# SECTION 6
# WATER SYSTEM

## 6.01 GENERAL

A. System Description

The existing City of West Sacramento water system supplies treated water within the developed areas of the City, and are served by the Bryte Bend Water Treatment Plant. This plant is located adjacent to the westerly bank of the Sacramento River and immediately west of Interstate 80. The plant treats water drawn from the river and the treated water is transmitted and distributed through a system, which consists of 5separate tank reservoirs and booster pump stations. An average operating pressure of 55 psi is maintained.

## 6.02 DESIGN REQUIREMENTS

A. General

Water system design within a development area shall conform to the General Plan, Master Water Plan, and any applicable Specific Plan of the City of West Sacramento, and shall be capable of transmitting and distributing adequate flows and maintaining sufficient pressures based on anticipated conditions of full ultimate development. All improvements including extensions, replacements, and repairs shall conform to the requirements of the Uniform Plumbing Code, the Uniform Fire Code, California Health & Safety Code, American Water Works Association Standards, the Water Code of the City of West Sacramento, these Design Standards, Standard Construction Specifications and Standard Details of the City of West Sacramento.

B. Normal Operating Pressure

Normal operating pressures of not less than 35 psi shall be maintained at all service connections except that during periods of peak domestic and fire demand, the pressure shall not be less than 20 psi.

C. Fire Flow Requirements

1. For the following general areas, the fire flows shall conform to the latest edition of the Uniform Fire Code or the indicated fire flows noted below, whichever is greater. Fire flows shall be provided with the initial development. Expansion or change in zoning of the development shall be subject to requirements of the Insurance Services Office.
    a. Residential Area - For residential areas having primarily one-story single-family dwellings, on average size lots, provide a minimum 750 gallons per minute.

b. Commercial and Multiple Dwelling Areas - For closely built areas containing apartments, condominiums and light commercial structures, provide 2,000 gallons per minute.

c. Principal Business Districts, Industrial, and Other Individual High-Value Buildings - Consult the Guide for Determination of Required Fire Flow of the Insurance Services Office.

D. Layout of Mains

1. The distribution system, whenever possible, shall employ the "Gridiron System" of water circulation so as to allow pressure equalization. Dead end water mains shall require specific approval by the City Engineer. In no case shall the dead end length of water mains exceed 600 feet.

2. All water pipelines designed for the transmission or distribution of domestic water supply shall be constructed and installed within public streets unless such construction or installation is determined to be impractical by the City Engineer. All water lines that lie outside of public streets shall be in a water easement or public utility/service easement (PUE/PSE). Attention is directed to Division I, Section 6.03 of these specifications for easement requirements.

3. The location of the water main in any street shall be three (3) feet from the lip of gutter on the northerly or westerly side of the street unless otherwise approved by the City Engineer.

E. Sizes

The minimum size water main shall be 8 inches in diameter. In all cases, water mains shall be of sufficient size to meet fire flow requirements.

F. Pipe Materials

1. Allowable materials shall be as specified in the Standard Construction Specifications.

2. When a ferrous material (i.e.; ductile iron and concrete cylinder welded steel) is used for a new water line, the City Engineer may require that the soil within the vicinity of the new water line be tested for corrosive potential. If it is determined that the soil is corrosive to the material being placed, the new water system must be protected by a corrosion control system. The corrosion control system must be designed by a licensed corrosion engineer and shall be submitted to the City Engineer for approval.

G. Valves

1. The distribution system shall be equipped with a sufficient number of valves so that no single shutdown will result in shutting down a transmission main, or necessitate the removal from service a length of pipe greater than 500 feet. Additionally, in no case shall more than two fire hydrants be removed from service. The valves should be so located that any section of main can be shut down without going to more than three locations to close valves.

2. All tees shall have two valves.

3. All crosses shall have three valves.

4. Valves, incorporating a blowoff device, or a fire hydrant, shall be installed at the terminus of all dead-end water mains.

5. A valve shall be installed on services immediately off the main for services 4" inches and greater in diameter.

6. Air Release valves shall be installed at high points in the vertical alignment of all water mains. The vertical alignment of water mains shall be designed to minimize this requirement.

7. Blow-off valves shall be installed at all dead ends and low points in the vertical alignment of water mains. The vertical alignment of water mains shall be designed to minimize this requirement.

8. Bollards or markers shall be installed at all valves and fittings when located in unpaved areas.

H. Fire Hydrants

1. Spacing

   a. Fire hydrants shall be placed at or near street intersections and at a maximum spacing of 500 feet measured along the street centerline.

   b. Fire hydrants on streets without fronting lots shall have a maximum spacing of 1,000 feet measured along the street centerline.

2. Service Requirements

   a. The minimum size water line serving a fire hydrant shall be 6 inches in diameter and no more than two hydrants will be allowed on any 8-inch main between intersecting mains.

   b. Fire hydrants shall be installed as specified in the Standard Details.

I. Services

1. In all new subdivisions, the residential service line shall be located a minimum of 1 foot from the side yard property line. Services for 2 lots with a common property line may be placed in a common trench straddling alternate property lines. Service lines from the water main to the property line shall be installed at the time the main is constructed to avoid frequent cutting of the street, unless otherwise approved by the City Engineer.

2. Service lines to existing buildings shall be installed so as to make the most direct connection to the existing structure.

3. A single domestic service connection shall not serve more than one parcel. Separate parcels shall be supplied water through separate service connections.

4. More than one domestic service shall not be supplied to a single property for the purpose of avoiding water connection charges. Water meters shall be sized consistent with the water service size. Backflow prevention devices shall be sized as necessary.

5. Minimum service line diameter to single family residences shall be ¾ inch with a maximum size of 1 inch. Services to schools, commercial, industrial or multi-family units shall be sized according to demand. 2-1/2 inch or 3 inch diameter line sizes shall not be allowed within public right-of-way or easements.

6. For major commercial, industrial or multi-family developments, a single service line may be utilized for combined fire and domestic services. The service line shall equal or exceed the combined sizes, in cross-sectional area, of the separate fire and domestic services.

7. For public irrigation systems, the City may consider the installation of a turbo type meter and/or varying meter and line sizes.

J. Cross Connections

1. Attention is directed to Title 17, Chapter V, Sections 7583 to 7622, inclusive, of the California Administrative Code, regulating the construction of cross connections between drinking water systems and other sources of water. All construction shall be in strict compliance with said regulations and all applicable City Ordinances. The addition of a backflow prevention device to any water system supplying an automatic fire sprinkler system shall cause the automatic sprinkler system to be recalculated. It is the responsibility of the property owner

to ensure that all sprinkler system requirements are met after installation of the device.

2. Backflow prevention devices shall be installed on all commercial, industrial, multifamily fire, domestic, and irrigation services as shown in the Standard Details.

K. Anchors

Concrete anchors, thrust blocks, or mechanical joint restraints, if approved by the City Engineer shall be provided at all bends, behind tees, fire hydrants, crosses (which are valved in such a manner that they can be used as tees) and valves, as shown in the Standard Details.

L. Fittings

Standard approved fittings shall be used at all bends of 11-1/4 degrees and greater. Deflections shall not exceed 80% of manufacturer's recommended maximum values.

M. Cover Requirements

Water mains and services shall be installed at a depth which will provide a minimum of 30 inches from the top of the pipe to finished grade or a minimum of 24 inches from the top of pipe to the street subgrade, whichever is greater.

## 6.03 RIGHT OF WAY POLICY

A. Requirements

All public water mains shall be located in easements, or right-of-ways granted or dedicated for water and/or public use. In the case of public right-or-way for streets, further dedication is not necessary.

B. Width

1. Easements for water lines shall meet both of the following width criteria:

   a. Minimum width of any easement shall be 15 feet.

   b. All easements shall have a minimum width in feet equal to the required trench width according to the standard detail for trench backfill plus 2 additional feet of width for every foot of depth of the pipe as measured from the bottom or the pipe to finished grade. All water lines shall be centered within their easements.