

EL DORADO HILLS FIRE DEPARTMENT FIRE PROTECTION STANDARD



Installation of Residential Fire Sprinkler Systems STANDARD #6 EFFECTIVE 1-1-2020 REVISED 1-10-2023

PURPOSE:

To ensure that the design, installation, and maintenance of automatic sprinkler systems in one and two-family dwellings, manufactured homes, and townhouses are appropriate for the protection against injury and life loss. Sprinkler systems designed to this standard are expected to [1] prevent flashover within the room of fire origin, and [2] improve the chance for occupants to escape or be evacuated.

SCOPE

This standard applies to the design and installation of automatic fire sprinkler systems in one and two-family dwellings, manufactured homes, and townhouses within the El Dorado Hills Fire Department (EDHFD) jurisdiction. This standard shall be used in conjunction with the 2022 edition of National Fire Protection Association (NFPA) 13D *Installation of Sprinkler Systems in One- and Two- Family Dwellings and Manufactured Homes*, California Residential Code, California Fire Code, local amendments, and other applicable national and manufacturer standards. When a design, installation or maintenance provision exists in more than one code or standard, **the most restrictive provision shall apply** unless otherwise approved by the fire code official.

AUTHORITY CITED

1. California Residential Code (CRC).
2. California Fire Code (CFC).
3. California Plumbing Code (CPC).
4. El Dorado Hills County Water District Ordinance.
5. National Fire Protection Agency (NFPA) 13D – 2022, *Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes*.

DEFINITIONS

Passive Purge System - The configuration of piping within a building that is designed to circulate water throughout and between each floor level.

PLAN SUBMITTAL REQUIREMENTS

1. New or altered residential fire sprinkler systems shall be designed and installed in accordance with 2022 CRC Section 313 and NFPA 13D – 2022 edition. Prior to system installation, design plans and other required documentation shall be submitted to and approved by the EDHFD.
2. Residential fire sprinkler systems shall be designed and installed by one of the following (NFPA 13D 4.5):
 - a. A specialty contractor holding a California Fire Protection Contractor (C-16) license.
 - b. California licensed Fire Protection Engineer (FPE) or Mechanical Professional Engineer (PE).
 - c. An owner-builder meeting the requirements of California Business and Professions Code Section 7026.12(b). A signed copy of the Homeowner Exemption Letter shall be provided upon submission of plans to EDHFD.
see attachment 1
3. A C-16 licensed contractor shall only design systems that the firm has the authorization to install. All copies of the plans shall be stamped and signed by the licensed individual.
4. The applicant shall pay all required plan review and inspection fees as described in the EDHFD Fee Schedule. The current fee schedule can be accessed via the following link: <https://edhfire.com/>. Plans will not be reviewed until plan review fees have been paid.
5. Design plans, hydraulic calculations, and product material specifications for system components shall be submitted digitally as a single PDF file through the following link: <https://edhfire.geocivix.com>.
6. Plans will be reviewed and if approved will be digitally stamped and dated. One copy of the Fire District stamped plans (Job Set) shall be printed and maintained on the job site for inspection and then provided to the building owner/manager for future maintenance purposes.

7. The following information shall be added to the cover sheet of all residential fire sprinkler system design plans submitted to EDHFD:

NOTE: The on-site water supply serving the fire sprinkler system shall be adequately flushed to remove all debris and other potential impediments in the presence of the EDHFD. The applicant and/or contractor of record shall ensure the on-site water supply has been adequately flushed and approved by EDHFD prior to the residential fire sprinkler system being connected to the riser.

8. The site plan sheet shall include a diagram illustrating the type, size, and length of the piping from the street side of the meter to the riser.
9. The site plan sheet shall include a trench detail illustrating the depth of bury, backfill materials, tracer wire and water line tape from the street side of the meter to the riser.
10. Field changes may require a re-submittal of plans and additional plan review fees.

GENERAL

1. Prior to system installation, design plans and other required documentation shall be submitted to and approved by the EDHFD. (CFC 901.2)
2. Any residential building within the scope of California Health & Safety Code Section 13143.6 used or intended to be used for the housing of more than six non-ambulatory persons shall install an automatic fire sprinkler system complying with NFPA 13. (CFC 903.2.8)
3. Residential fire sprinkler systems installed in all new one-and two-family dwellings, manufactured homes, and townhouses shall utilize a Passive Purge System design unless otherwise approved by EDHFD. (NFPA 13D 4.6)

Exception: *Manufactured homes installed, tested, and approved by the California Department of Housing and Community Development.*

4. Sprinkler riser assemblies shall be located in a wall, cabinet, or other enclosure with a minimum 12-inch wide by 24-inch high access door, unless otherwise approved by the EDHFD. The cabinet door shall be marked with signage permanently affixed reading "Fire Sprinkler Riser" with letters a minimum of 1-inch in height and of a color contrasting to the background. (NFPA 13D 7.2.4)
5. A spare sprinkler supply of at least one of each type and temperature sprinkler used within the dwelling shall be maintained on the property at an approved location. (NFPA 13D 5.1.1.2)

- a. Stock sprinklers shall be kept in a mounted and accessible cabinet.
 - b. One sprinkler wrench as specified by the sprinkler manufacturer shall be provided in a cabinet for each type of sprinkler installed.
- 6. A local water flow horn/strobe shall be provided on all fire sprinkler systems in homes at an approved location on the exterior of the dwelling. (NFPA 13D 7.6)
 - a. The alarm shall be activated by the water flow switch and shall sound between 30-90 seconds after fire sprinkler activation or Inspectors Test Valve (ITV) operation.
 - b. The alarm shall be identified with a weatherproof, visible sign that reads "Sprinkler Fire Alarm When Ringing Call 911".

WATER SUPPLY

- 1. Residential fire sprinkler systems shall have a water supply in accordance with the requirements found in NFPA 13D, Chapter 6 or CRC Section R313.3.5.
- 2. Public water system components serving residential fire sprinkler systems shall conform to the requirements of the El Dorado Irrigation District (EID).
- 3. Residential fire sprinkler systems utilizing a public water system shall use the following design criteria on the upstream (EID) side of the water meter as specified by EID:

Exception: When practical difficulties prevent the use of this design criteria due to topographic or other causes, EID shall be consulted to determine if additional pressure/flow conditions are present at the local site.

- a. Static Pressure: 40 PSI**
- b. Residual Pressure: 20 PSI**
- c. Flow: 1,000 GPM at 20 PSI**

Note - Actual static pressures may be much greater than 40 psi. All piping shall be designed to handle actual static pressures (1 psi minimum). (NFPA 13D 5.2.2.3)

- 4. As required by the water purveyor, all new multipurpose water systems supplying a residential fire sprinkler system, including both the lateral from the EID water main and water meter, shall be no less than 1 inch in diameter unless otherwise approved by EDHFD.
- 5. As required by the water purveyor, hydraulic calculations for a residential fire sprinkler system shall begin (Node 0) at the upstream (EID) side of the meter, not at the connection to the public water main, unless otherwise approved by EDHFD.

6. Systems supplied by a well shall have a letter (well report) from the project civil engineer or well contractor indicating the well and storage tank has the capacity to meet the fire sprinkler system demand (volume and pressure) for a minimum 10-minute duration as described in Section 6.1.2 of NFPA 13D.

Exception: Dwelling units meeting the criteria of Section 6.1.3 of NFPA 13D may reduce the system demand to a 7-minute duration.

7. Underground fire sprinkler supply piping shall be visually inspected, tested for leakage, flushed, and witnessed by the EDHFD prior to backfilling. The applicant and/or contractor of record shall ensure the underground fire sprinkler supply piping has been adequately flushed and approved by EDHFD prior to the residential fire sprinkler system being connected to the riser. Hydrostatic pressure testing shall be conducted at 150psi for no less than 30 minutes. (NFPA 13D 11.2.1.1)

Exception: Underground supply piping inspected by the County of El Dorado Building Official in accordance with the California Plumbing Code.

8. Non-metallic underground fire sprinkler supply piping shall be affixed with detectable tape attached to the top of the pipe or detectable wire and water tape directly above the water line. *see attachment 3*
9. Underground fire sprinkler supply piping shall be laid in sand or natural gravel not over one inch in diameter. Piping shall not be located less than 18-inches below the finished grade and piping shall be provided with a minimum 12-inch depth of cover. (CPC 609.1)
10. Underground fire sprinkler supply piping installed within a building and in or under a concrete slab shall be protected ferrous piping or copper tubing and shall not contain joints. (CPC 609.3)
11. Residential fire sprinkler systems installed in new manufactured homes are the responsibility of the California Department of Housing and Community Development and are subject to the following:
 - a. The seller of the manufactured home shall provide written verification that the system has been installed, tested, and approved by the California Department of Housing and Community Development. This documentation shall be provided prior to the final inspection and approval of the Certificate of Occupancy by EDHFD and the County of El Dorado Building Official.
 - b. The contractor or owner of the manufactured home shall provide written verification that the site water supply can provide the minimum flow (GPM) and pressure (pounds per square inch) at the base of the fire sprinkler riser,

as indicated in the Fire Sprinkler Information Label. Such a label is normally located in the water heater compartment. This documentation shall be provided to EDHFD prior to the issuance of a Certificate of Occupancy by the County of El Dorado Building Official.

- c. The underground fire sprinkler supply piping serving the manufactured home shall meet all installation and testing requirements of this standard. An underground fire sprinkler piping and trench detail shall be reflected on the New Residential Building plans for the purposes of inspection of the water line that services the residential fire sprinkler system. *see attachment 3*

PIPING CONFIGURATION (PASSIVE PURGE SYSTEM)

1. As required by the water purveyor, the piping configuration shall be designed to circulate water throughout and between each floor level by looping the piping system and maintaining minimum dead-end branch lines with a maximum length of 4 feet.

Exceptions:

1. Systems where a backflow assembly is required by the water purveyor.
 2. Systems supplied by a private well.
 3. Multi-purpose piping systems.
2. As required by the water purveyor, all systems shall provide a ½ inch outlet connected to the most remote water closet on each floor. The piping shall be CPVC to clearly identify that the water closet is connected to the sprinkler system.

INSTALLATION

1. Where water pressures supplying the fire sprinkler system exceed 80 PSI, as measured in the field or by EID, pressure-reducing valves (PRV) shall be installed. PRV pressure loss shall be reflected in the hydraulic calculations (NFPA 13D 5.2.2.4)
2. Piping shall be protected where any portion of the system (including pumps) is subject to freezing and cannot be maintained above 40°F. (NFPA 13D 9.1.2)
3. New residential fire sprinkler systems shall have approved warning signage secured to the wall or piping at the main control valve. (NFPA 13D 6.3.4) *see attachment 2*

SYSTEM ACCEPTANCE

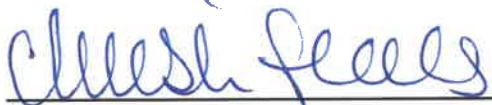
1. Residential fire sprinkler system acceptance testing shall be in accordance with Chapter 11 of NFPA 13D, CRC Section R313.3.8 and as described in this section.
 - a. **Underground Inspection.** (NFPA 13D 11.2.1.)
 - i. All piping that supplies water to the fire sprinkler system shall be exposed or center loaded with pipe markings, water tape, and/or detectable wire clearly visible. The piping shall be installed per the approved plans and shall be flushed while witnessed by the EDHFD prior to connection to the fire riser.
 - ii. A hydrostatic pressure test of the underground system piping shall be witnessed by a representative of EDHFD. The test shall be conducted at a minimum of 150psi for no less than 30 minutes.
 - b. **Pre-concealment Inspection.** A hydrostatic pressure test of the residential fire sprinkler system shall be witnessed by a representative of EDHFD. All areas of the system shall be exposed (*to visualize leaks*). The test shall be conducted at a minimum of 150psi for no less than 30 minutes. (NFPA 13D 11.2.1.)
 - c. **Final Inspection.** (NFPA 13D 11.2.3)
 - i. All recessed fire sprinklers shall have their cover plate removed during this inspection to verify that the sprinkler has been properly installed and aligned per the manufacturer's specifications and NFPA 13-D.
 - ii. A flow test shall be performed using the ITV. The associated alarm shall activate and sound an audible/visual alarm between 30-90 seconds of water flow occurring.
 - iii. All lighting fixtures and other potential obstructions to sprinkler discharge shall be in place.
2. It is the responsibility of the installing contractor/owner or their designee to be on the job site during inspections with approved plans (Job Set). Failure to do so will result in the cancellation of the inspection. Canceled inspections will be counted as one inspection and may require additional inspection fees.

MAINTENANCE OF SYSTEMS

1. Maintenance and repair of residential fire sprinkler systems shall comply with Chapter 12 of NFPA 13D and other applicable standards in effect at the time of system installation.
2. An owner's manual for the residential fire sprinkler system shall be provided to the homeowner prior to occupancy.

3. EDHFD shall be consulted whenever a residential fire sprinkler system is maintained to ascertain if additional inspections of the system may be required.
4. Water softeners, filtration systems, automatic shutoff valves, and similar devices that restrict or decrease the flow of water to the residential fire sprinkler system shall not be installed without prior approval by EDHFD.

Approved By:



Christhana Fields, Fire Marshal

ATTACHMENT 1

Homeowner Exemption Letter

Date: _____

El Dorado County Building Permit #: _____

Project Address: _____

APN: _____

This residential fire sprinkler system will be designed and installed in accordance with the owner-builder provisions found in Section 7026.12 of the California Business and Professions Code. This code section states:

The design and installation of a fire protection system, excluding an electrical alarm system, shall be performed only by either of the following [a] a contractor holding a fire protection contractor, as defined in the regulations of the board or by [b] an owner-builder of an owner occupied, single-family dwelling, if not more than two single-family dwellings on the same parcel are constructed within one year, plans are approved by the city, county, or city and county authority, and the city, county, or city and county authority inspects and approved the installation.

The EDHFD retains authority to inspect and approve the design and installation prior to the issuance of a certificate of occupancy for the dwelling.

Nothing in this exemption shall be considered as abrogating the provisions of any ordinance, rule, or regulation of any state or local agency related to the installation of a residential fire sprinkler system.

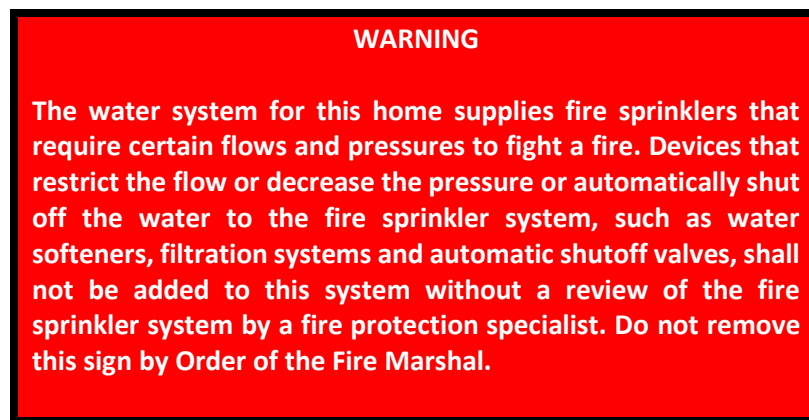
Homeowner(s) Signature: _____

Homeowner(s) Printed Name: _____

ATTACHMENT 2

NFPA 13D 6.3.4 and California Residential Code Section R313.3.7 Signage Requirements

A red plastic sign with one-eighth (1/8) inch or larger, white engraved lettering shall be secured to the wall or piping at the main shutoff valve to the water distribution system stating the following:



ATTACHMENT 3

