

## SECTION 17

### FIRE HYDRANT ASSEMBLIES

#### 17-1 General

##### 17-1.01 Scope

This section describes the requirements for furnishing and installing Fire Hydrant Assemblies as appurtenances to treated water mains. These requirements include the materials to be used, methods and requirements for installation, and measurement and payment.

This section does not include fire hydrants and wharf hydrants that are appurtenant to other structures such as buildings or storage tanks. If required, items such as these have been shown on the plans and have been described elsewhere in these specifications.

##### 17-1.02 Description of Work

Work under this section shall include, but not be limited to, excavation (regardless of surface or subsurface conditions), installing the connection to the main, shutoff valve and valve operator extension shaft, pipe and fittings for the fire hydrant lateral, fire hydrant, corrosion protection, placing reaction blocking, backfilling including the drain pit, installing the shutoff valve box along with lid and extensions, forming and pouring the valve box pad, completing the hydrant pad, and restoration of the surface area around the Fire Hydrant Assembly.

##### 17-1.03 Location

Location stationing shown on the plans for Fire Hydrant Assemblies is approximate and intended as a general location only. The final location of the fire hydrant assembly shall be as determined by the District Engineer in the field.

##### 17-1.04 Temporary Covers

Upon placing a new fire hydrant in position, it shall be covered with a serviceable burlap bag and tied tightly at the bottom to prevent accidental removal. The purpose of the cover is to eliminate any confusion during an emergency as to which fire hydrants are operational and which are not. The cover shall be removed during inspections and testing and then replaced. The covers shall be removed as soon as the new water system is capable of providing water for fire protection.

If the new fire hydrants are replacing existing fire hydrants, the covers shall be relocated to the old fire hydrants, or new covers installed, as soon as the water main to which they are connected can no longer provide water for fire protection.

It shall be the Contractor's responsibility to ensure that fire hydrants attached to water mains that are not pressurized, or have not been placed into full service, remain covered. It shall also be the Contractor's responsibility to ensure that fire hydrants that are in full service remain uncovered and accessible by fire district personnel.

### 17-1.05 Design

Fire Hydrant Assemblies shall be designed to meet the requirements of this subsection and all other requirements listed in this section. Fire Hydrant Assemblies shall be designed to withstand the working pressures shown on the plans, or a design working pressure of 150 psi, whichever is greater. Fire Hydrant Assemblies designed for working pressures greater than those contained in the standards and specifications referred to herein shall meet those same design requirements and testing procedures after they have been upgraded to meet the higher design working pressures.

### 17-1.06 Submittals

The following submittals for fire hydrants shall be furnished in duplicate: Catalog data, maintenance instructions, affidavit of compliance, and warranties. All other materials shall be furnished with submittals as described for each material elsewhere in these specifications.

### 17-1.07 Inspection

The Contractor shall make all fire hydrants, shutoff valves, pipe, and fittings available for inspection by the District Engineer prior to installation. The Contractor shall provide men and equipment necessary for the inspector to examine all materials thoroughly. Each phase of the work shall pass inspection by the District Engineer before commencing work on the next phase. The phases shall consist of, but not be limited to, cutting of pavement, excavation, tapping the water main, installation of the shutoff valve, fire hydrant lateral, fire hydrant, and drain pit, application of corrosion protection, backfilling, raising the valve box to final grade, and surface restoration. After installation is complete, the shutoff valve and fire hydrant will be inspected for proper operation and water tightness.

## 17-2 Materials

### 17-2.01 General

Materials furnished for Fire Hydrant Assemblies shall include, but not be limited to, tees and other fittings used for the connection to the main, pipe and fittings used for the fire hydrant laterals, shutoff valves along with a box, lid and extension, valve operator extension shaft, drain rock, concrete for reaction blocking and valve box pad and materials necessary for restoration of the area around the Fire Hydrant Assembly.

### 17-2.02 Fire Hydrants

Fire hydrants shall conform to AWWA C502, "Dry-Barrel Fire Hydrants" and these specifications. Fire hydrants shall be 6" nominal size and shall be traffic type models with breakaway flange and lugs incorporated into the hydrant barrel located just above ground level. Fire hydrant main valve shall close automatically upon breaking of the traffic flange. Fire hydrants shall have a 5 1/4-inch main valve opening. Drain valves shall be provided at the base of the hydrant which open only when the valve is in the closed or near closed position.

Fire hydrant operating stems shall use O-ring type seals and shall be fitted with a pentagon-operating nut, conforming to AWWA C502. Operating stems shall open in a counterclockwise direction and shall also have a breakaway coupling located at the same elevation as the breakaway flange on the hydrant barrel. The operating threads and thrust bearing housing shall

be sealed from water and dirt and shall be permanently lubricated or lubricated in the field by using a permanent grease fitting.

Fire hydrants shall have one 4 1/2-inch steamer nozzle and two 2 1/2-inch side outlet nozzles. All nozzle threads shall be National Standard Fire Hose Coupling Screw Threads. Nozzle shall be fitted with caps having pentagon nuts conforming to the hydrant-operating nut. Nozzle caps shall be secured to the hydrant body by a length of steel chain.

Fire hydrant boots shall be flanged or mechanical joint with retainer glands. AquaGrip by Mueller Company is acceptable. All fire hydrants shall have permanent markings identifying the manufacturer by name, initials, insignia, or abbreviations in common usage, designating the size of the main valve opening, the hydrant model number, and the year of manufacture.

Fire hydrants shall be ordered with varying lengths of hydrant barrels to suit field conditions and the lines and grades shown on the plans. Extension kits for the hydrant barrel shall be avoided. Where hydrant extensions are unavoidable, they shall be supplied in lengths of 6" increments (6", 12", 18"....). Stacking (using more than one) fire hydrant extensions will not be allowed. The hydrant valve shall remain in the base fitting.

The fire hydrant model selected shall be used throughout the work within the allowable pressure classes. Alternate fire hydrants may be furnished only after receiving written approval from the District Engineer. The District has limited the list of fire hydrant models in order to reduce valve maintenance costs and spare parts inventory. Fire hydrants shall be one of the following models all with 250 psi rating:

250 psi Rating

CLOW F-2545 (MEDALLION)  
M&H 929 (RELIANT)  
MUELLER SUPER CENTURION 250  
WATEROUS PACER WB-67-250

17-2.03 Connection to the Water Main

Connections to the water main for Fire Hydrant Assemblies shall use tee fittings with 6" flanged outlets. The tee fittings shall be fabricated steel, cast or ductile iron and shall conform in all respects to the requirements for Water Main fittings.

17-2.04 Shutoff Valves

Shutoff valves, valve boxes, lids and extensions, and valve operator extension shafts for Fire Hydrant Assemblies shall conform in all respects to the requirements for Main Line Valve Assemblies. Shutoff valves shall be flanged by flanged or flanged by mechanical joint and shall provide positive restraint for the fire hydrant lateral.

17-2.05 Pipe and Fittings for Fire Hydrant Laterals

Pipe and fittings for fire hydrant laterals shall conform in all respects to the requirements for ductile iron pipe and fittings for Water Mains. Pipe and fittings shall provide positive restraint between the shutoff valve and the fire hydrant. Tie rods will not be allowed.

### 17-2.06 Concrete

Concrete used for reaction blocking shall be 2,000 psi and concrete used for shutoff valve box pads shall be 3,000 psi, both conforming in all respects to the requirements for Concrete Work.

### 17-2.07 Drain Rock

Drain rock to be placed in the drain pit below the hydrant boot shall conform to the requirements for 1 inch minus permeable backfill as described for Water Mains.

### 17-2.08 Replacement Pavement

Replacement pavement shall be asphalt concrete pavement conforming to CALTRANS, Section 39, Type B and shall have a maximum aggregate of 1/2 inch. A fog seal conforming to CALTRANS, Section 37 shall also be applied.

## 17-3 Installation

### 17-3.01 General

Fire Hydrant Assemblies shall be installed as shown on the plans and as designated in these specifications. Fire hydrants shall be installed in a vertical position and shall have the 4 1/2-inch steamer nozzle approximately 18" above the hydrant pad, sidewalk, or top of curb. The steamer nozzle shall be pointed perpendicular to the road, unless otherwise specified by the District Engineer.

### 17-3.02 Storage and Handling

Fire hydrants and shutoff valves shall be stored and handled in their original containers and shall not be unpacked until 24 hours prior to installation, except for inspection. The shutoff valve and hydrant shall be maintained free from dirt and foreign matter and shall be stored on wooden pallets in their original containers. Piping and fittings for fire hydrant laterals shall be stored and handled in a manner described for Water Main materials elsewhere in these specifications. Materials for Fire Hydrant Assemblies shall not be strung out on the job more than two days prior to installation.

### 17-3.03 Excavation and Backfill

Excavation and backfill operations shall conform to all the requirements for Water Main Pipe Trench Excavation and Backfill.

### 17-3.04 Shutoff Valve Installation

Installation of the shutoff valves and related valve box, lid, extensions, and valve operator extension shaft shall conform to all the requirements for installation of Main Line Valve Assemblies.

### 17-3.05 Fire Hydrant Lateral Installation

Installation of the fire hydrant lateral pipe and fittings shall conform to all the requirements for Water Mains. The lateral shall provide positive restraint between the shutoff valve and the fire hydrant. Tie rods will not be allowed.

#### 17-3.06 Corrosion Protection

All joints contained in the fire hydrant lateral shall either be painted or wrapped in conformance to corrosion protection for Water Main joints.

#### 17-3.07 Reaction Blocking

All areas of the Fire Hydrant Assembly subject to thrust, including but not limited to, the branch tee and the hydrant boot, shall be provided with concrete reaction blocking conforming in all respects to reaction blocking for Water Mains. Care shall be taken when pouring the thrust block for the hydrant boot not to allow concrete to plug the drain holes.

#### 17-3.08 Drain Pit Installation

A drain pit below the hydrant boot shall be excavated to the lines and volume shown on the plans. This pit shall be backfilled with 1" size permeable backfill to a level at least 3" above the drain holes in the hydrant barrel. After compacting this material in place, a sheet of 15 lb. felt roofing paper or a layer of 6-mil polyethylene film shall be laid over the entire top surface of the drain pit. This barrier shall then be anchored in place and care shall be taken during backfill operations not to displace the barrier.

#### 17-3.09 Surface Restoration and Final Cleanup

After backfilling and compaction is complete, the surface over the Fire Hydrant Assembly including the shutoff valve and fire hydrant lateral, and all surfaces disturbed by this work, shall be restored to an "equal to, or better than" condition as it existed prior to the start of construction. The Contractor shall also comply with all city, county and state encroachment permit conditions.

### 17-4 Measurement and Payment

#### 17-4.01 Measurement

Work performed under this section shall be measured as the number of Fire Hydrant Assemblies, regardless of the fire hydrant lateral lengths, that have been completely installed.

#### 17-4.02 Payment

The contract price shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all work necessary for the installation of Fire Hydrant Assemblies as shown on the plans or as designated in these specifications. A description of the work is included at the head of this section. Any work associated herewith, but not included in other bid items, shall be deemed as included in the work described in this section.