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| STANDARD DETAILS & SPECIFICATIONS | Spec No | <u>W-2</u> |
| | Rev. Date | <u>07/01/20</u> |
| | Eff. Date | <u>11/05/09</u> |
| | Approved By | <u>[Signature]</u> |
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| SUBJECT: Fire Service Underground Piping, Private Fire Hydrants, Post Indicator Valves and Fire Department Connections for other than One and Two-Family Dwellings | | |

SCOPE

The Fire Chief is authorized to require the installation of fire protection water supplies and fire hydrants in accordance with the provisions of the Fire Code. The information contained within this document is to serve as a guideline for installation of such equipment. This document is not applicable for installations of public water mains and fire hydrants.

DEFINITIONS

Fire Flow: The flow rate (in gpm) of a water supply that is available for firefighting @ 20 psi.

FDC: Fire Department Connection

NFPA: National Fire Protection Association.

OS&Y: Outside Screw and Yolk

Piping: Any piping approved for use by the National Installation Standards or by the Fire Department.

PIV: Post Indicator Valve

Velocity Factor: The speed of water in the pipe in feet per second.

Wharf Hydrant: A hydrant with one, two-and-one-half inch (2½”) outlet.

REQUIREMENTS

Fire service underground piping shall be installed in accordance with National Fire Protection Association Standard (NFPA) #24, standard for the *Installation of Private Fire Service Mains* and in accordance with this standard.

I. UNDERGROUND FIRE SERVICE SUPPLY PIPING

- A. Fire service piping shall not be installed under buildings. When portions of the piping must penetrate building foundations or footings, it shall be installed per NFPA Std. #24 and protected by a sleeved penetration that provides a minimum two-inch (2") annular clear space; Underground fire service piping shall not be encased in concrete.
- B. Fire service piping shall not cross property lines unless part of a recorded deed.
- C. When an existing structure is expanded, resulting in an additional sprinkler system riser being provided, it shall be supplied from the existing fire service main and FDC. (See: "Post Indicator Valves" below for valve arrangements).
- D. Prior to connection to the fire sprinkler system, all underground fire service piping shall be subjected to a hydrostatic test at 200 psi for a period of 2 hours. After completion of the test, the piping shall be flushed as outlined in the NFPA standard.

II. POST INDICATOR VALVES

- A. New sprinkler or private fire protection water supply systems shall be provided with a PIV for system control. (Exception: approved back-flow prevention assemblies utilizing listed OS&Y valves).
- B. One-story buildings having multiple fire sprinkler system risers, (i.e., large warehouses or industrial buildings), shall have a single main supply PIV installed at the street, while the other risers may have exterior wall mounted PIV's or OS&Y control valves.
- C. Main system PIV's (or back-flow prevention assemblies controlling sprinkler or private fire protection water supply systems) shall be installed on the street address side of the building (or as otherwise approved by the Fire Code Official) not more than five feet (5') behind the back edge of the sidewalk (when a sidewalk is provided running parallel to the street and is within ten feet (10') of the street/curb line). In no case shall the PIV or control valve assembly be more than twenty feet (20') from the street/curb line.
- D. When sprinkler floor control valves are required in accordance with the California Fire Code, the PIV (or control valve assembly) shall be installed at the street for main system control, with the individual floor control valves located at the stairway landing of each floor.
- E. PIV's, OS&Y's or other exterior sprinkler control valves shall be provided with a durable, weather-proof label that indicates the specific building address or building number it serves.

- F. PIV's or exterior wall-mounted sprinkler control valves shall be painted Safety Yellow (or equivalent), except that the operating elements shall be maintained free of paint

III. FIRE DEPARTMENT CONNECTIONS

- A. The fire department connection (FDC) shall be installed at the street on the street address side of the building. It shall be located within 100 feet (100') of a public fire hydrant.
- B. The FDC may be located directly on the exterior wall of a building provided there are no unprotected building openings within a distance of 10 feet (10'), horizontally, on either side of the FDC and that distance is maintained vertically, to the top of the exterior wall. This provision may be modified by the Fire Code Official in the case of a practical difficulty.
- C. FDC's supplying only automatic fire sprinklers shall be equipped with a minimum of two (2), two-and-one-half inch (2½") national standard threaded inlet couplings. When FDC's supply both fire sprinklers and standpipes and/or both fire sprinklers and on-site fire hydrants, the connection shall provide a minimum of four, two-and-one half inch (2½") threaded inlets, served by a minimum six-inch (6") riser.
- D. Orientation of the FDC shall be such that hose lines may be readily and conveniently attached to the inlets without interference.
- E. FDC's shall be painted Safety Yellow (or equivalent).
- F. FDC's shall be provided with a durable, weather-proof label that indicates the specific building address or building number it serves.

IV. FIRE HYDRANTS

- A. Hydrant Type: * All fire hydrants shall be a "wet barrel" type with outlet sizes and configurations for the various municipalities served by the Santa Clara County Fire Department as follows:

| Municipality | Hydrant Type |
|---|---------------------------------------|
| Campbell | Two 2 ½ outlets and one 4-inch outlet |
| Cupertino | Two 2 ½ outlets and one 4-inch outlet |
| Los Altos & Los Altos Hills (Commercial) | Two 2 ½ outlets and one 4-inch outlet |
| Los Altos & Los Altos Hills (Residential) | One 2 ½ outlets and one 4-inch outlet |
| Los Gatos | Two 2 ½ outlets and one 4-inch outlet |
| Monte Sereno | Two 2 ½ outlets and one 4-inch outlet |
| Saratoga | Two 2 ½ outlets and one 4-inch outlet |
| Unincorporated | Two 2 ½ outlets and one 4-inch outlet |

*Wharf Hydrants may not be used for installations under this Standard.

B. Hydrant Threads: National Standard Thread.

C. Hydrant Location:

1. Hydrants are to be placed at locations approved by the Fire Department. Hydrants shall be located adjacent to roadways such that the centerline of the hydrant is at least 2 feet (2') but not more than 8 feet (8') from the face of the curb or roadway surface.
2. Hydrants shall be installed such that the center of the largest hose outlet is not less than eighteen inches (18") or more than thirty inches (30") above final grade.
3. The hydrant street control valve shall be located a minimum of 6 feet (6') from the centerline of the hydrant.
4. When required by the Fire Code Official, fire hydrants shall be protected by approved bollards, installed per Fire Department Standards.

D. Hydrant Supply Piping:

1. Hydrants supply piping shall be of a minimum size of 6 inches (6") for required flows up to 1000 GPM and shall be 8 inches (8") or greater for flows in excess of 1000 GPM. Contact the Fire Department for specific sizing requirements of mains and fire service connections.
2. The hydrant riser and riser elbow shall be ferrous metal. Buried horizontal piping runs may be of an approved plastic pipe.
3. Concrete thrust blocks sized in accordance with National Standards shall be provided at all changes in pipe direction.

E. Hydrant Color and Location Identification:

1. Fire hydrants shall be painted safety yellow (including caps and flanges).
Note: Private on-site hydrants supplied by the sprinkler system FDC shall have the top portion of the hydrant (approximately 4 inches) painted white.
2. Blue reflective markers shall be provided on the roadway to identify fire hydrant locations. The markers shall be secured to the roadway directly in line with the hydrant and as follows:
 - a. On roadways without center stripes, the blue markers shall be set in the center of the roadway.
 - b. On undivided striped roadways, blue markers shall be set six inches (6") to the hydrant side of the center stripe.
 - c. On divided roadways, the blue markers shall be set six inches (6") to the side of the lane striping that is closest to the hydrant.

F. Hydrant Clearance:

1. A minimum three-foot (3') clear space shall be maintained around the circumference of fire hydrants and similar fire appliances such as FDC's or PIV's.

V. REQUIRED PLAN SUBMITTAL

- A. Shop drawings reflecting compliance with the National Fire Protection Association Standard #24 (2016 edition), shall be prepared and submitted to the Fire Department for review. The shop drawings shall be drawn to scale and contain the following information:
1. Size, location, and type of all water supplies (Detail of connection to public water main).
 2. Size, type, and location of all piping: including the class and depth of cover.
 3. Size, type, and location of all control valves.
 4. Size, type, and location of all fire hydrants.
 5. Manufacturer's Specification sheet for all equipment including pipe, hydrants, tanks, valves, and fittings.
 6. Size, location and type of thrust blocks or anchor points.
 7. Type of joint restraint(s), to include the method of corrosion protection.
- B. Hydraulic Calculations: Hydraulic calculations may be required to verify required fire flow at hydrants prior to installation. If required by the Fire Department, hydraulic calculations shall be part of the plan submittal. Maximum Velocity Factor shall be 15 feet per second for hydraulic calculations.
- C. Fire Department Permits: Permits for installation are required. Contact the Fire Prevention Division for details regarding permit applications, and fees.
- D. Installation Requirements: Installation of fire service piping shall be performed only by individuals who are trained and licensed to perform such work. Poor workmanship will not be accepted or approved. All materials shall be new and in good physical condition.
- E. Installation Inspection: All underground piping and valves shall be inspected by the fire department prior to backfill. Hydrostatic, flow, and flush tests may also be required prior to final acceptance of the installation.