

Building Codes Update: The 2009 International Fire Code and the Apartment Industry

Apartment operators and developers should be aware of organizational changes in the 2009 edition of the [International Fire Code](#) (IFC) that have brought increased attention to **fire safety requirements for existing** buildings by code enforcement officials.

Specifically, the 2009 IFC consolidates all provisions related to existing construction in a new chapter: Chapter 46 Construction Requirements for Existing Buildings. Importantly, none of the provisions in this new chapter are new to the code. Instead, they are included in the IFC as “grandfather” clauses to protect existing properties from having to comply with requirements for new construction.

However, this organizational change has made many local code and fire officials more aware of these requirements since previously they were spread throughout the body of the code.

Apartment firms are strongly encouraged to familiarize themselves with Chapter 46 and determine whether the 2009 IFC has been adopted in jurisdictions where they operate.

Localities have the option of adopting the model building codes as written or making modifications to them in the adoption process. In addition, some localities have their own codes not based on the model codes or elect not to “upgrade” to new codes when they are issued.

As a result, firms are encouraged to monitor local code adoption to ensure that if the 2009 IFC is adopted, that it is not modified in a way that makes it more onerous. By reviewing the new chapter, members may also identify some code provisions that they would like to attempt to modify to make the codes less onerous.

This paper provides background and summarizes items identified as areas of concern by local apartment association affiliates.

Smoke Alarms

Since its inception, the IFC has required that smoke alarms be installed in new and existing apartments. For existing buildings, smoke alarms are only required for buildings that are “not already provided with” single-station smoke alarms. The “not already provided with” clause is very important in that it means if an existing property has a smoke alarm in the apartment unit, it does not have to comply with a new code provision that requires a smoke alarm in every bedroom, in the hallway outside of bedrooms and one on every level of multi-story apartments.

If the property does not already have a smoke alarm in each unit, if adopted as written, the IFC would require alarms to be installed as noted above. In existing buildings, however, the smoke alarms can be battery powered and they do not have to be interconnected (unless the building undergoes renovation that results in the removal of interior wall or ceiling finishes).

Note: In 2003, the International Property Maintenance Code (IPMC) incorporated the IFC smoke alarm requirements, including exceptions for existing buildings that allow battery power and do not require alarms to be interconnected. However, the IPMC does not include the “not already provided with” clause. Thus, if adopted, the IPMC would require battery-powered smoke alarms in all existing apartments, one in each bedroom, one outside of each bedroom and on every level.

Sprinklers

The sprinkler requirements in the International Code Council (ICC) codes apply only to new construction and major rehab. They are not retroactive to existing apartment buildings unless the building is undergoing major rehab, and then they would only be required under certain specific situations.

As of the 2000 edition of the ICC codes, sprinklers were required in apartment buildings more than two stories in height and with more than 16 dwelling units. In 2003 this was changed to require sprinklers in all apartments. Specifically, the code allows the NFPA 13R system in apartments up to four stories in height and pedestal-type construction, provided the overall building height is not more than 60 feet. The NFPA 13R sprinkler system is required in buildings more than 60 feet in height and/or more than four stories in height.

By generally containing fires to the room of origin, sprinkler systems have proven to be a very effective life safety tool in apartments; virtually no civilian or firefighter lives have been lost in sprinklered apartment buildings. In fact, the activation rate and performance of sprinklers in apartments is the best of any building type.

The International Building Code (IBC) also allows a number of design options (tradeoffs) when the sprinkler systems are installed. These design options more than offset the cost of the sprinkler system. They include:

NFPA 13R Sprinkler System. As of 2003, the following design options are permitted with the installation of an NFPA 13R sprinkler system.

1. Building height can be increased 20 feet and one story. The overall building height is limited to 60 feet.
2. The maximum area for a building can be increased by 25 percent with the addition of a fourth story.
3. Vertical separations of openings are not required.
4. Firewalls are permitted to terminate at the interior surface of noncombustible exterior sheathing and the firewalls are not required to extend 18" beyond the exterior of the building.
5. Elevator lobbies are not required in buildings up to four stories in height.
6. Fire blocking or draft stopping is not required at partitions if sprinklers are installed in the combustible floor/ceiling and roof/ceiling spaces.
7. The maximum transmitted temperature end point of 450 degrees is not required for doors and exit enclosures.
8. The maximum transmitted temperature end point of 450 degrees is not required for glazed openings.
9. Fire dampers are not required in ducts penetrating fire barriers.
10. Fire dampers are not required in ducts penetrating fire partitions.
11. Draft stopping at floor/ceiling spaces is not required if sprinklers are installed in the combustible concealed spaces.
12. Draft stopping above and in line with the dwelling units is not required, provided sprinklers are installed in the combustible concealed spaces.
13. Draft stopping in attics, mansards, overhangs or other concealed roof spaces is not required, provided sprinklers are installed in the combustible concealed spaces.
14. Interior wall and ceiling finish requirements are reduced from class B to C.
15. Class I standpipes are permitted in place of Class III.
16. Automatic heat detection is not required with fire alarm systems.

17. Manual fire alarm boxes are not required if the sprinkler system has a local alarm that will automatically activate with the sprinkler system.
18. Egress width reduced for stairs from 0.3 to 0.2 per occupant and all other components of the egress are reduced from 0.2 to 0.15 per occupant. This was changed in the 2009 edition removing the reduction for sprinklered buildings.
19. The accessible means of egress elevator is not required in buildings four or more stories in height if the area is served with a horizontal exit or ramp.
20. Minimum clear width for handrails of 48 inches is not required.
21. The area of refuge is not required.
22. Elevators are not required to be accessed from the area of refuge.
23. Area of refuge is not required to be separated from the remainder of the building by a smoke barrier.
24. Exit separation is reduced from one-half to one-third the diagonal length of the maximum overall floor area.
25. **(2003 IBC Only)** The corridor-fire-resistance rating of one hour is reduced to one-half hour with 20-minute doors.
26. Single-exit apartments with four dwellings per floor are allowed an extra story in height, up to three stories.
27. Separation for the interior of the building is not required for exterior stairways connected to open-ended corridors.
28. Fifty percent of the exit capacity is permitted to egress through areas on the level of discharge.
29. Emergency escape and rescue openings (windows) are not required.
30. Balconies and similar appendages on buildings of Type III, IV (non-combustible construction), and V (combustible construction) can be of Type V construction.
31. Dumpsters of 1.5 cubic yards or more can be stored in buildings.
32. Open-flame cooking devices are permitted on combustible balconies and within 10 feet of combustible construction.
33. Fire apparatus access road distance from buildings can be increased beyond the 150 foot maximum.
34. Spacing of fire hydrants can be increased from 400 feet to 600 feet.
35. Natural cut Christmas trees are permitted in areas protected with sprinklers.
36. Water fire flow requirements can be reduced up to 75 percent. This was changed to 50 percent in the 2003 IFC and back to 75 percent in the 2006 IBC.
37. Multifamily projects up to 200 units can have one fire department access road.

NFPA 13 Sprinkler System. The following design options are allowed, in addition to those listed above, with an NFPA 13 sprinkler system.

1. Building allowable height can be increased one story and 20 feet for an overall building height of 70 feet.
2. Building overall area limits can be increased based on separation and frontage by as much as 300 percent.

3. Type IA construction can be reduced to Type IB and Type IB construction can be reduced to Type IIA.
4. Fire ratings can be reduced by one hour. Some reductions are limited if the design has taken advantage of building area and height increases. One-hour walls cannot be reduced.
5. The maximum allowable area of unprotected openings is allowed to be the same as the area allowed for protected openings.
6. Vertical separations of openings are not required. (Note: This exception was extended to 13R systems in 2003.)
7. Area of openings in firewalls is unlimited if buildings on both sides of the firewall are protected with sprinklers.
8. Areas of openings in fire barrier walls are unlimited if fire areas on both sides of the wall are protected with sprinklers.
9. A shaft enclosure is not required for escalator or stairway openings if they are not part of the means of egress.
10. Half-hour wall separation is permitted between dwelling and sleeping units in buildings of Type IIB, IIIB and VB construction.
11. Half-hour floor separation is permitted between dwelling and sleeping units in buildings of Type IIB, IIIB, and VB construction.
12. Draft stopping above and in line with the dwelling unit is not required.
13. Draft stopping in attics, mansards, overhangs or other concealed roof spaces is not required.
14. Vestibules are not required in stairways in buildings if the exit stairways are pressurized.
15. Building entrance and egress access control systems (special locking devices) are permitted in buildings if the releases are activated with the sprinkler system.
16. The space between the corridor ceiling and the floor or roof structure can be used as a return plenum if the air-handling system is shut down upon activation of the sprinkler system.

Fire Alarm System

Since their inception, the ICC codes have required that a manual fire alarm system be installed in accordance with NFPA 72 in all new *and* existing apartment buildings more than three stories in height or with more than 16 dwelling units.

Although the fire alarm requirement was not in any of the legacy codes that were combined to create the ICC, it was added to the 2000 IFC based on existing provisions in the NFPA 101 Life Safety Code.

Under the IFC, if the fire alarm system is connected to the automatic sprinkler system, automatic heat detection is not required. The IFC 2000 had two exceptions for when the fire alarm system was not required:

1. Where each living unit is separated from other contiguous living units by a fire barrier having a fire-resistance rating of not less than three quarters of an hour, and where each living unit has either its own independent exit or its own independent stairway or ramp discharging at grade.
2. In buildings that are equipped throughout with an approved, supervised automatic sprinkler system installed in accordance with Section 903.3.1.1 (NFPA 13 system) or 903.3.1.2 (NFPA 13R system) and which have a local alarm to notify all occupants.

The IFC 2003 added a third exception dealing with new provisions in the code for open-ended corridors.

3. A fire alarm system is not required in buildings that do not have interior corridors serving dwelling units and are protected by an approved automatic sprinkler system installed in accordance with Sections 903.3.1.1 and 903.3.1.2, provided that dwelling units either have a means of egress door opening directly to an exterior exit access that leads directly to the exits or are served by open-ended corridors designed in accordance with Section 1022.6, Exception 4.

Buildings constructed prior to the development of the ICC codes may or may not have a fire alarm system. If the building already has a previously approved working fire alarm system, then the property is exempted from the current ICC code provisions. If no fire alarm system is present and the property is more than three stories high or has more than 16 dwelling units, a fire alarm system would have to be installed in accordance with NFPA 72.

Emergency Lighting

The 2009 IFC emergency lighting requirements for existing buildings mirror exactly the original 2000 IFC. The requirement that the power be supplied by the premise's electrical supply has not changed nor have the emergency power requirements in the event of a power supply failure. Under the code, emergency power can be supplied by an emergency system that can provide power for 60 minutes. The emergency power source can be storage batteries, unit equipment or on-site generator. There are no code provisions requiring retrofitting of walkways, stairs and exterior lighting.

Exit Signs

The technical requirements for exit signs for existing buildings remain the same as those in the initial 2000 ICC codes. The IFC specifically states that buildings must comply with the requirements of the building code that applied at the time of construction.

In all cases, the codes allow either internal or external illumination with an intensity of not less than five foot-candles for existing buildings. The power source for emergency exit signs for occupancies required to have two or more exits (note, no requirement for single exit) must be an automatic system. Signs must have emergency power that lasts not less than 60 minutes. Power can be supplied by storage batteries, unit equipment or on-site generator. The code does not require replacing existing signs that have a backup battery power source with the minimum 60 minutes, as that has been a code requirement from ICC's inception.

Guards (Banisters & Railings)

The 2009 IFC requires 42-inch high guards, although it allows 36-inch guards inside dwelling units and 30 inches for existing guards on the open side of stairs. It also allows existing guards that complied with earlier codes to remain in place.

Openings in Guards

The 2009 IBC includes a change such that guards cannot allow the passage of a 4-inch diameter sphere from the walking surface to the guard height. Exceptions set the opening limit at 4-3/8 inches for the height from 36 inches to 42 inches. Guards on the open side of stairs in individual dwelling units are also limited to the 4 3/8-inch measurement. Another exception sets the limit of not passing a 6-inch diameter sphere for the triangular opening formed by the stair tread run and rise.

The 2009 IFC limit for existing buildings is the passage of a 6-inch diameter sphere for any opening up to 34 inches along with the exception allowing the passage of a 6-inch diameter sphere in the triangle formed by the step and guard. The 2009 IFC also has a provision to allow existing open guards that were previously approved under prior editions of any code to remain in place.

Stairs

There is no situation in which the IFC would require the stairs in an existing building to be replaced. The only situation in which stair design would become an issue is in a complete rehab, but even in that situation the IFC provisions would not mandate that the stairs be replaced. Stair riser and tread dimensions have changed over the years, and like guard requirements, the stair provisions in the IFC accommodate stairs constructed under earlier codes.

Current codes require stairs to have a rise of no more than 7 inches with a minimum run of 11 inches. The 7/11 stairs require much longer overall runs and thus will not fit in locations designed under older editions of the codes. As a result, the 2009 IFC allows stairs with a rise of 8-1/4 inches and a run of 9 inches. The IFC also allows existing stairs to be rebuilt where space and construction will not allow the longer stairs. Thus any stair in an existing building would meet the IFC.

Handrails

Handrail height falls within the guard requirements discussed above.

Ramps

The 2009 IFC requirements for existing ramps have not changed since the inaugural 2000 IFC. Under the "grandfather" clause in all versions of the IFC, existing ramps used as a means of egress are allowed a slope of 1 unit vertical for 10 units horizontal (10 percent) with a maximum for any ramp of 1 unit vertical for 8 units horizontal (12.5 percent). In new construction, ramps as part of the means of egress would be limited to 1 unit vertical for 12 units horizontal (8 percent) and the same restriction for a maximum of 1 unit vertical for 8 units horizontal (12.5 percent).

Self-Closing Doors

The 2009 IFC requirement for self-closing doors is identical to the 2000 edition requirements. The code requires that doors serving more than 30 occupants shall provide an effective barrier to resist the movement of smoke and that they shall be kept closed or be self-closing. Buildings with sprinkler systems are not required to have self-closing doors.

Common Path, Dead End and Travel Distance Limits

The 2009 IFC travel limitations for R-2 occupancies (apartments) have not changed since the 2000 edition and should have no impact on existing buildings that were constructed to code. For new construction, however, the 2009 IFC now allows buildings with an NFPA 13R sprinkler system to have the same increases allowed for buildings with an NFPA 13 sprinkler system. Apartment buildings without sprinklers are limited to 75 feet common path of travel with a total travel exit access limit of 200 feet. In sprinklered buildings, the common path of travel is still limited to 75 feet, but the total travel exit access limit has been raised to 250 feet.