



### 2015 Pit Ladder Safety Code Requirements

#### A

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.

#### B

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.).

#### C

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.).

#### D

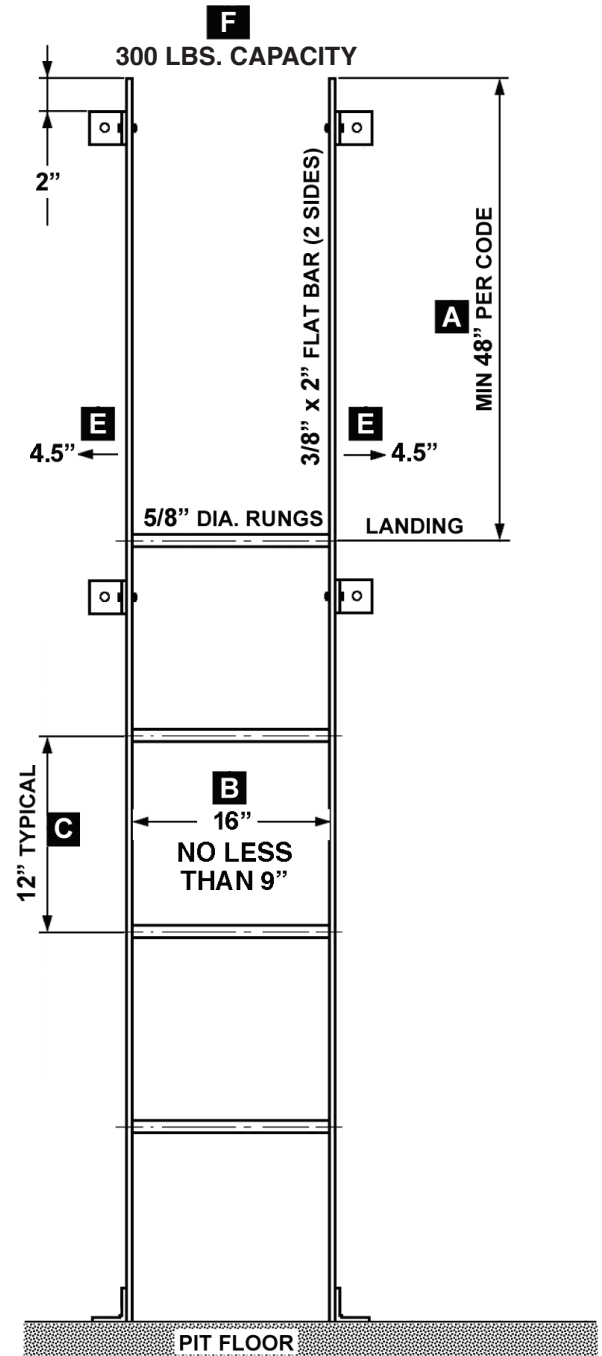
2.2.4.2.4 A clear distance of not less than 115 mm (4.5 in.) from the centerline of the rungs, cleats, or steps to the nearest permanent object in back of the ladder shall be provided.

#### E

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.

#### F

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





### 2015 Pit Safety Code Requirements

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#### PITS

2.2.4.4 Pits shall be accessible only to elevator personnel.

2.2.4.5 Separate pit access 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 1,825 mm (72 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 the 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).

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).

#### 2.2.6

##### STOP SWITCH IN PITS

An enclosed stop switch(es), meeting the requirements of 2.26.2.7 and 2.2.6.1 through 2.2.6.3, shall be installed in the pit of each elevator.

2.2.6.1. The stop switch shall be so located as to be accessible from the pit access door. Where access to the pits of elevators in a multiple hoistway is by means of a single access door, the stop switch for each elevator shall be located adjacent to the nearest point of access to its pit from the access door.

2.2.6.2. In elevators where access to the pit is through the lowest landing hoistway door, a stop switch shall be located approximately 450 mm (18 in.) above the floor level of the landing, within reach from this access floor and adjacent to the pit ladder, if provided. When the pit exceeds 1,700 mm (67 in.) in depth, an additional stop switch is required adjacent to the pit ladder and approximately 1,200 mm (47 in.) above the pit floor.

2.2.6.3. Where more than one switch is provided, they shall be wired in series.



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## 2015 Reopening Device, Phase Reversal, and Failure Protection Safety Code Requirements

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### 2.8.2

#### REOPENING DEVICE FOR POWER-OPERATED CAR DOORS OR GATES

Where required by 2.8.1, a power-operated car door or gate shall be provided with a reopening device that will function to stop and reopen the car door or gate and the adjacent hoistway door in the event that the car door or gate is obstructed while closing. If the closing kinetic energy is reduced to 2.5 ft-lbf (3.39 J) or less, the reopening device shall be permitted to be rendered inoperative [see 2.8.1(a)].

For center-opening doors or gates, the reopening device shall be so designed and installed that the obstruction of either door or gate panel when closing will cause the reopening device to function.

### 3.10.6

#### PHASE REVERSAL AND FAILURE PROTECTION

Elevators having polyphase alternating current power supply shall be provided with means to prevent the starting of the elevator motor if the phase rotation is in the wrong direction, or if there is a failure of any phase.

This protection shall be considered to be provided in the case of the generator field control having alternating current motor-generator driving motors, provided a reversal of phase will not cause the elevator driving machine motor to operate in the wrong direction. Controllers on which switches are operated by polyphase torque motors provide inherent protection against phase reversal or failure.



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## 2015 Emergency Operation and Signaling Devices Code Requirements

### SECTION 3.11 EMERGENCY OPERATION AND SIGNALING DEVICES

#### 3.11.1 CAR EMERGENCY SIGNALING DEVICES

Elevators shall be provided with the following signaling devices.

- a) In all buildings, the elevator shall be provided with the following;
  - 1) An audible signaling device, operable from the emergency stop switch, when provided, and from a switch marked "ALARM" that is located in or adjacent to each car operating panel. The signaling device shall be located inside the building and audible inside the car and outside the hoistway. One signaling device shall be permitted to be used for a group of elevators.
  - 2) Means of two-way conversation between the car and a readily accessible point outside the hoistway that is available to emergency personnel (telephone, intercom, etc.). The means to activate the two-way conversation does not have to be provided in the car.
  - 3) If the audible signaling device, or the means of two-way conversation, or both, are normally connected to the building power supply, they shall automatically transfer to a source of emergency power within 10 s after the normal power supply fails. The power source shall be capable of providing for the operation of the audible signaling device for at least 1 h, and the means of two-way conversation for at least 4 h.
- b) In buildings in which a building attendant (building employee, watchman, etc.) is not continuously available to take action when the required emergency signal is operated, the elevators shall be provided with a means within the car for communicating with

or signaling to a service which is capable of taking appropriate action when a building attendant is not available.

An emergency power system shall be provided conforming to the requirements of 3.11.1(a)(3).

#### 3.4.5 CAR ILLUMINATION

- a) Interiors of cars shall be provided with an electric light or lights. Not less than two lamps shall be provided.
- b) The minimum illumination at the car threshold, with the door closed, shall not be less than
  - 1) for passenger elevators: 5 fc (54 lx)
  - 2) for freight elevators: 2.5 fc (27 lx)
- c) Light control switches are not required, but if provided they shall be located in or adjacent to the operating device in the car. In elevators having automatic operation, they shall be of the key-operated type or located in a fixture with a locked cover.
- d) Passenger elevators shall be provided with a standby (emergency) lighting power source on each elevator conforming to the following:
  - 1) The standby system shall provide general illumination in the car. The intensity of illumination 4 ft. (1,219 mm) above the car floor and approximately 1 ft. (305 mm) in front of the car-operating device shall be not less than 0.2 fc (2.2 lx) Lights shall be automatically turned on in all elevators in service immediately after normal car lighting power fails. The power system shall be capable of maintaining the above light intensity for a period of at least 4 h.
  - 2) Not less than two lamps of approximately equal wattage shall be used.
- e) Top of car light fixtures shall be permitted to be provided with a non-key-operated switch in or adjacent to the fixture.