



## **Menlo Park Fire Protection District Fire Prevention Bureau**

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### **MENLO PARK FIRE PROTECTION DISTRICT STANDARDS FIRE PROTECTION SYSTEMS INSTALLATION OF RESIDENTIAL SPRINKLERS**

**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, the California Fire Code, the California Building Code, the California Residential Code, local amendments, and other applicable standards.

#### **1. RESPONSIBILITY**

- A. 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.
- B. Installer: The fire sprinkler system shall be installed by an individual who holds a State of California C-16 Contractor's License (for fire sprinklers) or, by an owner-builder of an owner-occupied, single-family dwelling.
- C. Designer: Plans shall be designed by a State of California C-16 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.
- D. A C-16 Licensed Contractor shall only design systems that the firm has a contract to install.

#### **2. PLANS SUBMITTAL PROCEDURE**

- A. Submit a Menlo Park Fire District Plan Review Application, a minimum of two sets of plans, hydraulic calculations, and the appropriate fees (See Menlo Park Fire District Fee Schedule). All fees shall be paid at the time of plan submittal.
- B. Plans will be checked and if approved, will be stamped, signed and dated. The Fire District will retain one set.

- C. One copy of the Fire District stamped plans and the original permit card shall be maintained on the job site.
- D. All modifications/changes to existing systems require a plan check and inspection by the Fire District.
- E. Field changes may require re-submittal of plans along with additional plan check fees.

### **3. SCHEDULING INSPECTIONS**

- A. The inspection fee that is paid at the time of plan submittal will provide you with two inspections to complete the project (one rough-in and one final inspection). For projects that exceed this limit, inspection requests will not be accepted unless additional fees are paid prior to scheduling an inspection.
- B. It is the responsibility of the installing contractor/owner to be on the job site during the inspection with approved plans and the original permit card. Failure to do so will result in the cancellation of the inspection. Cancelled inspections will be counted as one inspection.
- C. Inspection requests can only be taken from the installing contractor/owner.
- D. Contact Fire District Inspectors at least two business days prior to inspection for scheduling an inspection. Call the inspector of record indicated on the permit card.
- E. Inspection times are approximate and may vary because of delays at previous inspections or emergency response by Fire District personnel. Please allow time on either side of the inspection time for the inspector to arrive.

### **4. GENERAL REQUIREMENTS**

#### **A. Additional Requirements to NFPA 13D**

1) 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 be designed as follows (See also item 2 below):
 

Less than 2500 sq. ft.	2 Head Calculation
2500 sq. ft. to 3500 sq. ft.	3 Head Calculation
Larger than 3500 sq ft	4 Head Calculation
- 2) Automatic fire sprinkler protection shall extend to attached garages and basements. Fire sprinkler protection shall extend to accessory structures within 20 feet of the main structure and may also be required to extend to other structures that are located further than 150 feet from fire apparatus access. See CFC Section 503.1.1

- 3) Pilot sprinkler heads shall be installed in attic spaces that are more than 30 inches in depth. Pilot sprinklers shall be placed every 30 feet on center.
- 4) Automatic fire sprinklers shall be included in all bathrooms that contain combustible fixtures or in bathrooms exceeding 55 square feet.
- 5) Automatic fire sprinklers shall be provided under stairways.
- 6) The main drain shall be a minimum ½ inch.
- 7) The main control valve shall be of indicating type.
- 8) The exterior fire bell shall be placed in the same area as the water supply control valve.

#### B. 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 (See item 2 below).
  - 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) Water flow information including:
- Flow location
  - Static pressure, psi
  - Residual pressure, psi
  - Flow, gpm
  - Date
  - Time
  - Test conducted by or information supplied by\_\_\_\_\_.

- 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" values for the type of pipe used.
  - d) A pump curve or city supply curve, where the total demand point is clearly plotted.
  - e) A 10% reduction in the available water pressure shall be included in all calculations.
  - f) Provide a 5 gpm domestic demand at the base of the riser in the calculations.

- 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 Menlo Park Fire District 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 two spare fire sprinklers of each type, temperature rating and orifice size, along with a sprinkler wrench, shall be located in a spare head cabinet at the system riser or other approved location. If less than three heads of a particular type are used, only one spare head shall be provided.
- 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) A 10% reduction in the available water pressure shall be included in all calculations.
- k) This residential sprinkler system shall be tested and inspected at both rough and final inspection, prior to occupancy being granted. Call two working days in advance to schedule all inspections.

### C. Water Supply

- 1) All sprinkler systems shall have a single supply main serving both the automatic sprinkler system and the domestic system.
- 2) An additional 5 gpm shall be added to the sprinkler system demand to determine the size of common piping and the size of the total water supply requirements.  
Exception: Domestic design demand shall not be required to be added where provision is made to prevent flow into the domestic water system upon operation of a sprinkler.
- 3) Where system piping or pumps are located in areas subject to freezing, steps shall be taken to protect system integrity; this may include, but is not limited to, heating and/or installation of insulation.

### D. 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) When a pump is used, provisions shall be made to protect the pump from exposure to freezing and/or brush fires.
- 6) The pump shall be provided with a bypass for the system.

### E. Water Storage Tanks

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

### F. 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) An approved rubber faced check valve shall be located on the system side of the main control valve.
- d) All valves shall have an all-weather sign affixed to them, which indicate their purpose.
- e) For systems with normal operating pressure in excess of 100 psi, a listed pressure relief valve shall be installed on the riser.

## 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 and entryways shall be sprinkled.
- c) Attic pilot head sprinklers are required for attics greater than 30” and the coverage per sprinkler shall not exceed 30’ on center.
- d) 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) Pressure Gauge

A listed pressure gauge shall be installed and maintained on the sprinkler system riser. The pressure gauge shall be installed on the system side of the check valve.

## 4) 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.

## 5) Interior sounders

Upon activation of the fire sprinkler system, an interior sounder shall sound an alarm inside the building, capable of being heard in all sleeping rooms, and in accordance with NFPA 72. Smoke alarms shall not act as an interior sounder

## G. System Design

- 1) Systems shall be designed and calculated in accordance with NFPA 13-D Chapter 8 “Systems Design.”

## **5. TESTING PROCEDURE**

- A. The sprinkler system shall be field tested and inspected at the rough plumbing stage (i.e. exposed pipe and fitting stage) by the Fire Prevention Division. All systems shall be hydrostatically tested (not pneumatic) for leakage at 200 lbs. for not less than a two hour time period.
- B. Riser detail showing system split, pressure gage, check valve, main control valve, relief valve (where applicable), main drain, and domestic shut-off valve.
- C. Indicate the manufacturer, model, type, and pump curve of the booster pump (where applicable).
- D. The sprinkler system and all of the related components shall be tested and inspected by the Fire Prevention Division at the final inspection stage, prior to occupancy being granted.
- E. At least two spare sprinklers of each type, temperature rating, and orifice size used in the system and a sprinkler wrench shall be provided and located in the garage.

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

- A. 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.
- B. 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 license may install a fire sprinkler system in an existing manufactured home or multi-unit manufactured home with two dwelling units.
- C. The Menlo Park Fire Protection District is responsible for plan check, see item 4.