



# **THE CORPORATION OF THE TOWNSHIP OF UXBRIDGE FACILITY ACCESSIBILITY DESIGN STANDARDS**

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## ACKNOWLEDGEMENTS



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October, 2012

### **Re: Township of Uxbridge Facility Accessibility Design Standards**

Dear reader/user of these standards,

On behalf of the Corporation of the Township of Uxbridge we are pleased to be able to present to you our Facility Accessibility Design Standards. These standards are applied to all newly constructed and/or renovated Township of Uxbridge owned, leased or operated facilities.

We would like to thank and recognize the contributions of the Corporation of the City of London for their generous permission to utilize the Facility Accessibility Design Standard document as the basis for the creation of this standard.



**London**  
CANADA

In addition to our use of these standards for our own facilities, we encourage the use of the Township of Uxbridge Facility Accessibility Design Standards throughout the community and hope that you find them interesting and valuable for your facility construction and/or renovation projects.

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# 1.0 INTRODUCTION

This standard addresses accessibility requirements for the design and construction of new *facilities*, as well as the retrofit, *alteration* or *addition* to existing *facilities*, owned, leased or operated by the Township of Uxbridge. This standard particularly addresses the needs of persons with *disabilities*, including, but not limited to, persons with a mobility impairment, hearing impairment, visual impairment, cognitive impairment, persons who are deaf-blind and persons with limited stamina and/or dexterity.

This standard is intended to encompass the intent of the Ontario Human Rights Code, in terms of respecting the dignity of persons with *disabilities*. "The phrase 'respects their dignity' means to act in a manner which recognizes the privacy, confidentiality, comfort, autonomy and self-esteem of persons with *disabilities*, which maximizes their integration and which promotes full participation in society." (Ontario Human Rights Commission)

This standard incorporates the belief in universal design that recognizes the broad diversity of people who use *facilities*. Universal design is defined as:  
 "The design of products and environments to be usable by all people, to the greatest extent possible, without the need for

adaptation or specialized design." The universal design philosophy is structured around the seven design principles listed below. (Refer to Appendix A for further information on the universal design principles and their guidelines.)

This standard reflects minimum dimensional criteria required for adult persons. Prior to the design stage of a project, special consideration should be given to the function of the *facility* and the patrons who will use it. A review and upgrade of this standard may be required in some instances, particularly if a *facility* is designed primarily for the use of a particular type of user, such as children or older persons.

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The Township of Uxbridge shall review and/or update this standard periodically, to reflect technological advancement and new construction practices, as well as changes to the barrier-free design requirements of various

codes and standards such as the Ontario Building Code and the CSA Standard B651 - Accessible Design for the Built Environment.

This standard recognizes the concept of equivalent facilitation as a means to encourage new and innovative design ideas and solutions. Departures from particular technical and scoping requirements of this standard by the use of other designs and technologies are encouraged when the alternatives will provide substantially equivalent or greater access to the usability of the *element* and/or *facility*.

Dimensions used in this standard are in metric units. Nearest imperial equivalent dimensions are in parentheses.

For the purposes of this standard, words and terms in *italics* have their meanings defined in Section 2.0.

**1. EQUITABLE USE:**

The design is useful and marketable to people with diverse abilities.

**2. FLEXIBILITY IN USE:**

The design accommodates a wide range of individual preferences and abilities.

**3. SIMPLE AND INTUITIVE USE**

Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

**4. PERCEPTIBLE INFORMATION:**

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

**5. TOLERANCE FOR ERROR:**

The design minimizes hazards and the adverse consequences of accidental or unintended actions.

**6. LOW PHYSICAL EFFORT:**

The design can be used efficiently and comfortably with a minimum of fatigue.

**7. SIZE AND SPACE FOR APPROACH AND USE:**

Appropriate size and space are provided for approach, reach, manipulation and use, regardless of user's body position, size, posture or mobility.

The Principles of **UNIVERSAL DESIGN**

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## 2.0 GLOSSARY AND DEFINITIONS

### GRAPHIC CONVENTIONS

Dimensions that are not marked maximum or minimum are absolute, unless otherwise indicated.

### GENERAL TERMINOLOGY

**comply with** Meet one or more specifications of this standard.

**if... then** Denotes a specification that applies only when the conditions described are present.

**may** Denotes an option or alternative.

**shall** Denotes a mandatory specification or requirement.

**should** Denotes an advisory specification or recommendation.

### DEFINITIONS

**Access aisle:** An *accessible pedestrian space* between *elements*, such as parking *spaces*, seating and desks, that provides clearances appropriate for the use of the *elements*.

**Accessible:** Describes a *site*, *building*, *facility* or portion thereof that complies with this standard.

**Accessible element:** An *element* specified by this standard (for example, telephone, controls etc.).

**Accessible route:** A continuous unobstructed path connecting *accessible elements* and *spaces* of a *facility*. Interior *accessible routes* may include corridors, floors, *ramps*, elevators, platform lifts and *clear floor spaces* at fixtures. Exterior *accessible routes* may include parking *access aisles*, *curb ramps*, crosswalks at *vehicular ways*, *walks*, *ramps* and platform lifts.

**Accessible space:** *Space* that complies with this standard.

**Adaptable:** The ability of a certain *building space* or *element*, such as kitchen counters, sinks, and

grab bars, to be added or altered so as to accommodate the needs of individuals with or without *disabilities* or to accommodate the needs of persons with different types or degrees of *disabilities*.

**Addition:** An expansion, extension, or increase in the gross floor area of a *facility*.

**Alteration:** A change to a *facility* that affects or could affect the usability of the *facility* or part thereof. *Alterations* include, but are not limited to, remodelling, renovation, retrofitting, rehabilitation, reconstruction, historic restoration, resurfacing of *circulation paths* or *vehicular ways*, changes or rearrangement of the structural parts or *elements*, and changes or rearrangement in the plan configuration of walls and full-height partitions. Normal maintenance, painting or wallpapering, or changes to mechanical or electrical systems are not *alterations*, unless they affect the usability of the *building*.

**Area of rescue assistance:** An area which has direct access to an exit, where people who are unable to use stairs may remain temporarily in safety to await further instructions or assistance during emergency evacuation.

**Assembly area:** A room or *space* accommodating a group of individuals for recreational, educational, political, social, civic or amusement purposes, or for the consumption of food and drink.

**Attic or Roof space:** The space between the roof and the ceiling of the top storey or between a dwarf wall and a sloping roof.

**Automatic door:** A door equipped with a power-operated mechanism and controls that open and close the door automatically upon receipt of a momentary actuating signal. The switch that begins the automatic cycle may be a photoelectric device, floor mat, or manual switch. (See Power-assisted door)

**Board room** or **Conference room** or **Meeting room:** A room used for meetings, which accommodates six or more people.

**Building:** A structure occupying an area greater than ten square metres, consisting of a wall, roof and floor or any of them, or a structural system serving the function thereof, including all plumbing, fixtures and service systems appurtenant thereto; or a structure occupying an area of ten square metres or less that contains plumbing, including the plumbing appurtenant thereto; or structures designated in the Ontario Building Code.

**Circulation path:** An exterior or interior way of passage from one place to another for pedestrians, including, but not limited to, *walks*, hallways, courtyards, stairways, and stair landings.

**Clear:** Unobstructed.

**Clear floor space:** The minimum unobstructed floor or ground *space* required to accommodate a single, stationary wheelchair, scooter or other mobility device, including the user.

**Closed-circuit telephone:** A telephone with dedicated line(s), such as a house phone, courtesy phone or phone that must be used to gain entrance to a *facility*.

**Common use:** Refers to those interior and exterior rooms, *spaces* or *elements* that are made available for the use of a restricted group of people (for example, occupants of a homeless shelter, the occupants of an office *building*, or the guests of such occupants).

**Cross slope:** The slope that is perpendicular to the direction of travel. (See *running slope*)

**Curb ramp:** A short *ramp* cutting through a curb or built up to a curb.



## 2.0 GLOSSARY AND DEFINITIONS

**Detectable warning surfaces:** A standardized surface feature built into or applied to walking surfaces or other *elements* to warn persons with a visual *impairment* of hazards on a *circulation path*.

**Disability:** Any restriction or lack of ability to perform an activity in the manner or within the range considered normal for a human being.

**Egress, Means of:** A continuous and unobstructed way of exit travel from any point in a *facility* to a public way. A *means of egress* comprises vertical and horizontal travel and may include intervening room *spaces*, doorways, hallways, corridors, passageways, balconies, *ramps*, stairs, enclosures, lobbies, horizontal exits, courts and yards. An *accessible means of egress* is one that complies with this standard and does not include stairs, steps or escalators. Areas of rescue assistance, protected lobbies or protected elevators may be included as part of an *accessible means of egress*.

**Element:** An architectural or mechanical component of a *building, facility, space* or *site* (e.g., telephone, *curb ramp*, door, drinking fountain, seating or water closet).

**Entrance:** Any access point into a *building* or *facility* used for the purposes of entering. An *entrance* includes the approach *walk*, the vertical access leading to the *entrance* platform, the *entrance* platform itself, vestibules (if provided), the entry door(s) or gate(s), and the hardware of the entry door(s) or gate(s).

**Facility or Facilities:** All or any portion of *buildings*, structures, *site improvements*, complexes, equipment, roads, *walks*, passageways, *parks*, parking lots or other real or personal property located on a *site*.

**Ground floor:** Any *occupiable* floor less than one *storey* above or below grade with direct access to grade. A *facility* always has at least one *ground floor* and may have more

than one *ground floor*, as where a split-level *entrance* has been provided or where a *facility* is built into a hillside.

**Guard:** A safety railing used as a barrier to prevent encroachment or accidental falling from heights.

**Handrail:** A component which is normally grasped by hand for support at stairways and other places where needed for the safety of pedestrians.

**Heritage Facility:** A *facility* or portions thereof designated under the Ontario Heritage Act, or identified in the inventory of heritage resources for the Township of Uxbridge. (See *Public Heritage Facility*)

**Impairment:** Any loss or abnormality of psychological, physiological or anatomical structure or function.

**Mezzanine or Mezzanine floor:** That portion of a *storey* which is an intermediate floor level, placed within the *storey* and having *occupiable space* above and below its floor.

**Marked crossing:** A crosswalk or other identified path intended for pedestrian use in crossing a *vehicular way*.

**Occupiable:** A room or enclosed *space* designed for human occupancy in which individuals congregate for amusement, educational or similar purposes, or in which occupants are engaged at labour, and which is equipped with *means of egress*, light and ventilation.

**Open space:** Large-scale tracts of land without visible evidence of residential, commercial or industrial development. These areas may be privately or publicly owned and are generally left in a natural state and not programmed for active recreation. The benefits of open lands typically extend beyond the immediate area and usually provide community-wide benefits.

**Operable portion:** A part of a piece of equipment or appliance used to insert or withdraw objects, or to activate, deactivate, or adjust the equipment or appliance (for example, coin slot, push button, handle).

**Park:** Land that is privately or publicly held that has been developed for multiple recreational and leisure-time uses. This land benefits the entire community and balances the demands of the public for outdoor recreational facilities and other amenities, such as pathways, picnic areas, playgrounds, water features, *spaces* for free play and leisure.

**Power-assisted door:** A door used for human passage that has a mechanism that helps to open the door or relieves the opening resistance of a door, upon the activation of a switch or a continued force applied to the door itself.

**Private open space:** Privately owned land areas within a subdivision, generally smaller in scale than *open space*, which have been left free from structures, parking lots and roads. These types of areas generally benefit only the residents or employees of the particular subdivision and usually remain in private ownership.

**Public Heritage Facility:** A *facility* or portions thereof designated under the Ontario Heritage Act, or identified in the inventory of heritage resources for the Township of Uxbridge and that is open and accessible to the public. (See *Heritage Facility*)

**Public use:** Describes interior or exterior rooms or *spaces* that are made available to the general public. *Public use* may be provided at a *facility* that is privately or publicly owned.

**Ramp:** A walking surface which has a *running slope* greater than 1:25.

**Retrofit:** See *Alteration*.

**Running slope:** The slope that is parallel to the direction of travel. (See *Cross slope*)

## 2.0 GLOSSARY AND DEFINITIONS

**Service entrance:** An *entrance* intended primarily for delivery of goods or services and not intended for use by the public.

**Service room:** A room provided in a *building* to contain equipment associated with *building* services.

**Service space:** A space provided in a *facility* to facilitate or conceal the installation of *facility* service *facilities* such as chutes, ducts, pipes, shafts or wires.

**Signage:** Displayed verbal, symbolic, *tactile* and pictorial information.

**Site:** A parcel of land bound by a property line or a designated portion of a public right-of-way.

**Site improvement:** Landscaping, paving for pedestrian and *vehicular* ways, outdoor lighting, recreational *facilities* added to a *site*.

**Sleeping accommodations:** Rooms in which people sleep, for example, a dormitory.

**Space:** A definable area (e.g. room, toilet room, hall, *assembly area*, *entrance*, storage room, alcove, courtyard or lobby).

**Storey:** That portion of a *building* included between the upper surface of a floor and the upper surface of the floor next above. If such portion of a *building* does not include *occupiable space*, it is not considered a *storey* for the purposes of this standard. There may be more than one floor level within a *storey*, as in the case of a *mezzanine* or *mezzanines*.

**Structural frame:** The columns and the girders, beams, trusses and spandrels having direct connection to the columns and all other members which are essential to the stability of the *building* as a whole.

**TDD** (Telecommunication Device for the Deaf): See *Text telephone*.

**TTY** (Teletypewriter): See *Text telephone*.

**Tactile:** Describes an object that can be perceived using the sense of touch.

**Technically infeasible:** Means, with respect to an *alteration* of a *building* or a *facility*, that it has little likelihood of being accomplished, because:

- existing structural conditions would require moving or altering a load-bearing member which is an essential part of the *structural frame*; or
- other existing physical or *site* constraints prohibit modification or addition of necessary *elements*, *spaces* or features which are in full and strict compliance with the minimum requirements for new construction.

**Temporary structure:** A *facility* that is not of permanent construction but that is extensively used, or is essential for *public use* for a period of time. Examples of temporary *facilities* covered by this standard include, but are not limited to, reviewing stands, bleacher areas, temporary kiosks, temporary health screening services or temporary safe pedestrian passageways around a construction *site*. Structures and equipment directly associated with the actual processes of construction, such as scaffolding, bridging, materials hoists, or construction trailers, are not included.

**Text telephone (TTY):** Machinery or equipment that employs interactive text-based communication through the transmission of coded signals across the standard telephone network. *Text telephones* can include, for example, devices known as *TDDs* (telecommunication display devices or telecommunication devices for deaf persons) or computers with special modems. *Text telephones* are also called *TTYs*, an abbreviation for teletypewriter.

**Vehicular way:** A route intended for vehicular traffic, such as a street, driveway or parking lot, within the boundary of the *site*.

**Walk:** An exterior pathway with a prepared surface intended for pedestrian use, including general pedestrian areas, such as plazas and courts, within the boundary of the *site*.

## 3.0 SCOPE, APPLICATION AND ENFORCEMENT

### GENERAL

The requirements of this standard shall be

- mandatory for all newly constructed and retrofitted *facilities* owned, leased or operated by the Township of Uxbridge; and
- encouraged for all other *facilities*, whether new or retrofitted.

Exceptions: This standard does not apply to

- residential occupancies;
- *buildings* of Group F Division 1 occupancy, as defined by the Ontario Building Code (latest edition with all amendments); and
- *buildings* which are not intended to be occupied on a daily or full-time basis, including, but not limited to, automatic telephone exchanges, pump houses and substations.

### GENERAL APPLICATION

All areas of newly designed or newly constructed *facilities* and altered portions of existing *facilities* shall comply with Sections 4.1 to 4.4 of this standard, unless otherwise provided in this section or as modified in Section 4.5, Facility-Specific Requirements.

Exceptions: The requirements of Sections 4.1 to 4.4 do not apply to

- *service rooms*
- elevator machine rooms
- janitor rooms
- *service spaces*
- *crawl spaces*
- *attic* or *roof spaces*.

### APPLICATION BASED ON FACILITY USE

The specific *facility* types listed in Section 4.5 shall, in addition to all of the provisions specified in Section 4.1 to 4.4, comply with the additional design requirements specified in Section 4.5.

Where a *facility* contains more than one use covered by a special application section, each portion shall comply with the requirements for that section in addition to all other general provisions.

### WORK AREAS AND EMPLOYEE-DESIGNATED AREAS

All *facilities* shall be *accessible* for employees, as well as patrons/users. All areas intended for use by employees shall be designed and constructed to comply with this standard.

### TEMPORARY FACILITIES

This standard applies to temporary *facilities*, as well as permanent *facilities*.

### RETROFITTING, ALTERATIONS AND ADDITIONS

Each *addition* to an existing *facility* shall be regarded as an *alteration*.

Each *space* or *element* added to the existing *facility* shall comply with the applicable provision(s) of this standard.

Except where the provision of *accessible* features is *technically infeasible*, no *alteration* shall decrease or have the effect of decreasing accessibility or usability of an existing *facility* to below the requirements for new construction at the time of *alteration*.

If existing *elements*, *spaces* or common areas are altered, then each such altered *element/space/feature/area* shall comply with all applicable provisions. If the applicable provision for new construction requires that an *element/space/feature/area* be on an *accessible route* and the altered *element/space/feature/area* is not on an *accessible route*, this route shall be altered to become *accessible*.

If *alterations* of single *elements*, when considered together, amount to an *alteration* of a room or *space* in a *facility*, the entire *space* shall be made *accessible*.

No *alteration* of an existing *element*, *space* or area of a *facility* shall impose a requirement for greater accessibility than that which would be required for new construction.

If an escalator or stairs are proposed as a means of access where none existed previously, and major structural modifications are necessary for such installations, then a means of *accessible* access shall also be provided.

If a planned *alteration* entails alterations to an *entrance*, and the *facility* has an *accessible entrance*, the *entrance* being altered is required to be *accessible*.

If the alteration work is limited solely to the electrical, mechanical or plumbing system, or to hazardous material abatement, or to automatic sprinkler retrofitting, and does not involve the alteration of any *elements* or *spaces* required to be *accessible* under these guidelines, then this standard does not apply (except for alarms, public telephones and assistive listening systems).

An *alteration* that affects the usability of or access to an area containing a primary function shall be made to ensure that, to the maximum extent feasible, the path of travel to the altered area, the restrooms, telephones and drinking fountains serving the altered area are readily *accessible* to and usable by individuals with *disabilities*.

Where the provision of *accessible* features is *technically infeasible*, and the standard allows a reduction of manoeuvring space from the requirements for new construction, the reduced dimensions are minimums. Where possible, larger manoeuvring spaces must be provided.



## 3.0 SCOPE, APPLICATION AND ENFORCEMENT

### HERITAGE FACILITIES

This standard will apply to alterations to a Heritage Facility, however, under the Ontario Human Rights Code, there are allowances for modification to the defining features of a Heritage Facility which are deemed to alter the essential nature or substantially affect the viability of the enterprise.

*Public Heritage Facilities* should be assessed for compliance to accessibility standards on an individual basis, to determine the most effective and least disruptive means of retrofit, where required. Consider the following general guidelines:

- *Facilities* and/or areas that are generally used independently by the public and have undergone extensive modernization should be permanently and fully *accessible*. This includes parking areas, reception areas, washrooms, food service areas and gift shops. It can also include *walkways* and garden areas. If accessibility is limited by non-heritage *elements*, those *elements* should be revised.
- *Facilities* and/or areas which are used only by guided tour groups, through which assistance could easily be provided to open doors or to place a temporary *ramp*, could remain as existing or with minor temporary modifications.

- It is desirable to provide a complete experience of a *Public Heritage Facility*. If an *accessible* area or areas can be provided to fully experience a given *site* or *facility* context, access to the entire *site* or *facility* is not necessary.
- Access to above-grade and below-grade areas is not necessary if the context of those areas can be adequately provided on the *accessible* floor level.

If retrofit for accessibility of a main public *entrance* in a *Heritage Facility* would substantially threaten or destroy the historic significance of the *facility*, access shall be provided at an alternative *entrance* with directional signs at the main public *entrance*. The *accessible entrance* should have a notification system (if not generally used by the public) and remote monitoring (if security is an issue).

Safe *egress* from a *Heritage Facility* is required.

### EQUIVALENT FACILITATION

In a retrofit situation where the requirements of a section of this standard are *technically infeasible* to implement, equivalent facilitation may be proposed.

### IMPLEMENTATION

The Development Services Department of the Township of Uxbridge, as well as other Township departments, as well as contracted consulting firms shall be responsible for the application of the Facilities Accessibility Design Standards when designing and administering all construction and renovation projects associated with new *facilities*, as well as the retrofit, *alteration* or *addition* to existing *facilities*, owned, leased or operated by the Township.

Designing and constructing to this standard shall be included as a mandatory requirement in all Township of Uxbridge Request for Proposals, Tender Documents and construction Contracts.

### ENFORCEMENT

The Development Services Department of the Township of Uxbridge, and other Township departments, through the project management function, shall ensure compliance to this standard during the pre-planning, design, construction documents preparation and contracts administrative phase.

## 4.0 DESIGN STANDARDS

All areas of newly designed or newly constructed *facilities* and altered portions of existing *facilities* shall comply with this section, unless otherwise provided in Section 3.0.

Exceptions: This standard does not apply to

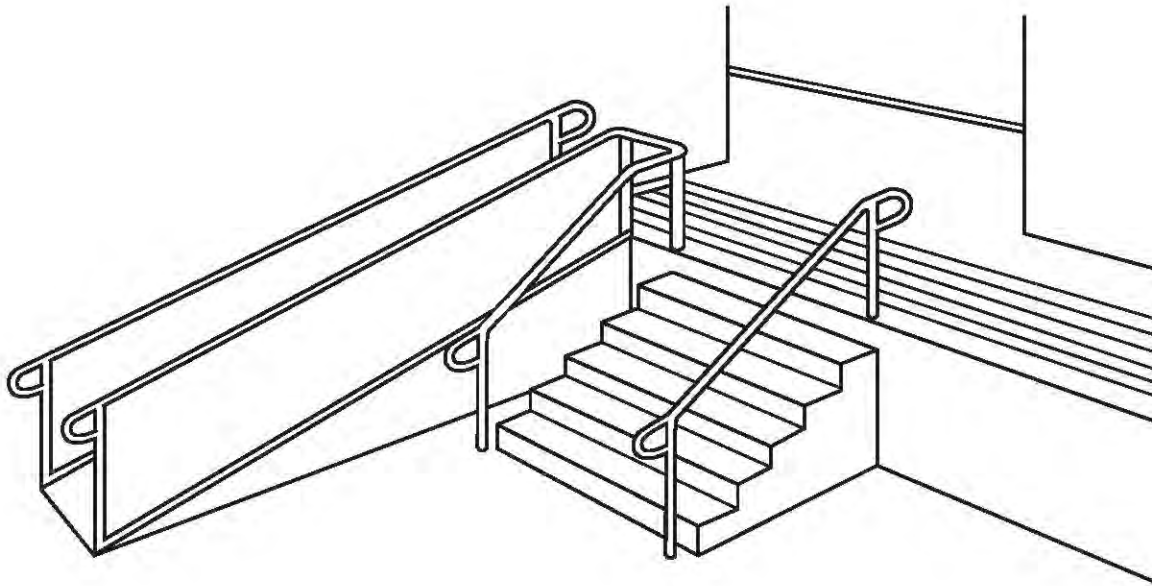
- residential occupancies;
- *buildings* of Group F Division 1 occupancy, as defined by the Ontario Building Code (latest

edition with all amendments); and

- *buildings* which are not intended to be occupied on a daily or full-time basis, including, but not limited to, automatic telephone exchanges, pump houses and substations.

The requirements of this section apply to all areas of a facility except

- *service rooms*
- *elevator machine rooms*
- *janitor rooms*
- *service spaces*
- *crawl spaces*
- *attic or roof spaces*



### 4.1.1 SPACE AND REACH REQUIREMENTS

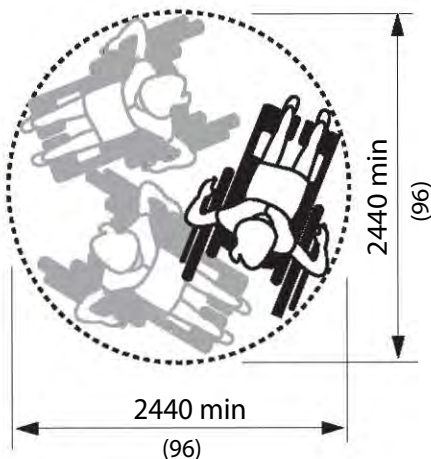
### 4.1 ACCESS AND CIRCULATION

#### RATIONALE

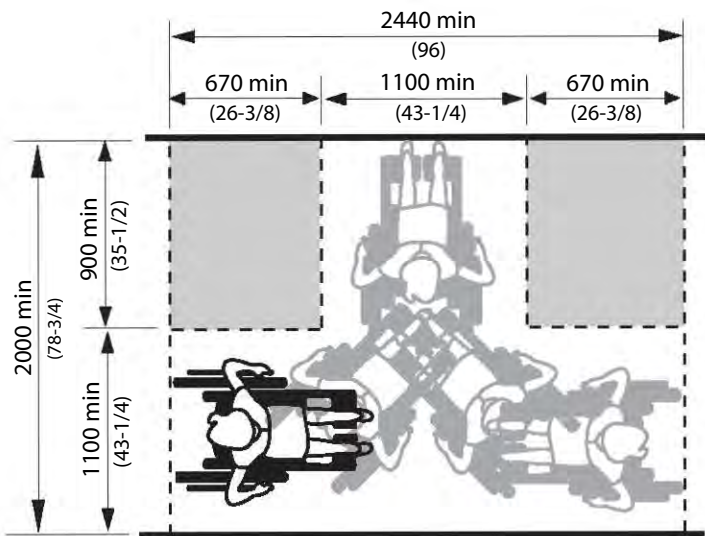
The dimensions and manoeuvring characteristics of wheelchairs, scooters and other mobility devices are as varied as the people who use them. Traditionally, accessibility standards have taken a conservative approach to wheelchair manoeuvrability, reflecting the needs of a physically strong individual using a manual wheelchair. Such an approach excludes the many users without such a degree of strength or those using a larger mobility device. This standard more accurately reflects the vast array of equipment that is used by persons to access and use facilities, as well as the diverse range of user ability. This standard incorporates more generous *space* requirements, particularly related to the dynamic movement of people using wheelchairs, scooters or other assistive devices.

#### APPLICATION

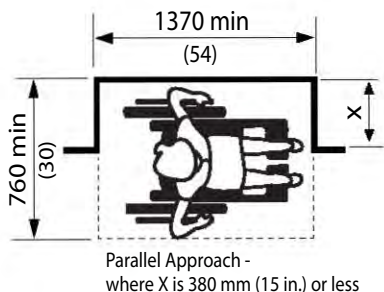
Space and reach range provisions for persons who use wheelchairs, scooters and other mobility devices shall comply with this section.



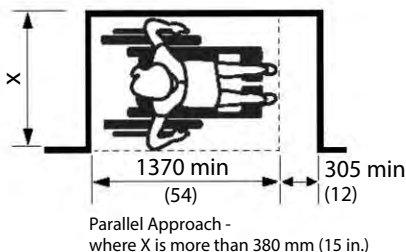
**Figure 4.1.1.1**  
360° Turning Space



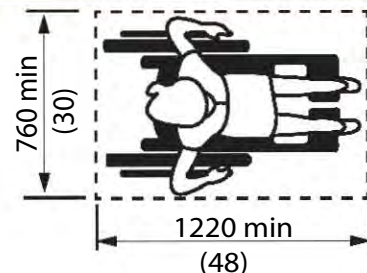
**Figure 4.1.1.2**  
180° Turning Space



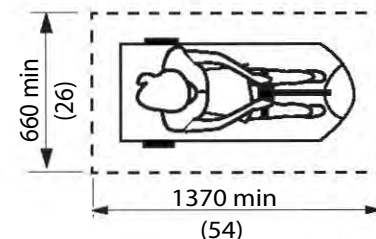
**Figure 4.1.1.3**  
Clearances at Alcove



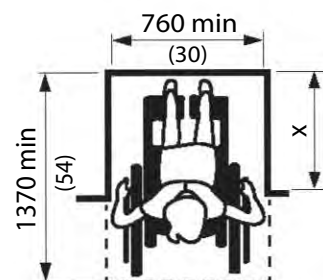
**Figure 4.1.1.4**  
Clearances at Alcove



**Figure 4.1.1.5**  
Clear Floor Space for Wheelchair

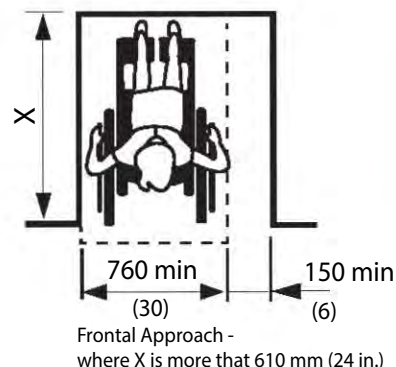


**Figure 4.1.1.6**  
Clear Floor Space for Scooter



Frontal Approach - where X is 610 mm (24 in.) or less

**Figure 4.1.1.7**  
Clearances at Alcove



**Figure 4.1.1.8**  
Clearances at Alcove

4.1 ACCESS AND CIRCULATION

4.1.1 SPACE AND REACH REQUIREMENTS

DESIGN REQUIREMENTS

The *space* required for a wheelchair to make a 360-degree turn is a *clear floor space* of 2440 mm (96 in.) in diameter (Figure 4.1.1.1) or for a 180-degree turn, as shown in Figure 4.1.1.2.

The minimum *clear floor space* or *ground space* necessary to accommodate the largest

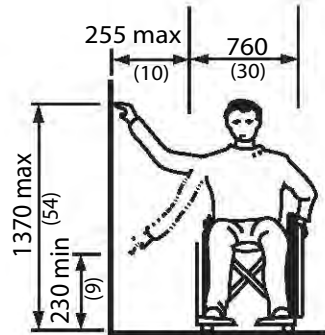


Figure 4.1.1.9 Side Reach

dimensional requirement of a single, stationary wheelchair or scooter and its' occupant shall be 760 mm (30 in.) x 1370 mm (54 in.). (Refer to Figures 4.1.1.5 and 4.1.1.6)

The minimum *clear floor space* or *ground space* for wheelchairs or scooters may be positioned for forward or parallel approach to an object.

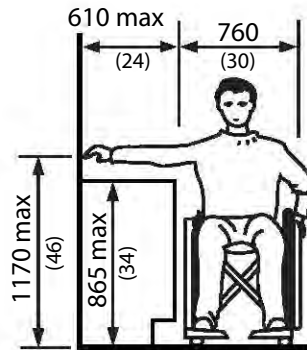


Figure 4.1.1.10 Side Reach over an Obstruction

*Clear floor space* or *ground space* for wheelchairs may be part of the *space* required under some objects.

One full, unobstructed side of the *clear floor space* or *ground space* for a wheelchair or scooter shall adjoin or overlap an *accessible route* or adjoin another wheelchair *clear floor space*. If a *clear floor space* is located in an alcove or otherwise confined on all or part of three sides, additional manoeuvring clearances shall be provided as shown in Figures 4.1.1.3, 4.1.1.4, 4.1.1.7 and 4.1.1.8.

The surface of *clear floor* or *ground spaces* for wheelchairs and scooters shall comply with 4.1.2.

If the *clear floor space* only allows forward approach to an object, the maximum high forward reach allowed shall be 1200 mm (47 in.). The minimum low forward reach is 400 mm (15-3/4 in.). Refer to Figure 4.1.1.11. If the high forward reach is over an obstruction, reach and clearances shall be as shown in Figures 4.1.1.12 and 4.1.1.13.

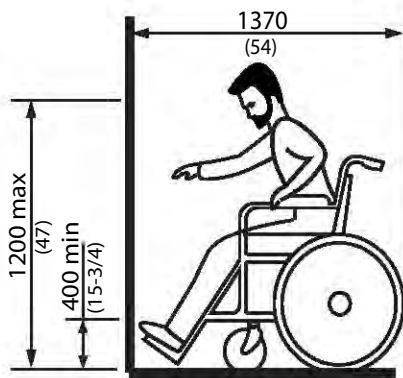


Figure 4.1.1.11 Forward Reach

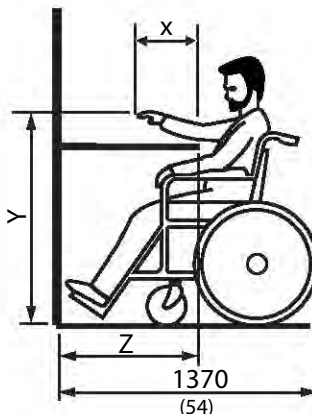


Figure 4.1.1.12 Forward Reach over an Obstruction

If the *clear floor space* allows parallel approach to an object, the maximum high side reach allowed shall be 1370 mm (54 in.) and the low side reach no less than 230 mm (9 in.) above the floor. Refer to Figure 4.1.1.9. If the side reach is over an obstruction, the reach and clearances shall be as shown in Figure 4.1.1.9 and 4.1.1.13. Notwithstanding these requirements, the Ontario Building Code requires all controls for the operation of *facility services* or safety devices, including electrical switches, thermostats and intercom switches, be mounted 900 mm (35 in.) to 1200 mm (47 in.) above the floor.

NOTE: In Diagrams 4.1.1.12 and 4.1.1.14, X shall be less than or equal to 635 mm (25 in.); Z shall be greater than or equal to X.

When X is less than 510 mm (20 in.), then Y shall be 1220 mm (48 in.) maximum.

When X is 510 to 635 mm (20 to 25 in.), then Y shall be 1120 mm (44 in.) maximum.

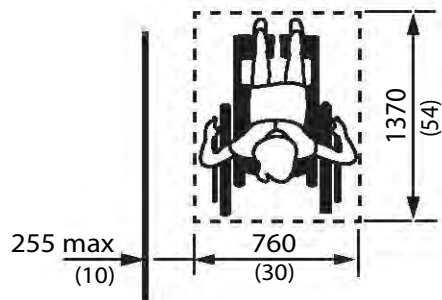


Figure 4.1.1.13 Side Reach - Maximum Distance to Wheelchair

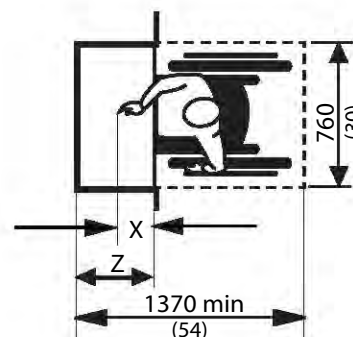


Figure 4.1.1.14 Forward Reach over an Obstruction



## 4.1.2 GROUND AND FLOOR SURFACES

## 4.1 ACCESS AND CIRCULATION

### RATIONALE

Design decisions related to ground and floor surfaces will influence every person who enters the building. Irregular surfaces, such as cobblestones or pea-gravel finished concrete, are difficult for both walking and pushing a wheelchair. Slippery surfaces are hazardous to all individuals and especially hazardous for seniors and others who may not be sure-footed.

Glare from polished floor surfaces can be uncomfortable for all users and can be a particular obstacle to persons with a visual *impairment* by obscuring important orientation and safety features. Pronounced colour contrast between walls and floor finishes may be helpful for persons with a visual *impairment*, as are changes in colour/texture where a change in level or function occurs.

Patterned floors should be avoided, as they can create visual confusion.

Thick pile carpeting makes pushing a wheelchair very difficult. Small and uneven changes in floor level represent a further barrier to using a wheelchair but also present a tripping hazard to ambulatory persons.

Openings in any ground or floor surface such as grates or grilles can catch canes or wheelchair wheels.

### APPLICATION

Ground and floor surfaces along all routes generally used by staff and public and within all areas generally used by staff and public shall comply with this section.

### DESIGN REQUIREMENTS

Ground and floor surfaces shall be stable, firm, slip-resistant and glare-free.

Changes in level, except for elevators and other elevating devices, shall conform to Table 4.1.2.

Carpets or carpet tile shall

- be securely fixed;
- have a firm cushion, pad or backing, where used;
- have a level loop, textured loop, level cut pile, or level cut/uncut pile texture with a maximum pad and pile height of 13 mm (1/2 in.); and
- have exposed edges fastened to floor surfaces with trim conforming to Table 4.1.2.

Gratings located in walking surfaces shall

- have spaces not greater than 13 mm (1/2 in.) wide in one direction; and
- be placed so that the long dimension is across the dominant direction of travel.

### RELATED SECTIONS

- 4.1.4 Accessible Routes, Paths and Corridors
- 4.4.8 Detectable Warning Surfaces
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour

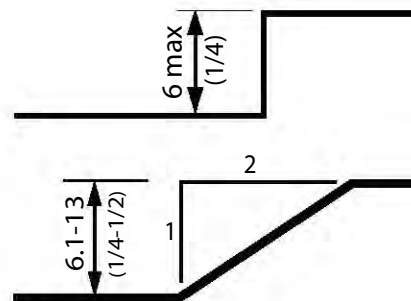


Figure 4.1.2.1  
Changes in Level

Vertical Rise	Edge Treatment
0 to 6 mm (0 - 1/4 in.)	May be vertical
6.1 mm to 13 mm (9/32 in. - 1/2 in.)	Bevel, maximum slope 1:2
Over 13 mm (over 1/2 in.)	Treat as a sloped floor, ramp or curb ramp

Table 4.1.2  
Changes in Level

OPENINGS LARGER THAN 13 (1/2 in.) MAY CATCH WHEELCHAIR WHEELS OR CANES

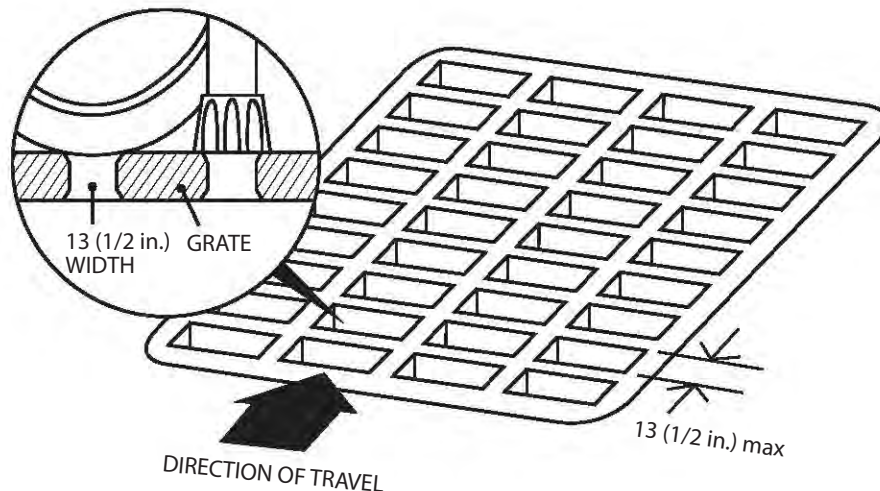


Figure 4.1.2.2  
Grills and Gratings



4.1 ACCESS AND CIRCULATION

4.1.3 PROTRUDING & OVERHEAD OBJECTS

**RATIONALE**

The creation of pathways free from protruding objects or freestanding obstacles is important to all *facility* users. An object protruding from a wall above the detection range of a cane is dangerous for persons with a visual *impairment* or a pedestrian distracted by a conversation. The underside of stairways is a common overhead hazard. Temporary construction barriers can also be hazardous if their lower edge is too high to be detected by a person using a long white cane for mobility. *Detectable warning surfaces* around freestanding obstacles, such as light standards, are advantageous to anyone using a pathway.

**APPLICATION**

Protruding objects from a wall, ceiling or other location shall comply with this section.

**DESIGN REQUIREMENTS**

Objects protruding from walls with their leading edges between 680 mm (26-3/4 in.) and 2100 mm (82-3/4 in.) from the floor shall protrude not more than 100 mm (4 in.) into pedestrian areas, such as walkways, halls, corridors, passageways or aisles.

Objects attached to a wall with their leading edges at or below 680 mm (26-3/4 in.) from the floor may protrude any amount.

Freestanding objects shall not have any overhang of more than 300 mm (11-3/4 in.) between 680 mm (26-3/4 in.) and 2100 mm (82-3/4 in.) from the ground or floor.

The maximum height of the bottom edge of freestanding objects with a *space* of more than 300 mm (11-

3/4 in.) between supports shall be 680 mm (26-3/4 in.) from the ground or floor.

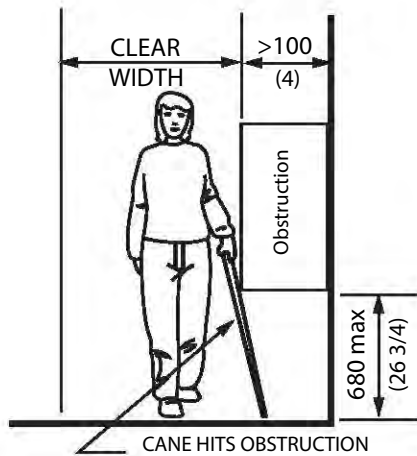
Protruding objects shall not reduce the *clear* width required for an *accessible route* or manoeuvring *space*.

The minimum *clear* headroom in pedestrian areas, such as walkways, halls, corridors, passageways, or aisles, shall be 2100 mm (82-3/4 in.).

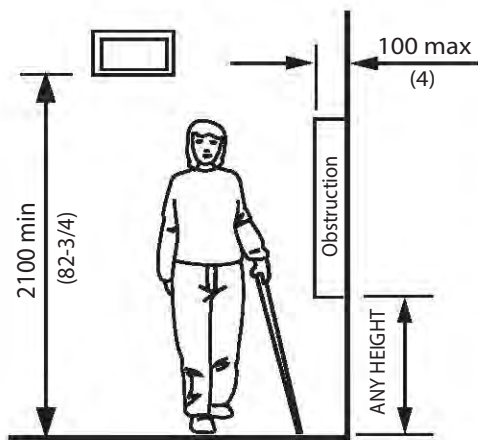
A detectable *guard*, guardrail or other barrier having its leading edge at or below 680 mm (26-3/4 in.) from the floor shall be provided where the headroom of an area adjoining an *accessible route* is reduced to less than 2100 mm (82-3/4 in.).

**RELATED SECTIONS**

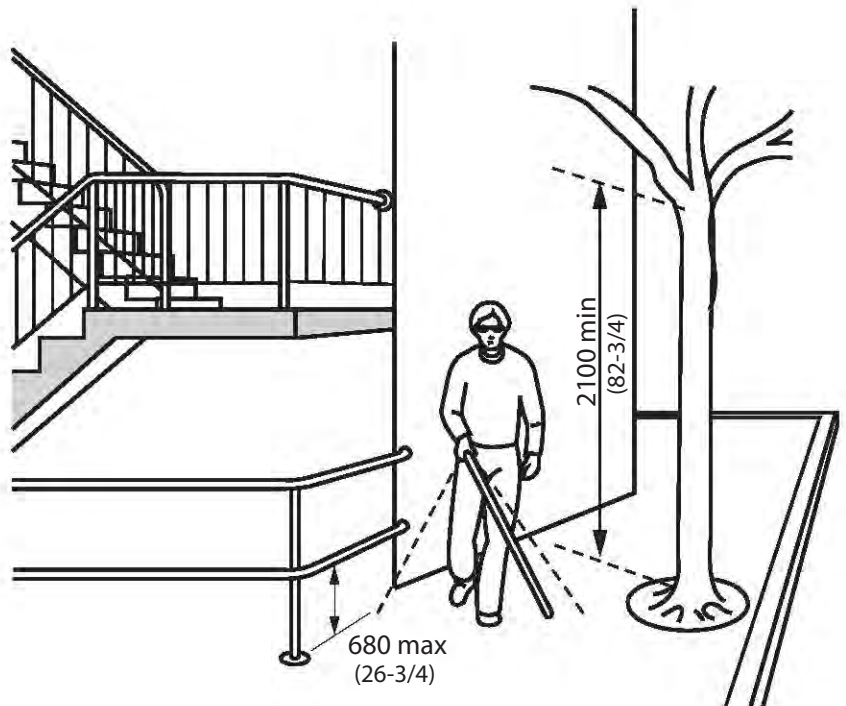
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.4.8 Detectable Warning Surfaces
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour



**Figure 4.1.3.1**  
Limits of Protruding Objects



**Figure 4.1.3.2**  
Limits of Protruding Objects



**Figure 4.1.3.3**  
Overhead Obstructions

### 4.1.4 ACCESSIBLE ROUTES, PATHS & CORRIDORS

### 4.1 ACCESS AND CIRCULATION

#### RATIONALE

Routes of travel through a facility should address the full range of individuals that may use them. They must provide the *clear* width necessary for persons using wheelchairs or scooters, those pushing strollers or those travelling in pairs. Consideration should be given not just to the width of items, such as wheelchairs and scooters, but also to their manoeuvrability. While a corridor may be wide enough for a person to drive a scooter in a straight line, it may not be possible to make a turn around a corner. The preferred minimum width for *accessible routes* is 1830 mm (72 in.).

Strong colour contrasts and/or tactile pathways set into floors may be used to assist individuals with a visual *impairment* to negotiate an environment. Edge protection that guards a change in level is an important safety feature for all users.

#### APPLICATION

Wherever possible, all routes, paths or corridors shall comply with this section.

At least one *accessible route* complying with this section shall be provided within the boundary of the *site* from *accessible parking spaces*, passenger-loading zones (if provided), and public streets or sidewalks to the *accessible facility entrance* they serve. The *accessible route* shall, to the maximum extent feasible, coincide with the route for the general public.

At least one *accessible route* shall connect *accessible buildings, facilities, elements* and *spaces* that are on the same *site*. It is preferable to have all routes *accessible*.

Except where essential obstructions in a work area would make an *accessible route* hazardous, an *accessible route* shall connect *accessible entrances* with all *accessible spaces* and *elements* within the *facility*. An *accessible route* complying with this section shall be provided within all normally *occupiable* floor areas. Exceptions: The provision of an *accessible route* does not apply

- to *service rooms*
- to elevator machine rooms
- to janitor rooms
- to *service spaces*
- to *crawl spaces*

- to *attic* or *roof spaces*
- to high-hazard industrial occupancies
- within portions of a floor area with fixed seats in an *assembly occupancy* where these portions are not part of an *accessible route* to *spaces* designated for wheelchair use; or
- within a suite of residential occupancy.

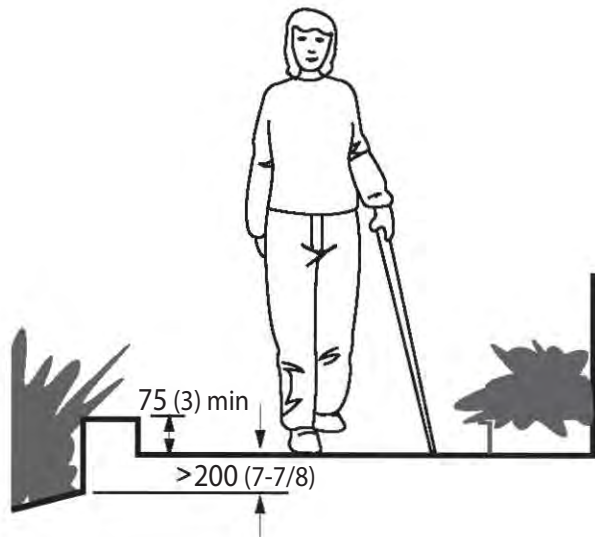


Figure 4.1.4.1 Edge Protection

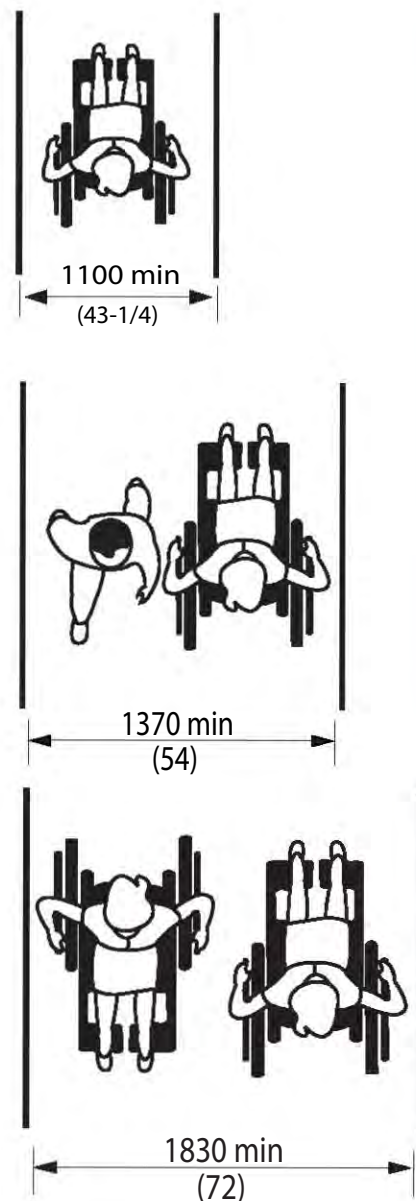


Figure 4.1.4.2 Access Widths

4.1 ACCESS AND CIRCULATION

4.1.4 ACCESSIBLE ROUTES, PATHS & CORRIDORS

**APPLICATION**  
(Continued)

Accessible routes are permitted to include *ramps*, *curb ramps*, stairs, elevators or other elevating devices (as permitted in 4.1.15) where a difference in elevation exists.

A walkway or pedestrian bridge connecting two barrier-free storeys in different buildings shall form part of an accessible route and shall comply with this section.

**DESIGN REQUIREMENTS**

The minimum *clear* width of an *accessible route* shall be 1100 mm (43-1/4 in.) except

- at doors - refer to 4.1.6;
- where additional manoeuvring *space* is required at doorways (See 4.1.6);
- at U-turns around obstacles less than 1220 mm (48 in.) wide, it shall be 1220 mm (48 in.);
- for exterior routes, it shall be 1220 mm (48 in.);
- where *space* is required for two wheelchairs to pass, it shall be 1830 mm (72 in.); and
- at secondary circulation routes within open office areas, where systems-furniture work station clusters are used, it shall be 920 mm (36 in.).

*Accessible routes* shall

- have a *running slope* not steeper than 1:25 (4%);
- have a *cross slope* not steeper than 1:50 (2%); and
- where the *accessible route* incorporates a *curb ramp*, the *curb ramp* portion of the *accessible route* shall comply with 4.1.10.

Every *accessible route* less than 1830 mm (72 in.) wide shall be provided with an unobstructed passing space of not less than 1830 mm (72 in.) in width and 1830 mm (72 in.) in length, located not more than 30 meters (98 ft. 5 in.) apart.

Except at stairs and at elevated platforms such as performance areas or loading docks, where the edge(s) of an *accessible route*, path or corridor is not level with the adjacent surface, the edge(s) shall

be protected

- by a colour contrasting curb of at least 75 mm (3 in.) high where the change in level is between 200 mm (7-7/8 in.) and 600 mm (23-5/8 in.); and
- by a *guard* which meets the requirements of the Ontario Building Code where the change in level is greater than 600 mm (23-5/8 in.).

Where there is a change in direction along an *accessible route* and the intended destination of the route is not evident, directional signage shall be provided.

All portions of an *accessible route* shall be equipped to provide a minimum level of illumination of 50 lux (4.6 ft.-candles). Exception: In outdoor park settings where routes are not normally illuminated, additional illumination is not required.

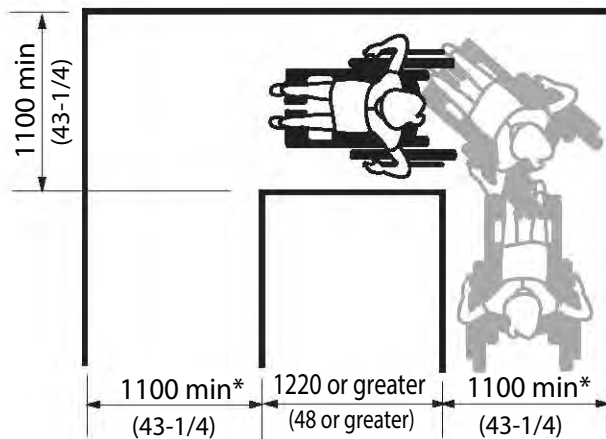
*Accessible routes*, paths or corridors having a slope steeper than 1:25 (4%) shall be designed as *ramps*, in compliance with 4.1.9.

*Accessible routes* shall incorporate level rest areas spaced no more than 30 metres (98ft. - 5in.) apart.

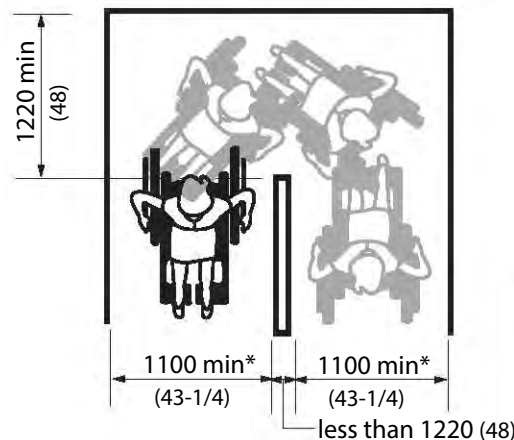
Designated areas for snow piling to be provided at exterior *accessible routes*, located away from pedestrian routes.

**RELATED SECTIONS**

- 4.1.2 Ground and Floor Surfaces
- 4.1.9 Ramps
- 4.1.10 Curb Ramps
- 4.3.3 Elevated Platforms
- 4.4.7 Signage
- 4.4.8 Detectable Warning Surfaces
- 4.4.12 Glare and Light Sources
- 4.4.13 Lighting
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour



**Figure 4.1.4.3**  
Turn around an Obstacle



**Figure 4.1.4.4**  
Turn around an Obstacle

Figures 4.1.4.3 and 4.1.4.4 illustrate interior routes. Dimensions marked \* to be increased to 1220 mm (48 in.) at exterior routes.

## 4.1.5 ENTRANCES

## 4.1 ACCESS AND CIRCULATION

### RATIONALE

Design decisions concerning entrances will have an immediate impact on the independence and dignity of everyone entering a facility. Entrances that address the full range of individuals using the facility promote a spirit of inclusion that separate *accessible* entrances do not. Features such as canopies can limit the influence of weather conditions on this already busy area and also make an entrance more obvious to a person with a cognitive disability or someone unfamiliar with the facility.

### APPLICATION

All *entrances* used by staff and/or the public shall be *accessible* and comply with this section. In a retrofit situation where it is *technically infeasible* to make all staff and public *entrances accessible*, at least 50% of all staff and public *entrances* shall be *accessible* and comply with this section. In a retrofit situation where it is *technically infeasible* to make all public *entrances accessible*, the primary entrances used by staff and the public shall be *accessible*.

*Accessible public entrances* must be provided in a number at least equivalent to the number of exits required by the Ontario Building Code. (This paragraph does not require an increase in the total number of public *entrances* required for a *facility*.)

An *accessible public entrance* must be provided to each tenancy in a *facility*.

In police stations and municipal courts subject to 4.5.8 and 4.5.9, public *entrances* that are secured shall be *accessible*, as required in 4.5.8 and 4.5.9.

If direct access is provided for pedestrians from an enclosed parking garage to a *facility*, at least one direct *entrance* from the parking garage to the *facility* must be *accessible*.

If access is provided for pedestrians from a pedestrian tunnel, walkway or pedestrian bridge, at least one *entrance* to the *facility* from each tunnel, walkway or bridge must be *accessible*.

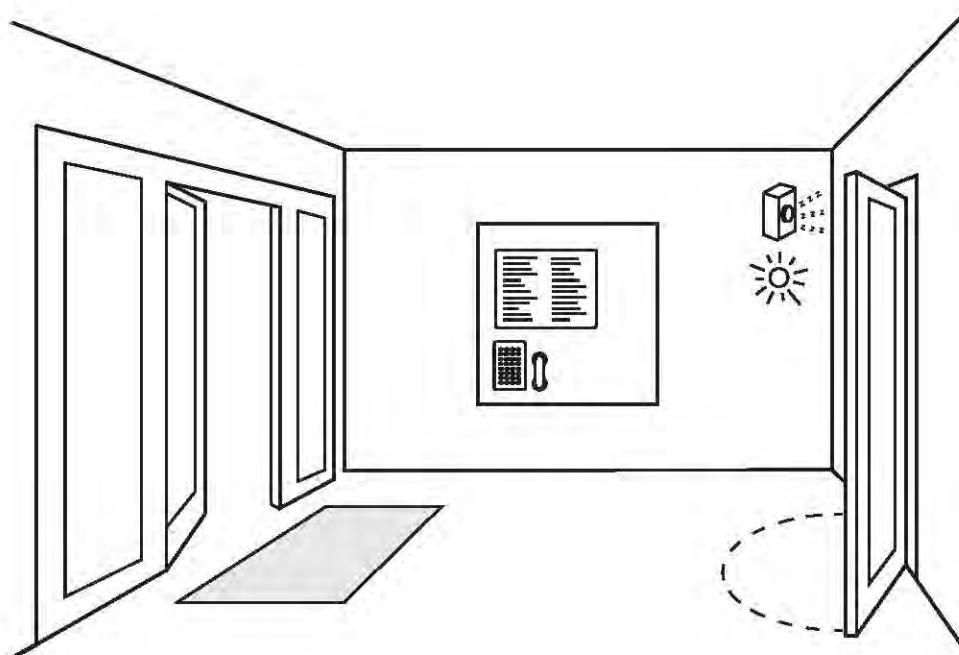
If the only *entrance* to a *facility* or tenancy is a *service entrance*, that *entrance* shall be *accessible*.

*Entrances* which are not *accessible* shall have directional *signage* complying with 4.4.7 which indicates the nearest *accessible entrance*.

*Accessible entrances* shall be identified with *signage* complying with applicable provisions of 4.4.7.

### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.6 Doors
- 4.1.7 Gates, Turnstiles and Openings
- 4.1.8 Windows, Glazed Screens and Sidelights
- 4.4.2 Controls and Operating Mechanisms
- 4.4.7 Signage
- 4.4.10 Information Systems
- 4.4.11 Card Access, Safety and Security Systems
- 4.4.13 Lighting





4.1 ACCESS AND CIRCULATION

4.1.6 DOORS

**RATIONALE**

Sufficiently wide doorways are advantageous to individuals using wheelchairs or scooters, pushing strollers, or making a delivery. However, a raised threshold at the base of the door could impede any one of these same individuals. This same group, with the addition of children, seniors or even someone carrying packages, would have difficulty opening a heavy door and would benefit from some form of automatic door opener. Where permitted and where feasible, entrances without doors are preferred.

Independent use of doors is desirable. Reliance on assistance from others to open doors is not an *accessible* or dignified solution.

Careful thought to the direction of the door swing can enhance the usability and limit the hazard to other pedestrians. Sliding doors can be easier for some individuals to operate, and can also require less wheelchair manoeuvring *space*. Doors that require two hands to operate are not considered to be *accessible*. Revolving doors are not *accessible* for persons using wheelchairs and strollers. Also, the coordination required to use such doors may be difficult for children or a person with a cognitive disability.

Glazed doors can present a hazard to all individuals and especially those with a visual *impairment*. The inclusion of colour-contrast strips across the glass, mounted at eye level, as well as colour-contrasting door frames and door hardware, will increase the safety and visibility of a glazed door for a person with a visual *impairment*.

**APPLICATION**

All doors used by staff or the public shall comply with this section. In a retrofit situation where it is *technically infeasible* to make all doors *accessible*, at least one door at each *accessible space* shall comply with this section. Exception: Doors not requiring full user passage, such as shallow closets, may have the *clear* opening

reduced to 510 mm (20 in.) minimum.

Each door that is an *element* of an *accessible route* shall comply with this section.

Each door required by 4.4.1 (Emergency Exits, Fire Evacuation and Areas of Rescue Assistance) shall comply with this section.

Where a door system incorporates multiple door leaves at a single location, at least one of the door leaves shall comply with this section.

Power operators shall be provided at the following door locations:

- entrances required by 4.1.5;
- washrooms that include an *accessible* toilet stall, where there is no individual washroom on the same floor. Exception: Where there is at least one other male and female washroom with accessible toilet stalls on the same floor, that are equipped with a power door operator;
- individual washrooms equipped with a door having a self-closing device;

- change rooms that contain *accessible* toilet and shower facilities, as well as a private *accessible* change room; and
- intermediate doorways across primary circulation routes within a *facility*. Exception: Doors that are held-open using electromagnetic hold-open devices.

Mats and mat sinkages at doors shall comply with this section.

Revolving doors or turnstiles shall not be the only means of passage at an *accessible entrance* or along an *accessible route*. An *accessible* gate or door shall be provided adjacent to the turnstile or revolving door and shall be designated to facilitate the same use pattern.

Frameless glass doors and/or sidelights shall not be used.

Door hardware on all doors throughout a facility (not only those deemed *accessible*), shall comply with the door hardware requirements of this section.

Context	Floor Space Required (in mm)		
	Depth	Width	Space beside latch
<b>Side-hinged door - Front approach (Figure 4.1.6.4)</b>			
Pull side	1525 (60 in.)	1600 (63 in.) (*1525 (60 in.))	600 (23-5/8 in.)
Push side	1370 (54 in.)	1250 (49-1/4 in.) (*1220 (48 in.))	300 (11-3/4 in.)
<b>Side-hinged door - Latch-side approach (Figure 4.1.6.3)</b>			
Pull side	1370 (54 in.) (*1220 (48 in.))	1600 (63 in.) (*1525 (60 in.))	600 (23-5/8 in.)
Push side	1370 (54 in.) (*1100 (43-1/4 in.))	1525 (60 in.)	600 (23-5/8 in.)
<b>Side-hinged door - Hinge-side approach (Figure 4.1.6.2)</b>			
Pull side	2440 (96 in.) (*1525 (60 in.))	2440 (96 in.) (*1525 (60 in.))	600 (23-5/8 in.)
Push side	1370 (54 in.) (*1100 (43-1/4 in.))	1830 (72 in.)	450 (17-3/4 in.)
<b>Sliding door (Figure 4.1.6.5)</b>			
Front approach	1370 (54 in.)	1100 (43-1/4 in.) (*920 (36 in.))	50 (2 in.)
Side approach	1370 (54 in.) (*1100 (43-1/4 in.))	1550 (61 in.) (*1370 (54 in.))	600 (23-5/8 in.)

**Table 4.1.6** Manoeuvring *Space* at Doors

In retrofit situations where it is *technically infeasible* to provide the required clearances at doors, the clearances may be reduced as shown by the asterisk (\*).



### 4.1.6 DOORS

### 4.1 ACCESS AND CIRCULATION

#### DESIGN REQUIREMENTS

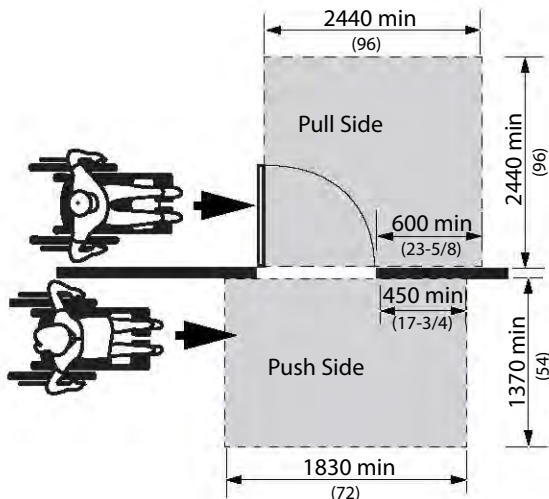
Where permitted, rooms without doors are preferred.

Accessible doors shall be on an accessible route that complies with 4.1.4.

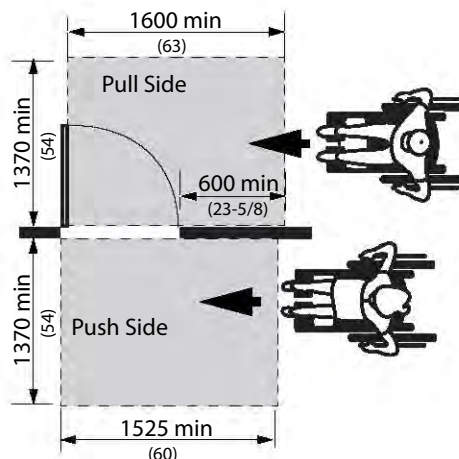
The minimum *clear opening* of doorways shall be 950 mm (37-1/2 in.), measured between the face of the door and the opposite door stop with the door open 90 degrees. In a retrofit situation where it is *technically infeasible* to provide this clearance, the minimum *clear opening* of doorways may be reduced to 850 mm (33-1/2 in.).

Doors shall have level wheelchair-manoeuvring *space* on both sides of the door. Unless equipped with a power door operator, doors shall have a *clear space* beside the latch, as described in Table 4.1.6.

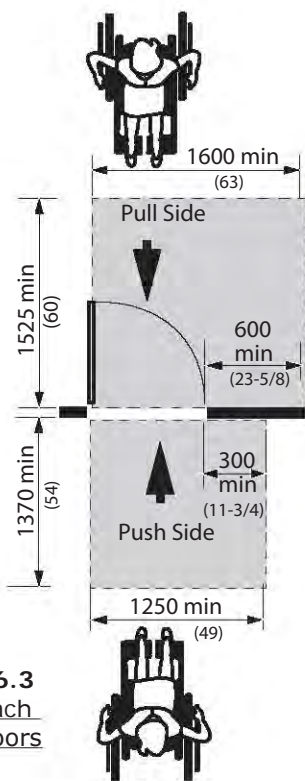
Exception: The *clear space* is not required on the inactive side of a door, where access is provided from one side only - such as to a closet.



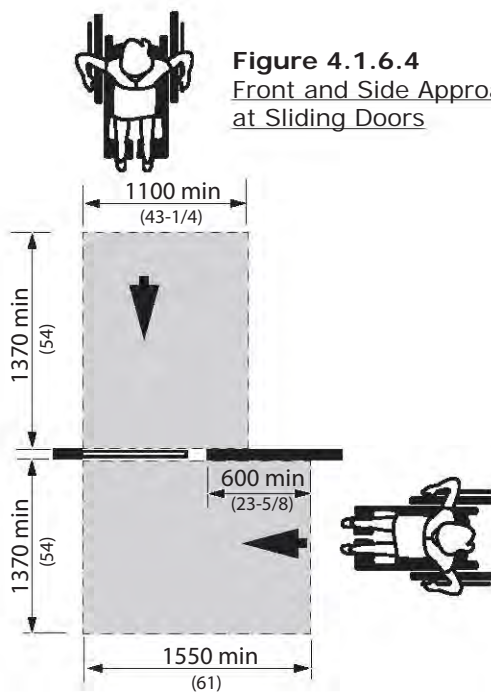
**Figure 4.1.6.1**  
Hinge Side Approach at Hinged Doors



**Figure 4.1.6.2**  
Latch Side Approach at Hinged Doors



**Figure 4.1.6.3**  
Front Approach at Hinged Doors



**Figure 4.1.6.4**  
Front and Side Approach at Sliding Doors

4.1 ACCESS AND CIRCULATION

4.1.6 DOORS

**DESIGN REQUIREMENTS**  
(Continued)

The required *clear space* beside the latch is to be unobstructed for the full height of the door.

The minimum *space* between two hinged or pivoted doors in series shall be 1370 mm (54 in.), plus the width of any door swinging into the *space*.

Thresholds shall

- be not more than 13 mm (1/2 in.) high; and
- where over 6 mm (1/4 in.) high, be bevelled at a maximum slope of 1:2.

Door hardware (operating devices such as handles, pulls, latches, and locks) shall

- be operable by one hand;
- not require fine finger control, tight grasping, pinching, or twisting of the wrist to operate; and
- be mounted between 900 mm (35 in.) and 1000 mm (39-3/8 in.) from the floor.

Operating hardware on sliding doors shall be exposed and usable from both sides when sliding doors are fully open.

The maximum door opening force for pushing or pulling open a door shall be

- 38 N (8.5 lb.) for exterior hinged doors;
- 22 N (4.6 lb.) for interior hinged doors; and
- 22 N (4.6 lb.) for sliding or folding doors.

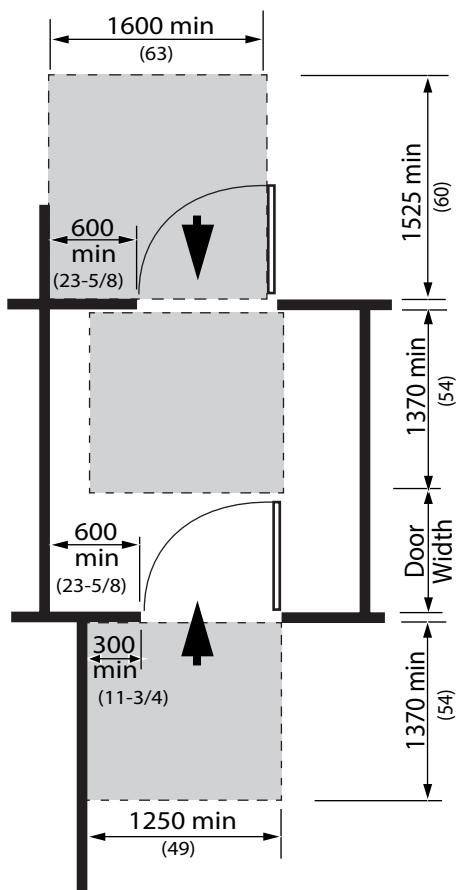
Door closers shall be adjusted to the least pressure possible, but never more than the opening forces noted in this section.

The sweep period of door closers shall be adjusted so that, from an open position of 90 degrees, the door will take not less than 3 seconds to move to a semi-closed position of approximately 12 degrees.

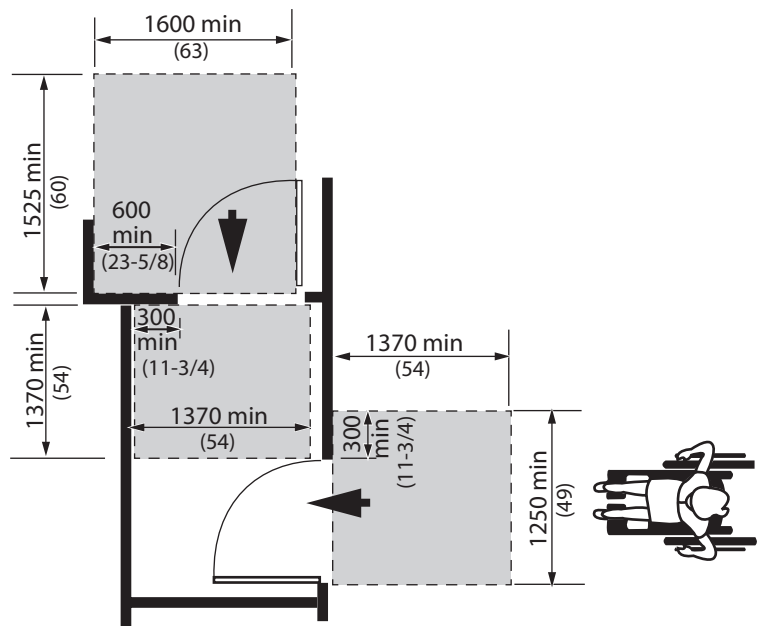
Power-assisted swinging doors shall

- take not less than 3 seconds to move from the closed to the fully open position; and
- require a force of not more than 66 N (13.8 lb.) to stop door movement.

Permanent mats and metal gratings at *entrances* and in vestibules shall be sunk level with the floor, so as not to create a tripping hazard.



**Figure 4.1.6.5**  
Manoeuvring Space at Doors in Series



**Figure 4.1.6.6**  
Manoeuvring Space at Doors in Series

## 4.1.6 DOORS

### 4.1 ACCESS AND CIRCULATION

Occasional mats (e.g. runners used in bad weather) should be level with the floor surface and/or have a gently bevelled edge, so as not to create a tripping hazard.

Where power door operators are provided they shall

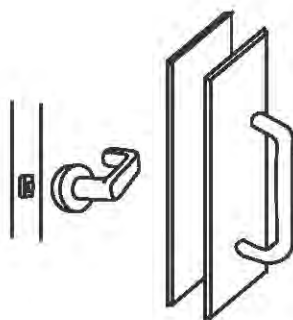
- be located to allow a person using a wheelchair or scooter to stop immediately adjacent to the control (refer to 4.1.1);
- be located at least 600 mm (23-5/8 in.) from any inside corner;
- if located on hinge side of door it controls, be located not less than 600 mm (23-5/8 in.) beyond the door swing, where the door opens towards the control;
- have its centre located 1000 - 1100 mm (39-3/8 - 43-1/4 in.) from the floor;
- incorporate controls that are clearly visible and minimum 150 mm (5-7/8 in.) in diameter;
- incorporate the International Symbol of Access for Persons with Disabilities;
- where pressure-sensitive mats, overhead beams or proximity scanners are used to detect traffic, incorporate systems that will detect individuals using wheelchairs or scooters; and
- where exterior doors swing open into a pedestrian area, incorporate safety *guards* that comply with 4.1.3, projecting a minimum of 300 mm (11-3/4 in.) beyond both sides of the open door. (See Figure 4.1.6.8)

Doors and/or door frames shall incorporate pronounced colour contrast, to differentiate them from the surrounding environment. Door handles and other operating mechanisms shall incorporate pronounced colour contrast, to differentiate them from the door itself.

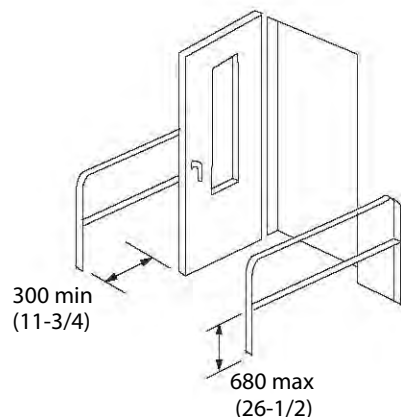
Where a door incorporates glazing or is fully glazed, it shall comply with Section 4.1.8 (Windows, Glazed Screens and Sidelights).

#### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.7 Gates, Turnstiles and Openings
- 4.1.8 Windows, Glazed Screens and Sidelights
- 4.4.2 Controls and Operating Mechanisms
- 4.4.7 Signage
- 4.4.10 Information Systems
- 4.4.11 Card Access, Safety and Security Systems

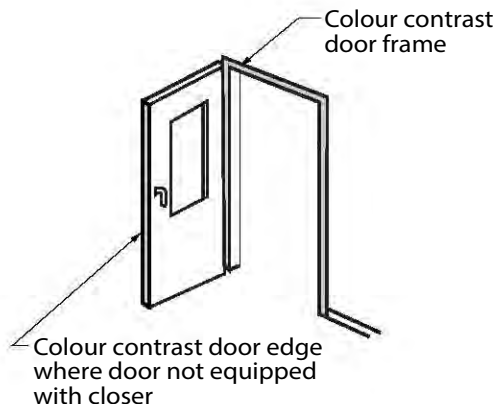


**Figure 4.1.6.7**  
Examples of Accessible Hardware



**Figure 4.1.6.8**  
Detectable Safety Guards

Where doors are not equipped with a closing device, the edge of door shall be colour contrasted to the face of the door. (See Figure 4.1.6.9)



**Figure 4.1.6.9**  
Colour Contrast at Doors

4.1 ACCESS AND CIRCULATION

4.1.7 GATES, TURNSTILES AND OPENINGS

**RATIONALE**

Gates and turnstiles should address the full range of users that may pass through them. Single-bar gates designed to be at a convenient waist height for ambulatory persons are at neck and face height for children and chest height for persons who use wheelchairs or scooters.

Revolving turnstiles are a physical impossibility for a person in a wheelchair to negotiate. They are also difficult for persons using canes or crutches, or persons with poor balance. An adjacent opening of an *accessible* width is essential for wheelchair access, as well as access for those using other mobility devices, strollers, walkers or delivery carts.

**APPLICATION**

Gates, turnstiles and openings shall comply with this section.

**DESIGN REQUIREMENTS**

Where gates or openings are provided through fences or screens to *public use* areas, such openings shall be *accessible* (i.e., a minimum of 950 mm (37-1/2 in.) wide, to allow free passage for persons who use a wheelchair or scooter. (Note: Hardware should be suitable for autonomous use, and any closing device should not be spring-loaded).

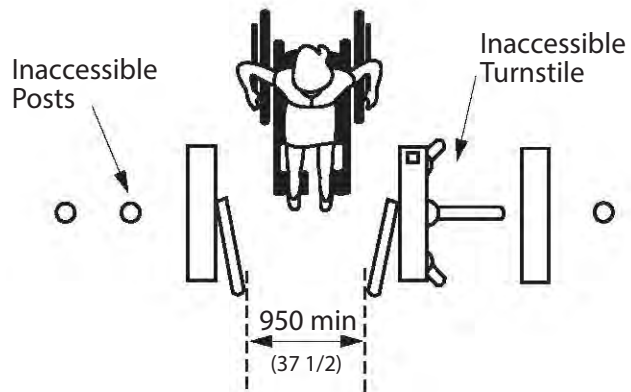
Where turnstiles or other ticketing control devices are utilized which are not *accessible*, a gate or opening which is *accessible* shall be provided in the same location and shall incorporate the International Symbol of Access for Persons with Disabilities.

Turnstiles shall incorporate a pronounced colour contrast to differentiate them from the surrounding environment.

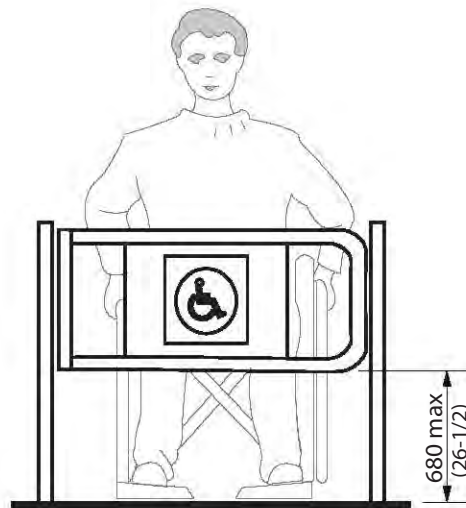
Where gates are incorporated into a chain-link fencing system, the poles at either side of the gate shall incorporate a pronounced colour contrast from the fence and the surrounding environment.

**RELATED SECTIONS**

- 4.1.1 Space and Reach Requirements
- 4.1.6 Doors
- 4.1.8 Windows, Glazed Screens and Sidelights
- 4.4.2 Controls and Operating Mechanisms
- 4.4.7 Signage
- 4.4.10 Information Systems
- 4.4.11 Card Access, Safety and Security Systems



**Figure 4.1.7.1**  
Access at Turnstile



**Figure 4.1.7.2**  
Access at Turnstile

## 4.1.8 WINDOWS, GLAZED SCREENS & SIDELIGHTS

## 4.1 ACCESS AND CIRCULATION

### RATIONALE

Broad expanses of glazing in screens, sidelights and doors can be difficult to detect. While this may be a particular concern to persons with a visual impairment, it is possible for anyone to walk into a clear sheet of glazing especially if they are distracted or in a hurry.

Persons who use wheelchairs or scooters experience the facility from a seated position thereby lowering their eye level and reach range. This necessitates the need for lower sill heights and easily reached operating mechanisms. Window controls and operating devices should also respect the limitations of hand strength or dexterity encountered with different types of disabilities, including arthritis.

### APPLICATION

Windows, glazed screens, fully-glazed sidelights, fully-glazed doors and vision panels in doors shall comply with this section.

Frameless glass doors and/or sidelights shall not be used.

### DESIGN REQUIREMENTS

Fully-glazed doors and sidelights at exterior entrances or vestibules, as well as fully-glazed interior doors, screens and sidelights shall be clearly identified with a horizontal row of decals, or a continuous stripe, minimum 50 mm (2 in.) wide and of highly contrasting colour, mounted with its centre line between 1475 mm (58 in.) and 1525 mm (60 in.) from the floor or ground. Additionally, a second row of decals, or a continuous stripe, a minimum 50 mm (2 in.) wide and of highly contrasting colour shall be provided, mounted with its centreline between 1170 mm (46 in.) and 1220 mm (48 in.) above the floor or ground.

Where decals are used, they shall be located at a maximum of 150 mm (5-7/8 in.) from centre to centre. The decals can either be 50 mm (2 in.) square or round, and/or of a special design (e.g., a

logo) provided the solid portion of the decals provides a high colour contrast and is easy to identify by persons with a visual impairment.

Where etched or patterned glass is used, decals or stripes of a highly contrasting colour shall still be provided.

Where frameless glass vision panels are used, exposed edges shall be identified with a vertical safety stripe, applied to cap the ends of each exposed glass panel.

Where viewing windows or vision panels are provided,

- the sill height shall be no more than 760 mm (30 in.) from the floor; and

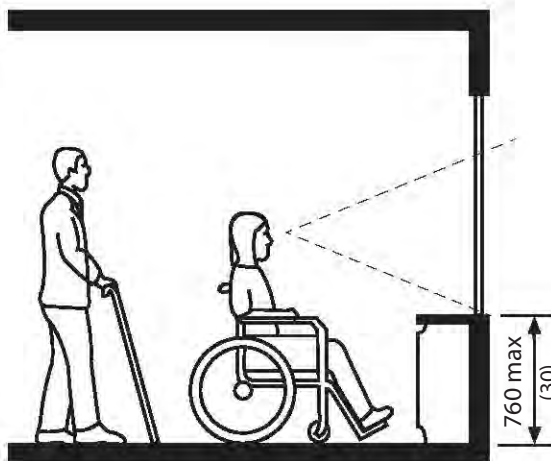
- where horizontal transoms are incorporated, the transoms shall not be located between 1060 mm (42 in.) and 1220 mm (48 in.) from the floor.

In facilities with operable windows, window opening hardware shall

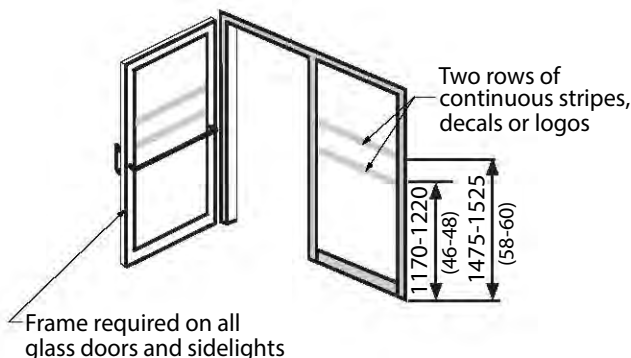
- be mounted between 400 mm (15-3/4 in.) and 1200 mm (47 in.) from the floor;
- be operable using one hand; and
- not require fine finger control, tight grasping, pinching, or twisting of the wrist to operate.

### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.4.2 Controls and Operating Mechanisms



**Figure 4.1.8.1**  
Window Sill Height



**Figure 4.1.8.2**  
Fully Glazed Doors, Sidelights and Vision Panel Markings



4.1 ACCESS AND CIRCULATION

4.1.9 RAMPS

**RATIONALE**

Traditionally, ramps have been synonymous with wheelchair accessibility. However, ramps can be problematic in providing accessibility. Ramps can be difficult and dangerous to negotiate. Also, the physical space required for ramps makes them cumbersome to integrate into a facility. However, where a change in level already exists or cannot be avoided, a properly designed ramp can provide access for those using wheelchairs or scooters, pushing strollers or moving packages on a trolley.

The design of the ramp is critical to its usefulness and safety. A steeply inclined ramp is difficult to ascend when using a wheelchair, and can increase the risk of the wheelchair tipping backwards. Descending a steep ramp can also be hazardous. Any cross slope will further increase the effort required to negotiate the ramp. Manoeuvring space at the top and bottom are also important factors in a ramps usability. Level areas at points along a long ramp enable an individual to rest.

Textured surfaces, edge protection and handrails all provide important safety features. Heated surfaces are recommended to address the safety concerns associated with snow and ice.

**APPLICATION**

Any part of an accessible route with a slope steeper than 1:25 shall be considered a ramp and shall comply with this section.

**DESIGN REQUIREMENTS**

Accessible ramps shall be on an accessible route complying with 4.1.4.

Where an accessible ramp is located in a barrier-free path of travel serving a building entrance, signage in compliance with 4.4.7 shall be installed to indicate the location of the accessible ramp and the accessible entrance.

The running slope shall be between 1:20 and 1:25. In a retrofit situation where it is technically infeasible to provide a ramp with a running slope between 1:20 and 1:25, a running slope not steeper than 1:12 may be used. Shallower slopes are preferred.

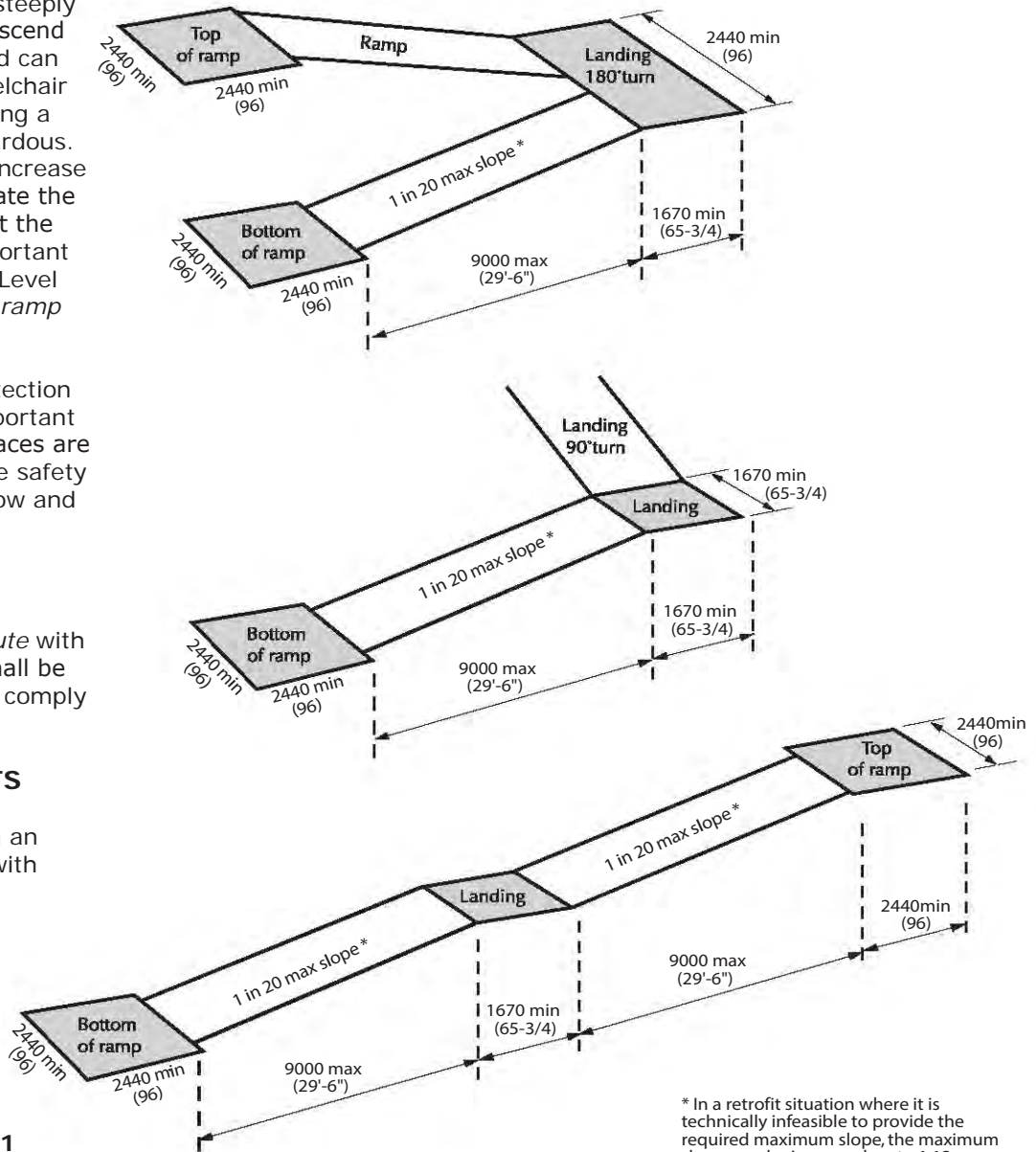
The maximum cross slope of ramp surfaces shall be 1:50.

Ramps shall have level landings at the top and bottom of each run and also where the ramp changes direction.

The maximum horizontal length between landings shall not exceed 9 m (29'-6").

Landings shall

- be at least as wide as the widest ramp run leading to it;
- have a minimum size not less than 2440 x 2440 mm (96 x 96 in.) if located at the top or



**Figure 4.1.9.1**  
Minimum Ramp Landing Dimensions

### 4.1.9 RAMPS

### 4.1 ACCESS AND CIRCULATION

bottom of a *ramp* or if served by a doorway. (In a retrofit situation where creating a suitably sized landing is *technically infeasible*, the required landing size may be reduced to 1670 x 1670 mm. (65-3/4 x 65-3/4 in.);

- where an intermediate landing at the switchback of a U-shaped *ramp* (Refer to Figure 4.1.9.1), have a length not less than 1670 mm (65-3/4 in.) and a width not less than 2440 mm (96 in.). In a retrofit situation where creating a suitably sized landing is *technically infeasible*, the required landing width may be reduced to 2120 mm (84in);

- where an intermediate landing at the corner of an L-shaped *ramp* (Refer to Figure 4.1.9.1), have a length and width not less than 1670 mm (65-3/4 in.); and
- where an intermediate landing at a straight *ramp* (Refer to Figure 4.1.9.1), have a length not less than 1670 mm (65-3/4 in.).

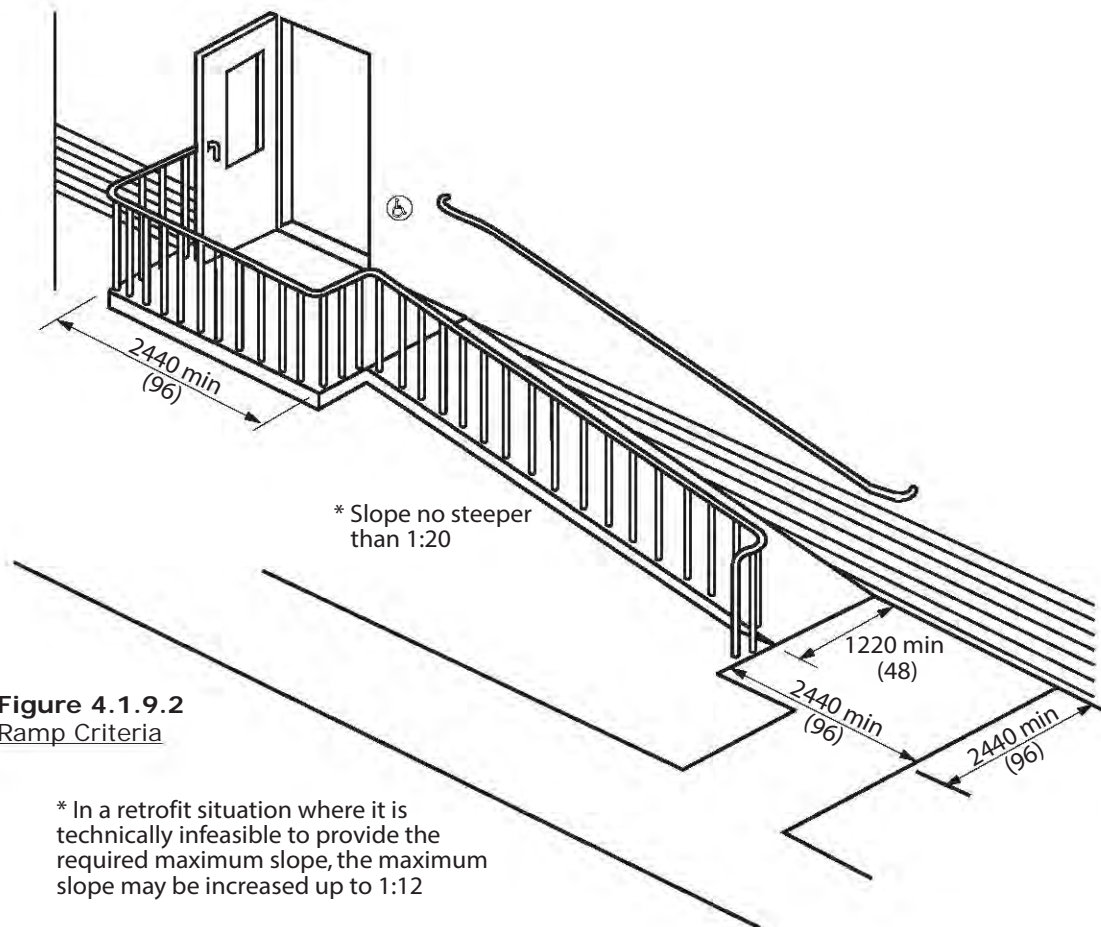
Ramp and landing surfaces shall be slip-resistant.

Outdoor *ramps* and their approaches shall be designed so that water will not accumulate on walking surfaces.

Edges of *ramps* and landings shall be protected with a wall or *guard* on all sides.

Where a *guard* is provided, it shall

- comply with the requirements of the Ontario Building Code;
- be provided
  - with a curb at least 75 mm (3 in.) high on any side of the *ramp* where no solid enclosure or *guard* is provided; and
  - with railings or other barriers that extend to within 50 mm (2 in.) of the finished *ramp*, or have a curb not less than 75 mm (3 in.) high.



4.1 ACCESS AND CIRCULATION

4.1.9 RAMPS

**DESIGN REQUIREMENTS**  
(Continued)

A ramp run with a rise greater than 150 mm (6 in.) shall have handrails which

- are on both sides;
- comply with 4.1.12;
- are continuous on the inside of switchback (U-shaped) or L-shaped ramps;
- extend horizontally at least 300 mm (11-3/4 in.) beyond the top and bottom of the ramp and return to the wall, floor, or post;

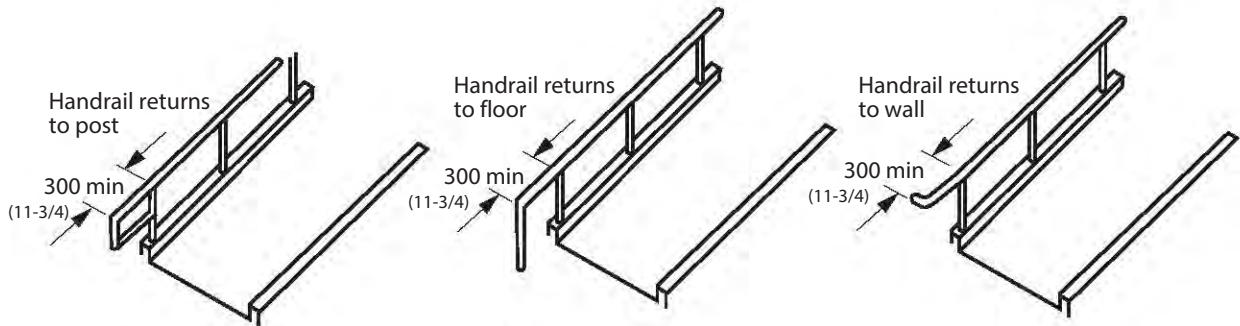
- measure between 865 mm (34 in.) and 920 mm (36 in.) from the ramp surface to the top of the handrail; and
- have a width between handrails of 950 mm - 1100 mm (37-1/2 to 43-1/4 in.).

EXCEPTION: Where a ramp serves as an aisleway for fixed seating, the requirement for ramp handrails does not apply.

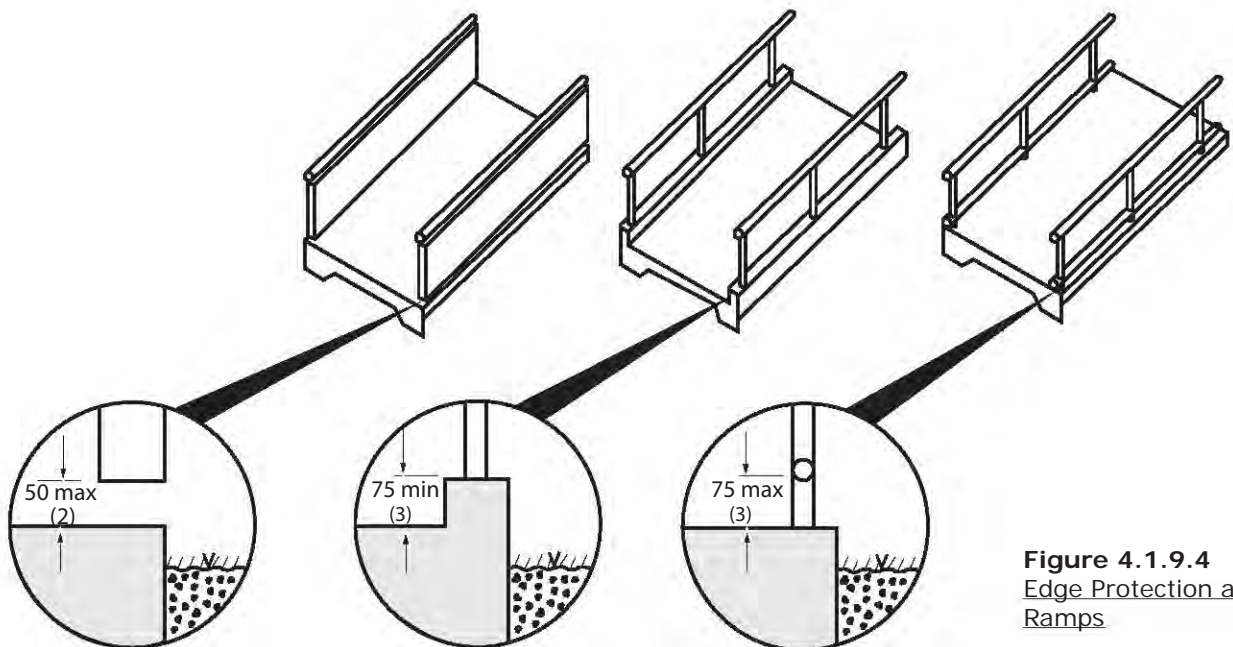
Designated areas for snow piling to be provided at exterior ramps, located away from pedestrian routes.

**RELATED SECTIONS**

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.6 Doors
- 4.1.10 Curb Ramps
- 4.1.12 Handrails
- 4.4.7 Signage
- 4.4.8 Detectable Warning Surfaces
- 4.4.12 Glare and Light Sources
- 4.4.13 Lighting
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour



**Figure 4.1.9.3**  
Horizontal Handrail Extensions



**Figure 4.1.9.4**  
Edge Protection at Ramps



## 4.1.10 CURB RAMPS

### 4.1 ACCESS AND CIRCULATION

#### RATIONALE

In the interest of moving people safely and efficiently off a roadway, the design of curb ramps is very important. The same issues related to the slopes of ramps apply equally to slopes of curb ramps. A well-designed curb ramp can be spoiled by an uneven or gapped transition between the road surface and curb ramp. Flared sides on the curb ramp eliminate the hazard of pedestrians stepping off of an edge. While a smooth transition and minimal slope are ideal for someone in a wheelchair, they are a potential hazard to an individual with a visual impairment who may not notice the transition from sidewalk to street. Textured surfaces become an important safety feature in this scenario.

Snow accumulation at curb ramps should be removed completely after each snow fall.

#### APPLICATION

Curb ramps complying with this section shall be provided wherever any path of travel crosses a curb.

#### DESIGN REQUIREMENTS

Accessible curb ramps shall be on an accessible route complying with 4.1.4.

The running slope shall be between 1:50 and 1:20 (2%-5%). In a retrofit situation where it is technically infeasible to achieve these slopes, a running slope no steeper than 1:12 (8.3%) may be used.

The minimum width of curb ramps, exclusive of flared sides, shall be 1500 mm (59 in.), except where the Alternate Ramp Curb configuration is used (Refer to Figure 4.1.10.2), where the minimum width at the top of the ramp may be reduced to 1220 mm (48 in.).

Flared sides shall typically be 900 mm (35-1/2 in.) as illustrated, measured at the curb location, with a slope not more than 1"12 where pedestrians are likely to walk across them.

Curb ramp configuration shall be as illustrated in Figures 4.1.10.1 to 4.1.10.7.

The maximum cross fall of gutters and road surfaces immediately adjacent to curb ramps shall be 1:20.

Figure 4.1.10.1  
Standard Curb Ramp

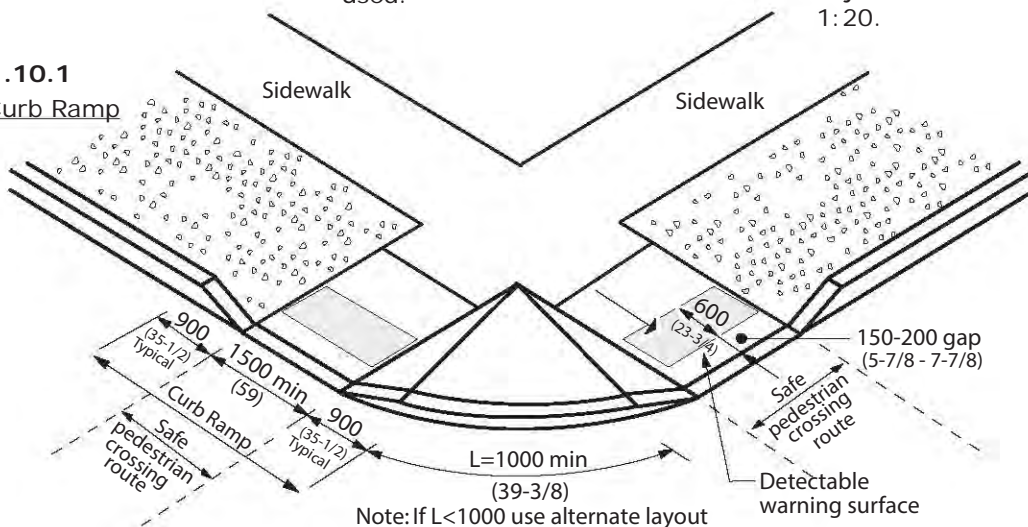
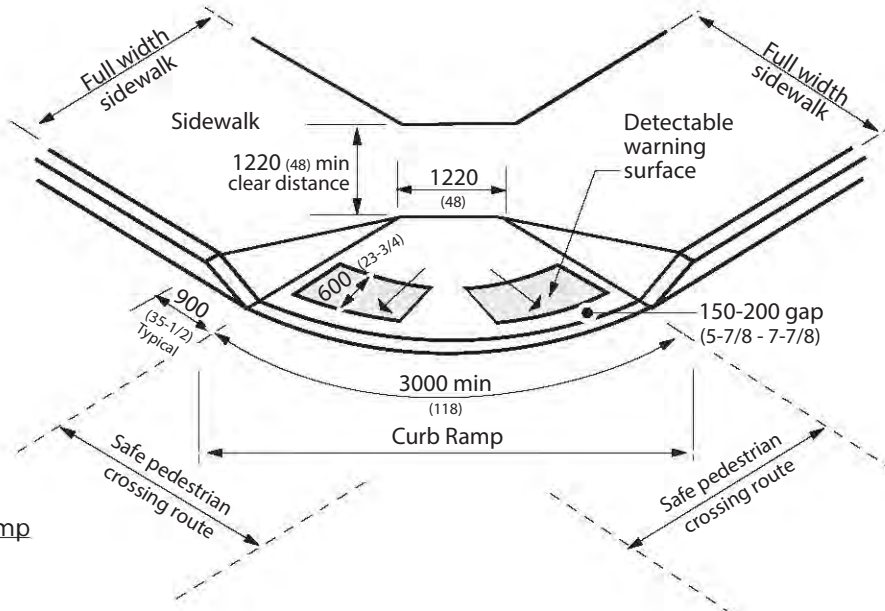


Figure 4.1.10.2  
Alternate Curb Ramp



4.1 ACCESS AND CIRCULATION

4.1.10 CURB RAMPS

**DESIGN REQUIREMENTS**  
(Continued)

Curb ramps at pedestrian crosswalks shall be wholly contained within the area designated for pedestrian use.

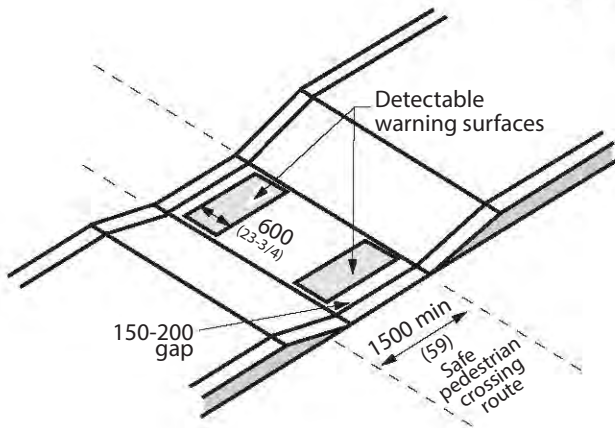
Surfaces of curb ramps shall

- be slip-resistant; and
- incorporate a truncated dome detectable warning surface
  - in compliance with 4.4.8;
  - 600 mm (23-5/8 in.) long, starting 150-200 (5-7/8 to 7-7/8 in) back from the edge of the curb;
  - extending the entire width of the ramp;
  - have a smooth transition from the ramp and adjacent surfaces.

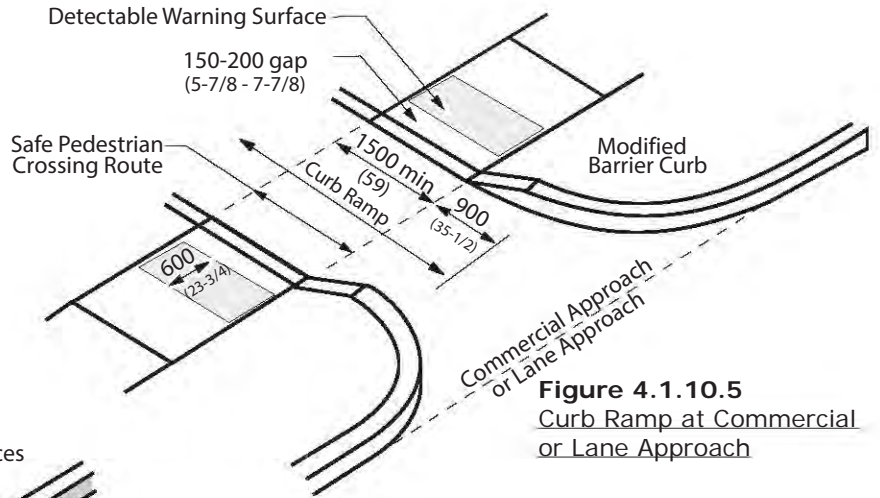
Designated areas for snow piling to be provided at all curb ramps, located away from pedestrian routes.

**RELATED SECTIONS**

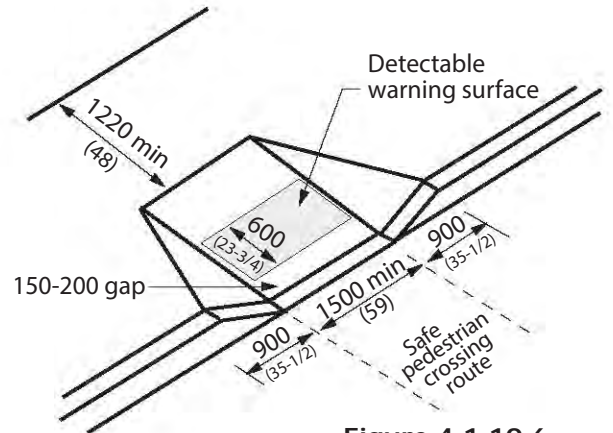
- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.4.8 Detectable Warning Surfaces
- 4.4.12 Glare and Light Sources
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour



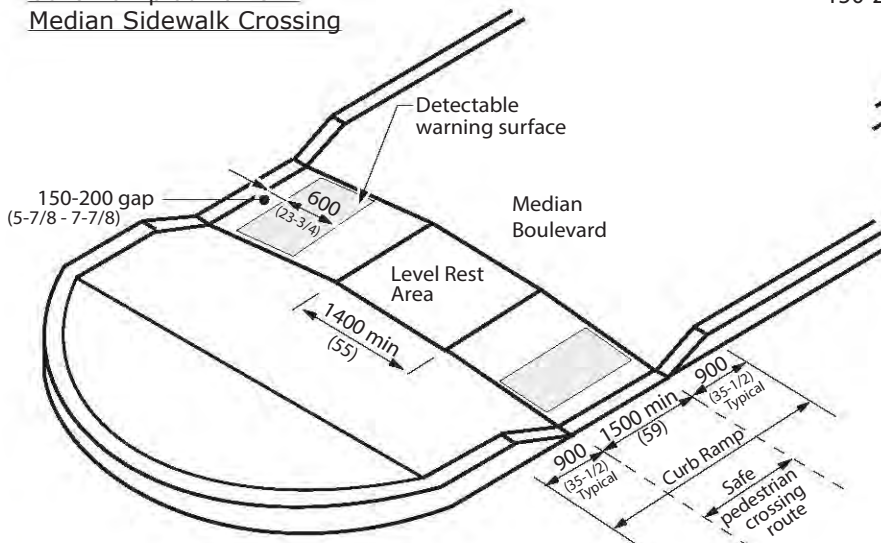
**Figure 4.1.10.3**  
Curb Ramp at Narrow Median Sidewalk Crossing



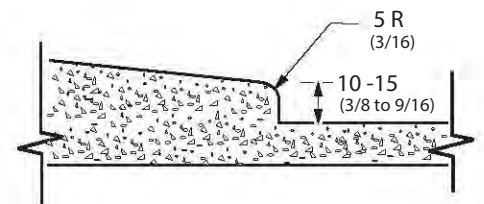
**Figure 4.1.10.5**  
Curb Ramp at Commercial or Lane Approach



**Figure 4.1.10.6**  
Curb Ramp at Mid-Block Crossing



**Figure 4.1.10.4**  
Curb Ramp at Wide Median Sidewalk Crossing



**Figure 4.1.10.7**  
Curb Ramp Transition at Pavement



## 4.1.11 STAIRS

## 4.1 ACCESS AND CIRCULATION

### RATIONALE

Stairs that are comfortable for many adults may be challenging for children, seniors or persons of short stature. Poorly designed nosings can present tripping hazards, particularly to persons with prosthetic devices or those using canes. Cues to warn a person with a visual impairment of an upcoming set of stairs are vitally important.

The appropriate application of *handrails* will aid all users navigating stairways.

### APPLICATION

Interior and exterior stairs shall comply with this section. In a retrofit situation

- stairs need not comply if they connect levels that are *accessible* by an elevator, *ramp* or other *accessible* means of vertical access; and
- dimensional changes to steps and landings are not required however all other design requirements must be met.

### DESIGN REQUIREMENTS

A flight of stairs shall

- have uniform riser heights (rise) and uniform tread depths (run);
- have a rise not more than 180 mm (7 in.) and not less than 125 mm (4-7/8 in.) high;
- have a run not more than 355 mm (14 in.) and not less than 280 mm (11 in.) deep, measured from riser to riser;
- incorporate *detectable warning surfaces* in compliance with 4.4.8.; and
- have no open risers.

Nosings shall

- project not more than 25 mm (1 in.);
- have no abrupt undersides;
- have a curved or bevelled leading tread edge of between 6 mm (1/4 in.) and 10 mm (3/8 in.);
- where projecting, be sloped to the riser at an angle not less than 60 degrees to the horizontal;
- be illuminated to a level of at least 100 lux (9.2 ft-candles);

- be slip-resistant; and
- have the horizontal and vertical surface of the stair nosing in colour contrast with the remainder of the riser and the tread.

Stairs shall incorporate *detectable warning surfaces* in compliance with 4.4.8.

Handrails for stairs shall

- comply with 4.1.12;
- be installed on both sides;
- be of uniform height, ranging between 865 mm (34 in.) and 920 mm (36 in.) above the stair nosing;
- have a continuous inside *handrail* on switchback stairs; and
- extend at the bottom of the stairs for a distance of one tread depth beyond the first riser, then horizontally not less than 300 mm (11-3/4 in.), at a height ranging between 865 mm (34 in.) and 920 mm (36 in.) above the floor;

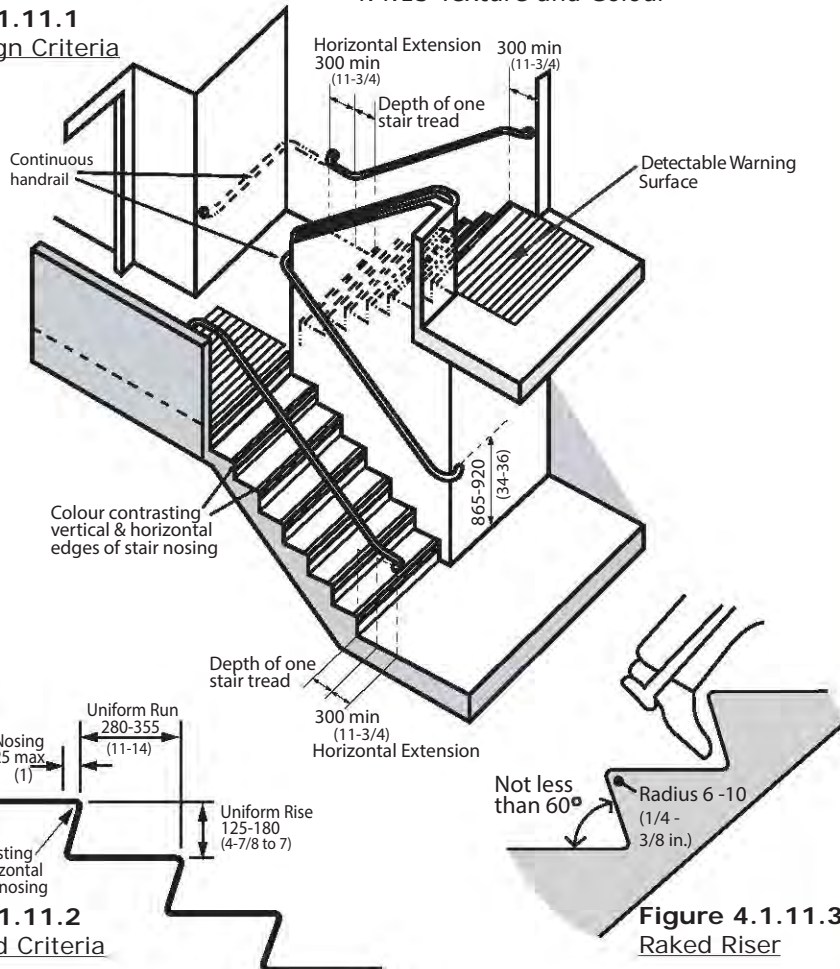
- extend horizontally at the top of the stairs not less than 300 mm (11-3/4 in.), at a height ranging between 865 mm (34 in.) and 920 mm (36 in.) above the floor; and
- return to the wall, or post in a manner that will not obstruct pedestrian travel or create a hazard.

Designated areas for snow piling to be provided at exterior stairs, located away from pedestrian routes.

### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.6 Doors
- 4.1.12 Handrails
- 4.4.7 Signage
- 4.4.8 Detectable Warning Surfaces
- 4.4.12 Glare and Light Sources
- 4.4.13 Lighting
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour

**Figure 4.1.11.1**  
Stair Design Criteria



**Figure 4.1.11.2**  
Stair Tread Criteria

**Figure 4.1.11.3**  
Raked Riser

## 4.1 ACCESS AND CIRCULATION

### 4.1.12 HANDRAILS

#### RATIONALE

In the design of *handrails*, consideration must be given to the range of hands that will grasp them. A *handrail* profile should be graspable for an adult hand as well as a child or a person with arthritis. The same is true for the heights of *handrails*.

Extensions of the *handrails* at the top and bottom of stairs, along with the use of a contrasting colour, provide important cues for a person with a visual *impairment*, and provide a support to ensure a safe and stable gait before ascending or descending the stairs. A continuous *handrail* with no interruptions ensures that a handhold will not be broken.

The *clear space* between the wall and *handrail* is also essential, as it must provide a *clear* area for the hand and knuckles but must not offer enough space into which an arm may slip during a fall or stumble on the stairs.

#### APPLICATION

Handrails shall comply with this section.

#### DESIGN REQUIREMENTS

Handrails shall

- be mounted 865 - 920 mm (34-36 in.) high, measured vertically from a line drawn through the outer edges of the stair nosings or from the surface of a ramp;
- have a circular section 30-40 mm (1-3/16 in. - 1-9/16 in.) in diameter or any non-circular shape, with a graspable portion that has a perimeter not less than 100 mm (4 in.) and not more than 125 mm (5 in.) whose largest cross-sectional dimension is not more than 45 mm (1-3/4 in.);
- be free of any sharp or abrasive *elements*;
- have continuous gripping surfaces, without interruption by newel posts, other construction *elements*, or obstructions that can break a handhold; and
- have a *clear space* between the *handrail* and the wall of
  - at least 50 mm (2 in.); or
  - at least 60 mm (2-3/8 in.) where the wall has a rough surface.
- be terminated in a manner that will not obstruct pedestrian travel or create a hazard.

A recess containing a *handrail* shall extend at least 450 mm (17-3/4 in.) above the top of the rail.

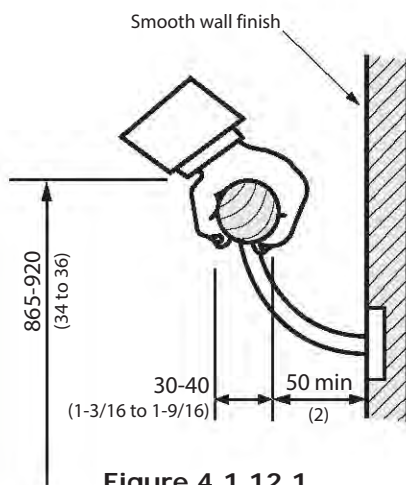
Handrails and their supports shall be designed and constructed to withstand the loading values obtained from the nonconcurring application of

- a concentrated load of not less than 0.9 kN (200 lb.) applied at any point and in any direction; and
- a uniform load of not less than 0.7 kN/m (47 lb./ft.) applied in any direction to the *handrail*.

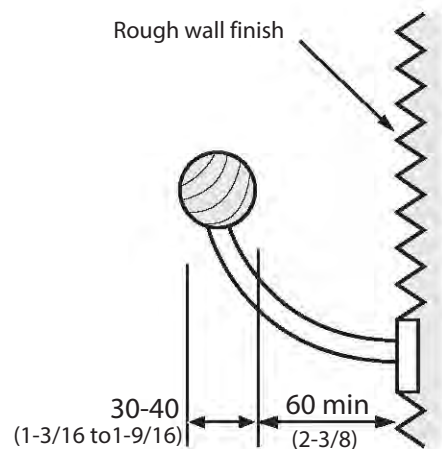
Handrails shall incorporate a pronounced colour contrast, to differentiate them from the surrounding environment.

#### RELATED SECTIONS

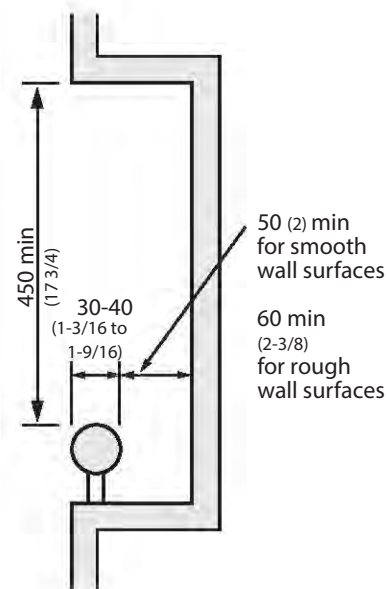
- 4.1.1 Space and Reach Requirements
- 4.1.9 Ramps
- 4.1.11 Stairs
- 4.4.15 Texture and Colour



**Figure 4.1.12.1**  
**Handrail**



**Figure 4.1.12.2**  
**Handrail at Rough Wall**



**Figure 4.1.12.3**  
**Handrail in Recess**

## 4.1.13 ESCALATORS

## 4.1 ACCESS AND CIRCULATION

### RATIONALE

Boarding and stepping off of an escalator can be challenging for many persons who could have difficulty with the timing or agility. In addition, any lack of contrast on the edge of steps makes it difficult to determine the position of the steps or judge their speed. *Detectable warning surfaces* extending in front of the escalator provide warning to any pedestrian, especially someone with a visual *impairment*. Contrasting colour strips on stair edges are also necessary.

### APPLICATION

Escalators shall comply with this section.

Where escalators are provided, an alternate *accessible route* shall also be provided in the same vicinity as the escalator.

### DESIGN REQUIREMENTS

Escalator installations shall include high definition (colour contrast) of tread edges and nosing.

*Detectable warning surfaces* in compliance with 4.4.8 shall be provided at the head and foot of the escalator.

The surface of escalator treads shall be in a matte finish, to minimize reflected glare.

Lighting over escalators shall be a minimum of 200 lux (18.4 ft-candles), evenly distributed, from a low-glare light source.

### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.4.7 Signage
- 4.4.8 Detectable Warning Surfaces
- 4.4.12 Glare and Light Sources
- 4.4.13 Lighting
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour

## 4.1 ACCESS AND CIRCULATION

### 4.1.14 ELEVATORS

#### RATIONALE

The buttons used on elevators need to address a range of functional issues, including reach, dexterity and visual impairments, as discussed in 4.4.2 and 4.4.15. More specific to elevators is the need to provide audible cues for individuals with a visual impairment to identify different floor levels, as well as the direction of travel. These are, in fact, of benefit to anyone who uses the elevator. Adequate door-closing delays provide individuals using mobility devices additional time to reach, enter or exit the elevator car. The installation of a mirror can assist individuals using mobility devices to back out of an elevator where there is not sufficient space to turn around.

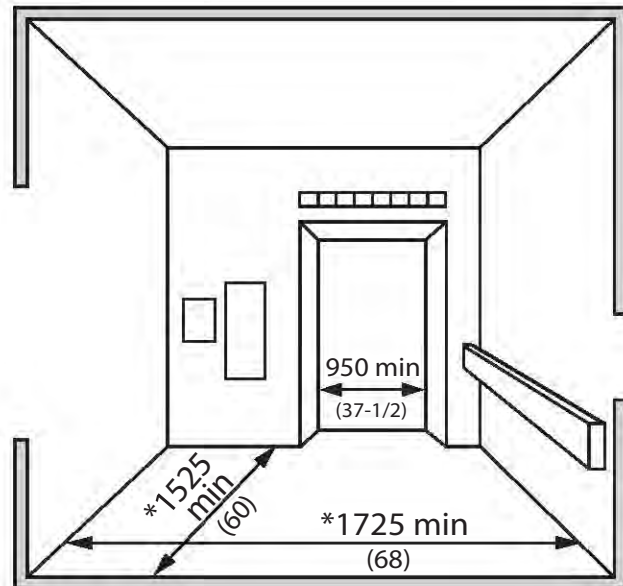
#### APPLICATION

One passenger elevator complying with this section shall serve each level, including *mezzanines*, in all multi-storey facilities, unless exempted below. If more than one elevator is provided, each passenger elevator shall comply with this section.

Freight elevators shall not be required to meet the requirements of this section, unless the only elevators provided are used as combination passenger and freight elevators for use by the public and employees.

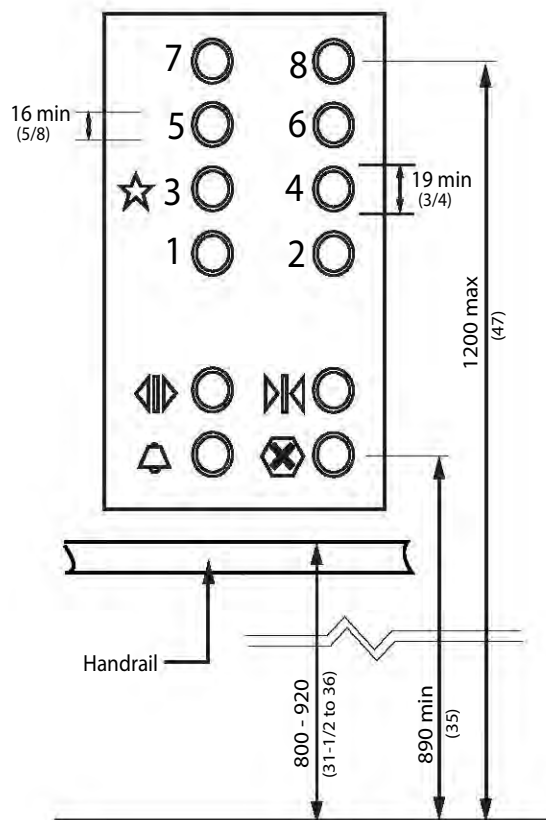
Elevator access is not required:

- in elevator pits, elevator penthouses, mechanical rooms, piping or equipment catwalks;
- when *accessible ramps* in compliance with 4.1.9 are used in lieu of an elevator;
- to levels of fire halls and ambulance stations not served by grade-level entry, which do not contain *public use facilities*; and
- when platform lifts (wheelchair lifts) in compliance with 4.1.15 and applicable Provincial Codes are used in lieu of an elevator, only under the following conditions:
  - to provide an *accessible route* to a performing area in an assembly occupancy;



**Figure 4.1.14.1**  
Elevator Cab

\* In high-use public facilities, increase minimum dimensions to 2030 x 1525 mm (80 x 60 in.)



**Figure 4.1.14.2**  
Control Panel



### 4.1.14 ELEVATORS

### 4.1 ACCESS AND CIRCULATION

- to comply with wheelchair viewing position line-of-sight and dispersion requirements of 4.3.2;
- to provide access to incidental occupied spaces and rooms that are not open to the general public and which house no more than five persons, including, but not limited to, equipment control rooms and projection booths; and
- to provide access to raised judges' benches, clerks' stations, speakers' platforms, jury boxes and witness stands or to depressed areas, such as the well of a court.

level to ± 13 mm (1/2 in.).

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

The clear width for elevator doors shall be minimum 950 mm (37-1/2 in.). In a retrofit situation where it is technically infeasible to provide a clear width of 950 mm (37-1/2 in.), the clear elevator door width may be reduced to 900 mm (35 in.).

Doors shall be provided with a door re-opening device that will function to stop and reopen the car door and an adjacent hoist way door to minimum 950 mm (37-1/2 in.), in the event the car door is obstructed while closing. This re-opening device shall also be capable of sensing an object or person in the path of a closing door at a nominal 125 ± 25 mm (5 ± 1 in.) and 735 ± 25 mm (29 ± 1 in.) above the floor without requiring contact for activation.

Elevator doors should remain fully open for minimum 8 seconds. This time may be reduced by operation of the door-close button.

The minimum distance between the walls or between wall and door,

excluding return panels, shall not be less than 1725 x 1525 mm (68 in. x 60 in.). In facilities with high public use, such as arenas, libraries or entertainment complexes, the distance between walls or between wall and door shall be 2030 x 1525 mm (80 in. x 60 in.). Exception: In a retrofit situation where it is technically infeasible to install an appropriately sized elevator, a LU/LA (Limited Use/Limited Application) elevating device with a platform length of at least 1525 mm (60 in.), may be used.

Car controls shall be readily accessible from a wheelchair upon entering an elevator.

Floor register buttons in elevator cabs shall

- be a minimum 19 mm (3/4 in.) in size and may be raised, flush or recessed. The depth of flush or recessed buttons when they are being operated shall not exceed 10 mm (3/8 in.); and
- be provided with visual and momentary audible indicators to show when each call is registered. The visual indicators shall be extinguished when each call is answered.

All car control buttons shall be designated by Grade 2 Braille characters and by raised standard alphabet characters for letters, Arabic characters for numbers, and standard symbols. Markings shall be a minimum of 16 mm (5/8 in.) high and raised a minimum of 0.75 mm (1/32 in.), placed immediately to the left of the buttons to which they apply. Exception: Where the call buttons are mechanical, the raised markings may be on the buttons.

Emergency car controls and door-operating buttons shall be grouped together at the bottom of the control panel. The centre line of the alarm button and the emergency stop switch shall be not less than 890 mm (35 in.) above the floor. The centre line of the highest floor button shall be no higher than 1200 mm (47 in.) above the floor. Other controls may be located where it is convenient.

#### DESIGN REQUIREMENTS

Accessible elevators shall be on an accessible route in compliance with 4.1.4.

Accessible elevators shall be identified by signage in compliance with applicable provisions of 4.4.7.

Elevators shall be automatic and be provided with a two-way automatic-leveling device to maintain the floor

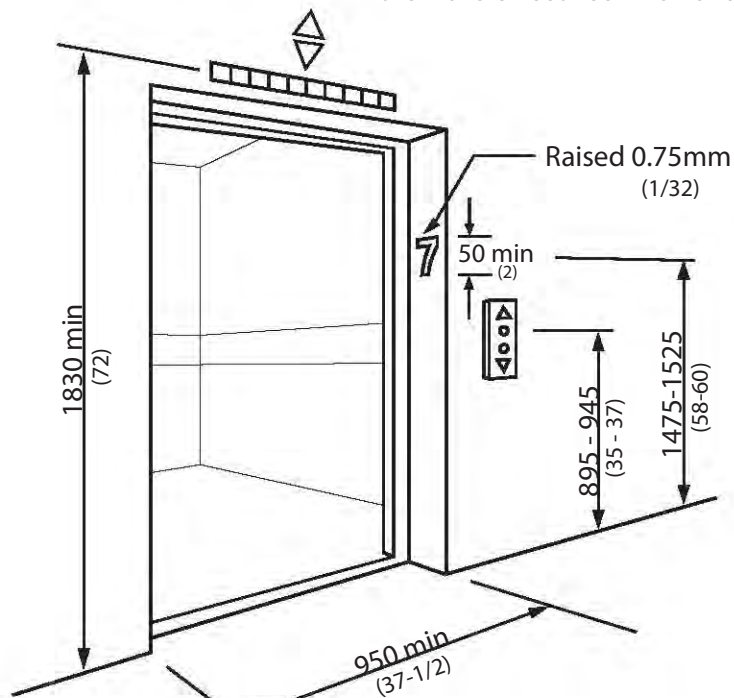


Figure 4.1.14.3 Elevator Entry

4.1 ACCESS AND CIRCULATION

4.1.14 ELEVATORS

**DESIGN REQUIREMENTS**  
(Continued)

An indicator shall be provided in the car to show the position of the car in the hoist way, by illuminating the indicator corresponding to the landing at which the car is stopped or passing. Indication characters shall be on a contrasting colour background and a minimum of 16 mm (5/8 in.) high.

Floors of elevator cabs shall have a firm and slip-resistant surface that permits easy movement of wheelchairs or scooters.

Handrails shall be provided on all non-access walls at a height of 800 to 920 mm (31-1/2 to 36 in.) with a space of 40 to 45 mm (1-9/16 to 1-3/4 in.) between the rails and wall.

The illumination at the car controls and landing sill shall be not less than 100 lux (10 ft-candles).

The centre line of hall call buttons shall be 920 ± 25 mm (36 ± 1 in.) above the floor. Buttons shall be a minimum of 20 mm (13/16 in.) in size, mounted one above the other.

Hall visual indication shall be provided to show each call that is registered and that is extinguished when the call is answered.

Hall or in-car lanterns shall be provided. The centre line of the fixture shall be a minimum of 1830 mm (72 in.) above the floor. An audible signal shall be provided when the elevator stops at the landing. Visual *elements* shall be a minimum of 60 mm (2-3/8 in.) in the smallest direction.

All elevator hoist way *entrances* shall have raised Arabic numerals and Braille floor designations provided on both jambs. The characters shall be a minimum of 50 mm high (2 in.) and raised at least 0.75 mm (1/32 in.) and shall be placed on both sides of the door jambs, with the centreline at 1500 ± 25 mm (59 ± 1 in.) from the floor.

As the car stops at a floor, the floor

and direction of travel shall be announced using voice-annunciation technology.

Elevators shall be linked by an emergency call system to a monitored location within the *facility* with two-way communication ability. The highest *operable portion* of the 2-way communication system shall be a maximum of 1200 mm (47 in.) above the floor of the car. It shall be identified by a raised symbol and lettering located adjacent to the device. The symbol shall be a minimum of 38 mm (1-1/2 in.) high and raised a minimum of 0.75 mm (1/32 in.). Permanently attached plates are acceptable. If the system uses a handset, then the length of the cord from the panel to the handset shall be minimum 735 mm (29 in.). Additionally, the handset shall be equipped with a receiver that generates a magnetic field in the area of the receiver cap, and the handset shall have a volume control and shall comply with CSA Standard T515. If the system is located in a closed compartment, the compartment door and hardware shall conform to 4.4.2. The emergency intercommunication system shall not require voice communication.

Lighting in elevator cabs shall be minimum 100 lux (9.2 ft-candles), measured at the floor level and at the same lighting level as the adjacent lobby *space*.

Mirrors shall not be used below a

height of 2000 mm (78-3/4 in.) within elevator cabs as a finish material on the wall opposite the door.

Where the dimension of elevator cabs is less than 1500 mm (59 in.) in any direction, an angled mirror shall be provided above a height of 2000 mm (78-3/4 in.) on the wall opposite the door, to assist persons who use wheelchairs to back out.

Floor finishes within elevator cabs shall comply with 4.1.2.

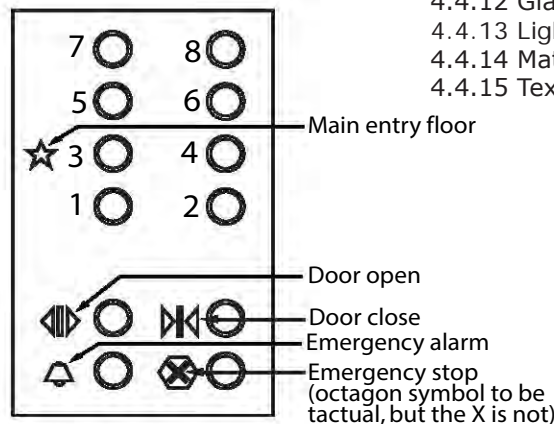
Where an elevator serves only two floors, it shall be programmed to move automatically, without the need to activate in-car control buttons.

Elevator doors shall incorporate pronounced colour contrast, to differentiate them from the surrounding environment.

There shall be a pronounced colour contrast between the car sill and the *facility* floor.

**RELATED SECTIONS**

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.6 Doors
- 4.1.12 Handrails
- 4.1.15 Platform Lifts
- 4.4.2 Controls and Operating Mechanisms
- 4.4.7 Signage
- 4.4.9 Public Address Systems
- 4.4.11 Card Access, Safety and Security Systems
- 4.4.12 Glare and Light Sources
- 4.4.13 Lighting
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour



**Figure 4.1.14.4**  
Tactile Symbols

## 4.1.15 PLATFORM LIFTS

## 4.1 ACCESS AND CIRCULATION

### RATIONALE

Platform lifts are typical in retrofit applications. Elevators that are used by all facility users are preferred to platform lifts which tend to segregate persons with disabilities and limit space at *entrance* and stair locations. Furthermore, independent access is often compromised, as platform lifts are often controlled by key operation. Whenever possible, grading or integrated elevator access should be incorporated to avoid the use of lifts.

If there are no suitable alternatives, lifts must be selected to permit the spatial requirement of larger mobility devices such as scooters.

### APPLICATION

*Accessible* platform lifts shall comply with this section.

Platform lifts may only be used in lieu of an elevator or *ramp* where allowable under 4.1.14.

Exception: Where it is *technically infeasible* to install an elevator, LU/LA (Limited Use/Limited Application) elevating device, or other *accessible* means of change of level.

### DESIGN REQUIREMENTS

*Accessible* platform lifts shall

- be on an *accessible route* complying with 4.1.4;
- be identified with *signage* complying with applicable provisions of 4.4.7;
- comply with CSA standard CAN/CSA B355 (latest edition); and
- facilitate unassisted entry, operation, and exit from the lift.

The platform size shall be no less than 890 x 1525 mm (35 x 60 in.).

The platform shall incorporate safety wheel-guards along all exposed edges.

The doors to the platform lift shall comply with 4.1.6.

Controls and operating mechanisms shall comply with 4.4.2.

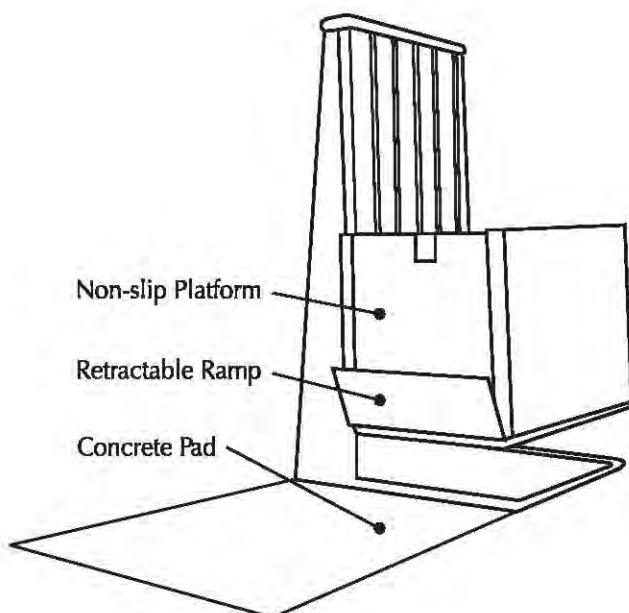
Platform lifts shall be linked by an emergency call system to a monitored location within the *facility*, with two-way communication ability. The highest *operable portion* of the two-way communication system shall be a maximum of 1200 mm (47 in.) from the floor of the platform. If the

system uses a handset, then the length of the cord from the panel to the handset shall be at least 735 mm (29 in.). If the system is located in a closed compartment, the compartment door and hardware shall conform to 4.4.2.

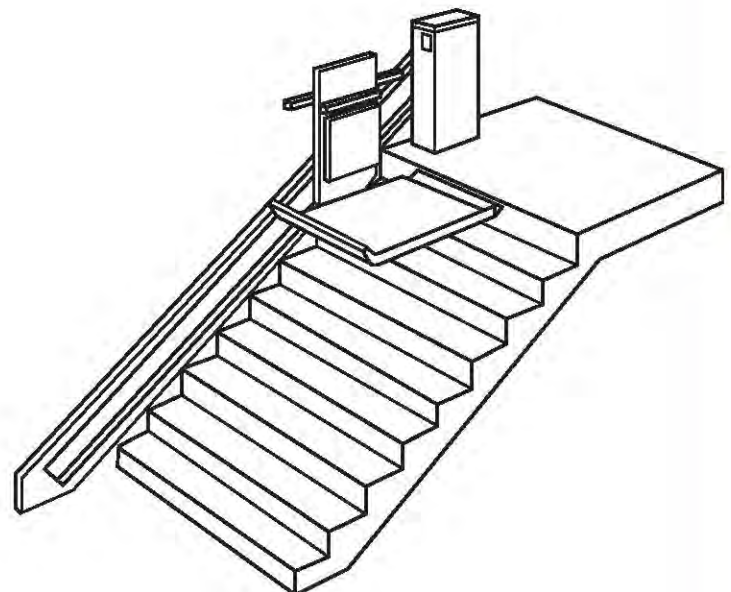
Floor finishes within platform lifts shall comply with 4.1.2 and 4.4.14.

### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.6 Doors
- 4.1.12 Handrails
- 4.1.14 Elevators
- 4.4.2 Controls and Operating Mechanisms
- 4.4.7 Signage
- 4.4.9 Public Address Systems
- 4.4.11 Card Access, Safety and Security Systems
- 4.4.12 Glare and Light Sources
- 4.4.13 Lighting
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour



**Figure 4.1.15.1**  
Vertical Platform Lift



**Figure 4.1.15.2**  
Inclined Platform Stair-Lift



## 4.2 WASHROOM FACILITIES

### RATIONALE

As an integral feature of a *facility*, washroom *facilities* should accommodate the range of people that will use the space. Although many persons with disabilities use toilet *facilities* independently, some may require assistance. Where the individual providing assistance is of the opposite gender then typical gender-specific washrooms are awkward and an individual washroom is preferred.

Parents and caregivers with small children and strollers may also benefit from a large, individual washroom with toilet and change *facilities* contained within the same *space*.

Circumstances such as wet surfaces and the act of transferring between toilet and wheelchair or scooter can make toilet *facilities* accident-prone areas. An individual falling in a washroom with a door that swings inward could prevent his or her own rescuers from opening the door. Due to the risk of accidents, design decisions such as door swings and material finishes have safety implications and therefore make toilet *facilities* a prime location for emergency call switches. The appropriate design of all features will increase the usability and safety of all toilet *facilities*.

The identification of washrooms involves design issues that must be considered. For children or someone who cannot read text, a symbol or pictogram is preferred. A person with a visual *impairment* would also benefit from accessible *signage*. Features such as colour-contrasting door frames and door hardware will also increase accessibility.

### APPLICATION

Where toilet *facilities* are provided, each public or *common use* toilet *facility* shall comply with this section. Other toilet rooms provided for the use of occupants of specific

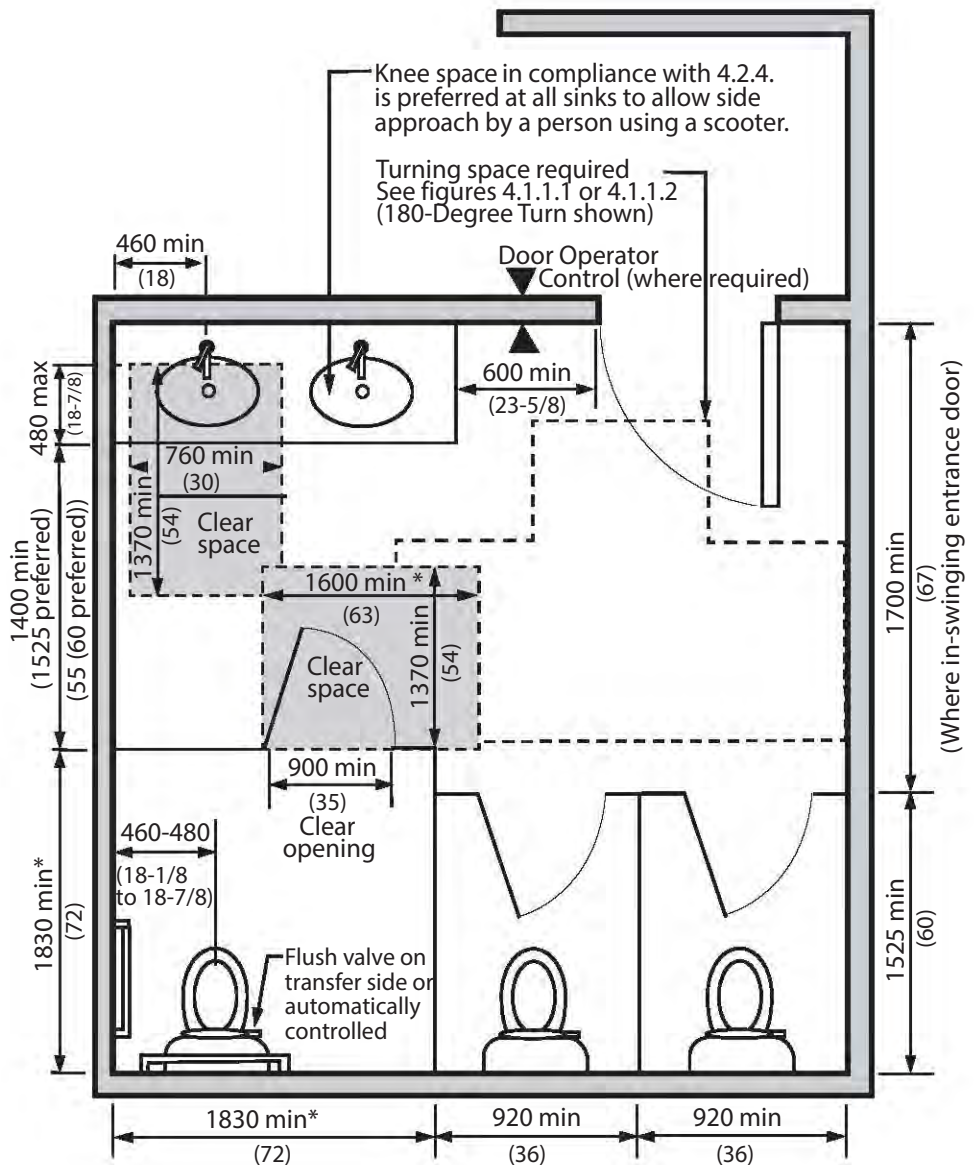
## 4.2.1 TOILET FACILITIES

*spaces* (i.e. a private toilet room for the occupant of a private office) shall be *adaptable*.

In a retrofit situation where it is *technically infeasible* to make existing public or *common use* toilet *facilities* accessible, the installation of at least one individual washroom per floor and in compliance with 4.2.7, located in the same area as existing toilet *facilities*, will be permitted in lieu of modifying existing toilet *facilities* to be *accessible*.

In addition to any *accessible* public or *common use* toilets, at least one individual washroom in compliance with 4.2.7 shall be provided in all public buildings and on every floor level in *assembly areas* where the floor incorporates *common* or *public use* washroom *facilities* containing four or more toilet and/or urinal fixtures.

If individual washrooms are not visible from the common or *public use* washrooms, directional *signage* in compliance with 4.4.7 shall be provided.



NOTE: In a retrofit situation where it is technically infeasible to provide the required clearances, the dimension marked with an \* may be reduced to 1525 mm (60 in.).

Figure 4.2.1.1 Washroom Dimensions



## 4.2.1 TOILET FACILITIES

Where bathing *facilities* are provided on a *site*, in conjunction with or in addition to toilet *facilities*, each such public or *common use* bathing *facility* shall comply with this section in addition to 4.2.8, 4.2.9, and other applicable sections of this standard.

For single-user portable toilet units clustered at a single location, a minimum of 5% but no less than one toilet unit in compliance with this section shall be provided at clusters wherever typical inaccessible units are provided. (Exception: Portable toilet units at construction *sites* used exclusively by construction personnel are not required to comply with this section.)

Where an individual washroom is provided primarily for the use of persons of both genders with physical *disabilities*, in lieu of *facilities* for persons with physical *disabilities* in washrooms used by the general public, the individual washroom shall be provided on the same floor level within 45 m (147 ft. 8 in.) of the washrooms used by the general public.

### DESIGN REQUIREMENTS

*Accessible* toilet *facilities* shall

- be on an *accessible route* complying with 4.1.4;
- be identified with *signage* complying with applicable provisions of 4.4.7;
- incorporate a *clear floor space* to allow a person in a wheelchair to make a 180-degree turn; and
- incorporate even illumination throughout of at least 100 lux (10 ft-candles).

All entrance doors to *accessible* toilet rooms shall

- comply with 4.1.6;
- not swing into the *clear floor space* required for any fixture;
- have a minimum 1700 mm (67) clearance between the inside face of an in-swinging entrance door and the outside face of an adjacent toilet stall.

*Accessible* fixtures and controls within toilet and bathing rooms shall

- be on an *accessible route* complying with 4.1.4.
- have a minimum clearance of 1400 mm (55) between the outside face of the *accessible* stall and any wall-mounted fixture or obstruction.

## 4.2 WASHROOM FACILITIES

### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.3 Protruding and Overhead Objects
- 4.1.6 Doors
- 4.2.2 Toilet Stalls
- 4.2.3 Toilets
- 4.2.4 Lavatories
- 4.2.5 Urinals
- 4.2.6 Washroom Accessories
- 4.2.7 Individual Washrooms
- 4.2.8 Bathtubs
- 4.2.9 Shower Stalls
- 4.2.10 Grab Bars
- 4.4.2 Controls and Operating Mechanisms
- 4.4.7 Signage
- 4.4.12 Glare and Light Sources
- 4.4.13 Lighting
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour

4.2 WASHROOM FACILITIES

4.2.2 TOILET STALLS

**RATIONALE**

Manoeuvrability of a wheelchair or scooter is the principal consideration in the design of an *accessible* stall. The increased size of the stall is required to ensure there is sufficient *space* to facilitate proper placement of a wheelchair or scooter to accommodate transfer onto the toilet fixture. Not only is *space* required for mobility equipment, there may also be instances where an individual requires assistance and the stall will have to accommodate a second person.

Door swings are normally outward for safety reasons and *space* considerations, but this makes it difficult to close the door once inside. A handle mounted part way along the door makes it easier for someone to close the door behind them.

Minimum requirements for non-*accessible* toilet stalls are included to ensure that persons who do not use wheelchairs or scooters can be adequately accommodated within any toilet stall. Universal features include *accessible* hardware and a minimum stall width to accommodate persons of large stature or parents with small children.

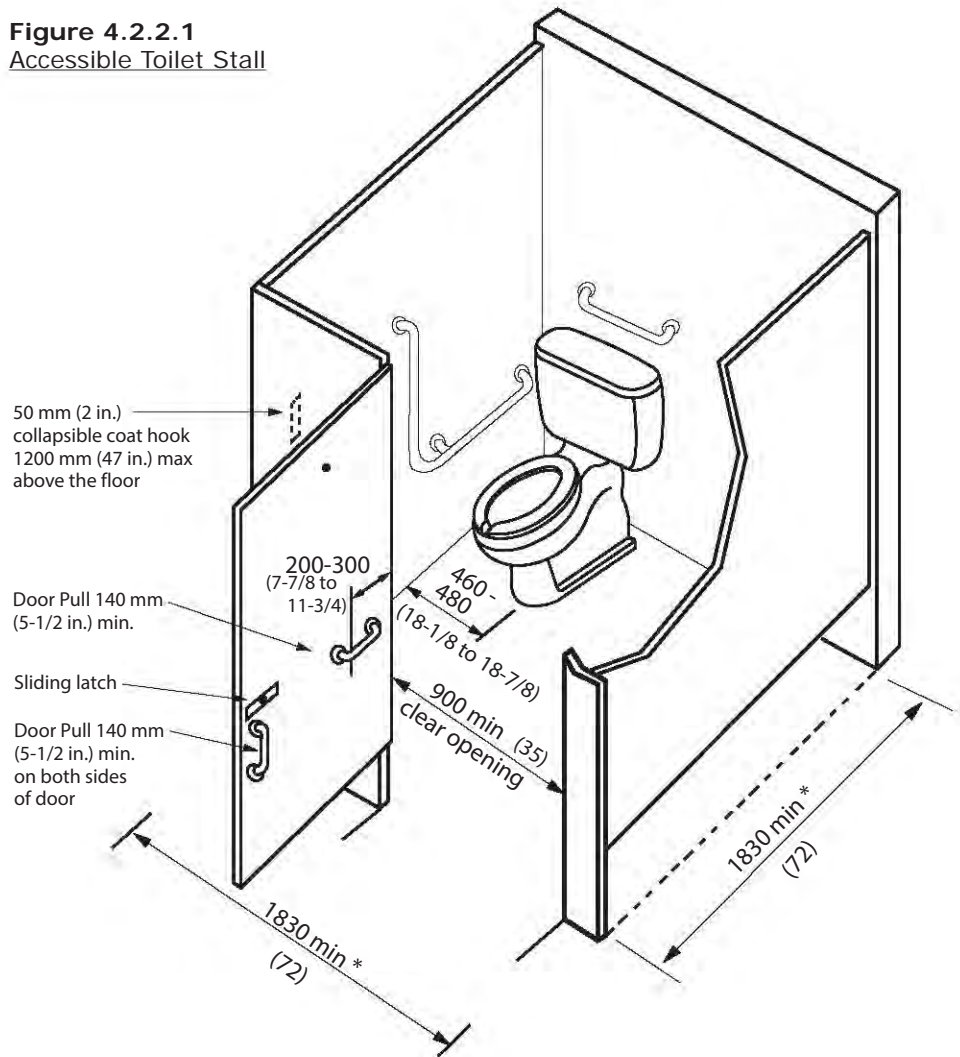
**APPLICATION**

*Accessible* toilet stalls shall comply with this section.

Where toilet stalls are provided in a toilet or bathing *facility*, then the number of *accessible* toilet stalls designated to accommodate persons with *disabilities* shall comply with Table 4.2.2.

All other toilet stalls within a *facility* (i.e., those considered to be non-*accessible*) shall be minimum 920 mm (36 in.) wide by 1525 mm (60 in.) long, and shall incorporate door-locking mechanisms in compliance with this section.

**Figure 4.2.2.1**  
Accessible Toilet Stall



NOTE: In a retrofit situation where it is technically infeasible to provide the required clearances, the dimensions marked with an \* may be reduced. Refer to 4.2.2 - Design Requirements.

# of toilet stalls within the washroom	Required # of accessible toilet stalls
1 - 5	1
More than 5	2

**Table 4.2.2**  
Number of Accessible Toilet Stalls

## 4.2.2 TOILET STALLS

## 4.2 WASHROOM FACILITIES

### DESIGN REQUIREMENTS

All toilet stall doors shall be capable of being locked from the inside by a device that is operable with one hand; does not require fine finger control, tight grasping, pinching, or twisting of the wrist; and requires a force of not more than 22 N (4.9 lb.) to activate (e.g., sliding bolt or lever).

Accessible toilet stalls shall

- be on an *accessible route* in compliance with 4.1.4.
- have internal dimensions at least 1830 x 1830 mm (72 x 72 in.). In a retrofit situation where providing the required internal dimensions is *technically infeasible*, the internal dimensions may be reduced to 1525 x 1525 mm (60 x 60 in.);
- have a toilet fixture in compliance with 4.2.3;
- be equipped with a collapsible coat hook mounted not more than 1200 mm (47 in.) above the floor on a side wall and projecting not more than 50 mm (2 in.) from the wall; and
- have a minimum 920 mm (36 in.) wide *clear transfer space* on one side of the toilet fixture. In a retrofit situation where it is *technically infeasible* to provide a 920 mm (36 in.) wide *clear transfer space*, this *space* may be reduced to 760 mm (30 in.). See 4.2.3. for more details.

Where more than one *accessible* toilet stall is provided within a toilet or bathing *facility*, the stalls shall be configured with the *clear transfer space* (i.e., the *open space* beside the toilet) on opposite sides of the toilet fixtures.

Accessible toilet stall doors shall

- provide a clear opening of at least 900 mm (35 in.) with the door in the open position. In a retrofit situation where it's *technically infeasible* to provide the required *clear opening*, the *clear opening* may be reduced to 810 mm (32 in.);
- swing outward, unless additional *clear floor space* of at least 760 mm x 1370 mm (30 in. x 54 in.) is provided within the stall and

- does not interfere with the arc of the door swing;
- be aligned with the *clear transfer space* adjacent to the toilet fixture;
- be equipped with gravity hinges so that the door closes automatically;
- be provided with a "D"-type contrasting-coloured door pull, at least 140 mm (5-1/2 in.) long, on the inside of an out-swinging door, located so that the centre line is between 200 and 300 mm (7-7/8 in. and 11-3/4 in.) from the hinged side of the door; and
- be provided with a "D"-type contrasting-coloured door pull at least 140 mm (5-1/2 in.) long, on both sides of the door, located near the latch;

Door hardware (operating devices such as handles, pulls, latches, and locks) shall

- be operable by one hand;
- not require fine finger control, tight grasping, pinching, or twisting of the wrist to operate; and

- be mounted between 810 mm (32 in.) and 1200 mm (47 in.) above the floor.

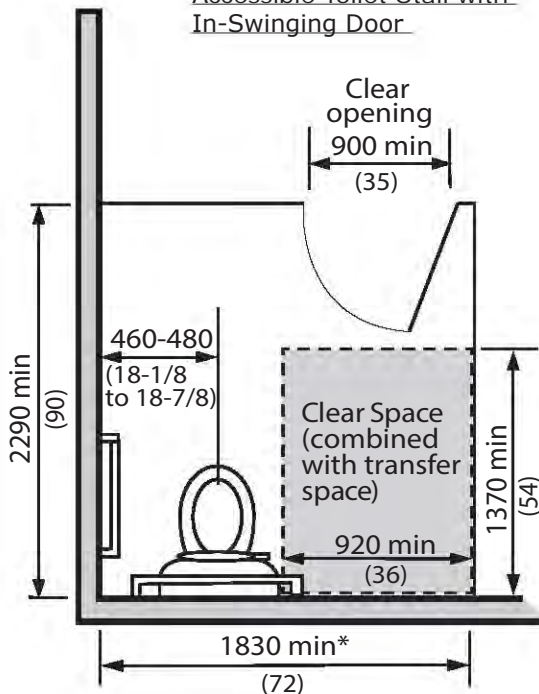
Toilet stall partitions and doors shall be colour-contrasted with the surrounding environment.

Toilets, flush controls and other *elements* shall be designed to meet the requirements of 4.2.3.

### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.3 Protruding and Overhead Objects
- 4.1.6 Doors
- 4.2.3 Toilets
- 4.2.6 Washroom Accessories
- 4.2.10 Grab Bars
- 4.4.2 Controls and Operating Mechanisms
- 4.4.13 Lighting
- 4.4.15 Texture and Colour

Figure 4.2.2.2  
Accessible Toilet Stall with  
In-Swinging Door



Note: In a retrofit situation where it is *technically infeasible* to provide the required clearances, the dimension marked with an \* may be reduced to 1525 mm (60 in.) and the clear transfer space may be reduced to 760 mm (30 in.).

## 4.2 WASHROOM FACILITIES

### 4.2.3 TOILETS

#### RATIONALE

Automatic flush controls are preferred. If flushing mechanisms are not automated, then consideration must be given to the ability to reach a switch and the hand strength or dexterity required to operate it. Lever style handles on the transfer side of the toilet facilitate these considerations.

Appropriate placement of grab bars makes sitting and standing or transfers between the toilet and a mobility device safer.

#### APPLICATION

Accessible toilets shall comply with this section. Wall-mounted toilets are preferred.

#### DESIGN REQUIREMENTS

Toilet fixtures shall have

- the top of the seat between 430 and 460 mm (17 and 18-1/8 in.) above the floor;
- no spring-activated seat;
- a back support where there is no seat lid or tank; and
- the tank top securely attached.

Toilets shall be located between 460 and 480 mm (18-1/8 to 18-7/8 in.) away from the adjacent wall measured from the centre line of the toilet to the surface of the wall.

A clear transfer space, minimum 920 mm (36 in.) wide designed to permit a wheelchair or scooter to back into a clear space beside a toilet fixture, shall be provided on one side of the toilet fixture in all accessible toilet stalls (see 4.2.2.) and in individual washrooms (see 4.2.7.). In a retrofit situation where it is technically infeasible to provide a 920 mm (36 in.) wide clear transfer space, this space may be reduced to 760 mm (30 in.).

The clear transfer space shall be clear of obstructions (such as garbage bins or baby change tables). EXCEPTION: Sanitary napkin disposal units may be

installed within the transfer space provided they are recessed or protrude not more than 100 mm (4 in.) into this space.

Toilet flush controls shall be

- hand-operated on the transfer side of the toilet; or
- be electronically automatically controlled.

Hand-operated flush controls shall comply with 4.4.2.

Toilets shall be equipped with grab bars that shall

- comply with 4.2.10;
- be L-shaped with 760 mm (30 in.) long horizontal and vertical components mounted with the horizontal component 750 mm - 810 mm (29-1/2 - 32 in.) above the floor and the vertical component 150 mm (5-7/8 in.) in front of the toilet bowl; and
- be at least 600 mm (23-5/8 in.) in length, mounted horizontally on the wall behind the toilet, from 840 mm (33 in.) to 920

mm (36 in.) above the floor, and, where the water closet has a water tank, be mounted minimum 150 mm (5-7/8 in.) above the tank.

Toilet-paper dispensers shall be

- wall mounted;
- located below the grab bar;
- in line with or not more than 300 mm (11-3/4 in.) in front of the toilet seat;
- not less than 600 mm (23-5/8 in.) above the floor; and
- contrasting in colour to the wall.

#### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.2.2 Toilet Stalls
- 4.2.10 Grab Bars
- 4.4.2 Controls and Operating Mechanisms
- 4.4.13 Lighting
- 4.4.15 Texture and Colour

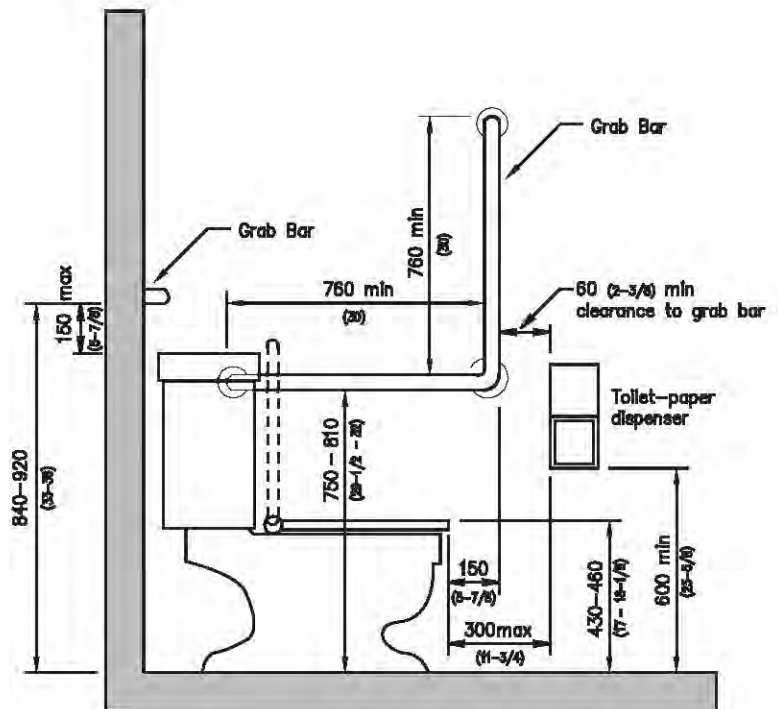


Figure 4.2.3.1  
Grab Bar Configuration



## 4.2.4 LAVATORIES

### RATIONALE

The accessibility of lavatories will be greatly influenced by their operating mechanisms. While faucets with remote-eye technology may initially confuse some individuals, their ease of use is notable. Individuals with hand strength or dexterity difficulties can use lever-style handles. For an individual in a wheelchair, a lower counter height and clearance for knees under the counter would be required. This lower counter may also serve children. The insulating of hot water pipes protects the legs of an individual using a wheelchair. This is particularly important when a disability impairs sensation such that the individual would not sense that their legs were being burned. The combination of shallow sinks and higher water pressures can cause unacceptable splashing at lavatories.

### APPLICATION

All lavatories shall comply with this section. In a retrofit situation where it is *technically infeasible* to have all lavatories comply with this section, at least one lavatory in each *accessible* washroom shall comply.

### DESIGN REQUIREMENTS

Lavatories shall

- be on an *accessible route* complying with 4.1.4;
- be mounted so that the minimum distance between the centre line of the fixture and the side wall is 460 mm (18-1/8 in.);
- have the top located between 820 mm (32-1/4 in.) and 840 mm (33 in.) above the floor;
- have a knee *space* of at least
  - 760 mm (30 in.) wide;
  - 735 mm (29 in.) high at the front edge;
  - 685 mm high (27 in.) at a point 205 mm (8-1/8 in.) back from the front edge; and
  - 230 mm (9 in.) high over the distance from a point 280 mm (11 in.) to a point 430 mm (16-7/8 in.) back from the front edge;

- have a minimum *clear floor space* 760 mm wide (30 in.) and 1370 mm (54 in.) deep, of which a maximum of 480 mm (18-7/8 in.) in depth may be under the lavatory;
- have hot water and drain pipes insulated if they abut the clearances noted above, or limit the water temperature to a maximum of 43 degrees Celsius (100 degrees F); and
- have soap and towel dispensers that are
  - located to be *accessible* to persons who use wheelchairs or scooters (i.e., not having to reach over the lavatory to access the devices);
  - located so that the dispensing height is not more than 1200 mm (47 in.) above the floor;
  - located in close proximity to the *accessible* lavatory;
  - operable with one hand;
  - colour-contrasted from the surrounding environment; and
  - in compliance with 4.4.2.

Faucets and other controls shall

- be in compliance with 4.4.2;

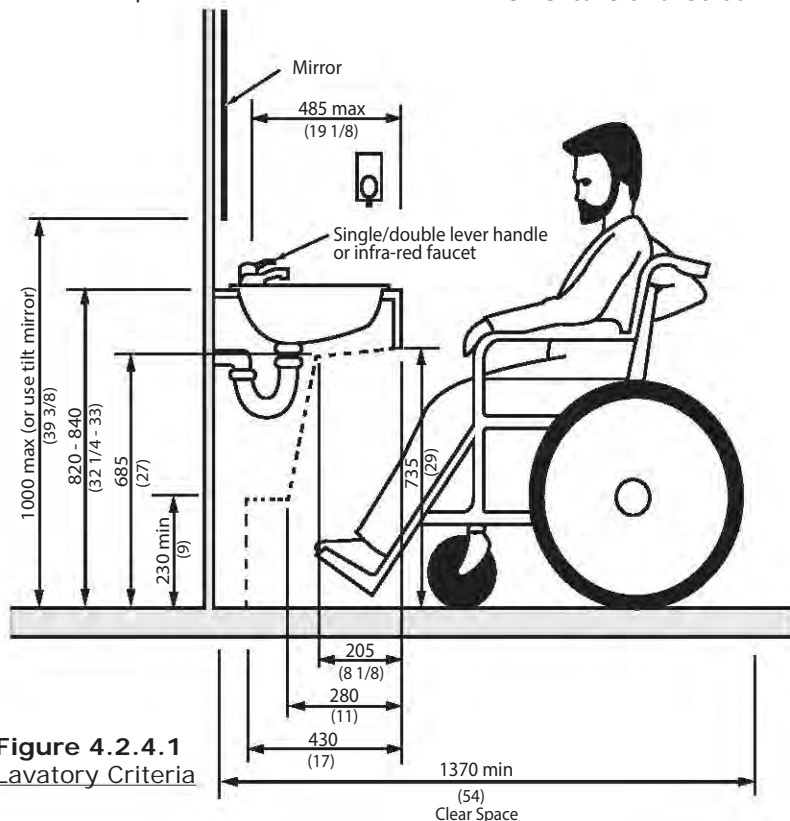


Figure 4.2.4.1  
Lavatory Criteria

## 4.2 WASHROOM FACILITIES

- have lever-style handles (not self-closing) operable with a clenched fist, or be electronically controlled; and
- be located so that the distance from the centre line of the faucet to the edge of the basin, or where the basin is mounted in a vanity, to the front edge of the vanity is not more than 485 mm (19-1/8 in.).

The front apron of a vanity shall have a minimum clearance of 760 mm (30 in.) wide by 735 mm (29 in.) high.

Shelves or other projections above lavatories shall be located so they will not present a hazard to persons with a visual *impairment*.

Where mirrors are provided at lavatories or vanity units, they shall comply with 4.2.6.

### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.4.2 Controls and Operating Mechanisms
- 4.4.13 Lighting
- 4.4.15 Texture and Colour

## 4.2 WASHROOM FACILITIES

### 4.2.5 URINALS

#### RATIONALE

A *clear floor space* is required in front of urinals to manoeuvre a mobility device. The provision of grab bars may assist an individual in rising from a seated position and to steady themselves. Floor-mounted urinals accommodate children and persons of short stature as well as enable easier access to drain personal care devices. Flush controls should be lever-style or automatic (preferred).

Strong colour contrasts between the urinal, the wall and the floor will assist persons with a visual impairment.

#### APPLICATION

Where urinals are provided in an *accessible toilet or bathing facility*, at least one shall comply with this section.

#### DESIGN REQUIREMENTS

Urinals shall be

- wall-mounted with an elongated rim located no higher than 430 mm (17 in.) above the finished floor; or
- floor-mounted with the rim at the finished floor level.

Urinals shall be at least 345 mm (13-1/2 in.) deep, measured from the outer face of the urinal rim to the back of the fixture.

A *clear floor space* of 760 mm x 1370 mm (30 in. x 54 in.) shall be provided in front of the urinal to allow for a forward approach. This *clear space* shall adjoin or overlap an *accessible route* and shall comply with 4.1.1.

Where privacy screens are provided

- there shall be at least 920 mm (36 in.) of clearance between them; and
- they shall incorporate a pronounced colour contrast, to differentiate them from the surrounding environment, with a vertical outer edge that contrasts with the screen and the surrounding environment.

Urinals shall have grab bars installed on each side that

- comply with 4.2.10;
- are not less than 600 mm (23-5/8 in.) long;
- are mounted vertically
  - not more than 380 mm (15 in.) from the centre line of the urinal; and
  - with the lowest end located between 600 - 650 mm (23-5/8 - 25-1/2 in.) above the floor.

Flush controls shall be hand-operated or automatic, mounted at no more than 1120 mm (44 in.) above the finished floor, and shall comply with 4.4.2.

Where a washroom contains more than two urinals, one urinal shall be provided specifically for children that is

- installed with the rim no higher than 430 mm (17 in.) from the finished floor; or
- floor-mounted, with the rim level at the finished floor

#### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.4.2 Controls and Operating Mechanisms
- 4.4.13 Lighting
- 4.4.15 Texture and Colour

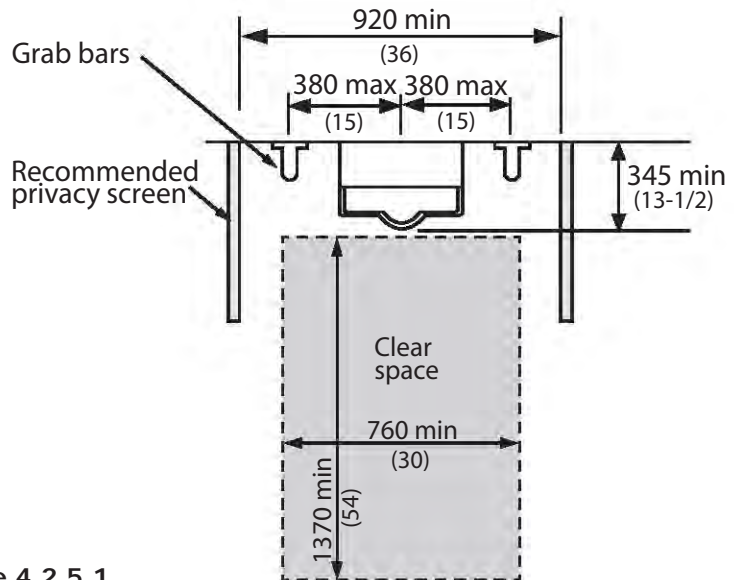


Figure 4.2.5.1  
Urinal

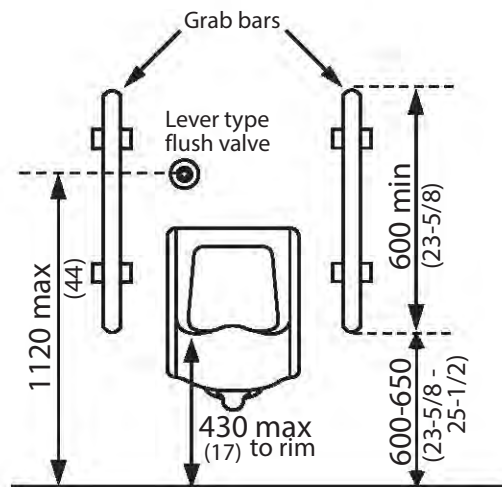


Figure 4.2.5.2  
Urinal

## 4.2.6 WASHROOM ACCESSORIES

## 4.2 WASHROOM FACILITIES

### RATIONALE

Design issues related to washroom accessories include the hand strength and dexterity required to operate mechanisms. Reaching the accessories is another concern. Accessories that require the use of two hands to operate can present difficulties for a range of persons with disabilities when the ability to reach or balance is impaired. Section 4.4.2 addresses operating mechanisms in greater detail.

### APPLICATION

Where washroom accessories are provided in a toilet or bathing facility, they shall comply with this section. In a retrofit situation where it is *technically infeasible* to make all washroom accessories comply with this section, at least one of each type of washroom accessory shall comply in all *accessible* toilet or bathing facilities.

### DESIGN REQUIREMENTS

Each type of washroom accessory provided, unless otherwise specified in 4.2.2 and 4.2.4, shall have *operable portions* and controls mounted between 900 mm (35 in.) and 1200 mm (47 in.) above the floor.

The operable controls and mechanisms of washroom accessories shall comply with 4.4.2.

Where mirrors are provided, at least one shall be

- mounted with its bottom edge not more than 1000 mm (39-3/8 in.) from the floor; or
- inclined from vertical to be usable by a person using a wheelchair.

### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.3 Protruding and Overhead Objects
- 4.4.2 Controls and Operating Mechanisms
- 4.4.13 Lighting
- 4.4.15 Texture and Colour

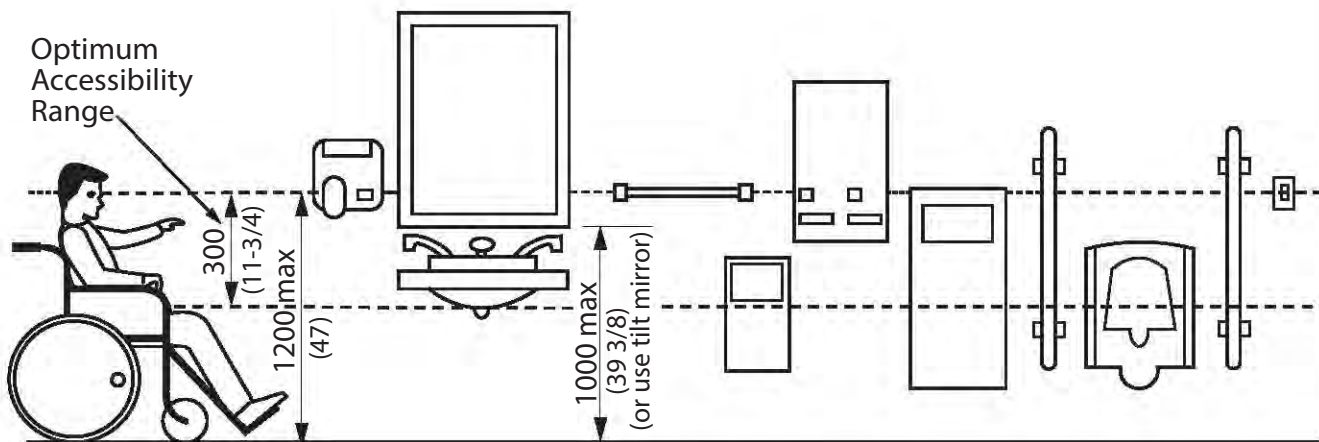


Figure 4.2.6.1  
Washroom Accessories

4.2 WASHROOM FACILITIES

4.2.7 INDIVIDUAL WASHROOMS

**RATIONALE**

The provision of a separate individual washroom is advantageous in a number of instances. For an individual using a wheelchair, the extra space provided with a separate washroom is preferred to an accessible stall. Should an individual require an attendant to assist them in the washroom then the complication of a woman entering a men's washroom or vice versa is avoided. This same scenario would apply to a parent with a young child of a different gender.

In the event of an accident or fall by a single individual in this form of washroom, an emergency call switch and a means of unlocking the door from the outside are important safety features.

**APPLICATION**

Accessible individual washrooms shall comply with this section.

At least one individual washroom, in addition to any *accessible public use* or *common use* toilets, shall be provided

- in all public buildings; and
- on every floor level in assembly buildings where the floor incorporates *common* or *public use* washroom facilities containing four or more toilet and/or urinal fixtures.

If individual washrooms are not visible from the *public use* or *common use* toilets, directional signage complying with 4.4.7 shall be provided.

**DESIGN REQUIREMENTS**

Accessible individual washrooms shall be

- on an *accessible route* in compliance with 4.1.4;
- identified with *signage* in compliance with applicable provisions of 4.4.7.
- designed to permit a wheelchair to turn within an *open space* that has a diameter of not less than 2440 mm (96 in.). In a retrofit situation where providing the required turning space is *technically infeasible*, the turning space may be reduced to not less than 2130 mm (84 in.);
- provided with a lavatory conforming to 4.2.4;
- equipped with a toilet fixture

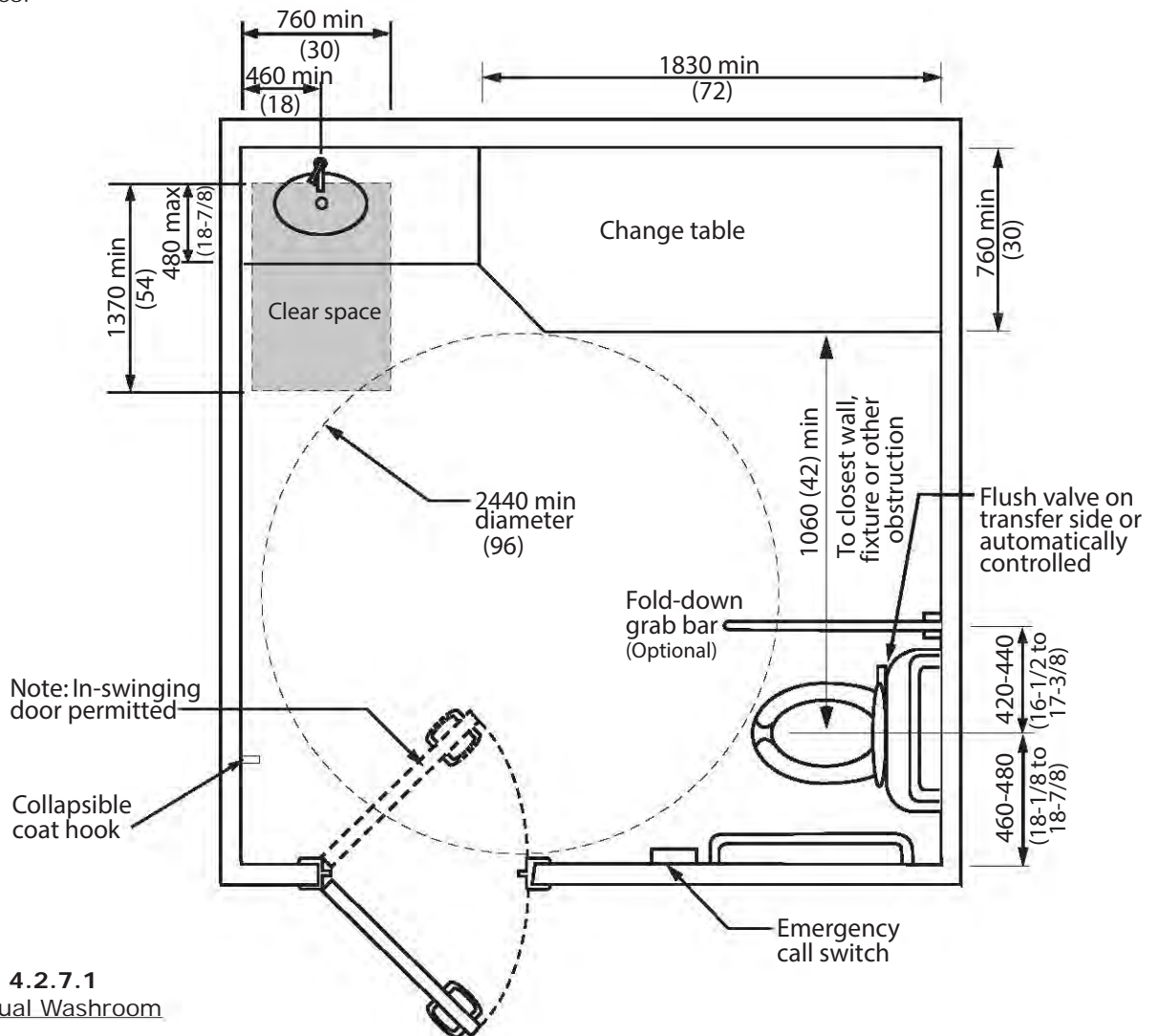


Figure 4.2.7.1 Individual Washroom



## 4.2.7 INDIVIDUAL WASHROOMS

## 4.2 WASHROOM FACILITIES

conforming to 4.2.3 that is located

- so that its centre line is not less than 460 mm (18-1/8 in.) and not more than 480 mm (18-7/8 in.) from an adjacent wall on one side; and
- so that its centre line is not less than 1060 mm (42 in.) to any wall, fixture or other obstruction on the other side.
- equipped with flush controls and other *elements* conforming to 4.2.3;
- equipped with grab bars conforming to 4.2.10;
- have fixture clearances conforming to 4.2.3 and 4.2.4;
- provided with a *clear* transfer space adjacent to the toilet fixture, as required by 4.2.3;
- equipped with a collapsible coat hook mounted not more than 1200 mm (47 in.) from the floor on a side wall and projecting not more than 50 mm (2 in.) from the wall;
- equipped with a shelf located not more than 1200 mm (47 in.) above the floor and installed in a location that will not create a hazard; and
- equipped with a mirror and washroom accessories complying with 4.2.6.

*Accessible* individual washroom doors shall

- comply with 4.1.6;
- have a graspable latch operating and locking mechanism located not less than 900 mm (35 in.) and not more than 1000 mm (39-3/8 in.) above the floor;
- be capable of being locked from the inside with one hand and being released from the outside in case of emergency;
- be provided with a "D"-type colour-contrasting door pull, minimum 140 mm (5-1/2 in.) long, and installed
  - on the inside of an out-swinging door,

- with the centre line located between 200 mm and 300 mm (7-7/8 in. and 11-3/4 in.) from the hinged side of the door, and
- not less than 900 mm (35 in.) and not more than 1000 mm (39-3/8 in.) above the floor;
- if it is an out-swinging door, be equipped with a door closer, spring hinges or gravity hinges so that the door closes automatically; and
- be provided with a power door operator, where the door is equipped with a self-closing device.

Where *accessible* individual washrooms are provided in assembly *buildings*, such as recreation centres, the washroom shall incorporate an emergency call system linked to a central monitoring location (e.g., office or switchboard).

*Accessible* individual washrooms shall incorporate a change table

- at least 760 mm (30 in.) wide by 1830 (72 in.) long;
- located with the change surface no higher than 865 mm (34 in.);
- which incorporates an adjacent *clear floor space* not less than 760 mm (30 in.) by 1370 mm (54 in.);
- designed to carry a minimum load of 1.33 kN (300 lbs.);
- located on an *accessible route* in compliance with 4.1.4; and
- if of the fold-down type, have no operable portions higher than 1200 mm (47 in.).

OPTIONAL:

- be equipped with a fold-down grab bar at least 760 mm (30 in.) in length at the open side of the toilet, mounted 420 - 440 mm (16-1/2 - 17-3/8 in.) from the centre line of the toilet and 630 - 690 mm (24-3/4 - 27-1/8 in.) above the floor.

### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.3 Protruding and Overhead Objects
- 4.1.6 Doors
- 4.2.3 Toilets
- 4.2.4 Lavatories
- 4.2.5 Urinals
- 4.2.6 Washroom Accessories
- 4.2.10 Grab Bars
- 4.4.2 Controls and Operating Mechanisms
- 4.4.7 Signage
- 4.4.11 Card Access, Safety and Security Systems
- 4.4.12 Glare and Light Sources
- 4.4.13 Lighting
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour

## 4.2 WASHROOM FACILITIES

### RATIONALE

Bathtubs can present a slipping hazard. Slip-resistant surfaces are an important feature and will benefit any individual, including those with *disabilities*. Grab bars also provide stability. Operating systems are subject to limitations in hand strength, dexterity and reach.

### APPLICATION

Where bathtubs are provided, all bathtubs shall comply with this section. In a retrofit situation where it is *technically infeasible* to have all bathtubs comply with this section, at least 10%, but never less than one, in each bathing *facility* shall comply with this section.

### DESIGN REQUIREMENTS

*Accessible* bathtubs shall be on an *accessible* route complying with 4.1.4.

*Accessible* bathtubs shall have

- a *clear floor space* at least 920 mm wide (36 in.) along the full length of the bathtub (the lavatory can encroach a maximum of 300 mm (11-3/4 in.) into this *space*, provided the available *clear floor space* complies with 4.2.4);
- faucet handles of the lever type that are not spring-loaded, or are automatically operable;
- faucet handles that are located so as to be usable by a person seated in the bathtub;
- faucets and other controls mounted not more than 450 mm (17-3/4 in.) above the bathtub rim;
- a shower head complying with 4.2.9;
- unless the bathtub is freestanding, be equipped with an "L" shaped grab bar and a vertical grab bar conforming to 4.2.10 mounted on the wall
  - where each leg of the "L" being at least 920 mm (36 in.) in length;
  - with the legs of the "L" being separated by a 90 degrees;
  - with the horizontal leg of the "L" being located 150 -

## 4.2.8 BATHTUBS

200 mm (5-7/8 - 7-7/8 in.) above and parallel to the rim of the bathtub; and

- with the vertical leg of the "L" being located 300 - 450 mm (11-3/4 - 17-3/4 in.) from the control end of the tub.
- with a vertical grab bar which is at least 1220 mm (48 in.) long, mounted vertically at the foot end of the tub adjacent to the *clear floor space*, with the lower end 180 - 280 mm (7 - 11 in.) above the bathtub rim.
- controls equipped with a pressure-equalizing or thermostatic-mixing valve, operable from the seated position and in compliance with 4.4.2;

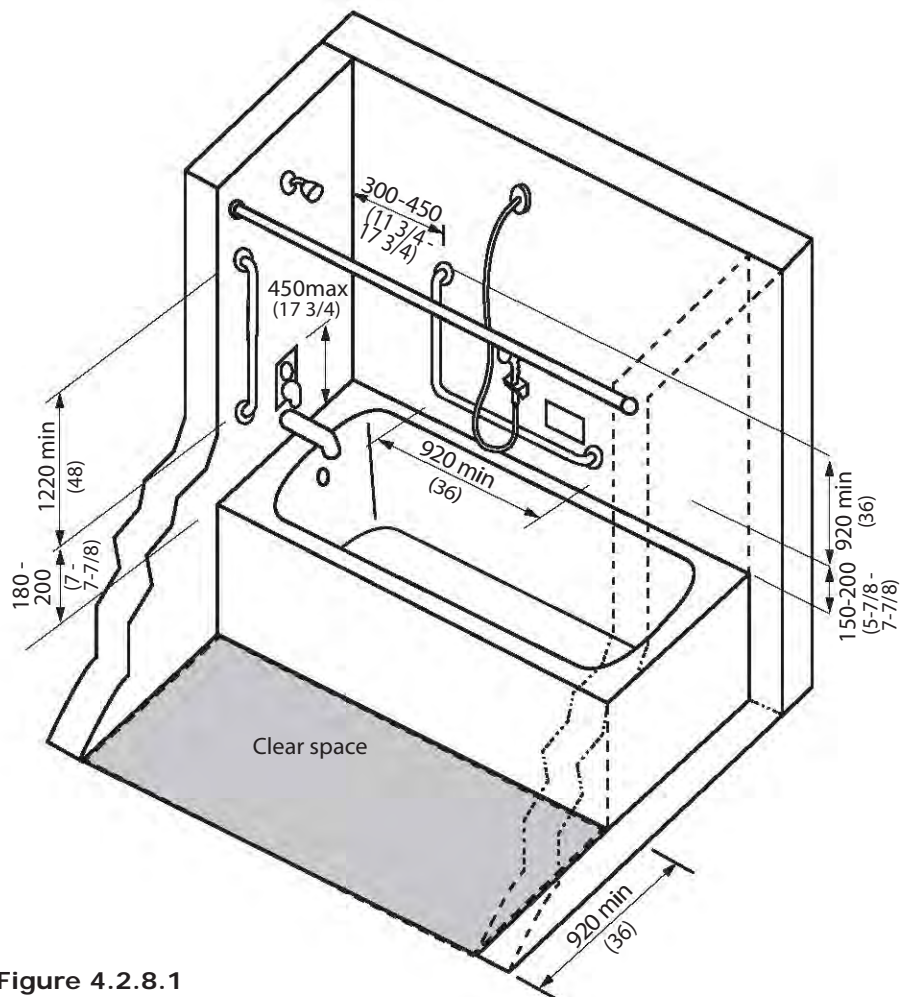
- soap holder(s) which can be reached from the seated position, ideally fully recessed;

Enclosures for bathtubs shall not

- obstruct controls;
- interfere with a person transferring from a wheelchair; or
- have tracks mounted on the bathtub rim.

### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.2.6 Washroom Accessories
- 4.2.10 Grab Bars
- 4.4.2 Controls and Operating Mechanisms
- 4.4.13 Lighting
- 4.4.15 Texture and Colour



**Figure 4.2.8.1**  
Bathtub

### 4.2.9 SHOWER STALLS

### 4.2 WASHROOM FACILITIES

#### RATIONALE

Roll-in or curbless shower stalls eliminate the hazard of stepping over a threshold and are essential for persons with *disabilities* who use wheelchairs or other mobility devices in the shower. Grab bars and non-slip materials are safety measures which will support any individual. Additional equipment such as a hand-held shower head or a folding bench, may be an asset to someone with a *disability* but also convenient for others. Equipment that contrasts in colour from the shower stall itself will assist individuals with a visual *impairment*.

#### APPLICATION

Where shower stalls are provided, all shower stalls shall comply with this section. In a retrofit situation where it is *technically infeasible* to have all shower stalls comply with this section, at least 10%, but never less than one, in each bathing *facility* shall comply with this section.

#### DESIGN REQUIREMENTS

*Accessible* shower stalls shall

- be on an *accessible route* complying with 4.1.4;
- be at least 1525 mm (60 in.) in width and 920 mm (36 in.) in depth;

- have a *clear floor space* at the *entrance* to the shower of at least 920 mm (36 in.) in depth and the same width as the shower, except that fixtures are permitted to project into that *space*, provided access to the shower is not restricted;
- have a slip-resistant floor surface;
- have no threshold, or a bevelled threshold not exceeding 13 mm (1/2 in.) above the finished floor;
- be equipped with a wall-mounted folding seat that is not spring-loaded, or make provisions for a portable seat that is
  - 450 mm (17-3/4 in.) wide and 400 mm (15 in.) deep;
  - mounted approximately 450 mm (17-3/4 in.) above the floor; and
  - designed to carry a minimum load of 1.33 kN (300 lbs.);
- be equipped with a horizontal grab bar that shall
  - conform to 4.2.10;
  - be at least 920 mm (36 in.) in length;
  - be mounted horizontally approximately 850 mm (33 in.) above the floor; and
  - be located on the wall so at least 300 mm (11-3/4 in.) of its length is reachable from one side of the seat;
- be equipped with a vertical grab bar that shall
  - be at least 760 mm (30 in.) in length;

- be mounted 80 - 120 mm (3-1/8 - 4-3/4 in.) from the front edge, starting between 700 and 800 mm (27-1/2 and 31-1/2 in.) from the floor; and
- conform to 4.2.10;
- be equipped with a pressure-equalizing or thermostatic-mixing valve in compliance with 4.4.2, located above the grab bar but no higher than 1000 mm (39-3/8 in.), maximum 685 mm (27 in.) from the seat wall;
- have soap holder(s) which can be reached from the seated position, ideally fully recessed; and
- be equipped with a shower head with at least 1525 mm (60 in.) of flexible hose that can be used both as a fixed position shower head and as a hand held shower head. The shower spray unit shall be reachable from the seated positions and have an on/off control. EXCEPTION: The use of two fixed-height shower heads with the capability of adjusting the direction of water flow is permitted instead of a hand-held spray unit in *facilities* that may be subject to vandalism. The height of the higher shower head to be 1825 mm (72 in.). The height of the lower shower head to be 1400 mm (55-1/8 in.). A valve to direct water between the shower heads, in compliance with 4.4.2, shall be located adjacent to the shower control/mixing valve.

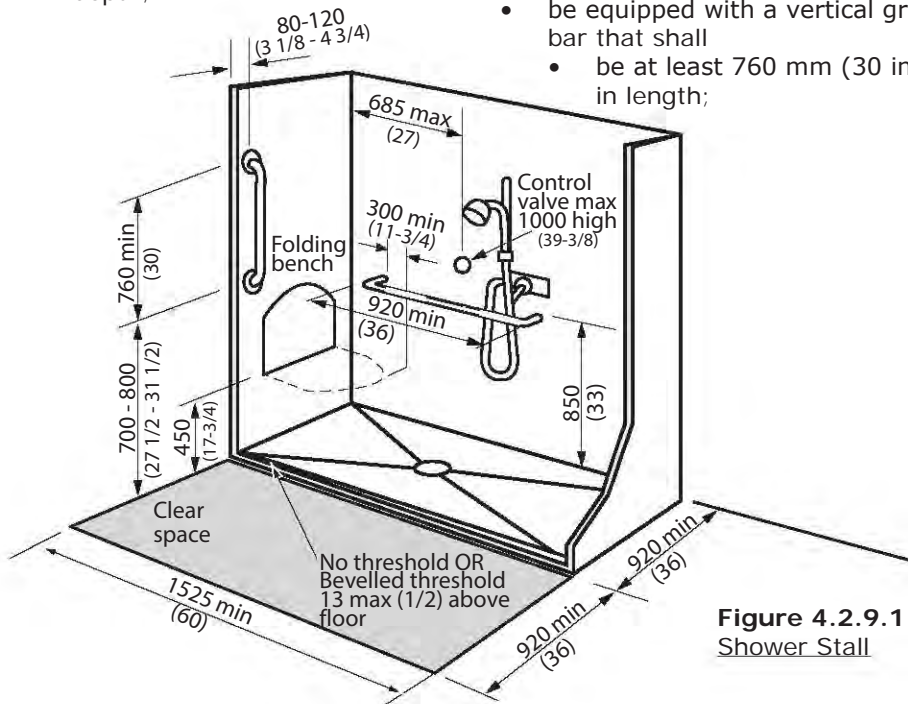


Figure 4.2.9.1 Shower Stall

Where the showerhead is mounted on a vertical bar, the bar shall be installed so as not to obstruct the use of the grab bar.

Enclosures for shower stalls shall not obstruct controls or obstruct transfer from a mobility device onto the shower seat.

#### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.2.6 Washroom Accessories
- 4.2.10 Grab Bars
- 4.4.2 Controls and Operating Mechanisms
- 4.4.13 Lighting
- 4.4.15 Texture and Colour

## 4.2 WASHROOM FACILITIES

### 4.2.10 GRAB BARS

#### RATIONALE

Grab bars are an important feature to those who require assistance in standing up, sitting down or stability while standing. Transferring between toilet and wheelchair or scooter may be another scenario where grab bars are utilized.

#### APPLICATION

Grab bars shall comply with this section.

#### DESIGN REQUIREMENTS

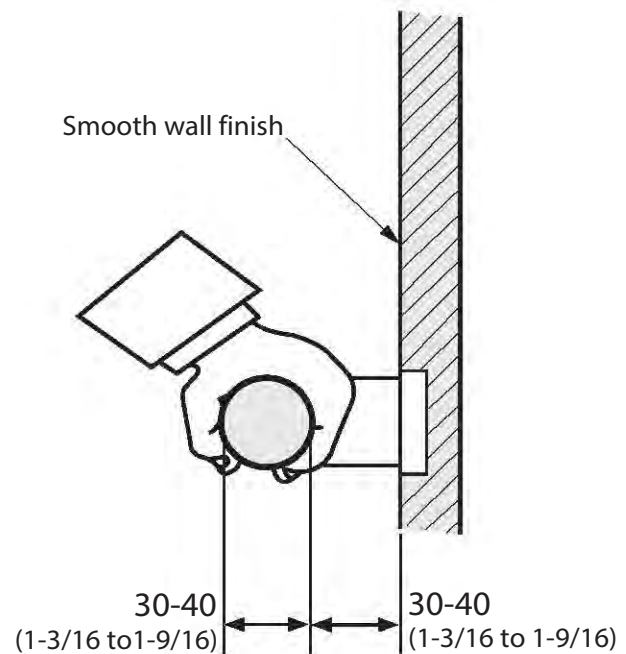
Grab bars shall

- be installed to resist a load of at least 1.3 kN (300 lb.), applied vertically or horizontally;
- be not less than 30 mm (1-3/16 in.) and not more than 40 mm (1-9/16 in.) in diameter;
- have a clearance of 30 mm (1-3/16 in.) to 40 mm (1-9/16 in.) from the wall;
- be free of any sharp or abrasive *elements*;
- be colour-contrasted with the surrounding environment; and
- have a slip-resistant surface.

Adjacent surfaces shall be free of any sharp or abrasive *elements*.

#### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.2.3 Toilets
- 4.2.5 Urinals
- 4.2.7 Individual Washrooms
- 4.2.8 Bathtubs
- 4.2.9 Shower Stalls
- 4.4.13 Lighting
- 4.4.15 Texture and Colour



**Figure 4.2.10.1**  
Grab Bar



### 4.3.1 DRINKING FOUNTAINS

### 4.3 OTHER AMENITIES

#### RATIONALE

When planning the design of drinking fountains, one should consider the limited height of children and that of a person using a wheelchair or scooter. In the same respect, there may be individuals who have difficulty bending who would require a higher fountain. The operating system should account for limited hand strength or dexterity. The placement of the fountain is also important. Fountains should be recessed, to avoid protruding into the path of travel, especially if they are wall mounted above the detectable height of a person using a cane. Angled recessed alcove designs allow more flexibility and less precision required by a person using a wheelchair or scooter.

#### APPLICATION

Where drinking fountains are provided on a floor level, at least one shall be *accessible* and shall comply with this section. Where more than one drinking fountain or water cooler is provided on a floor level, at least 50% shall be *accessible* and shall comply with this section.

Where only one drinking fountain is provided on a floor level, it shall incorporate components that are *accessible* to individuals who use mobility devices and to those who have difficulty stooping or bending.

#### DESIGN REQUIREMENTS

*Accessible* drinking fountains shall

- be located on an *accessible route* complying with 4.1.4;
- have a spout located near the front of the unit between 760 mm (30 in.) and 900 mm (35 in.) above the floor or ground surface;
- have a spout that directs the water flow in a trajectory that is parallel or nearly parallel to the front of the unit;
- have a spout that provides a water flow at least 100 mm (4 in.) high; and
- be equipped with controls that are located on the front of the unit, or on both sides of the unit, easily operated from a wheelchair or scooter using one hand with a force of not more than 22 N (4.9 lb.), or be automatically operable.

Cantilevered drinking fountains shall

- have a *clear floor space* of at least 760 mm (30 in.) by 1370 mm (54 in.);
- have a *knee space* between the bottom of the apron and the floor or ground of at least 760 mm (30 in.) wide, 200 mm (7-7/8 in.) deep and 685 mm (27 in.) high;
- have a *toe space* not less than 760 mm (30 in.) wide, 230 mm (9 in.) deep, and 230 mm (9 in.) high; and
- be recessed or otherwise located out of the circulation route.

Freestanding or built-in fountains not having a *knee space* shall have a *clear floor space* at least 1370 mm (54 in.) wide by 760 mm (30 in.) deep in front of the unit to accommodate a parallel approach.

#### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.3 Protruding and Overhead Objects
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.4.13 Lighting
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour

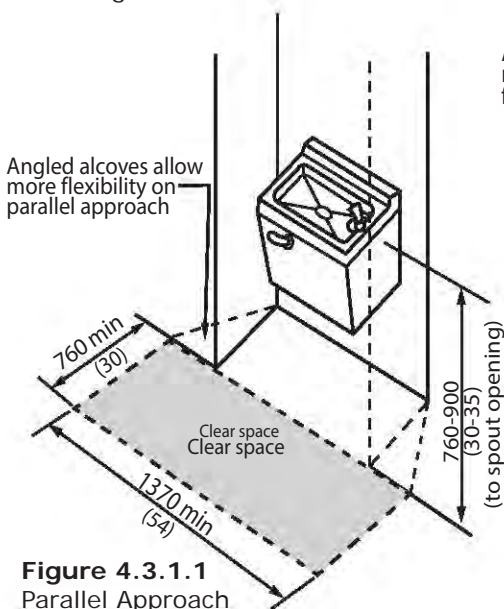


Figure 4.3.1.1 Parallel Approach

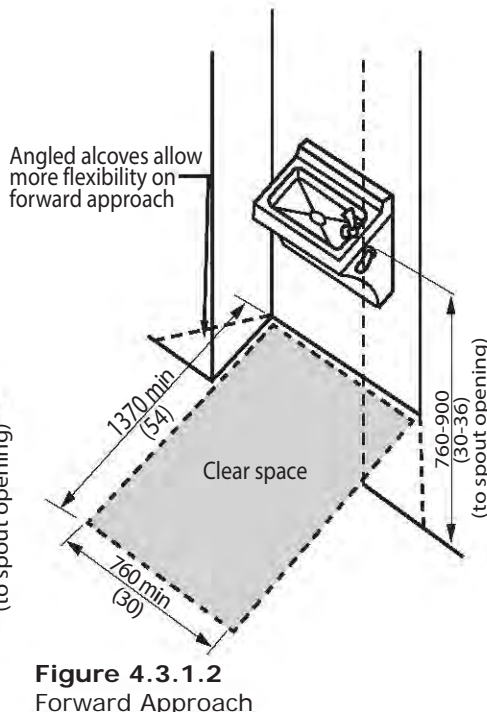


Figure 4.3.1.2 Forward Approach

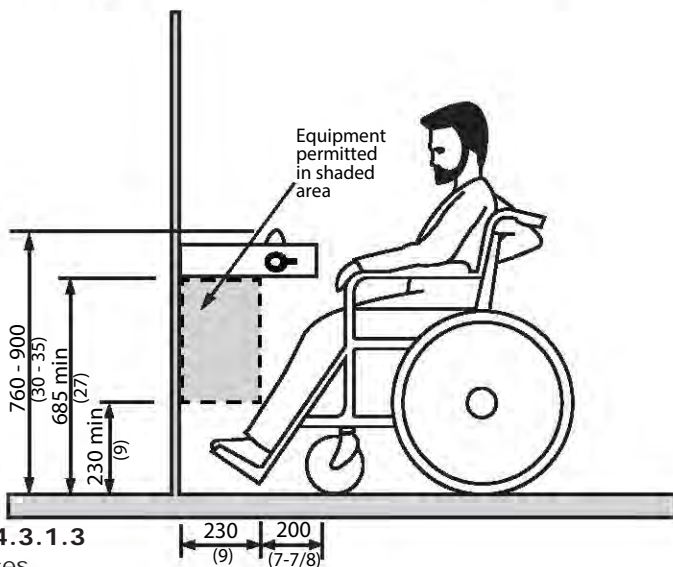


Figure 4.3.1.3 Clearances

### 4.3 OTHER AMENITIES

### 4.3.2 VIEWING POSITIONS

#### RATIONALE

Designated viewing areas are required for individuals unable to use typical seating. Viewing areas need to provide adequate *space* to manoeuvre a mobility device as large as a scooter and should not be limited to one location. Designated companion seating should also be provided. Guards placed around a viewing area should not interfere with the line of sight of someone sitting in a wheelchair or scooter. A choice of locations and ticket price range should be available.

#### APPLICATION

In places of assembly occupancy with fixed seating, *accessible* wheelchair/scooter locations shall comply with this section and shall be provided in numbers as indicated by Table 4.3.2.

In addition, 1%, but not less than one, of all fixed seats shall be aisle seats with no armrests on the aisle side, or shall have removable or folding armrests on the aisle side. A sign or marker shall identify each of the seats. *Signage* notifying patrons of the availability of such seats shall be posted at the ticket office.

#### DESIGN REQUIREMENTS

*Accessible* wheelchair/scooter locations shall adjoin an *accessible route* complying with 4.1.4, without infringing on *egress* from any row of seating or any aisle requirement.

Each *accessible* wheelchair/scooter location shall be

- an integral part of any seating plan. Seats shall be distributed in a manner that provides people with physical disabilities a choice of admission prices and lines of sight comparable to those for members of the general public;
- *clear* and level, or level with removable seats;
- if the wheelchair/scooter enters from a side approach, not less than 920 mm (36 in.) wide and 1525 mm (60 in.) long;
- if the wheelchair/scooter enters from a front or rear approach,

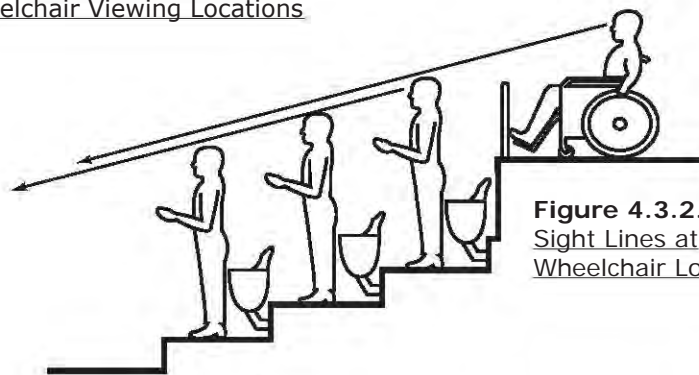
- not less than 920 mm (36 in.) wide and 1370 (54 in.) long;
- arranged so that at least two designated wheelchair/scooter locations are side by side;
- arranged so that at least one companion fixed seat is provided next to each wheelchair seating area (Note: Companion seating to be calculated in addition to the required *accessible* seating spaces identified in Table 4.3.2); and
- where the seating capacity exceeds 100, provided in more than one location

#### RELATED SECTIONS

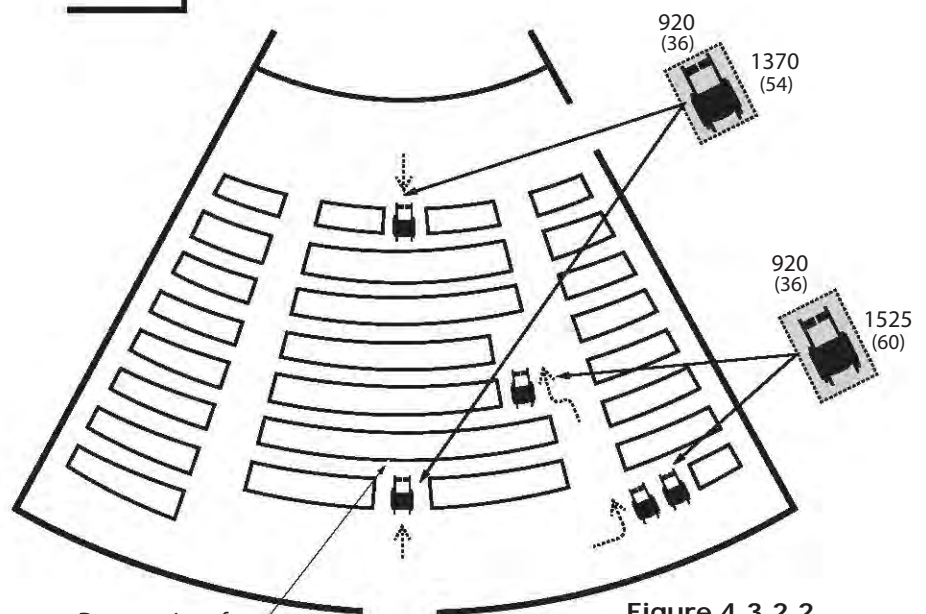
- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.3 Protruding and Overhead Objects
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.4.6 Assistive Listening Systems
- 4.4.7 Signage
- 4.4.9 Public Address System
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour
- 4.4.16 Acoustics

Number of Fixed Seats in Seating Area	Minimum number of <i>Spaces</i> Required for Wheelchairs
Up to 100	2
101 to 200	3
201 to 300	4
301 to 400	5
401 to 600	6
Over 600	not less than 1% of the seating capacity

**Table 4.3.2**  
Wheelchair Viewing Locations



**Figure 4.3.2.1**  
Sight Lines at Wheelchair Locations



**Figure 4.3.2.2**  
Distribution of Wheelchair Locations 47

### 4.3.3 ELEVATED PLATFORMS

### 4.3 OTHER AMENITIES

#### RATIONALE

Elevated platforms, such as stage areas, speaker podiums, etc., should be *accessible* to all. A marked *accessible route* should be provided, along with safety features to assist persons who are visually impaired.

#### APPLICATION

Elevated platforms provided for use by the general public, clients, customers or employees shall comply with this section.

#### DESIGN REQUIREMENTS

Elevated platforms shall

- be located on an *accessible route* that complies with 4.1.4;
- be capable of being illuminated to at least 100 lux (9.3 ft-candles) at floor level at the darkest point;

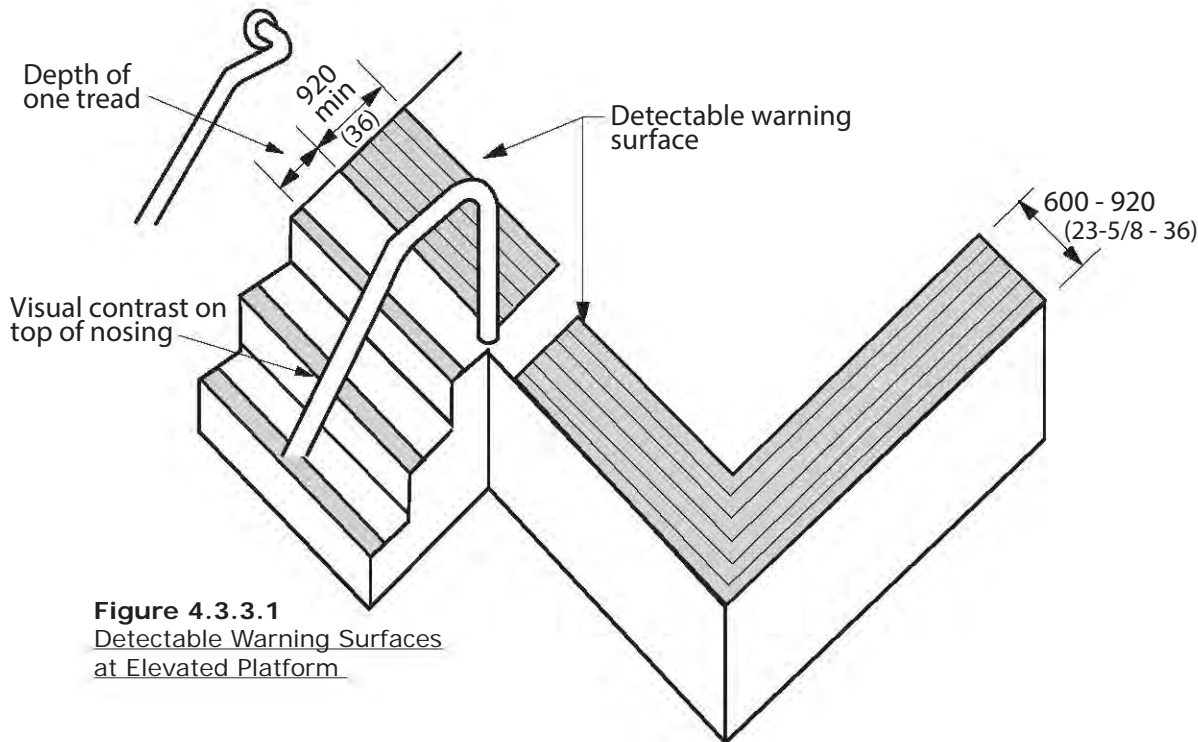
- be sized to safely accommodate wheelchairs and other mobility equipment in compliance with 4.1.1; and
- have open platform edges defined by a *detectable warning surface*.

The *detectable warning surface* on elevated platforms shall

- comply with the requirements of 4.4.8;
- be consistent throughout the setting;
- be positioned parallel to the open platform edge, extending the full length of the platform; and
- be a minimum depth of 600 mm (23-5/8 in.) and a maximum of 920 mm (36 in.), flush from the open edge of the platform.

#### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.3 Protruding and Overhead Objects
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.4.8 Detectable Warning Surfaces
- 4.4.13 Lighting
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour



**Figure 4.3.3.1**  
Detectable Warning Surfaces  
at Elevated Platform



## 4.3 OTHER AMENITIES

### RATIONALE

In addition to *accessible common use* dressing rooms, a separate unisex dressing room is useful. This is valuable in a scenario where an attendant of the opposite sex or a parent is assisting a child. Sufficient *space* should be allowed for two people and a wheelchair, along with benches and accessories.

The provision of *handrails* along circulation routes from dressing rooms to pool, gymnasium and other activity areas, will be of benefit to many *facility* users.

### APPLICATION

Where dressing rooms are provided for use by the general public, patients, customers or employees, they shall comply with this section. In a retrofit situation where it is *technically infeasible* to have all dressing rooms comply with this section, 10% of dressing rooms, but never less than one, for each type of use in each cluster of dressing rooms shall be *accessible* and comply with this section.

At least one private *accessible* dressing room shall be provided within *accessible* change rooms at pools and gymnasiums.

### DESIGN REQUIREMENTS

*Accessible* dressing rooms, and accessible elements within accessible dressing rooms, shall be located on an *accessible route* complying with 4.1.4.

Private *accessible* dressing rooms shall incorporate a *clear floor space* allowing a person using a wheelchair or scooter to make a 180-degree turn, accessed through either a hinged or sliding door. No door shall swing into any part of the required turning *space* within the private *accessible* dressing room. Turning *space* is not required within a private *accessible* dressing room accessed through a curtained opening of at least 950 mm (37-1/2 in.) wide, if *clear floor space* complying with section 4.1.1 renders the dressing room usable by a person in a wheelchair or scooter.

## 4.3.4 DRESSING ROOMS

All doors to *accessible* dressing rooms shall be in compliance with 4.1.6. Outward swinging doors shall not constitute a hazard to persons using adjacent circulation routes.

Every *accessible* dressing room shall have a 760 mm (30 in.) x 1830 mm (72 in.) bench fixed to the wall along the longer dimension. The bench shall

- be mounted 450 to 500 mm (17-3/4 in. to 19-5/8 in.) above the finished floor;
- have *clear floor space* provided alongside the bench to allow a person using a wheelchair or scooter to make a parallel transfer onto the bench;
- be designed to carry a minimum load of 1.33 kN (300 lb.); and

Where coat hooks are provided, they shall be a collapsible-style projecting not more than 50 mm (2 in.) from the wall. At least two collapsible coat hooks shall be mounted no higher than 1200 mm (47 in.) above the floor, and immediately adjacent to the *accessible* bench. (Note: Coat hooks should NOT be located over the *accessible* bench or in areas that may cause a hazard.)

Where dressing rooms are provided in conjunction with showers, swimming pools, or other wet

locations, they shall

- be designed with a slip-resistant floor surface that prevents the accumulation of standing water; and
- have a bench with a slip-resistant seat surface installed to prevent the accumulation of water.

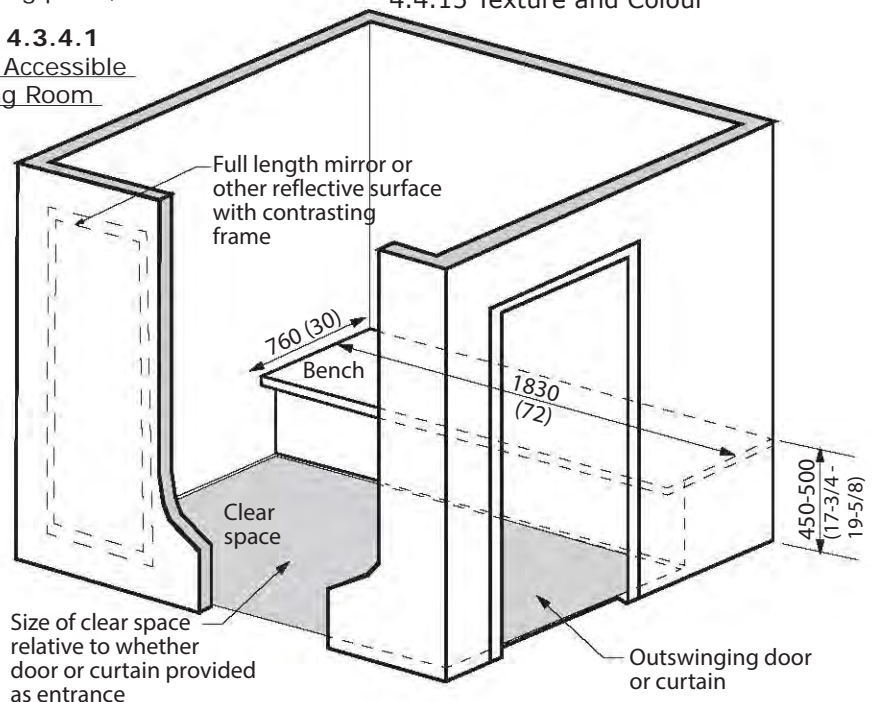
Where mirrors, or other reflective surfaces, are provided in dressing rooms of the same use, *accessible* dressing rooms shall incorporate a full-length mirror or other reflective surface measuring at least 460 mm (18 in.) wide by 1370 mm (54 in.) high and shall be mounted in a position affording a view to a person on the bench, as well as to a person in a standing position.

Dressing rooms shall incorporate even illumination throughout of at least 100 lux (10 ft-candles).

### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.3 Protruding and Overhead Objects
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.4.13 Lighting
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour

**Figure 4.3.4.1**  
Private Accessible  
Dressing Room





### 4.3.5 OFFICES, WORK AREAS & MEETING ROOMS

### 4.3 OTHER AMENITIES

#### RATIONALE

Offices providing services or programs to the public should be *accessible* to all, regardless of mobility or functional profile. Furthermore, office and related support areas should be *accessible* to staff and visitors with varying levels of ability.

All persons, but particularly those with a hearing *impairment*, would benefit from having a quiet acoustic environment - background noise from mechanical equipment such as fans, should be minimal. Telephone equipment for individuals with hearing *impairments* may also be required.

Tables and workstations should address the knee *space* requirements of an individual in a wheelchair. Circulation areas also need to consider the spatial needs of mobility equipment as large as scooters.

Natural coloured task lighting, such as that provided through halogen bulbs, is a design feature that will facilitate use by all, especially persons with vision *impairments*. In locations where reflective glare may be problematic, such as large expanses of glass with reflective flooring, consideration should be given to providing blinds that can be louvred upwards.

#### APPLICATION

Wherever offices, work areas or *meeting rooms* are provided for use by the general public, employees, clients or customers, they shall comply with this section.

#### DESIGN REQUIREMENTS

Where offices, work areas and *meeting rooms* are provided for use by the general public, clients or customers, they shall

- be located on an *accessible route* complying with 4.1.4;
- where equipped with a door, the door shall comply with 4.1.6;
- incorporate a *clear floor space* allowing a person using a wheelchair or scooter to make a 180-degree turn;
- incorporate an *accessible route* throughout the *space* that does not require a person using a wheelchair or scooter to travel backwards to enter/leave the *space*;
- incorporate an *accessible route* that connects the primary activity *elements* within the office, work area or meeting room;
- incorporate knee clearances below work surfaces that comply with 4.3.7;
- incorporate access to storage, shelving or display units in compliance with 4.3.9 for use by the general public, clients or customers;
- provide a *clear floor space* that complies with 4.1.1 in front of all equipment such as photocopiers where such equipment is provided for use by the general public, clients or customers; and
- be equipped with an assistive listening system that complies with 4.4.6, where an assistive listening system is required.

#### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.1.8 Windows, Glazed Screens and Sidelights
- 4.3.7 Tables, Counters and Work Surfaces
- 4.3.9 Storage, Shelving and Display Units
- 4.4.2 Controls and Operating Mechanisms
- 4.4.4 Visual Alarms
- 4.4.6 Assistive Listening Systems
- 4.4.12 Glare and Light Sources
- 4.4.13 Lighting
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour
- 4.4.16 Acoustics

## 4.3 OTHER AMENITIES

## 4.3.6 WAITING AND QUEUING AREAS

**RATIONALE**

Queuing areas for information, tickets or services should permit persons who use wheelchairs, scooters and other mobility devices as well as persons with a varying range of user ability to move through the line safely and conveniently.

Waiting and queuing areas need to provide *space* for mobility devices, such as wheelchairs and scooters. Queuing lines that turn corners or double back on themselves will need to provide adequate *space* to manoeuvre mobility devices. Providing *handrails* in queuing lines may be useful support for individuals and guidance for those with a visual *impairment*. The provision of benches in waiting areas is important for individuals who may have difficulty with standing for extended periods.

**APPLICATION**

Waiting and queuing areas shall comply with this section.

**DESIGN REQUIREMENTS**

Barriers at queuing areas shall be laid out in parallel, logical lines, spaced a minimum of 1100 mm (43 1/4 in.) apart.

Barriers at queuing areas, provided to streamline pedestrian movement, shall be firmly mounted to the floor, and should have rigid rails to provide support for waiting persons.

Where floor slots or pockets are included to receive temporary or occasional supports, such slots or pockets shall be level with the floor finish and have an integral cover, so as not to cause a tripping hazard.

Permanent queuing areas shall incorporate clearly defined floor patterns/colours/textures in compliance with 4.4.15, as an aid to guide persons with a visual *impairment*.

There shall be a pronounced colour contrast between ropes, bars or solid barriers used to define queuing areas and the surrounding environment.

**RELATED SECTIONS**

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.4.5 Public Telephones
- 4.4.6 Assistive Listening Systems
- 4.4.7 Signage
- 4.4.9 Public Address Systems
- 4.4.10 Information Systems
- 4.4.12 Glare and Light Sources
- 4.4.13 Lighting
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour
- 4.4.16 Acoustics

4.3.7 TABLES, COUNTERS AND WORK SURFACES

4.3 OTHER AMENITIES

RATIONALE

Tables, counters and work surfaces should accommodate the needs of a range of users. Consideration should be given to standing-use as well as seated use. For individuals using wheelchairs, tables need to be high enough to provide knee space and provide enough clear space for the wheelchair to pull into. The furniture placement at tables and manoeuvring space at counters should provide sufficient turning space for a person using a wheelchair or scooter.

APPLICATION

If fixed or built-in tables, counters and work surfaces (including, but not limited to, dining tables and study carrels) are provided in accessible public or common use areas, at least 10%, but not less than one, of the fixed or built-in tables, counters and work surfaces shall comply with this section.

DESIGN REQUIREMENTS

Accessible tables, counters and work surfaces shall be located on an accessible route complying with 4.1.4.

An accessible route complying with 4.1.4 shall lead to and around such fixed or built-in tables, counters and work surfaces.

Wheelchair seating spaces at accessible tables, counters and work surfaces shall incorporate a clear floor space of not less than 760 mm (30 in.) by 1370 mm (54 in.).

Where a forward approach is used to access a wheelchair seating space, a clear knee space of at least 760 mm (30 in.) wide, 480 mm (18-7/8 in.) deep and 685 mm (27 in.) high shall be provided. It may overlap the clear floor space by a maximum of 480 mm (18-7/8 in.).

The top of accessible tables, counters and work surfaces shall be located between 710 mm (28 in.) to 865 mm (34 in.) above the finished floor or ground surface.

Where speaker podiums are provided they shall

- be located on an accessible route in compliance with 4.1.4;
- be height-adjustable for use from a seated or standing position;
- incorporate clear floor space of at least 760 mm (30 in.) by 1370 mm (54 in.), configured for forward approach;
- incorporate clear knee space of at least 760 mm (30 in.) wide, 480 mm (18-7/8 in.) deep and 685 mm (27 in.) high; and
- incorporate controls and operating mechanisms in compliance with 4.4.2

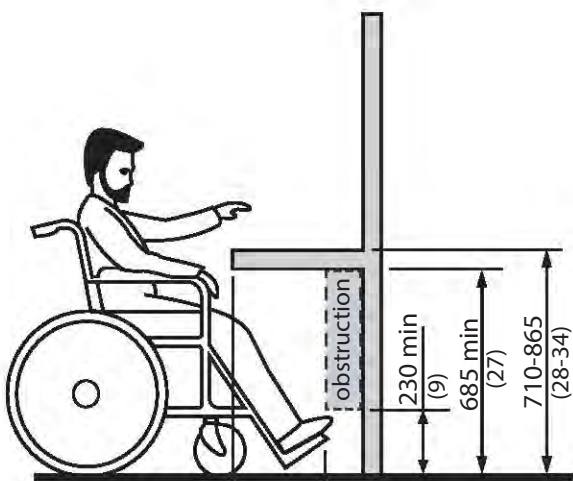


Figure 4.3.7.1 Clearances

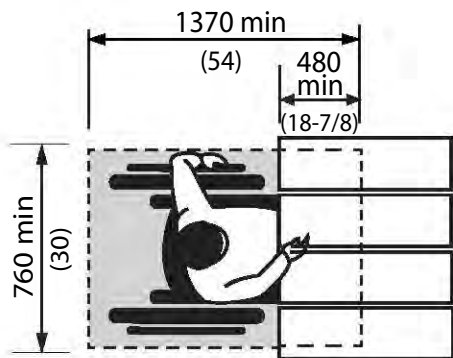


Figure 4.3.7.2 Frontal Approach

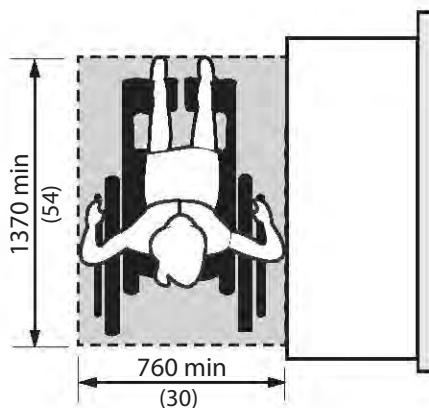


Figure 4.3.7.3 Parallel Approach

RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.4 Accessible Routes, Paths and Corridors

## 4.3 OTHER AMENITIES

## 4.3.8 INFORMATION, RECEPTION AND SERVICE COUNTERS

## RATIONALE

Information, reception and service counters should be *accessible* to the full range of *facility* users. A choice of counter heights is recommended to provide a range of options for a variety of persons. Lowered sections will serve children, persons of short stature and persons using mobility devices such as a wheelchair or scooter. The choice of heights should also extend to speaking ports and writing surfaces.

The provision of knee space under the counter facilitates use by a person using a wheelchair or a scooter.

The use of colour contrast, tactile difference or audio landmarks (e.g., receptionist voice or music source) can assist individuals with a visual *impairment* to more precisely locate service counters or speaking ports.

## APPLICATION

Counters for information or service shall have at least one section *accessible* to persons who use a wheelchair or scooter.

## DESIGN REQUIREMENTS

Information, reception and service counters shall be located on an *accessible route* complying with 4.1.4.

Counters for information, reception or service shall incorporate at least one *accessible* section that

- has a counter height located between 710 mm (28 in.) and 865 mm (34 in.) above the finished floor or ground;
- has a counter surface width of at least 920 mm (36 in.); and
- has *knee space* on both sides of the counter, below the counter surface, of at least 685 mm (27 in.) high by 480 mm (18-7/8 in.) deep by 760 mm (30 in.) wide.

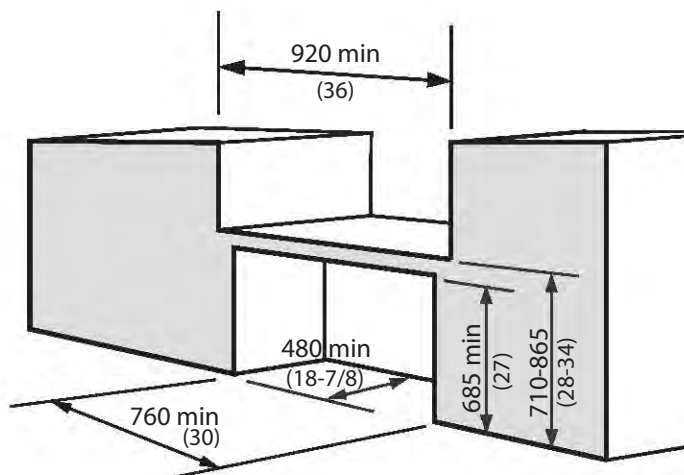
Wheelchair seating *spaces* at *accessible* sections of information, reception and service counters shall incorporate a clear floor space not less than 760 mm (30 in.) by 1370 mm (54 in.).

Where a forward approach is used to access a wheelchair seating space, a *clear knee space* of at least 760 mm (30 in.) wide, 480 mm (18-7/8 in.) deep and 685 mm (27 in.) high shall be provided. It may overlap the *clear floor space* by a maximum of 480 mm (18-7/8 in.).

Where speaking ports are provided at information, reception or service counters, at least one such position shall have a speaking port no higher than 1060 mm (42 in.) above the finished floor or ground.

## RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.4.6 Assistive Listening Systems
- 4.4.7 Signage
- 4.4.10 Information Systems
- 4.4.12 Glare and Light Sources
- 4.4.13 Lighting
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour
- 4.4.16 Acoustics



**Figure 4.3.8.1**  
Service Counter



### 4.3.9 STORAGE, SHELVING AND DISPLAY UNITS

### 4.3 OTHER AMENITIES

#### RATIONALE

The heights of storage, shelving and display units should address a full range of vantage points including the lower sightlines of children or a person using a wheelchair or scooter. The lower heights also serve the lower reach of these individuals. Displays that are too low can be problematic for individuals that have difficulty bending down. Appropriate lighting and colour contrast is particularly important for persons with a visual impairment.

#### APPLICATION

If fixed or built-in storage facilities, such as cabinets, closets, shelves and drawers, are provided in accessible spaces, at least one of each type provided shall contain storage space in compliance with this section.

Shelves or display units allowing self-service by customers in mercantile occupancies shall be located on an accessible route complying with 4.1.4.

#### DESIGN REQUIREMENTS

A clear floor space at least 760 mm (30 in.) by 1370 mm (54 in.) complying with 4.1.1 that allows either forward or parallel approach by a person using a wheelchair or a scooter shall be provided at accessible storage facilities.

Accessible storage spaces shall be within at least one of the reach ranges specified in 4.1.1. Clothes rods or shelves shall be a maximum of 1370 mm (54 in.) above the finished floor for a side approach. Where the distance from the wheelchair to the clothes rod or shelf is 255 – 535 mm (10-21 in.) (as in closets without accessible doors) the height of the rod or shelf shall be no more than 1200 mm (47 in.).

Where coat hooks are provided, they shall all be collapsible coat hooks, mounted no higher than 1200 mm (47 in.) above the floor. (Note: Coat hooks should NOT be located over benches)

Hardware for accessible storage facilities shall comply with 4.4.2. Touch latches and U-shaped pulls are acceptable.

#### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.4.2 Controls and Operating Mechanisms

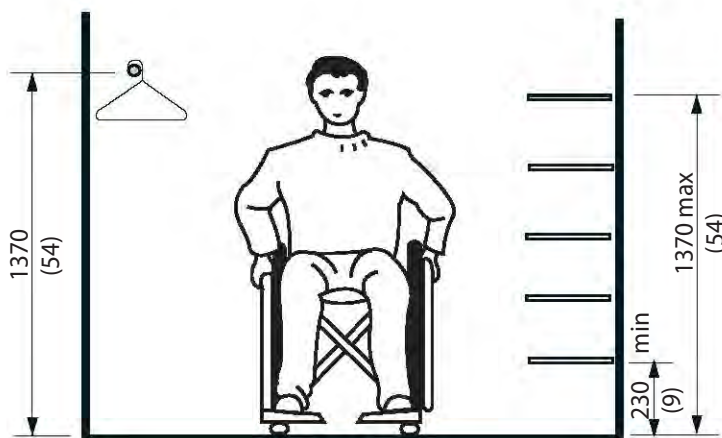


Figure 4.3.9.1  
Reach Limits for Storage

## 4.3 OTHER AMENITIES

## 4.3.10 LOCKERS AND BAGGAGE STORAGE

**RATIONALE**

In schools, recreational facilities, transit facilities, etc., or wherever public or private storage lockers are provided, at least some of the storage units should be *accessible* by a person using a wheelchair or scooter.

The provision of lockers at lower heights serves the reach restrictions of children or a person using a wheelchair or scooter. The operating mechanisms should also be at an appropriate height and operable by individuals with restrictions in hand dexterity.

**APPLICATION**

If lockers or baggage storage units are provided in *accessible* public or *common use areas*, at least 10%, but not less than one, of the lockers or baggage storage units shall comply with this section.

**DESIGN REQUIREMENTS**

*Accessible* lockers and baggage storage units shall be located on an *accessible route* complying with 4.1.4.

Lockers and baggage storage units shall have their bottom shelf no lower than 400 mm (15-3/4 in.) and their top shelf no higher than 1200 mm (47 in.) above the floor or ground.

Locks for *accessible* lockers and baggage storage units shall be mounted no higher than 1060 mm (42 in.) from the floor or ground and shall comply with 4.4.2.

Numbers or names on lockers and baggage storage units should be in clearly legible lettering, raised or recessed and of a highly contrasting colour or tone (in compliance with the relevant parts of 4.4.7).

Baggage racks or carousels for suitcases, etc. shall have the platform surface no higher than 460 mm (18 in.) from the floor and shall incorporate a continuous colour-contrasting strip at the edge of the platform surface.

Aisle *spaces* in front of lockers, baggage compartments and carousels should be a minimum of 1370 mm (54 in.) deep, to permit forward and lateral approach by a person using a wheelchair or scooter.

**RELATED SECTIONS**

- 4.1.1 Space and Reach Requirements
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.4.2 Controls and Operating Mechanisms
- 4.4.7 Signage
- 4.4.13 Lighting
- 4.4.15 Texture and Colour

### 4.3.11 BALCONIES, PORCHES, TERRACES AND PATIOS

### 4.3 OTHER AMENITIES

#### RATIONALE

Where a number of balconies, porches, patios or terraces are provided, it is desirable to consider options for different levels of sun and wind protection. This is of benefit to individuals with varying tolerances for sun or heat. Doors to these spaces typically incorporate large expanses of glazing. These should be appropriately marked to increase their visibility. Thresholds at balcony doors should be avoided.

#### APPLICATION

Balconies, porches, terraces and patios provided for use by the general public, clients, customers or employees shall comply with this section.

#### DESIGN REQUIREMENTS

Balconies, porches, terraces and patios shall

- be located on an *accessible route* complying with 4.1.4; and
- have a minimum depth of 2440 (96 in.). In retrofit situations where providing a depth of 2440 mm (96 in.) is *technically infeasible*, the minimum depth may be reduced to 1525 mm (60 in.).

Exterior balconies, porches, terraces and patios, where directly *accessible* from the interior *spaces*, shall incorporate a threshold in compliance with 4.1.2.

Balcony, porch, terrace and patio surfaces shall

- comply with 4.1.2;
- be sloped to ensure removal of water; and
- be sloped no more than 2%.

Railings and *guards* at balconies, porches, terraces and patios shall

- comply with the requirements of the Ontario Building Code; and
- be designed to allow *clear* vision below the rail for persons seated in a wheelchair or scooter; and
- incorporate pronounced colour contrast between the railings and *guards* and the surrounding environment.

Doors opening out onto balconies shall be located to open against a side wall or rail.

#### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour

4.3 OTHER AMENITIES

4.3.12 PARKING

**RATIONALE**

The provision of parking spaces near the entrance to a facility is important to accommodate persons with a varying range of abilities as well as persons with limited mobility and those caring for small children. Medical conditions, such as arthritis or heart conditions, using crutches, pregnancy or the physical act of pushing a wheelchair, all make it difficult to travel long distances. Minimizing travel distances is particularly important outdoors, where weather conditions and ground surfaces can make travel both difficult and hazardous. The accessible route of travel connecting the parking area to the entrance of a facility should be well marked and free of steps and curbs.

In addition to the proximity to entrances, the spatial requirements of accessible parking spaces is important. A person using a mobility aid such as a wheelchair requires a wider parking stall to accommodate the manoeuvring of the wheelchair beside the car or van. A van may also require additional space to deploy a lift or ramp through the side or back door. An individual would then require space for the deployment of the lift itself as well as additional space to manoeuvre on/off the lift.

A designated access aisle adjacent to a designated parking space is not required by all persons who would benefit from close proximity parking. Persons with limited mobility, expectant mothers, caregivers and persons who use a walker, cane, crutches or stroller can be accommodated by wider courtesy parking spaces near the entrance to a facility - identified in this section as a Limited Mobility/ Caregivers Only.

Heights along the routes to accessible parking is a factor. Accessible vans may have a raised roof resulting in the need for additional overhead clearance. Alternatively, the floor of the van may be lowered, resulting in lower tolerances for speed bumps and pavement slope transitions.

The number of accessible parking spaces required by this section may not be sufficient in some facilities (such as seniors' centres) where increased numbers of persons with disabilities may be expected.

Wherever possible locate parking signs away from pedestrian routes, as they may constitute an overhead and/or protruding hazard.

**APPLICATION**

This standard is applicable to all new parking structures and surface parking lots. For existing structures and surface parking lots undergoing renovations/alterations, standards should be employed to the greatest extent possible.

Designated parking spaces shall include Accessible parking spaces and Limited Mobility & Caregivers Only parking spaces. Limited Mobility & Caregivers Only parking spaces are recommended for all facilities and required for all assembly buildings.

The number of designated parking spaces shall be in accordance with Table 4.3.12. and shall be located on the shortest possible circulation route, with minimal traffic flow

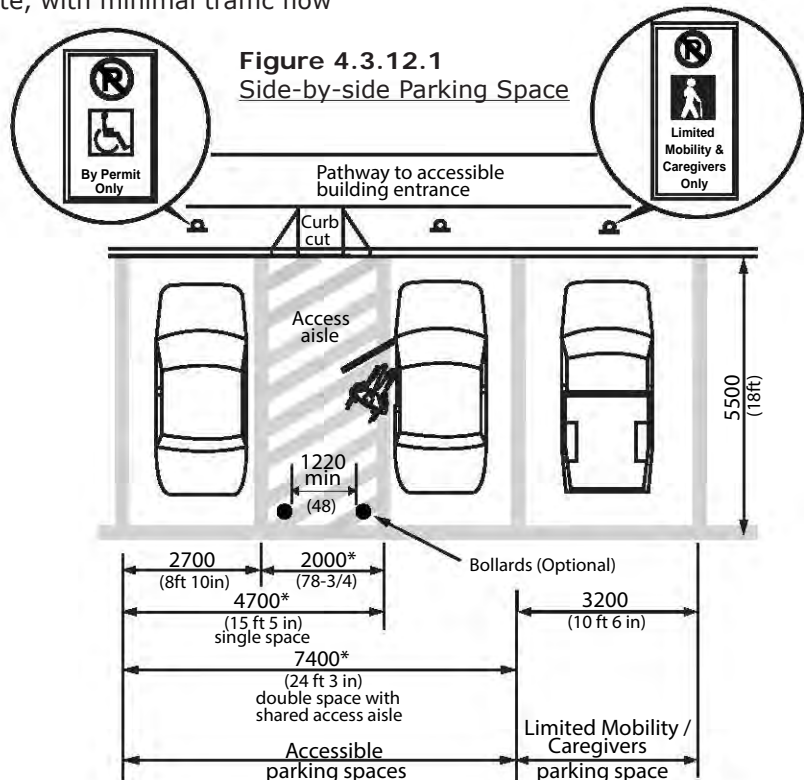
crossing, to an accessible facility entrance (e.g., in lots serving a particular facility) or to an accessible pedestrian entrance of the parking facility (e.g., in lots not serving a particular facility).

In facilities with multiple accessible entrances with adjacent parking, designated parking spaces shall be dispersed and located closest to the accessible entrances.

**DESIGN REQUIREMENTS**

An accessible route shall be provided from each designated parking space to an accessible entrance into the facility.

- Designated parking spaces shall be located on an accessible route complying with 4.1.4;
- have a firm, level surface with a maximum of 1.5% running slope for drainage;
- have a maximum cross slope of 1%;
- have a height clearance of at least 2750 mm (9 ft.) at the parking space and along the vehicle access and egress routes; and
- incorporate signage as outlined in this section.





### 4.3.12 PARKING

### 4.3 OTHER AMENITIES

Accessible parking spaces shall

- be at least 2700 mm (106 in.) wide;
- incorporate pavement markings containing the International Symbol of Access in accordance with Figure 4.4.7.4. Markings to include a 1525 x 1525 (5 ft. x 5 ft.) white border and symbol with a blue background field colour;
- have an adjacent *access aisle* at least 2000 mm (78-3/4 in.) wide clearly indicated by markings (Refer to Figures 4.3.12.1 and 4.3.12.2). In a retrofit situation where it is *technically infeasible* to provide a 2000 mm (78-3/4 in.) *access aisle*, the *access aisle* may be reduced to 1220 mm (48 in.); and
- have a height clearance at the parking space and along the vehicle access and egress routes,
  - of at least 2750 mm (108 in.) at outdoor parking; and
  - of at least 2590 mm (98 in.) at indoor parking parking, including vehicular entrances.

Indoor parking facilities shall incorporate a sign at the vehicle entrance indicating the minimum overhead clearance at the parking space and along the vehicle access and egress routes.

Where provided, and for all parking areas serving assembly buildings, Limited Mobility & Caregivers Only parking spaces shall be a minimum 3200 (10 ft. 6 in.) wide and incorporate signage in accordance with Figure 4.3.12.1.

Signage of accessible parking spaces shall incorporate an official designated disabled parking space sign developed by the Ministry of Transportation (1991).

Each accessible parking space shall be designated with signage that is

- mounted vertically on a post that is colour contrasted with the background environment;
- at least 300 mm (11-3/4 in.) wide x 450 mm (17-3/4 in.) high;
- installed at a height of 1500 mm (47 in.) to 2500 mm (98 in.) from the ground/floor surface to the centre line of the sign;
- for perpendicular parking, centred on the parking space; and
- for parallel parking, located toward the end of the parking space, on the opposite side from the access aisle.

Signs shall not be mounted on fences or building faces.

Where the location of designated parking spaces is not obvious or is distant from the approach viewpoints, directional signage shall be placed along the route leading to the designated parking spaces. Such directional signage shall incorporate the symbol of access

and the appropriate directional arrows.

Where the location of the nearest accessible entrance is not obvious or is distant from the approach viewpoints, directional signs shall be placed along the route leading to the nearest accessible entrance to the facility. Such directional signage will incorporate the symbol of access and the appropriate directional arrows.

#### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.3 Protruding and Overhead Objects
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.1.10 Curb Ramps
- 4.4.7 Signage
- 4.4.8 Detectable Warning Surfaces
- 4.4.13 Lighting
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour

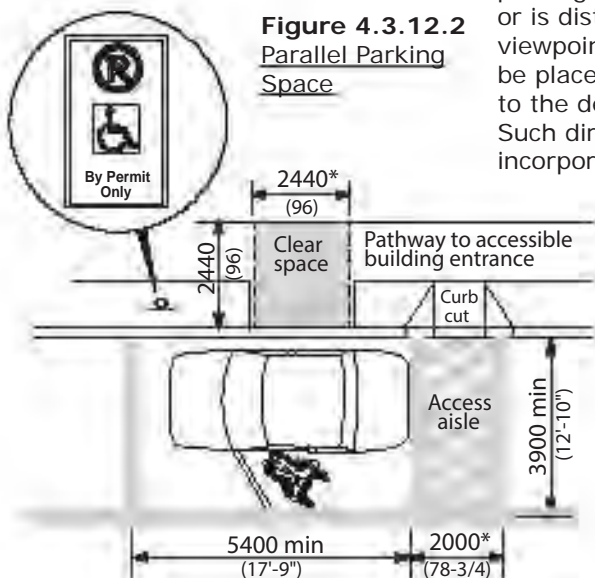


Figure 4.3.12.2 Parallel Parking Space

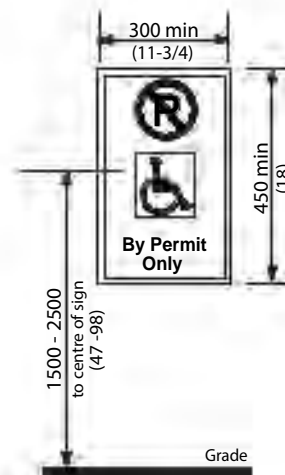


Figure 4.3.12.3 Designated Parking Signage

Number of Automobile Parking Spaces	Number of Accessible Parking Spaces	Number of Limited Mobility Parking Spaces
1 - 50	1	1
51 - 100	2	2
101 - 200	4	2
201 - 300	6	3
301 - 500	6	4
501 and over	6 plus 1 for each 100 over 500	4 plus 1 for each 100 over 500

Table 4.3.12 Designated Parking Spaces Requirements

\* NOTE: In a retrofit situation where it is *technically infeasible* to provide the required *access aisle* width, the aisle width may be reduced to 1220 mm (48 in.).

4.3 OTHER AMENITIES

4.3.13 PASSENGER-LOADING ZONES

**RATIONALE**

Passenger-loading zones are important features for individuals who may have difficulty in walking distances or those who use parallel transit systems. Accessible transit vehicles typically require space for the deployment of lifts or ramps and overhead clearances. Protection from the elements will be beneficial to all users and particularly those that may have difficulty with mobility.

**APPLICATION**

Where passenger-loading zones are provided, at least one shall comply with this section.

Accessible passenger-loading zones shall be identified with signage complying with applicable provisions of 4.4.7.

If the passenger-loading zone is a designated mobility transit stop zone, it shall comply with all relevant municipal bylaws.

**DESIGN REQUIREMENTS**

Passenger-loading zones shall

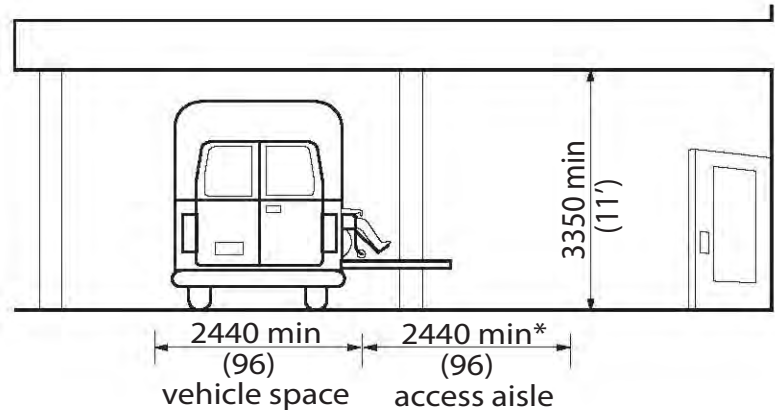
- be on an *accessible route* complying with 4.1.4;
- provide an *access aisle* at least 2440 mm (96 in.) wide and 7000 mm (23 ft.) long, adjacent and parallel to the vehicle pull-up *space*. (In a retrofit situation where providing a 2440 mm

(96 in.) wide *access aisle* is *technically infeasible*, the *access aisle* width may be reduced to 2000 mm (78-3/4 in.);

- have a *curb ramp* complying with 4.1.10 where there are curbs between the *access aisle* and the vehicle pull-up *space*; and
- have a minimum vertical clearance of 3350 mm (11 ft.) at the loading zone and along the vehicle access route to such areas to and from the *site entrances*.

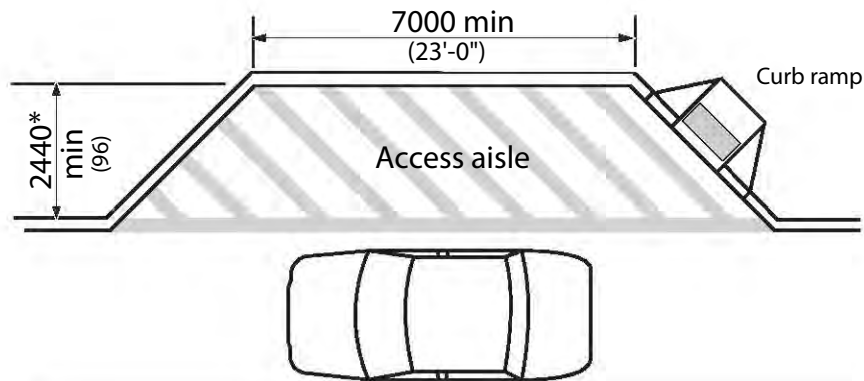
**RELATED SECTIONS**

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.3 Protruding and Overhead Objects
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.1.10 Curb Ramps
- 4.4.7 Signage
- 4.4.8 Detectable Warning Surfaces
- 4.4.13 Lighting
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour



**Figure 4.3.13.1**  
Clearances at  
Passenger Loading Zone

\* NOTE: In a retrofit situation where it is *technically infeasible* to provide the required *access aisle* width, the aisle width may be reduced to 2000 mm (78-3/4 in.)



**Figure 4.3.13.2**  
Passenger Loading Zone

### 4.3.14 LANDSCAPING MATERIALS AND PLANTINGS

### 4.3 OTHER AMENITIES

#### RATIONALE

Landscape materials, trees, shrubs and plants should be selected and located with a wide variety of users in mind. For instance, plants and shrubs with a variety of fragrances can provide an interesting orientation cue for persons with a visual *impairment*. Using contrasting flowers near walkways can also be helpful as a guide. Plants with thorns may constitute a walking hazard. Plants that drop large seed pods can present slipping hazards, as well as difficulties for pushing a wheelchair. Plantings and tree limbs that overhang pathways can impede all users and be a particular hazard to an individual with a visual *impairment*.

Raised beds can better accommodate persons who use a mobility device or those that have difficulty in bending to enjoy or tend to plantings however may create loitering problems.

The use of unit pavers as a walking/wheeling surface is not recommended, unless they are laid in a location that is not subject to the effects of settlement and frost heave, such as over a structural slab or indoors.

#### APPLICATION

Landscaping materials and plantings contained within the site shall comply with this section.

Where plant beds are provided for gardening use of the general public, clients, customers or employees, 10% of the area of the plant beds, but not less than one, shall comply with this section. It is preferable to have all plant beds comply with this section.

#### DESIGN REQUIREMENTS

*Accessible* plant beds shall be

- raised 460 mm (18 inches) above the adjacent floor or ground surface; and
- located on an *accessible route* complying with 4.1.4.

The edges of planting beds located immediately adjacent to pedestrian *walks* shall incorporate clearly defined, cane-detectable curbs at least 75 mm (3 in.) high.

Where variations in grading immediately adjacent to pedestrian *walks* are potentially hazardous (particularly to persons who are visually impaired), the hazardous edges of the *walk* shall incorporate clearly defined, cane-detectable curbs at least 75 mm (3 in.) high.

Shrubs with thorns and sharp edges shall be planted at least 920 mm (36 in.) away from *accessible* pathways and seating areas.

Plants that drop large seed pods shall not overhang or be positioned near *accessible* paths or walkways.

Permanent guide wires shall not be used in any area which is intended for use by the general public, clients, customers or employees. Temporary guide wires, such as those used when planting new trees, shall be clearly identified using strong colour contrast.

Tree *guards* shall conform to 4.1.3.

Overhanging branches of trees or shrubs over walkways or paths shall not reduce the available headroom at any part of the *walkway* or path to less than 2100 mm (82-3/4 in.).

#### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.3 Protruding and Overhead Objects
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.4.8 Detectable Warning Surfaces
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour

### 4.3 OTHER AMENITIES

### 4.3.15 BENCHES

#### RATIONALE

Benches provide convenient resting places for all individuals and are especially important for those who may have difficulty with standing or walking for extended periods. Benches should be placed adjacent to pedestrian walkways to provide convenient rest places without becoming potential obstructions. Appropriate seat heights can facilitate sitting and rising for individuals such as senior citizens. Armrests may also provide assistance in sitting and rising. A person with a visual impairment may find it easier to locate benches if they are located adjacent to a landmark, such as a large tree, a bend in a pathway, or a sound source.

#### APPLICATION

All benches, except those located in unpaved areas of parks, wilderness, beach or unpaved picnic areas, shall be accessible to persons using wheelchairs or other mobility devices.

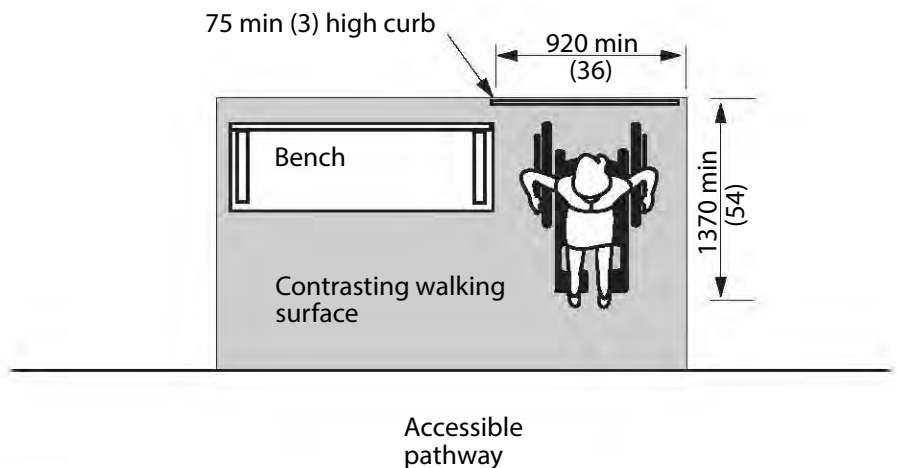
#### DESIGN REQUIREMENTS

Benches shall

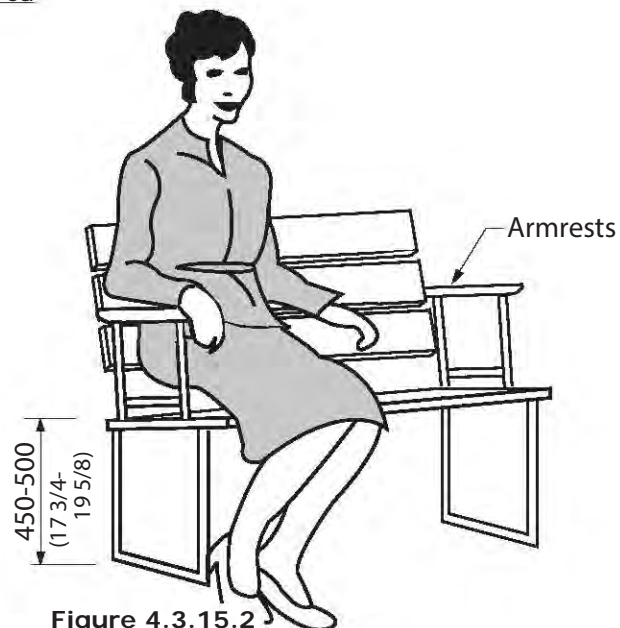
- be adjacent to an accessible route complying with 4.1.4;
- be stable;
- have a seat height between 450 mm (17-3/4 in.) and 500 mm (19-5/8 in.) from the ground;
- have arm and back rests;
- be of contrasting colour to their background; and
- have an adjacent level, firm ground surface at least 920 mm (36 in.) x 1370 mm (54 in.).

#### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.3 Protruding and Overhead Objects
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.4.8 Detectable Warning Surfaces
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour



**Figure 4.3.15.1**  
Rest Area



**Figure 4.3.15.2**  
Bench Seating



### 4.3.16 PICNIC TABLES

### 4.3 OTHER AMENITIES

#### RATIONALE

Picnic tables with an extension of the table surface make them *accessible* to a person using a wheelchair. A firm, level surface around the table, with an *accessible* path leading to the table, is required for wheelchair accessibility. A change in texture from a pathway to the picnic table area is an important cue for a person with a visual impairment.

#### APPLICATION

If picnic tables are provided in an *accessible* public or *common use* area, at least 10%, but not less than one, for each cluster of picnic tables shall comply with this section. It is preferable to have all picnic tables comply with this section.

#### DESIGN REQUIREMENTS

Picnic tables shall

- be adjacent to an *accessible route* complying with 4.1.4;
- have knee *space* under the table at least 760 mm (30 in.) wide by 480 mm (19 in.) deep and 685 mm (27 in.) high;
- have its top surface located between 710 mm (28 in.) to 865 mm (34 in.) above the finished floor or ground surface;
- be of contrasting colour to their background; and
- have a level, firm ground surface extending min. 2000 mm (78-3/4 in.) where *accessible space* is provided at a picnic table for persons who use wheelchairs or scooters and min. 1220 mm (48 in.) on all the other sides.

In a retrofit situation where it is *technically infeasible* to provide the required level surface, the dimensions may be reduced to min. 1220 mm (48 in.) on all sides.

#### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.3 Protruding and Overhead Objects
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.4.8 Detectable Warning Surfaces
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour

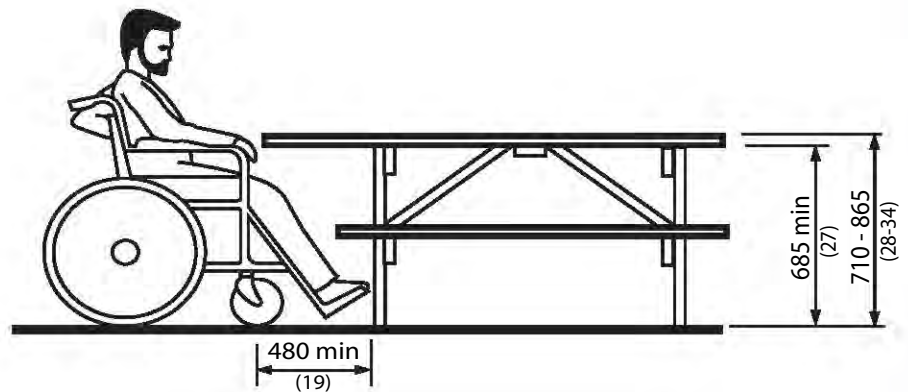


Figure 4.3.16.1  
Picnic Table

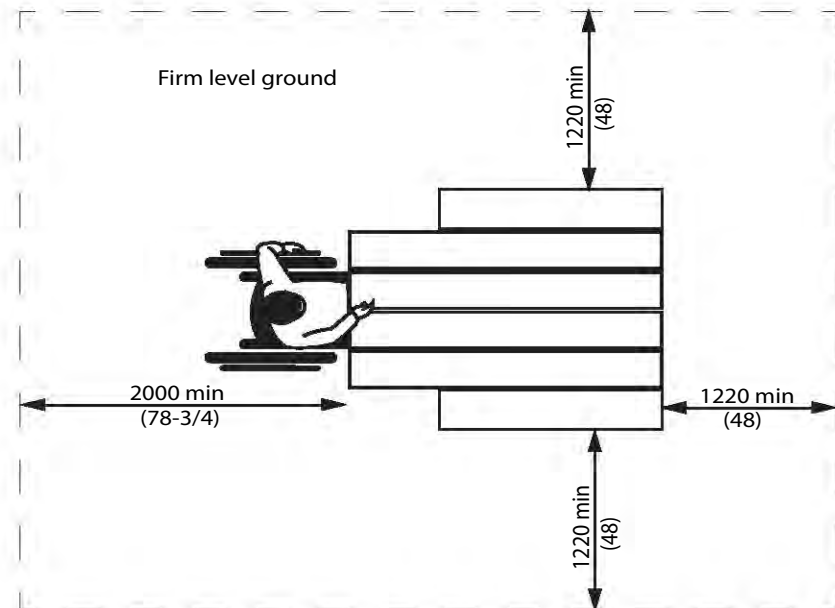


Figure 4.3.16.2  
Space around Picnic Table

## 4.3 OTHER AMENITIES

## 4.3.17 STREET FURNITURE

**RATIONALE**

Street furniture can provide a resting place for any individual with difficulty walking distances. Such furniture should incorporate strong colour contrasts and be located off pathways, to minimize its potential as an obstruction to pedestrians.

**APPLICATION**

Street furniture, including but not limited to, waste receptacles, light standards, signs, planters, mail boxes and vending machines contained within the *site*, shall comply with this section, including furniture that is located inside or outside of *facilities*.

All waste receptacles, except those located in unpaved areas of *parks*, wilderness, beach or unpaved picnic areas or large industrial containers, shall be *accessible* to persons using wheelchairs or other mobility devices.

**DESIGN REQUIREMENTS**

Street furniture shall

- not reduce the required width of an access route as specified in 4.1.4;
- be cane-detectable, in compliance with 4.1.3;
- be located to one side of the normal path of pedestrian travel, as illustrated in 4.3.15.1; and
- be securely mounted.

Waste receptacles shall be large enough to contain the anticipated amount of waste, so that overflows do not cause a tripping hazard.

Waste receptacles in *accessible* open areas, such as *parks*, wilderness areas, beaches or picnic areas, shall be mounted on firm, level pads.

Waste receptacles shall be clearly identified by suitable lettering, in compliance with the relevant parts of 4.4.7.

Where lids or openings are provided on waste receptacles, they shall be mounted no higher than 1060 mm (42 in.) above the adjacent floor or ground surface. Opening mechanisms shall comply with 4.4.2.

An exterior waste receptacle shall be provided close to each *accessible* public *entrance*.

Street furniture shall incorporate pronounced colour contrast to differentiate it from the surrounding environment.

**RELATED SECTIONS**

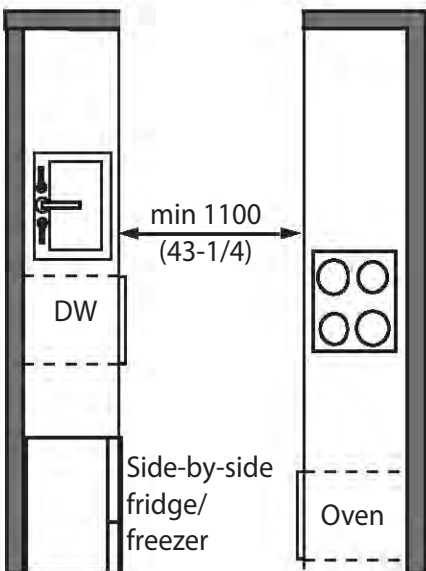
- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.3 Protruding and Overhead Objects
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.3.15 Benches
- 4.4.8 Detectable Warning Surfaces
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour

### 4.3.18 KITCHENS AND KITCHENETTES

### 4.3 OTHER AMENITIES

#### RATIONALE

Kitchens, kitchenettes and coffee stations require an appropriate level of access to be useable by persons with disabilities. Adequate manoeuvring space is required for users of mobility equipment to approach and use work surfaces, storage elements and appliances. A frontal approach to work surfaces and appliances is generally preferred, except at refrigerators where a side approach is preferred. Where a frontal approach is used, knee space and toe space are required.



**Figure 4.3.18.1**  
Pass-Through Kitchen

The use of colour contrast between kitchen elements will assist persons with low vision locate surfaces, appliances and controls. Darker coloured work surfaces are preferable as they make it easier to identify objects located on them.

#### APPLICATION

Kitchens and kitchenettes intended for use by staff or the public shall comply with this section. Exception: Commercial kitchens.

At least 50% of shelf space in storage facilities shall comply with this section.

#### DESIGN REQUIREMENTS

- Pass-through kitchens shall have
- where counters, appliances or cabinets are on two opposing sides, or when counters, appliances or cabinets are opposite a parallel wall, clearance between all opposing base cabinets, counter tops, appliances, or walls within a kitchen work area of 1100 mm (43-1/4 in.) minimum; and
  - two entries.

U-shaped kitchens enclosed on three continuous sides shall have a minimum clearance of 2440 mm (96 in.) between all opposing base cabinets, counter tops, appliances,

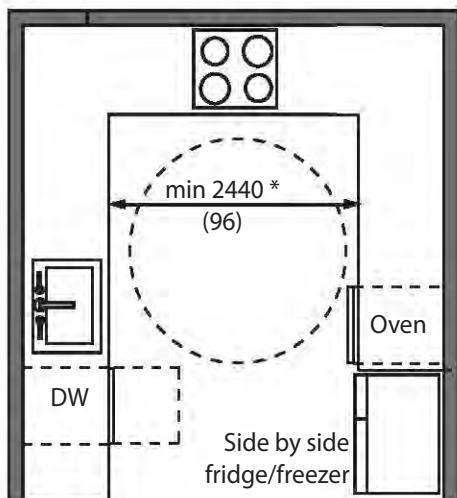
or walls within kitchen work areas. In a retrofit situation where providing a 2440 mm (96 in.) space is *technically infeasible*, this space may be reduced to 2130 mm (84 in.).

Storage elements shall

- be located on an accessible route with adjacent *clear floor space* in compliance with 4.1.1;
- comply with at least one of the reach ranges specified in 4.1.1; and
- incorporate *operable portions* in compliance with 4.4.2.

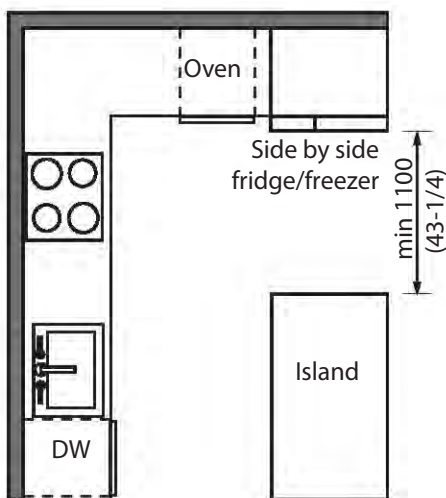
Kitchen sinks shall

- be located on an accessible route with adjacent *clear floor space* for a forward approach. Exceptions: A parallel approach is permitted to a kitchen sink where a cook top or conventional range is not provided and to wet bars;
- where a forward approach is provided, incorporate knee space below at least 760 mm (30 in.) wide, 480 mm (18-7/8 in.) deep, and 685 mm (27 in.) high;
- have the height of the rim or the counter top (whichever is higher) 710–856 mm (28-34 in.);
- incorporate faucets and other controls in compliance with 4.4.2;

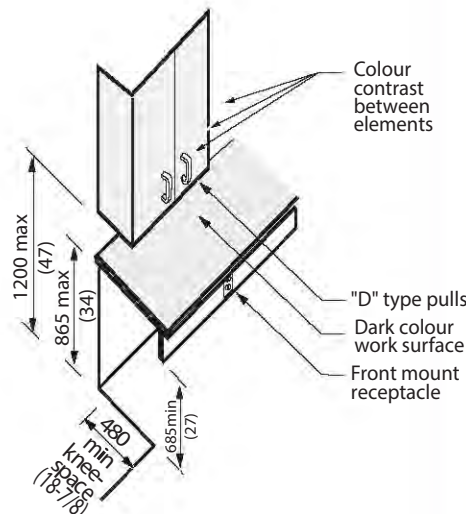


\* In a retrofit situation where it is technically infeasible to provide 2440 mm (96), this dimension may be reduced to 2130 (84 in.)

**Figure 4.3.18.2**  
U-Shaped Kitchen



**Figure 4.3.18.3**  
L-Shaped Kitchen with Island



**Figure 4.3.18.4**  
Storage Elements

### 4.3 OTHER AMENITIES

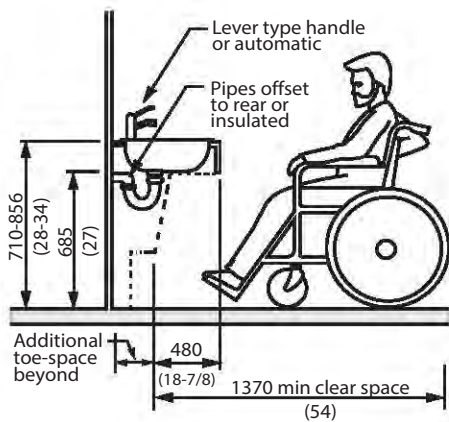
#### DESIGN REQUIREMENTS (Continued)

- have water supply and drain pipes under the sink insulated or otherwise configured to protect against contact; and
- incorporate no sharp or abrasive surfaces under the sink.

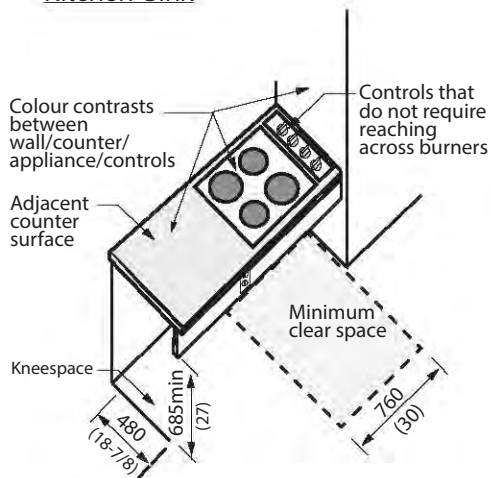
Kitchen appliances shall

- be located on an accessible route with adjacent *clear floor space* in compliance with 4.1.1; and
- incorporate controls and *operable portions* in compliance with 4.4.2. Exceptions: Appliance doors and door latching devices.

Dishwashers shall incorporate *clear floor space* adjacent to the dishwasher door. The dishwasher door, in the open position, shall not obstruct the *clear floor space* for the dishwasher or the sink.



**Figure 4.3.18.5**  
Kitchen Sink



**Figure 4.3.18.6**  
Cook Top

### 4.3.18 KITCHENS AND KITCHENETTES

Ranges and cooktops shall

- incorporate controls that are located to avoid reaching across the burners; and
- where a forward approach is provided
  - incorporate *knee space* below at least 760 mm (30 in.) wide, 480 mm (18-7/8 in.) deep, and 685 mm (27 in.) high; and
  - insulate or otherwise configure the appliance to prevent burns, abrasions, or electrical shock.

Ovens shall

- have controls located on the front panels, mounted no higher than 1400 mm (55-1/8 in.);
- where side-hinged doors are used, be located
  - with an adjacent work surface positioned adjacent to the latch side of the door; and
  - incorporate a pull-out shelf below the oven;
- where bottom-hinged doors are used, be located with an adjacent work surface positioned adjacent to one side of the door.

In facilities with children's programs, ranges, cooktops and ovens shall be equipped with a safety switch to de-activate appliance controls.

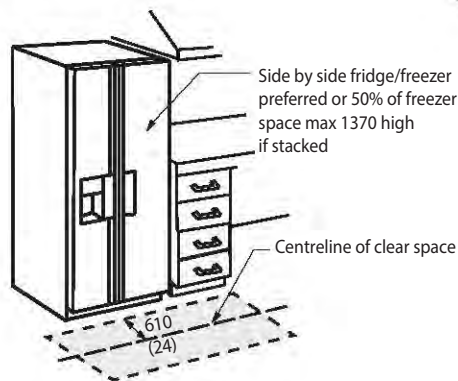
Refrigerators/freezers shall

- be configured with at least 50% of the freezer *space* maximum 1370 mm (54 in.) above the floor; and
- incorporate *clear floor space* in front, positioned for a parallel approach immediately adjacent to the refrigerator/freezer, with the centre-line of the *clear floor space* offset 610 mm (24 in.) maximum from the front face of the refrigerator/freezer.

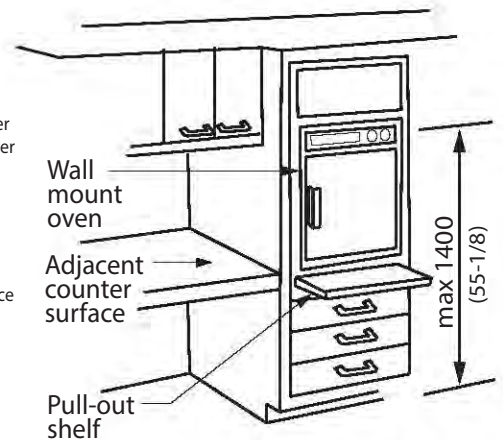
Kitchen elements shall incorporate colour contrast to visually differentiate the cabinets and appliances from adjacent wall and floor surfaces, the countertop from the cabinets and adjacent walls, and operable hardware on cabinets.

#### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.3 Protruding and Overhead Objects
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.4.12 Glare and Light Sources
- 4.4.13 Lighting
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour



**Figure 4.3.18.7**  
Fridge/Freezer



**Figure 4.3.18.8**  
Wall-Mounted Oven



### 4.4.1 EMERGENCY EXITS, FIRE EVACUATION AND AREAS OF RESCUE ASSISTANCE

### 4.4 SYSTEMS AND CONTROLS

#### RATIONALE

In order to be *accessible* to all individuals, emergency exits must include the same accessibility features as other doors specified in 4.1.6. The doors and routes must also be marked in a way that is *accessible* to all individuals, including those who may have difficulty with literacy, such as children or persons speaking a different language. Persons with a visual *impairment* will need a means of quickly locating exits – audio or talking signs could assist. In the event of fire when elevators cannot be used, areas of rescue assistance are an asset to anyone who would have difficulty traversing sets of stairs.

#### APPLICATION

In *facilities*, or portions of *facilities*, required to be *accessible*, *accessible means of egress* shall be provided in the same number as required for exits by the Ontario Building Code.

Where required exits from a floor level are not *accessible*, *areas of rescue assistance* shall be provided on the floor level in a number equal to that of the required exits.

Every *occupiable* level in non-residential occupancies above or below the first *storey* (as defined by the Ontario Building Code) that is *accessible*, shall

- be served by an elevator that has protection features, as specified in the Ontario Building Code; or
- be divided into at least two zones by fire separations, as specified in the Ontario Building Code.

In *occupiable* levels above or below the first *storey* in residential occupancies, the requirements for a protected elevator or two fire zones may be waived, if an appropriate balcony (as specified in the Ontario Building Code) is provided for each suite.

Areas of rescue assistance shall comply with this section.

A horizontal exit meeting the requirements of the Ontario Building Code shall satisfy the requirements for an *area of rescue assistance*.

#### DESIGN REQUIREMENTS

Where emergency warning systems are provided, they shall include both audible alarms and visible alarms. Visual alarms shall comply with 4.4.4.

*Accessible means of egress* shall comply with 4.1.4.

*Accessible means of egress* shall be identified with *signage* in compliance with the applicable provisions of 4.4.7.

*Areas of rescue assistance* shall

- be located on an *accessible route* complying with 4.1.4;
- incorporate the number of rescue *spaces* in accordance with Table 4.4.1;
- be of a size that allows a minimum floor *space* of 850 mm (33-1/2 in.) x 1370 mm (54 in.) per non-ambulatory occupant;
- be separated from the floor area by a fire separation having a fire-resistance rating at least equal to that required for an exit;
- be served by an exit or firefighters' elevator;
- be designated as an *area of rescue assistance* for persons with disabilities on the *facility* plans and in the *facility*;
- be smoke protected in *facilities* of more than three *storeys*;
- incorporate a 2-way voice communication system for use between each *area of rescue*

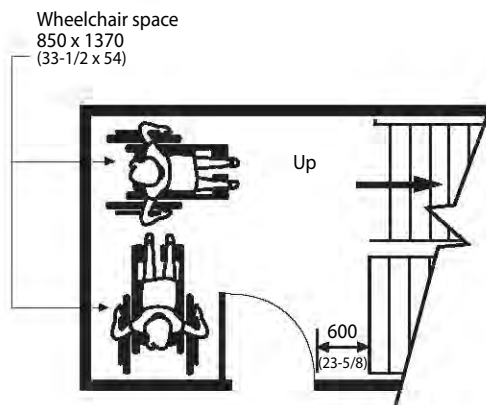
*assistance* and the central alarm and control *facility*; and be identified with *signage* in compliance with the applicable provisions of 4.4.7, stating AREA OF RESCUE ASSISTANCE and incorporating the international symbol for accessibility for disabled persons.

#### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.2 Ground and Floor Surfaces
- 4.1.3 Protruding and Overhead Objects
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.1.6 Doors
- 4.4.2 Controls and Operating Mechanisms
- 4.4.4 Visual Alarms
- 4.4.7 Signage
- 4.4.8 Detectable Warning Surfaces
- 4.4.9 Public Address Systems
- 4.4.14 Materials and Finishes
- 4.4.15 Texture and Colour

Occupant load of the floor area served by the area of rescue assistance	Minimum number of rescue spaces
1 to 400	2
Over 400	3 plus 1 for each additional increment of 200 persons in excess of 400 persons

**Table 4.4.1**  
Number of Rescue Spaces



**Figure 4.4.1.1**  
Area of Rescue Assistance

## 4.4 SYSTEMS AND CONTROLS

## 4.4.2 CONTROLS AND OPERATING MECHANISMS

## RATIONALE

Operating mechanisms that require a high degree of dexterity or strength will be difficult for many people to use. They can also be obstacles for children, individuals with arthritis or even someone wearing gloves. Controls that require two hands to operate can also be difficult for some people, particularly those with reach or balance limitations, or those who must use their hands to hold canes or crutches.

The placement of controls is integral to their accessibility. For the individual using a wheelchair, the height of the controls and the space to position the wheelchair in front of the controls are important. Controls placed high on a wall are also difficult for children or persons of short stature.

Individuals with a visual *impairment* may have difficulty with flush-mounted buttons, touch screens or controls without tactile markings. Controls that contrast in colour from their background, including colour-contrasted raised letters, may be easier to find by an individual with a visual *impairment*. Persons with cognitive challenges may find counterintuitive controls or graphics difficult.

## APPLICATION

Controls and operating mechanisms generally used by staff or public (e.g., light switches and dispenser controls) shall comply with this section. Exception: Restricted-access controls.

## DESIGN REQUIREMENTS

A *clear*, level floor area at least 760 mm x 1370 mm (30 in. x 54 in.) shall be provided at controls and operating mechanisms, such as dispensers and receptacles.

The *operable portions* of controls and operating mechanisms such as electrical switches, thermostats and intercom switches, shall be located between 900 mm (35 in.) and 1200 mm (47 in.) from the floor. Exception: Elevators and power door operator controls - Refer to 4.1.6 and 4.1.14.

Electrical outlets and other types of devices shall be located no lower than 400 mm (15-3/4 in.). Exception: Where electrical outlets are provided as components of systems furniture, these devices need not comply with this section provided they are installed in addition to electrical outlets required by the Authority having Jurisdiction.

Faucets and other controls shall be hand-operated or electronically controlled.

Hand-operated controls and mechanisms shall be operable

- with one hand;
- without tight grasping, pinching, or twisting of the wrist; and
- with a force of less than 22N (5 lb.).

Controls and operating mechanisms shall be capable of being illuminated to at least a level of 100 lux (9.2 ft-candles).

Controls and operating mechanisms shall incorporate a pronounced colour contrast, to differentiate them from the surrounding environment.

## RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.3 Protruding Objects and Overhead
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.1.6 Doors
- 4.1.7 Gates, Turnstiles and Openings
- 4.1.8 Windows, Glazed Screens and Sidelights
- 4.1.14 Elevators
- 4.1.15 Platform Lifts
- 4.2.2 Toilet Stalls
- 4.2.3 Toilets
- 4.2.4 Lavatories
- 4.2.5 Urinals
- 4.2.6 Washroom Accessories
- 4.2.7 Individual Washrooms
- 4.2.8 Bathtubs
- 4.2.9 Shower Stalls
- 4.3.1 Drinking Fountains
- 4.3.4 Dressing Rooms
- 4.3.5 Offices, Work Areas and Meeting Rooms
- 4.3.9 Storage, Shelving and Display Units
- 4.3.10 Lockers and Baggage Storage
- 4.3.17 Street Furniture
- 4.4.3 Vending and Ticketing Machines
- 4.4.5 Public Telephones
- 4.4.10 Information Systems
- 4.4.11 Card Access, Safety and Security Systems
- 4.4.13 Lighting
- 4.4.15 Texture and Colour

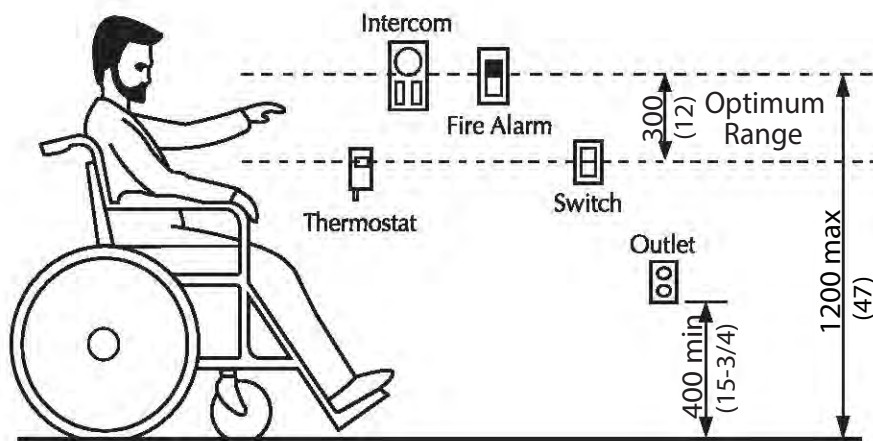


Figure 4.4.2.1  
Reach Range for Accessible Controls

### 4.4.3 VENDING AND TICKETING MACHINES

### 4.4 SYSTEMS AND CONTROLS

#### RATIONALE

Space in front of vending machines allows for manoeuvrability of mobility aids. Seating areas and tables adjacent to vending machines offer convenience and should accommodate the spatial requirements of a wheelchair or scooter. The selection of the machines should include a number of factors. Operating mechanisms should be within reach of children and individuals in wheelchairs. The mechanisms should be operable with one hand and minimal strength, to accommodate a host of disabilities including arthritis, or the need to stabilize oneself with a cane or a handful of bags. Lighting levels and colour contrasts make the machine more *accessible* to those with a visual *impairment*.

#### DESIGN REQUIREMENTS

Vending and ticketing machines shall be located on an *accessible route* in compliance with 4.1.4.

*Clear floor space* in front of vending and ticketing machines shall conform to 4.1.1.

The controls and operating mechanisms on vending and ticketing machines shall comply with 4.4.2.

*Signage* on vending and ticketing machines shall be in highly contrasting lettering, at least 13 mm (1/2 in.) high. Ideally, lettering and *signage* shall comply with relevant parts of 4.4.7.

#### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.4.2 Controls and Operating Mechanisms
- 4.4.15 Texture and Colour

#### APPLICATION

Vending and ticketing machines shall comply with this section.

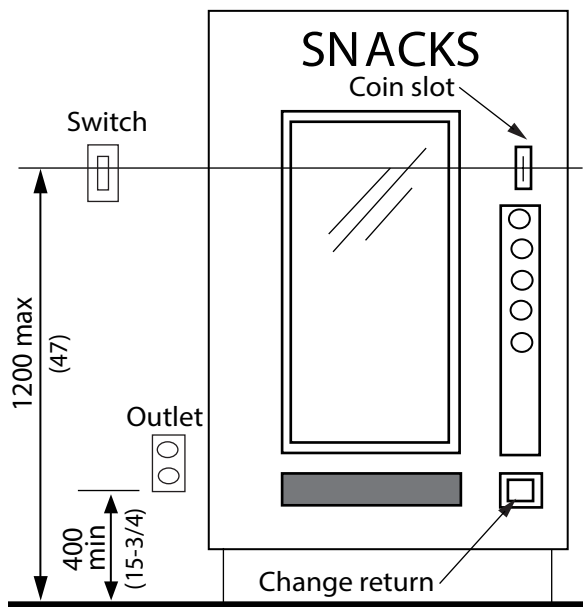


Figure 4.4.3.1 Vending Machine

## 4.4 SYSTEMS AND CONTROLS

## 4.4.4 VISUAL ALARMS

**RATIONALE**

Visual alarms are essential safety features for individuals who are deaf, deafened or hard of hearing such that they would not hear an audible alarm.

**APPLICATION**

Visual alarms shall comply with this section.

At a minimum, visual alarm appliances shall be provided in *facilities* in each of the following areas: restrooms and any other general usage areas (e.g., *meeting rooms*), hallways, lobbies and any other areas for *common use*.

Visual alarm signal appliances shall be integrated into the *facility* alarm system. If single-station audible alarms are provided, then single-station visual alarms shall be provided.

A signal intended for the public to indicate the operation of a building security system that controls access to a building shall consist of an audible and visual signal.

**DESIGN REQUIREMENTS**

Visual alarm signals shall have the following minimum photometric and location features:

- the lamp shall be a Xenon strobe type or equivalent;
- the colour shall be *clear* or nominal white (i.e. unfiltered or clear filtered white light);
- the maximum pulse duration shall be two-tenths of one second (0.2 sec) with a maximum duty cycle of 40 percent. The pulse duration is defined as the time interval between initial and final points of 10% of maximum signal;
- the intensity shall be a minimum of 75 candela;
- the flash rate shall be a minimum of 1 Hz and a maximum of 3 Hz;
- the appliance shall be placed 2100 mm (82-3/4 in.) above the floor level within the *space* or 150 mm (5-7/8 in.) below the ceiling, whichever is lower;
- in general, no place in any room or *space* required to have a visual signal appliance, shall be more than 15 meters (50 ft.) from the signal (in the horizontal plane). In large rooms and *spaces* exceeding 30 meters (100 ft.) across, without obstructions 2000 mm (78-3/4 in.) above the finished floor, such as auditoriums, devices may be placed around the perimeter, spaced a maximum of 30 meters (100 ft.) apart, in lieu of suspending appliances from the ceiling; and
- no place in common corridors or hallways in which visual alarm signalling appliances are required shall be more than 15 m (50 ft.) from the signal.

**RELATED SECTIONS**

- 4.4.1 Emergency Exits, Fire Evacuation and Areas of Rescue Assistance



## 4.4.5 PUBLIC TELEPHONES

## 4.4 SYSTEMS AND CONTROLS

### RATIONALE

The placement of telephones should address the limited reach of children or persons in a seated position. Longer cords facilitate the use of the phone for someone unable to get close to the phone due to a mobility device. Adjustable volume controls are important for persons who are hard of hearing, as are shelves that could support a TDD device. A fold-down seat is an asset to someone having difficulty standing for extended periods. Telephones projecting from a wall may present a hazard, particularly to persons with a visual impairment, if the sides are not configured to be cane-detectable.

### APPLICATION

Where public pay phones, public closed-circuit phones, or other public telephones are provided, they shall comply with this section to the extent required by Table 4.4.5.

All telephones required to be *accessible* shall be equipped with a volume control. In addition, 25%, but never less than one, of all other public telephones provided shall be equipped with a volume control and shall be dispersed among all types of public telephones, including *closed-circuit telephones*, throughout the *facility*.

*Signage* complying with applicable provisions of 4.4.7 shall be provided.

Where an interior public pay telephone is provided, then at least one interior public *text telephone* (TTY) shall be provided in the *facility* in a *public use area*.

Where an interior public pay telephone is provided in the secured area of a detention or correctional *facility* subject to 4.5.8, then at least one public *text telephone* shall also be provided in at least one secured area. Secured areas are those areas used only by detainees or inmates and security personnel.

### DESIGN REQUIREMENTS

*Accessible* telephones shall be on an *accessible route* complying with 4.1.4.

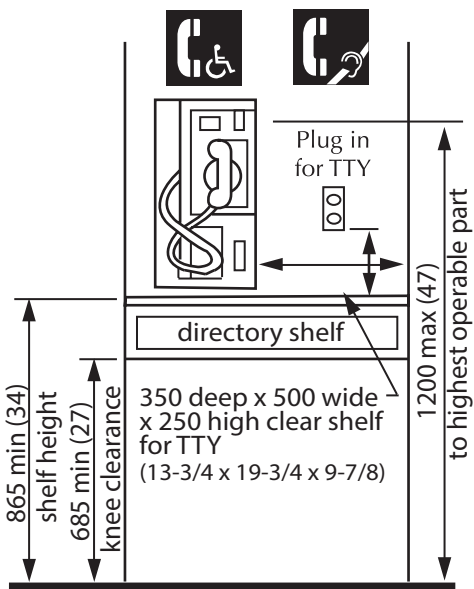
Telephones, enclosures and related equipment shall comply with 4.1.3.

Telephones shall have push-button controls where service for such equipment is available. The characters on the push buttons shall contrast with their background, which should be non-glare (matte finish), and the buttons themselves should contrast with their background.

The minimum handset cord length of *accessible* telephones shall be 1000 mm (39-3/8 in.).

The minimum illumination level at operating mechanisms, the directory, and shelf of *accessible* telephones shall be 200 lux (18.4 ft-candles).

- Accessible* telephones shall
- comply with CSA Standard T515;
  - have *operable portions* within the reach ranges specified in 4.1.1 and the coin slot, located maximum 1200 mm (47 in.) above the floor;
  - have a shelf of at least 350 mm (13-3/4 in.) deep by 500 mm (19-3/4 in.) wide with a minimum 250 mm (9-7/8 in.) *clear space* above the shelf, to accommodate the use of a portable *text telephone*;
  - have a separate telephone directory shelf;
  - be equipped with an electrical outlet, within or adjacent to the telephone enclosure;
  - be equipped with a handset capable of being placed flush on the surface of the shelf; and



**Figure 4.4.5.1**  
*Accessible Telephone*

Number of telephones provided on each floor	Number of <i>accessible</i> telephones required
1 or more single units	1 per floor
1 bank	1 per floor
2 or more banks	1 per bank

- Notes:
- 1) A bank of telephones consists of two or more adjacent public telephones, often installed as a unit.
  - 2) Accessible phones may be installed as single units in proximity to a bank of phones. If installed in proximity but not visible from the bank, signage in compliance with 4.4.7 shall be provided.
  - 3) At least one public telephone per floor level shall meet the requirements for a forward reach telephone.

**Table 4.4.5**  
*Number of Accessible Telephones Required*

4.4 SYSTEMS AND CONTROLS

4.4.5 PUBLIC TELEPHONES

- have a *clear floor space* of not less than 760 mm (30 in.) wide by 1370 mm (54 in.) deep in front of the telephone. NOTE: This *space* may extend maximum 480 mm (18-7/8 in.) beneath the telephone shelf where knee *space* clearance of minimum 685 mm (27 in.) is provided.

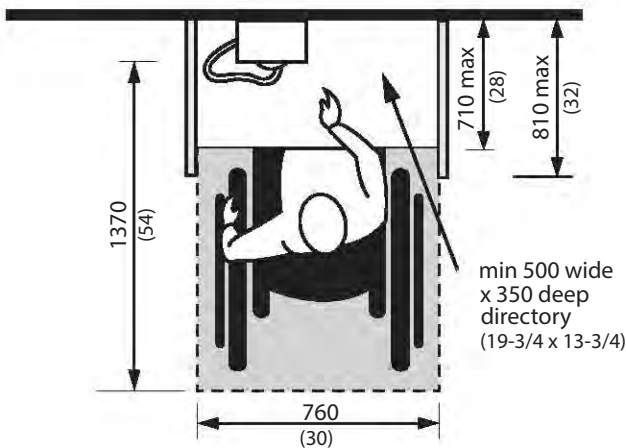
*Text telephones (TTY's)* used with a pay telephone shall be permanently affixed within, or adjacent to, the telephone enclosure. If an acoustic coupler is used, the telephone cord shall be sufficiently long to allow connection of the *text telephone (TTY)* and the telephone receiver.

*Accessible* telephones shall be identified by the appropriate symbol of accessibility for mobility impaired persons and/or persons who are deaf or hard of hearing.

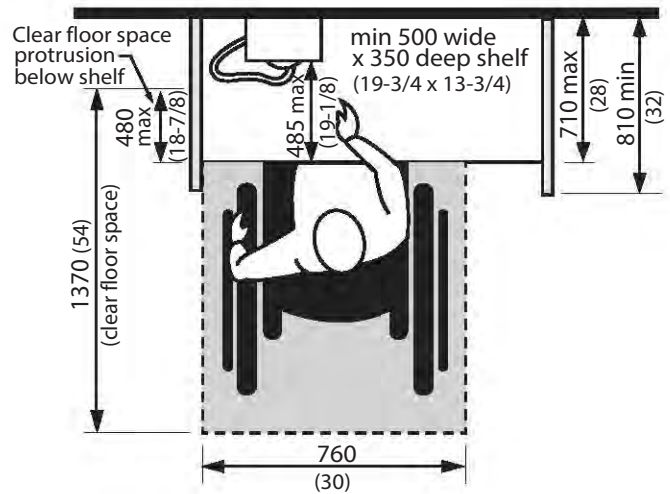
When directional signs for telephones are installed, they shall include the appropriate access symbols.

RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.3 Protruding and Overhead Objects
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.4.2 Controls and Operating Mechanisms
- 4.4.7 Signage
- 4.4.13 Lighting
- 4.4.15 Texture and Colour



**Figure 4.4.5.3**  
Parallel Approach to a Public Telephone



**Figure 4.4.5.4**  
Forward Approach to a Public Telephone

## 4.4.6 ASSISTIVE LISTENING SYSTEMS

## 4.4 SYSTEMS AND CONTROLS

### RATIONALE

The provision of assistive listening devices is important for the range of individuals who may have difficulty hearing.

Adequate and controllable lighting is required for persons who lip-read, or those who require increased task lighting, due to a visual *impairment*.

### APPLICATION

Assistive listening systems shall comply with this section.

This section applies to *assembly areas* where audible communication is integral to the use of the *space* (e.g., concert theatres, *meeting rooms*, classrooms, auditoria, etc.). Such *assembly areas* shall have a permanently installed listening system in compliance with this section where:

- (1) they accommodate at least 50 persons or where they have audio amplification systems or where greater than 100 sq.m. (1080 sq.ft.) in floor area; and
- (2) they have fixed seating.

For other *assembly areas*, a permanently installed listening system or an adequate number of electrical outlets or other supplementary wiring necessary to support a portable assistive listening system shall be provided. The minimum number of receivers to be provided shall be equal to 4% of the total number of seats, but no less than two.

### DESIGN REQUIREMENTS

*Signage* complying with applicable provisions of 4.4.7 shall be installed to notify patrons of the availability of a listening system.

Induction loops, infrared systems and FM radio frequency systems shall be considered acceptable types of assistive listening systems for persons who are hard of hearing.

Where an induction loop system is installed, dimmer switches and other controls that incorporate transformer coils shall be located so as not to interfere with the audio induction loop.

Where infrared assistive listening devices are used, overhead incandescent lights shall be located so as not to cancel out the infrared signal at the receiver.

Where an FM loop system or other assistive listening devices are available in public *facilities* or meeting areas, portable headsets that are compatible with personal hearing aids shall be made available.

Where an induction loop system is utilized, at least half the seating area shall be encompassed.

Where the listening system provided serves individual fixed seats, such seats shall be located within a 15 m (50-ft.) viewing distance of the stage or playing area and shall have a complete view of the stage or playing area.

### RELATED SECTIONS

- 4.4.7 Signage
- 4.4.13 Lighting
- 4.4.16 Acoustics

## 4.4 SYSTEMS AND CONTROLS

### 4.4.7 SIGNAGE

#### RATIONALE

Signage should be simple, uncluttered and incorporate plain language. The use of graphic symbols is helpful for individuals such as children; those with a limited literacy level; or those who speak a different language.

Sharp contrasts in colour make signage easier for anyone to read, particularly someone with a visual impairment. The intent of the symbol must be evident, culturally universal and not counterintuitive. To enhance readability, raised *tactile* lettering should incorporate edges that are slightly smoothed.

#### APPLICATION

Signage shall comply with this section.

Signs that designate permanent rooms or *spaces* shall be wall-mounted and include *tactile* characters and numbers. Tactile markings shall also supplement the text of

1. regulatory signs, such as prohibition and mandatory signs;
2. warning signs, such as caution and danger signs; and
3. identification signs, such as rooms, titles, names or numbers.

Signs that provide direction to, or information about, functional *spaces*, shall comply with this section. Exception: *Facility* directories, menus and all other signs that are temporary are not required to comply.

*Elements* and *spaces* of *accessible facilities* that shall be identified by the International Symbol of Accessibility are

- parking *spaces*, designated as reserved for individuals with disabilities;
- *accessible* passenger loading zones;
- *accessible ramps* located in a barrier-free path of travel serving a building entrance;
- *accessible entrances* when not all are *accessible* (*inaccessible entrances* shall have directional

*signage* to indicate the route to the nearest *accessible entrance*);

- *accessible* toilet and bathing facilities, including single-use portable units, when not all are *accessible*;
- *accessible* telephones;
- *accessible* elevators and other elevating devices;
- *accessible means of egress*; and
- *areas of rescue assistance*.

Audible signs (infrared and digital) that are readable by persons with a visual impairment using a receiving device may be the sole orientation aid across open *spaces*. Consideration should be given to including wire drops for future installation.

#### DESIGN REQUIREMENTS

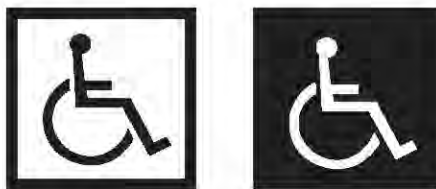
Letters and numbers on signs shall

- be arial font;\*
- have Arabic numbers;
- have a width-to-height ratio between 3:5 and 1:1; and
- have a stroke-width-to-height ratio between 1:5 and 1:10.

Character height dimensions for viewing distance shall comply with Table 4.4.7.

Characters, symbols and backgrounds of signs shall have an eggshell, matte or other glare-free finish.

Characters and symbols shall contrast with their background; either light characters on a dark background or dark characters on a light background.



**Figure 4.4.7.1**  
Colour Contrast on Signs

This is ab **Uf]U** font face

\* This is an **Uf]U** font face

Minimum character height, mm	Maximum viewing distance, mm
200 (7-7/8 in.)	6000 (19 ft. 8 in.)
150 (5-7/8 in.)	4600 (15 ft. 0 in.)
100 (3-15/16 in.)	2500 (8 ft. 2-1/2 in.)
75 (2-15/16 in.)	2300 (7 ft. 6-1/2 in.)
50 (2 in.)	1500 (4 ft. 11 in.)
25 (1 in.)	750 (2 ft. 5-1/2 in.)

**Table 4.4.7**  
Character Height on Signs



### 4.4.7 SIGNAGE

Where signs are required to be *tactile*, letters and numerals shall be

- raised at least 0.8 mm (1/32 in.), not sharply edged;
- be between 16 mm (5/8 in.) and 50 mm (2 in.) high;
- be arial font\*;
- be accompanied by uncontracted Braille (Grade 1) in signs with limited amounts of text (up to 10 words), and on all signs related to safety; and
- be accompanied by contracted Braille (Grade 2) in all other applications.

Pictograms shall be accompanied by an equivalent visual and *tactile* verbal description, placed directly

below the pictogram. The border dimension of the pictogram shall be 150 mm (6 in.) minimum in height.

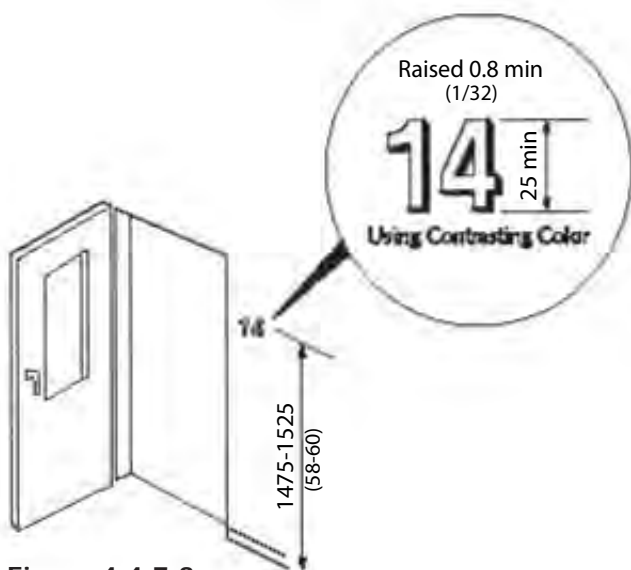
Where permanent identification is provided for rooms and *spaces*, signs shall be installed on the wall adjacent to the latch side of the door, located minimum 1400 mm (55 in.) and maximum 1500 mm (59 in.) above the finished floor. Where there is no wall *space* to the latch side of the door, including at double-leaf doors, signs shall be placed on the nearest adjacent wall.

The minimum level of illumination on signs shall be 200 lux (18.4 ft-candles).



**Figure 4.4.7.2**  
Pictograms

(Note: Must incorporate equivalent verbal description)



**Figure 4.4.7.3**  
Tactile Lettering

### 4.4 SYSTEMS AND CONTROLS

#### RELATED SECTIONS

- 4.1.3 Protruding and Overhead Objects
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.1.5 Entrances
- 4.1.6 Doors
- 4.1.7 Gates, Turnstiles and Openings
- 4.1.9 Ramps
- 4.1.14 Elevators
- 4.1.15 Platform Lifts
- 4.2.1 Toilet Facilities
- 4.2.7 Individual Washrooms
- 4.3.2 Viewing Positions
- 4.3.4 Dressing Rooms
- 4.3.12 Parking
- 4.3.13 Passenger-Loading Zones
- 4.4.1 Emergency Exits, Fire Evacuation and Areas of Rescue Assistance
- 4.4.5 Public Telephones
- 4.4.13 Lighting
- 4.4.15 Texture and Colour



**Grid for reference only**

**Figure 4.4.7.4**  
International Symbol of Access



**Figure 4.4.7.5**  
Pictogram for Limited Mobility & Caregiver Parking Space

4.4 SYSTEMS AND CONTROLS

4.4.8 DETECTABLE WARNING SURFACES

**RATIONALE**

Detectable warning surfaces provide important navigational cues for persons with a visual impairment. These surfaces alert all pedestrians to potential hazards, such as crosswalks or stairs. Suitable surfaces include a change in texture and high colour contrast but should not present a tripping hazard.

Detectable warning surfaces should be used consistently throughout a facility.

**APPLICATION**

Detectable warning surfaces at walkways, curb ramps, stairs and raised platforms shall comply with this section.

**DESIGN REQUIREMENTS**

All textured surfaces used as detectable warning surfaces shall be clearly detectable by walking upon as being different from the surrounding surface. (Refer also to 4.4.15). Note: Applying a paint finish to a concrete surface does not provide appropriate detectability.

Detectable warning surfaces shall contrast visually with adjoining surfaces, being either light on dark or dark on light.

Detectable warning surfaces at stairs shall

- be provided at the top of the stairs and at landings;
- extend the full width of the stair for a depth of at least 920 mm (36 in.) commencing one tread depth back from the stair; and
- not be more than 3 mm (1/8 in.) above or below the surrounding surface.

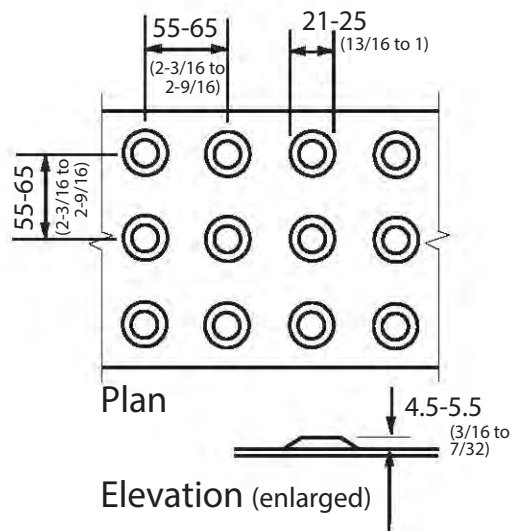
Detectable warning surfaces at curb ramps and elevated platforms shall

- be composed of truncated domes
  - with a height of 4.5 - 5.5 mm (0.18 to 0.22 in.);
  - with a base diameter of 21-25 mm (0.83 to 0.98 in.); and
  - be organized in a regular pattern with spacing of 55-65 mm (2-3/16 to 2-9/16 in.) on centre;
- be slip-resistant; and
- contrast visually with adjoining surfaces

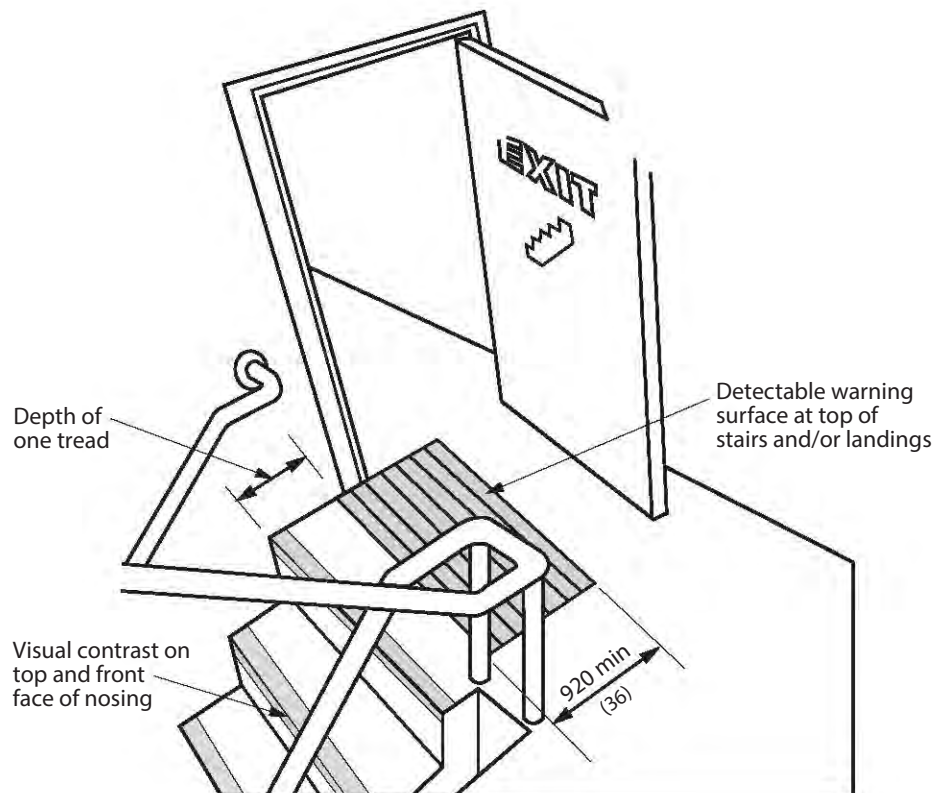
If a walk crosses or joins a vehicular way and the walking surfaces are not separated by curbs, railings or other elements between the pedestrian areas and vehicular areas, the boundary between the areas shall be defined by a continuous detectable warning surfaces, which is minimum 920 mm (36 in.) wide.

**RELATED SECTIONS**

- 4.1.3 Protruding and Overhead Objects
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.1.9 Ramps
- 4.1.10 Curb Ramps
- 4.1.11 Stairs
- 4.1.12 Escalators
- 4.3.1 Drinking Fountains
- 4.3.3 Elevated Platforms
- 4.3.12 Parking
- 4.3.13 Passenger-Loading Zones
- 4.4.15 Texture and Colour



**Figure 4.4.8.2**  
Truncated Dome  
Detectable Warning Surface



**Figure 4.4.8.1**  
Detectable Warning Surfaces at Stairs

## 4.4.9 PUBLIC ADDRESS SYSTEMS

## 4.4 SYSTEMS AND CONTROLS

### RATIONALE

Public address systems should be designed to best accommodate all users, especially those that may be hard of hearing. They should be easy to hear above the ambient background noise of the environment and there should be no distortion or feedback. Background noise should be minimized.

Visual equivalents should be made available for individuals with a hearing *impairment* who may not hear an audible public address system.

### APPLICATION

Public address systems shall comply with this section.

### DESIGN REQUIREMENTS

Public address speakers shall be mounted above head level, and provide effective sound coverage in required areas, such as corridors, assembly and *meeting room* areas, recreational and entertainment *facilities*, educational *facilities*, and *common use* areas in institutional settings.

Public address systems shall be zoned so that information can be directed to key locations only, minimizing background noise in other areas.

Where public address systems are used to broadcast background music, the music shall not be broadcast continuously or throughout the entire *facility*.

All-point call systems shall only be utilized for fire and emergency information.

Paging systems for staff and other key persons shall be discreet and low volume, and sound only at those devices or locations where such persons might expect to be located.

### RELATED SECTIONS

- 4.4.1 Emergency Exits, Fire Evacuation and Areas of Rescue Assistance
- 4.4.16 Acoustics

## 4.4 SYSTEMS AND CONTROLS

## 4.4.10 INFORMATION SYSTEMS

**RATIONALE**

Information should be *accessible* to all facility users. Where universally *accessible* formats are not possible, alternate formats should be available. Video display terminals may present difficulties for persons with a visual *impairment*. Alternate technology or audio interfaces can be beneficial.

To ensure that a person using a wheelchair or scooter can access an information terminal, consideration should be given to the lower vantage point and reach ranges of all information systems provided.

**APPLICATION**

Information systems, such as display kiosks and video display terminals, shall comply with this section.

**DESIGN REQUIREMENTS**

Where information is provided by video display terminals to the general public, clients or customers, the same information shall be provided in an alternative format, such as audio, Braille and large-text print. The minimum font size for large-text print shall be 16 point.

Information systems designed for direct access by the public, such as touch-screen video display, keyboard or keypad access, shall be mounted at a height suitable for use by a person using a wheelchair or scooter (Refer to 4.4.2).

Essential print information shall be printed in large text on a highly contrasting background colour, and should also be available in other formats, such as audiotape and large-text print.

Push buttons or other controls for accessing public information systems should be clearly identifiable by colour and/or tone from the background colour, and should include raised numbers, numerals or symbols for easy identification by persons with a visual *impairment*.

*Tactile* identification shall comply with 4.4.15.

**RELATED SECTIONS**

4.4.2 Controls and Operating Mechanisms

4.4.15 Texture and Colour



## 4.4.11 CARD ACCESS, SAFETY AND SECURITY SYSTEMS

## 4.4 SYSTEMS AND CONTROLS

### RATIONALE

In many cases, persons such as seniors and persons with *disabilities* may be considered to have a higher degree of vulnerability and therefore seek more reassurance and inherent security. Items such as adequate lighting and *accessible* signalling devices promote this security.

Emergency signalling devices are important in individual washrooms where the potential for a fall is increased and an individual may be alone.

Where card-access systems are selected as a means of entry to particular *facilities* or *spaces*, the systems and components selected should be suitable for use by persons with varying abilities, including persons with reduced manual dexterity, poor vision or difficulty with reaching. The use of heat-sensing activation buttons should be avoided, as they are indiscernible to a person who is blind.

### APPLICATION

Card-access, safety and security systems shall comply with this section.

Where signals intended for the public to indicate the operation of a building security system are provided, they shall consist of both audible alarms and visual signals.

### DESIGN REQUIREMENTS

Adequate lighting shall be provided continuously along public walkways, steps and *ramps* that are actively used at all times of year and/or where staff and public parking is provided.

Where public telephones are installed, an *accessible* public telephone complying with 4.4.5 shall be located at, or close to an *accessible entrance*, for the use of persons requiring assistance.

Where *accessible* individual washrooms in compliance with 4.2.7 are provided in larger public *facilities*, such as recreation *facilities*, the washroom shall incorporate an emergency call system linked to a central location (e.g., office or switchboard).

Card-entry systems shall

- be wall-mounted, no higher than 1060 mm (42 in.) above the floor or ground, adjacent to the door and free of the door swing;
- be colour-contrasted from the surface on which they are mounted;
- incorporate a card slot that is illuminated or colour contrasted from the mounting plate; and
- use cards that incorporate a distinctive colour, texture or raised graphic/lettering on one side.

Encoded-entry/exit systems, such as keypads, shall

- be wall-mounted, no higher than 1060 mm (42 in.) above the floor or ground, adjacent to the door and free of the door swing; and
- incorporate buttons that
  - are raised;
  - are mounted on a clearly differentiated coloured background; and
  - include raised numerals or letters in a constant array.

### RELATED SECTIONS

- 4.1.1 Space and Reach Requirements
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.1.5 Entrances
- 4.1.6 Doors
- 4.1.14 Elevators
- 4.1.15 Platform Lifts
- 4.2.7 Individual Washrooms
- 4.3.5 Offices, Work Areas and Meeting Rooms
- 4.4.2 Controls and Operating Mechanisms
- 4.4.13 Lighting
- 4.4.15 Texture and Colour

## 4.4 SYSTEMS AND CONTROLS

## 4.4.12 GLARE AND LIGHT SOURCES

**RATIONALE**

Direct or reflected glare from floors, walls or work surfaces is uncomfortable for all users and a barrier to persons with reduced vision. Therefore, every attempt should be made to select light sources, materials and finishes which do not add to the problem, and to ensure that natural daylight is controllable.

The strategic use of lighting is valuable to all individuals, and especially important for individuals with some form of visual *impairment*. In addition, offering a variety of task lighting at work areas is beneficial to all.

**APPLICATION**

Systems used to control glare and excessive reflected light shall comply with this section.

**DESIGN REQUIREMENTS**

Extensive high gloss floor and wall finishes are not acceptable, but high-gloss materials may be incorporated into floor and wall finish details, as long as they do not result in large reflective surfaces.

Monolithic floor surfaces, such as stone, granite, marble or terrazzo, shall have a matte or honed finish, to minimize reflected glare.

Finishes such as vinyl, other composition materials, quarry tile, glazed tile or mosaics, used on horizontal surfaces, such as floors and work surfaces, shall be in matte or satin finishes.

Finishes such as paint, vinyl wall coverings, stone, marble, wood, metals, plastic laminate, etc., used on vertical surfaces, such as walls and columns, shall have matte or satin finishes.

Curtains, blinds or other sun-screening systems shall be provided at windows and other places where direct sunlight can adversely affect the level of lighting and/or reflected glare.

Light fixtures shall be selected with diffusers, lenses or recessed light sources, so that no glare is created.

Where surface-mounted fluorescent ceiling fixtures are mounted below 2440 mm (96 in.), they shall have darkened sides (i.e., not wrap-around lenses) and be positioned perpendicular to the dominant direction of travel, or used in valance-type lighting along the perimeter of a *space*, resulting in indirect lighting.

The location of special features and key orientation *elements* shall be enhanced through the use of supplementary lighting. Such lighting shall have upward or downward components only.

**RELATED SECTIONS**

- 4.1.2 Ground and Floor Surfaces
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.1.5 Entrances
- 4.1.8 Windows, Glazed Screens and Sidelights
- 4.1.9 Ramps
- 4.1.10 Curb Ramps
- 4.1.11 Stairs
- 4.1.13 Escalators
- 4.1.14 Elevators
- 4.1.15 Platform Lifts
- 4.2.1 Toilet Facilities
- 4.3.8 Information, Reception and Service Counters
- 4.4.13 Lighting

## 4.4.13 LIGHTING

## 4.4 SYSTEMS AND CONTROLS

### RATIONALE

Artificial lighting and natural light sources should provide comfortable, evenly distributed light at all working areas, in all circulation routes and in all areas of potential hazard. Also, outdoor lighting should be provided at *entrances*, along frequently used access routes and at frequently used outdoor amenities.

### APPLICATION

Exterior and interior lighting systems shall comply with this section.

### DESIGN REQUIREMENTS

#### EXTERIOR LIGHTING

Exterior lighting shall be in compliance with Illuminating Engineering Society of North America Standards in all public thoroughfares, and at all pedestrian routes, to provide safe access for persons with disabilities from sidewalks, bus stops and parking areas to nearby *facilities* and *site* amenities.

At pedestrian *entrances*, lighting levels should be minimum 100 lux (9.4 ft-candles) consistently over the *entrance* area, measured at the ground.

Over frequently used pedestrian routes, including walkways, paths, stairs and *ramps*, lighting levels shall be minimum 30 lux (3 ft-candles) consistently over the route, measured at the ground.

At designated parking *spaces* including *accessible spaces* and limited mobility/caregivers *spaces*, lighting levels shall be minimum 30 lux (3 ft-candles) consistently over each of these parking *spaces*, measured at the ground.

Lighting levels at passenger drop-off areas shall be minimum 30 lux (3 ft-candles) consistently over the drop-off area, measured at the ground.

At frequently used steps and stairs, lighting shall be located at or beside the steps or stairs, to clearly define the treads, risers and nosings.

All lighting shall

- provide a good colour spectrum; and
- be evenly distributed to minimize cast shadows.

Supplementary lighting shall be provided to highlight key *signage* and orientation landmarks.

Low-level lighting shall be high enough to clear normal snow accumulation.

Lighting fixtures shall comply with the relevant parts of 4.1.3 and 4.3.17.

#### INTERIOR LIGHTING

Light sources and fixtures shall be selected to minimize direct glare or indirect glare on nearby reflective surfaces.

Light sources shall provide as full a spectrum of light as possible, as an aid to edge and colour definition.

Lighting shall be configured to create an even distribution at floor level and to minimize pools of light and areas of shadow.

The leading edge of stairs, steps, *ramps* or escalators shall be evenly lit to minimize tripping hazards.

Lighting levels in elevator lobbies shall be similar to the lighting levels in elevator cabs, to minimize tripping hazards, and in no case shall be less than 200 lux (20 ft-candles).

Lighting levels in washrooms and dressing rooms shall be evenly distributed and no less than 200 lux (20 ft-candles).

Lighting levels in office areas shall be evenly distributed and no less than 300 lux (30 ft-candles).

Emergency lighting over stairs and *ramps*, in an exit or path of travel, shall be at least 100 lux (10 ft-candles), generally at the walking surface, and in no place less than 50 lux (5 ft-candles).

Lighting over directional or informational *signage*, or highlighting other orientation features, at public telephones, information or service counters, and card or keypad security systems, shall be no less than 200 lux (20 ft-candles) measured at the working surface.

Lighting in *meeting rooms* and *assembly areas* shall be evenly distributed, and shall be capable of being adjusted (e.g., dimmers).

Lighting at lecterns, podiums/ platforms or other speaker locations shall be capable of being enhanced, even when other lighting is dimmed, to permit ease of lip-reading and/or viewing of the hand actions of a nearby signer for persons who are deaf.

### RELATED SECTIONS

- 4.1.4 Accessible Routes, Paths and Corridors
- 4.1.5 Entrances
- 4.1.9 Ramps
- 4.1.10 Curb Ramps
- 4.1.11 Stairs
- 4.1.12 Escalators
- 4.1.14 Elevators
- 4.1.15 Platform Lifts
- 4.2.1 Toilet Facilities
- 4.3.1 Drinking Fountains
- 4.3.3 Elevated Platforms
- 4.3.4 Dressing Rooms
- 4.3.5 Office, Work Areas and Meeting Rooms
- 4.3.8 Information, Reception and Service Counters
- 4.4.2 Controls and Operating Mechanisms
- 4.4.5 Public Telephones
- 4.4.7 Signage
- 4.4.12 Glare and Light Sources

## 4.4 SYSTEMS AND CONTROLS

## 4.4.14 MATERIALS AND FINISHES

**RATIONALE**

The selection of flooring materials can be critical to the safe and easy movement of persons using all kinds of mobility aids, as well as persons with low vision.

Floor finishes, such as carpet, should be selected and installed so that persons using wheelchairs and walkers or other mobility aids can easily travel over them without using undue energy or tripping.

Finishes that are slip-resistant and not highly reflective promote safe travel.

**APPLICATION**

Exterior and interior materials and finishes shall comply with this section.

**DESIGN REQUIREMENTS**EXTERIOR FINISH MATERIALS

Suitable walkway paving surfaces include macadam, concrete, compacted gravel screenings, interlocking brick and patio stones. Such materials used as walkways shall

- have joints that are no greater than 6 mm (1/4 in.) wide, with variations in level of no more than 3 mm (1/8 in.); and
- be laid to drain.

Where possible, gratings and grills shall be located to one side of the pedestrian walkways, so as not to impede the *accessible route*. Where this is not possible, the bars of the grating or grill shall be located perpendicular to the dominant path of travel, with openings of no greater than 13 mm (1/2 in.).

Steps shall be finished with a non-slip material and incorporate highly contrasted nosings.

*Ramp* surfaces shall be firm and non-slip.

Handrails and *guards* shall be continuous, smooth and well maintained.

INTERIOR MATERIALS AND FINISHES

Carpet shall be of low-level loop construction, 10 or 12-gauge non-static fibre, directly glued to the subfloor.

Where hard, monolithic materials are selected, they shall be non-slip and non-glare, complying with 4.4.12.

Where floor tiles, bricks or pavers are used, joints should be no wider than 6 mm (1/4 in.) and should be flush.

Wall surfaces in corridors shall be non-abrasive from the floor level to a minimum of 2000 mm (78-3/4 in.) above the finished floor.

**RELATED SECTIONS**

- 4.1.2 Ground and Floor Surfaces
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.1.5 Entrances
- 4.1.9 Ramps
- 4.1.10 Curb Ramps
- 4.1.11 Stairs
- 4.1.13 Escalators
- 4.1.14 Elevators
- 4.1.15 Platform Lifts
- 4.2.1 Toilet Facilities
- 4.3.4 Dressing Rooms
- 4.3.5 Office, Work Areas and Meeting Rooms
- 4.4.12 Glare and Light Sources



## 4.4.15 TEXTURE AND COLOUR

### RATIONALE

The ability of an individual with a visual *impairment* to navigate an environment can be enhanced through the strategic use of colour and texture.

Caution is recommended in the selection of heavy or distinct patterns on walls or floors, since these can add visual confusion to settings for persons with low vision. Simple, repetitive, non-directional patterns that feature monochromatic or low-colour contrast are preferred. Changes in material or texture should not necessitate a threshold.

### APPLICATION

Textural and colour systems shall be used to enhance accessibility and shall comply with this section.

### DESIGN REQUIREMENTS

Exterior colour schemes shall incorporate a pronounced colour contrast, to differentiate boundaries of objects, distinguish objects from their background, and to generally enhance spatial orientation. Generally, for seniors and persons with low vision, colours in the warm end of the spectrum (yellow, orange, bright red, etc.) are easier to recognize than those at the cool end of the spectrum.

Signs shall incorporate pronounced glare-free colour contrast. A minimum contrast of 70% light reflectance is required. For signs, the most visible colours are white or yellow on a black, charcoal or other dark background, such as brown, dark blue, dark green or purple. Black lettering on white is also acceptable, although less readable than the reverse. Unacceptable background colours are light grey and pastel colours. Red lettering on a black background is also unacceptable.

Colour contrast shall be used as a safety measure to define edges or boundaries of objects (e.g., stair nosings, doors, *handrails*, etc.). Colour or tone shall be used

to visually define the boundaries of a room (i.e., where the wall meets the floor). Baseboards in monochromatic environments shall be highly contrasting with the wall and floor colours, to provide boundary definition.

Colour shall be used consistently to visually identify distinctive objects (e.g., exit doors).

Bright colours and/or a highly contrasting tone shall be used to assist with wayfinding. (e.g. If used as part of a *signage* band located on walls at eye level, this band is easier to follow than monolithic wall colouring, and can be the visual cue for other essential signs.)

End walls or return walls in long corridors shall be visually defined using highly contrasting colours or tone, to enhance a change of direction or the end of the *space*.

*Detectable warning surfaces* shall be used to define potential hazards. (Refer to 4.4.8.). All textured surfaces used as *detectable warning surfaces* shall be clearly detectable by walking upon as being different from the surrounding surface. Suitable textures include

- 10 mm (3/8 in.) deep saw-cut concrete with regular grooves, positioned no more than 100 mm (4 in.) apart, commencing no closer than 100 mm (4 in.) from the curb; grooves should be at right angles to the path of travel for exterior textures; and
- raised domes, dots or squares, deeply grooved concrete, terrazzo or other stone-like materials, with closely centred grooves at right angles to the path of travel, or applied carborundum or other non-slip strips for interior textures.

Supplementary textural cues shall also be provided (e.g., by using different floor textures or materials, in major and minor routes).

Clearly defined boundaries of materials like carpeting or floor tiles shall enhance wayfinding by defining such as the junction

## 4.4 SYSTEMS AND CONTROLS

between walls and floors, doorway recesses and corridor intersections.

The same texture shall be used consistently throughout any one *site* to identify the same type of hazard.

### RELATED SECTIONS

- 4.1.2 Ground and Floor Surfaces
- 4.1.4 Accessible Routes, Paths and Corridors
- 4.1.6 Doors
- 4.1.7 Gates, Turnstiles and Openings
- 4.1.8 Windows, Glazed Screens and Sidelights
- 4.1.9 Ramps
- 4.1.10 Curb Ramps
- 4.1.11 Stairs
- 4.1.12 Handrails
- 4.1.13 Escalators
- 4.1.14 Elevators
- 4.1.15 Platform Lifts
- 4.2.2 Toilet Stalls
- 4.2.3 Toilets
- 4.2.4 Lavatories
- 4.2.5 Urinals
- 4.2.6 Washroom Accessories
- 4.2.7 Individual Washrooms
- 4.2.8 Bathtubs
- 4.2.9 Shower Stalls
- 4.2.10 Grab Bars
- 4.3.1 Drinking Fountains
- 4.3.3 Elevated Platforms
- 4.3.4 Dressing Rooms
- 4.3.5 Office, Work Areas and Meeting Rooms
- 4.3.6 Waiting and Queuing Areas
- 4.3.8 Information, Reception and Service Counters
- 4.3.9 Storage, Shelving and Display Units
- 4.3.10 Lockers and Baggage Storage
- 4.3.11 Balconies, Porches, Terraces and Patios
- 4.3.14 Landscaping Materials and Plantings
- 4.3.15 Benches
- 4.3.16 Picnic Tables
- 4.3.17 Street Furniture
- 4.4.1 Emergency Exits, Fire Evacuation and Areas of Rescue Assistance
- 4.4.2 Controls and Operating Mechanisms
- 4.4.5 Public Telephones
- 4.4.7 Signage
- 4.4.8 Detectable Warning Surfaces
- 4.4.11 Card Access, Safety and Security Systems

## 4.4 SYSTEMS AND CONTROLS

## 4.4.16 ACOUSTICS

**RATIONALE**

The acoustic environment of public buildings and *spaces* should accommodate the unique needs of persons who are hard of hearing and who need to differentiate essential sounds from general background noise. The sound transmissions of different areas can be used as an orientation cue and help to navigate a *space*. A well designed acoustical environment is to everyone's advantage.

**APPLICATION**

The acoustical environment of *facilities* used by the general public, clients, customers and employees shall comply with this section.

**DESIGN REQUIREMENTS**

Floor finishes, wall surfaces and ceilings shall be selected so that occasional noise is not unduly amplified. (e.g., Hard surfaces such as marble or terrazzo will allow each foot step to be heard by persons who are visually impaired, but add another level of confusion for persons who are hearing impaired.)

At *accessible routes* in large *facilities* where wayfinding is problematic, the sound transmission/reflection characteristics of finish materials shall aurally differentiate major and secondary paths of travel.

Ceiling shapes shall be designed so that echoes do not occur, unless an alternate acoustical treatment is incorporated. (Note: Domed shapes tend to distort sound.)

Public address and call systems shall be capable of being zoned to key areas, rather than blanketing all areas of a *facility* at all times. (Refer to 4.4.9.)

In *meeting rooms* and *assembly areas* where the spoken word is key to comprehending the proceedings, all unnecessary background noise (e.g., from fans or other mechanical equipment, air diffusers, etc.) shall be dampened and/or the room shall include adequate sound insulation.

**RELATED SECTIONS**

- 4.3.5 Office, Work Areas and Meeting Rooms
- 4.3.8 Information, Reception and Service Counters
- 4.4.5 Public Telephones
- 4.4.6 Assitive Listening Systems
- 4.4.9 Public Address Systems

## 4.5.1 ARENAS, HALLS AND OTHER INDOOR RECREATIONAL FACILITIES

## 4.5 FACILITY-SPECIFIC REQUIREMENTS

### RATIONALE

Opportunities for recreation, leisure and active sport participation should be available to all members of the community. Access should be provided to halls, arenas, and other sports *facilities*, including access to the *site*, all activity *spaces*, gymnasias, fitness *facilities*, lockers, change rooms and showers. Persons with a *disability* may be active participants, as well as spectators, volunteers and members of staff.

### APPLICATION

In addition to the design requirements specified in 4.1 to 4.4, arenas, halls and other indoor recreation *facilities* shall comply with this section.

Where dressing *facilities* are provided for use by the general public, clients, customers, performers or staff, at least 50%, but never less than one, for each type of use in each cluster of dressing *facilities* shall be *accessible* and in compliance with 4.3.4. It is preferable to have all dressing *facilities accessible*.

### DESIGN REQUIREMENTS

Arenas, halls and other indoor recreation *facilities* shall

- where visitor, spectator and/or participant seating is provided,
  - have *accessible* seating options in compliance with 4.3.2; and
  - incorporate *detectable warning surfaces* in compliance with 4.4.8. where seating is accessed by stairs.
- provide an *accessible route* in compliance with 4.1.4 to the arena/*facility* floor and/or ice surface, including access panels or gates providing at least 950 mm (37-1/2 in.) *clear* width;
- where *facilities* are provided for performances and other events, have a direct *accessible route* in compliance with 4.1.4 from the lobby/*entrances* and viewing locations to all performing areas, including stages, dressing rooms, washrooms and all other *spaces* used by performers;
- where stairs are provided, have stairs that comply with 4.1.11, including appropriate tactile and colour-contrasting features;
- where dressing *facilities* are provided, have dressing *facilities* that comply with 4.3.4;
- where lockers or shelving is provided, have lockers and shelving that comply with 4.3.9 and 4.3.10;
- where coat hooks are provided, have at least 10%, but never less than one, within the reach ranges specified in 4.1.1;
- where toilets and bathing *facilities* are provided, have toilets and bathing *facilities* that comply with 4.2.1;
- where concessions or other service counters are provided, comply with 4.1.3 and 4.3.8;
- where swimming pool, hot pools or therapy pools are provided, comply with 4.5.3; and
- where staff accommodation and related support areas, offices or *meeting rooms* are provided, comply with all relevant sections of 4.1 to 4.4.

### RELATED SECTIONS

All relevant parts of Sections 4.1, 4.2, 4.3 and 4.4.

## 4.5 FACILITY-SPECIFIC REQUIREMENTS

### RATIONALE

Opportunities for recreation, leisure and active sport participation should be available to all members of the community. Access should be provided to playing fields and other sports *facilities*, including access to the *site*, all activity areas, outdoor trails, docks, swimming areas, play *spaces*, lockers, change rooms and showers. Persons with a *disability* may be active participants, as well as spectators, volunteers and members of staff.

### APPLICATION

In addition to the design requirements specified in 4.1 to 4.4, the outdoor recreation *facilities* listed below shall comply with this section.

Where dressing *facilities* are provided to support the use of outdoor recreational *facilities* by the general public, clients, customers, performers or staff, at least 50%, but never less than one, for each type of use in each cluster of dressing *facilities* shall be *accessible* and in compliance with 4.3.4. It is preferable to have all dressing *facilities accessible*.

### DESIGN REQUIREMENTS

#### GENERAL

*Parks* accessibility shall encompass the development of routes, auxiliary services, planting and an overall environment which is *accessible* and provides a fulfilling recreational experience for all persons with a varying level of ability.

#### BOARDWALKS

Where boardwalks are provided, they shall

- have a minimum width of 2000 mm (78-3/4 in.);
- incorporate surfaces constructed of firm, non-slip materials. (Where wooden planks are used, they shall be laid perpendicular to the path of travel and have joints no greater than 6 mm (1/4 in.) wide;

## 4.5.2 OUTDOOR RECREATIONAL FACILITIES

- incorporate a continuous curbed edge where the grade drop-off on any side of the boardwalk is greater than 200 mm (7-7/8 in.). The curbed edge shall be at least 75 mm (3 in.) high and of a contrasting colour to the surrounding terrain;
- *handrails, guards* or other suitable barriers on both sides where the grade drop-off is greater than 450 mm (17-3/4 in.);
- access points to boardwalks that allow easy wheelchair access; and
- benches, garbage cans, drinking fountains, etc., where provided, shall be located adjacent to the boardwalk on firm, level surfaces at the same elevation as the boardwalk. (Refer also to 4.3.17.)

#### DOCKS

Where docks for fishing, boating or swimming are provided they shall

- be located on an *accessible route* in compliance with 4.1.4;
- where changes in elevation are necessary, incorporate *ramps* or *curb ramps* in compliance with 4.1.8 and 4.1.9. *Ramps* with a slope no greater than 1:12 are acceptable;
- incorporate a continuous curbed edge, at least 75 mm (3 in.) high and of a contrasting colour where dock surfaces are greater than 200 mm (7-7/8 in.) above the surface of the water;
- incorporate a *guard* where dock surfaces are greater than 450 mm (17-3/4 in.) above the surface of the water; and
- where steps are provided to access the water for swimming, incorporate colour-contrasting *handrails* at the steps. Such *handrails* shall extend to a minimum of 600 mm (23-5/8 in.) above the dock surface and return down to the dock.

#### OUTDOOR POOLS

Outdoor swimming pools shall comply with 4.5.3.

#### TRAILS AND FOOTBRIDGES

Where significant changes in grade occur, trail routes shall ideally be sloped at no greater than 1:20, or have adjacent steps and *ramps*.

Where steps, footbridges or *ramps* are used, the surfacing shall be of non-slip materials and include suitable colour-contrasting *handrails* and/or *guards*.

The slope on bridges shall not exceed 1:20.

#### PATHWAYS

*Accessible routes* and walkways shall conform with 4.1.4.

Garbage cans, light standards, benches and other potential obstructions shall be located adjacent to pathways. (Refer also to 4.3.17.)

A different ground colour and/or texture shall be used to indicate the following (Refer also to 4.4.15.):

- risk areas, such as intersections, *ramps* or steps; and
- functional changes, such as seating areas, viewpoints or outlooks.

#### PLANTING AND TREES

Planting and trees along *accessible* pathways shall comply with 4.3.14.

#### REST AREAS

Rest areas shall

- be provided on trails, pathways and walkways;
- be positioned adjacent to the trail, pathway or walkway;
- have *accessible* ground surfaces in compliance with 4.1.2;
- use a contrasting ground finish material to identify functional change; and
- incorporate at least one bench, in compliance with 4.3.15.



## 4.5.2 OUTDOOR RECREATIONAL FACILITIES

## 4.5 FACILITY-SPECIFIC REQUIREMENTS

### PARKS, PARKETTES AND PLAYGROUNDS – GENERAL

Entrance gates, paths and walkways throughout the park shall be *accessible* to a person using a wheelchair or scooter.

Picnic and play areas shall be provided in both sunny and shaded areas.

### PLAYGROUNDS

Children's play areas and playground equipment, sandboxes or other amenities shall generally be designed to be *accessible* to and useable by children with varying levels of ability. Colour contrast is important.

Playground surfaces shall be firm, level, non-abrasive and drain rapidly. Surfaces below playground equipment, including swings, slides and climbing structures, shall be level, free-draining and provide a safe, resilient landing surface.

### PICNIC TABLES

*Accessible* picnic tables shall comply with 4.3.16.

Where public parking is provided to serve picnic *facilities*, *accessible* picnic areas shall be within 30 m (100 ft.) of the *accessible* parking spaces.

### DRINKING FOUNTAINS

*Accessible* drinking fountains shall comply with 4.3.1.

### PUBLIC TELEPHONES

*Accessible* public telephones shall comply with 4.4.5.

### ILLUMINATION (WHERE PROVIDED)

Illumination levels shall

- be a minimum of 10 lux (1 ft-candle);
- be maintained at 5 lux (0.5 ft-candles) in areas of heavy trees and shrubbery; and
- be maintained at 5 lux (0.5 ft-candles) in all other areas of park at ground level.

Light sources used shall be indirect, non-glare, non-flickering type and provide even levels of light distribution. (Refer also to 4.4.13.)

### WASHROOMS

Where washrooms are provided to support the use of outdoor recreation *facilities* by the general public, clients, customers, performers or staff, they shall comply with all applicable sections of 4.2.

### WATERFRONT AREAS

Where paths and/or lookout points are provided, they shall be *accessible* to all individuals.

Seating shall be provided along paths and at lookout points, in compliance with 4.3.15.

Where parking is provided, it shall be located as close as possible to waterfront area. An *accessible route* shall be provided from the parking area to paths and/or lookout points (where provided).

### NATURAL AREAS

*Accessible* pathways, trails and footbridges shall be provided where environmental considerations will permit.

Paths and trails shall incorporate rest areas with appropriate seating.

Where special lookout locations or wildlife viewing areas are provided, they shall be identified with *clear signage*.

Trails shall feature a *tactile* map at the start of the trail and periodically along its length.

Information and interpretive *signage* shall incorporate Braille.

### GRANDSTAND AND OTHER VIEWING AREAS

Where visitor, spectator and/or participant seating is provided, *accessible* seating options in compliance with 4.3.2 shall be provided.

### PLAYING FIELDS

Controlled access points shall be designed to accommodate a person using a wheelchair or scooter. (e.g., Where turnstiles are used, an adjacent *accessible* gate shall be provided in compliance with 4.1.7.)

Level seating areas shall be provided beside sports fields for spectators or participants with *disabilities*.

Where provided, public viewing areas shall comply with 4.3.2.

Where provided, public washrooms shall comply with 4.2.1.

Where provided, public showers and change rooms shall comply with 4.2.1, 4.2.9 and 4.3.4.

### RELATED SECTIONS

All relevant parts of Sections 4.1, 4.2, 4.3 and 4.4.

## 4.5 FACILITY-SPECIFIC REQUIREMENTS

### 4.5.3 SWIMMING POOLS

#### RATIONALE

Swimming is an important recreational and therapeutic activity for many persons with *disabilities*. The buoyancy and freedom offered by an immersive water environment can be enabling in themselves. Primary considerations for accommodating persons who have mobility *impairments* include *accessible* change facilities and a means of access into the water. Ramped access into the water is preferred over lift access, as it promotes integration (everyone will use the ramp) and independence. Many persons who are visually *impaired* will benefit from colour and textural cues along primary routes of travel and at potentially dangerous locations, such as the edge of the pool, at steps into the pool and at railings.

#### APPLICATION

In addition to the design requirements specified in 4.1 to 4.4, swimming pools, wading pools, hot pools, splash pads, spray pads and therapy pools shall comply with this section.

#### DESIGN REQUIREMENTS

Swimming pools, wading pools, hot pools and therapy pools shall have

- where the pool is indoors, a direct *accessible route* in compliance with 4.1.4 from the lobby/*entrance* to the change rooms;
- a direct *accessible route* in compliance with 4.1.4 from the change rooms to the pool deck;
- access from the pool deck into the water, provided by a *ramp* sloped no steeper than 1:12. In retrofit situations where it is *technically infeasible* to provide a *ramp*, a mechanical pool lift may be used;
- a shower chair available at each *facility* for use in transferring into the water and/or shower;

- where steps are provided into the pool,
  - steps shall be marked with a colour-contrasting strip of at least 50 mm (2 in.) wide, at both the riser and the tread; and
  - colour-contrasting *handrails* on both sides of the steps. Such *handrails* shall extend at least 300 mm (11-3/4 in.) beyond the pool edge;
- where a curbed edge is provided, it shall be a minimum of 200 mm (7-7/8 in.) and a maximum of 400 mm (15-3/4 in.) in height;
- pool boundaries clearly defined by both a textural change and a colour contrast to both the water surface and surrounding pavement;
- firm, slip-resistant materials and finishes used on the pool perimeter, deck or paved areas surrounding the pool;
- non-abrasive and easy-to-clean pool perimeter finishes;
- adequate drainage on the pool deck to drain water quickly;
- where pool-depth indicator marking is provided, depth-indicator markings, as well as 'SHALLOW END' and 'DEEP END' markings, of a highly contrasting colour and sufficient size to be easily visible;
- where diving boards or platforms are provided, they shall be clearly marked and protected. Overhead clearances should be a minimum of 2100 mm (82-3/4 in.) or shall be protected by suitable *guards*;
- where lanes, and/or lane markers are provided, they shall be of a highly contrasting colour. Tie-off devices for lane markers shall be positioned such that they do not create a tripping hazard;
- where starting blocks are provided, they shall be of a highly contrasting colour and capable of being securely fixed in place;
- safety equipment and other accessories shall be stored such that they do not present a tripping hazard; and
- lifeguard chairs, slides and other pool related structures shall be in highly contrasting colours.

Wading pool access shall be safe and gradual so that a child with a *disability* can be assisted into the water easily and/or use a wheelchair to enter.

Swimming pools shall be of 'level-deck' design.

#### RELATED SECTIONS

All relevant parts of Sections 4.1, 4.2, 4.3 and 4.4.

## 4.5.4 CAFETERIAS

## 4.5 FACILITY-SPECIFIC REQUIREMENTS

### RATIONALE

Cafeteria serving lines and seating area designs need to reflect the lower sight lines, reduced reach, knee-space and manoeuvring requirements of a person using a wheelchair or scooter. Patrons using mobility devices may not be able to hold a tray or food items while supporting themselves on canes or while manoeuvring a wheelchair. Tray slides should be designed to move trays with minimal effort.

Features such as colour contrasts and large print menus may assist persons with a visual *impairment*.

### APPLICATION

In addition to the design requirements specified in 4.1 to 4.4, cafeterias shall comply with this section.

Where fixed tables or counters are provided, at least 10%, but not less than one, shall be *accessible* and shall comply with 4.3.7. It is preferable to have all fixed tables *accessible*.

In new construction, and where practicable in *alterations*, the fixed tables (or counters) shall be distributed throughout the *space*.

At least one lane at each cashier area shall be *accessible* and comply with this section. It is preferable to have all lanes at all cashier areas *accessible*.

### DESIGN REQUIREMENTS

Where food or drink is served at counters exceeding 865 mm (34 in.) in height and counters are for use by customers seated on stools or standing at the counter, a minimum of 1525 mm (60 in.) length of the counter shall be constructed in compliance with 4.3.8. Service may also be made available at *accessible* tables within the same area.

*Access aisles* at least 1100 mm (43-1/4 in.) shall be provided up to and around all *accessible* fixed tables. The *access aisle* shall be measured between parallel edges of tables or between a wall and the table edges.

Dining areas, including raised or sunken dining areas, and outdoor seating areas shall be *accessible*. In a retrofit situation where it is *technically infeasible* to provide access to all levels within a dining area, or to all parts of outdoor seating areas, at least one dining area shall be *accessible*. The *accessible* area must feature the same level of service and décor as the rest of the dining area and it must not be restricted to use by persons with *disabilities*.

Access to outdoor eating areas shall comply with 4.3.11.

Food service lines shall have a minimum *clear* width of 1100 mm (43-1/4 in.).

Tray slides shall be mounted no higher than 865 mm (34 in.).

If self-service shelves are provided, at least 50% must be within the reach ranges specified in 4.1.1. It is preferable to have all self-service shelves *accessible*.

Self-service shelves and dispensing devices for tableware, dishware, condiments, food and beverages shall be installed to comply with 4.1.1.

Cashier locations should feature at least one *access aisle*, which is a minimum of 1100 mm (43-1/4 in.) wide. It is preferable to have all aisles *accessible*.

In banquet rooms or *spaces* where a head table or speaker's lectern is located on a raised platform, the platform shall be *accessible* in compliance with 4.1.9 or 4.1.15, as well as 4.3.3.

*Spaces* for vending machines, beverage dispensers and other equipment shall comply with 4.1.1 and shall be located on an *accessible route* in compliance with 4.1.4.

Barriers and/or turnstiles, where provided to control access, shall comply with 4.1.7.

Queuing areas shall comply with 4.3.6.

### RELATED SECTIONS

All relevant parts of Sections 4.1, 4.2, 4.3 and 4.4.

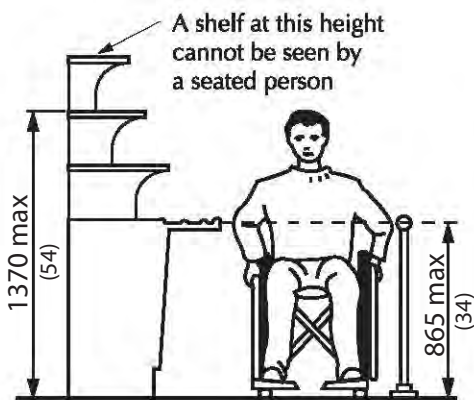


Figure 4.5.4.1  
Self Serve Counter

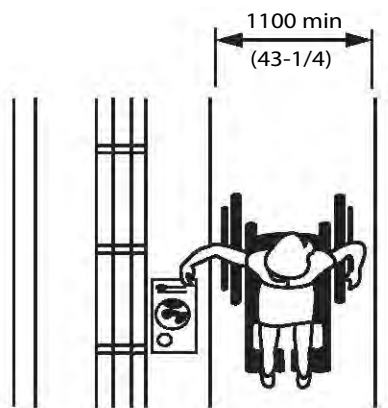


Figure 4.5.4.2  
Aisle Width

## 4.5 FACILITY-SPECIFIC REQUIREMENTS

### 4.5.5 CHURCHES, CHAPELS AND OTHER PLACES OF WORSHIP

#### RATIONALE

Access to all areas of worship should be provided. Access assumes that persons with *disabilities* may be participants, leaders, staff or volunteers.

#### APPLICATION

In addition to the design requirements specified in 4.1 to 4.4, churches, chapels and other places of worship and/or reflection shall comply with this section.

#### DESIGN REQUIREMENTS

All areas in churches, chapels and other places of worship and/or reflection shall be *accessible* to persons with *disabilities*, including main areas of worship, *meeting rooms*, washrooms, coatrooms and offices.

*Accessible* seating shall be provided in compliance with 4.3.2.

Pulpits, altars, daises and choir areas shall comply with 4.3.3.

Public address systems shall comply with 4.4.9.

Assistive listening systems shall comply with 4.4.6.

#### RELATED SECTIONS

All relevant parts of Sections 4.1, 4.2, 4.3 and 4.4.



## 4.5.6 LIBRARIES

## 4.5 FACILITY-SPECIFIC REQUIREMENTS

### RATIONALE

Traditional and automated systems should be available to all patrons and staff. Both the design of the *facility* and the provision of services should be considered. Service counters and study carrels should accommodate the knee-space and armrest requirements of a person using a wheelchair. Computer catalogues, carrels and workstations should be provided at a range of heights, to accommodate persons who are standing or sitting, as well as children of many ages and sizes.

The provision of workstations equipped with assistive technology such as large displays, screen readers, etc. will increase the accessibility of a library.

The provision of book drop-off slots at different heights for standing and seated use will enhance usability.

### APPLICATION

In addition to the design requirements specified in 4.1 to 4.4, libraries shall comply with this section.

Where fixed seating, tables or study carrels are provided, at least 10% but no less than one shall be *accessible* and in compliance with this section. It is preferable to have all fixed seating, tables and study carrels *accessible*.

At least one lane at each checkout area shall be *accessible* and comply with this section. It is preferable to have all lanes at all checkout areas *accessible*.

Where computer catalogues or workstations are provided, at least 50% shall be *accessible* and shall comply with this section. It is preferable to have all computer catalogues and workstations *accessible*.

### DESIGN REQUIREMENTS

*Accessible* fixed seating, tables and study carrels shall be located on an *accessible route* in compliance with 4.1.4.

Clearances between fixed seating, tables and study carrels shall comply with 4.1.4.

Where shelving is provided at fixed seating, tables or study carrels, the shelving shall be no higher than 1200 mm (47 in.).

*Accessible* fixed study carrels shall incorporate

- work surfaces and knee/toe clearance in compliance with 4.1.1;
- an electrical outlet; and
- lighting levels of at least 100 lux (9.3 ft-candles) at the work surface.

Where provided, traffic control or book security gates shall comply with 4.1.7.

Minimum *clear aisle space* at card catalogues and at stacks shall comply with 4.1.1.

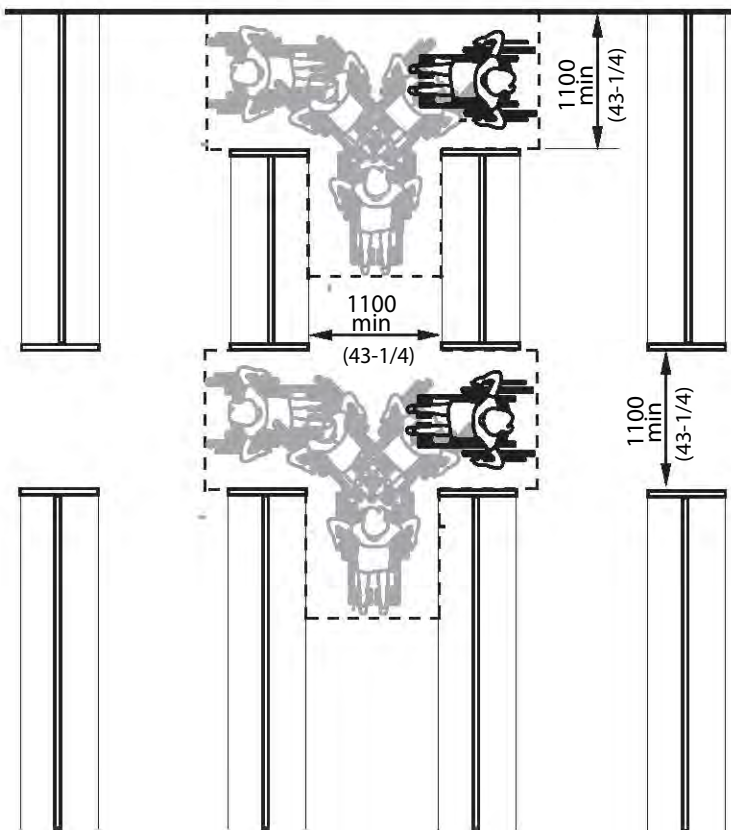


Figure 4.5.6.1  
Aisle Width

## 4.5 FACILITY-SPECIFIC REQUIREMENTS

### 4.5.6 LIBRARIES

#### DESIGN REQUIREMENTS (Continued)

Aisle configurations shall incorporate a *clear floor space* allowing a person in a wheelchair to make a 180-degree turn in compliance with 4.1.1.

Maximum reach heights at card catalogues shall comply with 4.1.1.

Shelf height in stack areas is unrestricted.

Circulation service counters and information service counters shall comply with 4.3.8.

Where provided, computer catalogues and computer workstations shall incorporate

- knee and toe *space* below the work surface in compliance with 4.1.1 and 4.3.7;
- a maximum work surface height of 865 mm (34 in.); and
- a maximum table depth of 915 mm (36 in.).

A minimum of one movable chair shall be provided at every information service counter, computer catalogue or computer workstation.

Book drop slots shall

- be located on an *accessible route* complying with 4.1.4;
- be located adjacent to a 2440 by 2440 mm (96 by 96 in.) level *clear floor space*. In a retrofit situation where it is *technically infeasible* to create a 2440 x 2440 mm (96 by 96 in.) *clear floor space*, the *space* may be reduced to 1525 x 1525 mm (60 by 60 in.); and
- have a slot that is operable using one hand, located between 860 mm (34 in.) and 900 mm (35 in.) above the floor.

Lighting at book stacks shall be mounted directly over the aisle *space* and provide a minimum of 200 lux (20 ft-candles) at a nominal working height of 920 mm (36 in.).

The acoustic quality shall be free of unnecessary background noise and should permit comprehension by persons with limited hearing. (Refer also to 4.4.16.)

Where CDs, tapes, talking books, etc. are available as part of the library resource materials, or for loan purposes, a separate *space* shall be provided for auditing this material without disturbing other library users.

#### RELATED SECTIONS

All relevant parts of Sections 4.1, 4.2, 4.3 and 4.4.

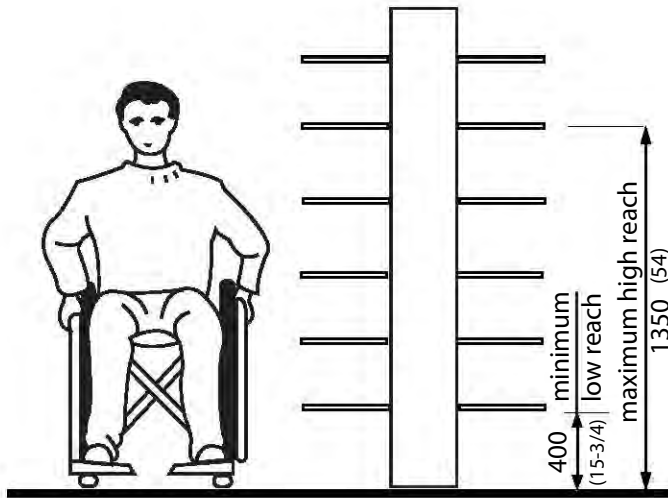


Figure 4.5.6.2  
Reach Heights

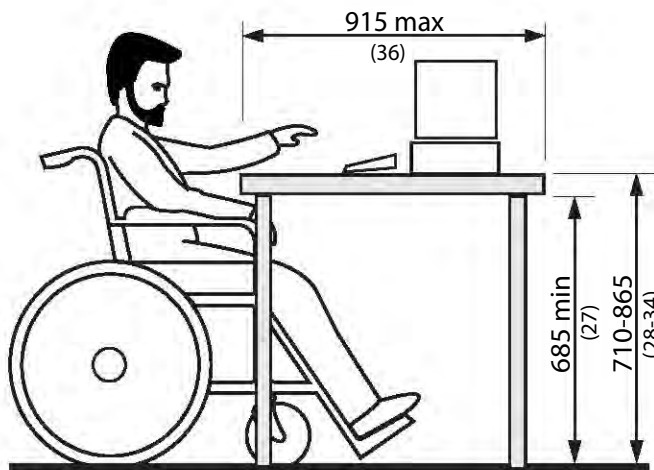


Figure 4.5.6.3  
Work Surfaces

### 4.5.7 BUSINESS, MERCANTILE AND CIVIC

### 4.5 FACILITY-SPECIFIC REQUIREMENTS

#### RATIONALE

The role of persons with *disabilities* should not be restricted or limited to that of the customer or consumer. Workspaces should be designed with a view to future adaptation or accommodation of individual equipment or assistive devices.

#### APPLICATION

In addition to the design requirements specified in 4.1 to 4.4, business, mercantile and civic *facilities* shall comply with this section.

In areas used for transactions where counters have cash registers and are provided for sales and distribution of goods or services to the public, at least one of each type shall have a portion of the counter *accessible* and in compliance with this section. Such counters shall include, but not be limited to, counters in retail stores and distribution centres.

Where counters are dispersed throughout the *facility*, the *accessible* counters must also be dispersed throughout the *facility*.

In public *facilities* where counters or teller windows have solid partitions or security glazing to separate personnel from the public, at least one of each type shall provide a method to facilitate voice communication. Such methods may include, but are not limited to, grills, slats, talk-through baffles, intercoms or telephone handset devices.

The number of *accessible* checkout aisles provided shall be in conformance with Table 4.5.7.

#### DESIGN REQUIREMENTS

All *accessible* sales and service counters shall be on an *accessible route* that complies with 4.1.4.

In areas used for transactions where counters have cash registers and are provided for sales and distribution of goods or services to the public, the counter shall have at least one portion that is at least 920 mm (36 in.) in length, with a maximum surface height of 865 mm (34 in.) above the finished floor and shall have adjacent *clear floor space* of at least 1370 mm x 760 mm (54 x 30 in.) to allow for parallel approach by a person using a wheelchair or scooter.

In areas used for transactions that may not have a cash register but at which goods and services are sold, including, but not limited to, ticketing counters, teller stations, registration counters, information counters, box office counters and library check-out areas either a portion of the main counter shall be a minimum of 865 mm (34 in.) in length, with a maximum height of 865 mm (34 in.) or an auxiliary counter with the required minimum dimensions shall be provided in close proximity to the main counter.

In public *facilities* where counters or teller windows have solid partitions or security glazing to

separate personnel from the public, the method of communication provided shall be *accessible* to both individuals who use a wheelchair or scooter and individuals who have difficulty bending.

The *clear* width of *accessible* checkout lines shall comply with 4.1.4, and the maximum adjoining counter height shall not exceed 965 mm (38 in.) above the finished floor. The top of any counter edge protection shall be no more than 50 mm (2 in.) above the top of the counter surface on the aisle side of the check-out counter.

*Signage* identifying *accessible* checkout aisles shall incorporate the International Symbol of Access and shall be mounted above the checkout aisle in the same location where the checkout number or type of checkout is displayed.

Any devices used to prevent the removal of shopping carts from store premises shall not prevent access or *egress* to persons who use a wheelchair or scooter. An alternate *entrance* that is equally convenient to that provided for ambulatory persons is acceptable.

#### RELATED SECTIONS

All relevant parts of Sections 4.1, 4.2, 4.3 and 4.4.

Total checkout aisles of each design	Minimum number of checkout aisles of each design
1-4	1
5-8	2
9-15	3
Over 15	3 plus 20% of additional aisles

**Table 4.5.7**  
Required Number of *Accessible* Checkout Aisles

## 4.5 FACILITY-SPECIFIC REQUIREMENTS

### RATIONALE

Police stations should accommodate persons with *disabilities* who may be members of the public, detainees, members of counsel or police staff. All areas of the police station that are used by the public, members of staff and counsel should be fully *accessible* to persons with *disabilities*. Secure areas, such as cells and common areas used by detainees, should have provisions to *accommodate* persons with *disabilities*.

### APPLICATION

In addition to the design requirements specified in 4.1 to 4.4, holding cells in police stations shall comply with this section.

Except as specified in this section, all *common use areas* serving *accessible* cells or rooms and all *public use areas* shall be designed and constructed to comply with 4.1 to 4.4. Exceptions: Requirements for *areas of rescue assistance* in 4.4.1 do not apply. Compliance with requirements for elevators and stairs is not required in multi-storey housing *facilities* where *accessible* cells or rooms, all *common use areas* serving them and all *public use areas* are located on an *accessible* route.

Entrances used by the public, including those that are secured, shall be *accessible* and in compliance with 4.1.5. Exception: Secured entrances, doors and doorways operated only by security personnel shall not be required to have *accessible* door hardware.

Where security systems are provided at public or other *entrances* required to be *accessible* by this section, an *accessible* route complying with 4.1.4 shall be provided through fixed security barriers at required *accessible* *entrances*. Where security barriers incorporate equipment such as metal detectors, fluoroscopes, or other similar devices which cannot be made *accessible*, an *accessible* route shall be provided adjacent to

## 4.5.8 POLICE STATIONS

such security screening devices, to facilitate an equivalent circulation path for persons using a wheelchair or scooter.

In non-contact visiting areas where detainees are separated from visitors, the following *elements*, where provided, shall be *accessible* and located on an *accessible* route complying with 4.1.4.

- Cubicles and Counters: 5%, but not less than one, shall comply with 4.3.7 on both the visitor and detainee sides. Where counters are provided, they shall comply with 4.3.8 on both the visitor and detainee sides. Exception: Non-contact visiting areas not serving *accessible* cells or rooms.
- Partitions: Solid partitions or security glazing separating visitors from detainees through which communication is necessary shall incorporate communication systems which are *accessible* to both individuals who use a wheelchair or scooter and individuals who have difficulty bending. If such communication systems incorporate a telephone handset, at least one telephone handset shall be equipped with a volume control.

At least 2%, but not less than one, of the total number of cells shall comply with this section. Where special cells are provided (e.g., orientation, protective custody, disciplinary, segregation, detoxification or medical isolation), at least one of each purpose shall comply with this section.

In addition to the aforementioned cell requirements, at least 2%, but not less than one, of general cells shall be equipped with audible emergency warning systems or permanently installed telephones within the cell, in compliance with this section.

Medical care *facilities* providing physical or medical treatment or care shall be *accessible* to persons with *disabilities*.

### DESIGN REQUIREMENTS

*Accessible* cells shall be located on an *accessible* route in compliance with 4.1.4.

Where provided to serve *accessible* cells, the following *elements* or *spaces* shall be *accessible* and connected by an *accessible* route.

- All doors and doorways on an *accessible* route shall comply with 4.1.6. Exception: Secured entrances, doors and doorways operated only by security personnel shall not be required to have *accessible* door hardware.
- At least one toilet and one bathing facility shall comply with 4.2.1.
- *Accessible* beds shall have manoeuvring space of at least 920 mm (36 in.) wide along one side.
- At least one drinking fountain and/or water cooler shall comply with 4.3.1.
- Fixed or built-in tables, counters or work surfaces shall comply with 4.3.7.
- At least one fixed bench shall comply with 4.3.15.
- Fixed or built-in storage shall comply with 4.3.9.
- All controls intended for operation by detainees shall comply with 4.4.2.

Where audible emergency warning systems are provided to serve occupants of cells, visual alarms complying with 4.4.4 shall also be provided. Exception: Visual alarms are not required where detainees are not allowed independent means of *egress*.

Where permanently installed telephones are provided within cells, they shall have volume controls.

### RELATED SECTIONS

All relevant parts of Sections 4.1, 4.2, 4.3 and 4.4.



## 4.5.9 MUNICIPAL COURTS

## 4.5 FACILITY-SPECIFIC REQUIREMENTS

### RATIONALE

Municipal court *facilities* should accommodate persons with *disabilities* who may be members of the judiciary, court clerks or other officials, defendants, members of counsel and members of the public.

Court *facilities* usually incorporate changes in level at the judge's dais and court officials' areas. While it is not required to make all of these areas fully *accessible*, it is a requirement that they be easy to adapt, should the need arise in the future to accommodate a person with a mobility *impairment*. Other areas of the court generally used by the public, defendants, witnesses and counsel should be *accessible* to all persons.

### APPLICATION

In addition to the design requirements specified in 4.1 to 4.4, municipal courts shall comply with this section.

In addition to the *accessible entrances* used by staff or the public as required in 4.1.5, where provided, at least one restricted *entrance* and one secured *entrance* to the *facility* shall be *accessible*. Restricted *entrances* are those *entrances* used only by judges, public officials, *facility* personnel or other authorized parties on a controlled basis. Secure *entrances* are those *entrances* to judicial facilities used only by detainees and detention officers. Exception: Secured *entrances*, doors and doorways operated only by security personnel shall not be required to have *accessible* door hardware.

An *accessible* route complying with 4.1.4 shall be provided through fixed security barriers at required *accessible entrances*. Where security barriers incorporate equipment such as metal detectors, fluoroscopes, or other similar devices which cannot be made *accessible*, an *accessible* route

shall be provided adjacent to such security screening devices, to facilitate an equivalent circulation path.

Where a two-way communication system is provided to gain admittance to a *facility*, or to restricted areas within a *facility*, the system shall provide both visual and audible signals and shall comply with 4.4.2.

Where provided, the following *elements* and *spaces* shall be on an *accessible* route complying with 4.1.4.

- Spectator, Press and other *areas* with Fixed Seats: Each spectator, press and other *area* with fixed seats having a seating capacity of 25 or less, shall have within its defined area a *clear floor space* complying with 4.1.1. Where the seating capacity of a spectator, press and other *area* with fixed seats is greater than 25, seating provision shall be provided in compliance with 4.3.2.
- Jury Boxes and Witness Stands: Each jury box and witness stand shall have within its defined area *clear floor space* complying with 4.1.1.
- Judges' Benches and Courtroom Stations: Judges' benches, clerks' stations, bailiffs' stations, court reporters' stations, and litigants' and counsel stations shall comply with 4.3.7.

Exceptions:

- Vertical access to raised judges' benches or courtroom stations need not be installed, provided that the requisite areas and manoeuvring *spaces* are installed at the time of initial construction, to allow future installation of a means of vertical access complying with 4.1.9, 4.1.14 or 4.1.15 without requiring substantial reconstruction of the *space*.

- In alterations, *accessible clear floor spaces* are not required to be located within the defined area of jury boxes or witness stands and may be located outside these *spaces* where a *ramp* or lift access poses a hazard by restricting or projecting into a required means of *egress*.

Permanently installed assistive listening systems in compliance with 4.4.6 shall be provided in each courtroom. The minimum number of receivers shall be 4% of the room occupant load, but not less than two receivers. An informational sign indicating the availability of an assistive listening system shall be posted in a prominent place.

Where provided in areas for jury assembly or deliberation, the following *elements* or *spaces* shall be on an *accessible route* complying with 4.1.4 and shall comply with the following provisions

- refreshment areas, kitchenettes and fixed or built-in refreshment dispensers shall be *accessible* to persons with *disabilities*.
- where provided, drinking fountains shall comply with 4.3.1.

### RELATED SECTIONS

All relevant parts of Sections 4.1, 4.2, 4.3 and 4.4.

## 4.5 FACILITY-SPECIFIC REQUIREMENTS

### 4.5.10 TRANSPORTATION FACILITIES

#### RATIONALE

Links to usable transportation should be *accessible* to all members of a community. Accessibility within terminals and use of systems should be addressed. This includes public and private bus, taxi, train, and airplane arrival and departure points. A variety of lift devices may need to be accommodated, and alternatives to audio and/or visual-only scheduling should be available.

#### APPLICATION

In addition to the design requirements specified in 4.1 to 4.4, transportation *facilities* located within a *site* shall comply with this section.

#### DESIGN REQUIREMENTS

##### BUS SHELTERS

Bus shelters shall

- be located on firm, level pads approximately at the same elevation as the sidewalk or walkway;
- have clearances around at least two sides of the shelter, including the landing pad side, of at least 1220 mm (48 in.);
- provide a *clear* view of oncoming traffic;
- incorporate sufficient clear floor space to accommodate a person using a wheelchair or scooter; and
- feature at least one seat with armrests and a seat height between 400 mm and 450 mm (15-3/4 in. and 17-3/4 in.);

All glazed panels surrounding bus shelters shall incorporate decals, and other safety features as specified in 4.1.8.

##### BUS STOPS

Bus stops shall

- incorporate a paved, firm, level surface, in compliance with local authority standards; and
- not be impeded by adjacent street furniture, such as dispensers, vending machines, waste boxes, planters, posts, signs and guide wires.

##### TRANSIT TERMINALS

Where bus platforms or other boarding platforms are provided, they shall allow safe access for persons who use a wheelchair or scooter, and where possible, provide level access into buses.

The edges of platforms shall incorporate a continuous *detectable warning surface* of at least 600 mm (23-5/8 in.) wide and in compliance with 4.4.8.

Lighting levels at all boarding platforms shall be at least 100 lux (10 ft-candles) at the platform or boarding-surface edge.

Boarding locations shall incorporate visible and audible warning signals to advise travellers of approaching vehicles.

Where special lifting devices are used, either on the vehicle or at the boarding point, appropriate manoeuvring *space* shall be provided around the boarding point for waiting passengers using wheelchairs.

Seating shall be provided in compliance with 4.3.15, at or close to boarding points.

#### RELATED SECTIONS

All relevant parts of Sections 4.1, 4.2, 4.3 and 4.4.

## UNIVERSAL DESIGN PRINCIPLES AND GUIDELINES

## APPENDIX A

Version 2.0 - 4/1/97

Compiled by advocates of universal design, listed in alphabetical order: Bettye Rose Connell, Mike Jones, Ron Mace, Jim Mueller, Abir Mullick, Elaine Ostroff, Jon Sanford, Ed Steinfeld, Molly Story, and Gregg Vanderheiden

Major funding provided by: The National Institute on Disability and Rehabilitation Research, U.S. Department of Education

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### UNIVERSAL DESIGN:

The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

The authors, a working group of architects, product designers, engineers and environmental design researchers, collaborated to establish the following Principles of Universal Design to guide a wide range of design disciplines, including environments, products, and communications. These seven principles may be applied to evaluate existing designs, guide the design process and educate both designers and consumers about the characteristics of more usable products and environments.

The Principles of Universal Design are presented here, in the following format: name of the principle, intended to be a concise and easily remembered statement of the key concept embodied in the principle; definition of the principle, a brief description of the principle's primary directive for design; and guidelines, a list of the key elements that should be present in a design which adheres to the principle. (Note: all guidelines may not be relevant to all designs.)

### PRINCIPLE ONE: Equitable Use

The design is useful and marketable to people with diverse abilities.

#### Guidelines:

- 1a. Provide the same means of use for all users: identical whenever possible; equivalent when not.
- 1b. Avoid segregating or stigmatizing any users.
- 1c. Provisions for privacy, security,

and safety should be equally available to all users.

- 1d. Make the design appealing to all users.

### PRINCIPLE TWO: Flexibility in Use

The design accommodates a wide range of individual preferences and abilities.

#### Guidelines:

- 2a. Provide choice in methods of use.
- 2b. Accommodate right- or left-handed access and use.
- 2c. Facilitate the user's accuracy and precision.
- 2d. Provide adaptability to the user's pace.

### PRINCIPLE THREE: Simple and Intuitive Use

Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

#### Guidelines:

- 3a. Eliminate unnecessary complexity.
- 3b. Be consistent with user expectations and intuition.
- 3c. Accommodate a wide range of literacy and language skills.
- 3d. Arrange information consistent with its importance.
- 3e. Provide effective prompting and feedback during and after task completion.

### PRINCIPLE FOUR: Perceptible Information

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

#### Guidelines:

- 4a. Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- 4b. Provide adequate contrast between essential information and its surroundings.
- 4c. Maximize "legibility" of essential information.
- 4d. Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
- 4e. Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

### PRINCIPLE FIVE: Tolerance for Error

The design minimizes hazards and the adverse consequences of accidental or unintended actions.

#### Guidelines:

- 5a. Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
- 5b. Provide warnings of hazards and errors.
- 5c. Provide fail-safe features.
- 5d. Discourage unconscious action in tasks that require vigilance.

### PRINCIPLE SIX: Low Physical Effort

The design can be used efficiently and comfortably and with a minimum of fatigue.

#### Guidelines:

- 6a. Allow user to maintain a neutral body position.
- 6b. Use reasonable operating forces.
- 6c. Minimize repetitive actions.
- 6d. Minimize sustained physical effort.

### PRINCIPLE SEVEN: Size and Space for Approach and Use

Appropriate size and space are provided for approach, reach, manipulation, and use, regardless of user's body size, posture, or mobility.

#### Guidelines:

- 7a. Provide a clear line of sight to important elements for any seated or standing user.
- 7b. Make reach to all components comfortable for any seated or standing user.
- 7c. Accommodate variations in hand and grip size.
- 7d. Provide adequate space for the use of assistive devices or personal assistance.

Please note that the Principles of Universal Design address only universally usable design, while the practice of design involves more than consideration for usability. Designers must also incorporate other considerations, such as economic, engineering, cultural, gender, and environmental concerns, in their design processes. These principles offer designers guidance to better integrate features that meet the needs of as many users as possible.