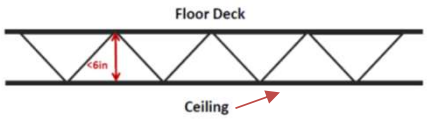
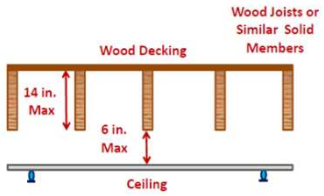
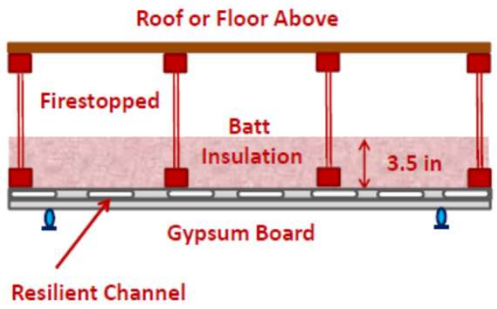
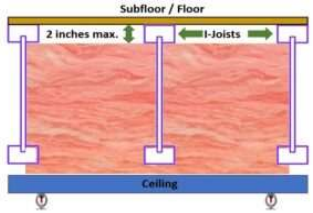
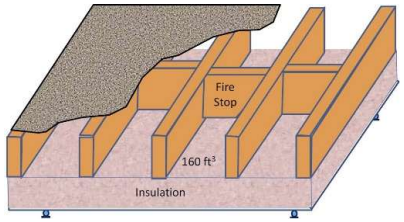
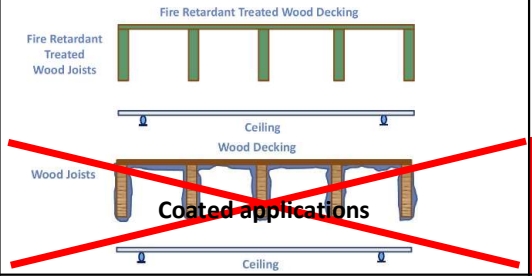
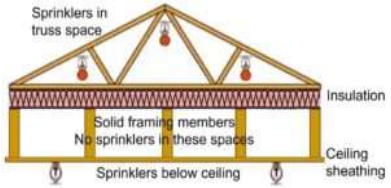
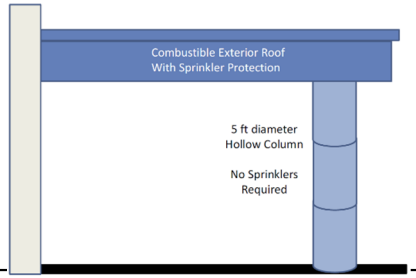
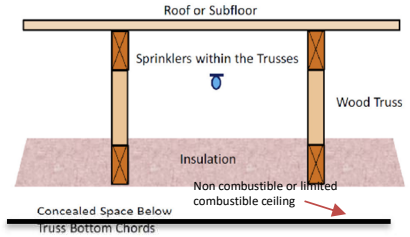
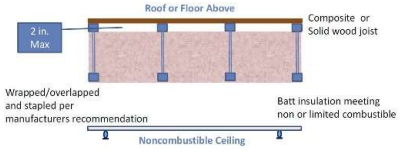
Concealed Space Sprinkler Requirements and Design Area requirements. NFPA 13 - 2013

When looking at sprinkler design in a concealed space, the following steps should be considered:

1. All concealed spaces require sprinkler protection, except as per 2.
2. If a concealed space meets one of the conditions in sections 8.15.1.2.1 through 8.15.1.2.18, and 8.15.6 then sprinkler protection is not required in the concealed space. But will require a design area of minimum 3000 ft^2 when using either the **density/area method** or **room design method**, except as per 3.
3. If a concealed space ALSO meets the requirements of section 11.2.3.1.4(4) (a) through (j), then the Design Area Requirement of 3000 ft^2 is not required.

	NFPA 13 – Chapter 8	Examples	NFPA 13 – Chapter 11	Minimum Design Area Requirement
Code Requirement	*8.15.1.1 Concealed Spaces Requiring Sprinkler Protection. Concealed spaces of exposed combustible construction shall be protected by sprinklers except in concealed spaces where sprinklers are not required to be installed by 8.15.1.2.1 through 8.15.1.2.18 and 8.15.6. 8.15.1.2* Concealed Spaces Not Requiring Sprinkler Protection.*		*11.2.3.1.4 Restrictions. When either the **density/area method** or **room design method** is used, the following shall apply:* *(4) The following unsprinklered concealed spaces shall not require a minimum area of sprinkler operation of 3000 ft^2 (279 m^2):*	
Exceptions	8.15.1.2.1* Concealed spaces of noncombustible and limited combustible construction with minimal combustible loading having no access shall not require sprinkler protection.		(a) Noncombustible and limited-combustible concealed spaces with minimal combustible loading having no access. The space shall be considered a concealed space even with small openings such as those used as return air for a plenum.	Normal
	8.15.1.2.2 Concealed spaces of noncombustible and limited combustible construction with limited access and not permitting occupancy or storage of combustibles shall not require sprinkler protection.		(b) Noncombustible and limited-combustible concealed spaces with limited access and not permitting occupancy or storage of combustibles. The space shall be considered a concealed space even with small openings such as those used as return air for	Normal
	8.15.1.2.3 Concealed spaces formed by studs or joists with less than 6 in. (150 mm) between the inside or near edges of the studs or joists shall not require sprinkler protection. (See Figure 8.6.4.1.5.1.)		N/A	**3000 ft^2**
	8.15.1.2.4 Concealed spaces formed by bar joists with less than 6 in. (152 mm) between the roof or floor deck and ceiling shall not require sprinkler protection.		N/A	**3000 ft^2**
	8.15.1.2.5* Concealed spaces formed by ceilings attached directly to or within 6 in. (152 mm) of wood joist or similar solid member construction shall not require sprinkler protection.			**3000 ft^2**

Except	8.15.1.2.6* Concealed spaces formed by ceilings attached to composite wood joist construction either directly or onto metal channels not exceeding 1 in. (25.4 mm) in depth, provided the joist channels are firestopped into volumes each not exceeding 160 ft³ (4.53 m³) using materials equivalent to the web construction and at least 3-1/2 in. (90 mm) of batt insulation is installed at the bottom of the joist channels when the ceiling is attached utilizing metal channels, shall not require sprinkler protection.		(j)*Light or ordinary hazard occupancies where noncombustible or limited-combustible ceilings are attached to the bottom of composite wood joists either directly or on to metal channels not exceeding 1 in. (25.4 mm) in depth, provided the adjacent joist channels are firestopped into volumes not exceeding 160 ft3 (4.5 m³) using materials equivalent to 1/2 in. (12.7 mm) gypsum board and at least 31/2 in. (90 mm) of batt insulation is installed at the bottom of the joist channels when the ceiling is attached utilizing metal channels.	**3000 ft2 design for LH and OH. when firestopped compartmentized with material equil to TJI** **Normal design when compartmentized and firestopped using material equal to 1/2" drywal**
	8.15.1.2.7 Concealed spaces filled with noncombustible insulation shall not require sprinkler protection. 8.15.1.2.7.1 A maximum 2 in. (50 mm) air gap at the top of the space shall be permitted.		(c) Combustible concealed spaces filled entirely with non-combustible insulation.	Normal
	8.15.1.2.8 Concealed spaces within wood joist construction and composite wood joist construction having noncombustible insulation filling the space from the ceiling up to the bottom edge of the joist of the roof or floor deck, provided that in composite wood joist construction the joist channels are firestopped into volumes each not exceeding 160 ft³ (4.53 m³) to the full depth of the joist with material equivalent to the web construction, shall not require sprinkler protection.		N/A	**3000 ft²**
	8.15.1.2.9 Concealed spaces over isolated small rooms not exceeding 55 ft² (5.1 m²) in area shall not require sprinkler protection.		(g) Concealed spaces over isolated small rooms not exceeding 55 ft² (5.1 m²) in area.	Normal
Exceptions	8.15.1.2.10 Concealed spaces where rigid materials are used and the exposed surfaces have a flame spread index of 25 or less, and the materials have been demonstrated not to propagate fire more than 10.5 ft (3.2 m) when tested in accordance with ASTM E 84, Standard Test Method of Surface Burning Characteristics of Building Materials, or ANSI/UL 723, Standard for Test for Surface Burning Characteristics of Building Materials, extended for an additional 20 minutes in the form in which they are installed, shall not require sprinkler protection.		(e) Concealed spaces where rigid materials are used and the exposed surfaces have a flame spread index of 25 or less and the materials have been demonstrated to not propagate fire more than 10.5 ft (3.2 m) when tested in accordance withASTM E 84, Standard Test Method of Surface Burning Characteristics of Building Materials, or ANSI/UL 723, Standard for Test for Surface Burning Characteristics of Building Materials, extended for an additional 20 minutes in the form in which they are installed in the space.	Normal
	8.15.1.2.11* Concealed spaces in which the exposed materials are constructed entirely of fire retardant–treated wood as defined by NFPA 703 shall not require sprinkler protection. A.8.15.1.2.11 The allowance to omit sprinklers for fireretardant–treated wood requires a pressure-treated application. **It does not apply to coated applications.**		(f) Concealed spaces in which the exposed materials are constructed entirely of fire- retardant treated wood as defined by NFPA 703.	Normal **NOT PERMITTED**

Exceptions	8.15.1.2.12 Noncombustible concealed spaces having exposed combustible insulation where the heat content of the facing and substrate of the insulation material does not exceed 1000 Btu/ft² (11,356 kJ/m²) shall not require sprinkler protection.		N/A	**3000 ft²**
	8.15.1.2.13 Concealed spaces below insulation that is laid directly on top of or within wood joists or composite wood joists used as ceiling joists in an otherwise sprinklered concealed space, with the ceiling attached directly to the bottom of the joists, shall not require sprinkler protection.		d)*Light or ordinary hazard occupancies where noncombustible or limited-combustible ceilings are directly attached to the bottom of solid wood joists or solid limited-combustible construction or noncombustible construction so as to create enclosed joist spaces 160 ft3 (4.5 m3) or less in volume, including space below insulation that is laid directly on top or within the ceiling joists in an otherwise sprinklered >160sqft	Normal 3000 sqft Residential 8 head
	8.15.1.2.14 Vertical pipe chases under 10 ft² (0.93m²), where provided in multifloor buildings where the chases are firestopped at each floor using materials equivalent to the floor construction, and where such pipe chases shall contain no sources of ignition, piping shall be water- filled or noncombustible and pipe penetrations at each floor shall be properly sealed and shall not require sprinkler protection.		(h) Vertical pipe chases under 10 ft² (0.93 m²), provided that in multifloor buildings the chases are firestopped at each floor using materials equivalent to the floor construction, and where such pipe chases shall contain no sources of ignition, piping shall be noncombustible, and pipe penetrations at each floor shall be properly sealed.	Normal
	8.15.1.2.15 Exterior columns under 10 ft² (0.93 m²) in area, formed by studs or wood joist supporting exterior canopies that are fully protected with a sprinkler system, shall not require sprinkler protection.		(i) Exterior columns under 10 ft² (0.93m²) in area formed by studs or wood joists, supporting exterior canopies that are fully protected with a sprinkler system.	Normal
Exceptions	8.15.1.2.16* Concealed spaces formed by noncombustible or limited-combustible ceilings suspended from the bottom of wood joists, composite wood joists, wood bar joists, or wood trusses that have insulation filling all of the gaps between the bottom of the trusses or joists, and where sprinklers are present in the space above the insulation within the trusses or joists, shall not require sprinkler protection.		N/A	**3000 ft²**
	8.15.1.2.17* Concealed spaces formed by noncombustible or limited-combustible ceilings suspended from the bottom of wood joists and composite wood joists with a maximum nominal chord width of 2 in. (50.8 mm), where joist spaces are full of noncombustible batt insulation with a maximum 2 in. (50.8 m) air space between the roof decking material and the top of the batt insulation shall not require sprinklers.		N/A	**3000 ft²**

	8.15.1.2.17.1 Facing that meets the requirements for noncombustible or limited-combustible material covering the surface of the bottom chord of each joist and secured in place per the manufacturer's recommendations shall not require sprinklers.		N/A	**3000 ft²**
	8.15.1.2.18 Soffits, Eaves, Overhangs, and Decorative Frame Elements.			
	8.15.1.2.18.1 Combustible soffits, eaves, overhangs, and decorative frame elements shall not exceed 4 ft 0 in. (1.2 m) in width			
	8.15.1.2.18.2 Combustible soffits, eaves, overhangs, and decorative frame elements shall be draftstopped, with a material equivalent to that of the soffit, into volumes not exceeding 160 ft3 (4.5 m3).			
	8.15.1.2.18.3 Combustible soffits, eaves, overhangs, and decorative frame elements shall be separated from the interior of the building by walls or roofs of noncombustible or limited-combustible construction.			
	8.15.1.2.18.4 Combustible soffits, eaves, overhangs, and decorative frame elements shall have no openings or unprotected penetrations directly into the building.			
	8.15.6 Spaces Under Ground Floors, Exterior Docks, and Platforms. 8.15.6.1 Unless the requirements of 8.15.6.2 are met, sprinklers shall be installed in spaces under all combustible ground floors and combustible exterior docks and platforms. 8.15.6.2 Sprinklers shall be permitted to be omitted from spaces under ground floors, exterior docks, and platforms where all of the following conditions exist: (1)The space is not accessible for storage purposes and is protected against accumulation of wind-borne debris. (2) The space contains no equipment such as conveyors or fuel-fired heating units. (3) The floor over the space is of tight construction. (4) No combustible or flammable liquids or materials that under fire conditions would convert into combustible or flammable liquids are processed, handled, or stored on the floor above the space.			

Additional Information:

(3)*

11.2.3.1.4 Restrictions. When either the density/area method or room design method is used, the following shall apply

3)Unless the requirements of 11.2.3.1.4(4) are met for buildings having unsprinklered combustible concealed spaces, as described in 8.15.1.2 and 8.15.6, the minimum area of

11.3 Special Design Approaches.

11.3.1 Residential Sprinklers.

11.3.1.1* The design area shall be the area that includes the four adjacent sprinklers that produce the greatest hydraulic demand.

11.3.1.2* Unless the requirements of 11.2.3.1.4(4) are met for buildings having unsprinklered combustible 8.15.6, the minimum design area of sprinkler operation

11.3.1.2.1* The design area of eight sprinklers shall be applied only to the portion of the residential sprinklers that are adjacent to the qualifying

11.3.1.2.2 The term adjacent shall apply to any sprinkler system protecting a space above, below, or next to the qualifying concealed space except

Definitions:

3.3.17 **Noncombustible Material**. A material that, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or

3.3.16* **Limited-Combustible (Material)**. Refers to a building construction material not complying with the definition of noncombustible material that, in the form in