



## **Minnesota State Fire Chiefs Association Model Policy for Residential Sprinkler Systems for One & Two Family Dwellings**

The following is a model policy for the installation of residential sprinkler systems in one and two family dwellings. This model policy was developed in an effort to encourage the installation of residential sprinkler systems and to remove regulatory road-blocks to residential sprinkler installations. It combines the requirements and allowances from the Minnesota State Fire Code and NFPA 13-D with life safety experiences and best practices from several communities into a simple easy-to-follow document for code officials to use as a guideline in their communities. This document was a joint effort between the Minnesota State Fire Chiefs Association, the Fire Marshals Association of Minnesota, and the Minnesota State Fire Marshal Division.

### **SECTION I – SITE ISSUES**

#### **A. Road Width:**

- Road widths may be reduced when approved by the authority having jurisdiction in a fully sprinklered development.

#### **B. Hydrant Spacing:**

- Hydrant spacing is allowed to be increased to 800 feet spacing (no more than 400 feet from a hydrant).

#### **C. Dead-End Roads & Turn-Arounds:**

- Dead end roads up to 300 feet in length are allowed without turn-around provisions (such as a cul-de-sac or hammerhead).

#### **D. Water Supply Taps from Municipal Supply to Homes:**

- A minimum 1" water supply shall be provided from the municipal water supply to the home (this includes a 1" tap and 1" line). See Section II – Item C for more information

### **SECTION II – SPRINKLER COVERAGE AND INSTALLATION REQUIREMENTS**

#### **A. Appropriate Design Standard:**

The appropriate design standard for residential sprinkler systems is NFPA 13-D (Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes). This standard should be followed except as modified herein.

- Sprinklers shall be listed for residential use and shall be used in accordance with their applicable spacing and listing criteria (except for garage protection below).

## **B. Areas That Can be Exempted from Having Sprinklers Installed:**

NFPA 13-D allows certain areas with a limited fire loss history from having sprinkler protection. These areas include:

- Bathrooms of 55 ft<sup>2</sup> and less.
- Clothes closets, linen closets, and pantries not exceeding 24 ft<sup>2</sup> or 3 ft in the least direction. The closet or pantry must not contain any mechanical equipment, electrical equipment, or electrical appliances (including washers or dryers).
- Open attached porches, carports, and similar structures.
- Attics, crawl spaces, and other concealed spaces that are not used or intended for living purposes.
- Covered unheated projections of the building at entrances/exits as long as there is another means of egress from the dwelling unit.
- Closets on exterior balconies, regardless of size, as long as there are no doors or unprotected penetrations from the closet directly into the dwelling unit.

## **C. Water Supplies – Municipal Systems:**

- Sprinkler flows shall be hydraulically calculated using the most demanding sprinkler flow. Two design sprinklers are required for NFPA 13-D systems.
- For NFPA 13-D systems the recommended water supply to the dwelling unit is 1 ½ inch (in some cases, a 1 inch supply may be acceptable if it can be proven hydraulically).
- The preferred method is to split the water supply as soon as it enters the building into domestic and fire protection. It is recommended that no meter be installed on the fire protection side. If a meter is required by the water utility, there are two options:
  - Size the meter for the incoming supply (1" or 1 ½"),
  - Provide separate meters (one for domestic; one for fire protection).
- A check valve is required immediately following the tap for the fire protection system.
- In the case of a multi-purpose sprinkler system (combined piping for domestic and fire protection use), a separate meter and check valve would not be required.

**Intent:** A sufficient water supply is necessary; this is generally verified through hydraulic calculations. A 1 inch water supply is generally considered as the minimum and 1 ½ inch water supply is generally preferred. Water meters are discouraged on the fire protection system due to friction loss in the meter. If meters are required by the municipality or the water utility provider, the meter should be upsized to match the incoming water supply size or separate meters should be provided.

## **D. Water Supplies – Private Systems:**

- NFPA 13-D allows for a water sources, supplied from a well, and the use of an automatically operated pump.
- The water supply components used for an NFPA 13-D sprinkler system do not need to be listed for fire protection (pump, well, tank, etc.).
- The size of the stored water supply is based on the demand of the sprinkler system and the duration.
- Typically the sprinkler demand for NFPA 13-D systems is 13 gpm for two sprinklers (26 gpm total). The use of extended coverage sprinklers may increase this demand.
- NFPA 13-D requires a 10-minute duration for a home over 2,000 sq. ft. in size (26 gpm times 10 minutes = 260 gallons). For smaller homes (under 2,000 sq. ft. in size) a 7 minute duration is allowed (26 gpm times 7 minutes = 182 gallons).
- The following types of water supplies are acceptable:
  - Stored supplies:
    - Pressure tank,
    - Bladder tank,

- Storage tank (indoor or underground),
  - Cistern.
- Wells.
- If the water supply is from a well only, the well must be capable of providing the required flow for the intended duration including normal domestic use.
- No back-up electrical power supply is required for NFPA 13-D systems.

**Intent:** The intent of NFPA 13-D is to allow for the installation of sprinkler protection using the types of materials commonly used in residential construction. Homes and buildings constructed in areas with no municipal supply have options for providing their own water supply through a combination of well, tanks, and/or pumps. Other than adding in the supply needed for the duration of time required, this section imposes no additional requirements on the water supply.

#### **E. Attached Garages:**

Sprinkler systems in single family dwellings and similar residential structures having attached garages require a single sprinkler (dry sidewall type) installed above the door between the garage and the dwelling unit to protect the structure from a fire originating in the garage. This sprinkler does not need to be hydraulically calculated nor does it need to meet the listed spacing or protection criteria.

**Intent:** The garage to house separation is critical to protect occupants from a fire originating in an attached garage. Most sidewall sprinklers are not listed to protect the entire garage area. This allows a relatively inexpensive means of preventing fire spread through the opening (i.e. door) between the attached garage and the house.

#### **F. System Attachments for NFPA 13-D Systems:**

- No fire department connection is required.
- No hydrostatic test (i.e. 200 PSI for 2 hours) is required since the system lacks a fire department connection.
- No off-site monitoring of flow or tamper conditions is required.

**Intent:** NFPA 13-D requirements.

#### **G. Exterior Alarms:**

- An outside audible flow alarm is strongly recommended for NFPA 13-D systems.
- A separate water meter is not required by NFPA 13-D if an outside flow alarm is provided but some municipalities may still require it.

**Intent:** NFPA 13-D does not require an outside alarm but encourages it to prevent unnecessary water damage. Water meters need not be provided if there is an outside flow alarm as theft of water would be detected by the outside flow alarm.

## **SECTION III – INSPECTIONS, TESTING & MAINTENANCE**

#### **A. Inspections:**

- Acceptance inspection – final inspection should be conducted.
- Acceptance test consists of the following:
  - Apply water pressure at normal operating pressure to the system.
  - Visually inspect for leaks.
  - Operate all valves to ensure proper operation (control, drain, and test valves).
  - Test operation of outside flow alarm, if provided.

- Perform other tests that may be required by the manufacturer.
- Additional inspections (such as “rough-in”) may be performed if deemed necessary.
- Sprinklers are allowed to be installed at proposed finished ceiling heights (in unfinished areas).

**B. System Maintenance:**

- Contractor to leave maintenance instructions (these should be a simple, easy to follow set of instructions for on-going maintenance of the system).
- Contractor to leave emergency repair telephone contact numbers at the system riser.
- Annual maintenance by an outside contractor is not required.

## **SECTION IV – PERMITS & PLAN REVIEWS**

**A. Permits:**

- Waive permit and plan review fees for single family dwellings or charge minimal fees.

**B. Plan Reviews:**

- Allow prototype plan review for similar floor plan structures in which hydraulic calculations suffice.

## **SECTION V – ALTERNATIVE MATERIALS AND METHODS**

The following building and fire code provisions could be waived subject to the approval of appropriate code officials (building and fire code officials) as the installation of a residential sprinkler system has been deemed to provide an equivalent level of life safety.

**A. Smoke Alarms:**

- In lieu of hard-wired and interconnected smoke alarms, allow battery-powered smoke detectors in sleeping rooms.
- Smoke alarms are still required in hallways giving access to sleeping rooms.

**B. Second Means of Escape:**

- Egress Windows are not required from sleeping rooms located on the main floor and above stories.
- At least one second means of escape (egress window or door) is required for below grade or basement areas having sleeping rooms or unfinished areas capable of being converted to future sleeping rooms.