



Plan Submittal and Inspection Requirements for NFPA-13D Systems



Permit/Design Standards: Section 105.7.1 of the Washington State Fire Code requires a Construction Permit to install or modify a Fire Sprinkler System. Section 903.3.3.1.3 requires any work performed under said permit to conform with NFPA 13D. The purpose of this document is to provide the reader with a summary of that information required to be included in any residential fire sprinkler plans submitted to this office and the installation requirements. *Failure to include any/all information identified here may result in delays if the plans are incomplete and require resubmittal.*

Designer Certification Requirements: The Revised Code of Washington (RCW) 18.160.040 requires all construction documents be reviewed by a designer possessing a *Level 1, 2, or 3 State Fire Sprinkler Certificate of Competency* issued by the Washington State Patrol Fire Protection Bureau (WSPFPB) prior to being submitted. All documents related to the system must bear the seal of the *Certificate of Competency* holder.

Contractor Requirements: Contractors possessing a *Level 1, 2 or 3 Contractor's License* issued by the WSPFPB may install a NFPA 13D fire sprinkler system. RCW 18.270.020 requires Fitters working on NFPA 13D systems to possess a *Residential or Journey Level Sprinkler Fitter Certificate* issued by the WSPFPB. However, under WAC 212-80-015 (e), a L & I licensed journey level or residential specialty plumber may install a 13D system connected to potable water (see multi-purpose below) *provided* the system is designed by an individual meeting the *Designer Certification Requirements* above. In addition, under subsection (f), owner/builders are permitted to install their own sprinkler systems *provided* they are designed by an individual possessing the requirements identified above and meet all the other requirements of this standard including inspections and tests.

Submitting Plans: The preferred method for submitting plans is through the County SMARTGOV portal however, plans may also be submitted in person. If so, one paper copy and one flash drive of all documents shall be provided. Each residence with its own fire sprinkler riser shall be considered a single system and constitute one submittal.

Electronic Submittal File Standards:

Acceptable File Types: Plans, calculations, specifications and supporting documents shall be up-loaded as a PDF file.

Document Orientation: All plans shall be up-loaded in the "Landscape" format in the horizontal position. All other documents may be submitted in the "Portrait" format.

Once the permit is issued, work may proceed. All work shall require at a minimum, two field inspection to be signed off (refer to the Inspection Requirements section below).

Plans and Documentation: Fire sprinkler plans shall provide the following information and applicants should use this standard as a checklist:

- Name of owner and occupant
- Location including street address.
- The Contractor's name, address, phone number and email address

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- Point of compass
- A graphic representation of the scale used (generally 1/4"=1') *shown on each sheet*
- Stamp and signature of system designer on all drawings and calculations
- Code edition utilized for the system design.
- A plan for each floor where work is being conducted.
- A full height cross section including structural member information, ceiling construction and slopes (to demonstrate conformance to 8.1.1 and 10.2.1).
- Location of walls, concealed spaces, closets, attics and bathrooms
- Any enclosures where sprinklers are omitted.
- Explanation of any omissions are being used with the appropriate code reference.
- Distances between fire sprinklers, walls and any other obstructions
- The location of any riser(s) and valves including an illustrated riser diagram
- The make, model, type, temperature rating and nominal K-Factor of all sprinklers including the sprinkler identification number.
- All control valves (only cock or ¼ turn “ball” types are permitted), check valves and drain (that discharges outdoors or into an approved drain)
- The make, model, type of the backflow prevention assembly (if present)
- Make, model and location of alarm bells (required for Stand-alone Systems)
- The information on the hydraulic data nameplate
- Hydraulic reference points shown on the plans that correspond with comparable reference points on the hydraulic calculations (Stand-alone Systems)
- The density, flow, design area, and discharge pressure.
- The manufacturer’s information on the pump and tank (if used) serving the system (also shown on the plans).
- If connected to a public water system, the waterflow information (static PSI, flow and residual PSI) from the water purveyor (within the last 12 months). If waterflow information is not current, a flow test conforming to NFPA 291 shall be performed by an approved firm or individual.

Once submitted plans have been approved, installation of the system may occur. Under no circumstances shall any work be performed until this occurs.

Safety Margin: To account for daily variations in water pressure, all systems shall be designed to operate 10 PSI lower than the pressure available.

Types of Systems: Generally, three types of 13D systems are commonly used. They include a:

Stand-alone System: A system where the aboveground piping serves only fire sprinklers.

Multipurpose Piping System: A piping system intended to serve both domestic needs in excess of a single fixture and fire protection needs from one common piping system throughout the dwelling unit.

Manufactured Home System: A system engineered, installed and approved at the factory, connected to a water supply at the building site that meets or exceeds the information on the manufacturer’s data plate.

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Inspection Requirements: A minimum of two inspections shall be required for a NFPA 13D system. A “Rough-In” (also known as a Hydrostatic or “Hydro”) and a Final. Because the inspection procedures will vary depending upon the type of system, the procedures are differentiated here.

Stand-alone Systems:

Rough-In: Once all system components are installed, an inspection shall be performed which includes:

- Verifying all piping and sprinklers are secure and installed per the approved plans.
- A pressure test is performed at the system’s operating pressure for 2 hours pumped up two hours prior to the scheduled inspection (A time-stamped photograph may be required).
- The presence of “tented” insulation (Min. R-13) draped over any sprinkler piping in open (attic) spaces below roof assemblies. Tented insulation shall be in addition to any other insulation required under the State Energy Code.

Final: Once all building surfaces are finished, a final inspection shall be performed which includes:

- Verifying all sprinkler heads, trim and escutcheons are installed per manufacturer's instructions and heads are unobstructed and free from paint (concealed heads shall have their escutcheons removed to verify this).
- Verifying a *Spare Head Box* is installed with an adequate number (and type) of sprinklers (and wrenches)
- The alarm bell is tested (if present)
- The *Hydraulic Data Nameplate* is installed adjacent to the riser.
- The system control valve is “locked” in the open position using a nylon or “zip” tie and a permanent sign labeled “FIRE SPRINKLER SHUT-OFF” is posted on or adjacent to it.

Multipurpose Piping System:

Rough-In: Once all system components are installed, an inspection shall be performed which includes:

- Verifying all piping and sprinklers are secure and installed per the approved plans.
- A pressure test is performed at the system’s operating pressure for 2 hours (pumped up two hours prior to the scheduled inspection). A time-stamped photograph may be required.
- The presence of “tented” insulation (Min. R-13) draped over any sprinkler piping in open (attic) spaces below roof assemblies. Tented insulation shall be in addition to any other insulation required under the State Energy Code.
- Verifying the “arm-over” length of piping between a sprinkler head and the supply pipe is not over 12” to minimize the risk of stagnant water.
- Conducting a “Bucket Test” to verify the volume of water delivered concurrently from the two most demanding sprinkler heads exceeds that required for the coverage area being served.

Final: Once all building surfaces are finished, a final inspection shall be performed which includes:

- Ensuring all system control valves are secure in the open position.

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- Verifying all sprinkler heads, trim and escutcheons are installed per manufacturer's instructions and heads are unobstructed and free from paint (concealed heads shall have their escutcheons removed to verify this).
- A Spare Head Box is present with 2 spare heads, one of each type of sprinkler (and wrenches)
- The *Hydraulic Data Nameplate* is installed adjacent to the riser.
- The system control valve is “locked” in the open position using a nylon or “zip” tie.
- The installation of a permanent warning sign with minimum ¼” lettering affixed adjacent to the main shut-off valve that reads:

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 shut-off valves shall not be added to this system without a review of the system by a fire protection specialist. DO NOT REMOVE THIS SIGN

Manufactured Home System: Due to these systems receiving their “Rough-In” inspection at the factory, only a modified “Final” inspection is required including the following:

- Conducting a “Bucket Test” to verify the volume of water delivered concurrently from the two most demanding sprinkler heads exceeds that identified on the manufacturer’s data plate.
- Verifying all sprinkler heads, trim and escutcheons are installed per manufacturer's instructions and heads are unobstructed and free from paint (concealed heads shall have their escutcheons removed to verify this).
- Verifying a *Spare Head Box* is installed with an adequate number (and type) of sprinklers (and wrenches)
- The alarm bell is tested (if present)
- The manufacturer’s data plate is installed in a conspicuous location in the home.
- The system control valve is “locked” in the open position using a nylon or “zip” tie and a permanent sign labeled “FIRE SPRINKLER SHUT-OFF” is posted on or adjacent to it.

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