



## Building Construction: Atrium Fire Protection Requirements

No. FP-2009-23 June 9, 2009

**Learning Objective:** The student shall be able to summarize the fire protection requirements for atriums.

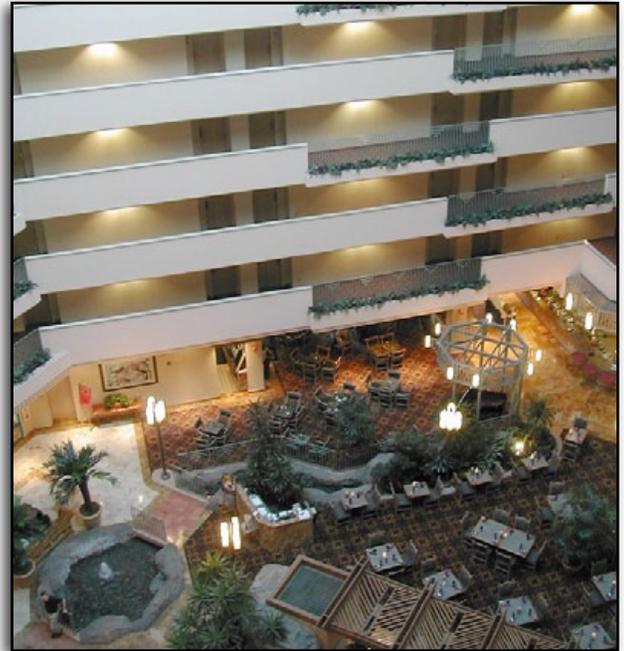
An “atrium” is a popular architectural feature that provides a visual impression of openness in large buildings.

However, atriums bring a special set of fire protection challenges. The atrium may act as a roofed-over chimney providing an unrestricted path for heat and fire gases from anywhere in the building. Occupied spaces, such as hotel rooms or offices, may open directly onto the atrium so tenants may be exposed immediately to toxic conditions upon leaving these spaces. The main means of egress may require occupants to pass through the atrium to safety.

In the model building codes, an atrium is “a large volume space created by floor openings connecting two or more stories and is closed at the top.” Shafts for enclosed stairways, elevators, hoistways, plumbing, electrical, air conditioning, or other equipment are not included in this definition.

In order to protect occupants and minimize the risk of fire spread, atriums have special fire protection requirements in the model building codes:

- They must be separated from the rest of the building by 1-hour fire-resistive fire barriers.
- Glass walls may be used in place of fire barriers if they have fire sprinklers at closely spaced intervals on both sides.
- The entire building must be sprinklered.
- The atrium must have an active or passive smoke control system designed to keep accumulated smoke at least 6 feet (1.8 m) above the means of egress walking surface for at least 20 minutes.
- Exit travel distance within some parts of the atrium cannot exceed 200 feet (61 m).
- Where an active smoke control system is used, it must be started automatically by smoke detection or sprinkler water flow, and must be capable of manual operation. Standby power must be provided for the active smoke control equipment.
- The walls and ceilings within the atrium must have a Class A or B interior finish.



This large open space in a highrise hotel is typical of an atrium design.

For additional information and specific requirements, refer to *International Building Code*<sup>®</sup> Chapter 4 or *NFPA*<sup>®</sup> 5000, *Building Construction and Safety Code*<sup>®</sup> Chapter 8.

