

SECTION 02510

WATER DISTRIBUTION

PART 1 - DESIGN DIRECTIVES

1.1 PROJECT INCLUDES

- A. Water service system and piping, accessories, and appurtenances for domestic water and fire service.

1.2 DESIGN CRITERIA

PART 2 - PRODUCTS

2.1 All fire protection piping and related equipment shall be FM approved.

2.2 Ductile iron pipe shall be cement lined conforming with AWWA C151, Class 52.

2.3 Copper pipe shall conform to ASTM B 88, Type K seamless, annealed temper; ANSI B16.22 wrought-copper solder-joint copper fittings.

2.4 Valves:

2.5 Anchorages:

2.6 Concrete Reaction Backing: ASTM C 150, Type I Portland cement for 3000 psi, 28 day minimum compressive strength.

2.7 Valve pits and Meyer pits: Not permissible.

2.8 Water Meter: refer to DC Standards 15410, 'Water Distribution Piping'.

2.9 Identification: Metallic-lined plastic underground warning tapes.

2.10 Valve boxes shall be cast iron, sliding adjustable type and provided with a cast iron cover. The upper section of the box shall have a bottom flange of sufficient bearing area to prevent settling. The bottom of the lower section shall enclose the operating key of the curb stop. The word, 'WATER' shall be cast into the cover.

PART 3 - EXECUTION

3.1 GENERAL

3.2 CONTROL OF ALIGNMENT AND GRADE

- A. The use of string levels, hand levels, carpenter's levels, or other similar devices for transferring grade or setting pipe are not permitted.
- B. During construction provide the engineer, at their request, all reasonable and necessary materials, opportunities, and assistance for setting stakes and making measurements, including the furnishing of one or two rodmen as needed at intermittent times.
- C. Maintain good alignment in laying pipe. The deflection at joints shall not exceed the manufacturer's recommended limit. Provide fittings, if required, in addition to those shown on the drawings when pipe crosses utilities encountered when excavating the trench.

3.3 INSTALLING PIPE AND FITTINGS

- A. The contractor shall have on the job site, with each pipe laying crew, all the proper tools to handle and cut the pipe
- B. All pipe and fittings shall be thoroughly cleaned before laying and shall be kept clean until installed.
- C. Pipe shall be laid in the trench only during dry conditions. At no time shall water in the trench be permitted to flow into the pipe. At any time that work is not in progress, or the trench is unattended, the end of the pipe shall be suitably closed to prevent the entry of animals, earth, water, or other foreign materials using watertight expandable plugs. Lay pipe and fittings in accordance with the requirements of AWWA C600.
- D. As soon as excavation has been completed to the proper depth, the pipe bed shall be prepared as follows:
 - 1. Pipe Laid on Undisturbed Subgrade: Manually excavate for pipe bells and along the trench bottom as necessary to provide a uniform bearing surface along the entire length of the pipe barrels.
 - 2. Pipe Laid on Bedding Material: Place and compact bedding materials to the elevation necessary to bring the pipe to grade. The compacted material shall be shaped so that the bottom quadrant of the pipe rests firmly on the bedding for the entire length of the pipe barrels. Suitable holes shall be dug for bells or couplings to provide ample space for joining pipe.

3.4 JOINTING DUCTILE IRON PIPE

3.5 VALVE INSTALLATION

- A. Valves shall be set with the stem vertical.
- B. Valves placed within 10' of mechanical joint fittings shall be restrained to the fittings with four ¾" steel rods. The rods shall be covered with two coats of bituminous paint.
- C. All valves and fittings shall assure electrical continuity using joint retainer glands or grounding straps.

3.6 VALVE BOX INSTALLATION

- A. Install valve boxes vertically, centered over the operating key, with the elevation of the top adjusted to conform to the finished surface. Adequately support the box during backfilling to maintain vertical alignment.

3.7 TESTING

- A. The contractor shall test all installed pipe in accordance with the requirements of AWWA C600, except as amended below:
 - 1. The contractor shall furnish all labor, materials, and equipment necessary for any and all required pipe taps for testing.
 - 2. A pressure test and leakage test are required for all pipe.
 - 1. Two hour duration.
 - 2. Test pressure is 150% of the operating pressure or 200 psig, whichever is greater.
 - 3. Pressure loss over the duration of the test shall not vary more than $\pm 5\%$.
 - 4. Allowable leakage shall be determined by the following formula:
 $L = SD\sqrt{P}/133200$
L=allowable leakage, gallons per hour
S=length of pipe tested, feet
D=nominal pipe diameter, inches
P=average test pressure, psig

3.8 DISINFECTING WATER MAINS

- A. The contractor shall provide all labor, materials, and equipment (water by owner) to complete disinfecting the mains. Include the installation of pipe taps necessary for chlorination or taking samples and paying for all bacteriological testing by an approved independent laboratory.
- B. The contractor shall disinfect all installed water mains in accordance with the requirements of AWWA C651, except as amended below:
 - 1. discuss the procedure with the engineer/owner and obtain approval before doing the work.
 - 2. all newly installed water mains shall be flushed at a minimum velocity of 2.5 ft/sec before and after disinfection.
 - 3. Chlorine shall be calcium hypochlorite or sodium hypochlorite solution using the continuous or slug method.

END OF SECTION 02510