



FRESNO COUNTY FIRE

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WATER STORAGE REQUIREMENTS RURAL SUPPLY VARIANCES FROM THE FIRE CODE FOR VERY LARGE RESIDENTIAL STRUCTURES

BACKGROUND

Rural fire flow supply requirements may be amended from Appendix B of the California Fire Code (CFC) when there is no reliable water supply system in place to protect the subject property and scope of work. The following information is designed to provide guidelines to establishing "reasonable" fire flow and water storage values for such areas based upon the identified factors. In order to mitigate a portion of the normally required fire flow both active and passive building design components will be considered.

Active systems include automatic notification and suppression systems such as fire sprinklers and fire alarms where they would not otherwise be required by the code. Early notification of a fire condition will help responders to arrive at the earlier stages of the fire, increasing the chances of successfully saving the structure. Automatic fire suppression systems such as fire sprinklers initiate the suppression activity while fire fighters are responding to the fire. Such systems are not designed to extinguish the fire, but rather, are design to hold the fire in check, or significantly slow the growth rate. Studies performed by the California Fire Sprinkler Advisory Board during the 1990's determined that in properly designed and operational systems, 80% of the fires were controlled by the activation of three (3) fire sprinklers. This equates to keeps the fire area to about 500 square feet of the structure when fire fighters arrive.

Passive design components are designed to resist the spread of the fire. Such systems include fire rated construction, draft stopping, higher classification of roof coverings, separation in between buildings, separation between buildings and vegetation, and separation between buildings and property lines.

CRITERIA FOR CONSIDERATION OF ALTERNATIVE FIRE FLOW REQUIREMENTS

All of the following must be met to consider alternate fire flow compliance.

- There must not be an available water supply system adjacent to the site (more than 1000 feet) capable of meeting the required fire flow, or the water purveyor will not allow connection to the applicant.
- An automatic fire sprinkler system must be provided in accordance with NFPA 13. NFPA 13R or 13D systems may be considered when applicable to the proposed project.
- Fire access must be provided to the site and the proposed buildings on the site in accordance with the CFC.

VERY LARGE RESIDENTIAL STRUCTURES

The information provided for very large residential structures shall be consistent with the requirements for alternative fire flow and water storage already permitted by the Fresno County Fire Protection District (FCFPD).

Very Large Residential Structures are defined as follows: Single family or duplex residences classified as R3 or R3.1 Occupancies where the habitable area exceeds 5,000 square feet or the combined habitable and non-habitable area of one contiguous structure exceeds 8,000 square feet.

Where an NFPA 13D fire sprinkler system is installed, very larger residential structures shall be provided with the calculated water storage per NFPA 1142 less a 10,000-gallon residential credit.

Where an NFPA 13R fire sprinkler system is installed, very large residential structures shall be provided with one half the calculated water storage per NFPA 1142 less a 10,000-gallon residential credit.

NOTE: Water storage shall not be less than required in accordance with NFPA 13D/13R as applicable to the proposed design.

EXAMPLES

Example #1

Structure with 6,000 square feet of habitable area and 1500 square feet of non-habitable area. A **NFPA 13D** fire sprinkler system is installed. The total volume of the structure is 112,500 cubic feet. The house is constructed of wood and there are no other structures within 50 feet.

Water storage is calculated as follows:

$$[(112,500 \times 1.5 \times 1) / 7] = 24,107 \text{ Gallons}$$

$$24,107 - 10,000 = 14,107 \text{ Gallons of water storage}$$

Example #2

Structure with 6,000 square feet of habitable area and 1500 square feet of non-habitable area. A **NFPA 13R** fire sprinkler system is installed. The total volume of the structure is 112,500 cubic feet. The house is constructed of wood and there are no other structures within 50 feet.

Water storage is calculated as follows:

$$[(112,500 \times 1.5 \times 1) / 7.] = 24, 107 \text{ Gallons}$$

$$24,107 - 10,000 = 14,107 \text{ Gallons}$$

$$14,107 / 2 = 7,054 \text{ Gallons of water storage required}$$