THE UNIVERSITY OF TEXAS AT DALLAS

Fire & Life Safety

Automatic Fire Sprinkler Systems

These guidelines are to be followed when an automatic fire sprinkler system is installed on a property owned and/or operated by UTD. This document shall assist in the preparation of design documents for review and permit. These guidelines are not to be interpreted as containing all data required for proper design, installation, or approval.

PERFORMANCE AND INSTALLATION REQUIREMENTS

- A full plan review of the entire system will be done to determine the proper design, coverage, and code/ standard compliance. When the sprinkler work includes less than 13 heads, a scope of work letter, signed by the company's RME-G, could be all that is required after review. As-built drawings may be requested.
- 2. Unless specifically allowed by the 2021 International Fire Code or the 2021 International Building Code, residential sprinkler systems installed in accordance with NFPA 13R shall not be recognized for the purposes of exceptions or reductions, commonly referred to as "trade-offs", permitted by other requirements of this code. When an exception is taken for the use of a sprinkler system under Chapter 5 of the 2021 IBC to increase the building size, only an NFPA 13 sprinkler system shall be permitted.
- 3. Residential sprinkler systems installed in accordance with NFPA 13R, shall include sprinkler protection throughout the attic, patios, balconies and breezeways.
- 4. An automatic sprinkler system shall be installed throughout new buildings, fire areas, and structures described in Sec. 903.2 of the International Fire Code (IFC). Separated fire areas, buildings and attached buildings must be separated by a UL listed two-hour fire rated wall, without openings, and must be supplied with separate utility connections to eliminate a requirement of automatic sprinkler system.
 - a. Exceptions: Automatic fire sprinklers are not required in the following open structures: Pavilions, open gazebos, detached canopies or open parking garages as defined by the Building Code. Except for parking garages, open structures shall have a minimum of seventy (70) percent clear opening on all sides. Parking garages shall be considered open structures when they meet the criteria for open parking garages as defined by the Building Code.
- 5. An automatic sprinkler system shall be installed in all new residential buildings classified by the International Building Code (IBC) as Group R-1, R-2 or R-4.
- 6. All sprinkler piping (other than underground fire line and 13R installations) shall be Schedule 40 pipe.
- 7. An automatic sprinkler system shall be installed throughout any existing non-residential building when any addition creates a space totaling twelve thousand (12,000) square feet or more.
- 8. An automatic sprinkler system shall be installed throughout any existing non-residential building when the combining of one (1) or more lease spaces results in a lease space totaling twelve thousand (12,000) square feet or more.
- 9. An automatic sprinkler system shall be installed in basements of new buildings exceeding 2,500 square feet.
- 10. An automatic sprinkler system shall be installed throughout all buildings containing a Group S-1 self-service storage facility. A screen shall be installed of not less than one (1) inch or greater than six (6) inches in size. The screen and its supports shall be installed such that all elements are at least eighteen (18) inches below any sprinkler heads to restrict storage above that level.
- 11. When determining the requirement for sprinkler protection, the total area under any roof overhangs, canopies, projections, or other permanent vertical structures, beyond that of the building footprint, is include the total area determination.

- 12. Any new building exceeding 2,500 sq. ft. that has an inside clear height in excess of 12 feet, making it possible to be used for storage in excess of 12 feet, shall be considered to be high-piled storage and shall comply with the provisions of NFPA 1 13.3.2.27.1. When a specific product cannot be identified, a fire protection system shall be installed for Class IV commodities, to the maximum pile height.
- 13. All Group R occupancies shall be provided with sprinkler protection on balconies, regardless of construction, with the exception of R-3 detached single family homes.
- 14. Automatic sprinkler systems shall be designed with a minimum 10 PSI safety factor. 10% will be acceptable with proof of adequate pressure.
- 15. Automatic Sprinkler System Room Access. Sprinkler system risers providing protection for buildings with multiple tenant spaces must be located in a ground floor room directly accessible from the exterior. The door must be labeled as the riser room. Buildings with single tenants may access the riser location from the interior of the building if wall-post sprinkler valves are installed.
- 16. Riser Room Size. All fire sprinkler riser rooms shall be a minimum of 36 sq. ft., with no dimension less than 6 ft., and shall be large enough to accommodate maintenance and testing actives.
- 17. Sprinkler systems for all strip retail centers, multiple tenant buildings, speculative warehouses, or any other multiple tenant building, regardless of ceiling height, shall be designed to provide a minimum of Ordinary Hazard Group 2.
- 18. All valves controlling the water supply for automatic sprinkler systems and water-flow switches on all sprinkler systems and standpipe systems, with the exception of fire department hose connections, shall be electronically supervised.
- 19. Approved, supervised, indicating control valves shall be provided at the point of connection to the riser on each floor in all high-rise buildings and all buildings more than one (1) story in height.
- 20. The FDC must be located along the side of the building adjacent to the fire lane, unless otherwise approved by the Fire & Life Safety Department.
- 21. The FDC shall be clear and unobstructed with a minimum of a 5 ft. clearance around the FDC, no higher than 48 in. above grade, and a clear path.
- 22. FDC must be within 130ft of hydrant, with minimum distance of 35ft.
- 23. FDC shall be 5" Storz connection with locking Knox cap keyed to Richardson Fire Department.
- 24. Inspector test connections, drains, and ball-drips shall be piped directly to the exterior.
- 25. Riser rooms shall be permanently heated, and such heating appliances shall be hard-wired to the building electrical distribution system. Heating devices shall not be provided with an on/off switch.
- 26. At least one inspection test valve (ITV) shall be located at the remote system area for each system. It is allowed to install the ITV at the riser assembly; however, the remote location is preferable. A top level ITV may also be double used for air venting.
- 27. Dry-system air compressors shall be hard wired.
- 28. Pre-action system solenoids shall be wired for alarm activation upon AC current loss.

ALARMS FOR FIRE SPRINKLER

1. Approved audible devices shall be connected to every automatic sprinkler system. Such sprinkler water flow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Alarm devices shall be provided on the exterior of the building, in an approved location. When water flow supervision is provided, alarm devices shall be located within the interior of the building and for all provided spaces in order to provide an internal evacuation signal throughout the building. Group R-1, R-2 and condominiums shall be provided with an alarm signal device in each unit to provide an internal evacuation signal. Where a fire alarm system is installed, activation of the automatic sprinkler system shall activate the building fire alarm system.

STANDPIPE SYSTEMS

- 1. Standpipe systems shall be installed in accordance with this section and 2019 NFPA 14.
- 2. Class I standpipes shall be required on all occupancies in which the distance from accessible points for the Fire Department ingress to any point in the structure exceeds two hundred fifty feet (250') along the route that a fire hose laid as measured from the fire lane. When required by this Code, standpipe connections shall be placed adjacent to all required exits to the structure and at two hundred (200') intervals along major corridors thereafter.
- 3. A fire pump shall be installed to provide for the necessary standpipe water supply, or as required by the Fire Code or Fire Marshal.
- 4. In addition to the required standpipe calculation, and additional FDC calculation shall be provide to indicate the standpipes can be fed solely by the FDC. An inlet flow and pressure of 1500 GPM and 150 PSI shall be used.
- 5. Hose valves shall have a 2 ½-inch outlet with locking Knox cap.
- 6. A full flow test will be required for all standpipe system at the approved designed flow and pressure in order to verify the hydraulic calculations.
- 7. In buildings exceeding 10,000 square feet in area per story and where any portion of the building's interior area is more than 200 feet of travel, vertically and horizontally, from the nearest point of fire department vehicle access, Class 1 automatic wet or manual standpipes shall be provided. For the purpose of this provision, fire areas shall not define separate buildings.
 - a Exceptions:
 - i Automatic dry, semi-automatic dry, and manual dry standpipes are allowed as provided in NFPA 14 where approved by the AHJ.
 - ii R-2 occupances four stories or less in height having no interior corridors.

BACKFLOW PREVENTION DEVICES

- 1. All fire sprinkler systems are required to be provided with an approved method of backflow prevention.
- 2. Vault mounted backflow prevention is allowed, however backflow prevention on the riser is preferred.
- 3. A reduced pressure zone (RPZ) backflow prevention device is required on antifreeze systems.
- 4. Assemblies shall be listed for fire protection use and installed in the correct orientation.
- 5. Assemblies must be capable of being electronically or mechanically monitored.
- 6. Assemblies must be provided with a *metered* bypass.
- 7. In accordance with 2019 NFPA 13 (Sec. 8.6.3.2.1), a method to perform a forward flow test at the system demand shall be provided downstream of the backflow prevention assembly.

EQUIPMENT IDENTIFICATION & ACCESS

1. All fire protection equipment shall be identified in an approved manor as outlined in the International Fire Code (IFC).

- 1. Modifications affecting more than 20 sprinklers will require testing. (20 or fewer sprinklers shall not require testing in excess of system working pressure)
- Portions of the system normally subjective to system working pressures in excessive of 150psi shall be tested as described in 2019 NFPA 13 28.2.1.3 at pressure 50 psi over the system working pressure. (2019 NFPA 13, 28.2.1.1)
- All piping and attached accessories subjected to system working pressure shall be hydrostatically tested at 200 psi and shall maintain that pressure without loss for 2 hours. (2019 NFPA 13, 28.2.1.1)
- 4. Test pressure read from gauge located at the low elevation point of the system or portion being tested (2019 NFPA 13, 28.2.1.5)
- 5. NFPA 13 "Contractors Material and Test Certificate for Aboveground Piping" form filled out, required for final approval. (2019 NFPA 13, 28.1)

PLANS SUBMITTAL REQUIREMENTS

- 1. Provide a written description of the work to be performed.
- 2. Licensing information.
 - a. Provide a copy of your State of Texas State Fire Marshal's Office license
- 3. Plans shall be clear and legible and all sheets shall be in a common and appropriate scale.
- 4. An Original (Wet) RME signature and stamp, as required by TIC Chapter 6003, Sec. 34.717, is required on all plan drawings and calculations.
- 5. Provide full set of hydraulic calculations.
 - a. Description of the design area
 - b. Design density of each design area
 - c. Provide graphic representation of the water flow analysis
 - d. Provide the water supply test information
- 6. Manufacturer documentation for all parts and materials used in the project.
 - a. Specific materials in the specification booklet are to be identified by an arrow or highlighter
- 7. Two (2) sets of plans shall be submitted. Plans shall contain sufficient detail to enable the plan reviewer to accomplish a complete review. The following information shall be provided on the plans;
 - a. Scope of Work
 - b. Name and address of job site
 - c. Occupancy classification
 - d. Hydraulic calculations for each design area
 - e. Title Block
 - f. Equipment List
 - g. North arrow & scale
 - h. Site plan to include the all fire hydrants, fire lanes, fire department connections and the fire service lead-in
 i. Floor plan
 - j. A complete full-height cross section of the building
 - k. Square footage & dimensions
 - I. Intended use of each room & location of doors
 - m. All pipe sizes & sprinkler locations
 - n. Sprinkler head coverage area
 - o. Sprinkler riser diagram
 - p. Inspectors test connection detail
 - q. Hanger details
 - r. Remote FDC details
 - s. Auxiliary drain details

- t. Clearly indicate each remote area
- u. Size and location of standpipe hose stations, if applicable
- The title block shall contain the following;
 - a. Location of the installation
 - b. Name and complete address of the business
 - c. Name and complete address of the installing company
 - d. Licensing information
 - e. "Wet" signature of RME
 - f. Date issued and any revisions
 - g. Drawn by

8.

- h. Authority Having Jurisdiction
- 9. A legend shall be provided to include;
 - a. Total number and type of all heads shown on plans
 - b. Symbol, device description, manufacturer, model number, and quantity of each
- 10. Drawings shall be generated by the installing company specific to the installation. Drawings shall show plan view and other pertinent information.
- 11. Drawings shall be submitted for review and approval, PRIOR to installation.

Installation of an automatic sprinkler system shall not be performed until plans have been reviewed and returned to the contractor with comments. Any work performed prior to the issuance of this permit may result in reporting to the licensing division of the Texas State Fire Marshal's Office.

GENERAL SUBMITTAL REQUIREMENTS

- 1. Plans approved by the Fire & Life Safety Department give authorization for installation. Final approvals are subject to field verification. Any approval does not release the contractor or property owner from the responsibility of full compliance with all applicable codes and ordinances.
- 2. All installations shall comply with the approved plans. Any deviation from the approved plans requires a resubmittal to the Fire & Life Safety Department.

TESTING REQUIREMENTS

- 1. Testing for automatic fire sprinkler system installations and/or renovations shall be completed in the presence of an inspector from the Fire & Life Safety Department.
- 2. Underground visual inspection will be required for all underground piping.
- 3. Hydrostatic testing will be performed for underground piping at 200 psi. Flushing of the underground pipe will be performed upon completion of the hydrostatic testing. Flush shall be performed via a device of no less than two inches smaller than the diameter of the underground line. An RME-U or RME-G shall be present for this testing.
- 4. Above ground hydrostatic testing shall be performed on all installations and renovations. As previously mentioned, installations/renovations of less than 20 heads may be tested at working pressure. Installations/renovations of more than 20 heads shall be tested at 200 psi. An RME-I or RME-G shall be present for this testing.
- 5. Final acceptance testing shall be performed on all installations/renovations. Testing shall include tamper switch monitoring, PIV, and water flow monitoring. For installations/renovations of less than 20 heads, an RME-I may perform the final acceptance testing. For installations/renovations of more than 20 heads, an RME-G shall perform the final acceptance testing. Tags will be hung on the system after testing is completed. Materials Test Certificate paperwork shall be completed by the RME and submitted to the inspector.