



FIRE FLOW / WATER SUPPLY GENERAL REQUIREMENTS (IN UNINCORPORATED AREAS OF STANISLAUS COUNTY)

This document is intended to provide general information about water supply requirements that are applied to new construction projects within the unincorporated areas of Stanislaus County. Fire flow and water supply requirements are found in Section 508, Appendix B and Appendix C of the California Fire Code. Fire Flow Requirements are applied to development in areas with municipal water systems; On-Site Water Requirements are applied to areas without municipal water systems. Contact the Office of the Fire Marshal or your local fire department if you have questions or need additional information.

Fire Flow Requirements for areas served by a municipal water system

For one- and two-family dwellings up to 3,600 square feet a minimum of 1,000 gpm for two hours is required. This flow may be reduced if the building has an approved automatic fire sprinkler system. At least one fire hydrant is required to be on an approved fire access roadway within 600 feet of all points of the structure.

Use the following table for all other structures:

MINIMUM REQUIRED FIRE FLOW AND FLOW DURATION						
Type IA and IB	Type IIA and IIIA	Type IV and V-A	Type IIB and IIIB	Type V-B	Fire Flow (gpm)	Duration (Hours)
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	2
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	2
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	2
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	2
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	2
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	3

Refer to the California Fire Code Appendix B for larger structures.

This flow may be reduced up to 75% if the building has an approved automatic fire sprinkler system, however the required flow shall not be less than 1,500 gpm.

Fire Hydrants shall meet the following requirements:

NUMBER AND DISTRIBUTION OF FIRE HYDRANTS			
Fire Flow Requirement (gpm)	Minimum number of Hydrants	Average Spacing Between Hydrants	Max Distance from Street to Hydrant
1,750 or less	1	500	250
1,751 - 2,250	2	450	225
2,251 - 2,750	3	450	225
2,751 - 3,250	3	400	225
3,251 - 4,000	4	350	210

Refer to the California Fire Code Appendix C for buildings with larger fire flows.

On-Site Water Requirements for areas not served by a municipal water system

An approved on-site water supply for fire suppression is required for many new projects located in rural areas where municipal water systems do not exist. This water supply must be accessible from an approved access roadway that is at least 20' wide with a vertical clearance of 13'6". On-site water supplies may include tanks, cisterns, swimming pools, and ponds but must be accessible and available year around regardless of weather or drought conditions. A dry fire hydrant or other approved access must be located not less than 100' from the building being protected. The maximum distance will be determined by the local fire chief. Some structures are exempt from providing on-site water storage.

Because of the expense that may be associated with providing an approved water supply it is strongly recommended that the proposed water supply be approved by the Fire Marshal and local fire department prior to submitting plans. Some factors may be increased or decreased based on the specific site and use.

National Fire Protection Association (NFPA) Standard #1142 Chapters 4 and 5 are used to calculate the amount of on-site water supply that is required for structures where no municipal water supply is available. The following formula is used:

GALLONS OF ON-SITE WATER NEEDED =

$$\text{Volume of structure} \div \text{Occupancy Hazard Classification} \times \text{Construction Classification}$$

NOTE:

Volume of Structure = Total volume of structure in cubic feet

Occupancy Hazard Classification

- 3 for severe hazard uses such as cereal or flour mills, explosives storage, feed and grist mills, hay storage, saw mills, and wood storage.
- 4 for high hazard uses such as auditoriums, commercial barns and commercial stables, department stores, feed stores, freight terminals, paper and pulp mills and processing, full-service repair garages, retail stores, and warehouses.
- 5 for moderate hazard uses such as amusement occupancies, clothing manufacturing, cold storage warehouses, farm storage (corn cribs, dairy barns, equipment sheds, hatcheries), machine and metalworking shops, plant nurseries, restaurants, and unoccupied buildings.
- 6 for low hazard uses such as beverage manufacturing plants, brick manufacturing plants, canneries, cement plants, churches, dairy products manufacturing, gasoline and minor repair service stations, horse stables, offices, parking garages, slaughterhouses, and wineries.
- 7 for light hazard uses such as apartments, colleges and schools, dwellings, hospitals, hotels and motels, nursing and convalescent homes, offices, and prisons.

Construction Classification

- I Metal or non-combustible = .50
- II Metal or non-combustible = .75
- III ordinary = 1.00
- IV Heavy timber = .75
- V Wood and wood frame = 1.50
- VB Single family dwelling = 1 (NFPA 1142 section 6.2.2)

For example, a Type II building measuring 100' long by 50' wide by 20' high used as a dairy barn would require 15,000 gallons of stored water ($100 \times 50 \times 20 \div 5 \times .75 = 15,000$). This number may be increased or decreased depending upon other circumstances such as exposures (another structure) within 50 feet of proposed new structure, installation of sprinkler system.

Automatic Fire Sprinklers

Requirements vary. Refer to Structures Requiring Automatic Fire Sprinkler Systems handout.