



Coffee Break Training - Fire Protection Series

Automatic Sprinklers: Sprinklers Beneath Ducts and Other Obstructions

No. FP-2013-10 March 5, 2013

Learning Objective: The student shall be able to describe sprinkler installation requirements beneath ducts and other obstructions.

Control mode sprinklers are intended to prevent fire spread by cooling the atmosphere and wetting combustible materials so they do not ignite. (See Coffee Break Training FP-2007-4.)

While sprinklers generally are installed at or near the ceiling, there are conditions, called “obstructions,” that may prevent discharged water from reaching the intended target. In National Fire Protection Association 13 (NFPA), *Standard for the Installation of Sprinkler Systems*, obstructions are defined two ways:

- Continuous Obstruction.** An obstruction located at or below the level of sprinkler deflectors that affects the discharge pattern of two or more adjacent sprinklers.
- Noncontinuous Obstruction.** An obstruction at or below the level of the sprinkler deflector that affects the discharge pattern of a single sprinkler.

When continuous or noncontinuous obstructions interrupt the water discharge in a horizontal plane more than 18 inches (457 mm) below the sprinkler deflector, additional steps must be taken to provide adequate sprinkler coverage. NFPA 13 requires sprinklers to be installed under fixed obstructions more than 4 feet (1.2 m) wide. In the illustration, the combined width of the perpendicular ducts exceeds 4 feet (1.2 m), so the fire protection contractor has installed a sprinkler beneath them.

NFPA 13 requires that open grate flooring more than 4 feet (1.2 m) in width have sprinkler protection below the grating. Sprinklers are not required under obstructions that are not fixed in place, such as conference tables.

When determining the water demand for sprinklers in the hydraulic remote area, generally all sprinklers in the area are included in the calculations. However, when spray or control mode special application sprinklers are installed within a space, a special exception applies when sprinklers are located above and below obstructions such as wide ducts or tables. In that specific example, sprinklers under the obstruction are not required to be included in the hydraulic calculation of the ceiling sprinklers. Furthermore, where the piping to sprinklers under obstructions follows the same sizing pattern as the branch lines, no additional hydraulic calculations are required for sprinklers under obstructions.

For additional information, refer to NFPA 13.



The cumulative width of these air handling ducts exceeds 4 feet (1.2 m), so the fire protection contractor has installed a sprinkler beneath them.



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