

Chapter 7. Communication Elements and Features

701 General

701.1 Scope. Communications elements and features required to be accessible by the scoping provisions adopted by the administrative authority shall comply with the applicable provisions of Chapter 7.

702 Alarms

702.1 General. Accessible audible and visual alarms and notification appliances shall be installed in accordance with NFPA 72 listed in Section 105.2.2, be powered by a commercial light and power source, be permanently connected to the wiring of the premises electric system, and be permanently installed.

703 Signs

703.1 General. Accessible signs shall comply with Section 703.

703.2 Visual Characters.

703.2.1 General. Visual characters shall comply with Section 703.2.

EXCEPTION: Visual characters complying with Section 703.3 shall not be required to comply with Section 703.2.

703.2.2 Case. Characters shall be uppercase, lowercase, or a combination of both.

703.2.3 Style. Characters shall be conventional in form. Characters shall not be italic, oblique,

script, highly decorative, or of other unusual forms.

703.2.4 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 complying with Table 703.2.4. Viewing distance shall be measured as the horizontal distance between the character and an obstruction preventing further approach towards the sign.

703.2.5 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” of the font shall be 55 percent minimum and 110 percent maximum of the height of the uppercase “I” of the font.

703.2.6 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 percent minimum and 30 percent maximum of the height of the uppercase “I” of the font.

703.2.7 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 percent minimum and 35 percent maximum of the character height.

Table 703.2.4—Visual Character Height

Height above Floor to Baseline of Character	Horizontal Viewing Distance	Minimum Character Height
40 inches (1015 mm) to less than or equal to 70 inches (1780 mm)	Less than 6 feet (1830 mm)	$\frac{5}{8}$ inch (16 mm)
	6 feet (1830 mm) and greater	$\frac{5}{8}$ inch (16 mm), plus $\frac{1}{8}$ inch (3.2 mm) per foot (305 mm) of viewing distance above 6 feet (1830 mm)
Greater than 70 inches (1780 mm) to less than or equal to 120 inches (3050 mm)	Less than 15 feet (4570 mm)	2 inches (51 mm)
	15 feet (4570 mm) and greater	2 inches (51 mm), plus $\frac{1}{8}$ inch (3.2 mm) per foot (305 mm) of viewing distance above 15 feet (4570 mm)
Greater than 120 inches (3050 mm)	Less than 21 feet (6400 mm)	3 inches (75 mm)
	21 feet (6400 mm) and greater	3 inches (75 mm), plus $\frac{1}{8}$ inch (3.2 mm) per foot (305 mm) of viewing distance above 21 feet (6400 mm)

703.2.8 Line Spacing. Spacing between the baselines of separate lines of characters within a message shall be 135 percent minimum to 170 percent maximum of the character height.

703.2.9 Height Above Floor. Visual characters shall be 40 inches (1015 mm) minimum above the floor of the viewing position, measured to the baseline of the character. Heights shall comply with Table 703.2.4, based on the size of the characters on the sign.

EXCEPTION: Visual characters indicating elevator car controls shall not be required to comply with Section 703.2.9.

703.2.10 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.

703.3 Tactile Characters.

703.3.1 General. Tactile characters shall comply with Section 703.3, and shall be duplicated in braille complying with Section 703.4.

703.3.2 Depth. Tactile characters shall be raised $\frac{1}{32}$ inch (0.8 mm) minimum above their background.

703.3.3 Case. Characters shall be uppercase.

703.3.4 Style. Characters shall be sans serif. Characters shall not be italic, oblique, script, highly decorative, or of other unusual forms.

703.3.5 Character Height. The uppercase letter “I” shall be used to determine the allowable height of all characters of a font. The height of the uppercase letter “I” of the font, measured vertically from the baseline of the character, shall be $\frac{5}{8}$ inch (16 mm) minimum, and 2 inches (51 mm) maximum.

EXCEPTION: Where separate tactile and visual characters with the same information are provided, the height of the tactile uppercase letter “I” shall be permitted to be $\frac{1}{2}$ inch (13 mm) minimum.

703.3.6 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 percent minimum and 110 percent maximum of the height of the uppercase “I” of the font.

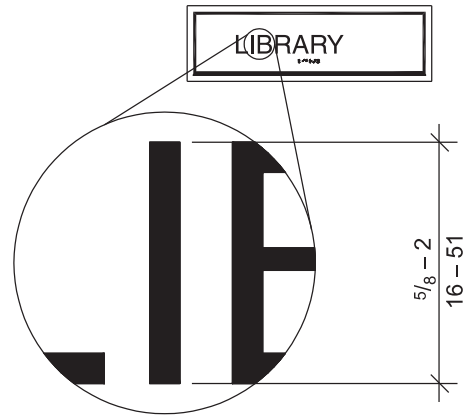


Fig. 703.3.5
Character Height

703.3.7 Stroke Width. Tactile character stroke width shall comply with Section 703.3.7. The uppercase letter “I” of the font shall be used to determine the allowable stroke width of all characters of a font.

703.3.7.1 Maximum. The stroke width shall be 15 percent maximum of the height of the uppercase letter “I” measured at the top surface of the character, and 30 percent maximum of the height of the uppercase letter “I” measured at the base of the character.

703.3.7.2 Minimum. When characters are both visual and tactile, the stroke width shall be 10 percent minimum of the height of the uppercase letter “I”.

703.3.8 Character Spacing. Character spacing shall be measured between the two closest points of adjacent tactile characters within a message, excluding word spaces. Spacing between individual tactile character shall be $\frac{1}{8}$ inch (3.2 mm) minimum measured at the top surface of the characters, $\frac{1}{16}$ inch (1.6 mm) minimum measured at the base of the characters, and four times the tactile character stroke width maximum. Characters shall be separated from raised borders and decorative elements $\frac{3}{8}$ inch (9.5 mm) minimum.

703.3.9 Line Spacing. Spacing between the baselines of separate lines of tactile characters within a message shall be 135 percent minimum and 170 percent maximum of the tactile character height.

703.3.10 Height above Floor. Tactile characters shall be 48 inches (1220 mm) minimum above the floor, measured to the baseline of the lowest tactile character and 60 inches (1525 mm) maximum above the floor, measured to the baseline of the highest tactile character.

EXCEPTION: Tactile characters for elevator car controls shall not be required to comply with Section 703.3.10.

703.3.11 Location. Where a tactile sign is provided at a door, the sign shall be alongside the door at the latch side. Where a tactile sign is provided at double doors with one active leaf, the sign shall be located on the inactive leaf. Where a tactile sign 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 tactile characters shall be located so that a clear floor area 18 inches (455 mm) minimum by 18 inches (455 mm) minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position.

EXCEPTION: Signs with tactile characters shall be permitted on the push side of doors with closers and without hold-open devices.

703.3.12 Finish and Contrast. Characters and their background shall have a nonglare finish. Characters shall contrast with their background

with either light characters on a dark background, or dark characters on a light background.

EXCEPTION: Where separate tactile characters and visual characters with the same information are provided, tactile characters are not required to have nonglare finish or to contrast with their background.

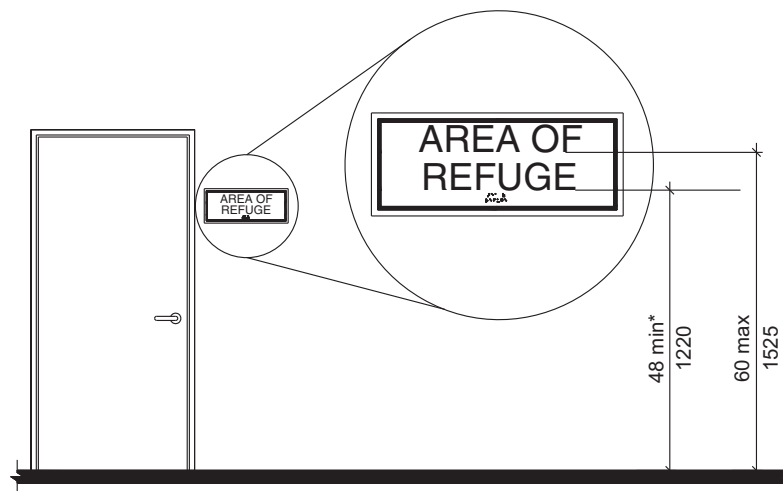
703.4 Braille.

703.4.1 General. Braille shall be contracted (Grade 2) braille and shall comply with Section 703.4.

703.4.2 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, or acronyms.

703.4.3 Dimensions. Braille dots shall have a domed or rounded shape and shall comply with Table 703.4.3.

703.4.4 Position. Braille shall be below the corresponding text. If text is multi-lined, braille shall be placed below entire text. Braille shall be separated $\frac{3}{8}$ inch (9.5 mm) minimum from any other tactile characters and $\frac{3}{8}$ inch (9.5 mm) minimum from raised borders and decorative elements. Braille provided on elevator car controls shall be separated $\frac{3}{16}$ inch (4.8 mm) minimum either directly below or adjacent to the corresponding raised characters or symbols.



*Note: For Braille mounting height see Section 703.4.5 (48" min to baseline of Braille cell).

Fig. 703.3.10
Height of Tactile Characters above Floor or Ground

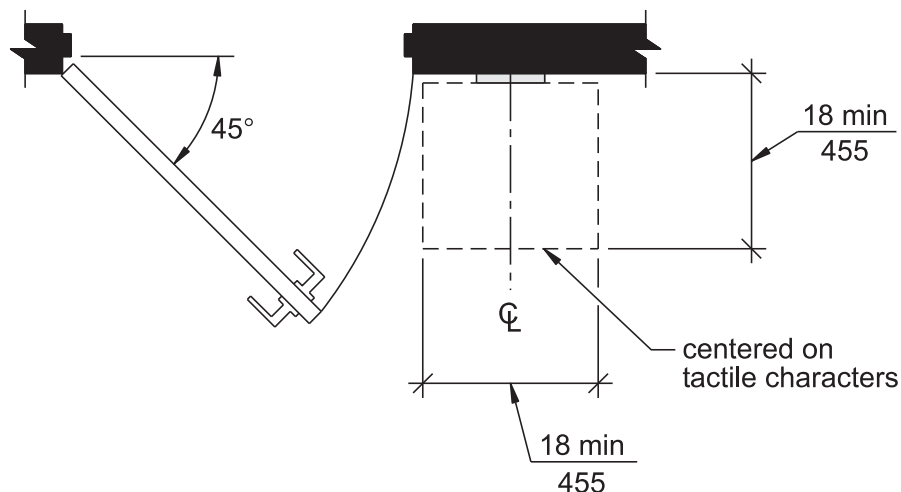


Fig. 703.3.11
Location of Tactile Signs at Doors

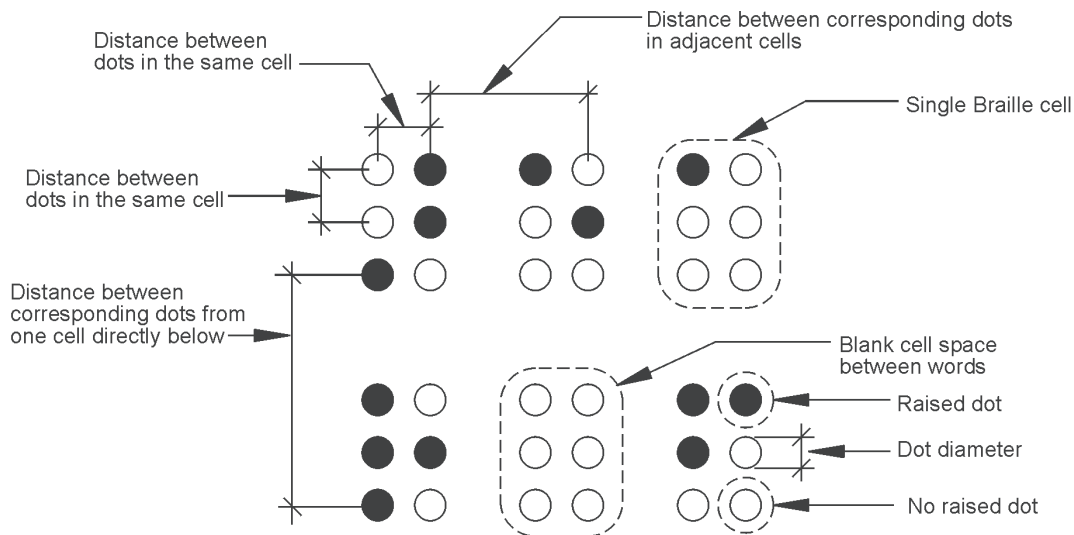


Fig. 703.4.3
Braille Measurement

Table 703.4.3— Braille Dimensions

Measurement range	Minimum in inches	Maximum in inches
	Dot base diameter	0.059 (1.5 mm)
Distance between two dots in the same cell	0.090 (2.3 mm)	0.100 (2.5 mm)
Distance between corresponding dots in adjacent cells ¹	0.241 (6.1 mm)	0.300 (7.6 mm)
Dot height	0.025 (0.6 mm)	0.037 (0.9 mm)
Distance between corresponding dots from one cell directly below	0.395 (10.0 mm)	0.400 (10.2 mm)

¹Measured center to center

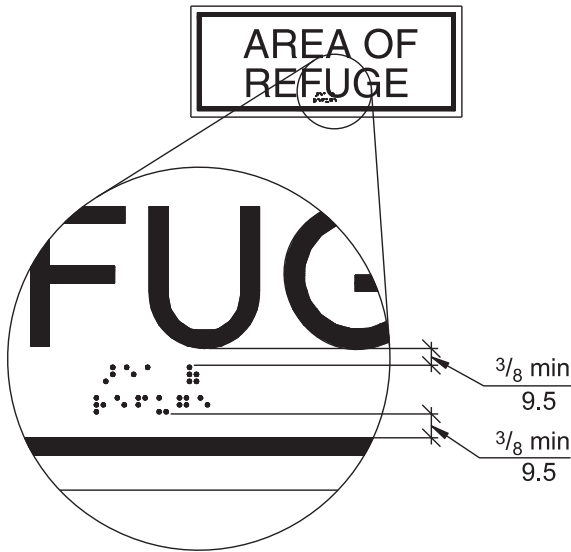


Fig. 703.4.4
Position of Braille

703.4.5 Mounting Height. Braille shall be 48 inches (1220 mm) minimum and 60 inches (1525 mm) maximum above the floor, measured to the baseline of the braille cells.

EXCEPTION: Elevator car controls shall not be required to comply with Section 703.4.5.

703.5 Pictograms.

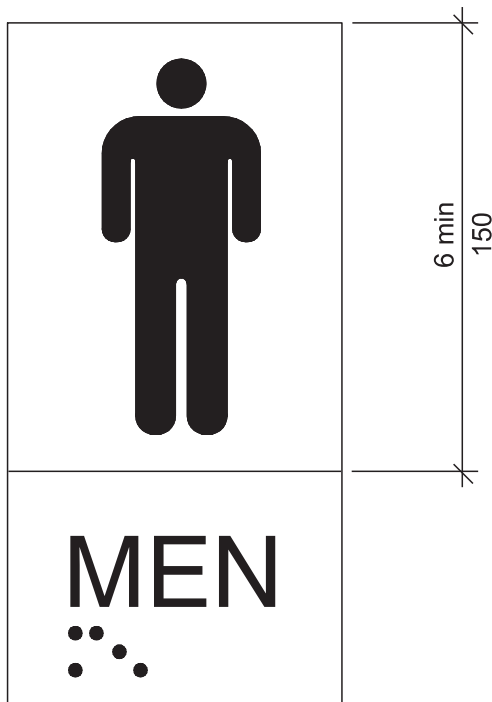


Fig. 703.5
Pictogram Field

703.5.1 General. Pictograms shall comply with Section 703.5.

703.5.2 Pictogram Field. Pictograms shall have a field 6 inches (150 mm) minimum in height. Characters or braille shall not be located in the pictogram field.

703.5.3 Finish and Contrast. Pictograms and their fields shall have a nonglare finish. Pictograms shall contrast with their fields, with either a light pictogram on a dark field or a dark pictogram on a light field.

703.5.4 Text Descriptors. Where text descriptors for pictograms are required, they shall be located directly below the pictogram field. Text descriptors shall comply with Sections 703.3.4 and 703.4.

703.6 Symbols of Accessibility.

703.6.1 General. Symbols of accessibility shall comply with Section 703.6.

703.6.2 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.

703.6.3 Symbols.

703.6.3.1 International Symbol of Accessibility. The International Symbol of Accessibility shall comply with Figure 703.6.3.1.

703.6.3.2 International Symbol of TTY. The International Symbol of TTY shall comply with Figure 703.6.3.2.

703.6.3.3 Assistive Listening Systems. Assistive listening systems shall be identified by the International Symbol of Access for Hearing Loss complying with Figure 703.6.3.3.

703.6.3.4 Volume-Controlled Telephones. Telephones with volume controls shall be identified by a pictogram of a telephone handset with radiating sound waves on a square field complying with Figure 703.6.3.4.

703.7 Remote Infrared Audible Sign (RIAS) Systems.

703.7.1 General. Remote Infrared Audible Sign Systems shall comply with Section 703.7.

703.7.2 Transmitters. Where provided, Remote Infrared Audible Sign Transmitters shall be designed to communicate with receivers complying with Section 703.7.3.



Fig. 703.6.3.1
International Symbol of
Accessibility

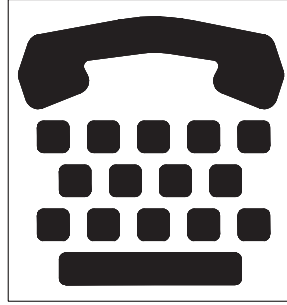


Fig. 703.6.3.2
International TTY Symbol



Fig. 703.6.3.3
International Symbol of
Access for Hearing Loss



Fig. 703.6.3.4
Volume-Controlled
Telephone

703.7.3 Remote Infrared Audible Sign Receivers.

703.7.3.1 Frequency. Basic speech messages shall be frequency modulated at 25 kHz, with a +/- 2.5 kHz deviation, and shall have an infrared wavelength from 850 to 950 nanometer (nm).

703.7.3.2 Optical Power Density. Receiver shall produce a 12 decibel (dB) signal-plus-noise-to-noise ratio with a 1 kHz modulation tone at +/- 2.5 kHz deviation of the 25 kHz subcarrier at an optical power density of 26 picowatts per square millimeter measured at the receiver photosensor aperture.

703.7.3.3 Audio Output. The audio output from an internal speaker shall be at 75 dBA minimum at 18 inches (455 mm) with a maximum distortion of 10 percent.

703.7.3.4 Reception Range. The receiver shall be designed for a high dynamic range and capable of operating in full-sun background illumination.

703.7.3.5 Multiple Signals. A receiver provided for the capture of the stronger of two signals in the receiver field of view shall provide a

received power ratio on the order of 20 dB for negligible interference.

703.8 Pedestrian Signals. Accessible pedestrian signals shall comply with Section 4E.06 - Accessible Pedestrian Signals, and Section 4E.08 - Accessible Pedestrian Signal Detectors, of the Manual on Uniform Traffic Control Devices listed in Section 105.2.1.

EXCEPTION: Pedestrian signals are not required to comply with the requirement for choosing audible tones.

704 Telephones

704.1 General. Accessible public telephones shall comply with Section 704.

704.2 Wheelchair Accessible Telephones. Wheelchair accessible public telephones shall comply with Section 704.2.

704.2.1 Clear Floor Space. A clear floor space complying with Section 305 shall be provided. The clear floor space shall not be obstructed by bases, enclosures, or seats.

704.2.1.1 Parallel Approach. Where a parallel approach is provided, the distance from the edge of the telephone enclosure to the face of

the telephone shall be 10 inches (255 mm) maximum.

704.2.1.2 Forward Approach. Where a forward approach is provided, the distance from the front edge of a counter within the enclosure to the face of the telephone shall be 20 inches (510 mm) maximum.

704.2.2 Operable Parts. The highest operable part of the telephone shall comply with Section 308. Telephones shall have push button controls where service for such equipment is available.

704.2.3 Telephone Directories. Where provided, telephone directories shall comply with Section 309.

704.2.4 Cord Length. The telephone handset cord shall be 29 inches (735 mm) minimum in length.

704.2.5 Hearing-Aid Compatibility. Telephones shall be hearing aid compatible.

704.3 Volume-Control Telephones. Public telephones required to have volume controls shall be equipped with a receive volume control that provides a gain adjustable up to 20 dB minimum. Incremental volume controls shall provide at least one intermediate step of gain of 12 dB minimum. An automatic reset shall be provided.

704.4 TTY. TTYs required at a public pay telephone shall be permanently affixed within, or adjacent to, the telephone enclosure. Where an acoustic coupler is used, the telephone cord shall be of sufficient length to allow connection of the TTY and the telephone handset.

704.5 Height. When in use, the touch surface of TTY keypads shall be 34 inches (865 mm) minimum above the floor.

EXCEPTION: Where seats are provided, TTYs shall not be required to comply with Section 704.5.

704.6 TTY Shelf. Where pay telephones designed to accommodate a portable TTY are provided, they shall be equipped with a shelf and an electrical outlet within or adjacent to the telephone enclosure. The telephone handset shall be capable of being placed flush on the surface of the shelf. The shelf shall be capable of accommodating a TTY and shall have a vertical clearance 6 inches (150 mm) minimum in height above the area where the TTY is placed.

704.7 Protruding Objects. Telephones, enclosures, and related equipment shall comply with Section 307.

705 Detectable Warnings

705.1 General. Detectable warning surfaces shall comply with Section 705.

705.2 Standardization. Detectable warning surfaces shall be standard within a building, facility, site, or complex of buildings.

EXCEPTION: In facilities that have both interior and exterior locations, detectable warnings in exterior locations shall not be required to comply with Section 705.4.

705.3 Contrast. Detectable warning surfaces shall contrast visually with adjacent surfaces, either light-on-dark or dark-on-light.

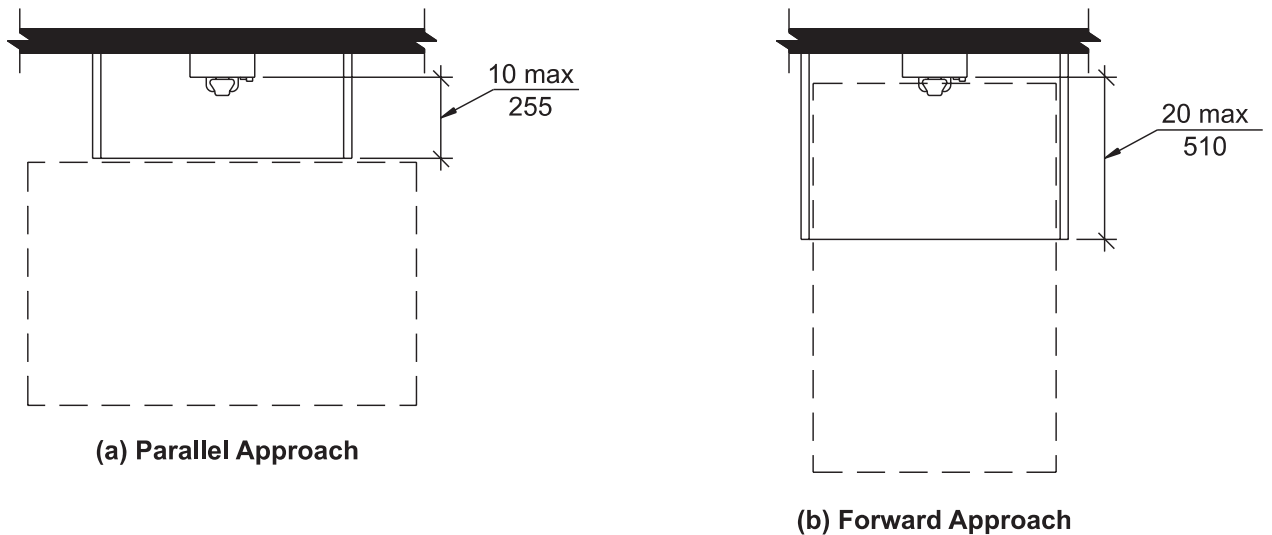


Fig. 704.2.1
Clear Floor Space for Telephones

705.4 Interior Locations. Detectable warning surfaces in interior locations shall differ from adjoining walking surfaces in resiliency or sound-on-cane contact.

705.5 Truncated Domes. Detectable warning surfaces shall have truncated domes complying with Section 705.5.

705.5.1 Size. Truncated domes shall have a base diameter of 0.9 inch (23 mm) minimum to 1.4 inch (36 mm) maximum, and a top diameter of 50 percent minimum to 65 percent maximum of the base diameter.

705.5.2 Height. Truncated domes shall have a height of 0.2 inch (5.1 mm).

705.5.3 Spacing. Truncated domes shall have a center-to-center spacing of 1.6 inches (41 mm) minimum and 2.4 inches (61 mm) maximum, and a base-to-base spacing of 0.65 inch (16.5 mm) minimum, measured between the most adjacent domes on the grid.

705.5.4 Alignment. Truncated domes shall be aligned in a square grid pattern.

706 Assistive Listening Systems

706.1 General. Accessible assistive listening systems in assembly areas shall comply with Section 706.

706.2 Receiver Jacks. Receivers required for use with an assistive listening system shall include a 1/8-inch (3.2 mm) standard mono jack.

706.3 Receiver Hearing-Aid Compatibility. Receivers required to be hearing aid compatible

shall interface with telecoils in hearing aids through the provision of neck loops.

706.4 Sound Pressure Level. Assistive listening systems shall be capable of providing a sound pressure level of 110 dB minimum and 118 dB maximum, with a dynamic range on the volume control of 50 dB.

706.5 Signal-to-Noise Ratio. The signal-to-noise ratio for internally generated noise in assistive listening systems shall be 18 dB minimum.

706.6 Peak Clipping Level. Peak clipping shall not exceed 18 dB of clipping relative to the peaks of speech.

707 Automatic Teller Machines (ATMs) and Fare Machines

707.1 General. Accessible automatic teller machines and fare machines shall comply with Section 707.

707.2 Clear Floor Space. A clear floor space complying with Section 305 shall be provided in front of the machine.

EXCEPTION: Clear floor space is not required at drive up only automatic teller machines and fare machines.

707.3 Operable Parts. Operable parts shall comply with Section 309. Each operable part shall be able to be differentiated by sound or touch, without activation.

EXCEPTION: Drive up only automatic teller machines and fare machines shall not be required to comply with Section 309.2 or 309.3.

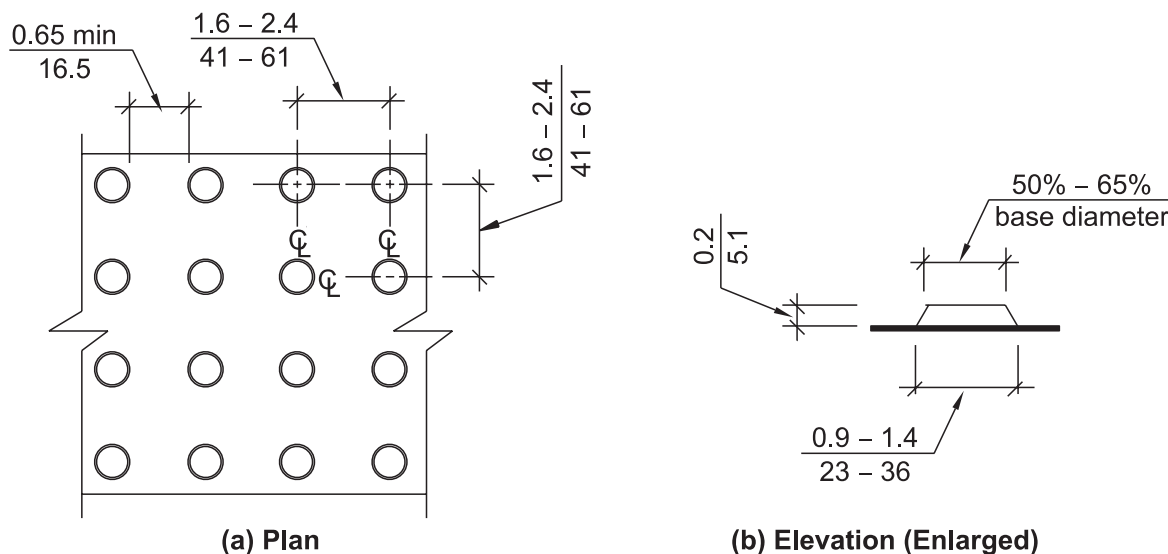


Fig. 705.5
Truncated Dome Size and Spacing

707.4 Privacy. Automatic teller machines shall provide the opportunity for the same degree of privacy of input and output available to all individuals.

707.5 Numeric Keys. Numeric keys shall be arranged in a 12-key ascending or descending telephone keypad layout. The number Five key shall have a single raised dot.

707.6 Function Keys. Function keys shall comply with Section 707.6.

707.6.1 Tactile Symbols. Function key surfaces shall have raised tactile symbols as shown in Table 707.6.1.

707.6.2 Contrast. Function keys shall contrast visually from background surfaces. Characters and symbols on key surfaces shall contrast visually from key surfaces. Visual contrast shall be either light-on-dark or dark-on-light.

EXCEPTION: Tactile symbols required by Section 707.6.1 shall not be required to comply with Section 707.6.2.

707.7 Display Screen. The display screen shall comply with Section 707.7.

707.7.1 Visibility. The display screen shall be visible from a point located 40 inches (1015 mm) above the center of the clear floor space in front of the machine.

EXCEPTION: Drive up only automatic teller machines and fare machines shall not be required to comply with Section 707.7.1.

Table 707.6.1—Tactile Symbols

Key Function	Description of Tactile Symbol	Tactile Symbol
Enter or Proceed:	CIRCLE	○
Clear or Correct:	LEFT ARROW	←
Cancel:	“X”	×
Add Value:	PLUS SIGN	+
Decrease Value:	MINUS SIGN	-

707.7.2 Characters. Characters displayed on the screen shall be in a sans serif font. The uppercase letter “I” shall be used to determine the allowable height of all characters of the font. The uppercase letter “I” of the font shall be ³/₁₆ inch (4.8 mm) minimum in height. Characters shall contrast with their background with either light characters on a dark background, or dark characters on a light background.

707.8 Speech Output. Machines shall be speech enabled. Operating instructions and orientation, visible transaction prompts, user input verification, error messages, and all displayed information for full use shall be accessible to and independently usable by individuals with vision impairments. Speech shall be delivered through a mechanism that is readily available to all users including, but not limited to, an industry standard connector or a tele-

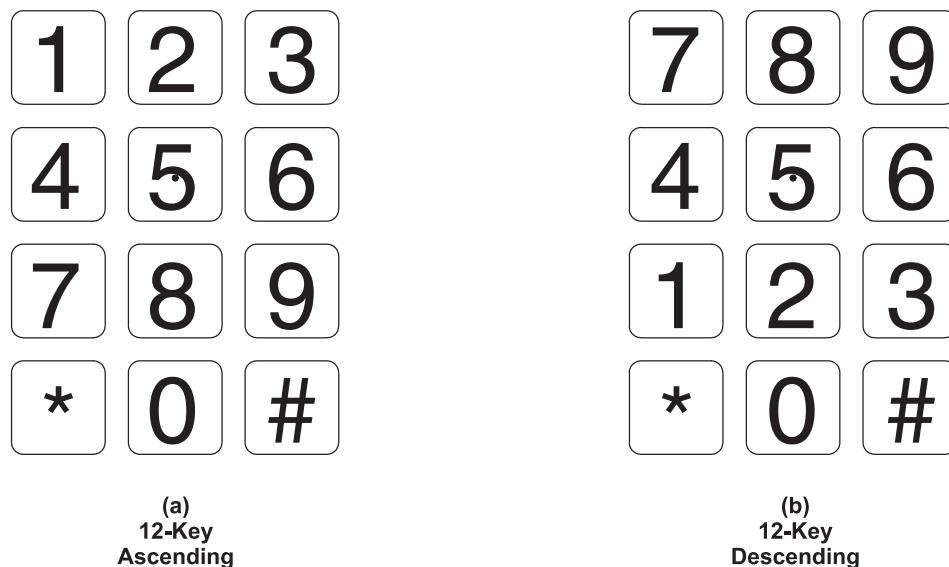


Fig. 707.5
Numeric Key Layout

phone handset. Speech shall be recorded or digitized human, or synthesized.

EXCEPTIONS:

1. Audible tones shall be permitted in lieu of speech for visible output that is not displayed for security purposes, including but not limited to, asterisks representing personal identification numbers.
2. Advertisements and other similar information shall not be required to be audible unless they convey information that can be used in the transaction being conducted.
3. Where speech synthesis cannot be supported, dynamic alphabetic output shall not be required to be audible.

707.8.1 User Control. Speech shall be capable of being repeated and interrupted by the user. There shall be a volume control for the speech function.

EXCEPTION: Speech output for any single function shall be permitted to be automatically interrupted when a transaction is selected.

707.8.2 Receipts. Where receipts are provided, speech output devices shall provide audible balance inquiry information, error messages, and all other information on the printed receipt necessary to complete or verify the transaction.

EXCEPTIONS:

1. Machine location, date and time of transaction, customer account number, and the machine identifier shall not be required to be audible.
2. Information on printed receipts that duplicates audible information available on-screen shall not be required to be presented in the form of an audible receipt.
3. Printed copies of bank statements and checks shall not be required to be audible.

707.9 Input Controls. At least one tactually discernible input control shall be provided for each function. Where provided, key surfaces not on active areas of display screens shall be raised above surrounding surfaces. Where membrane keys are the only method of input, each shall be tactually discernible from surrounding surfaces and adjacent keys.

707.10 Braille Instructions. Braille instructions for initiating the speech mode shall be provided. Braille shall comply with Section 703.4.

708 Two-Way Communication Systems

708.1 General. Accessible two-way communication systems shall comply with Section 708.

708.2 Audible and Visual Indicators. The system shall provide both visual and audible signals.

708.3 Handsets. Handset cords, if provided, shall be 29 inches (735 mm) minimum in length.