

STANDARD DETAILS & SPECIFICATIONS

SUBJECT: Installation of Private Hydrants & Water Supply for Other than One-and Two-Family Dwellings and Associated Structures

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Approved By	J. Saunders
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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 related to commercial and agricultural occupancies located in the unincorporated areas of Santa Clara County. This document is not applicable for installations of public water mains and fire hydrants.

DEFINITIONS

Rural / Urban: A 'Rural' lot shall be defined as one acre or more in size. An 'Urban' lot is less than one acre. This definition shall be independent of all Zoning designations.

Agricultural Building: A structure designed and constructed to house farm implements, hay, grain, poultry, livestock or other horticultural products. This structure shall not be a place of human habitation or a place of employment where agricultural products are processed, treated or packaged, nor shall it be a place used by the public. Exempt status is granted only by the Santa Clara County Planning Office.

Exempt Agricultural Building: Any agricultural building (see definition above) of less than ten thousand (10,000) square feet in total area located on a lot of ten (10) acres or greater. These structures do not require building permits.

Fire Protection Water Supply: Water provided for fire fighting purposes only. Water required for domestic, industrial, landscaping, agricultural or any other use shall be provided in addition to water required by this standard.

REQUIREMENTS

I GENERAL REQUIREMENTS

- A) These water requirements shall be provided and maintained for the purposes of fire protection only, and shall be in addition to water provided for any other purpose.
- B) Section B7 of the County of Santa Clara Ordinance shall apply to all buildings, regardless of use, and shall supersede all other requirements in this Standard with the exception of public school buildings and occupancy groups R-3 and U, as defined by the California Building Code:
 - 1. Buildings three (3) or more stories in height or 35 ft. in height, or that require a fireflow in excess of 2,000 gallons per minute, or the floor area is in excess of 10,000 square feet shall be equipped throughout with an approved automatic fire sprinkler system.

B) Section B7-12 of Santa Clara County Ordinance 800.22: *(Continued)*

2. Where water supplies available for fire protection do not meet the requirements of Appendix III-A, an approved (approved refers to an approval by the Fire Marshal) automatic sprinkler system installed throughout the building will be acceptable alternate means of protection provided that a sprinkler system is not otherwise required by the Fire or Building Code.

II FIRE PROTECTION WATER SUPPLY

A) Basic Requirements:

Fire flow and duration shall be determined by Table A-III-A-I of the California Fire Code. Standard hydrant(s) shall be provided within 150 feet of all portions of the structure(s) as required by the code.

B) Exceptions:

1. Isolated Rural Structures:

For the purposes of determining fireflow requirements only, 'Isolated Structures' shall mean those which are located in a Rural area, are comprised of a single structure or a group of 2-3 structures, and are located at least 50 feet from a property line or other structure or group of structures. Fire flow shall be determined by Table A-III-A-I of the California Fire Code. Duration shall be for a minimum of 30 minutes. Standard hydrant(s) shall be provided within 150 feet of all portions of the structure(s) as required by the code.

2. Fire Flow Requirements for 'Exempt' Agricultural Buildings:

- a. Water storage requirements for buildings that have been designated by the County Planning Department as 'Agricultural Exempt' will be determined per NFPA 1142: Standard for Water Supplies for Suburban and Rural Fire Fighting, however a minimum of 5,000 gallons shall be provided.
- b. A wharf hydrant with a 2-1/2" outlet is acceptable for 5,000 gallon tanks. Tanks up to 10,000 gallons shall be provided with wharf hydrant with a 4" outlet or double 2-1/2" outlets. A standard hydrant is required for tanks in excess of 10,000 gallons.
- c. Regardless of type, hydrants shall be located such that all exterior portions of the structure are within 400 feet of a hydrant. The number of hydrants provided shall be sufficient to satisfy this requirement.

Acceptable alternate methods of protection:

The installation of an approved NFPA 13 automatic fire sprinkler system will be deemed adequate. Requirements for water storage quantity shall be as calculated for system demand for a minimum of 30 minutes, with a minimum of 5,000 gallons storage. Hose streams may be deleted from such system calculations. A wharf hydrant with a 2-1/2" outlet shall be provided within 150 feet of the structure(s), regardless of tank size.

3. Greenhouses: (This section does not apply to structures with an Agricultural Exempt designation)
 - a. **10,000 sf or less**: Minimum 5,000 gallon above-ground storage tank or 500 gpm from a well or other source. A wharf hydrant with a 2-1/2" outlet shall be provided within 150 feet of all portions of the structure(s).
 - b. **Over 10,000 sf**: Water storage capacity shall be as required by NFPA 1142, with a minimum above-ground tank size of 5,000 gallons, and maximum tank size requirement of 30,000 gallons. A standard hydrant shall be provided.
 - c. **Hydrant Spacing**: Regardless of type, hydrants shall be located such that all exterior portions of the structure are within 400 feet of a hydrant. The number of hydrants provided shall be sufficient to satisfy this requirement.
4. **Riding Arenas**: Noncombustible canopy structures with dirt floors and no sides, used only for the purpose of providing shelter for riding arenas and are not used in any way for combustible or noncombustible storage, may be approved with no requirements for fire protection water supply. Such structures shall be reviewed on a case-by-case basis.
5. Shade Structures:* (See Section VI; "Miscellaneous Details" for definition)
 - a) **Up to 10,000 sq. ft.:** No water required
 - b) **10,001 – 20,000 sq. ft.:** 5,000 gallons
 - c) **20,001-40,000 sq. ft.:** 10,000 gallons
 - d) **40,001– 60,000 sq. ft.:** 20,000 gallons
 - e) **60,001 sq. ft. and above:** 30,000 gallons

A wharf hydrant with a 2-1/2" outlet shall be provided, or water storage tanks may be equipped with a 2-1/2 inch tank outlet valve installed at a height of 24 to 48 inches off grade. The outlet (or tank with outlet) shall be installed at a location acceptable to the Fire Marshal's Office, and access shall be provided at all times.

*NOTE: In lieu of water storage, a 'reliable' well pump producing 250 gallons per minute at 20 psi residual pressure may be provided. See VI-I.

6. Public School Structures: This section applies only to those structures owned and operated by the public school system which are reviewed by the Office of the State Architect. **NOTE**: Relocatable buildings installed on public school sites for 24 months or less are not subject to these regulations, regardless of where they are located on the property (see letter from the State Fire Marshal's Office dated 11/20/98).
 - a. Fire protection water supply shall be calculated using California Fire Code Appendix III-AA. Duration may be reduced to 30 minutes if the structure meets the definition of an Isolated Rural Structure.
 - b. Hydrant(s) shall be provided as required by California Fire Code Appendix III-BB.

7. Recreational Vehicle (RV) Parks: It is recommended that Recreational Vehicle (RV) parks without significant structures upon which to base fire protection water supply requirements should be provided as follows:
 - a. Minimum 5,000 gallon above-ground storage tank.
 - b. A wharf hydrant with a 4 inch outlet or double 2-1/2" outlets, fed by a 4 inch line shall be provided within 400 feet of all campsites/RV parking spots.

NOTE: Item II.B.7 is not enforceable without a change in the current Zoning Ordinance.

III HYDRANT & TANK SPECIFICATIONS

A) General:

1. The hydrant make/model shall be subject to Fire Marshal approval.
2. Hydrant placement shall be subject to Fire Marshal approval.
3. Hose threads for all hydrants shall meet National Hose Standard (NHS) requirements.
4. Hydrants may not be considered usable if railroad tracks, fences or major streets/highways lie between the subject occupancy and the hydrant.
5. A 3-foot minimum (8-feet in SRA) clear space shall be maintained around the circumference of fire hydrants.
6. When subject to the possibility of vehicle impact, fire hydrants shall be protected by approved bollards, installed per CFMO-C1.
7. Both wharf and standard type hydrants shall be painted & provided with a reflective marker in accordance with County Standard CFMO-W3.

B) Hydrants:

1. Hydrant Type:

- a. Wharf Hydrant with a 2-1/2" Outlet: Hydrant with a single two and one-half inch (2-1/2") outlet fed by a minimum four (4) inch line. Shall be supplied by an above-ground tank with a maximum of 5,000 gallon storage capacity. *[See CFMO W-4: Residential Wharf Hydrant Standard]*
- b. Wharf Hydrant with a 4" Outlet or double 2-1/2" Outlets: Residential type hydrant with one outlet measuring four (4) inches in diameter, or double outlets each measuring two and one-half (2-1/2) inches in diameter, fed with a minimum four (4) inch line. *[See CFMO W-4: Residential Wharf Hydrant Standard]*
- c. Standard Hydrant: Hydrant with one four (4) or four and one half (4-1/2) inch steamer connection and double two and one half (2-1/2) inch outlets. Hydrant shall be fed by a minimum six (6) inch line from either a storage tank or recognized water purveyor. Standard hydrants shall be provided for all storage tanks in excess of 10,000 gallons storage capacity. May be either wet or dry barrel type.

NOTE: Standard hydrants located within the South Santa Clara County Fire Protection District, all State Response Areas (SRA), on the Stanford University campus, and within the Palo Alto Fire Department's response area require a 4-1/2 inch steamer connection.

2. Hydrant location: Hydrants shall be located a minimum of 40 feet from any structure and no further than 150 feet from the furthest portion of the structure it is intended to protect.
3. Hydrant Spacing: Hydrants shall be spaced at a maximum of 250 feet on center unless specified otherwise by this standard. Hydrants for public schools shall be spaced as determined by Appendix A-III-B-I of the California Fire Code.
4. Hydrant Supply Piping:
 - a. Supply piping shall be a minimum diameter of 6 inches for required flows up to 1,000 GPM, and shall be 8 inches or greater for flows in excess of 1,000 GPM. Contact the Fire Marshal's Office for specific sizing requirements of mains and fire service connections.
 - b. Wharf hydrants: Supply piping shall be a minimum diameter of 4 inches. Height of risers for Wharf Hydrants shall be a minimum of 24 inches and a maximum of 48 inches. Riser minimum pipe diameter shall be 4 inches. All supply piping shall be buried except for Wharf Hydrant riser piping.
 - c. Standard hydrant: Supply piping shall be a minimum diameter of 6 inches.
 - d. Riser and elbow shall be ferrous metal. Buried horizontal piping runs may be of an approved plastic pipe.
 - e. Concrete thrust blocks shall be sized in accordance with national standards shall be provided at all changes in pipe direction.
5. Appurtenances:
 - a. Fire Department Connections: A Fire Department Inlet Connection shall be provided for all private standard hydrant system installations. The connection will be a minimum of a 4-way 2 - 1/2-inch connection, with a minimum 6" riser placed at a location approved by the Fire Marshal's Office.
 - b. Valves: Control valves shall be provided for installations. Valves shall be of the indicating type. The following control valves shall be provided:
 1. Tank Interconnection Control valves for isolation of tanks.
 2. Hydrant supply piping control valve: This valve located between the tanks and the hydrant shall be placed at location(s) approved by the Fire Marshal's Office.
 - c. Water Source Control Valves shall be provided to isolate tanks from water fill sources.
 - d. Fire department connections, post indicator valves, and fire sprinkler control valves shall be painted and provided with a reflective marker in accordance with County Standard CFMO-W3.

C) Tank Specifications:

1. Tank Location: Tanks shall not be located at a lower elevation than the outlet of the hydrant to provide positive pressure, unless an approved fire pump is provided. Underground tank(s) that require drafting of water will not be permitted.
2. Tank Construction: Fire protection water supply tanks shall be constructed of approved plastic, metal, cement, etc. Swimming pools, wooden tanks, etc. are not allowed. Tanks located within 20 feet of a structure shall be constructed of noncombustible material.
3. Interconnection of Tanks: Interconnection of tanks shall be accomplished by a minimum pipe size of 4 inches for combined storage capacity of up to 10,000 gallons maximum and six inches for combined storage capacity over 10,000 gallons. Piping for tank interconnections shall be steel pipe unless buried. Buried horizontal piping runs may be of an approved plastic pipe.
4. Tank Outlets: Tank outlets (a direct connection to a tank) may not be used in place of required hydrant(s) unless otherwise allowed by this standard. Tank outlets may only be used when other installations are not practical due to conditions acceptable to the Fire Marshal's Office.
5. Automatic Override: An automatically activated solenoid valve shall be provided when necessary to avoid pressure loss in fire protection water supply due to large-demand devices fed from the same water supply (i.e.: landscaping or agricultural irrigation).
6. Permits: A permit from the County Building Inspection Office is required for the installation of tanks in excess of 5,000 gallons where the ratio of height to diameter or width exceeds 2 to 1.

V **REQUIRED PLANS SUBMITTAL, PERMITS & INSPECTIONS**

- A) Submittals: Plans shall be submitted to the County Fire Marshal's Office for review. The plan shall be drawn to scale and contain the following information:
1. Size, location and type of all water supplies (tanks, private or public hydrants, wells, etc.).
 2. A complete description and diagram of all water sources. Examples would include but are not limited to import lines, tanks and wells.
 3. Size, type, and location of all piping: including the class and type and depth of cover.
 4. Size, type and location of all control valves.
 5. Size, type and location of all hydrants.
 6. Manufacturer's specification sheets for all equipment including hydrants, tanks and valves.
 7. Size, location and type of thrust blocks or anchor points.
 8. Hydraulic calculations may be required to verify required fire flow at hydrants prior to installation, and if required by the Fire Marshal's Office, shall be part of the plan submittal. Maximum Velocity Factor shall be 15 feet per second for hydraulic calculations.

B) Permits:

1. A permit from the Fire Marshal's Office is required for the installation of standard hydrants or hydrant systems. Contact the Fire Marshal's Office for details regarding permits, applications, and fees.
2. No work shall commence prior to permit issuance.
3. Permits from other County Departments may be required. Contact the County Building Inspection Office, the Department of Environmental Health, and the Planning Office for further information.

C) Installation Requirements:

1. Installation work shall be done by fully experienced and responsible persons. Poor workmanship will not be accepted for approval.
2. All materials shall be new or in good physical condition. The County Fire Marshal's Office reserves the right to disapprove the use of any used materials.

D) Installation Inspections:

1. All underground piping for standard hydrants and hydrant systems shall be inspected by the County Fire Marshal's Office prior to covering.
2. Flow and water flush tests shall also be required prior to final acceptance of the standard hydrant or hydrant system installation.

VI MISCELLANEOUS DETAILS

- A) If a municipal water supply is available within 300 feet of any portion of the property line, the property owner shall be required to extend the water system to provide fire protection water to the property whenever it is feasible to do so.
- B) Fireflow requirements for multiple structures shall be calculated based on the largest structure covered by the permit application.
- C) Fire protection water supply for structures of mixed construction types may be determined either by calculating each type separately then adding them together, or by using the most restrictive type for the entire structure, whichever yields the lowest flow rate.
- D) Where the flow from a single hydrant is insufficient to meet fireflow demands, the combined flow from two hydrants may be used if the nearest hydrant is located no more than 125 feet from the driveway, and the second is no more than 250' from the first hydrant and the driveway is not in excess of 150 feet from street to all portions of the structure. It is not necessary that both hydrants be on the same main.
- E) If the water supply for an existing structure is sufficient in quantity to meet the requirements for any additional structures as calculated separately, the existing approved above-ground tank may be used to supply both structures, and no additional water will be required.

- F) If an existing on-site hydrant is located within 150 feet of all portions of multiple structures, it may satisfy the hydrant requirement for each structure provided the water supply is sufficient for each. If the existing hydrant is located too far away, a second hydrant will be required.
- G) Privately owned hydrants or tanks located off the property shall not be considered usable unless it is part of an approved water mutual and the property owner can show he/she has rights to the water or equipment.
- H) If an agricultural or domestic well and pump is to be used as the sole source for fire protection water, a well report shall be required from a licensed well-drilling contractor or a registered Civil engineer to show that both the well and the pump can provide adequate fireflow as required in other sections of this standard.
- I) If well and pump are to be used for fire protection water, the pump must be one that is used regularly, and that will be noticed if not working. This is what we consider to be a 'reliable water source'. A pump used for nothing except fire protection water shall be a listed fire pump. **NOTE:** a storage tank which is refilled manually is not considered to be a reliable water source.
- J) Shade structures qualifying for water requirements as listed in Section 2.b.4 of this standard must meet all of the following conditions:
 - 1. Walls at least 75% open (no covering materials at any time). Roof and maximum of 25% of each wall may be covered by non-combustible or inherently flame retardant material approved by this office.
 - 2. No electrical service, gas service or mechanical ventilation
 - 3. No wood rack or shelving material
 - 4. Located a minimum of 20 feet from any other structure or any property line
 - 5. Structure shall not be used for storage purposes of any kind