



Automatic Sprinklers: Sprinkler Alignment and Obstructions

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Learning Objective: The student shall be able to identify the requirements for upright sprinkler orientation.

Today's illustration provides a wealth of lessons to be learned about sprinkler inspections.

While the most obvious problem appears to be the wood framing that has been notched around the sprinkler, there are other issues as well:

1. During its original installation, this standard sprinkler upright (SSU) should have been installed with its arms (the white portion of the frame) parallel to the sprinkler pipe. Upright sprinkler frames should line up with sprinkler pipe to minimize the influence of water "shadowing" when the sprinkler opens.
2. Modern sprinklers are designed so that about 95 percent of their discharge will be directed to the floor while the remaining 5 percent is discharged toward the ceiling. The horizontal framing above the deflector obstructs upward spray.
3. The vertical wood framing to the right of the sprinkler also creates a continuous obstruction that interferes with sprinkler discharge. NFPA 13, *Standard for the Installation of Sprinkler Systems*, requires that this sprinkler be located away from the obstruction at least three times its greatest dimension. In this case, assuming the nominal width of the vertical member is 3- 1/2-inches (90 mm), the sprinkler should be located at least 10- 1/2-inches (270 mm) from it.
4. While it is impossible from the picture to determine the distance between the sprinkler deflector and ceiling, the inspector should verify the spacing is within the requirements for obstructed construction.
5. It's also impossible from the picture to know the ambient temperature of the space where the sprinkler is installed, but NFPA 13 requires ordinary temperature rating sprinklers (135 to 175 °F) (57 to 80 °C) be installed throughout an occupancy unless there are special temperature or performance considerations.
6. The framer drove two nails through the vertical framing to hold the horizontal members. While not necessarily a violation of any installation standards, at least one appears to have come dangerously close to hitting the fusible link-and-lever assembly which may weaken it.



This upright sprinkler should be oriented with its arms parallel to the sprinkler pipe. Photo courtesy of Byron Blake.

For additional information, refer to NFPA 13.

