



Requirements for the Submittal of Sprinkler and Standpipe Systems NFPA 13, 13D, 13R, and 14 Systems

SECTION A – WALK-THRU PERMIT SUBMITTAL REQUIREMENTS

1. Permits and submittals are required for all work involving any sprinkler additions or modifications.
2. Modifications meeting the following criteria may qualify for a walk-thru permit:
 - 2.1. Non-residential.
 - 2.2. Nine (9) heads or fewer relocated on an existing system.
3. Drawings must be scaled or dimensioned. Plans must show pipe schedule or enough of the system piping to verify the modifications will not exceed the existing design.
4. Plans must be submitted in .pdf format. See website for naming conventions and file size requirements.
5. Sections B-E are not applicable to Walk-thru Permits, although compliance with the provisions of NFPA 13 is still required.

SECTION B - GENERAL SUBMITTAL REQUIREMENTS

1. Permits and submittals are required for all work, including any sprinkler additions or modifications.
2. Plans must be submitted in .pdf format. See website for naming conventions and file size requirements.
3. Calculations must be submitted in .pdf format, all calculations should be saved to the same file, individual calcs must be clearly labeled. Provide a copy of the water flow test data as documented from WSSC or the City of Rockville.
4. Equipment submittal sheets are required for backflow preventers, valves, gauges, meters, sprinklers and pipe and fittings. Submittals with residential, quick response, extended coverage, or other heads with special manufacturer's instructions shall include the manufacturer's advanced installation guide with criteria for all situations on the project (such as heat danger areas, cold solder, obstructions, etc.). Residential heads without advanced installation guides will not be permitted.
5. High-rise, Special Inspection Projects or other projects subject to special consideration: a copy of the signed Special Inspection or Fire Protection Agreement must accompany the submittal.
6. For complexes (such as garden apartments or townhouses) where typical building(s) prevail, show only the typical arrangement(s) and provide verification of the "worst case" building is calculated. Optional layouts may be included but must be clearly identified and be accompanied by hydraulic calculations.
7. Minimum scale for floor plans is 1/8" per foot. 1/4" per foot is preferred for residential areas.
8. For continuations of large projects or for revisions, indicate the previous reviewer's name and the permit number.
9. For submittals involving work on a portion of any plan (such as tenant work or partial revisions), cross off any areas not to be reviewed on each set.

SECTION C - INFORMATION REQUIRED ON DRAWINGS

1. **General**
 - 1.1. Plans shall include all information required by NFPA 13, Section 23.1.3.
 - 1.2. Project owner's name and address including zip code (tenant for tenant work; building owner for shell work).
 - 1.3. Building/Parent Permit number, if applicable.

- 1.4. Maryland sprinkler contractor license number & expiration date.
- 1.5. Sprinkler contractor name, address, telephone number, and contact person.
- 1.6. Symbol and abbreviation key.
- 1.7. Plans must be signed by a NICET III or higher. Original signature only. Digital signatures in compliance with COMAR 09.23.03.09 may be accepted as well.

2. Architectural

- 2.1. Indicate the overall use (single family, townhouse, tenant fit out, etc.)
- 2.2. All rooms and areas labeled with their use. Label should appear within the room or area, whenever possible.
 - 2.2.1. If hazard classification is not obvious by the room name, provide further clarification.
 - 2.2.2. For laboratories, provide NFPA 45 classification.
- 2.3. Indicate the location of all partitions and doors.
- 2.4. Indicate the rating of any fire rated walls, partitions, and doors (in particular when using room design method).
- 2.5. Indicate ceiling construction, height, and show details for any obstructions (lights, bulkheads, etc.).
- 2.6. Provide explanation/justification for all blind spaces and other areas where sprinklers are not to be installed.
- 2.7. Provide full-height cross sections; enough to show all conditions.
- 2.8. For determining hose reach, show parking space layout in garages with standpipe systems.
- 2.9. Show water curtains and 18" draft stops for floor openings.
- 2.10. 13D Systems -
 - 2.10.1. indicate lintel location and depth.
 - 2.10.2. indicate location of all heat sources and minimum distances for sprinkler location
 - 2.10.3. sprinklers in bathrooms to be in accordance with City of Rockville amendment 903.3.1.1.2.1

3. Site plan

- 3.1. To scale or dimensioned with a point of compass.
- 3.2. Show the size, type, and arrangement of feed mains.
- 3.3. Provide flow test point (static and flow hydrants), water supply and gradient information.
- 3.4. Provide floor elevation and building section elevation above sea level (to correspond to gradient data).
- 3.5. If the sprinkler contractor is to install underground piping, show depth of cover.
- 3.6. Fire department connection (FDC) must be within 100' of a fire hydrant (NFPA 13 & NFPA 14 systems).

4. Water Supply Information

- 4.1. City of Rockville -
 - 4.1.1. Obtain current flow test, elevation, and date from the City of Rockville's Department of Public Works, Utilities Division at (240) 314-8500.
 - 4.1.2. Adjust for low gradient obtained, in writing, from the City's Public Works engineering staff.
 - 4.1.3. Water service pipe installed underground between the City's main and the property line shall be type "K" copper tubing with flare fittings only for sizes up to and including two (2) inches. From the property line to the structure to be supplied shall be type "K" copper tubing with flare fittings only for sizes up to and including two (2) inches or acrylonitrile butadiene styrene pipe (ABS) plastic pipe for water supply. Sizes three (3) inches and above shall be of cast-iron pressure pipe, suitable for conditions to which it will be subjected. A #12 copper wire shall be taped to all nonmetallic water service pipe to provide a means of locating the lateral by a metal detector or other device.
- 4.2. Washington Suburban Sanitary Commission (WSSC) -
 - 4.2.1. New tap - Obtain information from WSSC Hydraulic Information Sheet (HIS). Submit a copy with the project submittal or reproduce on drawings.

- 4.2.2. Existing tap or if no HIS exists
 - 4.2.2.1. Obtain current flow test, elevation, and date from WSSC.
 - 4.2.2.2. Adjust for low gradient obtained from WSSC.
- 4.3. Existing underground lines
 - 4.3.1. A flow test inside the building or building fire pump shall be used due to the unknown condition of the underground pipe. ISD does not need to witness this test. Test data shall be no older than 1 year, shall be adjusted to the low gradient, and include outside hose stream allowance.
- 4.4. Other supply sources & details (tanks, pumps, etc.)
 - 4.4.1. Flow test of the water supply system shall be used. ISD will need to witness this test. The test data shall be no older than 1 year, adjusted for low hydraulic gradient, and include outside hose stream allowance.

5. System layout

- 5.1. Indicate pipe sizes.
- 5.2. Center to center dimensions or cut lengths of pipe, and distances of sprinklers to walls in all areas and rooms.
 - 5.2.1. Sloped ceilings: provide slope and flat dimensions.
 - 5.2.2. Above and below ceiling systems: provide dimensions for both.
- 5.3. Indicate size and length of riser nipples and drops.
- 5.4. Indicate locations of high temperature sprinklers.
- 5.5. Residential sprinklers:
 - 5.5.1. Show and dimension danger areas near heat producing devices as per manufacturer's recommendations or as per code, whichever is most stringent.
 - 5.5.2. Residential sprinkler heads are permitted in corridors when the corridor serves only dwelling units.
- 5.6. Indicate hanger locations, valves, drains, and test connections.
- 5.7. Additions or modifications to existing systems: show enough of existing system to verify pipe scheduling, feed mains, cross mains, and supply points.
- 5.8. Provide hydraulic reference points corresponding to calculations.
- 5.9. Sprinkler control valves (except elevator control valves) must be in stairs, valve rooms or pump rooms.
- 5.10. If a building is provided with multiple connections, they must all be interconnected.
- 5.11. Zoning -
 - 5.11.1. By floor when required by local amendment.
 - 5.11.2. Coordinate with fire alarm & smoke control zones. Atriums will usually require independent zones.

6. Riser diagram

- 6.1. Indicate sizes of all piping and devices.
- 6.2. Provide size, make and model of alarm, dry pipe or preaction valves.
- 6.3. Show FDC
- 6.4. Provide size, make and model of backflow preventer, detector check, and meter (if required).
- 6.5. Show air supervision for dry sprinkler systems or manual standpipe systems.
- 6.6. Residential systems: indicate the location of the drain and combined sprinkler/domestic control valve (if required).

7. Calculation Design Areas

- 7.1. Show the boundary of each area.
- 7.2. Room design method or irregular areas not meeting the $1.2 \sqrt{A}$ requirement: show rating of walls and doors to show compliance with NFPA 13.
- 7.3. Label all calculation areas and coordinate with the calculation cover sheets.

8. Notes

- 8.1. The number of sprinkler heads on each sheet must be shown in a legend.

- 8.2. Sprinkler symbols with make, model, orifice, temperature rating, and quantity must be shown on a legend on each sheet.
- 8.3. Capacity, in US gallons, of each dry pipe system.
- 8.4. Indicate the pipe type. If the type varies, then indicate the type for each size.
- 8.5. Indicate the locations for fittings, welds, and bends.
- 8.6. System design criteria (for each zone)
 - 8.6.1. For calculated systems, indicate the hazard classification, density, design area, and hose allowance.
 - 8.6.2. For high piled or high rack storage systems, provide a design analysis referencing figures, curves, and area/density modifications.
 - 8.6.3. For pipe schedule systems, indicate occupancy hazard
 - 8.6.4. For residential systems, plans shall include maximum coverage dimension on the plans.
- 8.7. Calculated systems. Provide the following notes for each design area:
 - 8.7.1. System demand notes for each zone (flow and pressure required at a common reference point).
 - 8.7.2. Maximum sprinkler spacing as proved by calculations. If spacing varies, the note must indicate this and will prohibit any field spacing changes.
 - 8.7.3. Calculated pipe sizing as proved by calculations (number of heads on each size pipe). If the sizing varies, the note must indicate this and will prohibit any field sizing changes.
- 8.8. For plastic pipe:
 - 8.8.1. Indicate hanger intervals per the manufacturer's requirements.
 - 8.8.2. Show a detail for the method of restraint at the sprinkler to counteract water force.
- 8.9. Indicate method for maintaining required temperature above freezing for piping installed in areas subject to temperatures below 32°F.

9. Standpipe systems (if provided)

- 9.1. Class I standpipes only permitted. Class II & III systems are prohibited.
- 9.2. Indicate riser and hose valve locations.
- 9.3. Provide a riser detail.
- 9.4. Meet required hose reach and show all doors to verify. Measure hose reach at right angles and start at the elevation of the hose outlet.
- 9.5. Show gauges at the top of each riser, hose valve height off the floor, and reducer caps & chains.
- 9.6. Pressure reducing or restricting valves are not permitted if it is possible to obtain the required pressures with the main pump relief valve. If this is not possible, show PRVs only on valves that have pressures over 175 psi. Provide settings for all PRVs.
- 9.7. Garage hose valves. Vehicle parking shall not obstruct hose valves. Hose valves shall not be located behind columns or parking spaces.
- 9.8. Hose valves outside of stairs may not substitute for those required in the stairs.

10. Fire Pump Details (if provided)

- 10.1. Provide capacity (flow and pressure), make, model, and listing.
- 10.2. Provide a cross section including all piping and bypass.
- 10.3. Indicate the location of the jockey pump and all controllers.
- 10.4. Indicate the location of the relief valve, if required by NFPA 20. The relief valve must be piped to drain or outside.
- 10.5. Addition or retrofit of any new sprinkler systems may necessitate the upgrading of existing fire pump installations to meet the requirements of NFPA 13, NFPA 14, and/or NFPA 20.
- 10.6. Eccentric suction reducers, if used, shall be mounted with flat on bottom if fed directly by an elbow from above.
- 10.7. Show the high hydraulic gradient (from the appropriate water authority) to enable us to verify the need for a relief valve and determine the hydrostatic test pressure.

11. High Rack & High Piled Storage

- 11.1. Indicate storage height, rack height, type of storage (palletized, solid shelf, etc.), and the rack or pile arrangement including aisle widths.
- 11.2. Provide commodity classifications for stored materials.
- 11.3. Hand-hose outlets. Hose is prohibited for new buildings and may be removed from existing buildings with approval from ISD.

12. Tenant Plans

- 12.1. Clearly indicate tenant location on plans.
- 12.2. Provide all notes per the list provided at the end of this document.
- 12.3. If the original system design criteria are not available, then recalculate and provide the new calculations. The original criteria must be adhered to unless the entire floor is recalculated.
- 12.4. Change to a higher hazard must be recalculated except rooms with 6 heads or less. These small rooms may use the same piping with a decrease in head spacing by density conversion (see density conversion section on tenant notes at the end of this document).
- 12.5. Change to a lesser hazard must use the same piping as shell calculations; spacing may be increased by density conversion.
- 12.6. Provide arm-over and tie-in details.
- 12.7. Show enough of the adjacent area(s) to permit verification of pipe sizing.

13. Sprinkler Head Replacements (maintenance only)

- 13.1. A report detailing the deficiency and the proposal to correct must be sent prior to permit submittal.
- 13.2. File a permit application along with scope of work detailing location of sprinkler heads to be replaced and type of heads. Plans not required.

14. Speculative Spaces (subject to tenant changes regardless of lease term)

- 14.1. New speculative spaces should be designed for adequate system flexibility and in accordance with the requirements of the City of Rockville.
- 14.2. Tenant spacing and sizing changes/additions shall conform to shell calculations and shall be consistent on any given floor.
- 14.3. Extended coverage sprinklers are not permitted in speculative business and mercantile occupancies.
- 14.4. Include elevation loss in calculations to roof deck for future tenants without ceilings.
- 14.5. If using QR area reduction, use full height to roof deck for future tenants without ceilings.
- 14.6. Minimum 1" outlets shall be provided.

SECTION D - INFORMATION REQUIRED ON CALCULATIONS

1. General

- 1.1. Provide the date, project name, project address, contractor name, contractor address, contractor phone number, and contact person.
- 1.2. Calculation identification number and floor must be shown on cover sheet and coordinated with plans.
- 1.3. Provide a fixture load analysis for NFPA 13R systems.
- 1.4. Required safety factor of 20% on all calculations. For systems without a pump, this is based on the demand pressure only at the supply point. For systems with a pump this is based on both the demand pressure and demand flow at the pump discharge.
 - 1.4.1. Required safety factor of 10% for 13R, 13D and owner-occupied 13 systems only.

2. Design Criteria

- 2.1. Provide hazard classification, design area, density, inside and outside hose allowances, area per sprinkler as calculated, and water supply and pump information.
- 2.2. Laboratory sprinkler systems must be designed in accordance with the hazard classifications in NFPA 45. Sprinkler systems protecting laboratories in Health Care occupancies shall also comply with NFPA 99.

- 2.3. Sprinkler criteria in other NFPA standards, such as NFPA 30 (flammable liquids), NFPA 30B (aerosols) and NFPA 430 (oxidizers), must be taken into consideration.
- 2.4. **NFPA 13R systems**
 - 2.4.1. Four sprinkler heads in accordance with 7.1/7.2.
 - 2.4.2. Areas outside dwelling units must be calculated per NFPA 13 unless the area meets all the criteria in 13R for a four-sprinkler design.
 - 2.4.3. Submit as many calculations as necessary to prove all conditions.
- 2.5. **NFPA 13D systems**
 - 2.5.1. Two sprinkler heads in accordance with 10.2.
 - 2.5.2. Three sprinkler heads if ceiling arrangement/sprinkler type falls outside of the requirements of 10.2/manufacturer specifications.
 - 2.5.3. Submit as many calculations as necessary to prove all conditions.

3. Calculations

- 3.1. Provided in NFPA 13 format.
- 3.2. Include sprinkler K-factor(s).
- 3.3. Provide hydraulic reference points.
 - 3.3.1. Reference points should be provided at the top and bottom of each riser
- 3.4. Provide pipe sizes and lengths (include drops and armovers in calculations).
- 3.5. Include and label fittings and devices.
- 3.6. Indicate friction loss factors and the total friction loss between reference points.
- 3.7. Provide pressure at each reference point.
- 3.8. Indicate velocity and normal pressures, if used.
- 3.9. Submit as many calculations as necessary to prove all conditions, including largest spacing, most demanding, sizing, longest branch lines, etc.
- 3.10. Insert inside hose allowance at the nearest hose valve and outside hose allowance at the nearest hydrant.
- 3.11. Carry calculations to:
 - 3.11.1. the point of connection, when using HIS.
 - 3.11.2. the gauge hydrant, when using an outside flow test.
 - 3.11.3. the gauge location, when using an interior flow test.
- 3.12. Include water curtain demand for floor openings in the nearest calculation on the same floor.

4. Other

- 4.1. Provide a summary graph sheet showing adjusted water supply, pumps, hose allowance, and demand point(s).
- 4.2. Calculations for gridded system must include:
 - 4.2.1. a sketch including reference points, flows, and flow directions
 - 4.2.2. proof of peaking.
- 4.3. On systems utilizing fire pumps, supply and demands must be corrected to the location of the pump for verification of adequate suction pressure at 150% of the fire pump's rated capacity.
- 4.4. Fire pump churn design shall use 101% capacity unless a certified pump churn shows a higher pressure.
- 4.5. Standpipe systems: include both fire pump and FDC calculations unless the fire pump is sized for the full system demand.
- 4.6. Standpipe calculations may use multiple FDCs only if all FDCs meet the position and location requirements.

SECTION E - NOTES TO BE SHOWN ON TENANT SPRINKLER DRAWINGS

ORIGINAL SYSTEM

Hazard occupancy per calc: _____ hazard occupancy _____ calc area
_____ density _____ safety factor

Calculated pipe sizing: _____ sprinklers on _____ pipe
_____ sprinklers on _____ pipe
_____ sprinklers on _____ pipe
_____ armover length _____ size

Calculated sprinkler head spacing: _____ SF max.
Pipe type: _____ Fitting type: _____
Sprinkler information (symbol, make, model, orifice, temp, etc.): _____

NEW SYSTEM/MODIFICATIONS

Pipe type: _____ Fitting type: _____
Sprinkler information (symbol, make, model, orifice, temp, etc.): _____

Number of: _____ new sprinklers _____ relocated sprinklers/off original outlets _____

Density conversion to higher hazard: (_____ SF orig. flow) / (_____ new density) = _____ new spacing
to

be used in all rooms of _____ hazard, group _____, with 6 or fewer heads.

Density conversion to lower hazard: (_____ SF orig. flow) / (_____ new density) = _____ new spacing
to

be used in all rooms of _____ hazard, group _____, with 6 or fewer heads.

All rooms are: _____ occupancy unless noted otherwise.

Ceiling height: _____ unless noted otherwise.

Laboratory class: _____ per NFPA 45

Hanger types - see detail # _____ Tie-in/armover information – see detail # _____

Tenant owner's current full address: _____

Building construction permit number: BLD / SFD _____

Sprinkler license: number _____ expiration date ____/____/____

Standpipe code (check one): ☐ Before 04/11/1995 (100' hose with 30' stream)
☐ After 04/11/1995 (150' hose) ☐ and sprinklered (200' hose)

Number of new fire hose valves provided: _____ (shall be 5' AFF and have reducers/caps/chains.)
Hydrotest pressure shall be _____ psi due to high gradient and pump churn.