



Coffee Break Training - Fire Protection Series

Building Construction: High-Rise Protection Features

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Learning Objective: The student will be able to identify critical construction and fire protection features required in high-rise buildings.

High-rise buildings — whether in a dense urban area or standing alone — provide a special challenge for the fire service. In the event of a fire, they often require massive evacuations or defend-in-place strategies to protect occupants, they demand a huge number of firefighters to address fire operations and support, and the very nature of their height makes reaching a fire problematic.

In order to improve life safety and fire operations, the model building codes require the following features to be included in newly constructed high-rise buildings, generally those having an occupied floor more than 75 feet (22.9 meters (m)) above the lowest level of fire department access.

These features include:

- They must be constructed with a fire resistance rating of not less than two hours for the structural frame, floor assemblies, and bearing interior and exterior walls.
 - If buildings have sprinkler control valves with supervisory and water flow alarms at each floor level, the fire resistance may be reduced to one hour, except in low-hazard factories and mercantile and low-hazard storage buildings.
- The building must be equipped with an automatic sprinkler system suitable for the occupancy hazard and a secondary water supply.
 - Sprinklers may be omitted from open parking garages and telecommunications equipment rooms that are separated from the building by one-hour fire-resistive construction.
- Fire pumps for sprinklers and standpipe systems must be supplied by at least two water mains from different streets. Fire pump rooms must be protected from fire and other hazards. (See Coffee Break Training 2008-6.)
- For communications, the building must be protected by an approved smoke detection and fire alarm system that includes a voice/alarm communications method. Emergency responder radio coverage must be provided in accordance with the fire code.
- Windows that open easily or mechanical ventilation must be provided for smoke removal.
- Standby and emergency power systems must be provided for such things as power and lighting, exit signs, elevator car lighting ventilation, fire pumps, and fire detection and alarm equipment.
- When a high-rise building is more than 420 feet (128 m) above the lowest level of fire apparatus access, additional exit stairs are required.



This high-rise building under construction must meet specific construction and fire protection requirements to satisfy safety standards.

For detailed requirements, refer to International Building Code, Chapter 4 and National Fire Protection Association 5000, *Building Construction and Safety Code*[®], Chapter 33.

For more information, take the NFA Online self-study course, “Principles of Building Construction” (Q0751) at <http://www.usfa.fema.gov/nfa/nfaonline/>.



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