Sprinkler System Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies

(NFPA 13R-2016)

Effective Date: January 1, 2017

2016 CBC 903.3.1.2 NFPA 13R sprinkler systems. Automatic sprinkler systems in Group R occupancies up to and including four stories in height shall be permitted to be installed throughout in accordance with NFPA *13R*. NFPA 13R – 2016 edition (13R), referenced in the 2016 California Fire Code (CFC), is modified by the State in Chapter 80 (*80) and by San Jose Ordinance 29807 (*SJ). Presented herein is a summary of the modifications and SJFD interpretations:

***FAQ**: **CFC 903.3.1.2.1 Balconies and decks**. Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of dwelling units and sleeping units where the building is of Type V construction provided there is a roof or deck above. Sidewall sprinklers that are used to protect such areas shall be permitted to be located such that their deflectors are within 1 inch (25 mm) to 6 inches (152 mm) below the structural members and a maximum distance of 14 inches (356 mm) below the deck of the exterior balconies and decks that are constructed of open wood joist construction.*
***CFC 903.3.1.2.2** Open-ended corridors. Sprinkler protection shall be provided in open-ended corridors and associated exterior stairways and ramps as specified in CFC Section 1027.6, Exception 3.*

NFPA 13R Section 2.2 Add the following (*80):
***NFPA Publications**. NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, 2013 California edition.*

NFPA 13R Section 6.6.6 Replace with the following (*SJ):
6.6.6 Pilot sprinklers.
Pilot sprinklers shall be provided in the attics and between floors where floor/ceiling assemblies consist of open web wood joists or trusses. Pilot sprinklers shall be intermediate temperature rated, K=4.2, quick response. Pilot sprinklers shall be located within twelve inches of the structure and/or at the apex of each ridgeline when applicable. A sprinkler is required where the ridgeline and hips converge. Sprinklers shall be spaced at maximum thirty feet centers (maximum fifteen feet from outside walls) and shall be located at all heat and fire sources including furnaces, hot water heaters, above kitchen ranges, etc.
***Note:** Similar to the requirements of NFPA 13 when sprinklers are required in attics/concealed spaces, pilot sprinklers shall be provided in these spaces where the depth of the space exceeds 6 inches, measured after insulation. Otherwise, the attic shall be fully insulated. If the attic will be fully insulated, the installing contractor shall obtain approval from the San Jose Fire Department prior to covering pipe (sheet rocking). Where attic spaces used for storage the sprinkler design shall be as directed in CFC section 903.3.1.2.1 and noted herein.*

NFPA 13R Section 6.6.7 Deleted (*SJ): Sprinklers are required in all exterior closets per local code.
Interior closets may omit sprinklers if the conditions of section 6.6.3 are met.

NFPA 13R Section 6.6.10 Add new the following (*80):

6.6.10. Solar photovoltaic panel structures

6.6.10.1 Sprinklers shall be permitted to be omitted from the following structures:
(1) Solar photovoltaic panel structures with no use underneath. Signs may be provided, as determined by the enforcing agency prohibiting any use underneath, including storage. SJ Policy – Only exempt if not exceeding 7 feet in height.
(2) Solar photovoltaic (PV) panels supported by framing that have sufficient uniformly distributed and unobstructed openings throughout the top of the array (horizontal plane) to allow heat and gases to escape, as determined by the enforcing agency.

NFPA 13R Section 6.7 (*SJ) ***Note:***

CPVC Fire Sprinkler Products, like all piping materials, will expand and contract with changes in temperature. The installation of expansion loops, offsets, or bends is required on long straight runs to compensate for this movement. This will allow the piping system to absorb forces generated by expansion/contraction without damage. This movement must be designed into the system per the manufactures stipulations. The GF Harvel CPVC Fire Sprinkler piping expansion/contraction Reference Tables are published on our website as an example of manufacturers conditions for your use.

NFPA 13R Section 6.16.4 Deleted (*SJ): Sprinkler systems are required to by zoned by floor per local code.

NFPA 13R Section 6.11.2 Modify as follows (*SJ): Fire department connections shall be 2½ in. inlets with female National Standard Hose threads; all inlets shall be equipped with individual check valves (e.g. clappers). The FDC inlets shall be located at a height of 30 to 36" aboveground.

NFPA 13R Section 7.4 Deleted (*SJ): Per local code, the design area shall be increased when unsprinklered concealed spaces exist.

NFPA 13R Section 10.2.2.1. Replaced with (*SJ): Per local code, the system shall be hydrostatically tested for leakage at 200 psi for a duration of 2 hours.

NFPA 13R Section 10.2.2.2 Deleted (*SJ): Per local code, the sprinkler system shall be hydrostatically.

NFPA 25 Section 11.4 Revise as follows (*80):

11.4 ***Instructions***.

The installing contractor shall provide the property owner or the property owner's authorized representative with the following:
(1) *All literature and instructions provided by the manufacturer describing proper operation and maintenance of any equipment and devices installed.*
Modified - (2) NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems 2013 California Edition and California Code of Regulations, Title* 19, *Chapter 5*.
Add - (3) *Once the system is accepted by the authority having jurisdiction a label as prescribed by California Code of Regulations, Title* 19, *Chapter* 5, *shall be affixed to each system riser.*

Hydraulic Calculations (*SJ)

1 The pressure cushion for hydraulic calculations shall be at least 10% of the water supply data provided by the water company at the flow require.

2 All hydraulic calculations shall include a copy of the letter from the Water Company that states the water-flow data verified within six months of the submittal date. Water-flow data may be obtained from the San Jose Water Company, San Jose Municipal Water Company or Great Oaks Water. If you wish, San Jose Fire Department can perform a water-flow test and provide the water-flow data at an hourly rate (3 hours minimum). However, this test will not take the place of the water company declaration.

3 The backflow prevention requirements for each water company are unique. A complete and approved Backflow Prevention Verification Form (see website) must be provided for each/all backflow preventer(s).

4 **Backflow Preventer Retroactive Installation** – When backflow prevention devices are to be retroactively installed on existing fire sprinkler systems, a thorough hydraulic analysis, including revised hydraulic calculations, new fire flow data, and all necessary system modifications to accommodate the additional friction loss, shall be completed as a part of the installation. New or changes to existing backflow preventers shall not be installed without Fire Department approval.

5 Provide documentation for all pipe length equivalents used to develop your calculations. As an Example, Tyco CPVC fittings are "special" in that they get reduced equivalent lengths (for 90° elbow) compared to other manufacturers, you need to provide note on plans and in the calculations that only Tyco CPVC fittings will be used. We will check these in the field, so, the fittings must be readily identified as Tyco CPVC fittings. If not, then you will need to revise your calculations to reflect the "normal" equivalent lengths.

6 The sprinkler calculation design is contingent on the installation conforming to the situations presented in 2016 NFPA 13R Chapter 7. For the situation of flat, smooth, horizontal ceilings with beams at the ceiling, there are a number of variables that could cause many sprinklers to open during a fire. Residential sprinklers must be used in accordance with all of the restrictions of their listing to protect against this circumstance.

6.1 Referring to NFPA 13R section 7.1.1.3.2 – Some residential sprinklers are listed to specifically protect spaces with compartment features beyond those indicated in 7.1.1.3.1 (1) through (5) and are permitted for use in accordance with 7.1.1.3.2.

6.2 Referring to NFPA 13R section 7.1.1.3.3 – There are some situations where no listed sprinklers exist for the compartment features under consideration. However, sprinklers are still required to be installed in the residence in accordance with NFPA 13R. For this situation, the appropriate number of sprinklers for the design area is to be determined through an analysis by qualified individuals in consultation with the SJFD. In making these determinations, consideration should be given to factors influencing sprinkler system performance, such as sprinkler response characteristics, impact of obstructions on sprinkler discharge, and number of sprinklers anticipated to operate in the event of a fire.

INSPECTIONS: See the handout online for Fire Sprinkler Systems for full instructions. In summary, inspections shall be scheduled by the installing contractor only. When scheduling for inspection, request sufficient time to complete a thorough inspection of the work performed. Travel time is included in your inspection time.

NOTE: Pursuant to Chapter 5.5, Division 1, Title 19 of the California Code of Regulations, effective 7/1/17 any individual performing the installation, alteration, or repair of water-based fire protection systems will be certified or registered with the State Fire Marshal. Violators may be subject to a "Stop Work Order".

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