

LA FIRE SPRINKLER ASSOCIATION QUARTERLY MEETING  
APRIL 20, 2005  
SFM ITEMS OF CONCERN

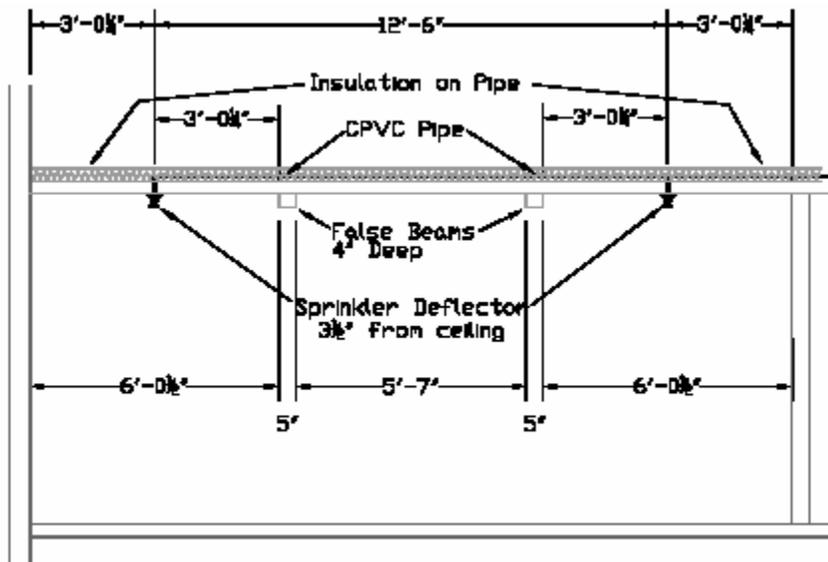
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1 2002 NFPA 13: 8.14.1.2.3 SPRINKLER PROTECTION OF COMBUSTIBLE CONCEALED SPACES WITH LESS THAN 6" BETWEEN OPPOSITE FACES IN CAVITY.

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Please be advised that this office takes guidance from NFPA 13: 8.14.1.2.3, 2002 edition. If a combustibile concealed space has a dimension of less than 6" between opposite faces of construction within the cavity, then sprinklers are not required.

As an example, regarding the 4" x 4" false beams in the following detail, sprinkler protection is not required. Because the opposite faces are less than 6", filling the cavity with non-combustibile insulation per NFPA 13:8.14.1.2.7, is also not required.



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2 2002 NFPA 13: 3.3.21 REQUIREMENTS FOR MINIMUM OF ONE SPRINKLER RISER PER BUILDING.

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11-18-2004 Inquiry to Christian Dubay, NFPA 13 Liaison Committee Member:

Scenario: Two buildings with demising wall separation (side by side). Underground private main turns up, through slab, in Building 1. Goes through control valve, backflow preventer, control valve, then splits. One side of tee serves Building 1 riser. Other side of tee goes back underground and then serves Building 2 riser. Therefore, Building 2 is susceptible to having water shut off by control valve in Building 1.

It looks to me like the intent of the referenced code section is to require that each building have its own control valve and, by default, control valves cannot be installed in buildings other than the building sprinkler system served by the control valve.

11-19-04 Response from Christian Dubay:

NFPA 13 Section 3.3.21 requires that a sprinkler system be in a single building or structure. Where the building is considered separate buildings each building would require its own sprinkler system. The determination of separate, but attached buildings is based upon the building code. If the building code considers the proposed arrangement two separate buildings then they must be treated as such.

Please note that Chapter 15 on water supplies does not permit one sprinkler system to supply another sprinkler system. This arrangement is not an acceptable form of water supply per NFPA 13.

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3 1999 NFPA 13: REGARDING FIRE DEPARTMENT CONNECTION LOCATION TO SPRINKLER SYSTEM.  
5-15.2.3.1,  
5-15.2.3.2(1)  
FI 91-2

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11-19-2004 Inquiry to Christian Dubay, NFPA 13 Liaison Committee Member:

Scenario: Given a wet pipe sprinkler system with a single system riser. Questions are:

1. Can the fire department connection be connected to a system cross main?
2. Can the fire department connection be connected to a system feed main?
3. Regarding Questions 1 and 2; is there a minimum allowed size of the mains to which the FDC piping may connect?
4. For gridded systems, can the fire department connection be connected to a system cross main?
5. Is the "point of attachment" meant to mean: "size of cross main pipe"?
6. Could the following review comment, based on the 1999 edition, be correct?

13: 5-15.2.2 Fire department connection pipe size shall be 4 in. for fire engine connections. This item is deficient in that the portion of the fire department connection piping, which includes the 2 1/2 inch feed main at the 1st Floor, between the point of connection to the main and the riser, is smaller than the system riser, which rises as 4-inch size, up to the 2nd Floor.

11-23-04 Response from Christian Dubay:

In response to your email it appears that you have a correct understanding of the intent of the FI. While it is acceptable to connect a FDC to a remote portion of the system the key points are that the pipe to which the FDC piping is attached to is at least as large as the FDC piping (e.g., 4 inches) and that there are no shut-offs that would isolate the FDC from supplying the entire system.

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4 2000 NFPA 14: SCOPE OF HOSE STATIONS AT STANDPIPE SYSTEMS.  
5-3.2(e)

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01-18-2005 Question:

Is the intent of the referenced code section, that hose connections be provided for roof access at all standpipes for a building? For example:

10 story building. Building has 3 standpipes, each in a required exit stair. Only one exit stair accesses the roof. The other two serve ten floors. Is the intent of code for the 2 ten-story standpipes to each have hose connections on the roof and the exit stair that serves the roof to have hose connection at the intermediate landing between 10th floor and roof deck?

01-21-2005 response from David Hague, PE, NFPA:

The intent of the standard is to treat the roof as a floor of the building. Roof outlets are required based on the travel distance limitations in 5.3.2(f).

There is currently a proposal to revise NFPA 14 for the 2006 edition to indicate this more clearly with an exception for buildings having a roof slope of more than 3" in 12".

01-21-2005 comment from Jean Carter, Architect/Engineer Supervisor, SFM:

Looks like answer to your question depends on distance from standpipe access from at deck to most remote area of roof. Since building is sprinklered, then if any portion of roof exceeds 250 feet from hose connection, the additional hose station(s) must be provided.

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5      2002 NFPA 13:8.4.5      NFPA 13 VS NFPA 13R IN BUILDINGS WITH MULTIPLE OCCUPANCIES  
2002 NFPA 13R:1.1, 6.7

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NFPA 13R:A.1.1 has been expanded in the 2002 edition of the code and the new portion is reiterated as follows. Please note that the left hand vertical bar signifies portion of the text which is new to this edition.

**A.1.1** NFPA 13R is appropriate for use as an option to NFPA 13, *Standard for the Installation of Sprinkler Systems*, only in those residential occupancies, as defined in this standard, up to and including four stories in height. It is the intent of this standard that if NFPA 13R is appropriate for use, that it be used throughout the entire building. It is recognized that an occupancy incidental to the operations of the residential occupancy might exist within that residential occupancy. Such incidental occupancy would be considered part of the predominant (residential) occupancy and subject to the provisions of the predominant (residential) occupancy by 6.1.14.2 of NFPA 101®, *Life Safety Code*®, and similar provisions in many local building and fire codes. Use of NFPA 13R throughout the entire building in this case is allowed.

Where buildings are greater than four stories in height, or where buildings are of mixed use where residential is not the predominant occupancy, residential portions of such buildings should be protected with residential or quick-response sprinklers in accordance with 8.4.5 of NFPA 13. Other portions of such buildings should be protected in accordance with NFPA 13. Where buildings of mixed use can be totally separated so that the residential portion is considered a separate building under the local code, NFPA 13R can be used in the residential portion, while NFPA 13 is used in the rest of the building.

Therefore, based on the information presented in Annex A of NFPA 13R, this office makes the following determinations:

For multiple occupancy buildings containing a residential occupancy, the designer must investigate the sprinkler system requirements for all occupancies in the building. The designer must consult the applicable NFPA 101 occupancy chapters and core chapters.

1. If any of the non-residential occupancies are required by code to be sprinklered, then the entire building shall be protected in accordance with NFPA 13, regardless of the physical location of the residential occupancy within the building.
  - A. Example A: 3-story building, 15,000 sq. ft. per floor. First floor is mercantile, open to the public. Second and third floors are apartments – residential occupancies. Regarding the mercantile occupancy, NFPA 101:36.3.5.1(3) requires mercantile occupancies exceeding 12,000 sq. ft. to be sprinklered. Therefore, a NFPA 13 sprinkler system for the entire building is required. Residential occupancies within the building may be designed per NFPA 13:8.4.5.
  - B. Example B: 3-story building, 9,000 sq. ft. per floor. First floor is mercantile, open to the public. Second and third floors are apartments – residential occupancies. However, one of the required exit stairs from the second and third floors discharges into a protected exit passageway - a rated corridor, at the first floor. Also, this same exit passageway is one of the required exits for the mercantile occupancy. Therefore, both occupancies have to share a portion of their required exiting design, which meets the definition of a mixed occupancy.

NFPA 101:6.1.14.3.2 requires that means of egress, type of construction, and other building safeguards shall comply with the most restrictive fire and life safety requirements of the occupancies involved. Therefore, each occupancy chapter has to be consulted.

#### Chapter 30 Apartment Buildings

In example B, NFPA 101:30.1.2.3(1) cannot be met because of the shared, partial exiting. Section 30.1.2.3(2) requires the mercantile occupancy to be sprinklered per Section 9.7. Since the mercantile occupancy is non-residential, it must be protected per NFPA 13 and not NFPA 13R. With Section 6.1.14.3.2 required to be enforced, the entire building must be sprinklered per Section 9.7, so the entire building must be sprinklered per NFPA 13. NFPA 13:8.4.5 allows the use of residential sprinklers within dwelling units but the building sprinkler design must be from NFPA 13.

#### Chapter 36 Mercantile Occupancies

In example B, NFPA 101:36.1.2.1.1 requires conformance with Section 6.1.14. As a mixed occupancy, Section 6.1.14.1.1 requires conformance with 6.1.14.3. Section 6.1.14.3.2 requires egress, construction type, protection and other safeguards to comply with most restrictive occupancy, in this case, Chapter 30. Per paragraph above, the entire building must be sprinklered per Section 9.7, so the entire building must be sprinklered per NFPA 13.

2. If all of the non-residential occupancies are not required by code to be sprinklered, when disregarding the residential occupancy, then the entire building may be designed utilizing NFPA 13R, provided NFPA 101 allows 13R for the residential occupancy involved. In a NFPA 13R design, non-residential occupancies shall comply with NFPA 13R:6.7.2 and 6.7.3.
- C. Example C: 3-story building, 9,000 sq. ft. per floor. First floor is mercantile, open to the public. Second and third floors are apartments – residential occupancies. Each occupancy has its own separate and independent exiting, per code. In accordance with NFPA 101:36.3.5.1, Example C does not engage any of the four subparagraphs (1) through (4), therefore, the mercantile occupancy is not required to be sprinklered. However, NFPA 101:30.3.5.1 requires all buildings containing dwelling units to be fully sprinklered unless Section 30.3.5.2 can be met.

In Example C, no portion of Section 30.3.5.2 can be met, therefore, the entire building must be fully sprinklered. In this example, Section 30.3.5.3 allows the use of NFPA 13R. Since Chapter 30 is driving the requirement for a building sprinkler system, the entire building may be protected per NFPA 13R. Under NFPA 13R, areas outside the dwelling units must comply with NFPA 13R:6.7.2.

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6 2002 NFPA 13: WATER SUPPLY REQUIREMENTS FOR ROOM DESIGN METHOD.  
11.2.3.3

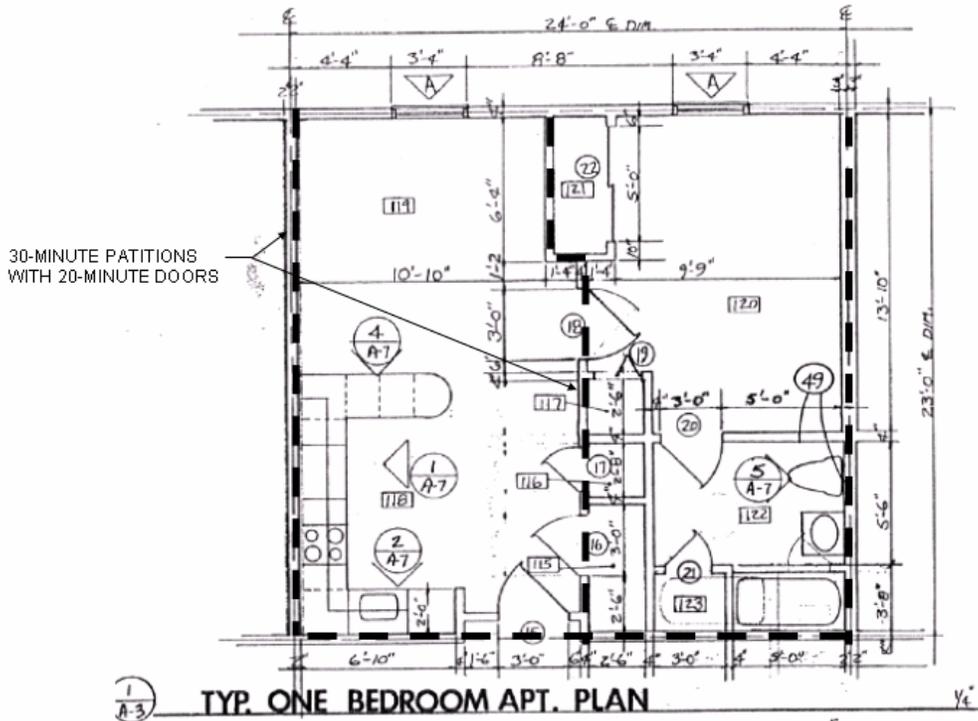
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04-10-2005 Question:

We have had internal discussions recently in regards to an NFPA rule that I need to secure your formal interpretation on. Per NFPA 13:11.2.3.3 Room Design Method:

“The water supply requirements for sprinklers only shall be based upon the room that creates the greatest demand.”

Does the SFM's office officially consider the appendix in the review since this is a "should" not a "shall" ruling?



04-12-2005 SFM response:

Annex A is just more explanatory information to support 12.2.3.3.1. Annex A says, "For example, in a case where the largest room has four sprinklers and a smaller room has two sprinklers but communicates through unprotected openings with three other rooms, each having two sprinklers, the smaller room and group of communicating spaces should also be calculated." The word "should" is misleading. The intent of the annex is that the designer must study all portions of a sprinklered plan, when contemplating room design. The walls and all openings, including door openings, must be rated as per Section 11.2.3.1.1. The designer must prove the worst hydraulic case, based on code requirements.

Room design is seldom submitted for review, but when it is, we check to make sure all partitions are appropriately fire rated. If not, then we must include all rooms surrounded by rated construction as "one room". If all rooms are rated correctly, but the doors are not, then we must include all rooms surrounded by rated construction, containing the non-rated or substandard rated doors, as "one room". This scenario is what the annex is referring to.

As designer, you must investigate, differentiate, and present hydraulic areas that you believe satisfies "worst case" hydraulic design. When we get your room design package, if we review it and are suspect about an area being, possibly, most hydraulically remote, then we will require additional calculations, unless you can justify the hydraulic areas presented, as "worst case".

Question:

If the SFM's office does, what is your interpretation on A.11.2.3.3.1? Are "all" the adjoining rooms and closets required to be calculated?

SFM response:

If all partitions and all openings are properly fire rated, per Section 11.2.3.1.1, then the worst case is probably the room with the most heads in it. Therefore, you would not have to calculate rooms with adjacent rooms and closets, unless the partitions or doors do not comply with Section 11.2.3.1.1.

Question:

Utilizing 11.2.3.3.4, If the room is smaller than 1500 sf then 11.2.3.1.8 1 or 2 shall apply. This would mean only calculating the "Kitchen Area (Room 118 & 119)" in our attached room layout. Is this correct?

SFM response:

Calculating the kitchen/living area would be the most hydraulically demanding "large room", provided all partitions in the entire building, are rated a minimum of 30 minutes, and the kitchen/living area shown on attachment was the largest room with the most heads. All room compartments must satisfy the 30-minute fire resistance requirement. With 30 minute walls, refer to NFPA 101:8.3.4 - all doors must have a minimum 20-minute rating and must be self closing, per 101:Table 8.3.4.2.

However, if only "some" of the partitions in the building meet the minimum 30-minute requirement, then you must investigate for the hydraulically most demanding area. At 61 sq. ft., the bathroom requires sprinkler protection, per NFPA 13:8.14.8.1.1. It appears that all closets are less than 24 sq. ft., meet all requirements of NFPA 13:8.14.8.2, and do not need sprinkler protection in each.

For example purposes only, I placed a dashed line on your sample plan (see above). The dashed lines represent 30-minute fire barriers. The unmarked, remaining partitions do not meet the minimum 30-minute requirement. In other words, the bedroom, bathroom and all five closets now become one large communicating space, and must be acknowledged as "one room" when using the room design method. In this case, both the bedroom and bathroom would be "communicating", meeting the intent of NFPA 13:A.11.2.3.3.1.

Another example: say all partitions throughout building can be verified as 30-minute rated, but the doors from living area to bedroom and bedroom to bathroom are not minimum 20-minute rated. If this is the case, then the entire residential unit has to be acknowledged as "one room" when using room design method. In this case, all three rooms would be "communicating", meeting the intent of NFPA 13:A.11.2.3.3.1.