



**2012**  
**SEATTLE**  
**BUILDING**  
**CODE**  
Elevator Excerpt

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## CHAPTER 30

# ELEVATORS AND CONVEYING SYSTEMS

Note: Chapter 30 is entirely amendments to the *International Building Code* and is not underlined.

### SECTION 3001 PURPOSE

The purpose of this chapter is to protect persons, buildings and the contents thereof from hazards arising from the use of elevators, dumbwaiters, material lifts, escalators, moving walks and other conveyances by establishing minimum requirements regulating the design, construction, alteration, operation and maintenance of elevators, dumbwaiters, material lifts, escalators, moving walks and other conveyances, and by establishing procedures by which these requirements may be enforced.

### SECTION 3002 SCOPE

**3002.1 General.** This code of safety standards covers the design, construction, installation, operation, inspection testing, maintenance, alteration and repair of elevators, dumbwaiters, material lifts, escalators, moving walks and other conveyances.

**3002.2 Application to existing conveyances.**

**3002.2.1 Minimum standard for existing conveyances.**

All existing conveyances shall comply with Washington Administrative Code (WAC) Chapter 296-96 Part D as it existed on February 15, 2013 and with Section 3011 as minimum standards.

**3002.2.2 Maintenance.** All conveyances covered under this chapter, both existing and new, and all parts thereof shall be maintained in a safe condition. All devices and safeguards that are required by this chapter shall be maintained in good working order. All devices or safeguards that were required by a code in effect when the conveyance was installed, altered, or repaired shall be maintained in good working order. Maintenance shall comply with ASME A17.1 Section 8.6. The owner or the owner's designated agent is responsible for the maintenance of such equipment.

**3002.2.3 Repairs and replacements.** Repairs to existing conveyances and replacements of devices and components shall be made with parts of at least equivalent material, strength and design. They shall comply with WAC 296-96 Part D and ASME A17.1 Section 8.6.

**3002.2.4 Additions and alterations.** Additions and alterations are permitted to be made to the conveyance system of existing buildings or structures without making the entire system comply with all of the requirements of this chapter for new buildings or structures, provided the additions and alterations that are made comply with the requirements of this chapter for a new system, except as

otherwise specifically provided in this code and in other applicable retroactive ordinances of the city.

Unless otherwise *approved* by the *building official*, alterations, repairs, replacements and maintenance of conveyances shall comply with the requirements of ASME A17.1 Section 8.7. Where Section 8.7 refers to a requirement that has been amended by this chapter, the requirements of this chapter take precedence. Where Section 8.7 refers to ASME A17.3, the requirements of WAC 296-96 Part D apply. Alterations to existing material lifts shall conform with the requirements of WAC Chapter 296-96 Part C1 Material Lifts.

**3002.2.5 Seismic improvements.** The *building official* is authorized to promulgate rules to establish standards for seismic improvements to existing conveyances.

**3002.2.6 Change of use.** When the use of an existing freight elevator is changed to carrying of passengers, the elevator must comply with the retroactive requirements of this code, ASME A17.1, 2.16.4 and WAC 296-96 Part D for passenger elevators.

**3002.2.7 Historic buildings and structures.** See the *International Existing Building Code* for regulations regarding historic buildings or structures.

**3002.3 References to the *National Electrical Code*.** For the purpose of this chapter, all references in the ASME Code to the *National Electrical Code* include the *Seattle Electrical Code*. All electrical work shall be done in accordance with the requirements of the *Seattle Electrical Code*.

**3002.4 Conflicts.** In any case where the codes adopted by reference in Section 3003 conflict with the requirements of this chapter, this chapter controls.

### SECTION 3003 CODES

**3003.1 *Seattle Elevator Code*.** The following are adopted by reference as part of the *Seattle Building Code*. They also constitute the *Elevator Code of the City of Seattle*.

1. Safety Code for Elevators and Escalators, ASME A17.1-2010, as amended in this ordinance and Appendices A through D, F through J, L, M and P through U.

#### Exceptions:

- 1.1. ASME A17.1 Sections 5.4, 5.5 and 5.10 are not adopted.
- 1.2. ASME A17.1 Section 1.2.1, Purpose is not adopted.
2. Safety Standard for Platform Lifts and Stairway Chairlifts, ASME A18.1-2011.

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3. Standard for Elevator Suspension, Compensation, and Governor Systems, ASME A17.6-2010.

**Exception:** ASME A17.6 Part 2 Aramid Fiber Ropes for Elevators is not adopted.

4. Safety regulations for all elevators, dumbwaiters, escalators and other conveyances, Washington Administrative Code Chapter 296-96 as it existed on February 15, 2013.

**Exception:** The following sections of WAC Chapter 296-96 are not part of the Elevator Code of the City of Seattle:

1. Part B, Licenses and Fees for all Elevators, Dumbwaiters, Escalators, and Other Devices.
2. Part B-1, Regulations and Fees for All Elevators, Dumbwaiters, Escalators and Other Conveyances.
3. Part C3, Construction, Operation, Maintenance and Inspection of Private Residence Conveyances for Transporting Property for Residential Use.
4. Part C4, Temporary Hoists.
5. Part C5, Additional Types of Conveyances.

**3003.2 Licensing.** All persons and firms working on conveyances in Seattle shall comply with RCW Chapter 70.87 and WAC Chapter 296-96.

**3003.3 Administrative rules.** The *building official* is authorized to adopt by administrative rule, in accordance with Section 104.8, that furthers the intent and purpose of this code, that encourages the use of state of the art technology, materials or methods of construction, and which provides standards that are equal or better than those contained in this code.

### SECTION 3004 DEFINITIONS

The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein. These definitions are in addition to ASME A17.1 Section 1.3, RCW 70.87, Laws Governing Elevators and Other Lifting Devices, and Chapter 2 of this code.

**ALTERATIONS, REPAIRS AND REPLACEMENTS.** See ASME A17.1 Section 1.3.

**AUTOMATIC ELEVATOR.** A type of elevator that does not require an attendant. All calls are registered by the passengers.

**AUTOMOBILE PARKING ELEVATOR.** An elevator located in either a stationary or horizontally moving hoistway and used exclusively for parking automobiles where, during the parking process, each automobile is moved under its own power onto and off the elevator directly into parking spaces or cubicles in line with the elevator and where no persons are normally stationed on any level except the receiving level.

**CONTROL ROOM.** An enclosed control space outside the hoistway, intended for full bodily entry, that contains the motor controller. The room could also contain electrical or

mechanical equipment used directly in connection with the elevator, dumbwaiter, or material lift but not the electric driving machine or the hydraulic machine.

**CONTROL SPACE.** A space outside the hoistway, intended to be accessed with or without full bodily entry, that contains the motor controller. This space could also contain electrical or mechanical equipment used directly in connection with the elevator, dumbwaiter, or material lift but not the electric driving machine or the hydraulic machine.

**CONVEYANCE.** An elevator, accessibility lift, escalator, dumbwaiter, material lift, automobile parking elevator, moving walk or other elevating device.

**CONVEYANCES IN SERVICE.** Units that are in operation, are inspected and certified by the *building official* for operation.

**CONVEYANCES OUT OF SERVICE.** The use of the unit has been prohibited either temporarily or permanently in accordance with Section 3005 below.

**ENFORCING AUTHORITY.** As used in ASME A17.1 means the *building official*.

**EXISTING INSTALLATIONS.** All conveyances that have been tested and *approved* for use by the *building official*.

**INSPECTOR.** Inspectors employed by the City of Seattle and working under the direction of the *building official*.

**MACHINE ROOM.** An enclosed machinery space outside the hoistway, intended for full bodily entry, that contains the electric driving machine or the hydraulic machine. The room could also contain the motor controller, and electrical and/or mechanical equipment used directly in connection with the elevator, dumbwaiter, or material lift.

**MACHINERY SPACE.** A space inside or outside the hoistway, intended to be accessed with or without full bodily entry, that contains elevator, dumbwaiter, or material lift mechanical equipment, and could also contain electrical equipment used directly in connection with the elevator, dumbwaiter, or material lift. This space could also contain the electric driving machine.

**MATERIAL LIFT.** A fixed, stationary conveyance that:

1. Has a car or platform that moves in guides;
2. Serves two or more floors or landings of a building or structure;
3. Has a vertical rise of at least 30 inches (762 mm) and no more than sixty feet (18 288 mm);
4. Has a maximum speed of fifty feet (15 240 mm) per minute;
5. Is an isolated, self-contained lift and is not a part of a conveying system;
6. Travels in an inclined or vertical, but not horizontal, direction;
7. Is operated only by, or under the direct supervision of, an individual designated by the employer; and
8. Is installed in a commercial or industrial area, and not in an area that is open to access by the general public.

**SECTION 3005  
AUTHORITY TO DISCONNECT UTILITIES,  
TAKE CONVEYANCES OUT OF SERVICE  
AND INVESTIGATE ACCIDENTS**

**3005.1 Disconnection of utilities.** In addition to the provisions for Emergency Orders provided in Section 102, the *building official* is authorized to disconnect or order discontinuance of any utility service or energy supply to equipment regulated by this code in cases of emergency or where necessary for safety to life and property. Such utility service shall be discontinued until the equipment, appliances, devices or wiring found to be defective or defectively installed are replaced, repaired, or restored to a safe condition. Proper posting and seals shall be affixed to the equipment to prevent inadvertent use.

**3005.2 Conveyances out of service.** A conveyance shall be taken out of service temporarily after the *building official* has inspected the unit for proper parking of the car, securing the hoistway openings, and disconnection of power. A seal and tag shall be placed on the equipment to insure against unauthorized use. A conveyance is permitted to remain in a temporarily out-of-service status for a period not to exceed two years, after which time it shall be placed in a permanently out-of-service status.

**Exception:** Elevators that could be returned to service without repair are permitted to remain in a temporary out-of-service status with approval of the *building official*.

A conveyance shall be placed permanently out of service by landing the car and counterweights and removing the hoisting cables or fluid lines. Conveyances placed in a permanently out-of-service status shall have the hoistway sealed off for fire protection by securing existing doors.

Conveyances in an out-of-service status either temporarily or permanently are permitted to be placed back into service and classified as an existing installation unless determined to be hazardous by the *building official*. Requirements in effect at that time must be completed before certification and use. No installation or reconnection of hydraulic elevators powered by city water pressure is permitted.

**3005.3 Report and investigation of accidents.** The owner or the owner's authorized agent shall promptly notify the *building official* of each accident involving a conveyance that requires the service of a physician or results in a disability exceeding one day, and shall afford the *building official* every facility for investigating and inspecting the accident. The *building official* shall without delay, after being notified, make an inspection and shall place on file a full and complete report of the accident. The report shall give in detail all material facts and information available and the cause or causes, so far as they can be determined. The report shall be open to public inspection at all reasonable hours. If an accident involves the failure or destruction of any part of the construction or the operating mechanism of a conveyance, the use of the conveyance is forbidden until it has been made safe, it has been reinspected and any repairs, changes, or alterations have been *approved* by the department, and a permit has been issued by the *building official*. The removal of any part of the damaged construction or operating mechanism from the

premises is forbidden until the *building official* grants permission to do so.

**SECTION 3006  
INSTALLATION AND ALTERATION PERMITS**

**3006.1 Installation permits.** A permit issued by the *building official* is required to install any elevator, escalator, dumbwaiter, automobile parking elevator, material lift, or moving walk or other conveyance. A separate permit shall be obtained for each conveyance installed regardless of location and/or contract arrangements.

**3006.2 Alteration/repair permits.** A permit is required to make any alterations to existing elevators, escalators, dumbwaiters, automobile parking elevators, material lifts, moving walks or other conveyances. A separate permit shall be obtained for each conveyance altered or relocated regardless of location and/or contract arrangements.

**Exceptions:**

1. Permits for repairs required by inspection reports are permitted to be combined for a single building.
2. The *building official* is permitted to issue a single permit for minor alterations to more than one conveyance that do not require individual retesting of each conveyance.
3. No permit shall be required for ordinary repairs made with parts of the same materials, strength and design normally necessary for maintenance.

**3006.3 Temporary use permits.** The *building official* is permitted to issue a temporary use permit for a period not to exceed 60 days to allow completion of installation and passing of the final inspection. Temporary use permits may be renewed by the *building official*. If, at any time during the period of temporary use, the *building official* determines that the building owner is not making adequate progress toward completion of the installation and passing of the final inspection, the *building official* is permitted to withdraw the temporary use permit on 7 days notice. The *building official* is authorized to forbid further use of the conveyance until a certificate of inspection is obtained. If any conveyance is found to be *unsafe* or fails to comply with a notice of correction, the *building official* is authorized to revoke the temporary use permit.

**3006.4 Expiration, renewal and revocation of permits.** Sections 106.9 through 106.12 apply to permits required by this chapter.

**SECTION 3007  
PLANS AND SPECIFICATIONS**

**3007.1 Permit drawings.** Two sets of drawings shall be submitted with applications for installations of new elevators, escalators, dumbwaiters, automobile parking elevators, material lifts, moving walks and other conveyances.

The drawings shall show beams, attachments, loads and reactions, and shall bear the seal of a structural engineer licensed under the laws of Washington State.

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The *structural engineer in responsible charge* for the building shall review the drawings and forward them to the *building official* with a notation indicating that the drawings have been reviewed and been found to be in general conformance to the design of the building.

**Exception:** An engineer's stamp is not required for hydraulic elevators.

**3007.2 Amendments to the permit.** If changes to the *approved* work are made during construction, approval of the *building official* shall be obtained prior to execution. The inspector may approve minor changes for work that will not reduce the structural strength or fire and life safety of the structure. The inspector shall determine if it is necessary to revise the *approved* construction documents. No changes that are subject to special inspection required by Chapter 17 shall be made during construction unless *approved* by the *building official*. If revised plans are required, changes shall be shown on two sets of plans that shall be submitted to and *approved* by the *building official*, accompanied by fees specified in the *Fee Subtitle* prior to occupancy. All changes shall conform to the requirements of this code and other pertinent laws and ordinances and other issued permits.

### SECTION 3008 REQUIRED INSTALLATION INSPECTIONS

**3008.1 Installation inspections.** It is the duty of the person doing the work authorized by a permit to notify the *building official* that such work is ready for inspection.

It is the duty of the person requesting any inspections required by this chapter to provide access to and means for proper inspection of such work.

Final inspection shall be called for by the applicant when the work described on the permit has been completed, and when ready for testing with weights and instruments, as needed. A final inspection is required after all wiring has been completed and all permanent fixtures such as switches, outlet receptacles, plates, lighting fixtures and all other equipment has been properly installed, and the hoistway, control rooms, machine rooms and machine spaces are properly completed.

### SECTION 3009 CERTIFICATES OF INSPECTION AND OPERATION

**3009.1 Certificates required.** It is a violation of this code to operate any elevator, escalator, dumbwaiter, automobile parking elevator, material lift, moving walk or other conveyance without a certificate of inspection or authorization of temporary use issued by the *building official*. A certificate of inspection shall be issued following an inspection by the *building official* showing that the conveyance has been found to be in safe operating condition and applicable fees for inspection time, as set forth in the *Fee Subtitle*, have been paid. The certificate is valid until 45 days after the next inspection or until the certificate is withdrawn, whichever comes first.

If any conveyance is found to be *unsafe* or fails to comply with a notice of correction, the *building official* is authorized to withdraw the certificate of inspection.

**3009.2 Periodic inspections.** The *building official* shall cause inspections to be made of every conveyance at intervals of 12 months or as soon thereafter as is practical. The inspector shall file a full and correct report on each conveyance with the *building official* that shall note any code violations, corrections required and the general condition of the conveyance.

**3009.3 Inspection report by building official.** After each required inspection of a conveyance the *building official* shall mail a copy of the inspection report to the owner of the conveyance inspected. If inspection shows a conveyance to be in violation of the requirements of this chapter, the *building official* shall issue a notice in writing listing the corrections to be made to the conveyance that are necessary to bring it into compliance with this chapter and is authorized to order the operation thereof discontinued until the corrections are made.

**3009.4 Inspections, tests and test reports.** Reports of required tests shall be submitted to the owner and to the *building official* on forms furnished by the *building official*. Performance of required tests and their cost shall be the responsibility of the owner. Identification of conveyances shall be noted by use of assigned city numbers.

### SECTION 3010 REQUIREMENTS FOR OPERATION AND MAINTENANCE

**3010.1 Responsibility for operation and maintenance.** The owner is responsible for the safe operation and maintenance of each device regulated by this chapter. The installation of pipes, ducts, conduits, wiring and the storage of materials not required for the operation of the elevator is prohibited in hoistways, control rooms, machine rooms and machine spaces. See Section 3022. Sidewalk elevators in public places are also subject to the requirements of Title 15, Seattle Municipal Code, Street and Sidewalk Use, as amended. See Part 8 of ASME A17.1 for requirements for operation and maintenance.

### SECTION 3011 RETROACTIVE REQUIREMENTS FOR EXISTING INSTALLATIONS

**3011.1 General.** Existing conveyances shall be made to comply with WAC 296-96 Part D, Regulations for Existing Elevators, Dumbwaiters, and Escalators and the provisions of this section.

**3011.2 Doors to elevator and dumbwaiter machine rooms.** Doors to elevator and dumbwaiter machine rooms, control rooms and machinery spaces shall be self-closing and self-locking. The lock shall be a spring-type lock arranged to permit the door to be opened from the inside without a key, incapable of being left in the unlocked position, and accessible only by a key from the outside.

**3011.3 Key retainer box.** A key retainer box locked and keyed to the standard City access key for elevator access and operation keys shall be provided. The key retainer box shall meet the following standards:

1. Dimensions – 8 inches high, 6 inches wide, 1 inch deep.
2. Material – 16 gauge steel welded.
3. Color – red (unless located in the main lobby above the hall call button, 6 feet nominal above the floor).
4. Labeling – “FOR FIRE DEPARTMENT USE.”
5. Lock – Ace one-inch cylinder cam lock key #39504.

The key retainer box is to be installed at the designated recall floor above the Phase I recall switch or in the main lobby above the hall call button when no recall feature exists. The key retainer box is to be mounted 6 feet nominal above the floor. The *building official* is permitted to approve other locations upon request.

Key retainer boxes are permitted to comply with Section 3016.9 as an alternative to complying with this section.

**3011.4 Elevator access keys.** Keys for access to and for the operation of elevating equipment shall be tagged and retained in the key retainer box. The key retainer box shall contain fire emergency service keys (Phase I and II, one key for each switch) and keys for any of the following that are in the building:

1. Doors to the control room, machine room and machine space;
2. Secondary level door;
3. Pit door;
4. Roof door;
5. Independent, hospital emergency and/or attendant operation;
6. Hoistway access;
7. Mechanical hoistway access devices (broken arm, lunar, etc.);
8. Miscellaneous switches with locks;
9. Fire alarm panel room;
10. Sprinkler valve control room.

**3011.5 Dumbwaiter machinery access.** Access doors to dumbwaiter machinery space shall be provided with electric contacts and labeled on the exterior side “DANGER - DUMBWAITER MACHINE” in one-inch letters.

**3011.6 Machine space lighting and receptacles.** Permanent electric lighting shall be provided in all control rooms, machine rooms and machinery spaces. The illumination shall be not less than 10 foot-candles (108 lux) at the floor level. The lighting control switch shall be located within easy reach of the access to the room or space. Where practicable, the light control switch shall be located on the lock-jamb side of the access door. Where practical, elevator pits, control rooms, machine rooms and machine spaces shall be provided with an electrical receptacle.

**3011.7 Access to terminal landings.** Mechanical access to terminal landings of elevator hoistways shall be provided in accordance with WAC 296-96-23162 (1).

**3011.8 Wall covering material for passenger cars.** All materials exposed to the car interior and the hoistway shall be metal or shall conform to the following:

- (1) Materials in their end use configuration, other than those covered by paragraph (2) below, shall conform to the following requirements, based on the tests conducted in accordance with the requirements of ASTM E 84, ANSI/UL 723 or NFPA 252:
  - (a) flame spread rating of 0 to 75;
  - (b) smoke development of 0 to 450.
- (2) Napped, tufted, wove, looped, and similar materials in their end use configuration on car enclosure walls shall have a flame spread rating of 0 to 25.
- (3) Padded protective linings, for temporary use in passenger cars during the handling of freight, shall be of materials conforming to either paragraph (1) or (2) above. The protective lining shall clear the floor by not less than 4 inches (102 mm).
- (4) Floor covering, underlayment, and its adhesive shall have a critical radiant flux of not less than 0.45 W/cm<sup>2</sup> as measured by ASTM E 648. Floor finish materials of a traditional type such as wood, vinyl, linoleum and terrazzo are permitted to be used.

**Exception:** Handrails, operating devices, ventilating devices, signal fixtures, audio and visual communication devices, and their housings are not required to comply with this Section 3011.8.

**3011.9 Control and operating circuits and overcurrent protection.** Overcurrent protection shall be maintained in accordance with *1984 National Electrical Code* Section 620-61.

#### **3011.9.1 Control and operating circuits.**

##### **3011.9.1.1 Electric elevators.**

1. For electric elevators, the normal and final terminal stopping device shall not control the same controller switches unless two or more separate and independent switches are provided, two of which shall be closed to complete the driving-machine motor-and-brake circuit in either direction of travel. Where a two- or three-phase alternating current driving-machine motor is used, these switches shall be of the multipole type.

The control shall be so designed and installed that a single ground or short circuit may permit either, but not prevent both, the normal and final stopping device circuits from stopping the car.

2. In the design and installation of the control and operating circuits in electric elevators, the following requirements shall be met:
  - a. If springs are used to actuate switches, contactors or relays to break the circuit to stop an

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- elevator at the terminal landings, they shall be of the compression type.
- b. The completion or maintenance of an electric circuit shall not be used to interrupt the power to the elevator driving-machine motor or brake at the terminal landings, nor to stop the car when the emergency stop switch is opened or any of the electrical protective devices operate.

**Exception:** The requirements of this rule do not apply to dynamic braking, nor to speed control switches.
  - c. The failure of any single magnetically operated switch, contactor or relay to release in the intended manner, or the failure of any static control device to operate as intended, or the occurrence of a single accidental ground, shall not permit the car to start or run if any hoistway door interlock is unlocked or if any hoistway door or car door or gate electric contact is not in the closed position.
  - d. If generator-field control is used, means shall be provided to prevent the generator from building up and applying sufficient current to the elevator driving-machine motor to move the car if the elevator motor control switches are in the "OFF" position. The means used shall not interfere with maintenance of an effective dynamic-braking circuit during stopping and standstill conditions.
  - e. The control circuits shall be so designed and installed that the car speed in the down direction with rated load in the car, under normal operating conditions with the power supply on or off does not exceed governor tripping speed or 125 percent of rated speed, whichever is less.
3. Elevators with driving motors employing static control without motor generator sets shall conform to the following requirements:
    - a. Two devices shall be provided to remove power independently from the driving-machine motor. At least one device shall be an electromechanical contactor.
    - b. The contactor shall be arranged to open each time the car stops.
    - c. The contactor shall open the driving-machine brake circuit.
    - d. An additional contactor shall be provided to also open the driving-machine brake circuit. This contactor is not required to have contacts in the driving-machine motor circuit.
  4. Elevators employing alternating-current driving motors driven from a direct-current power source through a static inverter shall conform to the following requirements:
    - a. Two separate means shall be provided to independently inhibit the flow of alternating current through the solid state devices that connect the direct-current power source to the alternating-current driving motor. At least one of the means shall be an electromechanical relay.
    - b. The relay shall be arranged to open each time the car stops.
    - c. The relay shall cause the driving-machine brake circuit to open.
    - d. An additional contactor shall be provided to also open the driving-machine brake circuit. This contactor is not required to have contacts in the driving-machine motor circuit.
    - e. The electrical protective devices required by Rule 210.2 of ASME A17.1d-1986 shall control both the means that inhibit the flow of alternating current through the solid state devices and the contactors in the brake circuit.

**Exception:** Leveling can take place with power opening of the doors and gates as restricted by the requirements of Rules 112.2a(1) and 112.2b(1) of ASME A17.1d-1986.
    - f. After each elevator stop, the car shall not respond to a signal to start unless the relay that inhibits the flow of alternating current through the solid state devices, and the contactors in the brake circuit, are in the de-energized position.
  5. The electrical protective devices required by Rule 210.2 of ASME A17.1d-1986 shall control the solid state device and both contactors.

**Exception:** Leveling can take place with power opening of doors and gates as restricted by the requirements of Rules 112.2a(1) and 112.2b(1) of ASME A17.1d-1986.
  - f. After each elevator stop, the car shall not respond to a signal to start unless both contactors are in the de-energized position.

**Exception:** Elevators employing alternating-current hoist motors driven from a direct-current source through a static inverter.



**3011.9.1.2 Hydraulic elevators.** The design and installation of the control and operating circuits for hydraulic elevators shall conform to the following requirements:

- a. Springs, where used to actuate switches, contactors or relays to stop an elevator at the terminals or to actuate electrically operated valves, shall be of the compression type.
- b. The completion or maintenance of an electric circuit shall not be used to interrupt the power to control-valve-operating magnets nor to the pump driving motor of electro-hydraulic elevators under the following conditions:
  1. To stop the car at the terminals.
  2. To stop the car when the emergency-stop switch or any of the electrical protective devices operate.
- c. The failure of any single magnetically operated switch, contactor or relay to release in the intended manner or the occurrence of a single accidental ground shall not permit the car to start or run if any hoistway door interlock is unlocked or if any hoistway-door or car-door or gate contact is not in the closed position.

**3011.10 Roped hydraulic elevators.** Roped horizontal hydraulic elevators are permitted to continue in service but once taken out of service shall not be reactivated.

**3011.11 Pit access and equipment.** Access ladders shall be installed in elevator pits deeper than 3 feet.

Pits shall be illuminated by a permanent luminaire that provides not less than 5 foot-candles (54 lux) of illumination at the pit floor. Light bulbs shall be externally guarded to prevent contact and accidental breakage.

Pit light control switches shall be located inside the hoistway of every elevator approximately 48 inches above the threshold, and either within 18 inches of the access door or within reach from the access floor and adjacent to the pit ladder if provided.

Access shall be provided for safe maintenance and inspection of all equipment located in the pit.

**3011.12 Floor numbers.** Elevator hoistways shall have floor numbers not less than 2 inches in height, placed on the walls and/or doors of hoistways at intervals such that a person in a stalled elevator upon opening the car door could determine the floor position.

**3011.13 Car top work light.** A permanently wired work light and outlet shall be installed on top of freight and passenger elevators to provide adequate illumination for inspection and work in the hoistway. The light shall be provided with a non-keyed switch in or adjacent to the fixture. The fixture shall be protected from accidental breakage.

**3011.14 Labeling.** All equipment (disconnect switches, machines and controllers) operating on a voltage in excess of 250 volts shall be labeled for the voltage used in letters  $\frac{3}{4}$  inches high.

**3011.15 Interior alterations.** Alterations or modifications of elevator car interiors shall comply with ASME A17.1, 8.7.2.15.2 (increase or decrease in deadweight of car), Building Code requirements concerning flame spread ratings for wall coverings (See Chapter 8), and lighting requirements of ASME A17.1.

**3011.16 Illumination.** Illumination in the elevator car shall be maintained unless it is turned off manually by the switch in the car. A readily-accessible and labeled toggle-type test switch shall be provided on the top of the car to cut lighting power manually and test the emergency lighting.

**3011.17 Conveyance number designation.** In any building with more than one elevator, escalator or other type of conveyance, a designating number (not less than two inches in height) shall be located at the door of the main entrance lobby, inside the car, on the machine, on the disconnect switch or stop switch, and on escalator upper and lower front plates.

**3011.18 Escalator starting switches.** “Up” and “Down” positions shall be clearly indicated on all starting switches.

**3011.19 Anchorage for elevator equipment.** All elevator equipment, hydraulic or cable type, shall be anchored.

**3011.20 Restricted opening of doors.** All existing passenger elevators in Group R-1 hotels and dormitory buildings shall comply with the following.

1. When a car is outside the unlocking zone, the hoistway doors or car doors shall be so arranged that the hoistway doors or car doors cannot be opened more than 4 inches (102 mm) from inside the car.
2. When the car doors are so arranged that they cannot be opened when the car is outside the unlocking zone, the car doors shall be openable from outside the car without the use of special tools.
3. The doors shall be unlocked when the car is within 3 inches (76 mm) above or below the landing and are permitted to be configured to be unlocked up to 18 inches (457 mm) above or below the landing.

## SECTION 3012 RETROACTIVE REQUIREMENTS FOR EXISTING MATERIAL LIFTS

**3012.1 General.** Existing material lifts shall be made to comply with the following requirements. (Note: New material lifts shall comply with Section 3013).

**3012.2 Hoistway enclosure gates and doors.** The openings at each material lift landing shall have gates or doors that guard the full width of the opening. A hoistway door shall be vertically sliding, bi-parting, counter-balanced, or horizontally swinging or sliding. Gates and doors shall meet the following requirements:

1. A balanced-type, vertically sliding hoistway gate shall extend from not more than 2 inches from the landing threshold to not less than 66 inches above the landing threshold.

2. A gate shall be solid or openwork of a design that will reject a ball 2 inches in diameter. A gate shall be located so that the distance from the hoistway face of the gate to the hoistway edge of the landing sill is not more than  $2\frac{1}{2}$  inches. A gate shall be designed and guided so that it will withstand a lateral pressure of one hundred pounds applied at approximately its center without breaking or being permanently deformed and without displacing the gate from its guides or tracks.
3. Hoistway gates or doors shall have a combination mechanical lock and electric contact, which shall prevent operation of the material lift by the normal operating devices unless the door or gate is closed.

**3012.3 Controls.**

1. The control station shall be remotely mounted so that it is inaccessible from the material lift car.
2. Controls shall be clearly marked or labeled to indicate the function of control.
3. All control stations shall have a stop switch. When opened, the stop switch shall remove the electrical power from the driving machine and brake. The stop switch shall:
  - 3.1. Be manually operated;
  - 3.2. Have red operating handles or buttons;
  - 3.3. Be conspicuously and permanently marked "STOP";
  - 3.4. Indicate the stop and run positions; and
  - 3.5. Be arranged to be locked in the open position.

**3012.4 Capacity posting and no-riders sign.** Each material lift shall have a capacity sign permanently and securely fastened in place in the material lift car and on the landings. The sign shall indicate the rated load of the material lift in pounds. The sign shall be metal with black letters two inches high on yellow background.

A sign stating "NO PERSONS PERMITTED TO RIDE THIS DEVICE" shall be conspicuously and securely posted on the landing side of all hoistway gates and doors and in the enclosure of each material lift car. The sign shall be metal with black letters 2 inches high on red background.

**SECTION 3013  
REQUIREMENTS FOR NEW MATERIAL LIFTS**

**3013.1 New material lifts.** New material lifts shall comply with ASME A17.1, Sections 2.7, 2.8 and 3.7. WAC 296-96 Part C1, Minimum Standards for All Material Lifts, as it existed on February 15, 2013, applies to all material lifts as defined in Section 3004.

**SECTION 3014  
EMERGENCY SERVICE FOR ELEVATORS  
IN EXISTING BUILDINGS - PHASE I RECALL**

**3014.1 General.** All existing elevators requiring Phase I recall when installed or under Chapter 93 of the Seattle Fire Code shall comply with this section.

**Exceptions:**

1. Elevators that comply with the standards for new installations provided in Section 3018;
2. Elevators with less than 25 feet of travel if the *building official* and the fire code official give written approval; and
3. Elevators that comply with ASME A17.1, Rule 211.3a 1984 edition or later and Sections 3014.10 and 3014.11.

**3014.2 Phase I recall keyed switch.** A three-position ("on," "off" and "by-pass") key cylinder switch shall be provided at each designated level within easy line of sight of the elevator controlled by the switch. If additional switches are provided in a central control station they shall be two position ("off" and "on") key-operated switches.

**3014.3 Keyed cylinder-type switches.** Keyed cylinder-type switches shall comply with the following:

1. Keys shall be removable only in the emergency ("on") and normal ("off") positions. Keys shall not be removable in the by-pass position.
2. One key shall be provided for each Phase I switch or key cylinder.
3. All emergency operation cylinders (Phases I and II) shall be keyed alike but such key shall not be a part of a building master key system.

**3014.4 Key location.**

1. A key box meeting the standards of Section 3011.3 shall be provided at the designated recall floor above the Phase I recall switch. The key box is to be mounted approximately 6 feet above the floor. The *building official* is permitted to approve other locations upon request.
2. When a central control station is provided, an additional set of keys shall be provided and hung in the control station in a location designated by the fire chief. The keys shall be identified by a ring or paddle.

**3014.5 Key switch functions.**

1. The three positions of the switch shall be marked "by-pass," "off" and "on".
2. If the switch is in the "off" position, normal elevator service shall be provided and smoke detectors, if required, shall be functional.

3. If the switch is in the “by-pass” position, normal elevator service shall be restored independent of any required smoke detectors.
4. If the switch is in the “on” position, the elevators are in Phase I elevator recall mode.

**3014.6 Phase I automatic recall operation.** If the Phase I recall switch is in the emergency (“on”) position:

1. All cars controlled by this switch that are on automatic service shall return nonstop to the designated level and power-operated doors shall open and remain open.
2. A car traveling away from the designated level shall reverse at or before the next available floor without opening its doors.
3. A car stopped at a landing shall have the in-car emergency stop switch or in-car stop switch rendered inoperative as soon as the doors are closed and the car starts toward the designated level. A moving car, traveling to or away from the designated level, shall have the in-car emergency stop or in-car stop switch rendered inoperative immediately.
4. A car standing at a floor other than the designated level, with doors open and in-car emergency stop switch or in-car stop switch in the run position, shall conform to the following:
  - 4.1. Elevators having automatic power-operated horizontally sliding doors shall close the doors without delay and proceed to the designated level;
  - 4.2. Elevators having power-operated vertically sliding doors provided with automatic or momentary pressure closing operation in accordance with ASME A17.1 Rule 112.3d 1984 or later edition shall have the closing sequence initiated without delay in accordance with ASME A17.1 Rule 112.3d (1), (2), (3), and (5) 1984 or later edition, and the car shall proceed to the designated level;
  - 4.3. Elevators having power-operated doors provided with continuous pressure closing operation per ASME A17.1 Rule 112.3b 1984 or later edition or elevators having manual doors shall conform to the requirements of Section 3014.7. Sequence operation, if provided, shall remain effective.
5. Door reopening devices for power-operated doors that are sensitive to smoke or flame shall be rendered inoperative. Mechanically actuated door reopening devices not sensitive to smoke or flame shall remain operative. Car door open buttons shall remain operative. Door closing shall conform to the requirements of ASME A17.1 Rule 112.5 1984 or later edition. Door hold open switches shall be rendered inoperative.
6. All car and corridor call buttons and all corridor door opening and closing buttons shall be rendered inopera-

tive. All call register lights and directional lanterns shall be extinguished and remain inoperative. Position indicators, if provided, shall remain in service. All prior registered calls shall be canceled.

7. The activation of a smoke detector installed in accordance with Article 93 of the *Seattle Fire Code* in any elevator lobby or associated elevator machine room, other than the designated level, shall cause all cars in all groups that serve that lobby to return nonstop to the designated level. The fire code official is permitted to approve the connection of other detection devices to activate recall. The operation shall conform to the requirements of Phase I emergency recall operation. Whenever new elevator controllers are installed, they shall meet all provisions of the then current building and elevator codes. Newly-installed controllers shall have the capability of selecting alternate recall floors.

**3014.7 Attendant-operated recall operation.** Attendant-operated elevators shall be provided with visible and audible signals that alert the operator to return to the lobby when the car has been recalled under Phase I control.

**3014.8 Dual recall operation.** Elevators arranged for dual operation shall conform to all requirements for automatic operation and attendant operation as applicable.

**3014.9 Inspection/maintenance recall operation.** During inspection operation the audible and visible signals required in Section 3014.7 will be actuated when the car has been recalled under Phase I control. The car shall remain under the control of the operator and/or car top station until the car is returned to service.

**3014.10 Nurses’ preemption.** Nurses’ preemption (hospital service) is permitted to commandeer up to one-half of the cars in a particular bank of elevators. At least one-half of the cars shall respond to Phase I and all cars not preempted shall respond.

**3014.11 Operation instruction.** Instructions for operation of elevators under Phase I shall be incorporated with or adjacent to the Phase I switch at the designated level. Instructions for operation of elevators under Phase II shall be incorporated with or adjacent to the switch, in or adjacent to the operating panel in each car. In addition, Phase I operating instructions shall be adjacent to the Phase I switch in the fire control center and other *approved* locations.

Instructions shall be in letters not less than  $\frac{1}{8}$  inch (3.2 mm) in height and shall be permanently installed and protected against removal or defacement.

**3014.12 Latching.** All cars responding to Phase I Recall, activated by a smoke detector or other *approved* detection device, shall return to the appropriate recall floor as determined by the first detector recall signal received. No device other than the Phase I switch is permitted to override the first recall signal received. A later detection signal shall not change the recall floor. Smoke detector activation shall only be reset manually.

**SECTION 3015  
EMERGENCY SERVICE FOR ELEVATORS  
IN EXISTING BUILDINGS - PHASE II HIGH  
RISE IN-CAR OPERATION**

**3015.1 General.** Existing elevators in buildings having floors used for human occupancy located more than 75 feet above the lowest level of fire department vehicle access, or buildings having floors used for human occupancy 35 feet above grade, which lack fire department vehicle access to at least one side shall have Phase II in-car operation and shall comply with this section.

**Exceptions:**

1. Elevators that comply with the standards for new installations as provided in Section 3019;
2. Elevators with less than 25 feet of travel when the *building official* and fire code official give written approval; and
3. Elevators that comply with ASME A17.1 Rule 211.3c 1984 or later edition.

**3015.2 Phase II in-car operation key switch.**

1. A two-position (“off” and “on”) key cylinder switch shall be provided in each elevator car.
2. The switch shall become effective only when the designated level Phase I switch is in the “on” position or a smoke detector has been activated and the car has returned to the designated level. The “on” position shall place the elevator in Phase II in-car operation.
3. The elevator shall be removed from Phase II operation only by moving the switch to the “off” position with the car at the designated level.
4. The switch shall be operable by the Phase I key and such key shall not be part of a building’s master key system.
5. The key shall be removable only in the “off” position.
6. One key shall be provided for each Phase II switch or key cylinder.

**3015.3 Key location.** See Section 3014.4 for the location of the keys.

**3015.4 Designated operator.** The operation of elevators on Phase II emergency in-car operation shall be by trained emergency service personnel only.

**3015.5 Car operation only.** An elevator shall be operable only by a person in the car.

**3015.6 Corridor call buttons and directional lanterns.** All corridor call buttons and directional lanterns shall remain inoperative.

**3015.7 Car and hoistway door operation.** The operation of car and hoistway doors shall comply with the following:

1. The opening of power-operated doors shall be controlled only by constant-pressure open buttons or switches.
2. If the constant-pressure open button or switch is released prior to the doors reaching the fully open position,

the doors shall automatically reclose. Once doors are fully open, they shall remain open until signaled to close.

3. The closing of power-operated doors shall be by constant pressure of either the call button or door-close button. If a door-close button is supplied, it shall be operable.
4. If the constant-pressure close button or car call button is released prior to the doors reaching the fully closed position, the doors shall automatically reopen. Once doors are fully closed, they shall remain closed until signaled to open.

**Exception:** Momentary pressure control of doors using the sill trip-type operator may be permitted as existing; however, the doors must not open automatically upon arrival at a floor.

**3015.8 Door reopening devices.** Smoke-sensitive door reopening devices and door hold-open switches shall be rendered inoperative. Non-smoke-sensitive door reopening devices required to be operative under all other conditions may be rendered inoperative under Phase II in-car operation only if the doors are closed by constant pressure.

**3015.9 Car call cancellation.** All registered calls shall cancel at the first stop.

**3015.10 Direction of travel.** Direction of travel and start shall be by the car call buttons. With doors in the closed position, actuation of the car call button shall select the floor and start the car to the selected floor. If no door-close button is available, constant pressure of the car call button shall select the floor, close the door, and start the car to the selected floor.

**Exception:** On proximity-type car call buttons or any other type subject to false firing (calls being placed by line spikes, intermittent loss of power, etc.), the doors shall be closed by a door-close button. Floors may be selected either before or after closing of the doors. The car will start only on the call button or door close button depending on which is the last device to be actuated.

**3015.11 Motor generator time out.** The motor generator shall not time out automatically.

**3015.12 Car position indicators.** The car position indicators, when provided, shall be operative.

**3015.13 Phase II priority.** Phase II operation shall override any floor calls keyed out for security reasons. Floor selection buttons shall be provided in the car to permit travel to all floors served by the car. Means that prevent the operation of these buttons shall be rendered inoperative.

**3015.14 False starts.** The elevator shall not start if no calls registered.

**3015.15 Terminal runs.** The elevator shall not make unprogrammed terminal runs.

**3015.16 Loss of power.** Elevators on fire emergency Phase II car operation shall remain in their respective locations and in Phase II mode upon loss of power. They shall not move unless the elevator is under the control of the operator and power has been restored.

## SECTION 3016 NEW INSTALLATIONS - CONSTRUCTION STANDARDS

**3016.1 General.** All new elevators, escalators, moving walks, dumbwaiters and other conveyances and their installation shall conform to the requirements of ASME A17.1 as amended by this chapter.

**3016.2 Wall covering material for passenger cars.** Wall covering material for passenger cars shall comply with the following:

1. ASME A17.1 Section 2.14.
2. *Seattle Building Code* requirements concerning flame spread ratings for wall coverings and use of plastics. (See Chapter 8.)
3. WAC 296-96-23216 as it existed on February 15, 2013, except that interior finish materials need not be firmly bonded flat to the enclosure and are permitted to be padded.

**3016.3 Seismic considerations.** New installations shall comply with ASME A17.1 Section 8.4. The provisions for Seismic Zone 3 shall apply.

**3016.4 Requirements to accommodate people with disabilities.** All new elevators shall comply with Chapter 11. In addition, WAC 296-96-02400 through 02605 applies.

**3016.5 Hoistway smoke control.** The requirements of Section 3016.5 apply in addition to ASME A17.1, 2.1.4 and Section 713.14.

1. Hoistways of elevators shall be provided with means to prevent the accumulation of smoke and hot gases in case of fire.
2. When an elevator hoistway is pressurized and emergency or legally required standby power is provided for the pressurization equipment under the provisions of Section 713 or 909, hoistway venting is not required.
3. Pressurization.
  - 3.1. When pressurization is installed in elevator hoistways, the pressurization of the hoistway shall be measured with all elevator systems in recall mode, Phase I, and all cars at the designated recall level with the doors in the open position.
  - 3.2. Activation of the fan serving the hoistway may be delayed by up to 30 seconds so that elevator recall can be initiated prior to pressurizing the hoistway.
4. Unless specifically installed to serve that space only, environmental air systems and pressurization systems shall not be located in hoistways, elevator mechanical rooms and elevator machinery spaces.

### Exceptions:

1. Pressurization ducts serving a hoistway that are separated from the room or space by construction equal to the rated construction of the room or space and so located that all required clearances are maintained.

2. Pressurization duct openings, dampers and grilles are permitted to be located in hoistway shaft walls if the pressurization air does not impair the operation of the elevator.
5. Hoistways shall not be pressurized through pressurization of elevator control rooms or machine rooms. The machine room floor between the hoistway and overhead control rooms or machine room shall contain as few penetrations as possible. All penetrations for cable drops, etc., shall be held to a minimum size.
6. Elevator doors shall operate properly when hoistway pressurization is in effect.
7. Ventilation louver operating motors shall not infringe on any elevator machinery or controller working clearances.
8. Hoistways shall be vented in accordance with the following:
  - 8.1. Hoistways of elevators with more than 25 feet of travel from lowest floor level to highest floor level shall be provided with means for venting smoke and hot gases to the outer air in case fire or smoke is detected in the building.
 

**Exception:** Pressurized hoistways are permitted to be unvented.
  - 8.2. Vents, if used, shall be located in the side of the hoistway enclosure directly below the floor or ceiling of the machine room or control room, if located at the top of the hoistway, and shall open directly to the outer air or through non-combustible ducts to the outer air. Ducts must have the same rating as is required for the hoistway they are venting.
  - 8.3. The area of the vents shall not be less than ((three and one-half))  $3\frac{1}{2}$  percent of the area of the hoistway nor less than three square feet for each elevator car, whichever is greater. The required area of the vent is to be free area, unobstructed by louvers, etc.
  - 8.4. When dampers are provided, they shall be of the normally-open type (open with power off). They shall be in the closed position unless power fails, or they are activated by fire alarm or *approved* smoke detection system.

**3016.6 Elevator operation on emergency power.** All elevators required to be supplied with emergency power shall comply with the following:

1. Each elevator shall be transferable to the emergency power supply system.
2. Emergency power supply systems capable of handling all elevators on the premises need no sequencing or switching other than the possibility of staggering the restarting of the generators.
3. Emergency power supply systems whose capacity can only handle one elevator of a duplex or one elevator in each group of elevators shall comply with the following. (For the purposes of this section, group is

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defined as all elevators serving the same portions of a building: highrise, midrise, lowrise, etc.)

- 3.1. All elevators on automatic operation shall be automatically assigned emergency power in sequence and returned to the Phase I recall or lobby floor, where they shall open their doors and then time out of service.
- 3.2. The last car down will generally be the selected car of a duplex or a group to remain in service. The service shall continue to be automatic.
- 3.3. The assignment of emergency power will skip or rotate past cars that are out of service (emergency stop switch pulled, malfunction, car top operation, etc.). If assignment is made to a manual or attendant-operated car and the car is unattended, the system shall rotate past the car as though it is out of service.
4. The lights for the car, control room, machine room and machine space shall be activated on the emergency system.
5. A manual emergency power assignment switch or switches shall be in an elevator status panel located in the fire department central control station. Each elevator shall be capable of being assigned emergency power from this location. The manual switching shall be effective at all times other than when the cars are automatically sequencing to the lobby or when the selected car is traveling. The switch shall not remove power in midflight or with doors closed.
6. Elevators on Phase II car operation shall remain in their respective locations upon loss of power. They shall remain in Phase II mode and shall not move unless the elevator is under the control of the operator and normal power has been restored or emergency power has been assigned to the car by either automatic or manual means.
7. Loss of power and initiation of emergency power immediately after Phase I recall operation has occurred shall not cause any cars to be stranded in the building. Upon the application of emergency power to the equipment, the cars shall follow the normal sequencing to the lobby, open their doors and time out of service. When all cars have been bypassed (out of service) or returned to the lobby, the assigned car shall then become available for firefighter's use on Phase II in-car operation.
8. Each elevator operating on emergency power shall be tested in accordance with applicable ASME A17.1a-2008, 2.16.8, 2.26.10 and 2.27.2, and ASME A17.2-2007, Part 6.
9. If the elevator cars are recalled to the alternate floor by Phase I recall and a loss of power occurs, the cars shall be sequenced to the alternate floor upon assignment of emergency power. The cars shall not go to the primary designated recall floor under these conditions. The alternate floor shall be provided with a

means of identifying the elevator that is supplied with emergency power.

10. The elevator position indicator system, if provided, shall not become disoriented due to the loss of power or any other reason. However, upon the resumption of power, the car may move to reestablish absolute car position.
11. Communications to the car shall remain in service.

**3016.7 Multiple hoistways.** The number of elevators permissible in a hoistway is as follows: See ASME A17.1, 2.1.1.4.

1. No more than four elevators shall be in a single hoistway.
2. No more than three elevators serving all or the same portion of a building are permitted to be in a single hoistway.

**Exception:** Four elevators serving all or the same portions of a building are permitted to be in a common hoistway under the following conditions:

1. The hoistway is pressurized; and
2. Emergency generator power is available to serve both the elevators and pressurization equipment.

**3016.8 Additional doors.** Doors other than the hoistway door and the elevator car door are prohibited at the point of access to an elevator car.

**Exception:** Doors that are readily openable from the car side without a key, tool, or special knowledge or effort.

**3016.9 Key retainer box.** A key retainer box locked and keyed to the secure city access key for elevator and other conveyance access and operation keys shall be provided. The key retainer box shall meet the following standards:

1. Minimum dimensions – 6 $\frac{1}{2}$  inches high, 6 inches wide, 2 inches deep
2. Material – at least 16 gauge steel welded
3. Color – red (unless located in the main lobby above the hall call button, 6 feet above the floor).
4. Labeling – “For Emergency Use.”
5. Lock – high security Medeco lock specified by the *building official*. Use of the key shall be restricted to fire, emergency response and elevator inspection personnel.

The key retainer box shall be flush or surface mounted, installed at the designated recall floor above the Phase I recall switch or in the main lobby above the hall call button if no recall feature exists. The key retainer box is to be mounted approximately 6 feet above the floor. The key retainer box shall be attached to the building so as to be able to withstand a force of 300 lbf/square foot applied horizontally at any point. In buildings with more than one elevator, the key retainer box shall be large enough to accommodate all required keys. The *building official* may approve other locations and custom box types upon request.

**3016.10 Elevator access keys.** Keys for access to and for the operation of elevator and other conveyance equipment shall

be tagged and retained in the key retainer box. The key retainer box shall contain fire emergency service keys (Phase I and II, one key for each switch) and keys to all of the following that are in the building:

1. Doors to the control room, machine room and machine space;
2. Secondary level door;
3. Pit door;
4. Roof door;
5. Independent, hospital emergency and attendant operation;
6. Hoistway access;
7. Mechanical hoistway access devices (broken arm, lunar, etc.);
8. Miscellaneous switch keys;
9. Fire alarm panel room;
10. Sprinkler valve control room.

**3016.11 Escalator and moving walk conveyance number designation.** In any building with more than one escalator or moving walk, a designating number (not less than two inches in height) shall be located on the upper and lower front plates.

**3016.12 Elevator car to accommodate ambulance stretcher.** In buildings four stories or more in height, and in buildings that are required to have an elevator and contain Group R-1, R-2 or I occupancies on a level other than the level of exit discharge, at least one elevator shall be provided for fire department emergency access to all floors. The elevator car shall be of such a size and arrangement to accommodate a 24-inch by 84-inch (610 mm by 2134 mm) ambulance stretcher with not less than 5-inch (127 mm) radius corners, in the horizontal, open position and shall be identified by the international symbol for emergency medical services (star of life). The symbol shall not be less than 3 inches (76 mm) in height and shall be placed inside on both sides of the hoistway door frame.

**Exception:** Elevators are not required in Group R-3 occupancies.

**Note:** The stretcher-sized elevator car may also serve as an *accessible means of egress* as required by Section 1007.2.1 of the *Seattle Building Code*.

**3016.13 Signs.** A sign complying with ASME A17.1 2.27.9 shall be posted in the elevator lobby of every elevator equipped for firefighters' emergency operation. The signs shall be located above each hall call fixture noting that the elevators will be recalled to the building lobby on fire alarm.

**Exception:** If *approved* by the *building official*, signs need not be posted in lobbies at the main egress level if the means of egress are obviously identifiable.

A sign indicating the number of each elevator shall be posted and maintained in the elevator lobby at the designated recall level and at alternate recall floors, if provided.

**3016.14 Fire service access elevators and occupant evacuation elevators.** See Section 403 for provisions related to fire service access elevators and occupant evacuation elevators.

**3016.15 Energy efficiency.** Elevator systems shall comply with this section.

**3016.15.1 Lighting.** Elevator car lighting systems shall have efficacy of not less than 35 lumens per watt.

**3016.15.2 Ventilation power.** Ventilation fans for elevators without air-conditioning shall not consume over 0.33 watts per cfm at maximum speed.

### SECTION 3017 NEW INSTALLATIONS - GENERAL EMERGENCY OPERATION REQUIREMENTS

**3017.1 General.** All elevators shall conform to the requirements of this section and the specific requirements of Sections 3018 and 3019.

**3017.2 Central control stations.** The following criteria shall be met if buildings provide a fire command center in accordance with Section 911:

1. An additional two-position ("off" and "on") Phase I recall switch for each elevator or group as defined by Section 3018 shall be installed when the control station is not within easy line of sight of the lobby Phase I recall switches; the switch(es) shall be rotated clockwise to go from "off" to "on" position;
2. A car position indicator shall be permanently installed, which shall be of a positive type that will not lose the car position nor need resetting on loss of power. Reading of the indicator shall not require special knowledge.
3. Firefighter's phone jacks shall be provided that allow each elevator car to be connected to the fire control center;

**Exception:** Fire department radio systems may be provided in lieu of phone jacks if *approved* by the fire department.

4. A manual emergency power assignment switch;
5. A Phase I indicator;
6. A Phase II indicator.

**3017.3 Nurses' preemption.** Nurses' preemption (hospital service) may be allowed to commandeer up to one-half of the cars in a particular bank of elevators. At least one-half of the cars shall respond to Phase I and all cars not preempted shall respond.

**3017.4 Phase I and II operation instructions.** Operation instructions shall be available in accordance with ASME A17.1, 2.27.7. In addition, Phase I operating instructions shall be adjacent to the Phase I switch in the fire command center and other *approved* locations. The Phase II operation instructions shall identify the location of the elevator machine rooms and control rooms.

**3017.5 Fireman’s visual signal, ASME 2.27.3.2.6.** Elevators requiring Phase I or Phase II operation shall comply with ASME 2.27.3.2.6 as amended below:

2.27.3.2.6 When a ~~((fire alarm initiating device))~~ smoke or heat detector in the machine room, ~~((control space,))~~ control room, or hoistway ~~((initiates))~~ is activated during Phase I Emergency Recall Operation, as required by 2.27.3.2.3 or 2.27.3.2.4 or Phase II Emergency In-Car Operation as required by 2.27.3.3, the visual signal [see 2.27.3.1.6(h) and Fig. 2.27.3.1.6(h)] shall illuminate intermittently only in a car(s) with equipment in that machine room, ~~((control space,))~~ control room, or hoistway.

**SECTION 3018  
NEW INSTALLATIONS -  
PHASE I RECALL REQUIREMENTS**

**3018.1 ASME A17.1, 2.27.3 General.** ASME A17.1, 2.27.3, Firefighters' Emergency Operations Service—Automatic Elevators, is superseded by the following.

Phase I emergency recall operation shall be provided for all elevators with fully automatic open and close power-operated doors.

**3018.2 ASME A17.1, 2.27.3.1 Phase I emergency recall operation.** Elevators requiring Phase I recall emergency operation shall comply with ASME A17.1, 2.27.3.1 Phase I Emergency Recall Operation, and the following:

Groups of elevators containing four or more cars shall be provided with two, three-position key switches per group. A group is defined for the purpose of this section as all elevators serving the same portion of a building. Two-position (“off” and “on”) switches shall be provided in the fire control center if this code requires such a center. The switch(es) shall be rotated clockwise to go from “off” to “on” position. Hall call buttons common to a group shall remain in service unless both Phase I recall switches of a four-car or larger group are placed in the recall mode, or a fire alarm recall signal is initiated.

**SECTION 3019  
NEW INSTALLATIONS - PHASE II IN-CAR  
OPERATION REQUIREMENTS (ASME A17.1, 2.27.8)**

**3019.1 Phase II In-car operation.** Elevators requiring Phase II in-car operation shall comply with ASME A17.1, 2.27.8 Switch Keys, as amended below.

**ASME 2.27.8 Switch Keys.** The key switches required by 2.27.2 through 2.27.5 for all elevators in a building shall be operable by the FEO-K1 key. The keys shall be Group 3 Security (see 8.1). A separate key shall be provided for each switch.

These keys shall be kept in the key retainer box required by Section 3016.9. ~~((on the premises in a location readily accessible to firefighters and emergency personnel, but not where they are available to the public.))~~ This key shall be of a tubular, 7 pin, style 137 construction and shall have a bitting of 6143521 starting at the tab sequenced clockwise

as viewed from the barrel end of the key. The key shall be coded “FEO-K1.” The possession of the “FEO-K1” key shall be limited to elevator personnel, emergency personnel, elevator equipment manufacturers, and authorized personnel during checking of Firefighters’ Emergency Operation (see 8.1 ~~and 8.6.11.1~~).

~~((Where provided, a lock box, including its lock and other components, shall conform to the requirement of UL 1037 (see Part 9).~~

~~NOTE (2.27.8): Local authorities may specify additional requirements for a uniform keyed lock box and its location to contain the necessary keys.))~~

**SECTION 3020  
NEW INSTALLATIONS -  
CONSTRUCTION OF HOISTWAYS,  
MACHINE ROOMS AND CONTROL ROOMS**

**3020.1 Construction of hoistways.** All new elevator hoistways shall comply with ASME A17.1, Section 2.1 as amended by this section. ~~((be of fire resistance rated construction if required by Section 707. ASME A17.1, 2.1.1.1, 2.1.1.2, 2.7.1.1, and 2.7.1.2 are superseded by this section.~~

~~Hoistways not required to be of fire resistance rated construction shall comply with ASME A17.1, 2.1.1.2 as amended below.))~~

**SECTION 2.1  
CONSTRUCTION OF HOISTWAYS  
AND HOISTWAY ENCLOSURES**

**2.1.1 Hoistway Enclosures**

~~((Hoistway enclosures shall conform to 2.1.1.1, 2.1.1.2, or 2.1.1.3.))~~

Hoistways that penetrate a floor/ceiling assembly shall be protected by a fire-resistance-rated enclosure complying with this section.

**Exceptions:**

1. In other than Group H occupancies, an enclosure is not required for elevators located within atriums complying with Section 404. The elevator is required to comply with 2.1.1.3.
2. Hoistway enclosures are not required to be fire-resistance rated as provided in Items 2.1 and 2.2.

2.1. In parking garages, hoistway enclosures that serve only the parking garage are not required to be rated.

2.2. In other than Groups I-2 and I-3, hoistway enclosures are not required to be rated, if the hoistway:

2.2.1 Does not connect more than two stories.

2.2.2 Does not open to a corridor in Group I and R occupancies.



2.2.3 Does not open to a corridor on nonsprinklered floors in any occupancy.

2.2.4 Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.

2.2.5 Is limited to the one smoke compartment.

**2.1.1.1 Fire-resistive Construction.**

2.1.1.1.1 Where rated hoistway enclosures are required, the enclosure shall be of fire-resistance rated construction as required for shafts by Section 713.4. ((Where fire resistive construction is required, hoistways shall be enclosed in conformance with the requirements of the building code (see 1.3).))

2.1.1.1.2 Partitions between hoistways and machine rooms and control rooms

~~((a) machinery spaces outside the hoistway~~

~~(b) machine rooms~~

~~(c) control spaces outside the hoistway~~

~~(d) control rooms that have)) shall be fire partitions complying with Section 708 having a fire-resistive rating of at least one hour, or shall be of noncombustible solid ((or openwork)) construction ((that meets the requirements of 2.1.1.2.2(d)(1), (2), and (3))). Partitions ((of solid construction)) shall be permitted to have openings essential for ropes, drums, sheaves, and other elevator equipment.~~

~~((Openwork construction shall reject a ball 25 mm (1 in.) in diameter, except where there are openings essential for ropes, drums, sheaves, and other elevator equipment.))~~

2.1.1.1.3 Hoistway enclosure openings shall be protected in accordance with Section 716 as required for fire partitions. Doors shall be self- or automatic-closing by smoke detection in accordance with Section 716.5.9.3. ((with entrances or access doors having a fire protection rating conforming to the requirements of the building code.))

**2.1.1.2 Non-fire-resistive Construction**

2.1.1.2.1 Where fire-resistive construction is not required by 2.1.1. ((the building code,)) hoistway construction shall conform to 2.1.1.2.2 or 2.1.1.3.

2.1.1.2.2 The hoistway shall be fully enclosed ((conforming to 2.1.1.2.2(a), (b), (c), and (d); or 2.1.1.2.2(a), (b), and (e).

~~(a) Enclosures and doors shall be unperforated to a height of 2 000 mm (79 in.) above each floor or landing and above the treads of adjacent stairways. The enclosure shall be unperforated, adjacent to, and for 150 mm (6 in.) on either side of any moving equipment that is within 100 mm (4 in.) of the enclosure.))~~

(b) Partitions between hoistways and machine rooms and control rooms

~~((1) machinery spaces outside the hoistway~~

~~(2) machine rooms~~

~~(3) control spaces outside the hoistway~~

~~((4) control rooms)) shall be of solid ((or openwork)) construction ((that meets the requirements of 2.1.1.2.2(d)(1), (2), and (3))). Partitions of solid construction shall be permitted to have openings essential for ropes, drums, sheaves, and other elevator equipment. ((Openwork construction shall reject a ball 25 mm (1 in.) in diameter, except where there are openings for ropes, drums, sheaves, and other elevator equipment.~~

~~(c) Openwork enclosures, where used above the 2000 mm (79 in.) level, shall reject a ball 25 mm (1 in.) in diameter.~~

~~(d) Openwork enclosures shall be~~

~~(1) at least 2.2 mm (0.087 in.) thick wire, if of steel wire grille~~

~~(2) at least 2.2 mm (0.087 in.) thick, if of expanded metal~~

~~(3) so supported and braced as to deflect not over 15 mm (0.6 in.) when subjected to a force of 450 N (100 lbf) applied horizontally at any point))~~

~~(e) Enclosures shall be permitted to be glass, provided it is laminated glass conforming to ANSI Z97.1, 16 CFR Part 1201((, or CAN/CGSB 12.1, whichever is applicable (see Part 9))). Markings as specified in the applicable standard shall be on each separate piece of glass and shall remain visible after installation.~~

2.1.1.2.3 Entrances shall be in conformance with 2.11, except 2.11.14, 2.11.15, 2.11.16, and 2.11.18.

2.1.1.3 Partially Enclosed Hoistways. For elevators that are not required to be fully enclosed by 2.1.1, protection at least 2 400 mm (94.5 in.) high shall be provided on the hoistway sides that are located 1 500 mm (59 in.) or less from elevator equipment to areas accessible to other than elevator personnel. Such protection shall comply with 2.1.1.2.

2.1.1.4 Multiple Hoistways. The number of elevators permissible in a hoistway shall be in conformance with the building code.

2.1.1.5 Strength of Enclosure. The hoistway enclosure adjacent to a landing opening shall be of sufficient strength to maintain, in true lateral alignment, the hoistway entrances. Operating mechanisms and locking devices shall be supported by the building wall, if load-bearing, or by other building structure. Adequate consideration shall be given to pressure exerted on hoistway enclosures as a result of windage and elevator operation. In high-rise buildings in Risk Category III or IV in accordance with Section 1604.5, for fire service access elevators according to Section 403.6.2.1, and in all buildings

## ELEVATORS AND CONVEYING SYSTEMS

that are more than 420 feet (128 m) in *building height*, hoistway enclosures shall comply with Section 403.2.3.

**3020.2 Private residence elevator hoistways.** Hoistways for private residence elevators shall comply with Section 3020.1. ASME A17.1, 5.3.1.1, 5.3.1.1.1 and 5.3.1.1.2 do not apply.

**3020.3 Location of equipment.** Motor controllers, motion controllers and drives shall not be located in hoistways.

**3020.4 Elevator machine rooms and control rooms.** Elevator controls and machinery other than driving machines and governors shall be located in a room dedicated exclusively to elevator equipment. Listed electrical equipment that serves the machine room is permitted to be installed in machine rooms. Air conditioning equipment is permitted to be installed in machine rooms in accordance with ASME A17.1, 2.8.5.

**3020.4.1 Fire-resistance rating of machine and control rooms.** Elevator machine rooms and control rooms that are adjacent to the hoistway with unprotected openings into the hoistway shall be enclosed by fire partitions and horizontal assemblies with a *fire-resistance rating* of at least one-hour but not less than the rating of the hoistway. The separation between the room and the hoistway is permitted to be nonrated. Exterior walls and roofs are not required to have a fire-resistance rating unless required by other sections of this code.

ASME A17.1 Sections 2.7.1.1 and 2.7.1.2 are superseded by this section.

**3020.4.2 Machine rooms and control rooms for electric elevators.** All machine rooms and control rooms for electric elevators shall comply with ASME A17.1 Section 2.7, Enclosure of Machine Rooms and Machinery Spaces, except 2.7.1.1 and 2.7.1.2.

**3020.4.3 Machine rooms and control rooms for hydraulic elevators.** All machine rooms and control rooms for hydraulic elevators shall have fire-resistive construction as required by Section 3020.4 and shall comply with ASME A17.1 Section 3.7, as amended below:

**ASME 3.7 (~~(Machinery Spaces,)~~ Machine Rooms, (~~(Control Spaces, and)~~ Control Rooms.** Machine rooms and (~~(machinery spaces)~~ control rooms for hydraulic elevators shall conform to 2.7.1 through (~~(2.7.5)~~ 2.7.4, 2.7.6.1, and 2.7.7 through 2.7.9 as amended by this code. Machine rooms and control rooms for hydraulic elevators shall comply with this section.

**ASME 3.7.1 Location of Machine Rooms.** Hydraulic elevator machine and control rooms (~~(shall)~~ are permitted to be located overhead, adjacent to, underneath the hoistway, or at a remote location. They shall not be located in the hoistway.

Where hydraulic machines and electrical control equipment are located in spaces separated from the hoistway enclosure (see 2.1.1 and 3020.1), such spaces shall be separated from other parts of the building by enclosures conforming to 2.7.1.2 (~~(and having an access door conforming to 2.7.3.4)~~ as amended by this code.

**3020.5 Working clearances.** The following working clearances shall be provided inside the machine room or control room for all elevators.

1. The width of working space in front of controllers shall be the width of the controller or 30 inches, whichever is greater. The depth of the working space in the direction of access shall be not less than 48 inches.
2. The minimum clear space working clearances for free-standing equipment shall be 18 inches on two sides and between units of controllers, selectors and/or walls or other building obstructions. The 18-inch side clearance is permitted to be combined to permit 36 inches clear on one side only.
3. The minimum space at the rear of controllers with back-wiring, terminals or other elements requiring access shall be 36 inches.
4. The working space shall be free of pipes, vents, storage, ducts or any other obstruction.

**Exception:** If *approved* by the *building official*, space outside elevator control rooms and machine rooms is permitted to be used to provide working clearance required for the front of controllers for rooms containing only elevator controls. If the space outside the room serves as a means of egress, not more than one-half the required egress width shall overlap the working clearance. If space outside the control room or machine room is used to provide working clearance, means shall be provided for protection of the working clearance during alteration, repair and maintenance of elevator equipment. The working clearance shall be located in conditioned space. The room where the controls or machines are located shall comply with all other requirements for control rooms or machine rooms.

**3020.6 Machine rooms or control rooms for private residence elevators.** Private residence elevators shall be provided with a machine room or control room. No *fire-resistance rating* is required for private residence elevator equipment or machine rooms.

**3020.7 Labeling.** Elevator machine and control rooms shall be identified by a permanent label on the door of the room. In buildings with more than one machine room or control room, the label shall identify which cars are served by the equipment in the room.

## SECTION 3021 NEW INSTALLATIONS - FLOORS

**3021.1 Floors.** All new elevator hoistways, machine rooms and control rooms shall comply with ASME A17.1, 2.1.3.3, Construction of Floors, as amended below. ASME A17.1, 2.1.3.4 is not adopted.

**ASME 2.1.3.3 Construction of Floors.** Floors of hoistways, control rooms and machine rooms shall (~~(be of concrete or metal construction with or)~~ have a coated concrete or metal surface without perforations that will resist absorption of oil, grease and similar materials. Control rooms and machine rooms shall have floors that cover

the entire area of the room. (~~Metal floors shall conform to the following:~~

- ~~(a) If of bar type grating, the openings between bars shall reject a ball 20 mm (0.8 in.) in diameter.~~
- ~~(b) If of perforated sheet metal or of fabricated open-work construction, the openings shall reject a ball 25 mm (1 in.) in diameter.)~~

**SECTION 3022  
EQUIPMENT IN HOISTWAYS,  
MACHINE ROOMS AND CONTROL ROOMS  
(ASME A17.1 Section 2.8)**

**3022.1 Prohibited wiring, pipes and ducts.** In accordance with ASME A17.1 Section 2.8, non-elevator electric wiring, pipes and ducts are prohibited in elevator machine rooms, control rooms and hoistways except as otherwise provided in this section. The use of false ceilings and furring does not remove such items from the elevator spaces and shall not be acceptable except as allowed by ASME A17.1, 2.8.2 as amended below.

**3022.2 Amendment to ASME A17.1 2.8.3.** All elevator hoistways, machine rooms and control rooms shall comply with ASME A17.1, 2.8.3, as amended below:

**ASME 2.8 Equipment in Hoistways, Machinery Spaces, Machine Rooms, (~~Control Spaces,~~) and Control Rooms.** Only machinery and equipment used directly in connection with the elevator shall be permitted in elevator hoistways, machinery spaces, machine rooms, (~~control spaces,~~) and control rooms.

**2.8.3 Pipes, Ducts, Tanks, and Sprinklers.**

~~2.8.3.1 ((Steam and hot water pipes shall be)) Pipes conveying gases, vapors or liquids are not permitted to be installed in hoistways, machinery spaces, machine rooms, (~~control spaces,~~) and control rooms unless necessary for operation or maintenance of the elevator and not used for any other purpose. ((for the purpose of heating these areas only, subject to 2.8.3.1.1 through 2.8.3.1.3)).~~

**Exception:** Subject to the approval of the *building official*, pipes that are not necessary for operation or maintenance of the elevator are permitted in machinery spaces, machine rooms and control rooms if they are protected with double containment and the joints within the machine space, machine room or control room are threaded, soldered or welded. Pipes shall not be located less than 7 feet above the floor in machine rooms.

~~((2.8.3.1.1 Heating pipes shall convey only low pressure steam [100 kPa (15 psi) or less] or hot water [100° C (212° F) or less].~~

~~2.8.3.1.2 All risers and return pipes shall be located outside the hoistway. When the machinery space, machine room, control space, or control room is located above the roof of the building, heating pipes for the machinery space, machine room, control space, or control room~~

~~shall be permitted to be located in the hoistway between the top floor and the machinery space, machine room, control space, or control room.~~

~~2.8.3.1.3 Traps and shutoff valves shall be provided in accessible locations outside the hoistway.)~~

**2.8.3.2** Ducts shall be permitted to be installed in the hoistway, (~~machinery space,~~) machine room, (~~control space,~~) or control room for the purpose of heating, cooling, ventilating, and venting these areas only and shall not encroach upon the required clearances.

Ducts and electrical conduit are permitted to pass through an elevator machine room or control room if they are separated from the room by construction equal to the rated construction of the room and so located that all required clearances are maintained.

**2.8.3.3** Sprinkler systems conforming to NFPA 13 (~~or the NBCC, whichever is applicable (see Part 9))~~) shall be permitted to be installed in the hoistway, (~~machinery space,~~) machine room, (~~control space,~~) or control room subject to rules promulgated by the building official. (~~2.8.3.3.1 through 2.8.3.3.4.~~

~~2.8.3.3.1 All risers shall be located outside these spaces. Branch lines in the hoistway shall supply sprinklers at not more than one floor level. When the machinery space, machine room, control space, or control room is located above the roof of the building, risers and branch lines for these sprinklers shall be permitted to be located in the hoistway between the top floor and the machinery space, machine room, control space, or control room.~~

~~2.8.3.3.2 In jurisdictions not enforcing the NBCC, where elevator equipment is located or its enclosure is configured such that application of water from sprinklers could cause unsafe elevator operation, means shall be provided to automatically disconnect the main line power supply to the affected elevator and any other power supplies used to move the elevator upon or prior to the application of water.~~

~~(a) This means shall be independent of the elevator control and shall not be self resetting.~~

~~(b) Heat detectors and sprinkler flow switches used to initiate main line elevator power shut down shall comply with the requirements of NFPA 72.~~

~~(c) The activation of sprinklers outside of such locations shall not disconnect the main line elevator power supply. See also 2.27.3.3.6.~~

**2.8.3.3.3** Smoke detectors shall not be used to activate sprinklers in these spaces or to disconnect the main line power supply.)

**2.8.3.3.4** ~~((In jurisdictions not enforcing the NBCC, when))~~ Where sprinklers are installed not more than 600 mm (24 in.) above the pit floor, 2.8.3.3.4(a) and (b) apply to elevator electrical equipment and wiring in the hoistway located less than 1200 mm (48 in.) above the pit floor, except earthquake protective devices conforming to 8.4.10.1.2(d); and on the exterior of the car at the point where the car platform sill and the lowest landing hoistway door sill are in vertical alignment.

(a) Elevator electrical equipment shall be weatherproof (Type 4 as specified in NEMA 250).

(b) Elevator wiring, except traveling cables, shall be identified for use in wet locations in accordance with the requirements in the Seattle Electrical Code, ~~((NFPA-70))~~

**2.8.3.4** Other pipes or ducts conveying gases, vapors, or liquid and not used in connection with the operation of the elevator shall not be installed in any hoistway, machinery space, machine room, ~~((control space,))~~ or control room. Where a machinery space, machine room, ~~((control space,))~~ or control room, or hoistway extend above the roof of a building, pipes shall be permitted from roof drains to the closest point where they can be diverted out of this space. Pipes shall be covered to prevent leakage or condensate from entering the machinery space, machine room, ~~((control space,))~~ control room, or hoistway.

**2.8.3.5** Where permitted and provided, pipes, drains, and tanks, or similar equipment that contains liquids, shall not be located directly above the elevator equipment and shall not encroach upon the required clearances in the hoistway, ~~((machinery space,))~~ machine room, ~~((control space,))~~ or control room.

## SECTION 3023

### PIT ACCESS (ASME A17.1, 2.2.4)

**3023.1 Access to pits.** All pits shall comply with ASME A17.1, 2.2.4 as amended below:

**ASME 2.2.4 Pit Access.** Safe and convenient access shall be provided to all pits, and shall conform to 2.2.4.1 through 2.2.4.6.

**2.2.4.1** Access shall be by means of the lowest hoistway door or by means of a separate pit access door.

**2.2.4.2** There shall be installed in the pit of each elevator, where the pit extends more than 900 mm (35 in.) below the sill of the pit access door (lowest hoistway door or separate pit access door), a fixed vertical ladder of noncombustible material, located within reach of the access door. The ladder is permitted to be retractable or nonretractable. Nonretractable ladders, where provided, shall conform to 2.2.4.2.1 through 2.2.4.2.6. Retractable ladders, where provided, shall conform to 2.2.4.2.1 through 2.2.4.2.3 and 2.2.4.2.5 through 2.2.4.8. When

in the extended position, retractable ladders shall conform to 2.2.4.2.4.

**2.2.4.2.1** The ladder shall extend not less than 1 200 mm (48 in.) above the sill of the access door or handgrips shall be provided to the same height.

**2.2.4.2.2** The ladder rungs, cleats, or steps shall be a minimum of 400 mm (16 in.) wide. When obstructions are encountered, the width shall be permitted to be decreased to less than 400 mm (16 in.). The reduced width shall be as wide as the available space permits, but not less than 225 mm (9 in.).

**2.2.4.2.3** The ladder rungs, cleats, or steps shall be spaced 300 mm (12 in.)  $\pm$  13 mm ( $\pm$  0.5 in.) on center, shall be provided to not less than the height of access door sill, and shall be designed to minimize slipping (e.g., knurling, dimpling, coating with skid-resistant material, etc.).

**2.2.4.2.4** A clear distance of not less than 115 mm (4.5 in.) from the centerline of the rungs, cleats, or steps to the nearest permanent object in back of the ladder shall be provided.

**2.2.4.2.5** Side rails, if provided, shall have a clear distance of not less than 115 mm (4.5 in.) from their centerline to the nearest permanent object.

**2.2.4.2.6** The ladder and its attachments shall be capable of sustaining a load of 135 kg (300 lb.).

**2.2.4.2.7** Retractable ladders that are in the line of movement of the car or counterweight when not fully retracted shall operate a retractable ladder electrical device (see 2.26.2.38) that shall cause the power to be removed from the elevator driving-machine motor and brake unless the ladder is in its fully retracted position.

**2.2.4.2.8** Retractable ladders shall be capable of being extended, mechanically secured and unsecured, and retracted from the access door, and

(a) the force(s) required to extend a retractable ladder from the fully retracted position to the extended and mechanically secured position shall not exceed 220 N (50 lbf)

(b) after being extended and mechanically secured, a retractable ladder shall remain secured in the extended position when subjected to a horizontal force not to exceed 2 220 N (500 lbf)

(c) the force(s) required to retract a retractable ladder from its extended position to its fully retracted position, after being unsecured, shall not exceed 220 N (50 lbf)

(d) the ladder shall be mechanically secured when in the retracted position

**2.2.4.3** Pit access by a ladder shall not be permitted when the pit floor is more than 3 000 mm (120 in.) below the sill of the access door, except where there is no building floor below the bottom terminal landing, this height shall be permitted to be greater but not more than 4 200 mm (165 in.).

**2.2.4.4** Pits shall be accessible only to elevator personnel.

**2.2.4.5** Separate pit door, when provided, shall be subject to the following requirements:

(a) If the door swings into the pit, it shall be located so that it does not interfere with moving equipment.

(b) If the door swings out, and the lowest structural or mechanical part, equipment, or device installed beneath the car platform, except guide shoes or rollers or safety jaw assemblies, projects below the top of the separate pit access door opening when the car is level with the bottom terminal landing

(1) an electric contact conforming to 2.26.2.26 shall be provided to prevent operation of the elevator when the door is open

(2) the door shall be provided with a vision panel(s) that is glazed with clear wired glass not less than 6 mm (0.25 in.) thick, will reject a ball 150 mm (6 in.) in diameter, and have an area of not more than 0.03 m<sup>2</sup> (47 in.<sup>2</sup>).

(c) The door shall provide a minimum opening of 750 mm (29.5 in.) in width and ~~((4-825))~~ 2 032 mm ~~((72))~~ 80 in.) in height.

(d) The door shall be equipped with a barrier conforming to 2.11.1.2(i), where the door sill is located more than 300 mm (12 in.) above the pit floor.

(e) The door shall be self-closing and provided with a spring-type lock arranged to permit the door to be opened from inside of the pit without a key. Such doors shall be kept closed and locked. A key shall be required to unlock the lock from outside the hoistway. The key shall be of Group 1 Security (see 8.1).

(f) Separate pit access doors shall not be located where a person, upon entering the pit, can be struck by any part of the car or counterweight when either is on its fully compressed buffer.

**2.2.4.6** Means to unlock the access door from inside the pit shall be provided. The means shall be located

(a) when no pit ladder is provided, not more than 1 825 mm (72 in.) vertically above the pit floor, or

(b) when a pit ladder is provided, not more than 1 825 mm (72 in.) vertically above a rung, cleat, or step. The minimum distance from the top rung, cleat, or step to the top of the pit ladder or handhold shall not be less than 1,200 mm (48 in.) (see 2.2.4.2.1 and Nonmandatory Appendix J, Fig. J-1), and

(c) with the door in the closed position, in a plane not more than 1 000 mm (39 in.) horizontally from a

rung, cleat, or step of the pit ladder (see Nonmandatory Appendix J, Fig. J-1).

**3023.2 Access to underside of cars.** Access to the underside of cars shall comply with ASME A17.1, 2.2.8 as amended below:

**2.2.8 Access to Underside of Car.** Where the distance from the pit floor to the underside of the plank channels or slings exceeds 2 100 mm (83 in.), with the car at the lowest landing, a means shall be permanently installed or permanently stored in the pit to provide access to the equipment on the underside of the car. When access is provided by means of a working platform it shall conform to the requirements of 2.7.5.3.2 through 2.7.5.3.6.

When working platform inspection operation is provided according to 2.7.5.3.6, in hoistways containing a single elevator.

(a) a pit access door is required, or

(b) an additional elevator personnel shall be present outside the hoistway when the pit inspection operation is in effect.

## SECTION 3024

### SHUTOFF VALVE (ASME A17.1, 3.19.4.1)

**3024.1 Hydraulic elevator shutoff valve.** All hydraulic elevators shall comply with ASME A17.1, 3.19.4.1, Shutoff Valve, as amended below:

**ASME 3.19.4.1 Shutoff Valve.** A manually operated shutoff valve shall be provided between the hydraulic machines and the hydraulic jack and shall be located outside the hoistway and adjacent to the hydraulic machine. An additional shutoff valve may be required in the pit by WAC 296-96-02425.

Where the hydraulic machine is located in the hoistway, the manually operated shutoff valve shall be permitted to be located inside the hoistway, provided that it is accessible from outside the hoistway to elevator personnel only (see 8.1).

## SECTION 3025

### GUARD AT CEILING INTERSECTION (ASME A17.1, 6.1.3.3.11)

**3025.1 Escalator guards.** All escalators shall comply with ASME A17.1, 6.1.3.3.11, Guard at Ceiling Intersection, and the following:

Guards shall be provided at any pinching, snagging or wedging points between the handrail, balustrade and adjacent building components or equipment if such points are within the clearances delineated in 6.1.3.3.11.

**SECTION 3026  
TEST REPORTS**

**3026.1 Test reports.** For tests required by Section 3028 and ASME 17.1, Part 8, as amended in this code, immediately after tests are completed all test results shall be submitted to the *building official* for approval on forms furnished by the *building official*. The submitted results shall be completed and signed by the person performing the tests and shall identify the testing firm. Copies of the completed forms shall be provided to the owner or to the owner’s duly-authorized agent.

**SECTION 3027  
ACCEPTANCE INSPECTIONS AND TESTS**

**3027.1 Acceptance inspections and tests.** Inspections and tests shall comply with ASME A17.1, 8.10, Acceptance Inspection and Tests, as amended below.

**ASME 8.10.1 General Requirements for Acceptance Inspections and Tests.**

**8.10.1.1 Persons Authorized to Make Acceptance Inspections and Tests.**

**8.10.1.1.1** The acceptance inspection shall be made by an inspector employed by the *building official* ~~((authority having jurisdiction, or by a person authorized by the authority having jurisdiction)).~~

**8.10.1.1.2** The person installing or altering the equipment shall perform all of the tests required by ASME A17.1, 8.10.2 through 8.10.5 in the presence of the inspector specified in 8.10.1.1.1.

~~((8.10.1.1.3 The inspector shall meet the qualification requirements of the ASME QEI 1. Inspectors and inspection supervisors shall be certified by an organization accredited by ASME in accordance with the requirements of ASME QEI 1.))~~

**SECTION 3028  
PERIODIC INSPECTIONS AND TESTS**

**3028.1 Persons authorized to make periodic inspections and witness tests.** Periodic inspection and tests shall comply with WAC 296-96-23600 as it existed on February 15, 2013 ~~the date this code became effective and ASME A17.1, 8.11 as amended below.~~

**8.11.1 General Requirements for Periodic Inspections and Witnessing of Tests.**

~~((8.11.1.1 Persons Authorized to Make Periodic Inspections and Witness Tests. The inspector shall meet the qualification requirements of the ASME QEI 1. Inspectors and inspection supervisors shall be certified by an organization accredited by ASME in accordance with the requirements of ASME QEI 1.))~~

**8.11.1.1.1 Periodic Inspections.**

(a) Periodic inspections shall be made by an inspector employed by the ~~((authority having jurisdiction))~~ *building official* or by a person

authorized by the ~~((authority having jurisdiction))~~ *building official*.

~~((b) The inspector shall submit a signed written report to the authority having jurisdiction containing the following information:~~

- ~~(1) date of inspection(s)~~
- ~~(2) components or systems that have not been inspected~~
- ~~(3) Code deficiencies noted during the inspection and a statement as to corrective action taken, if any))~~

**8.11.1.1.2 Periodic tests**

(a) Periodic tests as required in 8.6 shall be witnessed by an inspector employed by the ~~((authority having jurisdiction))~~ *building official*, or by persons authorized by the ~~((authority having jurisdiction))~~ *building official*.

~~((b) The inspector shall submit a signed written report to the authority having jurisdiction containing the following information:~~

- ~~(1) date of inspection(s)~~
- ~~(2) type of test(s) performed~~
- ~~(3) detailed results of the test(s) including but not limited to, speed, governor trip speed, safety slide distance, relief valve setting, escalator/moving walk brake torque setting, etc.~~
- ~~(4) Code deficiencies noted during the test~~
- ~~(5) statement as to any corrective action taken))~~

**8.11.1.2 Applicability of Inspection Requirements.** Inspections required by 8.11.2 through 8.11.5 are to determine that the existing equipment conforms with the following applicable Code requirements:

- (a) the Code at the time of installation
- (b) the Code effective as applicable to and for each alteration
- ~~((c) the ASME A17.3 Code, if adopted by the authority having jurisdiction-~~

**NOTES (8.11.1.2):**

~~(1) The ASME A17.2 *Guide for Inspection of Elevators, Escalators, and Moving Walks* (see Preface, ASME Elevator Publications) is a guide for inspections.~~

~~(2) References to “Items of the ASME A17.2 *Guide for Inspection of Elevators, Escalators, and Moving Walks* and the requirements of this Code are indicated in parentheses as a convenient reference to the applicable inspection procedures and requirements. It is important to understand that suggested test and inspection methodologies represent an approach but are neither exclusive nor comprehensive.”)~~

**8.11.1.3 Periodic Inspection and Test Frequency.** The equipment listed in Table 3028 shall be inspected and tested at the intervals specified in Table 3028. ~~((The frequency of periodic inspections and tests shall be established by the authority having jurisdiction.))~~

NOTE: Recommended intervals for periodic inspections and tests can be found in ~~((Nonmandatory Appendix N))~~ Table 3028.

**8.11.1.4 Installation Placed Out of Service.** Periodic inspections and tests shall not be required when an installation is placed “out of service”:

(a) as defined by the ~~((authority having jurisdiction))~~ *building official*; or

(b) when an installation whose power feed lines have been disconnected from the mainline disconnect switch; and

(1) an electric elevator, dumbwaiter, or material lift whose suspension ropes have been removed, whose car and counterweight rest at the bottom of the hoistway, and whose hoistway doors have been permanently barricaded or sealed in the closed position on the hoistway side;

(2) a hydraulic elevator, dumbwaiter, or material lift whose car rests at the bottom of the hoistway; when provided with suspension ropes and counterweight, the suspension ropes have been removed and the counterweight rests at the bottom of the hoistway; whose pressure piping has been disassembled and a section removed from the premises and whose hoistway doors are permanently barricaded or sealed in the closed position on the hoistway side; or

(3) an escalator or moving walk whose entrances have been permanently barricaded.

**8.11.1.5 Making Safety Devices Ineffective.** No person shall at any time make any required safety device or electrical protective device ineffective, except where necessary during tests and inspections. Such devices shall be restored to their normal operating condition in conformity with the applicable requirements prior to returning the equipment to service (see 2.26.7).

8.11.1.6 DELETED  
REDESIGNATED AS 8.6.1.7.3

**8.11.1.7 Unique or Product-Specific Procedures or Methods.** Where unique or product-specific procedures or methods are required to inspect or test equipment, such procedures or methods shall be provided by the manufacturer or installer. These procedures and any unique devices required by the procedures for inspection and testing shall be accessible on site to elevator personnel [see 8.6.1.2.1(f)].

**3028.2 Category Five tests.** Elevators shall be subject to five-year inspection test requirements in accordance with Table 3028, Periodic Test Requirements – Category Five, except that safety and governor systems of cars operating on wood guide rails shall be tested by tripping the governor by hand with rated load in the car, and the car at rest.

**3028.3 Cleaning and testing of escalators and moving walks.** In addition to the periodic inspection and tests specified in Table 3028, escalator and moving walk trusses and pans shall be cleaned every 12 months.

**3028.4 Step/skirt test.** The step/skirt performance index test specified in 8.6.8.15.19 is required for all periodic escalator tests at intervals specified in Table 3028.

ELEVATORS AND CONVEYING SYSTEMS

**TABLE 3028  
INSPECTION AND TEST INTERVALS**

Note: Intervals are specified in months; sections reference ASME A17.1 unless otherwise specified

SECTION	EQUIPMENT TYPE	PERIODIC INSPECTIONS		PERIODIC TESTS							
				Category One		Category Three		Category Five		Other	
		Requirement	Interval	Requirement	Interval	Requirement	Interval	Requirement	Interval	Requirement	Interval
8.11.2	Electric elevators	8.11.2.1	12	8.6.4.19	12	N/A	N/A	8.6.4.20	60		
8.11.3	Hydraulic elevators	8.11.3.1	12	8.6.5.14	12	8.6.5.15	36	8.6.5.16	60		
8.11.4; SBC 3028	Escalators & moving walks	8.11.4.1	12	8.6.8.15	12	N/A	N/A	N/A	N/A	SBC 3028	12
8.11.5.3	Hand elevators	8.11.2.1	12	8.6.4.19	12	N/A	N/A	8.6.4.20, 8.6.5.16	60		
8.11.5.4	Dumbwaiters	8.11.2.1, 8.11.3.1	12	8.6.4.19, 8.6.5.14	12	8.6.5.15	36	8.6.4.20, 8.6.5.16	60		
8.11.5.5	Material lifts and dumbwaiters with automatic transfer devices	8.11.2.1, 8.11.3.1	12	8.6.4.19, 8.6.5.14	12	8.6.5.15		8.6.4.20, 8.6.5.16	60		
8.11.5.6	Special purpose personnel elevators	8.11.2.1, 8.11.3.1	12	8.6.4.19, 8.6.5.14		8.6.5.15		8.6.4.20, 8.6.5.16	60		
8.11.5.7	Inclined elevators	8.11.2.1, 8.11.3.1	12	8.6.4.19, 8.6.5.14		8.6.5.15		8.6.4.20, 8.6.5.16	60		
8.11.5.9	Screw-column elevators	8.11.2.1, 8.11.3.1	12	8.6.4.19, 8.6.5.14		8.6.5.15		8.6.4.20, 8.6.5.16	60		
8.11.5.10	Rooftop elevators	8.11.2.1, 8.11.3.1	12	8.6.4.19, 8.6.5.14		8.6.5.15		8.6.4.20, 8.6.5.16	60		
8.11.5.11	Rack & pinion elevators	8.11.2.1, 8.11.3.1	12	8.6.4.19, 8.6.5.14		8.6.5.15		8.6.4.20, 8.6.5.16	60		
8.11.5.12	Limited use/limited application elevators	8.11.2.1, 8.11.3.1	12	8.6.4.19, 8.6.5.14		8.6.5.15		8.6.4.20, 8.6.5.16	60		



## SECTION 403 HIGH-RISE BUILDINGS

**403.1 Applicability.** *High-rise buildings* shall comply with Sections 403.2 through 403.6.

**Exception:** The provisions of Sections 403.2 through 403.6 shall not apply to the following buildings and structures:

1. Airport traffic control towers in accordance with Section 412.3.
2. *Open parking garages* in accordance with Section 406.5.
3. Buildings with a Group A-5 occupancy in accordance with Section 303.6.
4. Special industrial occupancies in accordance with Section 503.1.1.
5. Buildings with a Group H-1, H-2 or H-3 occupancy in accordance with Section 415.

**Interpretation I403.1a:** Item 2 only includes buildings in which parking is the principal use.

**Interpretation I403.1b:** For the purpose of this section, occupied roof decks are considered floors used for human occupancy if the *occupant load* of the deck is ten or more on the roof of a building not equipped with an *automatic sprinkler system* or where the *occupant load* is 50 or more on the roof of a building that is equipped with an *automatic sprinkler system*.

**403.1.1 Predesign conference.** At least 60 days prior to application, the applicant shall arrange a predesign conference with the design team, the *building official* and the fire code official, to review the proposed emergency life safety systems for the building and the protection of the life safety systems. The purpose of the meeting is to obtain conceptual approval from the *building official* and the fire code official of the proposed systems and to allow for design based upon the latest state-of-the-art.

The *building official* and fire code official are permitted to require sufficient documentation, based upon appropriate analyses, that the proposal meets the intent of nationally recognized good practices. The building permit shall not be issued until the *building official* and fire code official have *approved, in writing, the emergency life safety systems for the building and the protection of the life safety systems*. The documentation of

the predesign meeting shall be reflected on the plans for the building and become a permanent part of the Department of Planning and Development's records.

The sequence and timing of operation of smoke and heat detection systems shall be determined at the predesign conference.

**403.1.2 Testing.** All mechanical and electrical equipment installed according to *approved plans and specifications pursuant to this section shall be tested and proven to be in proper working condition to the satisfaction of the fire code official before issuance of the Certificate of Occupancy. Such systems shall be maintained in accordance with the Fire Code.*

**403.2 Construction.** The construction of *high-rise buildings* shall comply with the provisions of Sections 403.2.1 through 403.2.4.

**403.2.1 Reduction in fire-resistance rating.** The *fire-resistance-rating* reductions listed in Sections 403.2.1.1 and 403.2.1.2 shall be allowed in buildings that have sprinkler control valves equipped with supervisory initiating devices and water-flow initiating devices for each floor.

**403.2.1.1 Type of construction.** The following reductions in the minimum *fire-resistance rating* of the building elements in Table 601 shall be permitted as follows:

1. For buildings not greater than 420 feet (128 000 mm) in *building height*, the *fire-resistance rating* of the building elements in Type IA construction shall be permitted to be reduced to the minimum *fire-resistance ratings* for the building elements in Type IB.

**Exception:** The required *fire-resistance rating* of (~~columns supporting floors~~) structural frame and bearing walls shall not be permitted to be reduced.

2. In other than Group F-1, M and S-1 occupancies, the *fire-resistance rating* of the building elements in Type IB construction other than structural frame and bearing walls shall be permitted to be reduced to the *fire-resistance ratings* in Type IIA.
3. The *building height* and *building area* limitations of a building containing building elements with reduced *fire-resistance ratings* shall be permitted to be the same as the building without such reductions.

**403.2.1.2 Shaft enclosures.** For buildings not greater than 420 feet (128 000 mm) in *building height*, the required *fire-resistance rating* of the *fire barriers* enclosing vertical *shafts*, other than *exit enclosures* and elevator hoistway enclosures, is permitted to be reduced to 1 hour where automatic sprinklers are installed within the *shafts* at the top and at alternate floor levels.

**403.2.2 Seismic considerations.** For seismic considerations, see Chapter 16.

**403.2.3 Structural integrity of interior exit stairways and elevator hoistway enclosures.** For *high-rise buildings of Risk Category III or IV* in accordance with Section 1604.5, for fire service access elevators, and for all buildings that are more than 420 feet (128 000 mm) in *building height*, enclosures for *interior exit stairways* and elevator hoistway enclosures shall comply with Sections 403.2.3.1 through 403.2.3.4.

**403.2.3.1 Wall assembly.** The wall assemblies making up the enclosures for *interior exit stairways* and elevator hoistway enclosures shall meet or exceed Soft Body Impact Classification Level 2 as measured by the test method described in ASTM C 1629/C 1629M.

**403.2.3.2 Wall assembly materials.** The face of the wall assemblies making up the enclosures for *interior exit stairways* and elevator hoistway enclosures that are not exposed to the interior of the enclosures for *interior exit stairways* or elevator hoistway enclosure shall be constructed in accordance with one of the following methods:

1. The wall assembly shall incorporate no fewer than two layers of impact-resistant construction board each of which meets or exceeds Hard Body Impact Classification Level 2 as measured by the test method described in ASTM C 1629/C 1629M.
2. The wall assembly shall incorporate no fewer than one layer of impact-resistant construction material that meets or exceeds Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C 1629/C 1629M.
3. The wall assembly incorporates multiple layers of any material, tested in tandem, that meets or exceeds Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C 1629/C 1629M.

**403.2.3.3 Concrete and masonry walls.** Concrete or masonry walls shall be deemed to satisfy the requirements of Sections 403.2.3.1 and 403.2.3.2.

**403.2.3.4 Other wall assemblies.** Any other wall assembly that provides impact resistance equivalent to that required by Sections 403.2.3.1 and 403.2.3.2 for Hard Body Impact Classification Level 3, as measured by the test method described in ASTM C 1629/C 1629M, shall be permitted.

**403.2.4 Sprayed fire-resistant materials (SFRM).** The bond strength of the SFRM installed throughout the building shall be in accordance with Table 403.2.4.

**TABLE 403.2.4  
MINIMUM BOND STRENGTH**

HEIGHT OF BUILDING <sup>a</sup>	SFRM MINIMUM BOND STRENGTH
Up to 420 feet	430 psf
Greater than 420 feet	1,000 psf

For SI: 1 foot = 304.8 mm, 1 pound per square foot (psf) = 0.0479 kW/m<sup>2</sup>.  
a. Above the lowest level of fire department vehicle access.

**[F] 403.3 Automatic sprinkler system.** Buildings and structures shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 903.3.5.2. See Section 903.3.1.1.2 for additional requirements for sprinkler systems in high-rise buildings.

**Exception:** An *automatic sprinkler system* shall not be required in spaces or areas of(=

- ~~1. Open parking garages in accordance with Section 406.5.~~
2. ~~Ⓣ)telecommunications equipment buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an automatic fire detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour fire barriers constructed in accordance with Section 707 or not less than 2-hour horizontal assemblies constructed in accordance with Section 711, or both.~~

**[F] 403.3.1 Number of sprinkler risers and system design.** Each sprinkler system zone in buildings that are more than 420 feet (128 000 mm) in *building height* shall be supplied by no fewer than two risers. Each riser shall supply sprinklers on alternate floors. If more than two risers are provided for a zone, sprinklers on adjacent floors shall not be supplied from the same riser.

**[F] 403.3.1.1 Riser location.** Sprinkler risers shall be placed in *interior exit stairways* and ramps that are remotely located in accordance with Section 1015.2.

~~([F] 403.3.2 Water supply to required fire pumps. Required fire pumps shall be supplied by connections to no fewer than two water mains located in different streets. Separate supply piping shall be provided between each connection to the water main and the pumps. Each connection and the supply piping between the connection and the pumps shall be sized to supply the flow and pressure required for the pumps to operate.~~

~~**Exception:** Two connections to the same main shall be permitted provided the main is valved such that an interruption can be isolated so that the water supply will continue without interruption through no fewer than one of the connections.)~~

**[F] 403.3.3 Fire pump room.** Fire pumps shall be located in rooms protected in accordance with Section 913.2.1.

**[F] 403.4 Emergency systems.** The detection, alarm and emergency systems of *high-rise buildings* shall comply with Sections 403.4.1 through 403.4.9.

**[F] 403.4.1 Smoke detection.** Smoke detection shall be provided in accordance with Section 907.2.13.1.

**[F] 403.4.2 Fire alarm system.** A *fire alarm* system shall be provided in accordance with Section 907.2.13.

**[F] 403.4.3 Standpipe system.** A *high-rise building* shall be equipped with a standpipe system as required by Section 905.3.

[F] **403.4.4 Emergency voice/alarm communication system.** An *emergency voice/alarm communication system* shall be provided in accordance with Section 907.5.2.2.

[F] **403.4.5 Emergency responder radio coverage.** Emergency responder radio coverage shall be provided in accordance with Section 510 of the *International Fire Code*.

[F] **403.4.6 Fire command.** A *fire command center* complying with Section 911 shall be provided in a location *approved* by the fire department.

**403.4.7 No requirements.** ~~((Smoke removal. To facilitate smoke removal in post fire salvage and overhaul operations, buildings and structures shall be equipped with natural or mechanical ventilation for removal of products of combustion in accordance with one of the following:~~

1. Easily identifiable, manually operable windows or panels shall be distributed around the perimeter of each floor at not more than 50 foot (15 240 mm) intervals. The area of operable windows or panels shall be not less than 40 square feet (3.7 m<sup>2</sup>) per 50 linear feet (15 240 mm) of perimeter.

**Exceptions:**

1. In Group R-1 occupancies, each *sleeping unit* or suite having an *exterior wall* shall be permitted to be provided with 2 square feet (0.19 m<sup>2</sup>) of venting area in lieu of the area specified in Item 1.
2. Windows shall be permitted to be fixed provided that glazing can be cleared by fire fighters.
2. Mechanical air handling equipment providing one exhaust air change every 15 minutes for the area involved. Return and exhaust air shall be moved directly to the outside without recirculation to other portions of the building.
3. Any other *approved* design that will produce equivalent results.))

[F] **403.4.8 No requirements.** ~~((Standby power. A standby power system complying with Chapter 27 and Section 3003 shall be provided for standby power loads specified in 403.4.8.2. Where elevators are provided in a high rise building for accessible means of egress, fire service access or occupant self-evacuation, the standby power system shall also comply with Sections 1007.4, 3007 or 3008, as applicable.~~

~~[F] **403.4.8.1 Special requirements for standby power systems.** If the standby system is a generator set inside a building, the system shall be located in a separate room enclosed with 2 hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. System supervision with manual start and transfer features shall be provided at the fire command center.~~

~~[F] **403.4.8.2 Standby power loads.** The following are classified as standby power loads:~~

1. ~~Power and lighting for the fire command center required by Section 403.4.6;~~
2. ~~Ventilation and automatic fire detection equipment for smokeproof enclosures; and~~
3. ~~Elevators.))~~

[F] **403.4.9 Emergency power systems.** An emergency power system complying with Chapter 27 and Section 403.4.9.2 shall be provided for emergency power loads specified in Section 403.4.9.1.

[F] **403.4.9.1 Emergency power loads.** The following are classified as emergency power loads:

1. Exit signs and *means of egress* illumination required by Chapter 10;
2. Elevator car lighting;
3. *Emergency voice/alarm communications systems*;
4. Automatic fire detection systems;
5. *Fire alarm* systems; ~~((and))~~
6. Electrically powered fire pumps;
7. Power and lighting for mechanical equipment rooms and the fire command center required by Section 403.4.6;
8. Lighting for elevator machine rooms, machine spaces and control rooms;
9. Ventilation and automatic fire detection equipment for pressurized stairways;
10. Smoke control system; and
11. A selected elevator in each bank, in accordance with Section 3016.6.

**Note:** A bank of elevators is a group of elevators or a single elevator controlled by a common operating system. All elevators that respond to a single call button constitute a bank of elevators. All elevators shall be transferable to an emergency power system. There is no limit on the number of cars that are permitted to be in a bank, but no more than four cars are permitted within a common hoistway. See Section 3016.7.

12. For fire service and occupant evacuation elevators:
  - 12.1. Operation of all elevator cars.
  - 12.2. Elevator controller cooling equipment.
  - 12.3. Elevator machine room ventilation and cooling equipment.
  - 12.4. For fire service access elevators only, elevator hoistway lighting.

**403.4.9.2 Special requirements for emergency power systems.** Emergency power systems shall be located in

a separate room enclosed with two-hour fire-resistance-rated fire barriers and horizontal assemblies. System supervision with manual start and transfer features shall be provided at the fire command center.

**Exceptions:**

1. Where located within a sprinklered parking garage of Type I or II construction, emergency power and legally required standby power systems with fixed fuel quantities meeting the limits of Section 603.3 of the *International Fire Code*, and their transfer switches, are not required to be in a separate room. Other occupancies located in the *story* where the system is located shall be separated from the system by fire barriers with a minimum 1 hour fire-resistance rating.
2. Combustion and radiator intake air are permitted to be transferred from the adjacent garage. Radiator discharge air is permitted to be transferred to the adjacent garage. Radiator ventilation intake and discharge air locations shall be separated to maintain the radiator ventilation intake air temperature below the maximum temperature allowed to meet the emergency and legally required standby power system loads.

**403.5 Means of egress and evacuation.** The means of egress in *high-rise buildings* shall comply with Sections 403.5.1 through 403.5.6.

**403.5.1 Remoteness of interior exit stairways.** Required *interior exit stairways* shall be separated by a distance not less than 30 feet (9144 mm) or not less than one-fourth of the length of the maximum overall diagonal dimension of the building or area to be served, whichever is less. The distance shall be measured in a straight line between the nearest points of the *interior exit stairways*. In buildings with three or more *interior exit stairways*, no fewer than two of the *interior exit stairways* shall comply with this section. Interlocking or *scissor stairs* shall be counted as one *interior exit stairway*.

**Exception:** In buildings containing primarily Group R occupancies, required *interior exit stairways* are permitted to be separated by a distance not less than 15 feet (4572 mm).

**403.5.2 Additional exit stairway.** For buildings other than Group R-2 that are more than 420 feet (128 000 mm) in *building height*, one additional *exit stairway* meeting the requirements of Sections 1009 and 1022 shall be provided in addition to the minimum number of *exits* required by Section 1021.1. The total width of any combination of remaining *exit stairways* with one *exit stairway* removed shall be not less than the total width required by Section 1005.1. *Scissor stairs* shall not be considered the additional *exit stairway* required by this section.

**Exception:** ((An)) Subject to the approval of the *building official*, an additional *exit stairway* shall not be

required to be installed in buildings having elevators used for occupant self-evacuation in accordance with Section ((3008)) 403.6.2.

**403.5.3 Stairway door operation.** *Stairway* doors other than the *exit discharge* doors shall be permitted to be locked from the *stairway* side. *Stairway* doors that are locked from the *stairway* side shall be capable of being unlocked simultaneously without unlatching upon a signal from the *fire command center* and shall be capable of being unlocked simultaneously and automatically upon a signal from a fire alarm originating anywhere in the building. When *stairway doors* are installed that are not locked from the *stairway* side, wiring shall be installed to facilitate future installations of locking hardware.

**403.5.3.1 Stairway communication system.** A telephone or other two-way communications system connected to an *approved constantly attended station* shall be provided at not less than every fifth floor in each *stairway* ((where the doors to the *stairway* are locked)).

**403.5.3.2 Stairway penthouses.** All required *interior exit stairways* shall terminate at the roof in a *penthouse* with a door complying with Sections 1008.1.1 and 1008.1.2. The *building official* is permitted to approve an alternate design at the pre-design conference.

**403.5.4 ((Smokeproof enclosures)) Smoke control in exit stairways and elevator hoistways.** Every required *exit stairway* serving floors more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access shall ((be a *smokeproof enclosure* in accordance)) comply with Sections 909.20 and 1022.10.

**Exception:** Unless required by other sections of this code, portions of such stairways which serve floors below the *level of exit discharge* are not required to comply with Sections 909.20 and 1022.10 if the portion of the stairway below the *level of exit discharge* is separated from the pressurized stairway with not less than 1 hour fire barriers or horizontal assemblies or both.

**403.5.5 Luminous egress path markings.** Luminous egress path markings shall be provided in accordance with Section 1024.

**403.5.6 Emergency escape and rescue.** Emergency escape and rescue openings required by Section 1029 are not required.

**403.6 Elevators.** Elevator installation and operation in *high-rise buildings* shall comply with Chapter 30 and this section. ((Sections 403.6.1 and 403.6.2.))

In buildings with an elevator landing located more than 160 feet (48 768 mm) above the lowest level of fire department access, access to each floor shall be provided by not less than two elevators served by separate machine rooms.

**403.6.1 Fire service access elevator.** In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, no fewer

than two fire service access elevators, or all elevators, whichever is less, shall be provided in accordance with this section ((Section 3007)). Each fire service access elevator shall have a capacity of not less than 3500 pounds (1588 kg).

**403.6.1.1 General.** Where required by Section 403.6.1, every floor of the building shall be served by fire service access elevators complying with Sections 403.6.1.1 through 403.6.1.9.1. Except as modified in this section, fire service access elevators shall be installed in accordance with this chapter and ASME A17.1/CSA B44.

**403.6.1.2 Phase I emergency recall operation.** Actuation of any building fire alarm-initiating device shall initiate Phase I emergency recall operation on all fire service access elevators in accordance with the requirements in ASME A17.1/CSA B44. All other elevators shall remain in normal service unless Phase I emergency recall operation is manually initiated by a separate, required three-position, key-operated "Fire Recall" switch or automatically initiated by the associated elevator lobby, hoistway or elevator machine room *smoke detectors*. In addition, if the building also contains occupant evacuation elevators in accordance with Section 403.6.2, an independent, three-position, key-operated "Fire Recall" switch conforming to the applicable requirements in ASME A17.1/CSA B44 shall be provided at the designated level for each fire service access elevator.

**403.6.1.3 Water protection.** An approved method to prevent water from infiltrating into the hoistway enclosure from the operation of the *automatic sprinkler system* outside the fire service access elevator lobby shall be provided.

**403.6.1.4 Hoistway enclosures.** The fire service access elevator hoistway shall be located in a *shaft enclosure* complying with Section 713.

**403.6.1.5 Hoistway lighting.** When fire-fighters' emergency operation is active, the entire height of the hoistway shall be illuminated at not less than 1 footcandle (11 lux) as measured from the top of the car of each fire service access elevator.

**403.6.1.6 Fire service access elevator lobby.** The fire service access elevator shall open into a fire service access elevator lobby in accordance with Sections 403.6.1.6.1 through 403.6.1.6.5.

**Exception:** Where a fire service access elevator has two entrances onto a floor, the second entrance shall be permitted to open into an elevator lobby in accordance with Section 713.14.1.

**403.6.1.6.1 Access.** The fire service access elevator lobby shall have direct access to an enclosure for an *interior exit stairway*.

**403.6.1.6.2 Lobby enclosure.** The fire service access elevator lobby shall be enclosed with a *smoke barrier* having a *fire-resistance rating* of not less

than 1 hour, except that lobby doorways shall comply with Section 403.6.1.6.3.

**Exceptions:**

1. Enclosed fire service access elevator lobbies are not required at the *levels of exit discharge*.
2. Enclosed fire service access elevator lobbies are not required for elevators with *pressurized hoistways*.

**403.6.1.6.3 Lobby doorways.** Other than the door to the hoistway, each doorway to a fire service access elevator lobby shall be provided with a  $\frac{3}{4}$ -hour *fire door assembly* complying with Section 716.5. The *fire door assembly* shall also comply with the smoke and draft control door assembly requirements of Section 716.5.3.1 with the UL 1784 test conducted without the artificial bottom seal.

**403.6.1.6.4 Lobby size.** Each enclosed fire service access elevator lobby shall be not less than 150 square feet (14 m<sup>2</sup>) in an area with a minimum dimension of 8 feet (2440 mm).

**403.6.1.6.5 Fire service access elevator symbol.** A pictorial symbol of a standardized design designating which elevators are fire service access elevators shall be installed on each side of the hoistway door frame on the portion of the frame at right angles to the fire service access elevator lobby. The fire service access elevator symbol shall be designed as shown in Figure 403.6.1.6.5 and shall comply with the following:

1. The fire service access elevator symbol shall be not less than 3 inches (76 mm) in height.
2. The vertical center line of the fire service access elevator symbol shall be centered on the hoistway door frame. Each symbol shall not be less than 78 inches (1981 mm), and not more than 84 (2134 mm) inches above the finished floor at the threshold.



**FIGURE 403.6.1.6.5  
FIRE SERVICE ACCESS ELEVATOR SYMBOL**

**403.6.1.7 Elevator system monitoring.** The fire service access elevator shall be continuously monitored at the *fire command center* by a standard emergency service interface system meeting the requirements of NFPA 72.

**403.6.1.8 Protection of wiring or cables.** Wires or cables that are located outside of the elevator hoistway and machine room and that provide normal or emer-

gency power, control signals, communication with the car, lighting, heating, air conditioning, *ventilation* and fire-detecting systems to fire service access elevators shall be protected by construction having a *fire-resistance rating* of not less than 2 hours, or shall be circuit integrity cable having a *fire-resistance rating* of not less than 2 hours.

**Exception:** Wiring and cables to control signals are not required to be protected provided that wiring and cables do not serve Phase II emergency in-car operations.

**403.6.1.9 Standpipe hose connection.** A Class I standpipe hose connection in accordance with Section 905 shall be provided in the *interior exit stairway* and *ramp* having direct access from the fire service access elevator lobby.

**403.6.1.9.1 Access.** The *exit* enclosure containing the standpipe shall have access to the floor without passing through the fire service access elevator lobby.

**403.6.2 Occupant evacuation elevators.** Where installed in accordance with ((Section 3008)) this section, all passenger elevators for general public use shall be permitted to be used for occupant self-evacuation.

**403.6.2.1 General.** Where elevators are to be used for occupant self-evacuation during fires, all passenger elevators for general public use shall comply with Sections 403.6.2.1.1 through 403.6.2.9.1. Where other elevators are used for occupant self-evacuation, they shall also comply with these sections.

**403.6.2.1.1 Additional exit stairway.** Where an additional *means of egress* is required in accordance with Section 403.5.2, an additional *exit stairway* shall not be required to be installed in buildings provided with occupant evacuation elevators complying with Section 403.6.2.

**403.6.2.1.2 Fire safety and evacuation plan.** The building shall have an *approved* fire safety and evacuation plan in accordance with the applicable requirements of Section 404 of the *International Fire Code*. The fire safety and evacuation plan shall incorporate specific procedures for the occupants using evacuation elevators.

**403.6.2.2 Phase I emergency recall operation.** An independent, three-position, key-operated "Fire Recall" switch complying with ASME A17.1/CSA B44 shall be provided at the designated level for each occupant evacuation elevator.

**403.6.2.2.1 Operation.** The occupant evacuation elevators shall be used for occupant self-evacuation only in the normal elevator operating mode prior to Phase I Emergency Recall Operation in accordance with the requirements in ASME A17.1/CSA B44 and the building's fire safety and evacuation plan.

**403.6.2.2.2 Activation.** Occupant evacuation elevator systems shall be activated by any of the following:

1. The operation of an *automatic sprinkler system* complying with Section 903.3.1.1;
2. Fire alarm initiating devices required by another provision of the code that do not initiate Phase I Emergency Recall Operation;
3. *Approved* manual controls.

**403.6.2.3 Water protection.** An *approved* method to prevent water from infiltrating into the hoistway enclosure from the operation of the *automatic sprinkler system* outside the occupant evacuation elevator lobby shall be provided.

**403.6.2.4 Hoistway enclosure protection.** Occupant evacuation elevator hoistways shall be located in *shaft enclosures* complying with Section 713.

**403.6.2.5 Occupant evacuation elevator lobby.** The occupant evacuation elevators shall open into an elevator lobby in accordance with Sections 403.6.2.5.1 through 403.6.2.5.7.2.

**403.6.2.5.1 Access.** The occupant evacuation elevator lobby shall have direct access to an *interior exit stairway* or *ramp*.

**403.6.2.5.2 Lobby enclosure.** The occupant evacuation elevator lobby shall be enclosed with a *smoke barrier* having a *fire-resistance rating* of not less than 1 hour, except that lobby doorways shall comply with Section 403.6.2.5.3.

**Exceptions:**

1. Enclosed occupant evacuation elevator lobbies are not required at the *levels of exit discharge*.
2. Elevators with pressurized hoistways are not required to comply with Section 403.6.2.5.2.

**403.6.2.5.3 Lobby doorways.** Other than the door to the hoistway, each doorway to an occupant evacuation elevator lobby shall be provided with a  $\frac{3}{4}$ -hour *fire door assembly* complying with Section 716.5. The *fire door assembly* shall also comply with the smoke and draft control assembly requirements of Section 716.5.3.1 with the UL 1784 test conducted without the artificial bottom seal.

**403.6.2.5.3.1 Vision panel.** A vision panel shall be installed in each *fire door assembly* protecting the lobby doorway. The vision panel shall consist of fire-protection-rated glazing and shall be located to furnish clear vision of the occupant evacuation elevator lobby.

**403.6.2.5.3.2 Door closing.** Each *fire door assembly* protecting the lobby doorway shall be

automatic-closing upon receipt of any fire alarm signal from the emergency voice/alarm communication system serving the building.

**403.6.2.5.4 Lobby size.** Each occupant evacuation elevator lobby shall have minimum floor area as follows:

1. The occupant evacuation elevator lobby floor area shall accommodate, at 3 square feet (0.28 m<sup>2</sup>) per person, not less than 25 percent of the occupant load of the floor area served by the lobby.
2. The occupant evacuation elevator lobby floor area also shall accommodate one wheelchair space of 30 inches by 48 inches (760 mm by 1220 mm) for each 50 persons, or portion thereof, of the occupant load of the floor area served by the lobby.

**Exception:** The size of lobbies serving multiple banks of elevators shall have the minimum floor area approved on an individual basis and shall be consistent with the building's fire safety and evacuation plan.

**403.6.2.5.5 Signage.** An approved sign indicating elevators are suitable for occupant self-evacuation shall be posted on all floors adjacent to each elevator call station serving occupant evacuation elevators.

**403.6.2.5.6 Lobby status indicator.** Each occupant evacuation elevator lobby shall be equipped with a status indicator arranged to display all of the following information:

1. An illuminated green light and the message, "Elevators available for occupant evacuation," when the elevators are operating in normal service and the fire alarm system is indicating an alarm in the building.
2. An illuminated red light and the message, "Elevators out of service, use exit stairs," when the elevators are in Phase I emergency recall operation in accordance with the requirements in ASME A17.1/CSA B44.
3. No illuminated light or message when the elevators are operating in normal service.

**403.6.2.5.7 Two-way communication system.** A two-way communication system shall be provided in each occupant evacuation elevator lobby for the purpose of initiating communication with the fire command center or an alternate location approved by the fire department.

**403.6.2.5.7.1 Design and installation.** The two-way communication system shall include audible and visible signals and shall be designed and installed in accordance with the requirements in ICC A117.1.

**403.6.2.5.7.2 Instructions.** Instructions for the use of the two-way communication system along with the location of the station shall be perma-

nently located adjacent to each station. Signage shall comply with the ICC A117.1 requirements for visual characters.

**403.6.2.6 Elevator system monitoring.** The occupant evacuation elevators shall be continuously monitored at the fire command center or a central control point approved by the fire department and arranged to display all of the following information:

1. Floor location of each elevator car.
2. Direction of travel of each elevator car.
3. Status of each elevator car with respect to whether it is occupied.
4. Status of normal power to the elevator equipment, elevator controller cooling equipment, and elevator machine room ventilation and cooling equipment.
5. Status of standby or emergency power system that provides backup power to the elevator equipment, elevator controller cooling equipment, and elevator machine room ventilation and cooling equipment.
6. Activation of any fire alarm initiating device in any elevator lobby, elevator machine room or machine space, or elevator hoistway.

**403.6.2.7 Elevator recall.** The fire command center or an alternate location approved by the fire department shall be provided with the means to manually initiate a Phase I Emergency Recall of the occupant evacuation elevators in accordance with ASME A17.1/CSA B44.

**403.6.2.8 Protection of wiring or cables.** Wires or cables that are located outside of the elevator hoistway and machine room and that provide normal or standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to fire service access elevators shall be protected by construction having a fire-resistance rating of not less than 2 hours, or shall be circuit integrity cable having a fire-resistance rating of not less than 2 hours.

**Exception:** Wiring and cables to control signals are not required to be protected provided that wiring and cables do not serve Phase II emergency in-car operations.

**403.6.2.9 Emergency voice/alarm communication system.** The building shall be provided with an emergency voice/alarm communication system. The emergency voice/alarm communication system shall be accessible to the fire department. The system shall be provided in accordance with Section 907.5.2.2.

**403.6.2.9.1 Notification appliances.** No fewer than one audible and one visible notification appliance shall be installed within each occupant evacuation elevator lobby.

**403.7 Emergency operational plan.** Prior to the issuance of a Certificate of Occupancy, the owner-occupant of the building shall assign a responsible person as the building's Fire

## SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

Safety Director to work with the fire code official in establishing an operational plan for the building. The operational plan shall contain the guidelines and procedures to be followed and responsibilities of the fire department, building employees, and tenants under emergency conditions, including special provisions for persons with disabilities. The plan shall also include procedures for operation, maintenance and testing of the life safety systems and the allowable use and occupancy of each portion of the building. One copy of the operational plan shall be filed with the fire code official, and one shall be posted in the central control station prior to issuance of the Certificate of Occupancy.

**403.8 Signs.** Signs complying with Sections 403.8.1 through 403.8.4 shall be provided in *high-rise buildings*.

**403.8.1 Elevator lobbies.** A sign shall be posted in every elevator lobby above each hall call fixture noting that the elevators will be recalled to the building lobby on fire alarm.

Exception: If approved by the building official, signs need not be posted in lobbies at the main egress level if the means of egress are obviously identifiable.

**403.8.2 Recall floor lobbies.** A sign indicating the number of each elevator shall be posted and maintained in the elevator lobby at each designated recall floor and at alternate floors of recall, if provided.

**403.8.3 Stair re-entry signs.** A sign shall be posted on each floor landing within a stairway indicating where re-entry is provided into the building or indicating the location of telephones or other means of two-way communication.

**403.8.4 Other signs.** Other signs required by this code, including but not limited to stairway identification signs required by Section 1022.9 and exit signs required by Section 1011, shall be provided.



## SECTION 712 VERTICAL OPENINGS

\*\*

**712.1 General.** The provisions of this section shall apply to the vertical opening applications listed in Sections 712.1.1 through 712.1.18.

**712.1.1 Shaft enclosures.** Vertical openings contained entirely within a shaft enclosure complying with Section 713 shall be permitted.

**712.1.2 Individual dwelling unit.** Unconcealed vertical openings totally within an individual residential dwelling unit and connecting four stories or less shall be permitted.

**712.1.3 Escalator openings.** Where a building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, an escalator opening shall be protected according to Section 712.1.3.1 or 712.1.3.2.

**712.1.3.1 Opening size.** Protection by a draft curtain and closely spaced sprinklers in accordance with NFPA 13 shall be permitted where the area of the vertical opening between stories does not exceed twice the horizontal projected area of the escalator. In other than Groups B and M, this application is limited to openings that do not connect more than four stories.

**Note:** NFPA 13 requires draft curtains to be at least 18 inches (457 mm) deep, and to be of noncombustible or limited-combustible material.

**712.1.3.2 Automatic shutters.** Protection of the opening by approved shutters at every penetrated floor shall be permitted in accordance with this section. The shutters shall be of noncombustible construction and have a *fire-resistance rating* of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.3.1 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with

any obstacle, and to continue its progress on release there from.

**712.1.4 Penetrations.** Penetrations shall be protected in accordance with Section 714.

**712.1.5 Ducts.** Penetrations by ducts shall be protected in accordance with Section 717.6. Grease ducts shall be protected in accordance with the *International Mechanical Code*.

**712.1.6 Atriums.** In other than Group H occupancies, atriums complying with Section 404 shall be permitted.

**712.1.7 Masonry chimney.** Approved masonry chimneys shall be permitted where the annular space is fireblocked at each floor level in accordance with Section 718.2.5.

**712.1.8 Two-story openings.** In other than Groups I-2 and I-3, a floor opening that is not used as one of the applications listed in this section shall be permitted if it complies with all of the items below.

1. Does not connect more than two stories.
2. Does not contain a stairway or ramp required by Chapter 10.
3. Does not penetrate a horizontal assembly that separates fire areas or smoke barriers that separate smoke compartments.
4. Is not concealed within the construction of a wall or a floor/ceiling assembly.
5. Is not open to a corridor in Group I and R occupancies.
6. Is not open to a corridor on nonsprinklered floors.
7. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.

**712.1.9 Parking garages.** Openings through floors and for ((A))automobile ramps in ((open and enclosed)) parking garages shall be permitted where constructed in accordance with Sections 406.5 and 406.6((, respectively)).

**712.1.10 Mezzanine.** Vertical openings between a mezzanine complying with Section 505 and the floor below shall be permitted.

**712.1.11 Joints.** Joints shall be permitted where complying with Section 715.

**712.1.12 Unenclosed stairs and ramps.** Vertical floor openings created by unenclosed stairs or ramps in accordance with Sections 1009.2 and 1009.3 shall be permitted.

**712.1.13 Floor fire doors.** Vertical openings shall be permitted where protected by floor fire doors in accordance with Section 711.8.

**712.1.14. Group I-3.** In Group I-3 occupancies, vertical openings shall be permitted in accordance with Section 408.5.

**712.1.15 Elevators in parking garages.** Non fire-resistance-rated ((X))vertical openings for elevator hoistways in ((open or enclosed)) parking garages that serve only the

parking garage, and complying with Sections 406.5 and 406.6 (~~respectively~~), shall be permitted.

**Note:** When Section 712.1.15 is applied, the hoistway will be required to be enclosed, but it is not required to be fire-resistance rated. See Section 3020.1.

**712.1.16 Duct systems in parking garages.** Vertical openings for mechanical exhaust or supply duct systems in (~~open or enclosed~~) parking garages complying with Sections 406.5 and 406.6 (~~respectively~~) shall be permitted to be unenclosed where such duct system is contained within and serves only the parking garage.

**712.1.17 Nonfire-resistance-rated joints.** Joints in or between floors without a required *fire-resistance rating* shall be permitted in accordance with Section 711.4.1.

**712.1.18 Gas vents and piping.** Vertical openings for penetrations of floors inside a wall cavity by gas vents and piping in buildings of Types III, IV, and V construction shall be permitted.

**712.1.19 Openings otherwise permitted.** Vertical openings shall be permitted where allowed by other sections of this code.

## SECTION 713 SHAFT ENCLOSURES

\*\*

**713.1 General.** The provisions of this section shall apply to shafts required to protect openings and penetrations through floor/ceiling and roof/ceiling assemblies. Exit access stairways and exit access ramps shall be protected in accordance with the applicable provisions of Section 1009. Interior exit stairways and interior exit ramps shall be protected in accordance with the requirements of Section 1022.

**713.2 Construction.** Shaft enclosures shall be constructed as *fire barriers* in accordance with Section 707 or horizontal assemblies in accordance with Section 711, or both.

**713.3 Materials.** The shaft enclosure shall be of materials permitted by the building type of construction.

**713.4 Fire-resistance rating.** Shaft enclosures shall have a *fire-resistance rating* of not less than 2 hours where connecting more than four stories (~~or more~~), and not less than 1 hour where connecting (~~less than~~) four and fewer stories. The number of *stories* connected by the shaft enclosure shall include any basements but not any *mezzanines*. Shaft enclosures shall have a *fire-resistance rating* not less than the floor assembly penetrated, but need not exceed 2 hours. Shaft enclosures shall meet the requirements of Section 703.2.1.

**713.5 Continuity.** Shaft enclosures shall be constructed as *fire barriers* in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both, and shall have continuity in accordance with Section 707.5 for *fire barriers* or Section 711.4 for *horizontal assemblies* as applicable.

**713.6 Exterior walls.** Where *exterior walls* serve as a part of a required shaft enclosure, such walls shall comply with the

## FIRE AND SMOKE PROTECTION FEATURES

requirements of Section 705 for *exterior walls* and the fire-resistance-rated enclosure requirements shall not apply.

**Exception:** Exterior walls required to be fire-resistance rated in accordance with Section 1019.2 for exterior egress balconies, Section 1022.7 for interior *exit* stairways and ramps and Section 1026.6 for exterior *exit* stairways and ramps.

**713.7 Openings.** Openings in a shaft enclosure shall be protected in accordance with Section 716 as required for *fire barriers*. Doors shall be self- or automatic-closing by smoke detection in accordance with Section 716.5.9.3.

**713.7.1 Prohibited openings.** Openings other than those necessary for the purpose of the shaft shall not be permitted in shaft enclosures.

**713.8 Penetrations.** Penetrations in a shaft enclosure shall be protected in accordance with Section 714 as required for *fire barriers*. Structural elements, such as beams or joists, where protected in accordance with Section 714 shall be permitted to penetrate a shaft enclosure. See Section 3022 for installation of pipes and ducts in elevator hoistways.

**713.8.1 Prohibited penetrations.** Penetrations other than those necessary for the purpose of the shaft shall not be permitted in shaft enclosures.

**713.9 Joints.** Joints in a shaft enclosure shall comply with Section 715.

**713.10 Duct and air transfer openings.** Penetrations of a shaft enclosure by ducts and air transfer openings shall comply with Section 717.

**713.11 Enclosure at the bottom.** Shafts that do not extend to the bottom of the building or structure shall comply with one of the following:

1. They shall be enclosed at the lowest level with construction of the same *fire-resistance rating* as the lowest floor through which the shaft passes, but not less than the rating required for the shaft enclosure.
2. They shall terminate in a room having a use related to the purpose of the shaft. The room shall be separated from the remainder of the building by *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. The *fire-resistance rating* and opening protectives shall be at least equal to the protection required for the shaft enclosure.
3. They shall be protected by *approved fire dampers* installed in accordance with their listing at the lowest floor level within the shaft enclosure.

**Exceptions:**

1. The fire-resistance-rated room separation is not required, provided there are no openings in or penetrations of the shaft enclosure to the interior of the building except at the bottom. The bottom of the shaft shall be closed off around the penetrating items with materials permitted by Section 718.3.1 for draftstopping, or the room shall be provided with an *approved automatic sprinkler system*.

2. A shaft enclosure containing a refuse chute or laundry chute shall not be used for any other purpose and shall terminate in a room protected in accordance with Section 713.13.4.
3. The fire-resistance-rated room separation and the protection at the bottom of the shaft are not required provided there are no combustibles in the shaft and there are no openings or other penetrations through the shaft enclosure to the interior of the building.

**713.12 Enclosure at top.** A shaft enclosure that does not extend to the underside of the roof sheathing, deck or slab of the building shall be enclosed at the top with construction of the same *fire-resistance rating* as the topmost floor penetrated by the shaft, but not less than the *fire-resistance rating* required for the shaft enclosure.

**713.13 Refuse and laundry chutes.** In other than Group I-2, refuse and laundry chutes, access and termination rooms and incinerator rooms shall meet the requirements of Sections 713.13.1 through 713.13.6.

**Exceptions:**

1. Chutes serving and contained within a single dwelling unit.
2. Refuse and laundry chutes in Group I-2 shall comply with the provisions of NFPA 82, Chapter 5.

**713.13.1 Refuse, recycling and laundry chute enclosures.** A shaft enclosure containing a refuse, recycling, or laundry chute shall not be used for any other purpose and shall be enclosed in accordance with Section 713.4. Openings into the shaft, including those from access rooms and termination rooms, shall be protected in accordance with this section and Section 716. Openings into chutes shall not be located in *corridors*. Doors shall be self- or automatic-closing upon the actuation of a smoke detector in accordance with Section 716.5.9.3, except that heat-activated closing devices shall be permitted between the shaft and the termination room.

**713.13.2 Materials.** A shaft enclosure containing a refuse, recycling, or laundry chute shall be constructed of materials as permitted by the building type of construction.

**713.13.3 Refuse, recycling and laundry chute access rooms.** Access openings for refuse, recycling and laundry chutes shall be located in rooms or compartments enclosed by not less than 1-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. Openings into the access rooms 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 716.5.9.3.

**713.13.4 Termination room.** Refuse, recycling, and laundry chutes shall discharge into an enclosed room separated from the remainder of the building by *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. Openings into the termination room shall be protected by opening protectives having a *fire protection rat-*

ing equal to the protection required for the shaft enclosure. Doors shall be self- or automatic-closing upon the detection of smoke in accordance with Section 716.5.9.3. Refuse chutes shall not terminate in an incinerator room. Refuse, recycling and laundry rooms that are not provided with chutes need only comply with Table 509.

**713.13.5 Incinerator room.** Incinerator rooms shall comply with Table 509.

**713.13.6 Automatic sprinkler system.** An *approved automatic sprinkler system* shall be installed in accordance with Section 903.2.11.2.

**713.14 Elevator, dumbwaiter and other hoistways.** Elevator, dumbwaiter and other hoistway enclosures shall be constructed in accordance with Section 713 and Chapter 30.

**713.14.1 Elevator lobby.** An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 708 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 716.5.3 as required for *corridor* walls and shall be automatic-closing by actuation of a smoke detector in accordance with Section 716.5.9.3. ~~((p))~~ Penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1. 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 level(s) of *exit discharge*, provided the level(s) of *exit discharge* 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))~~ enclosed in accordance with Section ~~((712.4))~~ 3020.1 are not required to have enclosed elevator lobbies.
3. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening ~~((in accordance with Section 3002.6))~~ at the point of access to the elevator car. Such doors shall comply with the smoke and draft control door assembly requirements in Section 716.5.3.1 when tested in accordance with UL 1784 without an artificial bottom seal. They shall be maintained automatic closing by actuation of a smoke detector in accordance with Section 716.5.9.3. Doors that latch shall be provided with panic hardware, openable from inside the elevator car. The doors shall be readily openable from the car side without a key, tool, or special knowledge or effort.
4. Enclosed elevator lobbies are not required where the building is protected by an *automatic sprin-*

*kler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:

- 4.1. Group I-2 occupancies;
- 4.2. Group I-3 occupancies; and
- 4.3. Elevators ~~((serving floor levels over))~~ with more than 75 feet (22 860 mm) of travel ~~((above the lowest level of fire department vehicle access))~~ in high-rise buildings.

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. In addition to the requirements in Section 710 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 710.5.2.2, 710.5.2.3, and 716.5.9 and duct penetrations of the smoke partitions shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 909.21.
7. Enclosed elevator lobbies are not required where the elevator serves only *open parking garages* in accordance with Section 406.5.

**713.14.1.1 Areas of refuge.** Areas of refuge shall be provided as required in Section 1007.

1.2. the two floors immediately below the fire floor, and

1.3. the floor immediately above the fire floor.

2. Subject to the approval of the building official, pressurization is not required for elevators in high-rise buildings with less than 75 feet (22 860 mm) from the lowest floor to the highest ceiling of the stories served by the elevator.

**909.21.1.1 Supply air.** The supply air (~~intake~~) shall be taken from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air (~~exhaust system or~~) outlet.

**Exception:** The supply air intake may be located within the building provided it is located no more than 20 feet (6096 mm) from major openings in the building exterior such as loading docks and vehicular entrances. There shall be no obstruction to the flow of air to the intake.

**909.21.1.2 Use of ventilation systems.** Ventilation systems other than hoistway supply air systems are permitted to be used to exhaust air from adjacent space when necessary to maintain the differential pressure relationships. Ventilation systems used to achieve hoistway pressurization are not required to comply with Sections 909.21.4 and 909.21.5.

**909.21.2 Rational analysis.** A rational analysis complying with Section 909.4 shall be submitted with the *construction documents*.

**909.21.3 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.

**Interpretation I909.21:** Dampers other than motorized dampers required by the *International Energy Conservation Code* are not permitted in hoistway pressurization system supply air system unless *approved* by the *building official*.

**909.21.4 Fan system.** The fan system provided for the pressurization system shall be as required by Sections 909.21.4.1 through 909.21.4.4.

**909.21.4.1 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~~) hoistway enclosure.

**909.21.4.2 Smoke detection.** The fan system shall be equipped with (~~at least~~) two smoke detectors (~~that will~~) located in the duct in accordance with NFPA 72 arranged to automatically shut down the fan system only when both smoke detectors activate. (~~is detected within the system.~~) The detectors shall be located downstream of the fan and shall be connected to the fire alarm as a supervisory signal.

**909.21.4.3 Separate systems.** A separate fan system shall be used for each elevator hoistway.

**909.21 Elevator hoistway pressurization alternative.** Where elevator hoistway pressurization is provided in lieu of required enclosed elevator lobbies, the pressurization system shall comply with Sections 909.21.1 through 909.21.11.

**909.21.1 Pressurization requirements.** Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.10 inches of water (25 Pa) and a maximum positive pressure of 0.25 inches of water (67 Pa) with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all elevator cars at the floor of recall and all hoistway doors on the floor of recall open and all other hoistway doors closed. The opening and closing of hoistway doors at each level must be demonstrated during this test. The pressure differential shall be measured between the hoistway and the adjacent area. In residential buildings, the pressure differential is permitted to be measured between the hoistway and the dwelling units.

**Exceptions:**

1. The pressure differential is permitted to be measured relative to outdoor atmosphere on floors other than the following:

1.1. the fire floor.

**909.21.4.4 Fan capacity.** The ~~((supply))~~ fan system shall be provided with the capacity to pressurize the elevator hoistway as determined by a *registered design professional*. The fan system shall be provided with a means to balance or modulate the airflow to the elevator hoistway to meet the differential pressure requirements on all floors for each condition identified by the rational analysis. ~~((either be adjustable with a capacity of at least 1,000 cfm (.4719 m<sup>3</sup>/s) per door, or that specified by a registered design professional to meet the requirements of a designed pressurization system.))~~

**909.21.4.5 Fan System Equipment.** In *high-rise buildings*, equipment used in the fan system shall comply with Section 909.10.

**909.21.5((S))Legally required standby and emergency power.** ~~((The))~~ Pressurization systems shall be powered by an *approved* emergency or legally required standby power system. An emergency power system conforming with Section 909.11 shall be provided for pressurization systems in *high-rise buildings*. Legally required standby power shall be provided ~~((with))~~ for the pressurization system in all other buildings. The emergency and legally required standby power shall be from the same source as other required emergency systems for the building. ~~For other than high-rise buildings, connection ahead of the service disconnecting means in accordance with Seattle Electrical Code Section 701.11(E) is permitted as a source of legally required standby power.~~

**909.21.6 Activation of pressurization system.** The elevator pressurization system shall be activated upon activation of the building fire alarm system or upon activation of the elevator lobby smoke detectors. Where both a building fire alarm system and elevator lobby smoke detectors are present, each shall be independently capable of activating the pressurization system. Activation of the fan serving the hoistway is permitted to be delayed by up to 30 seconds so that elevator recall can be initiated prior to pressurizing the hoistway. Control systems shall be in accordance with Sections 909.12 and 909.13.

**909.21.7 Special inspection and acceptance testing.** *Special inspection* ~~((for performance))~~ shall be ~~((required))~~ in accordance with Section 909.18.8. System acceptance shall be in accordance with Section 909.19.

**909.21.8 Marking and identification.** Detection and control systems shall be marked in accordance with Section 909.14.

**909.21.9 Control diagrams.** Control diagrams shall be provided in accordance with Section 909.15.

**909.21.10 Control panel.** A control panel complying with Section 909.16 shall be provided.

**909.21.11 System response time.** Hoistway pressurization systems shall comply with the requirements for smoke control system response time in Section 909.17.

**[W] 909.21.12 Machine rooms.** Elevator machine rooms shall be pressurized in accordance with this section unless separated from the elevator hoistway by construction in accordance with Section 713.

## CHAPTER 8

# INTERIOR FINISHES

### SECTION 801 GENERAL

**801.1 Scope.** Provisions of this chapter shall govern the use of materials used as *interior finishes, trim and decorative materials*.

**801.2 Interior wall and ceiling finish.** The provisions of Section 803 shall limit the allowable fire performance and smoke development of *interior wall and ceiling finish* materials based on occupancy classification.

**801.3 Interior floor finish.** The provisions of Section 804 shall limit the allowable fire performance of *interior floor finish* materials based on occupancy classification.

[F] **801.4 Decorative materials and trim.** *Decorative materials* and *trim* shall be restricted by combustibility and the flame propagation performance criteria of NFPA 701, in accordance with Section 806.

**801.5 Applicability.** For buildings in flood hazard areas as established in Section 1612.3, *interior finishes, trim and decorative materials* below the elevation required by Section 1612 shall be flood-damage-resistant materials.

**801.6 Application.** Combustible materials shall be permitted to be used as finish for walls, ceilings, floors and other interior surfaces of buildings.

**801.7 Windows.** Show windows in the exterior walls of the first *story* above grade plane shall be permitted to be of wood or of unprotected metal framing.

**801.8 Foam plastics.** Foam plastics shall not be used as *interior finish* except as provided in Section 803.4. Foam plastics shall not be used as interior *trim* except as provided in Section 806.3 or 2604.2. This section shall apply both to exposed foam plastics and to foam plastics used in conjunction with a textile or vinyl facing or cover.

### SECTION 802 DEFINITIONS

**802.1 Definitions.** The following terms are defined in Chapter 2:

EXPANDED VINYL WALL COVERING.

FLAME SPREAD.

FLAME SPREAD INDEX.

INTERIOR FINISH.

INTERIOR FLOOR FINISH.

INTERIOR FLOOR-WALL BASE.

INTERIOR WALL AND CEILING FINISH.

SITE-FABRICATED STRETCH SYSTEM.

SMOKE-DEVELOPED INDEX.

TRIM.

### SECTION 803 WALL AND CEILING FINISHES

**803.1 General.** *Interior wall and ceiling finish* materials shall be classified for fire performance and smoke development in accordance with Section 803.1.1 or 803.1.2, except as shown in Sections 803.2 through 803.13. Materials tested in accordance with Section 803.1.2 shall not be required to be tested in accordance with Section 803.1.1.

**803.1.1 Interior wall and ceiling finish materials.** Interior wall and ceiling finish materials shall be classified in accordance with ASTM E 84 or UL 723. Such *interior finish* materials shall be grouped in the following classes in accordance with their flame spread and *smoke-developed indexes*.

Class A: = Flame spread index 0-25; smoke-developed index 0-450.

Class B: = Flame spread index 26-75; smoke-developed index 0-450.

Class C: = Flame spread index 76-200; smoke-developed index 0-450.

**Exception:** Materials tested in accordance with Section 803.1.2.

**803.1.2 Room corner test for interior wall or ceiling finish materials.** *Interior wall or ceiling finish* materials shall be permitted to be tested in accordance with NFPA 286. Interior wall or ceiling finish materials tested in accordance with NFPA 286 shall comply with Section 803.1.2.1.

**803.1.2.1 Acceptance criteria for NFPA 286.** The interior finish shall comply with the following:

1. During the 40 kW exposure, flames shall not spread to the ceiling.
2. The flame shall not spread to the outer extremity of the sample on any wall or ceiling.
3. Flashover, as defined in NFPA 286, shall not occur.
4. The peak heat release rate throughout the test shall not exceed 800 kW.
5. The total smoke released throughout the test shall not exceed 1,000 m<sup>2</sup>.

**803.1.3 Room corner test for textile wall coverings and expanded vinyl wall coverings.** Textile wall coverings and expanded vinyl wall coverings shall meet the criteria of Section 803.1.3.1 when tested in the manner intended for use in accordance with the Method B protocol of NFPA 265 using the product-mounting system, including adhesive.

**803.1.3.1 Acceptance criteria for NFPA 265.** The interior finish shall comply with the following:

1. During the 40 kW exposure, flames shall not spread to the ceiling.
2. The flame shall not spread to the outer extremities of the samples on the 8-foot by 12-foot (203 by 305 mm) walls.
3. Flashover, as defined in NFPA 265, shall not occur.
4. The total smoke released throughout the test shall not exceed 1,000 m<sup>2</sup>.

**803.1.4 Acceptance criteria for textile and expanded vinyl wall or ceiling coverings tested to ASTM E 84 or UL 723.** Textile wall and ceiling coverings and expanded vinyl wall and ceiling coverings shall have a Class A flame spread index in accordance with ASTM E 84 or UL 723 and be protected by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. Test specimen preparation and mounting shall be in accordance with ASTM E 2404.

**803.2 Thickness exemption.** Materials having a thickness less than 0.036 inch (0.9 mm) applied directly to the surface of walls or ceilings shall not be required to be tested.

**803.3 Heavy timber exemption.** Exposed portions of structural members complying with the requirements for buildings of Type IV construction in Section 602.4 shall not be subject to *interior finish* requirements.

**803.4 Foam plastics.** Foam plastics shall not be used as *interior finish* except as provided in Section 2603.10. This section shall apply both to exposed foam plastics and to foam plastics used in conjunction with a textile or vinyl facing or cover.

**803.5 Textile wall coverings.** Where used as interior wall finish materials, textile wall coverings, including materials having woven or nonwoven, napped, tufted, looped or similar surface and carpet and similar textile materials, shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of Section 803.1.2, 803.1.3 or 803.1.4.

**803.6 Textile ceiling coverings.** Where used as interior ceiling finish materials, textile ceiling coverings, including materials having woven or nonwoven, napped, tufted, looped or similar surface and carpet and similar textile materials, shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of Section 803.1.2 or 803.1.4.

**803.7 Expanded vinyl wall coverings.** Where used as interior wall finish materials, expanded vinyl wall coverings shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of Section 803.1.2, 803.1.3 or 803.1.4.

**803.8 Expanded vinyl ceiling coverings.** Where used as interior ceiling finish materials, expanded vinyl ceiling coverings shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of Section 803.1.2 or 803.1.4.

**803.9 Interior finish requirements based on group.** *Interior wall and ceiling finish* shall have a flame spread index not greater than that specified in Table 803.9 for the group and location designated. *Interior wall and ceiling finish* materials tested in accordance with NFPA 286 and meeting the acceptance criteria of Section 803.1.2.1, shall be permitted to be used where a Class A classification in accordance with ASTM E 84 or UL 723 is required.

**803.10 Stability.** *Interior finish* materials regulated by this chapter shall be applied or otherwise fastened in such a manner that such materials will not readily become detached where subjected to room temperatures of 200°F (93°C) for not less than 30 minutes.

**803.11 Application of interior finish materials to fire-resistance-rated or noncombustible building elements.** Where *interior finish* materials are applied on walls, ceilings or structural elements required to have a *fire-resistance rating* or to be of noncombustible construction, they shall comply with the provisions of this section.

**803.11.1 Direct attachment and furred construction.** Where walls and ceilings are required by any provision in this code to be of fire-resistance-rated or noncombustible construction, the *interior finish* material shall be applied directly against such construction or to furring strips not exceeding 1<sup>3</sup>/<sub>4</sub> inches (44 mm), applied directly against such surfaces.

**803.11.1.1 Furred construction.** If the interior finish material is applied to furring strips, the intervening spaces between such furring strips shall comply with one of the following:

1. Be filled with material that is inorganic or noncombustible;
2. Be filled with material that meets the requirements of a Class A material in accordance with Section 803.1.1 or 803.1.2; or
3. Be fireblocked at a maximum of 8 feet (2438 mm) in every direction in accordance with Section 718.

**803.11.2 Set-out construction.** Where walls and ceilings are required to be of fire-resistance-rated or noncombustible construction and walls are set out or ceilings are dropped distances greater than specified in Section 803.11.1, Class A finish materials, in accordance with Section 803.1.1 or 803.1.2, shall be used.

**Exceptions:**

1. Where *interior finish* materials are protected on both sides by an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Where *interior finish* materials are attached to noncombustible backing or furring strips installed as specified in Section 803.11.1.1.

**803.11.2.1 Hangers and assembly members.** The hangers and assembly members of such dropped ceilings that are below the horizontal fire-resistance rated floor or roof assemblies shall be of noncombustible materials. The construction of each set-out wall and



**TABLE 803.9  
INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY<sup>k</sup>**

GROUP	SPRINKLERED <sup>l</sup>			NONSPRINKLERED		
	Interior exit stairways, interior exit ramps and exit passageways <sup>a,b</sup>	Corridors and enclosure for exit access stairways and exit access ramps	Rooms and enclosed spaces <sup>c</sup>	Interior exit stairways, interior exit ramps and exit passageways <sup>a,b</sup>	Corridors and enclosure for exit access stairways and exit access ramps	Rooms and enclosed spaces <sup>c</sup>
A-1 & A-2	B	B	C	A	A <sup>d</sup>	B <sup>e</sup>
A-3 <sup>f</sup> , A-4, A-5	B	B	C	A	A <sup>d</sup>	C
B, E, M, R-1	B	C	C	A	B	C
R-4	B	C	C	A	B	B
F	C	C	C	B	C	C
H	B	B	C <sup>g</sup>	A	A	B
I-1	B	C	C	A	B	B
I-2	B	B	B <sup>h,i</sup>	A	A	B
I-3	A	A <sup>j</sup>	C	A	A	B
I-4	B	B	B <sup>h,i</sup>	A	A	B
R-2	C	C	C	B	B	C
R-3	C	C	C	C	C	C
S	C	C	C	B	B	C
U	No restrictions			No restrictions		

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929m<sup>2</sup>.

- a. Class C interior finish materials shall be permitted for wainscotting or paneling of not more than 1,000 square feet of applied surface area in the grade lobby where applied directly to a noncombustible base or over furring strips applied to a noncombustible base and fireblocked as required by Section 803.11.1.1.
- b. In other than Group I-3 occupancies in buildings less than three stories above grade plane, Class B interior finish for nonsprinklered buildings and Class C interior finish for sprinklered buildings shall be permitted in interior exit stairways and ramps.
- c. Requirements for rooms and enclosed spaces shall be based upon spaces enclosed by partitions. Where a fire-resistance rating is required for structural elements, the enclosing partitions shall extend from the floor to the ceiling. Partitions that do not comply with this shall be considered enclosing spaces and the rooms or spaces on both sides shall be considered one. In determining the applicable requirements for rooms and enclosed spaces, the specific occupancy thereof shall be the governing factor regardless of the group classification of the building or structure.
- d. Lobby areas in Group A-1, A-2 and A-3 occupancies shall not be less than Class B materials.
- e. Class C interior finish materials shall be permitted in places of assembly with an occupant load of 300 persons or less.
- f. For places of religious worship, wood used for ornamental purposes, trusses, paneling or chancel furnishing shall be permitted.
- g. Class B material is required where the building exceeds two stories.
- h. Class C interior finish materials shall be permitted in administrative spaces.
- i. Class C interior finish materials shall be permitted in rooms with a capacity of four persons or less.
- j. Class B materials shall be permitted as wainscotting extending not more than 48 inches above the finished floor in corridors and exit access stairways and ramps.
- k. Finish materials as provided for in other sections of this code.
- l. Applies when protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

horizontal fire-resistance rated floor or roof assembly shall be of fire-resistance-rated construction as required elsewhere in this code.

**Exception:** In Types III and V construction, *fire-retardant-treated wood* shall be permitted for use as hangers and assembly members of dropped ceilings.

**803.11.3 Heavy timber construction.** Wall and ceiling finishes of all classes as permitted in this chapter that are installed directly against the wood decking or planking of Type IV construction or to wood furring strips applied directly to the wood decking or planking shall be fire-blocked as specified in Section 803.11.1.1.

**803.11.4 Materials.** An interior wall or ceiling finish material that is not more than 1/4 inch (6.4 mm) thick shall be applied directly onto the wall, ceiling or structural element without the use of furring strips and shall not be sus-

pending away from the building element to which it is applied.

**Exceptions:**

1. Noncombustible interior finish materials.
2. Materials that meet the requirements of Class A materials in accordance with Section 803.1.1 or 803.1.2 where the qualifying tests were made with the material furred out from the noncombustible backing shall be permitted to be used with furring strips.
3. Materials that meet the requirements of Class A materials in accordance with Section 803.1.1 or 803.1.2 where the qualifying tests were made with the material suspended away from the noncombustible backing shall be permitted to be used suspended away from the building element.

**803.12 High-density Polyethylene (HDPE) and Polypropylene (PP).** Where high-density polyethylene or polypropylene is used as an interior finish it shall comply with Section 803.1.2.

**803.13 Site-fabricated stretch systems.** Where used as interior wall or interior ceiling finish materials, site-fabricated stretch systems containing all three components described in the definition in Section 802 shall be tested in the manner intended for use, and shall comply with the requirements of Section 803.1.1 or 803.1.2. If the materials are tested in accordance with ASTM E 84 or UL 723, specimen preparation and mounting shall be in accordance with ASTM E 2573.

## SECTION 804 INTERIOR FLOOR FINISH

**804.1 General.** *Interior floor finish* and floor covering materials shall comply with Sections 804.2 through 804.4.2.

**Exception:** Floor finishes and coverings of a traditional type, such as wood, vinyl, linoleum or terrazzo, and resilient floor covering materials that are not comprised of fibers.

**804.2 Classification.** *Interior floor finish* and floor covering materials required by Section 804.4.2 to be of Class I or II materials shall be classified in accordance with NFPA 253. The classification referred to herein corresponds to the classifications determined by NFPA 253 as follows: Class I, 0.45 watts/cm<sup>2</sup> or greater; Class II, 0.22 watts/cm<sup>2</sup> or greater.

**804.3 Testing and identification.** *Interior floor finish* and floor covering materials shall be tested by an agency in accordance with NFPA 253 and identified by a hang tag or other suitable method so as to identify the manufacturer or supplier and style, and shall indicate the *interior floor finish* or floor covering classification according to Section 804.2. Carpet-type floor coverings shall be tested as proposed for use, including underlayment. Test reports confirming the information provided in the manufacturer's product identification shall be furnished to the building official upon request.

**804.4 Interior floor finish requirements.** Interior floor covering materials shall comply with Sections 804.4.1 and 804.4.2 and interior floor finish materials shall comply with Section 804.4.2.

**804.4.1 Test requirement.** In all occupancies, interior floor covering materials shall comply with the requirements of the DOC FF-1 "pill test" (CPSC 16 CFR Part 1630) or with ASTM D 2859.

**804.4.2 Minimum critical radiant flux.** In all occupancies, interior floor finish and floor covering materials in enclosures for stairways and ramps, exit passageways, corridors and rooms or spaces not separated from corridors by partitions extending from the floor to the underside of the ceiling shall withstand a minimum critical radiant flux. The minimum critical radiant flux shall not be less than Class I in Groups I-1, I-2 and I-3 and not less than Class II in Groups A, B, E, H, I-4, M, R-1, R-2 and S.

**Exception:** Where a building is equipped throughout with an automatic sprinkler system in accordance with

Section 903.3.1.1 or 903.3.1.2, Class II materials are permitted in any area where Class I materials are required, and materials complying with DOC FF-1 "pill test" (CPSC 16 CFR Part 1630) or with ASTM D 2859 are permitted in any area where Class II materials are required.

## SECTION 805 COMBUSTIBLE MATERIALS IN TYPES I AND II CONSTRUCTION

**805.1 Application.** Combustible materials installed on or embedded in floors of buildings of Type I or II construction shall comply with Sections 805.1.1 through 805.1.3.

**Exception:** Stages and platforms constructed in accordance with Sections 410.3 and 410.4, respectively.

**805.1.1 Subfloor construction.** Floor sleepers, bucks and nailing blocks shall not be constructed of combustible materials, unless the space between the fire-resistance-rated floor assembly and the flooring is either solidly filled with noncombustible materials or fireblocked in accordance with Section 718, and provided that such open spaces shall not extend under or through permanent partitions or walls.

**805.1.2 Wood finish flooring.** Wood finish flooring is permitted to be attached directly to the embedded or fire-blocked wood sleepers and shall be permitted where cemented directly to the top surface of fire-resistance-rated floor assemblies or directly to a wood subfloor attached to sleepers as provided for in Section 805.1.1.

**805.1.3 Insulating boards.** Combustible insulating boards not more than 1/2 inch (12.7 mm) thick and covered with finish flooring are permitted where attached directly to a noncombustible floor assembly or to wood subflooring attached to sleepers as provided for in Section 805.1.1.

## SECTION 806 DECORATIVE MATERIALS AND TRIM

**[F] 806.1 General requirements.** In occupancies in Groups A, E, I and R-1 and dormitories in Group R-2, curtains, draperies, hangings and other *decorative materials* suspended from walls or ceilings shall meet the flame propagation performance criteria of NFPA 701 in accordance with Section 806.2 or be noncombustible.

**Exceptions:**

1. Curtains, draperies, hangings and other decorative materials suspended from walls of *sleeping units* and *dwelling units* in dormitories in Group R-2 protected by an *approved automatic sprinkler system* installed in accordance with Section 903.3.1 and such materials are limited to not more than 50 percent of the aggregate area of walls.
2. Decorative materials, including, but not limited to, photographs and paintings in dormitories in Group R-2 where such materials are of limited quantities

such that a hazard of fire development or spread is not present.

In Groups I-1 and I-2, combustible *decorative materials* shall meet the flame propagation criteria of NFPA 701 unless the *decorative materials*, including, but not limited to, photographs and paintings, are of such limited quantities that a hazard of fire development or spread is not present. In Group I-3, combustible decorative materials are prohibited.

Fixed or movable walls and partitions, paneling, wall pads and crash pads applied structurally or for decoration, acoustical correction, surface insulation or other purposes shall be considered *interior finish* if they cover 10 percent or more of the wall or of the ceiling area, and shall not be considered *decorative materials* or furnishings.

In Group B and M occupancies, fabric partitions suspended from the ceiling and not supported by the floor shall meet the flame propagation performance criteria in accordance with Section 806.2 and NFPA 701 or shall be noncombustible.

**[F] 806.1.1 Noncombustible materials.** The permissible amount of noncombustible decorative material shall not be limited.

**[F] 806.1.2 Combustible decorative materials.** The permissible amount of *decorative materials* meeting the flame propagation performance criteria of NFPA 701 shall not exceed 10 percent of the specific wall or ceiling area to which it is attached.

**Exceptions:**

1. In auditoriums in Group A, the permissible amount of decorative material meeting the flame propagation performance criteria of NFPA 701 shall not exceed 75 percent of the aggregate wall area where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 and where the material is installed in accordance with Section 803.11.
2. The amount of fabric partitions suspended from the ceiling and not supported by the floor in Group B and M occupancies shall not be limited.

**[F] 806.2 Acceptance criteria and reports.** Where required by Section 806.1, *decorative materials* shall be tested by an agency and meet the flame propagation performance criteria of NFPA 701 or such materials shall be noncombustible. Reports of test results shall be prepared in accordance with NFPA 701 and furnished to the *building official* upon request.

**[F] 806.3 Foam plastic.** Foam plastic used as *trim* in any occupancy shall comply with Section 2604.2.

**[F] 806.4 Pyroxylin plastic.** Imitation leather or other material consisting of or coated with a pyroxylin or similarly hazardous base shall not be used in Group A occupancies.

**[F] 806.5 Interior trim.** Material, other than foam plastic used as interior *trim*, shall have a minimum Class C flame spread and smoke-developed index when tested in accordance with ASTM E 84 or UL 723, as described in Section 803.1.1. Combustible *trim*, excluding handrails and guard-

rails, shall not exceed 10 percent of the specific wall or ceiling area to which it is attached.

**[F] 806.6 Interior floor-wall base.** *Interior floor-wall base* that is 6 inches (152 mm) or less in height shall be tested in accordance with Section 804.2 and shall not be less than Class II. Where a Class I floor finish is required, the floor-wall base shall be Class I.

**Exception:** Interior *trim* materials that comply with Section 806.5.

**SECTION 807  
INSULATION**

**807.1 Insulation.** Thermal and acoustical insulation shall comply with Section 720.

**SECTION 808  
ACOUSTICAL CEILING SYSTEMS**

**808.1 Acoustical ceiling systems.** The quality, design, fabrication and erection of metal suspension systems for acoustical tile and lay-in panel ceilings in buildings or structures shall conform with generally accepted engineering practice, the provisions of this chapter and other applicable requirements of this code.

**808.1.1 Materials and installation.** Acoustical materials complying with the *interior finish* requirements of Section 803 shall be installed in accordance with the manufacturer's recommendations and applicable provisions for applying *interior finish*.

**808.1.1.1 Suspended acoustical ceilings.** Suspended acoustical ceiling systems shall be installed in accordance with the provisions of ASTM C 635 and ASTM C 636.

**808.1.1.2 Fire-resistance-rated construction.** Acoustical ceiling systems that are part of fire-resistance-rated construction shall be installed in the same manner used in the assembly tested and shall comply with the provisions of Chapter 7.

