

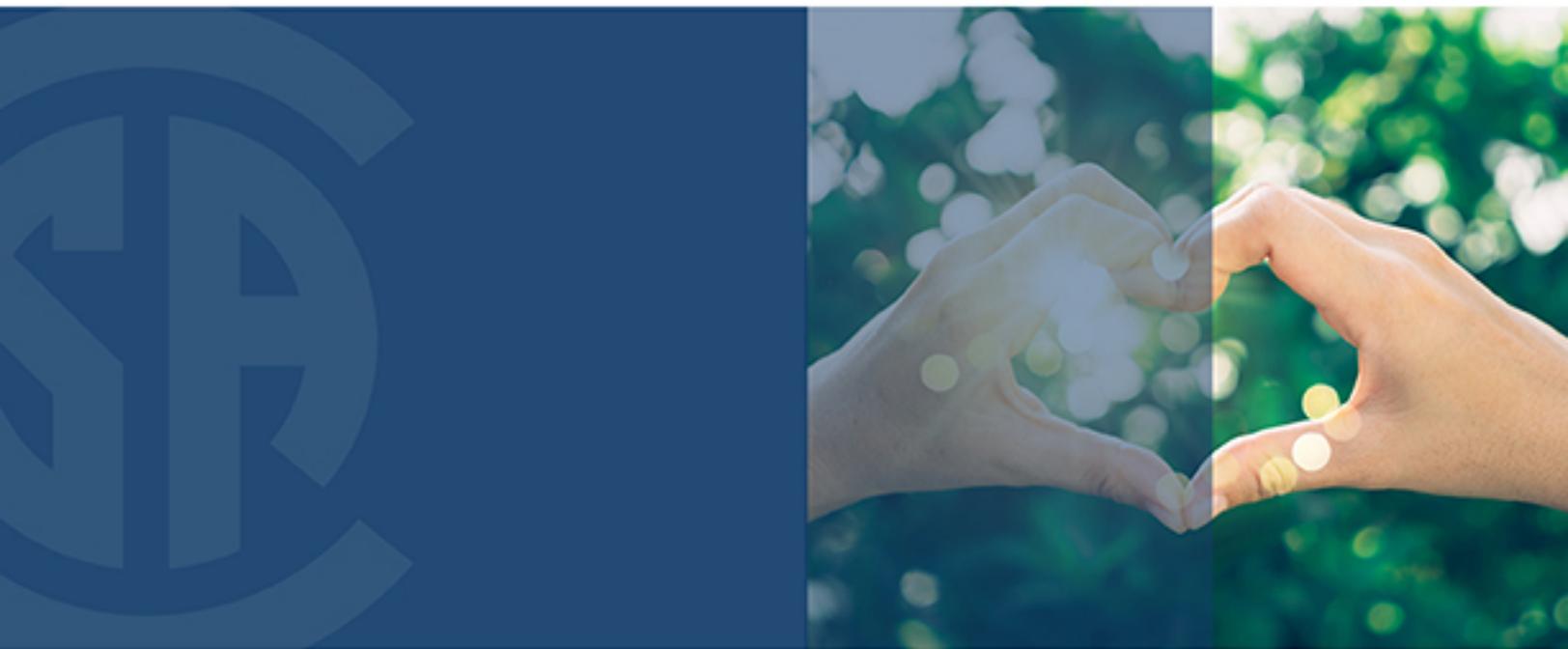


# CSA/ASC B651:23

National Standard of  
Canada



# Accessible design for the built environment



Accessibility Standards  
Canada

Normes d'accessibilité  
Canada



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# National Standard of Canada

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# Preface

This is the sixth edition of CSA/ASC B651, Accessible design for the built environment. It supersedes the previous editions published in 2018, 2012, and 2004 under the same title; the 1995 and 1990 editions published under the title Barrier-free design; and B651HB-18, Accessible design for the built environment — Implementation handbook.

The Technical Committee on Accessibility has produced related Standards including CSA/ASC B651.2, Accessible design for self-service interactive devices.

The Technical Committee has also developed other Standards including

- a) CSA B480, Customer service standard for people with disabilities;
- b) CSA B659, Inclusive design for an aging population; and
- c) CAN/CSA-ISO IWA 18, Framework for integrated community-based life-long health and care services in aged societies.

The following are major changes to this edition:

- a) dimensions have been updated based on current data from anthropometric research;
- b) commentary has been included to assist in the interpretation of standard requirements;
- c) Clause [4.2](#) has been added to provide a detailed explanation of luminance (colour) contrast;
- d) the addition of revised guidance regarding luminance (colour) contrast throughout the Standard;
- e) the addition of revised guidance regarding tactile direction indicator positioning to Clause [4.4.5.4.3](#);
- f) Clause [4.7.1](#) has been updated to include detailed guidance on addressing functional and cognitive barriers;

- g) Figure [12 a\)](#) has been updated to include both the original and updated versions of the ISO International Pictogram of Access;
- h) information regarding T-turns has been added to Clause [5.1](#);
- i) Clause [5.2.9.3](#) has been updated with revised guidance for controls for power-assisted doors;
- j) guidance regarding the minimum platform size for platform lifts that form part of an accessible path of travel has been added to Clause [5.6.2](#);
- k) revisions to Clause [6.1](#) have been made to include recommendations regarding water bottle filling and revised guidance regarding water fountain controls; and
- l) Clause [6.6.1](#) has been updated to address emerging adaptive technologies.

This Standard was prepared by the Subcommittee on Accessibility for the Built Environment, under the jurisdiction of the Technical Committee on Accessibility and the Strategic Steering Committee on Health and Well-Being, and has been formally approved by the Technical Committee.

The technical requirements in this Standard are minimum levels. They represent a consensus of the Technical Committee members, who represent a broad spectrum of interests. The members were helped and encouraged by the public comments received as a result of the wide distribution of a draft at the public review stage.

This Standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

**Notes:**

- 1) Use of the singular does not exclude the plural (and vice versa) when the sense allows.

- 2) Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.
- 3) This Standard was developed by consensus, which is defined by CSA Policy governing standardization — Code of good practice for standardization as “substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity”. It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this Standard.
- 4) To submit a request for interpretation of this Standard, please send the following information to [inquiries@csagroup.org](mailto:inquiries@csagroup.org) and include “Request for interpretation” in the subject line:
  - a) define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;
  - b) provide an explanation of circumstances surrounding the actual field condition; and
  - c) where possible, phrase the request in such a way that a specific “yes” or “no” answer will address the issue.Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization and are available on the Current Standards Activities page at [standardsactivities.csa.ca](http://standardsactivities.csa.ca).
- 5) This Standard is subject to review within five years from the date of publication. Suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to [inquiries@csagroup.org](mailto:inquiries@csagroup.org) and include “Proposal for change” in the subject line:
  - a) Standard designation (number);
  - b) relevant clause, table, and/or figure number;
  - c) wording of the proposed change; and
  - d) rationale for the change.

# CSA/ASC B651:23

# Accessible design for the built environment

## 0 Introduction

### 0.1 General

This Standard contains requirements for making buildings and other facilities accessible to people with a range of physical, sensory, or cognitive disabilities or a combination thereof, including but not limited to those that involve mobility, reaching, manipulation, hearing, and vision. It was developed to fill a need for a national technical standard that addresses accessibility as it pertains to different types of buildings and environmental facilities, and it can be referenced in whole or in part by a variety of adopting agencies or jurisdictions.

The technical requirements in this Standard cover design aspects of physical spaces and the elements within them to help ensure they are accessible to a wide variety of people having different abilities and disabilities. The Standard does not specify the extent to which these requirements have to be applied, as this is the responsibility of the authorities having jurisdiction, whether federal, provincial/territorial, or municipal. The 2015 and 2020 editions of the National Building Code of Canada (NBC) have referenced certain Clauses of CSA B651 as providing an alternative to the accessible design requirements in the NBC. The Standard is also referenced in other regulations and guidelines. The user is advised to contact their local AHJ in this field to determine to what extent this edition of the Standard is referenced.

The Technical Committee that developed this Standard recognizes that it operates within a broader context of social

and regulatory initiatives. For instance, the UN Convention on the Rights of Persons with Disabilities was adopted by the UN General Assembly in 2006 and ratified by Canada on March 11, 2010. This groundbreaking and legally binding UN Convention promotes and protects people with disabilities by ensuring they have the full and equal enjoyment of all human rights — a major step towards equalizing their opportunities and participation in society. In Canada, the federal Accessible Canada Act came into force July 2019. The intent of this Act is to proactively identify, remove, and prevent accessibility barriers for all areas under federal jurisdiction, with the ultimate goal of creating a barrier-free Canada.

This Standard also supports the principles of universal design (UD) as it applies to the built environment, i.e., designing environments so that they can be accessed, understood, and used to the greatest extent possible by all people regardless of their age, size, ability, or disability.

**Note:** At the Center for Universal Design (CUD), a group of architects, product designers, engineers, and environmental design researchers established seven principles of UD to provide guidance in the design of products and environments. The principles of UD are as follows:

- a) Equitable use — the design is usable by people with diverse abilities;
- b) Flexibility in use — the design accommodates a wide range of individual preferences and abilities;
- c) Simple and intuitive — use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or concentration level;
- d) Perceptible information — the design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities;
- e) Tolerance for error — the design minimizes hazards and the adverse consequences of accidental or unintended actions;
- f) Low physical effort — the design can be used efficiently, comfortably, and with a minimum of fatigue; and

- g) Size and space for approach and use — appropriate size and space is provided for approach, reach, manipulation, and use, regardless of the user's body size, posture, or mobility.

## 0.2 Copyright permissions

In Figure [12 a\)](#), the symbol from ISO 7001 was copied by CSA Group with the permission of the Standards Council of Canada on behalf of ISO. The Standard can be purchased from the national ISO member in your country or the ISO Store. Copyright remains with ISO.

In Figure [12 b\)](#), the symbol from ISO 7000 was copied by CSA Group with the permission of the Standards Council of Canada on behalf of ISO. The Standard can be purchased from the national ISO member in your country or the ISO Store. Copyright remains with ISO.

# 1 Scope

## 1.1 Purpose

This Standard specifies technical requirements on how to make buildings and the exterior built environment accessible and safe for those with physical, sensory, or cognitive disabilities.

### Notes:

- 1) Temporary buildings and facilities provided for public use should also comply with the technical requirements of this Standard. Such temporary facilities can include teaching spaces, reviewing stands, exhibit areas, bleachers, first aid facilities, and pedestrian passageways around construction sites, as well as temporary accommodations such as shelters.
- 2) Where public access is permitted during construction, renovation, or maintenance of a facility or an exterior environment, the requirements of this Standard should be respected to provide safe and equitable use for everyone.
- 3) Some people with disabilities could have requirements beyond the levels addressed in this Standard.

## 1.2 Application

This Standard describes technical requirements that can be used in the design and construction of new facilities or exterior environments, or in modifications to existing facilities or exterior environments. This Standard does not address the application of the technical requirements. The extent to which these requirements are to be applied is the responsibility of other AHJs.

## 1.3 Dimensions

The values given in SI units are the units of record for the purposes of this Standard. The values given in parentheses are for information and comparison only.

This Standard contains minimum requirements based on adult dimensions. Where converted from non-SI units, values have been rounded off with respect to critical dimensions.

All dimensions in figures are given in millimetres (mm) and are measured to the centreline, unless otherwise specified.

### Notes:

- 1) When designing for specific individuals, their particular abilities and preferences should be taken into account. For example, some people prefer to transfer to or from a wheeled mobility device towards their preferred side when using toilet facilities.
- 2) If a facility is primarily to serve children, dimensions and other provisions should be adjusted to make them suitable for children.

## 1.4 Commentary and figures

Commentary and figures are included for explanatory or illustrative purposes only and are not a mandatory part of the Standard.

Figures are not to scale. If there is any difference between the text and a figure (where provided), the text shall take precedence.

## 1.5 Annexes

Annexes [A](#) to [C](#) provide additional information on topics considered in the Standard.

Annex [D](#) provides guidance for the design of outdoor trails and beach access routes.

Annex [E](#) contains references for accessible outdoor recreational environments to supplement the information and guidance provided in Annex [D](#).

## 1.6 Terminology

In this Standard, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the Standard; “should” is used to express a recommendation or that which is advised but not required; and “may” is used to express an option or that which is permissible within the limits of the Standard.

Commentary accompanying clauses do not include requirements or alternative requirements; the purpose of a commentary accompanying a clause is to separate explanatory or informative material.

Text accompanying tables is considered part of the table and may be written as a requirement.

Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

## 1.7 Large print

Consistent with the recommendations of the CSA/ASC B651 series of Standards and for ease of reading, this Standard has been printed in a 14 pt font size.

## 2 Reference publications

This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below.

## **CSA Group**

ASME A17.1-2019/CSA B44-19

Safety code for elevators and escalators

ASSE 1016-2017/ASME A112.1016-2017/CSA B125.16:17  
(R2021)

Performance requirements for automatic compensating valves  
for individual showers and tub/shower combinations

B355-19

Platform lifts and stair lifts for barrier-free access

CAN/CSA-B613-00 (R2012) (withdrawn)

Private residence lifts for persons with physical disabilities

CAN/CSA-B651.2-07 (R2017)

Accessible design for self-service interactive devices

CAN/CSA-T515-97 (R2007) (withdrawn)

Telecommunications — Telephone terminal equipment —  
Acoustic and magnetic field requirements for handset  
telephones intended for use by the hard of hearing

T516-02 (R2007) (withdrawn)

Telecommunications — Telephone terminal equipment —  
Requirements for pay telephone keypads and function keys  
with particular regard to use by persons with disabilities

CAN/CSA-Z10535.1:15 (R2021)

Hoists for the transfer of disabled persons — Requirements and  
test methods (Adopted ISO 10535:2006, Second edition,  
2006-12-15, with Canadian deviations)

Z10535.2-17

Lifts for the transfer of persons — Installation, use, and  
maintenance

## **Center for Inclusive Design and Environmental Access**

Final Report of the Anthropometry of Wheeled Mobility Project,  
December 31, 2010

## **BSI (British Standards Institute)**

BS5395 Part 1:2000 (withdrawn)

Stairs, ladders and walkways. Code of practice for the design,  
construction and maintenance of straight stairs and winders

## **ISO (International Organization for Standardization)**

7000:2019

Graphical symbols for use on equipment — Registered symbols

7001:2007

Graphical symbols — Public information symbols

23599:2019

Assistive products for blind and vision-impaired persons —  
Tactile walking surface indicators

## **Transportation Association of Canada**

Guidelines for Understanding, Use and Implementation of  
Accessible Pedestrian Signals (2008)

Manual of Uniform Traffic Control Devices for Canada, Sixth  
Edition (2021)

## **Other publications**

Accessible Canada Act, 2019

IESNA HB-10-11 (2011)

Illuminating Engineering Society — The Lighting Handbook

## **3 Definitions and abbreviations**

### **3.1 Definitions**

The following definitions shall apply in this Standard:

**Accessible** — as applied to a site, building, or other facility, possessing the necessary characteristics for it to be entered, exited, and used by people, including those with physical, sensory, communication, or cognitive disabilities.

**Accessible route** — a pedestrian path of travel within an interior or exterior environment that is without barriers, as defined in this Standard, and usable by all people, including those with physical, sensory, communication, or cognitive disabilities.

**Adaptable seating** — a fixed seat or seats designed to facilitate a side transfer from a wheeled mobility device.

**Amenity** — anything that adds to a person's comfort or convenience.

**Amenity zone** — a designated area, adjacent or connected to an accessible route, that provides amenities and services (e.g., street furniture, mailboxes, telephones).

**Note:** Amenity zones can also include utilities such as light posts and hydrants.

**Braille** — a system where raised dots are used to represent letters and words. Unified English Braille (UEB) is the braille standard for Canada.

**Note:** In this Standard, unless stated otherwise, "braille" indicates uncontracted braille.

**Cane-detectable** — any object or a change in surface texture that falls within the detection range of a long white cane (see Clause [A.4](#)).

**Change bench** — a fixed-height bench with the necessary clearances and design elements to support its use by people with disabilities.

**Note:** Change benches are intended for use by people with disabilities with or without the assistance of another person.

**Crosswalk** — that portion of a pedestrian crossing that is within the vehicular right-of-way.

**Dwelling** — a housekeeping unit used or intended to be used by one or more people and usually contains cooking, eating, living, sleeping, and sanitary facilities.

**Glare** — an excessive reflection of light from a surface.

**Gutter** — the sloped drainage area directly in front of a curb or curb ramp.

**Illumination** — the intensity of light, as measured in lux (lx).

**Intersection** — a junction where two or more routes of travel (vehicular or pedestrian) meet or cross.

**Lavatory** — a bathroom sink.

**Light reflectance value** — the measure of visible and usable light that reflects from a surface.

**Luminance** — the intensity of light emitted or reflected in a given direction from the surface element divided by the area of the element in the same direction.

**Luminance (colour) contrast** — the difference in light reflectance value between adjacent surfaces (e.g., light on a dark background or dark on a light background).

**Michelson contrast** — the formula,  $C_M$ , used to calculate the luminance (colour) contrast value (%):

$$C_m = (L_1 - L_2) / (L_1 + L_2) \times 100$$

where

$L_1$  = the value of luminance on a lighter surface, expressed in  $\text{cd}/\text{m}^2$

$L_2$  = the value of luminance on a darker surface, expressed in  $\text{cd}/\text{m}^2$

**Notes:**

- 1) When luminance values are not available but CIE Y values are available, the values  $Y_1$  and  $Y_2$  may be substituted for  $L_1$  and  $L_2$ . Note the CIE Y value is identical to the LRV.
- 2) When the CIE Y values or the LRVs of the two surfaces to be compared are known, these values can be used to determine the luminance (colour) contrast. Otherwise, a measurement of luminance or reflectance is used to determine the luminance (colour) contrast. For measurement methods, see IESNA HB-10-11.

**Passenger pick-up area** — an area where pedestrians board and disembark from road vehicles.

**Pedestrian area** — an area where pedestrian traffic is permitted.

**Note:** This term applies to both exterior and interior spaces and can include walkways, halls, corridors, and aisles, as well as open spaces such as lobbies, atria, malls, or parks.

**Pedestrian clearance interval** — the maximum time required for a pedestrian who has started their crossing at a crosswalk to arrive at a point clear of intersecting traffic.

**Notes:**

- 1) The pedestrian clearance interval is indicated by a flashing signal, and follows the brief (4 to 7 s) "Walk" signal that alerts pedestrians to begin their crossing.
- 2) Pedestrian clearance time is computed as the crossing distance divided by the walking speed, usually calculated as 0.8 m/s.
- 3) When the pedestrian clearance interval begins, pedestrians should either complete their crossing if already in the

intersection or refrain from entering the intersection until the next pedestrian walk interval is displayed.

**Pedestrian crossing** — the combination of crosswalk segments, curb ramps/blended transitions, medians, and refuge islands that connect departure and arrival walkways across a vehicular right-of-way.

**Pedestrian right-of-way** — that portion of the public right-of-way that is dedicated to the unrestricted movement of people.

**Pedestrian route** — a continuous and unobstructed path of travel within a pedestrian circulation area that provides accessibility.

**Permanent** — in relation to residential accommodation, a term used to describe any dwelling (house, semi-detached, duplex, row house, multiplex, townhouse, condominium, or apartment) that one or more persons live in as their primary residence.

**Platform lift** — an elevating device that is installed at a permanent location in a building structure and is used to transport people with disabilities on a platform that moves between permanent levels.

**Enclosed stair lift** — an inclined lift where the platform runway is separate from the stair circulation space.

**Enclosed vertical lift** — a vertical lift with an enclosed platform runway.

**Unenclosed stair lift** — an inclined lift where the platform or chair runway is within the stair circulation space.

**Unenclosed vertical lift** — a vertical lift with a partially enclosed or unenclosed platform runway.

**Public right-of-way** — private property or public land, usually in interconnected corridors, that is acquired for or devoted to pedestrian and vehicular purposes.

**Raised crossing** — a crossing where the crosswalk is elevated 80 to 150 mm above the adjacent road surface, with ramps on the approaches. It is designed to reduce speeds and draw attention to the crosswalk so that pedestrians can traverse the road safely.

**Raised intersection (or zero grade crosswalk)** — a flat, raised area that covers an entire intersection, with sloped surfaces installed on all vehicular approaches.

**Note:** The intersection is usually raised to the level of the sidewalk or slightly below to provide a lip that is detectable by people with low or no vision.

**Ramp** — a sloping walkway leading from one level to another, which has a running slope with a ratio steeper than or equal to 1:20 (5%).

**Notes:**

- 1) Walkways with a running slope shallower than 1:20 are not considered to be ramps in the context of this Standard (see Clause [5.5.1](#)).
- 2) See Clause [8.3.3](#).

**Shared-use walkway** — a path of travel, separate from a vehicular route, where pedestrians on foot and those using various types of mobility devices (e.g., manual or powered wheelchairs, scooters, canes, long white canes, walkers, or crutches) share space with people who use non-motorized items (e.g., skateboards, inline skates, bicycles).

**Short-term accommodation** — any hotel/motel, hostel, education residence, emergency shelter, or other communal residence that one or more persons occupy temporarily.

**Sign-controlled intersection** — an intersection where movement of pedestrians and vehicles is regulated by designated signage.

**Signage** — information provided in the form of visual and tactile communication that incorporates one or more of the following elements:

- a) alphanumeric characters;
- b) pictograms;
- c) illustrations (plans, etc.); or
- d) braille.

**Signal-controlled intersection** — an intersection where movement of pedestrians and vehicles is regulated by signals and designated signage.

**Slip lane/uncontrolled access ramp** — a channelized vehicular route without stop controls that connects two vehicular rights-of-way.

**Slope** — the ratio of rise to run on an inclined surface.

**Counter slope** — the combined sum of the running slope of a curb ramp and of the gutter slope, in percentages.

**Cross slope** — the slope that is perpendicular to the direction of travel.

**Gutter slope** — the cross fall of the drainage area at the edge of the street directly in front of a curb ramp.

**Running slope** — the slope that is parallel to the direction of travel.

**Splitter island** — a flush or raised island that separates entering and exiting traffic (e.g., at a roundabout intersection).

**Tactile markings** — lettering or graphics that are slightly raised above the surface.

**Tactile walking surface indicator** — a standardized surface, detectable underfoot or by a long white cane, to assist people with low vision or blindness by alerting or guiding them.

**Tactile attention indicator** — a TWSI comprising truncated domes that signals a need for caution at a change in elevation, a vehicular route, train tracks, or other potential hazard.

**Tactile direction indicator** — a TWSI that uses flat-topped elongated bars to facilitate wayfinding in open areas.

**Note:** ISO 23599 refers to the tactile direction indicator as “guiding pattern.”

**Transfer space** — an unobstructed area that allows the positioning of a wheeled mobility device to enable a person to transfer to another adjacent seated position.

**Vehicular right-of-way** — that portion of the public right-of-way dedicated to the movement of motorized (mechanically propelled) vehicles for the transport of people or goods. This includes roadways, transit ways, and rail lines.

**Visitable** — in relation to residential accommodation, any dwelling that offers a basic level of access to accommodate visitors such as people who use a wheeled mobility aid, people who are older, or residents who might have a temporary disability. Visitable dwellings allow a person to enter a dwelling safely, manoeuvre independently throughout the visitable level, and use the toilet facilities.

**Visual contrast** — visual perception between one element and another.

**Note:** Visual contrast can be achieved through a difference in luminance, which is also referred to as luminance (colour) contrast. It can also be achieved through luminance (colour) contrast if there is adequate lighting for users to perceive the difference in colour.

**Walk signal interval** — that phase of a traffic signal cycle during which a pedestrian is to begin crossing, typically indicated by a “WALK” message or the walking person pictogram and its audible equivalent.

**Wayfinding** — a spatial problem-solving process based upon consistent use and organization of definite sensory cues in the environment that individuals use to understand where they are, know where their desired location is, and know how to get to that destination from their present location.

**Wheeled mobility device** — a collective term used to describe a range of wheeled personal transportation devices, including manual wheelchairs, powered wheelchairs, and mobility scooters.

**Note:** Where a clause in this Standard applies to a single type of mobility device, the specific term for that device will be used (e.g., manual wheelchair, powered wheelchair, mobility scooter).

### 3.2 Abbreviations

The following abbreviations shall apply in this Standard:

AHJ	— authority having jurisdiction
LRV	— light reflectance value
lx	— lux (unit of illuminance)
TAI	— tactile attention indicator
TDI	— tactile direction indicator
TWSI	— tactile walking surface indicator
UD	— universal design

## 4 General requirements

### 4.1 Area allowances

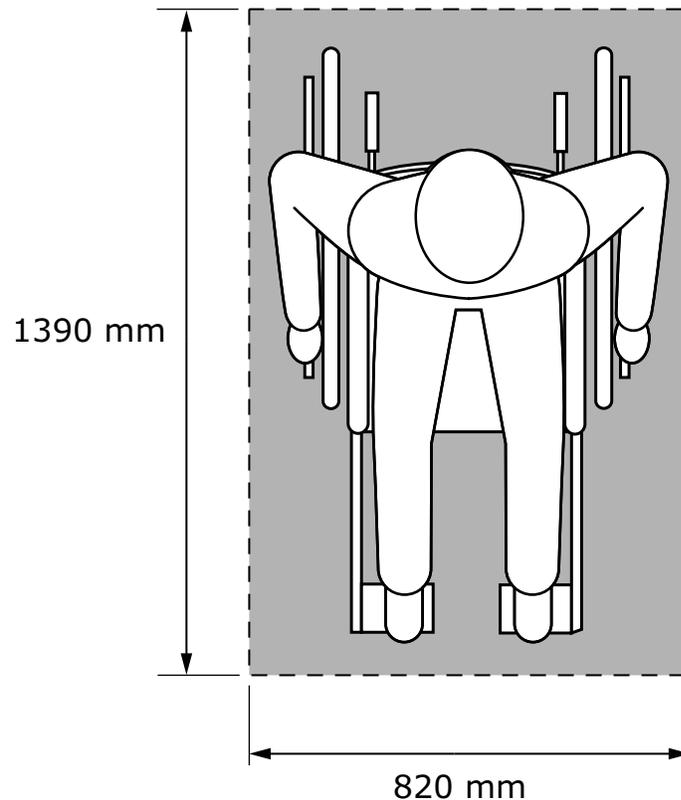
To accommodate an individual wheeled mobility device user, a clear floor or ground area shall be

- a) at least 820 by 1390 mm for a stationary position (see Figure [1](#)); and
- b) at least 2100 by 2100 mm for an unobstructed U-turn (see Figure [2](#)).

#### Notes:

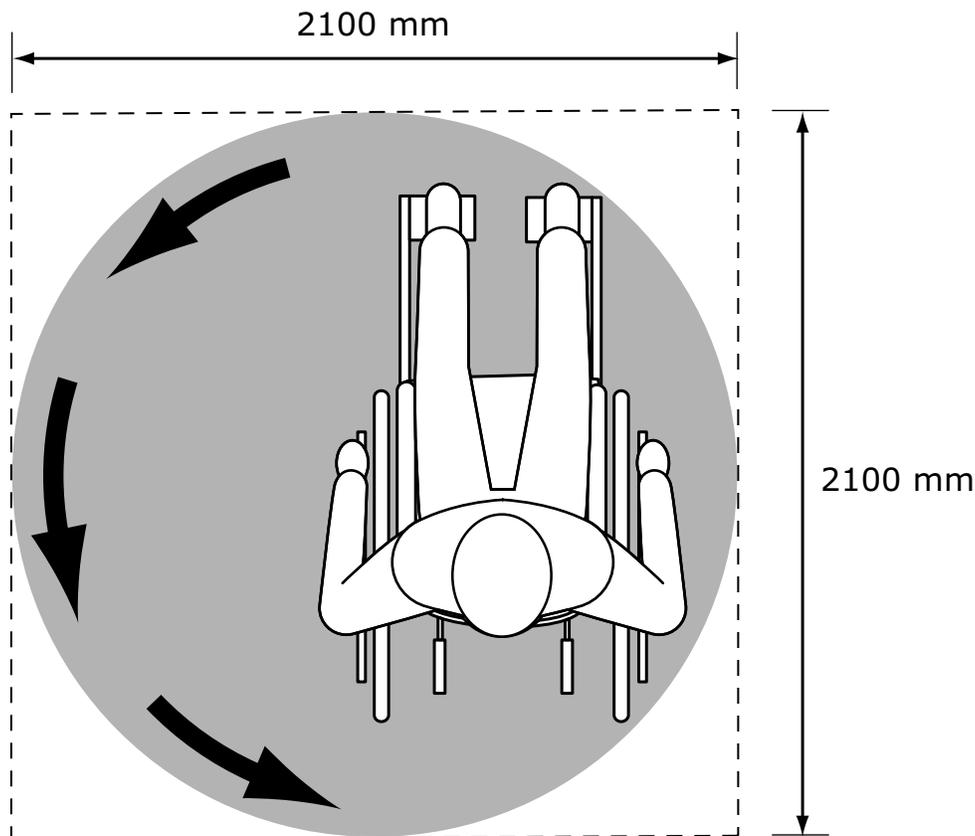
- 1) This Standard deals with accessibility requirements of people with various disabilities, including those who use crutches, a walker, a long white cane, or a service animal. Their spatial requirements can vary but should fit within the area allowance for wheeled mobility devices in this Standard.
- 2) For both a forward and side approach for a wheeled device user, a clear area of at least 1390 by 1390 mm should be provided. Part of this area may be part of the knee clearance, where it is specified.
- 3) The area allowances stated throughout this Standard are based on the dimensions that accommodate the 95th percentile of all wheeled mobility devices, as outlined in the Final Report of the Anthropometry of Wheeled Mobility Project.
- 4) Where possible, especially in exterior locations, a larger clear area of at least 2250 by 2250 mm should be provided.
- 5) Annex [A](#) provides dimensions for the needs of people using various mobility devices.

**Figure 1**  
**Minimum floor area for a person using a wheeled mobility device**  
(See Clause [4.1.](#))



**This figure illustrates the minimum floor area for a person using a wheeled mobility device. It shows a person sitting in a wheelchair, with a minimum length of 1390 mm and a minimum width of 820 mm for their wheeled mobility device.**

**Figure 2**  
**Minimum area at the toe level for a person using a wheeled mobility device to make a U-turn**  
(See Clause [4.1.](#))



**This figure illustrates the minimum floor area to make a U-turn for a person using a wheeled mobility device. It shows a person sitting in a wheelchair, with a circle drawn around them indicating a minimum turning diameter of 2100 mm.**

#### **4.2 Luminance (colour) contrast**

In compliance with Tables [1](#) and [2](#), clear and discernable luminance (colour) contrast shall be provided to help in the detecting of information, building elements, or potential hazards, and to facilitate orientation and wayfinding (see Table [3](#) for examples).

## Table 1 Minimum luminance (colour) contrast – General surfaces

(See Clause [4.2.](#))

This table provides a chart with the minimum light reflectance value for the lighter surface and a minimum luminance contrast value in relation to the visual task for matte surface materials. Column A on the left provides examples of visual tasks ranging from seeing large surface areas, such as walls and floors, to text information such as signage. Column B in the middle provides the minimum LRV levels required for the lighter of two surfaces expressed as a number. Column C on the right provides the Michelson contrast percentage expressed as a number.

<b>Visual Task</b>	<b>Minimum LRV* of the lighter surface (CIE Y)</b>	<b>Michelson contrast, C<sub>m</sub> (%)</b>
Large surface areas (e.g., walls, floors, doors, ceiling); elements and components to facilitate orientation (e.g., handrails, doors, furniture, tactile walking surface indicators, visual indicators on glazed areas)	≥ 40	≥ 30
Potential hazards (e.g., visual indicators on steps, glazed areas); small items (e.g., switches and controls); self-contrasting markings	≥ 50	≥ 60

(Continued)

**Table 1 (Concluded)**

<b>Visual Task</b>	<b>Minimum LRV* of the lighter surface (CIE Y)</b>	<b>Michelson contrast, <math>C_m</math> (%)</b>
Text information (e.g., signage)	$\geq 70$	$\geq 60$

\* The light reflectance value LRV, or CIE Y-value, is expressed on a scale of 0 to 100, with a value of 0 points for pure black and a value of 100 points for pure white.

**Table 2**  
**Minimum luminance (colour) contrast – Glossy or shiny surfaces**  
 (See Clause [4.2.](#))

This table provides requirements for minimum colour/luminance contrast for shiny and glossy materials, such as brushed stainless steel. Column A on the left provides examples of visual tasks ranging from large surface areas, such as walls and floors, to small items such as control buttons. Column B in the middle provides the minimum LRV levels required for the lighter of two surfaces expressed as a number. Column C on the right provides the Michelson contrast percentage expressed as a number.

<b>Visual Task</b>	<b>Minimum LRV of the lighter surface (CIE Y)</b>	<b>Michelson Contrast, <math>C_m</math> (%)</b>
Large surface areas (e.g., walls, floors, doors, ceiling); elements and components to facilitate orientation (e.g., base plates of controls, tactile walking surface indicators)	≥ 40	≥ 40
Small items necessary to enable use of building elements (e.g., control buttons, inscriptions on controls)	≥ 70	≥ 70

**Note:** Appropriate luminance (colour) contrast is dependent on two factors: the LRV value of the lighter surface, which is specified in column B of Tables [1](#) and [2](#), and the relative LRV contrast between

(Continued)

## **Table 2 (Concluded)**

the lighter and darker surfaces, expressed as a percentage difference specified in Column C of Tables [1](#) and [2](#). The LRV contrast is calculated using the Michelson contrast formula (see Clause [3.1](#)). LRV describes the reflection properties of surfaces and is generally measured with a spectrophotometer. It is expressed as a number without units.

**Table 3**  
**Examples**  
(See Clause [4.2.](#))

This table provides different examples of visual contrasts, LRV, and Michelson values, and whether the resulting value is compliant or not. Column A on the left provides three examples of two materials being tested. Column B to its right provides the LRV of the lighter surface. Column C to its right provides the LRV of the darker surface. Column D to its right provides the calculated LRV using Michelson contrast. Column E on the furthest right explains if it is compliant or not and why.

<b>Configuration</b>	<b>LRV of lighter surface</b>	<b>LRV of darker surface</b>	<b>Calculated LRV contrast between surfaces (using Michelson contrast)</b>	<b>Compliance status</b>
Light-coloured tile floor next to dark-coloured painted wall	45	20	38.5%	Compliant — the min LRV of the lighter surface is $\geq 40\%$ and the Michelson contrast is $\geq 30\%$
Light-coloured painted door adjacent to a dark-coloured painted wall	40	25	23%	Non-compliant — the min LRV of the lighter surface is $\geq 40\%$ but the

(Continued)

**Table 3 (Concluded)**

<b>Configuration</b>	<b>LRV of lighter surface</b>	<b>LRV of darker surface</b>	<b>Calculated LRV contrast between surfaces (using Michelson contrast)</b>	<b>Compliance status</b>
				Michelson contrast is not $\geq 30\%$
Dark-coloured bench against a light-coloured painted wall	50	20	43%	Compliant — the min LRV of the lighter surface is $\geq 40\%$ and the Michelson contrast is $\geq 30\%$

## 4.3 Operating controls

### 4.3.1 Scope

Operating controls include but are not limited to

- a) door handles and locks;
- b) window operators and locks;
- c) faucets and adjustable shower heads;
- d) electrical outlets and switches;
- e) thermostats;
- f) elevator call stations, controls, and panels;
- g) fire alarm pull stations; and
- h) activation devices.

### 4.3.2 Floor area

Controls shall be adjacent to a clear floor space of 820 by 1390 mm.

Where knee and toe space are provided, it shall be centred on either the length or the width of the clear floor space.

Where knee and toe space are not provided, it shall be centred on the 1390 mm length of the clear floor space.

#### Notes:

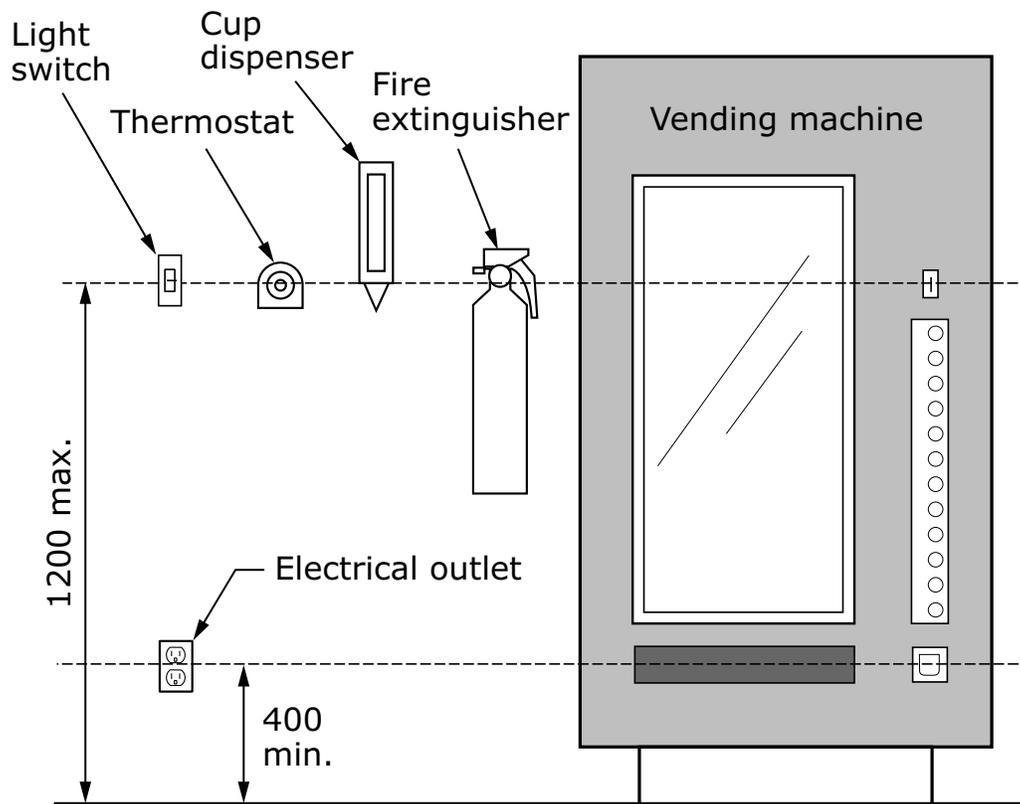
- 1) Where the side approach reach to a control exceeds 600 mm, the long dimension of the clear floor space should increase from 1390 to 2360 mm to permit alignment of the upper body with the control, thus shortening the reach distance.
- 2) A clear floor area at least 1390 by 2360 mm in front of all operating controls, with the long dimension parallel to the surface containing the control, provides for both a forward and a side approach.
- 3) The path to a control should provide turning opportunities, as defined in Clause [5.1.1](#), to allow people to turn around so as to approach the control on either their right or left side.

### 4.3.3 Height

The centreline of the operating controls shall be located in a range between 400 and 1200 mm from the floor (see Figure [3](#)).

**Note:** The specified limits are the minimum and maximum, and might not be ideal for all applications. For effective user access, care should be used when locating controls close to the 400 or 1200 mm limits, especially when a complex action or manipulation is required.

**Figure 3**  
**Height of operating controls**  
(See Clause [4.3.3.](#))



**This figure illustrates the height requirements for operating controls. The graphic shows the placement of various controls including a light switch, thermostat, cup dispenser, fire extinguisher, and vending machine with the primary touch point of each control placed 1200 mm from the ground. An electrical outlet is also shown in this example, and it is placed 400 mm above the ground.**

**Note:** All dimensions are in mm.

### 4.3.4 Operation

Controls shall be operable

- a) with one hand, using
  - i) a closed fist position; or
  - ii) another method of operation that does not require tight grasping, pinching, or twisting of the wrist; and
- b) with a force not to exceed 22 N.

**Notes:**

- 1) Electronic controls may facilitate use by a wider range of people.
- 2) The requirement for operation by one hand does not preclude several operations (i.e., one action after the other). For example, where it is preferable to avoid a situation in which a door lock has to be turned with one hand while the door handle is simultaneously turned with the other hand, having one action come after the other would meet this requirement.
- 3) A control that needs to be read or adjusted should be angled in such a way that it is usable from a seated and a standing position.

### 4.3.5 Control devices

Control devices shall provide tactile and/or auditory information to indicate function, position, and confirmation of activation.

**Note:** Controls with different shapes can help identify different functions.

### 4.3.6 Visual displays

Information on visual displays shall be

- a) supplemented by tactile and/or auditory information;
- b) luminance (colour) contrasted; and
- c) located on a surface that minimizes glare.

**Notes:**

- 1) Visual displays should allow for close approach for reading.

- 2) Where possible, visual displays should be positioned to minimize glare.

### **4.3.7 Illumination**

#### **4.3.7.1 General**

Operating controls shall be illuminated

- a) to a level of at least 100 lx; and
- b) where reading is necessary, to a level of at least 200 lx.

**Note:** People living with limited vision might find it easier to interact with illuminated controls if they can stand close to the device.

Placing controls in such a manner that the controls are only visible by standing back will make the controls inaccessible to anyone with sight loss that has residual vision.

#### **4.3.7.2 Internally illuminated controls**

If an operating control has its own illumination or is backlit and reading of the surface is not required for operation, an internal or background illumination level of 50 to 100 lx may be used.

### **4.3.8 Luminance (colour) contrast**

The operating controls shall be luminance (colour) contrasted with their background.

**Note:** Luminance (colour) contrast is intended to increase visibility of controls. The luminance (colour) contrast may be extended to include a cover plate if present.

## **4.4 Floor or ground surfaces**

### **4.4.1 General**

A floor or ground surface shall

- a) be stable and firm;
- b) be slip-resistant;
- c) produce minimal glare; and

d) not have strong visual patterning.

**Notes:**

- 1) Highly reflective surfaces can result in glare, which is a problem for many people.
- 2) The use of heavily textured surfaces, such as decorative paving, should be avoided in the path of travel, as uneven surfaces can cause difficulty in travel and manoeuvring for people using wheeled mobility devices or walking aids.
- 3) Heavily patterned floor and ground surfaces can cause confusion for people with limited vision and can interfere with wayfinding.
- 4) Annex [B](#) provides additional information on the potential for a slip on various floor surfaces.

#### 4.4.2 Changes in level

Changes in level, except for elevators, elevating devices, and curb ramps, shall comply with Table [4](#) [see Figures [4 a\)](#) to [4 c\)](#)].

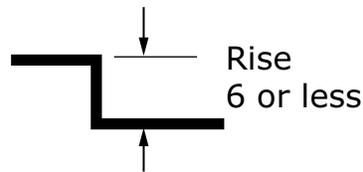
**Table 4**  
**Changes in level**

(See Clauses [4.4.2](#) and [4.4.3](#), and Figures [4 a\)](#) to [4 c\)](#).)

This table lists the vertical rise specifications for changes in level. The left column lists the vertical rise in mm and the right column describes the profile details.

<b>Vertical rise, mm</b>	<b>Profile</b>
0 to 6	May be vertical [see Figure <a href="#">4 a)</a> ]
7 to 13	Bevelled, but not steeper than the ratio of 1:2 (50%) [see Figure <a href="#">4 b)</a> ]
Over 13	Not steeper than the ratio of 1:12 (8.33%) [see Figure <a href="#">4 c)</a> ]

**Figure 4 a)**  
**Changes in level – Up to 6 mm**  
(See Clauses [4.4.2](#) and [5.2.6](#), and Table [4](#).)



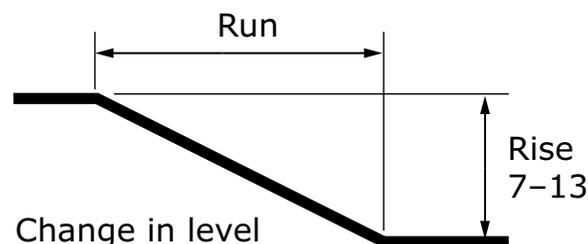
Change in level  
up to 6 mm

May be vertical

**This figure shows a change in level up to 6 mm  
as a step increase.**

**Note:** All dimensions are in mm.

**Figure 4 b)**  
**Changes in level – Between 7 and 13 mm**  
(See Clauses [4.4.2](#) and [5.2.6](#), and Table [4](#).)

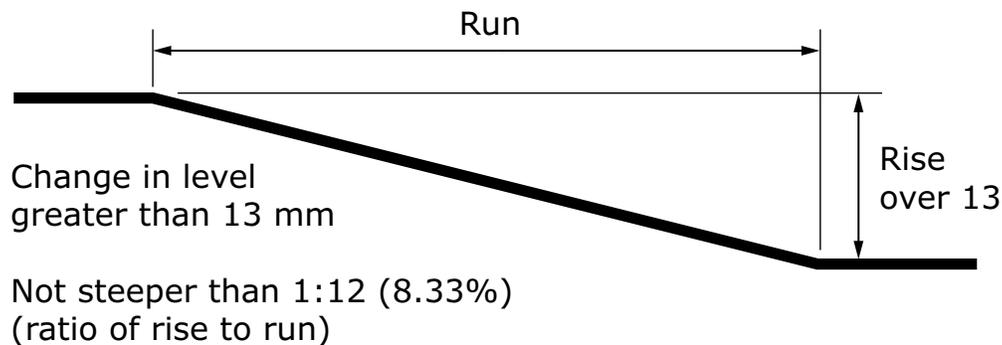


Change in level  
7-13 mm

Bevelled but not steeper  
than 1:2 (50%) (ratio of rise to run)

**This figure shows a change in level between 7 and  
13 mm as a ramp not steeper than 1:2 (50%) ratio of  
rise to run.**

**Figure 4 c)**  
**Changes in level – Greater than 13 mm**  
(See Clauses [4.4.2](#) and [5.2.6](#), and Table [4](#).)



**This figure shows a change in level greater than 13 mm as a ramp not steeper than 1:12 (8.33%) ratio of rise to run.**

#### 4.4.3 Carpets

Carpets or carpet tile shall

- a) have a low, firm, and level pile or loop;
- b) have a combined carpet and pad height of not more than 13 mm;
- c) be securely fastened;
- d) comply with Table [4](#) with respect to level changes in edge trim; and
- e) if installed with a cushion, underpadding, or backing, be backed or underlaid with firm materials only.

#### Notes:

- 1) New carpets can produce off-gassing, which can adversely affect people with environmental intolerances. Suppliers can provide carpets that have been off-gassed prior to installation.
- 2) Carpets without underpadding are preferred.

#### 4.4.4 Gratings

Gratings located in pedestrian areas shall

- a) have openings not greater than 13 mm wide in one direction; and
- b) be placed so that the long dimension of the opening is perpendicular to the primary direction of travel.

**Note:** Gratings should not be located in the accessible route.

#### 4.4.5 Tactile walking indicator surfaces

##### 4.4.5.1 General

Tactile walking indicator surfaces are used to inform people, both visually and by contact under foot or cane, of two possible situations:

- a) an attention indicator (e.g., truncated domes) signals a need for caution at a change in elevation, a vehicular route, train tracks, etc. [see Figure [5 a](#)]; or
- b) a direction indicator (e.g., elongated flat-top bar surface) facilitates wayfinding in open areas and indicates a possible route that can be taken.

##### 4.4.5.2 Surface

A tactile walking surface shall

- a) have the base surface level with the surrounding surface, or with its edges bevelled and not more than 3 mm above the surface to which it is applied [see Figure [5 b](#)];
- b) be slip-resistant; and
- c) have an adjacent walking surface that is smooth for at least 600 mm in width.

**Note:** Smooth adjacent surfaces enable TWSIs to be detected and distinguished. Depressed paving joint gaps should be avoided or comprise no more than 6% of the surface and have a maximum width, measured at the surface, of 10 mm and a maximum depth of no more than 2 mm.

### 4.4.5.3 Tactile attention indicator surfaces

#### 4.4.5.3.1 Configuration

A tactile attention indicator surface shall be composed of truncated domes

- a) with a height of between 4 and 5 mm;
- b) with the top diameter between 12 and 25 mm and the base diameter  $10 \pm 1$  mm greater than the top diameter;
- c) arranged in a square grid; and
- d) with a centre-to-centre distance of adjacent domes complying with Table 5 [see Figure 5 b)].

**Note:** Selection criteria for tactile attention indicators should include an assessment of potential wear, particularly in high-traffic areas or in exterior applications where snow and ice clearing equipment is used.

**Table 5**  
**Dome diameter and spacing combinations**  
(See Clause 4.4.5.3.1.)

This table lists the dome diameter and spacing combinations for tactile attention indicator surfaces for dome diameters from 12 to 25 mm.

<b>Top surface diameter, mm</b>	<b>Base surface diameter, mm, <math>\pm 1</math> mm</b>	<b>Centre-to-centre distance between domes, mm</b>
12	22	42 to 61
15	25	45 to 63
18	28	48 to 65
20	30	50 to 68
25	35	55 to 70

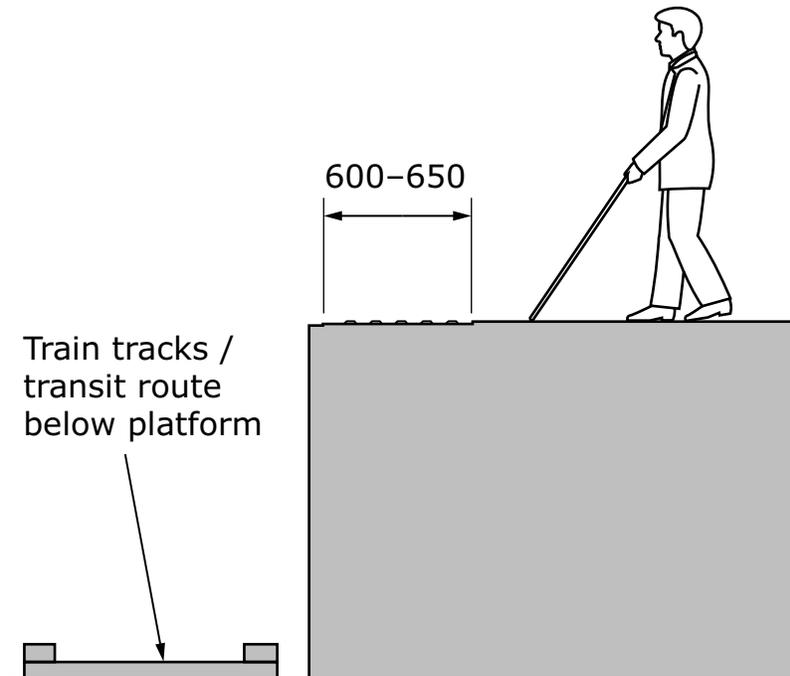
### 4.4.5.3.2 Location

A tactile attention indicator surface shall be located at

- a) stairs, to comply with Clause [5.4.3](#);
- b) an unprotected drop-off edge (e.g., a transit platform) where
  - i) the change in elevation is greater than 250 mm; or
  - ii) the slope is steeper than in a ratio of 1:3 (33%);
- c) the unprotected edges of a reflecting pool, to comply with Clause [8.6.12](#);
- d) curb ramps and blended transitions, to comply with Clause [8.3.3](#); and
- e) an entry into a vehicular route or area where no curbs or other elements separate the vehicular route from a pedestrian route [see Figure [5 a](#)].

**Figure 5 a)**  
**Tactile attention indicator surface – Change in elevation**

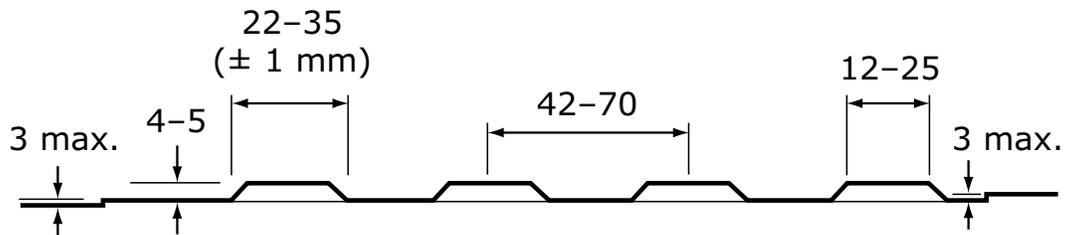
(See Clauses [4.4.5.1](#) and [4.4.5.3.2](#).)



**This figure shows a tactile attention indicator surface that signals a change in elevation at a transit platform. The graphic shows a person with a cane approaching the end of the transit platform. The tactile attention indicator surface is shown at the edge of the platform with a width of 600 to 650 mm.**

**Note:** All dimensions are in mm.

**Figure 5 b)**  
**Tactile attention indicator surface — Height of domes**  
 (See Clauses [4.4.5.2](#) and [4.4.5.3.1](#).)



**Note:** Truncated domes are organized in a regular pattern.

**This figure shows four tactile indicator surface domes organized in a regular pattern. The height of each dome is shown as 4 to 5 mm, with a full dome width of 22 to 35 mm ( $\pm 1$  mm), a top of dome width of 12 to 25 mm, and a distance between domes of 42 to 70 mm. The maximum height of the base surface carrying the attention indicator dome pattern is shown as 3 mm above adjacent paving.**

**Note:** All dimensions are in mm.

#### 4.4.5.3.3 Installation

When a tactile attention indicator surface is used to indicate a hazard, it shall be installed along the full width of the hazard

- a) to a depth between 600 and 650 mm; and
- b) with one side against the edge of the hazard, unless otherwise indicated in this Standard.

#### 4.4.5.3.4 Luminance (colour) contrast

When a tactile attention indicator surface is used to indicate a hazard, it shall have a luminance (colour) contrast of at least 50% with the adjacent surface using the Michelson contrast formula (see Clause [3.1](#)).

#### Notes:

- 1) The specified visual contrast percentage of 50% is a minimum. It is preferable to provide a higher visual contrast whenever

possible between the indicator surface and the surrounding surface.

- 2) The colour specifications for yellow should be
  - a) Munsell system: hue 5.0, chroma yellow 8.0/12;
  - b) CIE 1931 system: 59.10% luminosity at the chroma coordinates of  $x=0.4562$  and  $y=0.4788$ ; or
  - c) a version of yellow that provides an equivalent level of visibility.

#### **4.4.5.4 Tactile direction indicator surfaces**

##### **4.4.5.4.1 Configuration**

A tactile direction indicator surface shall be composed of flat-topped, parallel, elongated bars having

- a) a height of 4 to 5 mm;
- b) a top width between 17 and 30 mm and a base width  $10 \pm 1$  mm greater than the top width;
- c) a centre-to-centre distance of adjacent bars to comply with Table [6](#);
- d) a top length not less than 270 mm and the base length  $10 \pm 1$  mm greater than the top length; and
- e) not more than a 30 mm space between the ends of in-line bars [see Figure [6 b](#)].

**Note:** Tactile direction indicator layout that is as continuous as possible is the easiest to follow.

**Table 6**  
**Bar width and spacing combinations**  
 (See Clause [4.4.5.4.1.](#))

This table lists the width and spacing combinations for elongated bars on tactile direction indicator surfaces.

<b>Top width of elongated bars, mm</b>	<b>Base width, mm (<math>\pm 1</math> mm)</b>	<b>Centre-to-centre distance between elongated bars, mm</b>
17	27	57 to 78
20	30	60 to 80
25	35	65 to 83
30	40	70 to 85

#### **4.4.5.4.2 Location**

Tactile direction indicators should be located in large and open floor areas (e.g., shopping malls or transportation terminals) to facilitate wayfinding by indicating the primary route of travel.

The indicated route should lead from the entrance to major destinations, such as an information kiosk, registration desk, stairway, elevator, or store/service doors [see Figure [6 a](#)].

#### **Notes:**

- 1) An excessive number of tactile direction indicator paths can create confusion. One or two paths are all that should be considered in a discrete space (e.g., a lobby or transit facility).
- 2) Examples of facilities can include but not be limited to hotel lobbies, transit terminals, or any outdoor space where large expanses of paving exist.

#### 4.4.5.4.3 Installation

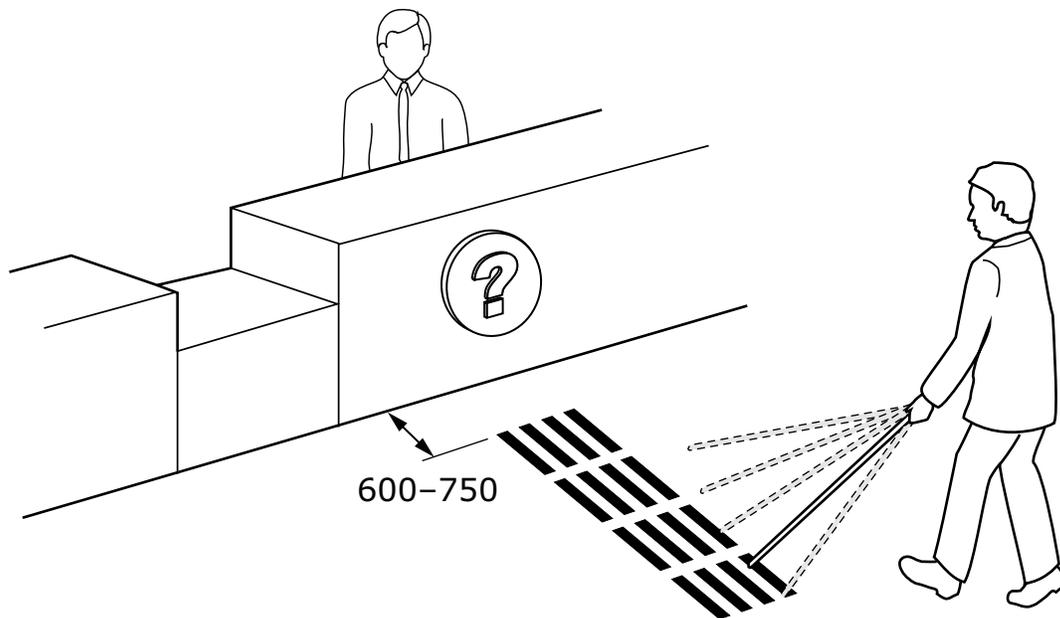
A system of tactile direction indicators shall

- a) where installed to define a route
  - i) be between 250 and 300 mm wide;
  - ii) have on each side a 600 mm space that is clear of obstructions;
  - iii) have the flat-topped elongated bars running in the direction of the route of travel;
  - iv) have turns and decision points at a 90° angle and identified by a 600 to 650 mm square surface area without tactile walking surface indicator marking; and
  - v) at an end point have a clear space between 600 and 750 mm where terminating at a wall or obstacle;
- b) where installed across an accessible path of travel as an indicator of a facility or diverging route
  - i) be between 600 and 650 mm wide; and
  - ii) have the elongated bars running in the direction toward the facility or diverging route [see Figures [7 d](#)) and [7 e](#))];
- c) where there is a risk of water ponding, have the elongated bars interrupted by a drainage gap 20 to 30 mm wide; and
- d) have a luminance (colour) contrast in accordance with the following:
  - i) a luminance (colour) contrast of at least 50% with the surrounding surface; and
  - ii) not be yellow.

#### Notes:

- 1) Figures [7 a](#)) through [7 h](#)) provide examples for the layout of tactile direction indicators in different applications.
- 2) The specified visual contrast percentage of 50% is a minimum. It is preferable to provide a higher visual contrast whenever possible between the indicator surface and the surrounding surface. See Clause [4.2](#) for the method for calculating luminance contrast.

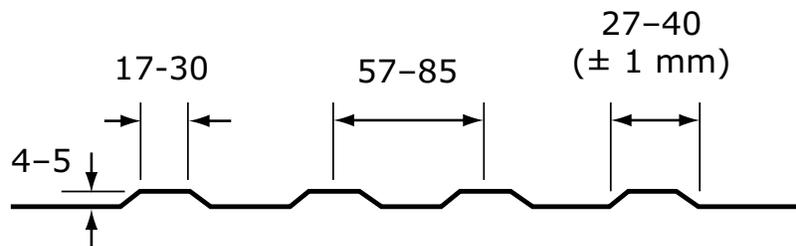
**Figure 6 a)**  
**Tactile direction indicator surface**  
(See Clause [4.4.5.4.2.](#))



**This figure illustrates a person using a long cane walking towards an information desk along a tactile direction indicator surface. The tactile direction indicator tiles end 600 to 750 mm before the desk.**

**Note:** All dimensions are in mm.

**Figure 6 b)**  
**Tactile direction indicator surface — Side view**  
 (See Clause [4.4.5.4.1.](#))

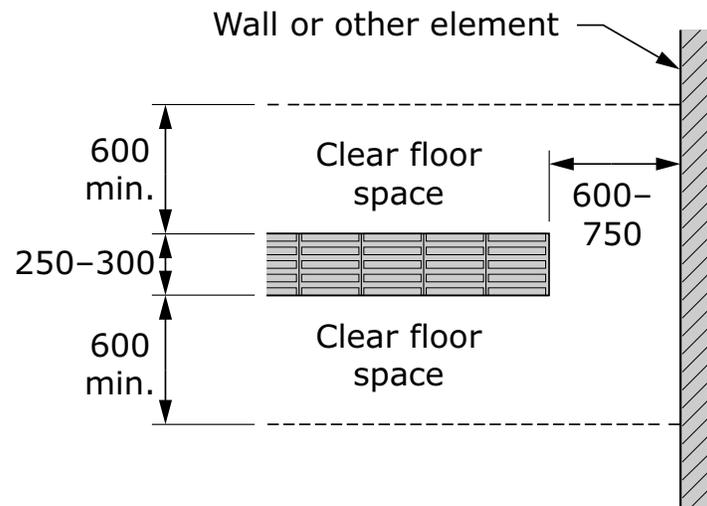


**Note:** Raised flat-topped elongated bars are parallel to the direction of travel.

**This figure shows the side view of a tactile directional indicator tile. The height of each bar is shown as 4 to 5 mm, with a bar base width of 27 to 40 mm ( $\pm 1$  mm), a top of bar width 17 to 30 mm, and a distance between bars of 57 to 85 mm. It is noted that the raised flat-topped elongated bars are parallel to the direction of travel.**

**Note:** All dimensions are in mm.

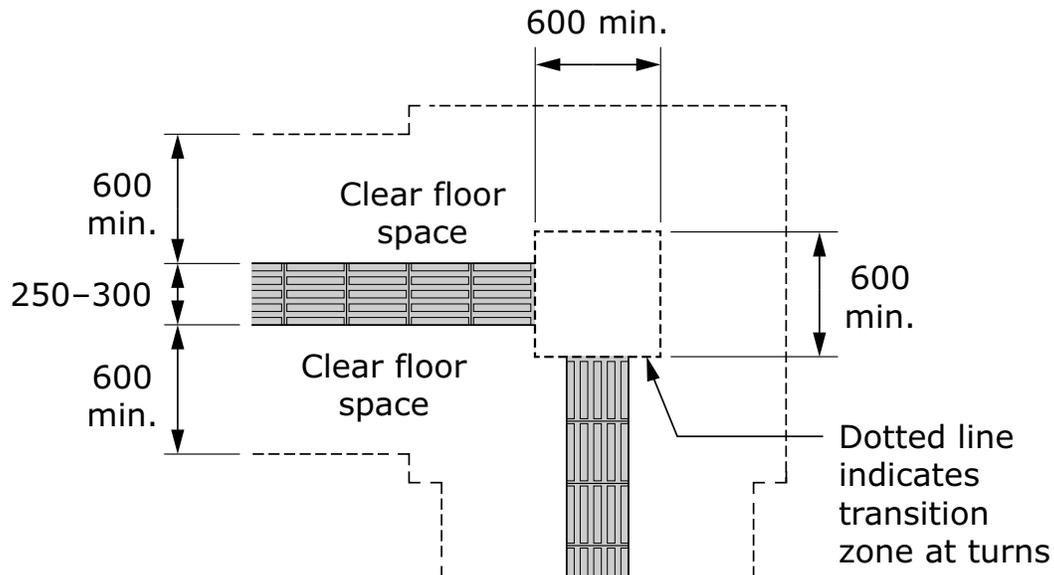
**Figure 7 a)**  
**Tactile directional indicator configurations – Travel**  
**in one direction**  
(See Clause [4.4.5.4.3.](#))



**This figure shows a tactile guidance tile indicating travel in one direction with a tactile directional indicator width of 250 to 300 mm noted and a minimum of 600 mm of clear floor space on either side of the tactile directional indicator. The tactile direction indicator terminates 600 to 750 mm before a wall or other vertical element.**

**Note:** All dimensions are in mm.

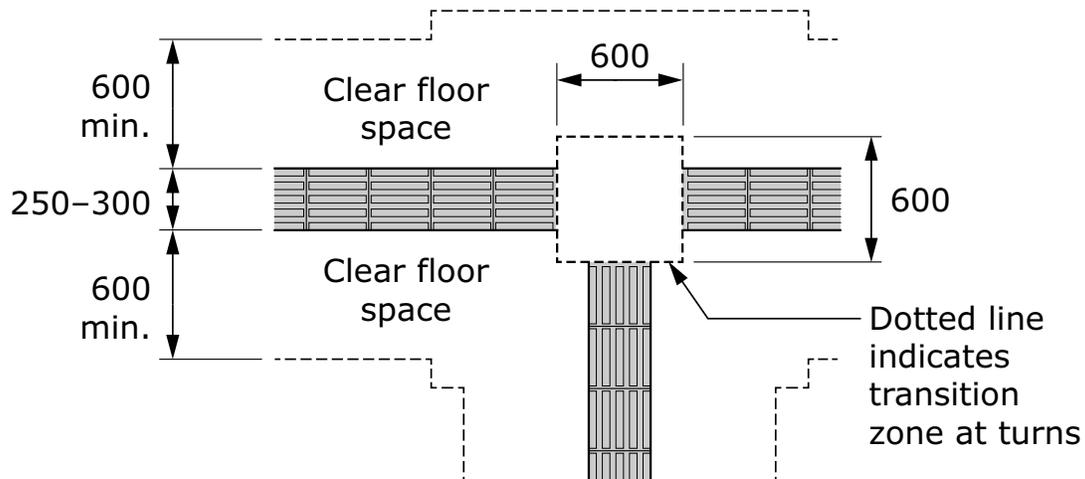
**Figure 7 b)**  
**Tactile directional indicator configurations —**  
**Guidance tile at a turn**  
 (See Clauses [4.4.5.4.3](#) and [8.5.2](#).)



**This figure shows the configuration of a guidance tile at a turn with a tactile directional indicator width of 250 to 300 mm noted and a minimum of 600 mm of clear floor space on either side of the tactile directional indicator. A transition zone of 600 mm wide and long is denoted at the 90° turn.**

**Note:** All dimensions are in mm.

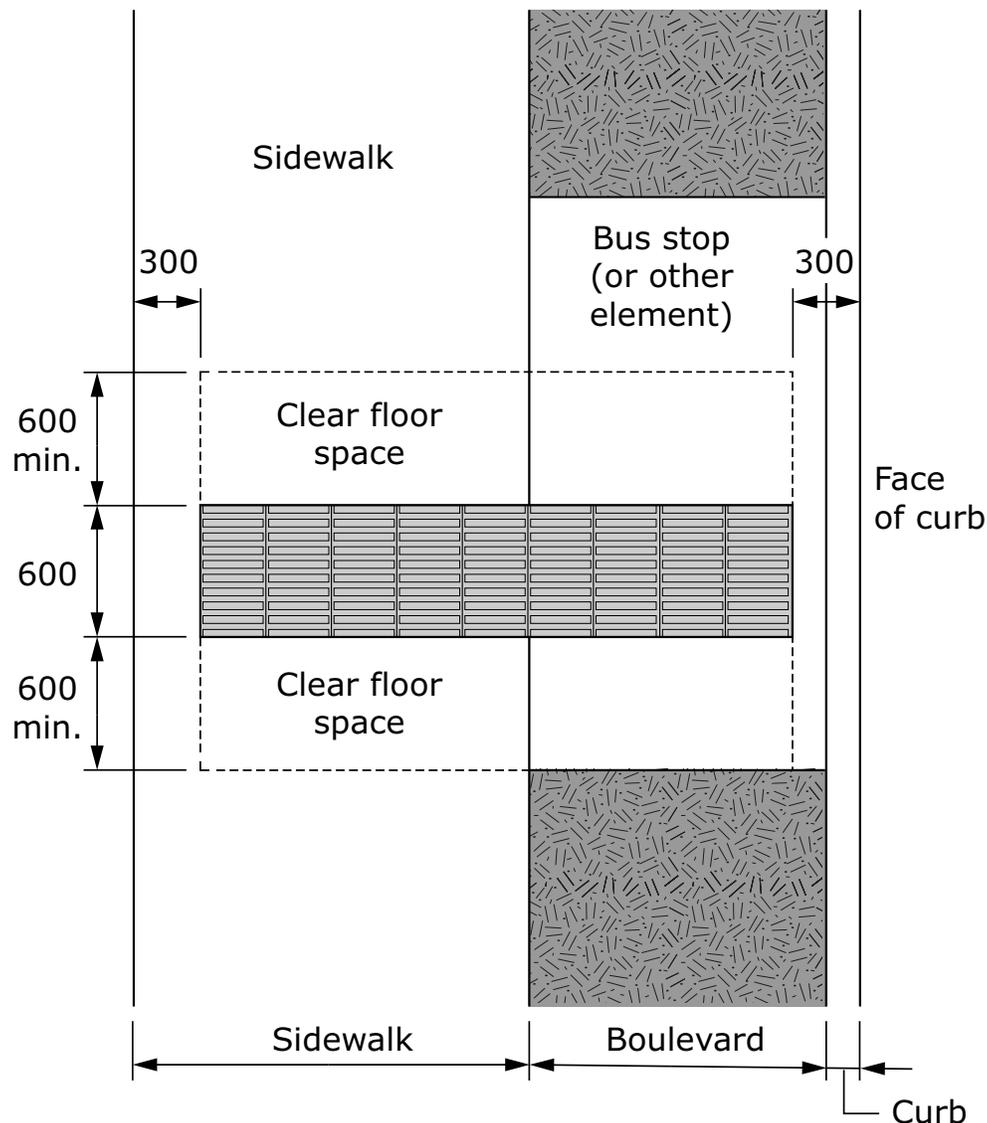
**Figure 7 c)**  
**Tactile directional indicator configurations —**  
**Directional tile at a decision-making point**  
(See Clause [4.4.5.4.3.](#))



**This figure shows the configuration of a directional tile at a decision-making point with a tactile directional indicator width of 250 to 300 mm noted and a minimum of 600 mm of clear floor space on either side of the tactile directional indicator. A transition zone 600 mm wide and 600 mm long is denoted at a decision point where tactile directional indicators would intersect.**

**Note:** All dimensions are in mm.

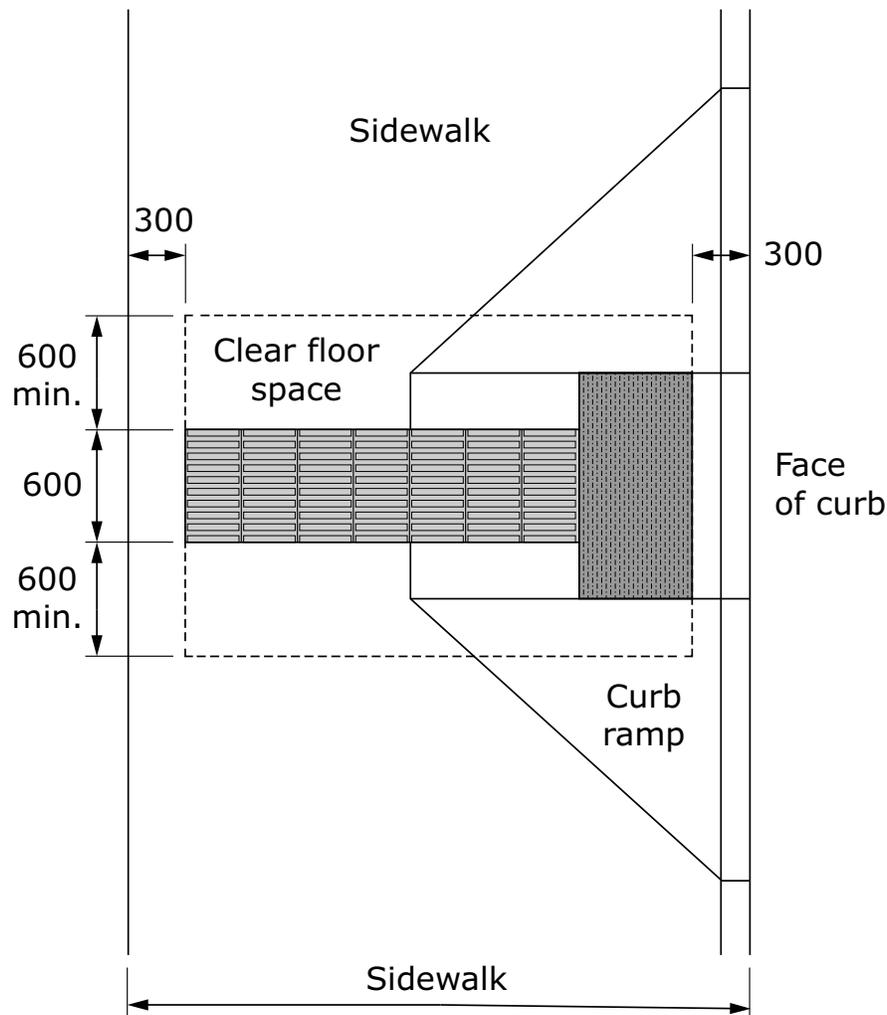
**Figure 7 d)**  
**Tactile directional indicator configurations –**  
**Directional tile in relation to an adjacent element**  
 (See Clause [4.4.5.4.3.](#))



**This figure shows the configuration of a directional tile in relation to an adjacent element (a curb face) with a tactile directional indicator width of 600 mm noted and a minimum of 600 mm of clear floor space on either side of the tactile directional indicator. The tactile directional indicator terminates 300 mm before the curb face.**

**Note:** All dimensions are in mm.

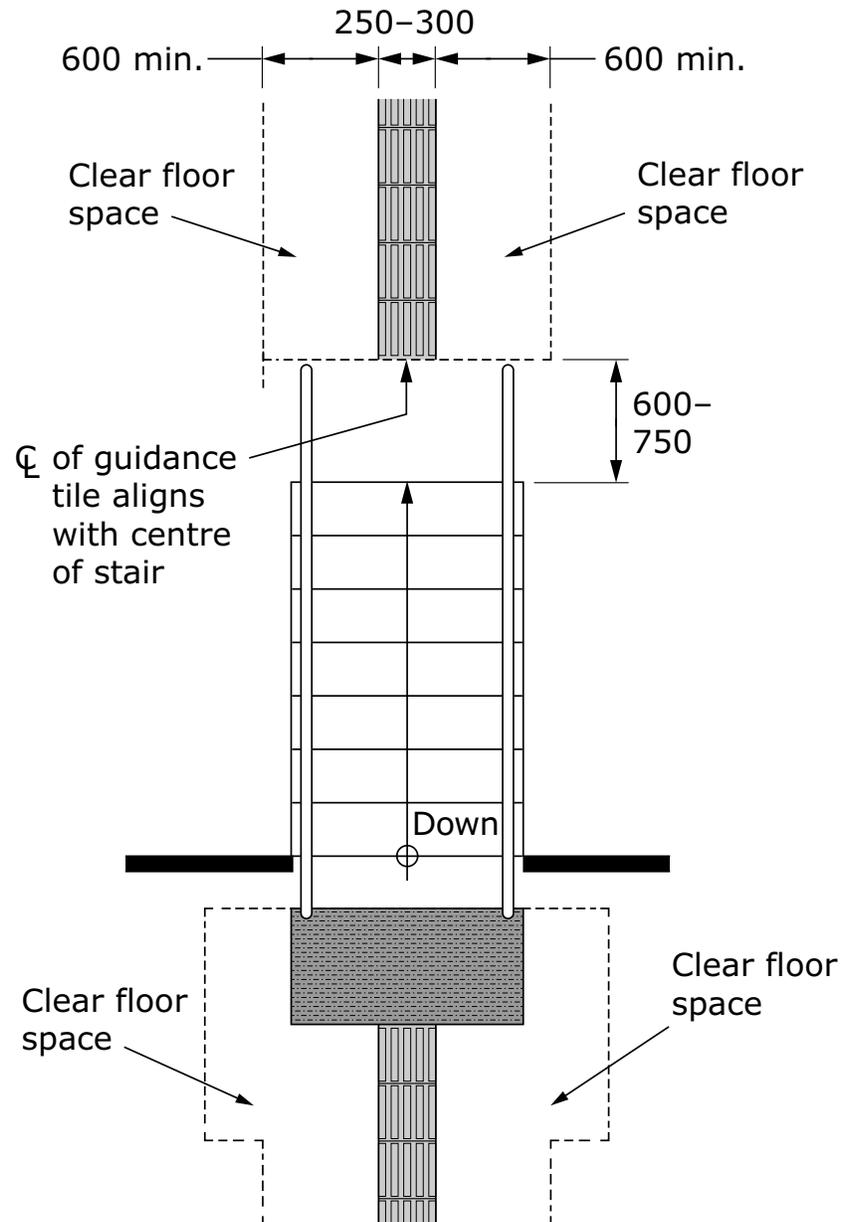
**Figure 7 e)**  
**Tactile directional indicator configurations –**  
**Guidance tile in relation to an adjacent curb ramp**  
 (See Clause [4.4.5.4.3.](#))



**This figure shows the configuration of a guidance tile in relation to an adjacent curb ramp with a tactile direction indicator width of 600 mm noted. The tactile direction indicator begins at the curb ramp tactile attention indicator, continues up the curb ramp, and terminates 300 mm before the back of the sidewalk.**

**Note:** All dimensions are in mm.

**Figure 7 f)**  
**Tactile directional indicator configurations –**  
**Guidance tile at stairs less than 1500 mm wide**  
(See Clause [4.4.5.4.3.](#))



## **Figure 7 f) (Concluded)**

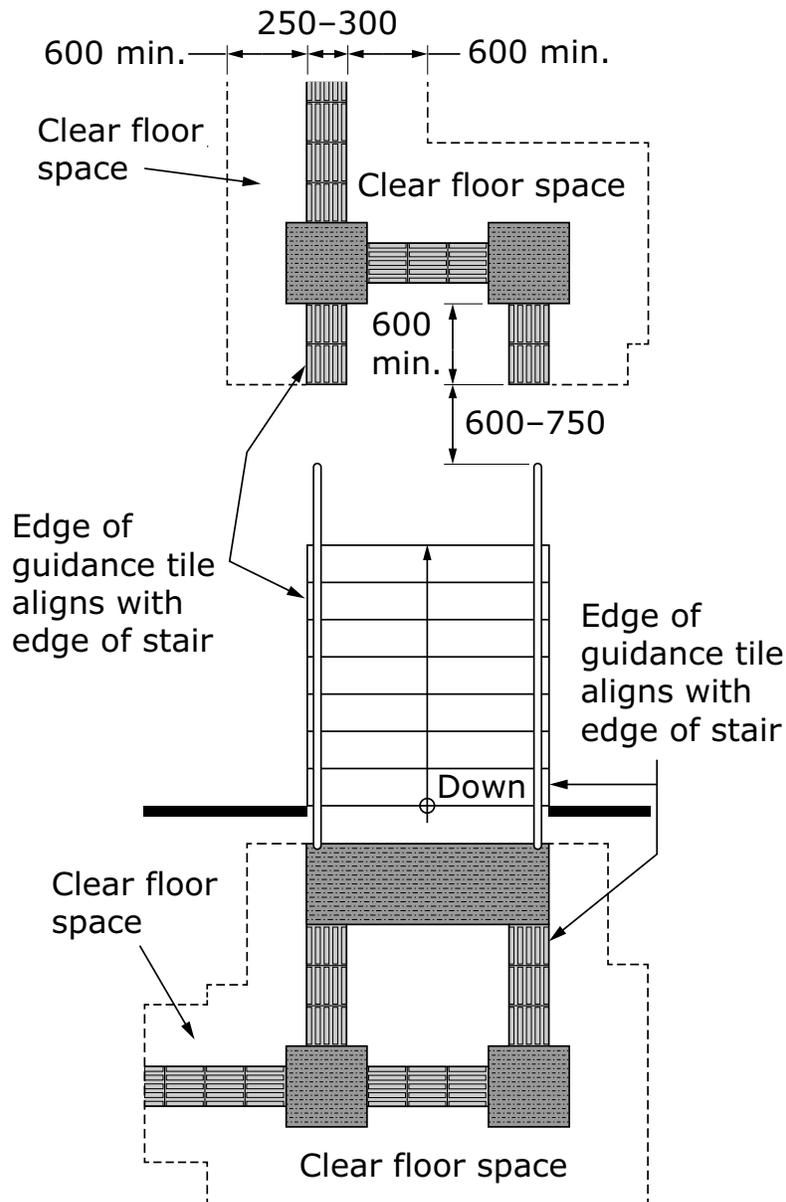
**This figure shows the configuration of a guidance tile at stairs, with a tactile directional indicator width of 250 to 300 mm noted and a minimum of 600 mm of clear floor space on either side of the tactile directional indicator.**

**The tactile directional indicator terminates 600 to 750 mm before the base of the stair and resumes at the top of the stair.**

**Note:** All dimensions are in mm.

**Figure 7 g)**  
**Tactile directional indicator configurations –**  
**Guidance tile approaching stairs more than 1500 mm**  
**wide**

(See Clause [4.4.5.4.3.](#))

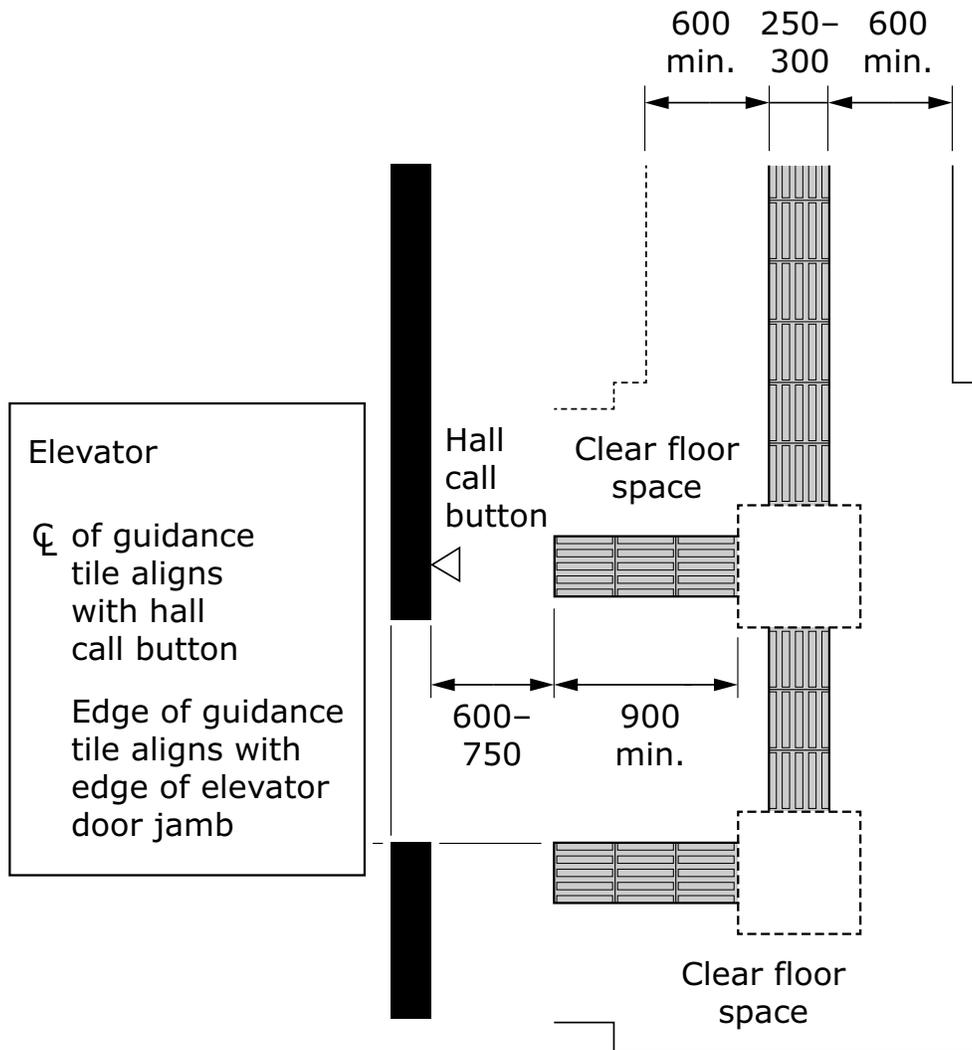


### **Figure 7 g) (Concluded)**

**This figure shows two lines of guidance tile approaching stairs more than 1500 mm wide, with a tactile directional indicator width of 250 to 300 mm noted and a minimum of 600 mm of clear floor space on either side of the tactile directional indicator, and a minimum tactile direction indicator length of 600 mm as it approaches the bottom of a stair. The tactile directional indicator terminates 600 to 750 mm before the base of the stair and resumes at the top of the stair.**

**Note:** All dimensions are in mm.

**Figure 7 h)**  
**Tactile directional indicator configurations –**  
**Guidance tile at an elevator**  
 (See Clause [4.4.5.4.3.](#))



## Figure 7 h) (Concluded)

**This figure shows the configuration of a guidance tile at an elevator, with a tactile directional indicator width of 250 to 300 mm noted and a minimum of 600 mm of clear floor space on either side of the tactile directional indicator. A primary single path of guidance tile runs in parallel to the elevator entrance, with two lines of tactile direction indicators approaching the elevator one line of guidance tile aligns with the hall call button and the other edge of guidance tile aligns with the edge of the elevator door jamb. Transition zones are marked where guidance tiles meet. The tactile directional indicator terminates 600 to 750 mm before the elevator and is a minimum of 900 mm long in approaching the elevator.**

**Note:** All dimensions are in mm.

## 4.5 Headroom and protruding objects

### 4.5.1 Headroom

#### 4.5.1.1 Height

Except at doorways and in storage garages, in pedestrian areas the clear headroom shall be at least 2050 mm from the floor [see Figures [8 a\)](#) and [8 c\)](#)]. In storage garages, the clear headroom shall be not less than 2000 mm.

#### **Notes:**

- 1) While a height of 2050 mm at doorways is preferred, a height of 1980 mm may be used.
- 2) A storage garage is a building or part of a building intended for the parking of motor vehicles. This does not include garages intended for motor vehicle servicing or repair.

#### 4.5.1.2 Headroom reductions

Where the headroom in a pedestrian area is reduced to less than 2050 mm from the floor, a guardrail or other barrier shall

be provided with its leading edge at or below 685 mm from the floor (see Figure [9](#)).

## 4.5.2 Protruding objects

### 4.5.2.1 General

Protruding objects shall not create a hazard or reduce accessibility in the pedestrian area.

#### Notes:

- 1) Pedestrian areas include walkways, halls, corridors, and aisles, as well as open spaces such as lobbies, atria, malls, plazas, or parks.
- 2) Protruding objects are potentially hazardous to people with low or no vision, unless they are located within the detection range of a long white cane. People who use a cane can detect objects if their lowest leading edge is at or below 685 mm from the floor.
- 3) Examples of protruding obstructions include signs (both permanent and temporary), telephone enclosures, drinking fountains, fire extinguishers, or the underside of stairways or escalators (see Figure [9](#)).
- 4) Recessing an object avoids creating a protrusion hazard.

### 4.5.2.2 Headroom maintenance

In pedestrian areas

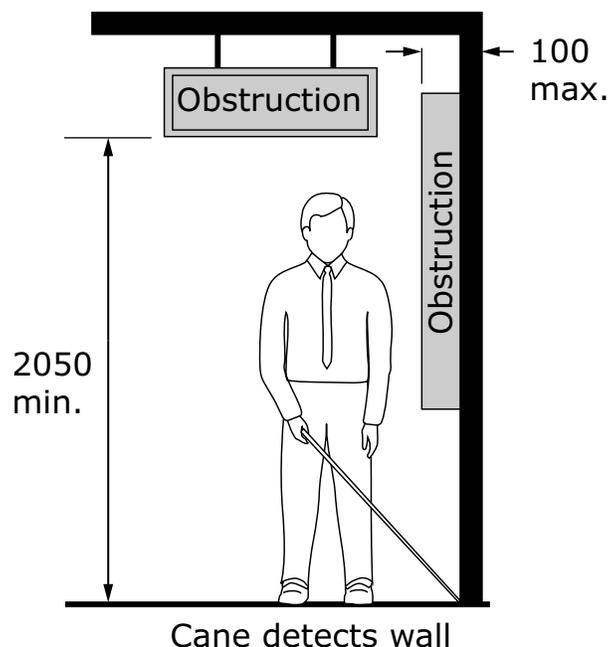
- a) objects attached to or suspended from a ceiling shall have their undersides at a height of at least 2050 mm from the floor; and
- b) objects protruding more than 100 mm from walls, columns, or free-standing supports shall either
  - i) be cane-detectable at or below 685 mm from the floor; or
  - ii) have their undersides at a height of at least 2050 mm from the floor [see Figures [8 a](#)) to [8 d](#))].

### 4.5.2.3 Width maintenance

Protruding objects shall not reduce the clear width required for an accessible route or manoeuvring space [see Figure [8 b](#))].

**Figure 8 a)**  
**Limits of protrusions and obstructions – Less than 100 mm from wall**

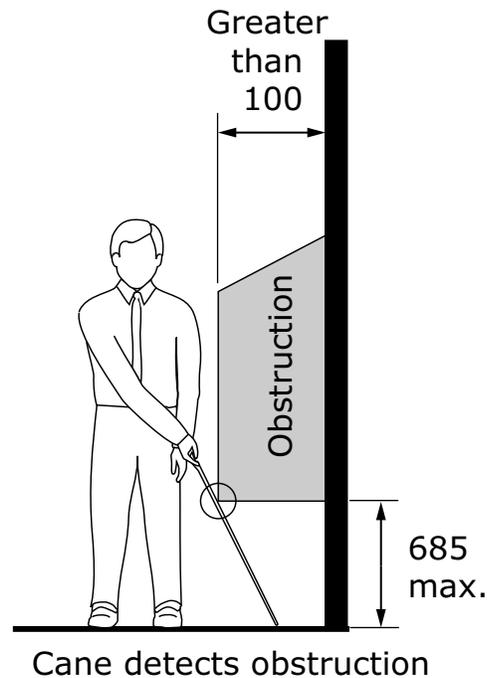
(See Clauses [4.5.1.1](#) and [4.5.2.2](#).)



**This figure shows a person standing under a sign with 2050 mm headroom clearance from the floor. The person also has a cane, which is not contacting an obstruction protruding from the wall; for this type of obstruction, a maximum protrusion of 100 mm is noted.**

**Note:** All dimensions are in mm.

**Figure 8 b)**  
**Limits of protrusions and obstructions – Greater than 100 mm from wall**  
(See Clauses [4.5.2.2](#) and [4.5.2.3](#).)

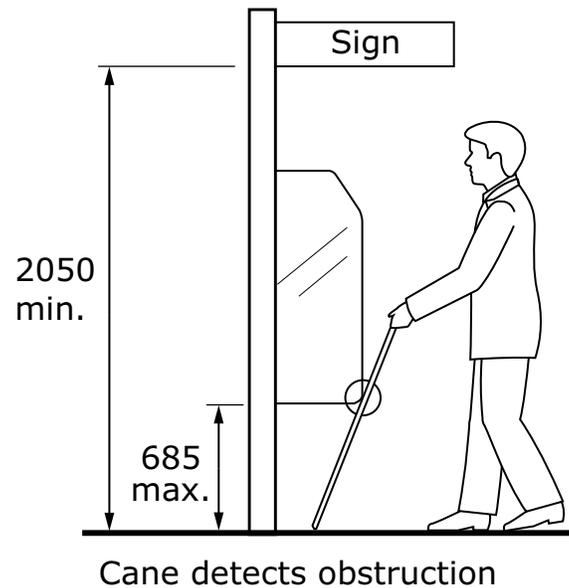


**This figure shows an obstruction that is protruding greater than 100 mm from the wall and is a maximum of 685 mm from the ground. This obstruction is detected by the person with a cane standing beside it.**

**Note:** All dimensions are in mm.

**Figure 8 c)**  
**Limits of protrusions and obstructions — Overhead signs**

(See Clauses [4.5.1.1](#) and [4.5.2.2](#).)

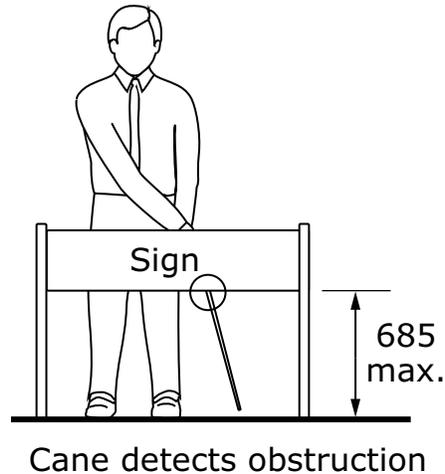


**This figure shows a person with a cane detecting an obstruction a maximum of 685 mm from the ground. A minimum sign height of 2050 mm is listed for signs that are placed outside of the cane's detection range.**

**Note:** All dimensions are in mm.

**Figure 8 d)**  
**Limits of protrusions and obstructions — Ground protrusions**

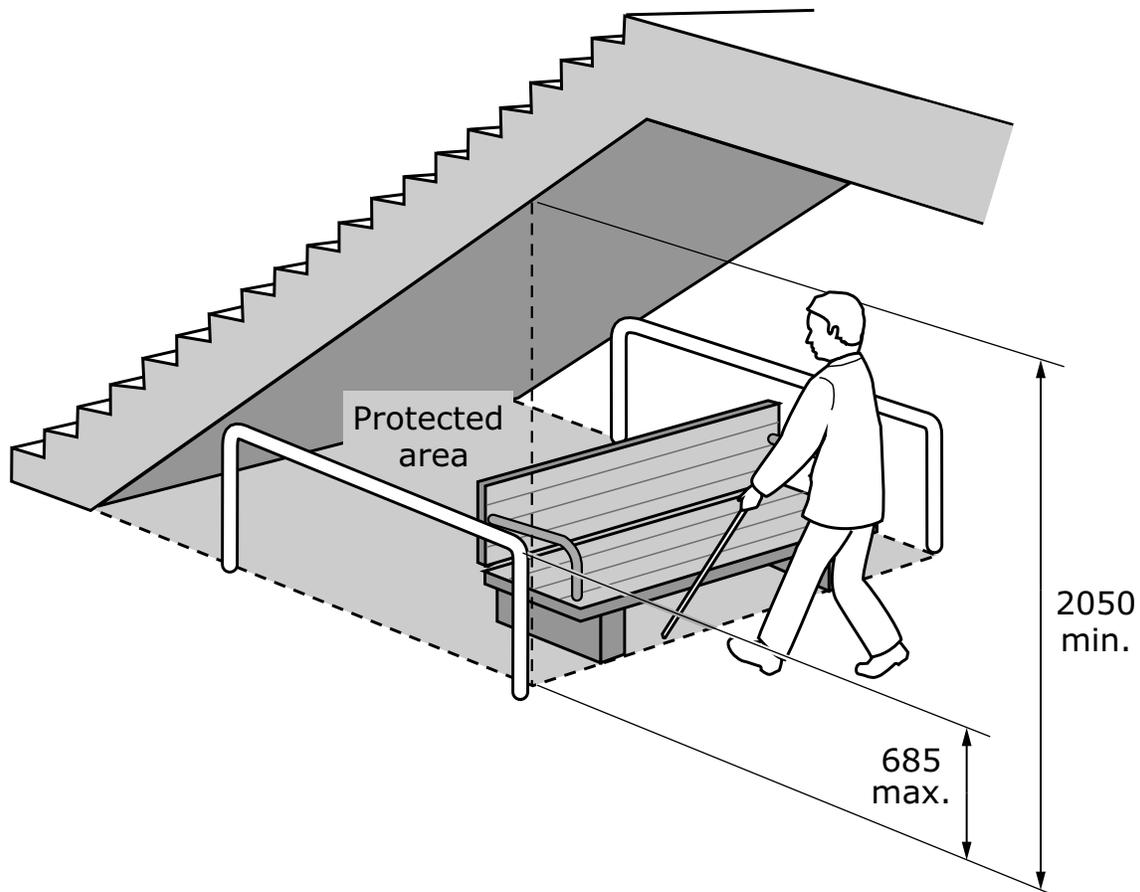
(See Clause [4.5.2.2.](#))



**This figure shows a cane detecting an obstruction of a sign that is 685 mm from the floor.**

**Note:** All dimensions are in mm.

**Figure 9**  
**Overhead hazards**  
(See Clauses [4.5.1.2](#) and [4.5.2.1](#).)



**This figure illustrates an example of protected space related to overhead hazards. The graphic shows a person approaching the underside of a staircase. A protected area is noted under the staircase where the overhead clearance is less than 2050 mm. A barrier with a height of 685 mm is placed on either side of the protected area, and the bench prevents access to the protected area from the front.**

**Note:** All dimensions are in mm.

## 4.6 Signage

### 4.6.1 Location

Where signage, including electronic displays, is provided, it shall be

- a) consistently located; and
- b) positioned to avoid shadow areas and glare.

#### **Notes:**

- 1) In addition to these general signage requirements, specific signage is covered under Clauses [5.7.2](#), [6.6.2](#), and [9.4.4](#).
- 2) Signage, including electronic displays, should be placed at decision-making points along routes of travel, including exits and entrances.
- 3) Consistent locations include height considerations for overhead or wall-mounted signs, as well as uniform placement of identification signs for facilities and services.
- 4) People might have a limitation in moving their head or a reduction in peripheral vision. Signs facing the direction of travel are easiest to notice and read.
- 5) Vertical wording and electronic scrolling signage should be avoided. Where scrolling signage is used, characters and pictograms should move slowly across the screen.

### 4.6.2 Configuration of signs

Where signage, including electronic displays, is provided, it shall

- a) have a glare-free surface;
- b) when used to give the same type of information within the same facility, be consistently shaped, coloured, and positioned; and
- c) be luminance (colour) contrasted with its background.

### 4.6.3 Characters

On signs, letters and numerals shall

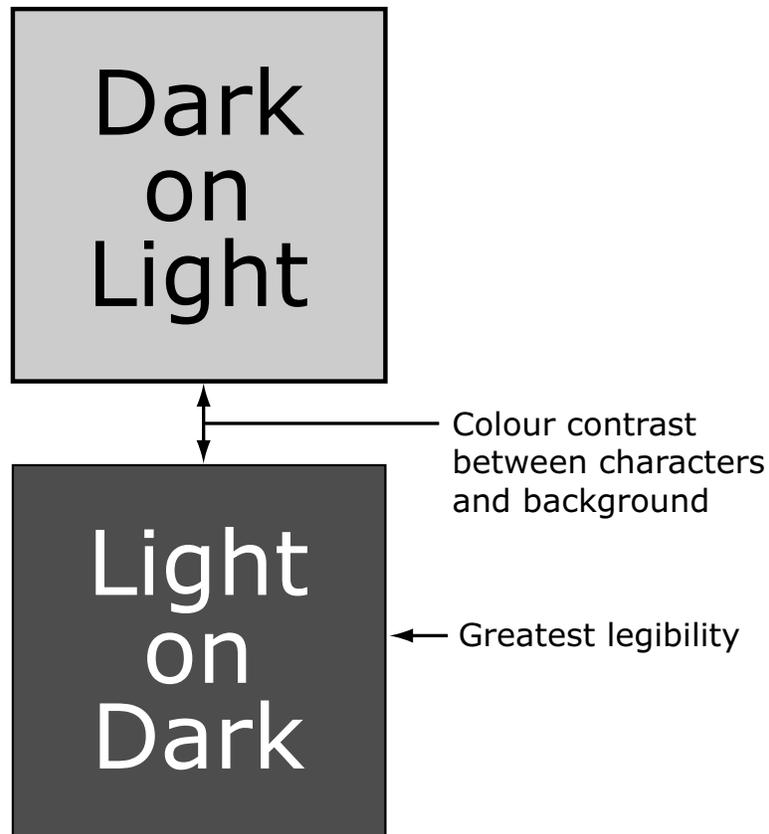
- a) use a sans serif font;

- b) have Arabic numbers;
- c) have a width-to-height ratio between 3:5 and 1:1;
- d) have a stroke-width-to-height ratio between 1:5 and 1:10;
- e) be luminance (colour) contrasted by at least 70% with their background (see Figure [10](#));
- f) have the character height sized relative to the intended viewing distance; and
- g) use an upper case “X” for character measurement.

**Notes:**

- 1) Table [7](#) provides guidance on character heights based on viewing distance.
- 2) Nearsighted people might have to approach much closer to read a sign than those with average visual acuity. Signs at eye level allow people to get closer to the sign.
- 3) Any writing should be at least a 14 pt font size.
- 4) Lowercase lettering is generally easier to read than capital letters. A mixture of uppercase and lowercase letters (e.g., “Canada”) can be more easily read and recognized.
- 5) Where the background colour of a sign does not contrast significantly with the surrounding surface, a contrasting border should be used around the sign.
- 6) Illuminated signs with letters such as red, green, or blue should not be used on a black background.
- 7) Examples of colours that contrast more than 70% are navy blue with matte white (95%), apple green with white (72%), and silver with saddle brown (70%).
- 8) Colour combinations that should be avoided include yellow/grey, white/grey, yellow/white, blue/green, red/green, black/violet, and red/black.

**Figure 10**  
**Legibility of printed characters**  
(See Clauses [4.6.3](#) and [6.1.5](#).)



**This figure demonstrates how letters and numerals are to be printed on signs to ensure the text colour is contrasted with its background for legibility. The greatest legibility is shown using a sign with a dark background (e.g., dark grey) and light-coloured text (e.g., white).**

**Table 7**  
**Character height relative to viewing distance**  
 (See Clause [4.6.3.](#))

This table lists the minimum character heights based on the maximum viewing distance.

<b>Minimum character height, mm</b>	<b>Maximum viewing distance, mm</b>
25	750
50	1500
75	2250
100	3000
150	4500
200	6000
250	7500
300	9000

#### **4.6.4 Pictograms and symbols**

Pictograms and symbols shall be luminance (colour) contrasted by at least 70% with their background.

#### **4.6.5 Illumination**

The level of illumination on signs shall be at least 200 lx.

#### **4.6.6 Tactile signs**

##### **4.6.6.1 General**

Tactile markings shall

- a) supplement the text of regulatory signs, such as prohibition and mandatory signs;

- b) supplement the text of warning signs, such as caution and danger signs;
- c) supplement the text of identification signs, such as rooms, titles, names, or numbers;
- d) include the capital braille character, and the “all-capital” braille characters where appropriate; and
- e) be placed near the bottom edge of the sign.

Uncontracted braille shall be used for signs that have 10 words or less, and contracted braille for signs with more than 10 words.

**Notes:**

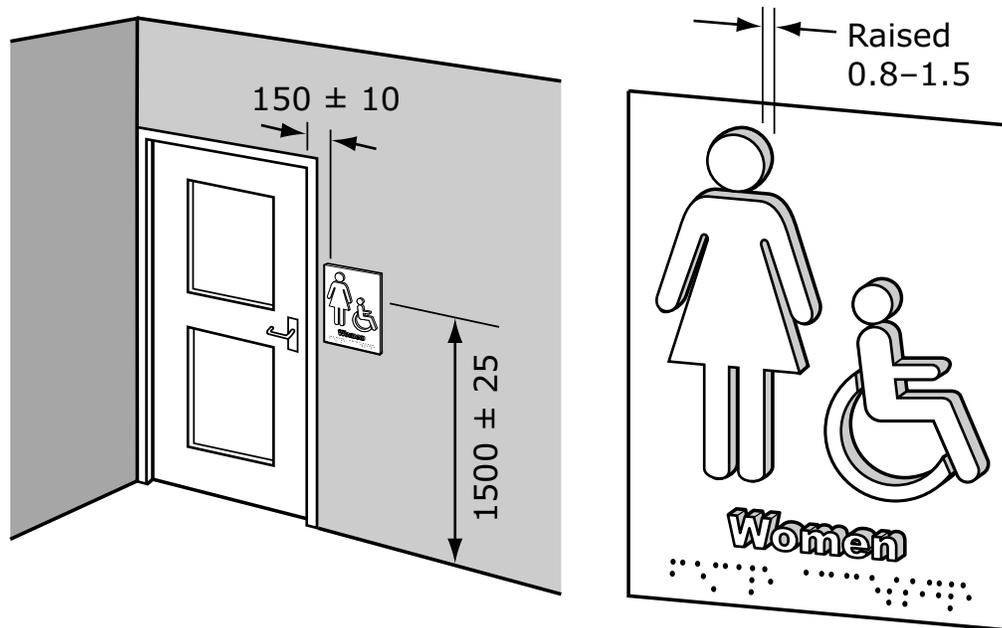
- 1) Prohibition signs denote an order forbidding an action, while mandatory signs denote an order requiring an action.
- 2) Caution signs denote a potential hazard, while danger signs denote a definite hazard.
- 3) Identification signs denote general orientation or specific information (e.g., at washrooms, routes of egress, stairwells, doorways, or offices).
- 4) Overhead signs do not have to be tactile since they cannot be reached for touching.
- 5) Alternative forms of communication can be considered, specifically for extensive information and guidance that might be issued by an individual enterprise or authority.

#### **4.6.6.2 Tactile characters**

On tactile signs, letters and numerals shall be

- a) raised between 0.8 and 1.5 mm above the surface (see Figure [11](#));
- b) sans serif;
- c) 16 to 50 mm in height;
- d) accompanied by braille near the bottom edge of the sign; and
- e) luminance (colour) contrasted with their background by at least 70%.

**Figure 11**  
**Location and size of tactile signs**  
 (See Clauses [4.6.6.2](#) to [4.6.6.4](#).)



**This figure demonstrates the location and size of a tactile sign. The graphic shows a washroom sign placed  $150 \pm 10$  mm from the outer edge of a door frame, on the latch side, and  $1500 \pm 25$  mm from the floor. The washroom sign is provided with a raised gender pictogram and raised International Pictogram of Access, both of which protrude 0.8 mm to 1.5 mm. Under the pictograms is raised text indicating a women's gendered bathroom and beneath that text is the braille.**

**Note:** All dimensions are in mm.

#### **4.6.6.3 Pictograms and symbols**

On tactile signs, pictograms and symbols shall be

- a) raised between 0.8 and 1.5 mm above the surface;
- b) at least 150 mm in height; and

- c) luminance (colour) contrasted with their background by at least 70%.

**Note:** If a sign includes both tactile characters and a pictogram, then the accompanying braille for both may be placed below the tactile characters and pictogram as shown in the example in Figure [11](#).

#### **4.6.6.4 Location of tactile signs**

A tactile sign shall

- a) if used to identify a door, be mounted on the wall beside the latch edge of the door;
- b) where applicable, have the leading vertical edge  $150 \pm 10$  mm from the door jamb (see Figure [11](#));
- c) where double-leaf doors are used or no wall space adjoins the door's latch edge, be mounted on the nearest adjacent wall;
- d) allow a person to approach the sign to within 100 mm without encountering protruding objects or standing within a door swing;
- e) be mounted with the horizontal centreline  $1500 \pm 25$  mm from the floor; and
- f) have a clear wall area around the sign at least 75 mm.

#### **4.6.7 Pictogram of accessibility**

Where a facility or its elements are required to be identified as accessible, the International Pictogram of Access shall be used [see Figures [12 a](#)), [12 b](#)), and [13](#)].

**Figure 12 a)**  
**International Pictogram of Access – Updated**  
(See Clauses [0.2](#), [4.6.7](#), [5.2.3](#), [5.2.9.3](#), [6.3.1.1](#), and [9.4.4.1](#)  
to [9.4.4.3](#).)



**This figure shows the updated International Pictogram of Access, an outline of a person in a wheeled mobility device.**

**Note:** ISO 7001 has updated the International Pictogram of Access to be more representative of the human form. Either pictogram in Figure [12 a\)](#) or [12 b\)](#) can be used.

**Figure 12 b)**  
**International Pictogram of Access – Traditional**  
(See Clauses [0.2](#), [4.6.7](#), [5.2.3](#), [5.2.9.3](#), [6.3.1.1](#), and [9.4.4.1](#)  
to [9.4.4.3](#).)



**This figure shows the traditional International Pictogram of Access, an outline of a person in a wheeled mobility device.**

**Figure 13**  
**Examples of service identification signs**  
**incorporating the International Pictogram of Access**  
(See Clauses [4.6.7](#) and [6.3.1.1.](#))



**This figure shows four examples of service identification signs incorporating the International Pictogram of Access. Gendered male, gendered female, and all-gender washroom signs are shown in addition to a payphone indicator sign. The ungendered washroom sign displays a toilet in profile.**

## 4.7 Additional considerations

### 4.7.1 Functional and cognitive barriers

Environments should be designed to reduce functional or cognitive barriers by

- a) designing spaces with simple and logical layouts;
- b) ensuring designs include consistent features throughout (e.g., washrooms located in the same place on each floor, signage having a consistent design throughout);
- c) implementing good acoustical design measures throughout spaces to avoid excessive noise interferences;
- d) implementing improved lighting throughout exterior and interior spaces (e.g., evenly distributed lighting along corridors, task or adjustable lighting in workspaces);
- e) providing air circulation and adjustable zoned thermostats; and
- f) ensuring information is accessible to everyone in various formats.

**Note:** Refer to the Universal Design Principles (see Clause [0.1](#)) to help ensure the overall design of an exterior or interior environment is accessible to the greatest number of people.

### 4.7.2 Environmental intolerances

Construction, furnishing, or decorative materials should not give off gases that affect the quality of indoor air. Contaminants such as gases, dust, and volatile organic compounds should be minimized. Adequate ventilation (natural and mechanical) should be provided at the level needed to dilute any contaminants and provide fresh air to the occupants.

### 4.7.3 Acoustics

All environments should be designed for sound control, both to

provide auditory cues where needed and to minimize distracting or disorienting sounds such as echoes.

**Notes:**

- 1) Acoustics play an important role in accessible design, since they can distort or enhance verbal information, as well as provide auditory information cues. For example, the careful application of sound insulation and absorbing materials on ceilings, walls, and floors is important in many settings (e.g., workplaces, entertainment, transportation, shopping, dining).
- 2) As a contrast to this, appropriate auditory cues along circulation routes and at destination points serve as useful wayfinding clues, especially for people who rely upon hearing to orient themselves.
- 3) Loud music in public environments could cause distractions, create communication barriers, and be damaging to hearing.

## **5 Interior circulation**

### **5.1 Accessible routes**

#### **5.1.1 Width**

The clear width of accessible routes shall be at least 1200 mm with the following exceptions:

- a) For short restrictions in width up to 600 mm in length, it shall be at least 860 mm [see Figure [14 a](#)].
- b) For doorways, it shall be at least 860 mm (see Clause [5.2](#)).
- c) For U-turns around an obstacle, it shall be at least 1200 mm (see Figure [16](#)).
- d) An accessible path of travel that is more than 24 m long shall have a manoeuvring zone at least 1800 mm wide for a length of 1800 mm at intervals not exceeding 24 m [see Figure [14 b](#)].
- e) For checkout lanes, the minimum width should be 1000 mm (see Figure [15](#)).

### 5.1.2 Accessible route termination

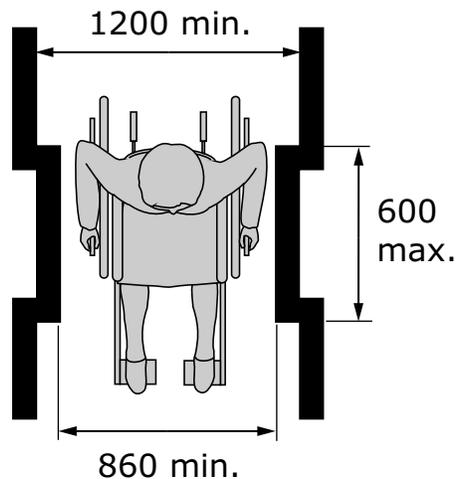
Where an accessible route terminates, there shall be at the end

- a) a clear floor space that is not less than
  - i) 2100 mm in diameter; or
  - ii) 1700 mm wide by 1500 mm long; or
- b) a T-shaped area with overall dimensions measuring a minimum of 1800 mm wide by 1500 mm long, where the two arms of the "T" are not less than 1200 mm wide and extend not less than 300 mm from each side of the shaft of the "T", and the shaft is not less than 1200 mm wide for a distance of 1500 mm (see Figure [17](#)).

#### Notes:

- 1) Routes should be at least 1800 mm wide to allow mobility device users to pass [see Figure [14 b](#)].
- 2) In a route around an obstacle, cutting the corners of the obstacle will provide additional manoeuvring space (see Figure [16](#)).

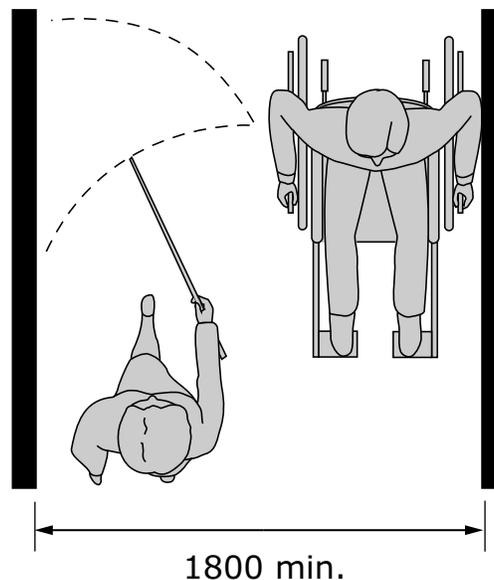
**Figure 14 a)**  
**Width of interior accessible routes – Manoeuvring a pathway with a temporarily reduced width**  
(See Clause [5.1.1.](#))



**This figure shows a person in a wheeled mobility device manoeuvring through a pathway with a temporarily reduced width. A standard pathway width of 1200 mm is noted with a reduced pathway width of 860 mm through the pinch point area, which has a maximum length of 600 mm.**

**Note:** All dimensions are in mm.

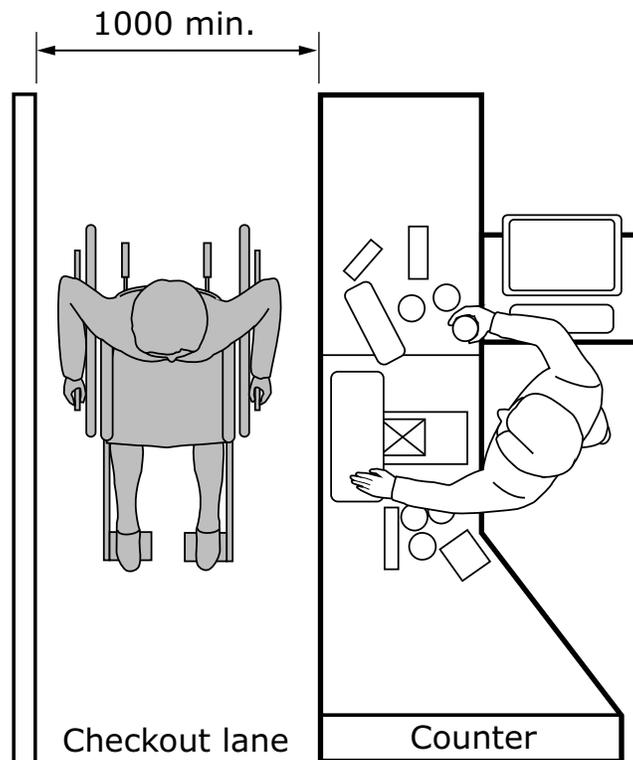
**Figure 14 b)**  
**Width of interior accessible routes — Passing width**  
(See Clauses [5.1.1](#) and [5.1.2](#).)



**This figure shows a person with a cane walking past a person in a wheeled mobility device along an accessible route that is a minimum of 1800 mm wide, which allows both mobility device users to pass.**

**Note:** All dimensions are in mm.

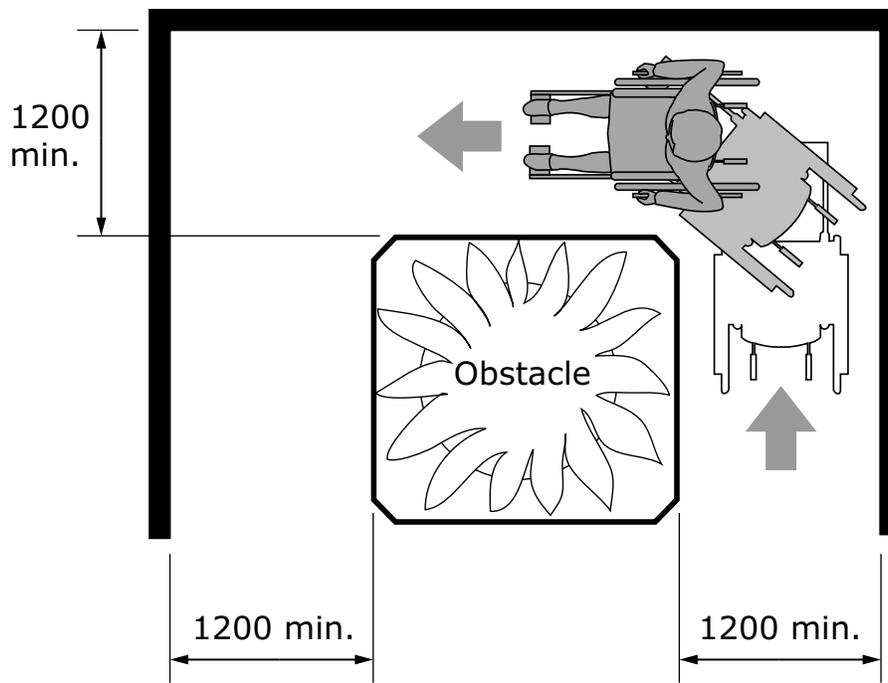
**Figure 15**  
**Width of accessible checkout lanes**  
(See Clause [5.1.1.](#))



**This figure demonstrates the minimum clear width of an accessible checkout lane of 1000 mm. In this example, the graphic shows a person with a wheeled mobility device manoeuvring past the checkout counter through the checkout lane.**

**Note:** All dimensions are in mm.

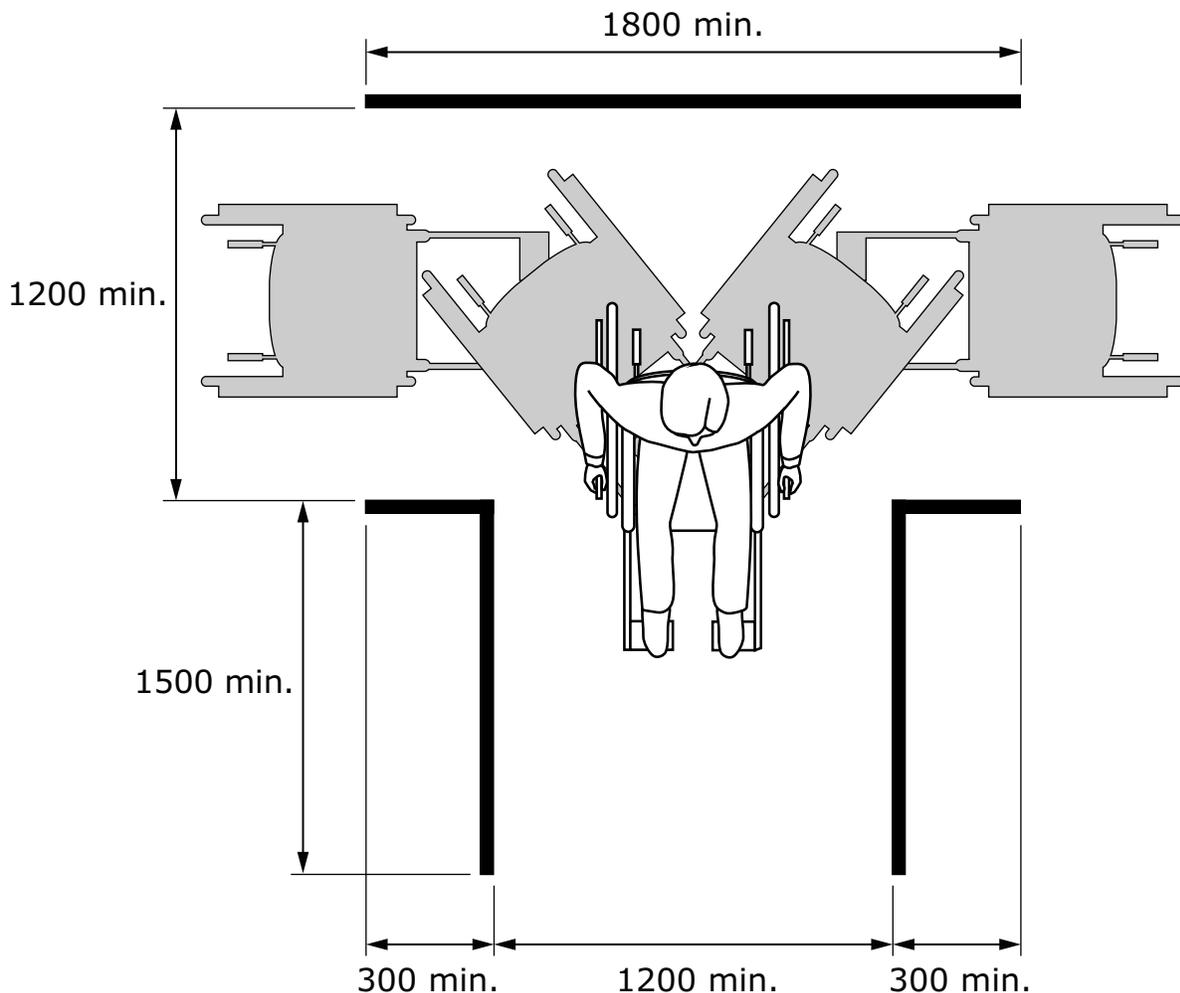
**Figure 16**  
**Width of accessible route around an obstacle**  
(See Clauses [5.1.1](#) and [5.1.2](#).)



**This figure shows a 1200 mm minimum accessible U-turn route around an obstacle.**

**Note:** All dimensions are in mm.

**Figure 17**  
**Dimensions of a T-turn in an accessible route**  
(See Clause [5.1.1.](#))



**This figure shows the dimensions of a T-turn in an accessible route. The graphic shows a person in a wheeled mobility device performing a t-turn. The primary hallway where the person is travelling has minimum dimensions of 1200 mm width by 1800 mm length. The side hallway utilized in the turn has a minimum width of 1200 mm and depth of 300 mm.**

**Note:** All dimensions are in mm.

### 5.1.3 Slope

Accessible routes shall

- a) have a running slope not exceeding the ratio of 1:20 (5%);
- b) where necessary for a slope to exceed the ratio of 1:20 (5%), be designed as
  - i) a ramp complying with Clause [5.5](#); or
  - ii) a curb ramp, where accessing a vehicular path of travel, complying with Clause [8.3.3](#); and
- c) have a cross slope not exceeding the ratio of 1:50 (2%).

### 5.1.4 Lineup guides

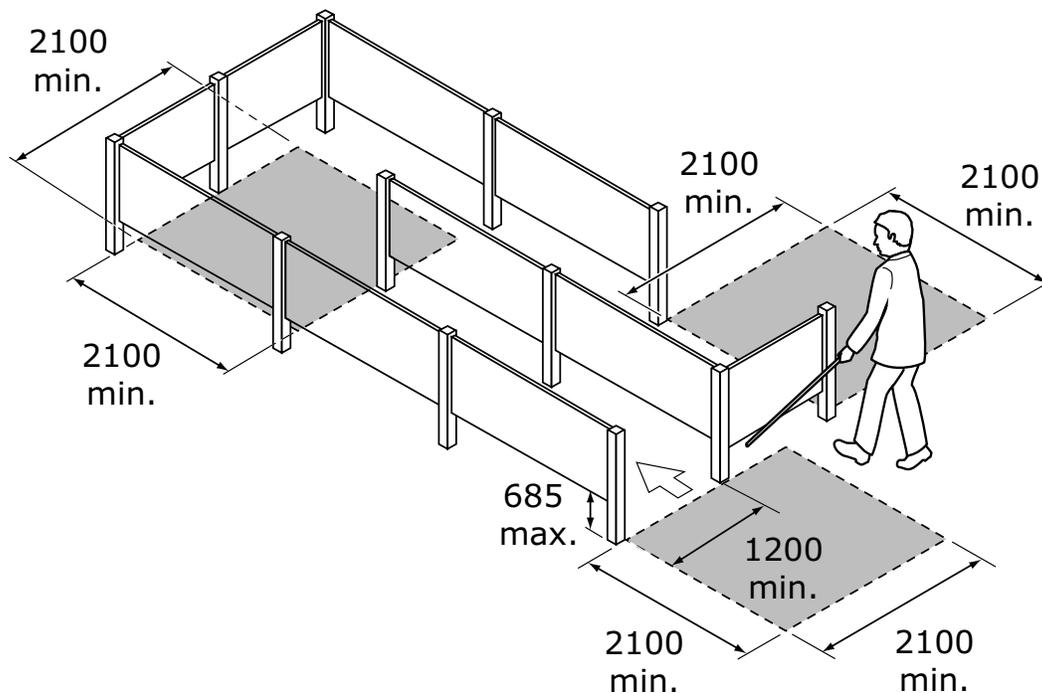
Lineup guides shall

- a) be separated by a clear width of at least 1200 mm (see Figure [18](#));
- b) have a clear floor area of at least 2100 by 2100 mm where lineups change direction and where they begin and end;
- c) be cane-detectable at or below 685 mm from the floor;
- d) be stable and not move easily;
- e) be luminance (colour) contrasted with their surroundings; and
- f) have a glare-free finish.

#### Notes:

- 1) The floor area dimensions are intended to provide adequate manoeuvring space throughout the lineup process.
- 2) A floor surface that is texture- and luminance (colour) contrasted with the surrounding surface can help to define the lineup area.
- 3) To create a more accessible environment for those who are unable to stand for long periods of time, seating near lineup locations should be provided.

**Figure 18**  
**Lineup area**  
 (See Clause [5.1.4.](#))



**This figure shows the required dimensions for lineup areas with handrails. The graphic shows a person with a cane approaching a lineup area with a minimum width between handrails of 1200 mm. Entrances, exits, and turns along the path have a minimum length and width of 2100 mm.**

**Note:** All dimensions are in mm.

### 5.1.5 Safety

Accessible routes, including accessible egress routes, shall

- have walking surfaces that comply with Clause [4.4](#);
- comply with Clause [4.5](#) for headroom where protrusions exist;
- comply with Clause [5.3](#) where handrails are provided; and

d) be kept unobstructed and comply with Clause [4.5.2.3](#).

**Notes:**

- 1) Walls at the end of corridors should be contrasted in colour or brightness with the other walls and floor. Where windows are located at the end of a corridor, means should be used to minimize glare.
- 2) Convex mirrors should be installed near the ceiling at all hallway intersections for viewing oncoming pedestrians.

## 5.2 Doors and doorways

### 5.2.1 Opening width

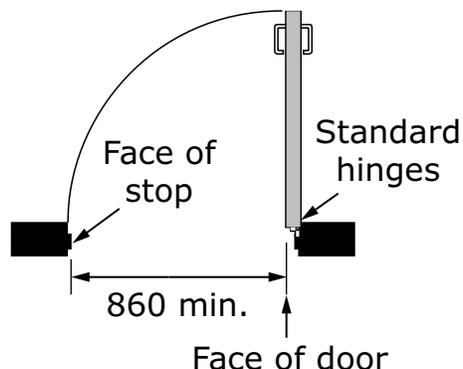
The clear opening width of a doorway shall be at least 860 mm

- a) for swinging doors, when measured between the face of the door or the panic hardware and the face of the stop with the door open 90° [see Figures [19 a\)](#) to [19 c\)](#)]; and
- b) for sliding doors, when measured between the edge of the open door and the door frame [see Figure [19 d\)](#)].

**Notes:**

- 1) Doors and door frames that luminance (colour) contrast with their background and each other enable people to locate the door more easily.
- 2) In a typical installation, a swinging door with a width of 965 mm would be needed to achieve this clearance.
- 3) In existing buildings, swing-clear hinges can often be used to increase the clear opening without enlarging the frame [see Figure [19 b\)](#)]. When open, such hinges move the door behind its frame, thereby increasing the clear opening width.

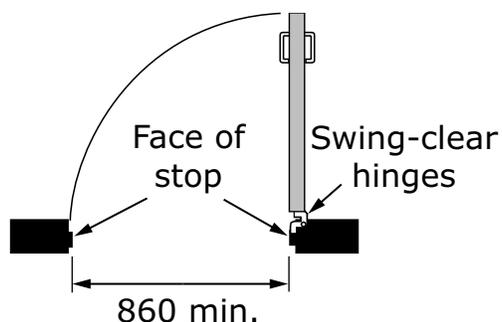
**Figure 19 a)**  
**Clear opening width of doorway – Standard hinges**  
(See Clause [5.2.1.](#))



**This figure shows an 860 mm opening width of a doorway between the face of stop and the face of the swinging door that is open 90°.**

**Note:** All dimensions are in mm.

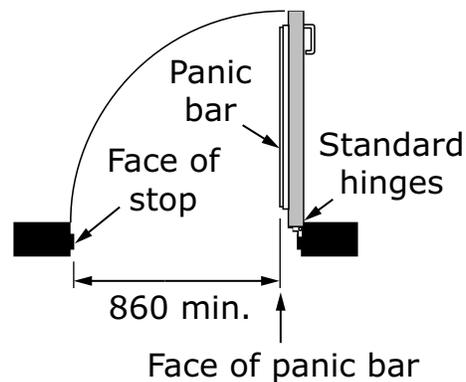
**Figure 19 b)**  
**Clear opening width of doorway – Swing-clear hinges**  
(See Clause [5.2.1.](#))



**This figure shows an 860 mm opening width of a doorway in between two stops for a swinging door with swing clear hinges that is open 90°.**

**Note:** All dimensions are in mm.

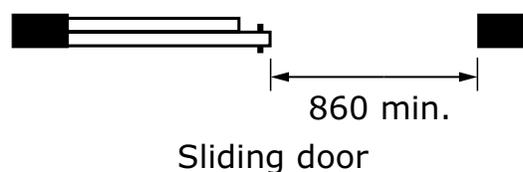
**Figure 19 c)**  
**Clear opening width of doorway – Standard hinges with panic bar**  
 (See Clause [5.2.1.](#))



**This figure shows an 860 mm opening width of a doorway between the face of stop and the face of panic bar for a swinging door that is open 90°.**

**Note:** All dimensions are in mm.

**Figure 19 d)**  
**Clear opening width of doorway – Sliding doors**  
 (See Clause [5.2.1.](#))



**This figure shows an 860 mm opening width of a doorway for sliding doors with the clear opening width of the doorway between the edge of the open door and the door frame.**

**Note:** All dimensions are in mm.

## 5.2.2 Manoeuvring area at doors

Doorways shall have

- a) a level manoeuvring area on the push and pull sides of a door;
- b) except on the inside of a closet, a clear floor area beside the latch edge (that extends the full height of the door) complying with Table 8 [see Figures 20 a) and 20 b)]; and
- c) the width of the clear floor area (as specified in Table 8), measured from the inside of the door frame.

### Notes:

- 1) The additional floor area at the latch edge of the door is needed so that a person in a wheeled mobility device or with a service animal can approach the door, activate the door handle, swing the door open, and pass through it without having to back up while opening the door.
- 2) Where a door leads to a ramp landing, an additional area might be needed (see Clause 5.5).
- 3) The dimensions specified in Table 8 are for all wheeled mobility devices.

**Table 8**  
**Manoeuvring area at doors**  
 (See Clause [5.2.2](#) and Figures [20 a](#)) to [20 d](#).)

This table lists the clear floor area dimensions required for maneuvering at swinging doors and sliding doors.

<b>Building element</b>	<b>Clear floor area depth required (from approach direction), mm</b>	<b>Clear floor area width required (from approach direction), mm</b>	<b>Distance from door opening measured at the latch edge, mm</b>
<b>Swinging door</b>			
Front approach [see Figure <a href="#">20 a</a> )]			
Pull side	1500	1700	600
Push side	1390	1200	300
Latch edge approach [see Figure <a href="#">20 b</a> )]			
Pull side	1500	1200	600
Push side	1500	1050	600
Hinge edge approach			

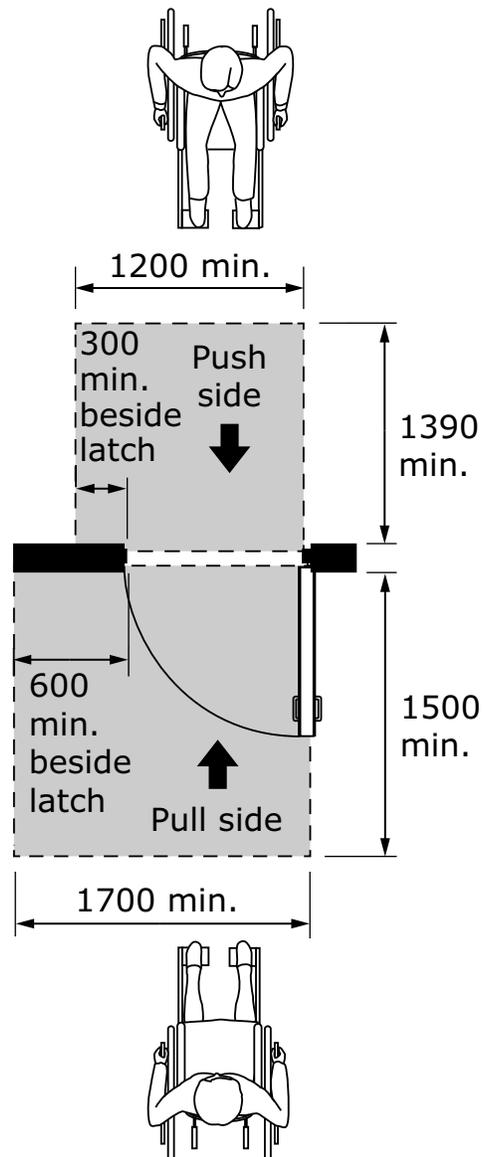
(Continued)

**Table 8 (Concluded)**

<b>Building element</b>	<b>Clear floor area depth required (from approach direction), mm</b>	<b>Clear floor area width required (from approach direction), mm</b>	<b>Distance from door opening measured at the latch edge, mm</b>
[see Figure <a href="#">20 c</a> ]			
Pull side	1500	1800	600
Push side	1500	1050	600
<b>Sliding door</b> [see Figure <a href="#">20 d</a> ]			
Pull side	1390	1200	300
Push side	1100	1390	600

—

**Figure 20 a)**  
**Manoeuvring area at doors — Front approach at**  
**swinging door**  
(See Clause [5.2.2](#) and Table [8](#).)

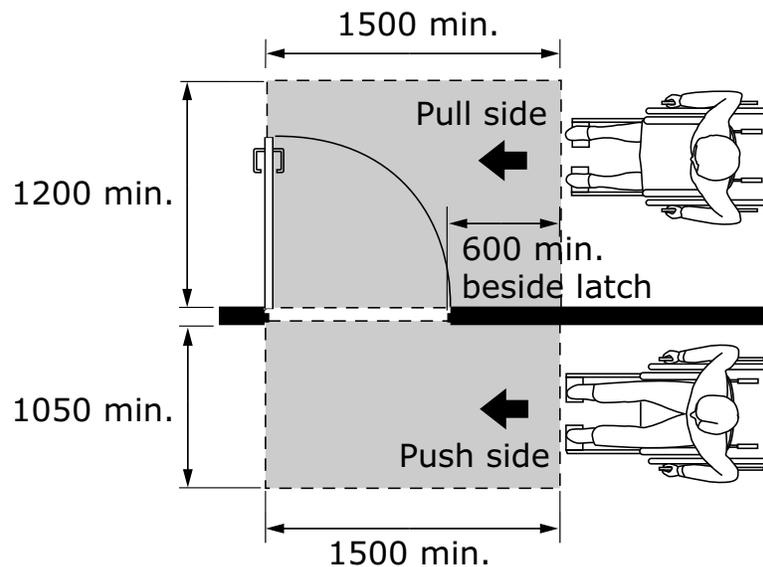


## **Figure 20 a) (Concluded)**

**This figure shows the minimum required dimensions for a mobility device user to manoeuvre at doors. It shows a front approach at a swinging door. The graphic shows a person in a wheeled mobility device approaching the push side of the door. A minimum clear floor area 1200 mm wide by 1390 mm deep is denoted in front of the door with a minimum of 300 mm clear floor beside the door latch. A person in a wheeled mobility device is also shown approaching the pull side of the door. To account for door swing, a minimum clear floor area 1700 mm wide by 1500 mm deep is denoted in front of the door with a minimum of 600 mm clear floor beside the door latch.**

**Note:** All dimensions are in mm.

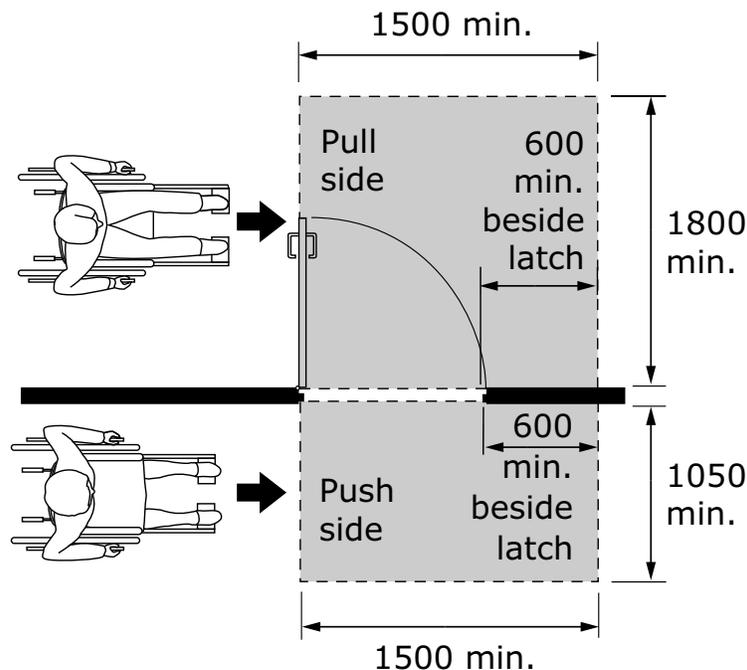
**Figure 20 b)**  
**Manoeuvring area at doors – Latch edge approach at swinging door**  
(See Clause [5.2.2](#) and Table [8](#).)



**This figure shows the minimum required dimensions for a mobility device user to manoeuvre at doors. It shows a latch edge approach at a swinging door. The graphic shows a person in a wheeled mobility device approaching the pull side of the door. On the pull side, a minimum clear floor area 1500 mm wide by 1200 mm deep is denoted in front of the door. The graphic also shows a person in a wheeled mobility device approaching the push side of the door. On the push side, a minimum clear floor area 1500 mm wide by 1050 mm deep is denoted in front of the door with a minimum of 600 mm clear floor beside the door latch.**

**Note:** All dimensions are in mm.

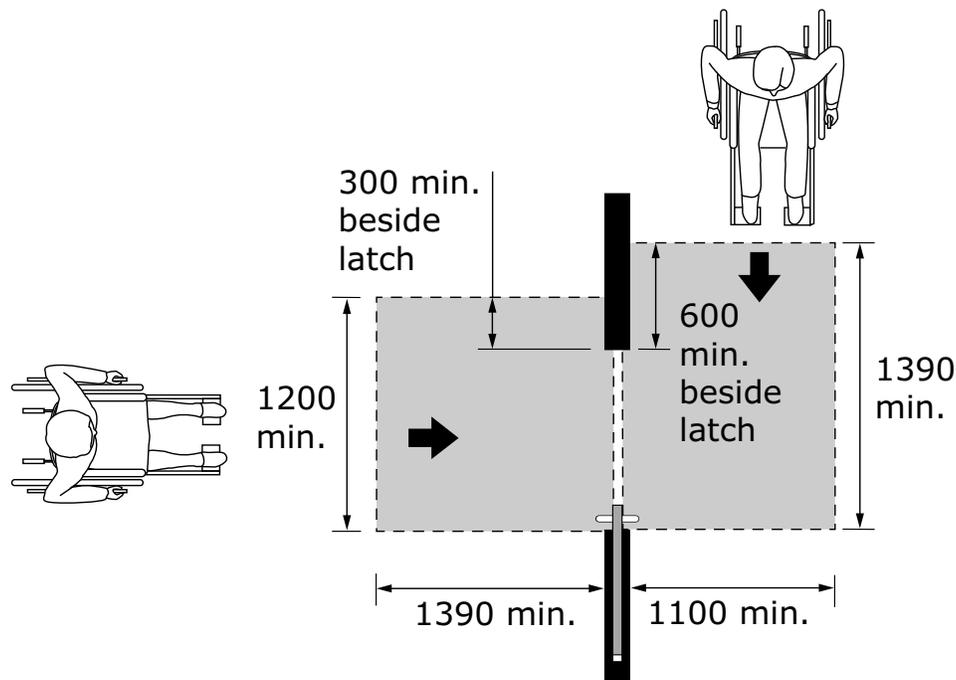
**Figure 20 c)**  
**Manoeuvring area at doors – Hinge edge approach**  
**at swinging door**  
 (See Clause [5.2.2](#) and Table [8](#).)



**This figure shows the minimum required dimensions for a mobility device user to manoeuvre at doors. It shows a hinge edge approach at a swing door. The graphic shows a person in a wheeled mobility device approaching the pull side of the door. On the pull side, a minimum clear floor area 1500 mm wide by 1800 mm deep is denoted in front of the door. The graphic also shows a person in a wheeled mobility device approaching the push side of the door. On the push side, a minimum clear floor area 1500 mm wide by 1050 mm deep is denoted in front of the door. On both sides of the door, a minimum of 600 mm clear floor area beside the door latch is shown.**

**Note:** All dimensions are in mm.

**Figure 20 d)**  
**Manoeuvring area at doors — Approaching a sliding door from the front and side**  
 (See Clause [5.2.2](#) and Table [8](#).)



**This figure shows the minimum required dimensions for a mobility device user to manoeuvre at doors. It shows people in wheeled mobility devices approaching a sliding door from the front and side. When approaching a sliding door from the front, a minimum clear floor area 1200 mm wide by 1390 mm deep is denoted in front of the door, with a minimum clear floor area of 300 mm beside the latch. When approaching the sliding door from the side, a minimum clear floor area 1100 mm wide by 1390 mm deep is denoted in front of the door, with a minimum clear floor area of 600 mm beside the latch.**

**Note:** All dimensions are in mm.

### 5.2.3 Multiple-leaf doorways

If a doorway has more than one independently operated leaf, at least one active leaf shall

- a) comply with Clauses [5.2.1](#) and [5.2.2](#); and
- b) where only one door is accessible in a bank of doors, be identified by the International Pictogram of Access [see Figures [12 a\)](#) and [12 b\)](#)].

#### Notes:

- 1) In double doors, the use of a centre post should be avoided.
- 2) All doors should be accessible.

### 5.2.4 Revolving doors

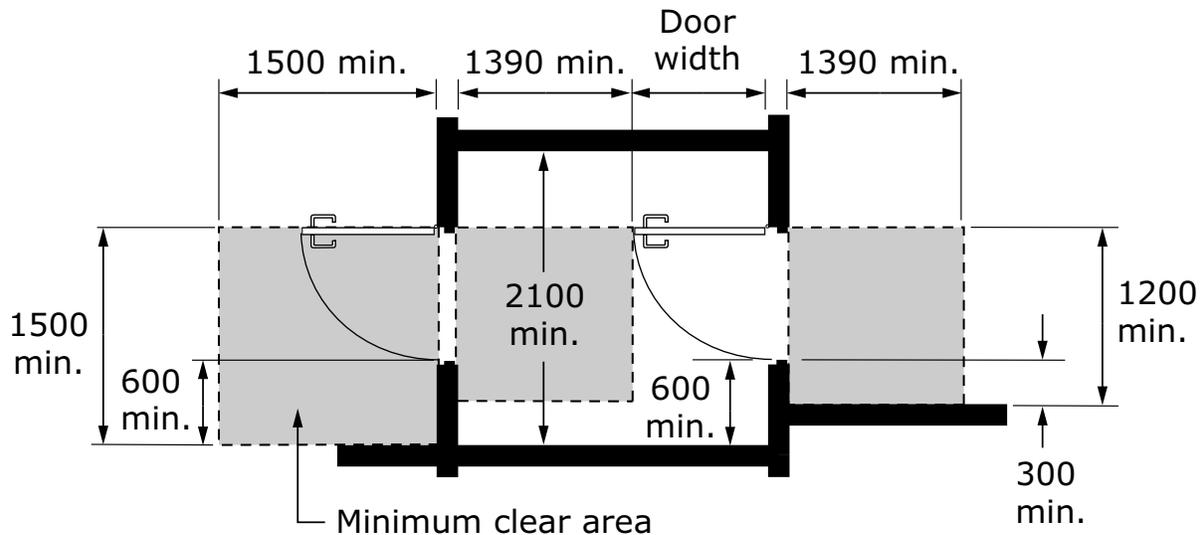
Where a revolving door is used, an adjacent door shall be provided that complies with Clauses [5.2.1](#) and [5.2.2](#).

### 5.2.5 Two doors in series

Two swinging doors in series shall have

- a) a distance between the doors of at least 1390 mm plus the width of any door swinging into the space [see Figures [21 a\)](#) and [21 b\)](#)];
- b) the path between doors a minimum of 2100 mm wide; and
- c) if all doors swing out of the vestibule, a minimum floor space of 2100 by 2100 mm.

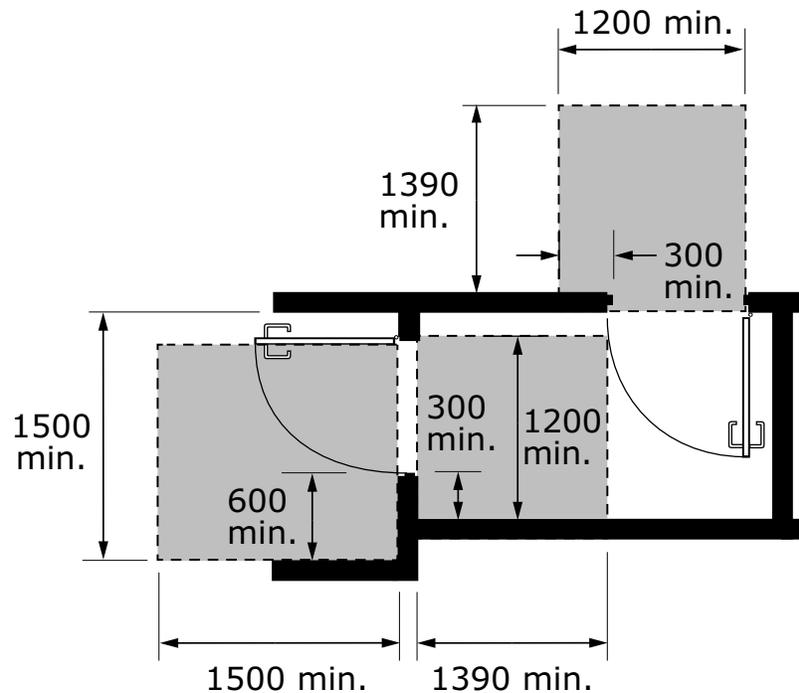
**Figure 21 a)**  
**Manoeuvring area at parallel swinging doors**  
 (See Clause [5.2.5.](#))



**This figure shows the floor area requirements for swinging doors in series that swing in the same direction. In front of the out swinging door, a minimum floor area of 1500 by 1500 mm is shown; in the vestibule, a minimum clear floor area 1390 mm deep plus the width of the door is listed; and behind the second outswing door a clear minimum floor area of 1390 mm deep by 1200 mm wide is listed.**

**Note:** All dimensions are in mm.

**Figure 21 b)**  
**Manoeuvring area at perpendicular swinging doors**  
 (See Clause [5.2.5.](#))



**This figure shows the floor area requirements for swinging doors in a series that swing in the same direction but are located on perpendicular walls. In front of the out swinging door a minimum floor area of 1500 by 1500 mm is shown; in the vestibule, a minimum clear floor area 1390 mm wide plus the width of the door is listed with a minimum vestibule depth of 1200 mm; and behind the second outswing door, a clear minimum floor area of 1390 mm deep by 1200 mm wide is listed.**

**Note:** All dimensions are in mm.

### 5.2.6 Thresholds

Thresholds shall be

a) not more than 13 mm high; and

- b) where over 6 mm high, bevelled at a slope not steeper than a ratio of 1:2 (50%) [see Figures [4 a\)](#) to [4 c\)](#)].

**Note:** Level thresholds are preferred.

## 5.2.7 Door hardware

### 5.2.7.1 Operating devices

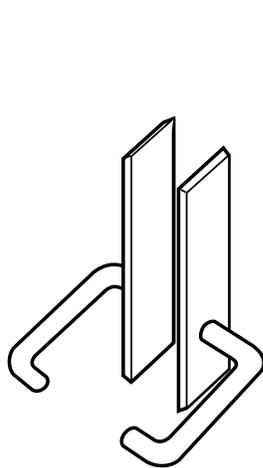
Operating devices such as handles, pulls, latches, or locks shall

- a) comply with Clause [4.3](#);
- b) be mounted between 900 and 1100 mm from the floor; and
- c) on a sliding door, be exposed and usable from both sides with a closed fist.

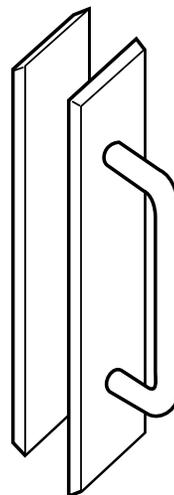
**Notes:**

- 1) Lever handles or other types of handles that can be operated with a closed fist should be used on latched doors. "U"-shaped door levers reduce the risk of catching on clothing or injury from the exposed lever end. Knob handles and thumb-latch handles are not appropriate because they require tight grasping and fine finger control. Push-pull mechanisms are preferred [see Figures [22 a\)](#) and [22 b\)](#)].
- 2) Panic hardware that does not interfere with passage through a doorway should be used.
- 3) Kickplates at least 250 mm high on the push side of doors should be considered in high-traffic areas to protect doors from damage.
- 4) Large D-shaped handles should be used for sliding doors. All D-shaped handles should have sufficient clearance from the door to allow for operation with a closed fist.

**Figure 22 a)**  
**Acceptable handles**  
(See Clause [5.2.7.1.](#))



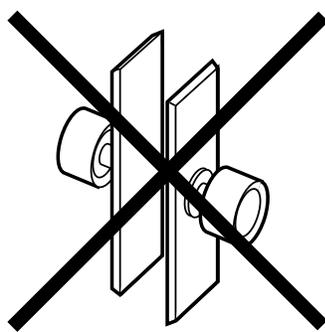
Lever handles



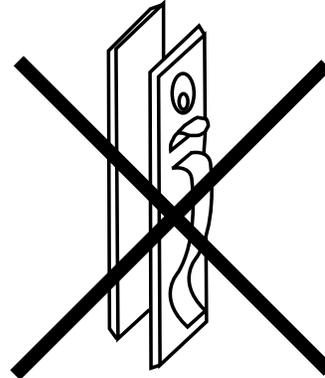
Push plate/door pull

**This figure shows two examples of lever and push plate/door pull handles that can be operated with a closed fist.**

**Figure 22 b)**  
**Unacceptable handles**  
(See Clause [5.2.7.1.](#))



Knob handles



Thumb-latch handles

**This figure shows examples of door handles that cannot be opened with a closed fist, including knob handles and thumb-latch handles.**

### 5.2.7.2 Door closers

The sweep period of door closers shall be adjusted so that the door will take 3 s or more to move from an open position of 90° to a semi-closed position of approximately 12°.

### 5.2.8 Door-opening force

A force for pushing or pulling a door shall not be more than

- a) 38 N for exterior swinging doors;
- b) 22 N for interior swinging doors; and
- c) 22 N for sliding or folding doors.

**Note:** Where a force greater than 22 N is required to open a door, a power-assisted door opener is recommended.

## 5.2.9 Power-assisted doors

### 5.2.9.1 General

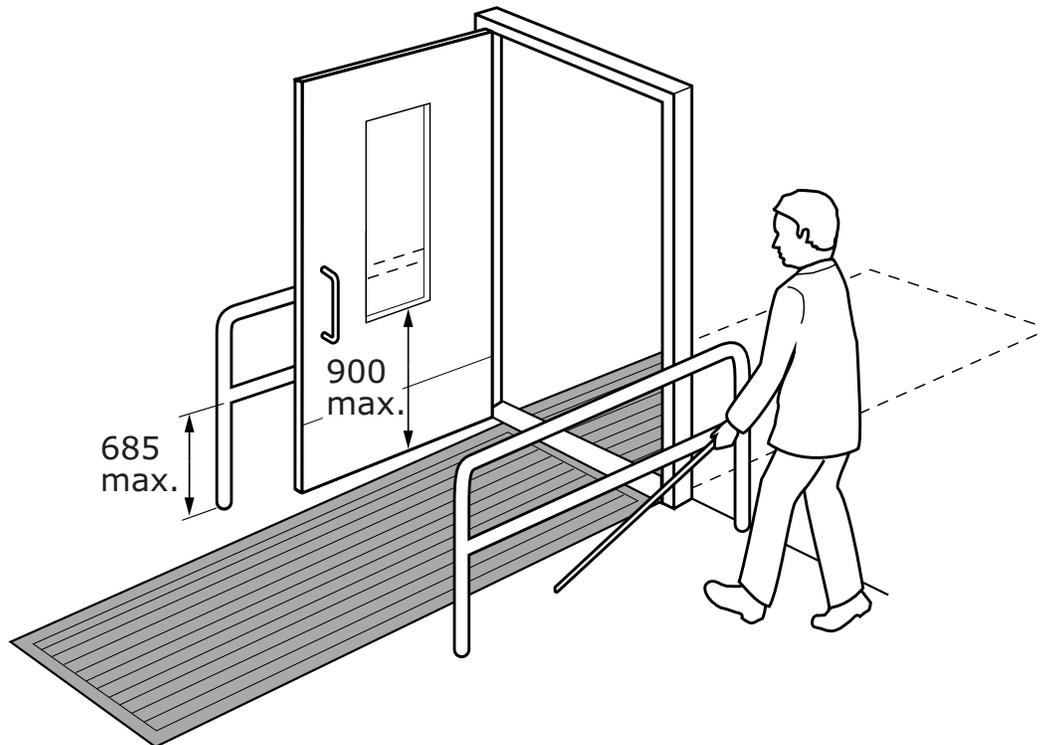
A power-assisted swinging door shall

- a) take 3 s or more to move from a closed to a fully open position, except when a safety sensor is installed;
- b) remain fully open for a minimum of 5 s;
- c) require a force of not more than 65 N to stop door movement, except when the door is equipped with a safety sensor that automatically stops the door if there is an obstruction in the path of movement; and
- d) where it opens into a route of travel, have cane-detectable guardrails or other barriers at right angles to the wall containing the door (see Figure [23](#)).

#### Notes:

- 1) Power-assisted doors have two different types of operation: one that is automatically activated by a motion detector or a floor-pad sensor, and one that is manually activated by pushing a control.
- 2) Doors that open automatically are the preferred option since they do not require manual activation.
- 3) Sliding automatic doors are generally the most convenient to use, since they provide for a smooth traffic flow and do not require guardrails for door-swing protection.
- 4) Manual power-assist controls might be difficult to activate for people with limited strength, reach, vision, or manual dexterity. The length of time the door should remain open is affected by the distance between the manual power-assist control and the door itself.

**Figure 23**  
**Guards at out-swinging power-assisted door**  
(See Clauses [5.2.9.1](#) and [5.2.10.](#))



**This figure shows a guardrail on either side of an out-swinging power-assisted door. In the graphic, a person with a long cane is shown approaching the guard railing, which is blocking them from entering the door swing area of the power-assisted door. The cane is able to detect the obstacle (i.e., the guard railing) as the height of the first bar in the guard railing is at a maximum height of 685 mm above the ground surface.**

**Note:** All dimensions are in mm.

### **5.2.9.2 Location of controls**

For doors that are not automatically activated, controls to open power-assisted doors shall be

- a) located along the route of travel;
- b) clearly visible before reaching the door; and

- c) adjacent to a clear and level floor area, 820 by 1390 mm, that is clear of the door swing but is no further than 1500 mm from it.

### 5.2.9.3 Controls

Controls for power-assisted doors shall

- a) where a motion sensor is used, have the door identified with the International Pictogram of Access [see Figures [12 a\)](#) and [12 b\)](#)];
- b) where a wave sensor is used, have the sensor
  - i) surface-raised at least 3 mm above the surrounding area on which it is mounted;
  - ii) identified with the International Pictogram of Access [see Figures [12 a\)](#) and [12 b\)](#)]; and
  - iii) mounted between 900 and 1100 mm above the walking surface;
- c) where activation pads are used, have a shape either
  - i) rectangular at least 25 by 75 mm;
  - ii) a vertical activation bar at least 75 mm by 900 mm; or
  - iii) circular with a diameter of at least 100 mm; and
- d) have activation pads
  - i) that comply with Clause [4.3](#);
  - ii) operable by touching or approaching in close proximity any part of the surface with a fist, arm, or foot; and
  - iii) identified with the International Pictogram of Access [see Figures [12 a\)](#) and [12 b\)](#)].

**Note:** Motion and wave sensors should have their focus area individually adjusted to the environment in which they are used such that they are responsive to the user but avoid unintended nuisance activation.

### 5.2.9.4 Security access systems

Where both power-assisted door activation pads and security access systems are used for the same door, they shall

- a) be located together with a horizontal separation of not more than 300 mm;
- b) be located so that the security access device is the first device encountered when approaching the door; and
- c) have the security access system comply with Clause [5.7.4](#).

**Notes:**

- 1) Security access systems capable of automatically opening a door through a single action are preferred.
- 2) In a power-assisted operation, the security profile would arm the activation pad for use.

### 5.2.10 Glazed panels

A glazed panel in a door shall

- a) be transparent;
- b) have its lower edge not higher than 900 mm from the floor (see Figure [23](#)); or
- c) where the door or sidelight is fully glazed, be marked with a continuous opaque strip that
  - i) complies with Clause [4.2](#);
  - ii) incorporates visual contrast within the strip to differentiate it from the background behind the glazed panel;
  - iii) is at least 50 mm in height; and
  - iv) extends the full width of the door and/or sidelight at a height between 1350 and 1500 mm from the floor, and a second strip between 850 to 1000 mm from the floor.

**Note:** Doors made entirely of glass and mounted in glass walls are difficult to detect and should have distinct markings to aid in defining and signalling the presence of doors and glass walls to users.

### 5.2.11 Doors in primary horizontal circulation routes

Where fire regulations permit, a door connecting primary horizontal circulation routes shall have a transparent glazed panel that complies with Clause [5.2.10](#).

**Note:** The type of glazing and its area in the door should not compromise the fire resistance of the door assembly.

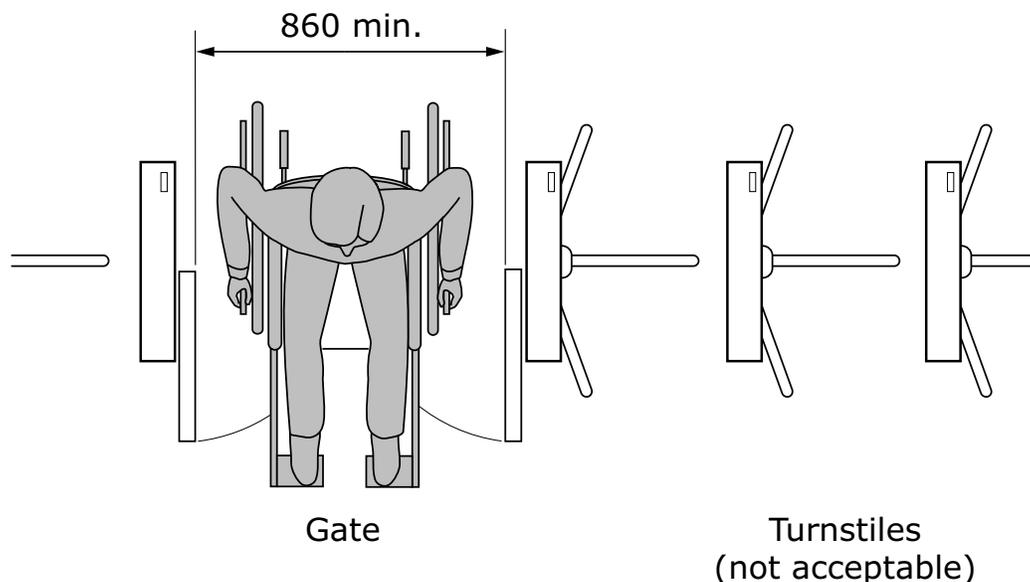
### 5.2.12 Turnstiles and access gates

Where entry/exit metering devices are used, at least one shall have a clear opening width of at least 860 mm.

- a) If the device does not accommodate this dimension (e.g., at turnstiles), then there shall be an adjacent alternative entry with a clear width of at least 860 mm (see Figure [24](#)).
- b) If the width of the accessible entry space is restricted for a distance of more than 600 mm, then the clear opening width should be at least 1000 mm.
- c) Security systems, if used, shall comply with Clause [5.7.4](#).

**Note:** Additional adjacent alternative entryways should be provided in case of failure of the entry/exit metering devices (see Figure [24](#)).

**Figure 24**  
**Alternative entry beside turnstiles**  
(See Clause [5.2.12.](#))



**This figure demonstrates the minimum clear width of 860 mm for an alternative entry beside turnstiles. The graphic shows a person in a wheeled mobility device manoeuvring through the alternative entry.**

**Note:** All dimensions are in mm.

## 5.3 Handrails

### 5.3.1 Handrail grip

Handrails shall

- a) resist a force of at least 1.3 kN applied in any direction;
- b) have a graspable cross-section that is either
  - i) circular with an outside diameter of 30 to 40 mm (see [Figure 25](#)); or
  - ii) non-circular with an outside perimeter between 100 and 125 mm, with the largest cross-sectional dimension not more than 45 mm (see [Figure 25](#));
- c) be free of any sharp or abrasive elements;

- d) have a continuous gripping surface without interruption by newel posts or other construction elements, or obstructions that interrupt a handhold;
- e) have a clear space between the handrail and the wall, and underneath the handrail, as follows:
  - i) between 35 and 45 mm wide for a smooth wall surface; and
  - ii) between 45 and 60 mm wide for a rough wall surface; and
- f) be luminance (colour) contrasted with the surrounding wall surface or background environment with a minimum luminance (colour) contrast of 30% (see Clause [4.2](#)).

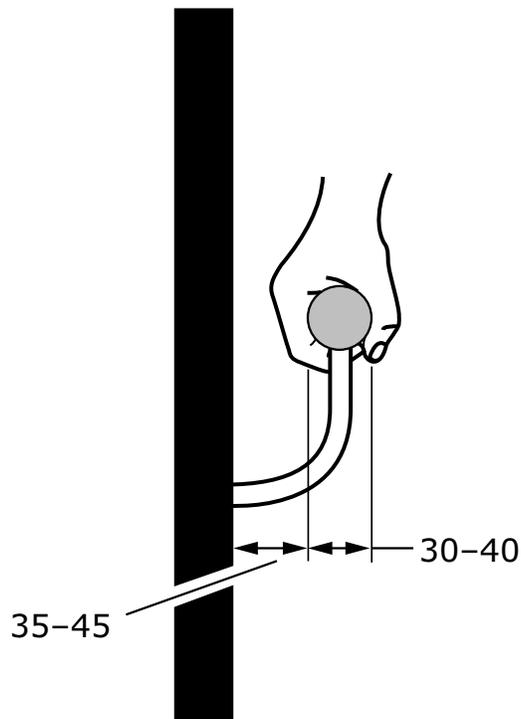
**Notes:**

- 1) Handrails are important features. They should be graspable and provide a firm and comfortable grip for the hand to slide along the rail without obstruction.
- 2) A circular section with a diameter not more than 40 mm is the preferred shape so that the thumb and fingers can lock around the handrail. Wide or deep handrails that allow only a pinched grip should not be used unless a proper hand-size grasping area is provided (see Figure [26](#)).
- 3) The maximum clearance allowed between the rail and wall is to provide for adequate gripping room, but also prevents injuries to arms slipping through the opening.
- 4) The handrail and clearance should not protrude more than 100 mm from the wall.

**5.3.2 Recessed handrail**

A recess containing a handrail shall extend at least 450 mm above the top of the rail (see Figure [27](#)).

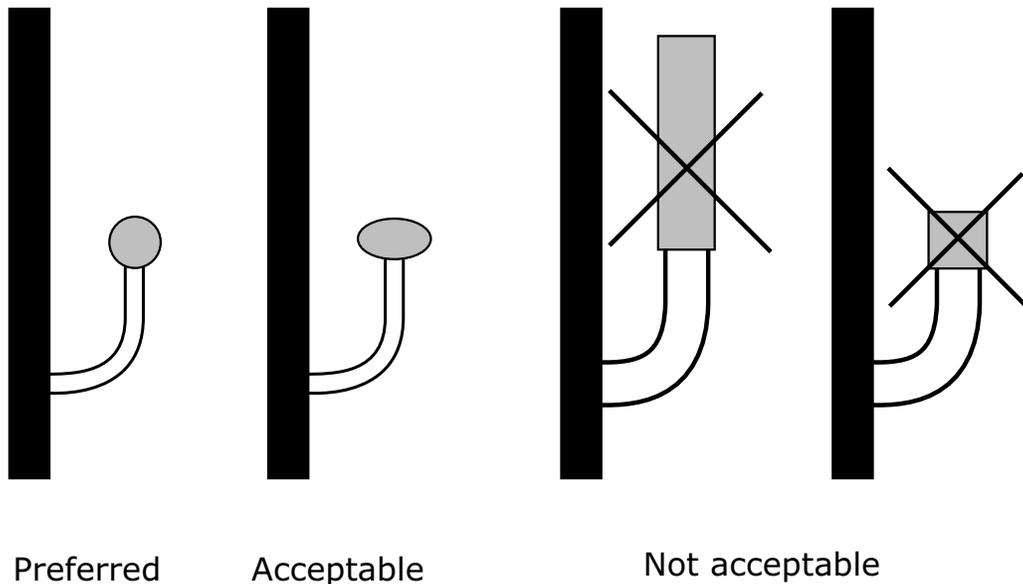
**Figure 25**  
**Handrails**  
(See Clause [5.3.1.](#))



**This figure shows the dimensions of the distance a graspable handrail should be from a mounted surface. In this example, the portion of the handrail that is mounted to the surface is 35 to 45 mm from the surface, and the handrail has a 30 to 40 mm circular diameter.**

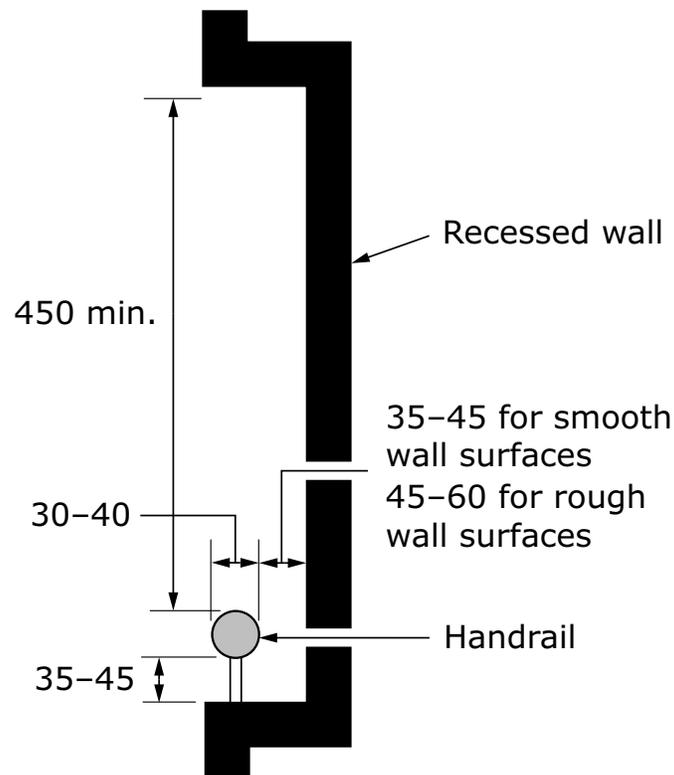
**Note:** All dimensions are in mm.

**Figure 26**  
**Handrail shapes**  
(See Clause [5.3.1.](#))



**This figure shows examples of acceptable and not acceptable handrail shapes. On the left side of the graphic, there is an image of a rounded handrail; this is the preferred handrail shape. On the right side of the graphic, there is a slightly wider elliptical handrail; it is still rounded, and therefore deemed acceptable though not the preferred completely round shape. Beside these examples are two more examples of handrails deemed unacceptable due to their square and rectangular shapes.**

**Figure 27**  
**Handrail in a recess**  
(See Clause [5.3.2.](#))



**This figure shows the required dimension of a graspable handrail located in a recessed wall. The graphic demonstrates a handrail mounted in front of a recessed wall, and indicates the handrail should be between 35 and 45 mm away from smooth wall surfaces, and between 45 and 60 mm away from rough wall surfaces. The handrail should be 35 to 45 mm from the base of the recess and a minimum of 450 mm from the top of the recess.**

**Note:** All dimensions are in mm.

## 5.4 Stairs

### 5.4.1 Treads and risers

A flight of stairs shall

- a) have uniform riser heights and tread depths;
- b) have risers not more than 180 mm high;
- c) have treads that are slip-resistant;
- d) have treads not less than 280 mm deep, measured from riser to riser;
- e) have no open risers [see Figure [28 c](#)]; and
- f) be illuminated to at least 200 lx at the tread.

#### Notes:

- 1) Stairs with open risers are hazardous to people who need a solid riser to guide the foot up the riser to the next step, or to those who need to place canes or crutches against the riser of the next step.
- 2) Strongly patterned carpets should not be used on stairs since they cause perceptual problems and obscure the definition of the tread edges.
- 3) Avoid metal grate materials for accessible stairs.

### 5.4.2 Nosing

The nosing shall

- a) project not more than 38 mm;
- b) have no abrupt undersides [see Figure [28 d](#)];
- c) have a radius of curvature at the leading edge of the tread not more than 13 mm;
- d) where projecting, be sloped to the riser at an angle greater than 60° to the horizontal [see Figure [28 a](#)]; and
- e) have a horizontal strip 50 ± 10 mm deep that
  - i) is luminance (colour) contrasted with the tread and riser to at least 50% (see Clause [4.2](#)); and

ii) extends the full width of the tread.

**Notes:**

- 1) The nosing is that part of a step that overhangs the step below. A contrasting colour at the nosing ensures that the tread edge is clearly visible.
- 2) Where projecting nosings are used, they should not have sharp or abrupt angles that prevent the foot from sliding up the riser.

### **5.4.3 Tactile attention indicator surfaces at stairs**

#### **5.4.3.1 General**

A tactile attention indicator surface shall

- a) comply with Clauses [4.4.5.2](#) and [4.4.5.3](#);
- b) be located at the top of stairs;
- c) be continuous across the width of the stair with a maximum gap of 75 mm to the stringer or end of tread; and
- d) have a length between 600 and 650 mm, commencing one tread depth from the edge of the stair [see Figures [5 a\)](#) and [28 b\)](#)].

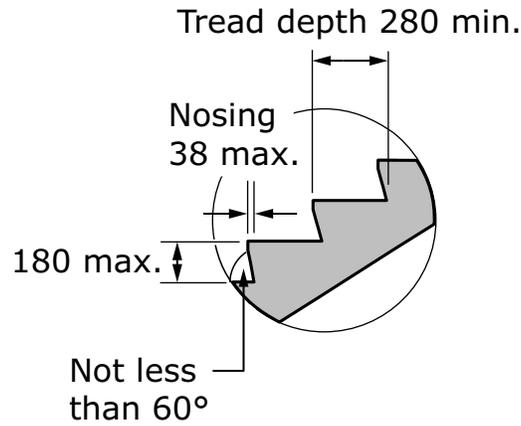
**Note:** A tactile attention indicator surface that is detectable underfoot or by a long white cane is necessary to caution people that they are approaching the onset of descending stairs.

#### **5.4.3.2 Location**

A tactile attention indicator surface shall be provided

- a) at stairs that are not enclosed;
- b) at each landing incorporating an entrance into a stair system;
- c) where the regular stairway pattern is broken; and
- d) where the run of a landing with no continuous handrail is greater than 2100 mm.

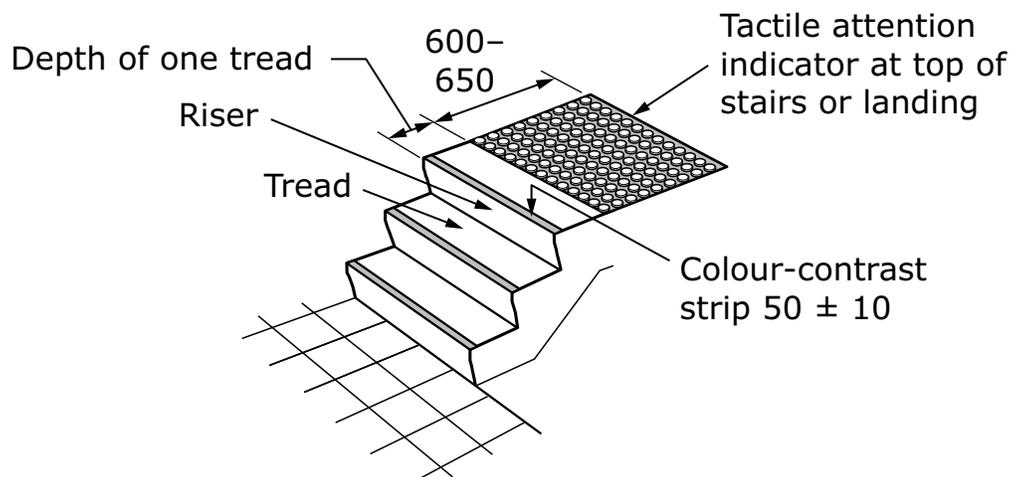
**Figure 28 a)**  
**Stair detail – Tread depth**  
(See Clause [5.4.2.](#))



**This figure shows that projecting stair nosing shall be sloped to the riser at an angle greater than 60° to the horizontal with a maximum tread height of 180 mm, minimum tread depth of 280 mm, and maximum nosing depth of 38 mm.**

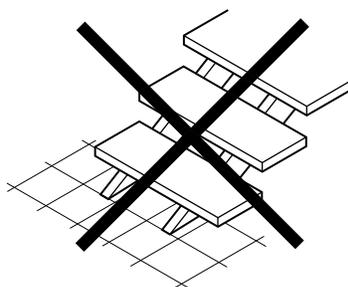
**Note:** All dimensions are in mm.

**Figure 28 b)**  
**Stair detail – Tactile attention indicator**  
(See Clause [5.4.3.1.](#))



**This figure shows the location of a tactile attention indicator at the top of stairs or landings. The tactile attention indicator is located one tread step depth away from the start of the stairs and is 600 to 650 mm deep. Colour contrasting strips  $50 \pm 10$  mm wide are also displayed at the nosing of each stair tread.**

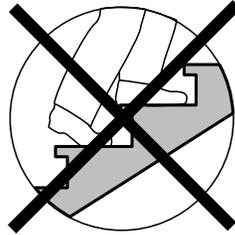
**Figure 28 c)**  
**Stair detail – Open risers**  
(See Clause [5.4.1.](#))



Open risers not acceptable

**This figure shows that open risers are not acceptable.**

**Figure 28 d)**  
**Stair detail – Abrupt undersides**  
(See Clause [5.4.2.](#))



Risers with abrupt undersides  
not acceptable

**This figure shows that risers with abrupt undersides are not acceptable.**

#### **5.4.4 Stair handrails**

Handrails shall be provided for stairs and shall

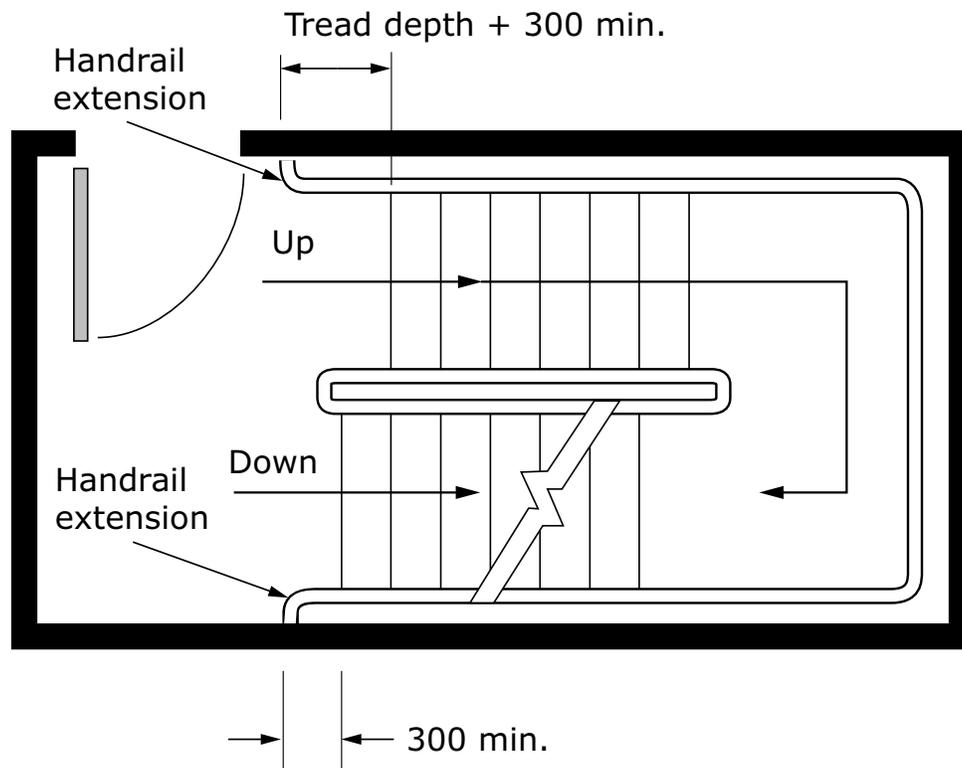
- a) comply with Clause [5.3](#);
- b) be installed on both sides of the stairs (see Figure [29](#));
- c) be of uniform height, from 860 to 920 mm, measured vertically from the leading edge of the tread;
- d) be continuous around landings less than 2100 mm in length, except where the landing
  - i) is intersected by an alternative path of travel; or
  - ii) has an entry door leading onto it;
- e) be continuous where located on the inside edge of the stairs (see Figure [30](#));
- f) at the top of the stairs, extend at least 300 mm parallel to the floor surface (see Figure [32 a](#));
- g) at the bottom of the stairs, continue to slope for a distance equal to the depth of one tread and then extend at least 300 mm parallel to the floor surface (see Figure [31](#)); and

h) have the rail extension return to the post, floor, or wall [see Figures [29](#), [31](#), and [32 b\)](#)].

**Notes:**

- 1) Many people rely on handrails to maintain balance, prevent falls, and serve as a visual and tactile wayfinding guide.
- 2) Handrail extensions at the top and bottom of stairs provide support and orientation for people using stairs, and a continuous handrail assists them in negotiating changes in direction [see Figures [31](#) and [32 a\)](#)].
- 3) The handrail extensions should be turned down or sideways so that they do not constitute a hazard by protruding into the path of travel.

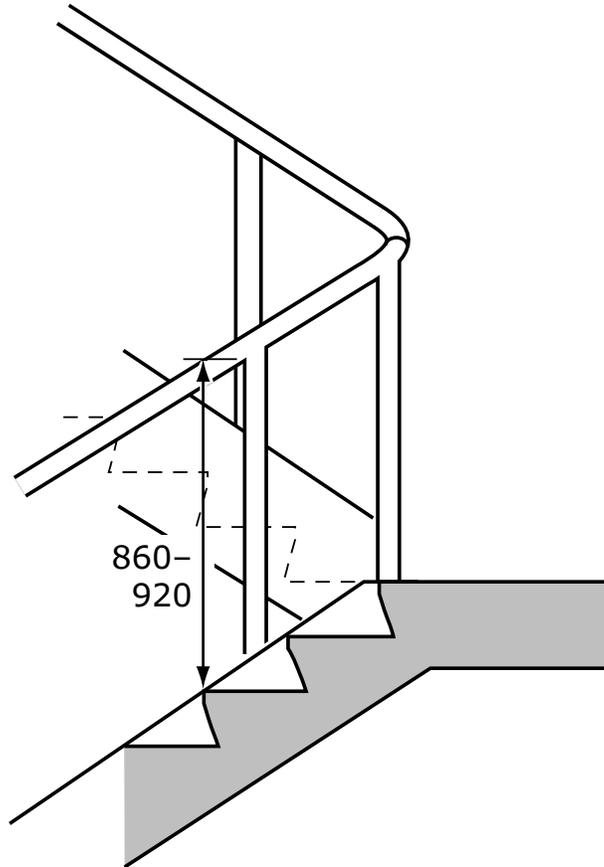
**Figure 29**  
**Stair handrails**  
(See Clause [5.4.4.](#))



**This figure demonstrates handrail details for stairs. The graphic shows a stairwell positioned close to a door entryway, and indicates the handrail at the top of the stairs should extend a minimum of 300 mm. At the base of the stairs, the graphic indicates the handrail should extend a minimum of 300 mm plus one tread depth.**

**Note:** All dimensions are in mm.

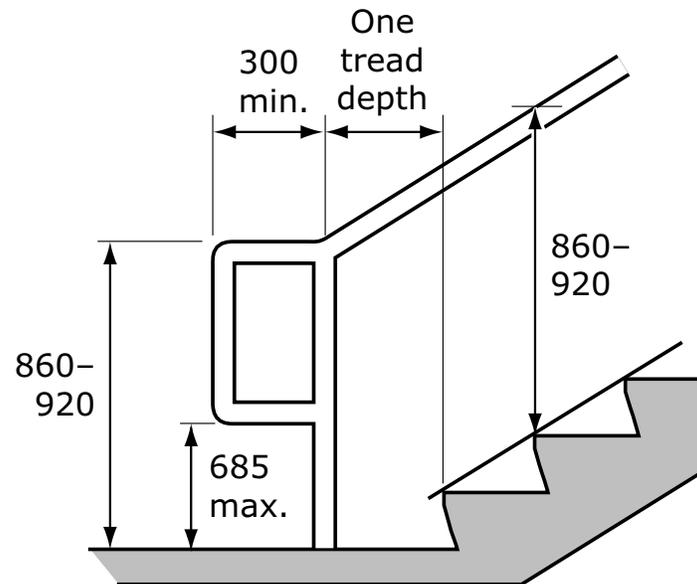
**Figure 30**  
**Continuous inside handrail at stairs**  
(See Clause [5.4.4.](#))



**This figure demonstrates the requirement to have a continuous handrail on the inside edge of stairs. The height of the handrail is 860 to 920 mm.**

**Note:** All dimensions are in mm.

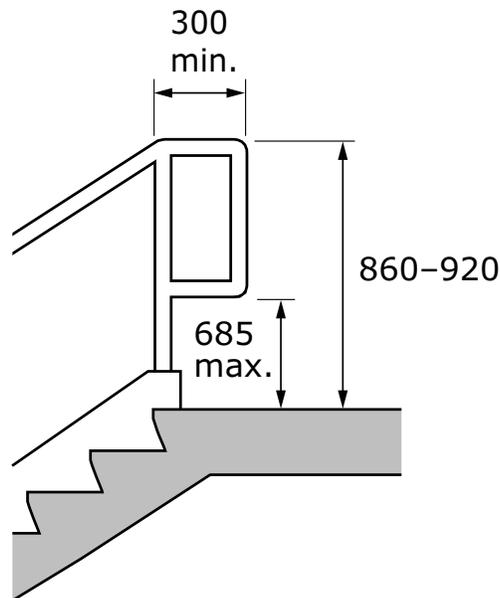
**Figure 31**  
**Handrail extension at bottom of stairs**  
(See Clause [5.4.4.](#))



**This figure demonstrates a looped handrail extension at the bottom of stairs that is parallel to the floor surface. The width of the extension is a minimum 300 mm (or the depth of one tread). The height of the extension is shown to be 860 to 920 mm from the floor, and at the bottom loop the height of the extension handle is a maximum of 685 mm above the floor surface.**

**Note:** All dimensions are in mm.

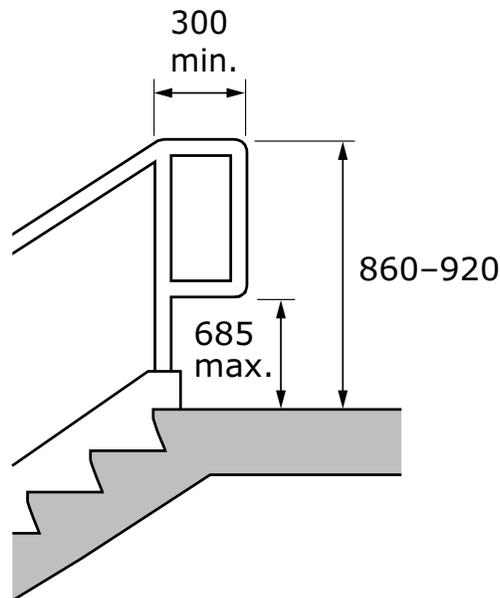
**Figure 32 a)**  
**Handrail extensions at top of stairs – Looped**  
(See Clause [5.4.4.](#))



**This figure shows a looped handrail extension that is a minimum 300 mm in length. The height of the extension is shown to be 860 to 920 mm from the ground, and the height of the bottom of the loop is a maximum height of 685 mm above the floor surface.**

**Note:** All dimensions are in mm.

**Figure 32 b)**  
**Handrail extensions at top of stairs – Return to wall**  
(See Clause [5.4.4.](#))



**This figure shows a simple handrail extension that returns to the wall at the end with a minimum width of 300 mm. The height of the extension is shown to be 860 to 920 mm from the ground to the floor surface.**

**Note:** All dimensions are in mm.

## 5.5 Ramps

### 5.5.1 Running slope and length

A ramp shall have

- a running slope with the ratio between 1:12 (8.33%) and 1:20 (5%); and
- a horizontal distance between level landings not greater than 9000 mm.

**Notes:**

- 1) A ramp is a sloping walkway leading from one level to another. The running slope of the ramp is the ratio of the change in level (vertical rise) to its horizontal length (run) [see Figures [33 a\)](#)

and [33 b](#)]. The more gradual the slope of the ramp (i.e., the less steep it is), the more easily people can use it without assistance. Therefore, slopes with the ratio between 1:20 (5%) and 1:15 (6.7%) are preferred.

- 2) Routes with a gradual slope that is less steep than 1:20 (5%) do not have to follow the specifications for ramps; however, a sloped route between 1:20 and 1:30 should be equipped with level landings at intervals of not more than 12 m.
- 3) Some people find using steps easier and safer than a ramp; therefore, both stairs and a ramp should be provided in any one location.
- 4) Ramps that surmount a major change in level (vertical rise) are long and could require multiple ramp and landing combinations. In such circumstances, other design solutions should be considered.
- 5) Curved ramps should not be used as a design solution.

### **5.5.2 Cross slope**

The cross slope of the ramp surface shall not be steeper than the ratio of 1:50 (2%).

### **5.5.3 Width**

The clear width on a ramp shall be at least 1200 mm.

### **5.5.4 Landings**

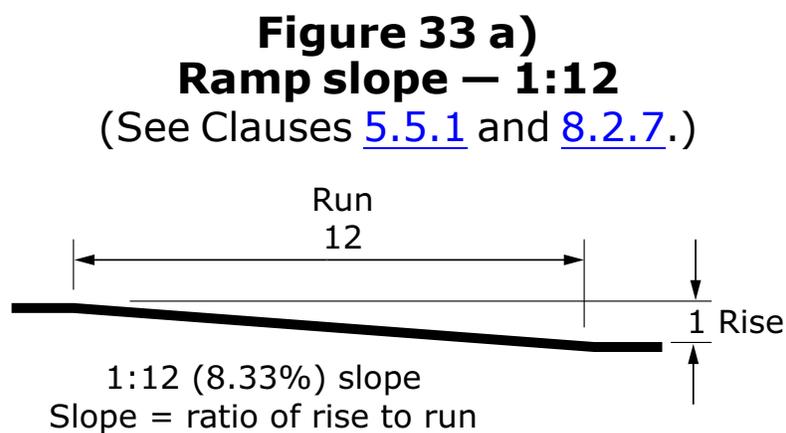
A level landing shall

- a) be provided at the top and bottom of each ramp;
- b) be provided at all changes of ramp direction;
- c) be at least as wide as the widest ramp leading to it;
- d) have a length not less than 1700 mm;
- e) at doorways serving an accessible route, have an area of at least 2100 by 2100 mm;
- f) include passing spaces with an area of at least 2100 by 2100 mm
  - i) at the connection points when more than two ramp segments are used to surmount a level change; and

- ii) at the turning point when a turn separates two ramp segments; and
- g) where it meets a slope change, have a  $50 \pm 10$  mm wide luminance (colour) contrasted and slip-resistant strip equal to the width of the ramp, with a luminance (colour) contrast of at least 50% located on the flat surface before the level change begins [see Figures [34 a](#)) and [34 b](#))].

**Notes:**

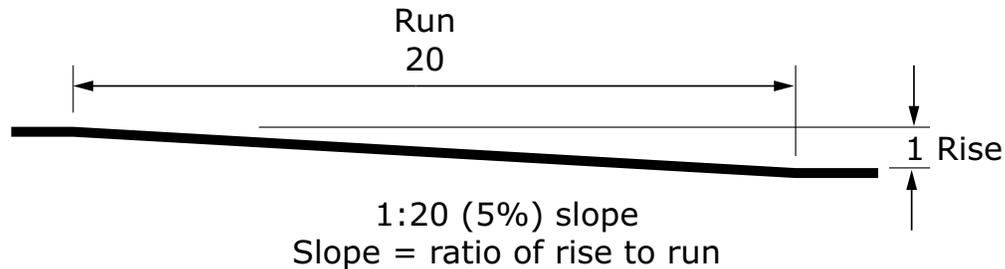
- 1) At intermediate landings that have a  $90^\circ$  turn, an increased manoeuvring area can be achieved by cutting the inner corner at a  $45^\circ$  angle to eliminate the sharp angle [see Figure [34 a](#))].
- 2) Doorways at landings should be provided with sufficient manoeuvring area at the latch edge of the door [see Figure [34 b](#))].



**This figure shows a ramp with a slope of 1:12 (8.33%).**

**Note:** All dimensions are in mm.

**Figure 33 b)**  
**Ramp slope – 1:20**  
(See Clauses [5.5.1](#) and [8.2.7.](#))



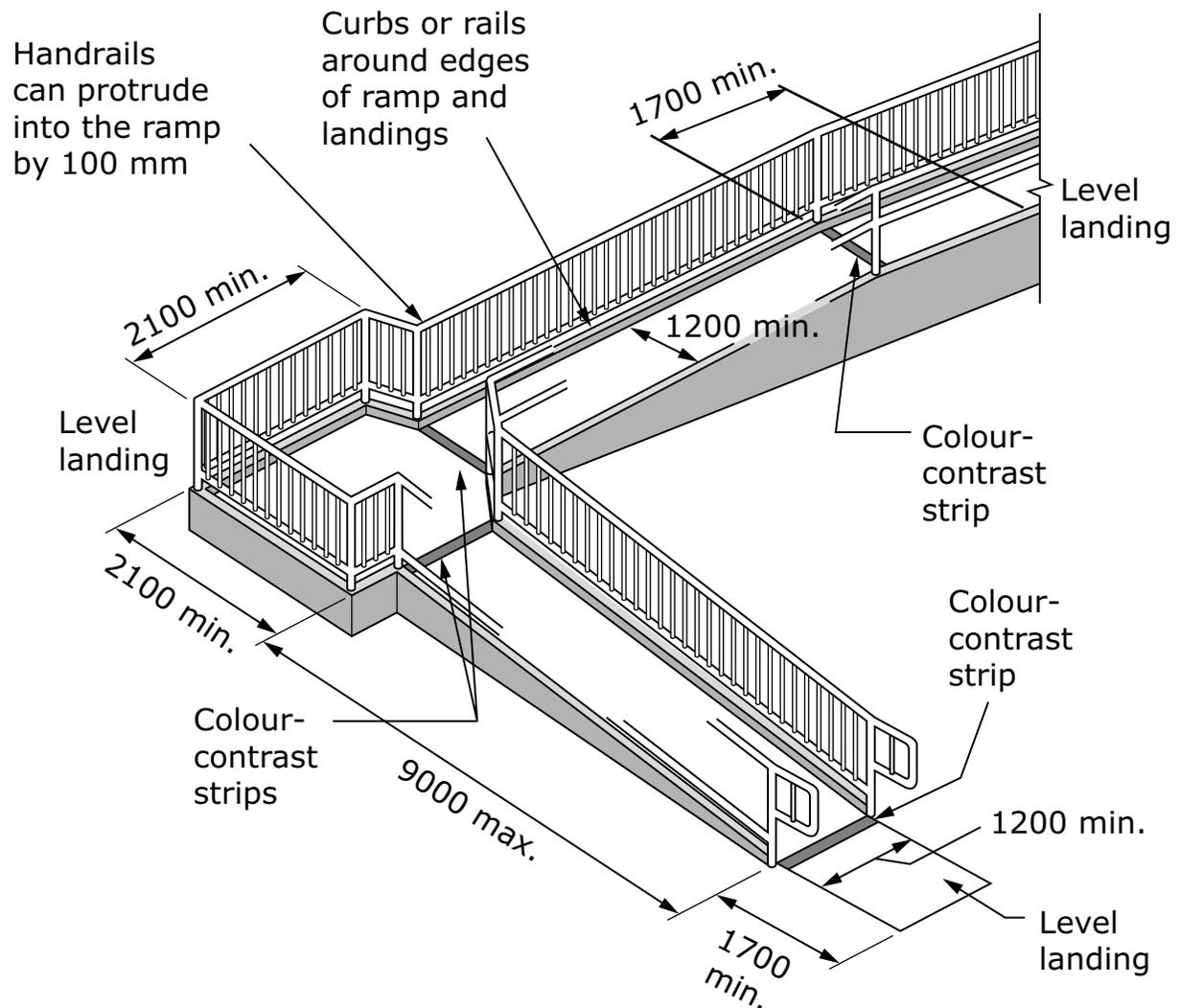
Any sloped walkway steeper than 1:20 is designed as a ramp

**This figure shows a sloped surface with a slope of 1:20 (5%).**

**Note:** All dimensions are in mm.

## Figure 34 a) Ramps and landings – Intermediate landing with a sharp turn

(See Clauses [5.5.4](#) and [8.2.7](#).)



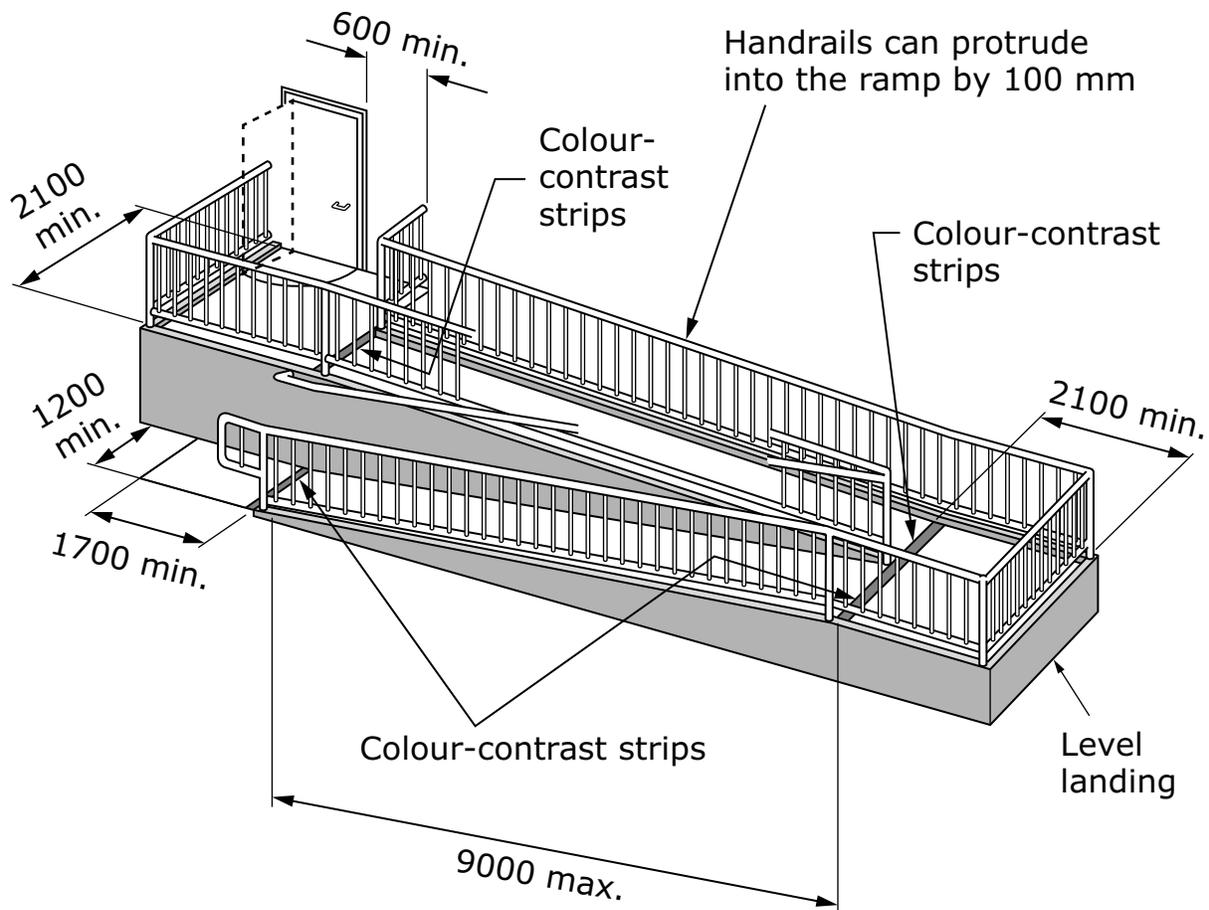
### **Figure 34 a) (Concluded)**

**This figure shows dimensions of an intermediate landing for ramps that have sharp turns. It depicts an entrance area onto the ramp at the floor level that is 1700 mm long by 1200 mm wide. The ramp leading to the lower-level landing is a maximum 9000 mm long. The level landing at the turn is square-shaped with a minimum length and width of 2100 mm. The ramp width is denoted as a minimum 1200 mm, and a 1700 mm-long level landing at the top of the ramp is displayed. The graphic indicates a colour-contrast strip at each major change in slope along the length of the ramp.**

**Notes:**

- 1) Handrails have been partially omitted for clarity.
- 2) All dimensions are in mm.

**Figure 34 b)**  
**Ramps and landings – Doorway at landing**  
 (See Clauses [5.5.4](#) and [8.2.7](#).)



**This figure shows a ramp approaching an out-swinging door from the latch side. The graphic shows the door frame positioned 600 mm from the mounted handrail. There is a colour-contrast strip adjacent to the doorway to indicate the change in slope heading down the ramp. The size of the landing in front of the doorway is 2100 mm by 2100 mm.**

**Notes:**

- 1) Handrails have been partially omitted for clarity.
- 2) All dimensions are in mm.

### 5.5.5 Surfaces

Ramp and landing surfaces shall comply with Clause [4.4.1](#).

**Note:** See Annex [B](#) for additional guidance on the potential for slip of floor and tread finishes.

### 5.5.6 Illumination

Illumination at the surface level of a ramp and its landings shall be 150 to 200 lx.

### 5.5.7 Edge protection

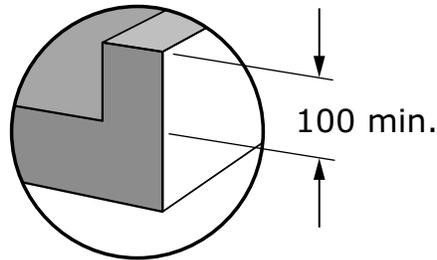
On ramps and landings that are not at grade or adjacent to a wall, protection shall be provided on all edges in the form of either

- a) a curb with a minimum height of 100 mm [see Figure [35 a](#)];  
or
- b) a raised barrier or rail with its lower edge not more than 100 mm from the ramp or landing surface [see Figures [35 b](#) and [35c](#)].

#### Notes:

- 1) Ramp edge protection is provided to prevent wheels or walking aids from moving off the ramp surface.
- 2) Edge protection is meant to complement the safety aspects of handrails (see Clause [5.5.8](#)).

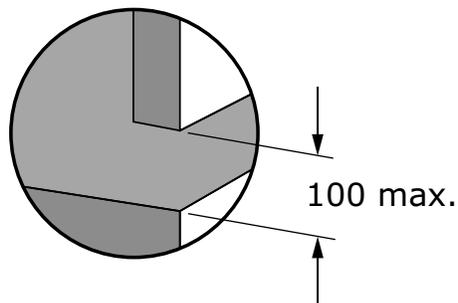
**Figure 35 a)**  
**Ramp edge protection — Curb**  
(See Clauses [5.5.7](#) and [8.2.7](#).)



**This figure shows edge protection provided by a curb with a minimum height of 100 mm.**

**Note:** All dimensions are in mm.

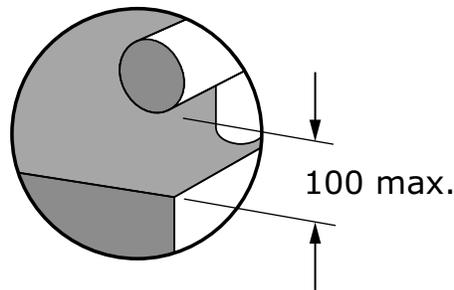
**Figure 35 b)**  
**Ramp edge protection — Raised barrier**  
(See Clauses [5.5.7](#) and [8.2.7](#).)



**This figure shows edge protection through a raised barrier with its lower edge not more than 100 mm from the ramp or landing surface.**

**Note:** All dimensions are in mm.

**Figure 35 c)**  
**Ramp edge protection — Rail**  
(See Clauses [5.5.7](#) and [8.2.7](#).)



**This figure shows an example of edge protection through a rail with its lower edge not more than 100 mm from the ramp or landing surface.**

**Note:** All dimensions are in mm.

### 5.5.8 Ramp handrails

Ramps shall

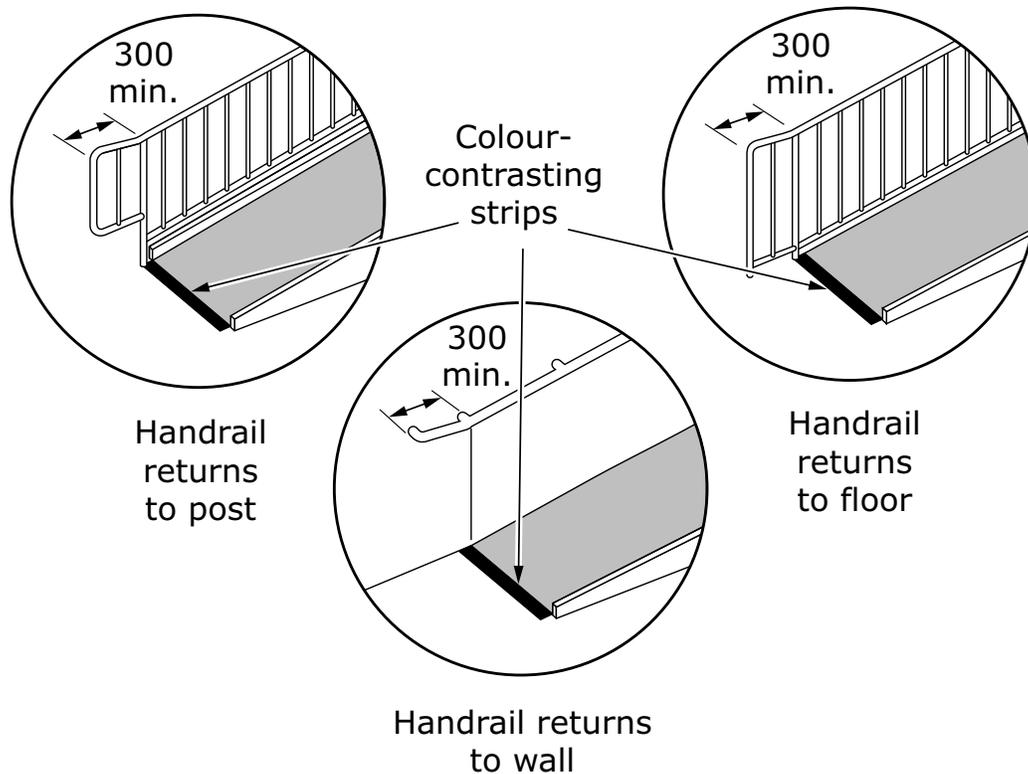
- a) have handrails on both sides that
  - i) comply with Clause [5.3](#);
  - ii) have a height between 860 and 920 mm, measured from the ramp surface to the top of the rail;
  - iii) are continuous on the ramp and around landings;
  - iv) have horizontal extensions beyond the top and bottom of the ramp at least 300 mm long that are returned to the post, floor, or wall [see Figure [36 a](#)]; and
  - v) are at least 30% luminance (colour) contrasted with their surroundings;
- b) have at least one set of handrails with a clear width between the rails of 920 to 1000 mm and below the rails a clear width of at least 1200 mm; and
- c) have horizontal extensions beyond the top and bottom of the ramp
  - i) at least 300 mm long; and

- ii) that are returned to the post, floor, or wall [see Figure [36 a\)](#)].

**Notes:**

- 1) Handrail extensions at the top and bottom of ramps provide support and orientation for people before they start using the ramp. The handrail extensions should be turned down or sideways so that they do not constitute a hazard by protruding into the path of travel [see Figures [36 a\)](#) and [36 b\)](#)].
- 2) The clear width between handrails is limited so that people who use manual wheelchairs can use both handrails to pull themselves up the ramp.
- 3) Where guardrails are installed to comply with AHJ, and where the top guardrail is higher than 920 mm, handrails at the required height should also be provided.

**Figure 36 a)**  
**Ramp handrail extensions — Handrail returns**  
(See Clause [5.5.8.](#))

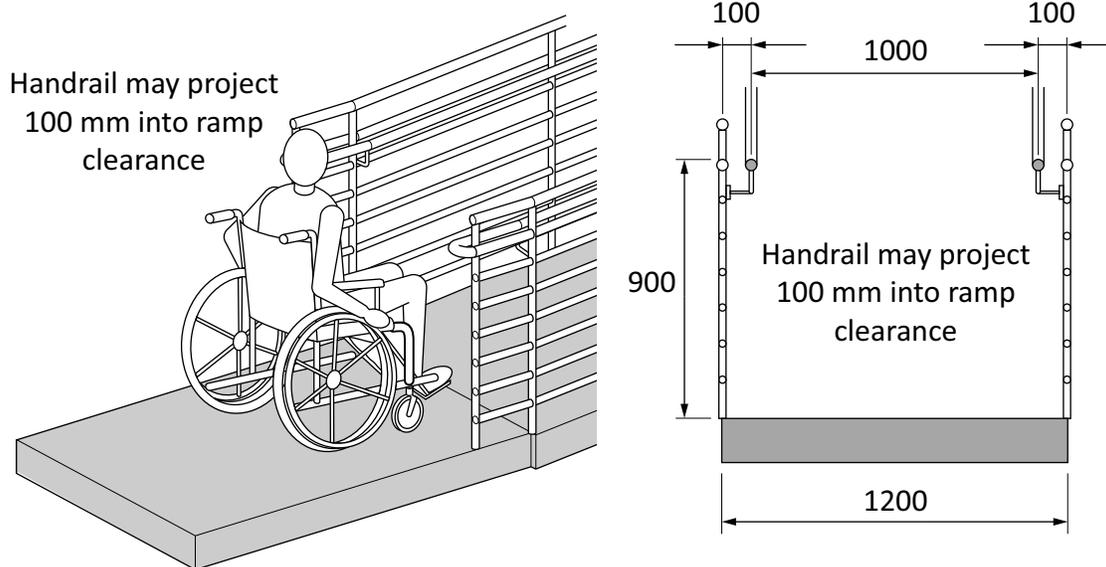


**Note:** Near handrail omitted for clarity.

**This figure shows three examples of ramp handrails. The first example shows a handrail that returns to a post. The second example shows a handrail that returns to the floor. The third example shows a handrail that returns to the wall. Each example shows the length of the handrail extension at a minimum of 300 mm from the end of the ramp, and the ramp end is marked by a colour-contrasting strip.**

**Note:** All dimensions are in mm.

**Figure 36 b)**  
**Ramp handrail extensions – Cross-section of**  
**handrails on a ramp**  
 (See Clause [5.5.8.](#))



**This figure shows two images. In the first image, a person sitting in a wheelchair enters a ramp with handrails that project 100 mm into the ramp. In the second image, an example cross-section of handrails on a ramp is displayed. The handrails are 900 mm tall. At the base, the handrail supports are a minimum of 1200 mm apart, and at the top the handrails narrow to become 1000 mm apart.**

**Note:** All dimensions are in mm.

## 5.6 Elevating devices

### 5.6.1 Elevators

An accessible elevator shall comply with Appendix E of ASME A17.1/CSA B44.

**Notes:**

- 1) Where practical, flow-through elevators are recommended to avoid the necessity of turning around within an elevator or backing out when using a wheeled mobility device.
- 2) Elevator configurations that incorporate offset doors and a side wall control panel on the door strike wall will allow for a parallel approach to the control panel, increasing the number of wheeled mobility device users who can independently use the elevator.
- 3) Where the internal area of an elevator has limited manoeuvring space for a wheeled mobility device user to turn around, an angled mirror should be provided at the top of the rear wall with a location and size to allow the user to see the floor indicator and the door opening.
- 4) Use of dark flooring surfaces in elevators is discouraged.

### 5.6.2 Platform lifts

Elevating devices such as platform lifts shall

- a) comply with CSA B355; and
- b) where forming part of an accessible route of travel, not require a key for use.

Where the platform lift forms part of an accessible path of travel, a minimum platform size of 1390 by 820 mm shall be provided to allow a person in a wheelchair to enter and exit without turns.

**Notes:**

- 1) Examples of platform lifts include enclosed stair lifts, enclosed vertical lifts, unenclosed stair lifts, and unenclosed vertical lifts.
- 2) Federal, provincial/territorial, and local regulations and by-laws can apply.

## 5.6.3 Escalators

### 5.6.3.1 Route of travel

Escalators shall not be considered as part of an accessible route of travel.

### 5.6.3.2 Handrail

The handrail of an escalator shall be 30% luminance (colour) contrasted with the surrounding surface.

### 5.6.3.3 Illumination

Escalators shall be illuminated to at least 200 lx at the tread surface level.

## 5.6.4 Moving walkways

### 5.6.4.1 General

A moving walkway shall have an adjacent accessible route.

**Note:** The adjacent accessible route is provided for the use of people who are unable to or prefer not to use a moving walkway. This route may include the use of elevators or platform lifts.

### 5.6.4.2 Treadway

The treadway on a moving walkway shall

- a) move at a constant speed for the entire distance between stationary entry and exit points;
- b) have a walking surface that does not accelerate (expand) or decelerate (contract) under foot;
- c) not have any portion that is comprised of rollers or sequential belts moving at differing speeds; and
- d) travel at a maximum speed of 2.25 km/h.

### 5.6.4.3 Width

The width of the exposed treadway of moving walkways shall be at least 1000 mm.

#### **5.6.4.4 Angle of inclination**

Moving walkways shall not be steeper than a ratio of 1:20 (5%).

**Note:** Moving walkways with an incline steeper than 1:20 (5%) or that have an abrupt slope increase should not be used. Steep inclines can be hazardous for all users.

#### **5.6.4.5 Handrail**

The handrail of a moving walkway shall be 30% luminance (colour) contrasted with the surrounding surface.

#### **5.6.4.6 Illumination**

Moving walkways shall be illuminated to at least 100 lx at the treadway surface.

#### **5.6.4.7 Audible indication**

A verbal audible announcement shall

- a) be provided to warn a rider that the moving walkway is ending; and
- b) have a signal, measured at the annunciator, at least 10 dBA above the ambient noise level.

**Note:** An audible indication can assist users in determining when the end of the moving walkway is approaching.

### **5.7 Emergency provisions**

#### **5.7.1 Visible alarms**

Visible alarms shall consist of lights that

- a) flash in conjunction with the audible emergency alarm;
- b) have a flash rate within the frequency range of 1 to 3 Hz;
- c) are synchronized to flash in unison;
- d) are placed so that a signal from at least one alarm is visible throughout any enclosed space; and

e) are significantly brighter than the ambient light.

**Notes:**

- 1) A flash rate in the frequency range of 1 to 3 Hz (pulses per second) has been found to minimize the risk of triggering an epileptic seizure.
- 2) Visible alarms should be used in conjunction with audible alarms to warn people of emergencies, including fire.
- 3) Visible alarms should be located in noisy areas of buildings and in rooms where someone would be alone, such as a washroom.
- 4) Visible alarms with overlapping signals should be synchronized so that the observed combined flash pattern does not exceed the allowable frequency range. Where this is not technically feasible, equivalent protection should be provided.

## 5.7.2 Areas of refuge

### 5.7.2.1 General

In addition to the applicable requirements of AHJ, an area of refuge shall

- a) be part of an accessible path of travel;
- b) have a door that complies with Clauses [5.2.1](#), [5.2.6](#), and [5.2.7](#);
- c) be of a size that provides for two spaces at least 900 by 1390 mm each;
- d) have a hands-free communication system that is
  - i) not higher than 1200 mm from the floor; and
  - ii) connected to an emergency response system;
- e) be separated from the building floor area by a fire separation with a fire resistance rating at least equal to that required for an exit;
- f) be smoke-protected; and
- g) be served directly by an exit or a firefighters' elevator.

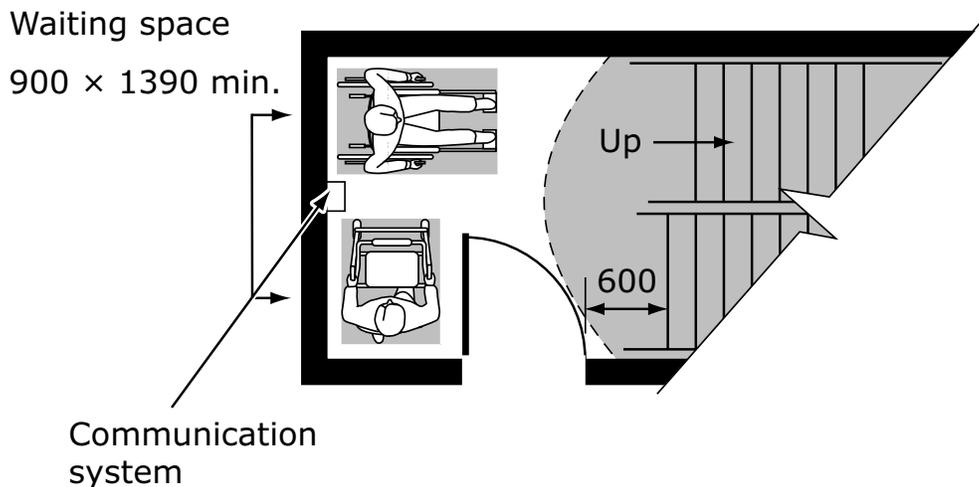
**Notes:**

- 1) An area of refuge is a safe holding space for people to wait in an emergency if they are unable to evacuate independently.

Firefighters are made aware of the existence of an area of refuge via the fire safety plan and they can assist those located there to safely evacuate the building after the emergency is contained or when it is safe to do so.

- 2) An area of refuge could be an enlarged landing in an exit stair (see Figure [37](#)), but people waiting in such a space should not obstruct evacuation, and the door swing should not encroach on the waiting space.
- 3) There should be a power-assisted door opener, supplied with emergency power, to enter an area of refuge.
- 4) An exit through a fire separation wall may be considered as equivalent to an area of refuge.
- 5) A firefighters' elevator is an elevator system designed for use by firefighters (or others under their supervision) in evacuation situations.
- 6) An elevator intended for independent use in evacuation by people with disabilities should be labelled as such.
- 7) The term "smoke-protected" describes spaces that will contain not more than 1%, by volume, of contaminated air from the fire floor during a 2 h period after the onset of a fire, assuming an outdoor air temperature equal to the January design temperature on a 2.5% basis.
- 8) A video intercom system could be used to provide the hands-free communication system in the area of refuge.

**Figure 37**  
**Example of area of refuge**  
 (See Clause [5.7.2.1.](#))



**This figure shows an area of refuge, which is a clear area of waiting space by a landing in an exit stair. The dimensions of the waiting space are a minimum 900 by 1390 mm. A door is also shown in the graphic indicating that a 600 mm clearance space between the swing of the door and the edge of the last tread is required.**

**Note:** All dimensions are in mm.

## 5.7.2.2 Emergency signage

### 5.7.2.2.1 Area of refuge

An area of refuge shall

- a) be identified by signage that complies with Clause [4.6](#);
- b) have the evacuation route to it identified by signage
  - i) that complies with Clause [4.6](#); and
  - ii) incorporates the pictograms shown in Figure [38 a](#));
- c) where a horizontal separation is used as an area of refuge, have the evacuation route to it identified by signage that complies with Clause [4.6](#);
- d) be identified on all publicly displayed evacuation plans; and

e) be designated in the fire safety/evacuation plan and procedure documents.

**Note:** Since areas of refuge provide only temporary safety, building management should develop fire safety/evacuation plans and operating procedures that complement the building design features.

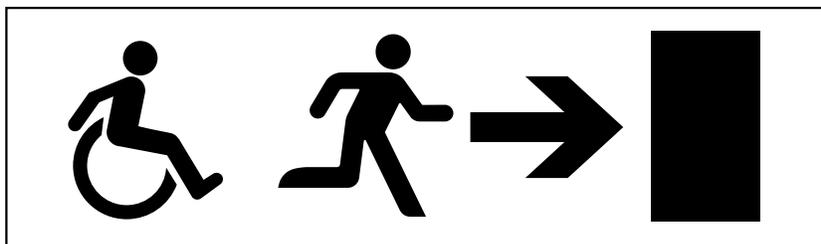
### 5.7.2.2.2 Accessible egress route

Where the evacuation route is different for people unable to evacuate independently, signs shall be posted indicating the accessible egress route, in accordance with the fire safety/evacuation plans, to

- a) the area of refuge, as shown in Figure [38 a](#));
- b) the final exit; or
- c) the accessible egress route to the firefighters' elevator or self-operated accessible evacuation elevator, as shown in Figure [38 b](#)).

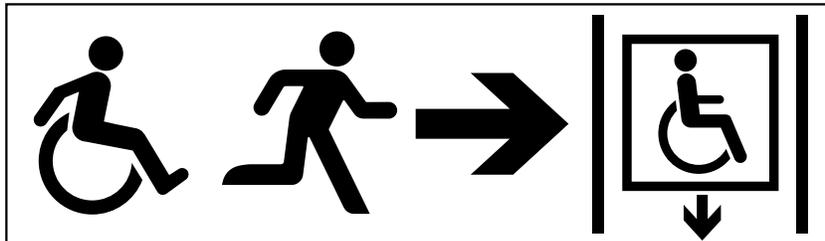
Plans for signage indicating the accessible egress route shall be included in the fire safety/evacuation plan and procedure documents, and this signage shall also be clearly identified on all publicly displayed evacuation plans.

**Figure 38 a)**  
**Directional evacuation signs – Area of refuge**  
(See Clauses [5.7.2.2.1](#) and [5.7.2.2.2](#).)



**This figure illustrates a directional evacuation sign to an area of refuge, with one person running towards a doorway and another person using a mobility device.**

**Figure 38 b)**  
**Directional evacuation signs – Elevators**  
(See Clause [5.7.2.2.2.](#))



**This figure illustrates a direction evacuation sign to a firefighters' elevator or self-operated evacuation elevator, with one person running towards a doorway and another person using a mobility device.**

### **5.7.3 Evacuation plans**

An emergency evacuation plan shall

- a) be mounted with the horizontal centreline  $1500 \pm 25$  mm from the floor;
- b) be provided in at least a 14 pt font;
- c) be available in alternative accessible formats; and
- d) have signage that complies with Clause [4.6](#).

### **5.7.4 Access to secure areas**

#### **5.7.4.1 Security access systems**

A security access system shall

- a) be located along the accessible route;
- b) be clearly visible before reaching the door;
- c) be adjacent to a clear floor area, 820 by 1390 mm, that is clear of the door swing but is no further than 1500 mm from it;
- d) where both activation pads and security access systems are used for the same door, comply with Clause [5.2.9.4](#);
- e) comply with Clause [4.3](#); and

- f) provide equitable alternative means to allow people with disabilities through the security system, where a security system is not accessible.

**Notes:**

- 1) Security access systems should be usable by everyone. Proximity or contactless scanners can facilitate this.
- 2) Biometric systems (e.g., retinal or palm scanners) cannot accommodate all users.

### **5.7.4.2 Card access**

#### **5.7.4.2.1 Card reader access**

Where a card is required to be inserted into a reader, the reader shall

- a) have the entry slot
  - i) located at a height between 800 and 900 mm from the floor;
  - ii) with its edges bevelled; and
  - iii) at least 30% luminance (colour) contrasted with the surrounding surface;
- b) include tactile graphic pictograms on the surrounding surface that
  - i) represent the card; and
  - ii) identify the orientation of the card insertion; and
- c) have both audible (e.g., beep) and visible (e.g., light) signals to indicate access has been granted.

#### **5.7.4.2.2 Proximity card access**

Where a proximity card reader is used, it shall

- a) be located at a height between 800 and 1200 mm from the floor; and
- b) have both audible (e.g., beep) and visible (e.g., light) signals to indicate access has been granted.

### 5.7.4.3 Keypads

A physical keypad shall

- a) be located at a height between 800 and 1200 mm from the floor;
- b) be a minimum of 30% luminance (colour) contrasted with the background;
- c) have characters that are at minimum 50% luminance (colour) contrasted with the keys; and
- d) if numeric, be telephone type and have a raised dot that is centrally located on the "5" key with the following dimensions:
  - i)  $0.7 \pm 0.1$  mm high; and
  - ii) a base 1.5 mm in diameter.

**Note:** The keypad should be angled to be usable from both a standing and a seated position.

### 5.7.4.4 Security gates or screens

Security gates or screens shall

- a) comply with Clause [5.2.12](#); and
- b) where queue systems are used, have both audible (e.g., beep) and visible (e.g., light) signals to indicate "proceed" and "stop" instructions.

## 6 Interior facilities

### 6.1 Drinking fountains

#### 6.1.1 General

A drinking fountain that accommodates both drinking water from the spout as well as filling a water bottle shall be selected.

## 6.1.2 Spouts

A spout shall

- a) have the opening between 750 and 900 mm from the floor [see Figures [39 a\)](#) and [39 b\)](#)];
- b) be located at the front of the unit;
- c) direct the water flow in a trajectory that is parallel or nearly parallel to the front of the unit; and
- d) provide a water flow at least 100 mm high.

### Notes:

- 1) The provision of two drinking fountains at different heights meets the needs of most people.
- 2) The height of the water flow allows for the insertion of a cup or glass.

## 6.1.3 Controls

Controls shall

- a) be automatically activated or hand-operated;
- b) be at least 30% luminance (colour) contrasted with the overall colour of the device;
- c) where not automatically activated, allow the user to control the timing;
- d) comply with Clause [4.3](#); and
- e) be located either on the front or on both sides of the fountain.

**Note:** Ideally, fountains should feature touchless activation sensors for hands-free and sanitary operation.

## 6.1.4 Floor area

A drinking fountain shall have a clear floor area of at least 820 by 1390 mm in front of the unit [see Figures [39 a\)](#) and [39 b\)](#)].

### Notes:

- 1) Locating the drinking fountain out of the route of travel is preferred.

- 2) Recessing the drinking fountain in an alcove removes it as a protrusion hazard.

### **6.1.5 Luminance (colour) contrast**

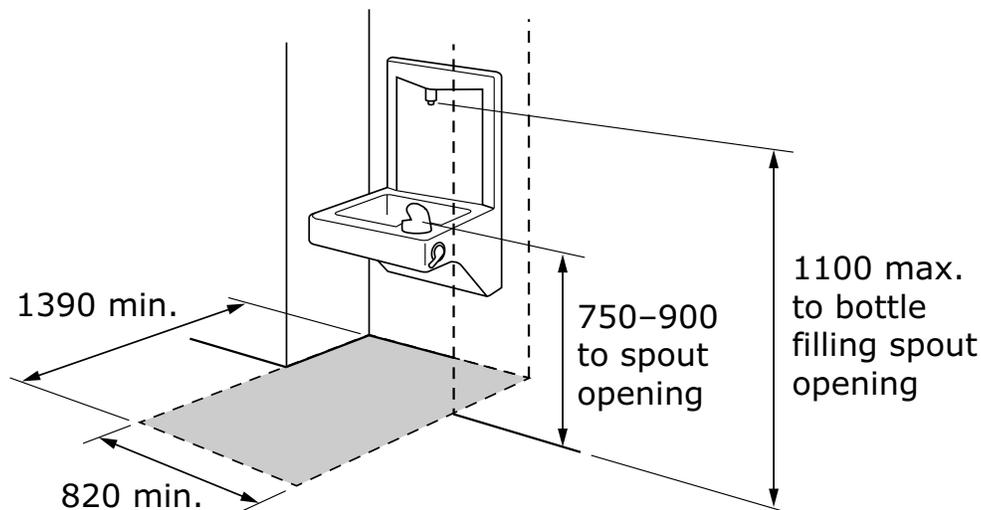
A drinking fountain shall be luminance (colour) contrasted at least 30% with the background. Refer to Figure [10](#) for contrast guidelines.

### **6.1.6 Cantilevered fountains**

A cantilevered drinking fountain shall

- a) be cane-detectable, recessed, or otherwise located out of the route of travel;
- b) have a knee clearance between the bottom of the apron and the floor at least 820 mm wide by 200 mm deep by 685 mm high (see Figure [40](#)); and
- c) have a toe space at least 820 mm wide by 230 mm deep by 230 mm high.

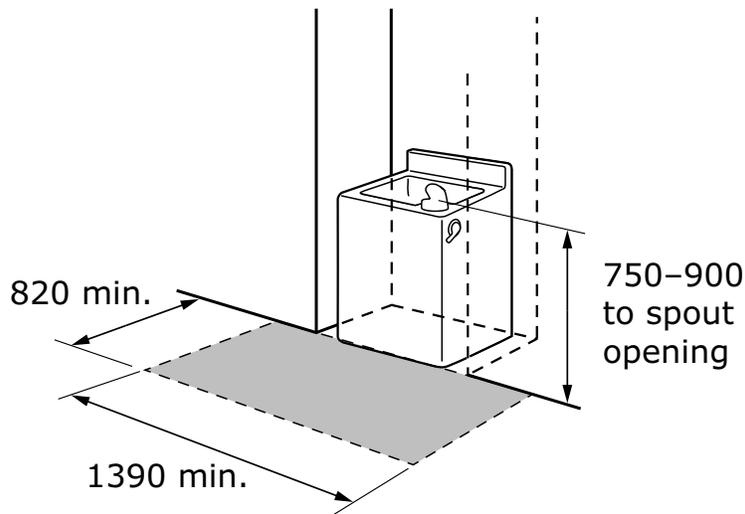
**Figure 39 a)**  
**Recessed drinking fountain — Mounted above floor**  
(See Clauses [6.1.2](#), [6.1.4](#), and [8.6.5](#).)



**This figure shows a recessed drinking fountain that is mounted above the floor, therefore requiring a clear floor area that extends underneath the fountain. The spout opening is situated 750 mm to 900 mm above the floor. The width of this clear area, measured between the two recessed walls, is 820 mm and the depth is 1390 mm. A bottle filling spout is available as part of the fountain and the spout opening is located a maximum of 1100 mm above the floor.**

**Note:** All dimensions are in mm.

**Figure 39 b)**  
**Recessed drinking fountain – Floor-standing model**  
(See Clauses [6.1.2](#), [6.1.4](#), and [8.6.5](#).)

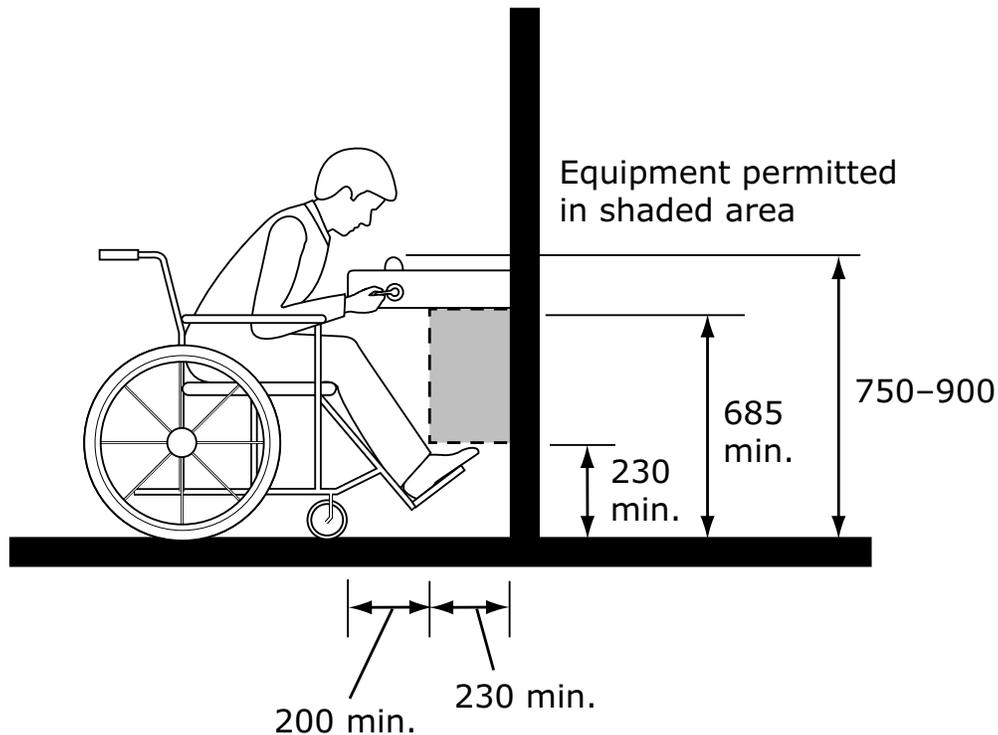


**This figure shows a recessed wall with a drinking fountain that is flush with the wall. The spout opening is situated 750 to 900 mm above the floor. There is no clear area underneath the fountain. The clearance area is measured in front of the fountain as 820 by 1390 mm.**

**Note:** All dimensions are in mm.

## Figure 40 Spout height and knee clearance at cantilevered fountain

(See Clause [6.1.6.](#))



**This figure illustrates the spout height and knee clearance at a cantilevered fountain. The graphic shows a person in a wheeled mobility device using a cantilevered fountain. The spout height is 750 to 900 mm above the floor. The person's feet have a minimum clearance area of 230 mm above the floor, whereas their knees have a minimum clearance 685 mm above the floor. The knee clearance is a minimum 200 mm deep and the toe clearance is a minimum 230 mm deep.**

**Note:** All dimensions are in mm.

## 6.2 Washroom facilities

### Notes:

- 1) All public washrooms should provide an accessible lavatory, toilet stall, urinal (where applicable), and washroom accessories.
- 2) In addition to accessible features in all public washrooms, universal washrooms should also be provided to accommodate a variety of users, including parents with children or a person with an attendant or partner (see Clause [6.3](#)).
- 3) In existing buildings, if it is difficult to provide accessible male and female washrooms, then universal washrooms can be substituted.
- 4) Scented products should be avoided where possible.

### 6.2.1 Identification

Signs at washroom entrances shall

- a) comply with Clause [4.6](#);
- b) where there is a door, be mounted on the latch side 150 mm from the door frame;
- c) where there is no door, be mounted on the outside walls of the main corridor, on both sides of the washroom entrance opening (see Figure [41](#)); and
- d) if the washroom is not accessible, indicate the location of the nearest accessible washroom.

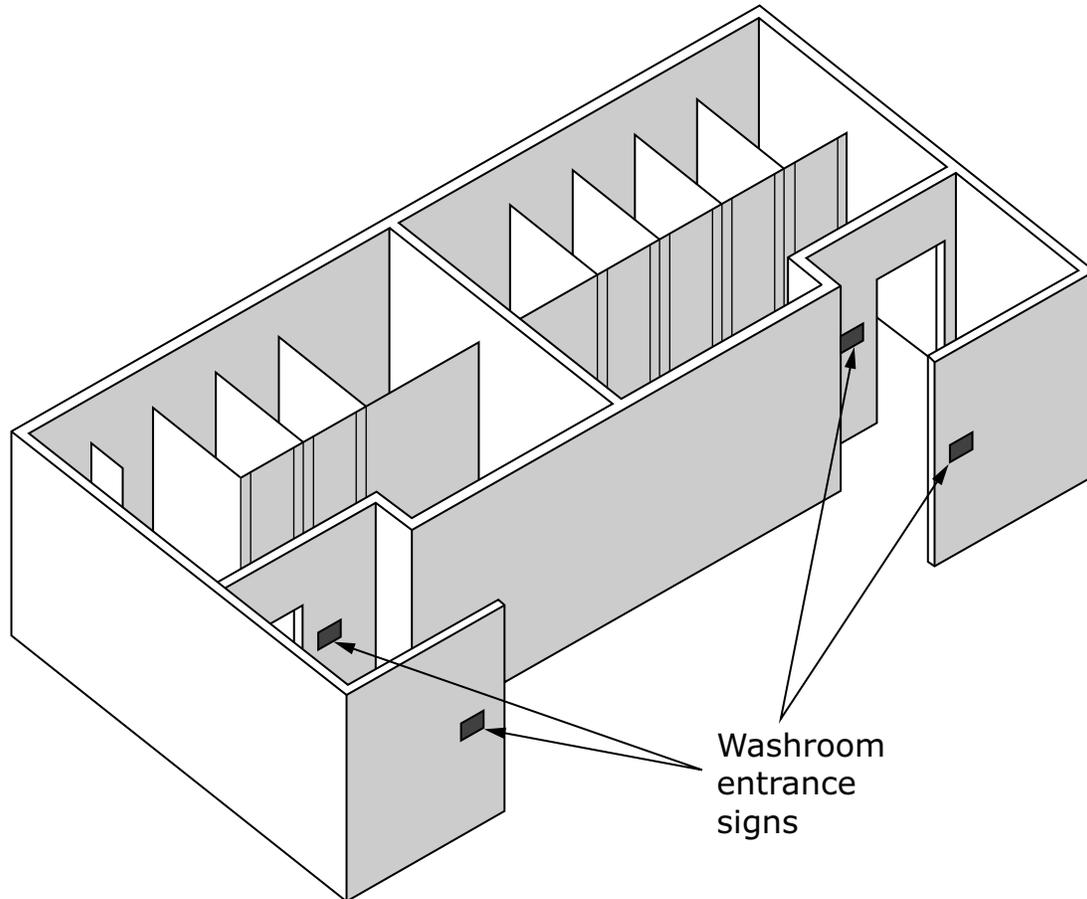
### 6.2.2 Floor area

A clear floor area for manoeuvring shall be provided

- a) at the door, if there is one, that complies with Clause [5.2.2](#); and
- b) in the interior, at least 2100 by 2100 mm in front of the accessible stall [see Figure [42 a\)](#) and [42 b\)](#)].

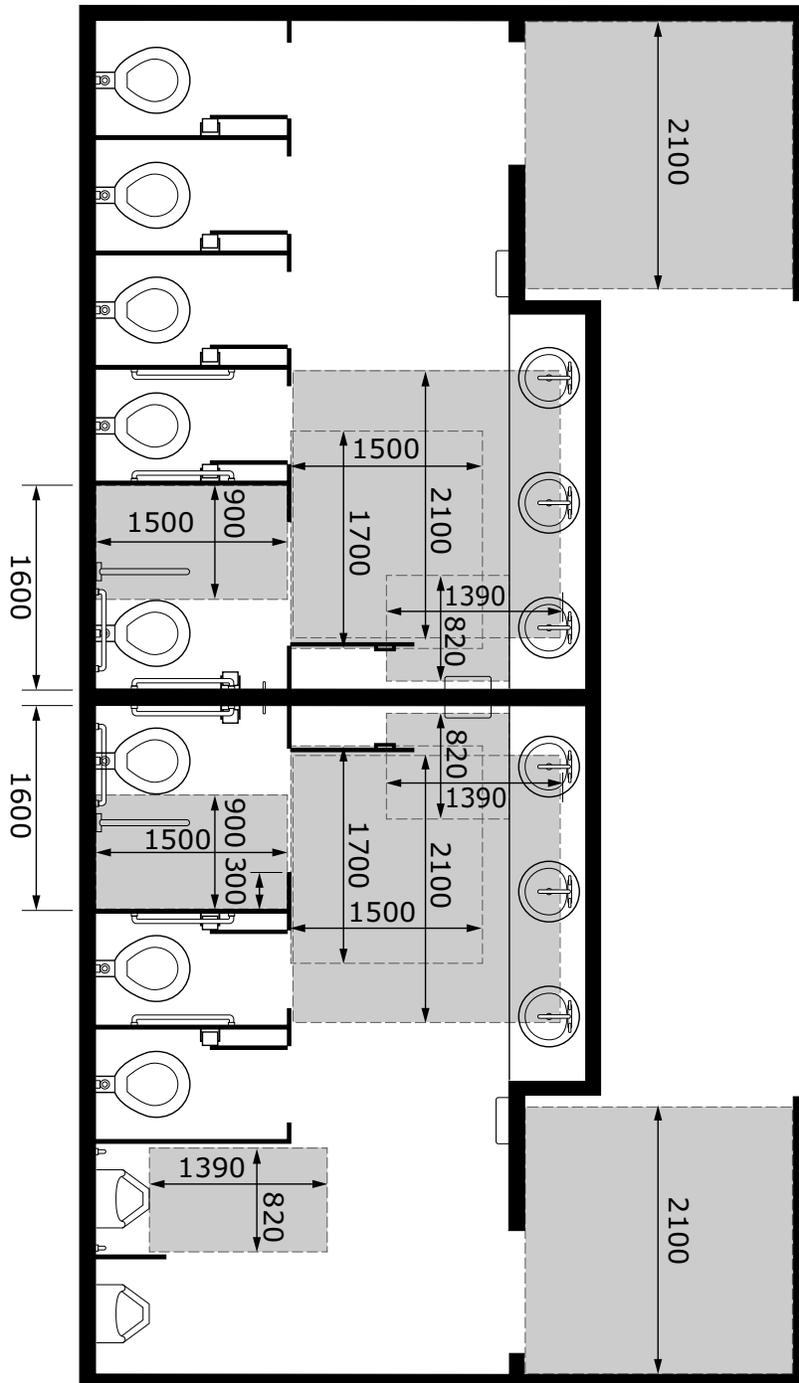
**Note:** When entering and leaving washrooms, people with disabilities frequently encounter difficulties. Entrances without doors are easier for everyone to use. If doors are required, there should be a single door rather than two doors in series.

**Figure 41**  
**Example of a washroom entrance**  
(See Clause [6.2.1.](#))



**This figure shows an example of a washroom layout with a split corridor leading into gendered washrooms. Signage indicating the gender of the washroom is located both where the hallway splits and at the entrance to each washroom.**

**Figure 42 a)**  
**Example of a washroom layout**  
 (See Clauses [6.2.2](#) and [6.2.7.2](#).)

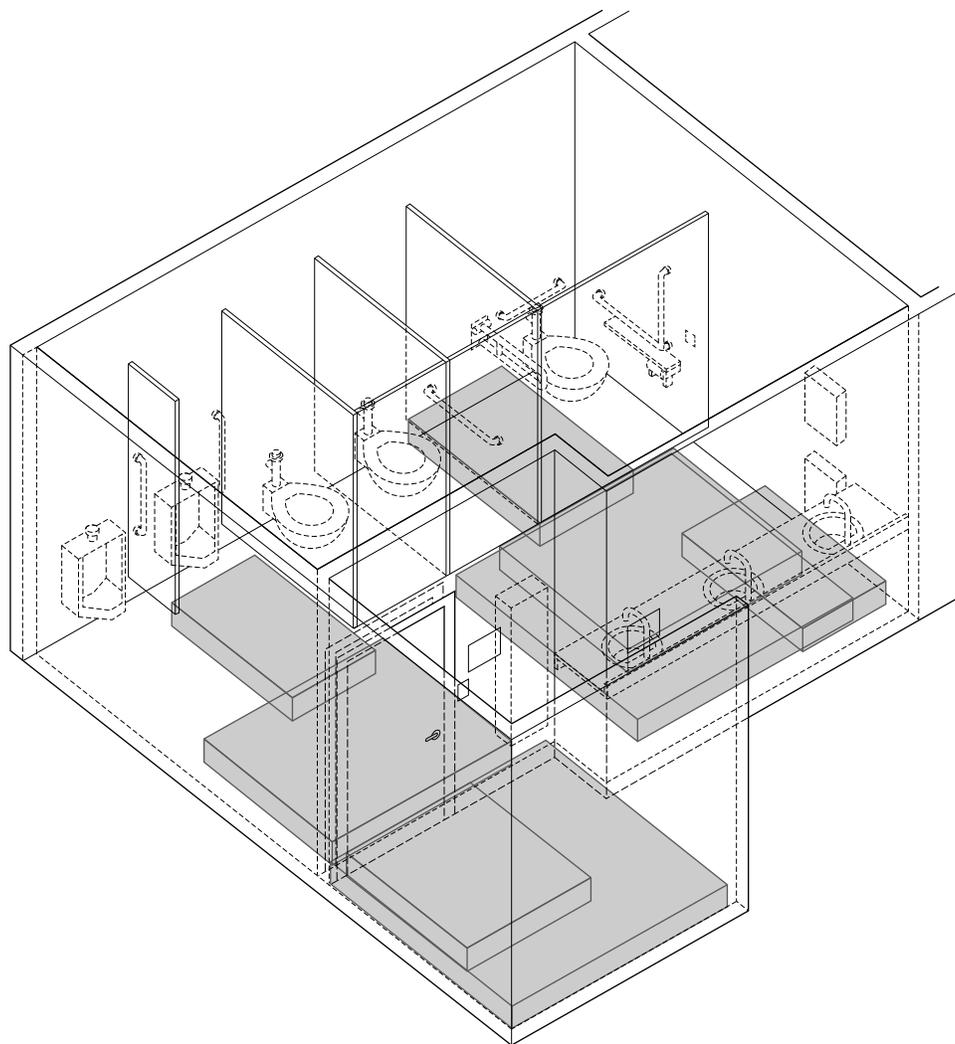


### **Figure 42 a) (Concluded)**

**This figure shows examples of a washroom layout with a clear floor area for manoeuvring at the door and in front of the accessible stalls denoted. It shows a plan with several dimensions listed. Room for a 2100-mm unobstructed U-turn is provided in the washroom. The clear floor area at the lavatory measures 820 by 1390 mm. The clear area when exiting the washroom measures 2100 by 2100 mm.**

**Note:** All dimensions are in mm.

**Figure 42 b)**  
**Washroom layout – 3D view**  
(See Clause [6.2.2.](#))



**This figure shows a 3D view of a washroom with two urinals, two toilets, and one accessible toilet.**

## **6.2.3 Lavatories**

### **6.2.3.1 General**

A lavatory shall

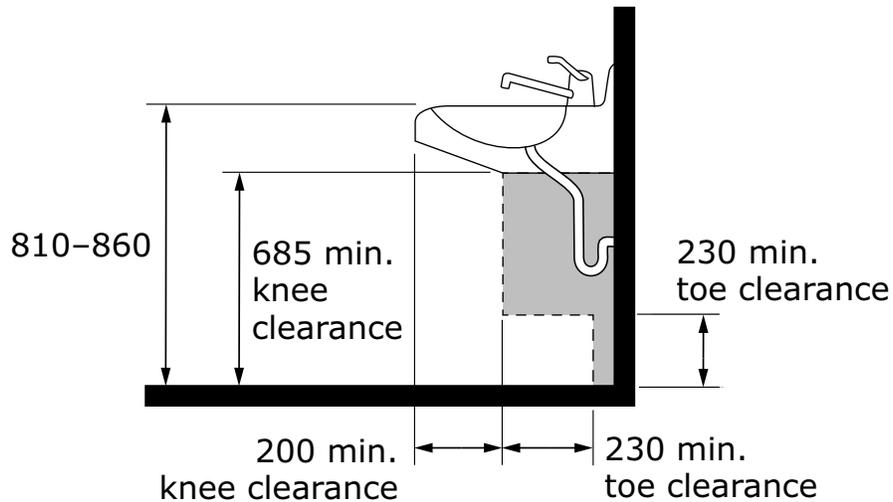
- a) be mounted with the centreline at least 460 mm from a side wall;

- b) have the top located between 810 and 860 mm from the floor;
- c) have a knee clearance centred on the lavatory at least 820 mm wide by 200 mm deep by 685 mm high, with an additional toe clearance at least 820 mm wide by 230 mm deep by 230 mm high;
- d) not consider the dip of the overflow in determining knee and toe clearances;
- e) have a clear floor area centred on the lavatory at least 820 by 1390 mm, of which not more than 480 mm may be under the lavatory; and
- f) have water supply and drainpipes under lavatories be heat-protected or otherwise configured to protect against contact [see Figures [43 a\)](#) and [43 b\)](#)].

**Notes:**

- 1) Water and drainpipes can be offset to the rear.
- 2) Lavatories that are shallow, with a long protruding lip and a gooseneck faucet, should not be used. When the water hits the shallow bowl, it tends to splash the user. Where the faucet handles are too far back, they might be difficult to reach.
- 3) Lavatories should not be placed on pedestals.

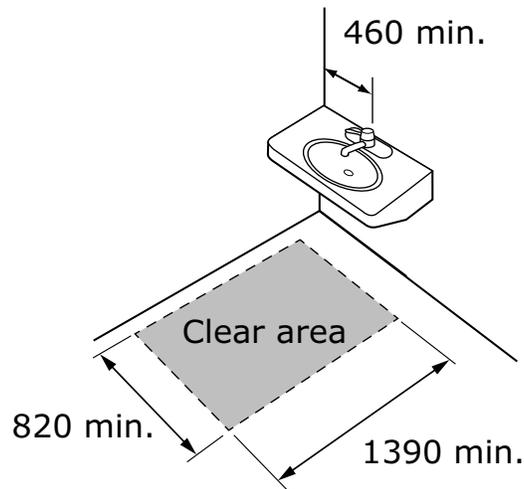
**Figure 43 a)**  
**Lavatory clearances – Minimum clearances**  
(See Clauses [6.2.3.1](#) and [6.2.3.2](#).)



**This figure shows the minimum clearances needed around a lavatory. The top of the basin is depicted as being 810 to 860 mm above the floor, with a minimum knee clearance of 685 mm high by 200 mm deep, and minimum toe clearance of 230 mm high by 230 mm deep.**

**Note:** All dimensions are in mm.

**Figure 43 b)**  
**Lavatory clearances – Floor area**  
 (See Clauses [6.2.3.1](#) and [6.2.3.2](#).)



**This figure shows a clear floor area measuring 820 by 1390 mm in front of a lavatory. The graphic shows the faucet placed at a minimum 460 mm from a side wall.**

**Note:** All dimensions are in mm.

### 6.2.3.2 Lavatory counters

If a lavatory is mounted in a counter, the front apron of the counter should be bull-nosed, with no sharp edges, and shall have a knee clearance centred on the lavatory at least 820 mm wide by 200 mm deep by 685 mm high, with an additional toe clearance at least 820 mm wide by 230 mm deep by 230 mm high [see Figures [43 a\)](#) and [43 b\)](#)].

**Note:** Clearance under a lavatory is important for wheeled mobility device access.

### 6.2.3.3 Faucets

Faucets and other controls shall

a) comply with Clause [4.3](#);

- b) not require the application of continuous force to maintain water flow; and
- c) where metered, provide at least 10 s of flow.

**Notes:**

- 1) Where lever handles are used, the lever in the “off” position should be angled to the front.
- 2) Hot and cold faucets for lavatories, bathtubs, and showers should be oriented consistently.

### 6.2.3.4 Water temperature

The temperature of the water supplied to the lavatory shall not exceed 49 °C.

**Note:** This temperature is a maximum. Lower maximum water supply temperatures could be needed in some applications (e.g., long-term care homes).

## 6.2.4 Washroom accessories

### 6.2.4.1 Operation

The operable parts and controls of at least one of each type of washroom accessory shall comply with Clause [4.3](#).

**Notes:**

- 1) Accessories such as towel dispensers and waste receptacles should be placed close to the lavatory and not protrude into the route of travel.
- 2) The clear floor area requirements in Clause [4.3.2](#) are meant to ensure unobstructed access to washroom accessories.
- 3) Consider adding an AC outlet in accessible toilet stall.

### 6.2.4.2 Mirrors

A mirror shall be mounted with its bottom edge not more than 1000 mm from the floor (see Figure [44](#)).

**Notes:**

- 1) Tilted mirrors should not be used.
- 2) A full-length mirror should not be installed where it would reflect the route of travel.

### **6.2.4.3 Soap dispensers**

Where a soap dispenser is provided at the accessible lavatory, it shall be

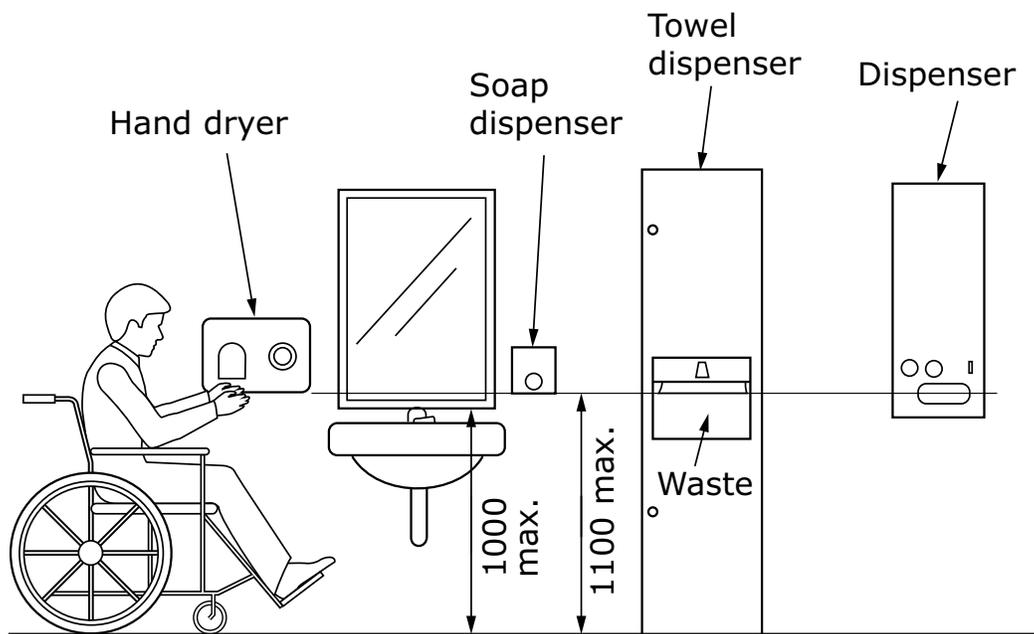
- a) located within a 500 mm reach of a person seated at the lavatory;
- b) located with the dispensing point not higher than 1100 mm from the floor; and
- c) operable with one hand to dispense soap on the palm of that hand (see Figure [44](#)).

### **6.2.4.4 Towel dispensers/hand dryers**

A towel dispenser or hand dryer adjacent to the accessible lavatory shall be

- a) located within a 500 mm reach of a person seated at the lavatory;
- b) no higher than 1100 mm at the point of interaction; and
- c) operable with one hand to dispense towels or activate hand dryer (see Figure [44](#)).

**Figure 44**  
**Washroom accessory heights**  
 (See Clauses [6.2.4.2](#) to [6.2.4.4](#).)



**This figure shows the height of washroom accessories in an accessible lavatory. The graphic shows a person in a wheeled mobility device using the washroom hand dryer. The primary access point of the hand dryer and other washroom accessories, including a soap dispenser, towel dispenser, and general dispensing unit are positioned at a maximum of 1100 mm above the floor, while the base of the mirror is positioned a maximum of 1000 mm above the floor.**

**Note:** All dimensions are in mm.

## 6.2.5 Grab bars

### 6.2.5.1 General

A grab bar shall

- be slip-resistant;
- have a diameter between 30 and 40 mm;

- c) where mounted in a corner with an adjacent wall, have a space between 35 and 45 mm between the adjacent wall and the grab bar; and
- d) not rotate within its fittings.

### **6.2.5.2 Structural strength**

A grab bar shall be installed to resist a force of at least 1.3 kN applied in any direction.

### **6.2.5.3 Surfaces**

A grab bar and adjacent surfaces shall be free of any sharp or abrasive elements.

## **6.2.6 Toilets**

### **6.2.6.1 Toilet fixtures**

A toilet fixture shall have

- a) the top of the seat between 430 and 485 mm from the floor (see Figure [45](#));
- b) no spring-activated seat;
- c) a back support where there is no seat lid or tank; and
- d) where there is a tank, a tank lid that is securely attached.

#### **Notes:**

- 1) Wall-hung toilets are preferred because they provide additional space at toe level.
- 2) Preferences for toilet seat heights vary considerably. Higher seats can be an advantage to some ambulatory people with disabilities, but are a disadvantage to those using wheeled mobility devices.
- 3) A back support reduces the chance of imbalance or injury caused by leaning against exposed valves or pipes. A toilet seat lid is an inexpensive means of providing a back support.

### 6.2.6.2 Location

A toilet shall

- a) be located with its centreline between 460 and 480 mm from an adjacent wall (see Figure [45](#)); and
- b) have a clear transfer space at least 900 mm wide by 1500 mm long on its open side, with the width measured from the edge of the toilet bowl (see Figure [46](#)).

### 6.2.6.3 Controls

Flush controls shall

- a) be automatically activated; or
- b) be hand-operated by a device that
  - i) complies with Clauses [4.3.1](#), [4.3.3](#), [4.3.4](#), [4.3.5](#), and [4.3.8](#); and
  - ii) is not more than 350 mm from the transfer space side of the toilet.

#### Notes:

- 1) Flush valves can be located beside the toilet or above and behind the toilet seat, and the related plumbing can be located behind the wall, or beside or behind the toilet.
- 2) Flush controls for tank-type toilets have a standard mounting location on the left side of the tank when facing the tank.
- 3) Tanks with controls mounted on the right side are often available by special order.
- 4) Where flush controls are automatically activated, they should be supplemented with a manually operated control. The manual flush control should comply with Clause [4.3](#).

### 6.2.6.4 Grab bars

Grab bars that comply with Clause [6.2.5](#) shall be provided as follows:

- a) There shall be one L-shaped grab bar that is
  - i) mounted on the side wall closest to the toilet; and

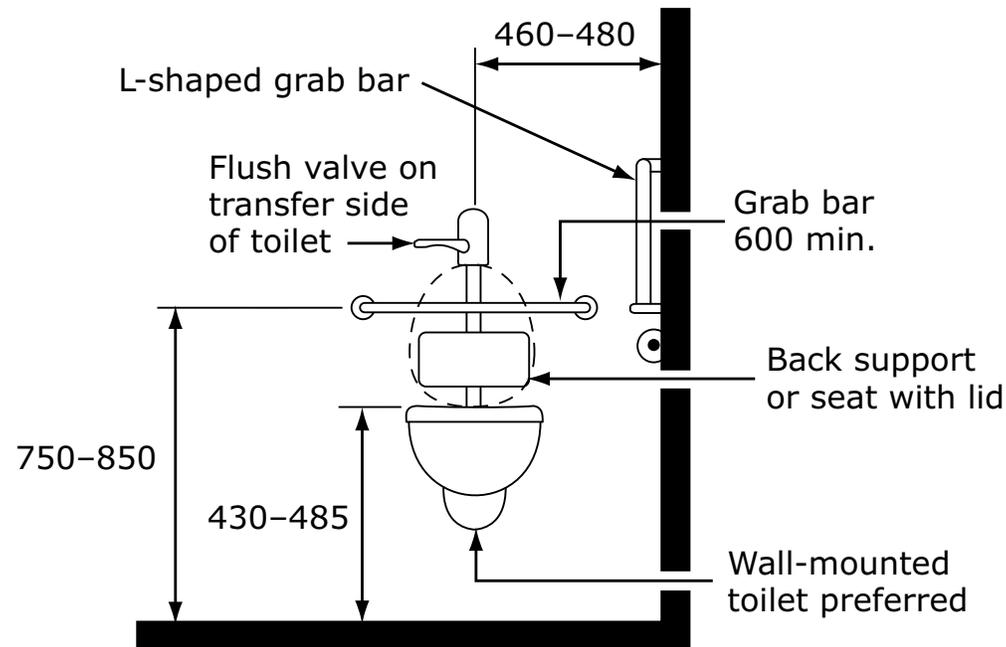
- ii) has horizontal and vertical components that are at least 760 mm long, such that
  - 1) the horizontal component is 750 to 850 mm above the floor and adjacent to the toilet; and
  - 2) the vertical component is 150 mm in front of the toilet.
- b) There shall be a horizontal grab bar that is
  - i) mounted on the rear wall (see Figure [45](#));
  - ii) centred over the toilet (see Figure [45](#));
  - iii) not less than 600 mm long (see Figure [45](#)); and
  - iv) mounted at the same height as the grab bar on the side wall, except where the toilet has an attached water tank or flushometer valve that conflicts with the grab bar, in which case the grab bar shall be mounted 100 mm above the top of the tank or flushometer valve.

**Notes:**

- 1) A vertical grab bar may be added on the adjacent wall. It should be at least 600 mm in length, located not more than 250 mm in front of the toilet seat, at a height of 900 to 1500 mm from the floor.
- 2) Flip-down grab bars are available. They may be added on the same side of the toilet as the transfer space, and the installation should comply with Clause [6.2.5](#).
- 3) Grab bars should luminance (colour) contrast with the background.

## Figure 45 Toilet

(See Clauses [6.2.6.1](#), [6.2.6.2](#), and [6.2.6.4](#).)



**This figure illustrates the height and location requirements of a toilet fixture in an accessible washroom. The graphic shows the grab bar a minimum 600 mm in length and placed 750 to 850 mm above the floor. The toilet seat is positioned 430 to 485 mm above the floor, with the back support or seat with lid placed directly above. The flush valve is placed on the transfer side of the toilet and is positioned 460 to 480 mm from the corner wall.**

**Note:** All dimensions are in mm.

### 6.2.6.5 Toilet paper dispensers

A toilet paper dispenser shall be located

- such that the closest edge of the dispenser is 300 mm from the front of the toilet; and

b) at a height between 600 and 800 mm from the floor.

**Notes:**

- 1) Bulk dispensers that interfere with the effective use of the grab bars should not be used.
- 2) Recessed toilet paper dispensers are preferred when using bulk dispensers.

## **6.2.7 Toilet stalls**

### **6.2.7.1 Accessible toilet stalls**

An accessible toilet stall shall have

- a) internal dimensions at least 1600 mm wide by 1500 mm deep (see Figure [46](#));
- b) a toilet complying with Clause [6.2.6](#);
- c) a hook on a side wall
  - i) mounted not more than 1200 mm from the floor; and
  - ii) projecting not more than 40 mm from the wall.

### **6.2.7.2 Toilet stall doors**

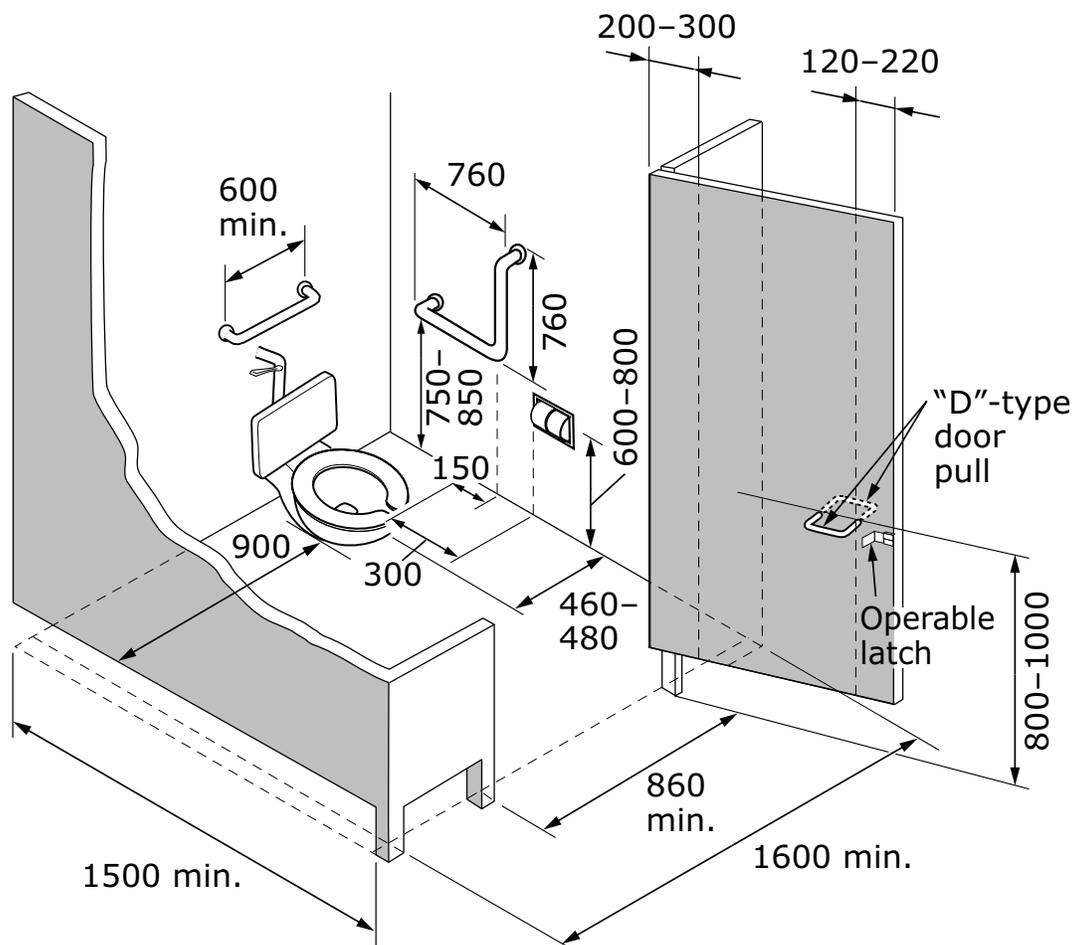
Toilet stall doors shall

- a) provide a clear opening of at least 860 mm with the door in the open position;
- b) be aligned with the transfer space adjacent to the toilet, unless the internal dimensions of the toilet stall exceed the minimum values specified in Clause [6.2.7.1 a\)](#), such that there is additional manoeuvring area between the door and the transfer space (see Figures [42 a\)](#) and [46](#));
- c) have a “D”-type door pull at least 140 mm long, mounted horizontally on the inside of an outward-swinging door
  - i) with its centreline located between 200 and 300 mm from the hinge edge; and
  - ii) at a height between 800 and 1000 mm from the floor (see Figure [46](#));

- d) have a “D”-type door pull at least 140 mm long, mounted horizontally on the outside
  - i) with its centreline located between 120 and 220 mm from the latch edge of the door; and
  - ii) at a height between 800 and 1000 mm from the floor;
- e) be self-closing so that when at rest the door will be ajar not more than 50 mm beyond the jamb;
- f) be latched from the inside by a device that complies with Clause [4.3.4](#); and
- g) have a clear area at least 2100 by 2100 mm in front of the stall that complies with Clause [5.2.2](#) (see Figure [42 a](#)).

## Figure 46 Toilet stall

(See Clauses [6.2.6.2](#), [6.2.7.1](#), and [6.2.7.2](#).)



**This figure shows dimensions for a toilet stall that has a "D"-type door pull mounted on the inside of an outward-swinging door. The stall measures a minimum 1500 mm deep by 1600 mm wide. The swinging door provides a minimum 860 mm wide clear opening, with door pulls and operable latch placed 800 to 1000 mm above the floor.**

**Note:** All dimensions are in mm.

### 6.2.7.3 Toilet stalls for users with limited mobility

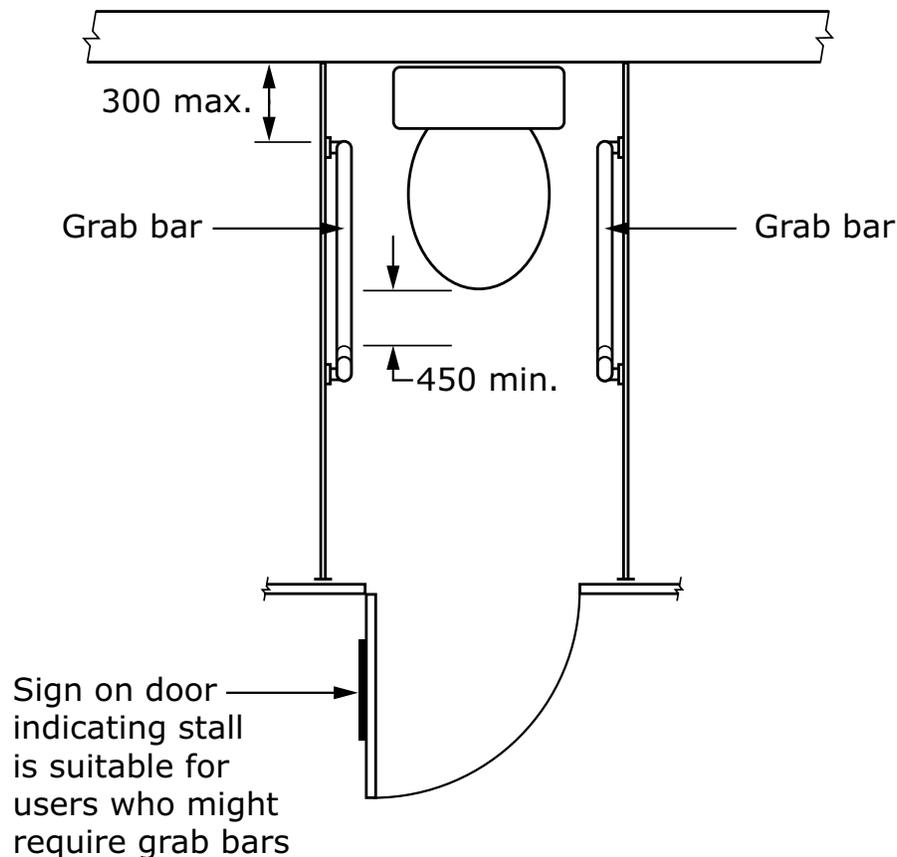
A toilet stall for users with limited mobility (see Figure [47](#)) shall be a standard-sized stall equipped with

- a) horizontal grab bars, one on each side of the fixture, that
  - i) comply with Clause [6.2.5](#);
  - ii) are at a height between 750 and 850 mm from the floor;
  - iii) begin not more than 300 mm from the rear wall; and
  - iv) extend at least 450 mm in front of the toilet seat;
- b) a toilet fixture that complies with Clause [6.2.6.1](#);
- c) a door that
  - i) opens outward;
  - ii) is self-closing so that when at rest the door will be ajar not more than 50 mm beyond the jamb; and
  - iii) is latched from the inside by a device that complies with Clause [4.3.4](#); and
- d) a sign on the door that
  - i) complies with Clause [4.6](#); and
  - ii) indicates that the stall is suitable for users who might require grab bar assistance.

#### Notes:

- 1) This toilet stall is standard-sized, and at least one should be provided to accommodate users with limited mobility, who might have balance, strength, pain, or other problems and would benefit from grab bars to help them sit and rise.
- 2) An example of a door sign would be the image of a person with a cane.

**Figure 47**  
**Toilet stall for users with limited mobility**  
(See Clause [6.2.7.3.](#))



**This figure shows the required dimensions for grab bars placed in a toilet stall for users with limited mobility. The graphic indicates there shall be a minimum 450 mm clear area from the front of the toilet seat to the front end of the grab bar. The graphic also emphasizes the importance of including signage on the front of the stall door indicating the stall is suitable for users who might require grab bars.**

**Note:** All dimensions are in mm.

## 6.2.8 Urinals

### 6.2.8.1 General

A urinal shall

- a) be a stall or wall-hung type, with the well located so that
  - i) the lower rim is not higher than 430 mm from the floor;  
and
  - ii) the upper rim is not lower than 860 mm from the floor;
- b) have a clear floor area in front of the urinal that is
  - i) adjacent to an accessible route;
  - ii) centred on the urinal;
  - iii) at least 820 mm wide by 1390 mm deep; and
  - iv) unobstructed by floor level changes or privacy screens;  
and
- c) have flush controls that are
  - i) automatically operated; or
  - ii) hand-operated and complying with Clauses [4.3.3](#) and [4.3.4](#).

**Note:** The height range for the urinal well permits use by both seated and standing people.

### 6.2.8.2 Grab bars

Grab bars that comply with Clause [6.2.5](#) shall be

- a) at least 600 mm long;
- b) mounted vertically on the back wall
  - i) at each side of the urinal;
  - ii) not more than 380 mm from the centre of the urinal; and
  - iii) with the centreline 1000 mm from the floor; and
- c) luminance (colour) contrasted with the back wall (see Figure [48](#)).

### 6.2.8.3 Centreline indicator

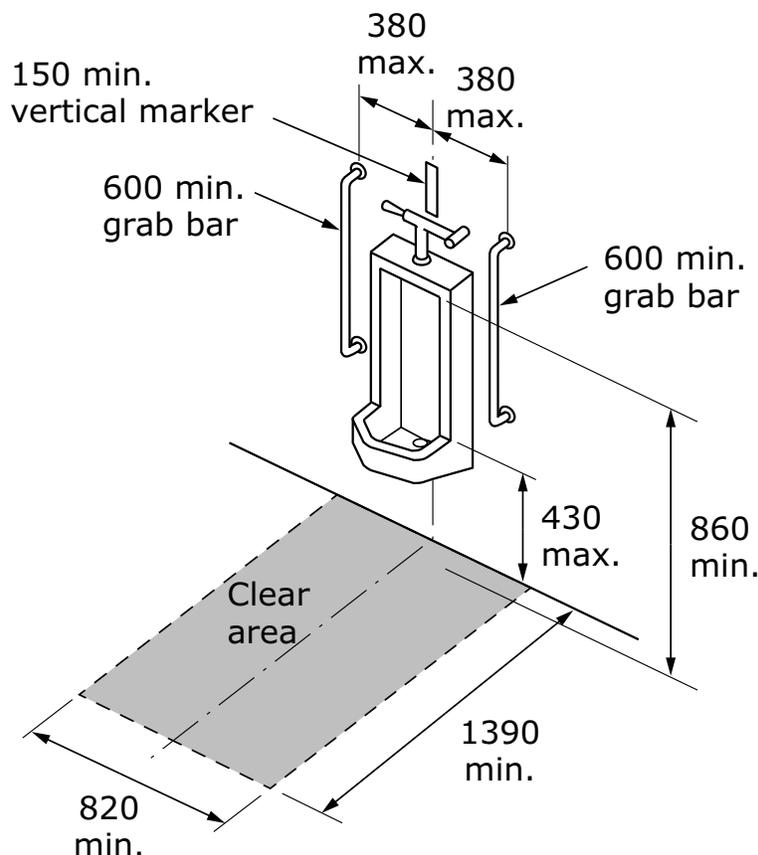
The centreline of a urinal shall be indicated by a vertical element that

- a) is centred on the urinal;
- b) extends to a height of at least 1300 mm from the floor but never less than 150 mm above the upper urinal rim;
- c) is at least 50 mm wide;
- d) is raised at least 3 mm from the wall surface; and
- e) is luminance (colour) contrasted not less than 30% with the back wall.

**Notes:**

- 1) The vertical indicator is to facilitate use by people with low or no vision.
- 2) Where more than one urinal is provided in a washroom, all urinals should have a centreline indicator.
- 3) Various elements can be used as a centreline indicator, such as exposed piping, architectural features (e.g., raised ceramic tiles), etc.

**Figure 48**  
**Urinal**  
 (See Clause [6.2.8.2.](#))



**This figure shows dimensions and location of vertical grab bars mounted on the back wall at each side of the urinal. The graphic shows both bars being 600 mm in length and placed on either side at a maximum distance of 380 mm from the vertical marker that identifies the mid-point of the urinal. The urinal is mounted at a maximum of 430 mm from the floor, with a minimum clear area of 820 by 1390 mm in front.**

**Note:** All dimensions are in mm.

## 6.3 Universal washrooms

### 6.3.1 General

#### 6.3.1.1 Washrooms with a single toilet and lavatory

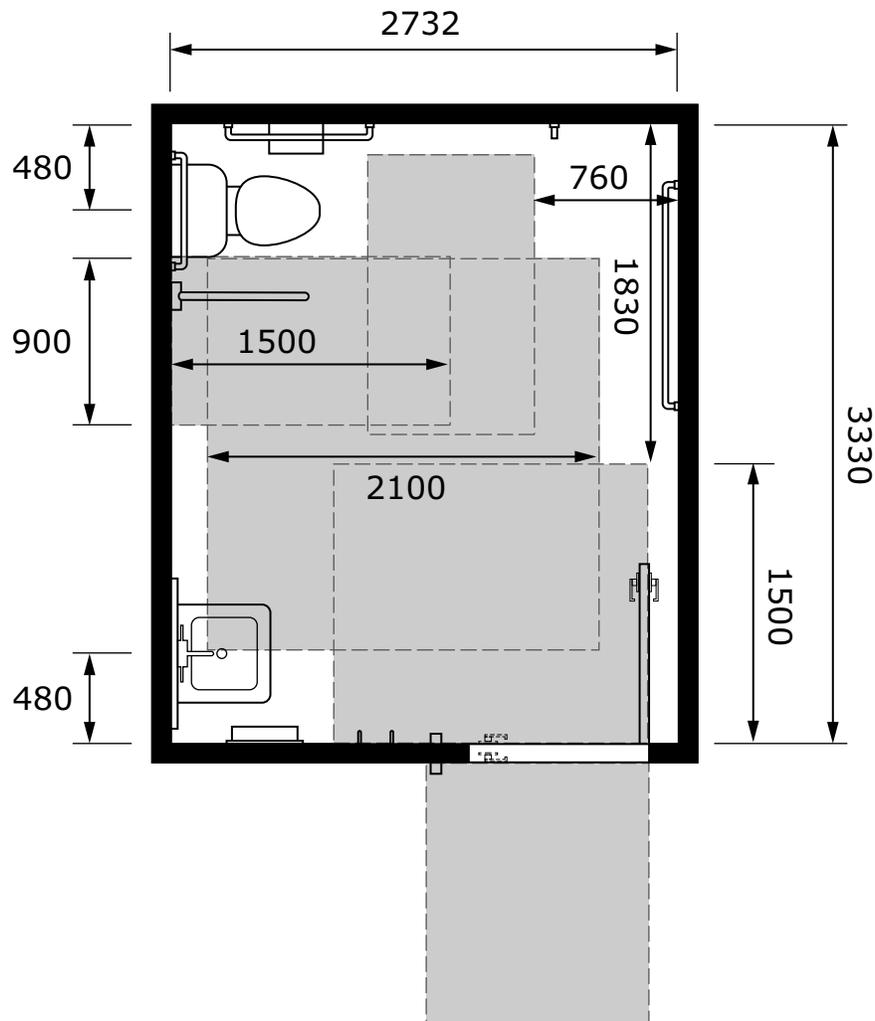
Where a universal washroom containing a single toilet and lavatory is provided, it shall

- a) provide a clear area of at least 2100 by 2100 mm;
- b) have a lavatory that complies with Clause [6.2.3](#);
- c) have a toilet that complies with Clause [6.2.6](#); and
- d) be identified by a sign that
  - i) complies with Clause [4.6.6](#); and
  - ii) shows a male and female pictogram or all-gender pictogram and the International Pictogram of Access [see Figures [12 a](#)), [12 b](#)), and [13](#)].

#### Notes:

- 1) A universal washroom (previously called an individual washroom) should be designed to accommodate a variety of users, such as a disabled person with an attendant (perhaps a partner) or a child with a parent.
- 2) The area around the toilet should provide an adequate transfer space for both the person and the attendant [see Figures [49 a](#)) to [49 e](#))].
- 3) Where more than one universal washroom is provided in a facility, the transfer spaces should be located on opposite sides of the toilet, to accommodate different transferring needs.
- 4) A universal washroom may be equipped with an adult change table or a change bench (see Clauses [6.3.4](#) and [6.4](#)).
- 5) Where a universal washroom with an adult change table is available in a large public building with many washrooms or in a building with many floors, there should be signage at each universal washroom to indicate where the washroom(s) with an adult change table is located.
- 6) A fold down grab bar could provide additional flexibility.

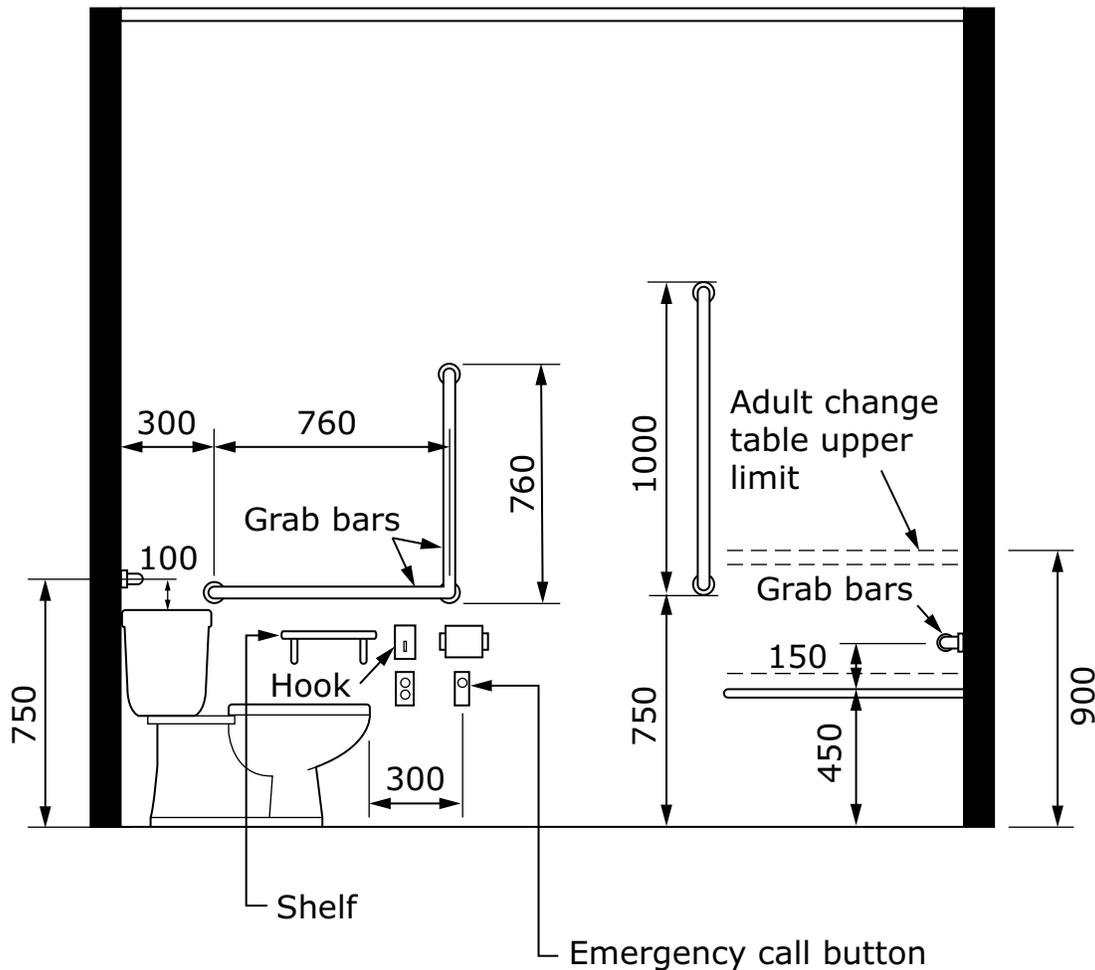
**Figure 49 a)**  
**Universal washroom — Example layout**  
(See Clause [6.3.1.1.](#))



**This figure shows a dimensioned plan of an example layout of a universal washroom. Included in this layout is a clear central-turn area of 2100 by 2100 mm.**

**Note:** All dimensions are in mm.

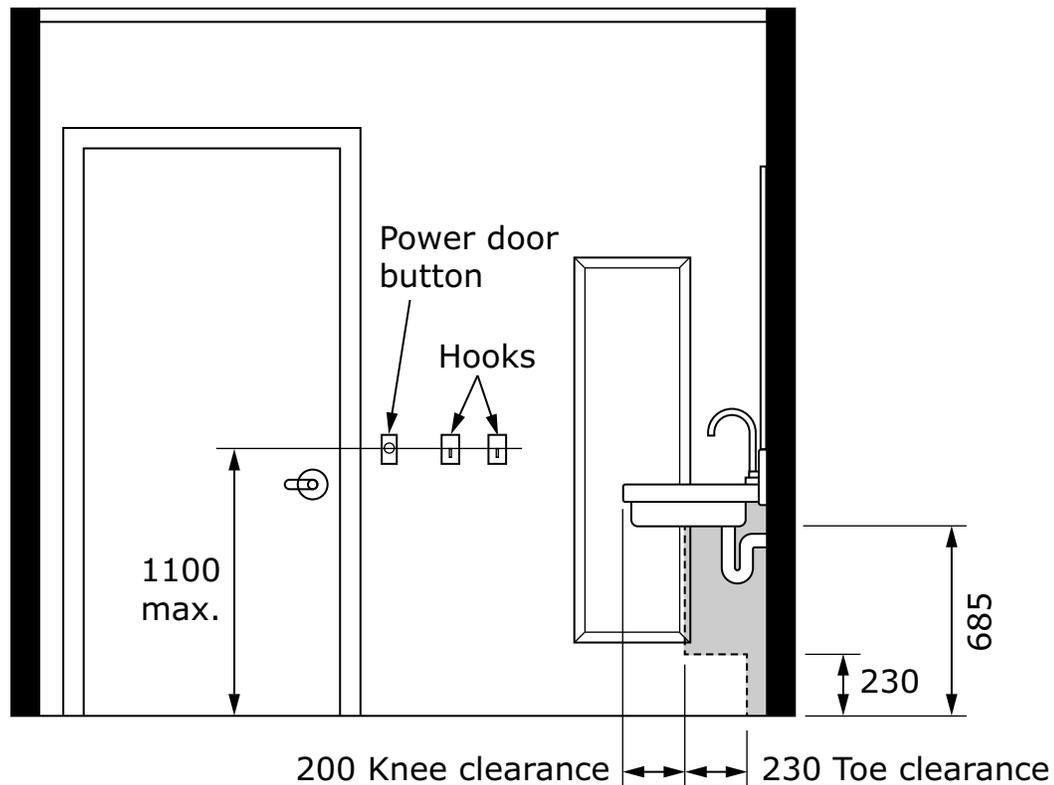
**Figure 49 b)**  
**Universal washroom – Dimensions around toilet and grab bars**  
 (See Clause [6.3.1.1.](#))



**This figure shows a dimensioned side view of the toilet and grab bars in a universal washroom. Beside the toilet, an L-shaped grab bar is depicted. In front of the toilet, a vertical grab bar 1000 mm long and 750 mm from the floor is shown.**

**Note:** All dimensions are in mm.

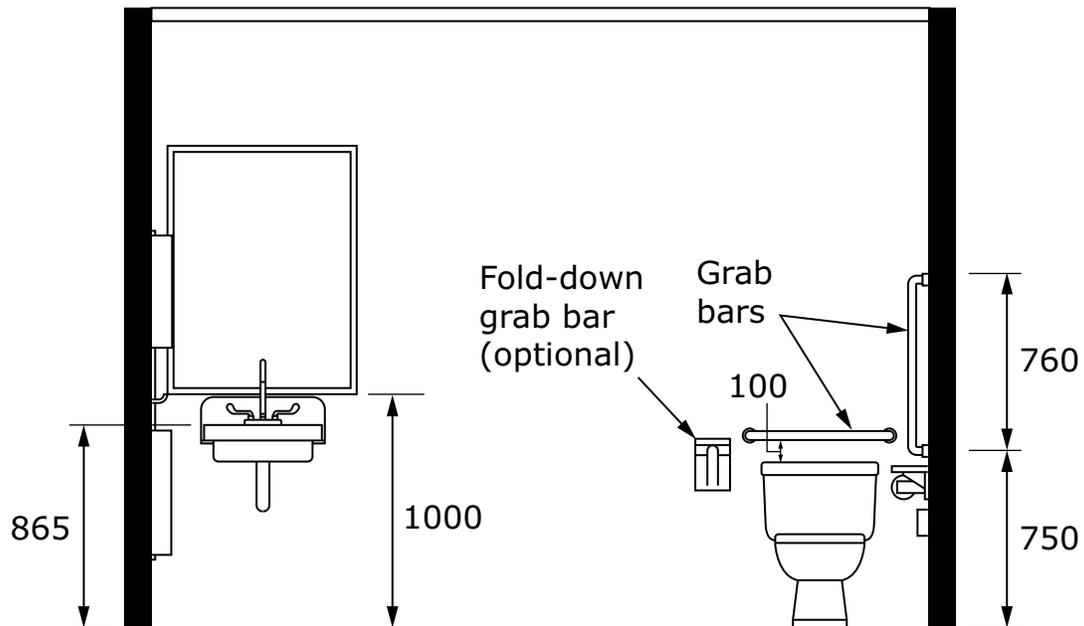
**Figure 49 c)**  
**Universal washroom – Dimensions around lavatory and door**  
(See Clause [6.3.1.1.](#))



**This figure shows the washroom dimensions around the lavatory and door in a universal washroom. Under the lavatory, a 685 by 200 mm knee clearance and 230 by 230 mm toe clearance are shown. Switches are located 1100 mm from the floor.**

**Note:** All dimensions are in mm.

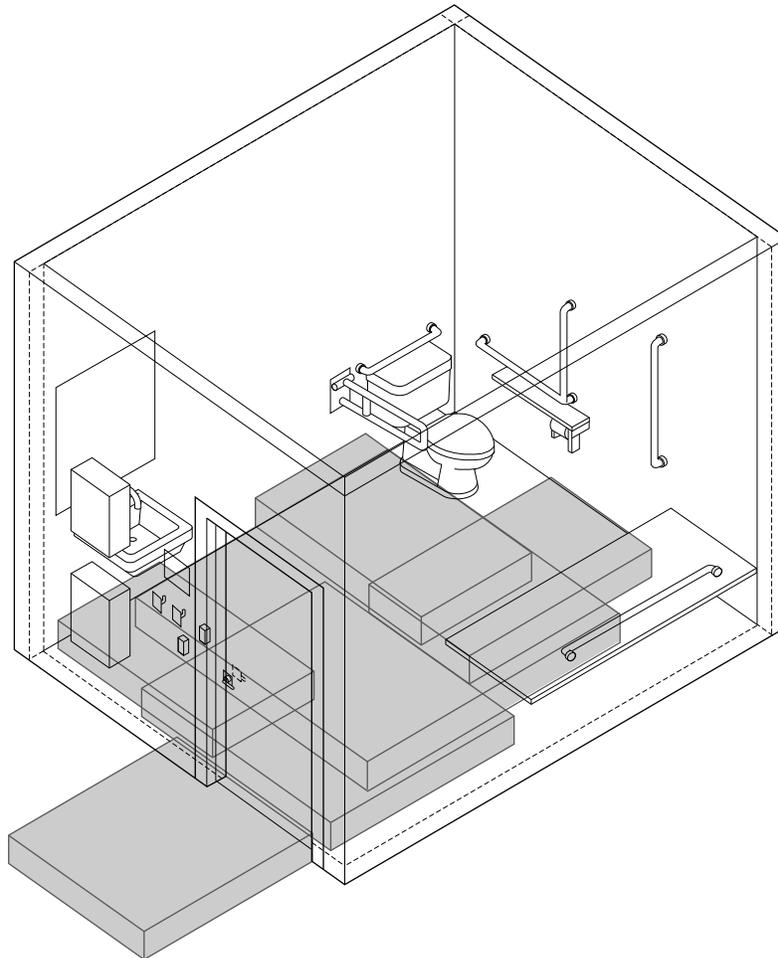
**Figure 49 d)**  
**Universal washroom – Height of lavatory and grab bar behind toilet**  
(See Clause [6.3.1.1.](#))



**This figure shows the washroom dimensions around the lavatory and toilet in a universal washroom, with the grab bars next to the toilet 750 mm from the floor.**

**Note:** All dimensions are in mm.

**Figure 49 e)**  
**Universal washroom – Clear floor area layout**  
(See Clause [6.3.1.1.](#))



**This figure shows a 3D view of a universal washroom, with the necessary floor clearances shown by boxes.**

### **6.3.1.2 Emergency call system**

A universal washroom shall be equipped with an emergency call system that can be actuated by a control located inside the washroom, which will activate audible and visual signal devices inside and outside of the washroom. A tactile sign having lettering at least 25 mm in height and posted above the emergency button shall indicate that signal devices will activate when the button is pushed.

There shall be signage posted outside the washroom with instructions to passersby on how to retrieve the washroom key, open the door, and render assistance in the event of an emergency.

If the door has an electric strike, it shall be automatically released when the alarm button is pressed so that assistance can be provided.

**Note:** The emergency call button should be located beside the toilet and 300 mm above the floor.

### 6.3.2 Washroom door

A door to a universal washroom shall

- a) comply with Clause [5.2](#);
- b) have a locking mechanism on the inside that complies with Clause [4.3.4](#);
- c) have a power-assisted door opener; and
- d) be capable of being unlocked from the outside in an emergency.

**Note:** Some means of identifying when the washroom is occupied should be provided.

### 6.3.3 Washroom accessories

Accessories in a universal washroom shall

- a) comply with Clause [6.2.4](#);
- b) include a shelf or counter at least 200 by 400 mm; and
- c) include a coat hook mounted on a side wall
  - i) at a height not more than 1200 mm from the floor; and
  - ii) protruding not more than 40 mm from the wall.

**Note:** The shelf should be adjacent to, but not impinge on, the clear space around the lavatory.

## 6.3.4 Adult change table

### 6.3.4.1 General

An adult change table, where provided, shall

- a) be located on an accessible route;
- b) be at least 760 mm wide by 1830 mm long [see Figure [50 a\)](#)];
- c) have a surface height above the finished floor that can be adjusted from between 450 and 500 mm at the low range to between 850 and 900 mm at the high range;
- d) have surfaces free of sharp edges, corners, or abrasive materials;
- e) be easy to clean;
- f) be designed to support a weight of at least 250 kg; and
- g) have a horizontal grab bar that
  - i) complies with Clause [6.2.5](#);
  - ii) is centred on the long dimension of the bench;
  - iii) is at least 1200 mm long; and
  - iv) is mounted so that it can be used regardless of the bench height adjustment.

**Note:** Shelves should be provided to accommodate the washroom user's supplies (e.g., gloves, removable table covers, disinfecting supplies, personal cleaning supplies).

### 6.3.4.2 Transfer space

A transfer space of 900 by 1500 mm adjacent to the adult change table shall be provided [see Figure [50 a\)](#)].

### 6.3.4.3 Location and controls

An adult change table, whether of the fixed or fold-down type, shall be installed so that it does not encroach into the clear transfer space when it is positioned for use. Controls for the table, if present, shall be no higher than 1200 mm.

### 6.3.4.4 Personal lifting devices

Personal lifting devices, if provided, shall comply with CAN/CSA-Z10535.1 and be installed in accordance with CSA Z10535.2.

## 6.4 Change benches

### 6.4.1 General

Where a change bench is provided, it shall

- a) be located on an accessible route;
- b) have an adjacent clear floor area at least 900 mm wide for the whole length of the bench;
- c) be at least 760 mm wide by 1830 mm long;
- d) have its top surface between 480 and 520 mm from the floor [see Figure [50 b](#)];
- e) be free of sharp edges or corners, and have no abrasive materials on its surfaces;
- f) be easy to clean;
- g) be designed to support a weight of at least 250 kg; and
- h) have a horizontal grab bar that
  - i) complies with Clause [6.2.5](#);
  - ii) is centred on the long dimension of the bench;
  - iii) is at least 1200 mm long; and
  - iv) is mounted between 750 and 850 mm from the floor.

#### Notes:

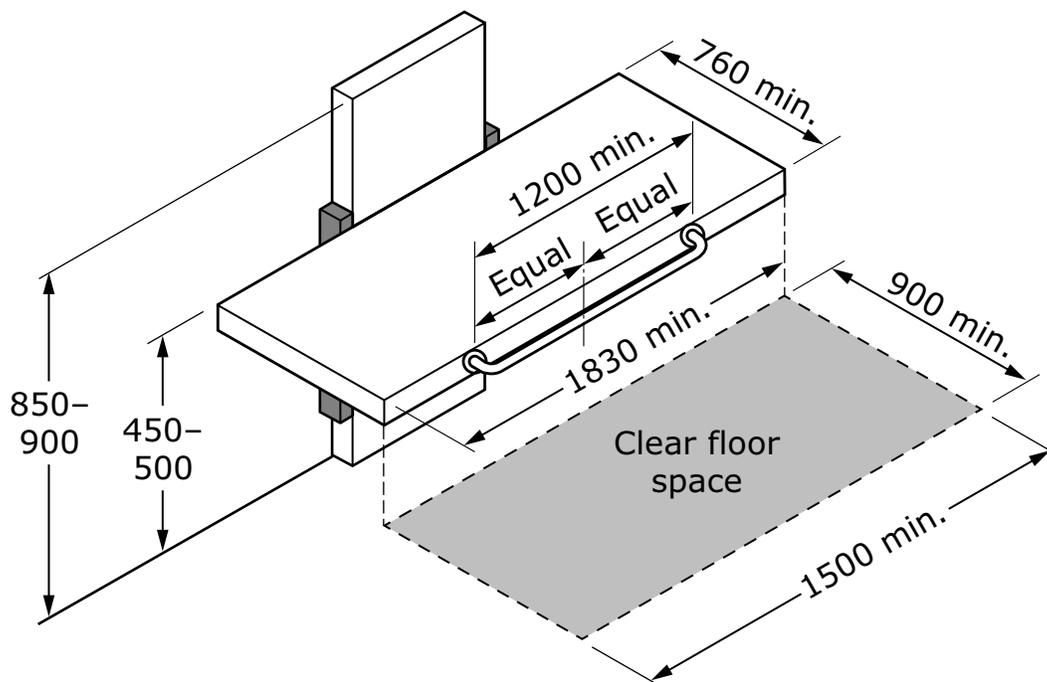
- 1) Change benches located in universal washrooms (or in bathing facilities) can benefit many people. They allow people with balance or strength problems to sit, and in certain circumstances they can be used in the same way as a change table (i.e., allowing a person with disabilities to lie down and be changed with the assistance of an attendant).
- 2) Change benches are also useful in locker rooms where people might need to use them to change into swimming suits, workout clothes, etc.

- 3) Public facilities in places such as highway rest stops, community centres, recreation centres, shopping malls, etc., should provide such benches in at least one universal washroom.
- 4) Where applicable, shelves should be provided to accommodate the washroom user's supplies (e.g., gloves, removable table covers, disinfecting supplies, personal cleaning supplies).

### **6.4.2 Transfer space**

A transfer space of 900 by 1500 mm adjacent to the change bench shall be provided [see Figure [50 b](#)].

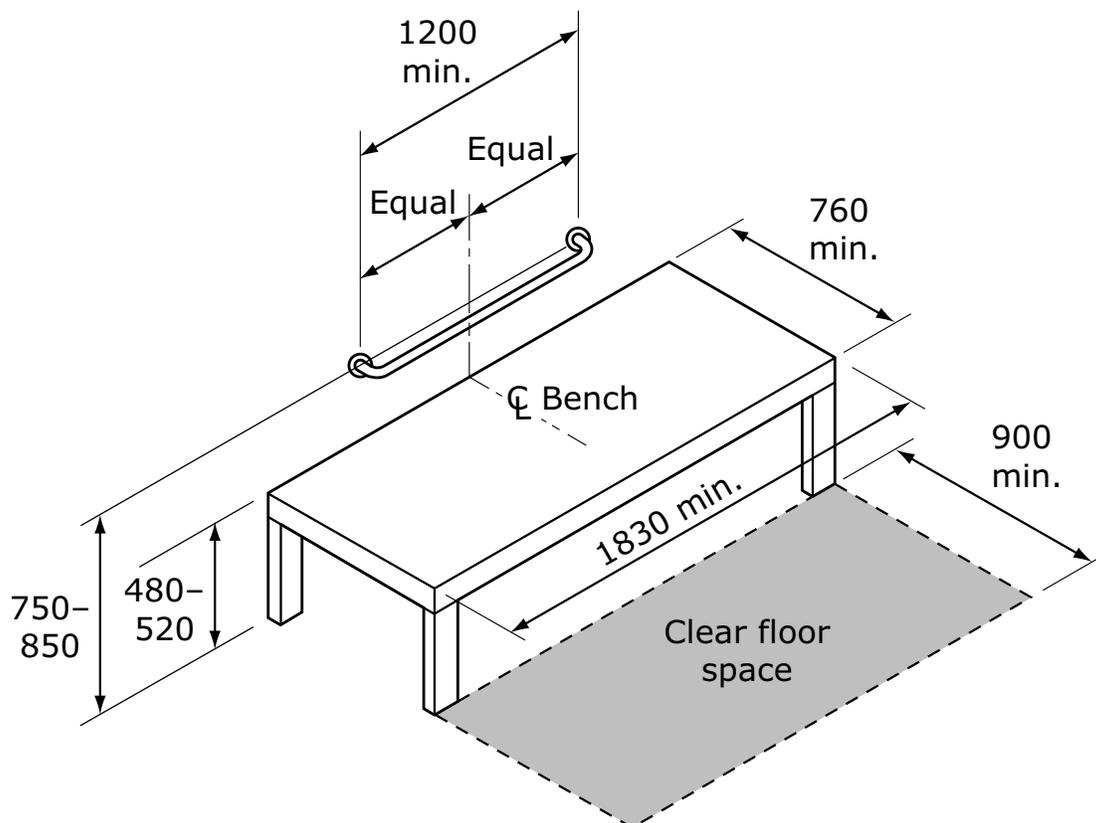
**Figure 50 a)**  
**Adult change table**  
 (See Clauses [6.3.4.1](#) and [6.3.4.2](#).)



**This figure shows the dimensions of an adult change table and clear floor area adjacent to the change bench. The graphic shows a minimum clear floor space 900 by 1830 mm in front of a change bench. The change bench is 760 by 1830 mm, with a surface height above the finished floor that can be adjusted from between 450 and 500 mm at the low range to between 850 and 900 mm at the high range. A grab bar attached to the change bench is mounted horizontally and is a minimum of 1200 mm long.**

**Note:** All dimensions are in mm.

**Figure 50 b)**  
**Change bench**  
 (See Clauses [6.4.1](#) and [6.4.2](#).)



**This figure shows the dimensions of a change bench and clear floor area adjacent to the change bench. The graphic shows a minimum clear floor space 900 mm by 1830 mm in front of a change bench. The change bench is a minimum 760 by 1830 mm with a height of 480 to 520 mm. A grab bar beside the change bench is mounted horizontally 750 to 850 mm from the floor and is a minimum 1200 mm long.**

**Note:** All dimensions are in mm.

## 6.5 Bathing facilities

### 6.5.1 Water temperature

The temperature of the water supplied to the shower or bathtub shall not exceed 49 °C.

**Note:** This temperature is a maximum. Lower maximum water supply temperatures could be needed in some applications (e.g., long-term care homes).

### 6.5.2 Showerheads

A showerhead shall

- a) be of the handheld type;
- b) be provided with a hose at least 1800 mm long;
- c) allow use in a fixed position;
- d) be mounted vertically
  - i) to be adjustable between 1200 and 2030 mm from the floor; and
  - ii) to not obstruct the use of the grab bars; and
- e) be protected with a valve in compliance with ASSE 1016/ASME A112.1016/CSA B125.16.

### 6.5.3 Enclosures

Doors or curtains for shower stalls shall not obstruct the controls or the transfer space.

**Note:** Shower doors, such as those affixed with a floor track or those that might limit the clear opening, should be avoided since they can create obstacles to entering the shower.

### 6.5.4 Shower floors

The shower floor shall

- a) be slip-resistant even when wet; and
- b) slope minimally to provide positive drainage.

**Note:** The drain should be located off to one side or, where a seat is provided, below the seat. See Annex [B](#) for guidance on potential for slip of floor finishes.

## 6.5.5 Roll-in shower stalls

### 6.5.5.1 Shower area

Roll-in shower stalls shall have an interior clear area of at least 900 by 1500 mm.

**Note:** This size of a roll-in shower stall should accommodate the use of a wheeled shower chair.

### 6.5.5.2 Access area

A clear floor area in front of the shower entrance shall be at least 900 by 1500 mm, with the 1500 mm dimension parallel to the shower entrance (see Figure [51](#)).

### 6.5.5.3 Grab bars

In a roll-in shower (see Figure [51](#)), four grab bars that comply with Clause [6.2.5](#) shall be mounted as follows:

- a) one horizontally on a side wall
  - i) at least 600 mm in length; and
  - ii) between 750 and 850 mm from the floor;
- b) one vertically on the opposite side wall
  - i) at least 1000 mm in length;
  - ii) with the lower end between 600 and 650 mm from the floor; and
  - iii) between 50 and 80 mm from the adjacent clear floor area;
- c) one horizontally on the back wall
  - i) at least 1000 mm in length; and
  - ii) between 750 and 850 mm from the floor; and
- d) one vertically on the back wall
  - i) at least 750 mm in length;
  - ii) with the lower edge between 50 and 60 mm above the horizontal grab bar in Item c); and

- iii) located between 400 and 500 mm from the side wall on which the other vertical grab bar is mounted.

**Notes:**

- 1) To expand the usability of this shower stall, a folding seat should be added on the side wall with the vertical grab bar.
- 2) The grab bars should be luminance (colour) contrasted with the background.

**6.5.5.4 Controls**

Faucets and controls for roll-in shower stalls shall

- a) comply with Clause [6.2.3.3](#);
- b) be mounted in the centre on the back wall above the grab bar; and
- c) be located at a maximum height 1200 mm from the floor.

**6.5.5.5 Thresholds**

A threshold at the entrance to a roll-in shower shall

- a) not exceed 13 mm in height; and
- b) if between 7 and 13 mm in height, be bevelled at a slope not steeper than the ratio of 1:2 (50%).

**6.5.5.6 Seat**

If a seat is provided in a roll-in shower stall, it shall

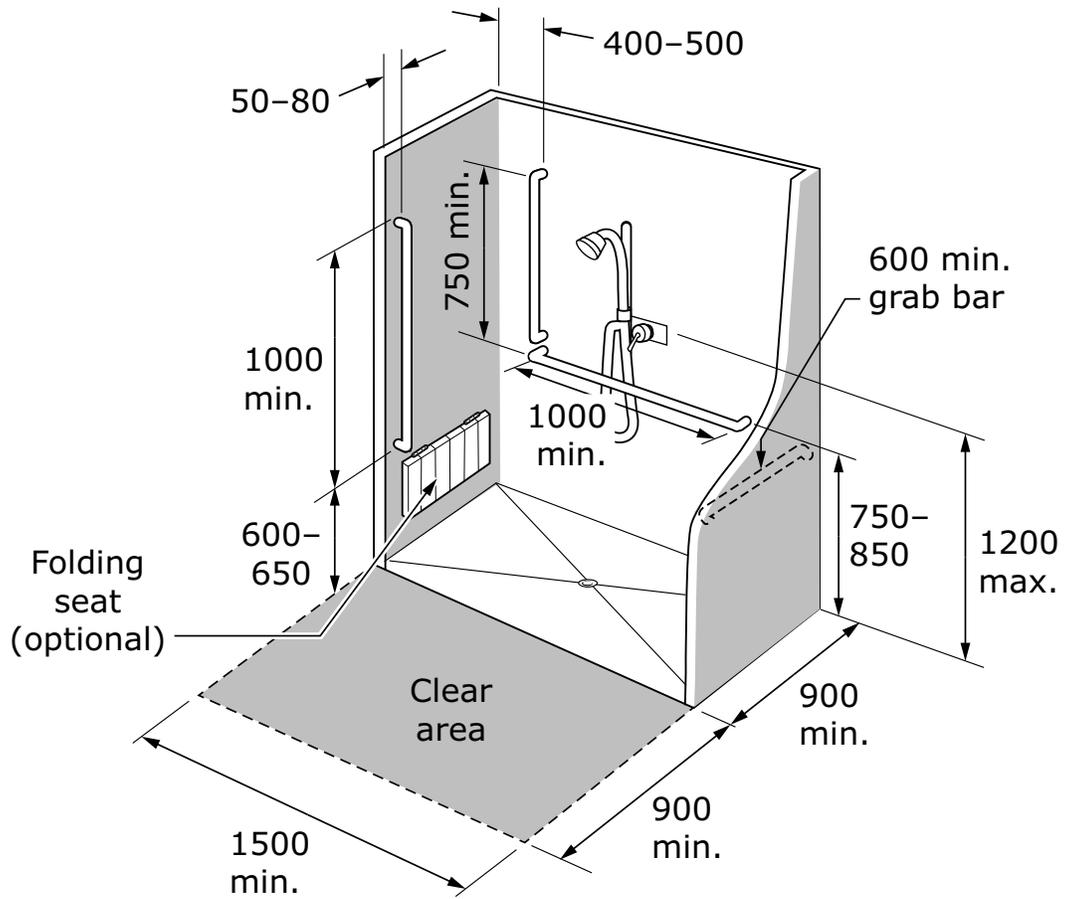
- a) be on the side wall with the vertical grab bar;
- b) be at least 400 mm wide extending the full depth of the stall, less a space allowed for the shower curtain;
- c) have its seating surface between 430 and 485 mm from the floor; and
- d) have a smooth, non-slip surface without rough edges.

**Notes:**

- 1) A seat that folds to a vertical position when not in use will allow people to use the shower in a seated or standing position.
- 2) If a seat is included, shower dimensions might need to be increased to maintain clear floor area.

- 3) The seat should be luminance (colour) contrasted with the wall and floor.

**Figure 51**  
**Roll-in shower stall**  
 (See Clauses [6.5.5.2](#) and [6.5.5.3](#).)



## Figure 51 (Concluded)

**This figure shows the dimensions of a clear floor area in front of a roll-in shower stall with grab bars depicted. The graphic shows a minimum 900 by 1500 mm clear area that leads into a shower area that measures the same. There is one minimum 1000 mm long vertical grab bar and (optional) folding seat placed on the left wall. There is a minimum 750 mm grab bar mounted vertically on the rear wall beside the showerhead, and a minimum 1000 mm long grab bar mounted horizontally on the same wall. The showerhead valves are positioned at a maximum of 1200 mm above the floor. A fourth horizontal grab bar is mounted on the right wall and is a minimum of 600 mm in length.**

**Note:** All dimensions are in mm.

### 6.5.6 Bathtubs

#### 6.5.6.1 Access area

A clear floor area at least 900 mm wide shall be provided in front of the bathtub, along its whole length (see Figure [52](#)).

**Note:** For transfer into the bathtub, there should be a seat located at the end of the bathtub that runs the width of the bathtub, is 400 mm deep, and is flush with the edges.

#### 6.5.6.2 Grab bars

##### 6.5.6.2.1 Mounting

Three grab bars that comply with Clause [6.2.5](#) shall be mounted as follows:

- a) one horizontally, centred on and along the length of the bathtub, that is
  - i) between 180 and 280 mm above the bathtub rim; and
  - ii) at least 1200 mm in length; and
  - iii) have a space of 35 to 45 mm between the grab bar and the wall; and

- b) two vertically, positioned at each end of the bathtub adjacent to the clear floor area and
  - i) the lower end of both bars between 180 and 280 mm above the bathtub rim;
  - ii) both bars at least 1200 mm in length; and
  - iii) both bars between 80 and 120 mm from the adjacent clear floor area (see Figure [52](#)).

### **6.5.6.2.2 Luminance (colour) contrast**

The grab bars should be 30% luminance (colour) contrasted with the background.

#### **Notes:**

- 1) The vertical grab bar should not interfere with the shower curtain.
- 2) Grab bars in prefabricated units may be used if they comply with Clause [6.2.5](#).

### **6.5.6.3 Controls**

Faucets and other controls shall

- a) comply with Clause [6.2.3.3](#);
- b) be located at the foot end of the bathtub between the centreline of the bathtub and the clear floor area; and
- c) be not more than 450 mm above the bathtub rim.

**Note:** Controls located close to the open side can be reached more easily.

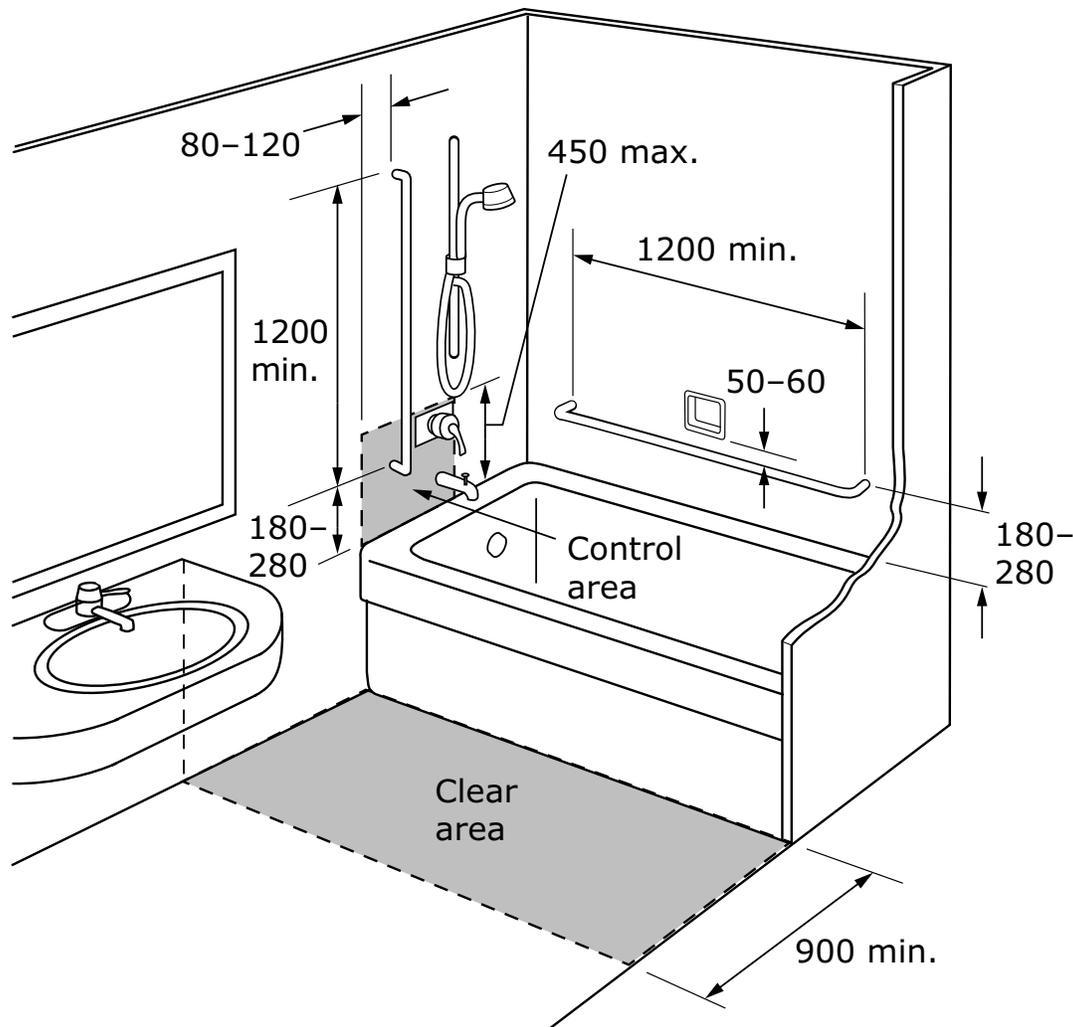
### **6.5.6.4 Enclosures**

Enclosures employing sliding doors or tracks on the rim shall not be provided on bathtubs.

### **6.5.6.5 Bathtub floor**

Bathtubs shall have a slip-resistant base.

**Figure 52**  
**Bathtub area and grab bars**  
 (See Clauses [6.5.6.1](#) and [6.5.6.2](#).)



**This figure shows the dimensions of a clear floor area in front of a bathtub with grab bars depicted. The clear floor area is 900 mm deep and situated between the lavatory and the bathtub. There is one minimum 1200 mm long vertical grab bar mounted on the left side of the showerhead. The second minimum 1200 mm long horizontal grab bar is mounted on the adjacent wall 180 to 280 mm above the bathtub and 50 to 60 mm from any wall cavities.**

**Note:** All dimensions are in mm.

## 6.6 Communications

### 6.6.1 Assistive listening systems

Where an assistive listening system (ALS) is provided, adaptive technologies (e.g., induction loop, infrared system, radio frequency system) shall be used to provide these services.

#### Notes:

- 1) Assistive listening systems amplify audible communication by transmitting sound from a microphone to a person using a receiver, free of unwanted background sound and reverberation. An ALS can be used by those who are hard of hearing, with or without assistive hearing technologies such as a hearing aid and/or a cochlear implant or like devices. They do not interfere with the listening enjoyment of people who are not hard of hearing.
- 2) Assistive listening systems may transmit a signal. Special-purpose receivers are needed for infrared and radio frequency systems, similar to what is used for translation services. An induction loop system can be used discreetly by people who use assistive hearing technologies such as a hearing aid and/or a cochlear implant or like devices that have a T-switch. Neck loops are available for people who do not have an assistive hearing technology but wish to augment their hearing. A hard wired system with a volume control device accommodates many people who are hard of hearing.
- 3) The choice and size (i.e., power) of the system will depend on the type of application and the size of the facility (e.g., assembly areas, cinemas, meeting rooms).
- 4) The pictogram of accessibility for people who are deaf or hard of hearing (see Figures [53 a](#)) and [53 b](#)) should be used to indicate the existence of such a facility.
- 5) Rooms or areas of rooms equipped with an ALS should have a sign that indicates the designated area for the service. This area should be close to the speaker so that people are able to benefit from lip reading.

## 6.6.2 Public telephones

### 6.6.2.1 Protruding parts

Telephones, enclosures, and related equipment shall comply with Clause [4.5](#).

### 6.6.2.2 Operating devices

A telephone shall have

- a) a keypad and function keys that comply with CSA T516; and
- b) its operable parts, including the coin slot
  - i) not more than 1370 mm from the floor; or
  - ii) not more than 1200 mm from the floor if the telephone is designed for use by seated individuals.

### 6.6.2.3 Cord length

The handset cord length shall be at least 1000 mm.

### 6.6.2.4 Illumination

The illumination level measured at the operating devices, directory, and shelf shall be at least 200 lx.

### 6.6.2.5 Telephones for standing individuals

At the telephone, a level shelf shall be

- a) at least 450 mm wide by 300 mm deep; and
- b) at a height between 730 and 860 mm from the floor.

### 6.6.2.6 Telephones for seated individuals

At the telephone, a clear floor area shall

- a) be at least 820 mm wide by 1390 mm deep, which shall extend not more than 480 mm under the shelf; and
- b) have a knee clearance between 685 and 730 mm high (see Figure [54](#)).

**Note:** If a seat is provided, the seat should be movable so that a person using a wheeled mobility device can approach and use the telephone.

## 6.6.2.7 Telephones

**Note:** This section outlines provisions for telephones (emergency, public) located throughout a space, including telephones provided for use by people who are deaf, deafened, or hard of hearing, or who benefit from assistance with speech.

### 6.6.2.7.1 Volume control

A telephone with a volume control shall

- a) comply with CSA T515;
- b) have a graduated volume control; and
- c) be identified by the pictogram of accessibility for people who are hard of hearing [see Figures [53 a\)](#) and [53 b\)](#)].

**Notes:**

- 1) Phones with volume control are primarily designed with people who are hard of hearing in mind, but they are useful for everyone in locations with high noise levels.
- 2) If more than one type of telephone is provided (e.g., card, coin, internal, taxi call), at least one of each type should be provided for use by both a seated person and a hard of hearing or deaf person.
- 3) If only one telephone is provided, it should allow for operation by a seated person and by a person who is hard of hearing, deafened, or deaf. If more than one telephone is provided, at least one should be for operation by a seated person, and at least one by a person who is hard of hearing, deafened, or deaf.

**Figure 53 a)**  
**Pictograms of accessibility – Hard of hearing**  
(See Clauses [6.6.1](#) and [6.6.2.7.1.](#))



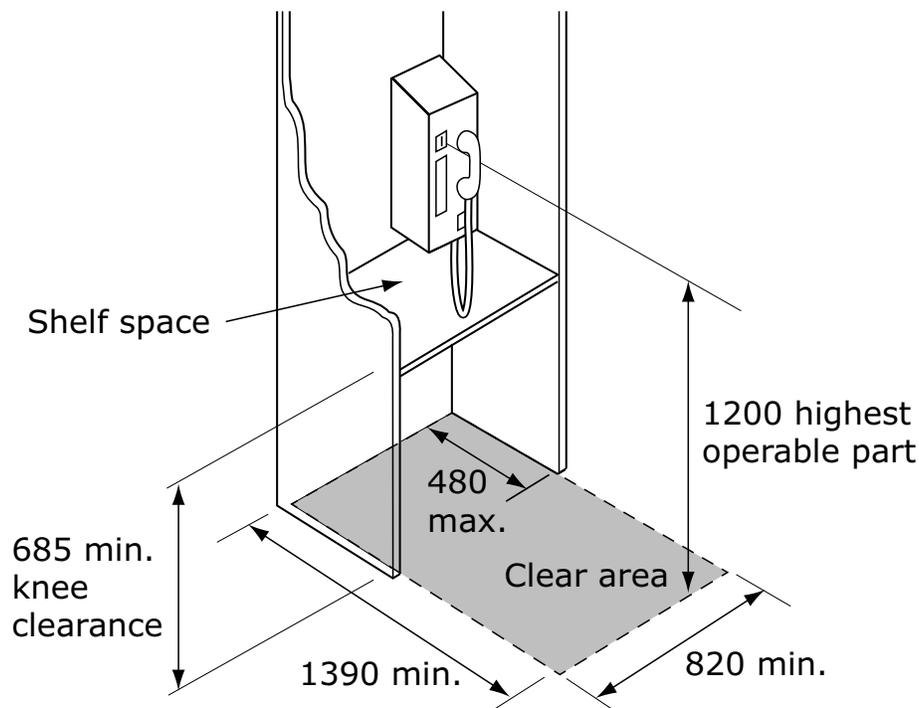
**This figure is a pictogram of accessibility for people who are hard of hearing featuring a slashed-ear pictogram.**

**Figure 53 b)**  
**Pictograms of accessibility – Volume control**  
(See Clauses [6.6.1](#) and [6.6.2.7.1.](#))



**This figure is a pictogram of accessibility for people who are hard of hearing featuring a telephone with volume control.**

**Figure 54**  
**Telephone height and shelf**  
(See Clause [6.6.2.6.](#))



**This figure demonstrates the clear floor area and knee height dimensions for seated individuals at a telephone station, with the highest operable part positioned 1200 mm above the floor. The graphic depicts a telephone mounted above a shelf space that has a maximum depth of 480 mm and a minimum 685 mm knee clearance height underneath. The clear floor area requirements incorporate the shelf space depth and are a minimum of 820 by 1390 mm.**

**Note:** All dimensions are in mm.

### **6.6.2.7.2 Identification of teletypewriter**

Where a teletypewriter (TTY) or a text telephone (TT) is

provided at a public telephone, it shall be identified by the pictogram for a TTY (see Figure 55).

**Notes:**

- 1) TTYs and TTs transmit visual text via the telephone system. They are used by many people who are deaf, deafened, or hard of hearing, or by people who benefit from assistance with speech, as well as by those who wish to communicate with them.
- 2) Public telephones equipped with a TTY or TT are available, and at least one should be provided in public areas.
- 3) If only one TTY or TT is provided, it should be located at the telephone for a standing position.

**Figure 55**  
**Pictogram for teletypewriter (TTY)**  
(See Clause [6.6.2.7.2.](#))



**This figure is the pictogram for a teletypewriter.**

### **6.6.2.8 Directional signs**

When directional signs to telephones are provided, they shall include the appropriate pictograms of accessibility and comply with Clause [4.6](#).

## 6.7 Seating

### 6.7.1 Spaces at tables and counters

#### 6.7.1.1 Floor area

A seating space for people using a wheeled mobility device, such as that provided at counters, tables, or work surfaces, shall have

- a) a clear floor area not less than 820 by 1390 mm [see Figures [56 a\)](#) and [56 b\)](#)]; and
- b) adequate manoeuvring space to approach it.

#### 6.7.1.2 Height

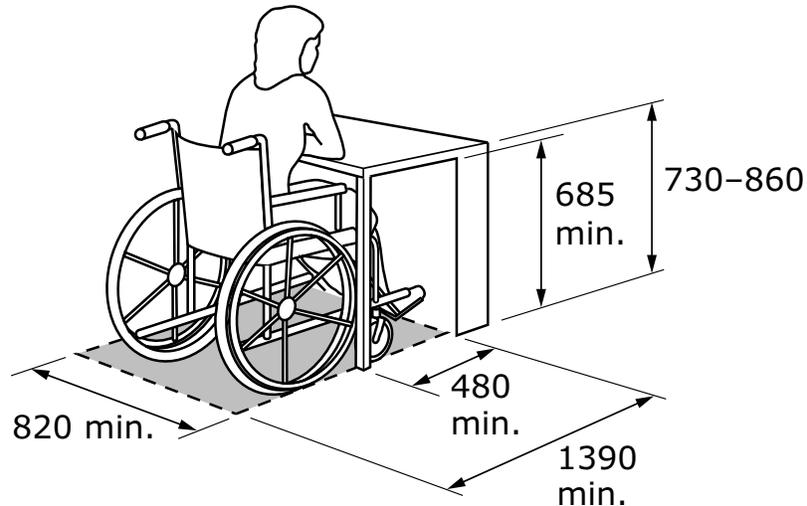
A table or counter surface shall be at a height between 730 and 860 mm from the floor.

#### 6.7.1.3 Knee clearance

Where a forward approach is used, the knee clearance shall be at least 820 mm wide by 480 mm deep by 685 mm high, which may overlap the clear floor area by not more than 480 mm [see Figure [56 a\)](#)].

**Note:** Other than at tables and counters, there might be different requirements for height and knee clearances.

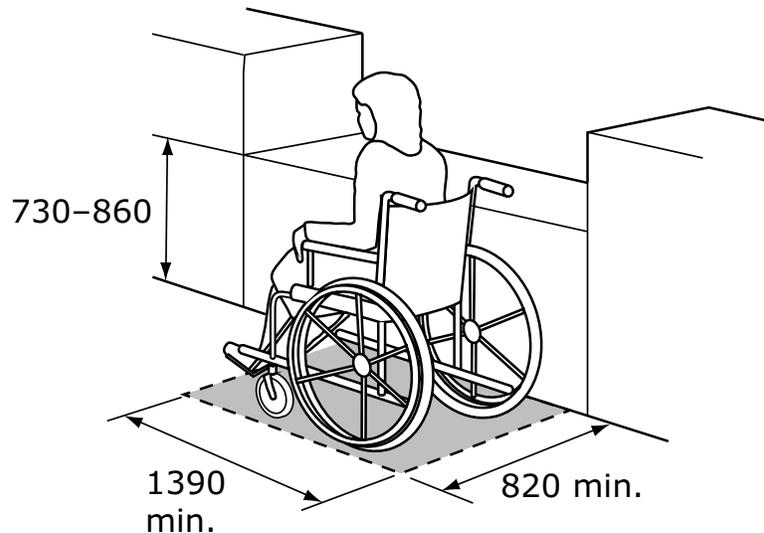
**Figure 56 a)**  
**Seating at tables and counters – Tables**  
(See Clauses [6.7.1.1](#) and [6.7.1.3](#).)



**This figure depicts a person in a wheeled mobility device pulled up to a table. The graphic indicates that knee clearance for seating space at a table is minimum 685 mm high by 480 mm deep, with the height of the table 730 to 860 mm. The clear area around the table is 820 by 1390 mm.**

**Note:** All dimensions are in mm.

**Figure 56 b)**  
**Seating at tables and counters — Counters**  
(See Clause [6.7.1.1.](#))



**This figure shows a person in a wheeled mobility device seated alongside a counter that is 730 to 860 mm above the floor. The clearance area in front of the counter is 820 by 1390 mm.**

**Note:** All dimensions are in mm.

## **6.7.2 Rest area seating**

### **6.7.2.1 Bench or seat area**

A bench or seat area shall

- a) be located adjacent to an accessible route;
- b) have a level and firm surface; and
- c) have an adjacent area that is level and firm, at least 850 by 1390 mm, and not part of the route of travel.

**Notes:**

- 1) Benches or seats should be set back from the accessible route.

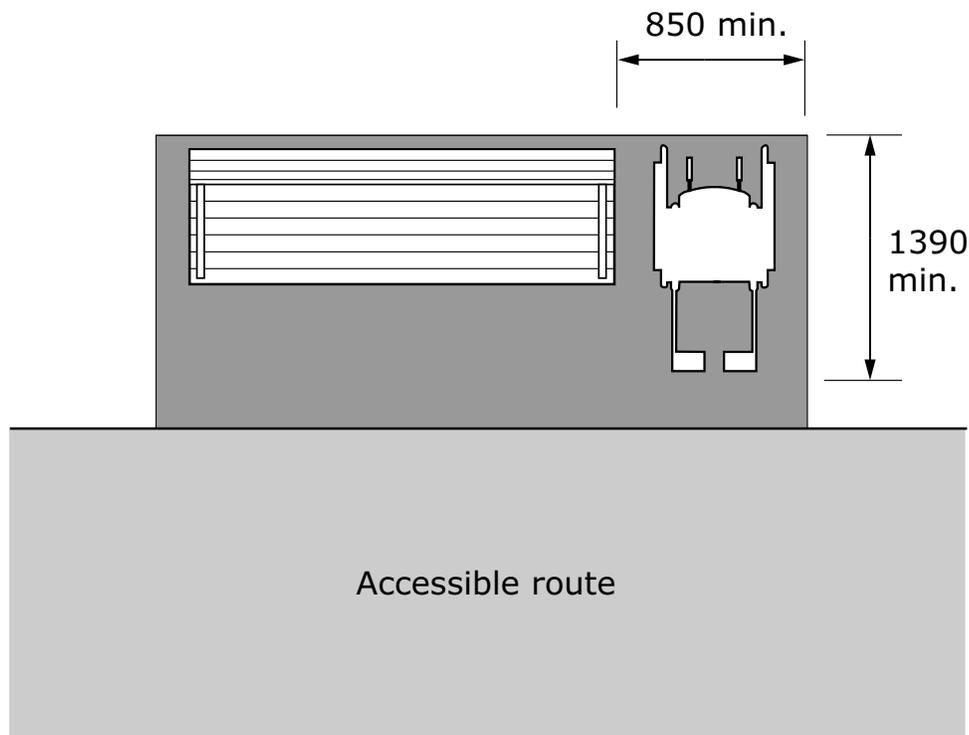
- 2) The level area adjacent to the seat can accommodate a person using a wheeled mobility device, a service animal, stroller, walker, etc. (see Figure [57](#)).
- 3) The ground or floor surface of the seating area should contrast in colour and texture with the surrounding surface.
- 4) Consider providing a bench or seat every 30 m within the rest area.

### **6.7.2.2 Benches or seats**

A bench or a seat shall

- a) be stable;
- b) have a seat height between 430 and 485 mm from the floor; and
- c) where there is more than one, provide a mix of options, i.e., some with backrests, some with armrests, and some with both.

**Figure 57**  
**Bench area**  
(See Clauses [6.7.2.1](#) and [8.6.3.1](#).)



**This figure illustrates the dimensions for a level area adjacent to a bench to accommodate a person using a wheeled mobility device, service animal, stroller, walker, etc. The figure shows an unoccupied wheeled mobility device beside a bench in a space that is 850 by 1390 mm. Both the bench and wheeled mobility device are facing an accessible route.**

**Note:** All dimensions are in mm.

### **6.7.3 Viewing spaces in assembly areas**

#### **6.7.3.1 Floor area**

A viewing space for a person using a wheeled mobility device shall have a clear floor area that is

a) at least 850 by 1390 mm; and

b) on a level surface.

### **6.7.3.2 Location of viewing space**

A viewing space for a person using a wheeled mobility device shall

- a) adjoin the accessible path of travel adjacent to a means of egress;
- b) be an integral part of the seating plan;
- c) be dispersed throughout the seating area on all levels (see Figure [58](#));
- d) be located adjacent to other seating; and
- e) provide for at least half of the spaces to be placed side by side (i.e., paired).

### **6.7.3.3 Sight lines**

A viewing space for a person using a wheeled mobility device shall provide lines of sight that are

- a) comparable to those for all viewing positions; and
- b) not reduced or obstructed by standing members of the audience (see Figure [59](#)).

#### **Notes:**

- 1) Assembly areas include, but are not limited to, auditoriums, theatres, cinemas, arenas, and stadiums that have seating.
- 2) Accent lighting should be provided along the edges of the aisle steps.
- 3) Wheeled mobility device viewing spaces can be created by removing fixed seating.
- 4) People using wheeled mobility devices usually sit higher than those in standard seating, and care should be taken that wheeled mobility device viewing positions be located so that when occupied, people who are seated behind them will not have their view obstructed (see Figure [59](#)).
- 5) Variety in seating location is necessary to provide choices for people using wheeled mobility devices and to accommodate a

companion who might be a wheeled mobility device user or an ambulatory person.

- 6) Guardrails protecting wheeled mobility device viewing spaces should not interfere with viewing.
- 7) The number of wheeled mobility device viewing spaces should be as listed in Table 9.

### 6.7.3.4 Adaptable seating

Fixed seats designated for adaptable seating shall be

- a) located adjoining a barrier-free path of travel without infringing on egress from any row of seating or any aisle requirements;
- b) equipped with a movable or removable armrest on the side of the seat adjoining the barrier-free path of travel; and
- c) situated, as part of the designated seating plan, to provide a choice of viewing location and a clear view of the event taking place.

**Note:** Adaptable seating should be high enough to facilitate transfer from a wheeled mobility device and afford good sight lines.

**Table 9**  
**Number of wheeled mobility device viewing spaces**  
(See Clause [6.7.3.3.](#))

This table lists the number of wheeled mobility device viewing spaces per number of seats in an assembly area.

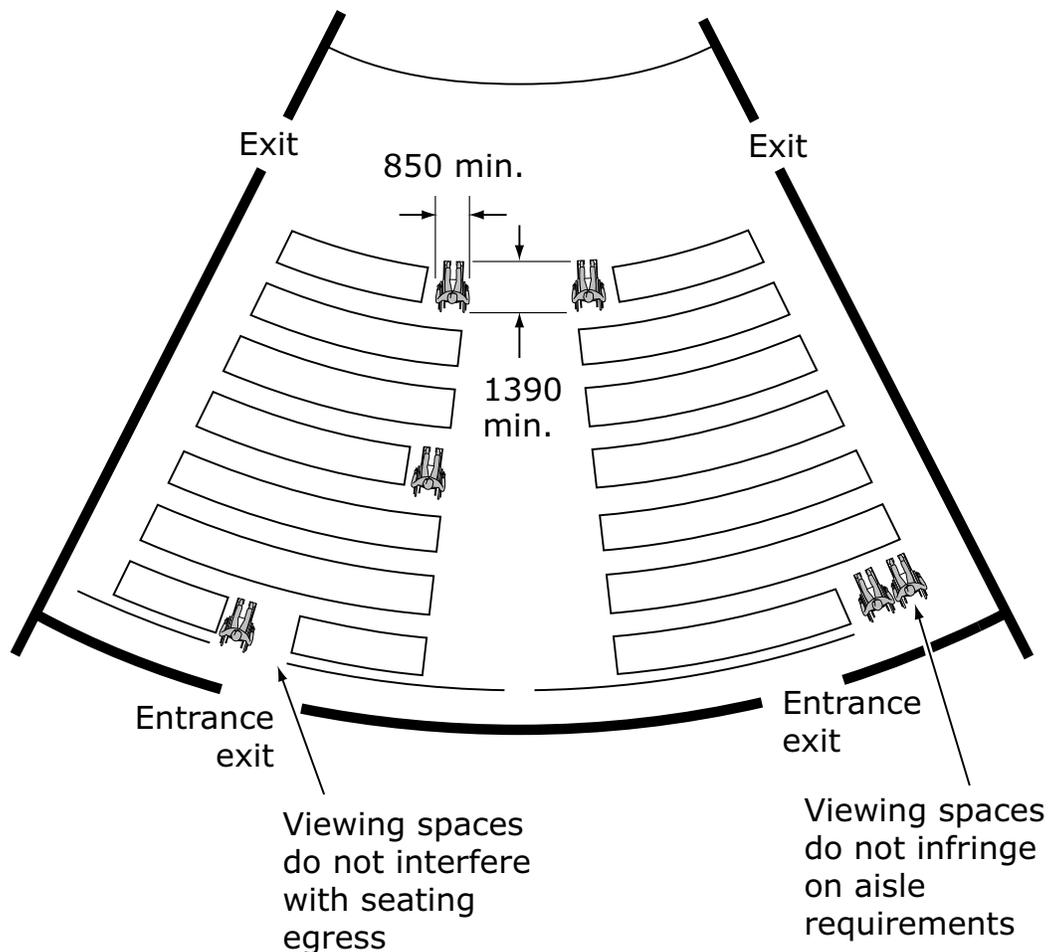
Number of seats	Wheeled mobility device viewing spaces
4 to 25	1
26 to 50	2
51 to 150	3 to 4

(Continued)

**Table 9 (Concluded)**

<b>Number of seats</b>	<b>Wheeled mobility device viewing spaces</b>
151 to 300	5
301 to 500	6
501 to 5000	6, plus 1 for each 150 or fraction thereof
Over 5000	36, plus 1 for each 200 or fraction thereof

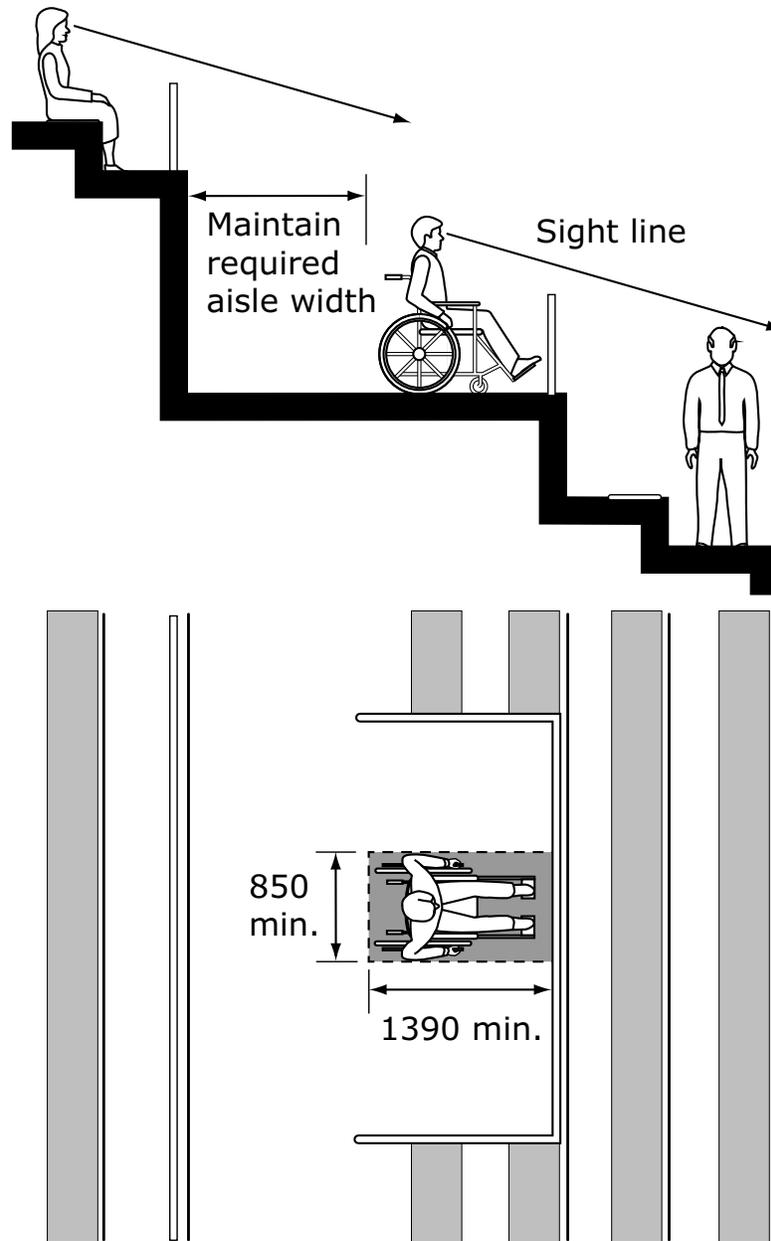
**Figure 58**  
**Assembly area viewing spaces**  
(See Clause [6.7.3.2.](#))



**This figure illustrates viewing spaces in an assembly area. The graphic depicts dedicated viewing spaces at the front and back areas of the assembly that do not interfere with seating egress. The area dimensions for each independent viewing space are a minimum 850 by 1390 mm.**

**Note:** All dimensions are in mm.

**Figure 59**  
**Reserved viewing spaces in a place of assembly**  
(See Clause [6.7.3.3.](#))



## Figure 59 (Concluded)

**This figure illustrates an example of viewing space dimensions in a stadium or arena.**

**The first graphic shows a profile view of a person in a wheeled mobility device sitting in a designated accessible seating area at a stadium. This graphic indicates the aisle width behind the accessible seating area shall be maintained, and the line of sight for a person seated in a designated accessible viewing space is not obstructed by a person standing two rows in front. The second graphic depicts a top view of the person in the wheeled mobility device sitting in the designated accessible seating area. It shows the dimensions of an independent seating space within this area to be a minimum 850 by 1390 mm.**

**Note:** All dimensions are in mm.

## 6.8 Dressing rooms, fitting rooms, and locker rooms

### 6.8.1 General

Accessible dressing rooms, fitting rooms, and locker rooms shall include

- a) a change bench that complies with Clause [6.4](#), including access and transfer space requirements;
- b) an emergency call system, with appropriate signage, that will activate an indicator light and an audible signal both inside and outside the room to summon non-emergency customer service assistance (see Clause [6.3.1.2](#));
- c) an accessible clothing hook
  - i) at a height not more than 1200 mm from the floor; and
  - ii) protruding not more than 40 mm from the wall;
- d) a full-length mirror; and

e) grab bars complying with Clause [6.4.1 h](#)).

**Notes:**

- 1) An increase in bench size should be considered to facilitate repositioning of the person for changing.
- 2) For heavier doors and doors with closers, a power door operator should be considered.

### **6.8.2 Individual rooms**

For an individual dressing room, fitting room, or locker room, the door shall either swing out, or, if it swings in, there shall be a clear floor space of at least 820 by 1390 mm beyond the door swing inside the room. The clear floor space shall be positioned for parallel approach to the long side of the bench and have room for a turning circle 2100 mm in diameter.

### **6.8.3 Change benches**

If the change bench is not affixed to a wall, then back support shall be provided. Back support shall be at least 1100 mm in length, and extend from a point that is a minimum 50 mm and a maximum 450 mm above the seat.

## **7 Residential accommodations — Permanent and short-term**

### **7.1 General**

Accessible dwellings, including permanent, short-term, and visitable dwellings, shall comply with CSA/ASC B652.

### **7.2 Common use spaces**

In multi-unit residential accommodation, all common-use spaces and services shall comply with the applicable sections of Clauses [4](#), [5](#), [6](#), [8](#), and [9](#).

## 8 Exterior circulation, spaces, and amenities

### 8.1 Scope

The requirements of this Clause deal with exterior pedestrian locations, on public or private property, that include circulation routes, spaces, and amenities that are part of

- a) public areas such as rights-of-way, parks, plazas, recreation facilities, etc.; and
- b) private areas such as outdoor restaurants, theatres, and the grounds of multi-unit residential, commercial, educational, club, and other complexes.

### 8.2 Accessible routes

#### 8.2.1 General

An accessible exterior pedestrian route shall

- a) comply with Clauses [4.4.1](#), [4.4.2](#), [4.4.4](#), and [4.5](#);
- b) where adjacent to a vehicular route, be separated from it by
  - i) a curb with a curb ramp;
  - ii) a railing or other barrier; or
  - iii) a tactile attention indicator surface complying with Clause [4.4.5](#);
- c) where bollards are used to prevent vehicles from entering the pedestrian route, have them comply with Clause [8.3.9](#);
- d) where traversing a vehicular area, comply with Clause [8.3](#); and
- e) where traversing large open plazas, be delineated on both sides by texture- and luminous (colour) contrasted surfaces at least 300 mm wide.

#### Notes:

- 1) Exterior pedestrian routes should have a firm surface, such as asphalt, concrete, pavers, or lumber (with planks perpendicular to the direction of travel). Irregular surfaces, such as cobblestones or exposed aggregate paving, can be difficult to traverse.

- 2) Buildings or facilities within a complex (including those located within a parking lot) should be connected to the accessible public pedestrian route by an accessible route.
- 3) The contrasting surface adjacent to the accessible route may be accomplished by landscaping features such as grass or alternative textured material.
- 4) Awnings, overhead canopies, guy wires or vegetation (e.g., tree branches) should not obstruct any part of the accessible route.
- 5) Protrusions from buildings (e.g., gas meters, standpipes) should be cane-detectable and luminance (colour) contrasted from their surroundings.
- 6) Accessible routes and spaces should be appropriately maintained, since some paving materials can settle or heave in time, which can become a significant pedestrian barrier or hazard.
- 7) Since snow accumulation becomes a barrier on accessible routes and spaces, it should be cleared at the earliest possible time. Snow clearing operations should not leave snowbanks at or near corners, curb ramps, transit stops, or other critical locations.

### 8.2.2 Width

The clear width of an accessible pedestrian route shall be

- a) at least 1600 mm;
- b) 1800 mm in high-traffic areas; or
- c) where adjacent to a curb ramp, at least 1390 mm (see [Clause 8.3.3.8](#) and [Figure 60](#)).

**Note:** Pathways benefit from being as straight and logical as possible to improve safe navigation and wayfinding needs, e.g., for people with low or no vision or people who are unfamiliar with a space. Paths that wander or zig-zag should be avoided, though exceptions might need to be made at pedestrian crossings because of the layout of the intersection.

### 8.2.3 Slope

The running and cross slopes of an accessible pedestrian route shall comply with Clause [5.1.3](#).

**Note:** If a public right-of-way cannot meet this or any other individual requirement for an accessible pedestrian route (e.g., if the running slope of the road is too steep), the route should nevertheless be built to comply with as many of the other requirements as possible so it can serve the greatest number of users. As well, an alternative accessible pedestrian route or other means of transport should be provided for the users who are excluded because of the missing accessible element.

### 8.2.4 Drainage

A pedestrian route shall

- a) be well-drained to prevent the accumulation of ice and water; and
- b) not allow water from building downspouts or other drainage systems to flow across it.

### 8.2.5 Edge protection

Where an accessible path is immediately adjacent to a vertical drop, edge protection shall

- a) not be required for a standard road curb;
- b) not be required on the active side of a transit platform where the vertical drop is less than 250 mm. If the vertical drop at a transit platform is 250 mm or more, the edge shall be protected with a tactile attention indicator that complies with Clause [4.4.5.3](#);
- c) provide an edge barrier to a minimum height of 75 mm where the vertical drop is between 75 and 600 mm; and
- d) provide a handrail complying with Clause [5.5.8](#) where the vertical drop is greater than 600 mm.

#### Notes:

- 1) Edge protection may be accomplished by several means (e.g., a concrete lip, raised landscape edging, or similar feature).

- 2) Edge protection along a pedestrian route should be incorporated for areas with any drop-off immediately adjacent to the walkway.

### **8.2.6 Shared-use routes**

An accessible route that is shared with other users such as cyclists, in-line skaters, etc., shall

- a) be delineated or separated from these activities by grade separation, curbs, bollards, or other physical means; and
- b) designate the separate routes by signage (on grade and on posts) that complies with Clause [4.6](#).

#### **Notes:**

- 1) Use of distinct underfoot paving for each use may be considered.
- 2) Contrasting painted lane markings may be used to reinforce other treatments.

### **8.2.7 Exterior ramps**

An exterior ramp shall

- a) have a running slope and length that complies with Clause [5.5.1](#);
- b) have a cross slope that complies with Clause [5.5.2](#);
- c) be at least 1200 mm wide;
- d) have level landings that
  - i) comply with Clause [5.5.4](#); and
  - ii) are designed to drain water from their surface (but not exceed the specified cross slope);
- e) have the sloped and level surfaces comply with Clauses [4.4.1](#) and [4.4.4](#);
- f) on ramps and landings that are not at grade or adjacent to a wall, have edge protection complying with Clause [5.5.7](#); and

- g) where the vertical rise is more than 250 mm, have handrails that comply with Clause [5.5.8](#) [see Figures [34 a\)](#) and [34 b\)](#)].

**Notes:**

- 1) A ramp is a sloping walkway leading from one level to another. The running slope of the ramp is the ratio of the change in level (vertical rise) to its horizontal length (run) [see Figures [33 a\)](#) and [33 b\)](#)].
- 2) The more gradual the slope of the ramp (i.e., the less steep it is), the easier it is to use without assistance. Therefore, slopes should have a ratio between 1:20 (5%) and 1:15 (6.7%).
- 3) Exterior landings should be 2250 mm long to accommodate larger wheeled mobility devices.
- 4) Adverse weather can cause slippery conditions on exterior ramps. To avoid this, several options are available: a porous material to lessen the build-up of snow and ice, a heated ramp surface, or a covered ramp.
- 5) An edge protection that is open at the surface level facilitates snow removal and lessens water accumulation [see Figures [35 b\)](#) and [35c\)](#)].
- 6) Many people find using steps easier and safer than a ramp. Therefore, both stairs and a ramp should be provided in any one location.
- 7) Ramps that surmount a major change in level (vertical rise) are by necessity very long, with multiple ramp and landing combinations. In such circumstances, other design solutions should be considered.
- 8) Curved ramps should not be used as a design solution.

### **8.2.8 Exterior stairs**

Exterior stairs shall

- a) comply with Clause [5.4](#);
- b) where the distance between the handrails is greater than 2200 mm, have an intermediate handrail that is located between 920 and 1000 mm from one of the handrails;
- c) be designed to avoid water accumulation; and

d) have landings designed to drain water from their surface but not be steeper than the ratio of 1:50 (2%).

**Note:** Though all stairs need at least two handrails, wide stairs can benefit from one or more additional handrails so that users have easy access to two adjacent handrails for safety.

### 8.2.9 Illumination for pedestrian routes

Illumination along a pedestrian route shall

- a) be continuous and not create any dark or shadow areas;
- b) have lighting standards located off the pedestrian route or space but adjacent to it; and
- c) illuminate components along a pedestrian route, such as stairs, ramps, or rest areas, to at least 50 lx at ground level.

**Note:** Lighting can be used as a wayfinding element to delineate the pedestrian route, as well as to emphasize building features such as entrances, stairs, ramps, or signage.

## 8.3 Pedestrian crossings

### 8.3.1 General

A pedestrian crossing that traverses a vehicular right-of-way shall

- a) where at grade
  - i) be perpendicular to the vehicular route being crossed;
  - ii) comply with Clauses [8.3.2](#) to [8.3.6](#); and
  - iii) comply with Clause [8.3.7](#), when signals are provided; or
- b) when designed as an overpass or underpass, comply with Clause [8.3.10](#).

**Note:** For safety at pedestrian crossings, corners should be designed to maintain adequate sight lines between drivers and pedestrians, have corner radii to ensure vehicles do not drive over the pedestrian area, ensure that crosswalks clearly indicate where crossings should occur, limit exposure to conflicting traffic, and provide refuges where necessary.

## **8.3.2 Pedestrian crossing variations**

### **8.3.2.1 Pavement grade level**

A pedestrian crossing with the crosswalk at the pavement grade level shall have its crosswalk connected to the pedestrian route beyond a vehicular right-of-way by a curb ramp complying with Clause [8.3.3](#).

### **8.3.2.2 Raised crossings**

A raised crossing shall have its crosswalk connected to the pedestrian route beyond a vehicular right-of-way by a blended transition complying with Clause [8.3.3](#).

## **8.3.3 Curb ramps and blended transitions**

### **8.3.3.1 Running slope**

The running slope at a curb ramp or blended transition shall be

- a) for a curb ramp, between a ratio of 1:15 (6.66%) and 1:10 (10%); and
- b) for a blended transition, not steeper than a ratio of 1:20 (5%).

### **8.3.3.2 Cross slope**

The cross slope at a curb ramp or blended transition shall

- a) be not steeper than a ratio of 1:50 (2%) at intersections; and
- b) match the street or highway gradient at mid-block pedestrian crossings.

### **8.3.3.3 Counter slope**

The running slope of pedestrian crossings at the foot of curb ramps, blended transitions, and turning spaces shall

- a) be 1:20 (5%) maximum; and

- b) have the sum of the running slope and that of a curb ramp, blended transition, or turning space not exceed 11%.

**Notes:**

- 1) A counter slope is the running slope of the pedestrian crossing as it approaches the base of a curb ramp, blended transition, or turning space.
- 2) A severe transition change between the base of the curb ramp and the pedestrian crossing running slope should be avoided because it creates the risk that a person might trip or a wheeled mobility device user get stuck at the transition.

### **8.3.3.4 Surface**

#### **8.3.3.4.1 Curb ramp or blended transition**

The surface of a curb ramp or blended transition shall

- a) be stable, firm, and slip-resistant;
- b) have a level transition to adjacent surfaces; and
- c) have a tactile attention indicator surface that
  - i) complies with Clause [4.4.5.3](#);
  - ii) extends the full width of the curb ramp or transition area; and
  - iii) has a length between 600 and 650 mm, starting between 300 and 350 mm from the road face of the curb.

**Notes:**

- 1) The slope of a ramp, as well as the tactile attention indicator surfaces, should provide the necessary indications that enable people with low or no vision to sense the transition between the sidewalk and the vehicular roadway.
- 2) Blended transitions should only be used in traffic calming locations since the shallow slope of a blended transition can be difficult for people with low or no vision to detect.
- 3) Luminance (colour) contrast with adjacent surfaces can aid in detecting curb ramps and blended transitions.
- 4) A curb or gradient is the primary indication by which people with a vision impairment sense the transition between the sidewalk and the vehicular roadway.

### 8.3.3.4.2 Tactile attention indicator

There shall be a tactile attention indicator surface on a curb ramp before a level curb-to-gutter transition.

### 8.3.3.5 Width

The width of a curb ramp or blended transition, exclusive of flared sides, shall be

- a) at least 1500 mm; or
- b) where at a marked crosswalk, match that of the crosswalk.

**Note:** Curb ramps should not be continuous around a corner.

### 8.3.3.6 Flared sides

Flared sides shall

- a) be provided on a curb ramp or blended transition where pedestrians are likely to walk across it;
- b) have a slope, measured parallel to the curb line, with a ratio between 1:10 (10%) and 1:15 (6.66%) (see Figure [60](#)); and
- c) be slip-resistant.

#### **Notes:**

- 1) Ramps with returned curbs are an alternative design that can be used where pedestrians are not expected to walk across the ramp (see Figure [61](#)).
- 2) Built-up ramps projecting into the roadway should not be used because they are dangerous for the users and obstructive to vehicles.
- 3) Contrasting pavement can help pedestrians be aware of the onset of a curb ramp.

### 8.3.3.7 Curb ramp drainage

A curb ramp or blended transition shall

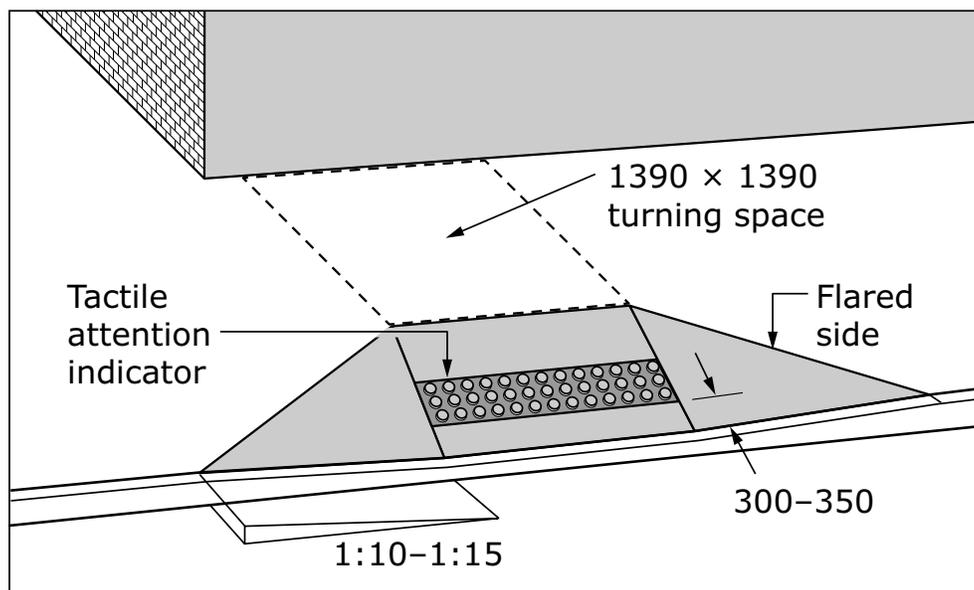
- a) provide for appropriate drainage so that water does not accumulate on the pedestrian route; and

- b) have no catch basin covers within the pedestrian crossing unless they meet the requirement for gratings (see Clause [4.4.4](#)).

### 8.3.3.8 Turning space

There shall be a turning space at least 1390 by 1390 mm at the top of a curb ramp level with the pedestrian route. This turning space may overlap other turning or clear spaces.

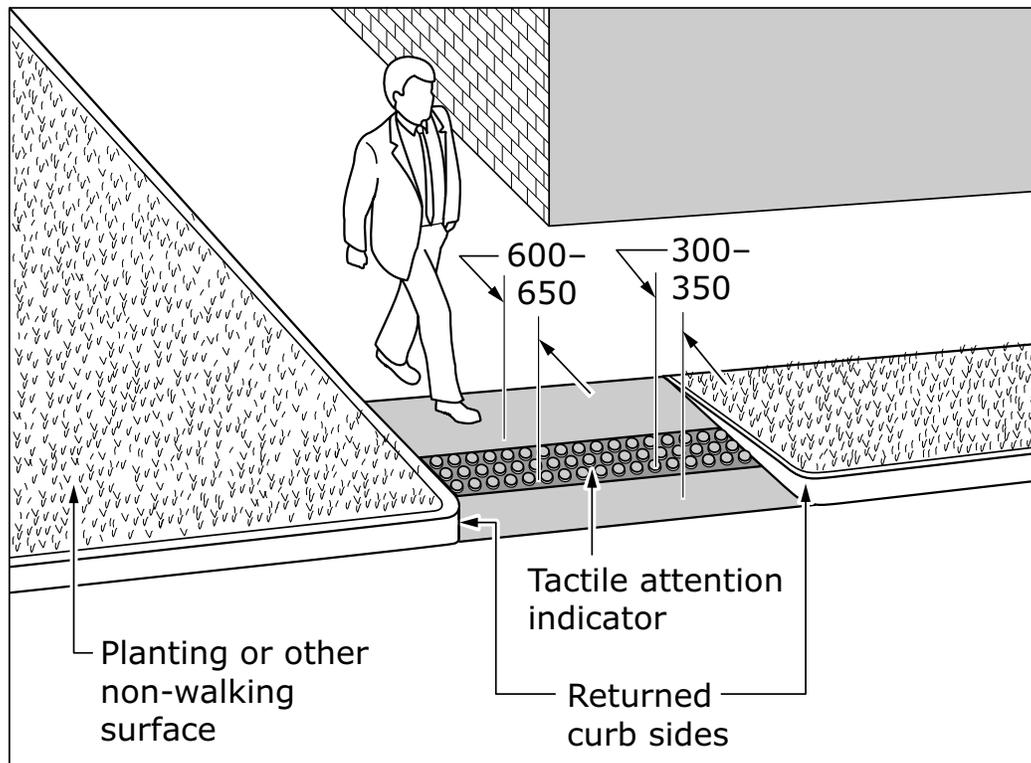
**Figure 60**  
**Accessible route and curb ramp with flared sides**  
(See Clauses [8.2.2](#) and [8.3.3.6](#).)



**This figure shows the dimensions of a curb ramp with flared sides. The slope of the flared sides is 1:10 to 1:15, and there is a tactile attention indicator on the ramp in between the flared sides and placed 300 to 350 mm from the curb. Once up the curb ramp, a turning space measuring 1390 by 1390 mm is depicted.**

**Note:** All dimensions are in mm.

**Figure 61**  
**Curb ramp with returned curb sides**  
 (See Clause [8.3.3.6.](#))



**This figure shows a curb ramp with returned curb sides depicted by a non-walking surface. The graphic shows a person walking down the ramp towards the tactile attention indicator. The tactile attention indicator is 600 to 650 mm wide and 300 to 350 mm from the curb.**

**Note:** All dimensions are in mm.

### 8.3.3.9 Parallel curb ramp

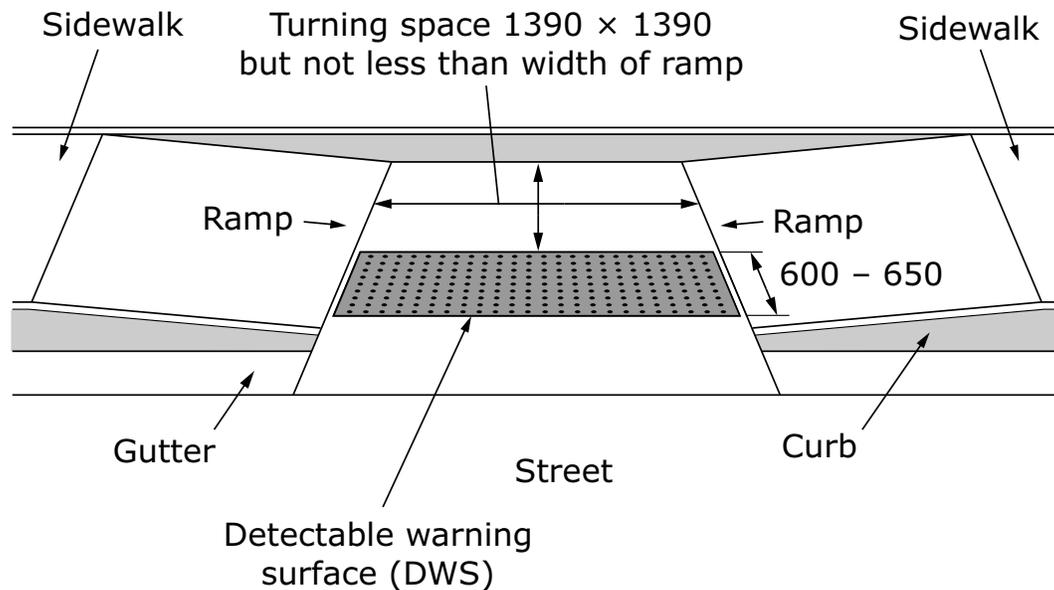
Where a curb ramp is located on an accessible narrow route, the sidewalk itself shall

- a) be ramped down in-line at a slope of between 1:12 (8.33%) and 1:15 (6.66%) to a landing space to allow directional turning at street level;

- b) have the turning space at least 1390 by 1390 mm, but not less than the width of the ramp;
- c) have the turning space running and cross slope not to exceed 1:50 (2%); and
- d) have a tactile attention indicator surface that
  - i) complies with Clause [4.4.5.3](#);
  - ii) is located on the turning space at the transition to vehicular right-of-way;
  - iii) extends the full width of the transition to vehicular right of way;
  - iv) is no more than 150 mm back from the line of the road face of the curb; and
  - v) has a length between 600 and 650 mm.

**Note:** Parallel curb ramps have a running slope that is in line with the direction of sidewalk travel and lowers the sidewalk to a level turning space where a turn is made to enter the pedestrian street crossing (see Figure [62](#)).

**Figure 62**  
**Parallel curb ramp**  
 (See Clause [8.3.3.9.](#))



**This figure shows a parallel curb ramp with running slope in line with the direction of sidewalk travel. The graphic depicts a 1390 by 1390 mm turning space containing a 600 to 650 mm tactile attention indicator surface.**

**Note:** All dimensions are in mm.

### 8.3.4 Crosswalks

#### 8.3.4.1 Surface

A crosswalk shall

- a) be at least 1800 mm wide between pavement markings (where provided);
- b) have a running slope not steeper than in a ratio of 1:20 (5%);
- c) have a cross slope
  - i) not exceeding a ratio of 1:50 (2%) for crossings with stop control;

- ii) not exceeding a ratio of 1:20 (5%) for crossings without stop control; or
- iii) in the case of mid-block pedestrian crossings, matching the street or highway grade; and
- d) where crossing rail tracks at grade
  - i) be level and flush with the top of the rail at its outer edges;
  - ii) be aligned with the top of the rail between the rails;
  - iii) where possible, have wheel flange way openings not more than 64 mm at non-freight rail tracks or 76 mm at freight rail tracks; and
  - iv) have a tactile attention indicator surface complying with Clause [4.4.5.3](#), spanning the width of the crosswalk, and located so that the edge nearest the rail crossing is between 1800 and 4600 mm from the centreline of the nearest rail.

**Notes:**

- 1) The distance range between the tactile attention indicator surface and the nearest rail provides clearance for rail crossing signals and gates.
- 2) When tracks are located in a street or highway that incorporates a pedestrian path, the tactile surfaces at the curb ramps eliminate the need for a second set of tactile indicators at the rail crossing.

**8.3.4.2 Pavement markings**

Where provided, crosswalk pavement markings shall

- a) comply with the Manual of Uniform Traffic Control Devices for Canada; and
- b) be slip-resistant.

**Notes:**

- 1) Pavement markings should clearly identify pedestrian crossing areas, bike lanes, and other locations where driver and pedestrian attention is especially important.

- 2) Permanent tactile crosswalk lines can assist people with low vision in remaining within the crossing at a vehicular right-of-way.
- 3) Pavement marking materials should be chosen for durability and to minimize tripping or loss of traction for pedestrians and bicyclists.
- 4) Pavement markings that delineate the crosswalk should be visible at night.

### **8.3.5 Alignment of pedestrian crossing components**

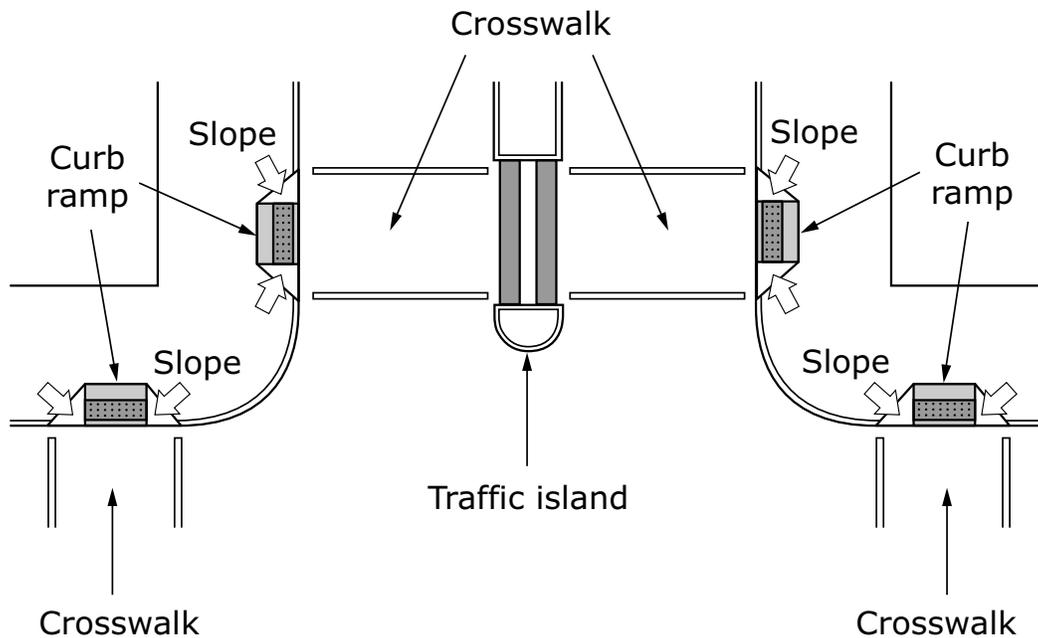
Pedestrian crossing components shall be located to

- a) limit exposure to vehicular traffic by following a line that is perpendicular to the vehicular route being crossed;
- b) be fully outside all motor vehicle and cycling lanes of the parallel roadway;
- c) in the case of refuge islands and medians, where possible, have all components (e.g., curb ramps, blended transitions, crosswalk segments) in a single continuous lateral alignment; and
- d) have curb ramps or blended transitions lead people directly into the crossing area designated for pedestrian use (see Figure [63](#)).

#### **Notes:**

- 1) When a roadway is skewed or the number of lanes differs from one side of an intersection to the other, it can be difficult for pedestrians to avoid straying into traffic lanes.
- 2) Where irregularly shaped islands separate traffic lanes that do not follow parallel tracks, a channelized pedestrian route should be provided on the island to connect the crosswalk segments.
- 3) The flared sides of curb ramps may be located outside the pedestrian crosswalk markings.

**Figure 63**  
**Intersection design**  
 (See Clauses [8.3.5](#) and [8.3.6.3](#).)



**This figure shows the location of curb ramps and pedestrian crossings at an intersection. The graphic depicts curb ramps on each end of a crosswalk running east-west, as well as individual curb ramps for each north-south crosswalk located on opposite sides of the intersection.**

## 8.3.6 Medians and pedestrian refuge areas

### 8.3.6.1 General

Where the pedestrian route connects crosswalk segments across a median or island,

- a) the island segment shall
  - i) provide an area at least 1600 mm wide to allow for passing;
  - ii) be at least 2100 mm long in the direction of pedestrian travel; and

- iii) where longer than 2100 mm or changing direction, be channelized to define the route to be taken; or
- b) where signalized and the island segment is less than 2400 mm long, the pedestrian clearance signal interval shall be set long enough to allow a person to travel the entire length of the pedestrian crossing and comply with Clause [8.3.7.3](#).

### **8.3.6.2 Raised medians or islands**

A pedestrian crossing route within a raised median or island shall

- a) where of sufficient length, have
  - i) at both sides of the island, curb ramps or blended transitions complying with Clause [8.3.5](#); and
  - ii) a walkway at least 1390 mm long between tactile attention indicator surfaces; or
- b) where cut through level with the roadway, comply with Clause [8.3.6.4](#).

**Note:** A raised island should not reduce the width of an adjacent crosswalk by projecting into it.

### **8.3.6.3 Level medians and islands**

Within a pedestrian crossing, an island level with the roadway shall

- a) if less than 2400 mm long, not require a tactile attention indicator surface; or
- b) if more than 2400 mm long
  - i) have at each roadway edge a tactile attention indicator 600 mm deep, complying with Clause [4.4.5.3](#); and
  - ii) have a walkway at least 600 mm deep between the tactile attention indicator surfaces (see Figure [63](#)).

## 8.3.6.4 Bulb-outs (curb extensions)

### 8.3.6.4.1 General

Where bulb-outs are provided, they shall

- a) only be used on streets with a parking lane;
- b) extend along the curb for at least 2000 mm;
- c) not have street furniture or utility equipment located between a pedestrian path and parallel traffic lanes, or within 1000 mm of the curb line on the street being crossed; and
- d) include a curb ramp complying with Clause [8.3.3](#).

**Note:** Narrowing a roadway by constructing a bulb-out or a curb extension at intersections reduces pedestrian risk by creating a shorter crossing distance. It also provides a safe waiting area for pedestrians, where they can see and be seen before crossing.

### 8.3.6.4.2 Bulb-outs at transit stops

If a bulb-out is used at a transit stop, it shall be

- a) of sufficient length to accommodate all transit vehicle access doors;
- b) if at a far-side stop, of sufficient length to have the transit vehicle remain at least 1200 mm clear of the pedestrian crosswalk; and
- c) comply with Clause [8.5.3](#) when used to create an accessible transit stop in a cycle lane.

## 8.3.7 Pedestrian crossing signals

### 8.3.7.1 Accessible pedestrian signals

Where provided, an accessible pedestrian signal installation shall comply with the Transportation Association of Canada's Guidelines for Understanding, Use and Implementation of Accessible Pedestrian Signals.

### **8.3.7.2 Activation push buttons at pedestrian crossings**

Where provided, a pedestrian crossing activation push button shall either

- a) for accessible pedestrian signals, comply with Clause [8.3.7.1](#); or
- b) for conventional pedestrian signals
  - i) be adjacent to the accessible pedestrian route without obstructing it;
  - ii) be located on a pole at a height of  $1100 \pm 150$  mm above the level of the pedestrian route; and
  - iii) have a clear level area 820 by 1390 mm adjacent to or overlapping the pedestrian route.

#### **Notes:**

- 1) To determine the suitability of an intersection for the installation of accessible pedestrian signals, the process described in the Guidelines for Understanding, Use and Implementation of Accessible Pedestrian Signals can be used.
- 2) Traffic control could necessitate conventional pedestrian signals at a location that does not qualify for accessible pedestrian signals. These could include complex intersections or those near each other.
- 3) The push button pole should not be located on a curb ramp.
- 4) The location of the pedestrian crossing activation buttons should not be obstructed by street furniture or snowbanks.

### **8.3.7.3 Pedestrian signal timing**

The timing of the pedestrian clearance interval shall be calculated

- a) using a pedestrian walk speed of not more than 0.8 m/s; and
- b) to include the entire length of the pedestrian crossing.

### 8.3.8 Speed bumps

Where a speed bump is installed, a clear level space on the roadway at least 1200 mm wide shall be provided between the speed bump and the edge of the roadway.

#### Notes:

- 1) People using wheeled mobility devices might require passage beyond the speed bump if use of part of the roadway is necessary to access their destination.
- 2) Speed bumps can cause problems for people with back problems and related disabilities since it is jarring to travel over a bump.

### 8.3.9 Bollards

Where bollards or curbs are located adjacent to a pedestrian route or space, they shall

- a) be luminance (colour) contrasted with their surroundings; and
- b) where access is intended between the bollards or curbs, provide a clear width of at least 1200 mm to allow the passage of wheeled mobility devices.

### 8.3.10 Overpasses and underpasses

#### 8.3.10.1 Pedestrian access route

A pedestrian overpass or underpass shall contain a pedestrian access route that complies with Clause [8.2](#).

**Note:** At pedestrian underpasses, sound-dampening measures should be used to reduce echoes from vehicles, thus allowing a better acoustic interpretation of the environment.

#### 8.3.10.2 Pedestrian approach

Where the pedestrian approach route has a slope steeper than a ratio of 1:20 (5%), the approach shall either

- a) be designed as a ramp and
  - i) comply with Clause [8.2.7](#) for unprotected exterior installations; or

- ii) if weather-protected, comply with Clause [5.5.1](#); or
- b) be equipped with an elevating device that allows for independent operation and complies with either
  - i) Appendix E of ASME A17.1/CSA B44; or
  - ii) CSA B355.

**Notes:**

- 1) To avoid potential breakdown and maintenance outages, an approach that does not require an elevating device should be used.
- 2) The user of an independently operated elevating device does not require either a key or another person to operate it.

## 8.4 Intersection design

### 8.4.1 General

Accessible pedestrian intersection elements shall be provided

- a) at all intersections in urban and suburban areas; and
- b) in rural areas, at intersections with a concentration of commercial or residential activity.

**Notes:**

- 1) Accessible pedestrian intersection elements include items such as curb ramps, crosswalks, crossing signals, and tactile walking surface indicators.
- 2) The layout of travel lanes, curb ramps, crosswalks, bicycle lanes, and transit stops all constitute part of the geometric roadway design. At intersections, potential conflict points (particularly those that confront vulnerable intersection users, such as pedestrians or bicyclists) should be made evident by offering approaching drivers, bicyclists, and pedestrians a clear view of one another.
- 3) The desired vehicle and pedestrian actions can be facilitated by discouraging undesirable movements, providing safe refuges, offering wayfinding cues for bicyclists and pedestrians, defining appropriate vehicular lanes, encouraging safe speeds, helping to separate points of conflict, or facilitating the movement of high-priority traffic flows.

## 8.4.2 Types of intersections

### 8.4.2.1 Uncontrolled access ramp intersections

Where an uncontrolled vehicular access ramp intersects a pedestrian route, it shall have

- a) a marked pedestrian crossing that complies with Clause [8.3](#);
- b) a vehicle stop line clearly defined by signage on and beside the roadway; and
- c) a traffic control device that complies with the requirements of the Manual of Uniform Traffic Control Devices for Canada, either
  - i) a yield to pedestrians sign; or
  - ii) a signalized pedestrian crossing having an accessible pedestrian signal that complies with Clause [8.3.7](#).

### 8.4.2.2 Sign-controlled intersections

A sign-controlled intersection with a pedestrian route shall

- a) have a marked pedestrian crossing that complies with Clause [8.3](#) for each controlled leg of the intersection; and
- b) comply with Clause [8.3.7](#) where an uncontrolled slip lane forms part of the intersection.

### 8.4.2.3 Signal-controlled intersections

#### 8.4.2.3.1 Design specifications

A signal-controlled intersection shall comply with the Manual of Uniform Traffic Control Devices for Canada.

**Note:** Consistent design helps make the layout and use of intersections readily apparent to pedestrians, some of whom might find wayfinding through an intersection a challenge.

#### 8.4.2.3.2 General intersections

A signal-controlled general intersection in a pedestrian route shall

- a) have a marked pedestrian crossing that complies with Clause [8.3](#) for each controlled leg of the intersection; and

- b) comply with Clause [8.4.2.1](#) where an uncontrolled slip lane forms part of the intersection.

### **8.4.2.3.3 Continuous or parallel flow intersections**

A continuous or parallel flow intersection shall

- a) comply with Clause [8.4.2.3.1](#);
- b) be equipped with accessible pedestrian signals that comply with Clause [8.3.7](#);
- c) have
  - i) a marked pedestrian crossing that complies with Clause [8.3](#) for each controlled leg of the intersection; and
  - ii) tactile pedestrian crosswalk surfaces where the crossing is between opposing traffic flows; and
- d) have channelizing features or tactile pathways on islands where the pedestrian route is between opposing traffic flows.

### **8.4.2.4 Roundabout intersections**

A roundabout intersection having a pedestrian route of travel shall

- a) have the pedestrian route alongside the roadway delineated from the vehicular route by curbs or other elements to preclude passage where a pedestrian street crossing is not intended;
- b) at each approach roadway that intersects the pedestrian route, have a marked pedestrian crossing that
  - i) complies with Clause [8.3](#); and
  - ii) is located at least 7.6 m from the circulation traffic lanes;
- c) have a tactile direction indicator surface to indicate the junction of a crosswalk and pedestrian route alongside the roadway that
  - i) complies with Clause [4.4.5](#);
  - ii) extends from the centreline of the ramp or blended transition across the full width of the pedestrian route alongside the roadway; and

- iii) is 600 mm long in the direction of pedestrian travel;
- d) for roundabout intersections with single-lane approach and exit legs, provide at each crosswalk a yield to pedestrians sign that complies with the Manual of Uniform Traffic Control Devices for Canada; and
- e) at roundabouts with multi-lane pedestrian street crossings, have
  - i) entry and exit lanes of the roundabout separated by a splitter island;
  - ii) on the splitter island, a channelized pedestrian route to ensure pedestrians follow the intended route;
  - iii) separate offset pedestrian crossings for entry and exit lanes of the roundabout; and
  - iv) for each multi-lane segment of a pedestrian street crossing, an accessible pedestrian signal that complies with Clause [8.3.7.1](#). Signals shall clearly identify which pedestrian street crossing segment the signal serves.

**Notes:**

- 1) Because pedestrian crossings are usually located to the side of a pedestrian route around a roundabout, and since noise from continuously circulating traffic can mask useful audible cues, carefully delineated crosswalk approaches (e.g., with plantings, low enclosures, curbs, or other defined edges) can be useful in identifying the crosswalk location(s).
- 2) Pedestrian crossings should be located away from circulating traffic lanes to avoid pedestrians from straying into continuously circulating traffic. Where they are available, crossings should make use of splitter islands for refuge areas.
- 3) For multi-lane crossings, a grade-separated pedestrian crossing is an alternative to signalized pedestrian crossings.

### **8.4.2.5 Vehicular overpasses or underpasses**

Where two vehicular rights-of-way meet at an overpass or underpass, the intersection shall

- a) provide a pedestrian route that complies with Clause [8.2](#) for each route where pedestrians are allowed;
- b) comply with Clause [8.3](#) where marked pedestrian crossings are provided; and
- c) comply with Clause [8.4.2.1](#) where an uncontrolled ramp intersects the pedestrian route.

### **8.4.2.6 Pedestrian mid-block crosswalks**

Where a pedestrian crosswalk is installed at an uncontrolled, mid-block location to facilitate crossing a vehicular right-of-way, it shall

- a) have a marked pedestrian crossing that complies with Clause [8.3](#); and
- b) have traffic signals that comply with the Manual of Uniform Traffic Control Devices for Canada (see Clause [8.3.7](#)).

### **8.4.2.7 Rail lines**

Where a rail line right-of-way intersects a pedestrian route as defined in Clause [8.2](#), a crosswalk shall be provided that complies with Clause [8.3.4](#).

## **8.4.3 Intersection design features**

### **8.4.3.1 Raised intersections**

A raised intersection shall

- a) have its crosswalks connected to the pedestrian path beyond a vehicular right-of-way by a blended transition that complies with Clause [8.3.3](#);
- b) contain the crosswalks within the raised area of the intersection; and

- c) have one side of the crosswalk continuously attached to the grade break between the roadway approach slope and the raised area.

### **8.4.3.2 Intersection corners**

Corner radii shall be designed to ensure that vehicles do not drive over pedestrian refuge areas.

**Note:** Often pedestrians are not able to determine if or when a part of a vehicle will cut across an island or a corner refuge area.

### **8.4.3.3 Angle of intersection**

Intersecting vehicular routes (not including access ramps) shall meet either

- a) at 90° angles for new intersections; or
- b) at angles not less than 75° where the right-of-way is restricted.

#### **Notes:**

- 1) Intersection approaches that meet at near-right angles and merge at flat angles eliminate awkward sight lines for drivers and pedestrians, which can be dangerous for both.
- 2) Skewed crossings expose pedestrians to vehicular traffic longer, thereby requiring an extended timing phase for the walk signal interval.

## **8.5 Transit stops**

### **8.5.1 General**

Equipment at transit stops, including shelters, shall

- a) not obstruct the accessible route; and
- b) comply with Clauses [4](#), [5.2](#), and [5.5](#).

**Note:** Consistent placement of transit stop features helps to create a predictable environment to assist in wayfinding.

## 8.5.2 Identification

A transit stop shall

- a) be identified with
  - i) a distinctive visual and tactile stop pole, where the tactile element can be accessed at or below 1200 mm from the ground; and
  - ii) a tactile direction indicator complying with Clause [4.4.5.4](#), at least 600 mm deep, extending the width of the pedestrian route (see Figure [7 b](#));
- b) have signage complying with Clause [4.6](#) that, where routes are identified, provides the information visually and via either
  - i) in braille and raised characters; or
  - ii) user or proximity-actuated audible signals;
- c) where a transit platform is separated from the pedestrian route by traffic lanes, have its identification located at the intersection of the pedestrian route and the pedestrian crossing to the transit platform;
- d) have no sharp edges or corners on equipment such as poles or signs; and
- e) where stop identification numbers are posted for real-time transit information, have them in large print, braille, and raised numerals.

### Notes:

- 1) A stop pole that is distinctive in a visual and tactile manner from other facilities or elements along an accessible route can assist people having low or no vision to locate transit stops.
- 2) Posted schedules, timetables, and maps are not required to be in tactile or audible format.

## 8.5.3 Boarding or alighting areas

A transit boarding or alighting area shall

- a) have a firm, stable, and slip-resistant surface;

- b) when higher than 250 mm above the transit right-of-way, have a tactile attention indicator surface along the unprotected drop-off edge that complies with Clause [4.4.5.3](#);
- c) at each loading position intended for users of a wheeled mobility aid, provide
  - i) a clear length of at least 2400 mm, measured perpendicular to the curb or vehicular route edge; and
  - ii) a clear width of at least 1500 mm, measured parallel to the vehicular route;
- d) have its grade with no slope steeper than in a ratio of 1:50 (2%);
- e) when at the side of a roadway, be connected to the pedestrian path by a pedestrian route complying with Clause [8.2](#);
- f) when separated from a pedestrian path by traffic lanes, be connected to the pedestrian route by a pedestrian crossing that
  - i) complies with Clause [8.3](#); and
  - ii) is equipped with accessible pedestrian signals that announce the transit platform connection and comply with Clause [8.3.7](#); and
- g) when located in a bicycle lane, have
  - i) the bicycle lane raised to the level of the adjacent pedestrian path;
  - ii) tactile attention indicators at the top of bicycle ramps that connect the bicycle lane across the boarding area;
  - iii) a tactile attention indicator delineating the line between the pedestrian path and the bicycle lane;
  - iv) curb grade separation from the adjacent traffic lane; and
  - v) signage advising cyclists to stop before entering the

boarding area when a transit vehicle is present for the purpose of boarding or alighting passengers.

**Note:** Where possible, transit stops should not be separated from the pedestrian route by traffic lanes.

### 8.5.4 Transit shelters

Where provided, a transit shelter shall

- a) have a level access to the accessible route;
- b) have floor and ground surfaces that comply with Clause [4.4](#);
- c) have protrusion hazards comply with Clause [4.5](#);
- d) have the signage comply with Clause [4.6](#);
- e) have an unobstructed clear floor area at least 2100 by 2100 mm directly inside the doorway;
- f) where no door is provided, have a clear opening at least 1000 mm wide; and
- g) where a door is provided, comply with Clause [5.2](#).

**Notes:**

- 1) Transit shelters should provide adequate space to accommodate the general public as well as people using mobility devices.
- 2) Furnishings within the shelter should be clear of the immediate area inside the door or doorway.

## 8.6 Urban furniture and equipment

### 8.6.1 General

Urban furniture and equipment shall

- a) not obstruct any part of an accessible route (see Clause [8.2](#)); and
- b) where pedestrian use or interaction is intended, be adjacent or connected to the accessible pedestrian route.

**Notes:**

- 1) The placement of sidewalk furniture is functionally important, but should not obstruct circulation.
- 2) Straightforward and predictable routing along a sidewalk, with equipment, street furniture, landscaping, and utilities grouped

together in an amenity zone (perhaps along the curb), will facilitate pedestrian circulation. This is particularly useful at turns, ramps, and in places and at objects that require additional manoeuvring space to approach and operate.

### 8.6.2 Amenity zone

Where urban furniture and equipment are provided, they shall be located in an amenity zone that

- a) is consistently located on one or both sides of an accessible route;
- b) contains within it the required urban elements;
- c) does not reduce the required clear width of the accessible route;
- d) is at least 300 mm wide, with a preferred width of 600 mm;
- e) has its surface texture- and luminance (colour) contrasted with the surrounding area; and
- f) where containing a transit stop, complies with Clause [8.5](#).

**Note:** The preferred location for the amenity zone is at the curb edge.

### 8.6.3 Rest areas

#### 8.6.3.1 Benches or seating

Where a bench or seating is provided, it shall

- a) comply with Clause [6.7.2](#); and
- b) have the adjacent level area separated by a raised curb or barrier from a drop off or downward slope.

**Note:** A walking surface that is texture- and luminance (colour) contrasted will help people to locate the rest area (see Figure [57](#)).

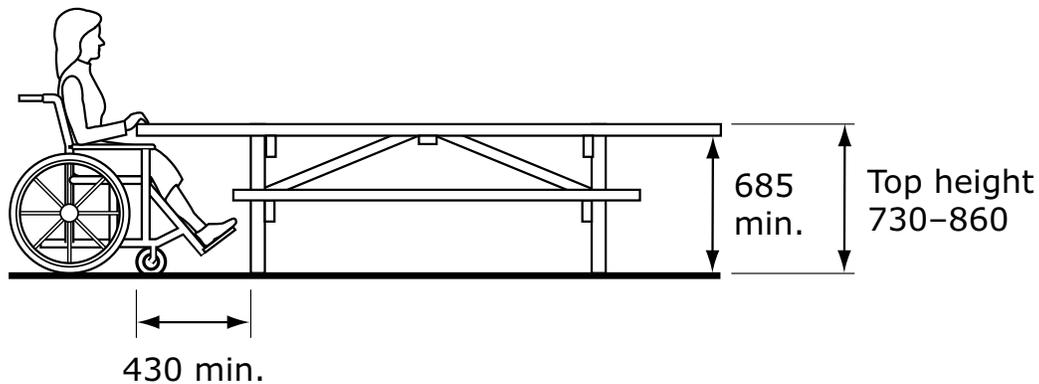
#### 8.6.3.2 Picnic tables

Where a picnic table is provided, it shall be

- a) on a level and firm surface that extends at least 2000 mm on all sides [see Figure [64 b](#)]; and

- b) equipped with a knee clearance under the table at least 820 mm wide by 430 mm deep by 685 mm high [see Figure [64 a](#)].

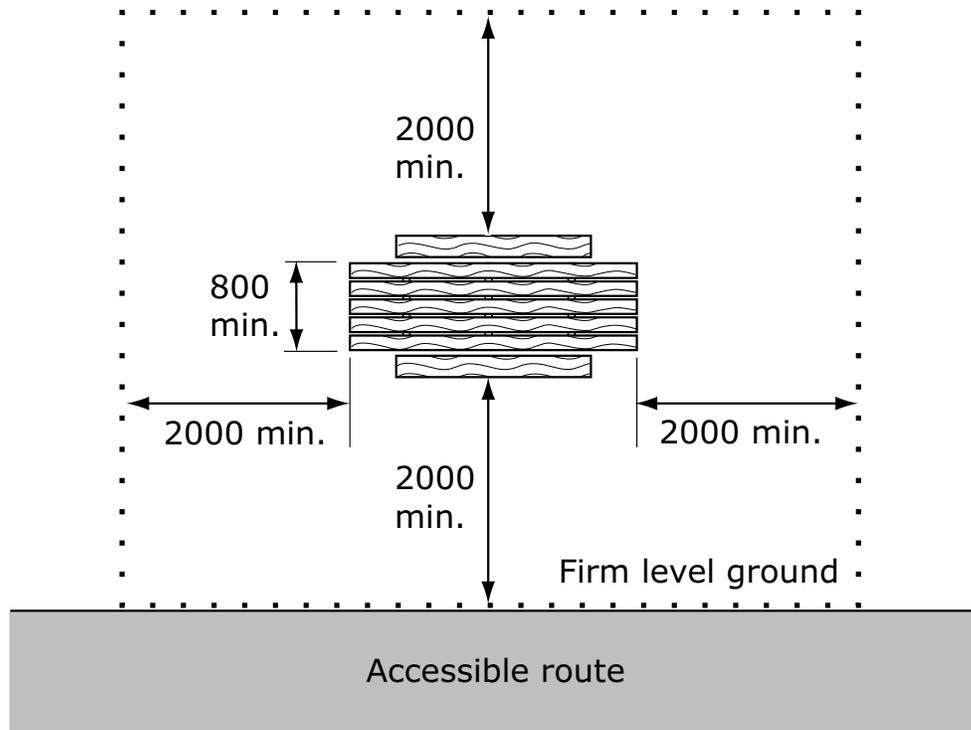
**Figure 64 a)**  
**Picnic table – Height and knee clearance**  
(See Clause [8.6.3.2.](#))



**This figure shows a person in a wheeled mobility device sitting at a picnic table with a top height of 730 to 860 mm above the ground. The knee clearance under the picnic table is 430 by 685 mm.**

**Note:** All dimensions are in mm.

**Figure 64 b)**  
**Picnic table – Clearance area**  
(See Clause [8.6.3.2.](#))



**This figure identifies 2000 mm as the minimum required clearance area surrounding a picnic table, with a minimum picnic table width of 800 mm.**

**Note:** All dimensions are in mm.

### **8.6.4 Public telephones**

Where a public telephone is provided, it shall

- comply with Clause [6.6.2](#);
- be located on a firm, stable, and slip-resistant surface;
- have the ground surface around and under the telephone luminance (colour) contrasted with its surroundings; and
- be cane-detectable.

### 8.6.5 Drinking fountains

Where a drinking fountain is provided, it shall

- a) be located adjacent or connected to an accessible route; and
- b) comply with Clause [6.1](#) [see Figures [39 a\)](#) and [39 b\)](#)].

**Note:** Inclusion of a water bottle filling spout will add to the accessibility of the drinking fountain.

### 8.6.6 Permanent washrooms

Where a permanent washroom is provided, it shall

- a) be connected to an accessible route;
- b) have level access from the washroom entry door to the accessible route;
- c) where doors are provided, comply with Clause [5.2](#);
- d) where applicable, comply with Clauses [6.2](#) and [6.3](#); and
- e) have signage that complies with Clause [4.6.7](#).

**Notes:**

- 1) A permanent washroom facility should have direct exterior access. It may be a freestanding building or located in a dedicated portion of a building.
- 2) For temporary outdoor toilets, see Clause [8.8.3](#).

### 8.6.7 Information kiosks

Where an information kiosk is provided, it shall

- a) be located adjacent to or connected to an accessible route;
- b) where applicable, comply with
  - i) Clause [4.1](#) for area allowances;
  - ii) Clause [4.3](#) for operating controls;
  - iii) Clause [4.4](#) for ground surfaces; and
  - iv) Clause [4.5](#) for clearances.
- c) comply with Clause [6.7.1](#) where counters are provided; and
- d) where a self-service interactive device is provided, comply with CAN/CSA-B651.2.

## 8.6.8 Exterior signage

Exterior signage shall

- a) comply with Clause [4.6](#); and
- b) comply with the Clause [4.5.2](#).

**Note:** Exterior signage includes sidewalk signage such as A-frame advertising, etc.

## 8.6.9 Bicycle parking

Where bicycle parking is provided, it shall be located such that bicycles do not protrude into the accessible pedestrian route.

**Note:** Having the bicycle parking area pavement textured and luminance (colour) contrasted to the surrounding surface will help to define the parking area for cyclists and pedestrians.

## 8.6.10 Parking meters, newspaper dispensers, and mail or courier boxes

Where a parking meter/ticket dispenser, newspaper dispenser, mailbox (both street and community), or courier box is provided, it shall

- a) be accessed from a clear ground area of at least 820 by 1390 mm that is connected to the accessible route;
- b) be securely fixed to the ground, post, or wall;
- c) have the ground surface firm, stable, and slip-resistant;
- d) be cane-detectable to the ground;
- e) have the operating mechanisms
  - i) located between 900 and 1200 mm above ground;
  - ii) comply with Clauses [4.3.2](#) and [4.3.4](#) to [4.3.8](#); and
  - iii) comply with CAN/CSA-B651.2 for self-service interactive devices.
- f) have signage that complies with Clause [4.6](#); and
- g) be luminance (colour) contrasted with the surroundings.

### **8.6.11 Waste receptacles, recycling bins, and ashtrays**

Where a waste receptacle, recycling bin, or ashtray is located along an accessible route, it shall

- a) be located adjacent or connected to the accessible route;
- b) be securely fastened to the ground, post, or wall;
- c) have the opening or lid not higher than 1060 mm from the ground;
- d) have a clear ground area of at least 820 by 1390 mm at the opening or lid;
- e) be cane-detectable to the ground; and
- f) be luminance (colour) contrasted with the surroundings.

### **8.6.12 Reflecting pools**

An unprotected edge of a reflecting pool shall

- a) have a firm, stable, and slip-resistant surface;
- b) have adequate drainage so that water does not accumulate on the surface; and
- c) have a tactile attention indicator surface that complies with Clause [4.4.5.2](#).

### **8.6.13 Miscellaneous items**

Miscellaneous items installed in the public right-of-way (e.g., intersection traffic control boxes, hydro transformers, hydrants) shall

- a) be located off the accessible route;
- b) comply with Clause [4.5](#); and
- c) in the case of guy wires
  - i) be clearly distinguished from their surroundings by luminance (colour) contrasting materials (see Clause [4.2](#)); and
  - ii) where in a paved public area, be vertical to a height of 2050 mm from the ground.

## 8.7 Landscaping elements

### 8.7.1 Flower or shrub planters

Where a flower or shrub planter is provided along an accessible route, it shall

- a) be located off the accessible route; and
- b) comply with Clause [4.5](#).

### 8.7.2 Planting bed edges

The edges of planting beds located adjacent to an accessible route shall

- a) be clearly defined by texture and luminance (colour) contrast from the surroundings;
- b) be designed to prevent ground cover or drainage from entering the pedestrian route; and
- c) where the planting material is soft or below the level of the pedestrian route, have edge protection a minimum of 100 mm in height.

**Note:** Where the planting surface is soft or lower than the accessible path of travel edge, protection should be provided to prevent wheels or walking aids from moving off the accessible path.

### 8.7.3 Vegetation

Vegetation located adjacent to an accessible route or rest area shall

- a) have no thorns or sharp edges;
- b) have no planting that can drop large seed pods overhanging or close by;
- c) not be poisonous; and
- d) comply with Clause [4.5](#) where tree branches or shrubs overhang the accessible route.

**Notes:**

- 1) Vegetation can affect melting snow and ice on walkways, and it can create dark shadow areas by causing inconsistent lighting. Before deciding on a location or type of plant, consideration

should be given to the mature shadow patterns during summer and winter months.

- 2) Because many trees with shallow or surface root systems heave or break the walking surface, caution should be used when choosing these varieties.

### **8.7.4 Guy wires**

Guy wires located along an accessible pedestrian route shall

- a) be contained so as not to obstruct pedestrian areas of travel;
- b) have any protrusions comply with Clause [4.5](#); and
- c) be clearly distinguished from their surroundings by luminance (colour) contrasted materials.

### **8.7.5 Grates around trees**

Where provided, a grate around a tree shall

- a) comply with Clause [4.4.4](#);
- b) be slip-resistant; and
- c) have edge protection at the tree opening a minimum of 100 mm in height.

**Note:** Where no grating is provided on trees with larger girth, the material around the tree should be firm and level with the sidewalk.

### **8.7.6 Tree guards**

Where a tree guard is provided, it shall be cane-detectable to comply with Clause [4.5](#).

## **8.8 Temporary facilities**

### **8.8.1 Construction along an accessible route**

Where a section of an accessible route is affected by construction, a safe and secure alternative pedestrian route through or around the improvement area shall

- a) comply with Clause [8.2](#);
- b) be announced with signage that complies with Clause [4.6](#); and

- c) have restricted hazard areas marked by cane-detectable barriers at or below 685 mm.

### **8.8.2 Scaffolding**

Where scaffolding is erected on or above an accessible route, it shall

- a) provide a walkway at least 1600 mm wide;
- b) have a height clearance that complies with Clause [4.5](#); and
- c) have all other requirements comply with Clause [5.1](#).

### **8.8.3 Temporary outdoor toilets**

Where a temporary outdoor toilet is provided, at least one shall

- a) be located adjacent or connected to an accessible route;
- b) have toilet identification that complies with Clause [4.6.7](#);
- c) have the entry door level with or ramped to the accessible route;
- d) have a door that
  - i) opens to the outside; and
  - ii) has a clear opening that is at least 860 mm wide;
- e) have a clear interior space at least 1600 by 1500 mm; and
- f) have a toilet that
  - i) is positioned in compliance with Clause [6.2.6.2](#);
  - ii) has the top of the seat between 430 and 485 mm from the ground;
  - iii) has grab bars that comply with Clause [6.2.6.4](#); and
  - iv) has a toilet paper dispenser that complies with Clause [6.2.6.5](#).

#### **Notes:**

- 1) In a temporary installation, at least one accessible outdoor toilet should be provided, with the total number of units appropriate to the event attendance.
- 2) Temporary installations can include outdoor events or be within temporary enclosures such as concerts, fairs, auctions, etc.
- 3) Jurisdictional requirements can apply.

## 9 Vehicular access

### 9.1 General

The requirements of this Clause deal with passenger pick-up areas and with designated accessible parking spaces, which may be located in either an exterior area or an interior structure.

**Note:** A passenger pick-up area is also assumed to be a drop-off area.

### 9.2 Pedestrian routes

A pedestrian route from a passenger pick-up area or a designated accessible parking space shall

- a) be part of the shortest accessible route to the building or facility entrance;
- b) where it is exterior, comply with Clause [8.2](#); and
- c) where it is interior, comply with Clause [5.1](#).

**Notes:**

- 1) Pick-up areas that serve a particular building and parking spaces designated for people who use mobility devices or who have mobility limitations should be located on the shortest possible pedestrian route to an accessible entrance.
- 2) In independent parking structures or lots that do not serve a particular building, the designated accessible parking spaces should be located on the shortest possible pedestrian route to an accessible entrance of the parking facility.

### 9.3 Passenger pick-up areas

#### 9.3.1 Access aisle

At a passenger pick-up area, a side access aisle shall be provided on the roadway that is

- a) adjacent and parallel to the accessible route;
- b) at least 1500 mm wide by 7000 mm long (see Figure [65](#));  
and

- c) separated from the walkway either
  - i) by a curb containing a curb ramp that complies with Clause [8.3.3](#); or
  - ii) where there is no curb, by a tactile attention indicator surface that complies with Clause [4.4.5.3](#).

**Notes:**

- 1) Passengers using wheeled mobility devices should have a transfer space level with the roadway.
- 2) Seating can be provided so that passengers can sit while waiting for pick-up.

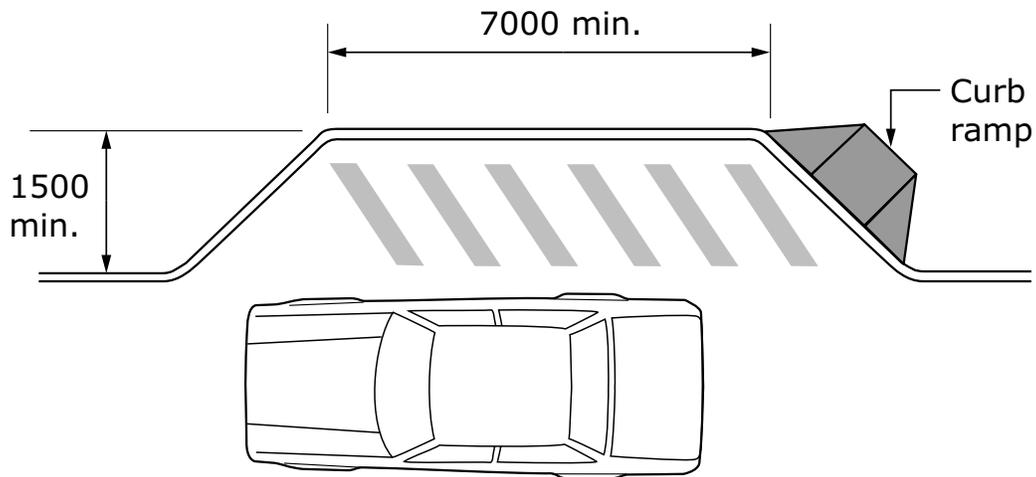
### **9.3.2 Height clearance**

The clearance from the pavement to the underside of any ceiling structure or hanging object shall

- a) be at least 3000 mm
  - i) at the passenger pick-up area; and
  - ii) along the vehicular route from the site entrance (see Figure [66](#)); and
- b) be identified with a sign indicating clearance height.

**Note:** Covered passenger pick-up should be provided.

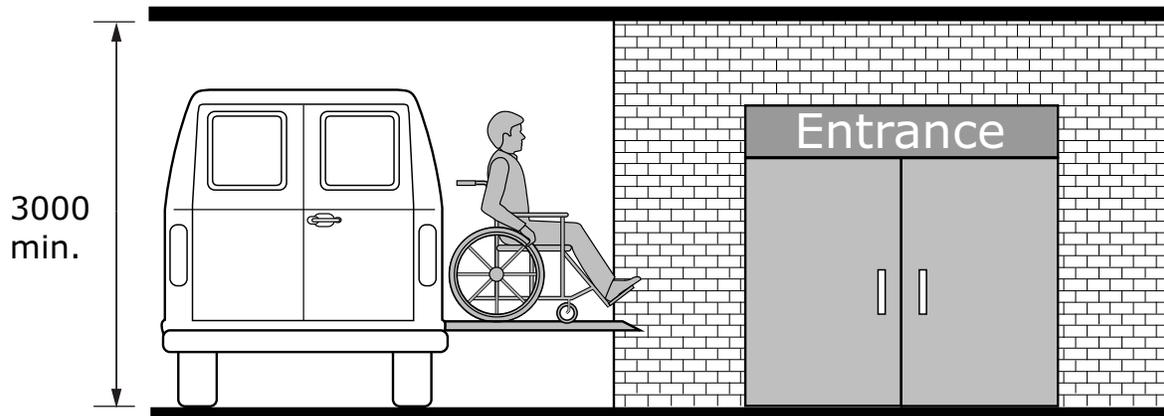
**Figure 65**  
**Access aisle at passenger pick-up area**  
(See Clause [9.3.1.](#))



**This figure illustrates an access aisle with curb ramp at a passenger pick-up area. The graphic shows a parallel parked vehicle waiting outside of the access aisle that is a minimum of 7000 mm wide by 1500 mm deep.**

**Note:** All dimensions are in mm.

**Figure 66**  
**Height clearance at passenger pick-up area**  
(See Clause [9.3.2.](#))



**This figure shows the height clearance required at a passenger pick-up area. The graphic shows an accessibility vehicle making a service stop at a facility entrance with a minimum 3000 mm high clearance.**

**Note:** All dimensions are in mm.

## 9.4 Designated accessible parking

### 9.4.1 Area allowances

A designated accessible parking space shall

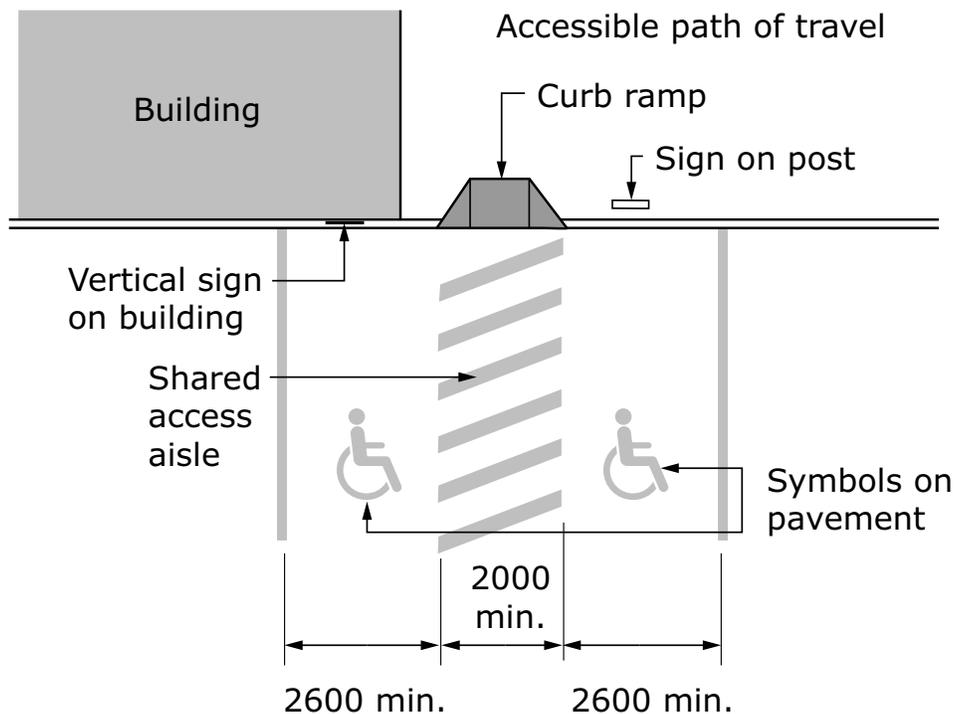
- a) be at least 2600 mm wide;
- b) for parking spaces perpendicular to the roadway, have an adjacent side access aisle at least 2000 mm wide (see [Figure 67](#)); and
- c) for parking spaces parallel to the roadway
  - i) have an adjacent rear access aisle at least 2000 mm long; and
  - ii) a 2000 by 5500 mm unobstructed side embarking area on the pedestrian right-of-way, with the exception that

the designated accessible parking sign may be placed within this space (see Figure [68](#)).

**Notes:**

- 1) A wider parking space is needed because wheeled mobility device entry into a vehicle is often via a side door with a platform lift or a removable metal ramp that extends outside the vehicle.
- 2) An additional manoeuvring area is needed beyond the platform lift or ramp. For parallel parking, a wider sidewalk might be necessary to allow for the required manoeuvring area. For parallel parking, a rear access aisle is also required because some vehicles have the wheeled mobility device entry at the back of the vehicle.
- 3) In parking lots, designated accessible parking spaces should be provided in compliance with local municipal or provincial regulations. In the absence of such regulations, Table [10](#) offers a guide to how many such spaces should be provided.
- 4) Where on-street parking is provided, at least 10% of the spaces per block should be a designated accessible parking space, but never less than one of two or more spaces.

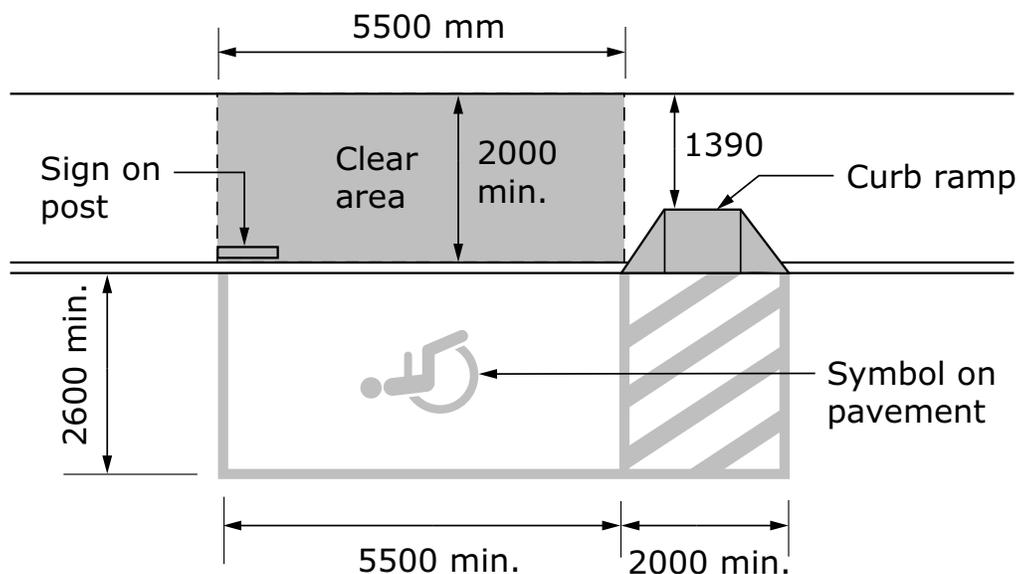
**Figure 67**  
**Accessible parking space perpendicular to the roadway**  
 (See Clause [9.4.1.](#))



**This figure shows the minimum area of an accessible parking space perpendicular to the roadway reserved for people with reduced mobility. The illustration shows two parking spaces at least 2600 mm wide separated by a shared access aisle of at least 2000 mm. An International Pictogram of Access is painted on the pavement in each parking space. Signs on the building and on a post are shown.**

**Note:** All dimensions are in mm.

**Figure 68**  
**Parallel accessible parking space**  
 (See Clause [9.4.1.](#))



**This figure shows the area allowance for a parallel designated accessible parking space. The graphic depicts a minimum 2600 by 5500 mm parking space, with a minimum 2600 by 2000 mm access aisle leading to a curb ramp. The clear area on the sidewalk and parallel to the parking space measures a minimum of 2000 by 5500 mm.**

**Note:** All dimensions are in mm.

**Table 10**  
**Recommended number of designated accessible parking spaces**  
 (See Clause [9.4.1.](#))

This table lists the recommended number of designated parking spaces in relation to the number of designated accessible parking spaces and designated mobility parking spaces.

<b>Number of designated parking spaces</b>	<b>Number of designated accessible parking spaces</b>	<b>Number of designated limited mobility parking spaces (See Clause <a href="#">9.5</a>)</b>
2 to 50	1 to 3	2 to 6
51 to 100	2 to 4	4 to 8
101 to 200	4 to 8	8 to 16
201 to 300	5 to 10	10 to 20
301 to 500	6 to 12	12 to 24
Over 500	6 to 12, plus 1 to 3 for every 100 spaces over 500	12 to 24, plus 2 to 6 for every 100 spaces over 500

### 9.4.2 Height allowances

The clearance from the pavement to the underside of any ceiling structure or hanging object shall be at least 2750 mm

- a) along the vehicular route; and
- b) at the designated accessible parking space(s).

**Note:** Vehicles with a platform lift or a ramp for wheeled mobility device access can be higher than standard vehicles and therefore need a higher clearance in garages.

### 9.4.3 Surface

A designated accessible parking space and its adjacent side aisle shall

- a) have a surface that is level, stable, firm, and slip-resistant;
- b) on the side access aisle, have diagonal markings that resist fading or removal and contrast with the pavement; and
- c) where bollards or curbs separate the vehicular area from a pedestrian route, have them comply with Clause [8.3.9](#).

### 9.4.4 Signage for designated accessible parking

#### 9.4.4.1 Identification

A designated accessible parking space shall be identified by

- a) a vertically mounted sign; and
- b) the International Pictogram of Access painted on the pavement [see Figures [12 a\)](#) and [12 b\)](#)].

#### Notes:

- 1) The location of designated accessible parking spaces should be identified for drivers entering a parking lot or structure by means of directional signs along the route leading to them [see Figure [69 b\)](#)].
- 2) The vertical sign should be located so that it is visible to a vehicle driver approaching the space, but not to create a protrusion hazard.

#### 9.4.4.2 Vertical signs

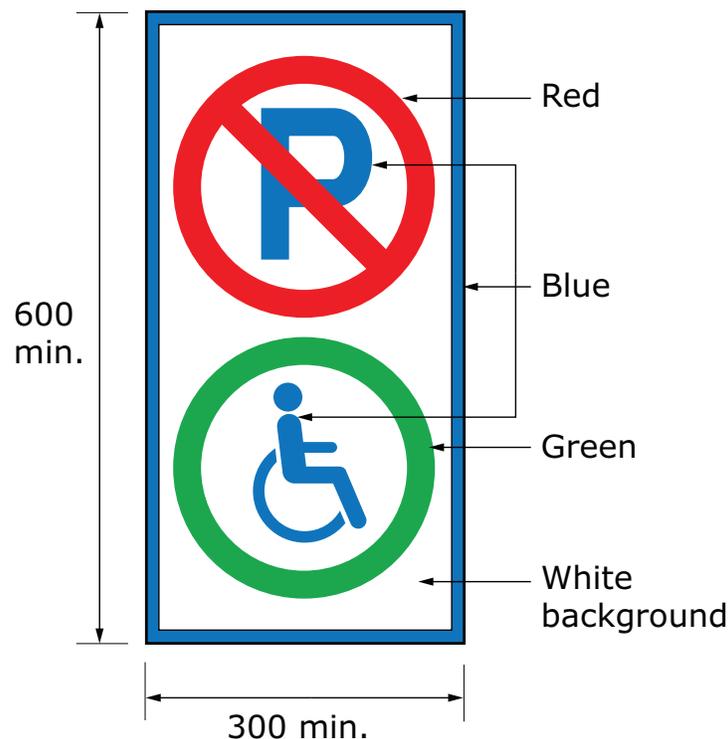
A vertical sign shall

- a) be at least 300 mm wide by 450 mm high;
- b) have the centre of the sign between 1500 to 2000 mm from the ground;
- c) incorporate the International Pictogram of Access [see Figures [12 a\)](#) and [12 b\)](#)]; and

d) comply with Clause [4.5](#).

**Note:** The vertical sign should be one that is officially recognized by the local jurisdiction or be the sign from the Manual of Uniform Traffic Control Devices for Canada [see Figures [69 a\)](#) and [69 b\)](#)].

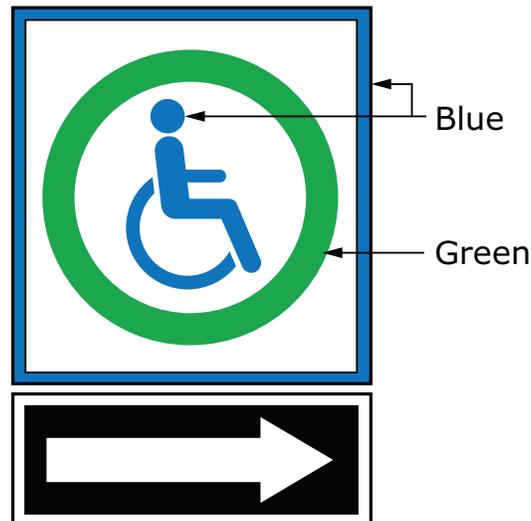
**Figure 69 a)**  
**Designated accessible parking signs – Uniform traffic control sign**  
(See Clause [9.4.4.2](#).)



**This figure shows a designated accessible parking sign. This figure is a 300 by 600 mm vertical uniform traffic control sign. The graphic shows a blue and red no parking pictogram on the top portion of the control sign, whereas the bottom portion has a blue and green accessible parking pictogram. The sign has a white background and blue border.**

**Note:** All dimensions are in mm.

**Figure 69 b)**  
**Designated accessible parking signs – Directional sign to parking spaces**  
(See Clause [9.4.4.1.](#))



**This figure is a directional sign to parking spaces. The graphic shows a blue and green accessible parking pictogram against a white background with a blue border. This pictogram is accompanied by a white arrow against a black background directly underneath.**

**Note:** All dimensions are in mm.

### **9.4.4.3 Pavement signs**

A painted sign on the pavement shall

- a) be located in the centre of the parking space; and
- b) have the International Pictogram of Access [see Figures [12 a\)](#) and [12 b\)](#)]
  - i) at least 1000 mm long; and
  - ii) luminance (colour) contrasted with the background pavement.

## 9.5 Designated accessible parking spaces for limited mobility users

Where provided as a courtesy, a designated accessible car space for users with limited mobility shall be

- a) at least 2400 mm wide; and
- b) identified by a sign for limited mobility access.

### Notes:

- 1) Limited mobility car users include people with heart or respiratory problems, or those with aids such as canes or crutches.
- 2) Limited mobility users appreciate a parking space close to the facility entrance, but do not necessarily require a side access aisle to enter the vehicle.

## 9.6 Ticketing dispensers or payment machines

A ticketing dispenser or payment machine for parking (at street side or in a parking facility) shall

- a) have its self-service interactive device comply with CAN/CSA-B651.2; and
- b) be accessed by a route that complies with either
  - i) Clause [5.1](#) for an interior location; or
  - ii) Clause [8.2](#) for an exterior location.

### Notes:

- 1) Ticket dispensers or payment machines (other than those accessed from inside a vehicle) should be located as close as possible to the designated accessible parking space(s).
- 2) Safe access to and clearance around a self-service device are important considerations when establishing designated accessible parking spaces.
- 3) Potential interference from other parked vehicles or site elements (e.g., planters) should be avoided.

## Annex A (informative)

# Anthropometrics of mobility aid users

**Note:** This Annex is not a mandatory part of this Standard.

### A.1 Scope

This Annex contains dimensions that can be used for guidance when designing accessible facilities and equipment for people using mobility devices.

### A.2 Reach ranges for a person in a wheeled mobility device

#### A.2.1 Forward reach without obstruction

The highest forward reach is 1200 mm from the floor, and the lowest forward reach is 400 mm from the floor (see Figure [A.1](#)).

#### A.2.2 Forward reach over obstruction

The highest forward reach is 1100 mm from the floor, which allows for a touch-reach over a 600 mm-deep obstruction or a grasp-reach over a 500 mm-deep obstruction (see Figure [A.2](#)).

#### A.2.3 Side reach without obstruction

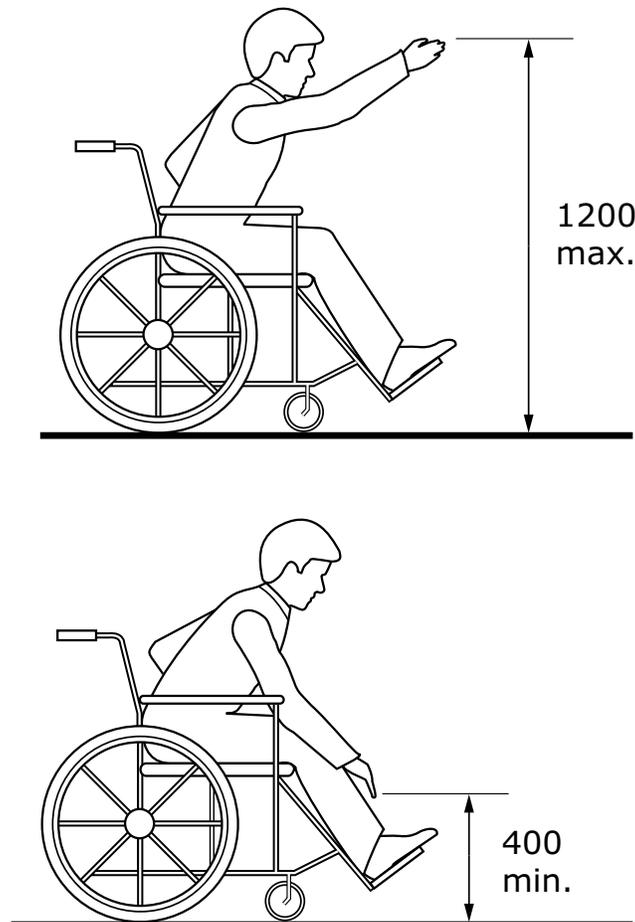
The highest side reach for touch is 1400 mm from the floor, and the lowest side reach for touch is 230 mm from the floor (see Figure [A.3](#)).

#### A.2.4 Side reach over obstruction

The highest side reach over an 860 mm-high obstruction is 1200 mm from the floor, which allows for a touch-reach depth of 600 mm or a grasp-reach depth of 500 mm (see Figure [A.4](#)).

**Note:** When designing for a specific individual, that person's actual reach ranges should be considered.

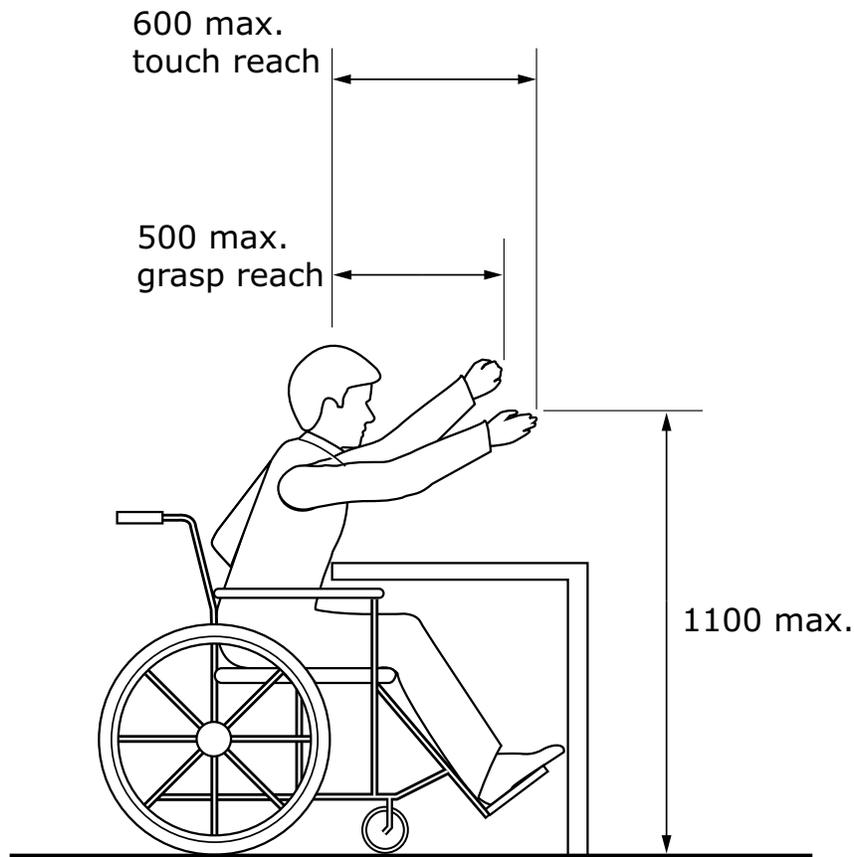
**Figure A.1**  
**Forward reach without obstruction**  
(See Clause [A.2.1.](#))



**This figure includes two graphics which demonstrate the minimum and maximum height for forward reach without obstruction. The top graphic shows a person in a wheeled mobility device reaching above and forward with a maximum reach height of 1200 mm. The bottom graphic shows the same person bent forward to reach below their knee for items that are a minimum of 400 mm above the ground.**

**Note:** All dimensions are in mm.

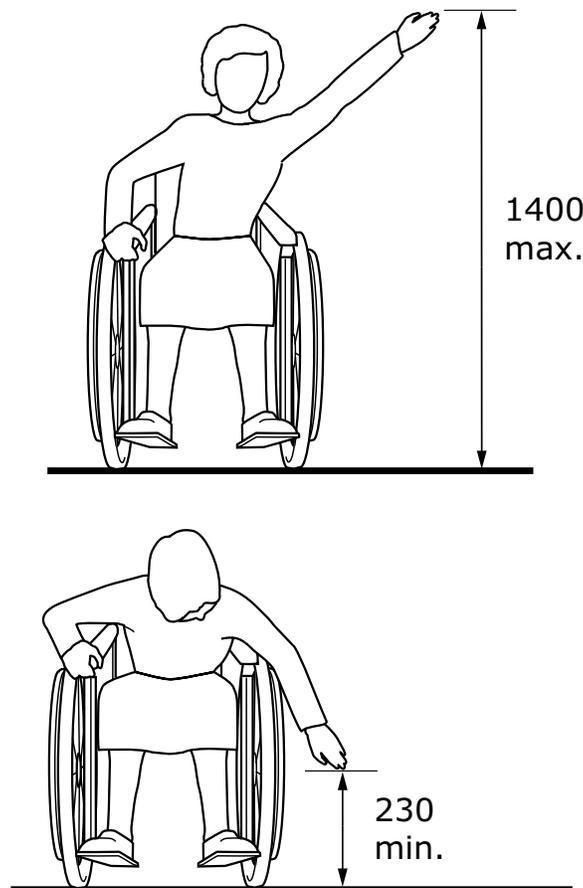
## Figure A.2 Forward reach over obstruction (See Clause [A.2.2.](#))



**This figure demonstrates the forward reach range for a wheeled mobility device user over an obstruction. This is depicted by a person in a wheeled mobility device reaching forward over a table. The person's maximum reach height is 1100 mm and extension is 600 mm for a touch reach, or 500 mm for a grasp reach.**

**Note:** All dimensions are in mm.

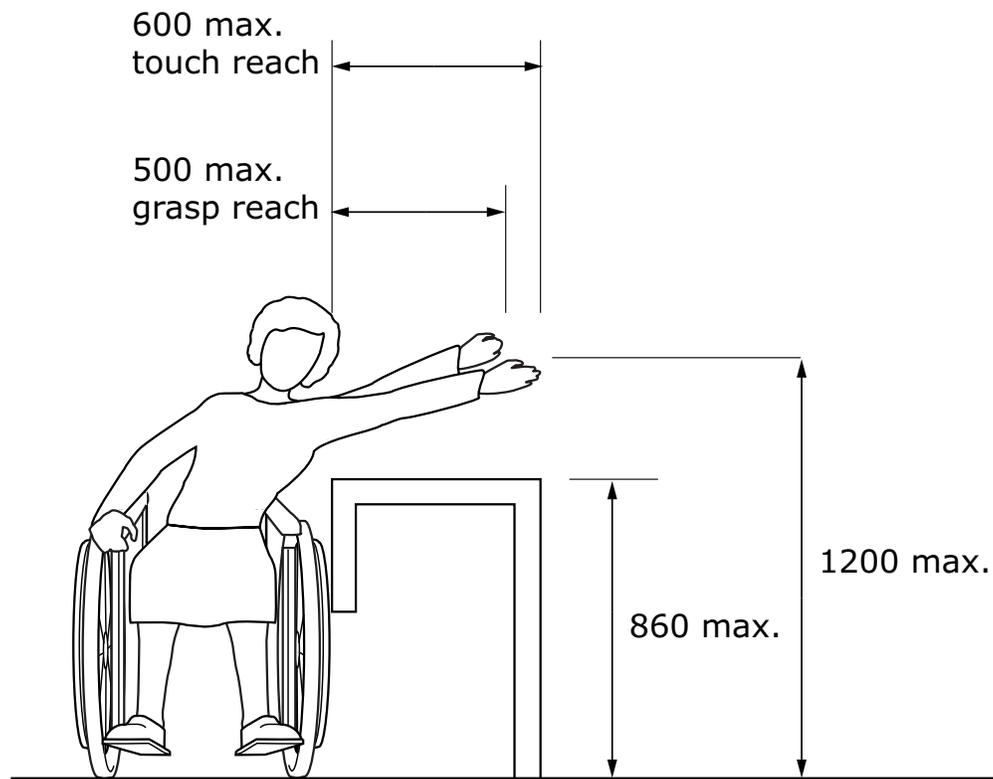
**Figure A.3**  
**Side reach without obstruction**  
(See Clause [A.2.3.](#))



**This figure demonstrates the minimum and maximum side reach without obstruction. The first portion of the graphic shows a person in a wheeled mobility device faced forward, reaching above and to the side at a maximum of 1400 mm. The bottom portion of the graphic shows the same person bent forward and to the side to reach below their knee objects that are a minimum of 230 mm above the ground.**

**Note:** All dimensions are in mm.

**Figure A.4**  
**Side reach over obstruction**  
(See Clause [A.2.4.](#))



**This figure demonstrates the side reach range over an obstruction. The graphic shows a person in a wheeled mobility device, reaching to the side and over an obstruction that is 860 mm high. Due to the obstruction, the person can extend to the side a maximum of 500 mm for a grasp reach and 600 mm for a touch reach, and with a maximum reach height of 1200 mm.**

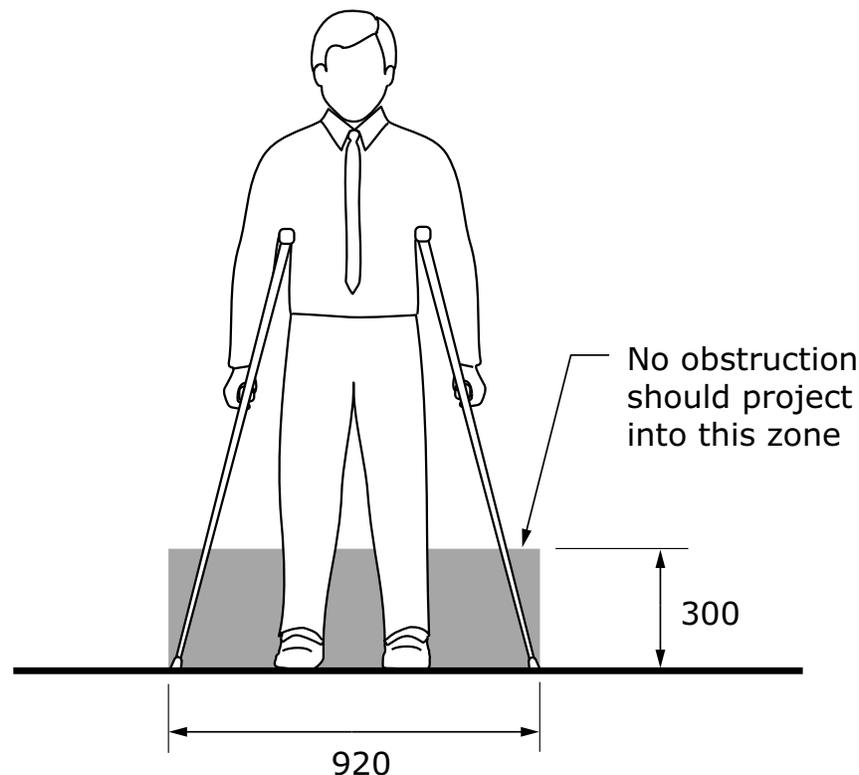
**Note:** All dimensions are in mm.

### **A.3 Walkway widths for people using crutches**

Although people who use walking aids can manoeuvre through door openings with a clear width of 810 mm, for comfortable gaits they require a walkway width of 920 mm (see Figure [A.5](#)). Crutch tips, which often extend down at a wide angle, are a

hazard in narrow walkways where they might not be seen by other pedestrians.

**Figure A.5**  
**Walkway width for people using crutches**  
(See Clause [A.3.](#))



**This figure demonstrates the walkway width required for people using crutches. The graphic shows a person using crutches on a walkway that is 920 mm wide. It also indicates that there should be no obstructions that protrude 0 to 300 mm above the floor.**

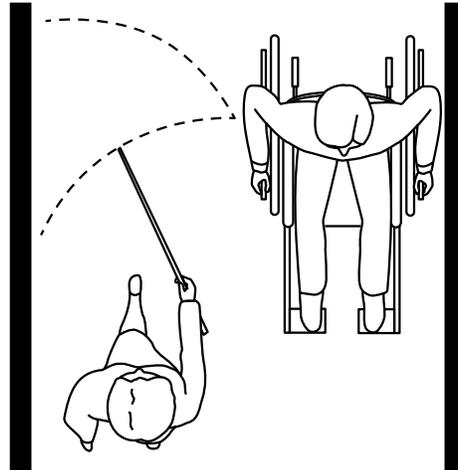
**Note:** All dimensions are in mm.

#### **A.4 Detection space for people using a long white cane**

People who use a long white cane to help them manoeuvre can detect an obstruction within a height range of up to 685 mm from the floor. The forward detection range can vary between

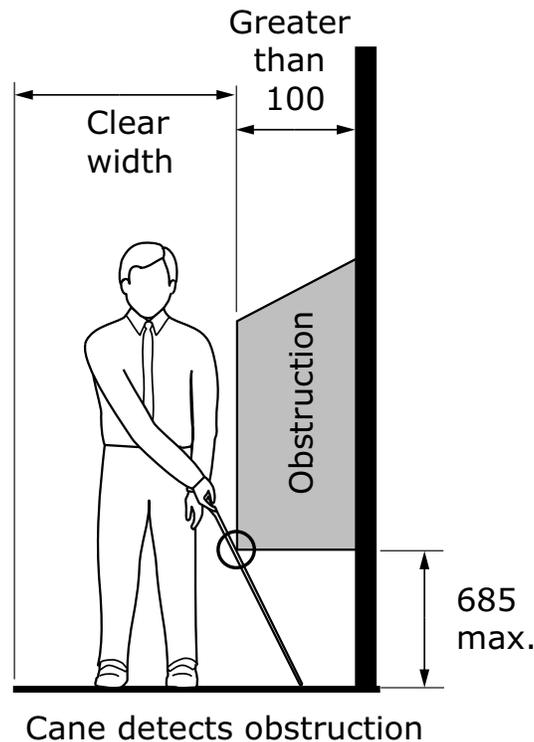
900 and 1600 mm (see Figures [A.6.1](#) and [A.6.2](#)). However, the detection distance is reduced by the same amount that the obstruction is above the floor.

**Figure A.6.1**  
**Detection space for people using a long white cane**  
(See Clause [A.4.](#))



**This figure demonstrates the required detection space for people using a long white cane. It shows a person with a cane walking past a person in a wheeled mobility device and using the cane to detect the wheeled mobility device and wall.**

**Figure A.6.2**  
**Detection space for people using a long white cane —**  
**Obstructions**  
(See Clause [A.4.](#))



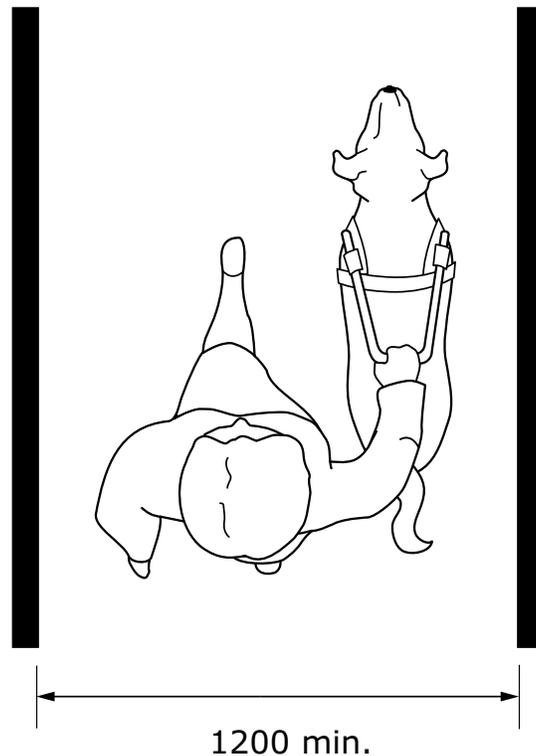
**This figure demonstrates the required detection space for people using a long white cane. It shows an obstruction that is protruding greater than 100 mm from the wall and is a maximum of 685 mm from the ground. This obstruction is detected by the person with a long cane standing beside it.**

**Note:** All dimensions are in mm.

### **A.5 Walkway width for a person with a service animal**

A person who uses a service animal requires a comfortable clear walkway width of 1200 mm (see Figure [A.7.](#)).

**Figure A.7**  
**Walkway width for a person with a service animal**  
(See Clause [A.5.](#))



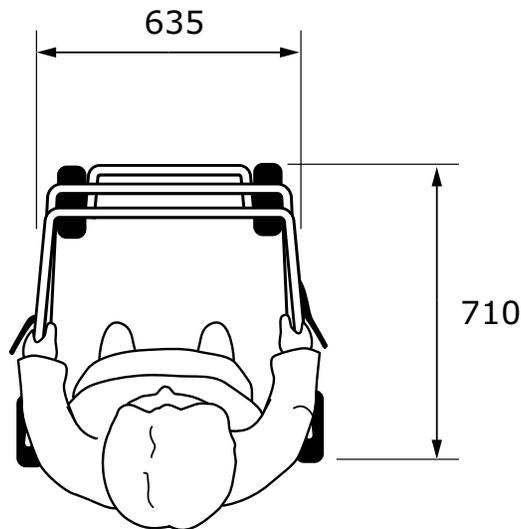
**This figure demonstrates the minimum required walkway width for a person with a service animal. The graphic shows a person walking with their service dog on a walkway that is 1200 mm wide.**

**Note:** All dimensions are in mm.

### **A.6 Dimensions for walkers**

Figure [A.8](#) shows typical dimensions for a person using a walker. These mobility devices, used especially by older people, are lightweight and fold easily for storage or transport.

**Figure A.8**  
**Floor area for a person using a walker**  
(See Clause [A.6.](#))



**This figure illustrates the floor area required for a person using a walker. The graphic identifies this area by marking 635 by 710 mm around an image of a person holding a walker.**

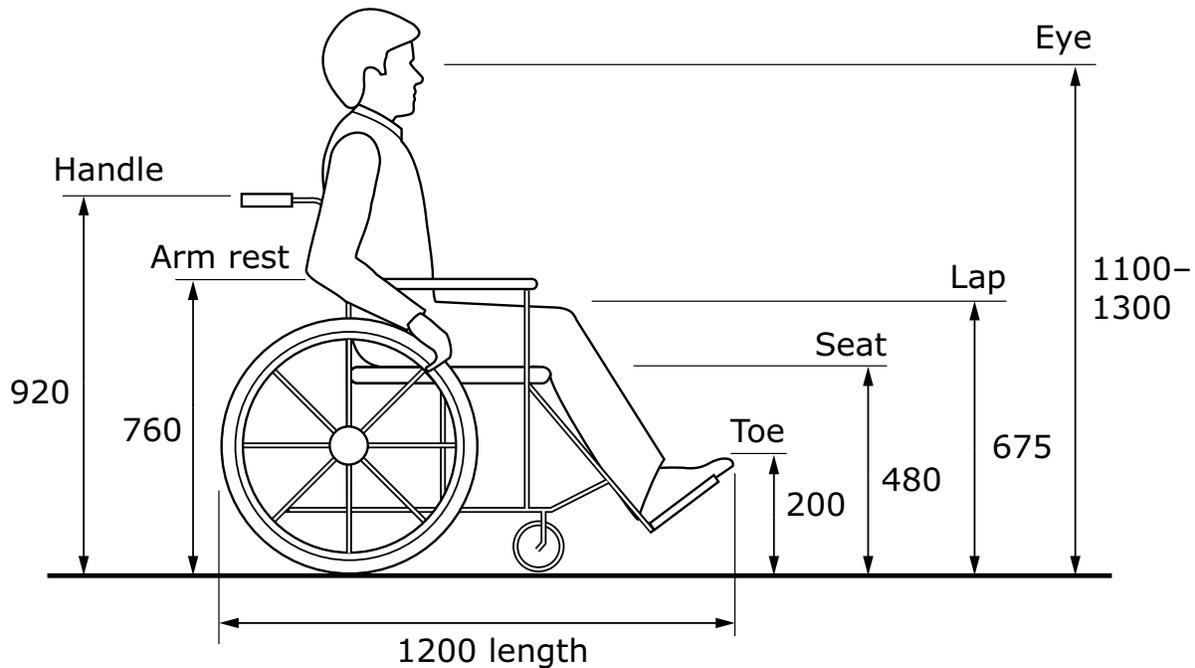
**Note:** All dimensions are in mm.

### **A.7 Dimensions of wheeled manual mobility devices**

Typical dimensions for manual wheelchairs are shown in Figures [A.9.1](#) and [A.9.2](#), though sport models tend to have a wider wheelbase. Manual wheelchairs are light in weight and can be folded, either along the long axis (as shown in Figure [A.9.2](#)) or by removing the wheels and folding the backrest against the seat.

The floor area for a person using a wheelchair, as shown in Figure [A.10](#), includes the additional side space required to accommodate the hand motion that propels a manual wheelchair, as well as the additional toe space that extends beyond the footrest.

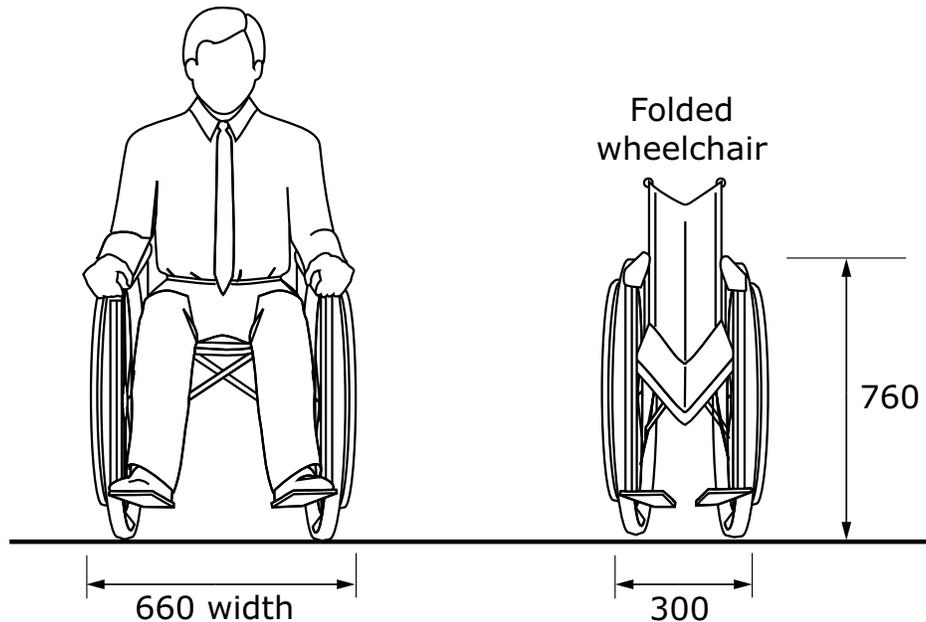
**Figure A.9.1**  
**Typical dimensions of an adult in a manual wheelchair – Side view**  
(See Clause [A.7.](#))



**This figure provides a profile view of the typical dimensions of an adult using a manual wheelchair. The eye of the wheelchair user is the highest point at 1100 to 1300 mm, the handle of the wheelchair is 920 mm high, the armrest is 760 mm high, the lap is 675 mm high, seat is 480 mm high, and toe is 200 mm high. The length of the wheelchair from the toe to the rear end of the wheel is 1200 mm.**

**Note:** All dimensions are in mm.

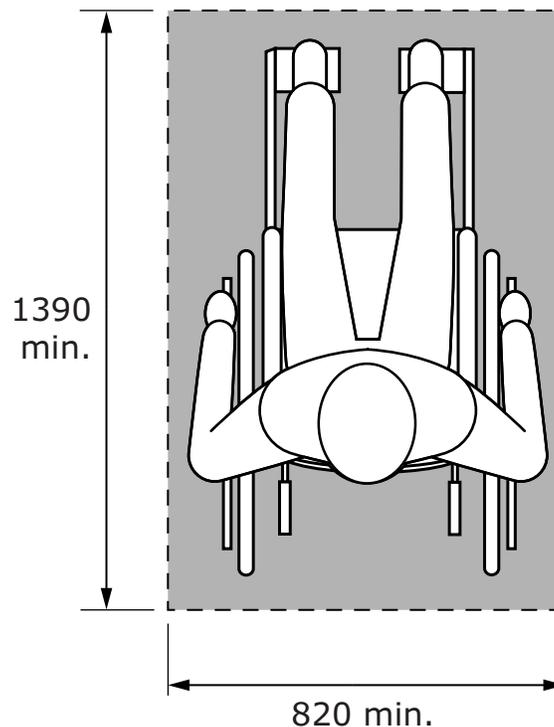
**Figure A.9.2**  
**Typical dimensions of an adult in a manual wheelchair – Front view**  
(See Clause [A.7.](#))



**This figure illustrates the dimensions of a manual wheelchair from the front view. When expanded, the wheelchair is 660 mm wide by 760 mm tall (at top of wheels). When folded, the wheelchair measures 300 mm wide by 760 mm tall (at top of wheels).**

**Note:** All dimensions are in mm.

**Figure A.10**  
**Minimum floor area for a person using a manual wheelchair**  
(See Clause [A.7.](#))



**This figure illustrates the minimum floor area for a person using a wheeled mobility device. The graphic shows a person sitting in a wheelchair, with a minimum length of 1390 mm and a minimum width of 820 mm for their wheeled mobility device.**

**Note:** All dimensions are in mm.

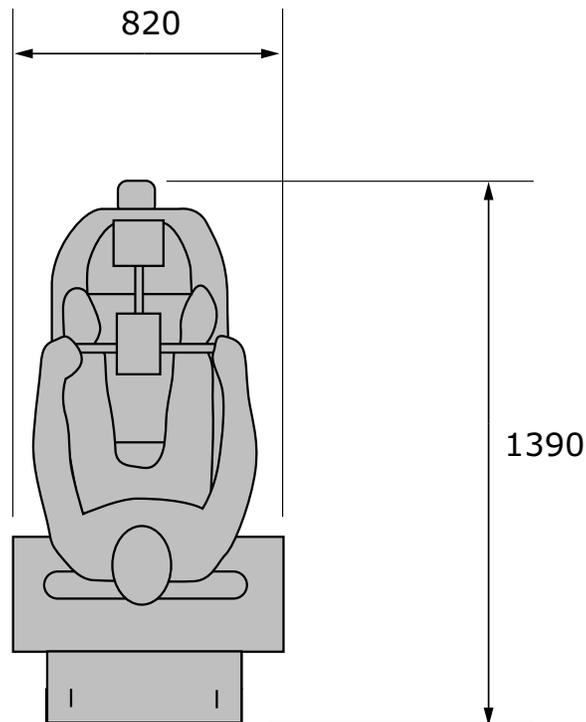
### **A.8 Dimensions of wheeled power mobility devices**

The footprints of powered wheelchairs currently in use tend to be longer than those of manual wheelchairs (see Figure [A.11](#)). Some might have extended footrests or a ventilator at the back of the chair. Powered wheelchairs are heavy, carry a battery that requires recharging when stored, and cannot be folded.

Scooters also have a longer footprint, require recharging, are heavy, and cannot be folded. Some people who use wheeled mobility devices own several for different occasions, such as a manual chair for the home and a powered chair for exterior use.

To better accommodate all wheeled mobility devices, a suggested best practice is to use a footprint that is 1500 mm long. This dimension is important, e.g., in the design of platform lifts, which currently tend to be minimal in size and often do not accommodate a longer mobility aid.

**Figure A.11**  
**Floor area for a person using a powered wheelchair or scooter**  
(See Clause [A.8.](#))



**This figure illustrates the minimum floor area for a person using a powered wheelchair or scooter. The graphic shows a person sitting in a powered wheelchair, with a minimum length of 1390 mm and a minimum width of 820 mm for their wheeled mobility device.**

**Note:** All dimensions are in mm.

### **A.9 Turning areas**

Manual wheelchairs require a turning area as shown in Figure [A.12](#). Power aids, however, often do not have the same manoeuvrability. The diameter needed for a continuous turn of a powered wheelchair is shown in Figure [A.13](#). Scooters, due to their design, turn differently than wheelchairs and can require

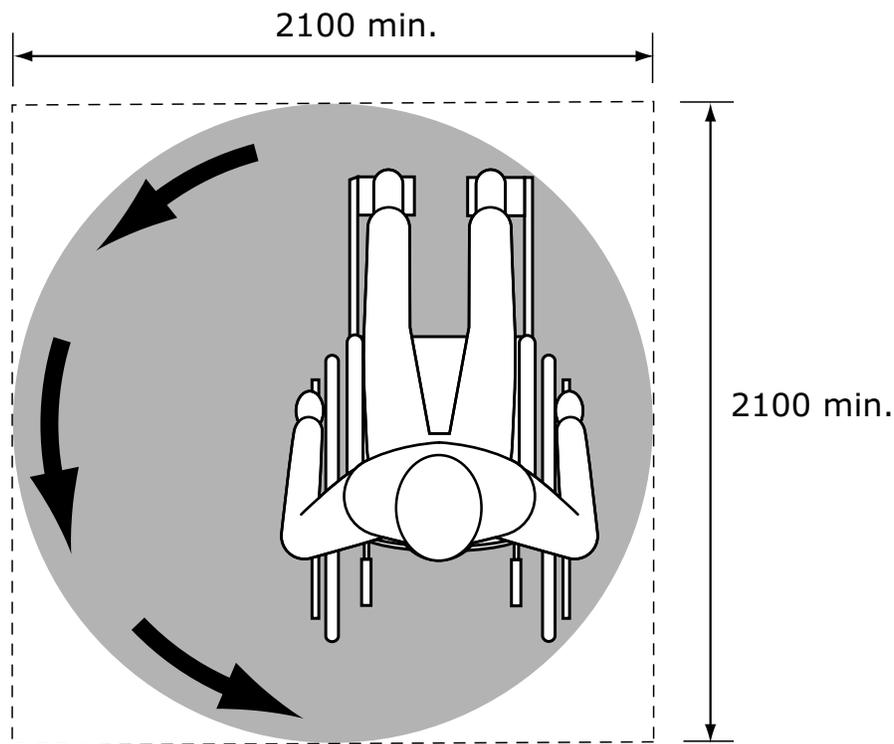
even more space for a continuous turn, as shown in Figure [A.14](#).

The turning space is important for areas such as landings, which must accommodate these wheeled mobility devices.

This Standard is addressing minimum space requirements for wheeled mobility devices as a group, rather than providing separate dimensions for manual wheelchairs and powered devices. The clear floor area requirement for a 180° turn of a wheeled mobility device has been increased to 2100 by 2100 mm, which research has indicated will accommodate 95% of mobility device users (Steinfeld et al., 2010). Larger devices could need to use a series of smaller turns to perform this manoeuvre.

In various instances, equipment or items might be added to the back of a manual wheelchair, powered chair, or scooter (such as a ventilator or backpack) that extends the length of the mobility aid footprint. In situations like these, the mobility aid might require an extended diameter to complete a 180° or 360° turn.

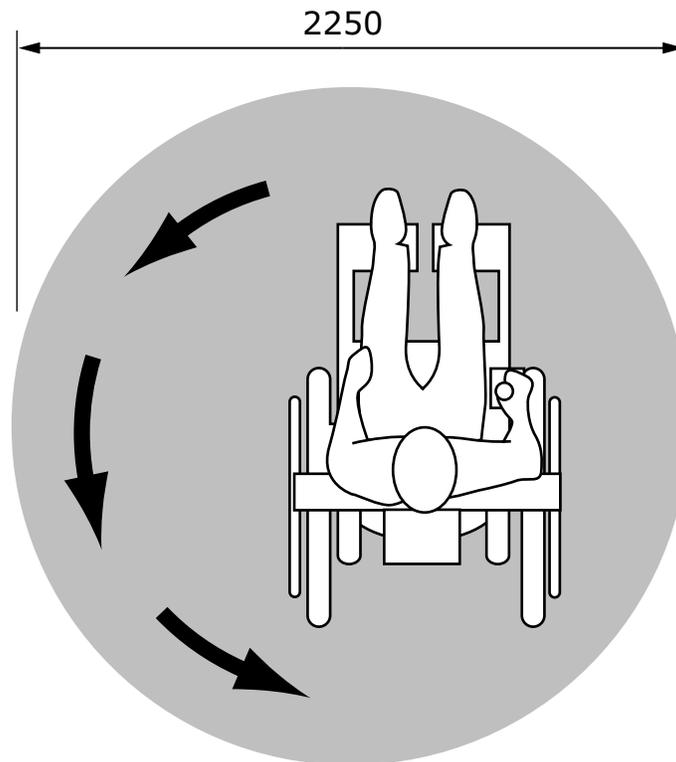
**Figure A.12**  
**Turning area for a person using a manual wheelchair**  
**(continuous turn)**  
(See Clause [A.9.](#))



**This figure illustrates the minimum floor area to make a continuous turn for a person using a manual wheelchair. The graphic shows a person sitting in a wheelchair, with a circle drawn around them indicating a minimum turning diameter of 2100 mm.**

**Note:** All dimensions are in mm.

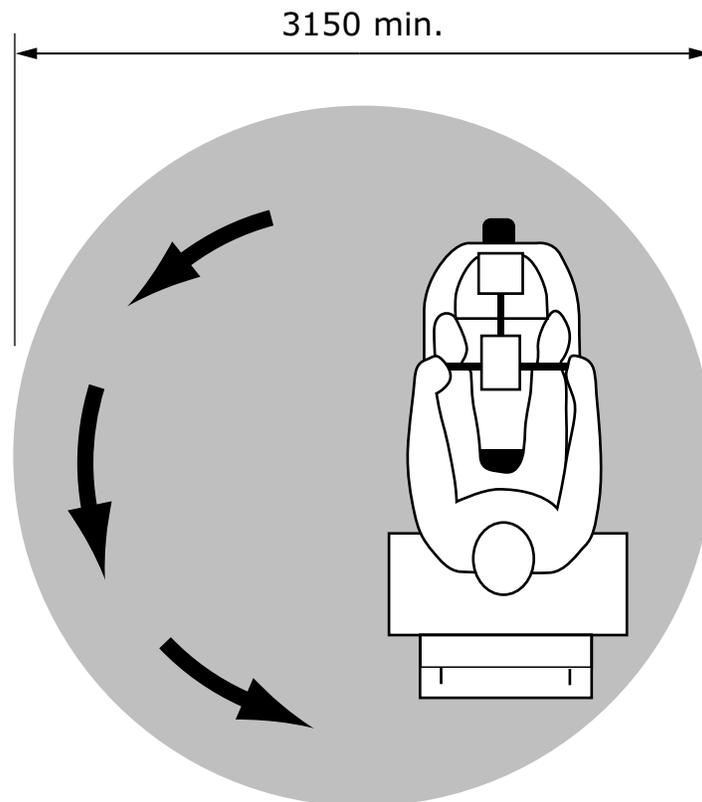
**Figure A.13**  
**Turning area for a person using a powered  
wheelchair (continuous turn)**  
(See Clause [A.9.](#))



**This figure illustrates the minimum floor area to make a continuous turn for a person using a powered wheelchair. The graphic shows a person sitting in a wheelchair, with a circle drawn around them indicating a minimum turning diameter of 2250 mm.**

**Note:** All dimensions are in mm.

**Figure A.14**  
**Turning area for a person using a large scooter**  
**(continuous turn)**  
(See Clause [A.9.](#))



**This figure illustrates the minimum floor area to make a continuous turn for a person using a large scooter. The graphic shows a person sitting in a large scooter, with a circle drawn around them indicating a minimum turning diameter of 3150 mm.**

**Note:** All dimensions are in mm.

### **A.10 References**

Betty Dion Enterprises Ltd. and The Canadian Institute for Barrier-Free Design. International Best Practices in Universal Design: A Comparative Study. Prepared for Agriculture and Agri-Food Canada and the Canadian Food Inspection Agency. Ottawa, Ontario: Betty Dion Enterprises Ltd., 2000.

Betty Dion Enterprises Ltd. International Best Practices in Universal Design: A Global Review. Ottawa, Ontario: Canadian Human Rights Commission. March 2006.

Center for Inclusive Design and Environmental Access (IDeA). Final Report — Anthropometry of Wheeled Mobility Project. School of Architecture and Planning, University at Buffalo, The State University of New York, December 2010.

KRW Incorporated. Requirements for Power Mobility Aids. Prepared for the US Architectural and Transportation Barriers Compliance Board, 1995.

Ringaert, L., Rapson, D., Qui, J., Cooper, J., and Shwedyk, E. Determination of New Dimensions for Universal Design Codes and Standards with Consideration of Powered Wheelchair and Scooter Users. Winnipeg: Universal Design Institute (Faculty of Architecture, University of Manitoba), 2001.

Steinfeld et al. Anthropometry of Wheeled Mobility Project: Final Report. Center for Inclusive Design and Environmental Access (IDEA), School of Architecture and Planning, University of Buffalo, The State University of New York, December 2010.

## Annex B (informative)

**Potential for slip of floor and tread finishes**

**Note:** This Annex is not a mandatory part of this Standard.

**Table B.1**  
**Potential for slip of floor and tread finishes**  
 (See Clauses [4.4.1](#), [5.5.5](#), and [6.5.4](#).)

This table lists the slip potential for multiple tread and floor finishes, and provides additional guidance regarding what materials could make floor and ground surfaces less slippery.

Material	Potential for slip		Remarks
	Dry and unpolished	Wet	
Carpet	Extremely low	Low	Loose or worn carpets can present a trip hazard.
Cast iron	Low	Moderate to low	If open treads are used, the potential for slip can be low in wet conditions.
Ceramic tiles (glazed or highly polished)	Low	High	—
Ceramic tiles (matte)	Low	Moderate to low	Wet slip potential is dependent on surface roughness. An Rz (din) value greater than 10 µm should be used for clean-water wet areas.

(Continued)

**Table B.1 (Continued)**

<b>Material</b>	<b>Potential for slip</b>		<b>Remarks</b>
	<b>Dry and unpolished</b>	<b>Wet</b>	
Clay pavers	Ex- tremely low	Low	Brick Development Association can advise*
Clay tiles	Low	Moder- ate to low	When surface is wet and polished, the potential for slip can be very high.
Clay tiles (carborun- dum finish)	Ex- tremely low	Ex- tremely low	Might be suitable for external stairs.
Clay tiles (textured)	Ex- tremely low	Low	Might be suitable for external stairs.
Concrete	Low	Moder- ate to low	If textured finish or a non-slip aggregate is used, potential for slip can be low.
Concrete (power float finish)	Low	Moder- ate	Surface dust can cause problems, particularly on new floors.
Cork tiles	Ex- tremely low	Low	—
Float glass	Ex- tremely low	High	Various techniques can be used to modify the surface of float glass,

(Continued)

**Table B.1 (Continued)**

<b>Material</b>	<b>Potential for slip</b>		<b>Remarks</b>
	<b>Dry and unpolished</b>	<b>Wet</b>	
			thus improving the wet potential for slip. Expert advice should be sought.
Granolithic	Low	Moderate to low	Slip-resistant inserts are necessary whenever granolithic is used for stair treads. Polished granolithic should not be used for stair treads.
GRP, profiled (chequer plate)	—	Low	Class determined by ramp method, water-wet with shod feet. No dry value determined.
Linoleum	Low	Moderate to low	Edges of sheet liable to cause tripping if not fixed firmly to base. Linoleum is very slippery when wet.
Mastic asphalt	Low	Low	—
Profiled ceramics	Low	Moderate to low	Profiled ceramics are suitable for use in barefoot areas. In shod-foot situations, the comment for matte ceramic tiles applies.

(Continued)

**Table B.1 (Continued)**

<b>Material</b>	<b>Potential for slip</b>		<b>Remarks</b>
	<b>Dry and unpolished</b>	<b>Wet</b>	
PVC	Low	High to moderate	Ex-factory classes for PVC should be treated with caution. The installed floor is unlikely to be suitable for use in wet conditions.
PVC, enhanced slip resistance	Low	Low	The anti-slip properties depend upon sufficient, uniformly distributed aggregate. Areas of reduced aggregate can present a serious slip hazard.
Resin, enhanced slip resistance	Extremely low	Low	The anti-slip properties depend upon sufficient, uniformly distributed aggregate. Areas of reduced aggregate can present a serious slip hazard.
Resin, smooth, self-levelling	Extremely low	High to moderate	—
Rubber (sheets or tiles)	Extremely low	High	Not suitable near entrance doors or other foreseeable wet areas.

(Continued)

**Table B.1 (Continued)**

<b>Material</b>	<b>Potential for slip</b>		
	<b>Dry and unpolished</b>	<b>Wet</b>	<b>Remarks</b>
Rubber, smooth and ribbed	Low	High	—
Stainless steel	Low	High	Wet slip potential is highly dependent on surface finish. Quoted values for 0.5 µm Rz (din) surface roughness.
Steel profiled (Diamond plate)	—	Moderate	Class determined by DIN ramp method. No dry value determined.
Terrazzo	Low	High to moderate	Slip-resistant inserts are necessary whenever terrazzo is used for stair treads. Polished terrazzo (including resin based) should not be used for stair treads.
Timber (finished)	Extremely low	High	Applies to sealed, varnished, or polished timber.
Timber (unfinished)	Low	Moderate	—

**Source:** BSI BS5395 Part 1.

(Continued)

## Table B.1 (Concluded)

\* Brick Development Association, Woodside House, Winkfield, Windsor, Berkshire, S1A 2DX, England.

### Notes:

- 1) The information in this Table has been drawn from previous editions of this Standard and from more recent research by Great Britain's Health and Safety Executive.
- 2) This Table is intended only as a guide. Depending on the precise nature of the wearing surface, seemingly similar products made from the same material can be totally different in terms of their slip-potential characteristics. It is especially important that specifiers are aware that many products will change significantly merely on installation. Wear, usage, contamination, cleaning, and maintenance regimes will all affect the performance of the product over its lifetime.
- 3) This Table is included for information and is not comprehensive.

## Annex C (informative)

### References for residential accommodation

**Note:** This Annex is not a mandatory part of this Standard.

The following publications provide detailed information on various design issues for building accessible housing.

Canada Mortgage and Housing Corporation.

Accessible Housing by Design — Appliances. Ottawa: 2016.

Accessible Housing by Design — Bathrooms. Ottawa: 2016.

Accessible Housing by Design — Kitchens. Ottawa: 2016.

Accessible Housing by Design — Lifts and Residential Elevators. Ottawa: 2016.

Accessible Housing by Design — Ramps. Ottawa: 2016.

Accessible Housing by Design — Residential Hoists and Ceiling Lifts. Ottawa: 2016.

Design Options for Barrier-Free and Adaptable Housing. Ottawa: 1996.

FlexHousing™ Checklist — Homes that Adapt to Life's Changes. Ottawa: 2009.

Housing for Adults with Intellectual Disabilities. Ottawa: 2006.

Housing Observer — Automation in the Home. Ottawa: 2016.

Socio-Economic Series 08-011: Understanding the Status of Visitability in Canada. Ottawa: 2008.

Manitoba Housing and Renewal Corporation. Visitable Housing — Community Building Through Visitable and Adaptable Housing. Winnipeg: 2006.

## Annex D (informative)

### Trails and beach access routes

**Note:** This Annex is not a mandatory part of this Standard. It has been written in mandatory language to facilitate adoption by anyone wishing to do so.

#### D.1 General

This Annex applies to trails that are designed, designated, and constructed as pedestrian routes for recreational use, for people travelling by foot, or users of mobility devices.

**Notes:**

- 1) The trails addressed in this Annex are generally in high-use, developed areas. As an example, such trails could include
  - a) a trail through an urban park that involves various types of terrain;
  - b) a shared-use walkway in a recreational area; or
  - c) beach access routes, including both permanent and temporary routes that can be removed for the winter months.
- 2) Trails are distinguished from regular exterior walkways and routes because they are not typically designed to provide an essential route to outdoor facilities and environments used daily.
- 3) Typical types of trails can include hiking, biking, or trails used for nature/scenic tours.
- 4) Because of their nature, trails and beach access routes will not necessarily be able to meet this Standard's requirements for accessibility. For example, trails in valleys and forests will often have adjacent slopes which will exceed the reference. Part of the trail experience is to be in less developed areas, and this Standard does not intend to take that away by bringing the city into the country, or by introducing unexpected hazards. This Annex has been written to reference relevant clauses from this Standard, with the intent that those should be followed. Other requirements should be considered and used as appropriate.
- 5) Before developing new or redeveloping existing recreational trails, the designers should consult with local authorities,

accessibility advisory committees, the public, and people with disabilities on

- a) the slope of the trail; and
- b) the need for, location of, and design of rest areas, passing areas, viewing areas, and trail amenities.

## **D.2 Ground surfaces**

Ground surfaces shall be in compliance with Clauses [4.4.1](#), [4.4.2](#), [4.4.4](#), and [4.4.5](#).

## **D.3 Edge protection**

Edge protection on trails shall comply with Clause [8.2.5](#).

## **D.4 Designated trailhead**

Designated trailheads shall be integrated as part of the trail design at key entrance and exit points along the trail, intermediate areas on lengthy trails, and decision points (e.g., changes in elevation, or opportunities to go in multiple directions) where required. Trailheads shall have accessible information signage (see Clause [4.6](#)).

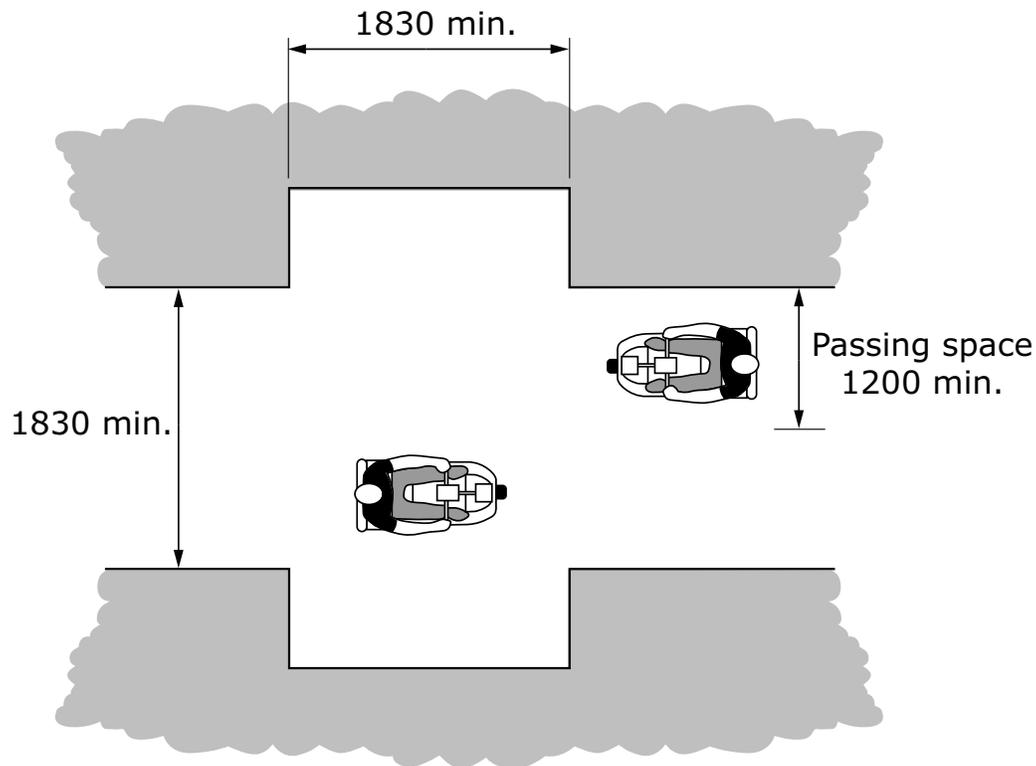
**Note:** Typically, trail design is developed through a case-by-case review and analysis based on trail type, location, and other conditions.

## **D.5 Trail clear width and height**

Trails shall

- a) have a clear opening complying with Clause [5.5.1](#);
- b) have a width complying with Clauses [8.2.2](#) and [5.1.1](#);
- c) provide at least 1200 mm (minimum) width at locations with site constraints;
- d) include passing space of 1830 mm (minimum) wide by 1830 mm (minimum) long, at intervals of 50 m or less (Figure [D.1](#)); and
- e) maintain headroom in accordance with Clause [4.5](#).

**Figure D.1**  
**Passing space**  
(See Clause [D.5.](#))



**This figure illustrates the minimum passing space on trails for wheeled mobility devices. The graphic shows two wheeled mobility devices navigating through a space that is 1830 mm wide, allowing for a minimum of 1200 mm of passing space.**

**Note:** All dimensions are in mm.

## **D.6 Trail running slope**

### **D.6.1 Gradation limits**

Unless exception criteria apply, trails shall comply with the following limits on gradients:

- 5% or less for any distance;
- 5.1% to 8.33% for a maximum distance of 61 m;
- 8.34% to 10% for a maximum distance of 9 m; and

d) 10% to 12% for a maximum distance of 3 m.

### **D.6.2 Gradient selection**

Trails shall be designed to provide the minimum gradient permitted by the terrain.

### **D.7 Trail cross slope**

Trail cross slope shall

- a) comply with Clause [5.5.2](#);
- b) ensure gradient does not exceed 1:20 (5%), unless criteria for exceptions are applicable; and
- c) be the minimum gradient permitted by the terrain.

### **D.8 Trail ramps**

Trail ramps shall comply with Clause [8.2.7](#).

### **D.9 Trail signage**

Trail signage shall

- a) comply with Clause [8.6.8](#);
- b) comply with applicable requirements;
- c) provide the necessary directional information at appropriate places along the trail;
- d) provide trail information at strategic locations, including entrances, exits, decision points, and trailheads, in order to objectively describe typical trail conditions, including
  - i) length;
  - ii) average and minimum trail width;
  - iii) average and maximum running and cross-slopes;
  - iv) surface type;
  - v) extreme or unique conditions (e.g., steep slopes, obstacles, or narrow widths); and
  - vi) features and amenities along the trail;
- e) be highly luminance (colour) contrasted against its background in all seasons, and present information in solid characters; and

- f) provide the same information where other media is used to provide information about a trail, such as websites and brochures.

**Note:** Jurisdictional laws, regulations, and by-laws can apply.

### **D.10 Beach access routes**

Beach access routes shall

- a) have a width in compliance with Clause [8.2.2](#);
- b) where the surface of the route is constructed (e.g., not natural)
  - i) have a 1:2 bevel at changes in level between 6 and 13 mm;
  - ii) provide a cross slope complying with Clause [5.5.2](#);
  - iii) provide a running slope complying with Clause [5.5.1](#);
  - iv) provide a ramp where changes in level are greater than 200 mm; and
  - v) ensure no gaps in the route larger than 13 mm with any elongated openings oriented perpendicular to the direction of travel;
- c) provide a cross slope to allow drainage, complying with Clause [8.2.4](#); and
- d) provide a clear opening of 850 to 1000 mm at beach access route entrances.

**Note:** Signage may be provided that indicates accessibility features of the beach.

### **D.11 Boardwalks**

Where a recreational trail or beach access route is equipped with a boardwalk, the boardwalk shall

- a) provide a width complying with Clause [8.2.2](#);
- b) contain no gaps in the route larger than 13 mm;
- c) include edge protection complying with Clause [8.2.5](#); and
- d) provide a ramp where running slopes are greater than 1:20 (5%).

## **D.12 Understanding the Universal Trail Assessment Process (UTAP)**

The UTAP was developed by Beneficial Designs Inc. and is considered an objective method of documenting trail conditions and evaluating trail accessibility levels.

The UTAP method relies on systematically evaluating trail measurements and data collected by auditors. Auditors begin at a station point (e.g., trailhead) and mark subsequent station points along the trail, which define trail segments. Typically, station points occur where there is a change in the trail characteristics, such as at the beginning/end of a slope, at an intersection, or at a major feature. For each trail segment, key measurements (e.g., running slope, cross slope, surface, width and length of trail) are gathered using the “Segment Data Collection Sheet”.

After collection, the data is entered into the “Trailware” software, which formally evaluates the data based on the UTAP methodology and generates a Trail Access Information (TAI) report. This report can then be used to provide trail accessibility information to all users.

## Annex E (informative)

# References for accessible outdoor recreational environments

**Note:** This Annex is not a mandatory part of this Standard.

### E.1 Standards

CAN/CSA-Z614:20

Children's playground equipment and surfacing

### E.2 Online resources

Accessibility for All — Park Trails

[www.dnr.state.md.us](http://www.dnr.state.md.us)

Accessible playgrounds

<https://www.playksl.com/>

Recreational Trails Program Accessibility Guidance

[www.fhwa.dot.gov/environment/recreational\\_trails/guidance/accessibility\\_guidance/index.cfm](http://www.fhwa.dot.gov/environment/recreational_trails/guidance/accessibility_guidance/index.cfm)

National Alliance for Accessible Golf

[www.accessgolf.org](http://www.accessgolf.org)

National Trails Training Partnership

[www.americantrails.org](http://www.americantrails.org)

### E.3 Publications

Axelson, P., Longmuir, P., Mispagel, K., and Passo, M. 2003. Universal Trail Assessment Process Trainer Manual. Minden, NV: PAX Press.

Axelson, P., Longmuir, P., Mispagel, K., and Passo, M. 2003. Universal Trail Assessment Process Trainer Resource Manual. Minden, NV: PAX Press.

Axelson, P., Longmuir, P., Mispagel, K., and Passo, M. 2003. Universal Trail Assessment Process Master Trainer Manual. Minden, NV: PAX Press.

Axelson, P., Kelley, W., Longmuir, P., Mispagel, K., Passo, M., Pasternak M., Pratt, T., Tuohy, J., Wong, K., Wright, W., and Yamada, D.A. 2002. Universal Trail Assessment Process Training Guide: Assessing outdoor paths, access routes, and trails to collect access, mapping, and maintenance information. Minden, NV: PAX Press.

Axelson, P.W., Chesney, D.A., Galvan, D.V., Kirschbaum, J.B., Longmuir, P.E., Lyons, C., and Wong, K.M. 1999. Designing sidewalks and trails for access — Part I of II: Review of existing guidelines and practices. Washington, D.C.: Federal Highway Administration.

Axelson, P.W., Yamada, D.A., Longmuir, P., Coutts, K., Rose, S., Smith, J., and Ysselstein, J. 1999. Accessible exterior surfaces: Technical report. Washington, D.C.: U.S. Architectural and Transportation Barriers Compliance Board.

Axelson, P.W., Kirschbaum, J., Yamada, D., Siekman, A., Kambitsch, K., Longmuir, P., McCambridge, M., and Mispagel, K. 1999. Recommendations for addressing accessibility in amusement parks. Alexandria, VA: International Association of Amusement Parks and Attractions.

Axelson, P.W., Yamada Chesney, D., Longmuir, P.E., and Wright, W. 1998. Computerized mapping of outdoor trails for accessibility. Phase II final report. Bethesda, MD: National Institute of Child Health and Human development, National Institutes of Health.

Bhambhani, Y., Coutts, K., Longmuir, P. E., Lyons, R., Seidl, C., and Wheeler, G. 2002. Inclusive fitness and lifestyle services for all disabilities. Ottawa, ON: Canadian Society for Exercise Physiology.

Kirschbaum, J.B., Axelson, P.W., Longmuir, P.E., Mispagel, K.M., Stein, J.A., and Yamada, D.A. 2001. Designing sidewalks and trails for access — Part II of II: Best practices design guide. Washington, D.C.: U.S. Department of Transportation.

Longmuir, P.E., and Axelson P.W. 1996. "Assistive technology for recreation." In J.C. Galvin and M.J. Scherer (Eds.). *Evaluating, selecting and using appropriate assistive technology*. Gaithersburg, MD: Aspen Publishers, Inc., pp. 162–191.

Longmuir, P.E., and Axelson, P.W. (2005). "Sport equipment." In S. Gavron and K. DePauw (Eds.), *Disability and Sport*. Champaign, IL: Human Kinetics.

Longmuir, P.E., Finney, D., & Conrad, J. (In review). *Canadian Trail PAQ Inventory Process training manual*. Ottawa, ON: Go for Green.

Longmuir, P.E., 2003. "Creating inclusive physical activity opportunities: An abilities-based approach." In R.D. Steadward, E.J. Watkinson, & G.D. Wheeler (Eds.), *Adapted Physical Activity*. Edmonton, AB: University of Alberta Press, pp. 363–382.

## Annex F (informative)

### **Additional national and international resources**

**Note:** This Annex is not a mandatory part of this Standard.

#### **CSA Group**

CSA Z204-94 (R1999) (withdrawn)

Guideline for Managing Indoor Air Quality in Office Buildings

#### **ASHRAE (American Society of Heating, Refrigeration and Air Conditioning Engineers)**

ANSI/ASHRAE 62.1-2016

Ventilation for Acceptable Indoor Air Quality

#### **CMHC (Canada Mortgage and Housing Corporation)**

CMHC 61089 (1998)

Building Materials for the Environmentally Hypersensitive

#### **ISO (International Organization for Standardization)**

ISO 21542:2011

Building construction — Accessibility and usability of the built environment

