Sacramento Metropolitan Fire District

Community Risk Reduction Division **www.metrofire.ca.gov**

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SACRAMENTO METROPOLITAN FIRE DISTRICT					
FIRE PREVENTION STANDARD					
STANDARD TITLE:	**Installation and Maintenance of Private Fire Hydrants**				
STANDARD NUMBER:	5	EFFECTIVE DATE:	06/01/2007	REVISION DATE:	02/20/26

SCOPE

This standard is for the design, installation, and maintenance of private fire hydrants and is pursuant to the 2025 California Fire Code, Local Ordinance and the 2025 edition of NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*.

This Standard will apply to all fire hydrants installed on private property within the jurisdiction of the Sacramento Metropolitan Fire District. This standard does not apply to public fire hydrants installed within a utility easement on private property.

Hydraulic calculations of private fire hydrant systems shall be submitted with the underground fire service plans. A minimum 20 psi shall be available at each 4.5" outlet on each fire hydrant when flowing water. (CFC § 501.3)

SPECIFICATIONS

1. Private On Site Hydrants

a. Fire hydrants shall be a Clow 960 or an approved equal. (NFPA 24, § 7.1.1)

b. Fire hydrants shall be mounted on an approved break off check valve. (NFPA 24 § 7.1.1.2)

c. All fire hydrants shall be supplied by a minimum of eight inch piping. The piping size may be reduced to six inch piping if the distance from the point of connection at the hydrant bury to the main supply piping or public water supply piping is less than 25 feet. (NFPA 24 § 10.1.1)

d. Non-metallic pipe shall not be used within five feet of a building. (NFPA 24 § 10.4.3)

e. Outlets shall be national standard threads with metal protector caps. One 4½-inch "steamer" outlet and two 2½-inch outlets are required. (NFPA 24 § 7.1.2)

f. The 4½-inch "steamer" outlet shall face the street or fire apparatus access roadway. This outlet shall be a minimum of 18 inches above grade measured from the center of the operating stem. (NFPA 24 § 7.1.1.3)

g. The 2½-inch outlets shall be placed above the 4½-inch "steamer" outlet and be oriented 90 degrees relative to each other. (NFPA 24 § 7.1.1.3)

h. Nut size of valve/stem and protector caps shall be of pentagonal shape and furnished with a nut of 1⅛-inches measured from point to flat of the pentagon. (NFPA 24 § 7.1.1.3)

i. Hydrant outlet valves shall open in a counter-clockwise direction. (NFPA 24 § 7.1.1.3)

j. Fire hydrants shall be a minimum of 24 inches in height from base flange to top of hydrant. (NFPA 24 § 7.1.1.3)

k. Fire hydrants are to be factory painted Rustoleum white or an approved equal. (NFPA 24 § 7.1.1.)

l. The fire hydrant base flange shall be a minimum, of 2 inches above the finished grade or planter curb. (NFPA 24 § 7.1.1.3)

m. Hydrants shall be within 8 feet of the approved fire department access. (NFPA 24 § 7.2.1)

n. Fire hydrant spacing in commercial areas shall be a maximum of 300 feet on center. (NFPA 24 § 7.2.1 and CFC § C102.1)

o. Fire hydrant spacing in residential areas shall be a maximum of 500 feet on center. (NFPA 24 § 7.2.1 and CFC § C102.1)

p. Buildings equipped with a standpipe shall have a fire hydrant located within 40 feet of the fire department connection. (CFC § 507.5.1.1)

q. Fire hydrants shall not be located closer than 40 feet from the building to be protected. (NFPA 24 § 7.2.3)

r. Fire hydrants shall not be installed in the bulb of a cul-de-sac. (NFPA 24 § 7.2.1)

s. There shall be no obstructions, including plants, within a 36-inch radius of any fire hydrant. (CFC § 507.5.5)

t. There shall be a seven-foot vertical clearance above the 36-inch clear radius around the fire hydrant. (CFC § 507.5.5)

u. Vehicle protection shall be provided for fire hydrants subject to vehicular damage by approved barricades or a minimum of a six-inch curb. (CFC § 507.5.6)

v. Blue reflective hydrant markers shall be installed in accordance with the following (CFC § 509.1):

    I. On unstriped roadways, blue markers shall be set in the center of the roadway.

II. On undivided striped roadways, blue markers shall be set 6 inches to the hydrant side of the center stripe.

III. On divided roadways, the blue marker shall be set 6 inches to the side of the median or lane striping, which is closest to the hydrant.

IV. In locations where hydrants are situated on corners, blue markers shall be installed on both approaches fronting the hydrant.

2. Backflow Prevention

a. Private fire hydrant supply piping may be provided with backflow prevention devices as approved by the local water purveyor and the Fire District. (NFPA 24 § 6.2.9)

b. Flow and pressure loss through the backflow prevention devices shall be taken into consideration when calculating pressure flow and loss for an on-site hydrant system. (NFPA 24 § 6.5.1)

3. Looped Systems (CFC § 507.1)

a. Three or more hydrants will require two points of connection to the public or private water supply piping.

b. Two or more hydrants in conjunction with fire sprinkler supply piping will require two points of connection to the public or private water supply piping.

c. Seven or more fire sprinkler systems will require two points of connection to the public or private water supply piping.

d. When two or more points of connection to the main water supply are required, they shall be installed as remotely as possible.

4. Shared Utility Agreement (CFC § 507.1)

a. A Shared Utility and Maintenance Agreement shall be recorded at the public recorder's office having jurisdiction and provided to the Fire District for all private fire hydrant systems serving multiple parcels or properties.

5. Installation and Inspections (NFPA 24 § 4.1.1)

a. Underground piping shall be installed in accordance with NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances* and the approved plans prepared by a civil engineer or piping installation contractor. The underground fire service installation contractor shall submit for review and

approval, a schematic drawing showing the part for part installation arrangement of the underground piping and appurtenances and a parts list with listing information for all parts prior to installation. A trench cross sectional detail shall be included on the plans. A copy of the APPROVED underground fire service plans shall be on site for all Sacramento Metropolitan Fire District (Fire District) inspections and acceptance testing. (NFPA 24 § 4.1)

b. Plastic piping approved for underground installations shall be PVC, C900, Class 150 or greater, and be listed for such use. (NFPA 24 § 10.1)

c. All runs of non-metallic water pipe shall have a No. 10 gauge solid soft drawn copper locator wire taped on top of the pipe to facilitate locating the pipe at a later date. The wire shall be stubbed up inside each valve box. Continuity test shall be conducted on each splice at all locations. (NFPA 24 § 10.4.2.2)

d. Galvanized pipe is not approved for underground supply piping. (NFPA 24 § 10.1)

e. Non-metallic pipe shall not be used within five feet of a building. (NFPA 24 § 10.4.3)

f. Above grade valves for controlling the water supply for on-site fire hydrant systems shall be electrically supervised. (NFPA 24 § 6.7.2) and (CFC § 903.4)

g. All piping shall be laid in a six inch bed of sand or natural gravel not over one inch in diameter and have a twelve inch fill of sand or natural gravel not over one inch in diameter. See detail, page 6. (NFPA 24 § 10.9.3)

h. A strand of minimum 3" wide non-detectable blue tape marked "CAUTION: WATER LINE BURRIED BELOW" shall be placed 12 inches above all piping. (NFPA 24 § 10.9.6)

i. All sections of ductile iron pipe or ductile iron fittings shall be encased in either 8-mil linear low density (LLD) or 4-mil high-density, cross-laminated (HDCL) polyethylene sheets or tubes in accordance with American Water Works Association Standard C105/A21.5-05, *Polyethylene Encasement for Ductile-Iron Pipe Systems.* Any fasteners shall be made of low-alloy steel. (NFPA 24 § 10.4.1.1)

j. Concrete thrust blocks or other approved retaining, shall be installed at all locations where piping changes direction. (NFPA 24 § 10.6.1)

k. A 200-PSI hydrostatic pressure test shall be performed on all installed piping and appurtenances for a period of two hours. The piping shall be center-loaded during pressure testing with all joints, fittings and appurtenances uncovered. Failure to comply with this section will result in a test failure and the uncovering of the piping for a visual inspection and retesting. (NFPA 24 § 10.10.2.2)

l. A fire hydrant flush, using the 4½-inch "steamer" outlet, shall be conducted at all hydrants and witnessed by the Fire District. Piping shall be flushed until all foreign objects have been discharged and the water is clear. (NFPA 24 § 10.10.2.2)

m. Fire District personnel may conduct flow testing to verify the ability of the system to provide the required fire flow.

6. Maintenance and Testing (CFC § 507.5.2)

a. Annual Maintenance

I. Ensure hydrant is visible and accessible.

II. Remove caps and inspect threads, gaskets and cap chains.

III. Clean and lubricate threads.

IV. Check condition of pentagon operating nut.

V. Locate and exercise the underground control valve (key valve, road box or foot valve).

VI. Operate each valve on the hydrant and flow water for approximately one minute.

VII. Clean and paint hydrant Rustoleum white or equal as necessary.

VIII. Ensure the blue reflective marker is installed and visible.

IX. Any deficiencies noted shall be corrected immediately.

b. Five Year Maintenance

I. Perform annual maintenance as outlined above.

II. Perform flow testing in accordance with NFPA 291, *Recommended Practices for Fire Flow Testing and Marking of Hydrants.*

III. Any deficiencies noted shall be corrected immediately.

c. Licensing Requirements

I. Fire hydrant maintenance and testing shall be performed by one of the following:

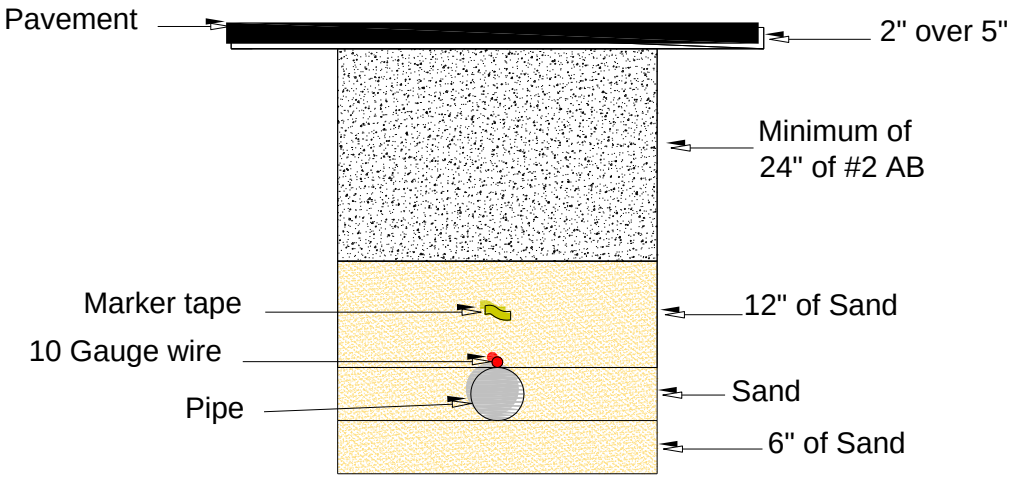
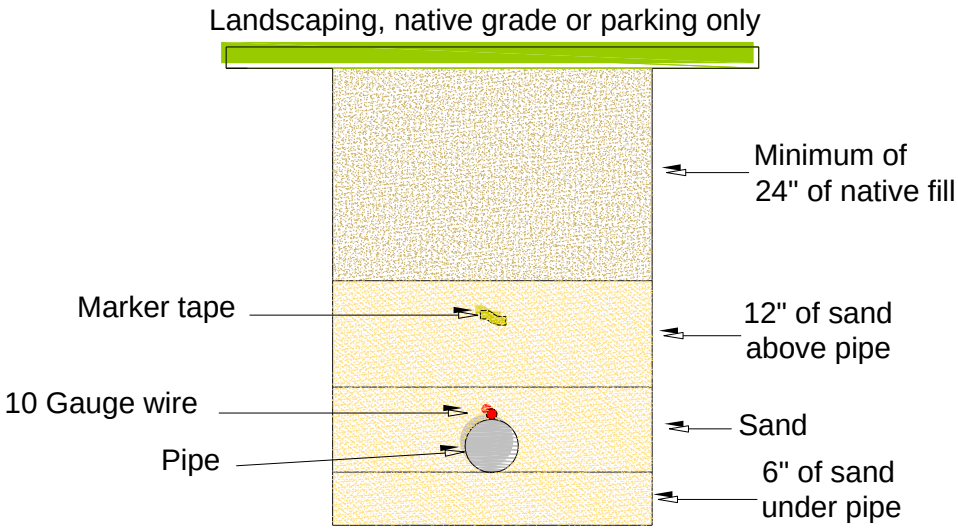
A. C-16 – Fire Protection Contactor

B. C-36 – Plumbing Contractor

C. C-34 – Pipeline Contactor

D. California State Fire Marshal – License A, Type

d. Record Keeping

All maintenance and testing of private fire hydrants shall be recorded and maintained by the property owner. Copies shall be made available to the Fire District upon request.

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