

CHAPTER 5 - WATER SYSTEM DESIGN

5.01 GENERAL DESIGN REQUIREMENTS

5.02 ALIGNMENT AND COVER

Curved alignment for water mains is permitted and shall follow the street centerline when practical. The minimum allowed radius shall be based on allowable pipe deflection for the pipe diameter and the pipe laying length but shall not exceed AWWA specs or manufacturer specs.

5.02.01 RIGHT-OF-WAY LOCATION

In general, water mains shall be located 11-feet south or east from the right-of-way centerline or as approved by the Engineer. For roadways less than 30-feet in width, the waterline location shall be a minimum of 5-feet from the face of curb and shall maintain 5-foot minimum center-to-center spacing with the stormwater line. Except as provided in **Section 2.07**, all water mains and service lines shall be in the public right-of-way. Curbs, gutters, sidewalks, posts, fences, walls, trees, road signs, or other similar structures, shall not be placed over waterlines unless otherwise approved by the Engineer. All abrupt changes in vertical or horizontal alignment shall be made with a fitting and adequate thrust restraint. Refer to **Standard Detail 507, Horizontal Thrust Blocking, Standard Detail 508, Vertical Thrust Blocking and Standard Detail 509, Straddle Block.**

5.02.02 MINIMUM DEPTH

5.02.03 MAXIMUM DEPTH

5.02.04 SEPARATION WITH SANITARY SEWER LINES

5.02.05 SEPARATION WITH UTILITIES OTHER THAN SANITARY SEWER LINES

5.02.06 EASEMENTS

5.02.07 RELATION TO WATERCOURSES

5.03 PIPE MATERIALS AND SIZE

All public water distribution systems shall be constructed with ductile iron pipe, in accordance with **Subsection 501.02.02**. When a potentially corrosive condition is encountered, all ductile iron pipe will be polyethylene encased per **Subsection 501.02.08** and meeting Ductile Iron Pipe Research Association (DIPRA) and AWWA Standards. Where an active cathodic protection system is encountered, High Density Polyethylene (HDPE) pipe may be considered as an alternate to ductile iron pipe, with approval by the Engineer. ~~HDPE pipe may also be used as an alternate to ductile iron pipe with approval by the Engineer.~~ All pipe joints shall be fully mechanically restrained.

Water distribution main sizes shall meet the design requirements listed above and conform to the following:

- A. 4-inch pipe shall be used in residential zones, on dead end streets, only when approved by the Engineer. The maximum length may not exceed 250 feet. Not more than 12 services may be connected.
- B. 6-inch pipe shall be the minimum standard size of distribution mains and shall only be used directly off of looped systems of 8-inch and larger pipe sizes. No hydrants are permitted on 6-inch lines.

- C. 8-inch pipe shall be used for mains supplying hydrants requiring a flow rate of 1,000 GPM.
- D. 10-inch or larger pipe shall be required as specified in the Master Plan and as required by the Engineer to meet Commercial and Industrial usage or fire flow demands exceeding 1,000 GPM.

The distribution grid shall be looped at 600-foot maximum intervals. Looping requirements must be met in a logical manner. It is prohibited to loop two water mains in the same street or loop a main back through an easement where no service need is met other than for the purposes of defeating the maximum dead-end length of 600-feet. Transmission water mains identified by the Engineer do not require looping. Dead end mains, permanent or temporary, shall be provided with a properly sized blow-off per **Standard Details 506(A-B), Blowoff Assembly**.

5.04 APPURTENANCES

5.05 BACKFLOW PREVENTION

5.06 WATER SERVICE LINES

5.07 SYSTEM TESTING

5.08 WATER QUALITY SAMPLING STATIONS