



## PROTECTED THROUGHOUT?



A phrase that is used over and over again in the codes, “*protected throughout with an automatic sprinkler system in accordance with 903.3.1.1*”, is a simple phrase that has a multitude of hidden twists and turns. The codes provide several exceptions where sprinklers may be omitted, but once omitted for whatever reason, is the facility sprinklered throughout? Does sprinklers throughout mean in attics, joist spaces, cavities above suspended ceilings? What about mechanical shafts, stairways, elevator shafts, elevator machine rooms, bathrooms, wardrobes, extremely small closets, electrical vaults, bank vaults, transformer rooms, canopies, porches? I’m sure that you can add several unique locations to the list. Is a sprinklered facility entitled to the many trade-offs offered due to sprinklers throughout once sprinklers have been omitted from a room or space?

With all these questions, lets see if we can find some answers. When the building code requires or allows trade offs for sprinklers throughout it usually requires the system to be “*in accordance with section 903.3.1.1, 903.3.1.2 or 903.3.1.3*”. The phrase is easier to understand if read “in accordance with NFPA 13, 13R or 13D” as the three code sections deal with the three NFPA sprinkler codes. The issue is further complicated by the use of a separate sprinkler code (NFPA 13) providing its’ own list of areas where sprinklers are not required.

A sprinkler system is a water based fire suppression system and includes the common wet, dry, preaction and deluge systems. Not as common are the water mist systems and water/foam systems. These two systems, while water based, are not covered by NFPA 13, 13R or 13D and would not be in accordance with the code for “sprinklers throughout”. While not listed by section 903.3, these two water-based systems should be considered as providing automatic sprinkler protection. NFPA 750 covers water mist systems, while NFPA 16 covers the water/foam systems.

Other fire suppression systems using extinguishing agents other than water are not considered a sprinkler system. This includes wet and dry chemical, and clean gaseous agents. With chemical or gaseous fire suppression systems, the quantity of suppression agent is limited. If the initial release does not fully suppress the fire, there is typically no reserve to provide a second or third application. Water for fire suppression may also be limited, especially in rural areas, however the systems are designed to provide water for 30 to 120 minutes based on the hazard. This provides time for the fire department to respond to a fire call. In addition, water suppression systems are designed to be augmented by the servicing fire departments, through fire department connections.

We will concentrate on NFPA 13 and the International Building Code (IBC) and save 13R & 13D for another time. Most of the building code references to automatic sprinklers throughout call for compliance with section 903.3.1.1 (NFPA 13). NFPA 13 tells use where sprinklers may be omitted. It



leaves several areas that do not require sprinklers do to the areas size, combustibility, or hazard. In addition, the IBC 903.3.1.1 lists four exceptions where sprinklers may be omitted in a building “sprinklered throughout”. Therefore, areas not required to be sprinklered by NFPA 13 or IBC 903.3.1.1 due to any exception, condition or function would not violate the sprinklered throughout provisions. Thus a building “*sprinklered throughout in accordance with 903.3.1.1*” need not have sprinklers in all areas.

So what are the areas not required to be sprinklered by NFPA 13. Sprinklers are not required in:

- 1 - Non-combustible concealed spaces, such as steel framed attics, non-combustible crawlspace with no storage, steel trussed floors,
- 2 - Non-combustible or limited combustible spaces such as above suspended ceilings or in interstitial spaces,
- 3 - Elevator shafts, but are required in elevator machine rooms and at the base of a hydraulic elevator shaft,
- 4 - Under non-combustible canopies or porches less than 4 feet in width with no combustible loading below the canopy,
- 5 - Intermediate floor levels or landings of non-combustible stairs, but required only at the top and bottom of the stairway enclosure,
- 6- Non-combustible non-accessible mechanical shafts, unless provided to reduce the shaft rating,
- 7 - Two hour rated dedicated electrical equipment rooms with dry type equipment and no storage,
- 8 - Cabinets, under counters, in wardrobes or enclosed furnishings, obstruction less than 4 feet wide, such as air ducts, open grate flooring, decks, etc.,
- 9 - Dwelling unit bathrooms under 55 sq. ft., but are required in all other use group bathrooms,
- 10 - Guestroom closets of 24 sq. ft. or less with the smallest dimension not over 3 feet.

Now lets look at the various areas where sprinklers may be omitted by the building code and still be considered sprinklered throughout. Section 903.3.1.1 provides its own list of where automatic sprinklers may be omitted. In these four cases an automatic smoke detection system is required in the room or space.

- The first is any room or space where the application of water will create a serious life or fire hazard.
- The second is any room or space where automatic sprinklers are undesirable due to the nature of the contents, and must be acceptable to the building official.
- The third is any room containing a generator or transformer, where the room is enclosed with a 2 hour fire-resistive assembly from the rest of the building. We assume the code is intending dedicated electrical generator rooms, or electrical transformer rooms used for building service transformers or generators. Otherwise, as written, it could be argued that a 2 hour separated large mechanical room need not be sprinklered because it contains a small transformer or small system generator.



-The fourth is any non-combustible constructed room or area where the contents are completely/wholly non-combustible. A space with wholly non-combustible contents is very rare, as packing, wrappings, and most furnishing are combustible.

There are other rooms or spaces where the building code permits the omission of sprinklers these include:

- Atrium spaces where the ceilings are over 55 feet in height above the floor directly below.  
(404.3. Exception2)
  
- Telecommunications buildings used exclusively for such equipment, where provided with an automatic fire alarm system (smoke, heat, ultra violet), 1 hour enclosing walls and 2 hour floor/ceiling assemblies. (903.2 Exception)

These last two omissions are neither referenced in Section 903.3.1.1 nor NFPA 13. Therefore, omission of sprinklers in these areas would not comply with the phrase “protected throughout” with an automatic sprinkler system in accordance with 903.3.1.1”. As an example, if we omitted sprinklers over an atrium ceiling over 55 feet in height, we could not use the extended travel distances nor reduced exit width factors for a building sprinklered throughout.

In conclusion “*automatic sprinklers throughout*” does not mean sprinklers everywhere. It means sprinklers only in areas where required by NFPA 13, and not exempted by the building code Section 903.3.1.1. Maybe?