NFPA 13: Obstructions
Presented by James Golinveaux

To receive credit for this seminar, you must:
1) Sign in on Sign-In sheet,
2) Attend seminar in its entirety, and
3) Submit a completed evaluation form.

Paper-Lite
In an effort to be environmentally responsible and to increase the quality and timeliness of training resources, AFSA is reducing the amount of paper used at our conventions.
The handout file for this seminar can be downloaded at:
www.firesprinkler.org/convention

DISCLAIMER
This seminar and its content is not a formal interpretation issued pursuant to NFPA regulations. Any opinion expressed is the personal opinion of the author and presenter and does not necessarily present the official position of the NFPA and its Technical Committees.
Instructor
- James Golinveaux
- Sr. Fellow – Tyco Fire Protection Products
- James.Golinveaux@tycofp.com
- Cell 1(401) 225-8828

ESFR Obstruction Demonstration

ESFR Obstructed Test
Obstruction Avoidance

- Minimize the impact of obstructions on sprinkler suppression.
- Prevent uncontrolled fires from overwhelming the fire sprinkler system.
- Prevent excessive numbers of sprinklers opening during a fire.
- Stop obstructions from hiding our good looking sprinklers!

Obstruction Avoidance

- Obstructions to Sprinkler Discharge Pattern Development.
  - Continuous or noncontinuous obstructions less than or equal to 18 in. (457 mm) below the sprinkler deflector that prevent the pattern from fully developing.
- Obstructions that Prevent Sprinkler Discharge from Reaching Hazard.
  - Continuous or noncontinuous obstructions that interrupt the water discharge in a horizontal plane more than 18 in. (457 mm) below the sprinkler deflector in a manner to limit the distribution from reaching the protected hazard.
- Clearance

Standard Spray Sprinklers

- Figure A.8.5.5.1
- Obstructions to Sprinkler Discharge Pattern Development for Standard Upright or Pendent Spray Sprinklers
- Pg. 293
- NFPA 13, 2013 Ed.
Standard Spray Sprinklers

8.6.5.1 Performance Objective.

8.6.5.1.1 Sprinklers shall be located so as to minimize obstructions to discharge as defined in 8.6.5.2 and 8.6.5.3, or additional sprinklers shall be provided to ensure adequate coverage of the hazard.

8.6.5.1.2* Sprinklers shall be arranged to comply with one of the following arrangements:

1. Subsection 8.5.5.2, Table 8.6.5.1.2, and Figure 8.6.5.1.2(a) shall be followed.
2. Sprinklers shall be permitted to be spaced on opposite sides of obstructions not exceeding 4 ft (1.2 m) in width, provided the distance from the centerline of the obstruction to the sprinklers does not exceed one-half the allowable distance permitted between sprinklers.
3. Obstructions located against the wall and that are not over 30 in. (762 mm) in width shall be permitted to be protected in accordance with Figure 8.6.5.1.2(b).
4. Obstructions located against the wall and that are not over 24 in. (610 mm) in width shall be permitted to be protected in accordance with Figure 8.6.5.1.2(c). The maximum distance between the sprinkler and the wall shall be measured from the sprinkler to the wall behind the obstruction and not to the face of the obstruction.

Table 8.6.5.1.2

Positioning of Sprinklers to Avoid Obstructions to Discharge (Standard Spray Upright/Standard Spray Pendent (SSU/SSP))

Table 8.6.5.1.2

Positioning of Sprinkler to Avoid Obstruction to Discharge (SSU/SSP)

Figure 8.6.5.1.2(a)

Figure 8.6.5.1.2(a)

Page 57

Page 57

NFPA 13, 2013 Ed.

NFPA 13, 2013 Ed.
Figure 8.6.5.1.2(b)
Obstruction Against Wall (SSU/SSP)
Pg. 58
NFPA 13, 2013 Ed.

Figure 8.6.5.1.2(c)
Obstruction Against Walls (SSU/SSP)
Pg. 58
NFPA 13, 2013 Ed.
8.6.5.2 Obstructions to Sprinkler Discharge Pattern Development.

8.6.5.2.1.3 Minimum Distance from Obstructions.
(A) Unless the requirements of 8.6.5.2.1.4 through 8.6.5.2.1.9 are met, sprinklers shall be positioned away from obstructions a minimum distance of three times the maximum dimension of the obstruction (e.g., structural members, pipe, columns, and fixtures).
(B) The maximum clear distance required shall be 24 in. (609 mm) in accordance with Figure 8.6.5.2.1.3(B).

8.6.5.2.1.4 For light and ordinary hazard occupancies, structural members only shall be considered when applying the requirements of 8.6.5.2.1.3.

---

Standard Spray Sprinklers

- Figure 8.6.5.2.1.3(B)
- Minimum Distance from Obstruction (SSU/SSP)
- Pg. 59
- NFPA 13, 2013 Ed.

---

8.6.5.2.1.5 Sprinklers shall be permitted to be spaced on opposite sides of the obstruction where the distance from the centerline of the obstruction to the sprinklers does not exceed one-half the allowable distance between sprinklers.

8.6.5.2.1.6 Sprinklers shall be permitted to be located one half the distance between the obstructions where the obstruction consists of open trusses 20 in. (51 cm) or greater apart (24 in. [61 cm] on center), provided that all truss members are not greater than 4 in. (102 mm) (nominal) in width.
8.6.5.2.1.7 Sprinklers shall be permitted to be installed on the centerline of a truss or bar joist or directly above a beam, provided that the truss chord or beam dimension is not more than 8 in. (203 mm) and the sprinkler deflector is located at least 6 in. (152 mm) above the structural member and where the sprinkler is positioned at a distance three times greater than the maximum dimension of the web members away from the web members.

8.6.5.2.1.8 The requirements of 8.6.5.2.1.3 shall not apply to sprinkler system piping less than 3 in. (80 mm) in diameter.

8.6.5.2.1.9 The requirements of 8.6.5.2.1.3 shall not apply to sprinklers positioned with respect to obstructions in accordance with 8.6.5.1.2.

8.6.5.2.1.10* Sprinklers shall be permitted to be placed without regard to the blades of ceiling fans less than 60 in. (1.5 m) in diameter, provided the plan view of the fan is at least 50 percent open.

8.6.5.2.2 Suspended or Floor-Mounted Vertical Obstructions. The distance from sprinklers to privacy curtains, freestanding partitions, room dividers, and similar obstructions in light hazard occupancies shall be in accordance with Table 8.6.5.2.2 and Figure 8.6.5.2.2.

8.6.5.2.2.1* In light hazard occupancies, privacy curtains, as shown in Figure 8.6.5.2.2, shall not be considered obstructions where all of the following are met:
(1) The curtains are supported by fabric mesh on ceiling track.
(2) Openings in the mesh are equal to 70 percent or greater.
(3) The mesh extends a minimum of 22 in. (559 mm) down from ceiling.
8.6.5.3* Obstructions that Prevent Sprinkler Discharge from Reaching Hazard.

8.6.5.3.2 The requirements of 8.6.5.3 shall also apply to obstructions 18 in. (457 mm) or less below the sprinkler for light and ordinary hazard occupancies.

8.6.5.3.3* Sprinklers shall be installed under fixed obstructions over 4 ft (1.2 m) wide.

8.6.5.3.4 Sprinklers shall not be required below obstructions that are not fixed in place, such as conference tables.

8.6.5.3.5 Sprinklers installed under open gratings shall be of the intermediate level/rack storage type or otherwise shielded from the discharge of overhead sprinklers.

8.6.6 Clearance to Storage (Standard Pendent and Upright Spray Sprinklers).

8.6.6.1 The clearance between the deflector and the top of storage shall be 18 in. (457 mm) or greater.

8.6.6.2.1 Where shelving is installed on a wall and is not directly below sprinklers, the shelves, including storage thereon, shall extend above the level of a plane located 18 in. (457 mm) below ceiling sprinkler deflectors.

8.6.6.2.2 Shelving, and any storage thereon, directly below the sprinklers shall not extend above a plane located 18 in. (457 mm) below the ceiling sprinkler deflectors.

8.6.6.3 Where other standards specify greater clearance to storage minimums, they shall be followed.
Standard Sidewall Spray Sprinklers

8.7.5.1.2 Sidewall sprinklers shall be installed no closer than 4 ft (1.2 m) from light fixtures or similar obstructions.

8.7.5.1.3 The distance between light fixtures or similar obstructions located more than 4 ft (1.2 m) from the sprinkler shall be in conformity with Table 8.7.5.1.3 and Figure 8.7.5.1.3.

Table 8.7.5.1.3

Positioning of Sprinklers to Avoid Obstructions (Standard Sidewall Spray Sprinklers)

Figure 8.7.5.1.3

Positioning of Sprinkler to Avoid Obstruction (Standard Sidewall Spray Sprinklers)

Obstructions projecting from the same wall as the one on which the sidewall sprinkler is mounted shall be in accordance with Table 8.7.5.1.4 and Figure 8.7.5.1.4.

8.7.5.1.4.1 Isolated obstructions projecting from the same wall as the one on which the sidewall sprinkler is mounted shall be located a minimum of 4 in. (102 mm) from the sidewall sprinkler.

8.7.5.1.5 Sprinklers shall be permitted to be spaced on opposite sides of obstructions less than 4 ft (1.22 m) in width where the distance from the centerline of the obstruction to the sprinklers does not exceed one-half the allowable distance between sprinklers.
Standard Sidewall Spray Sprinklers

- Figure 8.7.5.1.4
- Positioning of Sprinklers to Avoid Obstructions Along Wall (Standard Sidewall Spray Sprinklers)
- Pg. 62
- NFPA 13, 2013 Ed.

8.7.5.1.6* Obstructions on the wall opposite from the sidewall sprinkler shall be permitted where the obstruction is up to 2 ft (0.6 m) deep and 2 ft (0.6 m) wide.

- Figure A.8.7.5.1.6
- Permitted Obstruction on Wall Opposite Sidewall Sprinkler
- Pg. 296
- NFPA 13, 2013 Ed.

8.7.5.2 Obstructions to Sprinkler Discharge Pattern Development.

8.7.5.2.1.3* Unless the requirements of 8.7.5.2.1.4 or 8.7.5.2.1.5 are met, sprinklers shall be positioned away from obstructions a minimum distance of three times the maximum dimension of the obstruction (e.g., truss webs and chords, pipe, columns, and fixtures). The maximum clear distance required shall be 24 in. (610 mm) and shall be positioned in accordance with Figure 8.7.5.2.1.3 where obstructions are present.
Standard Sidewall Spray Sprinklers
- Figure 8.7.5.2.1.3
- Minimum Distance from Obstruction (Standard Sidewall Spray Sprinkler)
- Pg. 63
- NFPA 13, 2013 Ed.

Standard Sidewall Spray Sprinklers
- Table 8.7.5.2.2
- Suspended or Floor-Mounted Obstructions (Standard Sidewall Spray Sprinklers) in Light Hazard Occupancies Only
- Pg. 63
- NFPA 13, 2013 Ed.

Residential
- Same process – except generally the 3 times rule is 4 times
- ALWAYS reference the manufacturers residential installation guide for the residential sprinkler being used – the guide is part of the listing.
Extended Coverage
- Same process – except generally the 3 times rule is 4 times

CMSA
- **8.11.5.2 Obstructions to Sprinkler Discharge Pattern Development.**
  - **8.11.5.2.1.1** Continuous or noncontinuous obstructions less than or equal to 36 in. (914 mm) below the sprinkler deflector that prevent the pattern from fully developing shall comply with 8.11.5.2.

CMSA
- **8.11.5.2.1.3** Unless the requirements of 8.11.5.1.2 or 8.11.5.1.3 are met, for obstructions 8 in. (203 mm) or less in width, as shown in Figure 8.11.5.2.1.3, sprinklers shall be positioned such that they are located at least a distance three times greater than the maximum dimension of the obstruction from the sprinkler (e.g., webs and chord members, pipe, columns, and fixtures).
  - Figure 8.11.5.2.1.3
    - Minimum Distance from Obstruction (CMSA Sprinklers)
    - Pg. 79
    - NFPA 13, 2013 Ed.
8.11.5.2.2 Branch Lines. Upright sprinklers shall be positioned with respect to branch lines in accordance with one of the following:

1. Upright sprinklers shall be permitted to be attached directly to branch lines less than or equal to 4 in. (100 mm) nominal in diameter.
2. Upright sprinklers shall be permitted to be offset horizontally a minimum of 12 in. (305 mm) from the pipe.
3. Upright sprinklers shall be permitted to be supplied by a riser nipple (sprig) to elevate the sprinkler deflector a minimum of 12 in. (305 mm) from the centerline of any pipe over 4 in. (100 mm) nominal in diameter.

8.11.5.3.2 Sprinklers shall be positioned with respect to fluorescent lighting fixtures, ducts, and obstructions more than 24 in. (610 mm) wide and located entirely below the sprinklers so that the minimum horizontal distance from the near side of the obstruction to the center of the sprinkler is not less than the value specified in Table 8.11.5.3.2 and Figure 8.11.5.3.2.
8.11.5.3.4 Where the bottom of the obstruction is located 24 in. (610 mm) or more below the sprinkler deflectors, the following shall occur:

1. Sprinklers shall be positioned so that the obstruction is centered between adjacent sprinklers in accordance with Figure 8.11.5.3.4.
2. The obstruction width shall meet the following requirements:
   
   a. The obstruction shall be limited to a maximum width of 24 in. (610 mm) in accordance with Figure 8.11.5.3.4.
   b. Where the obstruction is greater than 24 in. (610 mm) wide, one or more lines of sprinklers shall be installed below the obstruction.
3. The obstruction extension shall meet the following requirements:
   
   a. The obstruction shall not extend more than 12 in. (305 mm) to either side of the midpoint between sprinklers in accordance with Figure 8.11.5.3.4.
   b. Where the extensions of the obstruction exceed 12 in. (305 mm), one or more lines of sprinklers shall be installed below the obstruction.
4. At least 18 in. (457 mm) clearance shall be maintained between the top of storage and the bottom of the obstruction in accordance with Figure 8.11.5.3.4.

Figure 8.11.5.3.4
Obstruction More Than 24 in. (610 mm) Below Sprinklers (CMSA Sprinklers)
Pg. 80
NFPA 13, 2013 Ed.

8.11.5.3.5 In the special case of an obstruction running parallel to or directly below a branch line, the following shall occur:

1. The sprinkler shall be located at least 36 in. (914 mm) above the top of the obstruction in accordance with Figure 8.11.5.3.5.
2. The obstruction shall be limited to a maximum width of 12 in. (305 mm) in accordance with Figure 8.11.5.3.5.
3. The obstruction shall be limited to a maximum extension of 6 in. (152 mm) to either side of the centerline of the branch line in accordance with Figure 8.11.5.3.5.
CMSA
- Figure 8.11.5.3.5
- Obstruction More Than 36 in. (914 mm) Below Sprinklers (CMSA Sprinklers)
- Pg. 80
- NFPA 13, 2013 Ed.

8.11.6 Clearance to Storage (CMSA Sprinklers). The clearance between the deflector and the top of storage shall be 36 in. (914 mm) or greater.

Early Suppression Fast-Response Sprinklers
- 8.12.5.1 Obstructions at or Near Ceiling.
- 8.12.5.1.1 Sprinklers shall be arranged to comply with Table 8.12.5.1.1 and Figure 8.12.5.1.1 for obstructions at the ceiling, such as beams, ducts, lights, and top chords of trusses and bar joists.
- 8.12.5.1.2 The requirements of 8.12.5.1.1 shall not apply where sprinklers are spaced on opposite sides of obstructions less than 24 in. (610 mm) wide, provided the distance from the centerline on the obstructions to the sprinklers does not exceed one-half the allowable distance between sprinklers.
Early Suppression Fast-Response Sprinklers

- Table 8.12.5.1.1
- Positioning of Sprinklers to Avoid Obstructions to Discharge (ESFR Sprinklers)
- Pg. 82
- NFPA 13, 2013 Ed.

---

8.12.5.2* Isolated Obstructions Below Elevation of Sprinklers. Sprinklers shall be arranged with respect to obstructions in accordance with one of the following:

1. Sprinklers shall be installed below isolated noncontinuous obstructions that restrict only one sprinkler and are located below the elevation of sprinklers such as light fixtures and unit heaters.
2. Additional sprinklers shall not be required where the obstruction is 2 ft (0.6 m) or less in width and the sprinkler is located horizontally 1 ft (0.3 m) or greater from the nearest edge of the obstruction.
3. Additional sprinklers shall not be required where sprinklers are positioned with respect to the bottom of obstructions in accordance with 8.12.5.1.
4. Additional sprinklers shall not be required where the obstruction is 2 in. (51 mm) or less in width and located a minimum of 2 ft (0.6 m) below the elevation of the sprinkler deflector or is positioned a minimum of 1 ft (0.3 m) horizontally from the sprinkler.
5. Sprinklers with a special obstruction allowance shall be installed according to their listing.

---

8.12.5.3.1 General Continuous Obstructions. Sprinklers shall be arranged with respect to obstructions in accordance with one of the following:

1. Sprinklers shall be installed below continuous obstructions, or they shall be arranged to comply with Table 8.12.5.1.1 for horizontal obstructions entirely below the elevation of sprinklers that restrict sprinkler discharge pattern for two or more adjacent sprinklers such as ducts, lights, pipes, and conveyors.
2. Additional sprinklers shall not be required where the obstruction is 2 in. (51 mm) or less in width and is located a minimum of 2 ft (0.6 m) below the elevation of the sprinkler deflector or is positioned a minimum of 1 ft (0.3 m) horizontally from the sprinkler.
3. Additional sprinklers shall not be required where the obstruction is 2 ft (0.6 m) or less in width and located a minimum of 1 ft (0.3 m) horizontally from the sprinkler.
4. Additional sprinklers shall not be required where the obstruction is 2 ft (0.6 m) or less in width and located a minimum of 2 ft (0.6 m) horizontally from the sprinkler.
5. Ceiling sprinklers shall not be required to comply with Table 8.12.5.1.1 where a row of sprinklers is installed under the obstruction.
Early Suppression Fast-Response Sprinklers

- **8.12.5.3.2 Bottom Chords of Bar Joists or Open Trusses.** ESFR sprinklers shall be positioned a minimum of 1 ft (0.3 m) horizontally from the nearest edge to any bottom chord of a bar joist or open truss.

- **8.12.5.3.2.1** The requirements of 8.12.5.3.2 shall not apply where upright sprinklers are located over the bottom chords of bar joists or open trusses that are 4 in. (102 mm) maximum in width.

- **8.12.6 Clearance to Storage (Early Suppression Fast-Response Sprinklers).** The clearance between the deflector and the top of storage shall be 36 in. (914 mm) or greater.

CONCLUSION

- **Questions & Answers**
- **Handout:** www.firesprinkler.org/convention
- **To receive credit for this seminar, make sure you’ve signed the Sign-in sheet and completed a course evaluation (paper or mobile device).**
- **Evaluations:** Paper or Mobile Device
  - **Attendee ID:** 5-digit number located on your badge
  - **Mobile Device:**
    - Use Guidebook App to submit evaluation, or
    - QR Scan application on your mobile device to scan the QR code before leaving.

Monday’s Presentation

Seminar ID# 00455

Wednesday’s Presentation

Seminar ID# 00483