

Guidelines for Architects and Engineers
Fairfax County, BDCD

210000 FIRE SUPPRESSION

NOTE: Fire Suppression Division was formerly included in Division 15000 Mechanical Plumbing, Section D.

1. Sprinkler System shall be designed, installed, and tested in accordance with all applicable codes and reviewed and approved by local authorities having jurisdiction. Contractor is responsible for all shop drawing review fees and permit fees charged by the Fire Marshal's office.
2. Fire protection drawings and calculations shall be prepared by or under the direct supervision of an individual having a NICET Level III or IV certification in water based systems layout or a Professional Engineer that passed the NCEES Fire Protection Engineering exam.
3. Specifications shall include requirement for contractor to provide hydraulic calculations for all new sprinkler systems and any retrofit projects as a submittal. Hydraulic calculations shall be prepared using a commercially available computer model such as HASS or HydraCALC.
4. Hydraulic calculations shall be done using the area/density method as outlined in NFPA 13 over the hydraulically most remote 1,500 sq. ft. The quick response area reduction is not permitted unless otherwise approved by the County for a specific reason.
5. Hydraulic calculations shall utilize hydrant flow test data that is less than 1 year old.
6. De-rate the water supply to the low hydraulic gradient. Provide a minimum 5 psi safety factor on all hydraulically calculated systems.
7. Properly adjust the water flow test data to the building from the effective point of the flow test.
8. Sprinkler systems for shell spaces shall be designed at Ordinary Hazard Group 2 (0.20 gpm/ sq. ft. over the most remote 1,500 sq. ft). Hazard Group 2 was chosen for situation when type of occupancy is not known. If occupancy type can be identified, Hazard Group may be specified to match occupancy type. BDCD PM will request Using Agency to confirm in writing. Head spacing shall be limited to 100 sq. ft. 1" outlets with 1" x 1/2" reducers shall be used for each sprinkler head. Each branch line shall be sized to allow for an additional two sprinkler heads. The pipe shall be installed as high as possible to avoid the need for relocating the lines during the tenant fit-out.
9. Sprinkler piping is not to be routed over top of electrical panels or equipment, except as specifically permitted by NEC. Route sprinkler lines into electrical rooms above

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- the door. Provide an isolation valve on the lines that serve the main electrical and telecom rooms.
10. The inspectors test valve shall be located in a readily accessible location. This is essential to minimize the impact to the user agencies during the cyclic testing. Provisions for discharging the water during the cyclic system test shall be made by piping the drain to the exterior of the building. The use of buckets for cyclic testing is not acceptable.
 11. Sprinkler devices, valves, etc., shall be permanently tagged noting the device and its purpose. Valves or devices that are located above accessible ceilings shall be marked at the ceiling level indicating a device or valve above.
 12. The use of McDonnell & Miller flow switches for the sprinkler system is unacceptable. These are not rated for use with fire alarm systems.
 13. Do not specify any currently or previously recalled sprinkler heads for use on any Fairfax County project without prior, written approval from the Fairfax County Fire Marshall.
 14. Specifications shall require contractor to provide appropriate quantities of spare sprinkler heads and spare sprinkler head wrenches (for each type installed) as required by code.
 15. All sprinkler piping shall be Schedule 40. Schedule 10 is not acceptable as it tends to fail after a few years with pinhole leaks.
 16. All riser fittings and inspectors test line shall be brass ball valves.
 17. All 2" main drain lines shall be piped to the exterior of the building. This is necessary to facilitate the annual testing and maintenance of the lines. The floor drains will not handle the rate of flow required for the Fire Marshall's annual test and recertification.
 18. All miscellaneous drain piping shall be internally and externally galvanized.
 19. Coordinate the type and location of the fire department connection with the Fire Marshal.
 20. Standpipe and hose valve locations shall be located as necessary to support the required 130' maximum hose and stream reach pursuant to the requirements of the VCC section 905.3. Distance shall be determined as path of access and not necessarily a straight line between points.

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21. Recessed sprinkler heads shall be fully recessed. A maximum +/- 1/4" tolerance shall be permitted in a visual area.
22. Changes in direction shall be done with fittings.
23. Do not use tees and plugs as a substitute for elbows.
24. Pipe size transitions shall be made with reducing fittings. Bushings are not permitted.
25. Do not use extended coverage sprinkler heads in Mechanical Rooms or other potentially obstructed locations.
26. Dry sprinkler valves shall be installed so that a proper test, reset, and maintenance can be performed from one location. Pressure gauges, drains and valves shall be installed as required to accomplish this. Line shall be installed with sufficient slope and no pockets to allow line to be completely drained. This shall be indicated on the drawings. A/E shall confirm as part of walk thru.
27. Use of dry sprinkler systems is discouraged and should only be used where required by code or operational requirements due to high maintenance and expensive repairs. Use is subject to FMD review and approval. If used:
 - a. Specify self-restorable valves to be reset by County's FMD staff.
 - b. Specify oil-less type air compressor.
 - c. Avoid using in unconditioned, hard to access areas, but if absolutely necessary, provide heat trace tape on sprinkler piping.
 - d. All dry sprinkler piping and fittings shall be galvanized.
28. Where there are exterior Drum Drips that are exposed to extreme temperatures, they shall be enclosed in an insulated Heat Box to prevent freezing and/or bursting of pipes. Heat tape of any type shall not be permitted. Provided Heat Box shall be red in color, feature secure locking, resistant to corrosion and provide required signage adhering to NFPA guidelines. Heat boxes shall communicate with a remote panel or Fire Alarm system to identify malfunction.
29. Seismic bracing shall be provided in accordance with the VUSBC and NFPA 13.
30. Provide seismic separation assemblies at all building expansion joints.
31. Provide a full-size set of as-built drawings, half size set of as-built drawings, and a flash drive that contains PDFs of all as-built drawings and hydraulic calculations in a locked document box adjacent to the sprinkler backflow preventer or alarm valve.
32. Assure location of key box as required by the Fire Marshall for the Fire and Rescue Department key access to building is located on floor plans. The contractor shall coordinate with Fire Marshall's office on exact location and provide and install all required key boxes.
33. Ceiling grid shall not be cut/notched to accommodate sprinkler pipe, valves or heads.

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34. Dry Sprinkler valves to be TYCO or Viking.