



Planning & Development Services
Building Inspections 668-8340



April 1, 2006

BARRIER-FREE DESIGN

ILLUSTRATED GUIDE

For Commercial, Institutional, Residential and Industrial Buildings

Section 3.8 of the National Building Code of Canada

(NBC 2005)



Please refer to pages 2 & 3 to determine which *buildings* require Barrier-Free Design & which *buildings* are exempt from Barrier-Free Design. However, if Barrier-Free access is provided voluntarily, (for example a Barrier-Free Ramp is installed on a single family dwelling) it shall be constructed in compliance with the applicable requirements of Section 3.8 of the NBC.

FOREWORD

The National Building Code of Canada (NBC 2005) is the legal document setting out minimum requirements for the design and construction of buildings within Yukon.

This Illustrated Guide is complimentary to Section 3.8 of the NBC 2005 – Barrier-Free Design, and is intended to assist in the interpretation and understanding of the code requirements pertaining to needs of the physically and sensory disabled as it relates to the access to and use of buildings.

Although care has been taken to accurately reflect the NBC 2005, **this Illustrated Guide is not a substitute or reproduction of all code requirements**, nor is it intended to limit the ways in which code compliance can be achieved.

Definitions or implied definitions hold no legal significance, but are used in the context normally applied describing methods or systems.

Definition - NBC 2005 – Division A, Section 1.4.

Sentence 3.8.1.1.(1) of the NBC 2005 sets out which *buildings* require Barrier-Free Design and which *buildings* are exempt from Barrier-Free Design.

If barrier-free access is provided voluntarily (ie. a barrier-free ramp is installed on a single family dwelling), it shall be constructed in compliance with the applicable requirements of Section 3.8 of the NBC 2005.

“Barrier-free” means that a building and its facilities can be approached, entered and used by persons with physical or sensory disabilities.

General Information on Designing for Persons with Physical or Sensory Disabilities

For the purposes of this publication, a person has a physical or sensory disability when he/she has a loss of or decrease in physical or sensory function that substantially limits the ability to move throughout the community and accessing facilities within the community.

Such disabilities include weakness; paralysis; absence of one or more limbs; loss of balance or co-ordination; spastic muscles; painful, stiff or deformed joints; visual impairments and hearing impairments.

Section 3.8 of the NBC 2005 sets out the requirements to achieve "Barrier-Free Design"

Section 3.8 Barrier-Free Design

3.8.1. General

3.8.1.1. Application

(See Appendix A.)

(1) The requirements of this Section apply to all *building* except

- (a) houses, including semi-detached houses, duplexes, triplexes, town houses, row houses and boarding houses,
- (b) *buildings* of Group F, Division 1 *major occupancy*, and
- (c) *buildings* which are not intended to be occupied on a daily or full time basis, including automatic telephone exchanges, pumphouses and substations.

A-3.8. Barrier-Free Design Assumptions. This Section contains minimum provisions to accommodate a person using a typical manual wheelchair or other manual mobility assistance devices such as walking aids, including canes, crutches, braces and artificial limbs.

A-3.8.1.1. Accessibility. Industrial buildings often pose a greater risk to their occupants due to the presence of significant quantities of dangerous materials or the use of hazardous processes. For example, plants which are classified as Group F, Division 2 or 3, may store and use toxic or highly flammable substances in significant quantities, or house processes which involve very high temperatures and which have a high degree of automation. In some facilities, particularly in primary industries such as forestry and metallurgy, the construction normally used and the operations carried out within the space can make compliance with the requirements of Section 3.8 impractical. It is therefore intended that these requirements be applied with discretion in buildings of Group F, Division 2 or 3 major occupancy. However, where industrial buildings contain subsidiary occupancies, such as offices or showrooms, it is reasonable to require that accessibility be provided in these spaces.

This section of the NBC 2005 applies to all new buildings and to extensions or material alterations to existing buildings.

These requirements reflect the intent of Human Rights Legislation to prevent discrimination against disabled persons, in specific building occupancies, whether they are tenants, visitors, or employees.

3.8.1.2. Entrances

(See Appendix A.)

(1) In addition to the *barrier-free* entrances required by Sentence (2), not less than 50% of the pedestrian entrances of a *building* referred to in Sentence 3.8.1.1.(1) shall be *barrier-free* and shall lead from

- (a) the outdoors at sidewalk level, or
- (b) a ramp that conforms to Article 3.8.3.4. and leads from a sidewalk.

(2) A *suite of assembly occupancy, business and personal services occupancy or mercantile occupancy* that is located in the *first storey* of a *building*, or in a *storey* to which a *barrier-free* path of travel is provided, and that is completely separated from the remainder of the *building* so that there is no access to the remainder of the *building*, shall have at least one *barrier-free* entrance.

(3) A *barrier-free* entrance required by Sentences (1) or (2) shall be designed in accordance with Article 3.8.3.3.

(4) At a *barrier-free* entrance that includes more than one doorway, only one of the doorways is required to be designed in accordance with the requirements of Article 3.8.3.3.

(5) If a *walkway* or pedestrian bridge connects two *barrier-free storeys* in different *buildings*, the path of travel from one *storey* to the other *storey* by means of the *walkway* or bridge shall be *barrier-free*.

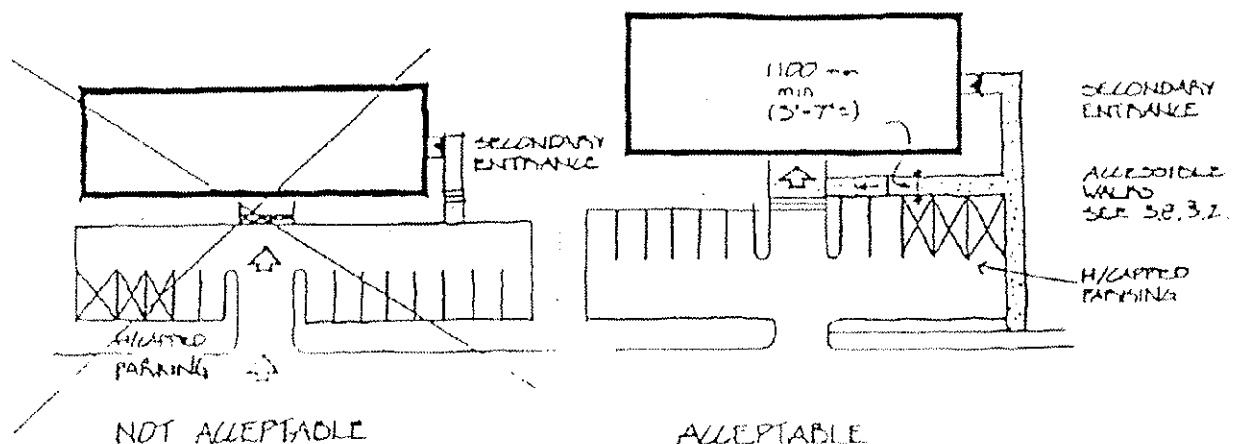
A-3.8.1.2. Entrances. An accessible route should exist from the sidewalk or roadway and parking area to an accessible building entrance. This route should be located so that persons with physical disabilities do not have to pass behind parked cars.

To provide more general access to buildings, not less than 50% of the pedestrian entrances are required to be barrier-free. This should include a principal entrance. If the 50% calculation results in a fraction, the number of barrier-free entrances should be the next higher unit value. For the purpose of determining the number of entrances to a building, several adjacent doors in a bank of doors are considered to be a single entrance.

The main public entrance to the building should be accessible to all persons, regardless of disability. Secondary entrances or entrances that require keys or other devices for the use of disabled persons would be considered discriminatory.

Where a secondary entrance is heavily utilized, for example; from adjacent to or from underground parking, these should also be designed to be accessible.

Not less than 50% of the pedestrian entrances of a building referred to in Sentence 3.8.1.1.(1) shall be barrier-free.



3.8.1.2

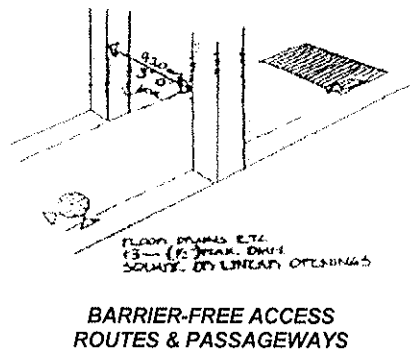
3.8.1.3. Barrier-Free Path of Travel

(1) Except as required elsewhere in this Part or as permitted by Article 3.8.3.3. pertaining to doorways, the unobstructed width of a *barrier-free* path of travel shall be not less than 920mm (36").

- (2) Interior and exterior walking surfaces that are within a *barrier-free* path of travel shall
- (a) have no opening that will permit the passage of a sphere more than 13 mm ($\frac{1}{2}$ ") diam,
 - (b) have any elongated openings oriented approximately perpendicular to the direction of travel,
 - (c) be stable, firm and slip-resistant,
 - (d) be bevelled at a maximum slope of 1 in 2 at changes in level not more than 13mm ($\frac{1}{2}$ "), and
 - (e) be provided with sloped floors or ramps at changes in level more than 13 mm ($\frac{1}{2}$ ").

(3) A *barrier-free* path of travel is permitted to include ramps, passenger elevators or other platform-equipped passenger-elevating devices to overcome a difference in level.

(4) The width of a *barrier-free* path of travel that is more than 30 m (100') long shall be increased to not less than 1 500 mm (5') for a length of 1 500 mm (5') at intervals not exceeding 30 m (100').



3.8.1.3.

3.8.1.4. Access to Storeys Served by Escalators and Moving Walks

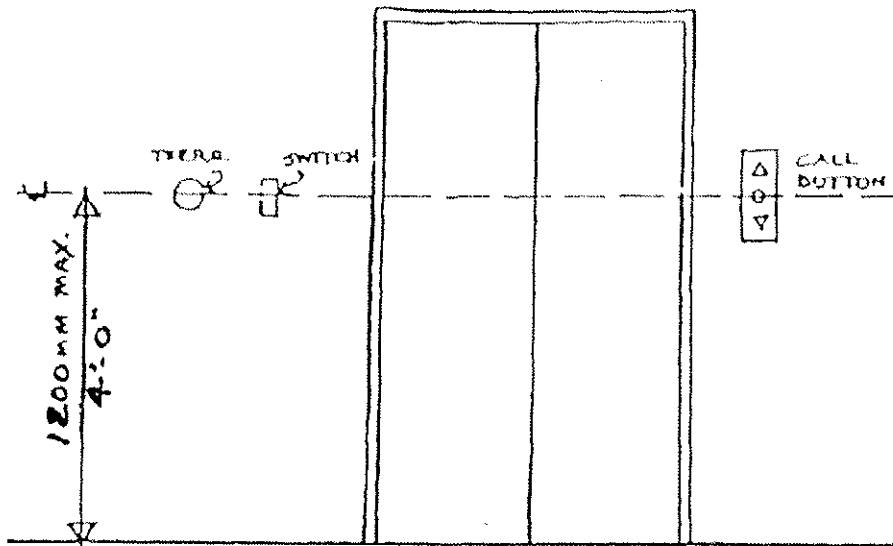
(1) In a *building* in which an escalator or inclined moving walk provides access to any floor level above or below the entrance floor level, an interior *barrier-free* path of travel shall be provided to that floor level. (See Appendix A.)

(2) The route from the escalator or inclined moving walk to the *barrier-free* path of travel that leads from floor to floor as required by Sentence (1) shall be clearly indicated by appropriate signs.

A-3.8.1.4.(1) Access to Storeys Served by Escalators and Moving Walks. In some buildings, escalators and inclined moving walks are installed to provide transportation from one floor level to another floor level so as to increase the capacity to move large numbers of persons. Some buildings located on a sloping site are accessible from street level on more than one storey and an escalator or inclined moving walk is provided for internal movement from floor to floor. In both these situations, a person with a physical disability must be provided with an equally convenient means of moving between the same floor levels within the building. This can be accomplished by providing elevators or a platform-equipped passenger-elevating device.

3.8.1.5. Controls

(1) Except as required by Sentence 3.5.2.1.(3) regarding elevators, controls for the operation of *building services* or safety devices, including electrical switches, thermostats and intercom switches, that are intended to be operated by the occupant and are located in or adjacent to a *barrier-free* path of travel shall be accessible to a person in a wheelchair, operable with one hand and mounted between 400 mm (16") and 1 200 mm (48") above the floor.



3.8.1.5.

Mounting Heights for Controls

Although some persons in wheelchairs can make a lateral approach and reach higher, a person making a frontal approach to controls needs a mounting height to the centre of the control not exceeding 1 200 mm (48").

3.8.2. Occupancy Requirements

Some confusion exists concerning access to buildings. This section requires access to the entrance storey level only. Access to other parts of the building would only be required where elevators, escalators, inclined moving walks, or other platform-equipped passenger-elevating devices are provided. In designing or renovating a building, attention to the location of the main functions of the building is needed. If the main use of the building is on another level, then access to these areas should be considered (such access to comply with 3.8.3.5(1)).

3.8.2.1. Areas Requiring a Barrier-Free Path of Travel

(See Appendix A.)

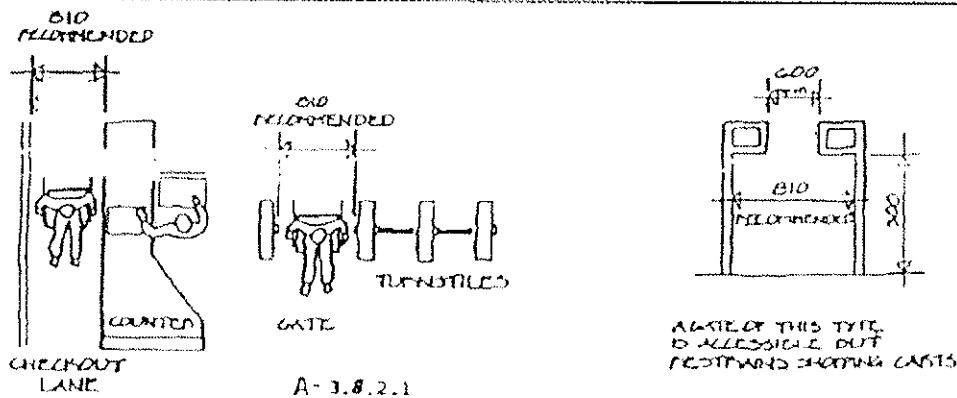
(1) Except as permitted by Sentence (2), a *barrier-free* path of travel from the entrances required by Sentences 3.8.1.2.(1) and (2) to be *barrier-free* shall be provided throughout the entrance storey and within all other normally occupied floor areas served by a passenger elevator, escalator, inclined moving walk, or other platform-equipped passenger-elevating device. (See Article 3.3.1.7. on page 9 of this Illustrated Guide, for additional requirements regarding floor areas above or below the first storey to which a *barrier-free* path of travel is required.)

- (2) A *barrier-free* path of travel for persons in wheelchairs is not required
- (a) to *service rooms*,
 - (b) to elevator machine rooms,
 - (c) to janitor's rooms,
 - (d) to *service spaces*,
 - (e) to crawl spaces,
 - (f) to *attic or roof spaces*,
 - (g) to floor levels not served by a passenger elevator, a platform-equipped passenger-elevating device, an escalator, or an inclined moving walk,
 - (h) to *high hazard industrial occupancies*,
 - (i) within portions of a *floor area* with fixed seats in an *assembly occupancy* where those portions are not part of the *barrier-free* path of travel to spaces designated for wheelchair use,
 - (j) within floor levels of a *suite of residential occupancy* that are not at the same level as the entry level to the *suite*,
 - (k) within a *suite of residential occupancy* that has not been designated by an *authority having jurisdiction* to be accessible for use by persons with physical disabilities, or
 - (l) within those parts of a *floor area* that are not at the same level as the entry level, provided amenities and uses provided on any raised or sunken level are accessible on the entry level by means of a *barrier-free* path of travel.

- (3) In an *assembly occupancy*, the number of spaces designated for wheelchair use within rooms or areas with fixed seats shall conform to Table 3.8.2.1. (See also Article 3.8.3.6. for additional requirements.)

Table 3.8.2.1.
Designated Wheelchair Spaces
Forming Part of Sentence 3.8.2.1.(3)

Number of Fixed Seats in Seating Area	Number of Spaces Required for Wheelchairs
2 - 100	2
101 - 200	3
201 - 300	4
301 - 400	5
401 - 500	6
501 - 900	7
901 - 1 300	8
1 301 - 1 700	9
each increment of up to 400 seats in excess of 1 700	one additional space



At least one conveniently located checkout lane, service counter or gate, should be wide enough to allow the free passage and movement of a wheelchair at all times.

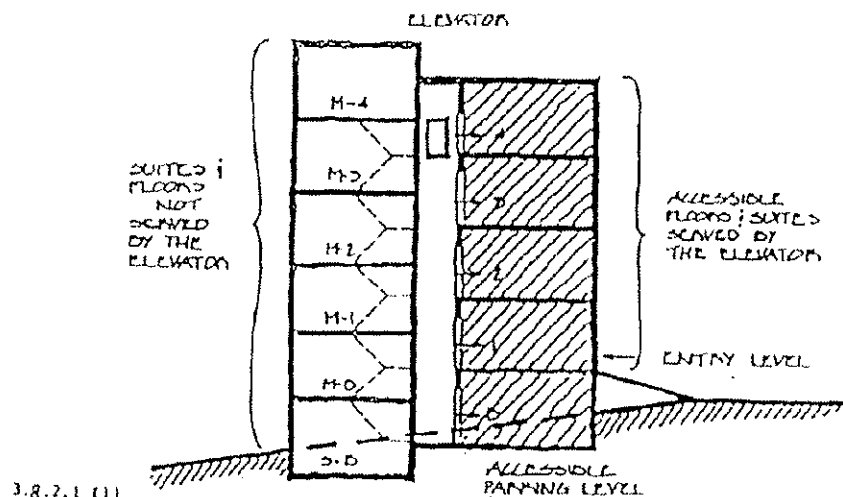
A-3.8.2.1. Access to Rooms and Facilities. If barrier-free access is required into suites or rooms in Subsection 3.8.2., it is intended that access be provided, with some exceptions identified in Sentence 3.8.2.1.(2), throughout each room or suite. Some examples of where barrier-free access is required are as follows:

- within each suite (subject to Clauses 3.8.2.1.(2)(j) to (l),
- within rooms or areas that serve the public or are designated for use by visitors, including areas in assembly occupancies with fixed seats, display areas and merchandising departments,
- within rooms or areas for student use in assembly occupancies,
- within general work areas, including office areas,
- within general use or general service areas, including shared laundry areas in residential occupancies, recreational areas, cafeterias, lounge rooms, lunch rooms and infirmaries,
- within sleeping rooms in hospitals and nursing homes,
- (if installed), into at least one passenger elevator or elevating device conforming to Article 3.5.2.1. and 3.8.3.5.,
- into washrooms described in Article 3.8.2.3.,
- to any facility required by this Section to be designed to accommodate persons with physical disabilities,
- onto every balcony provided in conformance with Sentence 3.3.7.1.(1)(c), and
- to service counters used by the general public (example include ticket counters, refreshment stands, drinking fountains, cafeteria counters, checkout counters and bank service counters).

The permission to waive a barrier-free path of travel for wheelchair access to certain specified areas of a building is not intended to waive accessibility requirements for persons whose physical disabilities do not require special provision for access to raised or sunken levels. Persons with visual or hearing disabilities that do not require the use of a wheelchair can be expected to move throughout a building.

The concept of providing similar amenities and facilities applies, among other things, to food, beverage, and entertainment facilities within restaurants, to smoking and non-smoking areas permitted in accordance with local regulations, and to window areas providing a view of an exterior attraction.

Availability of specific spaces depends on reservation policy and the sequence in which patrons arrive at a restaurant or other facility, and therefore is beyond the scope of this Code.



Accessibility "within" a floor area means that in general all normally occupied spaces are to be accessible, except those areas which are deemed not to require barrier-free access. Examples of excluded floor areas are small raised office areas in retail and industrial premises and storage platforms in industrial and other occupancies.

The concept of wheelchair accessibility does not extend to building service facilities, nor to all floor levels within a storey, e.g., mezzanines not served by an elevator. Mezzanines that are accessible by an elevator are therefore not excluded.

***3.3.1.7. Protection on Floor Areas with a Barrier-Free Path of Travel**

1) Every *floor area* above or below the *first storey* that is not *sprinklered* throughout and that has a *barrier-free* path of travel shall

a) be served by an elevator

i) conforming to Sentences 3.2.6.5.(4) to (6),

*ii) protected against fire in conformance with Clauses 3.2.6.5.(3)(b) or (c), and

iii) in a *building* over 3 *storeys* in *building height*, protected against smoke movement so that the hoistway will not contain more than 1% by volume of contaminated air from a fire floor during a period of 2 h after the start of a fire, assuming an outdoor temperature equal to the January design temperature on a 2.5% basis determined in conformance with Subsection 1.1.3.,

b) be divided into at least 2 zones by *fire separations* conforming to Sentences (2), (3) and (4) so that

i) persons with physical disabilities can be accommodated in each zone, and

ii) the travel distance from any point in one zone to a doorway leading to another zone shall be not more than the value for travel distance permitted by Sentence 3.4.2.5.(1) for the *occupancy* classification of the zone.

c) in the case of *residential occupancies*, be provided with balconies conforming to Sentence (5), except on the *storey* containing the *barrier-free* entrance required by Article 3.8.1.2.,

d) have an exterior *exit* at ground level, or

e) have a ramp leading to ground level. (See Appendix A.)

2) Except as permitted by Sentence (3), the *fire separations* referred to in Clause (1)(b) shall have a *fire-resistance rating* not less than 1 h.

3) The *fire-resistance rating* of the *fire separations* referred to in Clause (1)(b) is permitted to be less than 1 h but not less than 45 min provided the *fire-resistance rating* required by Subsection 3.2.2. is permitted to be less than 1 h for

a) the floor assembly above the *floor area*, or

b) the floor assembly below the *floor area*, if there is no floor assembly above.

4) A door acting as a *closure* in a *fire separation* referred to in Clause (1)(b) shall be weatherstripped or otherwise designed and installed to retard the passage of smoke. (See A-3.3.3.5.(6) in Appendix A.)

5) A balcony required by Clause (1)(c) shall

a) have direct *barrier-free* access from the *suite* or *floor area*

b) be not less than 1.5 m (5') deep from the outside face of the exterior wall to the inside edge of the balcony, and

c) provide not less than 1.5 m² (16 ft²) of balcony space for each nonambulatory occupant and 0.5m² (5.5 ft²) for each ambulatory occupant.

A-3.3.1.7.(1) Temporary Refuge for Persons with Disabilities. These measures are intended to provide temporary refuge for persons with disabilities. It is acknowledged, however, that the measures cannot provide absolute safety for all occupants in the fire area. It may, therefore, be necessary to develop special arrangements in the fire safety plan to evacuate persons with disabilities from these areas. Details for a suitable plan are contained in the NFC.

The protected elevator referred to in Clause 3.3.1.7.(1)(a) is intended to be used by fire fighters as a means for evacuating persons with disabilities. It is not intended that this elevator be used by persons with disabilities as a means of egress without the assistance of fire fighters.

If an estimate is to be made of the number of persons with disabilities in a floor area who can be accommodated in each zone in Clause 3.3.1.7.(1)(b), this estimate may be based on Table 3.8.2.1., which is used to determine the minimum number of spaces to be provided for wheelchair occupants in fixed seating areas. If more precise information is available, it should be used for sizing the zones.

***3.2.6.5. Elevator for Use by Fire Fighters**

1) At least one elevator shall be provided for use by fire fighters in conformance with Sentences (2) to (6).

2) The elevator referred to in Sentence (1) shall have a useable platform area not less than 2.2 m² (24 ft²) and shall be capable of carrying a load of 900 kg to the top floor that it serves from a landing on the *storey* containing the entrance for the fire fighter access referred to in Articles 3.2.5.4 and 3.2.5.5. within 1 min.

*3) Each elevator for use by fire fighters shall

a) be provided with a *closure* at each shaft opening so that the interlock mechanism remains mechanically engaged and electrical continuity is maintained in the interlock circuits and associated wiring for a period of not less than 1 h when the assembly is subjected to the standard fire exposure described in CAN4-S104-M, "Fire Tests of Door Assemblies,"

*b) be protected with a vestibule containing no *occupancy* and separated from the remainder of the *floor area* by a *fire separation* having a *fire-resistance rating* not less than 45min, or

*c) be protected with a corridor containing no *occupancy* and separated from the remainder of the *building* by a *fire separation* having a *fire-resistance rating* not less than 1 h.

3.8.2.2. Access to Parking Areas (See Appendix A.)

1) If exterior parking is provided, a *barrier-free* path of travel shall be provided between the exterior parking area and a *barrier-free* entrance conforming to Article 3.8.1.2. (Appendix A.)

2) If a passenger elevator serves one or more indoor parking levels, a *barrier-free* path of travel shall be provided between at least one parking level and all other parts of the *building* required to be provided with *barrier-free* access in accordance with Article 3.8.2.1.

3) If an exterior passenger loading zone is provided, it shall have

a) an access aisle not less than 1 500 mm (5') wide and 6 000 mm (20') long adjacent and parallel to the vehicle pull-up space,

b) a curb ramp, where there are curbs between the access aisle and the vehicle pull-up space, and

c) a clear height of not less than 2 750 mm (9') at the vehicle pull-up space and along the vehicle access and egress routes.

A-3.8.2.2. Parking Areas. In localities where local regulations or by-laws do not govern the provision of or dimensions of barrier-free parking spaces, the following provides guidance to determine appropriate provisions. If more than 50 parking spaces are provided, parking spaces for use by persons with physical disabilities should be provided in the ratio of one for every 100 parking spaces or part thereof. Parking spaces for use by persons with physical disabilities should

- (1) be not less than 2 400 mm (8') wide and provided on one side with an access aisle not less than 1 500 mm (5') wide,
- (2) have a firm, slip-resistant and level surface,
- (3) be located close to an entrance required to conform to Article 3.8.1.2.,
- (4) be clearly marked as being for the use of persons with physical disabilities, and
- (5) be identified by a sign located not less than 1 500 mm (5') above ground level, with the international symbol of accessibility and the words "Permit Required" (Figure A-3.8.2.2.A.).



Figure A-3.8.2.2.A.
"Permit Required" sign

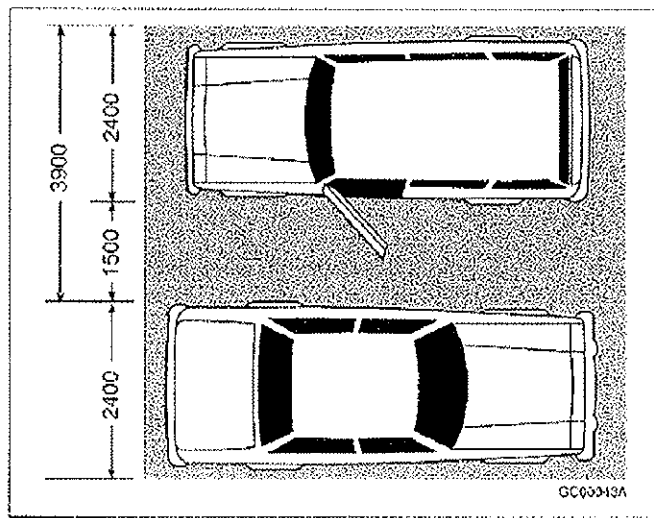


Figure A-3.8.2.2.B.
Shared access aisle

Asphalt, concrete and gravel are acceptable parking surfaces. Curb ramps should be not less than 920 mm (3') wide. Parallel parking spaces should be not less than 7 000 mm (23') long. If more than one parking space is provided for persons with physical disabilities, a single access aisle can serve two adjacent parking spaces. The arrangement shown in Figure A-3.8.2.2.B. allows the shared use of an access aisle to serve two adjacent parking spaces provided for use by persons with physical disabilities.

A-3.8.2.2.(1) Access to Exterior Parking. It is not intended that a separate accessible entrance must be provided from the exterior parking area. The designer may choose to designate the entrance leading to the exterior parking area as the required entrance or to provide a properly identified and unobstructed path of travel from the parking area to the entrance which is accessible. The entrance chosen should, in any case, be one normally used by the occupants of the building. Long paths of travel are not recommended.

An area of refuge is a space that facilitates a safe delay of egress, is protected from fire conditions developing in the floor area, and provides direct access to an exit or a fire-fighters' elevator. A fire-fighters' elevator, is an elevator system designed for use by fire-fighters and others with firefighter supervision. An exit through a fire wall may be considered as equivalent to an area of refuge.

Since areas of refuge provide temporary safety, it is important for the building management to have operating procedures in place that complement the building design features.

The term "smoke protected" describes spaces that will contain not more than 1% by volume of contaminated air from the fire floor, during a 2 h period after the start of a fire, assuming an outdoor air temperature equal to the January design temperature on a 2-12% basis. Signs along the normal path of egress should indicate the direction to the area of refuge.

Nonambulatory occupants in areas of refuge should not obstruct egress. The door should not encroach on the space for the wheelchairs. An area of refuge could be an enlarged landing in an exit stair, see figure below.

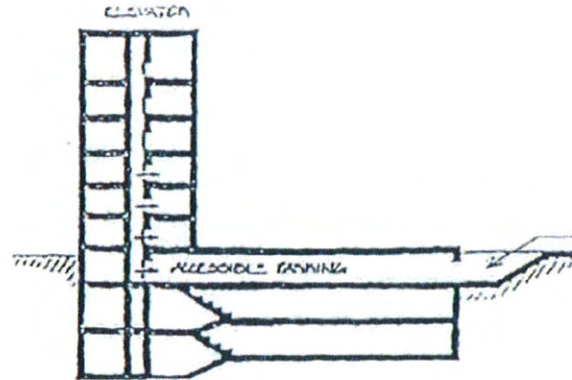
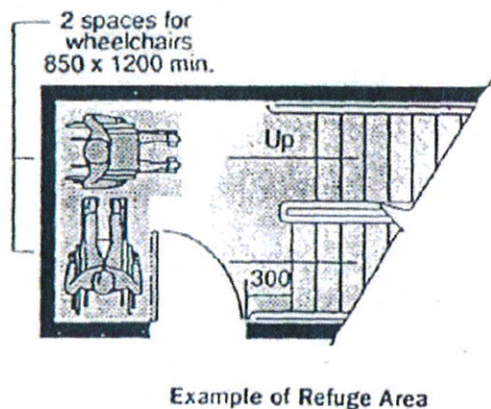


Figure 3.8.2.2.(2)

Figure 3.8.2.2.(2)

Where possible, the accessible parking level should allow sufficient vertical clearance to accommodate adapted vehicles used by disabled drivers and passengers.

Accessible parking spaces should be located as close to the elevator as possible, and disabled users should not have to cross behind parked cars to reach the elevator.

3.8.2.3. Washrooms Required to be Barrier-Free

(See Appendix A.)

1) Except as permitted by sentence (2), a washroom in a *storey* to which a *barrier-free* path of travel is required in accordance with Article 3.8.2.1., shall be *barrier-free* in accordance with the appropriate requirements in Articles 3.8.3.8. to 3.8.3.12.

2) A washroom need not conform to the requirements of Sentence (1) provided

- a) it is located within a *suite of residential occupancy*,
- b) other *barrier-free* washrooms are provided on the same *floor area* within 45m (150'), or
- c) it is located in an individual *suite* that is
 - i) used for a *business and personal services occupancy*, a *mercantile occupancy* or an *industrial occupancy*,
 - ii) less than 500 m² (5400 ft²) in area
 - iii) completely separated from, & without access to, the remainder of the *building*.

3) In a *building* in which water closets are required in accordance with Subsection 3.7.2., at least one *barrier-free* water closet shall be provided in the entrance *storey*, unless

- a) a *barrier-free* path of travel is provided to a *barrier-free* water closets elsewhere in the *building*, or
- b) the water closets required by Subsection 3.7.2. are for *dwelling units* only.

4) If *alterations* are made to an existing *building*, universal toilet rooms conforming to Article 3.8.3.12. are permitted to be provided in lieu of facilities for persons with physical disabilities in washrooms used by the general public.

See also 3.7.2.2.(15) and any Local Bylaws

A-3.8.2.3. Washrooms. The primary intent of this requirement is that all regular washrooms be made accessible to all persons, including persons with disabilities, primarily persons who must use a wheelchair. Well-designed washrooms which can accommodate disabled persons need not be much larger than conventional washrooms.

The exception in Clause 3.8.2.3.(2)(b) recognizes situations where several washrooms may be provided on a large floor area. In such a case, not all washrooms need to be barrier-free, provided that a barrier-free washroom is available within a reasonable distance (45m) (150') of one that is not and that the location of that barrier-free washroom is clearly indicated as required by Sentence 3.8.3.1.(3).

Clause 3.8.2.3.(2)(c) is intended to address "strip malls" (a shopping mall with no public corridor). Section 3.7., which requires plumbing facilities, does not address the concept of suite and could permit, for instance, a shopping mall containing only Group E occupancies (assuming the mall is more than 100 m² (1000 ft²)) to have only one washroom for each sex located in any one of the suites. It is desirable, however, that washrooms be located so as to be accessible at all times, since the owner or tenant of one suite has no control over the activities of another. These buildings may have either public barrier-free washrooms in a central location or washrooms which can accommodate persons with physical disabilities in each suite. This arrangement relieves any one tenant from having to provide 'public' washrooms. Hence, the exception for suites of less than 500 m² (5400 ft²) is meant as a relaxation to avoid an unnecessary burden on small facilities but should not be construed as meaning that these buildings need not provide accessible washrooms.

Sentence 3.8.2.3.(4) clarifies that universal toilet rooms ("unisex") should not be used as a substitute for making regular washrooms accessible. These washrooms are an alternative which the authority having jurisdiction could require in the course of renovations to an existing building to satisfy the requirements of Sentence 3.8.2.3.(1), where modifying existing washrooms proves impracticable or where Section 3.7. permits the use of a single washroom for both sexes. This does not preclude the provision of special washrooms in addition to barrier-free regular washrooms; "unisex" washrooms are desirable in large shopping complexes, as well as transportation terminals, where persons must be accompanied by an attendant because of their degree of disability. These facilities are convenient because they may be used regardless of the gender of the disabled person or the attendant.

3.8.3. Design Standards

3.8.3.1. Accessibility Signs

1) Signs incorporating the international symbol of accessibility for persons with physical disabilities shall be installed to indicate the location of a *barrier-free* entrance.

(See Appendix A.)

2) A washroom, shower, elevator or parking space designed to be *barrier-free* shall be identified by a sign consisting of the international symbol of accessibility for persons with physical disabilities and by appropriate graphic or written directions to indicate clearly the type of facility available. (See Appendix A.)

3) If a washroom is not designed to accommodate persons with physical disabilities in a *storey* to which a *barrier-free* path of travel is required, signs shall be provided to indicate the location of *barrier-free* facilities. (See Appendix A.)

4) Signs incorporating the symbol of accessibility for persons with hearing disabilities shall be installed to indicate the location of facilities for persons with hearing disabilities.

(See Appendix A.)

All accessible facilities within a building should be reachable by an accessible, barrier-free route. Supplementary directional signage to such facilities may be desirable.

Signs should generally be mounted at eye level, or other highly visible location.

A-3.8.3.1.(1) to (3) Accessibility Signs.

The official symbol, shown in Figure A-3.8.3.1.(1) to (3), indicates to persons with physical disabilities that they will have reasonable freedom of movement within a building so signed. The symbol is usually white on a blue background; where these colours do not stand out, the sign can be set on a white background. An arrow can be added to indicate direction or the location of an accessible space or facility.

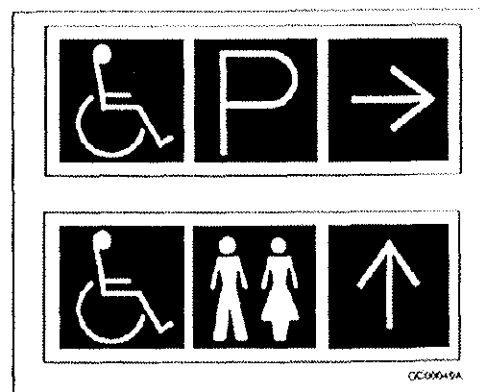


Figure A-3.8.3.1.(1) to (3)
Signs indicating accessible facilities

Diagram illustrating the cross-section of a road and drainage system. The road width is 1200 mm. The drainage ditch is 1500 mm wide. The ditch has a semi-circular bottom. The road surface is 1500 mm high. The ditch is 1100 mm high. The ditch is labeled "NO LEVEL CHANGE". The road surface is labeled "NON-SLIP FINISH". The ditch is labeled "H/W 2000 120 TO LEVEL 110".

3.8.3.2. Exterior Walks

- Exterior walks should drain easily; where textured surfaces are used to provide a non-slip surface, they should not include aggregate or ridges which encourage water or ice accumulation. A brushed concrete finish, at right angles to the path of travel, is generally preferred. If small unit pavers are used, the joints should be minimal.

1) Every doorway that is located in a *barrier-free* path of travel shall have a clear width not less than 800 mm (32") when the door is in the open position. (See Appendix A.)

- 3) Door operating devices shall be of a design which does not require tight grasping and twisting of the wrist as the only means of operation. (See Appendix A.)

- 15

5) Except as permitted by Sentence (6) and (12), every door that provides a *barrier-free* path of travel through an entrance referred to in Article 3.8.1.2. shall be equipped with a power door operator that allows persons to activate the opening of the door from either side if the entrance serves

- a) a hotel,
- b) a *building* of Group B, Division 2 *major occupancy*, and
- c) a *building* of Group A, D or E *major occupancy* more than 500 m² (5400 ft²) in *building area*. (See Appendix A.)

6) The requirements of Sentence (5) do not apply to an individual *suite* having an area less than 500 m² (5400 ft²) in a *building* having only *suites* of *assembly occupancy*, *business and personal services occupancy* or *mercantile occupancy* if the *suite* is completely separated from the remainder of the *building* so that there is no access to the remainder of the *building*.

7) Except as permitted by Sentence (8) and except for a door with a power door operator, a closer for a door in a *barrier-free* path of travel shall be designed to permit the door to open when the force applied to the handle, push plate or latch-releasing device is not more than

- a) 38 N in the case of an exterior door, or
- b) 22 N in the case of an interior door.

8) Sentence (7) does not apply to a door at the entrance to a *dwelling unit*, or where greater forces are required in order to close and latch the door against the prevailing difference in air pressure on opposite sides of the door. (See Appendix A.)

9) Except for a door at the entrance to a *dwelling unit*, a closer for an interior door in a *barrier-free* path of travel shall have a closing period of not less than 3 s measured from when the door is in an open position of 70° to the doorway, to when the door reaches a point 75 mm (3") from the closed position, measured from the leading edge of the latch side of the door. (See Appendix A.)

10) Unless equipped with a power door operator, a door in a *barrier-free* path of travel shall have a clear space on the latch side extending the height of the doorway and not less than

- a) 600 mm (24") beyond the edge of the door opening if the door swings toward the approach side, and
- b) 300 mm (12") beyond the edge of the door opening if the door swings away from the approach side. (See Appendix A.)

11) A vestibule located in a *barrier-free* path of travel shall be arranged to allow the movement of wheelchairs between doors and shall provide a distance between 2 doors in series of not less than 1 200 mm (48") plus the width of any door that swings into the space in the path of travel from one door to another.

12) Only the active leaf in a multiple leaf door in a *barrier-free* path of travel need conform to the requirements of this Article.

13) Except as provided in Clause 3.8.3.4.(1)(c), the floor surface on each side of a *barrier-free* path of travel shall be level within a rectangular area

- a) as wide as the door plus the clearance required on the latch side by Sentence 3.8.3.3.(10)
- b) whose dimension perpendicular to the closed door is not less than the width of the *barrier-free* path of travel but need not exceed 1 500 mm (5').

A-3.8.3.3.(1) Doorway Width. Standard wheelchair width specifications indicate a range of sizes from 584 mm (23") overall to 685 mm (27") overall. Every doorway that is located in a barrier-free path of travel must have a clear width of not less than 800 mm (32") when the door is in the open position and therefore it is important that this dimension be measured correctly. Figure A-3.8.3.3.(1) shows a door opened to 90°. It is clear that the door, and to a lesser extent the stop, impinges on the space within the door frame. The clear width of not less than 800mm (32") is measured from the face of the door to the outside edge of the stop on the door frame. It is not sufficient just to measure the inside width of the door frame. Other factors, including location of door stops other than on a door frame, and the installation of door closers and exit devices, should be taken into account. The intrusion of a door handle into the space is of lesser importance. It is recognized that there are many types of door frame and door mounts but the overall objective is to maintain a clear width of not less than 800 mm (32"). The diagram depicts a somewhat restrictive scenario, as many doors can open wider than 90°, however, a door smaller than 864 mm (34") would not be wide enough to ensure the minimum clear width of 800 mm (32") that is required.

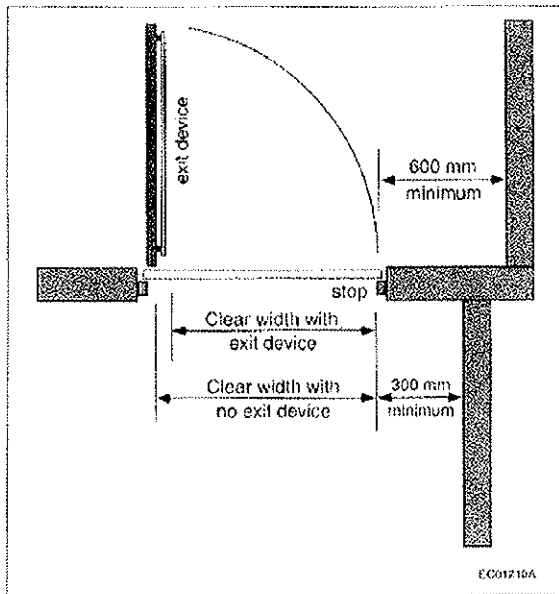
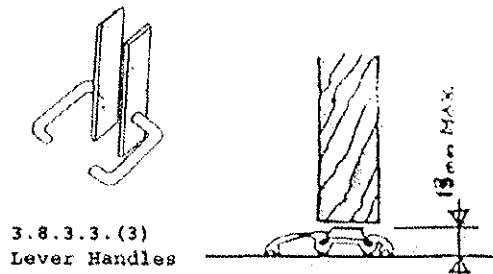
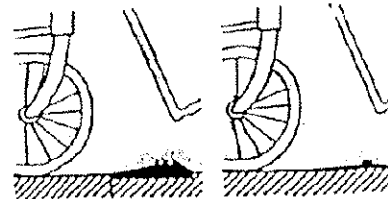


Figure A-3.8.3.3.(1)
Clear doorway width



3.8.3.3.(3)
Lever Handles



3.8.3.3.(4)
Threshold Heights

3.8.3.3.(4)
Threshold Heights

The overall height of the threshold should not exceed 13 mm (1/2"). Higher thresholds cannot be easily or safely negotiated by wheelchairs, and may cause a tripping hazard for the blind or other persons with walking problems.

A-3.8.3.3.(2) Washrooms in Residential Occupancies. This requirement ensures that the doorway to the washroom in a dwelling unit or a hotel or motel suite is at least large enough to accommodate someone using a wheelchair. The Code does not require these washrooms to be barrier-free, in order to avoid a set of prescriptive requirements which could limit design flexibility. It is relatively simple to make washrooms accessible through careful planning and positioning of fixtures and this can be achieved in an area not much larger than that of conventional washrooms.

A-3.8.3.3.(3) Lever Handles. Lever handles are usable by most persons with limited hand mobility and will meet the intent of this requirement. Lever handles with an end return towards the door are less prone to catch the clothing of someone passing through the doorway.

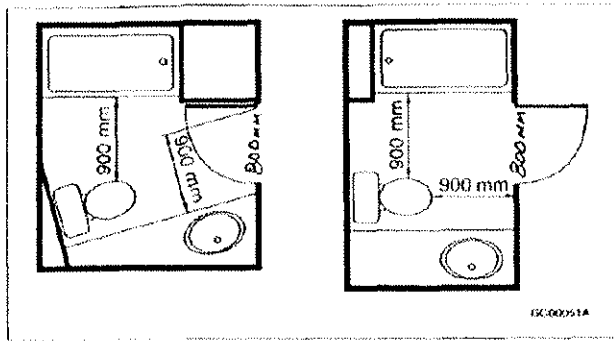


Figure A-3.8.3.3.(2)
Residential washrooms

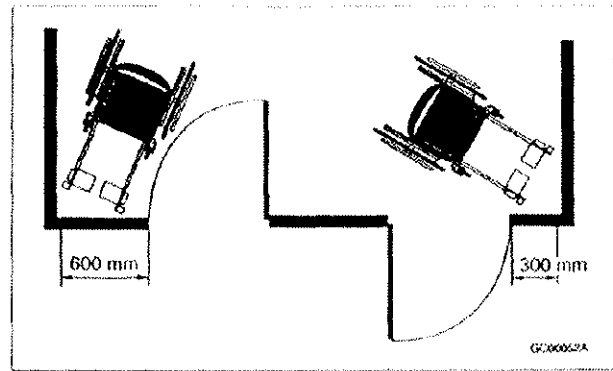


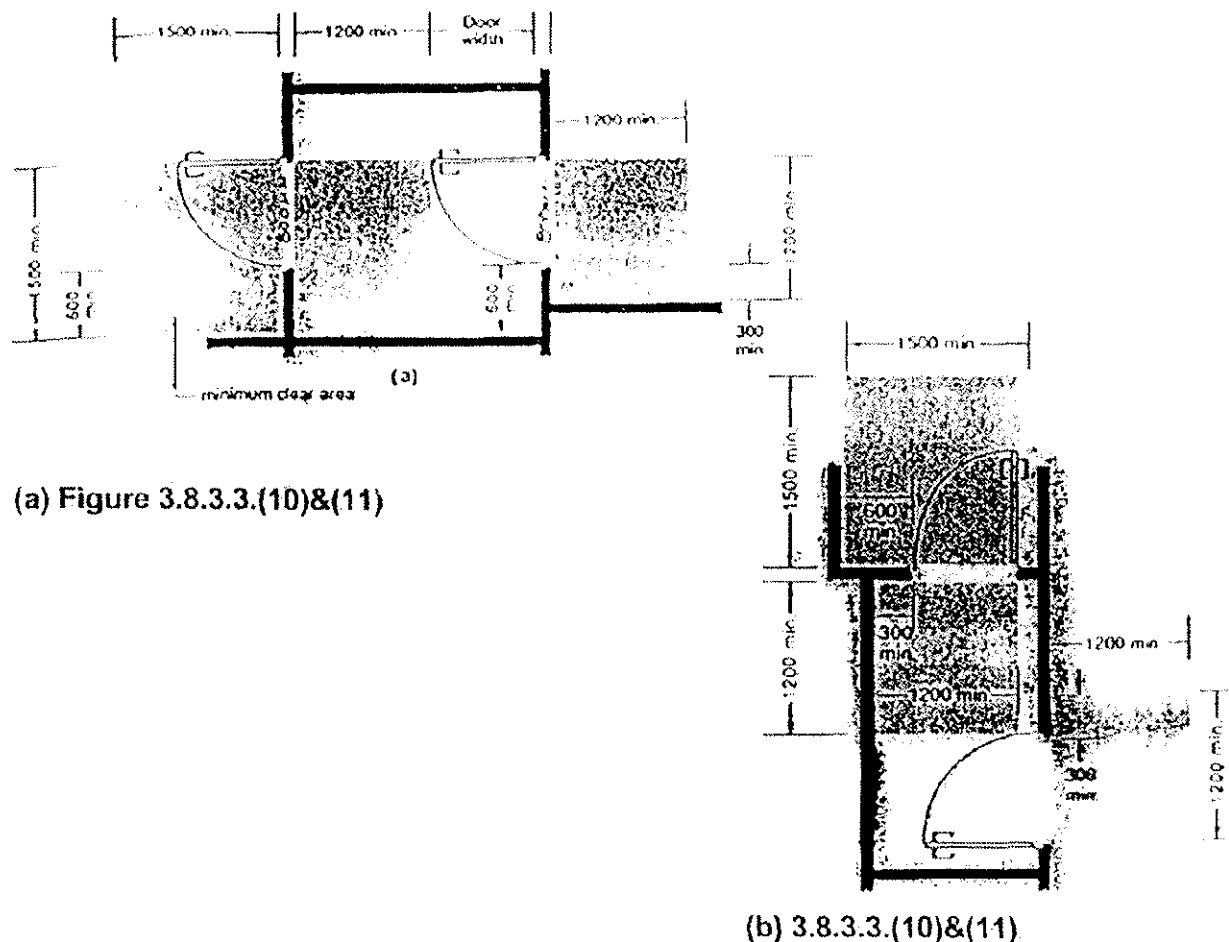
Figure A-3.8.3.3.(10)
Doorway clearance

A-3.8.3.3.(5) Doors with Power Operators. Doors equipped with a power operator actuated by a pressure plate identified with the international symbol for accessibility or, where security is required, by a key, card or radio transmitter, and that can otherwise be opened manually, meet the intent of the requirement. The location of these actuating devices should ensure that a wheelchair will not interfere with the operation of the door once it is actuated. Swinging doors equipped with power operators which are actuated automatically and open into passing pedestrian traffic should be provided with a guard or other device designed to prevent pedestrians from stepping into the swing area of the door. These guards or devices should be detectable by blind persons. For example, inverted U-shaped guards should have an additional rail at a height not more than 680 mm (27") so that it is detectable by the long cane. These doors should also have a device (mat or other sensor) on the swing side to prevent the door from opening if someone is standing in the swing area.

A-3.8.3.3.(8) Air Pressure Differences. Differences in air pressure on opposite sides of a door may be due to the operation of mechanical systems such as those associated with smoke control. So called "stack action" in buildings in winter can also cause differential pressures due to the buoyancy of warm air. Stack action is usually most noticeable between stairwells and the remainder of the building, and at the entrances to buildings; the taller the building, the greater the effect. Doors with automatic closers have to operate with sufficient opening force to allow the return action to overcome the differential pressure.

A-3.8.3.3.(9) Delayed Action on Door Closers. In some circumstances, closers with a delay feature which keeps the door open for several seconds before it begins to close might be desirable. However, closers with this feature have limited back-check, a feature of a normal door closer where resistance to opening increases as the door reaches the full arc of swing. Doors equipped with a delayed action closer are therefore more susceptible to damage should the door be opened with too much force or should someone try to force it closed, thinking the closer has failed to operate. Delayed action closers are not recommended for such occupancies as schools.

A-3.8.3.3.(10) Clearances at Doorways. Sufficient clearance must be provided on the latch side of doors for a user to operate the door opening mechanism and open the door without interference from the wheelchair. This is particularly important where the door swings towards the approach side. See Figure A-3.8.3.3.(10)



3.8.3.4.Ramps

1) A ramp located in a *barrier-free* path of travel shall

- a) have a width not less than 870 mm (34") between handrails,
- b) have a slope not more than 1 in 12 (See Appendix A),
- c) have a level area not less than 1 500 mm (5') by 1 500 mm (5') at the top and bottom and at intermediate levels of a ramp leading to a door, so that on the latch side the level area extends not less than
 - i) 600 mm (24") beyond the edge of the door openings where the door opens towards the ramp, or
 - ii) 300 mm (12") beyond the edge of the door opening where the door opens away from the ramp (See Appendix A),
- d) have a level area not less than 1 200 mm (48") long and at least the same width as the ramp
 - i) at intervals not more than 9 m (30') along its length, and
 - ii) where there is an abrupt change in the direction of the ramp, and
- e) except as permitted by Sentence (2), be equipped with handrails and *guards* conforming to Articles 3.4.6.4. and 3.4.6.5. (See page 22 of this Illustrated Guide.)

2) The requirement for handrails in Clause 3.8.3.4.(1)(e) need not apply to a ramp serving as an aisle for fixed seating.

3) Floors or walks in a *barrier-free* path of travel having a slope steeper than 1 in 20 shall be designed as ramps.

A-3.8.3.4.(1)(b) Ramp Slopes. Ramps with a slope of more than 1 in 16 can be very difficult for persons with physical disabilities with upper body mobility to manage. Even though they pose less of a problem for persons in motorized wheelchairs, these ramps can be unsafe to descend, especially in cold climates. Although Article 3.8.3.4. permits slopes on ramps as great as 1 in 12 for distances of up to 9 m (30'), slopes of 1 in 20 are safer and less strenuous. When limited space is available, as may be the case during renovations, ramps with a slope of up to 1 in 12 should be restricted to lengths not exceeding 3 m (10') whenever possible. A strip contrasting in colour and texture should be used at the top and bottom of ramps to warn blind and visually impaired persons.

A-3.8.3.4.(1)(c) Landing Design at Doorways Leading to Ramps

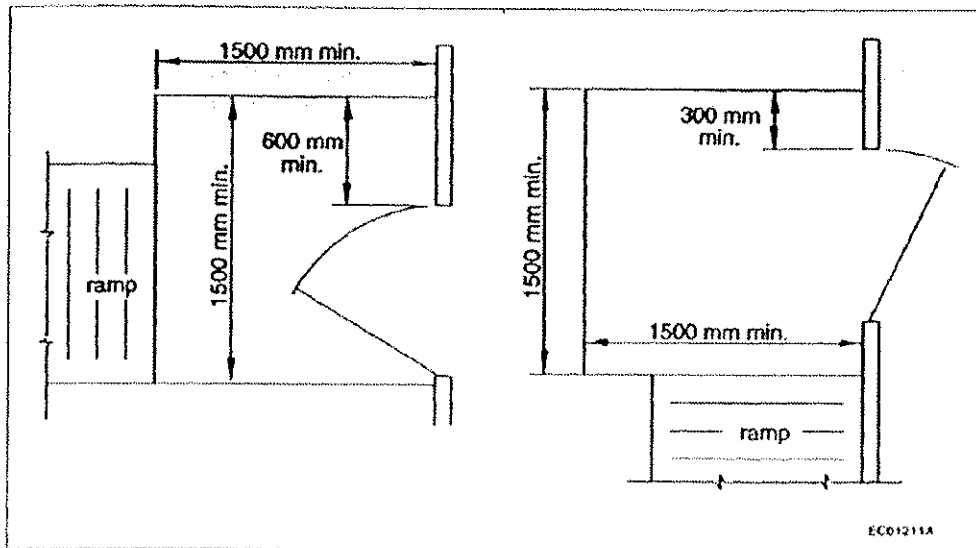
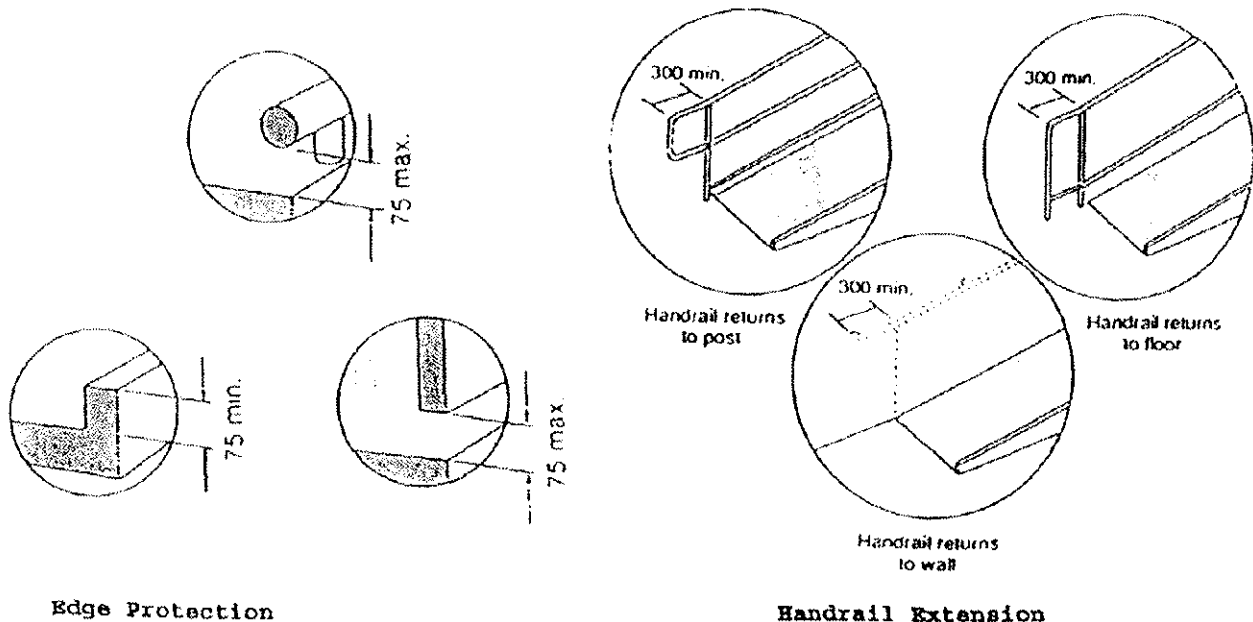


Figure A-3.8.3.4.(1)(c)
Landing design at doorways leading to ramps



Edge Protection

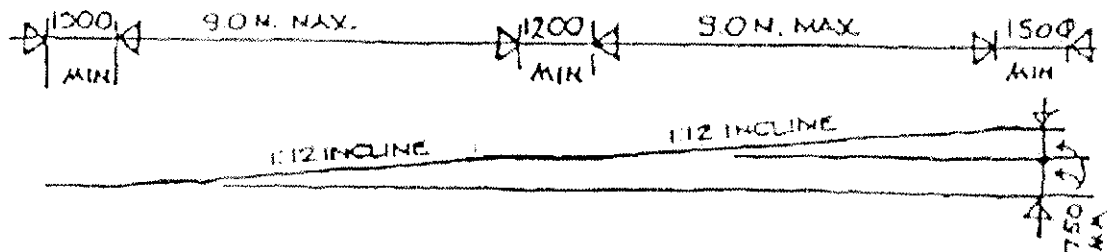
Handrail Extension

Wheelchair users require considerable space to turn into openings and at all level and directional changes eg: the turning circle required for the average wheelchair is 1.5 m (5'-0") diameter.

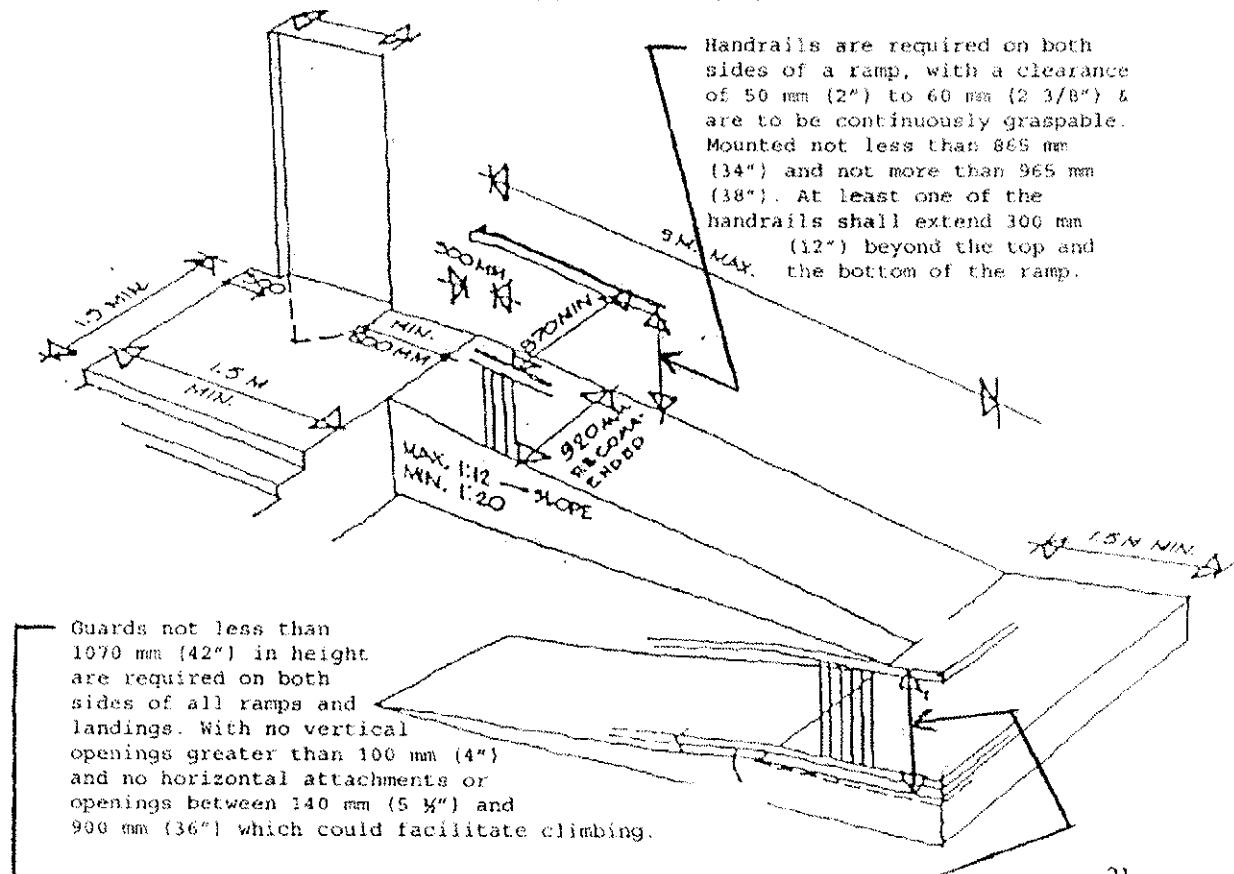
Persons in wheelchairs also require handrails on both sides of ramps to assist them and curbs or rails at the edge of the ramp to prevent the front wheels from slipping over the edge.

Where a door swings towards a person in a wheelchair, there should be sufficient space on the opening edge of the doorway to allow the wheelchair to approach and to allow the persons to pull the door clear of the footrest of the chair.

3.8.3.4.(1) Ramps In A Barrier-Free Access



Long Ramps: Should include level resting places at 9 m (30') intervals.



***3.4.6.4. Handrails**

1) A stairway shall have a handrail on at least one side, but if it is 1 100 mm (44") or more wide, it shall have handrails on both sides.

2) If the required width of a ramp or flight of stairs is more than 2 200 mm (88"), one or more intermediate handrails continues between landings shall be provided, and located so that there will be not more than 1 650 mm (65") between handrails.

***3)** Handrails shall be continuously graspable along their entire length and shall have

- a) a circular cross-section with an outside diameter not less than 30 mm (1 1/8") and not more than 43 mm (1 5/8"), or
- b) a non-circular cross-section with a graspable portion that has a perimeter not less than 100 mm (4") and not more than 125 mm (5") and whose largest cross-sectional dimension is not more than 45 mm (1 3/4 ").

***4)** Handrails on stairs and ramps shall be not less than 865 mm (34") and not more than 965mm (38") high, measured vertically from a line drawn through the outside edges of the stair nosing or from the surface of the ramp, except that handrails not meeting these requirements are permitted provided they are installed in addition to the required handrail.

***5)** Except where interrupted by doorways or newels at change in direction, at least one handrail shall be continuous throughout the length of a stairway or ramp, including landings.
(See Appendix A.)

6) Handrails shall be terminated in a manner which will not obstruct pedestrian travel or create a hazard. (See A-3.4.6.4.(5) in Appendix A.)

***7)** At least one handrail at the side of a stairway or ramp shall extend horizontally not less than 300 mm (12") beyond the top and bottom of the stairway or ramp.
(See A-3.4.6.4.(5) in Appendix A.)

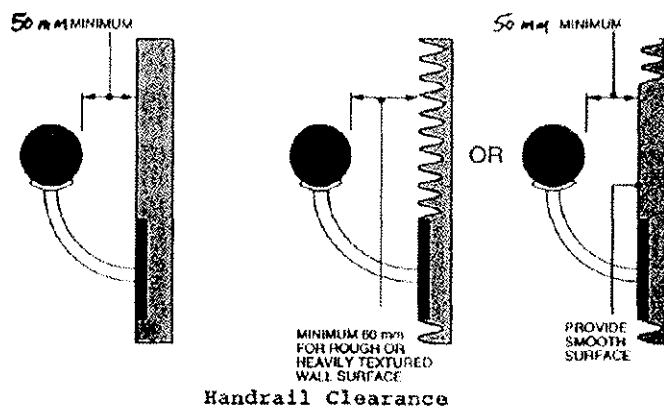
***8)** The clearance between a handrail and any surface behind it shall be not less than

- a) 50 mm (2"), or
- b) 60 mm (2 1/2") if the surface behind the handrail is rough or abrasive.

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

- a) a concentrated load not less than 0.9 kN applied at any point and in any direction for all handrails, and
- b) a uniform load not less than 0.7 kN/m applied in any direction to handrails not located within *dwelling units*.

***10)** At ramp shall have handrails on both sides.



A-3.4.6.4.(5) Continuity of Handrails. Blind or visually-impaired persons rely on handrails to guide them on stairways. A continuous handrail will assist them in negotiating stairs at changes in direction. The extended handrail is useful to persons with physical disabilities to steady themselves before using the stairs. Handrails should, however, return to the wall, floor or post, so as not to constitute a hazard to blind or visually-impaired persons.

***3.4.6.5. Guards**

1) Every *exit* shall have a wall or a well-secured *guard* on each side.

2) Except as required by Sentence (4), the height of *guards* for exit stairs shall be not less than 920 mm (36") measured vertically to the top of the *guard* from a line drawn through the outside edges of the stair nosing and 1 070 mm (42") around landings.

*3) The height of *guards* for exit ramps and their landings shall be not less than 1 070 mm (42") measured vertically to the top of the *guard* from the ramp surface.

4) The height of *guards* for exterior stairs and landings more than 10 m (33') above the adjacent ground level shall be not less than 1 500 mm (5') measured vertically to the top of the *guard* from the surface of the landing or from a line drawn through the outside edges of the stair nosings.

*5) Unless it can be shown that the size of the openings that exceed this limit does not present a hazard, there shall be no opening that permits the passage of a sphere whose diameter is more than 100 mm (4") through a *guard* for an *exit*.

6) In a stairway, a window for which the distance measured vertically between the bottom of the window and a line drawn through the outside edges of the stair nosings is less than 900mm (36"), or a window that extends to less than 1 070 mm (42") above the landing, shall

a) be protected by a *guard* that is

i) located approximately 900 mm (36") above a line drawn through the outside edges of the stair nosings, or

ii) not less than 1 070 mm (42") high measured to the top of the *guard* from the surface of the landing, or

b) be fixed in position and designed to resist the lateral design loads specified for *guards* and walls in Articles 4.1.5.15. and 4.1.5.17. **(See below)**

*7) Unless it can be shown that the location and size of openings do not present a hazard, a *guard* shall be designed so that no member, attachment or opening located between 140 mm (5") and 900 mm (36") above the level being protected by the *guard* will facilitate climbing.

***4.1.5.15. Loads on Guards**

(See Appendix A.)

1) The minimum specified horizontal load applied inward or outward at the top of every required *guard* shall be

a) 3.0 kN/m for *means of egress* in grandstands, stadia, bleachers and arenas,

a) a concentrated load of 1.0 k N applied at any point for access ways to equipment platforms, contiguous stairs and similar areas where the gathering of many people is improbable, and

c) 0.75 kN/m or a concentrated load of 1.0 kN applied at any point, whichever governs for locations other than those described in Clauses (a) and (b).

2) Individual elements within the *guard*, including solid panels and pickets, shall be designed for a load of 0.5 kN applied over an area of 100 mm (4") by 100 mm (4") located at any point in the element or elements so as to produce the most critical effect.

3) The loads required in Sentence (2) need not be considered to act simultaneously with the loads provided for in Sentences (1) and (4).

4) The minimum specified load applied vertically at the top of every required *guard* shall be 1.5 kN/m and need not be considered to act simultaneously with the horizontal load provided for in Sentence (1).

5) For loads on handrails, refer to Sentence 3.4.6.4.(9).

A-4.1.5.15. and 4.1.5.16.(1) Design of Guards. In the design of guards, due consideration should be given to the durability of the members and their connections.

***4.1.5.17. Loads on Walls Acting as Guards**

1) Where the floor elevation on each side of a wall, including a wall around a shaft, is more than 600 mm (24") higher than the elevation of the floor or ground on the other side, the wall shall be designed to resist the appropriate lateral design loads prescribed elsewhere in this Section or 0.5 kPa, whichever produces the more critical effect.

3.8.3.5. Elevators

1) A passenger-elevating device referred to in Article 3.8.2.1. shall conform to CAN/CSA-B355, "Lifts for Persons with Physical Disabilities."

All elevator and passenger lift controls, special call buttons, emergency phones and speakers should be mounted at heights which are usable by persons in wheelchairs. In addition the elevator or passenger lift should be able to be safely operated by disabled persons.

3.8.3.6. Spaces in Seating Area

1) Spaces designated for wheelchair use referred to in Sentence 3.8.2.1.(3) shall be

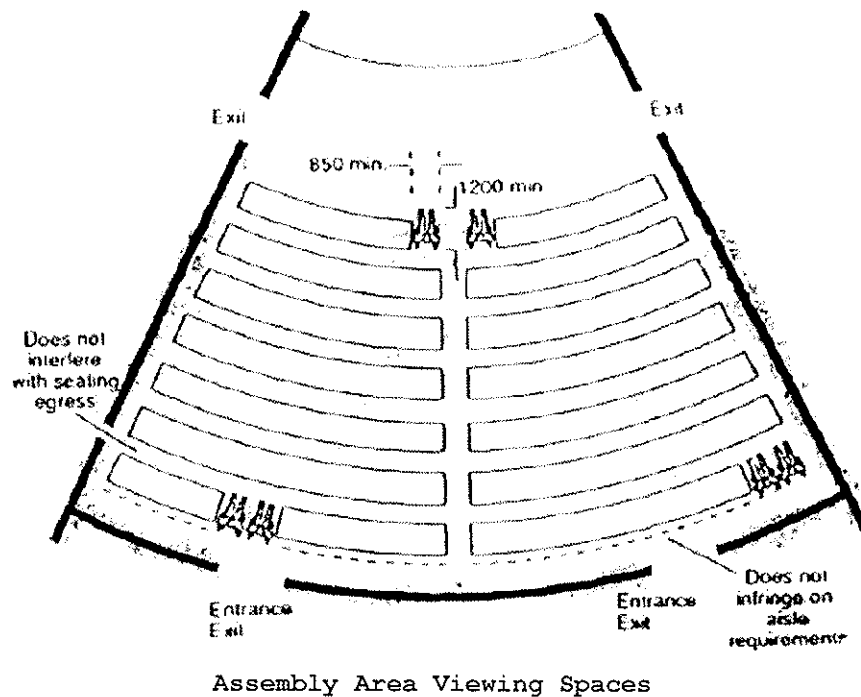
- a) clear and level, or level with removable seats,
- b) not less than 900 mm (36") wide and 1 525 mm (5') long to permit a wheelchair to enter from a side approach and 1 220 mm (4') long where the wheelchair enters from the front or rear of the space,
- c) arranged so that at least 2 designated spaces are side by side,
- d) located adjoining a *barrier-free* path of travel without infringing on egress from any row of seating or any aisle requirements, and
- e) situated, as part of the designated seating plan, to provide a choice of viewing location and a clear view of the event taking place.

3.8.3.7. Assistive Listening Devices (See Appendix A.)

1) Except as permitted by Sentence (2), in a *building of assembly occupancy*, all classrooms, auditoria, meeting rooms and *theatres* with an area of more than 100 m² (1000 ft²) shall be equipped with an assistive listening system encompassing the entire seating area.

2) If the assistive listening system required by Sentence (1) is an induction loop system, only half the seating area in the room need be encompassed.

In auditoriums, level areas should be provided for wheelchair users, large enough to accommodate two wheelchairs side by side, or persons using leg braces. Spaces should be located on each accessible level and in a variety of price categories. Such spaces should not obstruct the required aisles or exiting widths.



A-3.8.3.7. Assistive Listening Systems. Wireless sound transmission systems, including FM, infrared or magnetic induction loop systems, improve sound reception for persons with hearing disabilities by providing amplification which can be adjusted by each user while blocking out unwanted background noise. These systems transmit a signal that is picked up by a special receiver available for use by a person with a hearing disability, whether or not a hearing aid is used. Neither system interferes with the listening enjoyment of others.

The transmitter can be jacked into an existing P.A. system amplifier or used independently with microphones. The induction loop system requires users to sit in the area circumscribed by the loop; though installation of the loop is relatively simple, the installer should be knowledgeable about these systems if proper functioning is to be achieved. FM or infrared systems can be designed to broadcast signals which cover the entire room and thus do not restrict seating to any one area. Figures A-3.8.3.7.A. and A-3.8.3.7.B. show the general configuration of FM and infrared systems. Although portable systems (FM in particular) are available, these are best suited to small audiences. Generally, the systems installed in church halls, auditoria, theatres and similar places of assembly are not easily portable, as they are installed in a fixed location by a sound technician and form an integral part of the P.A. system of the room or building.

Hard-wired systems (where a jack is provided at a particular seat) will not meet this requirement unless adequate provisions are made to accommodate persons with hearing aids. In choosing the most appropriate system, a number of factors must be taken into account including cost, installation and maintenance, suitability to the audience, ease of operation and the need for privacy. Information on designers and suppliers of these systems may be obtained from the Canadian Hearing Society.

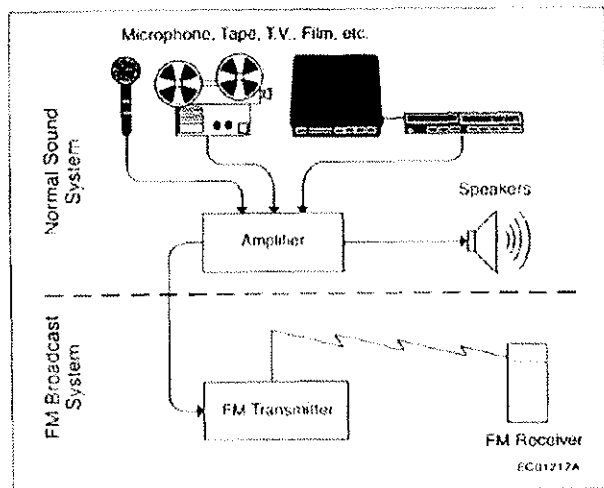


Figure A-3.8.3.7.A.
FM sound transmission system

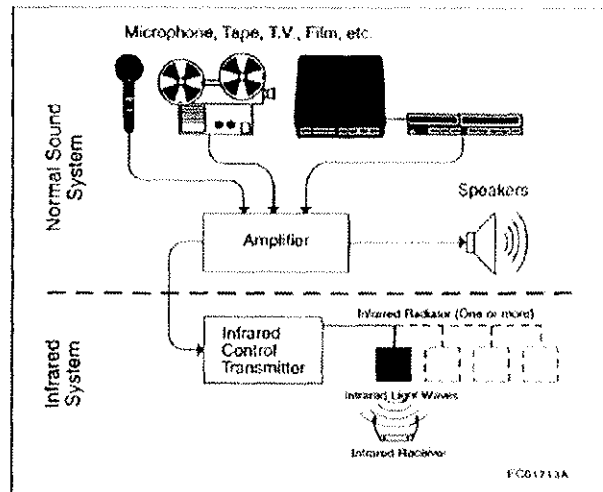


Figure A-3.8.3.7.B.
Infrared sound transmission system

3.8.3.8. Water Closet Stalls

1) At least one water closet stall or enclosure in a washroom required by Article 3.8.2.3. to be *barrier-free* shall

- a) be not less than 1 500 mm (5') wide by 1 500 mm (5') deep,
- b) be equipped with a door which shall
 - i) can be latched from the inside with a closed fist,
 - ii) provides a clear opening not less than 800 mm (32") wide with the door is open,
 - iii) swing outward, unless sufficient room is provided within the stall or enclosure to permit the door to be closed without interfering with the wheelchair (see Appendix A),
 - iv) is provided on the inside with a door pull not less than 140 mm (5 ½") long located so that its midpoint is not less than 200 mm (8") and not more than 300mm (12") from the hinged side of the door and not less than 900 mm (36") and not more than 1 000 mm (40") above the floor (see Appendix A), and
 - v) is provided with a door pull on the outside, near the latch side of the door,
- c) have a water closet located so that the clearance between the fixture and the wall on one side is not less than 285 mm (11 ¼ ") and not more than 305 mm (12"),
- d) be equipped with grab bars that
 - i) are mounted horizontally on the side wall closet to the water closet and shall extend not less than 450 mm (18") in both directions from the most forward point of the water closet (see Appendix A),
 - ii) if the water closet does not have an attached water tank, are at least 600 mm (24") in length, mounted horizontal on the wall behind the water closet and centered on the toilet bowl,
 - iii) are mounted not less than 840 mm (33") and not more than 920 mm (36") above the floor,
 - iv) are installed to resist a load of not less than 1.3 kN applied vertically or horizontally,
 - v) are not less than 30 mm (1 1/8") & not more than 40 mm (1 ½") in diameter, and
 - vi) have a clearance of not less than 35 mm (1 ¼") & not more than 45 mm (1 ¾") from the wall,

- e) be equipped with a coat hook mounted not more than 1 200 mm (48") above the floor on a side wall and projecting not more than 50 mm (2") from the wall, and
- f) have a clearance of not less than 1 700 mm (67") between the outside of the stall face and the face of an in-swinging washroom door and 1 400 mm (55") between the outside of the stall face and any wall-mounted fixture.

A-3.8.3.8.(1)(b)(iii) Water Closet Stalls. Doors to water closet stall for persons with physical disabilities should swing outward, preferably against a side wall.

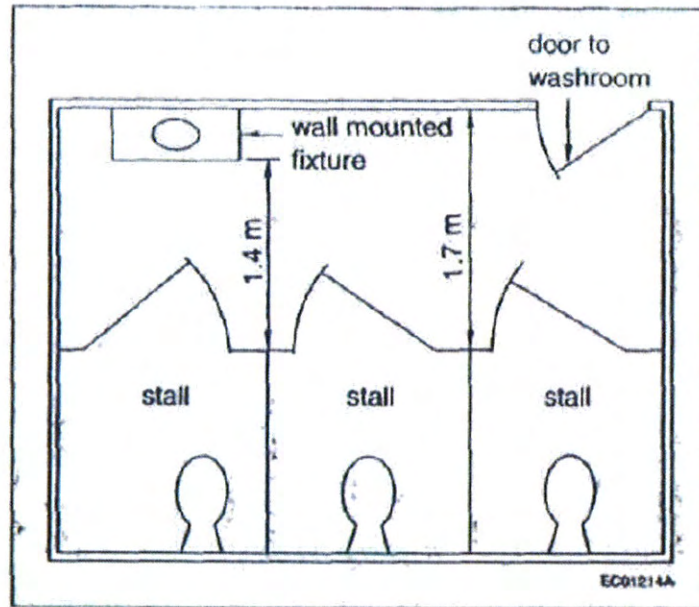


Figure A-3.8.3.8. (1) (b) (iii)
Water closet stalls

A-3.8.3.8.(1)(b)(iv) Door Pulls. The door pull should consist of a D-shaped handle mounted either horizontally or vertically. The centerlines are the lines drawn through the long axis and the short axis of the handle. If the handle is installed in the horizontal position, the short or transverse axis is the centerline which must be located at between 200 mm (8") and 300 mm (12") from the hinged side of the door, and the long or longitudinal axis is the one which is located between 900 mm (36") and 1 000 mm (40") from the floor. If the handle is installed in the vertical position, the distance is measured from the longitudinal axis to the hinged side of the door, while the distance from the floor is measured to the transverse axis.

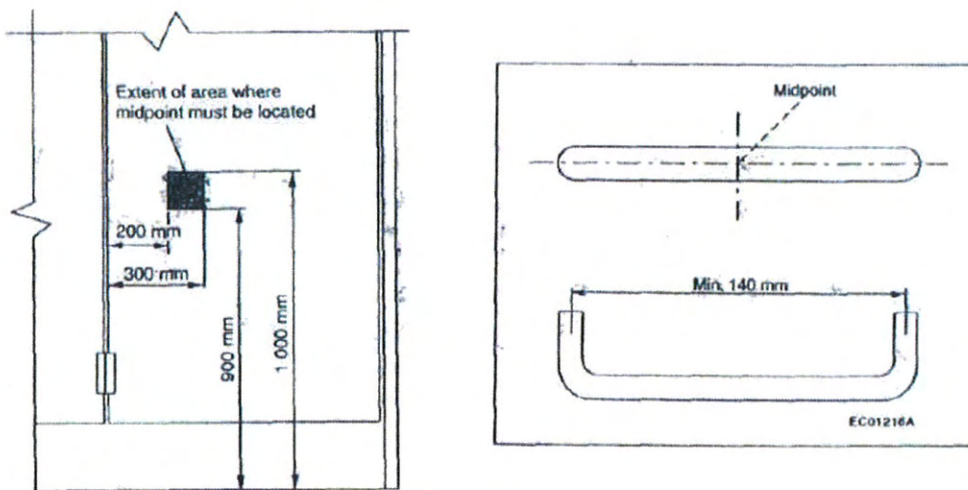


Figure A-3.8.3.8. (1) (b) (iv) .A.

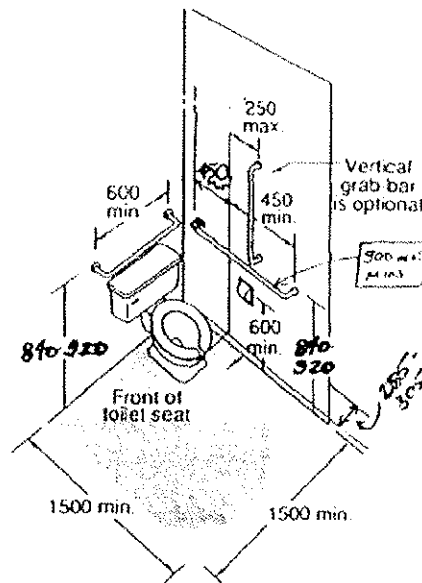
Hand-drawn floor plan of a room with the following features and dimensions:

- Top Wall:** Three rectangular windows. The leftmost window is labeled "460 MM." and the rightmost is labeled "600 MM. MIN.".
- Left Wall:** A vertical dimension line indicates a height of "1500 MM.".
- Right Wall:** A door is shown with a width of "800 MM." and a dashed line indicating an "ALTERNATE DOOR POSITION".
- Bottom Wall:** A horizontal dimension line indicates a width of "1500 MM.".
- Furniture:**
 - A "COAT HOOK" is located on the left wall, with a "800 MM." dimension.
 - A hatched rectangular area in the bottom-left corner contains a circle and a small square.
 - Two identical oval-shaped tables, each with a small square base, are positioned against the bottom wall. The distance between the center of the first table and the right wall is labeled "285-305 MM.".

A floor plan of a room with the following dimensions and features:

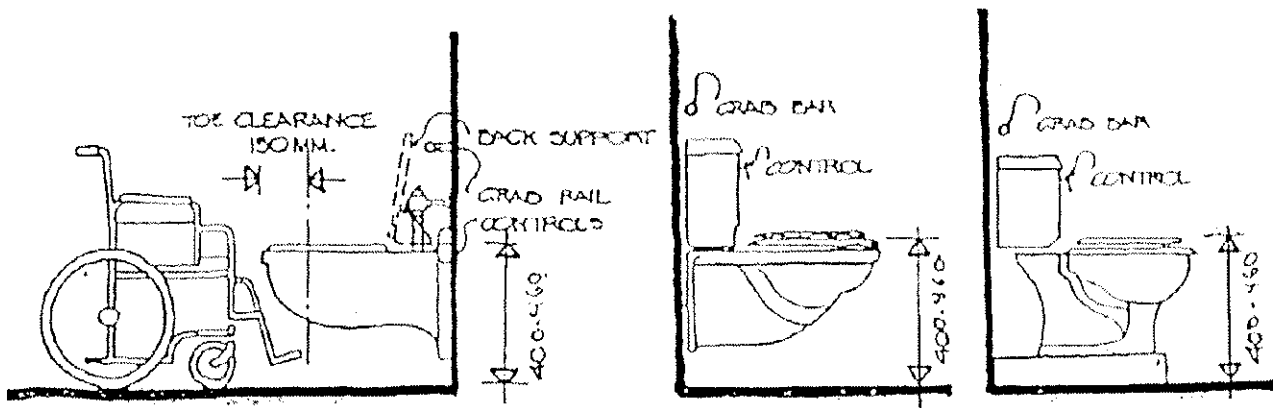
- Overall Dimensions:**
 - Width: 1500 MIN.
 - Height: 1300 MIN.
- Furniture and Layout:**
 - A shaded rectangular area in the top-left corner.
 - A circular table with a central point in the top-left area.
 - A rectangular table and a circular table in the middle-left area.
 - A large, irregular shape (possibly a desk or counter) in the middle-right area.
 - A curved wall or partition in the bottom-right corner.
- Internal Dimensions:**
 - A horizontal dimension of 800 MIN. is shown in the middle-right area.
 - A vertical dimension of 300 is shown in the middle-right area.
 - A horizontal dimension of 800 MIN. is shown at the bottom.

A-3.8.3.8.(1)(d)(i) Additional Grab Bars. Required grab bars must be mounted horizontally. It is the designer's prerogative to exceed the minimum requirements found in the NBC and specify the installations of additional grab bars in other locations. These additional grab bars may be of different configurations and can be installed in other orientations.



1) A water closet for a person with physical disabilities shall

- (See Appendix A.)



A wheelchair user requires a 1 500 mm diameter space to rotate his chair fully.

A-3.8.3.9.(1) Water Closets. Wall-mounted closets or floor models with receding bases are preferable because they provide the least amount of obstruction.

3.8.3.10. Urinals

- 1) If urinals are provided in a *barrier-free* washroom, at least one urinal shall be
 - a) wall mounted, with the rim located between 488 mm (19 ¼") and 512 mm (20 ¼") above the floor, or
 - b) floor mounted, with the rim level with the finished floor.
- 2) The urinal described in Sentence (1) shall have
 - a) a clear width of approach of 800 mm (32") centered on the urinal,
 - b) no step in front, and
 - c) installed on each side a vertically mounted grab bar that is not less than 300 mm (12") long, with its centerline 1 000 mm (40") above the floor, and located not more than 380 mm (15") from the centerline of the urinal.

3.8.3.11. Lavatories

- 1) A *barrier-free* washroom shall be provided with a lavatory that
 - a) is located so that the distance between the centerline of the lavatory and the side wall is not less than 460 mm (18"),
 - b) has a rim height not more than 865 mm (34") above the floor,
 - c) has a clearance beneath the lavatory not less than
 - i) 760 mm (30") wide,
 - ii) 735 mm (29") high at the front edge,
 - iii) 685 mm (27") high at a point 205 mm (8") back from the front edge, and
 - iv) 230 mm (9") high over the distance from a point 280 mm (11") to a point 430mm (17") back from the front edge (See Appendix A),
 - d) has insulated pipes where they would otherwise present a burn hazard (See Appendix A),
 - e) has a soap dispenser located close to the lavatory, not more than 1 200 mm (48") above the floor and accessible to persons in wheelchairs and,
 - f) has a towel dispenser or other hand-drying equipment located close to the lavatory, not more than 1 200 mm (48") above the floor in an area that is accessible to persons in wheelchairs.
- 2) If mirrors are provided in a *barrier-free* washroom, at least one mirror shall be
 - a) mounted with its bottom edge not more than 1 000 mm (40") above the floor, or
 - b) be inclined to the vertical to be usable by a person in a wheelchair.

A-3.8.3.11. (1) (c) Clearances Beneath a Lavatory

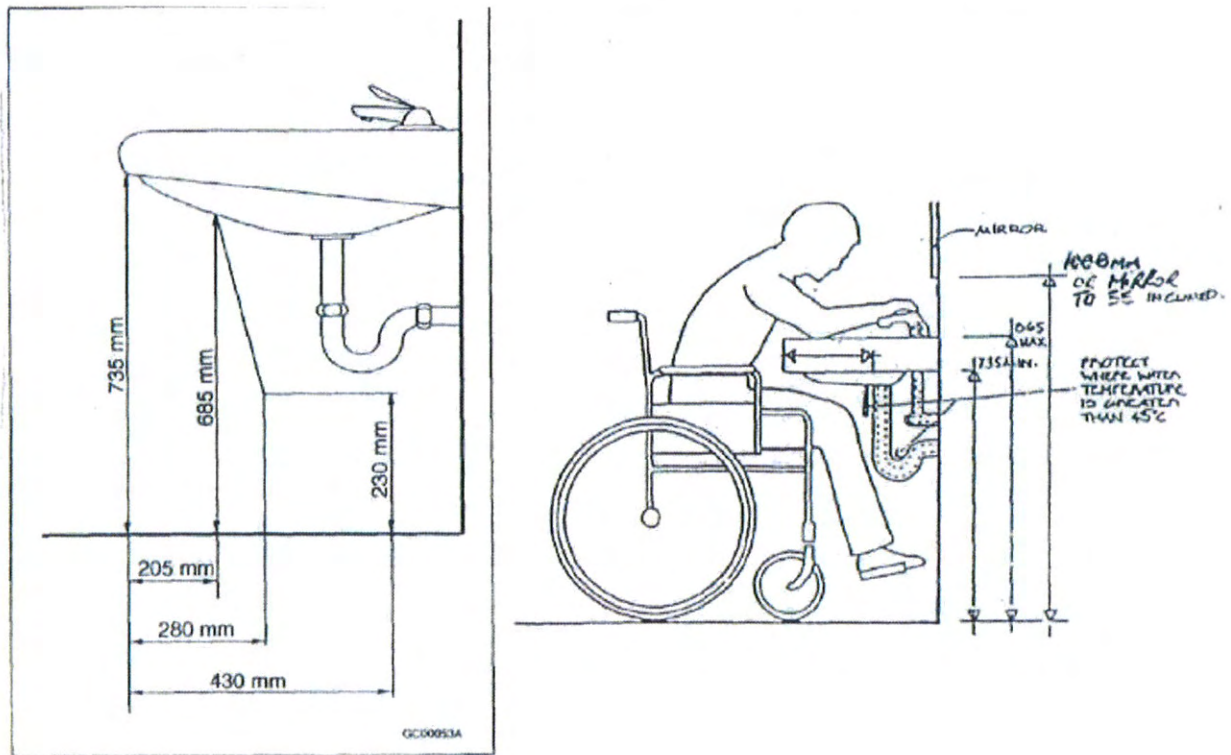
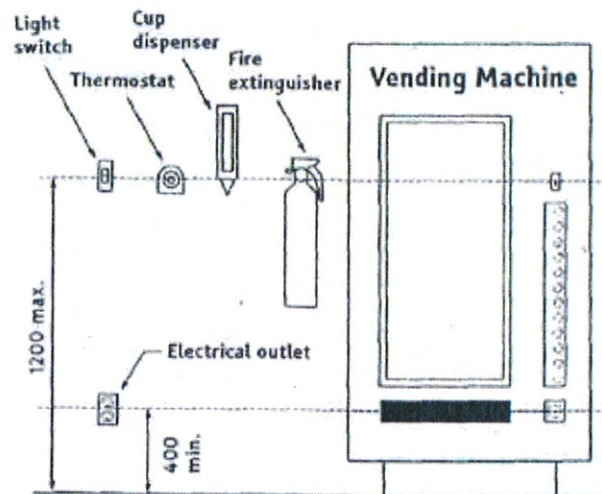


Figure A-3.8.3.11.
Clearances beneath a lavatory

A-3.8.3.11.(1)(d) Pipe Protection. The pipes referred to in Clause 3.8.3.11.(1)(d) include both supply and waste pipes. The hazard can be prevented by insulating the pipes, by locating the pipes in enclosures, or avoided by limiting the temperature of the hot water to a maximum of 45°C.



Generally all dispensers should meet this requirement.

3.8.3.12. Universal Toilet Rooms (See Appendix A.)

1) A universal toilet room shall

- a) be served by a *barrier-free* path of travel
- b) have a door capable of being locked from the inside and released from the outside in case of emergency and having
 - i) a latch-operating mechanisms that is operable with a closed fist, located not less than 900 mm (36") and not more than 1 000 mm (40") above the floor,
 - ii) if it is an outward swinging door, a door pull not less than 140 mm (5 ½") long located on the inside so that its midpoint is not less than 200 mm (8") and not more than 300 mm (12") from the hinged side of the door and not less than 900mm (36") and not more than 1 000 mm (40") above the floor (see A-3.8.3.8.(1)(b)(iv) in Appendix A), and
 - ii) if it is an on an outward swinging door, a door closer, spring hinges or gravity hinges, so that the door closes automatically, side of the door and not less than 900 mm and not more than 1 000 mm above the floor (see A-3.8.3.8.(1)(b)(iv) in Appendix A),
- c) have one lavatory conforming to Article 3.8.3.11.,
- d) have one water closet conforming to the requirements of Article 3.8.3.9. that has a clearance to the walls of
 - i) not less than 285 mm (11 ¼") and not more than 305 mm (12") on one side, and
 - ii) not less than 875 mm (34 ½") on the other side,
- e) have grab bars conforming to Clause 3.8.3.8.(1)(d),
- f) have no internal dimension between the walls that is less than 1 700 mm (67"),
- g) have a coat hook conforming to Clause 3.8.3.8.(1)(e) and a shelf located not more than 1 200 mm (48") above the floor,
- h) be designed to permit a wheelchair to back in alongside the water closet in the space referred to in Subclause (d)(ii), and
- j) be designed to permit a wheelchair to turn in an open space not less than 1 500mm (5') in diameter.

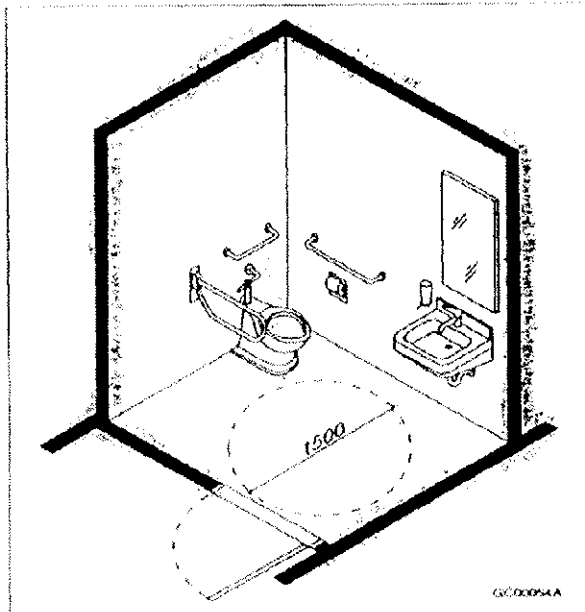


Figure A-3.8.3.12.A.

Universal toilet rooms with outward swinging door and a inward swinging door

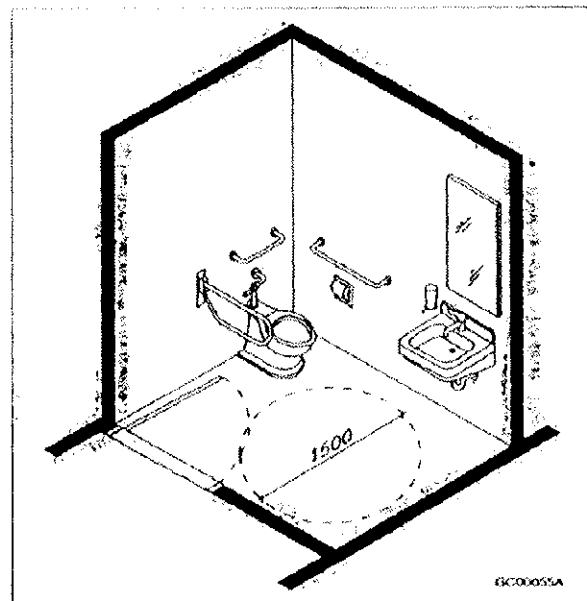


Figure A-3.8.3.12.B.

A-3.8.3.12. Universal Toilet Rooms. Unobstructed areas in front of the lavatory, in front of the water closet are necessary for maneuverability of a wheelchair. Although outward swinging doors are preferable for accessibility, inward swinging doors are also permitted. Figures A-3.8.3.12.A. and A-3.8.3.12.B. show design options that meet the intent of Article 3.8.3.12.

3.8.3.13. Showers

1) Except within a *suite of residential occupancy*, where showers are provided in a *building*, at least one shower stall in each group of showers shall be *barrier-free* and shall

- a) be not less than 1 500 mm (5') wide and 900 mm (36") deep,
- b) have a clear floor space at the entrance to the shower, not less than 900 mm (36") deep and the same width as the shower, except that fixtures are permitted to project into that space provided they do not restrict access to the shower (see Appendix A),
- c) have a slip-resistant floor surface,
- d) have a bevelled threshold not more than 13 mm (½") higher than the finished floor,
- e) have a hinged seat that is not spring-loaded or a fixed seat, the seat being
 - i) not less than 450 mm (17 ¾") wide and 400 mm (16") deep,
 - ii) mounted approximately 450 mm (17 ¾") above the floor, and
 - iii) designed to carry a minimum load of 1.3 kN,
- f) have a horizontal grab bar conforming to Subclause 3.8.3.8.(1)(d)(iv), (d)(v) and (d)(vi) that is (see Appendix A)
 - i) not less than 900 mm (36") long,
 - ii) mounted between 700 mm (27 ½") and 800 mm (32") above the floor,
 - iii) located on the wall opposite the entrance to the shower so that not less than 300 mm (12") of its length is at one side of the seat,
- g) have a pressure-equalizing or thermostatic mixing valve controlled by a lever or other device operable with a closed fist from the seated position,
- h) have a hand-held shower head with not less than 1 500 mm (5') of flexible hose located so that it can be reached from the seated position and equipped with a holder so that it can operate as a fixed shower head, and
- i) have fully recessed soap holders which can be reached from the seated position.

A-3.8.3.13.(1)(b) Clear Space at Entrances to Showers. The clear space at the entrance to a shower may be encroached upon by fixtures such as a wall hung sink which does not interfere with the leg rests of the wheelchair. However, this sink could restrict movement for persons who need to make a lateral transfer if it were installed at the seat end of the shower.

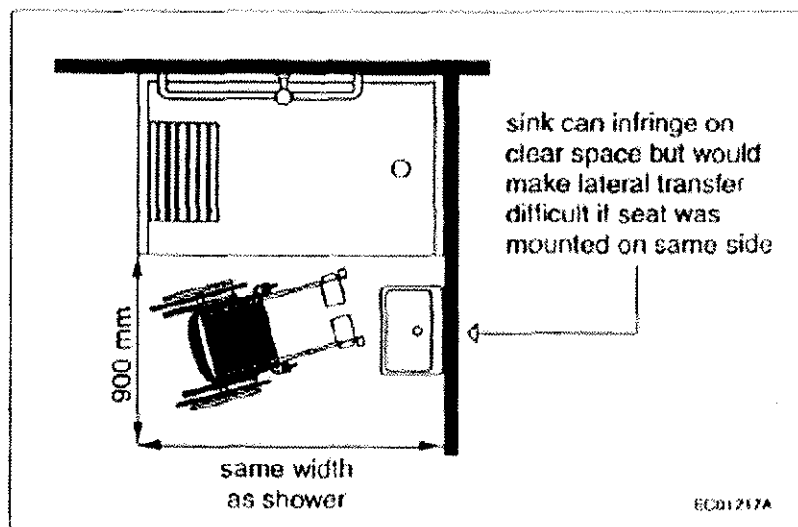
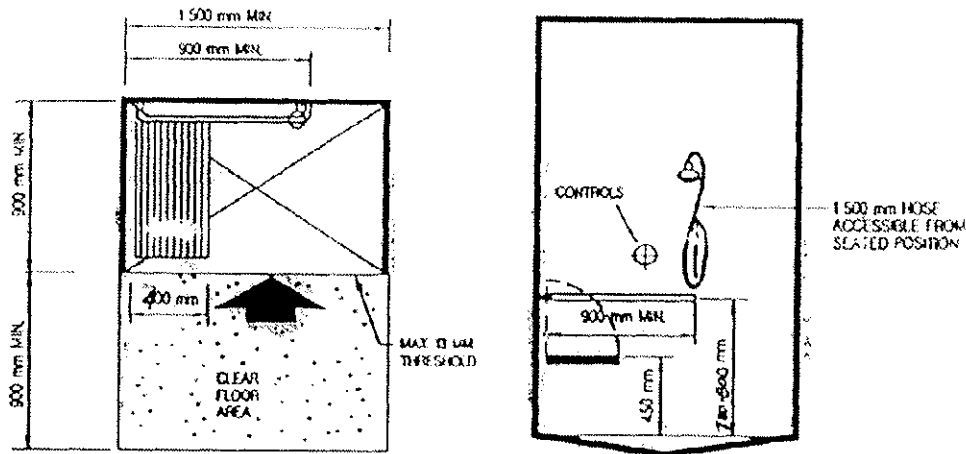


Figure A-3.8.3.13. (1) (b)

A-3.8.3.13.(1)(f) Grab Bars. One horizontal grab bar is required to be installed on the wall next to the seat. A grab bar behind the seat would prevent the user from leaning back against the wall, while one located on the wall opposite the seat can not be reached from the seated position. The seat itself may be used in conjunction with the bar for transfer. If design flexibility is required, fold away grab bars can be used as an alternative.



3.8.3.14 Counters

1) Every counter more than 2 m long, at which the public is served, shall have at least one *barrier-free* section not less than 760 mm (30") long centered over a knee space conforming to Sentences (3). (See Appendix A.) (See also A-3.8.2.1. in Appendix A.)

2) A *barrier-free* counter surface shall be not more than 865 mm (34") above the floor.

3) Except as permitted in Sentence (4), the knee space beneath a *barrier-free* counter intended to be used as a work surface shall be not less than

- a) 760 mm wide (30"),
- b) 685 mm high (27"), and
- c) 485 mm (19") deep.

4) A counter that is used in a cafeteria, or one that performs a similar function whereat movement takes place parallel to the counter, need not provide a knee space underneath it.

A-3.8.3.14.(1) Counters with Work Surface. It is not intended that all counters be *barrier-free*, but that sufficient *barrier-free* counter space be available. Examples of counters that should be *barrier-free* include check-in counters and those in financial institutions and reception areas as well as any counter at which processing and signing of documents takes place. The provision is not intended to apply to work surfaces in industrial occupancies.

3.8.3.15. Shelves or Counters for Telephones

(See Appendix A.)

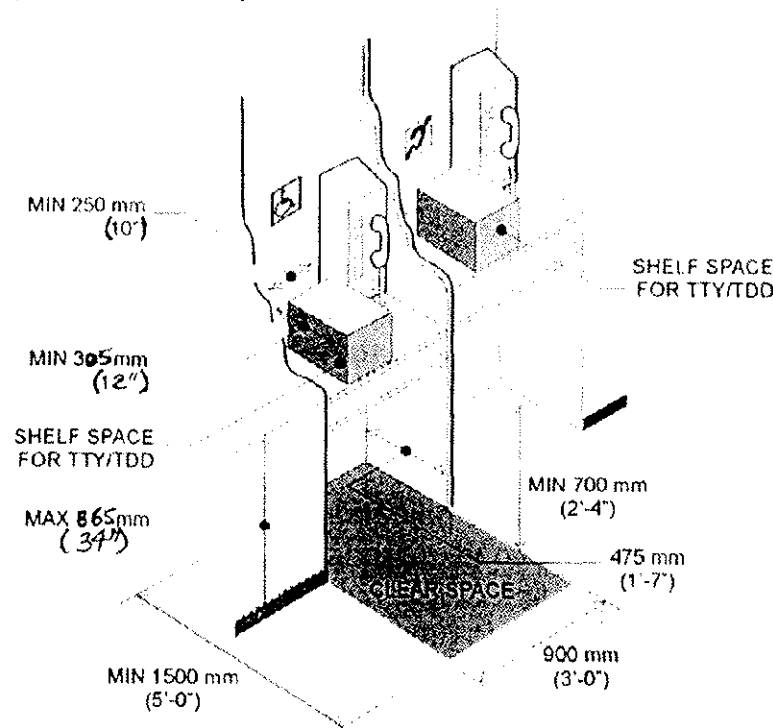
1) If built-in shelves or counters are provided for public telephones, they shall be level and shall

- a) be not less than 305 mm (12") deep, and
- b) have, for each telephone provided, a clear space not less than 250 mm (10") wide having no obstruction within 250 mm (10") above the surface.

2) The top surface of a section of the shelf or counter described in Sentence (1) serving at least one telephone shall be not more than 865 mm (34") above the floor.

3) If a wall-hung telephone is provided above the shelf or counter section described in Sentence (2), it shall be located so that the receiver and coin slot are not more than 1 200 mm (48") above the floor.

A-3.8.3.15. Telephone Shelves or Counters. Built-in shelves or counters for public telephones must be designed to accommodate persons using text phones (TT). These devices may also be referred to as teletypewriters (TTY) or telecommunication devices for the deaf (TDD). These devices require a level surface at least 305 mm (12") deep by 250 mm (10") wide with no obstruction above that space within 250 mm (10"). If a wall-hung telephone or other obstruction extends to less than 250 mm (10") from the shelf or counter, an equivalent clear space must be provided on either side of each telephone. At least one telephone should be equipped with a volume control on a receiver that generates a magnetic field compatible with the T-switch of a hearing aid. The lower portion of the shelf or counter is intended for persons using a wheelchair; therefore all parts of the operating mechanism of the telephone above this portion should be within reach of a wheelchair user.

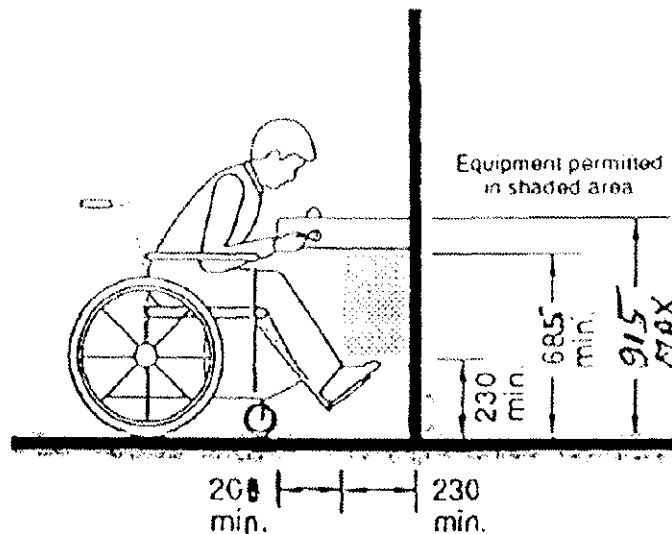


Public Telephone

3.8.3.16. Drinking Fountains

1) If drinking fountains are provided, at least one shall be *barrier-free* and shall

- have a spout located near the front of the unit not more than 915 mm (36") above the floor, and
- be equipped with controls that are easily operable from a wheelchair using one hand with a force of not more than 22 N or be automatically operable.



Spout Height and Knee Clearances at Drinking Fountain

3.8.3.17. Bathtubs

- 1) If a bathtub is installed in a *suite of residential occupancy* required to be *barrier-free*, it shall
 - a) be located in a room complying with the dimensions stated in Sentence 3.8.3.12.(1),
 - b) conform to Article 3.7.2.9. (**see below**), and
 - c) be equipped with a hand-held shower head conforming to Clause 3.8.3.13.(1)(h) but with not less than 1 800 mm (6') of flexible hose.

*3.7.2.9. Bathtubs

- 1) Where a bathtub is installed in a hotel or a motel, it shall
 - a) notwithstanding the presence of a water closet or a lavatory, have a clear floor space at least 750 mm (29 ½") wide along its length,
 - b) have faucets that conform to Clause 3.7.2.3.(4)(b) (**see below**),
 - c) have grab bars that
 - i) conform to Sentence 3.7.2.8.(1) (**see below**),
 - ii) are 1 200 mm (48") long located vertically at the end of the bathtub that is adjacent to the clear floor space, with the lower end between 180 mm (7") and 280 mm (11") above the bathtub rim, and
 - iii) are 1 200 mm (48") long located horizontally along the length of the bathtub at 180 mm (7") and 280 mm (11") above the bathtub rim, and
 - d) be open along its length with no tracks mounted on the bathtub rim.

*3.7.2.3. Lavatories

- 4) Lavatories required by Sentence (1) shall be equipped with faucets that
 - a) operate automatically, or
 - b) have lever-type handles that do not close under spring action.

*3.7.2.8. Grab Bar Installation

- 1) Grab bars that are installed shall resist a load not less than 1.3 kN applied vertically or horizontally.

Other items that should be considered when designing for Barrier-Free Accessibility.

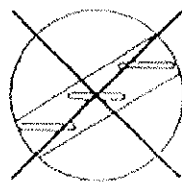
A-3.4.6.15.(1) Fastening Device. Turnpieces of a type which must be rotated through an angle of more than 90° before releasing a locking bolt are not considered to be readily operable. The release of a locking bolt should allow the door to open without having to operate other devices on the door.

A-3.4.6.18.(1)(d) Colour Contrast. The identification of floor and other signs intended to facilitate orientation for visually-impaired persons should offer maximum colour contrast to be effective. For this reason, it is recommended that white on black or black on white be used, as this combination produces the best legibility. It is also recommended that the sign surfaces be processed to prevent glare.

Stairs with open risers are hazardous to persons who need a solid riser to guide the foot up the riser to the next step or who place canes or crutches against the riser of the next step.

Where projecting nosings are used, they must not have sharp or abrupt angles that prevent the foot from sliding up the riser.

It is important for stairs and ramps to have good illumination so that they can be easily seen. Strongly patterned carpets should not be used on stairs, since they cause perceptual problems and obscure the definition of the tread edges.



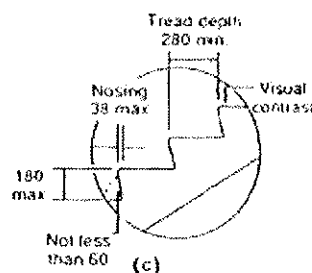
Open risers
not permitted

(a)

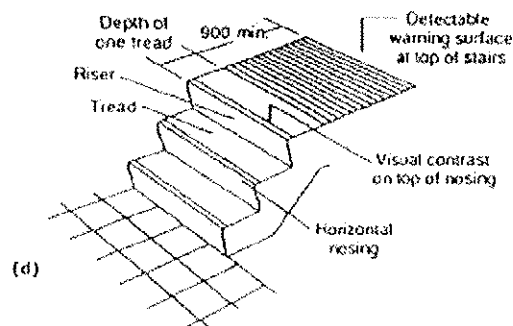


Risers without
rake back not
permitted

(b)



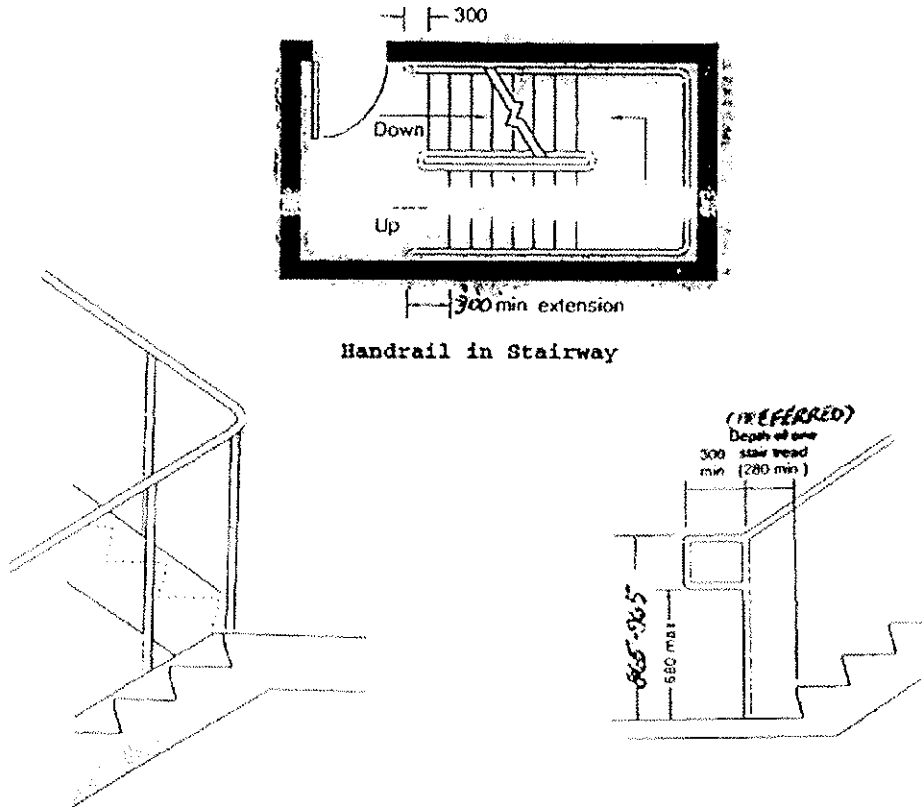
(c)



Stair Detail

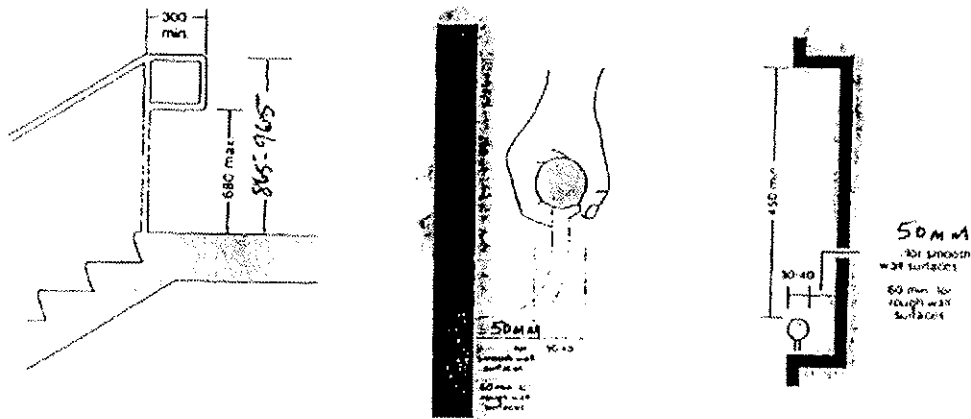
Many disabled persons rely upon handrails to maintain balance and prevent serious falls. Handrail extensions at the top and bottom of stairs provide tactile cues for persons with visual impairments, and a continuous handrail will assist them in negotiating stairs at changes in direction. Handrail extensions should not project into another path of travel, and handrails should return to the wall, floor, or post so as not to constitute a hazard.

The extended handrail is useful for persons with physical limitations to steady themselves before climbing or descending the stairs. The "one-tread depth" extension at the bottom is to ensure that the horizontal handrail extension is at the same height as the handrail on the stair.



Continuous Handrail at Centre of Stair

Handrail extension at Bottom of Stair



Handrail Extension at Top of Stair

Handrails

Handrails in Recess

Handrail Extension at Top of Stair

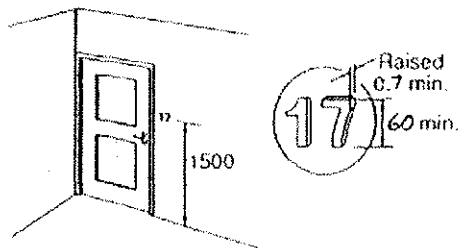
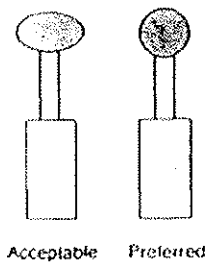
Handrails

Handrails in Recess

Handrails are extremely important features and must be designed to be easy to grasp and to provide a firm and comfortable grip so that the hand can slide along the rail without obstruction.

A circular section with a diameter not more than 40 mm (1 ½") is the preferred shape so that the thumb and fingers can lock around the handrail. Wide or deep handrails which allow only a pinched grip are undesirable unless a proper hand-size grasping area is provided. Standard pipe sizes designated by the industry as 32-38 mm meet the requirements.

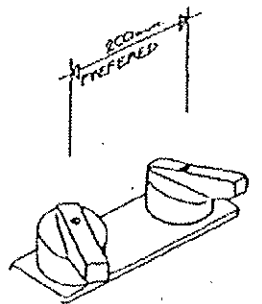
The maximum clearance allowed is to provide for adequate gripping room and prevent injuries caused by arms slipping through the openings.



Handrail Shapes

Raised Characters or Symbols on Identification Signs

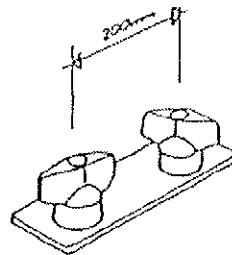
SUITABLE FAUCETS:



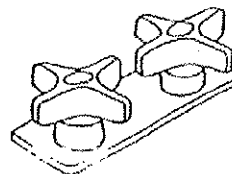
FAUCET WITH LEVER HANDLE



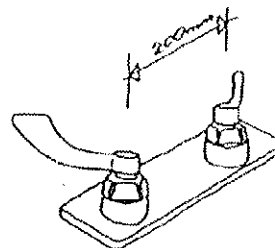
SINGLE LEVER ACTION



ALTERNATE FAUCET

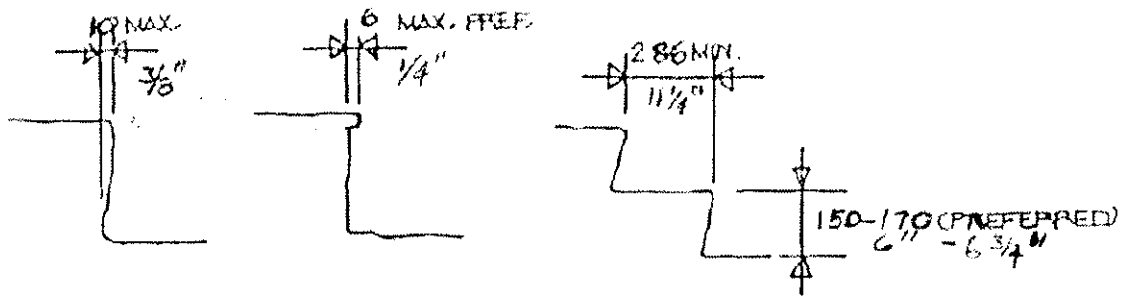


ALTERNATE FAUCET



FAUCETS WITH BLADE HANDLE

Although not specifically identified in the Accessibility Requirements (Section 3.8) of the Code, exit stairs and stairs used by the public in accessible buildings should be suitable for elderly and disabled users.



Suitable Stair Nosings

Note: Nosings which exceed 10 mm may (3/8") cause a tripping hazard for blind people or those with ambulatory impairments.

Because the non-ambulatory person or wheelchair user has the greatest number of mobility problems, additional information concerning the wheelchair is presented below.

WHEELCHAIR DIMENSIONS

The dimensions of common models vary as follows:

	<u>Range of Dimensions</u>	<u>Usual Dimension</u>
Length	33.5 to 48 in.	42 in.
Width when open	18.5 to 30 in.	26 in.
Width when collapsed	9 to 14.5 in.	11 in.
Height of seat above floor	14 to 20 in.	18 in.
Height of armrest from floor	19.5 to 33.5 in.	29.5 in.
Height of handle from floor	33 to 53.5 in.	37 in.

FUNCTIONING OF A WHEELCHAIR

The average space for turning through 180° is 5 ft. by 5 ft. A minimum width of 5 ft. is required for 2 wheelchairs to pass each other.

FUNCTIONING OF AN ADULT IN A WHEELCHAIR

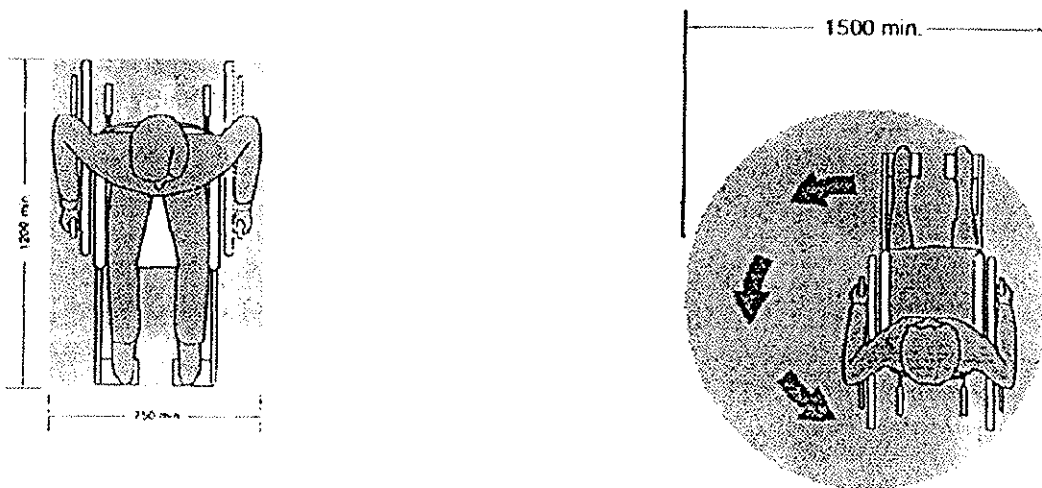
The upward reach from the floor ranges from 4 ft. 6 in. to 6 ft. 6 in. with an average reach being equal to 5 ft. The average horizontal working reach at a bench or table is 1 ft. 6 in. beyond the front edge of the seat. The average forward reach upwards, as when using a wall mounted dial telephone, is 4 ft. Removable arm rests may increase some of these dimensions slightly. Transference from the chair to a car, bed or water closet is usually achieved either by a slide, after removing and arm rest, or off the front corner of the wheelchair. Ideally, the two seats should be level. In any event, the chair seat should not be more than 3 in. higher than the seat or bed.

DESIGNING FOR CHILDREN

The preceding dimensions are for adults of average stature. In designing buildings for children, it may be necessary to alter some dimensions, such as the height of handrails.

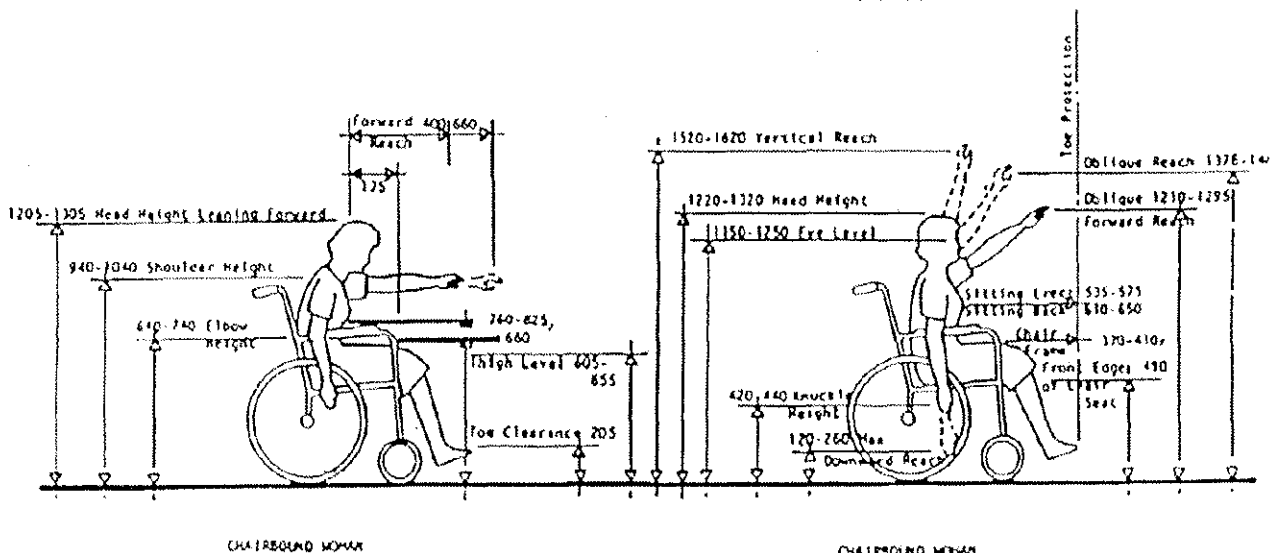
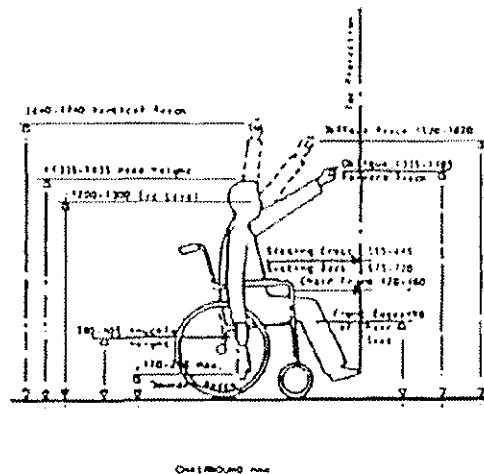
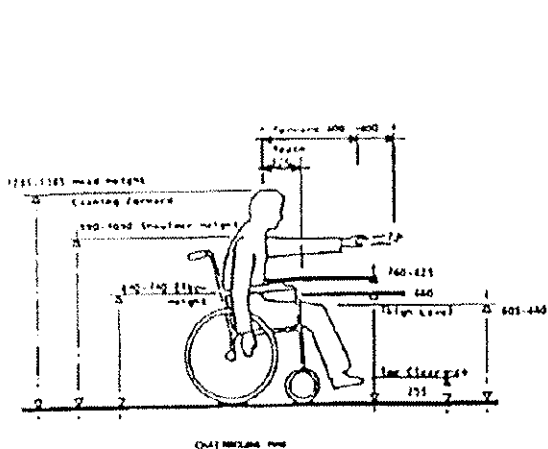
A 1200 mm (48") x 1200 mm (48") area would allow access for both forward and side approaches.

A 1200 mm (48") x 1200 mm (48") area would allow access for both forward and side approaches.



Minimum Clear Floor Area

Minimum Clear Turning Space at Toe Level for a Wheelchair to Pivot 180°



Note: Considerable dimensional variation exists between men & women using wheelchairs.

CHECK LIST FOR NBC 2005 - 3.8 BARRIER-FREE DESIGN

General

- 3.8.1.1. Does Section 3.8 apply to this building?
- 3.8.1.2. In addition to the main entrance are half of the other entrances accessible?
- 3.8.1.3. Are there any obstructions in the barrier-free path of travel?
- 3.8.1.4. Are escalators or moving walks going to be installed?
- 3.8.1.5. Are controls (switches, elevator controls, thermostats etc..) accessible?

Occupancy Requirements

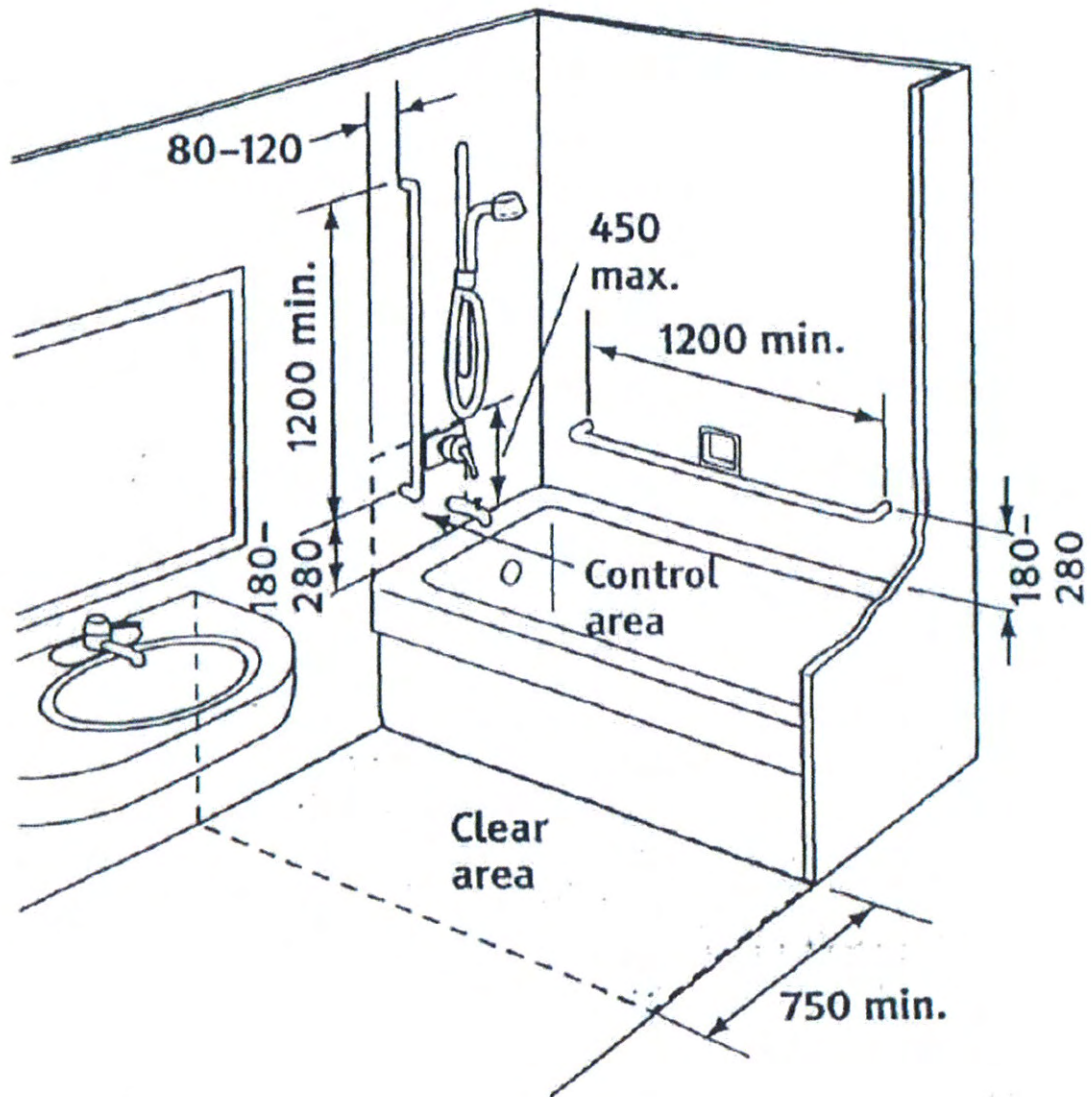
- 3.8.2.1. Is a barrier-free path of travel provided at the entrance storey and to each accessible storey that is served by elevator?
- 3.8.2.2. Is there access to parking areas?
- 3.8.2.3. Are the washrooms barrier-free in design, in a barrier-free path of travel?
(See Article 3.8.2.1)

Barrier-Free Design Standards

If this building is required to comply with section 3.8 Barrier-Free Design under Article 3.8.1.1, the following design standards apply:

- 3.8.3.1. Required signs (International Symbols for Accessibility)
- 3.8.3.2. Exterior Walks
- 3.8.3.3. Door, doorways, door swing and door hardware
- 3.8.3.4. Ramps
- 3.8.3.5. Elevators
- 3.8.3.6. Spaces in seating areas designated for wheelchair use.
- 3.8.3.7. Required assistive listening devices
- 3.8.3.8. Water closet stalls
- 3.8.3.9. Water closets
- 3.8.3.10. Urinals
- 3.8.3.11. Lavatories (washroom sinks)
- 3.8.3.12. Universal toilet rooms (for the use of disabled persons of both sexes in lieu of facilities for disabled persons in washrooms used by the general public)
- 3.8.3.13. Showers
- 3.8.3.14. Counters
- 3.8.3.15. Public telephone shelves and counters
- 3.8.3.16. Drinking fountains
- 3.8.3.17. Bathtubs

Barrier-Free Bathtubs in Suites of Residential Occupancy



Bathtub Area and Grab Bars