



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. 9 heads or fewer being modified. The addition of sprinkler heads or branch lines is not permitted under a Walk-thru Permit.
3. Drawings must **to scale or dimensioned** and show enough of the surrounding area to allow the fire plans examiner and fire inspector to verify locations of sprinkler heads and pipe sizes.
4. **Number of copies of drawings:** minimum of two; maximum of six. ISD will retain one set.
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 involving any sprinkler additions or modifications.
2. **Number of copies of plans:** minimum of two; maximum of six. ISD will retain one set.
3. **Number of copies of calculations:** one set; each calculated area stapled individually. Computer printed pages should be separated prior to stapling. Provide a copy of the water flow test data as documented from WSSC or the City of Rockville.
4. **Catalog cuts are required** for backflow preventers, detector checks, meters, and special sprinklers. 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 or other phased retrofits:** a copy of the signed 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 that the most remote building (highest and most remote from water source) is calculated.
7. Drawings must be prints with no handwritten changes or corrections (after printing) and must be folded and stapled in sets.
8. For **continuations of large projects or for revisions**, indicate the previous reviewer's name and the permit number. If possible, include a copy of the original reviewed plans.
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. Project name and address (include all addresses if more than one building).
- 1.2. Project owner's name and address including zip code (tenant for tenant work; building owner for shell work).
- 1.3. Building Permit (BLD) number.
- 1.4. 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. Minimum scale for floor plans is 1/8" per foot. 1/4" per foot is preferred for residential areas.

2. Architectural

- 2.1. Indicate the overall use (Single Family, townhouse, tenant fitout, etc.)
- 2.2. All rooms and areas labeled with their use. Labeled 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 (when using room design method).
- 2.5. Indicate ceiling construction, height, and 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. Open grid ceilings may be used in ordinary hazard only when comprising not more than 25% of the project area.
- 2.9. For the purpose of determining hose reach, show parking space layout in garages with standpipe systems.
- 2.10. Show water curtains and 18" draft stops for floor openings.
- 2.11. 13D Systems -
 - 2.11.1. ceilings that are not smooth or level may require that more than 2 sprinklers be calculated.
 - 2.11.2. indicate lintel location and depth.

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 low/high gradient info.
- 3.4. Indicate sea level elevations for supply point and building.
- 3.5. If a sprinkler contractor installs underground pipe, then 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.
- 4.2. Washington Suburban Sanitary Commission (WSSC) -
 - 4.2.1. New tap - Obtain information from WSSC Hydraulic Information Sheet (HIS). **See general contractor, consulting engineer, or building owner.** 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 at their Systems Maintenance Division, 4501 Sweitzer Lane, Laurel, MD 20707. Phone (301) 206-7016 or FAX (301) 206-7005.
 - 4.2.2.2. Adjust for low gradient obtained from WSSC at the address above or phone the Water Resources Division at (301) 206-8807.
- 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. Pipe schedule systems (if applicable)
 - 4.4.1. Provide a graph of the water supply vs. system demand to verify compliance with **NFPA 13, table 2.2.1.1(a)**. Show end head pressure, elevation loss, and backflow preventor loss. Correct water supply to the base of riser.
- 4.5. Other supply sources & details (tanks, pumps, etc.)
 - 4.5.1. 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 (typical branch line sizes acceptable).
- 5.2. Center to center dimensions or cutting lengths of pipe, and distances of sprinklers to walls in all areas and rooms.
 - 5.2.1. Sloped ceilings: provide give 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. If a building is provided with multiple FDCs, they must all be interconnected.
- 5.10. Zoning -
 - 5.10.1. By floor when required by local amendment.

- 5.10.2. Coordinate with fire alarm & smoke control zones. Atriums will usually require independent zones.

6. Riser diagram

- 6.1. Indicate pipe sizes.
- 6.2. Provide make and model of alarm dry pipe or preaction valves.
- 6.3. Show FDC, backflow preventer, detector check, and/or meter if required.
- 6.4. Show air supervision for dry sprinkler systems or manual standpipe systems.

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 VA 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. If any special sprinklers are used (residential, quick response, extended coverage, etc.), submit catalog cut sheets.
- 8.3. Capacity, in US gallons, of each dry pipe system.
- 8.4. Indicate the pipe type. If the type varies, then indicate 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 pipe schedule systems, indicate the hazard classification.
 - 8.6.2. For calculated systems, indicate the hazard classification, density, design area, and hose allowance.
 - 8.6.3. For high piled or high rack storage systems, provide a design analysis referencing figures, curves, and area/density modifications.
- 8.7. Calculated systems. Provide the following notes for each design area:
 - 8.7.1. System demand note 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. Calculations required for NFPA 13D systems
 - 8.8.1. One sprinkler head flowing at required pressure.
 - 8.8.2. Two sprinkler heads flowing at required pressure.
 - 8.8.3. Three sprinkler heads flowing if required by listing.
 - 8.8.4. Submit as many calculations as necessary to prove all conditions.
- 8.9. For plastic pipe:
 - 8.9.1. Indicate hanger intervals per the manufacturer's requirements.
 - 8.9.2. Show a detail for the method of restraint at the sprinkler to counteract water force.

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. Hose valves shall be located at intermediate stair landings.
- 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 unless reachable by a **44" curbed walkway**.
- 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 the approval from ISD.

12. Tenant Plans

- 12.1. Indicate or indicate tenant location highlighted or otherwise clearly delineated.
- 12.2. Provide all notes requested, 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, unless the entire floor is recalculated.
- 12.4. Provide arm-over and tie-in details.
- 12.5. If standpipes are provided: show hose valves, doors, and verify compliance with 200 ft. reach rule. If unable to meet the reach requirements with valves in stairs or public corridors, place the valves as close to corridors as possible.
- 12.6. Show enough of the adjacent area(s) to permit verification of pipe sizing.

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

- 13.1. New speculative spaces should be designed for adequate system flexibility and in accordance with the requirements of the City of Rockville.

- 13.2. High piled or high rack designs: Hose valves and column sprinklers may be installed as needed for each tenant, however hose valve supply point must be shown in the shell calculations.
- 13.3. Tenant spacing and sizing changes/additions shall conform to shell calculations and shall be consistent on any given floor.
- 13.4. Change to a lesser hazard must use the same pipe sizing as shell calculations; spacing may be increased by density conversion. Example: Original head flow of 20.0 gpm for 100 SF spacing at ordinary hazard group 2 density of 0.20. The new spacing for light hazard will be $20.0 \text{ gpm} / 0.10 \text{ density} = 200 \text{ SF}$.
- 13.5. Change to a higher hazard must be recalculated except rooms with six or fewer sprinkler heads, which may use the same sizing with a decrease in spacing, by density conversion. Example: Original sprinkler head flow 16.8 gpm for 168 SF spacing at light hazard density of 0.10. The new spacing for small mechanical room (ordinary group 1) will be $16.8 \text{ gpm} / 0.15 \text{ density} = 112 \text{ SF}$.
- 13.6. 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.

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. **Ordinary Hazard Group 2:** Any general storage, supply, shipping, receiving, loading or other storage areas, regardless of room name, unless special usage and owner certification allow for Ordinary Hazard Group 1 per table for Miscellaneous Storage.
- 2.3. **Ordinary Hazard Group 1:** Multi-purpose rooms in schools and other assembly occupancies are considered OHG1. If there is no multi-purpose room in a school, the gym shall be designed as OHG1.
- 2.4. **Extra Hazard Group 2:** "Space-saver" or high-density filing systems that close against each other are classified as EHG2.
- 2.5. 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.
- 2.6. Sprinkler criteria in other NFPA standards, such as NFPA 30 (flammable liquids), NFPA 30B (aerosols) and NFPA 430 (oxidizers), must be taken into consideration.

3. Calculations

- 3.1. Provided in NFPA 13 format.
- 3.2. Include sprinkler K factor(s).
- 3.3. Provide hydraulic reference points.
- 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.