12.1 General.

Residential sprinklers shall be selected for use and installation as indicated in this chapter and shall be positioned and spaced in accordance with Section 9.5.

12.1.1 *

Residential sprinklers shall be permitted in dwelling units and their adjoining corridors, provided they are installed in conformance with their listing and when installed under the following conditions:

(1) A flat, smooth, horizontal ceiling with no beams up to a maximum of 24 ft (7.3 m) above the floor.
(2) A flat, horizontal, beamed ceiling, with a maximum ceiling height of 24 ft (7.3 m), with beams up to 14 in. (355 mm) deep with pendent sprinklers under the beams. The compartment containing the beamed ceiling shall be a maximum of 600 ft^2 (56 m^2) in area. The highest sprinkler in the compartment shall be above all openings from the compartment into any communicating spaces.
(3) A smooth, flat, sloped ceiling with no beams up to a maximum slope of 8 in 12. The highest portion of the ceiling shall not be more than 24 ft (7.3 m) above the floor. The highest sprinkler in the sloped portion of the ceiling shall be above all openings from the compartment containing the sloped ceiling into any communicating spaces.
(4) A sloped ceiling with beams up to 14 in. (350 mm) deep with pendent sprinklers under the beams. The compartment containing the sloped, beamed ceiling shall be a maximum of 600 ft^2 (56 m^2) in area. The slope of the ceiling shall be between 2 in 12 and 8 in 12. The highest portion of the ceiling shall not be more than 24 ft (7.3 m) above the floor. The highest sprinkler in the sloped portion of the ceiling shall be above all openings from the compartment containing the sloped ceiling into any communicating spaces.
(5) A sloped ceiling with beams of any depth with sidewall or pendent sprinklers in each pocket formed by the beams. The compartment containing the sloped, beamed ceiling shall be a maximum of 600 ft^2 (56 m^2) in area. The slope of the ceiling shall be between 2 in 12 and 8 in 12. The highest portion of the ceiling shall not be more than 24 ft (7.3 m) above the floor.

12.1.2

Where construction features or other special conditions exist that are outside the scope of sprinkler listings, listed sprinklers shall be permitted to be installed beyond their listing limitations when acceptable to the authority having jurisdiction.

12.1.3

Residential sprinklers shall be used only in wet systems unless specifically listed for use in dry systems or preaction systems.

12.1.4

Where residential sprinklers are installed in a compartment as defined in 3.3.43, all sprinklers within the compartment shall be residential sprinklers.

12.1.4.1

Residential sprinklers shall be permitted to be installed in corridors of residential occupancies that are adjacent to areas protected by quick-response sprinklers.

12.1.5 Reserved.

12.1.6 * Listings.

12.1.6.1

Areas of coverage shall be in accordance with the manufacturer's listing.

12.1.7 Distances Between Sprinklers.

12.1.7.1

Maximum distances between sprinklers shall be in accordance with the manufacturer's listing.

12.1.7.2

The distance between the sprinkler and the wall shall not exceed half the maximum allowable distance between sprinklers per the manufacturer's listing.

12.1.7.3

The minimum distance between sprinklers within a compartment shall be 8 ft (2.4 m), unless the listing of the sprinkler requires a greater distance, unless required by 12.1.11.1.5.1, or unless separated by baffles that comply with the following:

(1) Baffles shall be arranged to protect the actuating elements.
(2) Baffles shall be of solid and rigid material that will stay in place before and during sprinkler operation.
(3) Baffles shall be not less than 8 in. (200 mm) long and 6 in. (150 mm) high.
(4) The tops of baffles shall extend between 2 in. and 3 in. (50 mm and 75 mm) above the deflectors of upright sprinklers.
(5) The bottoms of baffles shall extend downward to a level at least even with the deflectors of pendent sprinklers.

12.1.7.4

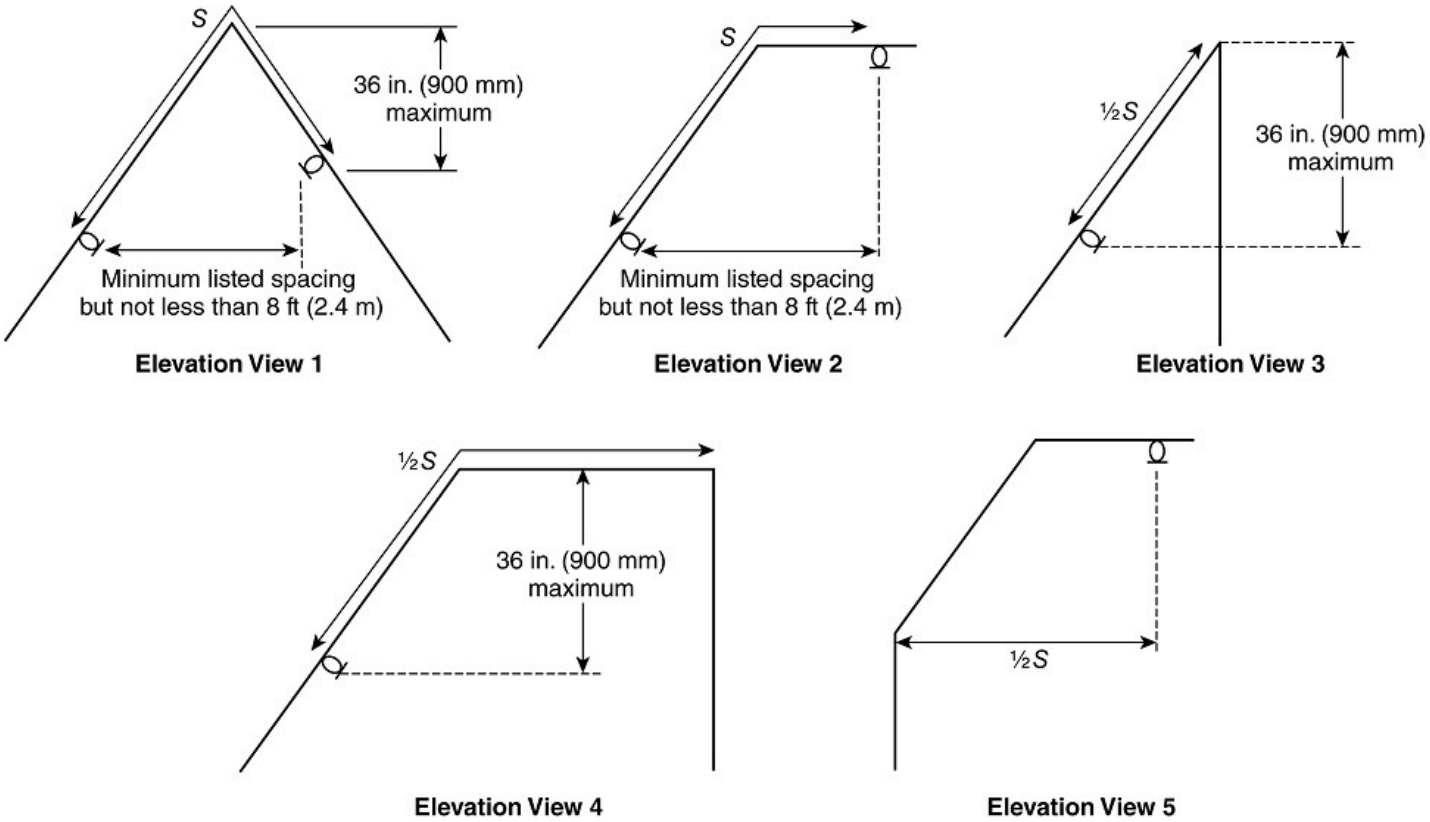
Residential sidewall sprinklers shall be permitted to be installed on opposing or adjacent walls, provided no sprinkler is located within the maximum protection area of another sprinkler or unless separated by baffles that comply with the following:

(1) Baffles shall be arranged to protect the actuating elements.
(2) Baffles shall be of solid and rigid material that will stay in place before and during sprinkler operation.
(3) Baffles shall be not less than 8 in. (200 mm) long and 6 in. (150 mm) high.
(4) The tops of baffles shall extend between 2 in. and 3 in. (50 mm and 75 mm) above the deflectors.
(5) The bottoms of baffles shall extend downward to a level at least even with the deflectors.

12.1.7.5

The maximum distance shall be measured along the slope of the ceiling as shown in Figure 12.1.7.5, and the maximum vertical distance from the peak shall be no more than 3 ft (900 mm).

Figure 12.1.7.5 Sprinkler Spacing with Sloped Ceilings.



12.1.7.6

Where sprinklers are installed along sloped ceilings, a sprinkler shall be installed within 3 ft (900 mm) of the peak and the sprinklers shall maintain the minimum listed spacing, but no less than 8 ft (2.4 m), measured in the plan view from one sprinkler to another as shown in Figure 12.1.7.5 unless separated by baffles that comply with the following:

(1) Baffles shall be arranged to protect the actuating elements.

(2) Baffles shall be of solid and rigid material that will stay in place before and during sprinkler operation.
(3) Baffles shall be not less than 8 in. (200 mm) long and 6 in. (150 mm) high.
(4) The tops of baffles shall extend between 2 in. (50 mm) and 3 in. (75 mm) above the deflectors of upright sprinklers.
(5) The bottoms of baffles shall extend downward to a level at least even with the deflectors of pendent sprinklers.

12.1.8 Deflector Position from Ceilings and Walls.

12.1.8.1

Pendent and upright sprinklers shall be positioned so that the deflectors are 1 in. to 4 in. (25 mm to 100 mm) from the ceiling unless the listing allows a greater distance.

12.1.8.1.1

Pendent and upright sprinklers installed under beamed or beamed and sloped ceilings shall be permitted to be installed where all of the following apply:

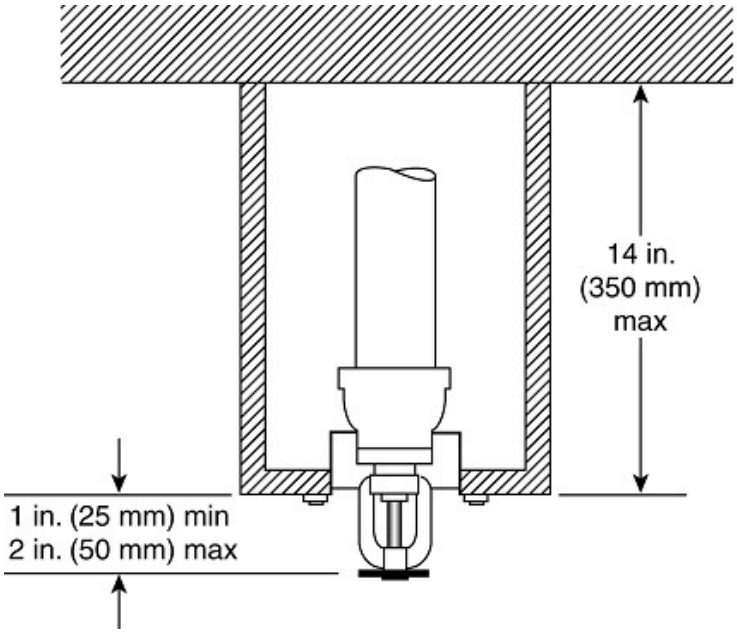
(1) Maximum beam depth of 14 in. (350 mm)
(2) Maximum ceiling height of 24 ft (7.3 m)
(3) Maximum ceiling slope of 8 in 12
(4) Maximum compartment size of 600 ft^2 (56 m^2)

12.1.8.1.2

Pendent-type residential sprinklers located under or adjacent to beams shall be installed in accordance with one of the following:

(1) Pendent, recessed pendent, concealed, and flush-type pendent sprinklers shall be permitted to be installed directly under a beam having a maximum depth of 14 in. (350 mm) with the sprinkler deflector 1 in. to 2 in. (25 mm to 50 mm) below the beam, or in accordance with the manufacturer's instructions for recessed or flush sprinklers if the deflector is less than 1 in. (25 mm) below the beam, as shown in Figure 12.1.8.1.2(a).
(2) Pendent sprinklers shall be permitted to be installed adjacent to beams where the vertical centerline of the sprinkler is no greater than 2 in. (50 mm) from the edge of the beam and with the sprinkler deflector 1 in. to 2 in. (25 mm to 50 mm) below the beam, or in accordance with the manufacturer's instructions for flush sprinklers if the deflector is less than 1 in. (25 mm) below the beam, as shown in Figure 12.1.8.1.2(b).

Figure 12.1.8.1.2(a) Position of Sprinkler Under Beam.



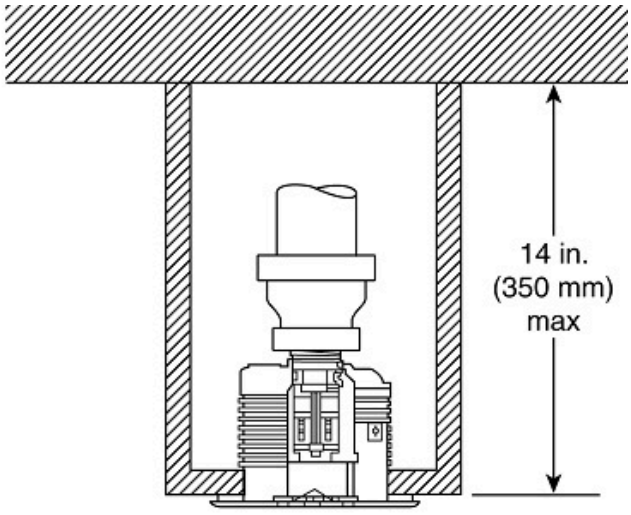
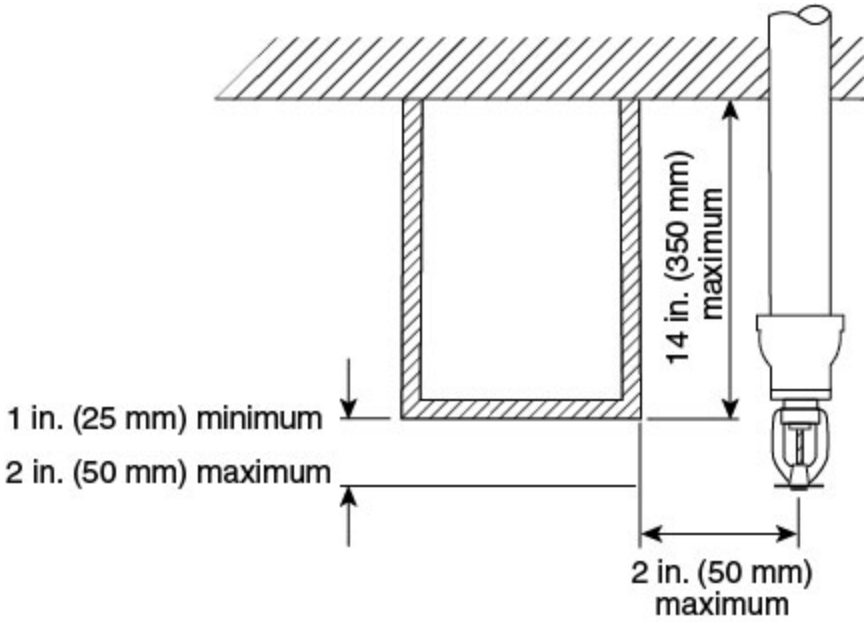


Figure 12.1.8.1.2(b) Position of Sprinkler Adjacent to Beam.



12.1.8.1.3

The highest sprinkler in the compartment shall be above all openings from the compartment into any communicated spaces.

12.1.8.2

Sidewall sprinklers shall be positioned so that the deflectors are within 4 in. to 6 in. (100 mm to 150 mm) from the ceiling unless the listing allows greater distances.

12.1.8.3

Where soffits used for the installation of sidewall sprinklers exceed 8 in. (200 mm) in width or projection from the wall, additional sprinklers shall be installed below the soffit.

12.1.8.4

Residential horizontal sidewall sprinkler deflectors shall be located no more than 6 in. (150 mm) from the wall on which they are mounted unless listed for greater distances.

12.1.8.5

The distance from sprinklers to the end walls shall not exceed one-half of the allowable distance permitted between sprinklers as indicated in the sprinkler listing.

12.1.8.6 Minimum Distance from Walls.

12.1.8.6.1

Sprinklers shall be located a minimum of 4 in. (100 mm) from an end wall.

12.1.8.7 Deflector Orientation (Residential Upright and Pendent).

12.1.8.7.1

Unless the requirements of 12.1.8.7.2 or 12.1.8.7.3 are met, deflectors of upright and pendent sprinklers shall be aligned parallel to ceilings, roofs, or the incline of stairs.

12.1.8.7.2

Where upright or pendent sprinklers are installed at the peak below a sloped ceiling or roof surface, the sprinkler shall be installed with the deflector parallel to floor.

12.1.8.7.3

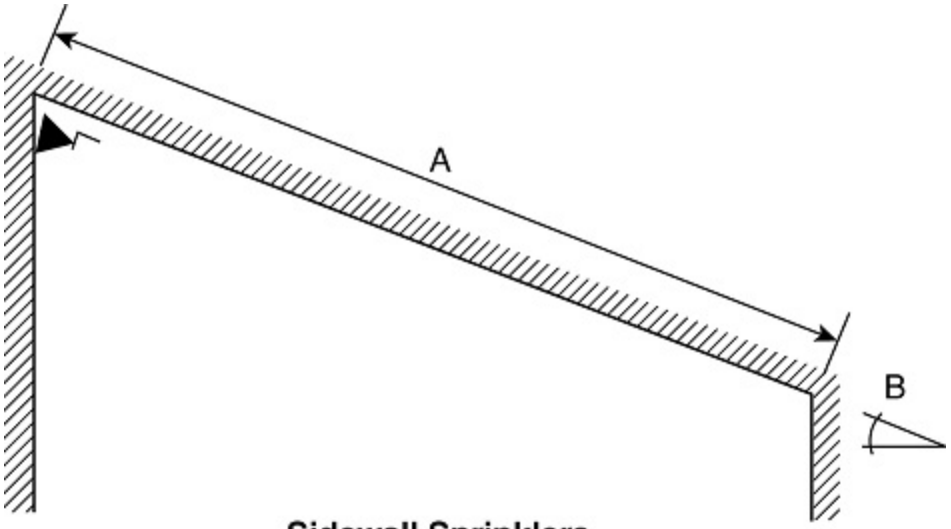
Roofs and ceilings having a pitch not exceeding 2 in 12 (16.7 percent) are considered horizontal in the application of 12.1.8.7, and upright and pendent sprinklers installed under horizontal ceilings shall be permitted to be installed with deflectors parallel to floor.

12.1.8.8 Deflector Orientation (Residential Sidewall Sprinklers).

Residential sidewall sprinklers, where installed under a sloped ceiling with a slope exceeding 2 in 12, shall be located in accordance with one of the following:

(1) At the high point of the slope and positioned to discharge downward along the slope as shown in Figure 12.1.8.8(a)
(2) Along slopes not exceeding 8 in 12 with the deflector installed parallel to the slope and positioned to discharge across the slope as shown in Figure 12.1.8.8(b)

Figure 12.1.8.8(a) Sidewall Deflector Orientation with Discharge Parallel to the Slope.

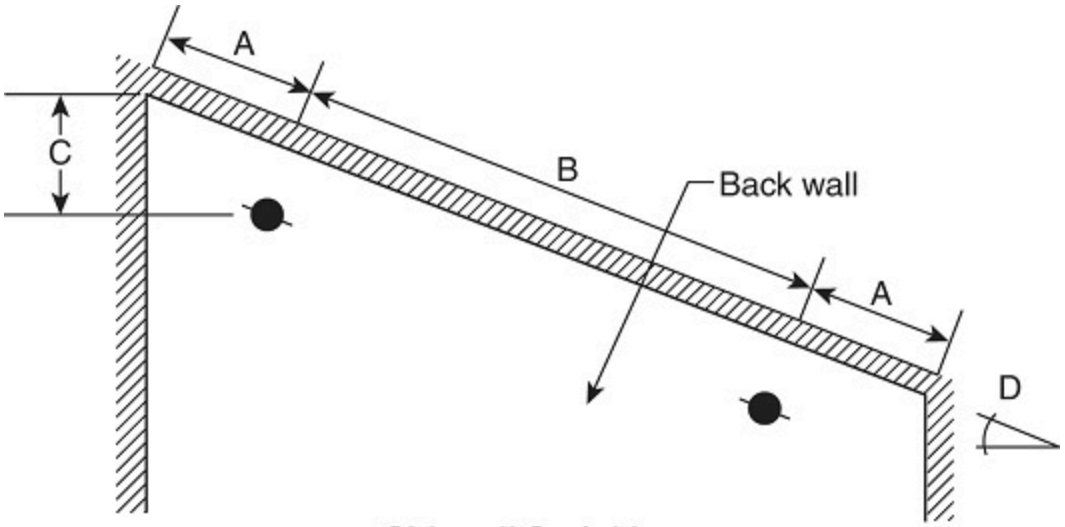


Sidewall Sprinklers
Elevation

A – Maximum: Up to the maximum sprinkler coverage area length for the coverage area being hydraulically calculated

B – Slope: >2 in 12 to 8 in 12

Figure 12.1.8.8(b) Sidewall Deflector Orientation with Discharge Perpendicular to the Slope.



Sidewall Sprinklers
Elevation

A – Maximum: One half the maximum sprinkler coverage area length for the coverage area being hydraulically calculated

B – Maximum: The maximum sprinkler coverage area length for the coverage area being hydraulically calculated

Minimum: 8 ft 0 in. (2.4 m)

C – Maximum: 3 ft 0 in. (0.9 m)

D – Slope: >2 in 12 to 8 in 12

12.1.9

Residential sprinklers installed in conformance with this standard shall follow the sprinkler obstruction rules of 12.1.10 or 12.1.11 as appropriate for their installation orientation (upright, pendent, or sidewall) and the obstruction criteria specified in the manufacturer's installation instructions.

12.1.10 Obstructions to Sprinkler Discharge (Residential Upright and Pendent Sprinklers).

12.1.10.1 Performance Objective.

12.1.10.1.1

Sprinklers shall be located so as to minimize obstructions to discharge as defined in 12.1.10.2 and 12.1.10.3, or additional sprinklers shall be provided to ensure adequate coverage of the hazard.

12.1.10.1.2

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

(1) Sprinklers shall be in accordance with 9.5.5.2, Table 12.1.10.1.2(a) or Table 12.1.10.1.2(b), and Figure 12.1.10.1.2(a).
(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. (750 mm) in width shall be permitted to be protected in accordance with Figure 12.1.10.1.2(b).
(4) Obstructions that are located against the wall and that are not over 24 in. (600 mm) in width shall be permitted to be protected in accordance with Figure 12.1.10.1.2(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.
(5) Obstructions 12 in. (300 mm) in width in hallways up to 6 ft (1.8 m) in width shall be permitted in accordance with Figure 12.1.10.1.2(d) when the sprinkler is located in the allowable obstruction zone and the closest edge of the obstruction is a minimum of 12 in. (300 mm) away from the centerline of the sprinkler.

Table 12.1.10.1.2(a) Positioning of Sprinklers to Avoid Obstructions to Discharge (Residential Upright

and Pendent Sprinklers)

Distance from Sprinkler to Side of Obstruction *(A)* (ft)	Allowable Distance of Deflector Above Bottom of Obstruction *(B)* (in.)
Less than 1½	0
1½ or more	1 or less
3 or more	3 or less
4 or more	5 or less
4½ or more	7 or less
6 or more	9 or less
6½ or more	11 or less
7 or more	14 or less
8 or more	15 or less
8½ or more	17 or less
9 or more	19 or less

Note: For *A* and *B*, refer to Figure 12.1.10.1.2(a).

Table 12.1.10.1.2(b) Positioning of Sprinklers to Avoid Obstructions to Discharge (Residential Upright and Pendent Sprinklers)

Distance from Sprinkler to Side of Obstruction *(A)* (mm)	Allowable Distance of Deflector Above Bottom of Obstruction *(B)* (mm)
Less than 450	0
450 or more	25 or less
900 or more	75 or less
1200 or more	125 or less
1400 or more	175 or less
1800 or more	225 or less
2000 or more	275 or less
2100 or more	350 or less
2400 or more	375 or less
2600 or more	425 or less
2700 or more	475 or less

Note: For *A* and *B*, refer to Figure 12.1.10.1.2(a).

Figure 12.1.10.1.2(a) Positioning of Sprinkler to Avoid Obstruction to Discharge (Residential Upright and Pendent Sprinklers).

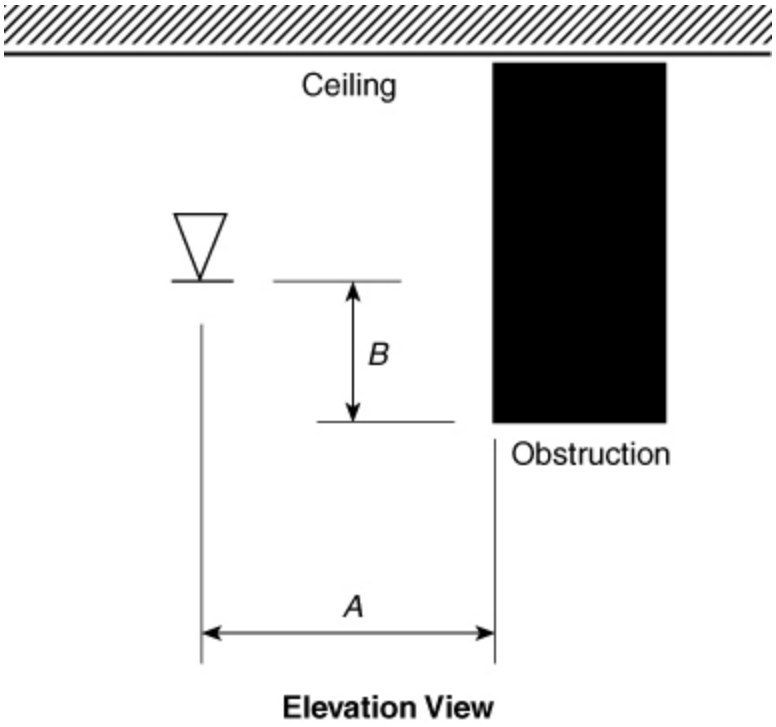


Figure 12.1.10.1.2(b) Obstructions Against Wall (Residential Upright and Pendent Sprinklers).

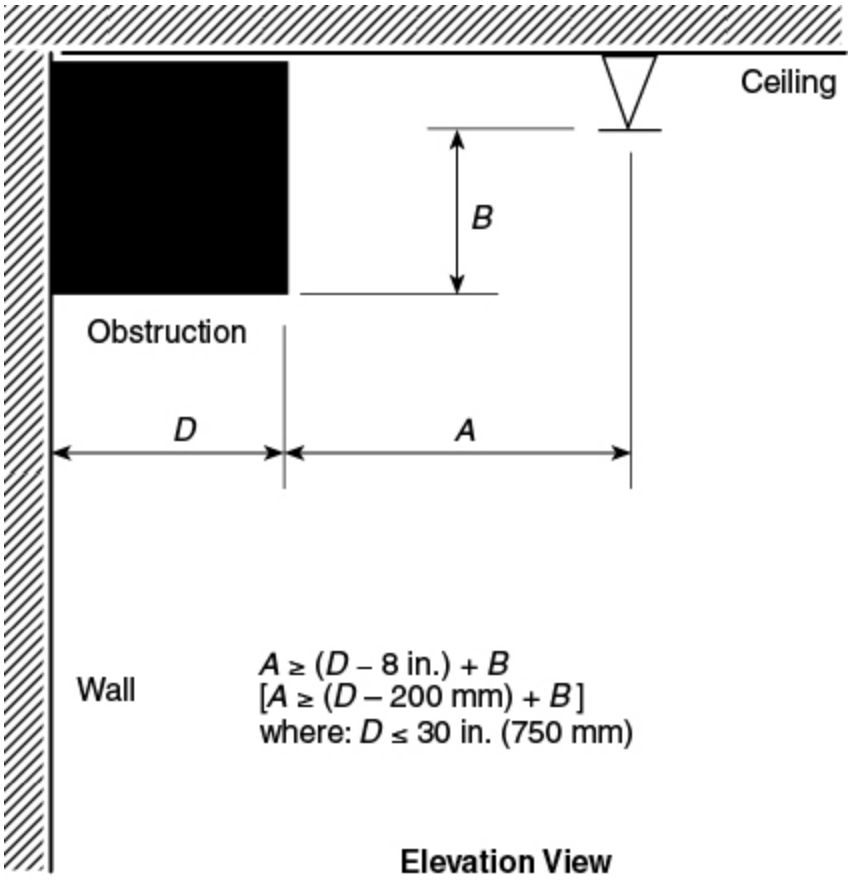


Figure 12.1.10.1.2(c) Obstructions Against Wall (Measurements for Residential Upright and Pendent Sprinklers).

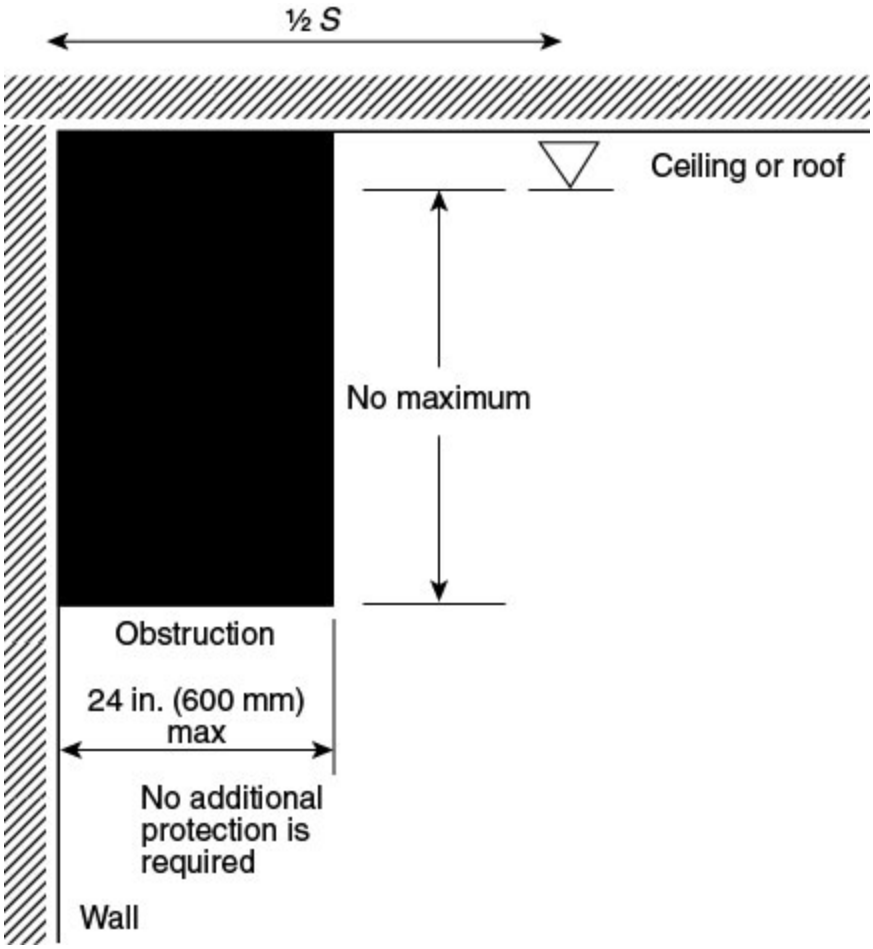
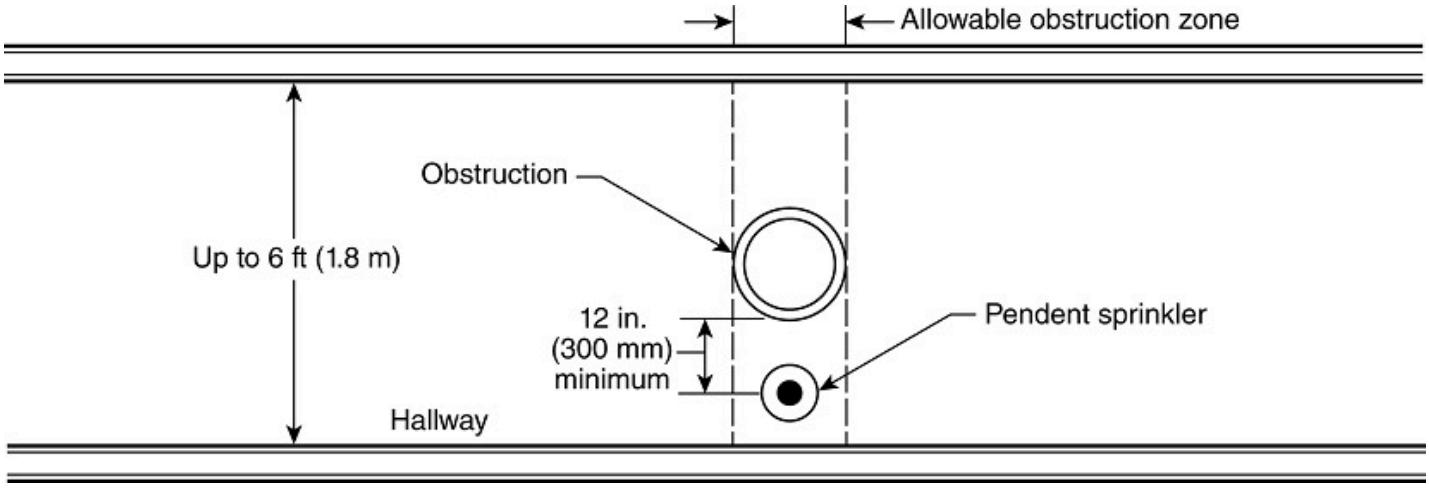


Figure 12.1.10.1.2(d) Obstruction in Hallway.



12.1.10.2 Obstructions to Sprinkler Discharge Pattern Development.

12.1.10.2.1 General.

12.1.10.2.1.1

Continuous or noncontinuous obstructions less than or equal to 18 in. (450 mm) below the sprinkler deflector that prevent the pattern from fully developing shall comply with 12.1.10.2.

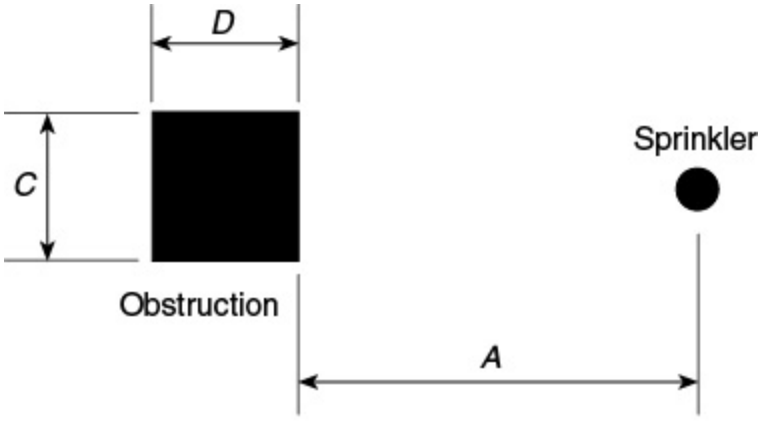
12.1.10.2.1.2

Regardless of the rules of this section, solid continuous obstructions shall meet the applicable requirements of 12.1.10.1.2.

12.1.10.2.1.3 *

Unless the requirements of 12.1.10.2.1.4 through 12.1.10.2.1.8 are met, sprinklers shall be positioned away from obstructions a minimum distance of four times the maximum dimension of the obstruction (e.g., truss webs and chords, pipe, columns, and fixtures) in accordance with Figure 12.1.10.2.1.3(a) and Figure 12.1.10.2.1.3(b).

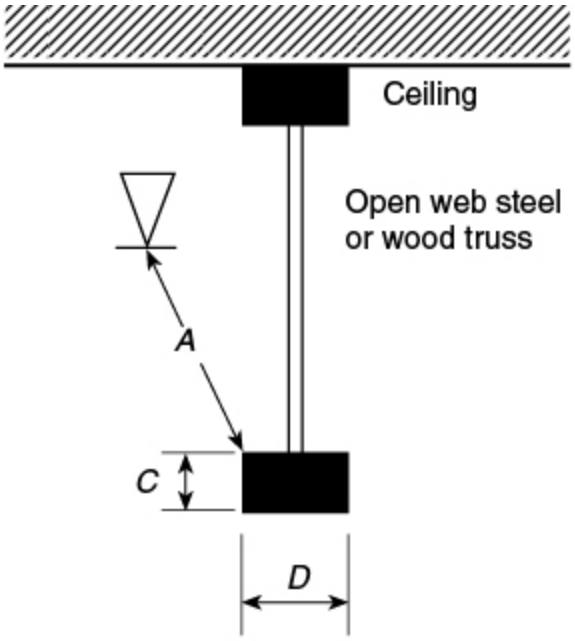
Figure 12.1.10.2.1.3(a) Minimum Distance from an Obstruction in the Vertical Orientation (Residential Upright and Pendent Sprinkler).



Plan View of Column
(Obstruction in vertical orientation)

$A \geq 4C$ or $4D$
(Use dimension C or D, whichever is greater)

Figure 12.1.10.2.1.3(b) Minimum Distance from an Obstruction in the Horizontal Orientation (Residential Upright and Pendent Sprinkler).



Elevation View of Truss
(Obstruction in horizontal orientation)

$A \geq 4C$ or $4D$
$A \leq 36$ in. (900 mm)
(Use dimension C or D, whichever is greater)

(A)
The maximum clear distance required to obstructions in the horizontal orientation (e.g., light fixture and truss chords) shall be 36 in. (900 mm).

(B)
The maximum clear distance shall not be applied to obstructions in the vertical orientation (e.g., columns).

12.1.10.2.1.4
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.

12.1.10.2.1.5
Sprinklers shall be permitted to be located one-half the distance between the obstructions where the obstruction consists of open trusses 20 in. (500 mm) or greater apart [24 in. (600 mm) on center], provided that all truss members are not greater than 4 in. (100 mm) (nominal) in width and web members do not exceed 1 in. (25 mm) in width.

12.1.10.2.1.6
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. (200 mm) and the sprinkler deflector is located at least 6 in. (150 mm) above the structural member and where the sprinkler is positioned at a distance four times greater than the maximum dimension of the web members away from the web members.

12.1.10.2.1.7
The requirements of 12.1.10.2.1.3 shall not apply to sprinkler system piping less than 3 in. (80 mm) in diameter.

12.1.10.2.1.8
The requirements of 12.1.10.2.1.3 shall not apply to sprinklers positioned with respect to obstructions in accordance with 12.1.10.1.2.

12.1.10.2.1.9 *
Sprinklers shall be permitted to be placed without regard to the blades of a ceiling fan, provided the plan view of the fan is at least 50 percent open.

12.1.10.2.2 Suspended or Floor-Mounted Vertical Obstructions.

The distance from sprinklers to privacy curtains, free-standing partitions, room dividers, and similar obstructions shall be in accordance with Table 12.1.10.2.2(a) or Table 12.1.10.2.2(b) and Figure 12.1.10.2.2.

Table 12.1.10.2.2(a) Suspended or Floor-Mounted Obstructions in Light Hazard Occupancies Only (Residential Upright and Pendent Sprinklers)

Horizontal Distance *(A)* (in.)	Minimum Vertical Distance Below Deflector *(B)* (in.)
6 or less	3 or more
9 or less	4 or more
12 or less	6 or more
15 or less	8 or more
18 or less	$9\frac{1}{2}$ or more
24 or less	$12\frac{1}{2}$ or more
30 or less	$15\frac{1}{2}$ or more
More than 30	18 or more

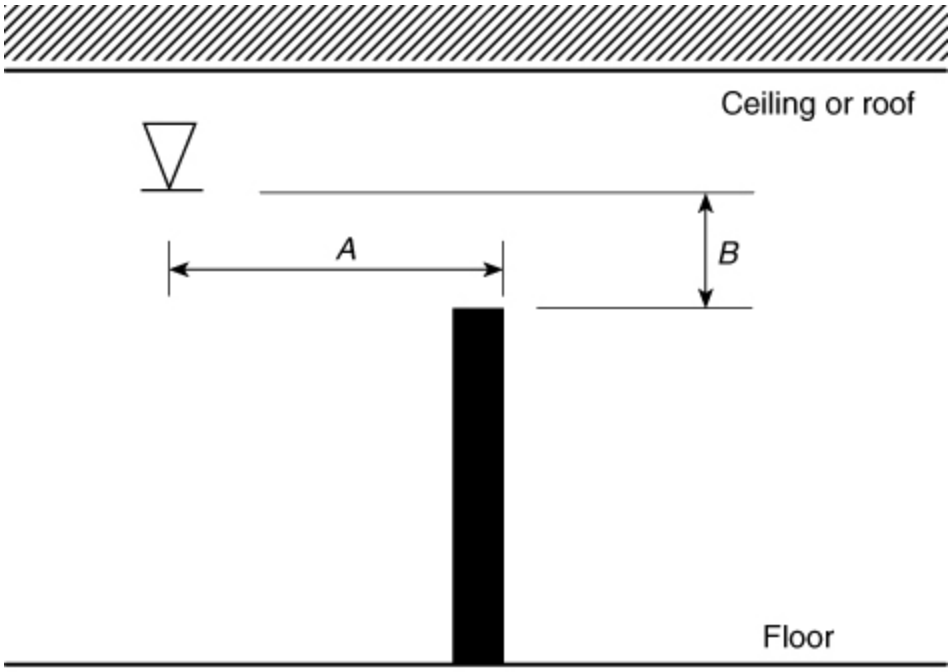
Note: For *A* and *B*, refer to Figure 12.1.10.2.2.

Table 12.1.10.2.2(b) Suspended or Floor-Mounted Obstructions in Light Hazard Occupancies Only (Residential Upright and Pendent Sprinklers)

Horizontal Distance *(A)* (mm)	Minimum Vertical Distance Below Deflector *(B)*(mm)
150 or less	75 or more
225 or less	100 or more
300 or less	150 or more
375 or less	200 or more
450 or less	240 or more
600 or less	315 or more
750 or less	390 or more
More than 750	450 or more

Note: For *A* and *B*, refer to Figure 12.1.10.2.2.

Figure 12.1.10.2.2 Suspended or Floor-Mounted Obstruction (Residential Upright and Pendent Sprinklers).



Elevation View

12.1.10.2.3 * Shadow Areas.

Shadow areas created by walls and partitions shall be permitted in the protection area of a sprinkler as long as the cumulative areas do not exceed 15 ft^2 (1.4 m^2) per sprinkler. *[See A.9.1.1(3), Figure A.9.1.1(3)(a), and Figure A.9.1.1(3)(b).]*

12.1.10.3 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. (450 mm) below the sprinkler deflector in a manner to limit the distribution from reaching the protected hazard shall comply with 9.5.5.3. *(See A.9.5.5.3.1.)*

12.1.11 Obstructions to Sprinkler Discharge (Residential Sidewall Sprinklers).

12.1.11.1 Performance Objective.

12.1.11.1.1

Sprinklers shall be located so as to minimize obstructions to discharge as defined in 9.5.5.2 and 9.5.5.3, or additional sprinklers shall be provided to ensure adequate coverage of the hazard.

12.1.11.1.2

Sidewall sprinklers shall not be installed less than 8 ft (2.4 m) from light fixtures or similar obstructions unless the requirements of 12.1.11.1.2.1 or 12.1.11.1.2.2 are met.

12.1.11.1.2.1

For obstructions such as light fixtures, where the greatest dimension of the obstruction is less than 2 ft (0.6 m), sidewall sprinklers shall be permitted to be installed at a minimum distance of four times the greatest dimension.

12.1.11.1.2.2

For obstructions located at least 4 in. (100 mm) above the plane of the sprinkler deflector, the sprinkler shall be permitted to be located less than 8 ft (2.4 m) from the obstruction.

12.1.11.1.3

The distance between light fixtures or similar obstructions located 8 ft (2.4 m) or greater from the sprinkler shall be in conformance with Table 12.1.11.1.3(a) or Table 12.1.11.1.3(b) and Figure 12.1.11.1.3.

Table 12.1.11.1.3(a) Positioning of Sprinklers to Avoid Obstructions to Discharge (Residential Sidewall)

Distance from Sprinkler to Side of Obstruction *(A)* (ft)	Allowable Distance of Deflector Above Bottom of Obstruction *(B)* (in.)

Distance from Sprinkler to Side of Obstruction *(A)* (ft)	Allowable Distance of Deflector Above Bottom of Obstruction *(B)* (in.)
Less than 8	0
8 or more	1 or less
10 or more	2 or less
11 or more	3 or less
12 or more	4 or less
13 or more	6 or less
14 or more	7 or less
15 or more	9 or less
16 or more	11 or less
17 or more	14 or less

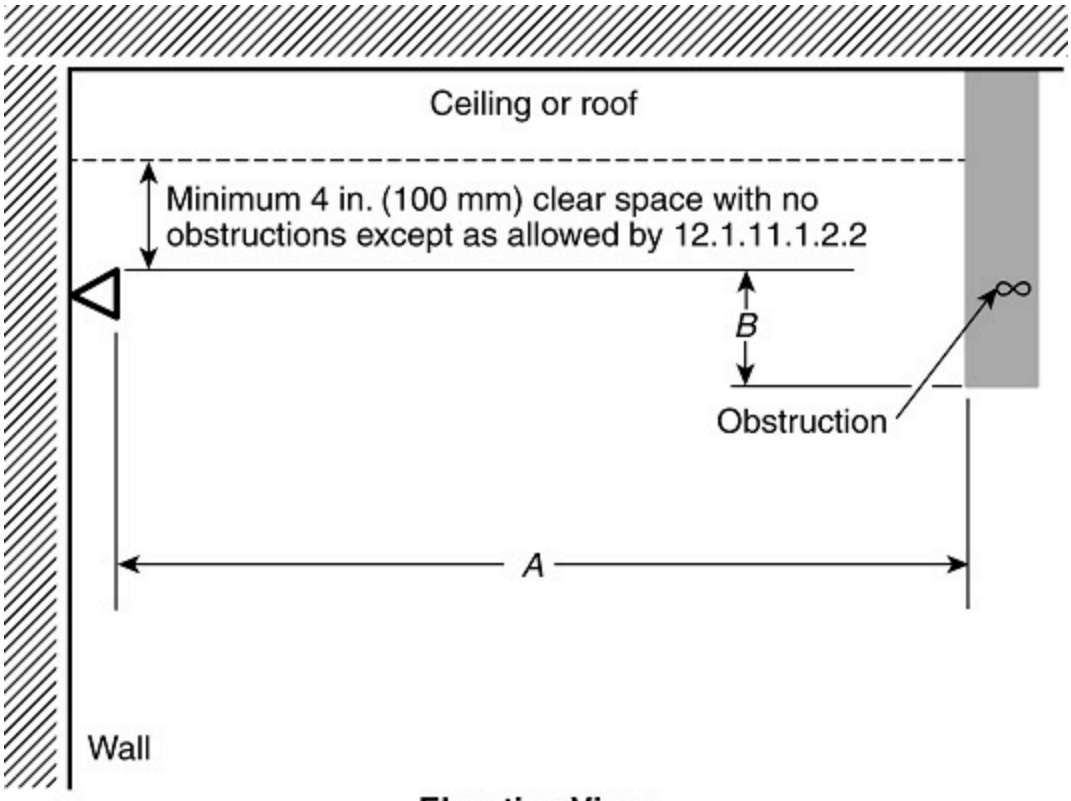
Note: For *A* and *B*, refer to Figure 12.1.11.1.3.

Table 12.1.11.1.3(b) Positioning of Sprinklers to Avoid Obstructions to Discharge (Residential Sidewall)

Distance from Sprinkler to Side of Obstruction *(A)* (mm)	Allowable Distance of Deflector Above Bottom of Obstruction*(B)* (mm)
Less than 2400	0
2400 or more	1 or less
3000 or more	50 or less
3400 or more	75 or less
3700 or more	100 or less
4000 or more	150 or less
4300 or more	175 or less
4600 or more	225 or less
4900 or more	275 or less
5200 or more	350 or less

Note: For *A* and *B*, refer to Figure 12.1.11.1.3.

Figure 12.1.11.1.3 Positioning of Sprinkler to Avoid Obstruction (Residential Sidewall Sprinklers).



Elevation View

12.1.11.1.4

Continuous obstructions projecting from the same wall as the one on which the sidewall sprinkler is mounted shall be in accordance with one of the following arrangements:

(1) Sprinklers shall be in accordance with Table 12.1.11.1.4(a) or Table 12.1.11.1.4(b) and Figure 12.1.11.1.4(a).
(2) Sprinklers shall be permitted to be spaced on opposite sides of obstructions less than 4 ft (1.2 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.
(3) Obstructions located against the wall and that are not over 30 in. (750 mm) in width shall be permitted to be protected in accordance with Figure 12.1.11.1.4(b).
(4) Obstructions located against the wall and that are not over 24 in. (600 mm) in width shall be permitted to be protected in accordance with Figure 12.1.11.1.4(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.
(5) Obstructions 12 in. (300 mm) in width in hallways up to 6 ft (1.8 m) in width shall be permitted in accordance with Figure 12.1.11.1.4(d) when the sprinkler is located in the allowable obstruction zone and the closest edge of the obstruction is a minimum of 12 in. (300 mm) away from the deflector.

Table 12.1.11.1.4(a) Positioning of Sprinklers to Avoid Obstructions Along Wall (Residential Sidewall)

Distance from Sprinkler to Side of Obstruction *(A)* (ft)	Allowable Distance of Deflector Above Bottom of Obstruction *(B)* (in.)
Less than 1½	0
1½ or more	1 or less
3 or more	3 or less
4 or more	5 or less
4½ or more	7 or less
6 or more	9 or less
6½ or more	11 or less
7 or more	14 or less

Note: For *A* and *B*, refer to Figure 12.1.11.1.4(a).

Table 12.1.11.1.4(b) Positioning of Sprinklers to Avoid Obstructions Along Wall (Residential Sidewall)

Distance from Sprinkler to Side of Obstruction *(A)* (mm)	Allowable Distance of Deflector Above Bottom of Obstruction *(B)* (mm)
Less than 450	0
450 or more	25 or less
900 or more	75 or less
1200 or more	125 or less
1400 or more	175 or less
1800 or more	225 or less
2000 or more	275 or less
2100 or more	350 or less

Note: For *A* and *B*, refer to Figure 12.1.11.4(a).

Figure 12.1.11.1.4(a) Positioning of Sprinkler to Avoid Obstruction Along Wall (Residential Sidewall Sprinklers).

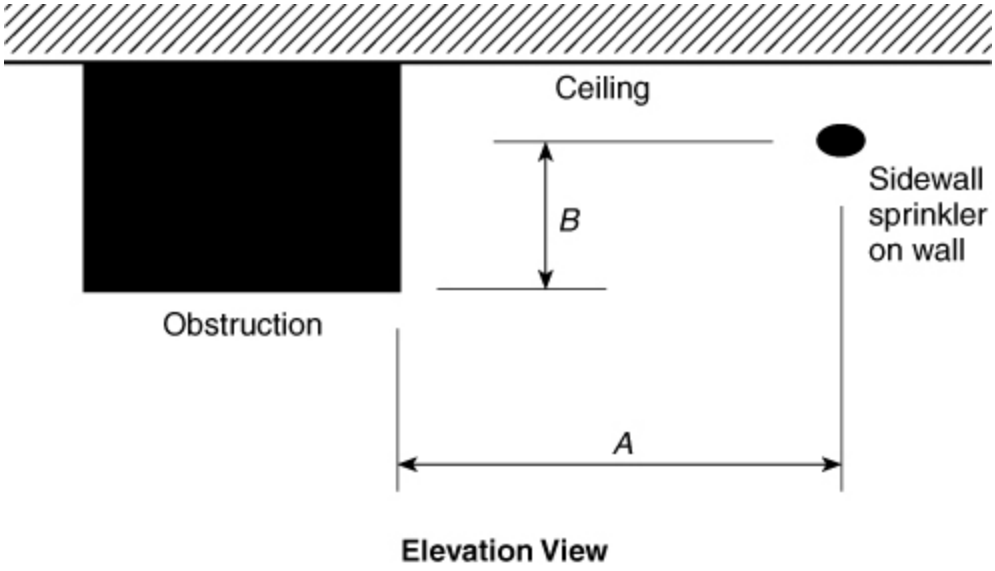


Figure 12.1.11.1.4(b) Obstruction Against Wall (Residential Sidewall Sprinklers).

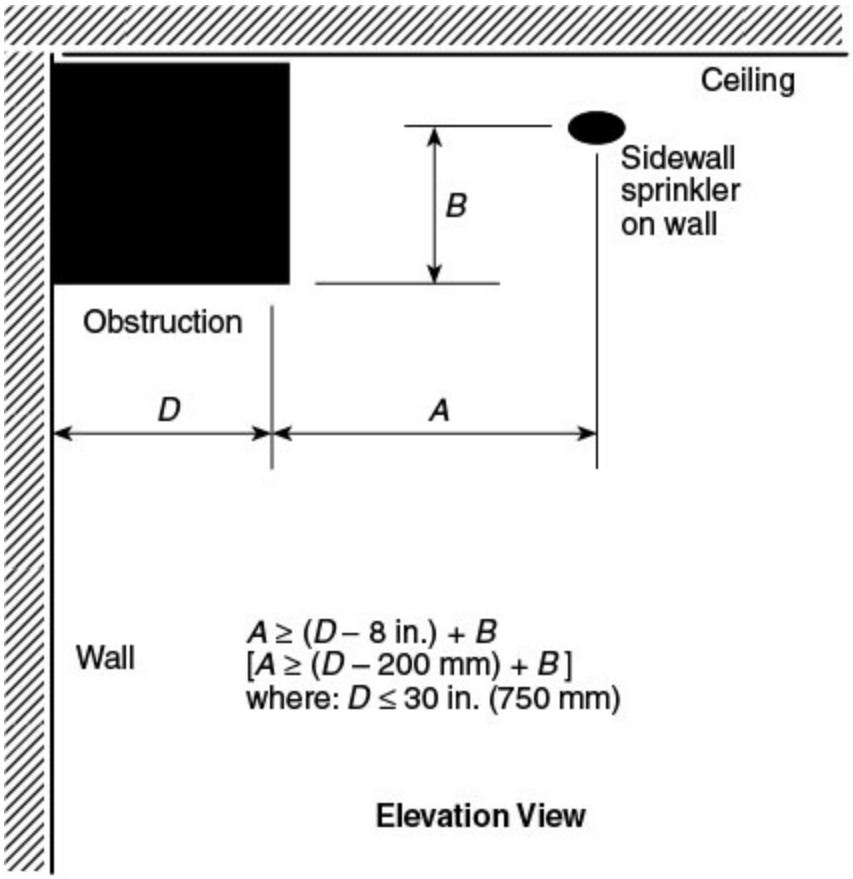


Figure 12.1.11.1.4(c) Obstruction Against Wall (Residential Sidewall Sprinklers).

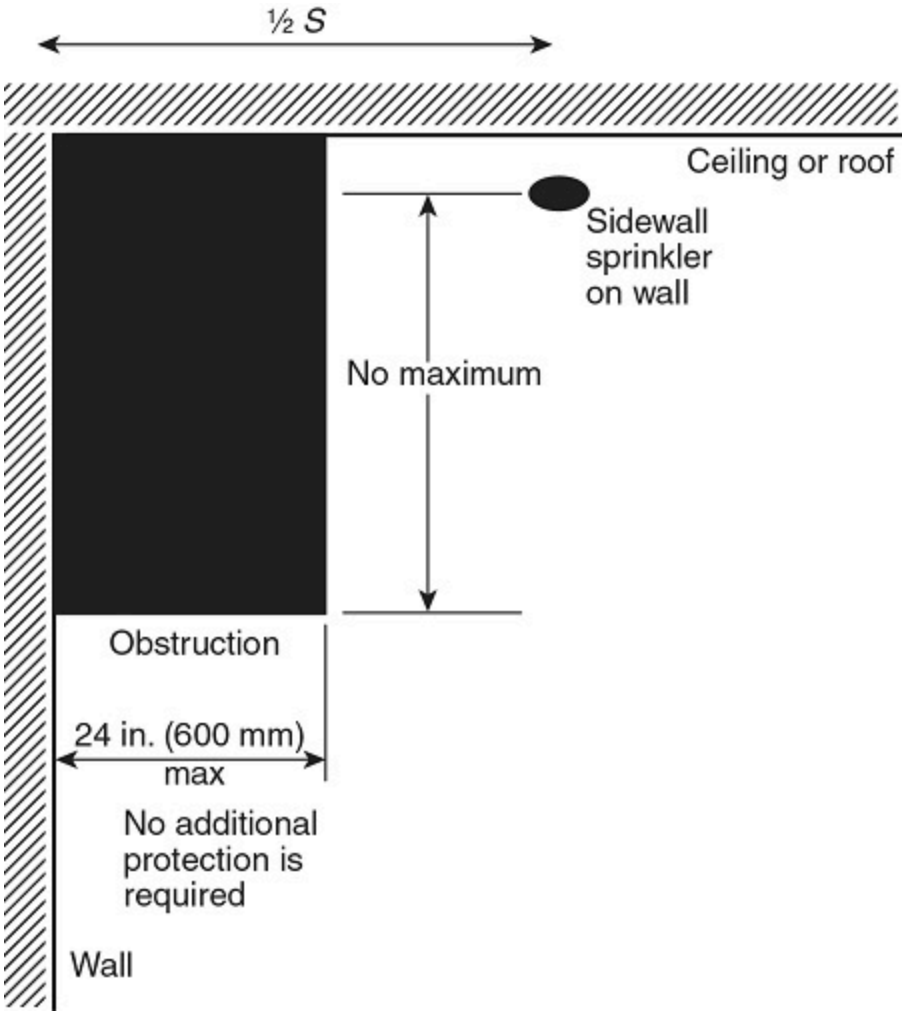
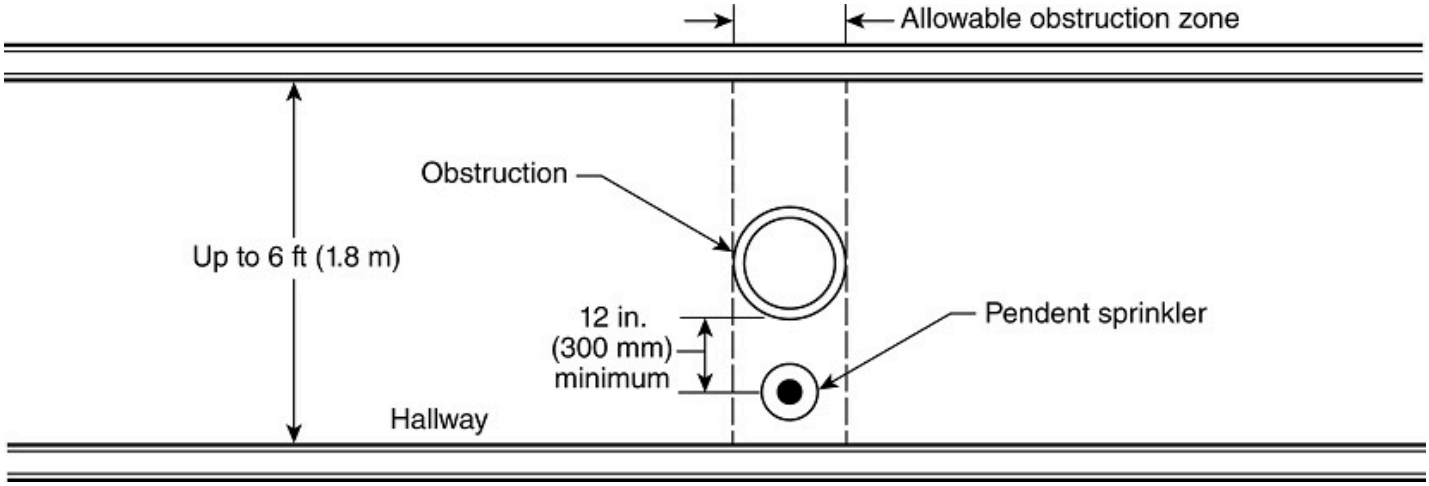


Figure 12.1.11.1.4(d) Obstruction in Hallway (Residential Sidewall Sprinklers).



12.1.11.1.5 * Soffits and Wall Cabinets.

Where soffits are used for the installation of sidewall sprinklers, the sprinklers and soffits shall be installed in accordance with 12.1.11.1.5.1, 12.1.11.1.5.2, or 12.1.11.1.5.3.

12.1.11.1.5.1

Where soffits exceed more than 8 in. (200 mm) in width or projection from the wall, pendent sprinklers shall be installed under the soffit.

12.1.11.1.5.2

Sidewall sprinklers shall be permitted to be installed in the face of a soffit located directly over cabinets, without requiring additional sprinklers below the soffit or cabinets, where the soffit does not project horizontally more than 12 in. (300 mm) from the wall.

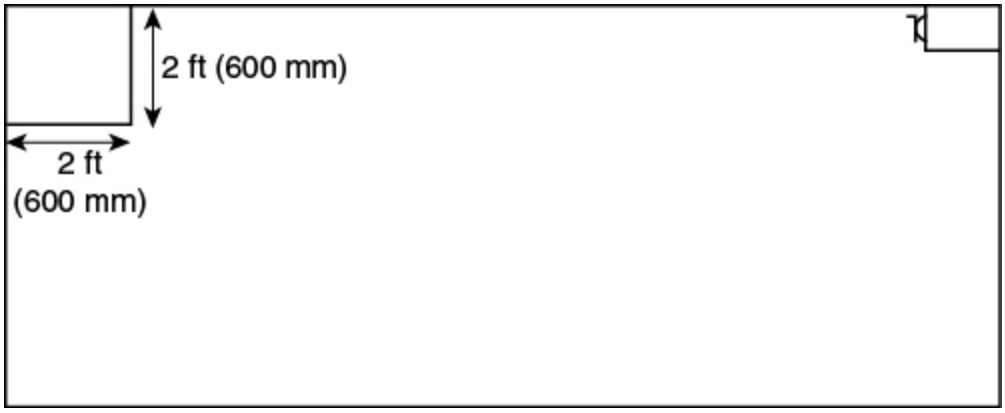
12.1.11.1.5.3

Where sidewall sprinklers are more than 3 ft (900 mm) above the top of cabinets, the sprinkler shall be permitted to be installed on the wall above the cabinets where the cabinets are no greater than 12 in. (300 mm) from the wall.

12.1.11.1.6

Obstructions on the wall opposite from the sidewall sprinkler shall be permitted in accordance with Figure 12.1.11.1.6.

Figure 12.1.11.1.6 Permitted Obstruction on Wall Opposite Residential Sidewall Sprinkler.



12.1.11.2 Obstructions to Sprinkler Discharge Pattern Development.

12.1.11.2.1 General.

12.1.11.2.1.1

Continuous or noncontinuous obstructions less than or equal to 18 in. (450 mm) below the sprinkler deflector that prevent the pattern from fully developing shall comply with this section.

12.1.11.2.1.2

Regardless of the rules of this section, solid continuous obstructions shall meet the requirements of 12.1.11.1.2 and 12.1.11.1.3.

12.1.11.2.1.3 *

Unless the requirements of 12.1.11.2.1.4 through 12.1.11.2.1.7 are met, sprinklers shall be positioned away from obstructions a minimum distance of four times the maximum dimension of the obstruction (e.g., truss webs and chords, pipe, columns, and fixtures).

(A)

The maximum clear distance required from obstructions in the horizontal orientation (e.g., light fixtures and truss chords) shall be 36 in. (900 mm).

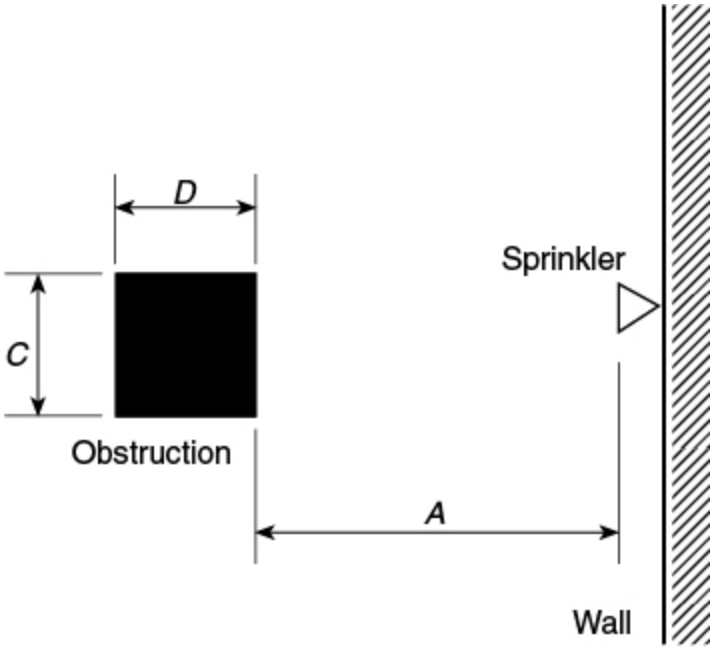
(B)

The maximum clear distance shall not be applied to obstructions in the vertical orientation (e.g., columns).

12.1.11.2.1.4

Sidewall sprinklers shall be positioned in accordance with Figure 12.1.11.2.1.4(a) and Figure 12.1.11.2.1.4(b) when obstructions are present.

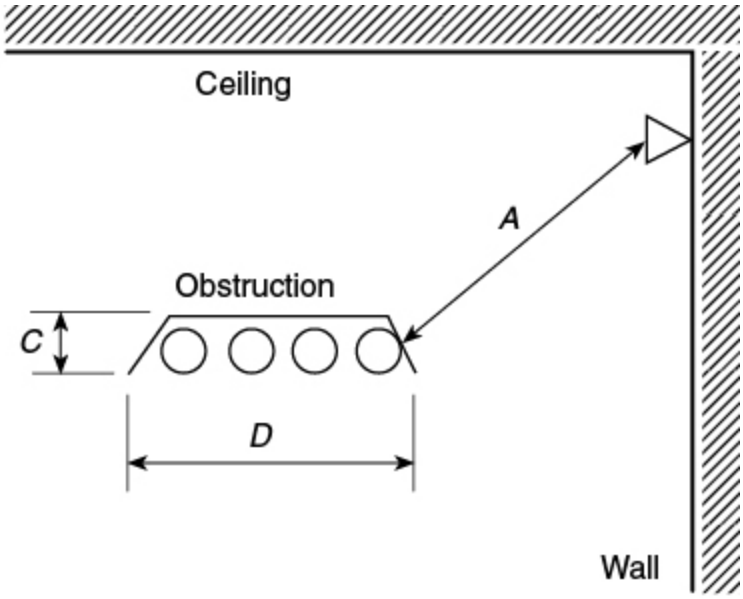
Figure 12.1.11.2.1.4(a) Minimum Distance from an Obstruction in the Vertical Orientation (Residential Sidewall Sprinkler).



Plan View of Column
(Obstruction in vertical orientation)

$A \geq 4C$ or $4D$
(Use dimension C or D, whichever is greater)

Figure 12.1.11.2.1.4(b) Minimum Distance from an Obstruction in the Horizontal Orientation (Residential Sidewall Sprinkler).



Elevation View of Pipe Conduit or Light Fixture
(Obstruction in horizontal orientation)
$A \geq 4C$ or $4D$
$A \leq 36$ in. (900 mm)
(Use dimension *C* or *D*, whichever is greater)

12.1.11.2.1.5

The requirements of 12.1.11.2.1.3 and 12.1.11.2.1.4 shall not apply where sprinklers are positioned with respect to obstructions in accordance with 12.1.11.1.2 and 12.1.11.1.3.

12.1.11.2.1.6

The requirements of 12.1.11.2.1.3 shall not apply to sprinkler system piping less than 3 in. (80 mm) in diameter.

12.1.11.2.1.7 *

Sprinklers shall be permitted to be placed without regard to the blades of a ceiling fan, provided the plan view of the fan is at least 50 percent open.

12.1.11.2.2 * Suspended or Floor-Mounted Vertical Obstructions.

The distance from sprinklers to privacy curtains, free-standing partitions, room dividers, and similar obstructions shall be in accordance with Table 12.1.11.2.2(a) or Table 12.1.11.2.2(b), Figure 12.1.11.2.2(a), and Figure 12.1.11.2.2(b).

Table 12.1.11.2.2(a) Suspended or Floor-Mounted Obstructions (Residential Sidewall Sprinklers)

Horizontal Distance *(A)* (in.)	Minimum Vertical Distance Below Deflector *(B)* (in.)
6 or less	3 or more
9 or less	4 or more
12 or less	6 or more
15 or less	8 or more
18 or less	$9\frac{1}{2}$ or more
24 or less	$12\frac{1}{2}$ or more
30 or less	$15\frac{1}{2}$ or more

Horizontal Distance *(A)* (in.)	Minimum Vertical Distance Below Deflector *(B)* (in.)
More than 30	18 or more

Note: For *A* and *B*, refer to Figure 12.1.11.2.2(a).

Table 12.1.11.2.2(b) Suspended or Floor-Mounted Obstructions (Residential Sidewall Sprinklers)

Horizontal Distance *(A)* (mm)	Minimum Vertical Distance Below Deflector *(B)* (mm)
150 or less	75 or more
225 or less	100 or more
300 or less	150 or more
375 or less	200 or more
450 or less	240 or more
600 or less	315 or more
750 or less	390 or more
More than 750	450 or more

Note: For *A* and *B*, refer to Figure 12.1.11.2.2(a).

Figure 12.1.11.2.2(a) Suspended or Floor-Mounted Obstruction (Residential Sidewall Sprinklers).

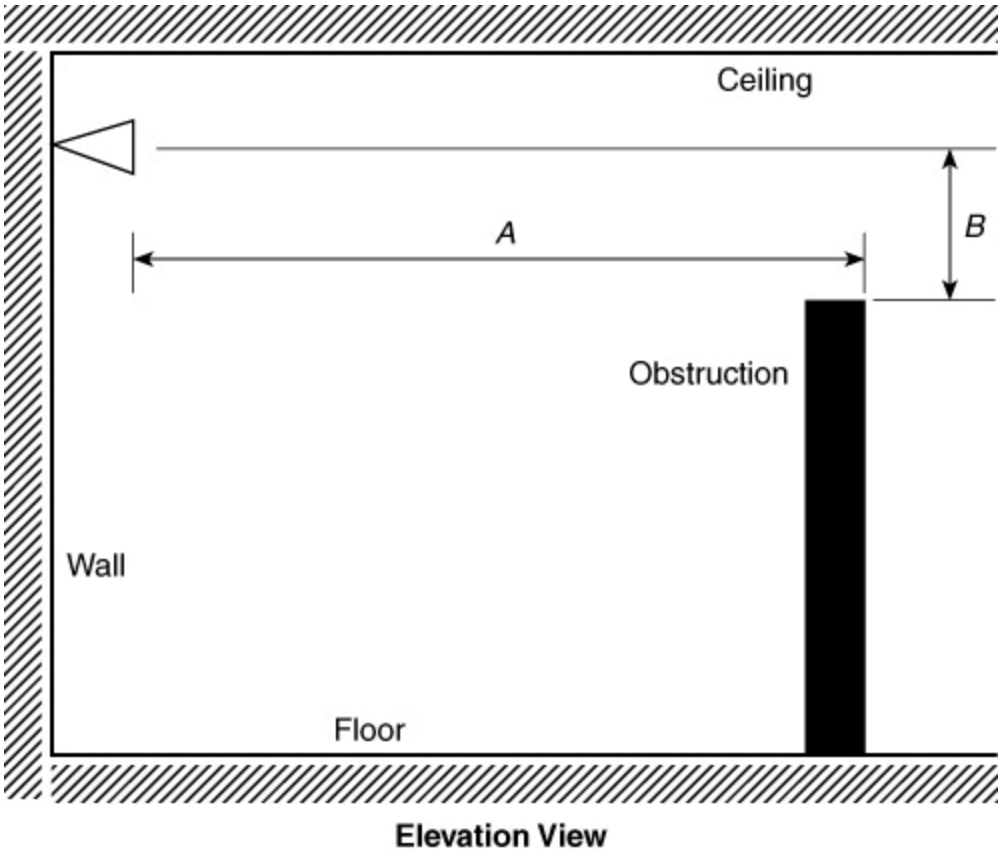
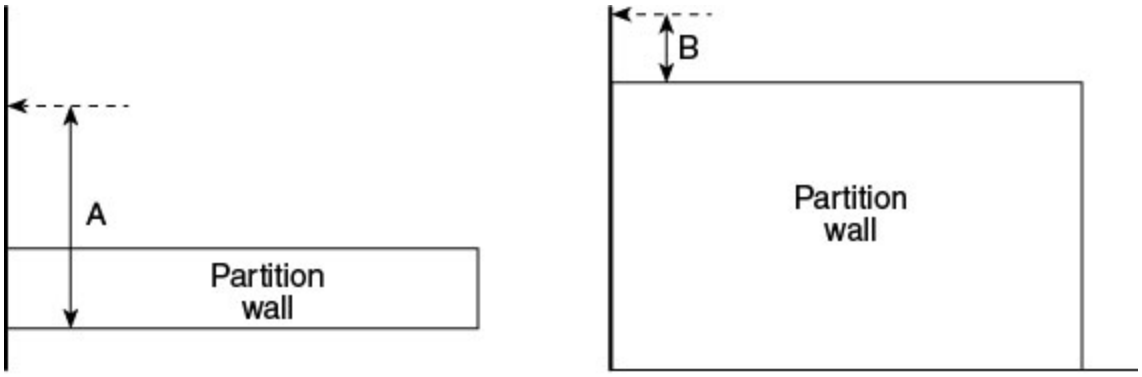


Figure 12.1.11.2.2(b) Suspended or Floor-Mounted Obstructions (Residential Sprinklers).



Plan View Elevation View

12.1.11.2.3 Shadow Areas.

Shadow areas created by walls and partitions shall be permitted in the protection area of a sprinkler as long as the cumulative areas do not exceed 15 ft^2 (1.4 m^2) per sprinkler. *[See A.9.1.1(3), Figure A.9.1.1(3)(a), and Figure A.9.1.1(3)(b).]*

12.1.11.3 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. (450 mm) below the sprinkler deflector in a manner to limit the distribution from reaching the protected hazard shall comply with 9.5.5.3. *(See A.9.5.5.3.1.)*

12.1.12 Ceiling Pockets.

12.1.12.1

Sprinklers shall be required in all ceiling pockets.

12.1.12.2

The requirement of 12.1.12.1 shall not apply where all of the following requirements are met:

(1) The total volume of the unprotected ceiling pocket does not exceed 100 ft^3 (2.8 m^3).
(2) The depth of the unprotected ceiling pocket does not exceed 12 in. (300 mm).
(3) The entire floor area under the unprotected ceiling pocket is protected by listed residential sprinklers at the lower ceiling elevation.
(4) The interior finish of the unprotected ceiling pocket is noncombustible or limited-combustible construction.