

# Fire Service Access Elevators Coordinate with Accessible Means of Egress

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The 2009 and 2012 editions of the *International Building Code*® (IBC) include provisions for Fire Service Access Elevators (FSAE). This article will focus on provisions of the 2012 IBC.

The intent for requiring FSAE was twofold: 1) to provide for an elevator system useable for a longer period of time during a fire event; and 2) to provide for a system that would increase the comfort level of and the usability for firefighters using that elevator system. Since the fire department uses elevators for both staging to fight the fire and for assisted evacuation, the addition of this system is also beneficial for those occupants of the building who need assistance to evacuate.

The basic requirements in Section 3007 for the FSAE are as follows:

All elevators, including the FSAE, are required to comply with the ASME A17.1/CSA B44 (3001.2, 3007.1) elevator safety standard.

Two FSAE are required to serve all floors where a building has an occupied floor more than 120 feet above the street level (i.e., lowest



level of fire department vehicle access) (Section 403.6.1). If the building has only one elevator, the code would allow for one FSAE (403.6.1). The FSAE can be the same elevator used for normal circulation in the building. This is **not** intended to be a specially reserved elevator. The FSAE has to be identified by a fire hat symbol (3007.7.5).

The FSAE is required to have a capacity not less than 3,500 pounds (403.6.1). The FSAE also can be the elevator sized to accommodate the ambulance stretcher (3002.4), but it is not specifically required to be the same elevator.

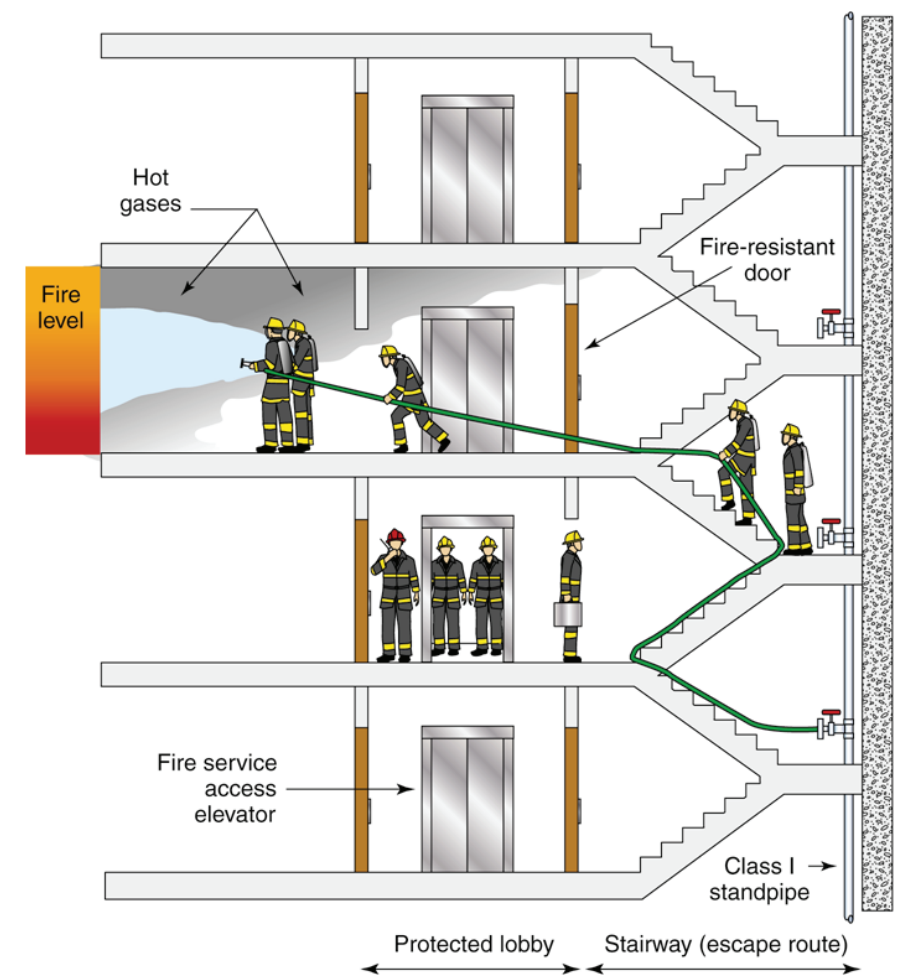
Typically, an elevator goes into Phase I recall when smoke activates the smoke detectors in the lobby, hoistway or elevator machine room; or when the fire department initiates recall. FSAEs must go into Phase I recall immediately upon activation of any building fire alarm. If there are more than two elevators in the same bank, the elevators that are not FSAE can continue to operate until they are recalled by the typical means. This is especially important if a building also has Occupant Evacuation Elevators (3008). It is not the intent to override Phase I recall or Phase II emergency operation, but rather to be in addition to those requirements.

The building sprinkler system must not include sprinklers in the elevator machine room/space or the shaft for the fire service access elevators (3007.3.1). In

addition, these spaces should be protected by smoke detection that would initiate Phase I recall (903.3.1.1.1 Exception 6). Each floor of the building must have a sprinkler control supervisory switch and a water flow-initiating device. The intent is to find the origin of the fire so the staging area can be determined (3007.3.2).

There is a concern that water from the sprinklers would get into the hoistway, either under the elevator doors and hoistway walls by flooding, or by the sprinklers spraying on the elevator doors. Solutions include trench drains at the elevator doors and curbs around the rest of the hoistway; sloped floors that drain away from the hoistway; gasketed opening and sealing cracks at the base of the hoistway walls (3007.4). Shunt trips typically turn off an elevator when water gets into the hoistway. Protecting the hoistway from water infiltration means the shunt trip is not necessary in the FSAE (3007.5).

Hoistways for the FSAE are required to be fire-resistant and meet structural integrity requirements for shafts in high-rise buildings (403.2.3, 708, 3007.6, 3007.6.1). In addition, lighting must be provided within the hoistway (3007.6.2). The light allows firefighters to check for fire, smoke or water in the hoistway and aids the firefighters' escape through the top of the cab if the elevator stops.



**Fire department staging to fight a fire.**

A key component for the FSAE are the lobby requirements. The same lobby used for the FSAE also can be used as the lobby for normal building circulation. This lobby will contain the two-way communication required for persons who cannot use the stairway to communicate with emergency responders (1007.8). Evacuation information signage in the elevator lobby can direct people for accessible means of egress (1007.10). Persons

with mobility impairments may be waiting in this lobby for fire department evacuation assistance. Fire officials will determine whether to move these individuals into the elevators immediately, or carry them down the stairway to another level and use the elevators from there. Fire and Safety evacuation plans will address how this will be handled. (1001.4, IFC 404).

The lobby must be enclosed with a smoke barrier having a fire resistance rating of not less than 1 hour (3007.7.2). The smoke barrier wall can terminate at the elevator hoistway; thus, the walls of the elevator hoistway form part of the enclosure around the lobby. Therefore, no protection is required on the doors between the elevator hoistway and the lobby. Since there are lobbies at all floors other than the floor at the level of exit discharge, the chance of smoke moving up the elevator hoistway will be minimized. Other than the elevator doors, openings into the lobby shall have a fire protection rating of not less than  $\frac{3}{4}$  hour and meet smoke and draft control assembly requirements (3007.7.3).

The minimum lobby size for FSAE is not less than 150 square feet, with a minimum dimension in either direction of 8 feet. This will result in a lobby at least 8 feet by 18.75 feet, a fairly standard lobby size. This will allow space for the fire department to stage firefighting operations. The lobby size requirements are the

same whether you have one or more FSAEs. It is the designer's choice to provide additional area for the general means of egress through this lobby, or additional area for persons who need assistance to wait within the elevator lobby. Additional area may not be needed if it is assumed that once the fire department arrives, the first trip back down for fire department equipment also can take persons who need assistance to the level of exit discharge or another safe place within the building.

The exit stairway must be directly accessed from the lobby (3007.7.1). The occupant of the fire floor should have begun evacuation before the fire department has arrived; however, there may still be building occupants evacuating through the FSAE lobby to get to the stairway. A Class I standpipe will be located within that stairway enclosure (3007.10). Typically, the fire department stages two floors below the fire floor and moves up to the fire floor through the exit stairway. Using a hose from the standpipe will keep the door to the enclosure open. So there will not be a risk of getting smoke into the elevator lobby, there must also be a door out of the stairway that does not lead through the FSAE lobby (3007.10).

There will be a system to monitor the FSAE from the fire command center (3007.8). Standby power must be provided for the elevator equipment, elevator hoistway

lighting, the HVAC system in the elevator machine room and the elevator controlling cooling equipment (3007.9). All wires outside the shaft shall be protected by 2 hour fire resistance rated construction or a circuit integrity cable (3007.9.1).

The key to the success of FSAEs is that the criteria was developed through a committee which included representatives from the elevator industry, firefighters, members of the building design community, and of the building codes and standards industry. The result is an elevator system that can be constructed to serve the needs of the general circulation and emergency responders; will be used by the fire service effectively; and is a true benefit for persons who need assistance in evacuation. The concept of a FSAE was supported by research through the Government Service Administration (GSA) and the National Institute of Standards and Technology (NIST). The ICC Code Technologies Committee (CTC) continues to have a code development study group that looks at issues such as elevator lobby design, FSAE and occupant evacuation elevators that will improve the functions of such systems. One of the items they took on as part of Group A code changes was how an exit stairway could be more remotely located from the FSAE lobby in high-rise buildings without a central core design. You can review Group-A information [here](#). **bsj**