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Development Standard - #4a

ONE- AND TWO-FAMILY DWELLINGS FIRE SPRINKLER SYSTEM STANDARD

The information contained in this standard is provided solely for the convenience of the reader in complying with the Santa Barbara County Fire Department (SBCFD) requirements. It should be used as a schematic reference only. The SBCFD reserves the right to make changes and improvements to this standard as and when required by law, or otherwise, at any time. The Department's current standards will be posted and made available for downloading by the public at the following web site: www.sbcfire.com

Please note that the SBCFD assumes no liability for any damages incurred directly or indirectly as a result of any errors, omissions, or discrepancies between this standard and any applicable law. It is the sole responsibility of the person or persons conducting any work pursuant to this standard to ensure their work complies with any and all applicable codes, ordinances, and regulations.

CHAPTER 1 ADMINISTRATION

1.1 PURPOSE. This standard is prepared for the use and guidance of those charged with designing, installing, inspecting, approving, or maintaining residential fire sprinklers systems in one-and two-family dwellings.

1.2 SCOPE. This standard applies to the design and installation of automatic fire sprinkler systems in one and two-family dwellings and manufactured homes within the jurisdiction of the Santa Barbara County Fire District (SBCFD). This standard shall be used in conjunction with the current adopted editions of the Santa Barbara County Fire Code, the California Residential Code (CRC), National Fire Protection Association (NFPA) Standard 13D and any other applicable standards.

1.3 APPLICABILITY. This standard shall apply to all automatic fire sprinkler systems installed in one and two-family dwellings, manufactured homes, and Accessory Dwelling Units as required within the jurisdictional boundaries of the Santa Barbara County Fire District.

1.4 FEES. A plan check fee is required for the installation of or modification to a fire sprinkler system as required by the current SBCFD fee schedule.

CHAPTER 2 DEFINITIONS

WATER PURVEYOR: A public utility, a mutual water company, a government body or other entity, owning and operating a water system and holding a valid permit from the state or county health department to purvey water.

CHAPTER 3 GENERAL

3.1 DESIGN AND INSTALLATION. The design and installation of a fire protection system, excluding an electrical alarm system, for a one and two-family dwelling and outside the dwelling up to the utility meter for the property may be installed by any of the following:

1) A contactor holding a fire protection contractor classification (C-16).
2) A contractor holding a plumbing contractor classification (C-36). January 1, 2023 Residential Fire Sprinklers 509-2
3) An owner-builder meeting the requirements of California Business and Professions Code Section 7026.12(b).
4) Design only. The system may be designed by a Registered Professional Engineer (Civil, Mechanical, or Fire Protection), licensed by the State of California (Board of Professional Engineers).

3.2 PLAN SUBMITTAL. Specifications for residential automatic fire sprinkler systems shall be drawn with care by a trained person. Plans shall be drawn to an indicated scale of not less than 1/8 inch = 1 foot and digitally submitted to Planning and Engineering by emailing digital copies of all documents to pe.submittals@countyofsb.org. The following items shall be included in all residential automatic fire sprinkler system plan specifications:

1) Scope of work for the project.
2) Name of owner and/or occupant.
3) Location of the project, including the assessor's parcel number (APN), address number, street name and city.
4) Permit number.
4) Name of the water purveyor if applicable.
5) Name of sprinkler installer, address, phone number, type of license and license number.
6) Plot plan showing tank, pump, structures, underground pipe size and type, point of supply connections, depth of bury, type and size of any valve or meters.
7) Piping plan showing tank, pump, and structure elevations as they relate to each other.
8) Full height cross-section showing building construction types, sloped, and beamed ceiling locations.
9) Riser detail showing system split, pressure gauge, check valve, main control valve, relief valve (where applicable), main drain and domestic shut-off valve.
10) Indicate the manufacturer, model, type and pump curve of the booster pump (where applicable).
11) Detailed calculations.
12) Sprinkler head spacing.
13) Show clearly all non-sprinklered areas.
14) Indicate manufacturer, style, model, orifice size and "K" factor of each sprinkler used.
15) The main drain shall be a minimum ½ inch.
16) Type and size of each pipe.
17) Hanger detail and spacing requirements per manufacturer.
18) Indicate type of fitting used.

19) The main control valve shall be located above grade and readily accessible.
20) Use of each room.
21) Location of heat sources.
22) Water flow information including: flow location, static pressure (psi), residual pressure (psi), flow (gpm), date, time and who conducted the test or supplied the information.
23) Manufacturer and model type of listed residential fire sprinkler check valve installed.

3.2.1 Hydraulic Calculations. The following information shall be contained in the hydraulic calculations:

1) Calculations must conform to manufacturer's specifications.
2) "K" factors for all sprinklers.
3) "C" values for the type of pipe used.
4) A pump curve or city supply curve, where the total demand point is clearly plotted.

3.3 VERBATIM NOTES. The following notes shall be completed and placed verbatim on the working sprinkler plans:

1) No work shall commence until plans have been approved by the Santa Barbara County Fire Department.
2) A set of approved plans, stamped, and dated by the Fire Department shall be kept on site and available upon request.
3) This residential sprinkler system shall be designed and installed as per the current adopted edition of NFPA 13D or the California Residential Code and Santa Barbara County Fire Standards.
4) Only listed and approved devices shall be installed in this system (except tanks).
   a. Exception: Unless approved by a licensed engineer.
5) Only new listed residential sprinklers shall be employed in the installation of this sprinkler system.
6) All piping shall be provided with hangers and shall be supported per code and manufacturer's specifications.
7) All piping shall be hung from structural members.
8) All CPVC piping shall be installed by persons who have been certified by the manufacturer for installation of CPVC piping.
9) All valves shall have a permanently affixed sign indicating its function per the Santa Barbara County Fire Standard.
10) Underground mains and lead-in connections shall be flushed before connection is made to overhead sprinkler piping.
11) No work shall be covered or otherwise rendered inaccessible or unviewable prior to inspection by Santa Barbara County Fire representative.
12) A minimum of two business days shall be given to the Fire Department when scheduling an inspection at https://sbcfire.com/inspection-requests/.
13) The residential sprinkler system shall be inspected at the rough stage by the Santa Barbara County Fire Prevention Bureau, prior any pipes being covered.
14) An Approved residential check valve shall be installed on the system side of the main control valve.

15) A bucket test shall be performed by Santa Barbara County Fire prior to final (2 head for 13D and 4 heads for 13R).
16) An audible alarm shall be installed per CFC.
17) Forced Air Units shall be provided with protection.
Spare head box shall be provided.
18) A remote inspector test is required unless exempted by Santa Barbara County Fire.

3.4 ALTERNATIVE METHODS. The Fire Chief or designee is authorized to approve alternate materials or methods provided that the Chief finds that the proposed design, use or operation satisfactorily complies with the intent of the Fire Code.

3.5 NFPA 13R DESIGN STANDARD. One- and two-family dwellings exceeding five thousand (5000) square feet shall be designed to NFPA 13R. In addition to the square footage rule, the Fire Code Official may require a one- and two-family dwelling to be designed to NFPA 13R for any of, but not limited to, the following reasons:

1) Access road length.
2) Access road grade.
3) Area topography.
4) Whenever the design of the structure is outside of the scope of NFPA 13D.

CHAPTER 4 WATER SUPPLY

4.1 GENERAL. All fire sprinkler systems, regardless of the water supply source, shall have a single supply main serving both the fire sprinkler system and the domestic water system.

4.1.1 The water main supplying the fire sprinkler system shall be no less than one inch (1”) interior diameter.

4.2 DEDICATED FIRE LINE. When required by the water purveyor, the dedicated fire line must be connected after the water meter with one main shut-off valve, located in the meter box, painted red, controlling both domestic and fire sprinklers. In such case, the following requirement shall apply.

4.2.1 Dedicated underground fire line shall be Blazemaster CPVC or equivalent.

4.3 ACCEPTABLE WATER SUPPLY. Acceptable water supplies include:

1) Direct connection to a reliable water source maintained by a water purveyor.
2) A stored water tank installed in accordance with SBCFD Standard #3.

CHAPTER 5 PUMPS

5.1 GENERAL. When domestic water supply pressure is insufficient to produce enough water flow and pressure to accommodate a fire sprinkler system, an automatic booster pump shall be required. Where a pump is the source of pressure for the water supply, it shall be for both the fire sprinkler system and the domestic system.

5.2 ACTIVATION. The pump must be activated automatically upon system demand.

5.3 PRIMING. The pump must be of self-priming type.

5.4 LISTING. The pump must be listed or approved for electrical safety by a recognized testing laboratory.

5.5 EXPOSURE. When a pump is used, provisions shall be made to protect the pump from exposure to freezing and/or brush fires.

CHAPTER 6 SYSTEM COMPONENTS

6.1 MAIN CONTROL VALVE. 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 an indicating type such as an O.S.&Y. or ball valve. The valve shall control both domestic water system and the automatic fire sprinkler system. The main control valve shall be readily accessible and above grade at the structure.

6.2 DOMESTIC VALVE. A separate shut-off valve for the domestic shall be provided.

6.3 SPRINKLER RISERS. Sprinkler Risers shall be installed in accordance with the following:

6.3.1 LOCATION. All risers shall be easily located, preferably on the outside of the building in plain sight. Risers may be installed in an access panel on an outside wall with permanent labeling on the door. Alternate locations must have approval by the Fire Official.

6.3.2 RISER MATERIAL TYPE. All exterior risers shall use copper piping and all shut off controls shall be ball valves. CPVC risers may only be used when the riser is located in an access panel on an outside wall.

6.3.3 CHECK VALVE. For back flow prevention, an approved double check valve assembly shall be installed on the system side on the riser.

6.3.4 SPRINKLER SYSTEM CONTROL VALVES: There shall be two shut off ball valves located on each side of the double check valve. These valves shall be locked in the open position upon final inspection.

6.3.5 PRESSURE GAUGE. A UL listed 300psi gauge shall be installed.

6.3.6 PRESSURE RELIEF VALVE: An approved poppet type pressure relief valve shall be installed on the riser between the back flow device and the system flow switch. Device shall be set with a design pressure of 160 psi. Note: This valve is not required when sprinkler system is supplied from a gravity fed stored water system.

6.3.7 DRAIN VALVE: An unthreaded half inch (1/2”) ball valve shall be installed on the system and positioned such that flow will be to the outside away from the building.

6.3.8 FLOW SWITCH. A system flow switch shall be installed. It shall be equipped with two connections: one for a local exterior six-inch (6”) bell and one for alarm system monitoring. All flow switches shall be set for a 20-40 second delay.

6.4 SIGNAGE. All sprinkler system shutoff valves shall have an all-weather sign affixed identifying the buildings they serve.

6.4.1 The main shut-off valve shall state the following in one-quarter inch (1/4") lettering: WARNING: The water system for this home supplies fire sprinklers that require certain flows and pressures to fight a fire. Devices that restrict the flow or decrease the pressure or automatically shut off the water to the fire sprinkler system, such as water softeners, filtration systems, and automatic shutoff valves, shall not be added to the system without a review of the fire sprinkler system by a fire protection specialist. Do not remove this sign.

6.5 ALARM. Each sprinkler riser shall have a minimum six-inch (6") alarm bell affixed to an exterior wall of the structure positioned such that it can be heard by closest neighbor when activated

6.6 OVERHEAD PIPING. Overhead piping shall be in accordance with the California Plumbing Code for potable water supplies. No steel or galvanized piping shall be permitted.

CHAPTER 7 OVERHED DESIGN

7.1 SPRINKLERS. Only new residential sprinklers shall be installed. Sprinklers shall only be installed according to their listing.

7.1.1 ATTICS. Finished attic spaces intended for storage shall be sprinklered.

7.1.2 GARAGES. Garages shall be sprinklered with residential type sprinklers at their listed spacing and flows.

7.1.3 WATER HEATER CLOSETS. All water heater closets regardless of size require fire sprinklers.

7.1.4 MECHANICAL ROOMS. Intermediate temperature sprinkler heads are required and spaced for ordinary hazard with cage protectors.

7.1.5 FORCED AIR UNITS (FAU). A single intermediate temperature sprinkler shall be installed over each individual FAU. When there is more than one FAU in a single location, sprinkler heads shall be spaced as per Ordinary Hazard.

7.1.6 HVAC DIFFUSER. Heads shall be located a minimum eighteen inches away from any HVAC diffuser grille.

7.1.7 HEAT /RETURN AIR REGISTERS. Sprinklers shall be located no closer than two feet from any register.

7.2 PIPING. Types of Piping acceptable for use in a residential fire sprinkler system include those indicated in table 5.2.2 of NFPA 13D, as well as those types of piping listed for sprinkler use.

7.3 HANGING METHODS. All piping shall be provided with approved hangers and supported per manufactures requirements. Refer to Chapter 8 of this standard for further requirements.

7.4 INSPECTOR'S TEST VALVE. Property owner shall install non-threaded one-half inch ball valve at the remote area of the system to serve as the inspector's test valve.

This same type of valve shall be located at the riser to serve as a system drain. Any threads on these outlets are to be removed.

7.5 OBSTRUCTIONS. Sprinkler spray patterns shall not be obstructed and all head clearances shall be provided as required by NFPA 13D

CHAPTER 8 INSTALLATION REQUIREMENTS

8.1 COPPER PIPE. The installation of copper pipe and pipe components shall be in accordance with the following:

8.1.1. All materials delivered to the job site shall be protected from the physical elements and damage. Any damaged, gouged, cut, scratched heads, pipe or fittings shall be removed and replaced.

8.1.2. No corrosive or self-cleaning fluxes shall be used. Joints shall be wiped clean of excess flux and solder.

8.1.3. All piping running through studs or masonry shall be protected by elastomeric or plastic sleeves at three foot (3') maximum intervals.

8.1.4. Nails are unacceptable as a means of securing hangers and supports.

8.1.5. Piping shall be supported at the following maximum intervals:

1. Within six inches (6") of all sprinkler drops
2. Within eighteen inches (18") of all joints
3. Within six-foot (6') intervals

8.1.6. Refer to local plumbing codes for acceptable hanger types.

8.1.7. Copper pipe may be exposed in attics, porches, canopies, garages and open carports.

8.1.8. When spray foam insulation is applied around sprinkler heads, a minimum of six inches shall be maintained between the spray foam insulation and all sides of the sprinkler head.

8.1.9. Approved copper pipe must be utilized and protected when application calls for piping running through the sub-roof assembly just below roof decking.

8.1.10. Approved Copper Pipe Types: Type "M" copper, Type "L" copper.

8.2 CPVC PIPE. The installation of CPVC pipe and pipe components shall be in accordance with the following:

8.2.1. CPVC piping is to be installed per manufacturer's listing. All CPVC piping & fittings are to be listed for fire sprinkler system installations.

8.2.2. Installers shall have attended a practical application training class by a CPVC pipe manufacturer and have in possession a pocket card verifying proper certification to install this pipe.

8.2.3. Hangers shall be approved for CPVC Pipe and installed every six feet along the length of the pipe and within six inches (6") from sprinkler heads or as indicated by the pipe manufacturer.

8.2.4. CPVC pipe must be protected as per manufactures recommendations where it could come in contact with spray foam insulation. Under no circumstances is CPVC pipe allowed to be encased by this product without protection. When spray foam insulation is applied around sprinkler heads, a minimum of six inches shall be maintained between the spray foam insulation and all sides of the sprinkler head.

8.2.5. Materials that have been identified as incompatible with CPVC shall not be allowed to contact the pipe. Examples of such materials are Romex electrical wiring, flexible wire/cable, metallic ducting, and communication lines. Check CPVC manufacture product data sheets for a complete list of incompatible materials.

CHAPTER 9 INSPECTIONS

9.1 INSPECTIONS. The requirements for inspections and types of inspections that are to be conducted are listed in this chapter and shall comply with the following.

9.2 COVERING WORK. No work shall be covered or otherwise rendered inaccessible or unviewable prior to fire department inspection.

9.3 SCHEDULING WINDOW. Inspections shall be scheduled at least two business days prior to the desired inspection time via the inspection request webpage found at https://sbcfire.com/inspection-requests/.

9.4 ROUGH INSPECTION. 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 Bureau.

9.5 HYDROSTATIC TEST. All systems shall be hydrostatically tested (not pneumatic) for leakage at 200 PSI for 2 hours at the rough stage.

9.6 UNDERGROUND. All systems shall have an underground flush completed at the time of hydrostatic test prior to connecting the underground to the overhead piping.

9.7 BUCKET TEST. A functional test (bucket test) shall be conducted prior to the final inspection signoff from the hydraulically most demanding heads, when the overhead system is connected to the underground and the water meter is in place. The system shall meet the required flow. Exhibit A indicates how to assemble the test equipment. Sprinkler heads used for the bucket test must be of the same model and manufacturer listed on the head legend of the approved plans.

9.8 FINAL INSPECTION. The sprinkler system and all related components shall be tested and inspected by the Fire Prevention Bureau at the final inspection stage, prior to occupancy being granted.

CHAPTER 10 MANUFACTURED HOME

10.1 REQUIREMENTS FOR NEW HOMES. 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 provided 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.

10.2 RETROFITTING EXISTING HOMES. The installation of a fire sprinkler system in an existing manufactured home or multiunit 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; a fire protection contractor holding a valid C-16 license; or a plumbing contractor holding a valid C-36 license may install a fire sprinkler system in an existing manufactured home or multi-unit manufactured home with two dwelling units.

10.3 HOMEOWNERS RESPONSIBILITY. The homeowner is responsible for the following:

10.3.1 Underground water supply line shall be flushed before connection is made to the sprinkler system.

10.3.2 Ensure that the available water supply will meet the demand indicated on the “Fire Sprinkler System Information and Installer Certification.”

10.3.3 Hydrostatically test the sprinkler system at 200 PSI for 2 hours.

10.3.4 Pay inspection fees prior to scheduling a final inspection.