

ASME A17.1-2019/CSA B44:19

(Revision of ASME A17.1-2016/CSA B44-16)

Safety Code for Elevators and Escalators

**Includes Requirements for Elevators,
Escalators, Dumbwaiters, Moving
Walks, Material Lifts, and Dumbwaiters
With Automatic Transfer Devices**

AN AMERICAN NATIONAL STANDARD



**The American Society of
Mechanical Engineers**



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NONMANDATORY APPENDIX E

ELEVATOR REQUIREMENTS FOR PERSONS WITH PHYSICAL DISABILITIES IN JURISDICTIONS ENFORCING THE NBCC

INTRODUCTION

This Appendix was developed and approved by the CSA B44 Technical Committee. The ASME A17 Standards Committee, in the spirit of harmonization, authorized the publication of this Appendix.

This Appendix is not a mandatory part of this Code; however, it is provided for reference in order to comply with the requirements of the NBCC.

E-1 SCOPE

This Appendix contains requirements intended to make passenger elevators usable by persons with physical disabilities in jurisdictions enforcing the NBCC. These requirements are in addition to, or modifications of, certain requirements specified elsewhere in this Code. Elevators shall be passenger elevators as classified by ASME A17.1/CSA B44. Elevator operation shall be automatic.

E-2 DEFINITIONS

destination-oriented elevator system: an elevator system that provides lobby controls for the selection of destination floors, lobby indicators designating which elevator to board, and a car indicator designating the floors at which the car will stop.

elevator car call sequential step scanning: a technology used to enter a car call by means of an up or down floor selection button.

physical disability: a disability resulting in a mobility or sensory impairment.

variable message signs (VMS): electronic signs that have a message with the capacity to change by means of scrolling, streaming, or paging across a background.

variable message sign (VMS) characters: characters of an electronic sign composed of pixels in an array.

E-3 LEVELING

Each car shall automatically stop and maintain position at floor landings within a tolerance of 13 mm ($\frac{1}{2}$ in.) under rated loading to zero loading conditions.

E-4 DOOR OPERATION

Power-operated horizontally sliding car and landing doors opened and closed by automatic means shall be provided.

E-5 DOOR SIZE

The clear width of elevator doors shall comply with [Table E-5-1](#).

E-6 DOOR PROTECTIVE AND REOPENING DEVICE

E-6.1 Doors shall be provided with a door reopening device that automatically stops and reopens the car door and landing door if the door becomes obstructed by an object or person. This reopening device shall also be capable of sensing an object or person in the path of a closing door at 125 mm \pm 25 mm (5 in. \pm 1 in.) and 735 mm \pm 25 mm (29 in. \pm 1 in.) above the floor without requiring contact for activation, although contact may occur before the door reverses.

E-6.2 Door reopening devices shall remain effective for a period of not less than 20 s.

E-7 DOOR TIMING FOR HALL AND CAR CALLS

E-7.1 The minimum acceptable time from notification that a car is answering a call until the doors of that car start to close shall be calculated from the following equation, but shall not be less than 5 s:

$$T = D/(455 \text{ mm/s})$$

or

$$T = D/(1.5 \text{ ft/s})$$

where T equals the total time in seconds and D equals the distance (in millimeters or feet) from the point in the lobby or corridor 1525 mm (60 in.) directly in front of the farthest call button controlling that car to the centerline of its hoistway door.

E-7.2 For cars with in-car lanterns, T shall begin when the signal is visible from the point 1525 mm (60 in.) directly in front of the farthest hall call button and the audible signal is sounded.

Table E-5-1 Minimum Dimensions of Elevator Cars

Door Location	Door Clear Width, mm	Inside Car, Side to Side, mm	Inside Car, Back Wall to Front Return, mm	Inside Car, Wall to Inside Face of Door, mm
Centered	1 065	2 030	1 295	1 370
Side (off-center)	915 ²	1 725	1 295	1 370
Any	915 ²	1 370	2 030	2 030
Any	915 ²	1 525	1 525	1 525

GENERAL NOTES:

(a) This Table is based on Tables 407.2.8 and 407.4.1 in ANSI/ICC A117.1, metric values only.

(b) A tolerance of -16 mm shall be permitted.

E-7.3 Elevator doors shall remain fully open in response to a car call for 3 s minimum.

E-8 INSIDE DIMENSIONS OF ELEVATOR CARS

E-8.1 The inside dimensions of elevator cars shall comply with [Table E-5-1](#).

E-8.2 Other car configurations that provide a 915 mm (36 in.) minimum clear door width and a circular space with a minimum diameter of 1 525 mm (60 in.) with the door closed are permitted.

E-9 CAR CONTROLS

E-9.1 Features. Car controls shall have the features as specified in [Clauses E-9.2](#) through [E-9.4](#).

E-9.2 Height. Buttons with floor designations shall be located a maximum of 1 220 mm (48 in.) above the floor or ground measured to the centerline of the buttons. Emergency control buttons, including emergency alarms where provided, shall be grouped at the bottom of the panel. Emergency control buttons shall have their centerlines 890 mm (35 in.) minimum above the floor or ground.

E-9.3 Buttons

E-9.3.1 Button Dimensions. Buttons shall be 19 mm (0.75 in.) minimum in their smallest dimension. Buttons or surrounding button collars shall be raised a minimum of 1.5 mm (0.06 in.).

E-9.3.2 Button Arrangement. Buttons shall be arranged with numbers in ascending order. Floors shall be designated ... -4, -3, -2, -1, 0, 1, 2, 3, 4, etc., with floors below the main entry floor designated with negative numbers. Numbers shall be permitted to be omitted, provided the remaining numbers are in sequence. Where a telephone keypad arrangement is used, the number key (#) shall be used to enter the minus symbol (“-”). When two or more columns of buttons are provided, they shall read from left to right.

E-9.3.2.1 Where existing building floor designations differ from the arrangement required by [Clause E-9.3.2](#) or are alphanumeric, a new operating panel shall be permitted to use such existing building floor designations.

E-9.3.3 Button Characteristics

E-9.3.3.1 Control buttons shall be identified by raised characters and Braille complying with [Clause E-20](#).

E-9.3.3.2 Raised character and Braille designations shall be placed immediately to the left of the button to which the designations apply. When a negative number is used to indicate a negative floor, the Braille designation shall be a cell with the dots 3 and 6 followed by the ordinal number.

E-9.3.4 Control Button. The control button for the main entry floor, and control buttons other than remaining buttons with floor designations, shall be identified with raised symbols and Braille as shown in [Table 2.26.12.1](#).

The location and size of Braille, where required, shall comply with [Table 2.26.12.1](#).

E-9.3.5 Visible Indicators. Buttons with floor designations shall be provided with visible indicators to show that a call has been registered. The visible indication shall extinguish when the car arrives at the designated floor.

E-9.3.6 Elevator Car Call Sequential Step Scanning. Elevator car call sequential step scanning shall be provided where car control buttons are provided more than 1 220 mm (48 in.) above the floor. Floor selection shall be accomplished by applying momentary or constant pressure to the up or down scan button. The up scan button shall sequentially select floors above the current floor. The down scan button shall sequentially select floors below the current floor. When pressure is removed from the up or down scan button for more than 2 s, the last floor selected shall be registered as a car call. The up and down scan buttons shall be located adjacent to or immediately above the emergency control buttons.

E-9.4 Telephone-Style Keypads. Telephone-style keypads shall be in a standard telephone keypad arrangement. Call buttons shall be 19 mm (0.75 in.) minimum in their smallest dimension. Buttons shall be raised a minimum of 1.5 mm (0.06 in.). Braille shall not be required. Characters shall be 13 mm (0.5 in.) minimum in height and otherwise conform to [Clause E-20.4](#). The number five key shall have a single raised dot. The dot shall be 3.00 mm to 3.05 mm (0.118 in. to 0.12 in.) base diameter and in other aspects conform to [Table E-20.4.3-1](#). Characters shall be centered on the corresponding keypad button. A display shall be provided in the car with visible indicators to show registered car destinations. The visible indication shall extinguish when the call has been answered. A standard five-pointed star shall be used to indicate the main entry floor.

E-10 CAR POSITION INDICATORS

E-10.1 General. In elevator cars, both audible and visible car floor location indicators shall be provided to identify the floor location of the car.

E-10.2 Visible Indicators. Indicators shall be located above the car control panel or above the door. Numerals shall be 16 mm (0.63 in.) minimum in height.

E-10.2.1 Floor Arrival. To indicate a car passing a floor and when a car stops at a floor served by the elevator, the corresponding character shall illuminate.

E-10.3 Audible Indicators

E-10.3.1 The audible signal shall be 10 dBA minimum above ambient, but shall not exceed 80 dBA maximum, measured at the annunciator. The signal shall be an automatic verbal announcement that announces the floor at which the car is about to stop. The verbal announcement indicating the floor shall be completed prior to the initiation of the door opening. The verbal annunciator shall have a frequency of 300 Hz minimum and 3 000 Hz maximum.

E-10.3.2 For elevators, other than destination-oriented elevators, that have a rated speed of 1 m/s (200 ft/min) or less, where the verbal annunciator is not provided, an audible signal with a frequency of 1 500 Hz maximum that sounds as the car passes or stops at a floor served by the elevator shall be permitted.

E-11 EMERGENCY COMMUNICATIONS

E-11.1 General. Emergency two-way communication systems between the elevator car and a point outside the hoistway shall comply with [2.27.1](#). The operable parts of a two-way communication system shall be located between 380 mm (15 in.) and 1 220 mm (48 in.) from the floor.

E-11.2 Instructions. Operating instructions required by [2.27.1](#) shall be presented in both tactile and visual form.

E-12 FLOOR SURFACES

Floor surfaces in elevator cars shall have a firm, stable, and slip-resistant surface that permits easy movement of wheelchairs. Carpet pile height shall be 13 mm (0.5 in.) maximum.

E-13 HANDRAILS

Handrails shall be provided on all nonaccess walls. The top of the gripping surfaces of the handrails shall be at a height of 800 mm to 920 mm (31.5 in. to 36.2 in.), with a space of 35 mm to 45 mm (1.4 in. to 1.8 in.) between the handrails and wall.

E-14 ILLUMINATION LEVELS

The level of illumination at the car controls shall be 100 lx (10 fc) minimum.

E-15 HALL BUTTONS

E-15.1 Hall buttons and keypad buttons in elevator lobbies and halls shall be located vertically between 890 mm (35 in.) and 1 220 mm (48 in.) above the floor, measured to the centerline of the respective button.

E-15.2 A clear floor space of 760 mm (30 in.) minimum by 1 220 mm (48 in.) minimum shall be provided at hall buttons and keypads.

E-15.3 Hall buttons shall be 19 mm (0.75 in.) minimum in the smallest dimension.

E-15.4 Hall buttons shall have visual signals to indicate when each call is registered and when each call is answered. Call buttons shall provide an audible signal or mechanical motion of the button to indicate when each call is registered.

E-15.5 The hall button that designates the UP direction shall be located above the button that designates the DOWN direction. Buttons or surrounding button collars shall be raised a minimum of 1.5 mm (0.06 in.). Objects located beneath hall buttons shall protrude 25 mm (1 in.) maximum.

E-15.6 Keypads. Where keypads are provided, they shall comply with [Clause E-9.4](#).

E-16 HALL OR IN-CAR SIGNALS

E-16.1 General. A visible and audible signal shall be provided at each hoistway entrance to indicate which car is answering a call and its direction of travel, except that signals in cars, visible from the floor area adjacent to the hall call buttons and complying with requirements of [Clauses E-16.2](#) and [E-16.3](#) shall be permitted.

E-16.2 Audible Signals. Audible signals shall sound once for the UP direction and twice for the DOWN direction, or shall have verbal annunciators that state the word UP or DOWN. Audible signals shall have a frequency of 1 500 Hz maximum. Verbal annunciators shall have a frequency of 300 Hz minimum and 3 000 Hz maximum. The audible signal or verbal annunciator shall be 10 dBA minimum above ambient, but shall not exceed 80 dBA maximum, measured at the hall call button.

E-16.3 Visible Signals

E-16.3.1 Height. Hall signal fixtures shall be 1 830 mm (72 in.) minimum above the floor or ground, measured to the centerline of the fixture.

E-16.3.2 Size. The visible signal elements shall be 60 mm (2.36 in.) minimum between the uppermost and lowest edges of the illuminated shape measured vertically.

E-16.3.3 Visibility. Signals shall be visible from the floor area adjacent to the hall button.

E-17 FLOOR/CAR DESIGNATIONS

Raised character and Braille floor designations shall be provided on both jambs of elevator hoistway entrances and shall be centered at 1 525 mm (60 in.) above the floor, measured from the baseline of the characters. A raised star placed immediately to the left of the floor designation shall also be provided on both jambs at the main entry level. Such characters shall be 50 mm (2 in.) high and shall comply with [Clauses E-20.2](#) and [E-20.3](#).

E-18 DESTINATION-ORIENTED ELEVATORS

E-18.1 General. Destination-oriented elevators shall comply with [Clauses E-3](#) through [E-8](#), [E-11](#), [E-12](#), [E-14](#), [E-17](#), and [E-18.2](#) through [E-18.6](#).

E-18.2 Call Buttons. Call buttons shall be 890 mm minimum and 1 220 mm maximum (35 in. minimum and 48 in. maximum) above the floor or ground, measured to the centerline of the buttons. A clear floor or ground space of 760 mm × 1 220 mm (30 in. × 48 in.) shall be provided. Call buttons shall be 19 mm (0.75 in.) minimum in their smallest dimension. Buttons shall be raised a minimum of 1.5 mm (0.06 in.). Objects beneath hall call buttons shall protrude 25 mm (1 in.) maximum into the clear floor or ground space. Destination-oriented elevator systems shall have a keypad or other means for the entry of destination information. Keypads, if provided, shall be in a standard telephone keypad arrangement, and buttons shall be identified by visual characters complying with [Clause E-20.2](#). Characters shall be centered on the corresponding keypad button. The number five key shall have a single raised dot. The dot shall be 3.00 mm to 3.05 mm (0.118 in. to 0.12 in.) base diameter, and in other aspects comply with [Table E-20.4.3-1](#). Destination-oriented elevator

systems shall be provided with a visual signal and audible tones and verbal announcements to indicate which car is responding to a call. The audible tones and verbal announcements shall be activated by pressing a function button. The function button shall be identified by the international symbol for accessibility and a raised indication (see [Figure E-20.6.3](#)). The symbol shall be 16 mm (0.63 in.) in height and be a visual character complying with [Clause E-20.2](#). The indication shall be three raised dots, spaced 6 mm (0.25 in.) at base diameter, in the form of an equilateral triangle. The function button shall be located immediately below the keypad arrangement or floor buttons. A display shall be provided in the car with visible indicators to show registered car destinations.

E-18.3 Hall Signals

E-18.3.1 General. Destination-oriented elevators shall be provided with a visible signal and audible tones and verbal announcements to indicate which car is responding to a call. The signals shall be the same as those given at the call button or call button keypad, if provided. Each elevator in a bank shall have audible and visible means for differentiation.

E-18.3.2 Visible Signals

E-18.3.2.1 Height. Hall signal fixtures shall be 1 830 mm (72 in.) minimum above the floor or ground, measured to the centerline of the fixture.

E-18.3.2.2 Size. The visible signal elements shall be 60 mm (2.36 in.) minimum in their smallest dimension.

E-18.3.2.3 Visibility. Signals shall be visible from the floor area adjacent to the hoistway entrance.

E-18.4 Car Controls. Emergency controls, including emergency alarms where provided, shall have centerlines that are 890 mm minimum and 1 220 mm maximum (35 in. minimum and 48 in. maximum) above the floor or ground. Buttons shall be 19 mm (0.75 in.) minimum in their smallest dimension. Buttons shall be raised a minimum of 1.5 mm (0.06 in.).

E-18.5 Car Position Indicators

E-18.5.1 General. In elevator cars, audible and visible car location indicators shall be provided.

E-18.5.2 Visible Indicators. A display shall be provided in the car with visible indicators to show car destinations. Numerals shall be 16 mm (0.63 in.) high minimum. The visible indicators shall extinguish when the car arrives at the designated floor.

E-18.5.3 Audible Indicators. An automatic verbal announcement that announces the floor at which the car is about to stop shall be provided. The announcement shall be 10 dBA minimum above ambient and 80 dBA maximum, measured at the annunciator. The verbal

announcement indicating the floor shall be completed prior to the initiation of the door opening. The verbal annunciator shall have a frequency of 300 Hz minimum and 3000 Hz maximum.

E-18.6 Elevator Car Identification. In addition to the tactile signs required by [Clause E-17](#), a raised elevator car identification shall be placed immediately below the hoistway entrance floor designation. The characters shall be 50 mm (2 in.) high and shall comply with [Clauses E-20.2](#) and [E-20.3](#).

E-18.7 Destination-Oriented Elevators. Destination-oriented elevators shall not be required to comply with [Clause E-7.1](#).

E-19 LIMITED-USE/LIMITED-APPLICATION ELEVATORS

Limited-use/limited-application elevators shall comply with [Clauses E-1](#), [E-3](#), [E-5](#) through [E-17](#), and [E-19](#).

E-19.1 Elevator Door Requirements. Elevator hoistway doors shall comply with [Clause E-19.1](#).

E-19.1.1 Sliding Doors. Sliding hoistway doors shall comply with [Clause E-4](#).

E-19.1.2 Swinging Doors. Swinging hoistway doors shall open and close automatically and shall comply with [Clause E-19.1.2](#). The clear floor space for hall call buttons shall be located beyond the arc of the door swing.

E-19.1.2.1 Power Operation. Swinging doors shall be power-operated and shall comply with ANSI/BHMA A156.19.

E-19.1.2.2 Duration. Power-operated swinging doors shall remain open for 20 s minimum when activated.

E-19.1.3 Door Location and Width. Car doors shall comply with [Clause E-19.1.3](#).

E-19.1.3.1 Cars With a Single Door or With Doors on Opposite Ends. Car doors shall be positioned at the narrow end of cars with a single door and on cars with doors on opposite ends. Doors shall provide a clear opening width of 815 mm (32 in.) minimum.

E-19.1.3.2 Cars With Doors on Adjacent Sides

E-19.1.3.2.1 Car doors shall be permitted to be located on adjacent sides of cars that provide a 1.67 m² (18 ft²) platform. Doors located on the narrow end of cars shall provide a clear opening width of 915 mm (36 in.) minimum. Doors located on the long side shall provide a clear opening width of 1065 mm (42 in.) minimum and shall be located as far as practicable from the door on the narrow end.

E-19.1.3.2.2 Car doors that provide a clear opening width of 915 mm (36 in.) minimum shall be permitted to be located on adjacent sides of cars that

provide a clear floor area of 1295 mm (51 in.) width and 1295 mm (51 in.) in depth.

E-19.2 Elevator Car Requirements. Elevator cars shall comply with [Clause E-19.2](#).

E-19.2.1 Inside Dimensions. Elevator cars shall provide a clear floor width of 1065 mm (42 in.) minimum. The clear floor area shall not be less than 1.46 m² (15.75 ft²).

E-19.3 Elevator Car Controls, Control panels shall be centered on the longest side wall.

E-20 SIGNS

E-20.1 Accessible signs shall comply with [Clause E-20.2](#). Tactile signs shall contain both raised characters and Braille. Where signs with both visual and raised characters are required, either one sign with both visual and raised characters, or two separate signs, one with visual and one with raised characters, shall be provided.

E-20.2 Visual Characters

E-20.2.1 General

E-20.2.1.1 Visual characters shall comply with either [\(a\)](#) or [\(b\)](#).

(a) Visual characters that also serve as raised characters shall comply with [Clause E-20.3](#).

(b) Visual characters on variable message signs (VMS) signage shall comply with [Clause E-20.7](#).

(c) Visual characters not covered in [\(a\)](#) and [\(b\)](#) shall comply with [Clause E-20.2](#).

E-20.2.1.2 The visual and raised requirements of [E-20.2.1.1\(a\)](#) shall be permitted to be provided by two separate signs that provide corresponding information, provided one sign complies with [Clause E-20.2](#) and the second sign complies with [Clause E-20.3](#).

E-20.2.2 Case. Characters shall be uppercase, lowercase, or a combination of both.

E-20.2.3 Style. Characters shall be conventional in form. Characters shall not be italic, oblique, script, highly decorative, or of other unusual form.

E-20.2.4 Character Height. The uppercase letter “I” shall be used to determine the allowable height of all characters of a font. The uppercase letter “I” of the font shall have a minimum height of 16 mm (0.63 in.), plus 3 mm (0.118 in.) per 305 mm (1 ft) of viewing distance above 1830 mm (6 ft). Viewing distance shall be measured as the horizontal distance between the character and an obstruction preventing further approach toward the sign.

E-20.2.5 Character Width. The uppercase letter “O” shall be used to determine the allowable width of all characters of a font. The width of the uppercase letter “O” shall

be 55% minimum and 110% maximum of the height of the uppercase letter “I” of the font.

E-20.2.6 Stroke Width. The uppercase letter “I” shall be used to determine the allowable stroke width of all characters of a font. The stroke width shall be 10% minimum and 30% maximum of the height of the uppercase “I” of the font.

E-20.2.7 Character Spacing. Spacing shall be measured between the two closest points of adjacent characters within a message, excluding word spaces. Spacing between individual characters shall be 10% minimum and 35% maximum of the character height.

E-20.2.8 Line Spacing. Spacing between the baselines of separate lines of characters within a message shall be 135% minimum to 170% maximum of the character height.

E-20.2.9 Finish and Contrast. Characters and their background shall have a non-glare finish. Characters shall contrast with their background, with either light characters on a dark background or dark characters on a light background.

E-20.3 Raised Characters

E-20.3.1 General. Raised characters shall comply with [Clause E-20.3](#), and shall be duplicated in Braille complying with [Clause E-20.4](#).

E-20.3.2 Depth. Raised characters shall be raised a minimum of 0.8 mm (0.03 in.) above their background.

E-20.3.3 Case. Characters shall be uppercase.

E-20.3.4 Style. Characters shall be sans serif. Characters shall not be italic, oblique, script, highly decorative, or of other unusual form.

E-20.3.5 Character Height

E-20.3.5.1 The uppercase letter “I” shall be used to determine the allowable height of all characters of a font. The uppercase letter “I” of the font, measured vertically from the baseline of the character, shall be 16 mm (0.63 in.) minimum and 50 mm (2 in.) maximum.

E-20.3.5.2 Where separate raised and visual characters with the same information are provided, the height of the raised uppercase letter “I” shall be permitted to be 13 mm (0.5 in.) minimum.

E-20.3.6 Character Width. The uppercase letter “O” shall be used to determine the allowable width of all characters of a font. The width of the uppercase letter “O” of the font shall be 55% minimum and 110% maximum of the height of the uppercase letter “I” of the font.

E-20.3.7 Stroke Width. Raised character stroke width shall comply with [Clause E-20.3.7](#). The uppercase letter “I” of the font shall be used to determine the allowable stroke width of all characters of a font.

E-20.3.7.1 Maximum. The stroke width shall be 15% maximum of the height of the uppercase letter “I” measured at the top surface of the character.

E-20.3.7.2 Minimum. When characters are both visual and raised, the stroke width shall be 10% minimum of the height of the uppercase letter “I.”

E-20.3.8 Character Spacing. Character spacing shall be measured between the two closest points of adjacent raised characters within a message, excluding word spaces. Spaces between individual characters shall be 3 mm (0.118 in.) minimum measured at the top surface of the characters, 16 mm (0.63 in.) minimum measured at the base of the characters, and 4 times the raised character stroke width maximum. Characters shall be separated from raised borders and decorative elements 10 mm (0.4 in.) minimum.

E-20.3.9 Line Spacing. Spacing between the baselines of separate lines of raised characters within a message shall be 135% minimum and 170% maximum of the raised character height.

E-20.3.10 Location. Where a sign containing raised characters and Braille is provided at double doors with one active leaf, the sign shall be located on the inactive leaf. Where a sign containing raised characters and Braille is provided at double doors with two active leaves, the sign shall be to the right of the right-hand door. Where there is no wall space on the latch side of a single door, or to the right side of double doors, signs shall be on the nearest adjacent wall. Signs containing raised characters and Braille shall be located so that a clear floor area 455 mm (18 in.) minimum by 455 mm (18 in.) minimum, centered on the raised characters, is provided beyond the arc of any door swing between the closed position and 45 deg open position.

E-20.3.11 Finish and Contrast

E-20.3.11.1 Characters and their background shall have a non-glare finish. Characters shall contrast with their background with either light characters on a dark background or dark characters on a light background.

E-20.3.11.2 Where separate raised characters and visual characters with the same information are provided, raised characters are not required to have non-glare finish or to contrast with their background.

E-20.4 Braille

E-20.4.1 General. Braille shall be contracted (Grade 2) Braille and shall comply with [Clause E-20.4](#).

Table E-20.4.3-1 Measurement Range for Standard Sign Braille

Measurement Range	Minimum, mm	Maximum, mm
Dot base diameter	1.5	1.6
Distance between two dots in the same cell, center to center	2.3	2.5
Distance between corresponding dots in adjacent cells, center to center	6.1	7.6
Dot height	0.6	0.9
Distance between corresponding dots from one cell to the cell directly below, center to center	10.0	10.2

E-20.4.2 Uppercase Letters. The indication of an uppercase letter or letters shall only be used before the first word of sentences, proper nouns and names, individual letters of the alphabet, initials, and acronyms.

E-20.4.3 Dimensions. Braille dots shall have a domed or rounded shape and shall comply with [Table E-20.4.3-1](#). See also [Figure E-20.4.3-1](#).

E-20.4.4 Position. Braille shall be below the corresponding text. If text is multilined, Braille shall be placed below the entire text. Braille shall be separated 10 mm (0.4 in.) minimum from any other raised characters and 10 mm (0.4 in.) minimum from raised borders and decorative elements. Braille provided on elevator car controls shall be separated 5 mm (0.2 in.) minimum either directly below or adjacent to the corresponding raised characters or symbols.

E-20.5 Pictograms

E-20.5.1 General. Pictograms shall comply with [Clause E-20.5](#).

E-20.5.2 Pictogram Field. Pictograms shall have a field 150 mm (6 in.) minimum in height. Characters or Braille shall not be located in the pictogram field.

E-20.5.3 Finish and Contrast. Pictograms and their fields shall have a non-glare finish. Pictograms shall contrast with their fields, with either a light pictogram on a dark field or a dark pictogram on a light field.

E-20.6 Symbols of Accessibility

E-20.6.1 General. Symbols of accessibility shall comply with [Clause E-20.6](#).

E-20.6.2 Finish and Contrast. Symbols of accessibility and their backgrounds shall have a non-glare finish. Symbols of accessibility shall contrast with their backgrounds, with either a light symbol on a dark background or a dark symbol on a light background.

E-20.6.3 International Symbol of Accessibility. The International Symbol of Accessibility shall comply with [Figure E-20.6.3](#).

E-20.7 Variable Message Signs

E-20.7.1 General. Where provided, variable message signs shall have high resolution VMS characters with a vertical pixel count of 16 rows or greater and shall comply with [Clause E-20.7](#).

Figure E-20.4.3-1 Braille Measurements

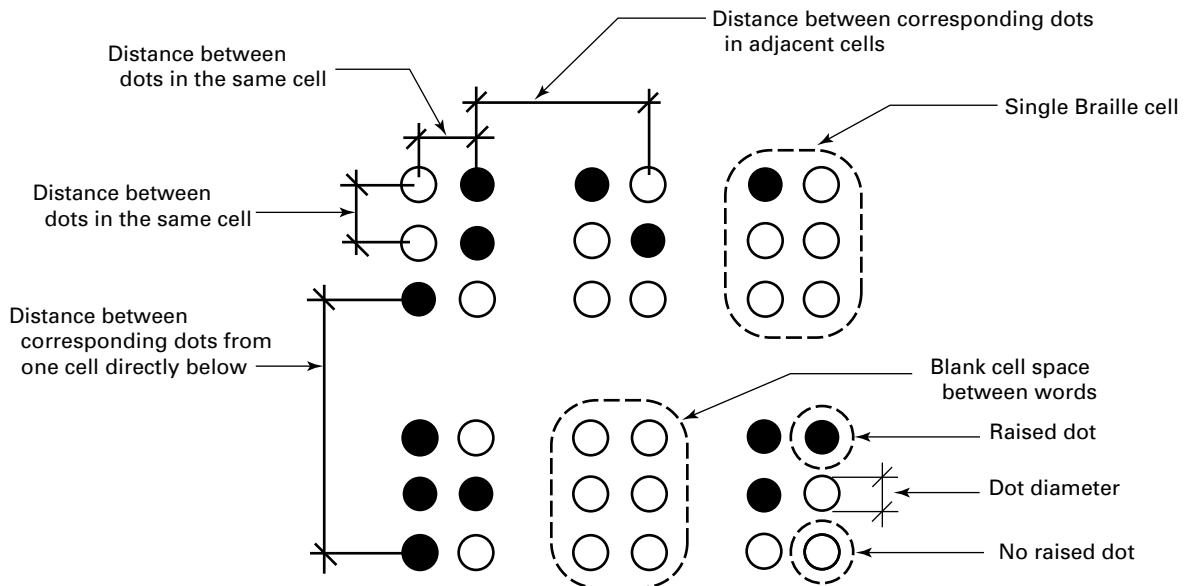
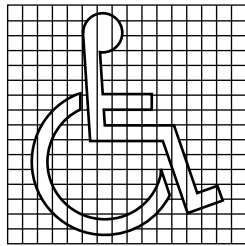


Figure E-20.6.3 International Symbol of Accessibility



(a) Proportions



(b) Display Conditions

E-20.7.2 Protective Covering. Where a protective layer is placed over VMS characters through which the VMS characters must be viewed, the protective covering shall have a non-glare finish.

E-20.7.3 Rate of Change. Where a VMS message can be displayed in its entirety on a single screen, it shall be displayed on a single screen and shall remain motionless on the screen for a minimum of 3 s, or 1 s minimum for every seven characters of the message including spaces, whichever is longer.