

FIRE PROTECTION SYSTEMS

Compliance: The design, installation, and placement of all fire protection systems shall be in complete compliance with the applicable edition *National Fire Codes, NFPA Standards #13 and 14* and other applicable codes therein. These *Codes* are to be viewed as providing minimal requirements for fire protection. Where the requirements of these *Standards* exceed the minimum requirements for compliance referenced above, they shall be complied with.

Sprinkler System Requirements: Automatic fire suppression systems shall be installed through all new buildings and all buildings that are completely renovated. Partial systems that are installed with areas of major renovation must be designed in accordance with NFPA 13 so as to ensure adequate water supply, system performance, fire alarm system interface, system supervision, and the potential to be expanded should future projects be undertaken at the subject site. For the purpose of this section, "completely renovated" shall be defined as renovation projects in which 75% of the gross floor area of the building is affected by the scope of the project. When there are multiple, phased renovation projects planned to occur in a building, the total affected floor area shall be considered the sum of all such project areas.

Design Water Pressure: All fire protection systems shall be sized using water supply tests. A flow test is considered to be valid if it was performed not more than five years prior to construction and there were no major modifications made to the surrounding distribution system since the last valid test.

Modifications/Additions: Any modifications or additions to an existing automatic fire suppression system shall require the entire system to be hydraulically calculated.

Wet vs. Dry Pipe Systems: Wet pipe systems are to be used exclusively with one allowable exception: in areas where freezing may occur. Dry pipe systems are allowed in these areas only. If, due to building remodeling, an area served by a dry pipe system is no longer exposed to freezing temperatures, the fire protection system

serving this area shall be converted to a wet pipe system.

Other Systems: Other more specialized types of sprinkler systems such as preaction, combined dry pipe / preaction, and antifreeze systems shall not be installed without special approval (i.e. without an approved request for variance). The use of a pre-activation system in computer rooms will not require a variance. Fire suppression systems shall not contain ozone-damaging substances such as Halon. Refer to the *LEED Reference Guide* for qualifying alternatives.

Electrical Load Centers and Distribution Centers: In lieu of a sprinkler system, these electrical equipment rooms shall be housed in a 2-hour fire-rated enclosure including protection for penetrations. This enclosure shall be dedicated to electrical equipment only and use only dry-type electrical equipment.

Water Service: Each building shall be provided with a combined domestic/ fire protection water service. The domestic and fire protection lines are separated inside the building.

Fire Department Connection: A freestanding fire department connection (FDC) shall be connected to the automatic fire suppression system within each building. The FDC shall be located as far from the building and as near to a hydrant as practical, permitting ready access by a fire truck. Its location shall be subject to approval by F&S. The ball drip valve associated with the FDC shall be located in the basement of the building or within a shallow sump depressed within the lowest floor of the building such that the line outside of the building remains completely free of water. A wall mounted FDC is permitted when the building does not have a basement.

Double Check: Each fire protection water service fed from a University water main shall incorporate a double check valve assembly at the building service entrance.

Fire Pumps with Associated Jockey Pumps, Ancillary Equipment, Electrical Service, and Controls. Their installation

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shall be required for new construction only when the utility water pressure cannot meet NFPA flow and pressure requirements at the hydraulically most remote area with no additional hydraulic safety factors applied. When required, their design shall comply with *National Fire Code NFPA #20* and other applicable *NFPA Fire Codes*. They shall be base-mounted, horizontal, centrifugal type pumps. A bypass line shall be provided in the event the fire pump fails.

Flow Switches: Flow switches shall be installed as required by code and shall interface directly with the building fire alarm system. Each flow switch shall include an adjustable time delay feature. Electronic bells are generally not needed.

Sprinkler Zones: Each zone of an automatic fire suppression system shall not cover more than one floor of a building.

Inspector's Test Connections: Each zone of each sprinkler system shall incorporate an inspector's test connection (ITC). If the sprinkler system is a wet type system, the ITC shall be located at the riser. Each ITC shall discharge outdoors or into an open-site drain located in a mechanical equipment room. Any drain that is used for this purpose shall be capable of accepting the full flow of water under system pressure without creating water damage to the surroundings. In order to facilitate routine inspection, ITC's shall not require the use of ladders or temporary hoses.

System Main Drain: A main drain for the fire protection system shall be provided. The drain must be arranged such that no water remains in the line following a main drain test. The main drain test is done under utility water pressure. Therefore, this line must discharge outdoors or into an 8" hub drain.

Standpipe Systems: In those cases where a standpipe system is required, a combined sprinkler/standpipe system shall be installed rather than require a separate fire sprinkler standpipe. Hose cabinets and hoses shall not be installed with these systems. Combination Extinguisher & Fire Department Valve Cabinets shall be installed. The recessed or semi-recessed

cabinets shall be installed at each mid-landing of each floor.

Special Systems: The design and installation of special fire suppression systems such as inert gas and chemical systems are to be closely coordinated with, and are subject to approval by, F&S.

Fire Extinguishers: Fire extinguishers and recessed or semi-recessed cabinets shall be provided in all buildings in accordance with NFPA 10, Standard for Portable Fire Extinguishers, and the Campus Fire Extinguisher Program coordinated by F&S covering the inventory, inspection and testing of extinguishers.

At least one (1) 10 lb. ABC dry chemical fire extinguisher shall be provided for every 3,000 GSF in a Low Hazard Occupancy facility, every 1,500 GSF in a Moderate Hazard Occupancy and every 1,000 GSF in a High Hazard Occupancy facility. The travel distance to the extinguisher shall not exceed 75 feet.

Except in special cases, the number and location of the extinguishers shall be based upon Class A Fires.

In laboratories or areas containing Class B Hazards, a 10 lb. ABC dry chemical fire extinguisher with a UL rating of 4A-80B:C shall be provided such that the travel distance shall not exceed 50 feet.

In situations where additional extinguishers are required based upon special hazards or conditions, Clean Agent extinguishers (i.e., Halotron, CleanGuard), CO₂ extinguishers, Class K and Class D extinguishers shall be installed.

It is in the environmental interest of the University of Illinois that a suitable substitution fire extinguisher, such as Halotron or CleanGuard, be used to protect "sensitive areas" that were formally protected by Halon. Extinguishers shall not contain ozone-damaging substances. See *Section 10 44 00 - Fire Extinguisher Cabinets and Accessories* for detailed requirements for fire extinguishers and cabinets.