



# Clovis Fire Department

## Standard # 2.4

### FIRE PROTECTION SYSTEMS INSTALLATION OF RESIDENTIAL SPRINKLERS NFPA 13D

**SCOPE:** This standard applies to the design and installation of automatic fire sprinkler systems in one and two-family dwellings and manufactured homes. This standard shall be used in conjunction with NFPA 13D, Installation of Sprinkler Systems in One and Two-Family Dwellings and Manufactured Homes, California Building Code 2013, California Fire Code 2013, local amendments, and other applicable national and manufacturer standards.

#### **RESPONSIBILITY**

1. All individuals and companies who intend to engage in the installation or alteration of fire sprinkler systems are subject to the requirements of this standard.
2. Installer: The fire sprinkler system shall be installed by an individual who holds a State of California C-16 Contractor's License or C-36 Contractor's License or, by an owner-builder of an owner-occupied, single-family dwelling.
  - a. Assembly Bill AB 433 allows a State of California C-36 Contractor's License a provision to design and install residential fire sprinklers. The effective date of the bill was January 1<sup>st</sup> 2014.
3. Designer: Plans shall be designed by a State of California C-16 or C-36 Licensed Contractor or by a Registered Professional Engineer (Civil, Mechanical, or Fire Protection), licensed by the State of California, Board of Professional Engineers. All copies of the plans shall be stamped and signed by the licensed individuals.
4. A C-16 or C-36 licensed contractor shall only design systems that the firm has a contract to install. Plans shall be stamped and signed by the contractor doing the installation.

#### **PLANS SUBMITTAL PROCEDURE**

1. Include a minimum of three sets of fire sprinkler plans, cut sheets, and calculations with the full set of house plans that are submitted to the Building Department. The plans will then be routed to the Clovis Fire Department for review with the permit number assigned to the plans. Fire sprinkler plans dropped off directly to the Clovis Fire Department will have to be picked up and submitted to the Building Department for an assigned permit number.
2. Plans will be checked and if approved, will be stamped, signed and dated. The Building Department will retain one set.
3. One copy of the Fire Department stamped plans and the original permit card shall be maintained on the job site.
4. All modifications/changes to existing systems require a plan check the Fire Department and inspection by the Building Department.
5. Field changes may require re-submittal of plans along with additional plan check fees.

#### **GENERAL REQUIREMENTS**

## Additional requirements to NFPA 13D

Automatic sprinkler systems installed in one and two-family dwellings shall be installed throughout in accordance with NFPA 13D. Additional requirements for NFPA 13D sprinkler systems shall include:

1. Automatic fire sprinkler protection shall extend to attached garages and basements.
2. Automatic fire sprinklers shall be included in all bathrooms exceeding fifty-five (55) square feet.
3. The main control valve shall be of indicating type.

## Plan Submittal Information

1. To speed up the plan check process and to avoid the possibility of returning the plans for corrections, please use the following checklist, prior to submittal, to insure that the appropriate information is included on the working sprinkler drawings:
  - a. Name of owner and/or occupant
  - b. Location of project, including street, number and city
  - c. Name of sprinkler installer, address, phone number, type of license and license number
  - d. Total number of square feet
  - e. Point of compass
  - f. All plans must be to scale or dimension. The scale shall be no smaller than 1/8 inch = 1 foot.
  - g. Plot plan showing tank, pump, structures, underground pipe size and type, point of supply connections, depth of bury, type and size of any valves or meters.
  - h. Piping plan showing tank, pump and structure elevations as they relate to each other.
  - i. Full height cross-section showing building construction types, vaulted and beamed ceiling locations.
  - j. Water tank details including size and type of construction (where applicable)
  - k. Detailed hydraulic calculations per the currently adopted version of NFPA 13D.
  - l. Sprinkler head spacing
  - m. Show clearly all unsprinklered areas
  - n. Indicate manufacturer, style, model, orifice size, and "K" factor of each sprinkler used.
  - o. Indicate the type and size of pipe
  - p. Hanger details
  - q. Indicate type of fitting used
  - r. Use of each room
  - s. Location of heat sources
  - t. For hydraulic design purposes, include the following:
    - 45 psi static
    - 35 psi residual
    - 1800 gallons per minute at 35 psi residual

- For all standard plans, include a minimum of 40' of 1" type K copper pipe (C factor of 150) with an interior diameter of .995 from the city main to the meter.
  - Include an additional 10'6" of pipe lengths for the fittings for the meter in the underground in the hydraulic calculations for standard plans and custom homes. This should be added to the 40' of 1" type K copper pipe for a total of 50'6".
  - For all standard plans, indicate a minimum of 70' of pipe from the meter to the riser and specify type and size of pipe.
  - All calculations for custom homes must indicate the actual length of pipe from the city main to the meter using 1" type K copper pipe (C factor of 150) with an interior diameter of .995 and the type and length of pipe after the meter.
  - Indicate a minimum 3 pound friction loss for the meter.
  - Include a 5 gallon domestic water demand in all hydraulic calculations for 13D systems.
    1. Exception: not required for stand-alone systems that have a separate underground that is not connected anywhere to the domestic system.
2. The following information shall be contained in the hydraulic calculations.
- a. Calculations must conform to manufacturer's specifications
  - b. "K" factors for all sprinklers
  - c. "C" valves for the type of pipe used.
  - d. A pump curve or city supply curve, where the total demand point is clearly plotted.
3. The following notes shall be completed and placed verbatim on the working sprinkler plans:
- a. This residential sprinkler system shall be designed and installed in accordance with NFPA 13D and Clovis Fire Department Standards.
  - b. Only listed and approved devices shall be installed in this system.
  - c. Only new listed residential sprinklers shall be employed in the installation of this sprinkler system.
  - d. A minimum of one spare fire sprinkler of each type (typically a total of 2 fire sprinkler heads), temperature rating and orifice size shall be located in a spare head cabinet in the laundry room closet or in the garage adjacent to the door leading into the house.
  - e. All piping shall be provided with hangers and shall be supported per code and manufacturer's specifications.
  - f. All piping shall be hung from structure members.
  - g. All CPVC piping shall be installed by persons who have been certified by the manufacturer for installation of CPVC piping.
  - h. All primers and glues shall be listed and approved for use with CPVC piping in systems using CPVC pipe.
  - i. Underground mains and lead-in connections shall be flushed before connection is made to sprinkler piping.
  - j. This residential sprinkler system shall be tested and inspected at both rough and final inspection, prior to occupancy being granted.

## **Automatic Booster Pump**

1. When the domestic water supply is deficient or a water tank is being used to supply the automatic sprinkler system, an automatic booster pump may be required to maintain the required pressure at the minimum gallons per minute.
2. The pump must be automatically activated upon system demand.
3. The pump must be of self-priming type.
4. The pump must be listed or approved for electrical safety by a recognized testing laboratory.
5. Water pump shall activate automatically upon system demand and be self-priming and UL listed for electrical safety.
6. When a pump is used, provisions shall be made to protect the pump from exposure to freezing and/or brush fires.

## **Water Storage Tanks**

1. Each tank shall have a connection to a supply source to refill the tank automatically.

## **System Components**

1. Valves and Drains
  - a. Each system shall have a main control valve located on the system side of the water meter or pump. The main control valve shall be of the indicating type such as a ball valve.
  - b. The valve shall control both the domestic water system and the automatic sprinkler system.
  - c. All valves shall have an all-weather sign affixed to them, which indicate their purpose.
2. Sprinklers
  - a. Only new residential sprinklers that are manufactured after July 12, 2002 shall be installed. Sprinklers manufactured prior to July 12, 2002 can be used as replacement sprinklers on existing systems.
  - b. Attached garages shall be sprinklered with intermediate temperature residential fire sprinkler heads.
  - c. In areas where ambient temperature exceeds the specifications of the listed residential sprinklers (i.e., attics, utility rooms and water heater closets), approved intermediate temperature commercial quick response automatic sprinklers shall be used. The orifice size shall be the same as the residential heads used.
3. Piping
  - a. When copper tubing is soldered, 95/5 solder shall be used.
  - b. Approved plastic pipe may be used when installed in accordance with the manufacturers listing where installed in attics. Adequate insulation shall be provided on the attic side of the piping to avoid exposure of the piping to temperatures in excess of its rated temperature.

## **TESTING PROCEDURE**

1. The sprinkler system shall be field tested at city pressure and inspected at the rough plumbing stage (i.e., exposed pipe and fitting stage) by the Building Department.
2. Riser detail showing system split, main control valve, and domestic shut-off valve.
3. Indicate the manufacturer, model, type, and pump curve of the booster pump (where applicable).
4. All systems shall have an underground flush completed at time of hydrostatic test prior to connecting the underground to the overhead piping. The underground shall be flushed one second for every ten feet of pipe. Eleven seconds will be adequate time to flush all standard plans homes and custom homes will vary depending on the length of pipe shown on the plans.
5. A minimum of one spare fire sprinkler of each type (typically a total of 2 fire sprinkler heads), temperature rating and orifice size shall be located in a spare head cabinet in the laundry room closet or in the garage adjacent to the door leading into the house.
6. The sprinkler system and all of the related components shall be tested and inspected by the Building Department at the final inspection stage, prior to occupancy being granted.

## **MANUFACTURED HOMES AND MULTI-UNIT MANUFACTURED HOUSING WITH TWO DWELLING UNITS**

1. The Department of Housing and Community Development is responsible for plan approval, in-plant inspection, testing and installation of fire sprinkler systems installed in new manufactured housing units and multi-unit manufactured housing with two dwelling units for sale in California. Prior to shipment of a home containing a fire sprinkler system, the factory is required to affix a "Fire Sprinkler System Information and Installer Certification" label inside the unit that provides detailed information for the on-site installer and homeowner use. The label is required to be affixed on an inside wall or door of the water heater compartment.
2. The installation of a fire sprinkler system in an existing manufactured home or multi-unit manufactured home with two dwelling units requires prior design approval from the Department of Housing and Community Development and inspection approval of the installation prior to the installer covering the piping material with finished wall or ceiling materials. Only the occupant homeowner or a fire protection contractor holding a valid C-16 or C36 license may install a fire sprinkler system in an existing manufactured home or multi-unit manufactured home with two dwelling units.
3. The Clovis Fire Department is responsible for plan checking.