

further emphasizes the precautions necessary with systems that connect multiple stories.

**707.13.4 Termination room.** Refuse and laundry chutes shall discharge into an enclosed room separated from the remainder of the building by a fire barrier that has a fire-resistance rating of not less than 1 hour. Openings into the termination room shall be protected by opening protectives having a fire protection rating of not less than  $\frac{3}{4}$  hour. Doors shall be self- or automatic closing upon the detection of smoke in accordance with Section 715.4.7.3. Refuse chutes shall not terminate in an incinerator room. Refuse and laundry rooms that are not provided with chutes need only comply with Table 508.2.

❖ Refuse and laundry chutes are required to terminate in rooms enclosed by fire barriers so as to segregate such rooms from all parts of the building. See the requirements of Section 707.11, Item 2, as well as the restrictions of this section. The termination room represents the collection and fuel load concentration point and, as such, must be protected not only from outside ignition sources, but also to retard the spread of fire originating in the termination room. Accordingly, the waste chute must not terminate in a room containing an incinerator. The purpose of waste chutes originally was to collect the refuse for incineration; thus, proximity to the incinerator was thought desirable. The hazards of ignition, however, preclude such convenience. The reference to Section 508.2 serves as a reminder that laundry and waste collection rooms are considered a specific hazard and are regulated by the incidental use requirements.

**707.13.5 Incinerator room.** Incinerator rooms shall comply with Table 508.2.

❖ This section requires that incinerators be enclosed by fire barriers (see Table 508.2) for the same reasons that Section 707.13.4 requires termination rooms to be enclosed.

**707.13.6 Automatic sprinkler system.** An approved automatic sprinkler system shall be installed in accordance with Section 903.2.10.2.

❖ This section requires that the chute, termination room and incinerator room associated with a waste or linen system be protected with an automatic fire sprinkler. Note that the requirement for suppression is within the chute itself and not within the required shaft that encloses the chute. Section 903.2.10.2 identifies the location of the sprinkler protection.

**707.14 Elevator, dumbwaiter and other hoistways.** Elevator, dumbwaiter and other hoistway enclosures shall be constructed in accordance with Section 707 and Chapter 30.

❖ The hoistway enclosure is the fixed structure consisting of vertical walls or partitions that isolates the enclosure from all other building areas or from an adjacent enclosure in which the hoistway doors and door assemblies are installed. With the exception of observation elevators, the hoistway is normally enclosed with fire barriers (see Section 707.4). A hoistway enclosure for fire spread purposes may not be required if suitable

protection measures are provided. Section 707.2 lists exceptions for shaft enclosures around floor openings and is applicable to all hoistways. In addition, shaft enclosures are not required for elevators located in an atrium, since there is no penetration of floor assemblies. Elevator hoistways are enclosed to ensure that flame, smoke and hot gases from a fire do not have an avenue of travel from one floor to another through a concealed space (see the discussion of stack effect in the commentary to Section 707.14.1). Enclosures are also provided to restrict contact with moving equipment and to protect people from falling.

**707.14.1 Elevator lobby.** An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby shall separate the elevator shaft enclosure doors from each floor by fire partitions equal to the fire-resistance rating of the corridor and the required opening protection. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

#### Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
  2. Elevators not required to be located in a shaft in accordance with Section 707.2 are not required to have enclosed elevator lobbies.
  3. Where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.
  4. In other than Group I-3, and buildings having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
  5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
  6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 707.14.2.
- ❖ An elevator lobby or one of its alternatives found in exceptions to Section 707.14.1 is required whenever an elevator shaft connects more than three stories. Most of the exceptions or alternatives to lobbies are found in some form in one or more of the legacy codes from which lobby provisions were developed. Elevator shafts often constitute the largest vertical shaft in multistory buildings. Hoistways can create a passageway for the accumulation and spread of hot smoke and gases from a fire to other floors in a building. Smoke is

well recognized as the major killer in fire situations, often migrating to areas remote from the source of the fire.

Chapter 7 provisions address the isolation by compartmentation of fire growth. Analyses of fires in multistory buildings have documented the movement of smoke to upper levels. In the 1980 fire at the MGM Grand Hotel in Las Vegas, 70 of the 84 deaths occurred on the 14th to 24th floors even though the fire was on the first level. The Johnson City Retirement fire in 1989 also had a fire originating on the first level with all but two of the 16 fatalities occurring on the upper floors due to smoke movement via vertical shafts that included the elevator hoistway.

The elevator lobby requirement further isolates the fire-rated elevator shaft enclosure and its doors from the remainder of the floor by fire partitions. The general requirement for the fire partition to have a rating that matches the corridor requirements is used since the lobby provisions were previously tied to the elevator opening into a fire-resistance-rated corridor instead of to the number of stories connected by the elevator shaft. Fire partitions require a fire-resistance rating and protection of openings as covered in Section 708.3 and the remaining portions of Section 708. Corridor requirements for egress are defined in Section 1017 and Table 1017.1. Opening protectives for the lobby reduce heat and smoke spread into the area immediately in front of hoistway doors and delay or prevent the vertical spread of smoke to other floors through the elevator shaft itself.

Multistory buildings have increasing security concerns that have often resulted in controlled access from elevator lobbies to the remainder of the floor. Section 707.14.1 clearly establishes that every elevator lobby shall have access to at least one means of egress; ensuring that no occupant in a lobby is left isolated from escape when elevators are recalled during Phase I elevator recall as required by Chapter 30. ASME A17.1, *Safety Code for Elevators and Escalators*, details recall requirements, which are adopted by reference in Chapter 30.

The six exceptions modify the base requirement for lobbies in some way. Exception 1 removes the requirement for an enclosed elevator lobby on the street floor of a building when the entire street floor is equipped with automatic sprinklers. This exception is notable in that it does not require sprinkler protection in the entire building, only the street floor. Buildings that are fully sprinklered would also be relieved of the requirement to provide a lobby on the street floor.

Exception 2 removes elevators not required to be in a shaft from having enclosed elevator lobbies. Section 707.2 contains 11 different exceptions for varied opening protectives. The exception to elevator shaft requirements are found in Exception 5 for atriums where the shaft is typically common to the openings between floors.

Exception 3 removes the requirement for elevator lobbies when additional doors are provided that meet

two separate criteria. First of all, the additional door must be operable from the car side of the elevator shaft without a key, tool, special knowledge or effort as stated in Section 3006.2. This ensures that if the door does close that it can be opened by someone who arrives at that level on the elevator. This could happen if the fire department is using the elevator to access the fire floor or staging for the fire on an adjacent level. The second issue is the testing of the door. Typically, the elevator doors at the hoistway opening already have a prescribed fire-resistance rating and none is required for the additional door. The exception does, however, require that the additional door must be tested in accordance with UL 1784 without an artificial bottom seal. The UL 1784 test is titled *Air Leakage Tests of Door Assemblies* and does not require any fire-resistance-rated testing. Air leakage testing does contain an elevated temperature test that exposes the opening protective to an air temperature of 400°F (204°C) in addition to measuring pressure differential performance at 0.10 inches of water gage (25 Pa). Doors are installed in the test according to the requirements of NFPA 105, *Standard for the Installation of Smoke and Draft Control Door Assemblies*, which is also referenced in the code. Side swinging doors that are tested to UL 1784 are often marked with an "S" label. The testing under UL 1784 to meet the Section 707.14.1 exception does not allow the use of an artificial bottom seal for the test as a measure of ensuring that smoke movement around all four sides of the opening protective does not leak significantly. There are three types of opening protectives that meet Exception 3; two are proprietary designs that consist of sliding or rolling barriers and the third is the traditional side swinging door. The requirement for this door to meet the air leakage requirements is to limit the spread of smoke or other gases to or from the elevator shaft and then to other levels. As mentioned earlier, the hoistway doors will typically provide the fire protection rating that is required by Sections 707.7 and 715.4. However, due to the typical operation and movement of the hoistway doors, they generally can not provide the level of reduced air leakage that is required to stop the spread of smoke.

Exception 4 applies to other than Group I-3 occupancies. Buildings having occupied floors not higher than 75 feet (22 860 mm) above the lowest level of fire department vehicle access are not required to have lobbies when the building is protected throughout by NFPA 13 or NFPA 13R automatic sprinkler systems installed in accordance with Section 903.3.1.1 or 903.3.1.2 requirements. Conversely, all high-rise buildings, regardless of occupancy, are required to have elevator lobby protection.

This exception is modified slightly from the exception that previously existed when the lobby provision was tied to an opening into a fire-resistive-rated corridor. Because of the inclusion of the 75-foot (22 860 mm) height limitation, this exception can virtually be used to eliminate the four-story threshold that is now

found in the base paragraph. Therefore, an elevator shaft that serves six or seven floors does not require a lobby, provided the building is sprinklered and it is not a high-rise or a Group I-3 occupancy.

Exception 5 provides an alternative means of constructing an elevator lobby. This exception allows the substitution of nonrated smoke partitions in lieu of 1-hour fire-resistance-rated fire partitions to separate the elevator lobby on each floor. The building must be protected throughout by NFPA 13 or NFPA 13R automatic sprinkler systems installed in accordance with Section 903.3.1.1 or 903.3.1.2 requirements. This exception is a recognition of the effectiveness of sprinklers in limiting fire spread and the continued concern over limiting smoke movement from the floor of fire origin.

Exception 6 allows the substitution of elevator hoistway pressurization for enclosed lobbies. Section 707.14.2 details the design of the pressurization system and is similar to smoke control requirements found in Section 909. Pressurization relies upon mechanical systems that provide air into the hoistway or shaft in excess of expected environmental (stack effect) and fire-generated pressures.

**707.14.2 Enclosed elevator lobby pressurization alternative.** Where elevator hoistway pressurization is provided in lieu of required enclosed elevator lobbies, the pressurization system shall comply with this section.

❖ Where elevator lobbies are required by Section 707.14.1 and Exception 6 of that section is used, the design and operation requirements of Section 707.14.2 are to be applied in the construction and testing of the elevator hoistway pressurization system. These requirements, while similar to the Section 909 smoke control requirements, are altered to meet specific vertical shaft concerns found in elevator hoistways. This pressurization system is considered as an equivalent approach to the typical option of using an elevator lobby to provide a barrier between the elevator shaft and the rest of the story.

This alternative was developed from provisions that were used in Portland, Oregon as a means to eliminate elevator lobbies. While Section 909.20.5 continues to provide pressurization criteria for smokeproof enclosures for stairways, the criteria were deemed to be inadequate and inappropriate for the protection elevator hoistways

**707.14.2.1 Pressurization requirements.** Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.04 inches of water column (1.00 Pa) and a maximum positive pressure of 0.06 inches of water column (1.49 Pa) with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all ground floor level hoistway doors open and all other hoistway doors closed. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.

❖ The pressurization requirements of Section 707.14.2.1 provide a minimum and maximum positive

pressure that must be achieved by the hoistway or shaft mechanical pressurization system. Positive pressure stairways have different limits. For hoistways, the range of pressurization is from 0.04 to 0.06 inches of water column (1.0-1.49 Pa) with regard to each occupied floor. The minimum pressure is to ensure that the stack effect is overcome and the maximum pressure is to ensure that the hoistway door operation will not be affected during Phase II operation by emergency responders. The design of the system must meet acceptance testing that verifies the pressure differential at the midpoint of each door on each floor is within the defined range. Section 3003.2 establishes that elevators shall have Phase I fire-fighter recall. Phase I recall returns elevators to a designated floor (usually the first floor or floor of fire department access) when smoke detectors located at any elevator landing or the elevator machine room detects smoke. Testing with the ground floor level hoistway doors open and all others closed duplicates the position of elevator doors in a fire emergency. Air supply intakes located remote from an uncontaminated source or 20 feet (6096 mm) from any air exhaust system or outlet help to ensure that the shaft will not become contaminated with smoke from a fire that is exhausted near the pressurization system. During Phase II fire fighter operations, fire fighters will use elevators to stage operations below the fire floor and rescue residents from upper floors. The air supply isolation requirements help to ensure that the elevator hoistway remains tenable through the fire event or well into it before elevators can no longer be used.

**707.14.2.2 Ducts for system.** Any duct system that is part of the pressurization system shall be protected with the same fire-resistance rating as required for the elevator shaft enclosure.

❖ Hoistway venting requirements in Section 3004 and ASME A17.1, *Safety Code for Elevators and Escalators* define fire-resistance ratings for the elevator shaft and penetrations into the hoistway. Section 707.14.2.2 requires the pressurization system ducts to comply with Chapter 30 and ASME A17.1 fire-resistance-rating requirements.

**707.14.2.3 Fan system.** The fan system provided for the pressurization system shall be as required by this section.

❖ Section 707.14.2.3 simply details that the fan system used for pressurization meets all of the section's subpart requirements.

**707.14.2.3.1 Fire resistance.** When located within the building, the fan system that provides the pressurization shall be protected with the same fire-resistance rating required for the elevator shaft enclosure.

❖ Fire-resistance requirements in Section 707.14.2.3.1 must duplicate shaft requirements in Section 3004 and ASME A17.1, *Safety Code for Elevators and Escalators*, which define fire-resistance ratings for the elevator shaft and penetrations into the hoistway.