



CITY OF VICTORVILLE

FIRE PREVENTION DIVISION

14345 Civic Center Drive
Victorville, CA 92392
(760) 955-5233

FIRE PREVENTION STANDARD W-2 ONSITE FIRE PROTECTION WATER SYSTEMS

Standard Number

W-2

Revision Date:
11-5-25

AUTHORITY

California Fire Code Sections 102.9, 103, and section 104.1.1 as amended in section 8.08.04⁽⁵⁾ of the City of Victorville Municipal Code provides that the fire code official of the City of Victorville Fire Prevention Division shall have the authority to adopt policies, procedures, rules, and regulations in order to clarify the application of the Fire Code and to specify requirements not specifically provided for by the Fire Code. For further requirements on this subject, see section 507 et. seq. of the California Fire Code. This standard may be modified with the approval of the Fire Code Official.

PURPOSE

The purpose of this standard is to serve as a guideline to the current edition of NFPA 24 and NFPA 25 CA for establishing an on-site private water supply capable of providing an adequate water supply for firefighting purposes, as determined by the requirements in the Fire Code.

SCOPE

This standard establishes minimum requirements for the installation and maintenance of all private fire hydrants and appliances related to an onsite fire protection system.

DISCLAIMER

These standards may change without notice. Whenever applicable statutes, regulations and standards are updated and adopted, the latest shall apply. Please contact the Victorville Fire Prevention Division at (760) 955-5227 to determine if these standards have changed. These requirements do not exempt any individual from complying with other applicable state, county, or city codes and standards.

SUBMITTALS

The following shall be submitted to the Fire Prevention Division for approval and permit prior to performing any work on any fire sprinkler system:

- 1) A completed City of Victorville Fire permit application
- 2) A set of detailed plans describing the work to be done. (For information on what must be included on plans, see sections below in this Standard and the City of Victorville Plan Submittal Checklist.)
The designer of the system shall provide a certification statement with the following text verbatim: "I certify that the design of the water system is in accordance with the requirements of the City of Victorville".
- 3) Manufacturer's specifications sheets (cut sheets) for all proposed materials and equipment.



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- 4) A water flow test report from the water purveyor dated within one (1) year of submittal.
- 5) Any other important details and information as required by this Standard.
- 6) Payment of all appropriate fees.
- 7) No work shall commence until plans are approved by the Fire Prevention Division and/or the water company having jurisdiction.

UNDERGROUND PIPING SYSTEMS

- 1) Commercial/industrial projects with a building(s) exceeding 100,000 square feet or a private underground supply that serves five (5) or more sprinkler risers or fire hydrants shall be required to have a looped fire line system with a minimum of two (2) points of connection to the public and/or private water source.
- 2) Underground pipe shall be laid with the identification data facing up to permit inspection and verification of pipe nomenclature.
- 3) Thrust blocks or restrained joints shall be provided as per NFPA 24 and (Figure W-3.1).
- 4) When plastic mains are installed, they shall be marked with 12-gauge tracer wire, taped to the top of the pipe, or with approved tracer tape installed in the trench according to the manufacturer's instructions.
- 5) Underground sprinkler piping serving fire sprinkler systems shall be installed in accordance with City of Victorville Standard W-2 and the current edition of NFPA 13 and NPFA 24.
- 6) Post Indicator Valves (PIVs) and Fire Department Connections (FDCs) serving fire sprinkler systems shall be installed in accordance with City of Victorville Fire Prevention Standard F-4 and the current edition of NFPA 13 and NFPA 24.

FIRE HYDRANT DISTANCES

- 1) All fire hydrants, public and private, shall be located within one hundred fifty (150) feet from all portions of the building(s) to be protected, as measured along approved fire apparatus access routes.
- 2) In no case shall fire hydrants be closer than twenty-five (25) feet to any building, unless approved by the Fire Code Official.
- 3) Public fire hydrants installed to support a fire sprinkler system shall not exceed fifty (50) feet from the fire department connection nor be closer than three (3) feet. **(See Diagram W-2.1).**



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FIRE HYDRANT SPACING

- 1) RESIDENTIAL AREAS (SINGLE-FAMILY):
- 2) Single-family residential developments may have spacing between hydrants no more than six hundred (600') feet, and the hydrant shall not be more than three hundred (300') feet (as measured along vehicular travel ways) to the main driveway on the address side of the proposed single-family structure.
 - a. Shorter hydrant spacing may be required by local ordinances and regulations.
- 3) MULTIPLE FAMILY RESIDENTIAL, INDUSTRIAL, AND COMMERCIAL AREAS:
 - a. Public fire hydrants shall be installed on public streets at distances no greater than three hundred (300') feet between each appliance.
 - b. Public fire hydrants shall be required on both sides of a public street if the public right-of-way exceeds eighty (80') feet.
 - c. Private on-site fire hydrants may be required if any portion of the building(s) to be protected exceeds three hundred fifty (300') feet from the public fire hydrant as measured along vehicular travel-ways.

HYDRANT SIZE, INSTALLATION, LOCATION AND TYPE

- 1) The centerline of the riser shall be normally two (2') feet behind the curb face, unless otherwise approved by the Fire Code Official. (**See Diagram W-2.2**).
- 2) Where curbs and/or sidewalks exist, the centerline of the bottom outlet must be no lower than eighteen (18") inches and no higher than twenty-four (24") inches above the finished grade. In the absence of a curb, set the center of the bottom outlet no lower than eighteen (18") inches and no higher than twenty-four (24") inches above the crown of the road (the crown of the road is the highest point in the middle of the roadway) and provide steel pipe barricades, four (4") inches in diameter filled with concrete, three (3) feet from the hydrant so as not to obstruct the outlets and valve nuts. (**See Diagram W-2.2**).
- 3) Fire hydrant shut-off valves (street valves) shall be located in the drive aisle, directly in front of the 4" port, 3' to 10' from the hydrant, covered with a metal valve box cover painted blue. (**See Diagram W-2.3**).



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- 4) No fire hydrant shall be installed closer than five (5') feet from the edge of driveway aprons.
- 5) Fire hydrants on cul-de-sacs shall be located between the short portions of 2 driveways and shall not be located at the end of the cul-de-sac. On main-line extensions, fire hydrants shall not be located at the end of the line. There shall be a blow-off at the end of line, if required by the local water purveyor. (**See Diagram W-2.4**).
- 6) Wet barrel fire hydrants shall be manufactured to ANSI and AWWA standards. The six
- 7) (6") inch riser and outlets (two - 2 1/2 inch and one - 4 inch) shall be cast as an integral part of the head. They shall be fastened/locked to the head in such a manner to prevent the unintentional removal of the outlets out of the head.
- 8) Manufacturer's specifications of fire hydrants shall be submitted to the Fire Code Official upon request.
- 9) All hydrants on private property shall be an approved hydrant with breakaway bolts.
- 10) Private dry barrel fire hydrants in areas subject to freezing shall meet the same specifications as local public dry barrel fire hydrants maintained by the local water purveyor. In no case shall a dry barrel hydrant be less than 6" x 4" x 2 1/2" x 2 1/2".
- 11) The exterior of the hydrant head, including the riser, excluding the threads, shall be painted with two coats of primer and two coats of exterior oil-based safety yellow paint.

THRUST BLOCKING

- 1) Thrust blocking shall be installed for all fire underground systems where a change in elevation and/or a change in direction occurs.
- 2) The typical concrete rating shall be a minimum rating of 2,500 P.S.I., and with a width typically 1-2 times greater than in height. (see figure W-3.1), contact the City of Victorville Engineering Department to confirm specifications.

WATER MAIN SIZES

- 1) Multi-residential and Commercial-Industrial water main size - shall be determined by the required fire flow.
- 2) Final flow tests shall be made by flowing fire hydrants of all new water distribution systems constructed in accordance with approved water plans. The tests shall be observed by the Fire code official and calculated to establish adequate water is provided prior to final inspection.

HYDRANT MARKERS



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- 1) The developer/contractor shall install blue reflective markers in accordance with the following specifications:
- 2) Markers shall be Ray-O-Lite 2SRPM-DB or equivalent.
- 3) Adhesive shall be Ray-O-Lite 2SRMESS1 or equivalent.
- 4) Location of pavement markers: Markers shall be placed eighteen (18) inches from the painted center line (CL) or, if no painted CL exists, eighteen (18) inches from the center of the roadway on the side nearest the hydrant.
- 5) On a four- (4) lane street with a turn lane at the intersection, the marker shall be eighteen (18) inches from the edge of the turn lane on the side nearest the hydrant.
- 6) Streets with a median having a hydrant on the roadside shall have markers placed eighteen (18) inches from the edge of the painted line closest to, and on the side nearest the hydrant.
- 7) Hydrants at an intersection shall have markers placed on both streets.
- 8) Hydrants on a median shall have a marker eighteen (18) inches from the median edge on both sides of the median.
- 9) For multi-lane streets with a center turn lane not at an intersection, the marker shall be eighteen (18) inches from the edge of the turn lane on the side nearest the hydrant.
- 10) In areas subject to regular snow coverage, alternative marking devices may be used with the approval of the Fire Code Official.

SYSTEM TESTING

- 1) All underground piping shall be hydrostatically tested in accordance with NFPA 24 and flushed prior to connection to any overhead sprinkler piping.
- 2) It is the underground contractor's responsibility to give proper notification of these tests prior to any piping being concealed.
- 3) At completion of testing, the contractor will provide the Fire Prevention Division Inspector with a completed copy of the Contractor's Material and Test Certification for Underground piping.

SPECIAL CONCERNS

- 1) Special hazard areas, high-rise buildings, and other areas of fire protection not covered in this standard may require special consideration. The contractor is encouraged to contact the Fire Code Official regarding these areas not covered in this standard.



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DIAGRAM W-2.1: FIRE HYDRANT AND PIV DETAILS

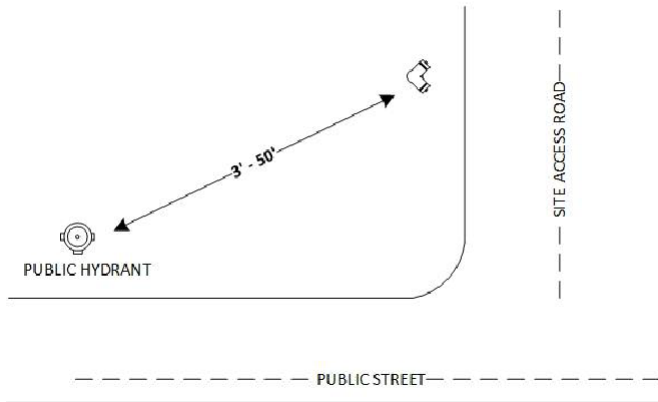
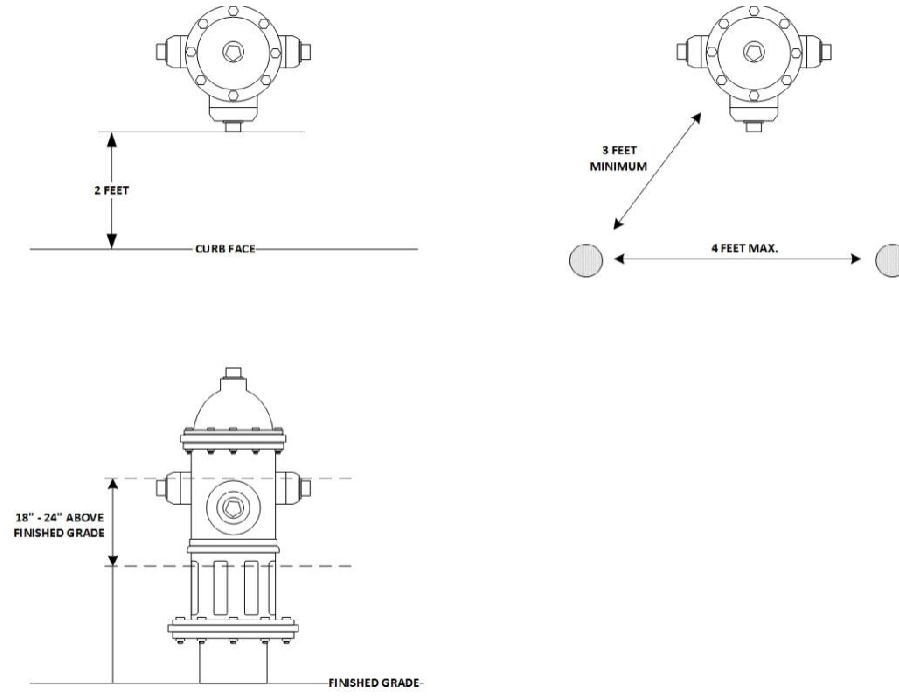


DIAGRAM W-2.2: FIRE HYDRANT INSTALLATION DETAILS





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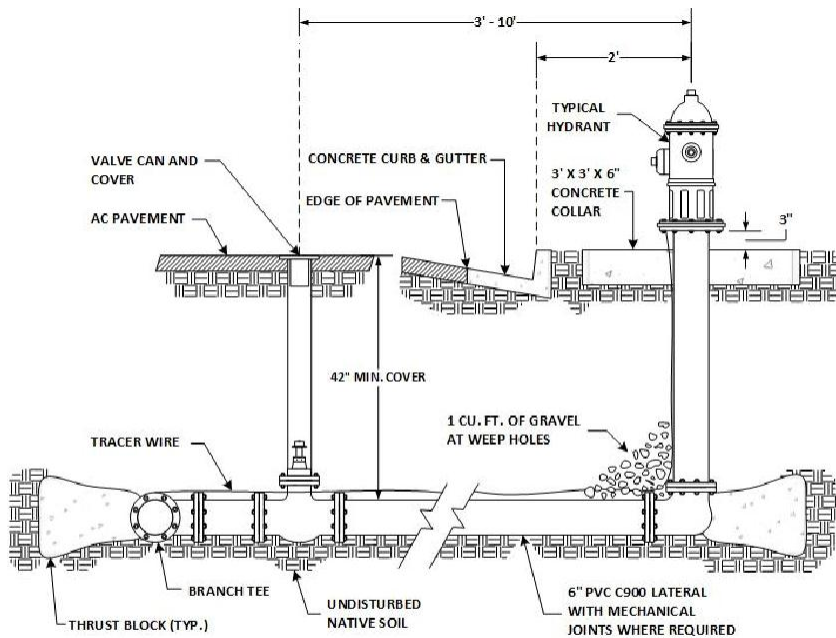
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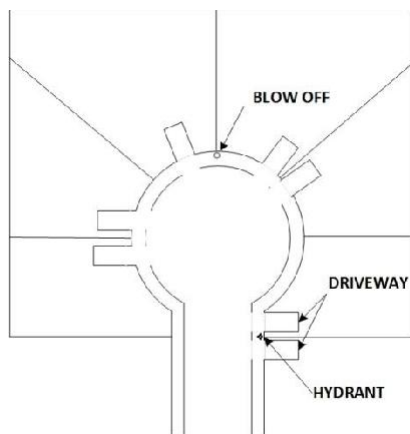
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DIAGRAM W-2.3: FIRE HYDRANT INSTALLATION DETAILS



TYPICAL FIRE HYDRANT DETAIL

DIAGRAM W-2.4: FIRE HYDRANT DETAILS





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3000 PSF - THRUST BLOCK BEARING AREA (S.F.) AND DIMENSIONS (FT.)

PIPE SIZE	TEE'S / DEAD END			90° BEND			45° BEND			22½° BEND			11¼° BEND		
	AREA	WIDTH	HEIGHT	AREA	WIDTH	HEIGHT	AREA	WIDTH	HEIGHT	AREA	WIDTH	HEIGHT	AREA	WIDTH	HEIGHT
4"	2.04	1.75	1.17	2.88	2.08	1.39	1.56	1.53	1.02	0.79	1.09	0.73	0.40	0.77	0.52
6"	4.21	2.51	1.67	5.95	2.99	1.99	3.22	2.20	1.47	1.64	1.57	1.05	0.82	1.11	0.74
8"	7.24	3.29	2.20	10.23	3.92	2.61	5.54	2.88	1.92	2.82	2.06	1.37	1.42	1.46	0.97
10"	10.89	4.04	2.69	15.40	4.81	3.20	8.33	3.54	2.36	4.25	2.52	1.68	2.13	1.79	1.19
12"	15.40	4.81	3.20	21.77	5.71	3.81	11.78	4.20	2.80	6.01	3.00	2.00	3.02	2.13	1.42

AREAS IN THIS TABLE WERE DERIVED USING 225 PSI WATER PRESSURE AND 3000 LB/SQ FT SOIL RESISTANCE. THIS IS BASED UPON NFPA 13, 2022 TABLE A.6.6.1(b) FOR SANDY SILT SOIL TYPES.

NOTE: THRUST BLOCK SIZE REPRESENTS BEARING SURFACE THAT IS AGAINST UNDISTURBED SOIL

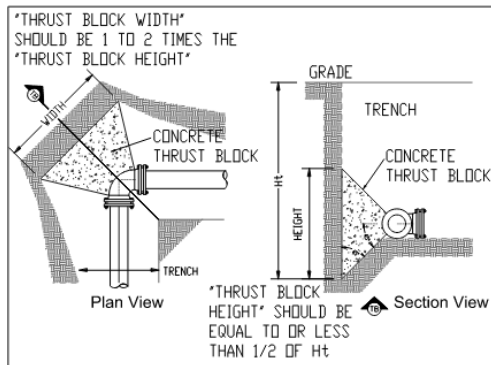


DIAGRAM W-3.1:

TYPE OF FITTING	90° BEND	45° BEND
TYP. INSTALLATION		
TYP. INSTALLATION		
TYPE OF FITTING	11 1/4° OR 22 1/2° BEND	TEE OR DEAD END
TYP. INSTALLATION		