

**YOUR GOALS. OUR MISSION.**

NBRU-00066

August 12, 2019

Anthony Coppola  
New Jersey Department of Environmental Protection  
401 E State Street  
Trenton, NJ 08608

**Re: Water Treatment Plant Meter & Scada Integration Project  
North Brunswick Township, County of Middlesex  
Project No. S340888-02 (Contract 2)  
24-inch Insertion Valve - AIS Waiver Request**

Dear Mr. Coppola,

The Township of North Brunswick is installing a new Finished Flow Meter and respective vault at their Water Treatment Plant. This includes removing the existing piping, installing new water meter vault, roughly 15-LF of 18-inch DIP, two (2) 24"x18" Mechanical Joint Reducers and one (1) 24-inch insertion valve as manufactured by Hydra-Stop. All products, except for the 24-inch Insertion Valve, follow the AIS requirements.

As previously discussed, 24-inch insertion valves are presently not produced within the United States. Therefore, it makes it difficult to follow the AIS requirements for this service. If the Township is required to use an AIS complaint valve, and cannot utilize the 24-inch insertion valve, the Township will be required to shut down the Treatment Plant and rely on emergency interconnections at a cost of \$10,000 per day in order to make their installations of the new meter, piping and vault. The work is schedule to take 2 weeks to complete. The cost of purchasing water for the two-week period would add approximately \$140,000 to the project.

In 2016, the U.S. Environmental Protection Agency granted a project waiver pursuant to the "American Iron and Steel" requires of the Clean Water Act Section 608 under the authority of Section 608(c)(2) to the Cape May County Municipal Utilities Authority in New Jersey for the purchase of One (1) 24-inch insertion valve, as they experienced similar circumstances. It is requested that a similar waiver be implemented for the purchase of one (1) 24-inch insertion valve as manufactured by Hydra-Stop on this project as well. The supporting documents are enclosed.

If you have any questions, or require additional information, please call.

Very truly yours,  
T&M ASSOCIATES

  
VITO SPADAVECCHIA  
DEPARTMENT MANAGER

VS:DN

Enclosures

cc: Dave Helfrich, New Jersey Department of Environmental Protection  
Pete Peterson, American Water  
Kathryn Monzo, Business Administrator  
Justine Progebin, Assistant Business Administrator

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**SHOP DRAWING REVIEW**

***Insertion Valve***

*Shop Drawing # 02731-01*

- NO EXCEPTIONS TAKEN**
- EXCEPTION TAKEN AS NOTED**  
No Reply Required Unless Checked Below
- NOTE EXCEPTIONS AND CONFIRM IN WRITING**
- REVISE AS NOTED / RESUBMIT FOR REVIEW**
- REJECTED / RESUBMIT AS SPECIFIED**
- SUBMITTAL NOT REQUESTED OR NO ACTION  
REQUIRED / RETURNED WITHOUT REVIEW**

Our review is only to assess general conformance with the design concept of the Project and the applicable Contract Documents. Contractor is responsible for dimensions to be confirmed and coordinated at the job site, for information that pertains solely to the fabrication process or to the means and methods of construction, coordination of the work of all trades, and performing all work in a safe and satisfactory manner. This review (including noted corrections/comments) does not modify Contractor's duty to comply with the Contract Documents.

**BY:** Alexander Bar   
**Date:** 7/30/2019

**Project Name:** Water Treatment Plant Meter & SCADA  
Integration

**Project Number:** NBRU-00066

**Contractor:** VNL INC

**Comments:**

1. Approval is subject to and AIS requirement waiver being granted by the NJDEP and EPA.

## Appendix 2: HQ Review Checklist for Waiver Request

Instructions: To be completed by EPA. Review all waiver requests using the questions in the checklist, and mark the appropriate box as Yes, No or N/A. Marks that fall inside the shaded boxes may be grounds for denying the waiver. If none of your review markings fall into a shaded box, the waiver is eligible for approval if it indicates that one or more of the following conditions applies to the domestic product for which the waiver is sought:

1. The iron and/or steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality.
2. The inclusion of iron and/or steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

Review Items	Yes	No	N/A	Comments
<b>Cost Waiver Requests</b> <ul style="list-style-type: none"> <li>• Does the waiver request include the following information?                             <ul style="list-style-type: none"> <li>– Comparison of overall cost of project with domestic iron and steel products to overall cost of project with foreign iron and steel products</li> <li>– Relevant excerpts from the bid documents used by the contractors to complete the comparison</li> <li>– A sufficient number of bid documents or pricing information from domestic sources to constitute a reasonable survey of the market</li> </ul> </li> <li>• Does the Total Domestic Project exceed the Total Foreign Project Cost by more than 25%?</li> </ul>				
<b>Availability Waiver Requests</b> <ul style="list-style-type: none"> <li>• Does the waiver request include supporting documentation sufficient to show the availability, quantity, and/or quality of the iron and/or steel product for which the waiver is requested?                             <ul style="list-style-type: none"> <li>– Supplier information or other documentation indicating availability/delivery date for materials</li> <li>– Project schedule</li> <li>– Relevant excerpts from project plans, specifications, and permits indicating the required quantity and quality of materials</li> </ul> </li> <li>• Does supporting documentation provide sufficient evidence that the contractors made a reasonable effort to locate domestic suppliers of materials, such as a description of the process for identifying suppliers and a list of contacted suppliers?</li> <li>• Based on the materials delivery/availability date indicated in the supporting documentation, will the materials be unavailable when they are needed according to the project schedule? (By item, list schedule date and domestic delivery quote date or other relevant information)</li> <li>• Is EPA aware of any other evidence indicating the non-availability of the materials for which the waiver is requested? Examples include:                             <ul style="list-style-type: none"> <li>– Multiple waiver requests for the materials described in this waiver request, for comparable projects in the same State</li> <li>– Multiple waiver requests for the materials described in this waiver request, for comparable projects in other States</li> <li>– Correspondence with construction trade associations indicating the non-availability of the materials</li> </ul> </li> <li>• Are the available domestic materials indicated in the bid documents of inadequate quality compared those required by the project plans, specifications, and/or permits?</li> </ul>	Yes			emails are included to show lack of availability
	Yes			emails
			NA	
	Yes			1 waiver for another project in NJ.
	Yes			emails specify no other adequate values

## Appendix 1: Information Checklist for Waiver Request

The purpose of this checklist is to help ensure that all appropriate and necessary information is submitted to EPA. EPA recommends that States review this checklist carefully and provide all appropriate information to EPA. This checklist is for informational purposes only and does not need to be included as part of a waiver application.

Items	✓	Notes
<p>General</p> <ul style="list-style-type: none"> <li>• Waiver request includes the following information:               <ul style="list-style-type: none"> <li>— Description of the foreign and domestic construction materials</li> <li>— Unit of measure ✓</li> <li>— Quantity ✓</li> <li>— Price ✓ <i>email</i></li> <li>— Time of delivery or availability ✓</li> <li>— Location of the construction project ✓</li> <li>— Name and address of the proposed supplier ✓</li> <li>— A detailed justification for the use of foreign construction materials ✓</li> </ul> </li> <li>• Waiver request was submitted according to the instructions in the memorandum</li> <li>• Assistance recipient made a good faith effort to solicit bids for domestic iron and steel products, as demonstrated by language in requests for proposals, contracts, and communications with the prime contractor ✓</li> </ul>	✓	
<p>Cost Waiver Requests</p> <ul style="list-style-type: none"> <li>• Waiver request includes the following information:               <ul style="list-style-type: none"> <li>— Comparison of overall cost of project with domestic iron and steel products to overall cost of project with foreign iron and steel products</li> <li>— Relevant excerpts from the bid documents used by the contractors to complete the comparison</li> <li>— Supporting documentation indicating that the contractor made a reasonable survey of the market, such as a description of the process for identifying suppliers and a list of contacted suppliers</li> </ul> </li> </ul>		
<p>Availability Waiver Requests</p> <ul style="list-style-type: none"> <li>• Waiver request includes the following supporting documentation necessary to demonstrate the availability, quantity, and/or quality of the materials for which the waiver is requested:               <ul style="list-style-type: none"> <li>— Supplier information or pricing information from a reasonable number of domestic suppliers indicating availability/delivery date for construction materials ✓ <i>emails</i></li> <li>— Documentation of the assistance recipient's efforts to find available domestic sources, such as a description of the process for identifying suppliers and a list of contacted suppliers. ✓ <i>emails</i></li> <li>— Project schedule ✓</li> <li>— Relevant excerpts from project plans, specifications, and permits indicating the required quantity and quality of construction materials ✓</li> </ul> </li> <li>• Waiver request includes a statement from the prime contractor and/or supplier confirming the non-availability of the domestic construction materials for which the waiver is sought ✓</li> <li>• Has the State received other waiver requests for the materials described in this waiver request, for comparable projects? ✓</li> </ul>		

SECTION 02731

SITE PIPING AND FITTINGS

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. The construction of the site and piping, as shown on the contract drawings and in accordance with these specifications.
- B. Work shall include cutting and removal of existing pavement; trench excavation; dewatering trench; maintenance of service, location and protection of existing utilities; permanent and temporary sheeting and bracing as required to protect the work and adjacent structures; laying, joining, permanent trench repair including pavement repair; furnishing, installing and testing of all pipes, fittings, plugs, and other materials required to construct the piping and connection to existing and new piping as shown on contract documents, bedding, backfilling, restoration and clean up, accessories, appurtenances and miscellaneous work.
- C. The work shall also include the making of all connections to pipelines and appurtenances; furnishing and installation of all valves, piping, flexible joints, expansion joints, line stops, wet taps, appurtenances, coating and painting installation of concrete thrust blocks and supports; all as specified herein and as shown on the Drawings.

1.02 RELATED WORK

- A. Section 02015 – Utility Test Pits
- B. Section 02200 – Earthwork
- C. Division 15 – Mechanical

1.03 SYSTEM DESCRIPTION

- A. Site piping shall be constructed in strict accordance with the Rules and Regulations of the NJ Department of Environmental Protection.
- B. Pipe and fitting materials, and jointing shall be in accordance with the following schedule. This schedule is set forth as a guide to illustrate requirements. The lack of specific mention of any particular pipeline does not relieve the Contractor from the responsibility for furnishing, installing, painting, and testing same, in accordance with the requirements of these specifications and the following schedule:

SCHEDULE OF PIPE AND FITTINGS
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DESCRIPTION	MATERIAL	JOINTING
Force Mains (Buried)	Ductile Iron Pipe	Mechanical Joint
Force Mains (Non-Buried)	Ductile Iron Pipe	Flanged
Potable Water	Copper	Sweat

- C. Bedding shall be provided under all buried pipes unless indicated otherwise.
- D. Beveled pipes, elbows, wyes, tees, and other special pipes shall conform to the specifications for straight pipe, insofar as such specifications are applicable. Where special design or construction is necessary for such pipes, the design and construction shall be subject to the approval of the Engineer.
- E. A minimum of 3.0 ft. of cover shall be provided for all buried pipe unless indicated otherwise.
- F. All exposed piping shall be furnished with pipe insulation where required (except air piping).

#### 1.04 REFERENCES

- A. American Society for Testing and Material Standards
- B. American Water Works Association Standards
- C. American National Standards Institute
- D. NJ Standard Specifications for Road and Bridge Construction, latest edition.

#### 1.05 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data and installation instructions for all equipment and products of this section. Piping system shall include pipes, valves, valve operators, connections, fittings, fasteners, seals, and all other components as shown on plans, described in specifications, and/or as necessary to make a complete piping system.
- B. Shop Drawings: Submit shop drawings for all piping systems, showing piping materials, size, locations, and centerlines (for internal pipe) or inverts (for external pipe). Include details of underground structures, connections, supports, and cleanouts. Show interface and spatial relationship between piping and proximate structures.
- C. Record Drawings: At project closeout, submit record drawings of installed piping

and products, in accordance with contract requirements.

## PART 2 - PRODUCTS

### 2.01 DUCTILE IRON PIPE

#### A. Ductile Iron Pipe, Joints, and Fittings:

1. Non-Flanged Pipe: Conform to ANSI/AWWA C151 for material, pressure, dimensions, tolerances, tests, markings, and other requirements.
  - a. Pressure Class: As specified in piping schedules in Section 33 05 05, Buried Piping Installation
  - b. Push-On Joints: Comply with ANSI/AWWA C111 and ANSI/AWWA C151, capable of meeting pressure class or special thickness class, and test pressure specified in piping schedules in Section 33 05 05, Buried Piping Installation.
    - 1) Gaskets: Vulcanized SBR, unless otherwise specified.
    - 2) Stripes: Each plain end shall be painted with a circular stripe to provide a guide for visual check that joint is properly assembled.
    - 3) Products and Manufacturers: Provide one of the following:
      - a) Tyton Joint by U.S. Pipe and Foundry Company.
      - b) Or equal.
2. Restrained Joints for Water Main: Restrained push-on joints shall be capable of being deflected after full assembly. Field cuts of restrained pipe are not allowed without approval of ENGINEER.
  - 2) Products and Manufacturers: Provide restrained joints for push-on joint piping by one of the following:
    - a) Field Lok 350 Gasket by U.S. Pipe and Foundry Company for up to 24 inches in diameter.
    - b) TR Flex by U.S. Pipe and Foundry Company for up to 36 inches in diameter.
    - c) Or equal.

### 2.02 PVC PIPE

- #### A.
- Polyvinyl chloride (PVC) pipe, fittings, and valves for pressure piping shall be manufactured from a PVC compound which meets the requirements of ASTM D1784, Specification for Rigid Polyvinyl Chloride (PVC) Compounds and Chlorinated Polyvinyl Chloride (CPVC) Compounds and scheduled as required to conform to the latest requirements of ASTM D1785 for Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120, or AWWA Standard C900-75 for Polyvinyl Chloride (PVC) Pressure Pipe, 4" through 12", for Water. Fittings shall conform to the requirements of ASTM D2466 and ASTM D2467 for Socket - Type Polyvinyl Chloride (PVC) Plastic Pipe fittings, Schedule 40 and Schedule 80, respectively. Valves shall be manufactured of the same PVC molding

compound as the fittings to assure compatibility. All socket-type connections shall be jointed with primers and solvent cements complying to ASTM D2564, Solvent Cements for Polyvinyl Chloride (PVC) Plastic Pipe and Fittings. Threaded fittings shall conform to the requirements of ASTM D2464, Threaded Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80. Push-on joints for bell-end PVC 1120 pressure pipe shall utilize approved elastomeric gasket couplings.

- B. PVC gravity sewer pipe and fittings shall be made from PVC components as defined and described in ASTM D1784 for rigid polyvinyl chlorine compounds. Rubber gaskets shall be marked to indicate nominal pipe sizes and proper insertion direction and shall meet requirements of ASTM F-4777. All PVC gravity sewer pipe and fittings 4" through 15" shall be SDR-35 and shall meet all requirements of ASTM D3034 and gravity sewer pipe and fittings 18" through 27" (wall thickness T-1) shall meet requirements of ASTM F679. The joints shall meet the requirements of ASTM D3212.

### 2.03 FLEXIBLE COUPLINGS

- A. Flexible coupling shall be utilized to join pipes at locations indicate on the Drawings and shall be as manufactured by Dresser Industries, Inc., or equal. All cast iron flexible couplings shall be coated in accordance with Section 09900 and supplied with 316 stainless steel bolts to protect against corrosion. Flexible coupling sizes are nominally noted on plans; however, Contractor shall confirm actual pipe sizes to be used with coupling and order coupling accordingly.
- B. Victaulic couplings shall conform to specifications ANSI/AWWA C-606, as shall the pipe used in conjunction with these couplings. The housing shall be of ductile iron conforming to ASTM A-536 or malleable iron conforming to ASTM A-47. The gasket shall be of halogenated butyl material and be resistant to sludge, sewage, saltwater, and sodium hypochlorite (less than 1% concentration).

### 2.04 D.I.P. LINE CAPS

- A. Ductile iron caps shall be installed as shown on the plans or as directed by the engineer. The caps shall be mechanical joint fittings and be fully protected with adequate thrust blocking. The caps shall conform to all requirements outlined under ANSI/AWWA C110/A21.10 for caps and plugs.
- B. The Contractor is to conduct cutting and capping of pressurized line during the night when usage is lowest. Contractor is to coordinate with the Owner for the cut-in times and location of adjacent valves.

### 2.05 CONCRETE THRUST BLOCKS

- A. Class of concrete for thrust blocks shall be as shown on the detail in plans and shall



have a minimum twenty-eight (28) day comprehensive strength of 2,500 lbs. per square inch. All materials shall conform to the applicable provisions of the latest edition of Section 914 of the NJDOT Standard Specifications for Road and Bridge Construction.

## 2.06 LINE STOP BYPASS

- A. Line stops bypass fittings shall be installed as shown on the plans or as determined by the Engineer.
- B. Line stopping shall include sleeve, valve stopper, etc. Line stop shall be left in place unless otherwise directed by the Engineer. Line stop shall be made by TDW Services, Inc., New Castle, DE, 800-828-1988, or equal.

## 2.07 INSERTION VALVE

- A. The Contractor shall provide equipment capable of installation of an insertion valve without shutdown of flow in the pipe. The Contractor's equipment shall be capable of inserting a valve into a pipe in the range of 4" to 24".
- B. Insertion valves shall be EZ Insertion Valves manufactured by Advanced Valve Technologies, Inc. or equal. Size to be as indicated on plans.
- C. The valve shall be capable of pressure-tight assembly to exterior of the pipe in which flow is to be stopped at a working pressure not to exceed 250 PSI and shall meet or exceed AWWA Specification C509 for Resilient Seal Valves.
- D. The Ductile Iron Gate shall have a resilient rubber seal, 360 degrees around the gate and is expandable to the ID (Inside Diameter) of the pipe.
- E. The valve body shall have an epoxy/ E Coating of no less than 8 mills.
- F. The valve shall use Stainless Steel fasteners joining the Valve Bonnet to the Valve top casting, unless otherwise noted in assembly drawings.
- G. The Contractor shall test pit the pipe to determine pipe size and material prior to construction. The Contractor shall be responsible for selecting the size and type of valve to work with the existing pipe.
- H. The proposed insertion valve and installation procedure shall be submitted in the form of a shop drawing for Engineer's review and approval prior to construction.

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. Where pipe crossings occur, the lower pipe shall be laid first and all backfill

compacted to the level of the higher pipe before the higher pipe is laid. At the discretion of the Engineer, backfill material under such conditions may be earth, broken stone or 2500 PSI concrete.

- B. The extent of excavation shall conform to the dimensions provided in the construction details. If the Contractor exceeds these dimensions, it shall replace the specified pipe with a pipe of greater crushing strength, or install pipe in a higher class bedding, or both, as directed by the Engineer at no increase in cost to the Owner. The extent of excavation open at any time shall not exceed 50 linear feet per pipe crew.
- C. If, in the opinion of the Engineer, the material at or below the grade to which the excavation would normally be carried is unsuitable for foundation of DIP pipe, it shall be removed to such widths and depths as directed and be replaced with coarse aggregate as specified under Section 02200.
- D. If the bottom of any excavation is taken beyond the limits indicated on the drawings and details or in accordance with the preceding specifications, it shall be backfilled at the Contractor's expense with compacted granular material or crushed stone to the pipe subgrade designated on the plans. No additional payment will be made for excavation and/or backfill below the grade shown on the plan.
- E. All suitable excavated materials shall be temporarily stored on-site in such a manner as to not interfere with traffic or to cause overloading of the sides of the trench.
- F. If, in the opinion of the Engineer, the material from a portion of the pipe trench is unsuitable for backfill, it shall be removed and disposed of at an off-site location.
- G. All pipe shall be laid on a solid, dry foundation. Pipe shall be laid true to the lines and grades shown on the Contract Drawings with the bell ends upstream. Each section of pipe shall rest upon the pipe bed the full length of its barrel and for a minimum of one-half its diameter with recesses excavated to accommodate bells and joints. Any pipe which has its grade or joints disturbed after laying shall be taken up and relaid at the Contractor's expense. The Contractor shall close the ends of all unconnected pipe with a waterproof stopper. Bedding shall be in conformance with the standard detail and the provisions of Section 02200.
- H. All pipes and joints shall be installed in accordance with the manufacturer's requirements. When the requirements contained in this specification exceed the manufacturer's specifications, the specifications contained herein shall govern.
- I. All pipe shall be joined in strict accordance with the manufacturer's specifications. Voids under joints shall be filled with proper bedding material compacted thoroughly in accordance with Section 02200.
- J. Piping and appurtenances shall be cleaned of foreign matter before being lowered

into the trench and shall be kept clean during the laying operations by plugging or other approved means. Cutting of pipe shall be done in a neat and workmanlike manner with an approved type of mechanical cutter without damage to the pipe or lining so as to leave a smooth end at right angle to the axis of the pipe.

- K. The vertical separation at a crossing of sewer and water shall be at least 18" with water on top. Where this is not possible the sewer shall be encased in concrete for a distance of at least 10 feet on either side of the crossing and in conformance with concrete encasement detail.
- L. As the installation of new sewer pipe proceeds, the Contractor shall reconnect all lateral service connections to provide temporary sewer service until the completion of lateral house connection works. It will be necessary in these instances to place newly installed sewers into service prior to the completion of the entire project. The Contractor shall include all costs occasioned by such opening in the price bid for the various items of work. All insurances, bonds, and guarantees shall be in effect in accordance with the provisions of the Contract Documents, and shall not be affected by the prior use of completed sections of the work.
- M. As the installation of new sewer pipe proceeds, the Contractor shall reconnect all live lateral service connections in accordance with the methods specified herein.
- N. Joints of piping, couplings, fittings and specials, whether push-on type, flange, or mechanical type, shall be made up in accordance with the manufacturer's printed recommendations.
- O. At areas where ductile iron pipe runs parallel to cathodically protected utility lines on the same side of the road or where ductile iron pipe and utility lines cross, the ductile iron pipe shall be protected by encasing it with polyethylene plastic pipe encasement. The polyethylene shall be applied loosely but continuously around the entire circumference of the pipe to the required limits with joints in plastic made by overlapping a minimum of 1 foot and securing with 2" wide polyethylene adhesive tape. Care shall be taken in the installation and backfilling operation to prevent tearing the plastic and exposing the metal pipe.
- P. All gaskets and mating surfaces shall be thoroughly cleaned and lubricated in accordance with the manufacturer's specifications. The pipe shall be aligned with the previously installed pipe and, with gasket in place, put together. After pipes are put together, the joint shall be inspected to verify that gasket is properly positioned and that the joint has been properly made and is tight.
- Q. If, while making the joint, the gasket becomes loose or misplaced, the pipe shall be removed and the joint remade watertight.
- R. Unless otherwise approved by the Engineer, the Contractor shall backfill and compact all trenches at the end of each working day with suitable material from the

trench excavation or temporary stockpile.

- S. All trenches shall be paved with bituminous stabilized base in accordance with these specifications within 24-hours of completion of backfill and compaction, unless approved otherwise by Engineer. Backfill shall be brought to elevations which allow construction of paving specified elsewhere in these specifications.
- T. If, in the opinion of the Engineer, the excavated material is unsuitable, and material from temporary stockpile material is unavailable, select off-site material shall be provided as described under Section 02200, Earthwork.
- U. Upon completion of construction, all dirt and other foreign material shall be removed from pipelines and their appurtenances.
- V. The Contractor shall, as indicated on the plans, locate, disconnect, and plug the existing water mains to be abandoned.
- W. Existing storm drains in roadways which are disturbed during construction shall be repaired. A brick collar shall be built around the joint and floated with a cement layer.

### 3.02 LAYING AND JOINT-GENERAL

- A. All interior (non-buried) ductile iron and steel pipe shall be painted and shall therefore be supplied without outside bituminous coating. All buried ductile iron piping in appurtenances shall receive outside bituminous coating in accordance with AWWA C106-70.
- B. Jointing shown as mechanical may be replaced with approved rubber gasketed push-on joint at the Contractor's option with the approval of the Engineer.
- C. Any damage to new or existing structures or piping occurring through settlement, water or earth pressure, or other causes due to inadequate bracing or through negligence or fault by the Contractor in any other manner, shall be repaired by the Contractor at its own expense.
- D. At the completion of the pipe installation and prior to backfill, the Contractor shall assist the Engineer in the preparation of As-Built Drawings showing the location of the pipe with reference to the job base lines, grade, and elevations at the entrance of the structures. Specials such as valves, tees, etc., shall be shown and accurately located.
- E. All pieces shall be carefully examined for defects, and no piece known to be defective shall be laid. Any defective piece discovered after laying, shall be removed and replaced in a satisfactory manner, regardless of any prior approvals.
- F. All pipe and castings shall be thoroughly cleaned before being lowered into the trench, or before jointing. The exposed ends of all uncompleted lines shall be closed with tight wooden plugs adequately set and thoroughly secured. Pipe shall be laid in a manner to assure that valve stems and boxes will be set plumb.
- G. Special care shall be exercised at the outside face of structures and manholes to support piping bridging the excavation for such structures or manholes. The pipe shall be supported by compacted gravel bedding or Class D concrete or Class C concrete piers as directed by the Engineer. The cost for these supports shall be deemed included in the lump sum and/or unit price bid for the work.
- H. Where required for proper location of laterals, valve fittings, or other castings, or for any other purpose or where ordered, pipe or fittings shall be cut with approved pipecutter. Cutting shall be carefully done by experienced men, in such a manner as to leave a smooth end normal to the axis of the pipe.
- I. Concrete thrust blocks shall be provided on all pressure buried pipelines, all tees, bends, dead-ends, and where required by the Engineer. Thrust block placement and size shall be as indicated on the detail "Thrust Blocks Table." Class of concrete for thrust blocks shall be as shown on the detail in plans and shall have a minimum 28-day compressive strength of 4,000 lbs. per square inch. All materials shall conform

to the applicable provisions of the latest edition of Section 914 of the NJDOT Standard Specifications for Road and Bridge Construction.

### 3.03 TESTING

- A. General: The Contractor shall provide all labor, materials, equipment, gauges, air, water, caps, plugs, taps, temporary bracing, and all else necessary to pressure test all piping systems installed under this Contract. Temporary bracing shall be dismantled and removed upon completion of the pressure test by the Contractor.
- B. The Contractor shall provide for hydraulic pressure test of the water main or force main before making the final connection into existing pipes as follows:
  - 1. Hydraulic pressure testing shall conform to AWWA Standard C-600.
  - 2. A hydrostatic test pressure shall be maintained in the pipeline for a minimum period of two (2) hours. At the end of the test period, if the test pressure has remained constant, the pipeline shall have passed the test. If the pipe does not hold pressure, the Contractor shall locate the leak, permanently repair the section of piping where the leak is occurring to the satisfaction of the Engineer, and retest the pipe line as specified above. This process shall be repeated until the pipeline has successfully passed the pressure test.
  - 3. Contractor shall make certain that all air is expelled from a pipe line before it is tested. All caps, plugs, and fittings shall be adequately braced and anchored to withstand the test pressures.
  - 4. Hydrostatic test pressure shall be 150 psi or 1.5 times the working pressure measured at the highest elevation in the pipeline under test, whichever is greater.
  - 5. The leakage test may be performed concurrently with the pressure test. If no pressure drop is seen during pressure test, the leakage test may be waived by the engineer.
  - 6. If leakage is encountered during the hydrostatic test, the Contractor shall begin this leakage test which shall be accomplished by increasing the hydrostatic pressure to a specified value and maintaining of water that must be supplied into the newly laid pipe, or any valved section thereof, to maintain the specified leakage test pressure after the air in the pipeline has been expelled.
  - 7. The hydrostatic pressure for the leakage test shall be 150 psi.
  - 8. Flanged, victaulic, and welded pipe lines shall no leakage at the test pressure. The leakage for mechanical joint, and push-on joint pipe lines shall not

exceed the allowable leakage computed by the following formula:

$$L = \frac{ND(P)^{1/2}}{7400}$$

where:

L = is the allowable leakage in gallons per hour.

N = is the number of joints in the length of the pipeline being tested.

D = is the nominal diameter of the pipe in inches.

P = is the average test pressure during the leakage test in pounds per square inch gauge.

### 3.04 INSPECTION AND REJECTION OF PIPE

- A. The quality of all materials, the process of manufacture, and the finished pipe shall be subject to inspection and approval of the Engineer. Such inspection may be made at the place of manufacture or on the work site after delivery, or at both places, and the pipe shall be subject to rejection at any time on account of failure to meet any of the specification requirements even though sample pipes may have been accepted as satisfactory at the place of manufacture.
- B. The Contractor shall submit to the Engineer, for its approval, material certificates from this manufacturer indicating that the pipe and fittings meet the specifications set forth herein.
- C. Any pipe or fitting which has been found to be damaged after delivery will be rejected and, if such pipe has already been laid in the conduit line, it shall be repaired in a manner acceptable to the Engineer or, at the Engineer's option, removed and replaced and made good solely at the Contractor's expense. The ends of the pipe shall be free of dents and gouges which will affect the tightness of the joint. ASTM and ANSI/AWWA specifications require rejection of any pipes or fittings containing cracks, holes, foreign inclusions, or other injurious defects.

### 3.05 MAINTENANCE OF SEWER SERVICE

- A. Wherever proposed pipe lines are in conflict with the existing piping during construction the Contractor shall maintain service by making a temporary connection between the two sides. The Contractor is responsible for choosing pipe, fittings, couplings, and restraints adequate to maintain the flow and system pressure of the existing piping system until the new piping system is fully operational.

END OF SECTION 02731