manufacturer's authorized representative, that it has been adjusted and initially operated in the presence of the manufacturer's authorized representative, and that it is operating in accordance with the specified requirements, to the manufacturer's satisfaction. All costs for meeting this requirement shall be included in the Contractor's bid price.

1.5 SUBMISSION REQUIREMENTS

A. Accompany submittals with transmittal letter, containing:
   1. Sequential Transmittal Number.
   2. Date.
   3. Project title and number.
   4. Contractor's name and address.
   5. The sequential shop drawing number (called the Engineer’s Shop Drawing number) of each shop drawing, project data and sample submitted shall be:
      i. Engineer’s shop drawing number shall start at 001 for the first shop drawing in the first transmittal and continue sequentially until the last shop drawing is submitted.
      ii. Resubmissions shall be denoted with a letter following the number. For example the first resubmission of Shop Drawing 001 shall be numbered 001A, a second resubmission of shop 001 shall be numbered 001B, and that sequence shall continue for any subsequent resubmissions.
      iii. O&M submittals shall be numbered with separate and unique Engineer’s shop drawing numbers.
   6. The Contractor’s Shop Drawing number (if a different numbering system to the Engineer’s number is used by the Contractor).
   7. Notification of deviations from Contract Documents.
   8. Other pertinent data.

B. A completed Submittal Certification Form shall be attached to each copy of each shop drawing and must include:
   1. Identification of deviations from Contract Documents.

2. Contractor's stamp, initialed or signed, certifying review of the submittal, verification of field measurements and compliance with Contract Documents.
3. Where specified or when requested by the Engineer, manufacturer's certification that equipment, accessories and shop painting meet or exceed the Specification requirements.
4. Where specified, manufacturer's guarantee.

C. Requirements for Electronic Submittals:
1. Each individual shop drawing or O&M submittal shall be contained in one PDF.
2. The first page of the PDF shall be the Submittal Certification Form, which clearly identifies the submittal, specification section and shop drawing number. File names shall also identify the submittal contained in the PDF. Example file name: 02444-(Shop Drawing No.).pdf
3. The electronic copy in PDF form shall be **exactly** as submitted in the hard copy. Electronic copies in PDF form shall be submitted on a CD or DVD and shall accompany the hard copies.
4. The electronic PDF shall include an electronic table of contents that is bookmarked for each section of the submittal.

The electronic PDF shall be configured such that is fully searchable.

6. PDF versions of 24x36 drawings shall be converted to 24 x 36 PDFs so as not to lose the clarity of the original drawing.
7. Electronic submittals that are not submitted in accordance with the requirements stated above will not be reviewed by the Engineer.

1.6 RESUBMISSION REQUIREMENTS

A. Revise initial drawings as required and resubmit as specified for initial submittal.
B. Indicate on drawings any changes which have been made other than those required by Engineer. All renumbering of shop drawings, relabeling of individual pieces or assemblies or relocating of pieces or assemblies to other Drawings within the submittal shall be clearly brought to the attention of the Engineer
C. All resubmittals shall include a summary of the previous submittal review comments with the vendors' written response as to how the previous comments were addressed.

1.7 ENGINEER'S REVIEW

A. The review of shop and working drawings hereunder will be general only, and nothing contained in this specification shall relieve, diminish or alter in any respect the responsibilities of the Contractor under the Contract Documents and in particular, the specific responsibility of the Contractor for details of design and dimensions necessary for proper fitting and construction of the work as required by the Contract and for achieving the result and performance specified thereunder.
B. The Engineer's review comments will be summarized on a Submittal Review Form, which includes an action code. A description of each action code is provided below.
    1. **No Exceptions Taken (Status 0 on shop drawing log)**. The shop drawing complies with the Contract Document requirements. No changes or further information are required. Where appropriate, the submittal review form will be used to alert the Contractor, Owner and Field personnel of remaining items within that specification section that still needs to be submitted.
    2. **Make Corrections Indicated (Status 1 on shop drawing log)**. The shop

drawing complies with the Contract Document requirements except for minor changes, as indicated. Resubmittal is not required unless it is specifically called for; however, Engineer requires that all comments will be addressed by the Contractor, unless otherwise notified in writing prior to execution of the relevant work.

3. **Conditional to Remarks (Status 2 on shop drawing log)**. The shop drawing potentially complies with the Contract Document requirements, contingent upon satisfactory resolution of review comments. Remarks will explicitly list what information needs to be resubmitted. Resubmittal from the Contractor should include a cover letter or summary which indicates how each review comment has been addressed. This action code will not be used, or will be sparingly used, for electronic submittals.
4. **Revise and Resubmit (Status 3 on shop drawing log)**. The shop drawing does not comply with the Contract Document requirement as submitted, but may with changes indicated and/or submission of additional information. The entire package must be resubmitted with the necessary information and a cover letter which indicates how each review comment has been addressed and where to find the information in the resubmittal.
5. **Rejected (Status 4 on shop drawing log)**. The shop drawing does not comply with the Contract Document requirements, for the reasons indicated in the remarks, and is unacceptable.
6. **For Information Only (Status 5 on shop drawing log)**. The shop drawing review was informational only.
7. **In Review (Status 6 on shop drawing log)**. The shop drawing is currently under review.

SUBMITTAL CERTIFICATION FORM

PROJECT: _____ CONTRACTOR'S PROJ. NO: _____

CONTRACTOR: _____ ENGINEER'S PROJ. NO: _____

ENGINEER: _____

TRANSMITTAL NUMBER: _____ SHOP DRAWING NUMBER:_____

SPECIFICATION SECTION OR DRAWING NO: _____

DESCRIPTION: _____

MANUFACTURER:_____

The above referenced submittal has been reviewed by the undersigned and I/we certify that the material and/or equipment meets or exceeds the project specification requirements with

☐ NO DEVIATIONS

or

☐ A COMPLETE LIST OF DEVIATIONS AS FOLLOWS[a]:

_____
_____
_____
_____

By:_____ By:_____

Contractor[b]

Manufacturer[c]

Date: _____Date: _____

[a] Any deviations not brought to the attention of the Engineer for review and concurrence shall be the responsibility of the Contractor to correct, if so directed.

[b] Required on all submittals

[c] When required by specifications Page ___ of ___

General Contractor's Stamp

END OF SECTION

SECTION 01720

PROJECT RECORD DOCUMENTS

PART l - GENERAL

1.1 DESCRIPTION

A. Work Included:
   1. Keep accurate record documents for all additions, demolition, changes of material or equipment (from that shown on the Drawings), variations in work, and any other additions or revisions to the Contract (via Change Order, Work Change Directive, Field Order or Clarification).

B. Related Work Specified Elsewhere:
   1. Shop Drawings, Project Data, and Samples are specified in "General Conditions" and Section 01340, Submittals.

1.2 MAINTENANCE OF DOCUMENTS

A. Maintain at job site, one copy of:
   1. Contract Drawings
   2. Specifications
   3. Addenda
   4. Reviewed Shop Drawings
   5. Change Orders
   6. Any other modifications to the Contract
   7. Field Test Reports

B. Store documents in files and racks specifically identified for this use, that are apart from documents used for construction.

C. File documents in a logical manner indexed for easy reference.

D. Maintain documents in clean, dry, legible condition.

E. Do not use record documents for construction purposes.

F. Make documents available at all times for inspection by the Engineer and Owner, and by the end of the project, transmit these documents to the Engineer.

1.3 RECORDING

A. Label each document "PROJECT RECORD" in large high printed letters.

B. Keep record documents current and do not permanently conceal any work until required information has been recorded.

C. General Field Recording Issues:
   1. All ties should be taken from existing, permanent features such as utility poles, corners of buildings and hydrants. Porches, sheds or other house additions should be avoided for they could be torn down. A minimum of two swing ties shall be taken. Survey grade GPS coordinates are also acceptable.
   2. Stations should be recorded to the nearest foot.
   3. Inverts should be recorded to the nearest hundredth of a foot.
   4. Elevations should be recorded to the nearest hundredth of a foot.
   5. Building dimensions should be recorded to the nearest 1/4".

D. Project Record Drawings – Legibly mark Contract Drawings to record existing

utilities and actual construction of all work, including but not limited to the following (where applicable):

1. Existing Utilities
    a. Water mains and services, water main gate valves, sewer mains and services, storm drains, culverts, steam lines, gas lines, tanks and other existing utilities encountered during construction must be accurately located and shown on the Drawings. In congested areas supplemental drawings or enlargements may be required.
    b. Show any existing utilities encountered in plan and profile and properly labeled showing size, material and type of utility. Ties should be shown on plan. Utility should be drawn to scale in section (horizontally and vertically) and an elevation should be called out to the nearest hundredth of a foot.
    c. When existing utility lines are broken and repaired, ties should be taken to these locations.
    d. If existing water lines are replaced or relocated, document the area involved and pipe materials, size, etc. in a note, and with ties.
2. Water Mains and Force Mains
    a. Show ties to the location of all valves, bends (horizontal and vertical), tees and other fittings. The use of thrust blocks should be recorded.
    b. Revise elevations indicated on the Drawings to reflect actual construction.
3. House Services
    a. Draw all house services (even to empty lots) on plan and show ties.
4. Ledge
    a. Ledge profiles should be shown. Note whether the plotted ledge profile reflects undisturbed or expanded conditions.
5. Roads
    a. Show centerline road profile and level spot elevations.
    b. Show pavement widths.
    c. On road cross sections, show the pavement cross slope.
    d. Show any deviations from the design plans.
6. Utilities
    a. When encountered, additional utilities (e.g., gas, cable, telephone, fiber optic, etc.) shall be indicated on the Record Drawings.
7. Specifications and Addenda - Legibly mark up each section to record:
    a. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
    b. Changes made by Change Order, Field Order, or other method.

1.4 SUBMITTALS

A. At the completion of the project, deliver record documents to the Engineer.
B. Accompany submittal with transmittal letter, in duplicate, containing:
    1. Date, project title and number.
    2. Contractor's name and address.
    3. Title and number of each record document with certification that each document is completed and accurate.
    4. Signature of Contractor, or his authorized representative.
C. Failure to supply all information on the Project Record Drawings as specified in Part 1.3 may result in additional retainage from monthly partial payment requests, and in

non-approval of final payments of the Contract and/or if contract time (as specified in accordance with the Standard General Conditions of the Construction Contract) has elapsed, this shall be grounds for the enactment of the liquidated damages as specified.

END OF SECTION

Section 02616

DUCTILE IRON MAIN ANTI-CORROSION POLYETHYLENE ENCASEMENT (POLYWRAP)

PART 1 - GENERAL

1.1 BUY AMERICA

A. All iron and steel shall meet Buy America requirements and American Iron and Steel (AIS) requirements.

1.2 DESCRIPTION

A. Work Included: Furnish all materials and install polyethylene encasement (polywrap) of ductile iron water and sewer main for all ductile iron main, valves and fittings and as specified herein.

B. Related Work Specified Elsewhere: Ductile Iron pipe and fittings, trench excavation, valves.

1.3 QUALITY ASSURANCE

A. A competent laboratory must be maintained by the manufacturer of the polywrap at the point of manufacture to insure quality control.

B. During all periods of shipment and storage, the fabric shall be wrapped in a heavy duty protective covering to protect the fabric from direct sunlight, ultraviolet rays, and temperatures greater than 140ºF, mud, dirt, dust and debris.

1.4 SUBMITTALS

A. Manufacturer shall furnish certified test reports with each shipment of material attesting that the polywrap meets the requirements of this Specification.

B. Contractor shall submit product information they intend to use and the installation method they intend to employ.

PART 2 - PRODUCTS

2.1 BUY AMERICA

A. All iron and steel shall meet Buy America requirements and American Iron and Steel (AIS) requirements.

2.2 MATERIALS

A. **Linear low density polyethylene (LLDPE)** Polyethylene encasement protection wrap for ductile iron pipe. 8 mil thickness. Tubes or sheets

TABLE 1

Geotextile Mechanical Property	Test Method	Minimum Permissible Value
Tensile Strength (both directions)	ASTM D882	3600 psi
Elongation	ASTM D882	800 percent

Geotextile Mechanical Property	Test Method	Minimum Permissible Value
Dielectric Strength	ASTM D149	800 V/mil
Impact Resistance	ASTM D1709-B	600 g
Propagation Tear Resistance Strength	ASTM D1922	2550 gf

B. Polywrap shall meet all requirements of ANSI/AWWA C105/A21.5
C. Polywrap shall consist of 3 layers of co-extruded linear low density polyethylene fused into a single layer, minimum 8 Mil thickness.
D. Inside surface of Polywrap shall be infused with an antimicrobial compound to mitigate microbiologically induced corrosion (MIC) and a volatile corrosion inhibitor to control galvanic corrosion.
E. The polywrap shall meet or exceed the minimum values stated above as determined by the most recent test methods specified above. The product must be marked with the specification conformance, applicable pipe sizes and the words "corrosion protection".

PART 3 - EXECUTION

3.1 DUCTILE IRON PIPE AND FITTINGS

A. Installation of the polywrap shall be done in accordance with one of the three recommended methods as outlined in ANSI/AWWA C105/A21.5. Methods A and B use polyethylene tubes, and method C uses polyethylene sheets.
B. Method A uses one length of polyethylene tube, overlapped at the joints, for each length of pipe. A minimum of 2' overlap shall be used. The polyethylene wrap shall be cut approximately 2 feet longer than that of the pipe section. After assembling the pipe joint, the polyethylene shall be overlapped approximately one (1) ft. and at all joints sealed with approved adhesive tape. Additional taping shall be used at 3 foot (3') intervals along the pipe. Any rips, punctures or other damage to the polyethylene shall be repaired immediately with adhesive tape. All copper service connections shall be wrapped for a distance of 3 feet from the centerline of the main. Before installing the polyethylene wrap, the exterior of the pipe shall be free of foreign material.
C. Method B uses a length of polyethylene tube for the barrel of the pipe and a separate length of polyethylene tube or sheet for the joints. The national standard does not recommend Method B for bolted-type joints unless an additional layer of polyethylene is provided over the joint area as in Methods A and C. If this method is chosen an additional layer of polyethylene will be provided over the joint area.
D. In Method C, each section of pipe is completely wrapped with a flat polyethylene sheet.

3.2 JOINTS, VALVES, APPURTENANCES AND TAPS

A. All ductile iron pipe, fitting and valves will be wrapped in accordance with

C105/A21.5.

B. Pipe-shaped appurtenances: bends, reducers, offsets, and other pipe-shaped appurtenances in shall be covered in the same manner as the pipe.

C. Odd-shaped appurtenances: Wrap odd-shaped appurtenances such as valves, tees, and crosses with a flat sheet or split length of polyethylene tube by passing the sheet under and then over the appurtenance and bringing it together around the body of the appurtenance. Make seams by bringing the edges of the polyethylene together, folding over twice, and taping them down.

D. Joints: Overlap joints as in normal installation; then tape the polyethylene securely in place at valve stems and other penetrations. When bolted-type joints are used, care should always be taken to prevent bolts or other sharp edges of the joint configuration from penetrating the wrap.

E. Branches, blow offs, air valves: To provide openings for branches, blow-offs, air valves, and similar appurtenances, make an X-shaped cut in the polyethylene and temporarily fold back the film. After installing the appurtenance, tape the slack securely to the appurtenance and repair the cut and any other damaged areas in the polyethylene with tape.

F. Service taps: Wrap a minimum of two layers of polyethylene adhesive tape completely around the pipe to cover the area where the tapping machine and chain will be mounted. Then install the corporation stop directly through the tape and polyethylene. After the tap is made, inspect the entire circumferential area for damage and make any necessary repairs.

G. Hydrants: Do not wrap hydrants that do not have drain port plugs installed. Tape the polyethylene securely in place on the hydrant branch after the valve, before reaching the hydrant.

3.3 GENERAL

A. Quality of installation is more important than the actual sequence followed.

B. Polyethylene shall not be stored in the sun.

C. When lifting polyethylene-encased pipe with a crane, use a synthetic sewn “sling” or padded wire rope sling to protect the polyethylene.

D. Remove all lumps of clay, mud, cinders, etc., on the pipe surface before encasing the pipe.

E. Prevent soil or bedding material from becoming trapped between the pipe and the polyethylene.

F. When installing polyethylene encasement below the water table or in areas subject to tidal action, seal as thoroughly as possible both ends of each polyethylene tube with polyethylene adhesive tape or plastic tie straps at the joint overlap. Additionally, place circumferential wraps of tape or plastic tie straps at two-foot intervals along the barrel of the pipe to help minimize the space between the polyethylene and the pipe.

END OF SECTION

SECTION 02617

PIPE BOARD INSULATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: Provide and apply insulation to buried water line piping as shown in the contract Drawings and specified herein.

1.2 RELATED SECTIONS

A. Division 1
B. Division 2

1.3 REFERENCES

A. ASTM C272 - Test Method for Water Absorption of Core Materials for Structural Sandwich Construction.
B. ASTM C518 - Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter.
C. ASTM D1621 - Test Method for Compressive Properties of Rigid Cellular Plastics.

1.4 SUBMITTALS

A. Submit product data under provision of Division 1.
B. Submit manufacturer's installation instructions.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to project site in manufacturer's original unopened packaging.
B. Identify contents, manufacture, brand name, thermal values, and applicable standards.
C. Store materials in area protected from weather, and moisture.
D. Remove damaged materials from site.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Rigid Pipe Insulation
    1. Dow Chemical Company – Styrofoam Highload 40
    2. Certifoam 40
    3. Or equivalent

2.2 RIGID PIPE INSULATION

A. Insulation: Closed cell polystyrene foam board
    1. Standard Two Foot Width.
    2. Aged "R" Value - "R" = 5.0 per inch, ASTM C518.
    3. Water Absorption - 0.1 percent, ASTM C272.
    4. Water Vapor Permeance - 1.0 perm (max) ASTM E96
    5. Compressive Strength - 40 pounds per square inch, ASTM D1621.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Lay rigid pipe insulation where depth of mainline cover is less than 5 feet, where vertical separation to culvert or storm drain is less than 24 inches, or where indicated on plans, directly on sand, tightly butting each sheet of insulation against adjacent sheet.

B. Lay rigid pipe insulation where depth of service line is less than 4 feet 6 inches in unplowed areas and 5 feet in plowed areas, or where vertical separation to culvert or storm drain is less than 24 inches, directly on sand, tightly butting each sheet of insulation against adjacent sheet.

END OF SECTION

SECTION 02627

COPPER TUBE SIZE POLYETHYLENE SERVICE PIPE & FITTINGS (BURIED APPLICATIONS)

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: Furnish and install copper tube size polyethylene tubing pipe of the type and size and in the locations shown on the Drawings and as specified herein.

B. Related Work Specified Elsewhere:

1. Pipe and Pipe Fittings - General is specified in this Division.
2. Excavation, Bedding and Backfill are specified in this Division.

1.2 QUALITY ASSURANCE

A. AWWA C901 (latest revision)

B. ASTM D3350 and D2737 (latest revision)

C. Service Brass: AWWA C-800 (latest revision)

D. NSF-certified

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pipe use:

1. Domestic Water (buried exterior).
    a. Pipe with a working pressure of 200 psi.

B. Fittings:

1. Buried Fittings: Waterworks brass, polyethylene pipe compression fittings with beveled BUNA-N gaskets for a water tight seal.
2. Acceptable manufacturer:
    a. Mueller Company
    b. Ford
    c. or equal
3. Insert stiffeners required.
4. All brass fittings shall be “lead free”.

C. Tracer Wire:

1. Tracer wire shall be provided for all pipe. Tracer wire shall be connected to main-line tracer wire and curb stop per the manufacturers recommendations.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Jointing

1. Packed on compression joints
    a. Cut pipe squarely.
    b. Ream or file pipe to remove burrs.
    c. Insert stainless steel stiffener.
    d. Seat pipe in fittings and tighten nut.

e. Tighten restraint screw.

2. “Quick” compression joints
   a. Cut pipe squarely.
   b. Ream or file pipe to remove burrs.
   c. Insert stainless steel stiffener.
   d. Seat pipe in fittings and tighten nut.
3. Adapters: Use as required to connect to existing services.
4. Bending Pipe
   a. Bend pipe by the method and to the radius to comply with the manufacturer's recommendations.
   b. Bend pipe with suitable tools to provide smooth bend free of any cracks or buckles.
   c. Provide "goose neck" in new services as shown on Drawings.

END OF SECTION

SECTION 02628

HIGH DENSITY POLYETHYLENE PIPE AND FITTINGS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: Furnish, install and test all polyethylene pipe, pipe fittings and appurtenances of the type(s) and size(s) and in the location(s) as shown on the Drawings and as herein specified.

B. Related Work Specified Elsewhere:
   1. Applicable sections of Division 2

1.2 QUALITY ASSURANCE

A. Pressure rating or pressure class of pipe as shown on the Drawings or specified herein.

B. Standards:
   1. ANSI/AWWA C901-02: Standard for Polyethylene (PE) Pressure Pipe and Tubing, ½" (13 mm) through 3" (76 mm) for Water Service.
   2. AWWA C 906-99: Standard for Polyethylene (PE) Pressure Pipe and Fittings, 4" (100 mm) through 63" (1,575 mm) for Water Distribution and Transmission.
   3. ASTM D 2657-07: Standard Practice for Heat Joining Polyolefin Pipe and Fittings.
   4. ASTM D 2683-14: Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing.
   5. ASTM D 2837-13e1: Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products.
   6. ASTM D 3261-15: Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
   7. ASTM D 3350-14: Standard Specification for Polyethylene Plastic Pipe and Fittings Materials.
   8. ASTM F 1055-16: Standard Specification for Electrofusion type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and tubing.
   9. NSF/ANSI-61-2003e: Standard for Drinking Water Systems Components - Health Effects, NSF International, Ann Arbor, MI.
   10. CSA B 137.1-2002: Polyethylene Pipe, Tubing, and Fittings for Cold-Water Pressure Services.
   11. ASTM F2164, Standard Practice for Field Leak Testing of Polyethylene (PE) Piping Systems Using Hydrostatic Pressure.
   12. Manufacturers of high density polyethylene pipe, fittings, adapters, and couplings must be certified under ISO 9000, Quality Management Systems - Fundamentals and Vocabulary, International Organization for Standardization (ISO), Geneva, Switzerland.
   13. 49 CFR 192 subpart F, 192.281, selected requirements for plastic joints; 192.282, requirements for qualifying joining procedures; 192.285, specifies qualifying persons to make joints; and 192.287, specifies inspection of joints.
   14. Fusion Operators: Operators shall meet the minimum qualification requirements outlined in 49 CFR 192 subpart F, 192.285 and shall have

documented experience with successful butt fusion of pipe larger than 24 inch diameter.

15. Joint Fusion Data: Fusion plate temperature (oF), interfacial fusion pressure (psi), interfacial contact fusion time (sec.), and cooling time (min.) shall be recorded by data logger for computer download or recorded by the operator(s) in a field book for each joint fusion completed.
16. Pipe deemed damaged or unacceptable to the Engineer shall be replaced at no additional cost to the Owner. Pipe shall be adequately protected during storage to prevent external damage to the pipe side wall or ends. Pipe with gouged side walls will be rejected by the Engineer.
17. Exterior pipe markings shall include the nominal pipe diameter, SDR, and rated working pressure.

C. Acceptable Pipe and Fitting Supplier/Manufacturers:
1. PolyPipe, Inc. "PW Pipe"
2. KWH Pipe, "Sclairpipe"
3. Performance Pipe
4. "Isco-Pipe"
5. "Poly-Cam"
6. "Friatec"
7. Vari-Tech "Performance Pipe"
8. Independent Pipe Products, Inc.
9. Or approved equal.

1.3 SUBMITTALS

A. Submit shop drawings in accordance with the applicable section of Division 1 and the General Conditions of the Construction Contract.
B. Submit manufacturer's "Certification of Conformance" that pipe and fittings and other piping appurtenances meet or exceed the requirements of these Specifications.
C. Submit experience statement for operator(s) to complete the pipe fusion to demonstrate the minimum experience and qualification requirements described in paragraph 1.2.B.14.
D. Following pipe construction, submit joint fusion data in an electronic spreadsheet format as a record to document joint fusion quality control.
E. Submit manufacturers installation instructions and specifications for all fittings, couplings, adapters, saddles, etc.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pipes shall be either Iron Pipe Size (IPS) or Ductile Iron Pipe Size (DIPS) with SDR ratings as indicated in the pipe schedule.
B. Polyethylene compounds utilized in the manufacture of products furnished under this specification shall be listed in PPI TR-4, with a minimum cell classification of PE 445574C for PE 4710 materials, as defined in ASTM D3350. Pipe shall be in conformance with AWWA C901, AWWA C906, or CSA B137.1. They shall have a PPI recommended Hydrostatic Design Basis (HDB) of 1600 psi (PE4710) at a temperature of 73.4°F (23°C).
C. All materials which come in contact with water, including lubricants, shall be evaluated, tested and certified for conformance with NSF/ANSI Standard 61.

D. Clean re-work material of the same type grade, and cell classification generated from the manufacturer's own pipe and fitting production may be used by the same manufacturer as long as the pipe, tubing and fittings produced meet all the requirements of AWWA C901, AWWA C906, or CSA B137.1.
E. Pipe and tubing furnished under this specification shall be manufactured using compounds complying with the requirements above. Dimensional and performance characteristics shall conform to the requirements of AWWA C901, AWWA C906, or CSA B137.1.
F. The polyethylene compound shall be suitably protected against degradation by ultraviolet light by means of carbon black, well dispersed in a concentration of not less than 2%.
G. The polyethylene resin compound shall have a resistance to environmental stress cracking as determined by procedure detailed in ASTM D l693 with sample preparation by procedure C of ASTM D 4703 of not less than 40 hours.
H. Pipe shall be homogeneous throughout and free of visible cracks, holes, foreign material, blisters, or other deleterious faults.
I. Polyethylene fittings shall have the same pressure rating as the pipe itself for all pressurized pipeline applications.
J. Polyethylene fittings shall be molded style for diameters up to 12 inches and fabricated style for diameters larger than 12 inches.

2.2 PIPE SCHEDULE

PIPE IDENTIFICATION	DIA. (inches)	SDR	IPS/DIPS	WORKING PRESSURE RATING (PSI)	DE-BEAD REQUIRED INSIDE PIPE
HDPE Water Main	10	11	DIPS	200	No

2.3 ADAPTERS AND COUPLINGS (AS APPLICABLE)

A. Polyethylene Mechanical Joint Adapter
   1. For joining IPS or DIPS size polyethylene pipe to any ANSI\AWWA C153 ductile iron fitting and valve.
   2. Molded from NSF listed PE 4710 resin.
   3. Adaptor shall meet requirements of AWWA C901, 906.
   4. Adaptor kit to include anchor fitting, epoxy coated ductile iron retainer gland ring, gasket, and long tee-bolts, and rubber gasket.
   5. Provide stainless steel stiffeners as necessary.
B. Polyethylene Flanged Adapter
   1. For joining IPS or DIPS size polyethylene pipe to ANSI B16.1, ANSI B16.5, or ANSI A21.10 (AWWA C110) flange as required.
   2. Molded from NSF listed PE 4710 resin.
   3. Adaptor kit to include epoxy coated ductile iron backing ring, gasket, and long tee-bolts, and rubber gasket.
   4. Adaptor shall meet requirements of AWWA C901, 906.

2.4 FABRICATION

A. Thermal Butt-Fusion:
   1. Join the pipe to itself, or to the polyethylene fittings or to the flange connections by means of thermal butt-fusion.

2. Have all fusion performed by personnel trained by the pipe supplier or other qualified persons, using tools approved by the pipe supplier.
3. The polyethylene fittings and flanged connections to be joined by thermal butt-fusion shall be from the same type, grade and class of polyethylene compound as the polyethylene pipe unless otherwise approved.
4. Joint strength must be equal to that of the adjacent pipe.

B. Socket Fusion (When Applicable)
1. Join the pipe to socket type fittings by means of socket fusion
2. Have all fusion performed by personnel trained by the pipe supplier or other qualified persons, using tools approved by the pipe supplier.
3. The polyethylene fittings to be joined by thermal socket-fusion shall be from the same type, grade and class of polyethylene compound as the polyethylene pipe unless otherwise approved.

C. Electrofusion (When Applicable)
1. Applies to the installation of electrofusion couplings and saddles.
2. Have all fusion performed by personnel trained by the pipe supplier or other qualified persons, using tools approved by the pipe supplier.
3. The coupling or saddle shall be joined using heat created by electric current from a control box.
4. Install clamps to hold the fitting in place during the fusion process.

D. Flanged Joints
1. Flange joining of sections of pipe is allowed to facilitate the pipe installation process as approved by the Engineer.
2. Joints shall include full face gaskets.
3. Flange bolts shall be tightened to the same torque valve and tightening pattern recommended by the manufacturer.
4. Flange bolts and nuts shall be Type 316 stainless steel and have tensile strength equivalent to SEA Grade 3.
5. Use flat Type 316 stainless steel washers between the nut and backup ring.
6. Retighten bolts to the manufacturer recommended torque value after an hour to offset the effects of compression set.

E. Mechanical Connections: The mechanical connections of the polyethylene pipe to auxiliary equipment shall be in accordance with the pipe suppliers written instructions.

PART 3 - EXECUTION

3.1 INSTALLATION OF PIPES AND FITTINGS

A. Install joint and transition adapters in accordance with the manufactures recommendations.
B. Refer to the drawings and Division 2 for additional bedding and backfill requirements.
C. Joining surfaces must be clean and dry.
D. Pipe must not be dumped, dropped, pushed or rolled into the trench. Provide appropriate equipment to lift move and lower the pipe into the trench as necessary.

3.2 BACKFILL AND FILL

A. General:

1. Backfilling shall consist of replacing material removed to permit installation of structures or utilities, as indicated in the Contract Documents.
2. Filling shall consist of placing material in areas to bring them up to grades indicated on the Drawings.
3. The Contractor shall provide and place all necessary backfill and fill material, in layers to the required grade elevations.
4. Backfill excavations as promptly as work permits, but not until completion of the following:
    a. Inspection, approval, and recording locations of underground utilities.
    b. Density testing having results meeting requirements specified herein.
5. In general, and unless otherwise indicated, material used for backfill of trenches and excavations around structures shall be suitable excavated material which was removed in the course of making the construction excavation. Unless otherwise specified or allowed by the Engineer the backfill and fill shall be placed in layers not to exceed 8 inches in thickness.
6. All fill and backfill under structures and pavement, and adjacent to structures, shall be compacted crushed stone or select fill as specified or as indicated on the Drawings. The fill and backfill materials shall be placed in layers not exceeding 8 inches in thickness.
7. Suitable excavated material shall meet the following requirements:
    a. Free from large clods, silt lumps or balls of clay.
    b. Free from stones and rock fragments with larger than 12 inch max. dimension.
    c. Free from organics, peat, etc.
    d. Free from frozen material.
8. If sufficient suitable excavated material is not available from the excavations, and where indicated on the Drawings, the backfill material shall be select fill or common borrow, unless otherwise indicated, as required and as directed by the Engineer.
9. Do not backfill with, or on, frozen materials.
10. Remove, or otherwise treat as necessary, previously placed material that has frozen prior to placing backfill.
11. Do not mechanically or hand compact material that is, in the opinion of the Engineer, too wet.
12. Do not continue backfilling until the previously placed and new materials have dried sufficiently to permit proper compaction.
13. The nature of the backfill materials will govern the methods best suited for their placement and compaction. Compaction methods and required percent compaction is covered in Compaction section.
14. Before compaction, moisten or aerate each layer as necessary to provide a water content necessary to meet the required percentage of maximum dry density for each area classification specified.
15. Do not allow large masses of backfill material to be dropped into the excavation in such a manner that may damage pipes and structures.
16. Place material in a manner that will prevent stones and lumps from becoming nested.
17. Completely fill all voids between stones with fine material.
18. Do not place backfill on or against new concrete until it has attained sufficient strength to support loads without distortion, cracking, and other damage.

19. Deposit backfill and fill material evenly on all sides of structures to avoid unequal soil pressures.
20. Keep stones or rock fragments with a dimension greater than two inches at least one foot away from the pipe or structure during backfilling.
21. Leave sheeting in place when damage is likely to result from its withdrawal.
22. Completely fill voids left by the removal of sheeting with screened stone which is compacted thoroughly.

B. Pipe Bedding, Initial Backfill and Trench Backfill:

1. Place bedding and backfill in layers of uniform thickness specified herein, and as shown on the Drawings.
2. Thoroughly compact each layer by means of a suitable vibrator or mechanical tamper.
3. Install pipe bedding and initial backfill in layers of uniform thickness not greater than eight (8) inches.
4. Deposit the remainder of the backfill in uniform layers not greater than eight inches.
5. Provide underground utility marking tape for new utility trenches as shown on the Drawings. Refer to Section 02650 – Buried Utility Markings.
6. Where soft silt and clay soils are encountered the trench shall be excavated six inches below the normal bedding and backfilled with 6-inches of compacted sand.
7. Backfill trenches with concrete where trench excavations pass within 18 inches of column or wall footings and which are carried below the bottom of such footings, or which pass under wall footings. Place concrete to the level of the bottom of adjacent footings.
8. The following schedule lists the bedding materials for various types of pipe. Refer to the pipe trench detail for dimensional requirements.

BEDDING REQUIREMENTS

DI or HDPE	MDOT 703.13 Crushed Stone ¾-Inch

9. The following schedule lists the initial backfill requirements for various types of pipes. Refer to the pipe trench detail for dimensional requirements.

INITIAL BACKFILL REQUIREMENTS

DI or HDPE Pipe	MDOT 703.13 Crushed Stone ¾-Inch

10. Special bedding and backfill requirements shown on the Drawings supersede requirements of this section.
11. Where pipes or structures pass through or under the impervious core of the lagoon embankments, bedding and backfill material shall consist of the impervious embankment material. Extra care should be given to properly and thoroughly compact the bedding material around the pipe.

C. Improper Backfill:
1. When excavation and trenches have been improperly backfilled, and when settlement occurs, reopen the excavation to the depth required, as directed by the Engineer.
2. Refill and compact the excavation or trench with suitable material and restore the surface to the required grade and condition.
3. Excavation, backfilling, and compacting work performed to correct improper backfilling shall be performed at no additional cost to the Owner.

D. Ground Surface Preparation:
1. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, scarify or break-up sloped surface steeper than 1 vertical to 4 horizontal.
2. When existing ground surface has a density less than that specified under "compaction" for the particular area classification, break up the ground surface, pulverize, moisture-condition to the optimum moisture content, and compact to required depth and percentage of maximum density.

3.3 TESTING

A. Joint Quality
1. 12" diameter and smaller - On each day butt fusions are to be made, the first fusion of the day shall be a trial fusion. The trial fusion shall be allowed to cool completely, then fusion test straps shall be cut out. The test strap shall be 12" or 30 times the wall thickness in length (minimum) and 1" or 1.5 times the wall thickness in width (minimum). Bend the test strap until the ends of the strap touch. If the fusion fails at the joint, a new trial fusion shall be made, cooled completely and tested. Butt fusion of pipe to be installed shall not commence until a trial fusion has passed the bent strap test.
2. Pipes larger than 12" diameter - Visual inspection of the joint shall be the primary indicator of joint quality. Specific visual inspection criteria shall be provided by the pipe and fitting manufacturer. The v-groove between the bends

shall be uniform around the circumference of the pipe and the both sides of the bead shall have uniform thickness and height indicating proper pipe alignment during the fusion process.

3. All fused joints shall be visually inspected by qualified fusion operators and the Engineer during construction to assure uniform alignment and beading.

B. Leak Test

1. Hydrostatic leak testing shall be performed in accordance with procedures specified in Chapter 2, Inspections, Tests and Safety Considerations of Plastic Pipe Institute's (PPI) "Handbook of Polyethylene Pipe" 1st edition, 2006.
2. Two types of leak test procedures are acceptable: 1) Monitored Make-up Water Test, and 2) Non-Monitored Make-Up Water Test
3. Monitored Make-Up Water Test procedures are as follows:
    a. Clean water shall be used as the pipe testing fluid. The test section of pipe shall be completely filled with water taking care to bleed off any trapped air. Venting at high points may be required to purge air pockets while the test section is filling.
    b. The maximum allowable test pressure is 1.5 times the system design pressure at the lowest elevation in the section under test.
    c. The test procedure consists of 2 phases, an initial expansion phase and a testing phase. During the expansion phase, the test section is pressurized to test pressure and a sufficient quantity of make-up water is added each hour for 3 hours to maintain test pressure.

       After the initial expansion phase, about 4 hours after pressurization, the test phase begins. The test phase begins with the water pressure in the pipe at the test pressure. The test phase may be 1, 2 or 3 hours long, after which time a measured amount of water is added in order for the water pressure in the pipe to return to the test pressure. If the quantity of make-up water does not exceed the values in the table below, the test section of pipe passes the leak test.

LEAK TEST MAKE-UP WATER ALLOWANCE

Nominal Pipe Size (inches)	Make-up Water Allowance (U.S. Gallons per 100 feet of pipe)		
	1 Hour Test	2 Hour Test	3 Hour Test
1 ¼	0.06	0.10	0.16
1 ½	0.07	0.10	0.17
2	0.07	0.11	0.19
3	0.10	0.15	0.25
4	0.13	0.25	0.40
5	0.19	0.38	0.58
5.375	0.21	0.41	0.62
6	0.3	0.6	0.9
7 .125	0.4	0.7	1.0
8	0.5	1.0	1.5
10	0.8	1.3	2.1
12	1.1	2.3	3.4
13.375	1.2	2.5	3.7
14	1.4	2.8	4.2
16	1.7	3.3	5.0
18	2.0	4.3	6.5
20	2.8	5.5	8.0
22	3.5	7.0	10.5
24	4.5	8.9	13.3
26	5.0	10.0	15.0
28	5.5	11.1	16.8
30	6.3	12.7	19.2
32	7.0	14.3	21.5
34	8.0	16.2	24.3
36	9.0	18.0	27.0
42	12.0	23.1	35.3
48	15.0	27.0	43.0
54	18.5	31.4	51.7
63	-	-	-

4. Non-Monitored Make-Up Water Test procedures are as follows:
   a. The test procedure consists of 2 phases, an initial expansion phase and a testing phase. For the initial expansion phase, make-up water is added as required to maintain the test pressure in the test section of pipe for 4 hours.
   b. After the expansion phase is complete, the test phase begins with the pressure in the pipe at test pressure. The test pressure is then reduced by 10 psi. If the pressure remains steady (within 5% of target value) after one hour, then the pipe has passed the leakage test.

END OF SECTION

SECTION 02640

SERVICE SADDLES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: Furnish and install service saddles of the type(s) and size(s) and in the location(s) shown on the Drawings and as specified herein.

1.2 QUALITY ASSURANCE

A. All service saddles of the same type shall be manufactured by one manufacturer.
B. All saddles shall be compliant with NSF 61 and NSF 372 for low-lead content
C. Qualifications of Manufacturer: Products shall have proven reliable in similar installations over a reasonable number of years.

1.3 SUBMITTALS

A. Submit shop drawings in accordance with the applicable section of Division 1 and the General Conditions of the Construction Contract.
B. Submit manufacturer's "Certification of Conformance" that service saddles meet or exceed the requirements of these Specifications.
C. Submit manufacturers installation instructions and specifications for all service saddles.

PART 2 - PRODUCTS

2.1 MATERIALS

A. For cast iron, ductile iron and asbestos cement (AC) pipe.
    1. Body casting - wrap around design constructed of ductile iron (ASTM A 536).
    2. Gasket - 3½ inch diameter constructed of Buna-N, grooved to conform to pipe surface and bonded in place.
    3. Straps and bolts - low alloy steel conforming to AWWA C800.
    4. Washers and nuts - heavy hex nuts and washers constructed low alloy steel conforming to AWWA C800.
    5. Double strap required.
    6. Acceptable manufacturer.
        a. Romac (style 202S).
        b. Smith Blair (Model 317)
        c. Ford Meter Box Company (Model FCD202)
        d. Or equal.

B. For C900 PVC and HDPE (minimum SDR26) pipe.
    1. Body casting - wrap around design constructed of ductile iron (ASTM A 536) with nylon fused coating 10-12 mils.
    2. Gasket - 3½ inch diameter constructed of Buna-N, grooved to conform to pipe surface and bonded in place.
    3. Bands and bolts - welded 2" wide straps (14 gauge) and 5/8 inch treaded bolt combination constructed of Type 304 (18-8) stainless steel. Welds shall be passivated.

4. Washers and nuts - heavy hex nuts and washers constructed of 18-8 stainless steel.
5. Double band required.
6. Acceptable manufacturer.
    a. Romac (style 202NS for PVC and style 202N for HDPE).
    b. Smith Blair (Model 317)
    c. Ford Meter Box Company (Model FC202)
    d. Or equal.

C. For other type(s) of pipe – confirm with Engineer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install at locations shown on the Drawings and as specified by the pipe manufacturer and saddle manufacturer.
B. Check for leaks prior to backfilling as appropriate.
C. Tap pipe with tools and by methods specifically furnished by pipe manufacturer.
D. For PVC, HDPE and AC pipe use tapping machine with smooth strap retainer (chains or other devices that may gouge or score the pipe shall not be used).

END OF SECTION

SECTION 02641

GATE VALVES

PART 1 - GENERAL

1.2 DESCRIPTION

A. Work Included: Furnish, install and test gate valves of the type(s) and size(s) and in the location(s) shown on the Drawings and as specified.

B. Related Work Specified Elsewhere:

1. "Valve Boxes" and "Ductile Iron Pipe & Fittings for Buried Applications" are specified in this Division.

1.3 QUALITY ASSURANCE

A. All gate valves of same type and style shall be manufactured by one manufacturer.

B. Acceptable Manufacturers:

1. American Flow Control
2. Kennedy
3. Darling
4. Mueller
5. Or approved equal.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Waterworks type NRS valves (AWWA):

1. Valve Body, bonnet and stuffing box - Ductile iron (ASTM A395 or VA536 C1B), coated inside and out with fusion bonded epoxy meeting AWWA C550. Face-to-face dimensions shall comply with ANSI B16.10 and flanges to comply with ANSI B16.1.
2. Resilient Wedge - Ductile iron wedge with bonded Nitrile elastomer covering.
3. Stem – Copper Alloy, ASTM B584, or stainless-steel ASTM A276 or A473
4. Stuffing box O-rings
   a. Two O-rings, each nitrile rubber.
   b. Capable of changing under pressure.
5. Wedgenut - Bronze, ASTM B62, B148, B584 or B763.
6. Bolting - stainless steel Type 18-8, ASTM F593, GP1
7. End Connections
   a. Buried valves - mechanical joints
8. Operation
   a. Buried valves - 2-inch square nut, cast iron, ASTM A126, C1B
   b. Opening Direction – left **(counter-clockwise)**
   c. For horizontal locations, provide bevel gear operator. Bevel gear operator to be totally enclosed grease filled gearing, IP68 buried duty, number of turns to open or close shall closely match the formula: ((3 x D) + 2) x 4 ratio, 2-inch operating nut. Rotork IB series or approved equal.
9. Valve Pressure rating: 200 psi.

10. Standards - valves shall meet or exceed AWWA C515, latest edition.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install 12-inch and smaller valves with stem position vertical. Install 16-inch and larger valves with stem position horizontal and bevel gear operator.
B. Valve box vertical and centered over operating nut.
C. Valve box supported during backfilling and maintained vertical.
D. Install and test in accordance with AWWA C515, latest revision.

END OF SECTION

SECTION 02642

CORPORATE STOPS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: Furnish and install corporation stops of the type(s) and size(s) and in the location(s) shown on the Drawings and as specified herein.

1.2 QUALITY ASSURANCE

A. All corporation stops shall be manufactured by one manufacturer.
B. Qualifications of Manufacturer: Products have proven reliable in similar installations over a reasonable number of years.
C. Acceptable Manufacturers:
   1. Ford Meter Box Company Inc.
   2. A. Y. MacDonald Manufacturing Company
   3. Mueller Company
   4. Or equivalent

1.3 SUBMITTALS

A. Submit shop drawings in accordance with the applicable section of Division 1 and the General Conditions of the Construction Contract.
B. Submit manufacturers product data and installation instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Ball style corporation valve conforming to AWWA C 800. Valve shall have solid one-piece tee head and stem, dual o-rings in the stem, coated brass ball with no metal-to-metal contact, and integral or secured ends to prevent unintentional disassembly.
B. Constructed of “Lead free” brass in compliance with NSF 372, NSF 61 and Safe Drinking Water Act Section 1417. Lead free fittings shall contain less than 0.25% lead on a weighted average and installed using flux and solder containing not more than 0.2% lead.
C. Inlet shall have AWWA standard thread (a.k.a. Mueller or “CC” thread).
D. Outlet shall be copper pipe packed joint (CPPJ) or approved restrained grip joint
E. Working pressure of 300 psi shall be required.
F. Valve shall open left

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install at locations shown on the Drawings and as specified in accordance with manufacturer's instructions.
B. Check and adjust all corporation stops for smooth operation.

END OF SECTION

SECTION 02643

CURB STOPS

PART 1 - GENERAL

1.2 DESCRIPTION

A. Work Included: Furnish and install curb stops of the type(s) and size(s) and in the location(s) shown on the Drawings and as specified herein.

1.3 QUALITY ASSURANCE

A. All curb stops shall be manufactured by one manufacturer in the US.

B. Qualifications of Manufacturer: Products shall have proven reliable in similar installations over a reasonable number of years.

C. Acceptable Manufacturers:

1. Ford (B44)
2. A Y McDonald
3. or approved equal

PART 2 - PRODUCTS

2.1 PRODUCT CONSTRUCTION

A. Ball style valve conforming to AWWA C 800. Valve shall have solid one-piece tee head and stem, dual o-rings in the stem, coated brass ball with no metal-to-metal contact, ring lock to lock stem solidly into the body and non-directional seats to support the valve and assure watertight.

B. Constructed of “Lead free” brass in compliance with NSF 61 Annex G and Safe Drinking Water Act Section 1417. Lead free fittings shall contain less than 0.25% lead on a weighted average and installed using flux and solder containing not more than 0.2% lead.

C. Inlet and outlet shall be copper packed pipe joint (CPPJ) type or approved restrained grip joint.

D. Working pressure of 300 psi shall be required.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install at locations shown on the Drawings and in accordance with manufacturer's instructions.

3.2 ADJUSTMENTS

A. Check and adjust all curb stops for smooth operation.

END OF SECTION

SECTION 02645

CURB BOXES

PART 1 - GENERAL

1.2 DESCRIPTION

A. Work Included: Furnish and install curb boxes of type (s) and size (s) and in the locations shown on the Drawings and as specified herein.

1.3 QUALITY ASSURANCE

A. All curb boxes shall be manufactured by one manufacturer in the US.

B. Qualifications of Manufacturer: Products have proven reliable in similar installations over a reasonable number of years.

C. Acceptable Manufacturers:

1. Bingham & Taylor
2. Quality Water Products.
3. Mueller Co.
4. Hayes Manufacturing Co.
5. Or equivalent.

PART 2 - PRODUCTS

2.1 MATERIALS AND FABRICATION

A. Cast iron base piece, steel upper, cast iron lid, and threaded bronze plug with pentagon nut (Rope Thread).

B. Extension type and arch pattern base with 5/8" diameter stainless steel minimum, 36" stationary rod with brass cotter pin. Yoke shall be integral to the rod.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install as shown on the Drawings and/or as requested by the Engineer.

1. When installation is complete no pressure shall be exerted by the curb box on either the curb stop or the service pipe.

END OF SECTION

SECTION 02646

VALVE BOXES

PART 1 - GENERAL

1.2 DESCRIPTION

A. Work Included: Furnish and install valve boxes of type(s) and size(s) and in the locations shown on the Drawings and as specified herein.

1.3 QUALITY ASSURANCE

A. All valve boxes shall be manufactured by one manufacturer in the US.
B. Qualifications of Manufacturer: Products to have been proven reliable in similar installations over a reasonable number of years.
C. Acceptable Manufacturers:
   1. Bingham & Taylor
   2. Mueller
   3. Quality Water Products
   4. Or Equivalent

PART 2 - PRODUCTS

2.1 MATERIALS

A. The valve box shall be ductile iron, slip type two-piece integral base, 5-1/4 inch shaft. Top section with flanges.
B. Cast or Ductile iron, with drop type covers and the word "Water" cast in. Covers shall be drop-type with pick holes for easy removal.
C. Belled base section.
D. Bottom section shall 36” minimum, 26” top section.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation as shown on the Drawings and/or as specified herein.
   1. When installation is complete, no pressure shall be exerted by valve box on the water main or on the valve.
   2. Be of such length as required without full extension. Minimum lap 6 inches.

END OF SECTION

SECTION 02649

TRACER WIRE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Install electrically continuous tracer wire with access points as described herein to be used for locating non-metallic pipe with an electronic pipe locator after installation.

1.2 SUBMITTALS

A. Manufacturer's materials specifications

1.3 QUALITY ASSURANCE

A. All system components specified herein shall be furnished by a single Manufacturer who regularly engages in the production of this type of equipment. The Manufacturer shall be responsible for the performance and warranty of the entire system provided under this section.

B. Qualifications of Manufacturers: The Manufacturer shall have a minimum of 10 years of experience in the design and manufacture of the specified systems.

C. Acceptable Manufacturers:
   1. Copperhead Industries
   2. Seton
   3. Or equivalent

D. Project Design: Attention is directed to the fact that the Drawings are based on Copperhead Industries as listed in this Section.

1.4 PROJECT CONDITIONS

A. Service Laterals on public property - Trace wire must terminate at an approved grade level/inground trace wire access box, located at the edge of the road right-of-way, and out of the roadway.

B. Service Laterals on private property - Trace wire must terminate at an approved above-ground trace wire access box, affixed to the building exterior directly above where the utility enters the building, at an elevation not greater than 5 vertical feet above finished grade, or terminate at an approved grade level/in-ground trace wire access box, located within 2 linear feet of the building being served by the utility.

C. Hydrants – Trace wire must terminate at an approved above-ground trace wire access box, properly affixed to the hydrant grade flange. (affixing with tape or plastic ties shall not be acceptable)

D. Long-runs, in excess of 500 linear feet without service laterals or hydrants - Trace wire access must be provided utilizing an approved grade level/in-ground trace wire access box, located at the edge of the road right-of-way, and out of the roadway. The grade level/in-ground trace wire access box shall be delineated using a minimum 48” polyethylene marker post, color coded per APWA standard for the specific utility being marked.

PART 2 - PRODUCTS

2.1 MATERIAL

A. Tracer wire for open trench installations shall be 10-gauge minimum copper clad steel wire (CCS) with thermoplastic insulation recommended for direct burial (Copperhead #1030-HS or equal).

B. Tracer wire for horizontal directional drill installations shall be 8-gauge minimum extra-high strength (1,700 lb. yield strength) CCS with 45 mil HDPE insulating jacket and 30 Volt maximum rating (Copperhead SoloShot 845-EHS or equal).

C. Tracer wire for pipe bursting/slip lining installation shall be 7 x 7 Stranded Copper Clad Steel, Extreme Strength with 4,700 lb. break load and minimum 50 mil HDPE insulating jacket (Copperhead #PBX-50 or equal).

D. All mainline trace wires must be interconnected in intersections, at mainline tees and mainline crosses. At tees, the three wires shall be joined using a single 3-way lockable connector (Copperhead #LCS1030 or equal). At Crosses, the four wires shall be joined using a 4-way connector. Use of two 3-way connectors with a short jumper wire between them is an acceptable alternative. Wire connectors shall be watertight and provide electrical continuity.

E. Direct bury wire connectors shall include 3-way lockable connectors and mainline to lateral lug connectors specifically manufactured for use in underground trace wire installation. Connectors shall be dielectric silicon filled to seal out moisture and corrosion, and shall be installed in a manner so as to prevent any uninsulated wire exposure (Copperhead #3WB-01 or equal).

F. Tracer wire color shall be blue for all water construction

G. Tracer wire access boxes or test stations shall be heavy duty in-ground boxes with cast iron lids color coded to identify use. Non-Roadway access boxes shall be light-duty grade level boxes (Copperhead # LD14*TP or equal). Concrete/Driveway boxes shall be standard grade level boxes (Copperhead #CD14*TP 14" or equal). Fire hydrant access boxes shall be above ground two terminal boxes with 1" conduit (Copperhead Cobra #T3-75-F or equal).

H. Trace wire must be properly grounded at all dead ends/stubs. Grounding of trace wire shall be achieved by use of a drive-in magnesium grounding anode rod with a minimum of 20-feet of #14 red HDPE insulated copper clad steel wire connected to anode (minimum 0.5 lb.) specifically manufactured for this purpose, and buried at the same elevation as the utility (Copperhead #ANO-14 or equal).

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. Tracer wire shall be installed on HDPE mains, laterals and services. The wire shall be installed in such a manner as to be able to properly trace all water mains without loss or deterioration of signal or without the transmitted signal migrating off the tracer wire.

B. Trace wire shall be installed in the same trench for open trench installation, inside bored holes if horizontal directional drilling and inside casing if cased pipe installation for all non-metallic pipelines. It shall be secured to the pipe as required to ensure that the wire remains adjacent to the pipe. The trace wire shall be securely bonded together at all wire joints with an approved watertight connector to provide electrical continuity, and it shall be accessible at all new water valve boxes.

C. At all valve box connections, tracer wire shall be installed inside the valve box with tracer wire clips to hold the tracer wire to one side to avoid interference when valve wrench is used. Tracer wire clips shall be Vait Products Gate Valve Box Tracer Wire Clips or approved equal.

D. At all hydrant connections, tracer wire shall be installed inside a magnetized tracer box directly adjacent to the hydrant. Tracer boxes shall be heavy duty cast lid boxes with 5-inch top flange and color-coded lid to match utility located. Lids shall be directly connected to tracer wire and not require removal of the lid for connection of locator device. Tracer boxes shall be Copperhead SnakePit Roadway Boxes or approved equal.

E. At the point of connection between cast or ductile iron water mains, with any non-iron water main, the tracer wire shall be properly connected to the iron pipe with a cad weld or approved equivalent. Tracer wire welds shall be completely sealed with the use of an approved mastic type sealer specifically manufactured for underground use. Mastic shall be applied in a thick coat a minimum of ½-inches thick and shall be protected from contamination by the backfill material with the use of a plastic membrane.

F. Tracer wire shall be laid flat and securely affixed to the pipe at 10 foot intervals. The wire shall be protected from damage during the execution of the works. No breaks or cuts in the tracer wire or tracer wire insulation shall be permitted. At water service saddles, the tracer wire shall not be allowed to be placed between the saddle and the water main. Except for approved spliced-in connections, tracer wire shall be continuous and without splices from valve box to valve box.

G. At all non-metallic pipe ends, a minimum, of 6 feet of tracer wire shall be extended beyond the end of the pipe, coiled and secured for future connections. The end of the tracer wire shall be spliced to the wire of a six-pound magnesium or zinc anode and is to be buried at the same elevations as the water main.

H. For horizontal directional drilling, auguring or boring installations, two tracer wires shall be installed with the pipe and connected to the tracer wire at both ends, or cad welded to the existing iron pipe at both ends.

I. Spliced connections between the main line tracer wire and branch connection tracer wire shall only be allowed at water main tees, crosses or at iron or copper water services where a portion of the branch connection water main or water service is replaced with a non-iron or non-copper material. The branch connection tracer wire shall be a single tracer wire properly spliced to the main line tracer wire. Where the existing branch connection is neither iron nor copper, then the new branch connection tracer wire shall be properly spliced to the existing tracer wire on the branch connection.

J. At all repair locations where there is existing tracer wire, the tracer wire shall be properly reconnected and spliced as outlined above.

3.2 TERMINATION/ACCESS

A. All tracer wire termination points shall utilize an approved tracer wire access box specifically manufactured for this purpose.

B. All grade-level/in-ground boxes shall be properly identified with “sewer” or “water” cast into the cap and color coded.

C. A minimum of 2 feet of excess/slack wire is required at all tracer wire access boxes after meeting final elevation.

D. All tracer wire access boxes must include a manually interruptible

conductive/connective link between the terminals for the tracer wire connection and the terminal for the grounding anode wire connection.

E. A drive-in grounding anode rod is required at each termination/access point installed at pipe elevation. Anode rod shall have factory applied grounding anode wire for connection to access box. Grounding anode wire shall be connected to the identified terminal on all access boxes.

3.3 TESTING REQUIREMENTS

A. Contractor shall perform a continuity test on all trace wire in the presence of the Engineer or the Engineers' representative. If the trace wire is found to be not continuous after testing, Contractor shall repair or replace the failed segment of the wire.

3.4 MEASUREMENT

A. There is no separate payment for the supply and installation of tracer wire on any construction or installation of non-ductile iron water main by the Contractor. The Contractor shall consider the supply and installation of the tracer wire incidental to all construction of non-ductile mains.

END OF SECTION

SECTION 02650

BURIED UTILITY MARKINGS

PART 1 - GENERAL

1.1 BUY AMERICA

A. All iron and steel shall meet Buy America requirements.

1.2 DESCRIPTION

A. Work Included:
   1. This work shall consist of providing and installing utility line markings above all buried lines installed as part of this contract and replacing existing markings disturbed as part of this contract.

B. Related Work Specified Elsewhere:
   1. Pipe, excavation, backfill, and insulation are specified in the appropriate Sections in this Division.

PART 2 - PRODUCTS

2.0 MATERIALS

A. Materials and color shall be in accordance with latest AASHTO specifications for pipe and utility marking.

B. Marking tape color shall be in accordance with latest American Public Works Association (APWA) Uniform Color Code and American National Standards Institute ANSI Standard Z535.1, Safety Color Code specifications for buried utility marking as noted in the Schedule below.
   1. Schedule

Marker Color	Buried Utility
Blue	Potable Water &Associated lines
Green	Sanitary Sewers, Storm Drain and other Drain lines
Orange	Telecommunication, signal, alarm
Purple	Reclaimed, Recycled, Irrigation Water and Slurry Lines
Red	Electric Power lines cables conduits and lighting cables
Yellow	Gas, Oil, Steam, Petroleum or Gaseous Material Lines

   2. Warning Information shall be in Black Letters with typical wording of:
      a. "CAUTION: BURIED (NAME OF UTILITY LINE) BELOW"

C. For ferrous pipe material use 0.004" minimum polyethylene film; 6" wide clearly marking type of buried utility.

D. For non-ferrous pipe material (e.g. Concrete, PVC, PE, etc.) use detection tape composite of polyethylene and metallic core 6" wide clearly marking type of buried utility.

E. Seton Identification Products, New Haven, CT, Utility Safeguard LLC or equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Marking tape shall be installed over utility lines centerline and buried 24" below grade.

B. Markings damaged during opening of trench shall be reinstalled with 2' overlap at broken sections.

END OF SECTION

SECTION 02655

COUPLINGS & CONNECTORS FOR BURIED APPLICATIONS

PART 1 - GENERAL

1.2 DESCRIPTION

A. Furnish and install couplings and connectors of the type and size in the location shown on the Drawings and as specified herein.

1.3 QUALITY ASSURANCE

A. Minimum pressure rating equal to that of the pipeline in which they are to be installed.

B. Couplings and connectors, other than those specified herein, are subject to the Water District Engineer's approval.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All Couplings and Connectors:
   1. Gasket Materials: Composition suitable for exposure to the liquids to be contained within the pipes.
   2. Diameters to properly fit the specific types of pipes on which couplings and connectors are to be installed.

B. Sleeve Type Flexible Couplings
   1. Buried Couplings:
      a. Ductile iron center sleeve and end rings made per ASTM A536, Grade 65-45-12
      b. Two wedge-section virgin SBR or GPDM rubber gaskets compounded for water service,
      c. Nuts and bolts shall be 304 stainless steel or ductile iron low alloy steel per ANSI/AWWA A21.11/C-111 with anti-galling protection.
      d. Acceptable Manufacturers:
         (1) Romac Industries Macro HP or Alpha
         (2) Krausz Hymax
         (3) Or Equal

C. Solid Sleeve Couplings
   1. Solid sleeves shall be ductile iron with mechanical joint ends.
   2. Couplings shall meet AWWA/ANSI C-153/A21.53 and C-111/A21.11 for joints, and C-104/A21.4 for cement lining in sizes 3"-24".
   3. Nuts and bolts shall be ductile iron low alloy steel per ANSI/AWWA A21.11/C-111.

D. Flexible Couplings for drain connections
   1. Rubber material with stainless steel clamps
   2. Must provide a positive seal against infiltration and exfiltration
   3. Coupling materials must conform to ASTM C443, C564, and D1869.

E. Mechanical Joint Adaptors (Foster Adaptor®)

1. Required to connect fittings and valves with mechanical joints
2. Ductile iron construction mechanical joint bolt pattern.
3. Bolts and nuts shall meet AWWA C-111.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Sleeve Type Couplings:
   l. Thoroughly clean pipe ends a minimum of 12-inches from the ends prior to installing couplings, and use soapy water as a gasket lubricant.
   2. Slip an end ring and gasket over each pipe and place the center sleeve centered over the joint.
   3. Insert the other pipe length into the center sleeve the proper distance.
   4. Press the gaskets and end rings evenly and firmly into the center sleeve flares.
   5. Insert the bolts, finger tighten and progressively tighten diametrically opposite nuts uniformly around the adapter with a torque wrench applying the torque recommended by the manufacturer.
   6. Insert and tighten the tapered threaded lock pins.

B. Install thrust rods, supports, and other provisions to properly support pipe weight and axial equipment loads.

END OF SECTION

SECTION 02675

CLEANING, TESTING AND DISINFECTION OF WATER MAINS

PART 1 GENERAL

1.1 DESCRIPTION

A. The work of this section includes the furnishing of all labor, tools, equipment and materials and performing all operations necessary for the flushing, pressure testing, leakage testing and chlorination of water mains as specified herein and as required to complete the work.

1.2 QUALITY ASSURANCE

A. Standards (as applicable):
   1. All work shall be in accordance with this specification and AWWA C651. Where conflicts appear between these specifications and AWWA C651 the more stringent requirement shall apply.
   2. Chlorine solution for disinfecting water mains and appurtenances shall be made from either liquid sodium hypochlorite, or solid calcium hypochlorite, which shall conform to the latest AWWA B300 Standard for Hypochlorite.
   3. Chlorine test kits shall be as described in the current edition of AWWA M12 - Simplified Procedures for Water Examination.
   4. Disposal of chlorinated water as per AWWA C651, Appendix B.

1.3 COORDINATION

A. Use of water will only be as approved and coordinated by the Owner.

B. All flushing, pressure and leakage testing and chlorinating shall be done by the Contractor in the presence of the Water District Engineer and in the presence of the Owner or Owner's Representative in accordance with the requirements of the local and state plumbing codes and the appropriate Sections of these Specifications, at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Each temporary blow-off shall consist of a corporation cock, type K copper tubing and a curb stop, each of not less than 1-inch diameter.

B. A pumping unit or proportionate feeder suitable for delivering a hypochlorite solution to the isolated main shall be provided. The unit used shall prevent chlorine solution from flowing back into the existing system.

PART 3 - EXECUTION

3.1 GENERAL

A. Thoroughly clean all piping prior to testing. Remove all dirt, dust, oil, grease and other foreign material. Exercise care while cleaning to avoid damage to linings and coatings.

B. Supply all labor, equipment, materials, gages, and pumps required to conduct the tests. The drawings do not detail taps, gages, plugs and other related materials required to perform testing. These materials are the responsibility of the Contractor.

C. Flushing, testing and chlorinating of the mainline shall closely follow main laying work. As the mainline is installed, it shall be tested approximately every 1,000 feet, or between line valves, whichever is less. Should the mainlines fail to be flushed, tested, and chlorinated as specified, the main laying work shall be suspended until the flushing, testing and chlorinating is done.

D. Final acceptance of the water main shall be based on successful (negative) results of bacteriological tests, which shall be done on samples taken from the main following chlorination and final flushing. Locations of samples shall be determined by the Water District Engineer.

E. The testing and related procedures described herein, shall be performed in the order listed.

F. The Contractor, with the assistance of the Owner, shall fill mains as slowly as practicable so as not to cause dirty water and serious pressure drops within the existing system.

3.2 FLUSHING

A. All new water mains, and existing water mains that have been drained and cut-into for making connections, shall be thoroughly flushed prior to pressure or leakage testing or final chlorination. Flushing shall be accomplished by partially opening and closing valves, hydrants, and blowoffs, several times, under expected line pressure, with flow velocities of not less than 2.5 feet per second, in the main. The size and number of hydrant outlets and/or main taps to provide the required flow (at 40 psi residual pressure) is as follows:

Minimum Required Flow and Openings Required to Flush Water Mains
(Assuming 40 psi Residual Pressure in Water Mains)

Main Diameter (in.)	Flow Required to Produce 2.5 fps in Main (gpm)	Minimum Size of Taps (in.)	Hydrant Outlets	
			Number	Size (in.)
4	100	15/16	1	2-1/2
6	220	1-3/8	1	2-1/2
8	390	1-7/8	1	2-1/2
10	610	2-5/16	1	2-1/2
12	880	2-13/16	1	2-1/2
16	1565	3-5/8	2	2-1/2

1. If less than a 40 psi residual is available in the main, with the size tap shown above then a larger, or more tap(s) or hydrant outlets will be required, as determined by the Water District Engineer.
2. The length of time for flushing, at or above the minimum allowable velocity, shall be computed to allow a minimum of 3 times the total volume of water in the main to be flushed to waste. Flushing shall be done in the presence of the Water District Engineer.

3.3 AIR REMOVAL

A. Following flushing, and before applying the specified test pressure, air shall be completely expelled from the mains, valves, and hydrants. After all air has been expelled, the air blowoffs can be closed, and the test pressure applied.

3.4 PRESSURE TEST

A. All new water mains, or any sections thereof, shall be subjected to a hydrostatic pressure of at least 1.5 times the working pressure that will exist at the point of testing, or 150 psi, whichever is greater. Test pressures shall meet the following requirements:
   1. Be of at least 2-hour duration.
   2. Be not less than 1.25 times the expected system working pressure at the highest point along the test section.
   3. Not exceed main or thrust-restraint design pressures.
   4. Not vary by more than + 5 psi for the duration of the test.
   5. Not exceed 2-times the rated pressure of the valves or hydrants when the pressure boundary includes closed valves or hydrants. Valves shall not be operated in either direction at differential pressure greater than the rated pressure.
   6. Not exceed 1.5-times the rated pressure of the valves when the pressure boundary of the test section includes closed butterfly valves or resilient seated gate valves.

B. Each section of main shall be slowly raised to the specified test pressure for two separate periods. The first period shall be for 15-minutes, after which the pressure shall be allowed to drop slowly back to system pressure. The pressure shall then be slowly raised again to the specified test pressure and maintained for 2-hours. The test pressure shall be based on the elevation of the lowest point of the main, in the test section and shall be corrected to the elevation of the test gauge, as directed by the Water District Engineer. The test pressure shall be applied by means of a pump connected to the main, in an approved manner, and which will prevent any backflow into the existing system. Valves shall not be operated in either the closing or opening direction, at differential pressure greater than the rated pressure.

C. Any exposed main, fittings, valves, hydrants and joints shall be carefully examined during the test. Any damaged or defective main, fittings, hydrants, or valves discovered following, or as a result of the pressure test shall be repaired or replaced with sound material. If faulty materials are removed and replaced, the pressure testing procedure shall be repeated.

3.5 LEAKAGE TEST

A. Leakage testing shall be conducted concurrently with the pressure test.

B. Leakage is defined as the quantity of water that must be pumped into the new main during the test, or any section thereof, required to maintain pressure within 5 psi of the starting test pressure. Leakage shall be recorded to the nearest one-tenth of a gallon. The Contractor shall employ qualified personnel throughout the testing. Leakage shall not be measured by a drop in pressure over a period of time.

C. Leakage in the test section must be less than an amount determined as follows:

$$L = \frac{SD(P^{0.5})}{148{,}000}, \text{ where}$$

L = allowable gallons of leakage per hour

S = the length of main tested, in feet

D = the nominal main diameter in inches
P = the average test pressure during the test, in psi

D. The leakage formula is based allowable leakage of 11.65 gallons per day, per mile of main, per inch (nominal) of main diameter, at a pressure of 150 psi. Allowable leakage under various conditions is shown below.

Allowable Leakage (gph) per 1,000 Feet of Mainline

Average Test Pressure(psi)	Nominal Diameter (inches)						
	6	8	10	12	16	20	24
250	0.64	0.85	1.07	1.28	1.71	2.14	2.56
225	0.61	0.81	1.01	1.22	1.62	2.03	2.43
200	0.57	0.76	0.96	1.15	1.53	1.91	2.29
175	0.54	0.72	0.89	1.07	1.43	1.79	2.15
150	0.50	0.66	0.83	0.99	1.32	1.66	1.99
125	0.45	0.60	0.76	0.91	1.21	1.51	1.81
100	0.41	0.54	0.68	0.81	1.08	1.35	1.62

1. If the mainline under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each size.
2. When testing against closed metal seated valves, an additional leakage shall be allowed per closed valve of 0.0078 gallons per hour, per inch of nominal valve diameter.
3. When hydrants are in the test section, the test shall be made against the closed hydrant(s).

E. Acceptance shall be determined on the basis of allowable leakage. If leakage in any test is greater than that specified, the Contractor shall locate and make repairs as necessary until the leakage is within the specified allowance.
1. All visible leaks are to be repaired regardless of the amount of leakage.
2. All water mains shall be pressure and leakage tested in the presence of the Water District Engineer, in order to qualify for acceptance.

3.6 CHLORINATION

A. The method of chlorination shall be the *Continuous Feed Method* as described hereinafter. Chlorination procedures will not be allowed until acceptable flushing and pressure testing has been performed and accepted. The continuous feed method consists of the following steps:
1. Prior to the application of chlorine, confirm that valves are closed to prevent back-feeding chlorine solution into the existing system.
2. At a point not more than 10 feet downstream from the beginning of the new main, fill the main with chlorinated potable water, having an initial concentration of 25 mg/l free chlorine residual.
   a. Water from the existing distribution system or other approved source of supply shall flow at a constant measured rate, into the new main. In the absence of a meter, the rate may be approximated by measuring the

discharge rate at the end of the test section with a pito-gauge or by measuring the time to fill a container of known volume.

3. The application of chlorine solution shall continue until the entire main is filled with water having 25 mg/l of free available chlorine. To assure that 10 mg/l free chlorine residual concentration is achieved throughout the test section, the Contractor shall measure chlorine concentration at regular intervals.

B. The amount of chlorine required to obtain a concentration of 25 mg/l per 100 feet of various diameter mains is as follows.

Chlorine Required to Obtain 25 mg/l per 100 feet of Various Diameters

Main Diameter (inches)	Sodium Hypochlorite (gallons)				Calcium Hypochlorite (ounces)
	5% Available Chlorine	10% Available Chlorine	12.5% Available Chlorine	15% Available Chlorine	65% Available Chlorine
4	0.03	0.02	0.02	0.01	0.02
6	0.08	0.04	0.03	0.03	0.75
8	0.13	0.07	0.06	0.06	1.30
10	0.20	0.10	0.09	0.07	2.10
12	0.28	0.15	0.12	0.10	2.90
16	0.50	0.25	0.22	0.17	5.30
20	0.80	0.40	0.34	0.28	8.40
24	1.30	0.60	0.50	0.40	12.00

1. The above quantities are to be added to a sufficient quantity of water, dissolved, and mixed. The solution shall be injected into the main as specified.
2. The quantities shown are based on concentrations of available chlorine by volume. Extended or improper storage may have caused a loss of available chlorine.

C. The chlorinated water shall be retained in the main for a minimum of 24-hours. At the end of this 24-hour period, retest portions of the main to confirm that a minimum of 10 mg/l free available chlorine residual exists in the main. If the residual chlorine is less than 10 mg/L, acceptable bacteria results may not be obtained.

3.7 FINAL FLUSHING OF CHLORINATED WATER

A. After the initial 24-hour period, the heavily chlorinated water shall be flushed from the main until chlorine measurements show the concentration in water leaving the main is no higher than that generally prevailing in the system.

B. The Contractor shall obtain approval of location(s) for discharging the heavily chlorinated water, which will result from the chlorination procedures. Great care shall be exercised in the selection of the rate of flow and the discharge points, in order to minimize complaints, and damage to public or private property.

C. The heavily chlorinated water shall be suitably and thoroughly neutralized prior to disposal into the environment. In no case shall chlorinated or neutralized water be discharged directly into a water body. If necessary, state, federal, and local regulatory agencies should be contacted to determine special provisions for the disposal of heavily chlorinated water.

3.8 BACTERIOLOGICAL TESTS

A. After final flushing and before the water main is placed in service, water samples shall be collected twice (24-hours apart) by the Water District Engineer or Owner and tested for bacteriological quality in accordance with standard methods. Water samples shall show the absence of coliform organisms and background bacteria.

B. If, during construction, trench water has entered the main, or if in the opinion of the Water District Engineer excessive quantities of dirt or debris have entered the main, bacteriological samples shall be taken at intervals of approximately 200 feet and shall be identified as to location. Samples shall be taken of water that has stood in the main for at least 24-hours after final flushing has been completed.

C. Samples shall be obtained through a corporation cock and copper tubing installed by the Contractor.

D. The Water District Engineer or Owner shall deliver samples to a laboratory approved by the Department of Health Services for bacterial analysis. The Owner shall pay for the cost of analysis. Only after each consecutive sample is approved shall the mains be incorporated into the water system. In the event that positive reports of contamination are received, the mains shall be flushed and chlorinated as many times as may be necessary to obtain approved (negative) results.

3.9 RE-CHLORINATION

A. If the initial chlorination fails to produce satisfactory bacteriological samples, the main shall be re-flushed and re-sampled.

3.10 CHLORINATION PROCEDURES WHEN CUTTING INTO OR REPAIRING EXISTING MAINS

A. Trench Treatment. If during excavation the trench is either wet or filled with water, it is recommended that liberal quantities of hypochlorite tablets be applied to open trench areas to lessen the danger from pollution.

B. The interior of all main and fittings used in making a repair shall be swabbed or sprayed with a 1 percent hypochlorite solution before they are installed.

C. If valve and hydrant locations permit thorough flushing toward the work location from both directions, it shall be done. Flushing shall be started as soon as the repairs are completed and shall be continued until discolored water is eliminated.

D. Slug Chlorination. Where practical and in addition to the procedures above, a section of main in which the break is located shall be isolated. All service connections shall be

shut off, and the section flushed and chlorinated by the *Slug Chlorination* method. This method allows the chlorine dose to be increased to as much as 300 mg/l, and the contact time reduced to as little as 1-hour. After chlorination, the section shall be properly flushed until discolored water is eliminated and the water is free of noticeable chlorine odor.

E. Bacteriological samples shall be taken after repairs. If the direction of flow is unknown, samples shall be taken on each side of the main break. If positive samples are recorded, daily sampling shall be continued until two consecutive negative samples are recorded.

END OF SECTION

SECTION 03319

PRE-CAST CONCRETE THRUST BLOCKS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: Furnish and install pre-cast concrete thrust blocks for pipes in the location(s) and of the dimension(s) and shapes shown on the Drawings, as directed by the Engineer and as required to rigidly support pipes.

B. The Contractor shall provide pre-cast concrete thrust blocks, if cast-in-place thrust blocks are not used as indicated on the drawings.

1.2 QUALITY ASSURANCE

A. Acceptable Manufacturers:
   1. Superior Concrete, Auburn, ME
   2. Precast of Maine, Topsham, ME
   3. Or approved equal.

1.3 SUBMITTALS

A. Submit dimensioned drawings for each type of thrust block required, as indicated on the drawings.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Thrust blocks shall be manufactured of 3,000 psi concrete or greater.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Thrust blocks shall be installed as shown on the Drawings, to secure pipe and fittings and properly compacted as specified.

B. Secure pipe to prevent movement and floatation during the placement of the concrete.

END OF SECTION

APPENDIX B

WEST GARDINER

WATER LINE REPLACEMENT

MTA CONTRACT 2022.14

MAINE TURNPIKE AUTHORITY

WEST GARDINER, MAINE

CORRTECH PROPOSAL

APRIL 2022

WRIGHT-PIERCE
Engineering a Better Environment

CORRTECH
CORROSION UNDERSTOOD

April 26, 2022

Mr. Darrin Lary
Wright Pierce
11 Bowdoin Mill Island, Suite 140
Topsham, ME 04086

RE: Cathodic Protection System Installation, Engineering Support and Materials
8 and 10-in DIP Water Line, West Gardiner Service Plaza, Maine Turnpike Authority
CorrTech Proposal No. 15719

Dear Mr. Lary,

CorrTech Inc. is pleased to submit this proposal to provide installation oversight, materials and testing and documentation for the completed cathodic protection systems being installed on the ductile iron pipe segments, at the West Gardiner Service Plaza. This proposal is based on the following information:

Sketch from Wright-Pierce of HDPE replacement pipe

CorrTech has included in the following materials in this proposal:

- 40 count – zinc anodes, 24-pounds
- 40 count – Thermite Weld Shots and (1) mold
- 200 feet – AWG 10 HMWPE Cable for Anode Bonding
- 200 feet – AWG 6 HMWPE Cable for Pipe Bonding
- 2 count – flush mount test stations
- 2 gallons – bitumastic pipe coating (for thermite weld coating)

A total of four (4) anodes would be installed at each excavation, two (2) on each side of the pipe. At every other pipe joint, the piping will be electrically bonded for continuity of the system. Where the ductile iron piping transitions to HDPE pipe, a total of six (6) anodes will be installed, three (3) on each side of the pipe. A total of two (2) flush mounted test stations would be installed, per field convenience, to facilitate future testing of the system.

System Test & Activation and Final Report

Upon completion of the system installation, the pipe should be backfilled so that CorrTech would energize and test all components to verify proper installation and overall cathodic protection system effectiveness. This testing will be performed in accordance with common engineering practice and NACE Standard Practice SP0169. CorrTech would provide a NACE International Cathodic Protection Technician for this phase of the work. A brief field report documenting the installation would be submitted.

FEE SCHEDULE

The following fee schedule is presented for this proposal:

Service Description	**Fee**
Cathodic Protection Materials, Lump Sum	$9,200.00
Installation oversight during construction, inclusive of travel expenses, Day Rate	$3,600.00
Testing and Final Report, Lump Sum	$4,800.00
TOTAL	**$17,600.00**

This proposal is based on the following conditions:

1. CorrTech would oversee installation of the materials in one (1) excavation provided by others.
2. This proposal is valid until 8/30/22.

CorrTech's attached Standard Terms and Conditions will apply to this project. By providing your duly authorized signature below, you agree that the parties relationship, and the services to be provided, under this proposal shall be subject solely to CorrTech's Standard Terms and Conditions, and that any terms and conditions on your purchase order or other form that may vary from, conflict with, or purport to add to or modify, CorrTech's Standard Terms and Conditions shall not apply, even though such form may state otherwise. CorrTech hereby objects in advance to all such competing terms and conditions.

Please review the attached Standard Terms and Conditions carefully and let us know if you have any questions about them. If the scope of services, terms and conditions, and fee described herein is acceptable, then please indicate your acceptance by signing below and returning one original to our office.

Written authorization is needed before work can be scheduled. If you have any questions or comments, please contact me at 508-435-0090.

Respectfully submitted,

Scott Paul, P.E
President
NACE Corrosion Specialist No. 4163

CONTRACT AUTHORIZATION

I, the undersigned, hereby represent that I am authorized to sign this proposal on behalf of Wright Pierce and that my signature constitutes a binding acceptance of this proposal No. 15719 as a valid and enforceable agreement between CorrTech, Inc and Wright Pierce.

Date:	By: Authorized Representative
Print Name:	

PO# Assigned (if any)	Billing Contact Name
Address:	2nd Line or PO Box
City:	State/ Zip:
Phone:	E-Mail

Any Special Billing instructions should be listed below:

STANDARD TERMS AND CONDITIONS

1. CorrTech, Inc.

   a) CorrTech, Inc. ("CorrTech") agrees to provide Client with the services set forth in the proposal pursuant to the terms and conditions ("Terms and Conditions") set forth herein. Together, the proposal and the Terms and Conditions shall constitute the complete agreement between CorrTech and the Client ("Agreement") for the services described in the proposal. If there is a conflict between the proposal and these Terms and Conditions, these Terms and Conditions shall control.

   b) Client shall designate in writing a person to acts as its Authorized Representative with respect to this Agreement.

   c) Client shall provide all information and criteria as to Client's requirements, objectives, and expectations for CorrTech's services including all numerical criteria that are to be met and all standards for development, design, or construction.

2. Billing and Payment

   a) Client agrees to pay CorrTech in accordance with the rates, charges, and/or amount set forth in the attached proposal. Invoices for CorrTech's services will be submitted either periodically or upon completion of such services, at the election of CorrTech. All such invoices shall be due and payable upon receipt unless both parties agree in writing to different terms.

   b) In the event payment is not timely made, the overdue balance shall bear interest at 1.5 percent per month or the maximum lawful allowable rate, whichever is higher.

   c) Client's failure to pay any invoice due to CorrTech within agreed upon terms will constitute a breach of this Agreement. Without waiving any other claim or right against Client, CorrTech may elect to terminate its performance of services upon failure by Client to pay amounts owed CorrTech when due by providing Client with ten (10) days written notice of CorrTech's intent to terminate. In the event of a termination by CorrTech, Client shall pay CorrTech for all services performed as of the date of termination, as well as all reasonable costs incurred as a result of such termination, including, but not limited to, interest, lost profits, and reasonable legal fees. The waiver by CorrTech of any of its rights under this Agreement in any one or more instance shall not constitute a waiver of any other rights hereunder or of such rights on any future occasion.

3. Right of Entry

a) Client hereby grants to CorrTech and its agents, staff, consultants, and contractors or subcontractors permission and the right to enter upon the subject worksite for the purpose of performing all acts, studies, and research in accordance with the proposal ("Right of Entry"). Should Client not own the site, Client warrants and represents by acceptance of the proposal that it has authority and permission of site owner and any site occupant to grant CorrTech this Right of Entry.

b) Client represents and acknowledges that it is now and shall remain in control of the site at all times. CorrTech shall have no responsibility or liability for any aspect or condition of the site, now existing or hereafter arising or discovered. CorrTech does not, by this Agreement, assume any responsibilities or liability with respect to the site.

4. Site Disturbance Resulting from Work

a) Client hereby recognizes that the use of equipment necessary to perform CorrTech's services may affect, alter, or damage the terrain, vegetation, buildings, structures, and equipment in, at, or upon the site. CorrTech shall not be liable to Client for such effect, alteration, or damage. CorrTech will take reasonable precautions to limit such effects, alterations and damage.

b) Client shall provide CorrTech with all previous studies, plans, or other documents pertaining to the work in Client's possession or reasonably obtainable by Client, in support of CorrTech's services. CorrTech will use reasonable care, to locate subsurface structures in the vicinity of CorrTech's subsurface explorations. Client recognizes that it is impossible for CorrTech to assure the sufficiency of such information. Accordingly, Client waives any claim against CorrTech, and agrees to defend, indemnify and hold CorrTech harmless from any claim or liability for injury or loss allegedly arising from errors, omissions, or inaccuracies in documents or other information provided to CorrTech from Client, or from CorrTech's reasonable reliance on such documents or information.

5. Standard of Care

CorrTech shall perform its services in a professional manner consistent with the standard of care applicable to similar services in the jurisdiction where the project is located ("Standard of Care"). Client agrees that CorrTech is providing no warranty or guarantee, either expressed or implied, in connection with its services, unless expressly contained in these Terms and Conditions.

6. Insurance

CorrTech represents and warrants that its staff is protected by Worker's Public Liability and Property Damage insurance policies. Client agrees that CorrTech will not be liable or responsible to Client for any loss, damage, or liability beyond the amounts, limits, exclusions, and conditions of such insurance.

7. Construction Observation Services

a) Client agrees that any and all construction services related to CorrTech's services will be performed by a contractor retained by Client ("Contractor"), and that CorrTech shall have no responsibility or obligation for the performance of Contractor.

b) The purpose of CorrTech's site visits will be to enable CorrTech to better carry out the duties and responsibilities specifically assigned to CorrTech in this Agreement. CorrTech shall not, during such visits, or at any time, or as a result of CorrTech's observations of Contractor's work, supervise, direct, or have control over Contractor's work, nor shall CorrTech have authority over or responsibility for the means, methods, techniques, equipment choice and usage, sequences, schedules, or procedures of construction selected by Contractor, for safety precautions and programs incident to Contractor's work, nor for any failure of Contractor to comply with laws and regulations applicable to Contractor's furnishing and performing its work, including, but not limited to, those under the Occupational Safety and Health Act of 1970. Accordingly, CorrTech neither guarantees the performance of any Contractor nor assumes responsibility for any Contractor's failure to furnish and perform its work in accordance with the Contract Documents.

c) It shall be Client's responsibility to notify the appropriate federal, state, or local public authorities or agencies, as required by law or otherwise of any condition that could in any way constitute a danger or threat to public health, safety, or the environment, arising out of, or in any way related to work performed in accordance with CorrTech's services.

8. Documents

All logs, field data, field notes, laboratory test data, calculations, estimates, and other documents prepared by CorrTech shall constitute CorrTech's instruments of service, and shall remain the property of CorrTech. CorrTech will retain all pertinent records relating to the services performed for a period of five (5) years following submission, during which period, the records will be made available to Client at CorrTech's office at all reasonable times. Copies will be prepared by CorrTech for Client for reasonable cost of reproduction.

9. Governing Law and Severability

a) This Agreement shall be governed by the laws of the State or jurisdiction in which the CorrTech office that issued the proposal is located, excluding any rule or principle that would refer to and apply the substantive law of another State or jurisdiction.

b) Each provision of this Agreement is severable and distinct from and independent of every other provision hereof. If one provision is declared void or unenforceable, the remaining provisions shall remain in effect. The terms contained in Section 9 shall survive the termination or expiration of this Agreement.

10. Indemnification

To the fullest extent allowed by law, Client shall indemnify and hold CorrTech, its affiliates, directors, officers, employees and agents harmless from and against all claims, losses, damages, liabilities, costs, attorney fees and expenses sustained or incurred, directly or indirectly, to the extent arising out of or relating to this Agreement, including, but not limited to, the negligent acts, errors, omissions, the treatment, storage, disposal or transportation of toxic or hazardous waste or contaminating substance, violation of any federal, state, or local statute, regulation, or ordinance relating to hazardous waste and environmental contamination by Client, its affiliates, directors, officers, employees, contractors and agents in the performance of professional Services by Engineer and its Sub-consultants.

11. Confidentiality

As a result of the performance of CorrTech's services, CorrTech may have access to information and materials of a highly sensitive nature belonging to Client, including confidential information. CorrTech agrees that CorrTech shall not, without Client's prior written consent, disclose, make commercial or other use of, or give or sell to any person, firm, or corporation, any confidential information received directly or indirectly from Client or acquired or developed in the course of the performance of this Agreement unless: (1) required to do so pursuant to applicable law; or (2) it is rightfully in the possession of CorrTech from a source other than Client prior to the time of disclosure of the information to CorrTech under this Agreement; or (3) it was in the public domain prior to the time of the CorrTech's receipt; or (4) it was independently developed by CorrTech prior to the time of receipt.

12. Claims and Disputes

a) Any and all claims, disputes or other matter in question arising out of or related to the services provided by CorrTech shall be subject to mediation as a condition precedent to binding dispute resolution. If such matter relates to or is the subject of a lien arising out of the Architect's services, the Architect may proceed in accordance with applicable law to comply with the lien notice or filing deadlines prior to resolution of the matter by mediation or by binding dispute resolution. Unless the parties mutually agree otherwise, mediation shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in a place mutually agreed upon.

b) If the parties do not resolve a dispute through mediation, the dispute shall be subject to [arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement] [or] [litigation in a court of appropriate jurisdiction in the state or jurisdiction in which the CorrTech office that issued the proposal is located.

13. Limitation of Liability

a) CorrTech and Client waive consequential damages for claims, disputes or other matters in question arising out of or relating to CorrTech's services.

b) To the fullest extent permitted by law, the total liability of CorrTech, its officers, directors, employees, agents, and contractors to Client, for any and all injuries, claims, losses, expenses, or damages whatsoever arising out of or in any way related to CorrTech's services, the project or this Agreement shall not exceed the total compensation received from CorrTech under this Agreement.

14. Delays

In the event that CorrTech's services are interrupted due to causes beyond its control, CorrTech shall be compensated by Client for the labor, equipment and other costs CorrTech incurs in order to maintain his or her workforce for Client's benefit during the interruption. Notwithstanding the foregoing, CorrTech shall not hold Client responsible for damages or delays caused by acts of God or other circumstances beyond Client's control, and which could not reasonably be anticipated or prevented.