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 of Private Fire Service Mains**

STANDARD NUMBER: 9 EFFECTIVE DATE: 04/01/07 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 the 2025 edition of NFPA 24, and the 2025 edition of NFPA 13.

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

SPECIFICATIONS

1. Underground piping shall be installed in accordance with the 2025 edition of NFPA 24, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances.*

2. Underground fire service plans shall be prepared by a civil engineer or piping installation contractor.

a. 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. 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)

b. A trench cross sectional detail shall be included on the plans.

c. Fire service underground plans shall bare a water district approval signature for all civil improvement projects requiring review and approval by the local water purveyor.

3. Underground fire service plans will not be accepted before civil improvement plans are submitted and approved.

4. 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)

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

6. 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)

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

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

9. Pipe running under a building or building foundation shall be a UL Listed, stainless steel, solid sweep and shall not contain mechanical joints. (NFPA 24 § 10.4.3.1.1)

10. 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 4. (NFPA 24 § 10.9.3)

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

12. 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)

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

14. The fire sprinkler riser shall be located on the outside wall, 12-24 inches from that outside wall and at least 12 inches from any other wall. (NFPA 13 6.1.4)

15. Above grade valves for controlling the water supply for on-site fire hydrants and automatic fire sprinkler systems shall be indicating valves and electrically supervised. (NFPA 24 § 6.7.2) and (CFC § 903.6.1)

16. Private underground fire service systems shall be looped under the following circumstances (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.

17. A 200-PSI hydrostatic pressure test shall be performed, and witnessed by the Fire District, for 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)

18. A fire sprinkler underground supply piping flush, using a full pipe diameter discharge, shall be conducted and witnessed by the Fire District prior to connection to the above ground fire sprinkler system. Flushing shall be performed utilizing burlap sacks or equivalent, to strain the hose outlet(s). Piping shall be flushed until no foreign objects are located in the burlap sack(s) and the water is clear. Contractors shall have the appropriate tools and equipment on-site to complete the flush in a timely manner including sufficient fire hose to direct the water to a safe and approved location. Adequate drainage shall be available to accept a minimum of five minutes flow per 100 feet of pipe at the required flush flow rate outlined in NFPA 24. It is the responsibility of the applicant to obtain all necessary approvals prior to release of water to the environment. (NFPA 24 § 10.10.2.1)

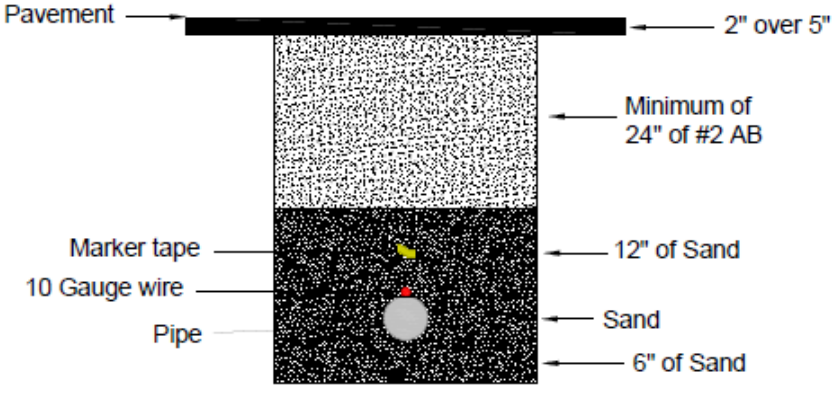
19. A fire department connection piping flush shall be conducted, and witnessed by the Fire District, if connected to the fire sprinkler supply piping below grade. Piping shall be flushed until all foreign objects have been discharged and the water is clear. (NFPA 24 § 10.10.2.1)

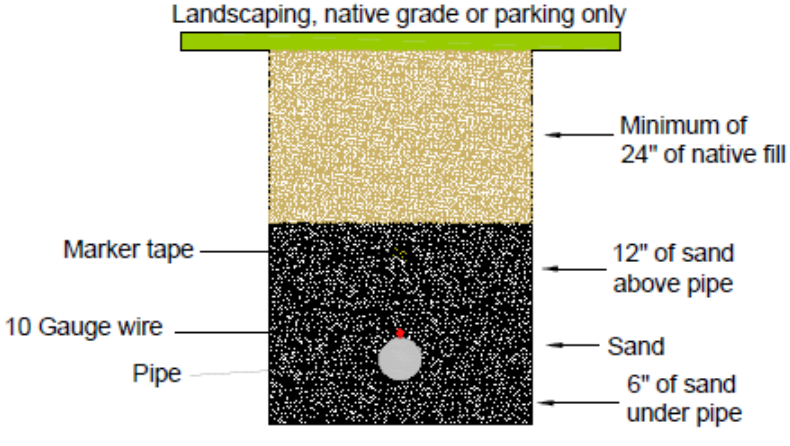
20. A fire hydrant flush, using the 4-½ inch “steamer” outlet, shall be conducted at all hydrants and witnessed by the Fire District. Piping shall be flushed until all foreign objects have been discharged and the water is clear. (NFPA 24 § 10.10.2.1)

21. A Contractor’s Material and Test Certificate for Underground Piping form shall be signed by the installing contractor and owners’ representative. A copy of this form shall be provided to the Fire District prior to final acceptance of the underground installation. (NFPA 24 §10.10.1)

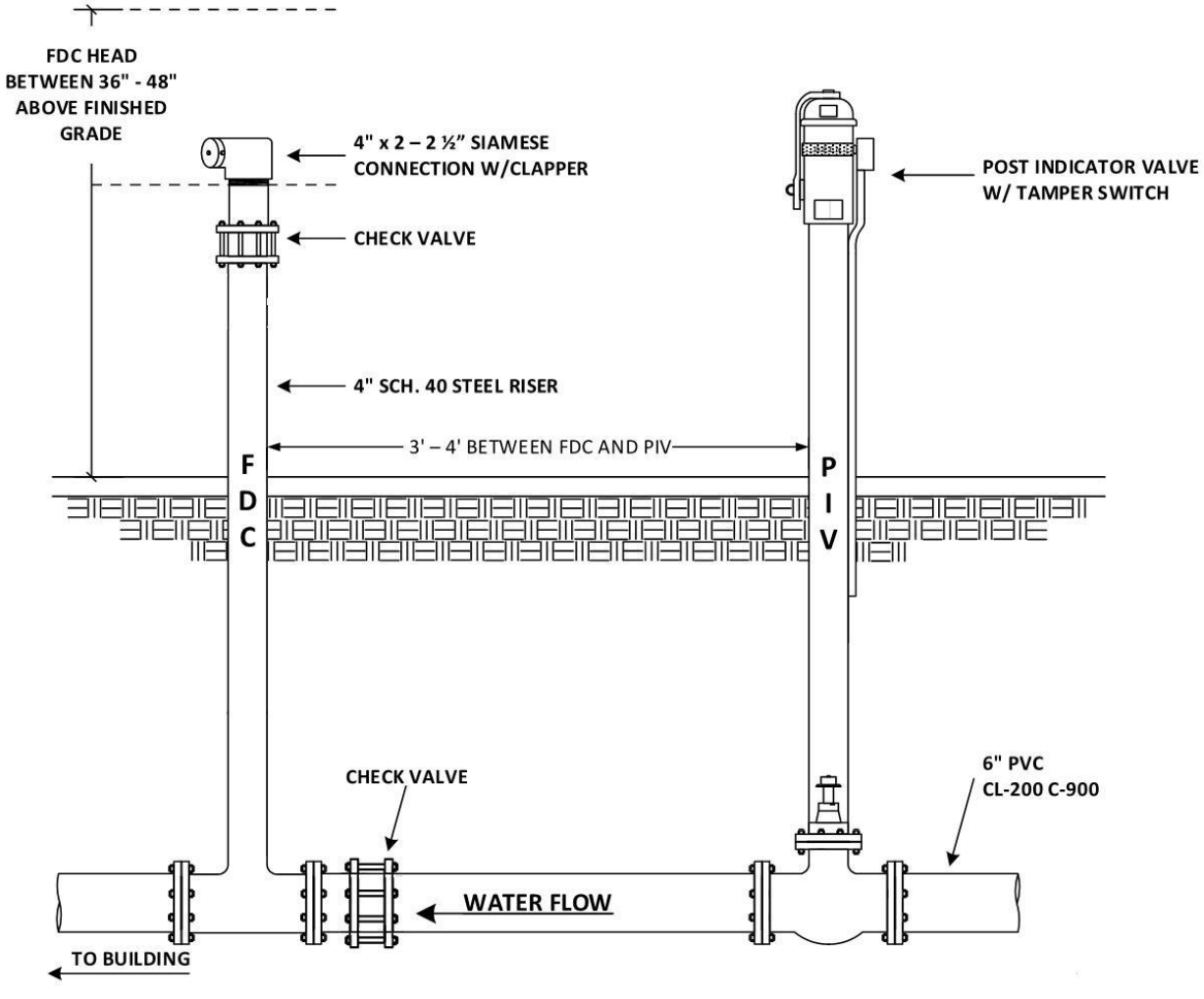
22. A copy of the private fire service underground plans (UGS) shall be placed in a document box by the fire sprinkler riser.

TRENCH DETAIL

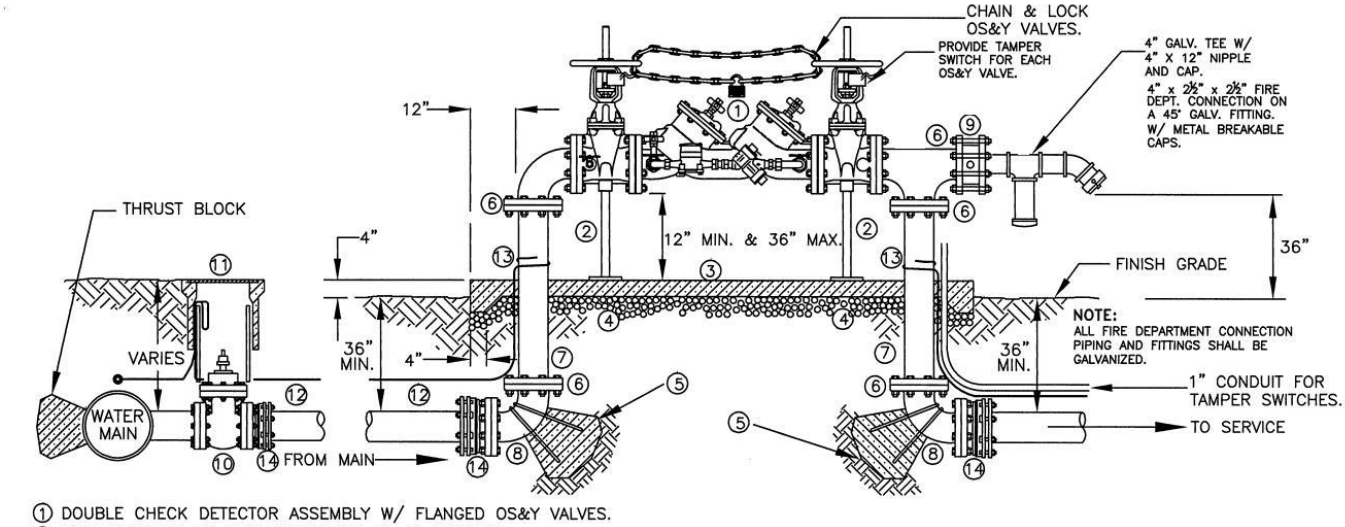




FIRE DEPARTMENT CONNECTION AND POST INDICATOR VALVE DETAIL



BACKFLOW PREVENTER WITH FIRE DEPARTMENT CONNECTION DETAIL



① DOUBLE CHECK DETECTOR ASSEMBLY W/ FLANGED OS&Y VALVES.
② PIPE SUPPORT, 2" GALVANIZED SCH 40 AT MINIMUM.
③ 4" CONCRETE SLAB – 24" WIDE WITH VARYING LENGTH.
④ 6" OF CRUSHED AGGREGATE COMPACTED TO 95% COMPACTION.
⑤ THRUST BLOCK (PER DWG. 8–3A) WITH #5 REBARS. WRAP THE PORTION OF THE REBAR THAT IS NOT EMBEDDED IN THE CONCRETE WITH 20 MIL POLYETHYLENE TAPE.
⑥ FLANGED CONNECTION ONLY.
⑦ FLANGE X FLANGE SPOOL, DUCTILE IRON. WRAP WITH TWO LAYERS OF 20 MIL TAPE AT SLAB PENETRATION.
⑧ FLANGE X FLANGE 90° ELBOW, DUCTILE IRON.
⑨ WAFER CHECK VALVE.
⑩ GATE VALVE, FLANGE X FLANGE.
⑪ VALVE BOX, SEE DWG. 8–5 FOR REQUIREMENTS.
⑫ DUCTILE IRON PIPE, PUSH ON JOINTS. RESTRAIN WITH U.S. PIPE FIELD LOK GASKETS OR APPROVED EQUAL.
⑬ LOCATING WIRE PER DWG. 8–4A. LOOP WIRE AROUND PIPE AT TOP OF SLAB.
⑭ FLANGE X MJ ADAPTER. RESTRAIN MJ WITH EBAA MEGALUG 1100 OR APPROVED EQUAL.