

5.08 Fire Service Access Elevators (FSAE) and Occupant Evacuation Elevators (OEE) (2022)

Reference: 2022 San Francisco Fire Code (SFFC), Section 511.1; 2022 San Francisco Building Code (SFBC), Sections 403.5.2, 403.6.1, 3007 & 3008; 2022 NFPA 72 Sections 21.5, A.21.5 & 21.6; 2019 ASME A17.1 Section 2.27.11.

1.0 PURPOSE. The purpose of this document is to provide for safeguards and fire safety features in high rise buildings such that the fire department has a more efficient means than stairs, and safer means than Phase II In-Car Emergency Operation by firefighters utilizing standard elevators. The FSAEs will provide firefighters with safe means for reaching and fighting fires and rescue occupants on all floors of high-rise buildings. The OEEs will provide safe means for occupants to self-evacuate in tall buildings (in addition to stairs).

2.0 SCOPE:

A. FSAEs shall apply to all new high-rise buildings more than 120 feet in height as defined by the SFBC Section 403.6.1. For those buildings covered by the scope of this document, two (2) FSAEs designed for firefighters use during fire emergencies are required to be provided in accordance with this Administrative Bulletin, and be provided with associated lobbies in accordance with 2022 SFBC Sec. 3007. Both FSAEs shall comply with Sections 2022 SFBC 403.6.1 & 3007 and 2022 NFPA 72 Sections 21.5 & A.21.5. Each FSAE shall have a capacity of not less than 3,500 pounds and shall comply with 2022 SFBC Section 3002.4 (ambulance stretcher size).

B. OEEs shall be optional per 2022 SFBC Sec. 403.5.2 or for any other building, at the owner's request. OEEs shall be provided in accordance with 2022 SFBC Sec. 3008 and 2022 NFPA 72 Section 21.6. All traction passenger elevators in the building including the two required FSAEs, shall serve as OEEs and shall be provided with Occupant Evacuation Operation (OEO) per ASME A17.1-2019 Section 2.27.11. All hydraulic elevators and freight elevators are prohibited to serve as FSAEs and/or OEEs. When approved by SFFD on a case-by case basis, shuttle traction passenger elevators serving 2-3 levels may be exempt from serving as OEEs.

3.0 PROTECTION FROM FIRE, HEAT, SMOKE AND WATER. FSAEs and OEEs shall be designed so that they are protected from the effects of fire, heat, smoke, or water. This will be accomplished through a performance-based design narrative submitted to SFFD for review and approval. The design narrative shall be authored by a qualified Professional Engineer licensed in the state of CA and shall be submitted at the Site Permit stage (Preliminary Narrative) and at the Architectural/Mechanical stage (Final Narrative). The design shall include, but is not limited to, the following:

a. Protection of the FSAE/OEE hoistways, their associated Elevator Machine Rooms (EMR), or Elevator Control Rooms (ECR) and associated enclosed FSAE/OEE lobbies are required. The protection (from smoke) of these associated FSAE/OEE areas and spaces shall be described on the Smoke Control report, reviewed and approved separately by SFFD. Occupied or non-occupied rooms or spaces such as: electrical rooms, mechanical rooms, storage rooms, telecommunication rooms, office rooms, residential rooms, etc. shall not be permitted to open into the FSAE/OEE lobby in any occupancy.

b. At a minimum, a trench drain at all FSAE/OEE lobby door openings located at the floor side of the lobby door (outside the FSAE/OEE lobby), shall be designed to accommodate a 100 GPM flow of

the automatic fire sprinklers in areas located outside the FSAE/OEE lobbies. On the ground floor, where an enclosed FSAE/OEE lobby is not required, trench drains shall also be provided at the FSAE/OEE non-enclosed lobby opening or at other approved location(s). This is to prevent water intrusion to the FSAE/OEE hoistway(s) from sprinkler(s) activation on upper floors and/or at the ground floor. This design shall not violate accessibility requirements in regards to level landing or threshold heights. The required drainage is not intended to accommodate water from sprinklers flowing within the FSAE/OEE lobbies. A ½ inch threshold shall be provide for each trench to prevent water from passing into the lobbies over the trench grates.

c. An approved water proofing system around all hoistway and FSAE/OEE lobby walls on all levels shall be provided to prevent water from infiltrating into the FSAE/OEE hoistways between the walls and floor assemblies. The water proofing system shall be provided around the hoistway and FSAE/OEE lobby walls for a minimum of six (6) inches height above the finished floor.

d. Provisions for keeping elevator equipment at the appropriate temperature to sustain operation for the length of time the building generator is designed to operate -- 8 hours minimum. This may require a careful review of the equipment, its operating temperatures, the HVAC system and the standby power system required for all other life safety systems in the building.

e. All Machine-Room-Less (MRL) FSAE/OEEs in all occupancies, having their driving machines located inside the hoistway(s) shall have an approved venting to the exterior of the building. This shall be detailed on associated architectural and mechanical permit plans. Where hoistway pressurization method is approved and provided, hoistway venting shall not be required for that specific hoistway(s) only. Hoistway pressurization shall not be approved in lieu of FSAE/OEE lobbies. All floors/levels in the building shall be served by both FSAEs and shall also be provided with enclosed lobbies per 2022 SFBC Sec. 3007.6.4.

f. An approved means for firefighters to monitor heat conditions in FSAE/OEE lobbies and associated machine/control rooms, utilizing an analog heat sensing system, or a listed 2-temperature-stages heat detectors, shall be provided on a FSAE/OEE status panel located in the FCC. This status panel is intended to provide firefighters with more information to determine whether the FSAE/OEE protection has been compromised. The status panel shall comply with 2022 NFPA 72 Section 21.5, A.21.5 & 21.6 and 2022 SFBC Section 3008 as described in item 4.g below.

4.0 PRESCRIPTIVE REQUIREMENTS. The design shall include the following prescriptive requirements:

a. FSAE/OEE hoistways, lobby, and machine room smoke control mechanical components used to protect the FSAE/OEEs, shall be protected in accordance with smoke control system requirements as described in the Smoke Control report based on 2022 SFDBI AB #047 and 2022 SFBC Section 909 and shall be included in UUKL weekly self-testing of smoke control components. This system shall be illustrated and controllable at the Firefighter's Smoke Control Panel (FFSCP) located in the FCC.

b. The FSAE/OEEs and their installation shall conform to the currently adopted California Elevator Code: CCR Title 8 Elevator Safety Orders (ESO) and its adopted national elevator code - ASME A17.1 and specific CA Elevator Regulations.

c. Power transfer switches for FSAE/OEEs shall be located as close as practicable to the motors

and controls they supply. The normal power feeders and the stand-by feeders supplying the transfer switches shall be by independent routes, and shall comply with the 2022 San Francisco Electrical Code.

d. The entire FSAE hoistway shall be illuminated at not less than 1 foot-candle (11 lux) as measured from the top of the car of each fire service access elevator when in Phase I Manual or Automatic Emergency Operation and during Phase II, Firefighter's in-car Emergency Operation. This lighting shall be provided with standby power. A separate manual switch to activate the hoistway lights shall be provided on the FSAE Status Panel at the FCC. The FSAEs vendor shall provide an output from the FSAE system indicating when the FSAEs are in Phase I Emergency Recall Operation. The FSAE hoistway lights shall turn off automatically when the FSAEs are returned to normal service operation.

e. All OEEs shall run simultaneously on generator backup power. The following features serving each FSAE/OEEs shall be supplied by both normal power and Type 60/Class 2/Level 1 standby power:

- Elevator equipment - simultaneous use for both FSAEs and all OEEs.
- FSAE hoistway lighting.
- Elevator machine or control room ventilation and cooling equipment.
- Elevator controllers cooling equipment.

f. Wires or cables that provide normal and standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire/smoke and heat-detecting systems to the FSAEs/OEEs, shall be protected by construction having a minimum 2-hour fire resistance rating or shall be circuit integrity cables in conduit (CIC) having a minimum 2-hour fire-resistance rating.

g. The FSAE/OEEs shall be continuously monitored at the FCC per 2022 NFPA 72 Section 21.5,

A.21.5 and 21.6, 2022 SFBC Section 3008 and ASME A17.1-2019 Section 2.27.11. The elevator vendor shall provide the elevator monitoring system and the fire alarm system vendor shall provide the FSAE Status Panel. Coordination must take place between the elevator and fire alarm system contractors/vendors.

h. Where Machine Room-less(MRL) elevators are utilized as FSAE/OEEs, a smoke detection system utilizing air sampling type smoke detectors, or other approved smoke detection devices accessed from outside the hoistway through an approved access hatch door, shall be provided at the top of the hoistway in an approved location.

i. Emergency Responders Radio Coverage with 99% signal strength shall be provided in all FSAE/OEE cars to provide radio communication between the FSAE/OEE cars and the FCC.

j. The FCC shall be located in an approved location proximate to the FSAEs. The approved location must be close to an entryway where Fire Department vehicle access is provided. The preferred location is near the main entrance. The FCC must be two-hours fire rated with a 90-minute door and it must be protected from water intrusion from sprinkler/s activation on upper floors. (Reference 2022 SFFC Section 508.1.2)

k. In Residential high-rises (R-1 and R-2 Occupancies) where FSAEs are required, each entrance to the FSAE lobby serving a residential floor is required to have protected path of travel between the FSAE lobby and the Exit stair or Exit passageway. Only in the garage/basement level(s), one entrance

to the FSAE lobby is required to have protected path of travel.

l. FSAE Symbol: Designated FSAEs shall be identified with the symbol for fire department operation (firefighter's hat symbol). Each symbol shall be not less than 78 inches, and not more than 84 inches above the floor level at the threshold. It shall be a white helmet symbol on a black background - 3-inches tall Metal sign with same ratio between the hat size to background as specified in 2022 SFBC Section 3007.6.5. **The FSAE sign shall be installed on each side of every FSAE entrance on every floor, on the hoistway door frame, per the specific height requirements indicated in SFBC Section 3007.6.5.**

m. Per 2022 SFBC Section 3002.4, each FSAE shall be provided with "Ambulance Stretcher" size car. An associated international symbol of emergency medical services (star of life) shall be provided for each FSAE. This symbol is required on every level and both sides of each FSAE elevator hoistway door frame.

n. Automatic fire sprinklers are prohibited in all the following FSAE/OEE spaces: machine or control rooms, associated machinery spaces, the bottom (pit) and tops of associated FSAE/OEEs hoistways. Shunt Trip function is prohibited for all FSAE/OEEs.

o. The storage of combustible materials in any elevator machine or control room and lobbies is prohibited. The San Francisco Fire Department will consider the building to be equipped throughout with an automatic sprinkler system if all other areas are sprinklered in accordance with the 2022 NFPA 13..

p. Submittal Requirements. All FSAEs/OEEs designs shall be described in an FSAE/OEE design narrative, written by either the smoke control author or by other qualified Professional Engineer. The preliminary FSAE/OEE design narrative shall be submitted for SFFD review at the site permit stage of the project. A final FSAE narrative shall be submitted at the architectural and mechanical permit stage. This narrative shall include a description of the proposed strategy for the FSAE/OEE protection and will include justification for the performance criteria. The FSAE /OEE design narrative shall be authored by a qualified Professional Engineer who is licensed in the State of California. This individual shall take responsibility for describing the safety features of the building that will protect the elevator under the requirements of this document.

q. FSAE/OEE addendum submittal. All FSAE/OEE projects shall include a separate FSAE/OEE submittal as the last addendum to the site permit. This addendum shall incorporate all approved associated FSAE/OEE sheets from the Architectural and MEP addenda. The purpose of the FSAE/OEE addendum is mainly for record keeping. No work is required to be performed under this addendum. The FSAE/OEE Narrative author shall be responsible to review this submittal to ensure all FSAE/OEE protection features described in the Narrative are provided on associated approved permit plans. A compliance review stamp and signature shall be provided by the FSAE/OEE Narrative author on the cover sheet of all FSAE/OEE addendum submittals.