



Fire Sprinkler Protection in Fire Stations

Q: Is fire sprinkler protection required in fire stations that accommodate sleeping facilities that are not classified as accessory per 508.3.1?

A: Yes. Per (2006) IBC 903.2.7: “An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area.” Per the 2006 IBC Commentary to this section, “This section requires sprinklers in any building that contains a Group R fire area. This includes uses such as hotels, apartment buildings, group homes and dormitories. There are no minimum criteria and no exceptions.”

Q: If yes, does the entire building including the bay areas need similar protection?

A: Per (2006) IBC 903.2.7: “**An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area.**” Note that a true “fire wall” [not “fire barrier” or “fire partition”] can be used to separate a building into two separate buildings per IBC 705.1 but only if constructed per all applicable requirements of IBC 705 including structural integrity, structural independence, continuity and adequate fire resistance for exposure protection.

Q: When did this requirement become effective?

A: This requirement was introduced in its current form in the 2003 edition of the IBC and the OSFM adopted it on July 22, 2005; however, the SC Building Codes Council required counties and municipalities in SC to implement enforcement of it effective **January 1st, 2005.**

Q: What is a fire station?

A: A fire station is usually classified as a **mixed occupancy building**. A fire station may have a training area (Assembly - Group A), office areas (Business - Group B), sleeping quarters for the firefighter (Residential - Group R), and vehicle and other miscellaneous storage areas for the fire equipment (Storage - Group S). Some buildings may not contain all of these occupancies. It is the designer’s option to decide exactly how to classify the various areas of the building into incidental use areas per 508.2.1, accessory occupancies per 508.3.1, non-separated occupancies per 508.3.2, and separated occupancies per 508.3.3.

- Q: What are sleeping quarters in a fire station and how are they specifically classified?**
- A:** Per the IBC Commentary to the definition of dormitory in IBC 310.2, "...sleeping areas of a fire station and similar lodging facilities for occupants not of the same family group are also considered **dormitories**." A dormitory is specifically listed in Section 310.1 as an example of **R-2 occupancy**.
- Q: What are the apparatus bays in a fire station and how are they specifically classified?**
- A:** Per the IBC Commentary to IBC 406.3.4, "Facilities used for the parking of trucks or buses must be classified as an **enclosed parking garage** even if the opening requirements of Section 406.3.3.1 are met." Per the IBC Commentary to IBC 406.2.1, "Parking garages are considered to be storage occupancies (**Group S-2**)."
- Q: Does the presence of apparatus bays, which do not normally meet the definition of "open parking garage" in IBC 406.3.2, require a fire station to be sprinklered?**
- A: Yes.** Per IBC 903.2.9 Group S-2, "An automatic sprinkler system shall be provided throughout buildings classified as enclosed parking garages in accordance with Section 406.4 or where located beneath other groups."
- Q: Can fire station apparatus bays with closable bay doors qualify as openings per 406.3.3.1 in order to meet the definition of "open parking garage" in IBC 406.3.2?**
- A: No.** Per the IBC Commentary to the scope of open parking garages listed in IBC 406.3.1, it is clear that "Section 406.3 provides requirements that are unique to open parking garages [...] because of the permanently open exterior walls of open parking garages which permit the dissipation of heated gases."
- Q: What sprinkler system design standard is required for a fire station?**
- A:** Fire stations normally only fall within the scope of **NFPA 13**. NFPA 13R is only applicable when a building is classified solely as residential occupancy (not mixed) and is 4 stories or less in height. NFPA 13D is only applicable to one- and two-family dwellings. Additionally, a NFPA 13 system is the only type of sprinkler system that can be used to qualify for certain code modifications such as the area increase of 506.3; the rating reductions in 508.3.3, Table 601, and 708.3; and various other modifications too numerous to list here. If an architect utilizes just one of these modifications in his building design, the result is that a NFPA 13 system is required, even if the building is within the scope of NFP 13R. Per IBC 901.2 "Any fire protection system for which an exception or reduction to the provisions of this code has been granted shall be considered to be a required system."
- Q: Do fires occur at fire stations?**
- A: Yes.** Fires in fire stations may seem counter-intuitive, like a robbery at a police station. However, like structures everywhere, fire stations are also susceptible to the dangers of fire. Fire stations are not always occupied by fire fighters. This is especially true of volunteer fire departments, but occurs at any fire station whose on-duty fire fighters have all left to respond to emergency calls in the community. The

occurrence of fires in fire stations is a valid concern and such incidents are well documented. Per the U.S. Fire Administration report entitled *Fire Station Fires* (Rev. December 2001): "Fire station fires most often originate in fire departments' vehicles (44%); 37% of fires are structure fires. The leading cause of the approximately 150 fire station fires each year is attributed to "electrical distribution," although "cooking" is the leading cause of structure fires. Electrical wire is the leading material ignited, most often due to short circuits. Too often, fire stations have no damage insurance or are underinsured."

Q: Are there potential ramifications of not installing a required sprinkler system?

A: The parties ultimately responsible for designing and permitting the occupancy of such a building may have **increased potential liability** by omitting sprinklers in the absence of approved alternative methods of compliance or performance based designs.

Q: Should fire stations be sprinklered when not required to by the IBC?

A: Yes. Fire stations, hospitals, police stations, etc. provide essential services to the community which should be protected in order to avoid interruption of emergency response service capabilities. The May 1997 US Fire Administration report entitled *Safety and Health Considerations for the Design of Fire and Emergency Medical Services Stations* states "the U.S. Fire Administration strongly recommends that [fire and EMS] stations be protected with automatic sprinkler systems." The *US Air Force Fire Station Design Guide – 1997* states "Provide an automatic sprinkler system throughout with smoke detectors in all sleeping areas." The future cost to repair or rebuild a fire station as well as replace or repair the damaged vehicles and equipment can be difficult, especially for small volunteer departments and fire departments which are either uninsured or underinsured. Automatic sprinkler protection should be considered a means for protecting the community's investment in a new fire station. Fire stations are often also used for other purposes such for emergency shelters, community functions, safe havens, etc. And remember, we always teach best by example.