



San Mateo County Fire Department

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Standard Detail and Specification Manual

Section: Fire Protection Equipment	Title: Rural Water Supply & Hydrants
Effective: January 1, 2023	Revised: May 5, 2022
Number: CFS-03	Authorized By: Patrick Griffin, Fire Marshal

SCOPE:

The provisions of this standard establish a minimum emergency water supply and flow to attack or defend property from fire. These provisions shall apply to structures located in rural areas not serviced by a water purveyor, pursuant to a new development approval. A water supply and fire flow shall be provided for every facility, building, or portion of a building hereafter constructed or moved into or within the jurisdiction. A water supply and fire flow shall also be provided when the scope of work on existing buildings meets the definition of a “substantial alteration” as defined in San Mateo County Ordinance.

REFERENCE CODES:

- California Fire Code (CFC) Section 507, & Appendix B, Appendix BB
- California Code of Regulations, Title 14, Section 1275.00-1275.20
- National Fire Protection Association, NFPA 22 Standard for Water Tanks for Fire Protection.
- National Fire Protection Association, NFPA 1142 Standard on Water Supplies for Suburban and Rural Firefighting

TYPE OF WATER SUPPLY:

Water supplies may consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems capable of providing the required fire flow. In calculating the emergency water supply, swimming pools and ponds shall not be considered as a primary water source.

WATER TANKS – GENERAL PROVISIONS:

- Water tanks may be constructed of concrete, metal, wood, fiberglass or polypropylene plastic.
- A screened vent 1.5 times the diameter of the outlet is required. (e.g., a 4-inch outlet requires a 6-inch vent).

- Water tank(s) supplying hydrants shall be located at an elevation which provides adequate positive pressure.
- Water tanks located closer than 30 feet to structures or flammable vegetation shall be constructed of non-combustible materials.
- Water tanks shall be interconnected by using a minimum pipe size of 4-inch, interconnection piping and valves must be of a material not damaged by UV exposure. The cross connection shall also have an appropriately sized control valve located at each tank.
- Landscaping water supply shall not be stored in tanks providing water for fire hydrants unless approved by the Fire Marshal. The landscaping water shall be in addition to that required for fire protection, and an automatically activated solenoid valve shall be required to avoid pressure loss in fire protection water supply due to large demand from the same water supply (landscaping or agricultural irrigation).
- Water tanks used for fire protection shall remain full at all times, and shall be filled automatically from a reliable water source (e.g. well, year round spring, or creek).
- Where water tanks provide both domestic and fire protection supply, the water tank shall be fitted with a float switch wired to the domestic water shut off solenoid.
- Control valves shall be provided for all hydrant installations and be located at the tank or in a location approved by the Fire Marshal.
- All water tanks shall be pressure tested and filled per NFPA 1142 requirements.
- All aboveground fire sprinkler or fire hydrant water piping shall be metallic.
- Signage shall be posted that identifies all control valves.

RURAL WATER SUPPLY DETERMINATION:

Water Storage for One- and Two-Family Dwellings (Group R Division 3):

- Residential structures shall have a minimum of 5,000 gallons plus required domestic. Determined by the Fire Marshal utilizing NFPA 1142. The water supply must include the calculated flow requirements for the required fire sprinkler system.
- Fire flow requirements for multiple structures shall be calculated based on the structure requiring the largest Fire Flow per NFPA 1142.

RURAL HYDRANTS – GENERAL PROVISIONS:

- Hydrants shall be clearly visible from the street. The location and placement of hydrants shall be approved by the Fire Marshal.

- Hydrants shall be located no closer than 50 feet to any building, no further away than 150 feet of the protected structure, and be located on the fire department access side of the building.
- Hydrant supply pipe shall be listed and approved for fire protection service for underground pipe, such as AWWA C900. Pipe shall be buried a minimum of 30 inches below grade (36 inches if the pipe passes under a road or is subject to heavy loads).
- Pipes supplying rural hydrants shall have a minimum diameter of no less than 4 inches.
- Rural hydrants shall have at least one 4 ½” outlet with National Hose thread, and shall have a removable metallic cap unless using a Wharf Hydrant then a 2 ½” outlet National Hose thread.
- The hydrant riser and elbow shall be steel. All above ground piping used for fire hydrant water supply shall be metallic.
- Hydrants shall have a concrete pad, 4 in. deep x 2 ft. x 2 ft., at the base.
- All hydrants and supply piping shall be designed to support a negative 30-inch Hg drafting operation.
- All draft hydrants shall be positive pressure and meet the required fire flow on demand. (Hydrants requiring priming, shall not be considered as a primary water source).
- Hydrants shall be positioned so the center of the discharge is 30-36 inches above grade within 5 feet of the roadway.
- When required, concrete thrust blocks shall be sized in accordance with national standards and shall be provided at any change in pipe direction.
- All hydrants shall have a 3-foot diameter minimum clearance from any physical object that may impede operations (retaining walls, guard posts, rocks etc.).
- Flammable vegetation shall be cleared for a minimum 8-foot radius from around all hydrants regardless of type.
- Permanent guard posts or bollards shall be installed where necessary to protect exposed fire hydrants from vehicular damage.
- Hydrants shall not be obstructed by parking or in any other manner. “No Parking” signs may be required by the fire official.
- Hydrant location shall be identified by the installation of blue reflective markers on the roadway.

- Rural hydrants shall have a permanent sign affixed, red in color with white 1-inch letters stating “Wet Draft Hydrant, _____ gallons”, with the gallons of water available for the hydrant provided. Hydrants shall be painted red and have a minimum 2” Blue reflective band around the top of the pipe just below the valve.

WATER SYSTEM PLAN SUBMITTAL:

A plan showing all components of the fire protection water system shall be submitted digitally to Planning and Building Department of San Mateo County to be reviewed and approved by the San Mateo County Fire Department and shall include the following:

- Size, location, and type of all water supply tanks showing vent and outlet locations and sizes.
- A complete description and diagram showing the water piping layout. Include water source (e.g., supply lines, wells, springs, community water system tap).
- Size, type, location, and depth of cover for all piping including domestic/fire sprinkler supply and hydrant supply.
- Size, type and location of all control valves, fittings, required pumps (with specifications), electrical service, and all structures.
- Size, type, location, and capability of fire hydrants.
- Elevation of water tank, hydrant and sprinklered buildings.
- Has an adequate emergency access roadway been provided? (Reference to CFS Standard for Fire Department Access Roadways)
- Has the property owner provided a letter that they are aware of the potential delay in response time due to the location of their property and terrain? Will this document be recorded against the deed?

INSPECTIONS:

Prior to covering any fire suppression water supply pipe, the San Mateo County Fire Department Fire Marshal Office must be notified.

- **HYDRANT PRESSURE TEST & FLUSH:** The installing contractor shall pressure test and flush the underground fire hydrant supply pipe as required. The flush and pressure test require verification by SMC FD.
- **FIRE SPRINKLER PRESSURE TEST AND FLUSH:** Prior to connecting the underground fire sprinkler supply pipe to the fire sprinkler riser, the pipe shall be pressure tested at 200 PSI for 2 hours, and flushed by the installing contractor as required. If the underground piping is not to be connected to the riser immediately, the pipe shall be capped to prevent contamination.