

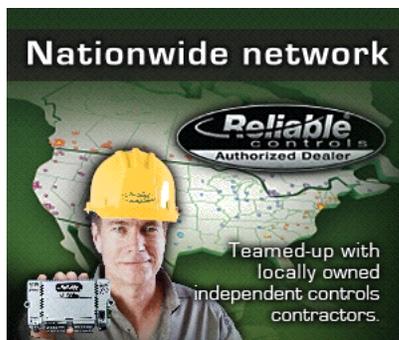
## Active, passive protection and building codes

Several resources provide guidance on both active and passive fire protection.

Kathleen Roach, CET, CFPS, Interface Engineering, Portland, Ore.  
07/14/2014

The building and fire codes do not call out specific fire safety goals; their main objective is life safety of occupants and firefighters. Preservation of the primary structure and neighboring structures is a resulting benefit.

Some occupancies, such as I-occupancies (prisons, hospitals), where occupants may be unable to evacuate themselves due to incarceration or physical disabilities, limit fire protection strategies to “defend in place” and require both active and passive fire protection.



Because of the documented effectiveness of functioning and adequate fire sprinkler systems, the IBC allows a reduction of some passive fire protection systems in some occupancies where full fire sprinkler systems are installed throughout a building. These usually mean full NFPA 13 systems. If a residential building of four stories or less is otherwise eligible for an NFPA 13R system, if a reduction of the passive systems is desired due to the installation of a fire sprinkler system, the IBC, in most but not all instances, requires that the fire sprinklers be installed “throughout” the building, meaning an upgrade to an NFPA 13 system. Keep in mind that local authorities having jurisdiction (AHJ) may consider that many of the alternate methods of fire protection identified in IBC 904 (clean agent systems and the like) do not qualify for these “trade-offs.”

Where fire sprinklers are installed, some of the passive system trade-offs allowed by the 2012 IBC include the following. State and local amendments may affect them.

- Building height increases of 1 story and up to 20 ft. (IBC 504.2).
- Building area increases of up to 300% for 1-story buildings and 200% increases for multiple-story buildings (IBC 506.3).
- Unlimited areas in 1- and 2-story buildings for group B, F, M, and S buildings (IBC 507.3 and 507.4).
- Occupancy separations: Up to a 1-hour reduction in the fire-resistance rating of fire separation walls (IBC 508.4).
- Fire-resistance rated construction: Fire sprinklers can substitute for 1-hour rated construction, unless the fire sprinkler systems is otherwise required in Type IIA, Type IIIA, and Type V-A construction (IBC Table 601e).
- Corridor rating: Fire-resistance rating deleted (IBC Table 1018.1).
- Balcony ratings: Balcony construction type and fire-resistance rating and aggregate width modified (IBC 1406.3).
- Exterior wall openings: Sprinklered maximum allowable area of unprotected openings is allowed to be the same as for protected openings (IBC Table 705.8).
- Exterior wall openings: Where buildings are provided with sprinklers and water curtains are installed at the exterior, the protection requirements of openings in an exterior wall may be deleted (IBC 705.8.2).
- Exterior wall openings: Flame barriers protecting window separations of 5 ft or less may be deleted where sprinklers are installed throughout (IBC 705.8.5).
- Fire walls: Fire sprinklers allow certain modifications in fire walls (IBC 706.5(3) and 706.8).
- Fire barriers: Permitted openings in fire barriers may be increased if both fire areas are sprinklered (IBC 707.6).
- Draftstopping: Floor/ceiling assembly draftstopping requirements at 1000 sq ft and attic and concealed space draftstopping at 3000 sq ft are eliminated (IBC 718.3.3 and 718 4.3).
- Interior wall and ceiling finishes: May be reduced to a lower category (IBC Table 803.9).
- Interior floor finishes: Requirements reduced for floor finish materials in vertical exits and exit passageways and exit access corridors (IBC 804.4.1).
- Accessibility stairs and areas of refuge: 48-in. [Americans with Disabilities Act](#) (ADA) egress stairs and areas of refuge may be deleted (IBC 1007.3).
- Elevators: Elevators are not required to serve as ADA means of egress (IBC 1007.2.1).
- Elevators: Elevator hoistway venting may be deleted in some occupancies (IBC 3004.1).
- Fire alarm: Multiple manual pull stations are not required when sprinklers are provided in many occupancies (IBC 907.2).

- Fire alarm: Multiple manual pull stations are not required when sprinklers are provided in many occupancies (IBC 907.2).
- Fire alarm: Heat detectors are not required (IBC 907.4.3.1).
- Fire alarm: Locations allowed by NFPA 13 to omit sprinklers may omit smoke detectors if sprinklered (IBC 907.2.13.1.1).
- High-rise buildings: Reductions in many fire-resistance ratings where sprinkler floor control valves are supervised and water flow initiating devices connected to the fire alarm system are provided (IBC 403.2.1).
- High-rise buildings: Fire barrier walls enclosing vertical shafts (other than exit enclosures and elevator hoistway enclosures) are allowed to be reduced to a 1-hour fire-resistance rating where automatic sprinklers are installed at the top and at alternate floor levels within the shafts (IBC 403.2.1.2).

The [National Fire Sprinkler Association's](#) "The Fire Sprinkler Guide," edited by Jeffrey M. Hugo, is an excellent resource for a fuller listing of allowable trade-offs.

NFPA's "[Fire Protection Handbook](#)" is another excellent source of further information on active and passive fire protection.

---

*Kathleen Roach is associate principal and senior fire/life safety designer at Interface Engineering. She has approximately 20 years of experience in fire protection design and strong technical knowledge of codes, standards, and recommended practices. Her work includes specification and design for fire suppression systems and fire/life safety reviews.*

---

#### Related News:

-  [Fire risk from solid fuel commercial cooking](#) - 08.12.2014 16:45
-  [Additional info about integrating BAS and fire/life safety systems](#) - 14.10.2014 16:14
-  [Balancing passive, active fire protection](#) - 14.07.2014 01:24
-  [NFPA 72-2016 proposed changes](#) - 10.07.2014 01:12
-  [How to engineer manufacturing, industrial buildings: Fire and life safety](#) - 30.06.2014 01:00
-  [Smoke control system testing](#) - 27.06.2014 01:42
-  [Designing fire systems for flammable, combustible liquids](#) - 21.02.2014 01:15

[Post a comment](#)

---

[Log in or create an account](#) to submit your comment for this article.

No comments