SECTION 33 14 16
SITE WATER UTILITY DISTRIBUTION PIPING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SECTION INCLUDES

A. Water pipe for site conveyance lines.

B. Pipe valves.

1.03 DESCRIPTION OF WORK

A. Exterior water distribution system work is shown on the drawings and includes all pipe, valves, meters if required, hydrants and other items required to provide service from 5 feet outside of building to tie in with local utility lines unless shown otherwise.

B. Contractor shall pay all cost required by the utility company pertaining to construction and tie-in. Deposits required for permanent service will be paid by the Owner.

1.04 RELATED REQUIREMENTS

A. Section 33 01 10.58 - Disinfection of Water Utility Piping Systems: Disinfection of site service utility water piping.

1.05 REFERENCE STANDARDS

A. Central Arkansas Water Standard Pipeline Materials and Construction Specifications, Latest Edition

1.06 DEFINITIONS

A. Bedding: Fill placed under, beside and to 6 inches over pipe, prior to subsequent backfill operations.

1.07 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on pipe materials, pipe fittings, valves and accessories.

C. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

D. Testing: Results of hydrostatic tests.ASTM B418

1.08 QUALITY ASSURANCE

A. Perform Work in accordance with utility company requirements.

B. Comply with applicable requirements of locally adopted plumbing codes.

C. Local codes and utility company requirements take precedence over the Construction Documents.

D. Fire protection work shall also comply with NFPA requirements.

E. Verify with local water utility company the meter size required to allow sufficient discharge flow pressure for proper sanitary operation of all fixtures in the Project, and fire protection if required.

F. The contractor shall furnish the meter if the utility company does not.

G. Obtain all necessary permits and approvals.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store valves in shipping containers with labeling in place.

PART 2 PRODUCTS

2.01 WATER PIPE

A. Ductile Iron Pipe (For pipe 3 inch diameter & greater): AWWA C151:
   1. Fittings: Ductile or gray iron, AWWA C110, with mechanical joints.
   2. Joints: AWWA C111, rubber gasket.
   3. Cement Lining: AWWA C104 with sealcoat.
   4. Encasement: AWWA C105 polyethylene encasement.

B. Copper Tubing (For pipe less than 4 inch diameter): ASTM B88, Type K, annealed:
   1. Fittings: ASME B16.18, cast copper, or ASME B16.22, wrought copper.
   2. Joints: Compression connection or AWS A5.8, BCuP silver braze.

C. PVC Pipe (For pipe less than 4 inch diameter): ASTM D 2241 SDR 17 for 250 psig rating.
   1. Fittings: ASTM D2466, PVC.
   2. Joints: ASTM D 3139 compression gasket ring.

D. PVC Pipe: AWWA C900 Class 150:
   1. Fittings: Ductile or gray iron, AWWA C110, with mechanical joints.
   2. Joints: ASTM D3139 compression gasket ring.

E. Marking Tape (for plastic pipe): Magnetic detectable conductor, clear plastic covering, imprinted with "Water Service " in large letters

F. Trace Wire (for plastic pipe): 14 Ga. bare copper trace wire.

2.02 VALVES

A. Valves: Manufacturer's name and pressure rating marked on valve body.

B. Gate Valves Up To 3 Inches (75 mm):
   1. Brass or Bronze body, non-rising stem, inside screw, single wedge or disc, compression ends, with control rod, post indicator, valve key, and extension box.

C. Gate Valves 3 Inches (75 mm) and Over:
   1. AWWA C509, iron body, bronze trim, non-rising stem with square nut, single wedge, resilient seat, flanged ends, control rod, post indicator, valve key, and extension box.

2.03 PIPE NIPPLES FOR SCREWED CONNECTIONS

A. Pipe Nipples for Screwed Connections Up to 3 Inches (75mm);
   1. Red Brass, Sch 80.ASTM B43

2.04 BEDDING AND COVER MATERIALS

A. Pipe Bedding Material: Sand or granular fill as specified in Section 31 23 23 - Fill.

B. Pipe Cover Material: Structural fill under pavements, slabs-on-grade, and similar construction as specified in Section 31 23 23 - Fill.

C. Pipe Cover Material: General fill under lawns as specified in Section 31 23 23 - Fill.

2.05 ACCESSORIES

A. Concrete for Thrust Restraints: 2000 psi at 28 days.

B. Trace Wire for Non-metallic Pipe: 14 Gage bare copper wire.

PART 3 EXECUTION

3.01 SANITARY AND SAFETY HAZARDS

A. The operating routine shall include necessary protective measures to detect and remove or destroy any contaminant of concern or regulation that might enter the distribution system. Every precaution must be taken against the possibility of sewage contamination of the water in the distribution system. Water mains and sanitary sewers shall be constructed as far apart as practicable, and shall be separated by undisturbed and compacted earth. A minimum horizontal distance of ten feet shall be maintained between water lines and sewer lines or other sources of

contamination. Water lines and sewers shall not be laid in the same trench, except on the written approval of the Arkansas Department of Health. Water mains necessarily in close proximity to sewers shall be placed so that the bottom of the water line is at least 18 inches above the top of the sewer line at its highest point. If this distance must unavoidably be reduced, the water line or the sewer line shall be encased in watertight pipe with sealed watertight ends extending at least ten feet either side of the crossing. Any joint in the encasement pipe shall be mechanically restrained. The encasement pipe may be vented to the surface if carrying water or sewer under pressure. Where a water line must unavoidably pass beneath the sewer line, at least 18 inches of separation shall be maintained between the outside of the two pipes in addition to the preceding encasement requirement. Exceptions to this shall be approved in writing by the Arkansas Department of Health.

B. A minimum horizontal distance of three feet shall be maintained between water lines and other underground utilities of a non-sanitary nature (gas, electric, etc.). Exceptions to this shall be approved in writing by the Arkansas Department of Health.

3.02 EXAMINATION

A. Verify that building service connection and municipal utility water main size, location, and invert are as indicated.

3.03 PREPARATION

A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare pipe connections to equipment with flanges or unions.

3.04 INSTALLATION - PIPE

A. Separation Of Water And Sewer Lines:
   1. Water and sewer lines shall have a 10'0" horizontal separation.
   2. Where water and sewer lines cross, an 18 inch vertical separation shall be made between the top of the lower pipe and the bottom of the upper pipe.
   3. The water line shall be above the sewer line if possible.

B. Install pipe to indicated elevation to within tolerance of 5/8 inches (16 mm).

C. Install ductile iron piping and fittings in polyethylene encasement, per local utility company requirements, if any.

D. Install ductile iron piping and fittings to AWWA C600.

E. Route pipe in straight line.

F. Install pipe to allow for expansion and contraction without stressing pipe or joints.

G. Install access fittings to permit disinfection of water system performed under Section 33 01 10.58.

H. Install trace wire for non-metallic pipe 6 inches above top of pipe. Pull trace wire up in valve and meter boxes.

I. Install marking tape 12" below finished grade in lawn areas and under walks; 6" below bottom of pavements.

3.05 INSTALLATION - VALVES, HYDRANTS, BACKFLOW PREVENTERS

A. Provide a drainage pit with 6 cu. ft. of washed gravel. Encase elbow of hydrant in gravel to 6 inches above drain opening. Do not connect drain opening to sewer.

3.06 SERVICE CONNECTIONS

A. Provide water service to utility company requirements with reduced pressure backflow preventer and water meter with bypass valves and sand strainer.

3.07 PROTECTION

A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.

3.08 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Perform field inspection and testing in accordance with Section 01 40 00.

C. Perform hydrostatic pressure and leakage test of the system to 225 psi. for not less than two (2) hours in accordance with AWWA C600. Repair leaks and re-test piping sections that fail the test.

D. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

END OF SECTION