

Update on Technical Changes to the Fire Sprinkler Requirements (NFPA 13 and IBC 2006)



Cecil Bilbo, Jr.
Director of Technical Services



2007 Chapter Format

- Chapter 1 – 11
 - Basically Unchanged in Format
- Chapter 12 - General Requirements for Storage
- Chapter 13 - Miscellaneous Storage
- Chapter 14 – Class I-IV: Palletized, Solid Pile, Bin Box, or Shelf Storage

2

2007 Chapter Format

- Chapter 15 – Plastics: Palletized, Solid Pile, Bin Box, or Shelf Storage
- Chapter 16 – Class I-IV: Rack Storage
- Chapter 17 – Plastics: Rack Storage
- Chapter 18 – Rubber Tire Storage
- Chapter 19 – Rolled Paper
- Chapter 20 – Special Designs

3

2007 Chapter Format

- Chapter 21 – Special Occupancies
- Chapter 22 – Plans and Calculations
- Chapter 23 – Water Supplies
- Chapter 24 – System Acceptance
- Chapter 25 – Marine Systems
- Chapter 26 – Inspection, Testing, and Maintenance

4



Chapter 5
Classification of Occupancies
and Commodities

Chapter 5

- 5.3.1* Ordinary Hazard (Group 1) occupancies or portions of occupancies where combustibility is low, quantity of combustibles is moderate, stockpiles of combustibles do not exceed 8 ft (2.4m), and fires with moderate rates of heat release are expected. Dedicated and Miscellaneous storage shall be protected in accordance with Chapter 12 and 13 as applicable.

6

Chapter 5

- 5.3.2 Ordinary Hazard (Group 2) occupancies or portions of other occupancies where the quantity and combustibility of contents are moderate to high, where stockpiles of contents with moderate rates of heat release do not exceed 12 ft and stockpiles of contents with high rates of heat release do not exceed 8 ft. Dedicated and Miscellaneous storage shall be protected in accordance with Chapter 12 and 13 as applicable.

7

Chapter 5

- A.5.3.2 Exterior loading docks only utilized for loading and unloading should be classified as OH2. Where utilized for storage exterior loading docks and all interior loading docks should be protected based upon the actual occupancy, the materials handled on the dock, as if the materials were actually stored in that configuration.

8



Chapter 6 System Components and Hardware

Chapter 6 - Welding

- Updated Welding requirements:
 - ASME Section IX – Welding and Brazing Qualifications.
 - Stamp on each piece of pipe vs weld.
 - Annex clarifications on types of welds and stress calculations to specify minimum weld size.

10

Chapter 7 – Dry Pipe Systems

- 60 Seconds to Inspector's Test
UNLESS:
 - 500 gallons and less, no time limit
 - 750 gallons and less, with QOD no time limit
 - If calculated for water delivery, time limit to test manifold in accordance with the Table 7.2.3.6.1

11

Dry-Pipe Systems Table for Alternate Delivery Times

- Table 7.2.3.6.1 – Get water to:
 - LH in 60 seconds, with 1 sprinkler open
 - OH in 50 seconds, with 2 sprinklers open
 - EH in 45 seconds, with 4 sprinklers open
 - High-piled storage in 40 seconds, with 4 sprinklers open
- For computer program, still need an ITC to establish baseline time
- For manifold, need multiple orifice connection

12



Chapter 7 - Dry Pipe Manifold for 4 Sprinklers Open

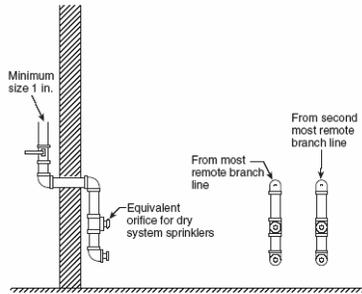


FIGURE A.7.2.3.5.

13

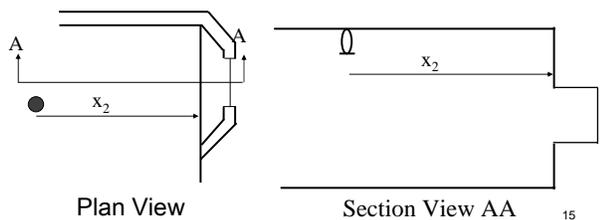
Chapter 8 - General

- 8.1.1(7) Furniture, such as portable wardrobe units, cabinets, trophy cases and similar features not intended for occupancy, do not require sprinklers to be installed in them. This type of feature shall be permitted to be attached to the finished structure.
- 8.5.3.2.3 The distance from the wall to the sprinkler shall be measured to the wall behind furniture, such as: wardrobes, cabinets, and trophy cases.

14

Bay Window With No Floor Area

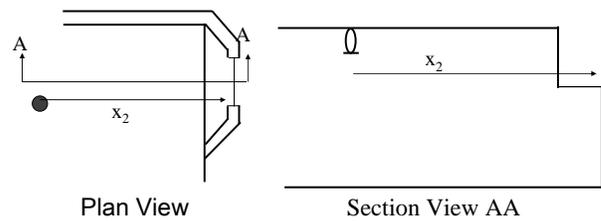
Measure distance from the center of the sprinkler to the wall, not the window



15

Bay Window Creating Floor Area

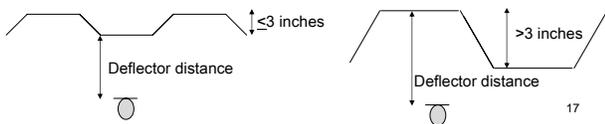
Measure distance from the center of the sprinkler to the wall with the window in it



16

Chapter 8 - Measurement

- For corrugated metal deck roofs up to 3 in., (76 mm) in depth, the distance shall be measured to the sprinkler from the bottom of the deck. For deeper decks, the distance shall be measured to the highest point on the deck.



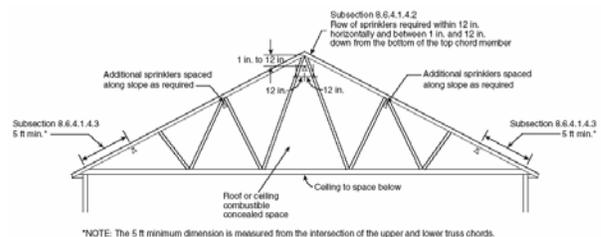
Chapter 8 – Detached Buildings

- 8.2.5* Detached Buildings.
- 8.2.5.1 Unless the requirements of Section 8.2.5.2 apply, detached buildings, regardless of separation distance, that do not meet the criteria of section 8.2.4 shall be provided with separate fire sprinkler systems.
- 8.2.5.2 When acceptable to the authority having jurisdiction detached structures shall be permitted to be supplied by the fire sprinkler system of an adjacent building. (See annex item A.8.2.5 for guidance.)

Chapter 8 – Sloped Combustible

- Concealed Spaces with Wood Truss or Wood Joist – 3 ft. or less on center with a slope greater than 4 in 12.
 - 12 in. horizontally from peak.
 - 12 in. vertically from the peak.
 - Outer row at least 5 ft from the intersection of the truss chords or the wood rafters and ceiling joists.

Chapter 8 – Sloped Combustible



Chapter 8 – EC and Residential Sidewall

- 8.9.4.1.3.3 Soffits and Cabinets in Residential Areas/Occupancies
 - 8 inch rule for soffits
 - Sidewall sprinkler at face of soffit over cabinets up to 12 inches wide
- Annex Note
 - Rules developed from testing by NFSA
 - With kitchen cabinets, pendants better than sidewalls
 - It is not the intent to require sprinklers under

21

Chapter 8 - ESFR

- ESFR Sprinklers
 - Minimum Protection Area of Coverage. The minimum allowable protection area of coverage for a sprinkler (A_s) shall not be less than 64 ft² (6m²).

22

Chapter 9 – Hanger Rods

- 9.1.2.3 Hanger rods shall be installed so that lateral gravity loads are not induced on the rods.

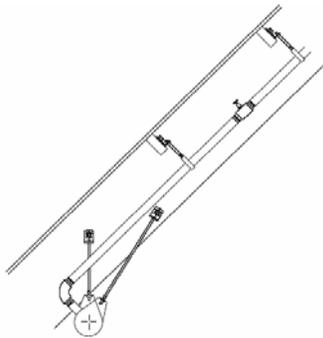


FIGURE A.9.1.2.3

Chapter 9 – Flexible Sprinkler Hose

- 9.2.1.3.3* Flexible Sprinkler Hose Fittings.
 - A.9.2.1.3.3 Examples of areas of use include clean rooms, suspended ceilings, and exhaust ducts.
- 9.2.1.3.3.1 Listed flexible sprinkler hose fittings and its anchoring components, intended for use in installations connecting the sprinkler system piping to sprinklers shall be installed in accordance with the requirements of the listing including any installation instructions.

24

Chapter 9 – Flexible Sprinkler Hose

- 9.2.1.3.3.2 When installed and supported by suspended ceilings the ceiling shall meet ASTM C-635 and shall be installed in accordance with ASTM C-636.
- 9.2.1.3.3.3* Where flexible sprinkler hose fittings exceed 6 ft in length and are supported by a suspended ceiling a hanger attached to the structure shall be required to ensure that the maximum unsupported length does not exceed 6ft.

25

Chapter 9 - Seismic

- **Seismic Bracing Changes – Why?**
 - NFPA 13 complies with the requirements and permitted limits of ASCE 7.
 - NFPA 13 applicable for all seismic situations.
 - Simplified method without requiring a complete engineering analysis.
 - Allows for the seismic design requirements for sprinkler systems to remain in NFPA 13.
 - Provide as much material as possible in NFPA 13 to limit need for outside sources.

26

Chapter 22 – Hydraulic Reports

- 22.3.5 Computer Generated Hydraulic Reports. – Committee Standardized the material reported in hydraulic reports effective January 1, 2008:
 - Summary Sheet
 - Graph Sheet
 - Supply Analysis
 - Node Analysis
 - Detailed Worksheets

27

Chapter 23 - Treatment

- 23.1.5.2 Water supplies and environmental conditions shall be evaluated for conditions that contribute to unusual corrosive properties. Where conditions are found that contribute to unusual corrosive properties, the owner(s) shall notify the sprinkler system installer and a plan shall be developed to treat the system using one of the following methods:
 - (1) Install a water pipe that is corrosion resistant.
 - (2) Treat all water that enters the system using an approved corrosion inhibitor.
 - (3) Implement an approved plan for monitoring the interior conditions of the pipe at established intervals and locations.

28



Signs for everything

The Committee felt the need to
“communicate”.

- Control Valves
- Auxiliary Drains
- Head Cabinets
- Riser Data Plate

29

Control Valves

- 6.7.4.3.1* Systems that have more than one control valve that must be closed to work on a system or space shall have a sign referring to existence and location of other valves

30

SPRINKLER SYSTEM — GENERAL INFORMATION	
for _____	
High-piled storage	<input type="checkbox"/> Yes <input type="checkbox"/> No
Rack storage	<input type="checkbox"/> Yes <input type="checkbox"/> No
Commodity class	_____
Max. storage ht	_____ ft
Aisle width (min.)	_____ ft
Encapsulation	<input type="checkbox"/> Yes <input type="checkbox"/> No
Solid shelving	<input type="checkbox"/> Yes <input type="checkbox"/> No
Flammable combustible liquids	<input type="checkbox"/> Yes <input type="checkbox"/> No
Other storage	<input type="checkbox"/> Yes <input type="checkbox"/> No
Hazardous materials	<input type="checkbox"/> Yes <input type="checkbox"/> No
Idle pallets	<input type="checkbox"/> Yes <input type="checkbox"/> No
Antifreeze systems	<input type="checkbox"/> Yes <input type="checkbox"/> No
Dry or aux systems	<input type="checkbox"/> Yes <input type="checkbox"/> No
Location:	_____
Name of contractor or designer: _____	
Address:	_____
Phone:	_____
Date:	_____
Flow test data:	_____
Static:	_____ psi
Resid:	_____ psi
Flow:	_____ gpm
PItest:	_____ psi
Date:	_____
Location:	_____
Location of aux/low point drains:	_____
Original main drain test results:	_____
Static:	_____ psi
Residual:	_____ psi

Figure A.16.6 Sprinkler System General Information

31

Sprinkler TechNotes

- Jan/Feb 2006 – ROC Changes to NFPA 13
- Mar/Apr 2006 – ROC Changes to NFPA 13R and NFPA 13D
- May/June 2006 – ROC Changes to NFPA 20
- Sept/Oct 2006 – NFPA Meeting changes and Standards Council Appeals
- Nov/Dec 2006 – Summary of major changes to NFPA 13

32



2006 IBC Fire Sprinkler Update

Independent control for tenant spaces in malls

The covered mall building and buildings connected must be protected with a NFPA 13 sprinkler system.

Sprinkler protection for the mall has to be independent from that provided for tenant spaces or anchors. Where tenant spaces are supplied by the same system, they shall be independently controlled.

[Section 402.8]

33

Ceiling of atrium over 55 ft high

The area of the building adjacent to or above the atrium does not have to be sprinklered, provided that portion of the building is separated from the atrium portion by a 2-hour fire-resistance-rated fire barrier or horizontal assembly.

If the ceiling of the atrium is over 55 feet then sprinkler protection at the ceiling of the atrium is not required.

[Section 404.3]

34

Spaces for telecommunications equipment

Sprinklers are not required in spaces or areas with telecommunications equipment and associated equipment provided the space is equipped with a fire alarm system and is separated from the remainder of the building by fire barriers

[Section 903.2 (Exception)]

35

Rubbish and linen chutes

Sprinkler have to be installed at the top of rubbish and linen chutes and in their terminal rooms.

Chutes extending through three or more floors must have additional sprinklers installed at alternate floors.

[Section 903.2.10.2]

36



Exempt locations

1. Any room where the application of water, or flame and water, constitutes a serious life or fire hazard.
2. Any room or space where sprinklers are considered undesirable because of the nature of the contents, when approved by the fire code official.
3. Generator and transformer rooms separated from the remainder of the building by walls and floor/ceiling or roof/ceiling assemblies having a fire-resistance rating of not less than 2 hours.
4. In rooms or areas that are of noncombustible construction with wholly noncombustible contents.

* The areas must be protected with a fire detection system

[Section 903.3.1.1.1]

37

Balconies and decks on occupancies protected by NFPA 13R

Sprinklers must be provided on exterior balconies, decks and ground floor patios where the building is of Type V construction.

Sidewall sprinklers can be located with their deflectors within 1 - 6 inches below the structural members and a maximum distance of 14 inches below the deck of the exterior balconies and decks that are constructed of open wood joist construction.

[Section 903.3.1.2.1]

38

Backflow requirements

The potable water supply shall be protected against backflow in accordance with the requirements of this section and the *International Plumbing Code*.

[Section 903.3.5]

39

Domestic supply and limited area systems

Limited area sprinkler serving fewer than 20 sprinklers are permitted to be connected to the domestic service.

1. Valves shall not be installed between the domestic water riser control valve and the sprinklers.
Exception: An approved indicating control valve supervised in the open position.
2. The domestic service shall be capable of supplying the simultaneous domestic demand and the sprinkler demand required to be hydraulically calculated

[Section 903.3.5]

40



Secondary supply in seismic zones

A secondary on-site water supply equal to the hydraulically calculated sprinkler demand, including the hose stream requirements, must be provided for high-rise buildings in Seismic Design Category C, D, E or F.

The secondary water supply shall have a duration of not less than 30 minutes as determined by the occupancy hazard classification in accordance with NFPA13.

Exception: Existing buildings.

[Section 903.3.5.2]

41

High-rise waterflow alarm for each floor

In buildings with a floor used for human occupancy that is located more than 75 feet above the lowest level of fire department vehicle access, a separate zone by floor shall be provided for sprinkler water flow devices.

[Section 907.8.2]

42

Contact and Membership Info

Professional Memberships - \$165.00 / yr

www.nfsa.org

National Fire Sprinkler Association
40 Jon Barrett Rd.
Patterson, NY 12563
845-878-4200

Cecil Bilbo, Jr. Director of Technical Services
1 Main St., Champaign, IL 61820

43

