

ELEVATOR DESIGN & CONSTRUCTION

ADA & ASME Requirements You Need to Know

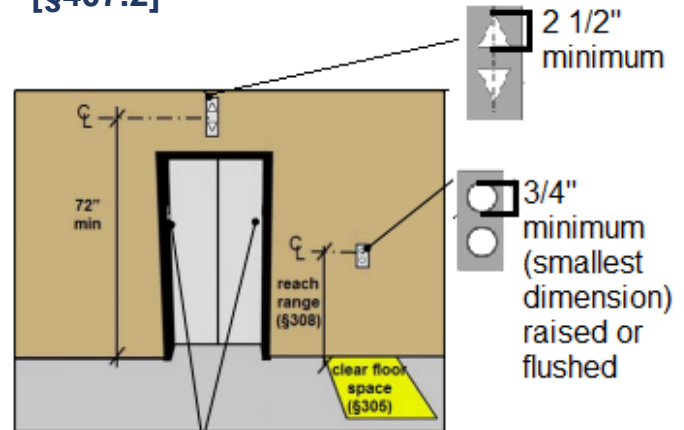
Around the world, 325 million passengers ride on elevators every day. In only three days, that amount is equivalent to the entire population on Earth.

In the United States (U.S.) twenty six percents of adults have some disability according to the Centers for Disease Control and Prevention (CDC). That is 61 million adults relying on design engineers and construction companies to design and build elevators that comply with the Americans Disability Act (ADA).

The ADA standards are issued by the Department of Justice (DOJ) and the Department of Transportation (DOT). For the construction and alterations of a facility elevator codes, requirements and standards come from the American Society of Mechanical Engineers (ASME) and International Building Codes® (IBC).

This guide explains the ASME criteria for elevators and platform lifts in the ADA Standards.

Elevator Landing Requirements [§407.2]



Hall Signals (§407.2.2)

- Required at each hoistway (including elevators with only 2 stops)
- Indicate car arrival and travel direction (separate fixtures are not required to indicate direction)
- Visible indicators can be vertical or side-by-side.
- Visible from area of hall call button, including those in cars (1 in-car lantern is acceptable if visible from the hall call button)
- Audible signals: one (up)/ two (down) or annunciator
- Frequency: 1500 Hz max. (300 – 3,000 Hz verbal annunciator)
- Signal level: 10 dB min. above ambient, 80 dB max.

Call Controls (§407.2.1)

- Within reach range, measured to centerline of highest operable part
- Compliant as operable part
- Up button above down button

- Visual indication of call registered, and call answered.
- Raised from, or flush with, faceplate or, if provided, trim ring or ferrule

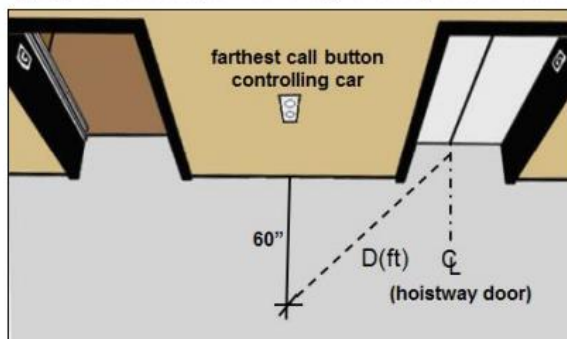
Hoistway Signs (§407.2.3)

- Both jambs, 48" – 60" AFF (measured to raised character baseline)
- Characters and symbols raised 1/32" min., sans serif.
- Compliance with other requirements in 703.2 for raised characters (upper case, style, character proportion and spacing, stroke thickness, and line spacing)
- Grade II braille complying with 703.3 below raised characters.
- Tactile star with braille ("MA'IN") required on both jambs at the main entry level

Elevator Door Requirements [§407.3]

Door and Signal Timing (§407.3.4)

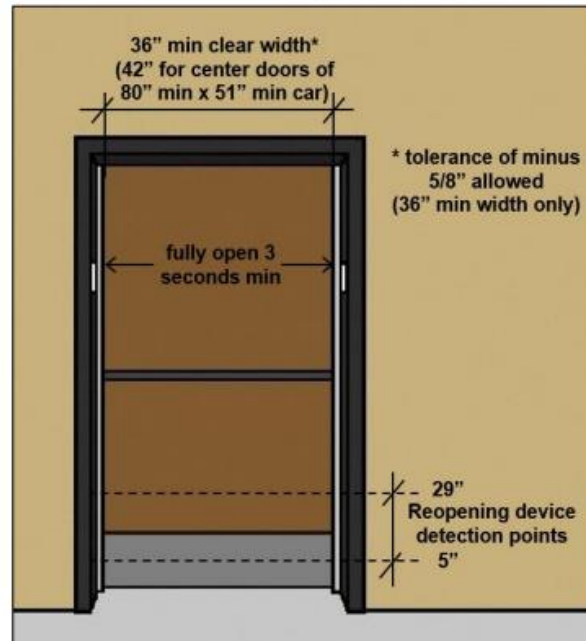
Timing begins at audible and visible notification of car arrival based on when the signal becomes visible from the specified location point in front of the call button. At elevators with in-car lanterns, timing begins once doors open wide enough for the signal to be visible from this point.



Minimum timing from car arrival notification to start of door closing: $D / 1.5 \text{ ft/s}$ (no less than 5 sec.)

Door Delay (§407.3.5)

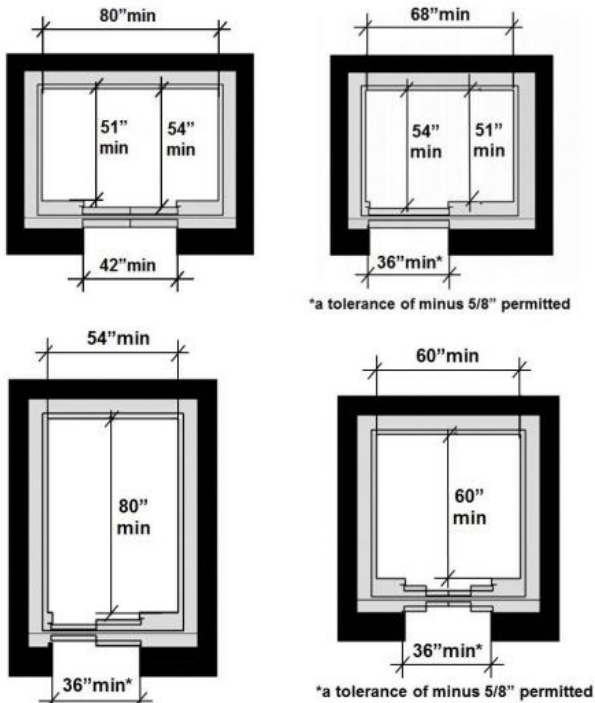
- Doors must remain fully open 3 seconds min. in response to a call Reopening Device (§407.3.3)
- Cannot require physical contact (but contact can occur before door reverses)
- Doors do not have to fully reopen.
- Must be effective for at least 20 seconds while obstructed but can close sooner if unobstructed or upon user activation of door close.
- Automatic operation or user activation cannot reduce the minimum opening time (3 sec.) or door and signal timing but can control reopening time.



Elevator Car Requirements [§407.4]

The ADA Standards specify the minimum car dimensions. Alternative configurations that provide unobstructed wheelchair turning space (60" diameter circle or T-turn) with the doors closed are permitted.

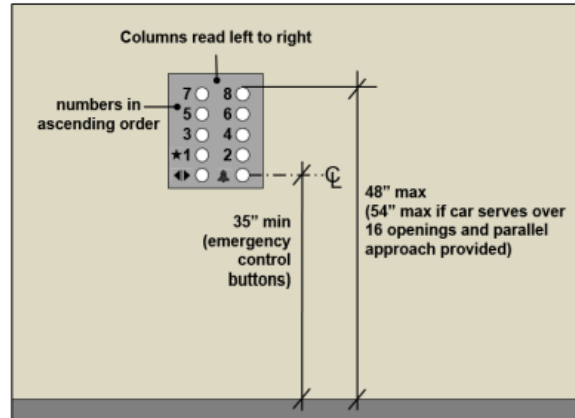
Elevator Car Dimensions (§407.4.1)



*a tolerance of minus 5/8" permitted

Car Controls [§407.4.6 and §407.4.7]

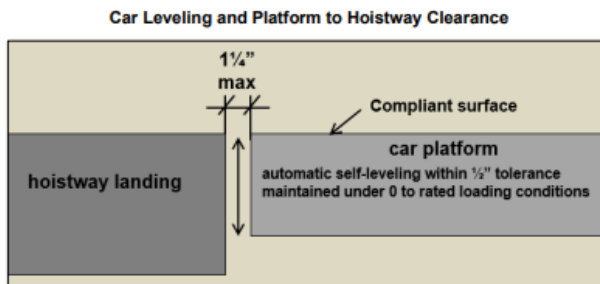
If more than one car control panel is provided in a car, both must comply (except in existing cars where only 1 panel must comply).



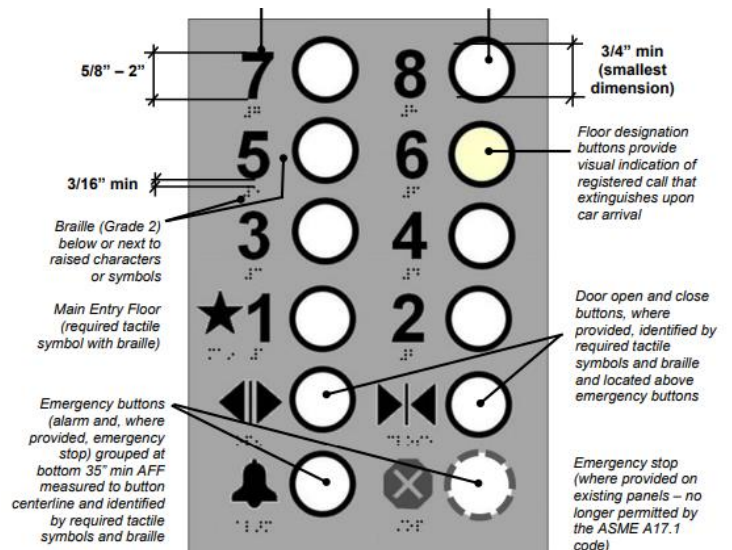
Elevator Car Requirements [§407.4.2 – §407.4.5]

Other requirements for elevator cars include:

- compliant floor surfaces
- a maximum 1/4" horizontal clearance between car platform sill and hoistway landing
- a self-leveling feature
- 5 ft. candles min. illumination at platform, controls, threshold, and landing sill



- Raised characters to immediate left of button, raised 1/32" min, sans serif (sufficient color contrast from the background is recommended)
- Buttons raised from or flush with faceplate/ trim ring (ferrule)



In-car switches not for passenger use (e.g., fireman's operations) are not required to comply

Keypads (§407.4.6.3 and §407.4.7.2)

Keypads, if provided in cars, must comply:

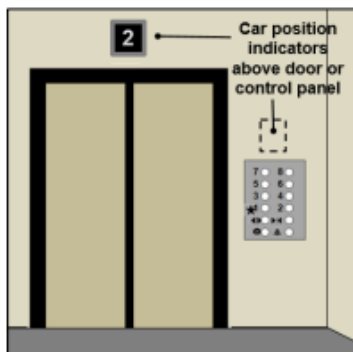
- Location within reach range, measured to centerline of highest operable part.
- Standard phone keypad arrangement
- Raised or flush buttons, $\frac{3}{4}$ " min. in smallest dimension
- Raised dot "5" key (0.025"-0.037" high, 0.118" 0.120" base diameter)
- Compliant visual characters (§703.5) centered on button.



Car Position Indicators (§407.4.8)

Position indicators are required for all cars, including those of 2-stop elevators. Specifications include:

- $\frac{1}{2}$ " min. character height
- Illumination of each floor level passed or stopped at
- Automatic verbal announcement of stop or nonverbal audible signal of passed floors and stops (if elevator not destination-oriented and has a rated speed of 200 ft./ minute max.)
- Frequency: 300 – 3,000 Hz for verbal annunciator, 1500 Hz max. for non-verbal signal
- Signal level: 10 dB min. above ambient to 80 dB max.



Emergency Communication (§407.4.9)

The ASME A17.1 code requires a two-way means of emergency communication in elevator cars. This system establishes direct communication with authorized personnel and must be activated by a push button.

Handsets, which are vulnerable to vandalism, and closed compartments are prohibited. The activating button must be permanently identified by a tactile phone symbol and the term "HELP" located either on or adjacent to the button. Operating instructions are also required.

The ASME A17.1 also requires a visual signal, such as a labeled LED light or lighted jewel, to acknowledge that the emergency call has been received. The visual signal is considered a component of the two-way communication, though voice communication may also be established. The visual indication must be on the same panel as the "HELP" push button and extinguish when a communications link is terminated.

In addition to the ASME requirements, the ADA Standards require that the push button and other device controls comply as operable parts (§309). They also require the push button to be labeled with a specified tactile phone symbol and braille.

Operating instructions and other information, including the label for the visible signal, must meet criteria for visual characters but are not required to be tactile.



The ASME A17.1 code addresses features of required two-way emergency communication devices, including controls and visual indicators. The ADA Standards apply requirements for operable parts and tactile characters and symbols.

IBC Building Codes

The materials you select for building an elevator must also comply with International Building Codes (IBC). See IBC 2021 Chapter 30 Elevators & Conveying Systems – Chapter 30 at www.codes.iccsafe.org. It covers the design, construction, installation, alteration, and repair of elevators, conveying systems, and their components. that protect occupants and assist emergency responders during fires.