

SANTA ROSA FIRE DEPARTMENT

FIRE PREVENTION BUREAU STANDARD

July 1, 2010



PRIVATE FIRE MAIN, HYDRANT OR AUTOMATIC SPRINKLER SYSTEM UNDERGROUND INSTALLATIONS

PURPOSE

This standard outlines the general requirements for the installation of a Private Underground Fire Service Water Supply. Information contained herein applies to typical instances and may not address all circumstances.

All private underground fire service mains supplying automatic sprinkler systems and/or private fire hydrants require permits, plan review and approval prior to installation.

Allow at least 10 working days for the review of submitted plans. Please call the Fire Department- Fire Plan Review at (707) 543-3500 for additional information.

CODE REFERENCES

City of Santa Rosa - Design and Construction Standards.
NFPA 24. 2007 Edition
City of Santa Rosa Storm Water Ordinance.
2007 California Fire Code (CFC) Chapter 9 (901.5)

PERMIT(S) REQUIRED

- Fire Service Underground
- Encroachment Permit (required by the Public Utilities Department to perform work in the public right-of-way)

Categories and fee amounts are found at: <http://ci.santa-rosa.ca.us/doclib/Documents/IB%20018.pdf> - Please call the Fire Department- Fire Plan Review at (707) 543-3500 for exact permit fee amount.

REQUIRED INSPECTIONS

Inspections shall be scheduled a minimum of 48 hours in advance. Directions for scheduling are found at: <http://ci.santa-rosa.ca.us/news/Pages/AutomatedFireInspectionRequestSystem.aspx>

Hydrostatic Test (NFPA 3.3.14.3)- All new private fire service mains shall be hydrostatically tested at not less 200 p.s.i. for two (2) hours. Trenches may be backfilled only between joints; all joints and thrust blocks shall be left exposed before testing. Once the piping pressurized, it shall not have the pressure increased or decreased during the duration of the test. Prior to backfill, provisions must be made for placement of conduits for installation of fire alarm valve monitoring, if a fire alarm control panel is to be installed.

Flushing Test (NFPA 3.3.14.2) - Underground mains and lead-in connections to system risers shall be flushed thoroughly before connection is made to system piping. The minimum rate of flow shall be not less than the water demand rate of the system, which is determined by the system design, or not less than that necessary to provide a velocity of 10 ft/second, whichever is greater. A hose of not less than 4" diameter shall be used for flushing; larger diameter or multiple hoses may be required to achieve necessary flow rate.

Note: Hydrostatic tests and flushing tests must be performed in the presence of a Fire Department representative. Flushing cannot be done until required City water meters have been installed and a tag has been placed on the double detector check valve by the City Encroachment Division. Water used during the flushing process cannot be allowed to flow directly into any waterway or storm drain.

NFPA 24 – Table 10.10.2.1.3

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Flow Required to Produce a Velocity of 10 Ft per Second (3 m/sec) in Pipes		
Pipe Size	Flow Rate	
(in.)	(gpm)	(L/min)
4	390	1476
6	880	3331
8	1,560	5905
10	2,440	9235
12	3,520	13323

DOCUMENTS

- | | | | |
|----|--------------------------|--------------------------|--|
| | Y | N | |
| 1. | <input type="checkbox"/> | <input type="checkbox"/> | Completed Permit Application and Plan Review Form |
| 2. | <input type="checkbox"/> | <input type="checkbox"/> | Fees shall be submitted along with four (4) sets of plans, |
| 3. | <input type="checkbox"/> | <input type="checkbox"/> | Fire flow calculations and the information requested in this Standard. |
| 4. | <input type="checkbox"/> | <input type="checkbox"/> | Santa Rosa City Business Tax Certificate, |
| 5. | <input type="checkbox"/> | <input type="checkbox"/> | Current contractor's license |
| 6. | <input type="checkbox"/> | <input type="checkbox"/> | Proof of worker's compensation insurance |

NOTE: The contractor doing the underground work should be the contractor applying for and signing the permit application.

Working plans shall be drawn to an indicated scale, on sheets of uniform size, with the following details shown:

- | | | | |
|----|--------------------------|--------------------------|--|
| 1. | <input type="checkbox"/> | <input type="checkbox"/> | Name of owner and occupant; |
| 2. | <input type="checkbox"/> | <input type="checkbox"/> | Location, including street address |
| 3. | <input type="checkbox"/> | <input type="checkbox"/> | Point of compass |
| 4. | <input type="checkbox"/> | <input type="checkbox"/> | Size and location of City main in street |
| 5. | <input type="checkbox"/> | <input type="checkbox"/> | Underground pipe size, length, location, weight, materials, point of connection to City main; type of valves, meters, and valve pits |
| 6. | <input type="checkbox"/> | <input type="checkbox"/> | Trenching details, including depth the pipe is laid below grade, backfill provisions; |
| 7. | <input type="checkbox"/> | <input type="checkbox"/> | Location of existing and proposed hydrants, showing size and number of outlets, valves and location of same; |

LOCATION AND SIGNAGE – *NFPA 24, Chapter 5.9.5* - All pipe, fittings, valves, hydrants and accessories shall be UL or FM approved. All aboveground control valves shall be electrically supervised and signals shall be transmitted to a constantly attended location, and shall be locked and secured in the “open” or “on” position, using standard “breakaway” style locks. All exterior wiring from supervisory devices shall be in underground conduit. All valves shall be provided with identification signs clearly indicating the portion of the system it controls, using all-

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weather signs. Signs shall be on contrasting colors, with lettering that is a minimum of 1” in height. Examples of the sign text are:

CONTROLS FIRE SPRINKLERS AT 123 MAIN ST	CONTROLS PRIVATE HYDRANTS AT 123 MAIN ST
CONTROLS PRIVATE HYDRANTS AND FIRE SPRINKLERS AT 123 MAIN ST	CONTROLS FIRE SPRINKLERS AND STANDPIPES AT 123 MAIN ST
FIRE DEPARTMENT CONNECTION AUTOMATIC FIRE SPRINKLERS	FIRE DEPARTMENT CONNECTION STAND PIPE

Location of all pipe and devices, as follows:

- | | | | |
|----|--------------------------|--------------------------|--|
| | Y | N | |
| 1. | <input type="checkbox"/> | <input type="checkbox"/> | Double Detector Check Valve Assembly (DDCV). The control valves must include valve supervision to the fire alarm control panel. Indicate the make and model of the DDCV on the plans and submit the manufacturer’s data sheet for the DDCV showing the pressure loss. Include the City Standard Detail #880 on the plans. An inspection box must be provided for underground assemblies. |
| 2. | <input type="checkbox"/> | <input type="checkbox"/> | Single Detector Check Valve (SDCV). The control valves must include valve supervision to the fire alarm control panel. Indicate the make and model of the SDCV on the plans and submit the manufacturer’s data sheet for the SCDV, showing the pressure loss. Include the City Standard Detail #888 on the plans. An inspection box must be provided for underground assemblies. |
| 3. | <input type="checkbox"/> | <input type="checkbox"/> | Underground Isolation Control Valves. Show the location of all valves. The location of all valves must be approved by the Fire Department. Valves must be listed. Include the City Standard Detail on the plans. |
| 4. | <input type="checkbox"/> | <input type="checkbox"/> | Fire Department Connections (FDC). Show the location of the FDC. It must be accessible and at an acceptable distance from the building (approximately 40 feet). The FDC must be within 50 feet of a fire hydrant. Indicate the number and size of the inlets and the piping. Show the required check valve at the inlet. The FDC must be separated from the fire mains which supply the fire hydrants by the use of a check valve. This check valve may be above ground or below ground in an accessible vault. This check valve must have isolation on both sides to facilitate maintenance. One of the valves may be the PIV. |
| 5. | <input type="checkbox"/> | <input type="checkbox"/> | Post Indicator Valve (PIV). <i>NFPA 24 – 6.3.</i> Show the location of all PIV’s. The PIV is required to be located at least 40 feet from the building and in an unobstructed location. Where it is not possible, the location must be specifically approved. |
| 6. | <input type="checkbox"/> | <input type="checkbox"/> | Fire Hydrants. <i>NFPA 24 – 7.1.</i> Indicate the make and model of the fire hydrants to be installed on the plans. Fire hydrants are required to be located at least 40 feet from the building and in an unobstructed location. The location of all fire hydrants must be specifically approved. Include the City Standard Detail. |
| | Y | N | |
| 7. | <input type="checkbox"/> | <input type="checkbox"/> | Type of Pipe. <i>NFPA 24 – 10.1.</i> Indicate the type of pipe (PVC, Cement Lined Ductile Iron, etc.), diameter and pressure class (150 or 200 p.s.i.) on the plans. PVC pipes must be identified as “AWWA C-900”. NOTE: Where PVC pipe is used down stream of the check valve at the FDC, it must be Class 200. |

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8. **Method of Joint Restraint.** *NFPA 24 – 10.8.1.* All tees, plugs, caps, bends, reducers, valves, and hydrant branches shall be restrained against movements by using thrust blocks in accordance with 10.8.2 or restrained joint systems in accordance with 10.8.3. Include the City Detail on the plans.
9. **Thrust Blocks.** *NFPA 24 – 10.8.2* Where thrust blocks are used, the plans must include the calculations used to determine the size of the thrust blocks per NFPA 24, 10.8.2 and A-10.8.2, and information regarding the LATERAL soil bearing capacity from the soils engineer's report. Submit a copy of the section of the soils engineer's report which defines the LATERAL soil bearing capacity. The bearing area must be shown on the plans and be based on 200 p.s.i. test pressure.
10. **Rods.** *NFPA 24 – 10.8.3.1.2.* Where rods are used to secure pipe, provide the diameter and number of rods, and the method of corrosion protection. This includes the vertical pipe at the sprinkler riser.
11. **Trench Details.** The type of trench (per City Standards), depth of bury, type and depth of fill, percent compaction, etc, must be shown on the plans. Include the City Standard Detail on the plans.
12. **Tracer Wire.** The plans must include tracer wire for PVC pipe (#12 insulated copper wire, secured to the top of the pipe at 10 foot intervals as shown in City Standards).
13. **Conduit.** The plans must include conduit for valve supervision when required.
14. **Corrosion Protection.** *NFPA 24 – 10.8.3.5* After installation rods, nuts, bolts, washers, clamps and other restraining devices shall be cleaned and thoroughly coated with a bituminous or other acceptable corrosion-retarding material.
15. **Manufacturer's Data Sheets.** Provide manufacturer's data sheets for all pipe, hydrants, backflow devices, fittings, FDC, PIV, valves and ALL other devices. One set of manufacturers' data sheets must be provided for each set of plans to be approved.
16. **Pipe Installation at Building Foundation.** The Site Plan must include a detail for the Fire Service Underground Supply for the fire sprinkler system as it enters the building. Show how it is to be installed at the foundation (i.e., under the foundation, or through the foundation), and through the building pad. Where the supply pipe is to be installed as past of an existing exterior riser, the plans must clearly indicate that the thrust block at the base elbow is completely independent of the foundation. Where the underground main is installed parallel to the building foundation, the civil/structural engineer responsible for the building foundation must approve the location of the main. Special care must be exercised where pipe is installed parallel to a foundation. The structural engineer's approval must be obtained and submitted with the plans.

NOTE: This item must be coordinated with the structural engineer responsible for the foundation design.