



Sprinkler System – Obstructions and Impediments

Sprinkler systems deliver cooling water to a fire and pre-wet the surrounding materials to limit fire spread. A sprinkler system accomplishes this by delivering a specific pattern and flow of water (density) to the surface of a fire. When an object prevents the discharge pattern from fully developing or reduces the sprinkler density, and allowing a fire to grow, the sprinkler head is considered to be obstructed. Other actions, called impediments, can hamper sprinkler head effectiveness. This handout provides an overview of sprinkler system obstructions and impediments. Specific systems may have additional concerns that should also be evaluated.

Obstructions

Changes in a building's storage arrangements or in the location of structural supports, pipes, ducts, or other fixtures should be closely examined to prevent creating an obstruction to the sprinkler system. When an obstruction, such as a light fixture, is placed in the discharge pattern, the system's effectiveness will be diminished.

NFPA 13, Standard for the Installation of Sprinkler Systems, published by the National Fire Protection Association (NFPA), provides clearance requirements for sprinkler heads based on the specific type of sprinkler head used and the nature of the obstruction. Chapter 8.5.5 of NFPA 13 provides general guidelines for obstruction prevention, including:

- Do not locate large obstructions [over 4-ft (1.2-m) wide], such as ducts, open-grate floors, and conveyors, under a sprinkler head. Sprinkler heads should be located under such obstructions to ensure adequate sprinkler discharge coverage.
- Do not install cable trays, heating ducts, or other large obstructions closer than three times its width to a sprinkler head. For example, if a duct is 2-ft (0.6-m) wide, then it should be 6 ft (1.8 m) from the sprinkler head.

Storage Clearances

The demand for increased space for the storage of products, supplies, etc. often results in materials being located too close to a sprinkler head, blocking the sprinkler discharge. Subsection 8.5.6 of NFPA 13 provides general clearance requirements for storage; these include maintaining at least:

- 18 in (457 mm) between the top of storage and a sprinkler head. This distance may be reduced when large-scale fire tests for the particular hazard have shown the reduced distance to be effective.
- 36 in (914 mm) between the top of storage and special application sprinklers.
- 36 in (914 mm) between the top of rubber tire storage and a sprinkler head deflector.

Impediments

A number of common impediments to sprinkler head discharge that do not fall into the category of "obstructions," but which can hamper sprinkler head effectiveness, include:

- Painting sprinkler heads will cause the sprinkler head to react slowly, or not at all, during a fire.
- Hanging decorations, banners, plants, or any other materials from sprinkler heads, can disrupt the discharge pattern.
- Replacing sprinkler heads with another type, or with one of a different temperature rating, can cause either a delay or a premature activation of the system.
- Sprinklers protecting spray areas may be covered with cellophane bags having a thickness of 0.003 in (0.076 mm) or less or thin paper bags shall be used, to protect them from overspray.



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