

## SECTION 02510

### WATER DISTRIBUTION

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Pipe and fittings for site water lines including domestic water lines and fire water lines.
- B. Valves and Fire hydrants.

##### 1.02 RELATED SECTIONS

- A. Section 02250 - Dewatering
- B. Section 02317 - Trenching for Site Utilities.
- C. Section 03300 - Cast-in-Place: Concrete for thrust restraints.

##### 1.03 REFERENCES

- A. AWWA C104/A21.4 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water; American Water Works Association; 2003 (ANSI/AWWA C104/A21.4).
- B. AWWA C105/A21.5 - Polyethylene Encasement for Ductile-Iron Pipe Systems; American Water Works Association; 2005 (ANSI/AWWA C105/A21.5).
- C. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; American Water Works Association; 2000 (ANSI/AWWA C111/A21.11).
- D. AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast, for Water; American Water Works Association; 2002 (ANSI/AWWA C151/A21.51).
- E. AWWA C502 - Dry Barrel Fire Hydrants; American Water Works Association; 2005 (ANSI/AWWA C502/C502a).
- F. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service; American Water Works Association; 2001 (ANSI/AWWA C509).
- G. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances; American Water Works Association; 2005 (ANSI/AWWA C600).

##### 1.04 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves and accessories.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. 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.

##### 1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with Portland Water District specifications. The contractor shall comply with the requirements contained within these section and those contained within the Districts specifications. In the event of conflicting requirements, the more stringent standard shall apply.

##### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Unload materials so as to avoid shock or damage. Handle and store all pipe in such a manner

as to avoid deterioration or other injury thereto. Place no pipe within pipe of larger size. Store pipe and fittings on sills above storm drainage level and delivery for laying after trenches are excavated. Valves and Hydrants shall be dried and stored to protect them from damage.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Refer to the Portland Water District specifications attached to this section.

### **2.02 THRUST BLOCKS**

- A. Blocks shall be concrete of a mix not leaner than 1:2-1/2:5 cement:sand:stone, and shall have a compressive strength of not less than 3,000 psi at 28 days. Concrete for thrust blocks shall be placed against undisturbed earth.
- B. Bedding: As specified in Section 02317.
- C. Cover: as specified in Section 02317.

## **PART 3 EXECUTION**

### **3.01 TRENCHING**

- A. See Sections 02315 and 02317 for additional requirements
- B. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

### **3.02 INSTALLATION - PIPE**

- A. Service line from existing main shall be furnished and installed to serve the project. The project contract work shall begin at indicated public water supply line and shall include all water lines, valves, and appurtenances as shown on the drawings, except as indicated otherwise.
- B. Pipe-Laying - General:
  - 1. The interior of all pipe shall be clean and joint surfaces wiped clean and dry before the pipe is lowered into trench. Lower each pipe, fitting and valve into the trench carefully and lay true to line and without objectionable breaks in grade. The depth of cover below finished grade shall be not less than 5'-6" and the standard cover shall be 6'-0".
  - 2. Provide uniform bearing for all pipe in trenches. Do not allow trench water or dirt to enter the pipe after laying. Insert a watertight plug in the open end of the piping while laying of pipe is not in progress.
  - 3. Do not lay pipe closer than 10 feet to a sewer. At cross-overs with sewer, no joint in the water line shall be closer than 6 feet from the cross-over point. A minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer shall be maintained when the water main is either above or below the sewer. Provide valves, plugs or caps, as required, where pipe ends are left for future connections.
- C. All pipe shall be laid with standard provisions for expansion and contraction and in accordance with manufacturer's recommendations. All pipe with slip type joints shall be restrained at elbows and tees by thrust blocks or rods and clamps.
- D. Install suitable fittings at all changes in direction, dead ends and branch connections, provided that double strap saddles, in lieu of tees, may be used for service taps.
- E. Before setting each valve, make sure that the interior is clean, and test opening and closing. Set valves and stops with stems plumb and at the exact location shown. Provide brick laid flat, or other similar foot-pieces, under each curb box. Valve and service boxes shall be plumb, with tops at finished grade.
- F. Install ductile iron piping and fittings to AWWA C600

- G. Route pipe in straight line.
- H. Install pipe to allow for expansion and contraction without stressing pipe or joints.
- I. Slope water pipe and position drains at low points.
- J. Connect to building water outlet

**3.03 INSTALLATION - VALVES AND HYDRANTS**

- A. Set valves on solid bearing.
- B. Center and plumb valve box over valve. Set box cover flush with finished grade.
- C. Set hydrants plumb; locate pumper nozzle perpendicular to and facing roadway.

**3.04 DISINFECTION OF WATER DISTRIBUTION SYSTEM**

- A. Perform in accordance with Portland Water District specifications and requirements.

**3.05 FIELD QUALITY CONTROL**

- A. Pressure test water mains in accordance with the requirements of the Portland Water District.
- B. Disinfect water mains in accordance with the requirements of the Portland Water District.
- C. If test indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

**3.06 ATTACHMENTS**

- A. Portland Water District Specification - Section II: Work Associated with Water Main Construction.
- B. Portland Water District Specification - Section III: Water Main Materials Specification.

**END OF SECTION 02510**