

NFPA 13 – 2016 FAQs

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1. Do I need sprinklers in my building?

NFPA 13 is an installation standard and does not specify which buildings or structures require a sprinkler system. NFPA 13 specifies how to properly design and install a sprinkler system using the proper components and materials after it has been determined that a sprinkler system is required. The administrative authority for requiring sprinklers within buildings rests with any of the following: the local building code, NFPA 5000, NFPA 101, International Building Code, or insurance regulations that typically specify which buildings and structures require sprinkler systems. Where the building code does not require a sprinkler system but one is installed voluntarily, the requirements of NFPA 13 still apply to the portion of the building being protected.

2. If I have a dry-pipe sprinkler system under a pitched roof exceeding a slope of 16.7%, do I apply both area increases from Section 11.2.3.2.4 and Section 11.2.3.2.5?

Yes, both sections would be applied cumulatively to the design area chosen from Figure 11.2.3.1.1 in accordance with Section 11.2.3.2.7. For example: Assuming a light or ordinary hazard occupancy, an appropriate area of sprinkler operation selected from Figure 11.2.3.1.1 is 1500 square feet. As required by Section 11.2.3.2.4, 1500 square feet is increased by 30% to 1950 square feet ($1500 \times 1.3 = 1950$) for the steeply pitched roof. As required by Section 11.2.3.2.5, the 1950 square feet is increased by 30% for the dry pipe system ($1950 \times 1.3 = 2535$). Therefore, the original density chosen from Figure 11.2.3.1.1 must be applied over 2535 square feet. All other design area modifications applicable to the system being installed must be applied in addition to those discussed here.

3. Can plastic pipe be used on a sprinkler system complying with NFPA 13?

Section 6.3.9 allows the use of nonmetallic pipe that has been specifically listed for fire protection use. This pipe must be installed in accordance with its listing limitations, including installation instructions.

4. What is the limit for the calculated water velocity in a sprinkler system complying with NFPA 13?

NFPA 13 does not specify a maximum limit for the calculated water velocity.

5. Do walk-in type freezers, coolers, vaults and safes require sprinklers?

Yes. As explained by A.8.1.1, these areas require sprinklers because they are part of the premises. NFPA 13 requires that sprinklers be installed throughout the premises in accordance with Section 4.1 except where specifically allowed to be omitted. There are no provisions that allow for sprinkler omission in freezers or coolers.

6. In applying the 'Three Times Rule' for sprinkler obstructions (i.e. Section 8.6.5.2.1.3), what dimension is the 24 inch (600 mm) maximum referring to?

This maximum dimension is the dimension measured from the sprinkler to the nearest edge of the obstruction. Isolated obstructions that are more than 24 inches (600 mm) away from standard upright and pendent sprinklers do not generally create a significant obstruction.

7. Are sprinklers required in closets?

Yes. Section 8.5.5.4 requires sprinklers in all closets and compartments. There are limited exceptions specified in Section 8.15.8.2 for certain small closets ($\leq 24\text{ft}^2$) ($\leq 2.2\text{m}^2$) in clothes closets, linen closets and pantries within dwelling units of hotels and motels and in Section 8.15.9 in clothes closets in patient sleeping rooms in hospitals where the area of the closet does not exceed 6ft^2 (0.5m^2).

8. Can a supply control valve be installed downstream of the fire department connection?

No, Sections 8.17.2.5.2, 8.16.1.1.1.3, and 8.16.1.1.4.3 specifically state that there shall be no shutoff valve in the fire department connection. Normally, a control valve is required before and after each check valve in a source of supply. The valves are required so that the check valve can be isolated and serviced. A control valve is also required in each automatic source of supply in accordance with Section 8.16.1.1.1.2. However, these control valves are not necessary, nor allowed, in the fire department connection piping. While the control valves are not allowed in the fire department connection piping itself, control valves can be installed downstream from the fire department connection piping in accordance with 8.17.2.4.3 for fire department connections serving multiple systems only. It would be impractical to require a fire department connection after all control valves in a multi-zone or multi-system arrangement. Furthermore, Section 8.16.1.1.2.1 of NFPA 13 requires that all valves controlling water supplies be supervised in the open position. In all cases, the arrangement for the fire department connection must comply with Section 8.17.2.4.

9. If a water curtain is installed, what is the equivalent fire separation rating?

NFPA 13 does not specify an equivalent fire separation rating for water curtains installed in accordance with Section 8.15.4.1 and designed in accordance with Section 11.3.3.

10. What is the allowable reduction in fire separation ratings in a building where a sprinkler system is installed?

NFPA 13 does not address such reductions. Some building/fire codes will specify an allowable reduction in fire separation ratings for certain buildings where sprinklers are provided in accordance with NFPA 13. You would need to consult with the applicable building/fire code for your particular project to determine if there are any allowable reductions.

11. Are sprinklers required in the upper portion of an architectural ceiling feature, even when there are no openings to above and the sprinklers at the lower portion do not exceed area of coverage limitations?

This question usually arises with architectural features such as skylights and rooms with multi-level ceilings. The general concern with these types of features is the potential for heat to 'pocket' and the negative impact to the operation of the sprinklers. This could be true even if sprinklers are spaced within their limitations for allowable area of protection. The applicable sections of Chapter 8 address the distance below the ceiling that sprinklers must be positioned. The need for sprinklers in the upper portion can be determined based on the distance from the upper level to the position at which the sprinklers would be installed on the lower level. If this distance exceeds the allowable distances specified in Chapter 8, then sprinklers would be required at the upper level. Obstructions specified by Chapter 8 to any of the sprinklers would also need to be examined and accounted for. Section 8.6.7 Ceiling Pockets (Standard Pendent and Upright Spray Sprinklers) and Section 8.8.7 Ceiling Pockets (Extended Coverage Upright and Pendent Sprinklers) offer provisions that permit the omission of sprinklers in the upper level under certain conditions. Where Section 8.6.7 and 8.8.7 are appropriately applied, the design area reduction for quick-response sprinklers cannot be taken in accordance with Item (4) of Section 11.2.3.2.3.1

12. Are sprinklers required within furniture?

No. Sprinklers are required within all permanent spaces of the structure, such as closets, in accordance with Section 4.1. Moveable furniture items, such as desks, dressers and wardrobes, do not require sprinklers within them even when they are affixed to the permanent structure of the building.

13. Must I design the sprinkler system to protect the same hazard throughout the structure?

No. NFPA 13 does not require that the entire structure be protected as a single hazard classification. There are three important things to keep in mind when designing a system with multiple hazard classifications.

- a. The first is that you will lock the building use into the hazard configuration that the sprinkler system is designed for. If the entire space was protected for the highest hazard, the building user would not have to worry about the general locations of the different hazards.
- b. The hydraulic calculation procedure and system layout become more complex with multiple hazard classifications than where the highest hazard is used throughout.

- c. Section 11.1.2 specifies requirements for buildings with two or more adjacent hazard occupancies.

14. If there are no hose connections inside a building sprinklered to comply with NFPA 13, will the water demand need to include a hose stream allowance?

Yes. An outside hose stream demand would be required in accordance with Table 11.2.3.1.2. Note that the table specifies an option for 0, 50 or 100 gpm for inside hose demand. Regardless of the inside hose demand, the total combined inside and outside hose demand must meet the flow specified in the table.

15. Is there a ceiling height at which NFPA 13 permits the omission of sprinklers?

No.

16. Does NFPA 13 address fire sprinkler systems protecting storage above 12 feet?

Yes. Starting with the 1999 edition, NFPA 13 incorporated the fire sprinkler system design and installation requirements from:

NFPA 231 (Standard for General Storage),

NFPA 231C (Standard for Rack Storage of Materials),

NFPA 231D (Standard for Storage of Rubber Tires),

NFPA 231E (Recommended Practice for the Storage of Baled Cotton) and

NFPA 231F (Standard for the Storage of Roll Paper).

The other requirements of NFPA 231, NFPA 231C, NFPA 231D, NFPA 231E and NFPA 231F were incorporated into a new standard NFPA 230 (Standard for the Fire Protection of Storage).

17. How are the NFPA 13 design requirements arranged for systems protecting storage of normal combustibles and plastics?

Such requirements are located in a separate chapter - Chapter 12. A detailed table of contents for storage applications is as follows:

Chapter 12 – General Requirements for Storage

Chapter 13 – Protection of Miscellaneous and low-Piled Storage

Chapter 14 – Protection for Palletized, Solid-Piled, Bin Box, Shelf, or Back-to-Back Shelf Storage of Class I through Class IV Commodities

Chapter 15 – Protection for Palletized, Solid-Piled, Bin Box, Shelf, or Back-to-Back Shelf Storage of Plastic and Rubber Commodities

Chapter 16 – Protection of Rack Storage of Class I Through Class IV Commodities

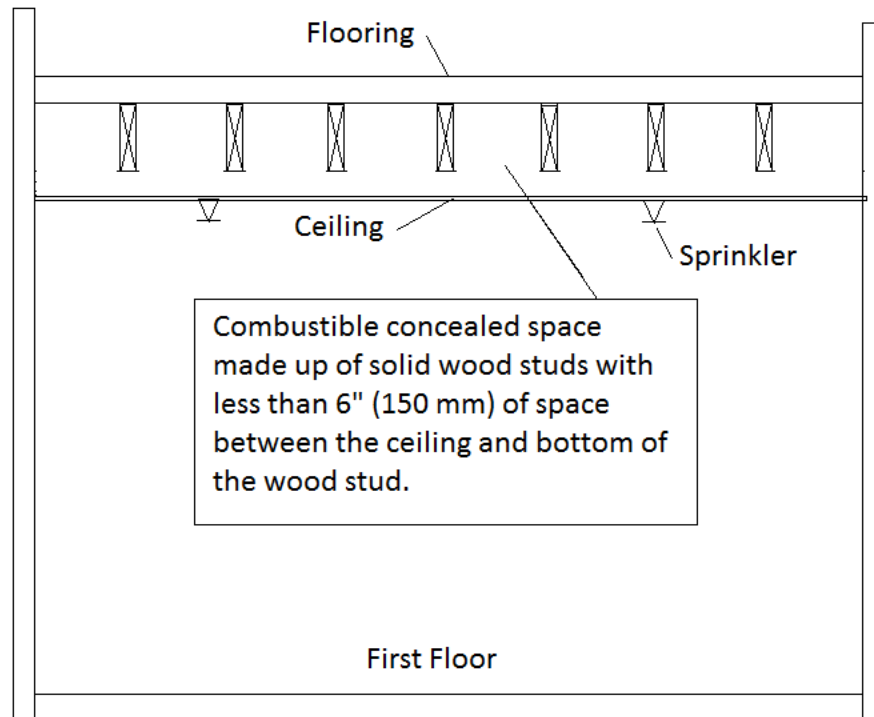
Chapter 17 – Protection of Rack Storage of Plastic and Rubber Commodities

Chapter 18 – Protection of Rubber Tire Storage

Chapter 19 – Protection of Roll Paper

Chapter 20 – Special Designs for Storage

Chapter 21 – Alternative Sprinkler System Designs for Chapters 12 Through 20



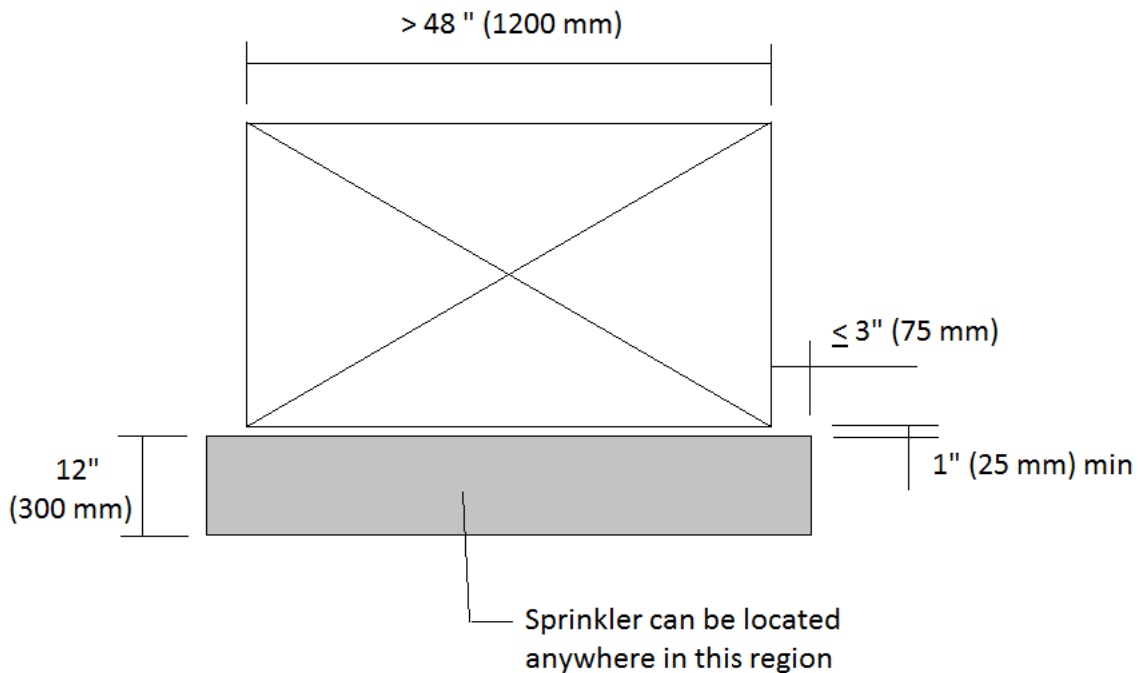
18. Does 11.2.3.1.5.1 require a 3000 ft² hydraulic design area for a combustibile concealed space that meets concealed spaces not requiring sprinkler protection as per 8.15.1.2.3? The space in question is a combustibile concealed space between floors. The space is made up of solid wood studs with less than 6" of space between the ceiling and the bottom of the wood stud (see image above).

The subject of combustibile concealed spaces is a complex one. Generally any combustibile concealed space requires the installation of sprinklers however, several sections of NFPA 13 permit the omission of sprinklers in these spaces. The one in which you describe and as illustrated above is one such space where sprinklers are not required to be installed as per Section 8.15.1.2.3. Further, when the omission of sprinklers is permitted by Chapter 8, Chapter 11 contains provisions for extending the area of protection due to the assumed delay in notification of a fire in such a space. Section 11.2.3.1.5.1 requires the area of operation to be increased to 3000ft² as a result. Further, this increase in operating area must also be applied to any system adjacent to the combustibile concealed space. There are also many instances where an increase in the area of operation is not necessary as permitted by Section 11.2.3.1.5.2 and include such concealed spaces as:

- noncombustibile or limited combustibile concealed spaces having no access (even with such openings as a return air plenum),
- noncombustibile or limited combustibile concealed spaces with limited access and not permitting occupancy or storage of combustibles,
- spaces filled entirely with noncombustibile insulation,
- light or ordinary hazard occupancies where noncombustibile or limited combustibile ceilings are directly attached to wood joists or solid limited combustibile construction or noncombustibile construction creating enclosed joist spaces of 160ft³ (4.5m³) or

less including space below insulation that is laid directly on top of or within ceiling joists in an otherwise sprinklered concealed space

- Concealed spaces where rigid materials are used and the exposed surfaces have a flame spread rating of 25 or less and do not propagate more than 10.5ft (3.2 m) when tested in accordance with ASTM E84 extended for an additional 20 minutes
- Concealed spaces where the exposed materials consist of fire treated wood in accordance with NFPA 703
- Concealed spaces over isolated small rooms that do not exceed 55ft² (5.1 m²) in area.
- Vertical pipe chases less than 10ft² (0.9 m²) in area, that are firestopped at each floor and contain no sources of ignition or combustible piping.
- Exterior columns in 10ft² (0.9 m²) in area formed by studs or wood joists supporting exterior canopies that are protected by a sprinkler system
- Light or ordinary hazard occupancies with noncombustible or limited combustible ceilings are attached to the bottom of composite wood joists either directly or by metal channels not more than 1 In. (25 mm) deep provided that adjacent joist channels are firestopped with volumes not exceeding 160 ft² (4.5 m²) using ½" (13 mm) gypsum (or equivalent) and at least 3.5" (90 mm) of batt insulation is installed at the bottom of the joist channels when the ceiling is attached utilizing metal channels.

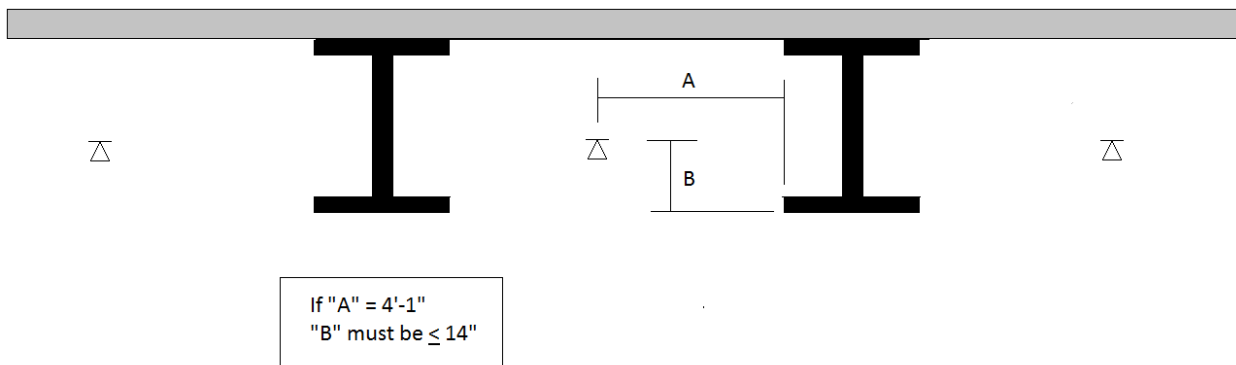


19. I have an obstruction that is 60" (1500 mm) wide. Per NFPA 13 (2016) Section 8.5.5.3.1.1, Sprinklers must be located below the obstruction and not more than 3" from the outside edge of the obstruction.

Question 1: Will this require that the sprinkler head be placed as least 57" (1425 mm) from the opposite edge at minimum?

Question 2: If this is not the case, then what exactly is this requirement asking for?

The sprinkler can be placed anywhere under the obstruction or within 3" (75 mm) outside of the edge of the obstruction. Testing has shown that this placement will still place the sprinkler in such a way as to expose it to any heat that passes by the obstruction. Note that Section 8.5.5.3.1.3 requires the use of an intermediate level (rack) sprinkler when placed adjacent to the obstruction.



20. I have a situation where a sprinkler is located 4'-1" away from the edge of an I-beam and is elevated 15" above the bottom of the beam. What is the minimum distance that the sprinkler deflector can be located above the bottom of the beam?

Table 8.6.5.1.2 indicates that the sprinkler deflector must be not more than 14" above the bottom of the beam. If this condition cannot be met, then the sprinkler is considered to be obstructed and water spray will not extend beyond the edge of the beam flange. Another option is to place another sprinkler on the opposite side of the obstruction in accordance with Section 8.6.5.1.2(2).



21. Regarding the distances from a heating source (such as a diffuser) to a sprinkler as referenced in Table 8.3.2.5(a), how is the specified distance intended to be measured?

When evaluating the distance from a heating source (such as a diffuser) to a sprinkler, the distance should be measured from the edge of the diffuser to the sprinkler. The proximity of the sprinkler to the heating source will also determine the temperature rating of the sprinkler. For example, in the sprinkler pictured above, since the sprinkler is located immediately below the diffuser and is well within a 1ft. radius from the edge, the sprinkler should be of an intermediate temperature rating and not an ordinary temperature rating as shown.