



## THE INSTALLATION SHALL MEET THE FOLLOWING STANDARDS AND THE CALIFORNIA FIRE CODE

NFPA 13, Standard for the Installation of Sprinkler Systems  
NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection  
NFPA 24, Standard for Installation of Private Fire Service Mains  
NFPA 22, Standard for Water Tanks for Private Fire Protection  
NFPA 25, Standard for Testing, Maintenance, Inspection of Water-Based Fire Protection  
Systems Title 19 California Code of Regulations

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### QUALIFICATIONS FOR DESIGN

The design of an underground fire line will be by a qualified civil engineer, fire sprinkler contractor, or engineering contractor. The plan will be stamped and signed by the designer. A complete drawing conforming to NFPA 24 and material sheets will be provided.

### FIRE PREVENTION PERMIT REQUIRED

Apply at: <https://www.cityofsanrafael.org/building-permits>. Upload plans and materials cut sheets to your permit application.

### WATER DISTRICT APPROVAL REQUIRED

Provide note on plans: Marin Water District has approved the installation of the underground fire line. Note: Water District staff must be present for flow tests.

### CITY OF SAN RAFAEL ENCROACHMENT PERMIT REQUIRED

For trenching into the public street, curb, gutter and sidewalk. Contact the Department of Public Works at <https://www.cityofsanrafael.org/public-works-permits/>. Note on plans that Encroachment Permit has been obtained.

### ACCEPTANCE TESTS TO BE WITNESSED BY SAN RAFAEL FIRE DEPARTMENT

Fire detection and alarm systems, fire-extinguishing systems, fire hydrant systems, fire standpipe systems, fire pump systems, private fire service mains and all other fire protection systems and appurtenances thereto shall be subject to acceptance tests as contained in the installation standards and as approved by the fire code official. The fire code official shall be notified before any required acceptance testing. **(CFC 901.5)**

- CALL MINIMUM 24 HOURS ADVANCE NOTICE AT 415-485-3365. No inspections on Fridays.
- Underground fire service main shall be sized according to hydraulic calculations for the fire sprinkler system, hydrant fire flows and hose allowance as per specified in NFPA 13 & NFPA 24.



- Shall be hydrostatically tested and witnessed by our office as per NFPA 10.10.2.2 for 200 PSI for 2 hours,
- Corrosive chemicals or leak stop additives of any nature shall not be used for testing and stopping leaks **(NFPA 16.2.1.9)**
- The torquing of bolted joints shall be checked **(NFPA 24:10.7.2)**
- All piping shall be flushed and shall not be less than the following flow rate as per NFPA 10.10.2.1.3
- A minimum of flow velocity at least 10 feet per second which is necessary to for cleaning the pipe and for lifting foreign material to an aboveground flushing outlet. It shall be continued for a sufficient time to ensure thorough cleaning. **(NFPA 10.10.2.1.3)**

## **PIPING DEPTH OF COVER**

Underground fire service main required depth of cover, Top of pipe to grade is 1 foot below frost line, 30" min. cover and 36" min. cover under driveways.

Pipe shall be listed for fire protection and AWWA C900 standards as per Table 10.1.1 including Polyvinyl Chloride (PVC) Pressure Pipe, 4 in. Through 12 in.

Pipe shall not be run under buildings. **(NFPA 10.6.1)**

## **BACKFILLING**

The trench shall be backfilled between joints before testing to prevent movement of the pipe. Hydrostatic tests should be made before the joints are covered so that leaks can be readily detected. Thrust blocks should be sufficiently hardened before hydrostatic testing is begun. If the joints are covered with backfill prior to testing, the contractor remains responsible for locating and correcting any leakage in excess of that permitted. **(NFPA 10.10.2.6)**

Where required for safety measures presented by the hazards of open trenches, the pipe and joints shall be permitted to be backfilled, provided the installing contractor takes the responsibility for locating and correcting leakage. **THIS REQUIRES FIRE DEPARTMENT APPROVAL (NFPA 10.10.2.7)**

Backfill shall be tamped in layers or puddle under and around pipes to prevent settlement or lateral movement and shall contain no ashes, cinders, refuse, organic matter or corrosive materials. **(NFPA 10.9.1)**

Rocks shall not be placed in trenches. **(NFPA 10.9.2)**

## **VALVES**

All valves controlling connections to water supplies and to supply pipes to sprinklers shall be listed indicating valves. **(NFPA 6.1.1)**

Post indicator valves shall be located not less than 40 feet from the buildings, unless approved by Merced County Fire Department. **(NFPA 6.3.3)**

## **PIPE RESTRAINTS, THRUST BLOCKING, CORROSION PROTECTION**

*Any joint restraint for the fire service main shall be installed as per NFPA Section 10.*

Fire mains utilizing restrained joint systems shall include one or more Locking mechanical/push joints, setscrew retainer glands, bolted flange joints, heat fused/welded joints, pipe clamps/tie rods or other approved methods or devices. **(NFPA 10.8.3)**

Restraint is required on all tees, plugs, caps, bends, reducers, valves, and hydrant run outs. **(NFPA 10.8.1.1)**

Rods used for restraint shall be sized in accordance to Table 10.8.3.1.2.2.

Hydrants shall be set on flat stones or concrete slabs and shall be provided with small stones or the equivalent placed about the drain to ensure drainage. **(NFPA 7.3.1)**

Threaded rod shall not be bent or formed **(NFPA 10.8.3.1.2.4)**

All nuts, bolts, washers, rods and clamps shall be coated with a bituminous or other acceptable corrosion retarding material. **(NFPA 10.8.3.5)**

Thrust blocks shall be installed as per NFPA 10.8.2 and shall be considered as satisfactory where the soil is suitable for their use. **(NFPA 10.8.2.1)** Shall be sized in accordance with NFPA Section A.10.8.2

## **FIRE HYDRANT TYPE**

Fire Hydrants shall be CLOW model 950 for residential and CLOW model 960 for commercial.

## **INSTALLATION HEIGHTS**

Fire Department Connection not less than 18 inches and not more than 4 foot above grade or access level. **(NFPA 8.17.1.7)**

Post Indicator Valves Top of the post is 32-40 inches above the final grade **(NFPA 8.16.1.3.1)**.

Hydrant Center of hose outlet shall be not less than 18 inches or more than 36" above final grade. With a minimum 3 foot clearance around hydrant.

Fire hydrants, FDCs and PIVs shall be protected against mechanical damage. **(NFPA 8.16.1.3.2)**

## **FDC INFORMATION**

The fire department connection shall be on the system side of the water supply check valve. **(NFPA 8.16.2.4.1 8.16.2.4.2)**

For single systems, the fire department connection shall be installed as follows:

- (1) Wet system—on the system side of system control, check, in addition, alarm valves (see Figure A.8.15.1.1)
- (2) Dry system — between the system control valve and the dry pipe valve
- (3) Preaction system — between the preaction valve and the check valve on the system side of the preaction valve
- (4) Deluge system — on the system side of the deluge valve

A listed check valve shall be installed in each fire department connection. Must be approved by Water District. **(NFPA 8.16.2.5.1)**



There shall be no shutoff valve in the fire department connection piping. **(NFPA 8.16.2.5.2)**

## **SIGNAGE**

Label all valves, shutoffs, post indicator valve, for fire sprinkler systems **(CFC 912.4)**

**8.16.2.4.5** Where a fire department connection services only a portion of a building, a sign shall be attached indicating the portions of the building served.

**8.16.2.4.7.1** Each fire department connection to sprinkler systems shall be designated by a sign having raised or engraved letters at least 1 in. in height on plate or fitting reading service design — for example, AUTOSPKR., OPEN SPKR., AND STANDPIPE.

**8.16.2.4.7.2** A sign shall also indicate the pressure required at the inlets to deliver the greatest system demand.

## **VALVE SUPERVISION**

Provide and verify provisions for valve supervision, backflow prevention devices, post indicator valves, shutoffs as per NFPA 72 and CFC 905.9. Are the conduits in place?

## **DISCLAIMER**

***All construction shall be completed in a professional manner and in compliance with all provisions of the current California Building Standards Codes and all referenced documents contained within. The Code and Standard sections cited are specific to your project and provided to assist you, however, they are not intended to be all-inclusive.***