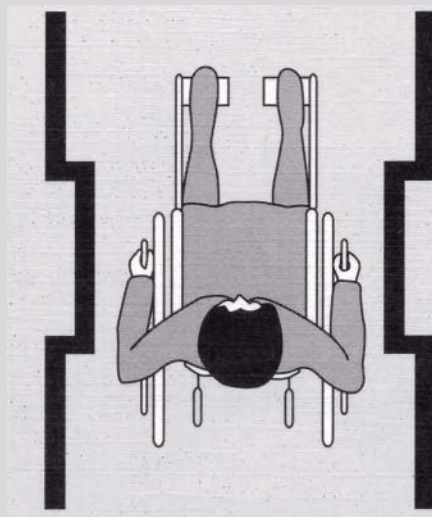


CODE ON

BARRIER-FREE ACCESSIBILITY IN BUILDINGS

1995



PUBLIC WORKS DEPARTMENT
BUILDING CONTROL DIVISION

PREFACE

1 When the Building Control Regulations, 1989 came into force on 1 May 1989, all new buildings to which disabled persons have or may reasonably be expected to have access were required to be designed in accordance with the Code On Barrier-Free Accessibility in Buildings to facilitate access to and use of the new buildings and their facilities by disabled persons.

2 The Code on Barrier-Free Accessibility in Buildings was first published in 1990 by the Building Control Division of the Public Works Department for the purpose of implementing this new legal provision. It was the dawn of a new era in Singapore in which all new buildings were not only designed to be more disabled friendly but would also cater to the needs of the future greying population.

3 After several years of experience in implementing the Code and with the feedback from the various professional bodies and the associations or organisations involved with physically handicapped persons, the Building Control Division initiated a comprehensive review of the Code with a view to updating and fine-tuning the provisions and technical requirements of the Code to better suit our local conditions. The review was undertaken by a task force jointly formed by the Building Control Division, the Singapore Institute of Architects (SIA) and the Handicaps Welfare Association (HWA).

4 With the implementation of the new provisions and requirements in this revised Code, the Building Authority is confident that the future needs of the disabled and the elderly would be better and more satisfactorily served.

5 The Building Control Division would like to take this opportunity to record its appreciation of the invaluable inputs, contributions and assistance provided by the Singapore Institute of Architects and the Handicaps Welfare Association to the task force in the revision of this Code.

**BUILDING CONTROL DIVISION
PUBLIC WORKS DEPARTMENT**

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CHAPTER 1

SCOPE AND DEFINITIONS

1.1 SCOPE

- 1.1.1 The access provisions and facilities recommended in this Code are intended primarily to apply to the wheelchair user. Such provisions would also cater to the ambulant disabled. However, where possible and practicable, access provisions and facilities are recommended to serve the needs of the ambulant disabled. Such provisions when taken as a whole would also greatly benefit the elderly and the infirm.

1.2 DEFINITIONS

- 1.2.1 For the purpose of this Code, the definitions below shall apply:-

Accessible

Describes a site, building, facility, or portion thereof that complies with this code and that can be approached, entered and used by people with physical disabilities.

Accessible Route

A continuous unobstructed path connecting all accessible elements and spaces in a building or facility that can be negotiated by a severely disabled person using a wheelchair and that is also safe for and usable by people with other disabilities. For non-ambulatory people, this accessible path shall not incorporate any step, stairway, turnstile, revolving door, escalator or other impediment which would prevent it from being safely negotiated by people with disabilities. Interior accessible routes shall include corridors, floors, ramps, lifts, and clear floor space at fixtures. Exterior accessible routes shall include parking access aisles, kerb ramps, walkways, and ramps.

Ambulant Disabled

A person who is able, either with or without personal assistance, and who may depend on prostheses (artificial limbs), orthoses (callipers), sticks, crutches or walking aids to walk on level or negotiate suitably graded steps provided that convenient handrails are available.

Circulation Path

An exterior or interior way of passage from one place to another for pedestrians, including walkways, hallways, courtyards, stairways, and stair landings.

Disabled Person

A person who, as a consequence of physical disability or impairment, is either ambulant disabled or wheelchair bound which affects his mobility and use of buildings.

Grab Bar

A bar used to give a steadying or stabilizing assistance to a person engaged in a particular function.

Handrail

A rail used in circulation areas such as corridors, passageways, ramps and stairways to assist in continuous movement.

Individual Washroom

A compartment having the basic requirements of a water closet compartment, wash basin and other essential washroom accessories as required by people with physical disabilities.

Kerb

A side barrier to a trafficable surface.

Kerb Ramp

A short ramp cutting through a kerb or built up to it.

Operable Parts

A part of a piece of equipment or appliance used to insert or withdraw objects, or to activate, deactivate, or adjust the equipment or appliance (for example, coin slot, pushbutton, handle).

Ramp

An inclined way connecting one level to another.

Symbol

Symbol of Access for the Disabled Person.

Water Closet Compartment

A compartment having a water closet with grab bars installed to assist people with physical disabilities.

Wheelchair User

A person who depends on a wheelchair for mobility.

Width

Clear distance from one finished surface to another.

1.2.2 Unless otherwise specified, all dimensions shown in the figures in this code are in millimetres (mm).

1.2.3 Where 'shall' is used in this code, it refers to mandatory requirement. Where 'should' is used, it refers to recommendation.

CHAPTER 2

PROVISIONS FOR DISABLED PERSONS

- 2.1 In addition to the requirements specified in the Table in regulation 36(2) of the Building Control Regulations, (Cap. 29, Reg. 5), accessible provisions for the disabled shall be made in the types of buildings as given in the Table below:-

TABLE

Provisions for Disabled Persons

Types of Building	Minimum Accessible Provisions								
Banks	At least one service counter shall be provided.								
Shophouses and first-storey shops	The shopping area shall be accessible.								
Hotels	At least one guestroom in every 200 guestrooms or part thereof shall be accessible.								
Concert halls, cinemas, theatres, stadiums or other places of public resort where permanent seating arrangement is provided	At least two wheelchair spaces for every 400 seats or part thereof shall be provided.								
Religious buildings	The main area of worship shall be accessible.								
Hostels, halls of residence or dormitories	At least one room, preferably at the access level, shall be accessible.								
Hawker centres and eating outlets	At least one table for every 10 tables or part thereof shall be reserved for use by disabled persons or at least two tables, whichever is the greater.								
Car parks (surface car parks or multi-storey car park buildings)	The number of accessible parking lots shall be as follows:								
	<table><tr><td>No. of carpark lots</td><td>No. of accessible lots</td></tr><tr><td>First 50</td><td>1</td></tr><tr><td>Next 50</td><td>1</td></tr><tr><td>Every subsequent 200 lots as may be required by the Building Authority</td><td>1</td></tr></table>	No. of carpark lots	No. of accessible lots	First 50	1	Next 50	1	Every subsequent 200 lots as may be required by the Building Authority	1
	No. of carpark lots	No. of accessible lots							
	First 50	1							
	Next 50	1							
Every subsequent 200 lots as may be required by the Building Authority	1								
Others: (Large departmental stores, supermarket, foyers of places of public resort, public concourses)	Seats shall be provided for disabled persons who are unable to stand for a long period. An empty space to accommodate a wheelchair shall also be provided								

- 2.2 In the case of residential buildings or factories and workshops up to 4 storeys in height if, in the opinion of the Building Authority, the development is fairly extensive or substantial he may exercise his discretion under Regulation 36(2) of the Building Control Regulations, (Cap. 29, Reg. 5) to require facilities to be provided in accordance with this Code. Qualified Persons are therefore advised to seek the advice of the Building Authority in such cases early in the design stage so that, if required, such facilities could be incorporated in the design.

CHAPTER 3

GENERAL REQUIREMENTS

3.1 SPACE ALLOWANCES

- 3.1.1 The minimum clear floor or ground area required to accommodate a single, stationary wheelchair and occupant shall be 900 mm x 1200 mm as illustrated in *Figure 1*.
- 3.1.2 A minimum clear floor or ground area of 1200 mm x 1200 mm would allow access for both forward and side approach.

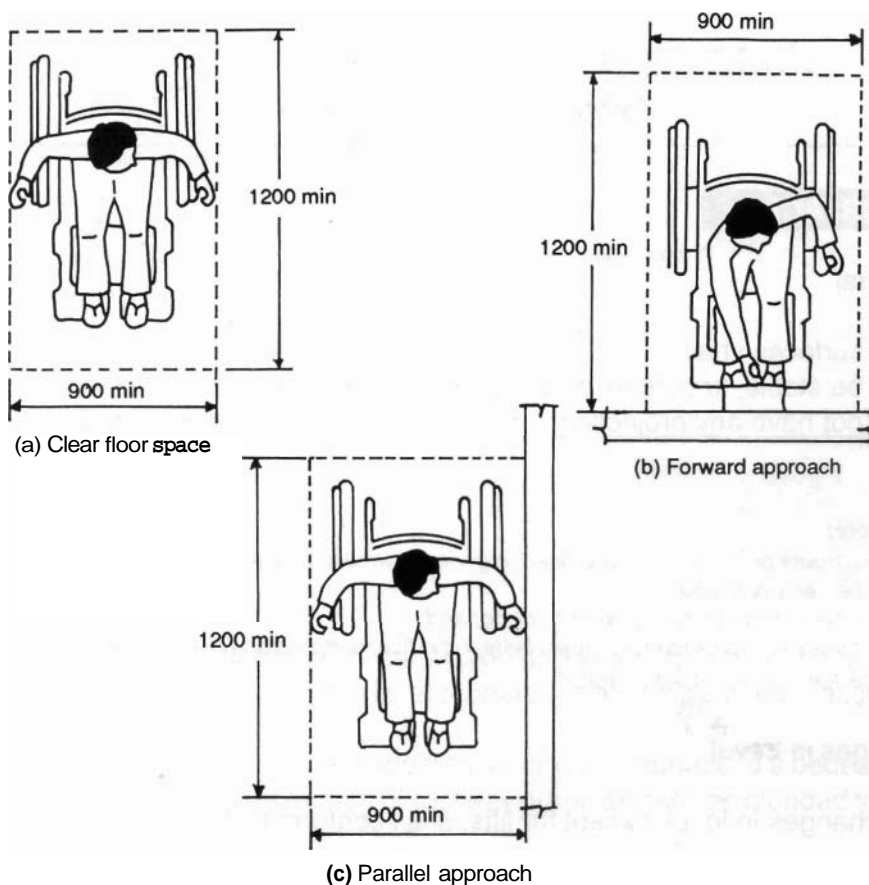


Figure 1
Minimum Clear Floor Space

- 3.1.3 The minimum clear floor or ground area for a wheelchair to turn shall be 1800 mm x 1800 mm as illustrated in *Figure 2*.
- 3.1.4 Additional information on the wheelchair and anthropometrics are given in Appendix A.

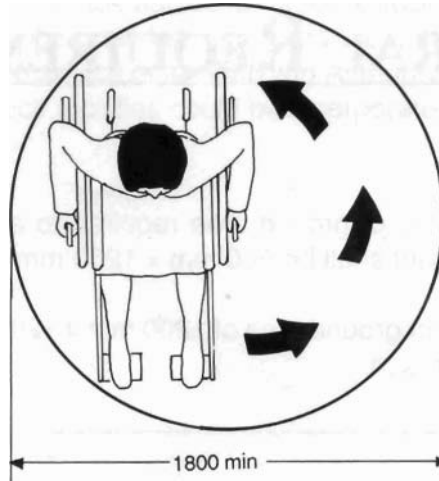


Figure 2
Minimum Clear Turning Space

3.2 FLOOR SURFACES

3.2.1 General

Floor surfaces shall :-

- be stable, firm, level and slip-resistant as described in Appendix B; and
- not have any projections, drops or unexpected variation in levels.

Footnote:

Where carpets or carpet tiles are used in general circulation area, they should

- be securely fixed;
- have a firm cushion, pad or backing; and
- have exposed edges of carpets fastened to floors surfaces and trim along the entire length of the exposed edge complying with Table 1.

3.2.2 Changes in Level

Any changes in level, except for lifts, shall conform to Table 1.

Table 1

Changes in Level

Changes in Vertical Rise, (mm)	Gradient not steeper than
0 to 15	1 : 2
15.1 to 50	1 : 5
50.1 to 200	1 : 10
Exceeding 200	1 : 12

3.2.3 Gratings

Gratings located along walking surfaces shall :-

- preferably be covered;
- have spaces not greater than 12 mm wide in one direction; and
- be placed so that the long dimension is across the dominant direction of travel as illustrated in *Figure 3*.

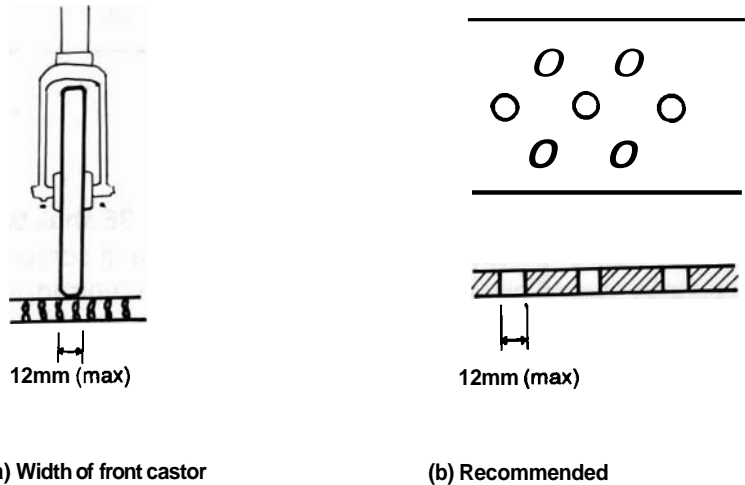


Figure 3
Gratings

3.3 APPROACHES

3.3.1 Approach to Building

- A passenger alighting and boarding point complying with clause 3.3.2 should, where possible, be provided at the level of approach for the disabled to alight from and board a vehicle.
- Where transfer has to be made from a vehicular surface to a pedestrian surface, the driveway and the pavement or footway surfaces shall be blended to a common level or ramped.
- Differences in level between the driveway and the pavement or footway level shall be avoided. Where the difference is unavoidable then such drop shall conform to Table 1.

3.3.2 Passenger Alighting and Boarding Point

A passenger alighting and boarding point as illustrated in *Figure 4* shall :

- provide an access aisle of at least 1500 mm wide by 6000 mm long adjacent and parallel to the vehicle pull-up space;
- have a kerb ramp complying with Clause 3.7 if there are kerbs between the access aisle and the vehicle pull-up space; and
- where possible, be sheltered.

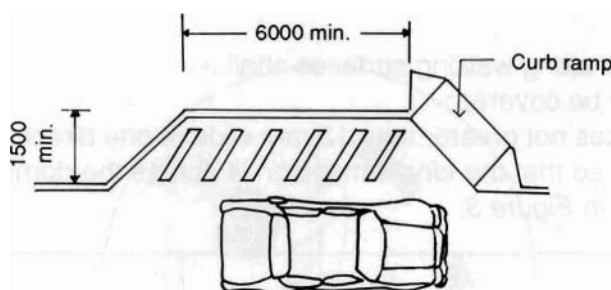


Figure 4
Passenger Alighting and Boarding Point

3.3.3 Access to Building

- The buildings specified in the Table to Regulations 36 shall be provided with at least one accessible entrance door served by an approach complying with Clause 3.3.1.
- The access should preferably be through the main entrance of the building.
- Symbol shall be displayed at all other non-accessible entrances to direct people with disabilities to the accessible entrance.
- At least one accessible route leading to an accessible entrance of the building shall be provided from the alighting and boarding point of taxi stands and car park lots for the disabled.
- The width of the accessible entrance door shall not be less than 900 mm and the width of the corridors or passageways leading to and from such access door shall not be less than 1200 mm.

3.4 ACCESSIBLE ROUTES, CORRIDORS OR PATHS

3.4.1 Width

The minimum clear width of :-

- an accessible route shall be 1200 mm to allow for both a wheelchair and a walking person to pass as shown in *Figure 5* except where additional manoeuvring space described in clause 3.5.4 is required at doorways;
- a checkout lane shall be at least 900 mm as shown in *Figure 6*.
- Where space is required for two wheelchairs to pass, the minimum clear width shall be 1800 mm.

3.4.2 Bollards

Where bollards are erected at entrances to walkways or pathways, a minimum clear space of 900 mm shall be provided between the bollards.

3.4.3 Protruding Objects

Obstacles, projections or other protrusions shall be avoided in pedestrian areas such as walkways, halls, corridors, passageways or aisles.

3.4.4 Resting Areas

- a. Long paths of travel should be avoided and resting areas should be provided at frequent intervals not exceeding 30 000 mm.
- b. Wherever possible, exterior walkways should be protected from the elements.

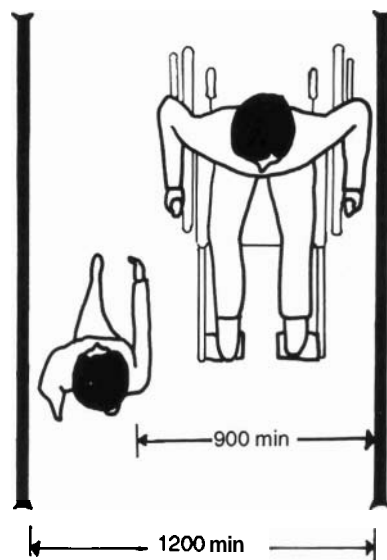


Figure 5
Width of Accessible Routes

The minimum width recommended for checkout lanes is 900 mm

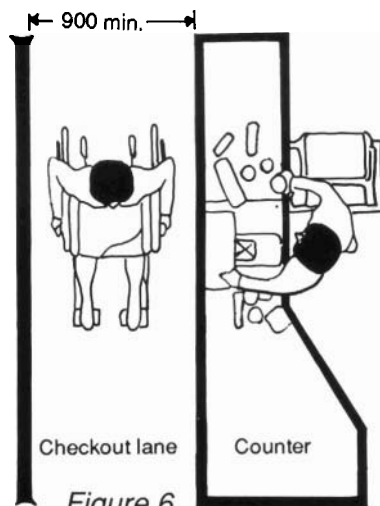


Figure 6
Width of Accessible Checkout Lanes

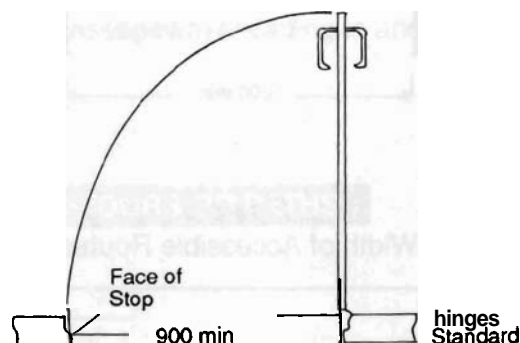
3.5 DOORS

3.5.1 General

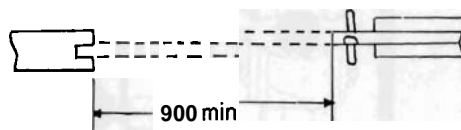
- Doorways shall be level.
- At least one power assisted or automatic door should be provided at the main entrance to a building.
- Wherever possible and practicable, automatic door, swing or sliding type, should be provided instead of doors which are manually opened. Heavy or revolving doors should be avoided.
- Where revolving doors are installed, there shall be an auxiliary side-hung door with a minimum clear opening of 900 mm.
- Bathroom doors should swing out so that the person inside the bathroom does not fall against the door and block it. Consideration should be given to the use of sliding or folding doors, which are easier to operate and require less wheelchair manoeuvring space.

3.5.2 Clear Width

The minimum clear opening of doorways shall be 900 mm measured between the face of the door and the face of the door stop with the door open at 90 ° as illustrated in *Figure 7*.



(a) Swing Door



(b) Sliding/Folding door

Figure 7
Clear Width of Doorways

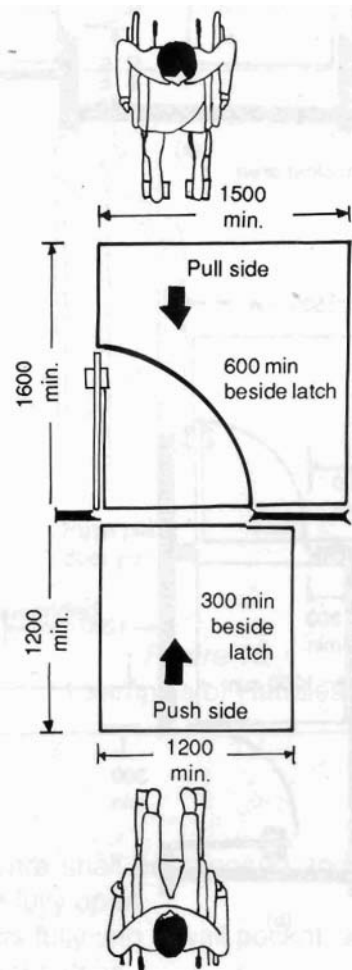
3.5.3 Double-Leaf Doorways

If doorways have two independently operated door leaves, at least one active leaf shall comply with Clauses 3.5.2 and 3.5.4.

3.5.4 Manoeuvring Space at Doors

Wheelchairmanoeuvring spaces as illustrated in *Figure 8*, shall be free of any obstruction, and be provided on the side where the door handle is located in the following manner :-

- a. on the pull side, a minimum space of 600 mm;
- b. on the push side, a minimum space of 300 mm;
- c. for two-way swing door, a minimum space of 300 mm.



Front Approach at Hinge Door

Figure 8

Minimum Doorway Manoeuvring Space

3.5.5 Two Doors in Series

The minimum space between two hinged doors or pivoted doors in series shall be 1200 mm plus the width of the door swinging into that space as illustrated in *Figure 9*.

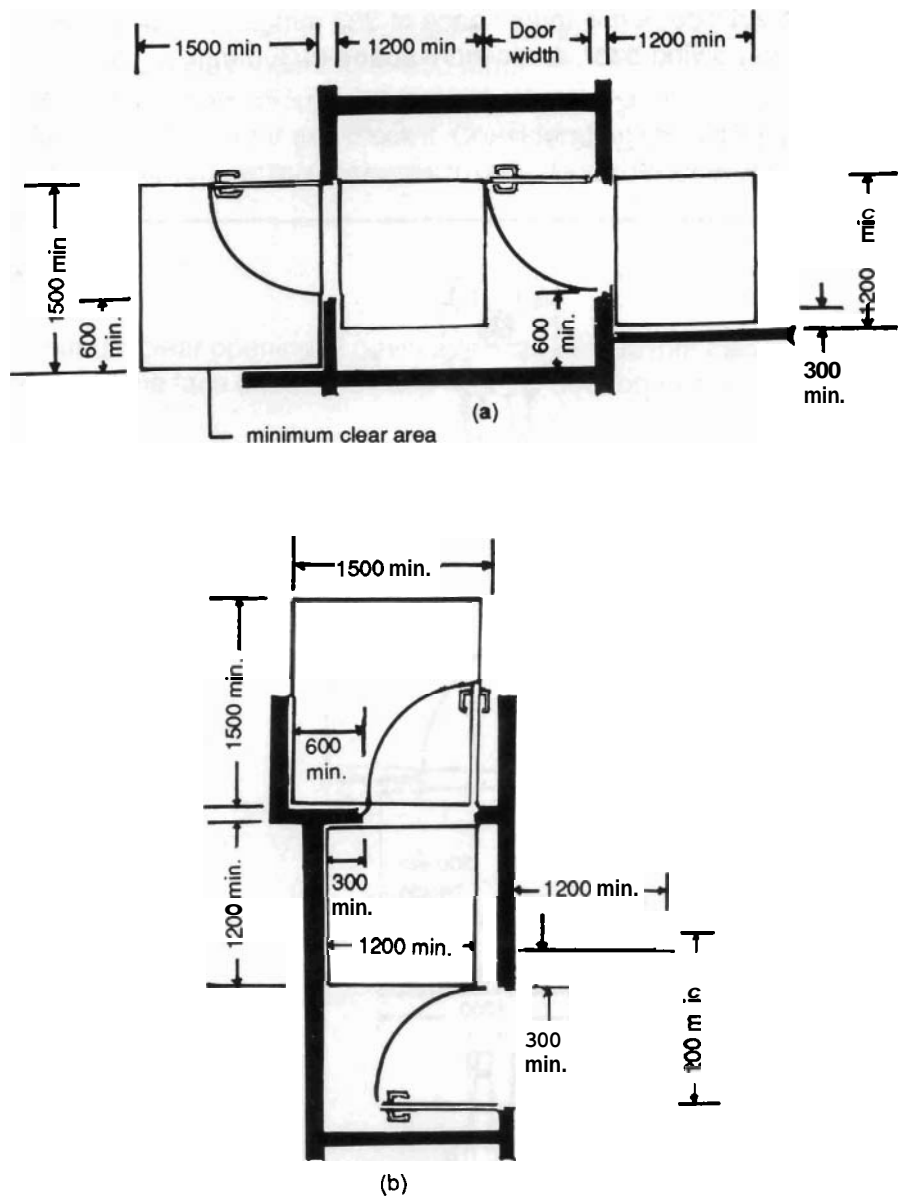


Figure 9
Manoeuvring Space at Doors in Series

3.5.6 Door Hardware

Operating devices such as handles, pulls, latches and locks shall :-

- be operable by one hand;
- not require fine finger control, tight grasping, pinching, or twisting to operate; and
- be mounted at a height of 900 mm to 1100 mm from the floor.

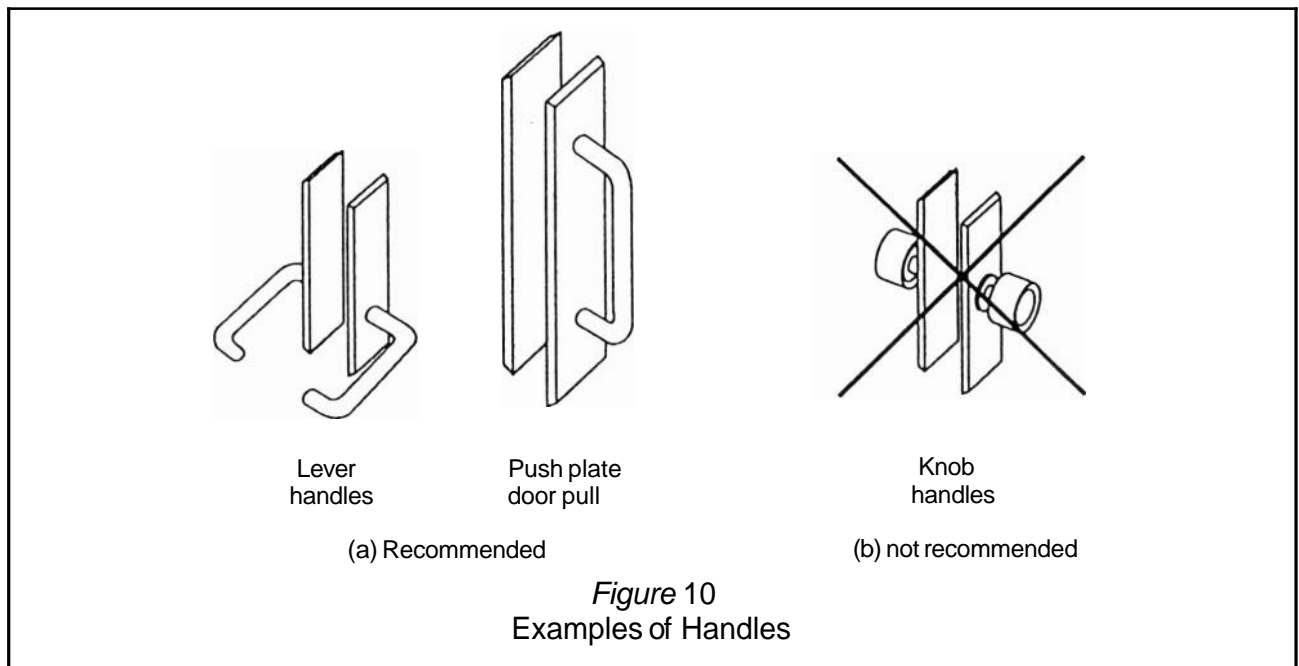
3.5.7 Door Handles

Door handles, as illustrated in *Figure 10*, with the following characteristics are recommended :-

- Push-pull mechanisms that do not require grasping;
- Lever handles should be used on latched doors; and
- U-shaped door handles that reduce the risk of catching on clothing, or injury from the exposed level end.

Footnote:

Door knob is not recommended as it does not provide adequate grip for persons with impaired hand functions.



3.5.8 Sliding/Folding Doors

- Operating hardware shall be exposed and usable from both sides when sliding/folding doors are fully open.
- If the door retracts fully into a wall pocket, an accessible handle is required on the exposed edge of the door.

3.5.9 Door Opening Force

The maximum force for pushing or pulling open a door should be :-

- 38N for exterior hinged doors;
- 22N for interior hinged doors; and
- 22N for sliding or folding doors.

This clause does not apply to the force required to retract latch bolts or disengage other devices that may hold the door in a closed position.

3.5.10 Door Closers

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

3.5.11 Vision Panels

All two-way swing doors or doors across circulation routes shall be provided with vision panels as shown in *Figure 11* giving a zone of visibility from a height of 800 mm to 1500 mm. This will allow for both the ambulant disabled and wheelchair user to be seen/observed by a person on the opposite side in order to prevent him from being accidentally struck by the opening door.

3.5.12 Kickplates

Kickplates of not less than 250 mm high as shown in *Figure 11* are recommended for doors in high-use areas to protect the push side of doors from damage.

3.5.13 Guardrails (Automatic swing door)

Where doors swing automatically into the path of travel, it is desirable to have guardrails as shown in *Figure 12*.

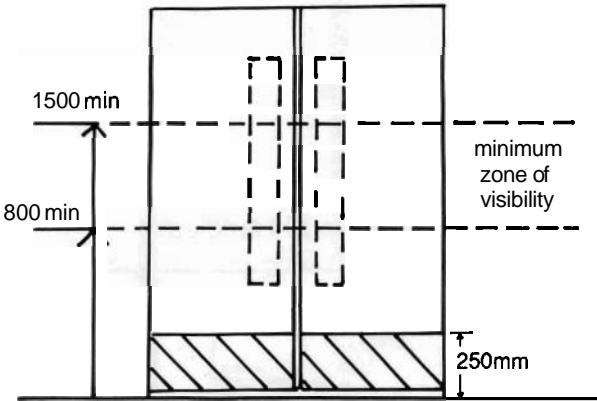


Figure 11
Vision Panels and Kickplates

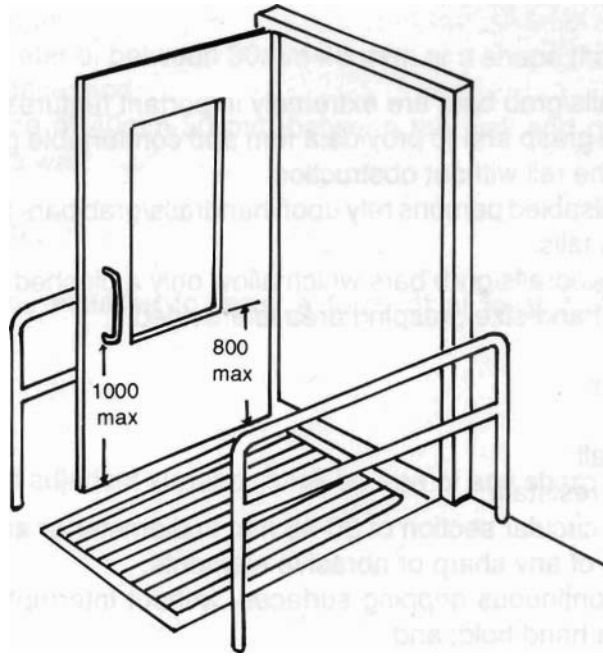
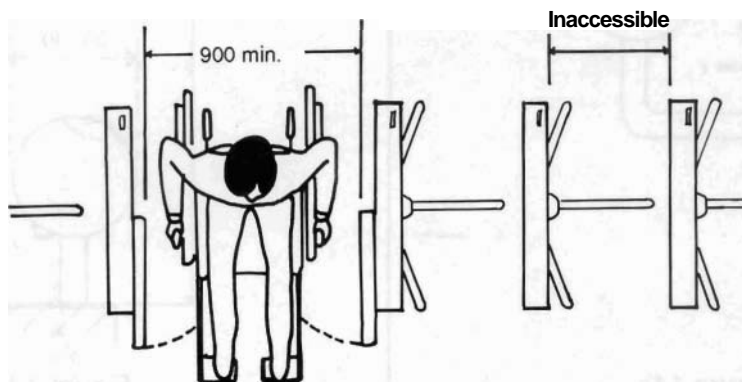


Figure 12
Guardrails at Automatic Swing Doors

3.5.14 Turnstiles

Turnstiles cannot be used by persons on wheelchairs and can be hazardous to ambulant persons who use crutches or walking aids. An accessible gate with a clear width of at least 900 mm should be provided beside a turnstile as shown in *Figure 13*.



Gate

Turnstiles

Figure 13
Access Beside Turnstiles

3.6 HANDRAILS/GRAB BARS

3.6.1 General

- a. Handrails/grab bars 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.
- b. Many disabled persons rely upon handrails/grab bars to maintain balance or prevent serious falls.
- c. Wide handrails/grab bars which allow only a pinched grip are undesirable unless a proper hand-size grasping area is provided.

3.6.2 Requirements

Handrails shall:-

- a. be slip-resistant;
- b. have a circular section of 30-45 mm in diameter or an equivalent gripping surface;
- c. be free of any sharp or abrasive elements;
- d. have continuous gripping surfaces, without interruptions or obstructions that can break a hand hold; and
- e. have a clear space between the handrail and the wall as shown in *Figure 14a* of
 - (i) not less than 40 mm;
 - (ii) at least 60 mm where the wall has a rough surface.

3.6.3 A recess containing a handrail shall extend at least 450 mm above the top of the rail as shown in *Figure 14b*.

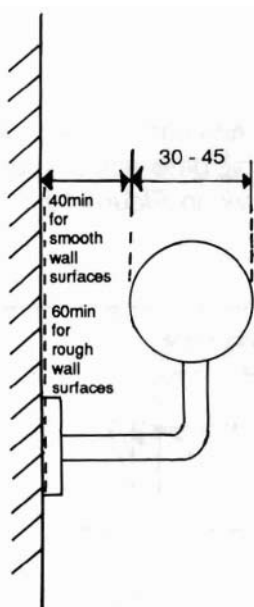


Figure 14a
Handrails

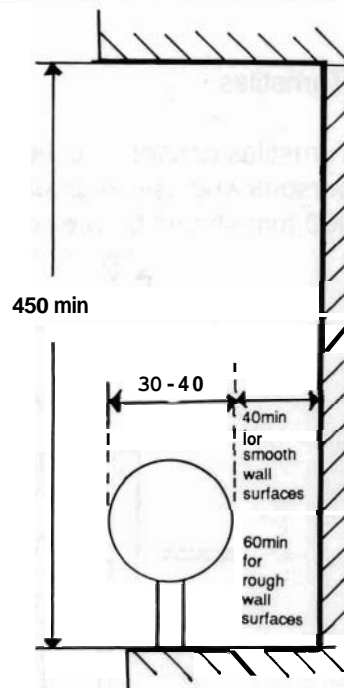


Figure 14b
Handrails in Recess

3.6.4 Grab bars shall:-

- a. be slip-resistant;
- b. have a diameter of between 30mm-45 mm, or a shape that provides an equivalent gripping surface; and
- c. have a space of 40mm-50 mm between the wall and grab bar where mounted adjacent to a wall.

3.6.5 Structural Strength

Grab bars shall be installed to resist a force of at least 1.3KN applied vertically or horizontally.

3.6.6 Safety

The grab bars and adjacent surfaces shall be free of any sharp or abrasive elements.

3.7 KERB RAMPS AT WALKWAYS AND PEDESTRIAN CROSSINGS

3.7.1 General

Kerb ramps :-

- do not require handrails;
- should not project onto a road surface;
- shall be located or protected to prevent obstruction by parked vehicles; and
- shall be free from any obstruction e.g. signposts, traffic lights or the like.

3.7.2 The gradient of a kerb ramp shall not be steeper than 1:10.

3.7.3 The width of a kerb ramp shall not be less than 900 mm.

3.7.4 Where the vertical rise is greater than 150 mm, it shall constitute as a ramp and shall conform with Clause 3.8.

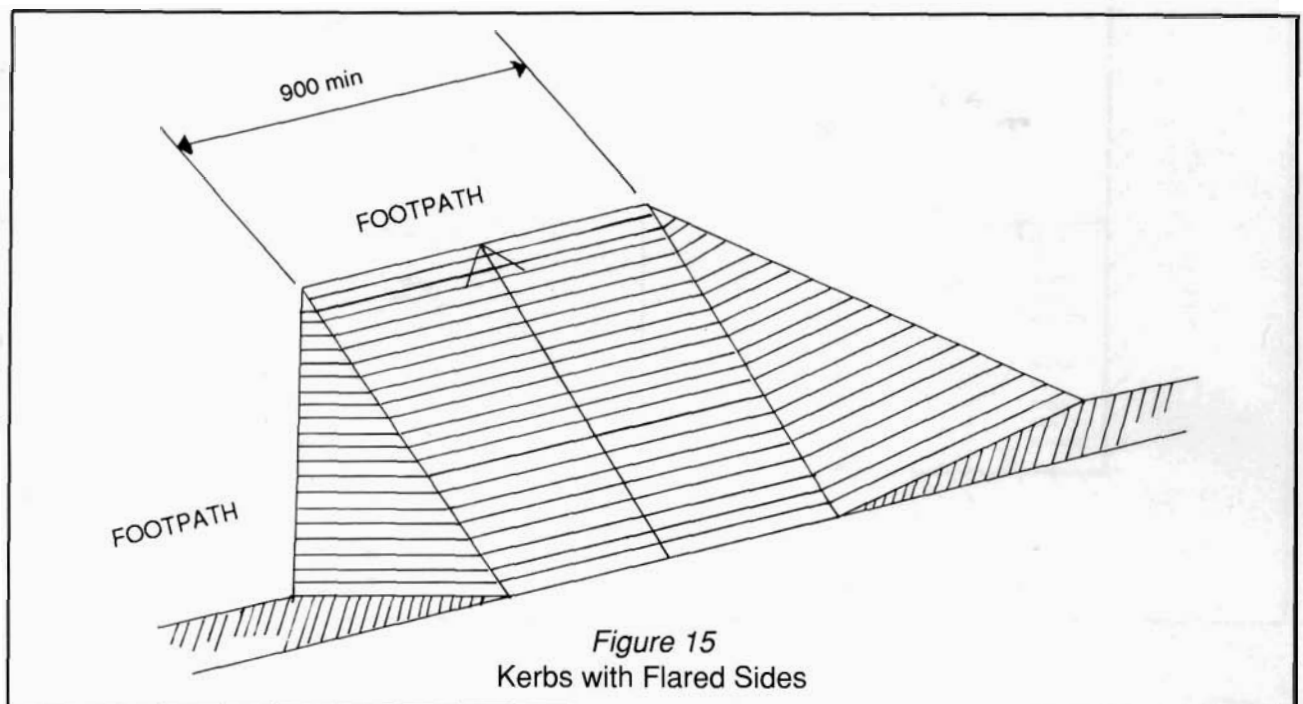
3.7.5 Kerb surfaces shall be slip-resistant.

3.7.6 Outdoor Conditions

The approach shall be designed so that water will not accumulate on the walking surfaces.

3.7.7 Flared Sides

- Kerb ramps shall have flared sides where pedestrians are likely to walk across them as shown in *Figure 15*.
- The gradient of the flared side shall not be steeper than 1:10.

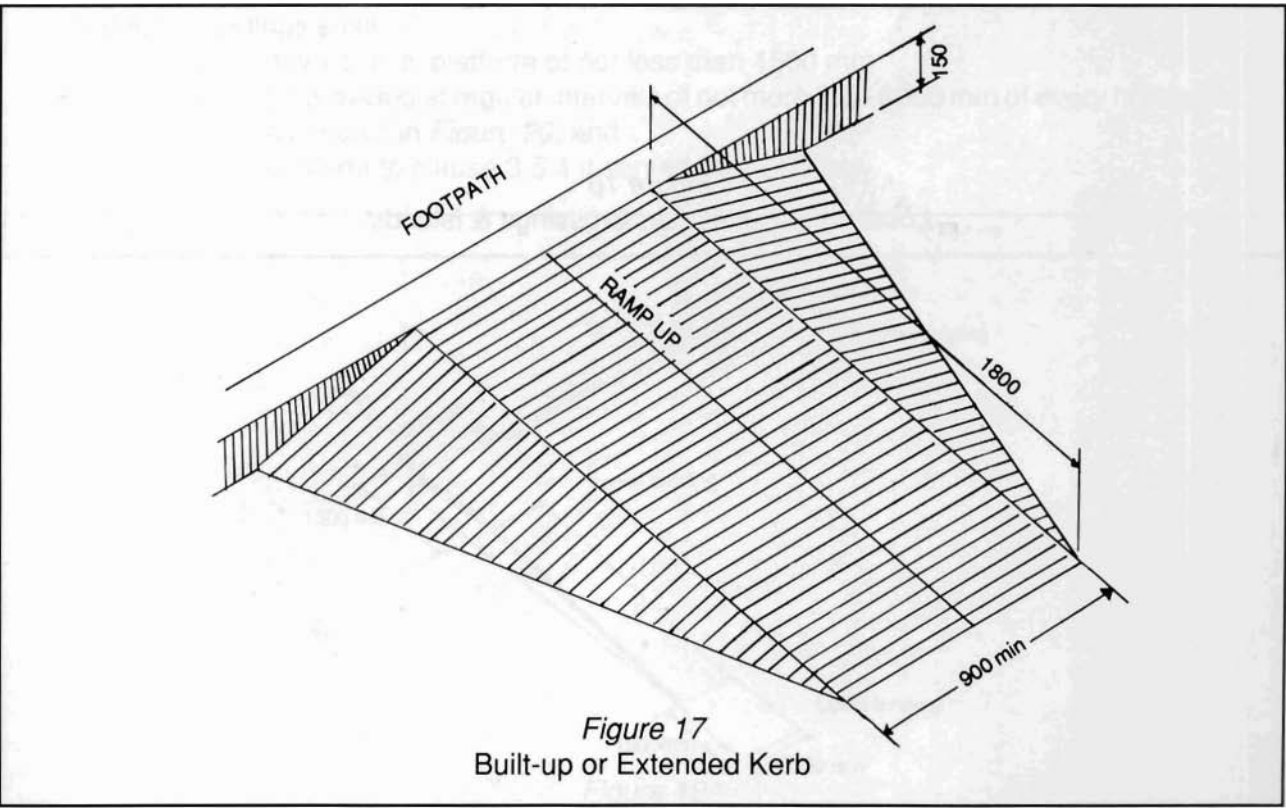
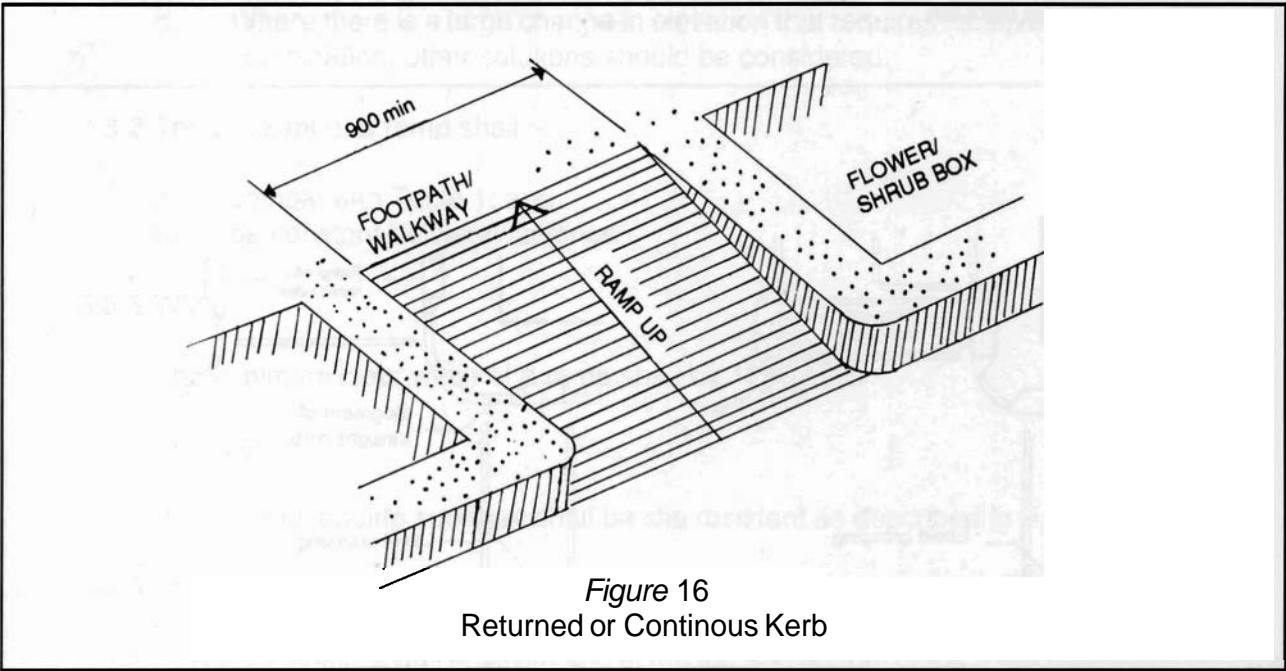


3.7.8 Continuous/Returned Kerbs

Kerb ramps with returned/continuous kerb as shown in *Figure 16* are an alternative approach that can be used where pedestrians would not be expected to walk across the ramp.

3.7.9 Built-up/Extended Kerbs

Built-up or extended kerb ramps as shown in *Figure 17* are not recommended if it projects into a roadway as it is dangerous to users and obstructive to vehicles.



3.7.10 Location at Pedestrian Crossing

Kerb ramps at pedestrian crossings shall be wholly contained within the area designated for pedestrians' use as shown in *Figure 18*.

3.7.11 Islands

Raised islands in crossings shall :-

- be cut through and level with the street as shown in *Figure 18*; or
- have kerb ramps at both sides and have a level area not less than 1200 mm long in the middle.

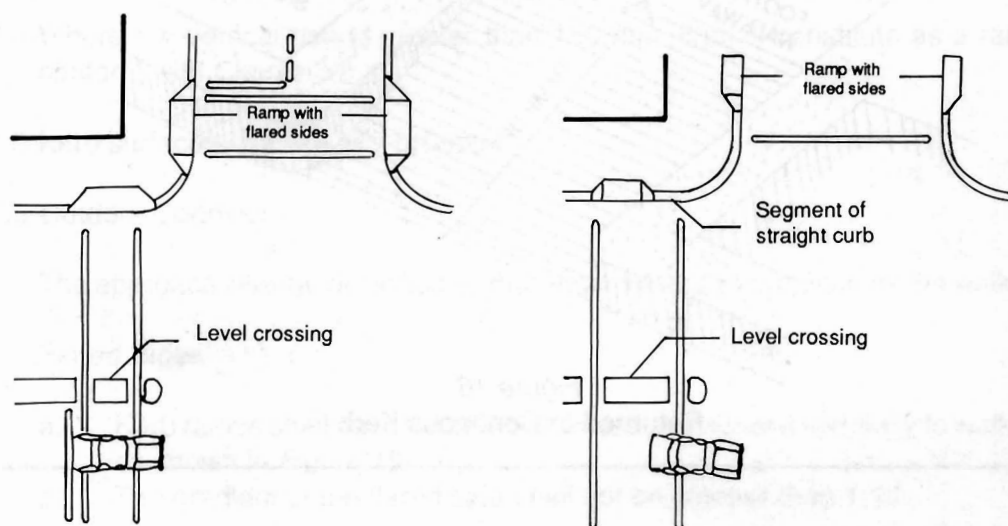


Figure 18
Location at Pedestrian Crossings & Islands

3.8 SLOPE RAMPS

3.8.1 General

- a. Ramps allow persons in wheelchairs to move from one level to another. However, many ambulant persons with disabilities negotiate steps more easily and safely, thus accessibility by both steps and ramps is preferred.
- b. Where the horizontal run of the approach ramp exceeds 9000 mm in length, an alternative stepped approach as described in clause 3.9, in addition to the ramp approach, may be provided for the ambulant disabled and shall not exceed 1200 mm.
- c. Where there is a large change in elevation that requires multiple ramps and landing combination, other solutions should be considered.

3.8.2 The gradient of a ramp shall :-

- a. comply with Table 1; and
- b. be constant between landings.

3.8.3 Width

The minimum clear width of a ramp shall be 1200 mm.

3.8.4 Surfaces

Ramps and landing surfaces shall be slip resistant as described in *Appendix B*.

3.8.5 Landings

3.8.5.1 Ramps shall have a level landing at the top and bottom of each run and also where the run changes direction as shown in *Figure 19*.

3.8.5.2 Landings shall :-

- a. have a level platform of not less than 1500 mm;
- b. be provided at regular intervals of not more than 9000 mm of every horizontal run as shown in *Figure 20*; and
- c. conform to clause 3.5.4 if served by a doorway.

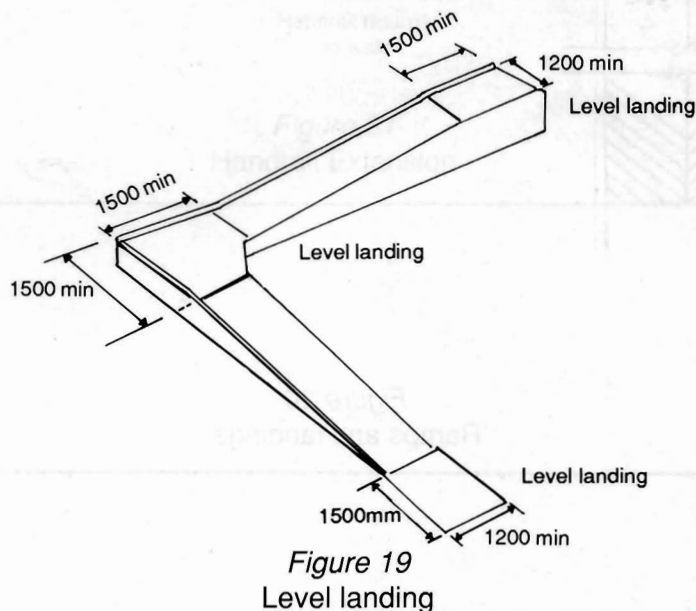


Figure 19
Level landing

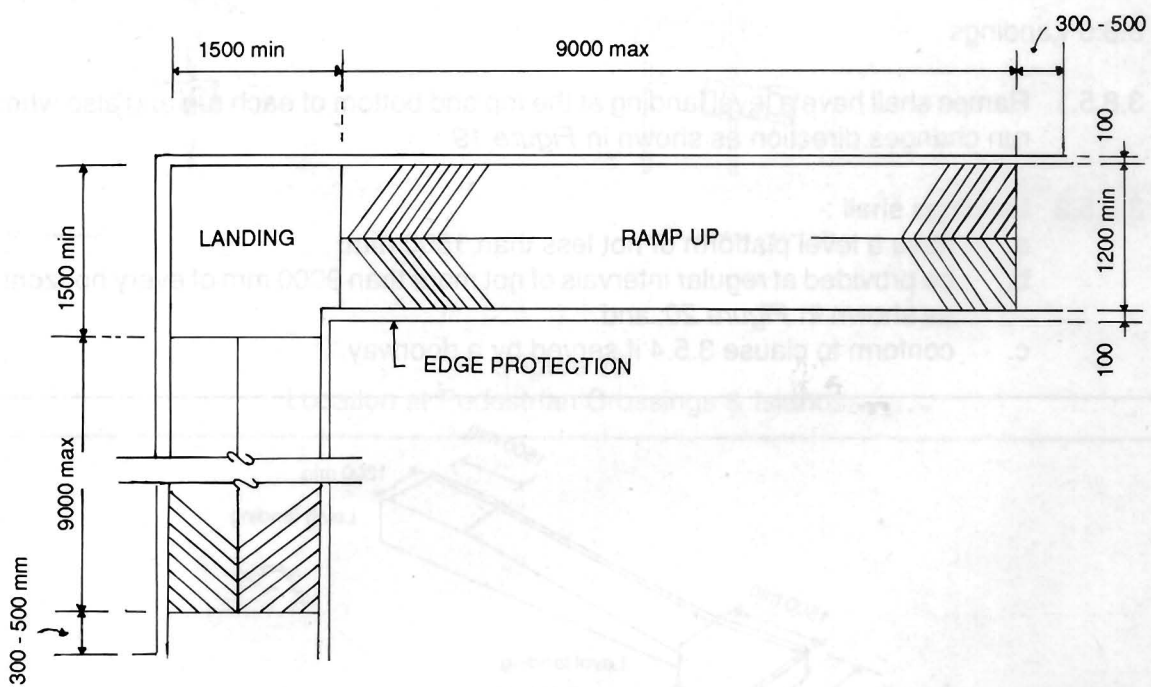
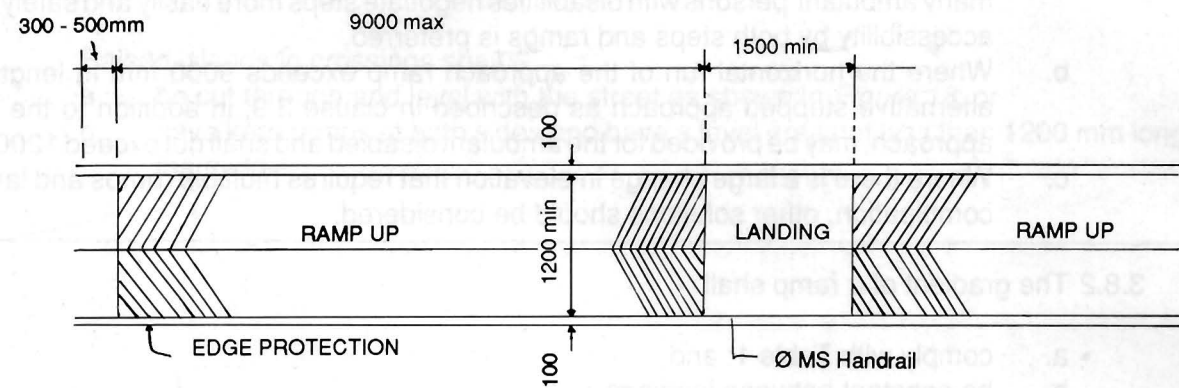


Figure 20
Ramps and landings

3.8.6 Ramp Handrails

- 3.8.6.1 A ramp run with a rise greater than 150 mm, shall have handrails that
- are on both sides;
 - comply with Clause 3.6.2; and
 - are placed at a height of between 800 mm and 900 mm above the floor level.
- 3.8.6.2 Handrail extensions as shown in *Figure 21* :-
- shall extend horizontally for a distance of not less than 300 mm beyond the top and bottom of the ramp to provide support for persons who may need help to negotiate the ramp; and
 - should not project into another path of travel.

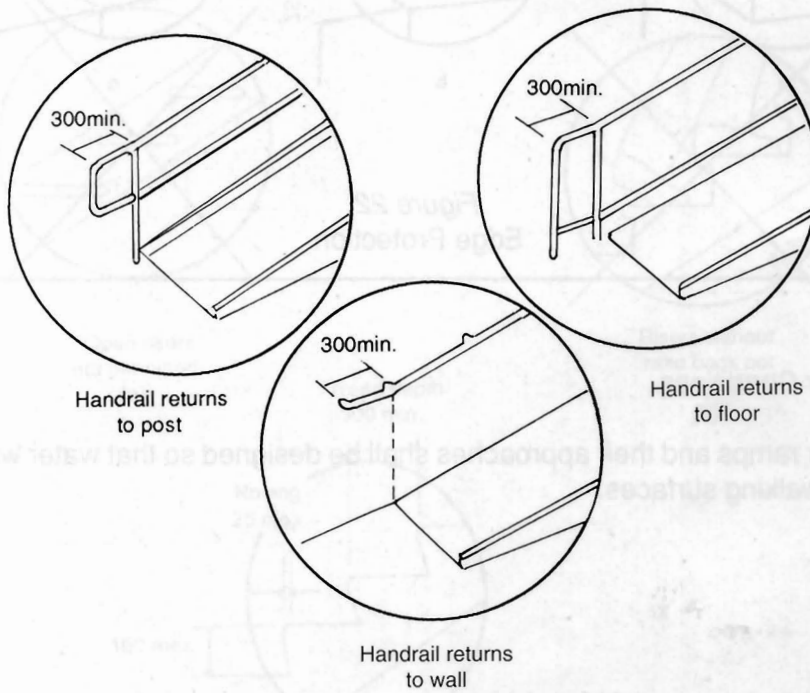


Figure 21
Handrail Extension

3.8.7 Edge Protection

Ramps and landings not adjacent to a wall shall have an edge protection such as :-

- a kerb with a minimum height of 75 mm as shown in *Figure 22a*;
- a raised barrier with its lower edge not more than 75 mm from the ramp or landing surface as shown in *Figure 22b*; or
- a rail with the bottom edge not more than 75 mm from the ramp or landing surface as shown in *Figure 22c*.

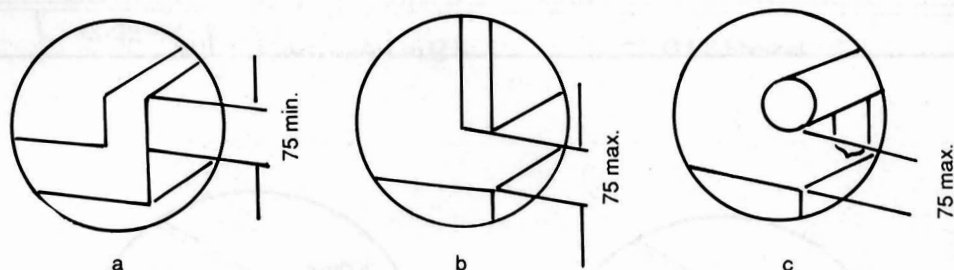


Figure 22
Edge Protection

3.8.8 Outdoor Conditions

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

3.9 STAIRS

3.9.1 In public buildings, at least one of the staircases should be designed to comply with clauses 3.9.2 to 3.9.4.

3.9.2 Threads and Risers

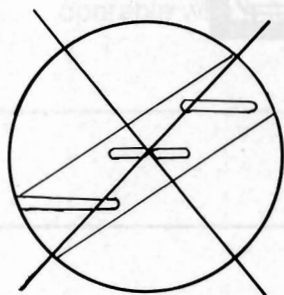
A flight of steps shall have:-

- uniform riser of 150 max and threads of 300 min; and
- no open risers as shown in *Figure 23a*.

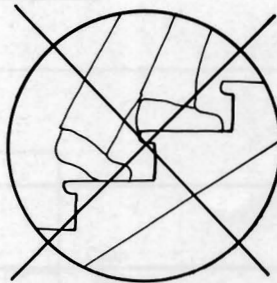
3.9.3 Nosings

Nosings shall

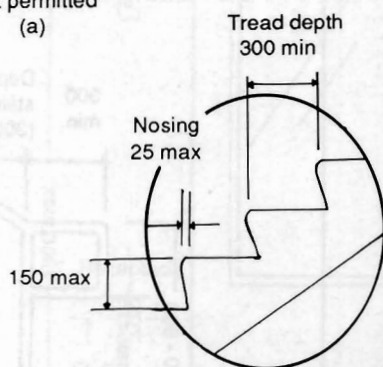
- have no abrupt undersides as shown in *Figure 23b*; and
- project not more than 25 mm over the back edge of the step as shown in figure 23c.



Open risers
not permitted
(a)



Risers without
rake back not
permitted
(b)



(c) Acceptable treads and risers

Figure 23
Stair Detail

3.9.4 Stair handrails

Handrails for stairs shall :-

- a. comply with Clause 3.6.2;
- b. be installed on both sides as shown in *Figure 24*;
- c. have their tops between 800 mm and 900 mm from the stair nosing; and
- d. be continuous throughout the entire length and extend not less than 300 mm beyond the top and bottom step as shown in *Figure 25*.

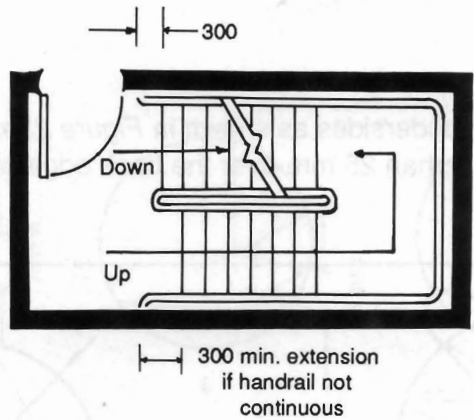


Figure 24
Handrail in stairway

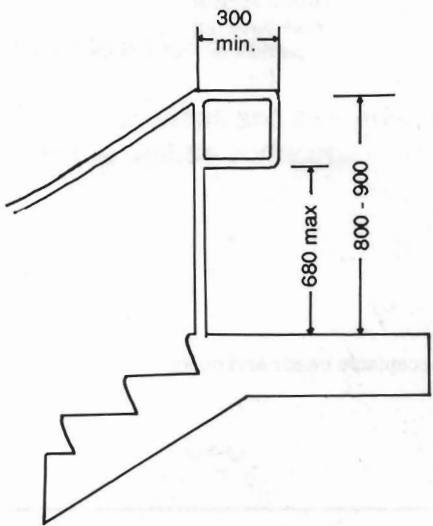


Figure 25a
Handrail extension at top of stairs

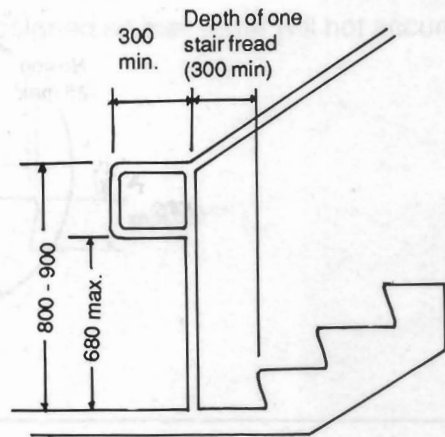


Figure 25b
Handrail extension at bottom of stairs

3.10 CONTROLS AND OPERATING MECHANISM

3.10.1 Floor Space

A clear and level floor space of at least 900 mm x 1200 mm should be provided at controls, operating mechanisms such as dispensers and receptacles designated for use by disabled persons.

3.10.2 Electrical Controls and Outlets

The operable part of controls such as vending machines, electrical switches, wall sockets and intercom buttons should be :-

- located adjacent to a clear floor space that has a minimum width of 900 mm;
- located at a height of between 600 mm to 1200 mm from the floor with the exception of vending machines and car park auto pay machines where the upper limit of the controls shall not extend beyond 1300 mm from the floor level as shown in *Figure 26*;
- operable by one hand;
- of a type that does not require tight grasping, pinching or twisting of the wrist; and
- operable with a force less than 22N.

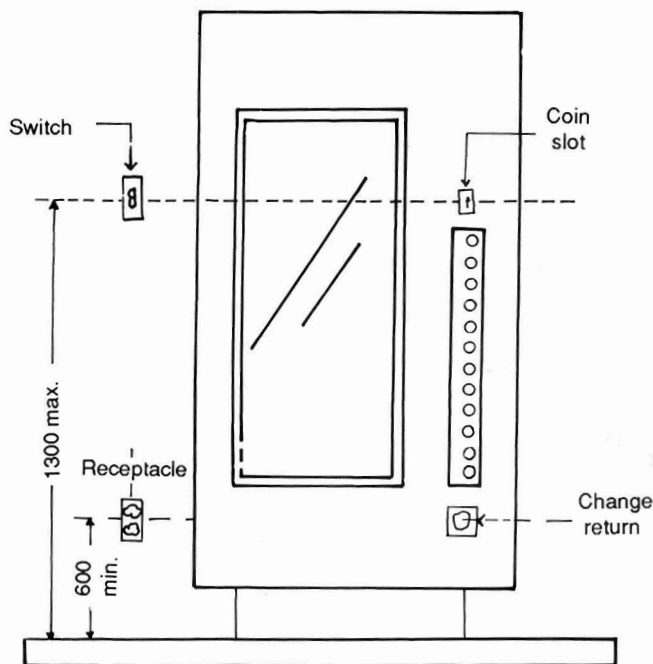


Figure 26
Vending Machine/Car Park Auto Pay Machine

APPENDIX D

NEGOTIATING DOOR IN A PASSAGEWAY

From Position 1, the wheelchair must move to Position 3 so that the user can reach the door latch and swing the door open. Since lateral shift of the rear drive wheels of a wheelchair cannot be achieved in straight travel other than by turning, the chair must follow the track 1 to 2 to 3.

After swinging the door open, the chair needs to be backed and turned to position 4 and then follow track 5 to 6 to pass through the doorway.

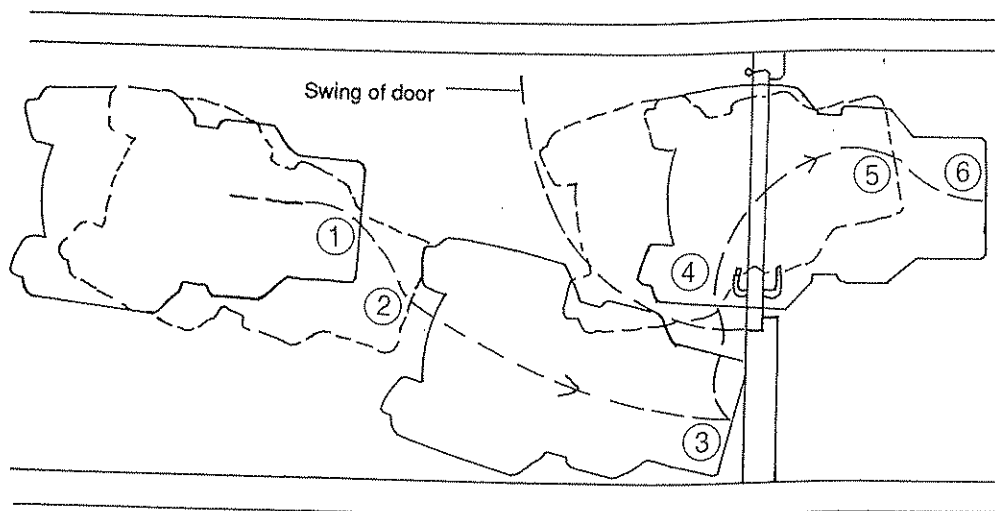
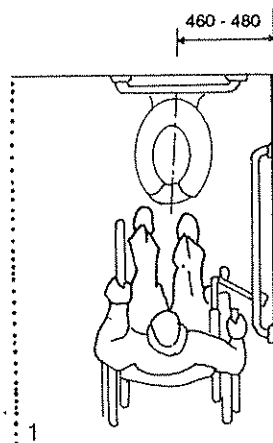
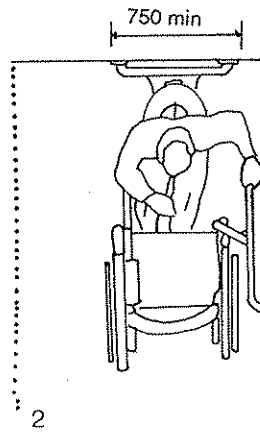


Figure D1
Positions Taken by a Wheelchair When Negotiating
Door in a Passageway



Takes transfer position, removes armrest, sets brakes.

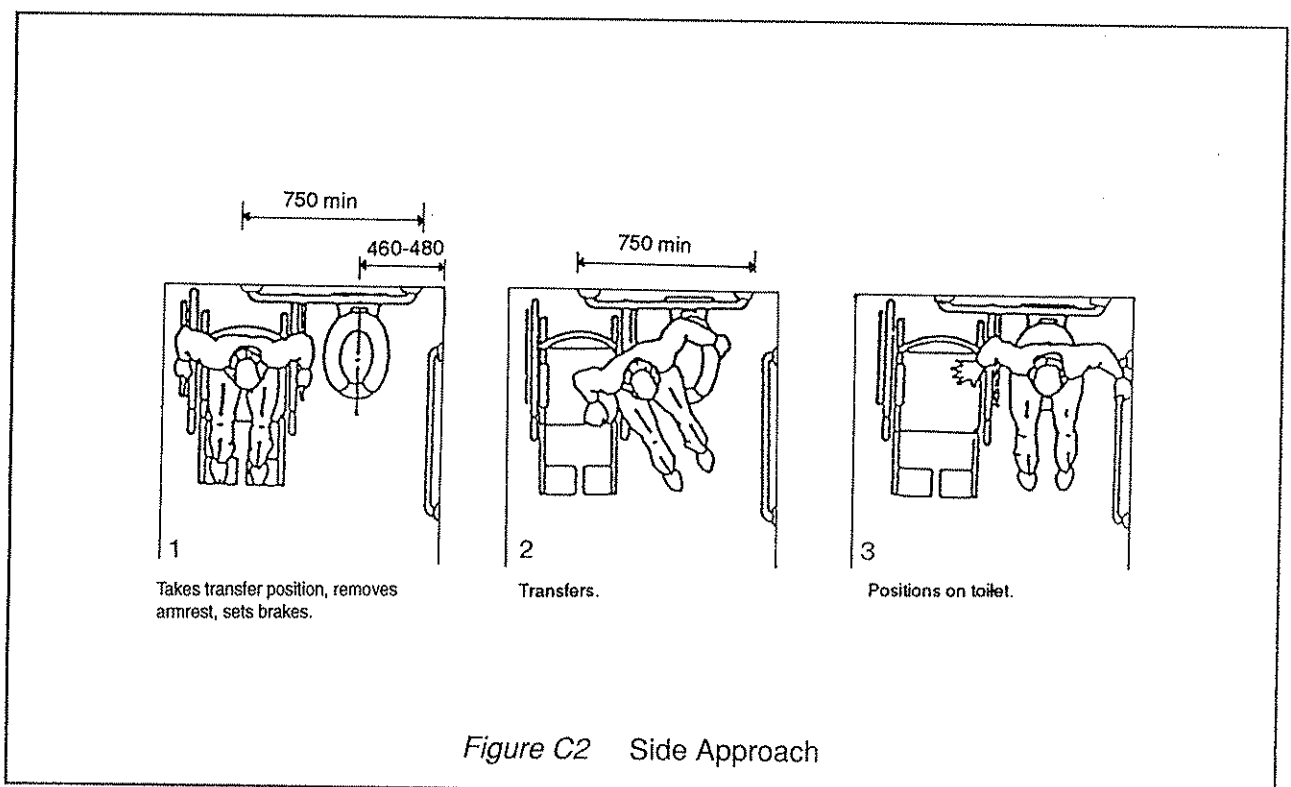
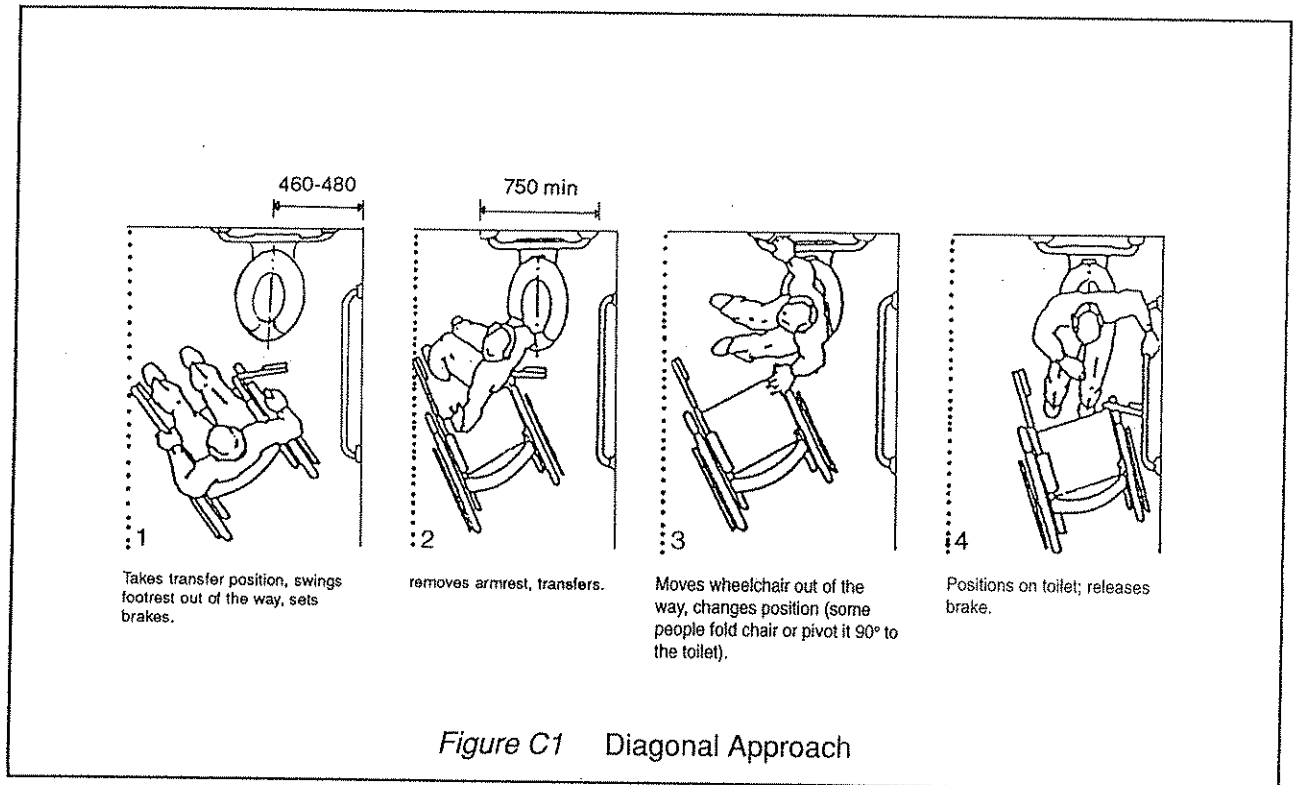


Transfers and positions on toilet

Figure C3 Frontal Approach

APPENDIX C

GUIDELINES FOR WHEELCHAIR TRANSFER



APPENDIX B

SLIP-RESISTANCE OF FLOOR FINISHES

Note : This Appendix is not a mandatory part of this Code.

TABLE B1
Slip-Resistance of Typical Flooring Surfaces.

Material	Slip-resistance		Remarks
	Dry and Unpolished	Wet	
Clay tiles (carborundum finish)	very good	very good	May be suitable for external stairs
Carpet	very good	good	
Clay tiles (textured)	very good	good	May be suitable for external stairs
Cork tiles	very good		
PVC with nonslip granules	very good	good	
PVC	very good	poor to fair	Slip-resistance when wet may be improved if PVC is textured. Edges of sheet liable to cause tripping if not fixed firmly to base.
Rubber (sheets or tiles)	very good	very poor	Not suitable near entrance doors.
Mastic asphalt	good	good	
Vinyl asbestos tiles	good	fair	
Linoleum	good	poor to fair	Edges of sheets may cause tripping if not securely fixed to base.
Concrete	good	poor to fair	If a textured finish or a non-slip aggregate is used, slip-resistance value when wet may be increased to good.
Granolithic	good	poor to fair	Slip-resistance when wet may be improved to good by incorporating carborundum finish.
Cast iron	good	poor to fair	Slip-resistance may be acceptable when wet if open treads used.
Clay tiles	good	poor to fair	Slip-resistance when wet and polished very poor.
Terrazzo	good	poor to fair	Nonslip nosing necessary on stairs. Slip-resistance when polished or if polish is transferred by shoes from adjacent surfaces very poor.

* Very good means surface suitable for areas where special care is required, approximates to c.o.f. > 0.75.

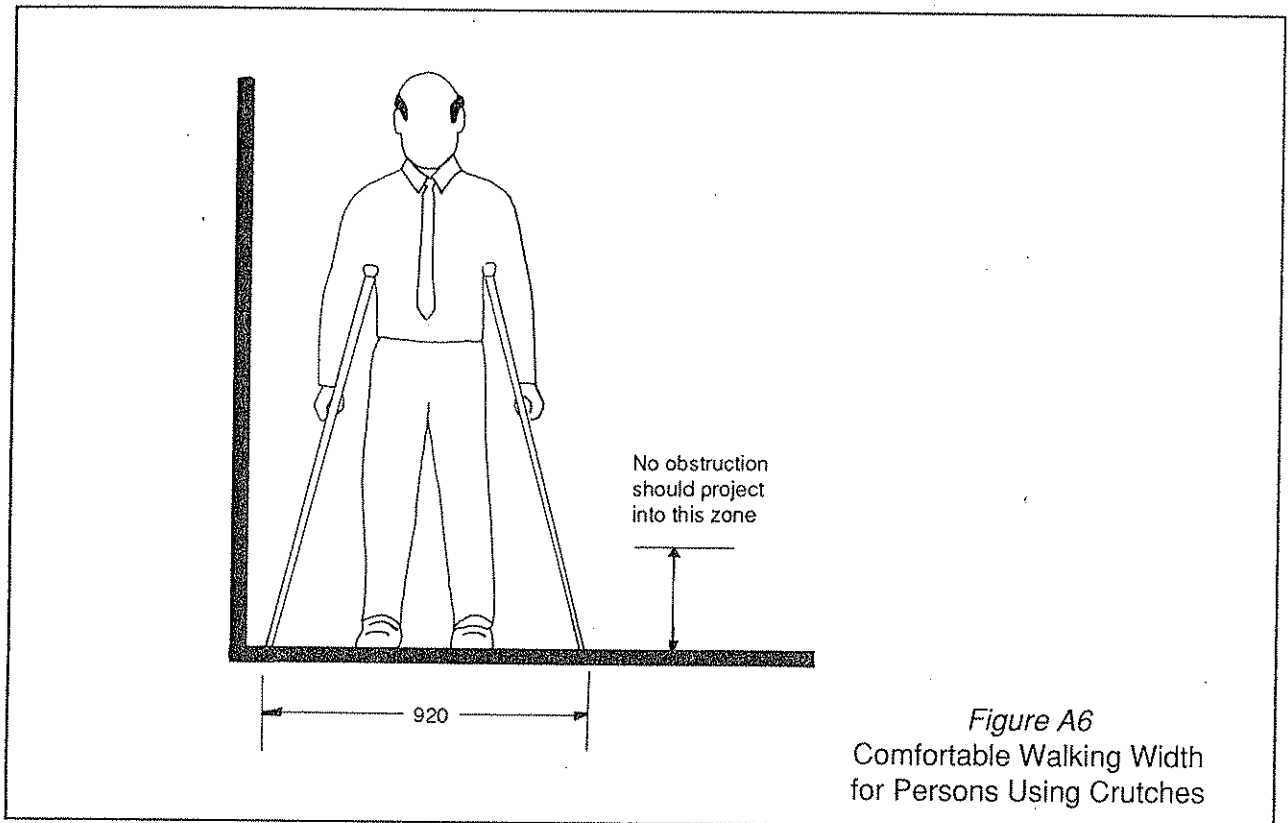
* Good means surface satisfactory for normal use, approximates to c.o.f. $0.4 < 0.75$.

* Poor to Fair means surface below acceptable safety limits, approximates to c.o.f. $0.2 < 0.4$.

* Very Poor means surface unsafe, approximates to c.o.f. < 0.2.

A4. WALKWAY WIDTHS FOR PERSONS USING CRUTCHES

Although people who use walking aids can manoeuvre through door openings of 900 mm clear width, they need wider passageways or walkways for comfortable gaits as shown in *Figure A6*. Crutch tips, often extending down at a wide angle, are a hazard in narrow passageways where they might not be seen by other pedestrians.



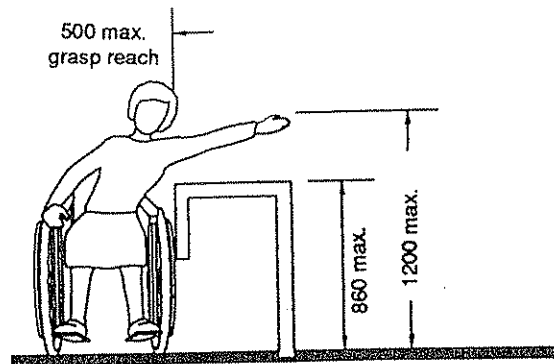


Figure A4
Side Reach Over Obstruction

A3. WHEELCHAIR DIMENSIONS

Figure A5 describes some of the typical dimensions of a standard wheelchair. Electric wheelchairs may be of a larger dimension, much heavier and do not have the same manoeuvrability/capability as manual wheelchairs.

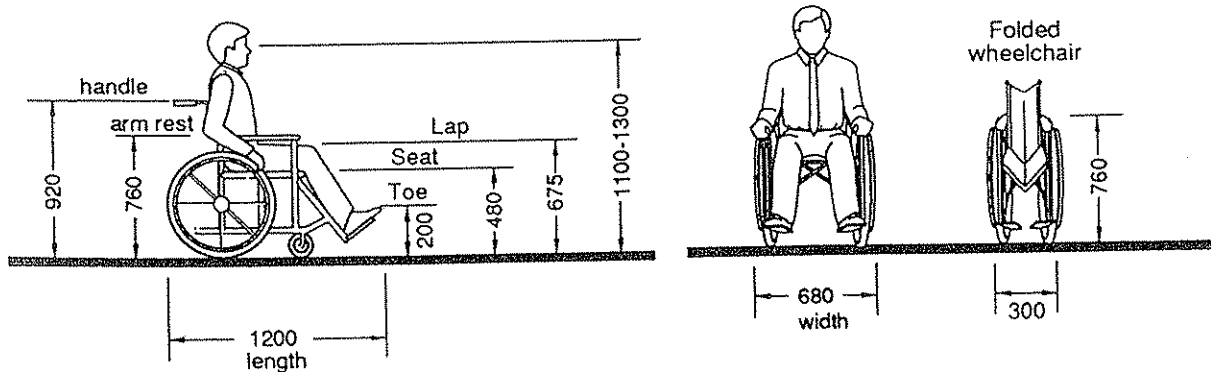


Figure A5
Typical Dimensions of Wheelchairs Commonly Used by Adults

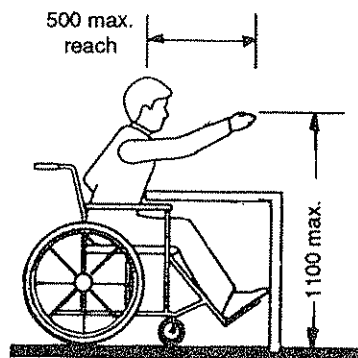


Figure A2
Forward Reach Over Obstruction

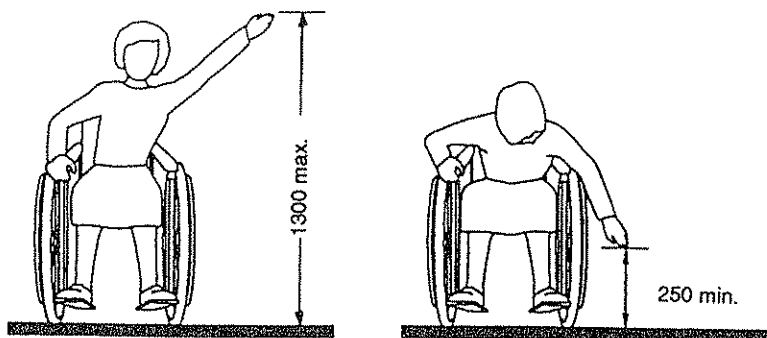


Figure A3
Side Reach Without Obstruction

APPENDIX A

ANTHROPOMETRICS

Note : This Appendix is not a mandatory part of this Code.

A1. SCOPE

This Appendix contains dimensions that can be used for guidance when designing facilities and equipment to be used by persons with disabilities.

A2. REACH RANGES FOR PERSONS IN A WHEELCHAIR

A2.1 Forward Reach

a. Without Obstruction

The maximum forward reach is 1200 mm from the floor and the minimum forward reach is 400 mm from the floor as shown in *Figure A1*.

b. Over Obstruction

The maximum forward reach over an obstruction 500 mm deep is 1100 mm from the floor as shown in *Figure A2*.

A2.2 Side Reach

a. Without Obstruction

The maximum side reach is 1300 mm from the floor and the minimum side reach is 250 mm from the floor as shown in *Figure A3*.

b. Over Obstruction

The maximum side reach over an obstruction 860 mm high x 500 mm deep is 1200 mm from the floor as shown in *Figure A4*.

Footnote :

When designing for a specific individual, the actual reach limitations should be taken into account.

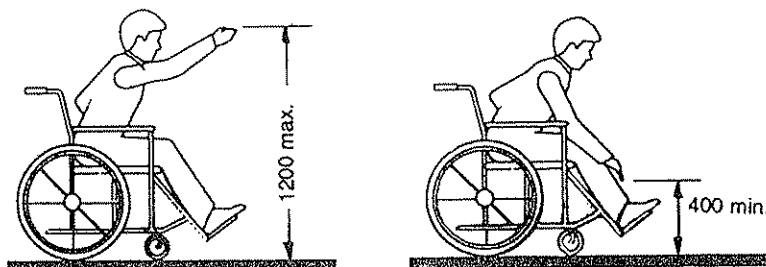


Figure A1
Forward Reach Without Obstruction

10.5 SPECIFICATIONS

- 10.5.1 The size of the characters and symbols should be based on the intended viewing distance and determined in accordance with the following :-

Viewing Distance (m)	Size (mm)
Up to 7.0	60 x 60
7.0 - 18.0	100 x 100
Above 18.0	200 x 200 to 450 x 450

- 10.5.2 The height of letters in the signs for varying viewing distances shall be determined in accordance to the following :-

Required Viewing Distance (m)	Min. height of letters (mm)
2	6
3	12
6	20
8	25
12	40
15	50
25	80
35	100
40	130
50	150

10.4 SERVICE IDENTIFICATION

The Symbol as shown in *Figure 53* shall be displayed at various facilities for disabled such as lifts, entrances, telephone booths, toilets, carpark and the like.

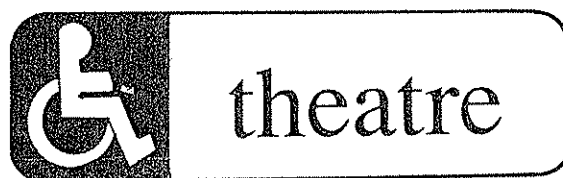
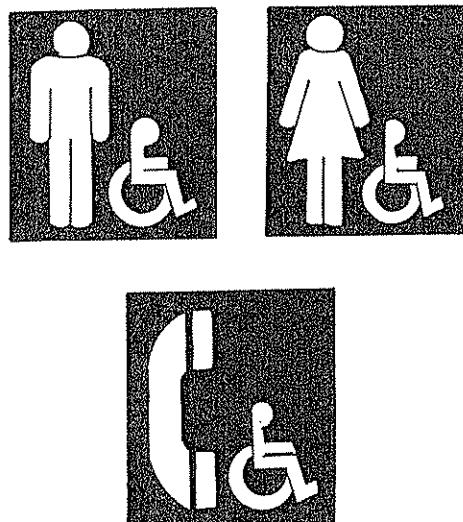


Figure 53
Service Identification at Destination

10.3 DIRECTIONAL SIGNS

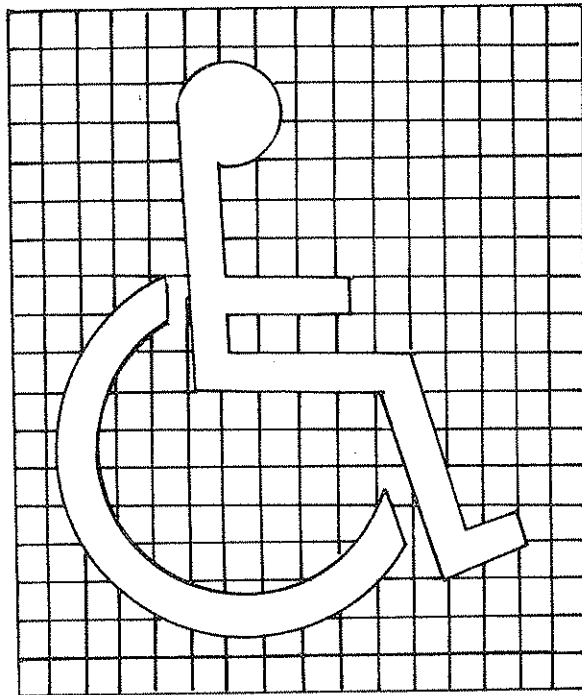
- 10.3.1 Directional signs as shown in *Figure 51* shall be displayed at main lobbies or passageways and at points where there is a change of direction to direct the disabled to the various facilities such as lifts, entrances, telephone booths, toilets, carparks, etc.
- 10.3.2 Where the location of the designated facility is not obvious or is distant from the approach viewpoints, directional signs as shown in *Figure 52* should be placed along the route leading to the facility.



Figure 51
Directional signs



Figure 52
Signs Directing to Facility



Background
squares for
reference only

Figure 50
Symbol of Access for the Disabled Person

CHAPTER 10

INTERNATIONAL SYMBOL OF ACCESS FOR THE DISABLED PERSON

10.1 GENERAL

- 10.1.1 Where a building is designed in compliance with this Code, the attention of all users shall be drawn to the facilities available in order that disabled persons are made aware of the existence of suitable provisions for them. The Symbol of Access shall be permanently and conspicuously displayed to indicate the location of the various facilities in the building.
- 10.1.2 Disabled persons may have limitations in the movement of their head, or a reduction in peripheral vision. Signs positioned perpendicular to the path of travel are easiest for them to notice. Persons can generally distinguish signs within an angle of 30° to either side of the centreline of their faces without moving their heads.

10.2 SYMBOL OF ACCESS

- 10.2.1 The form of the Symbol of Access for the Disabled Person shall comply with the following:-
- The Symbol shall consists of two elements, namely a symbolized figure in a wheelchair and a plain square background;
 - The proportional layout of the Symbol shall be in accordance with *Figure 50*;
 - The colour of the figure should be white on a blue background; and
 - The symbolized figure should face to the right.
- 10.2.2 The Symbol shall be displayed :-
- outside the building to identity buildings with accessible facilities; and
 - at areas where facilities are provided for people with disabilities.
- 10.2.3 The Symbol shall be used to identify accessible features and facilities used by people with disabilities but shall not be limited to the wheelchair user.

9.7 ACCESSIBLE ENTRANCE

Accessible entrances shall be levelled or have a kerb ramp complying with Clause 3.7 leading to the entrance of the building as shown in *Figure 49*.

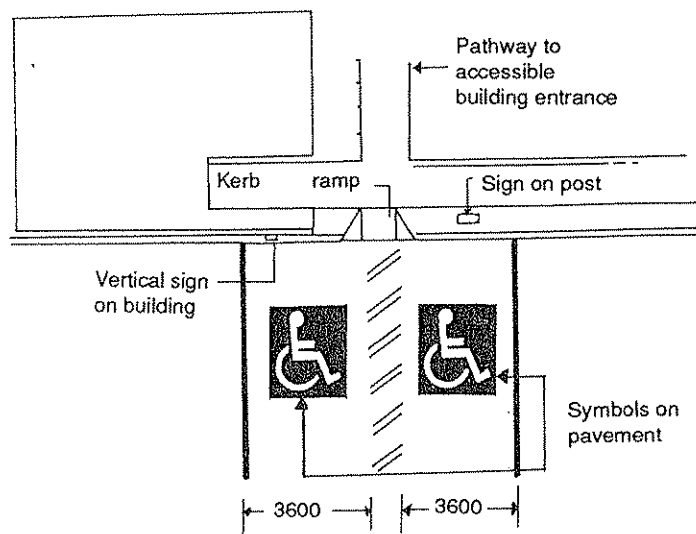


Figure 49
Access Level

9.8 CAR PARK AUTO PAY MACHINE

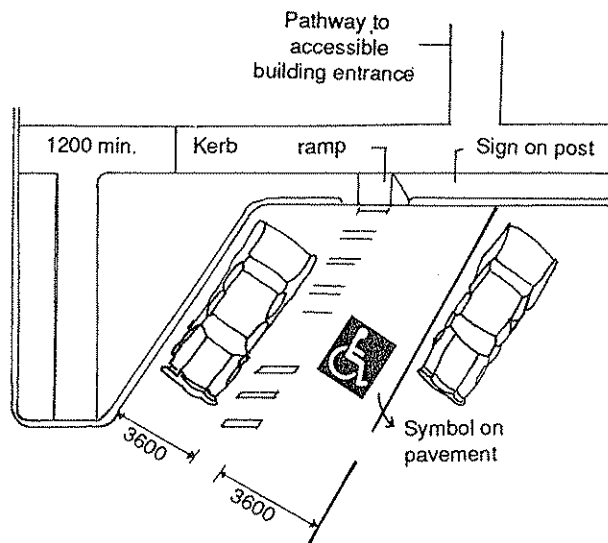
Such machines shall :-

- be located on the same level as the accessible car parking lots; and
- have the operable parts complying with Clauses 3.10.1 and 3.10.2.

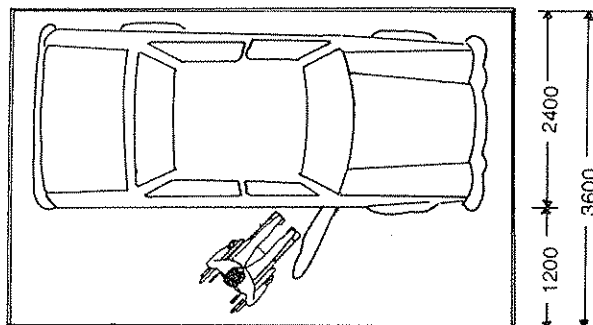
9.6 ACCESSIBLE CAR PARKING LOTS

The accessible car parking lots shall :-

- have dimensions of 4800 mm x 3600 mm as illustrated in *Figure 48*;
- have a firm, level surface without aeration slabs; and
- wherever possible, be sheltered.



(a) Parking Lot, Directional/Diagonal to Kerb



(b) Reverse Parking Lot

Figure 48

9.2 USAGE

The accessible parking lots shall be used by drivers and/or riders with disabilities to park their cars or motorcycles.

9.3 SYMBOL

9.3.1 The Symbol of Access shall be clearly marked on the accessible parking lot(s) for drivers/riders with disabilities only.

9.3.2 The Symbol painted on the designated lot shall comply with Clause 10.2 and the following :-

- a) a square with dimensions of at least 1000 mm but not more than 1500 mm in length;
- b) be located in the centre of the lot; and
- c) the colour of the Symbol shall be white on a blue background.

9.4 CAR PARK ENTRANCE

Car park entrance shall have a height clearance of at least 2000 mm.

9.5 LOCATION

9.5.1 Accessible parking lots that serve a particular building shall be located nearest to an accessible entrance and/or lift lobby.

9.5.2 For a car park that does not serve a particular building, accessible parking lots shall be located nearest to and linked by an accessible walkway which shall not be part of the driveway.

9.5.3 The accessible route should not require persons in wheelchairs to pass behind vehicles that may be backing out.

CHAPTER 9

CAR PARK

9.1 SIGNAGES

- 9.1.1 The symbol shall be displayed at approaches and entrances to car parks to indicate the provision of accessible car parking lot(s) for the disabled within the parking vicinity.
- 9.1.2 Directional signs as shown in *Figure 47* shall be displayed at points where there is a change of direction to direct the disabled to the accessible parking lot(s).
- 9.1.3 Where the location of the accessible parking lots is not obvious or is distant from the approach viewpoints, directional signs should be placed along the route leading to the accessible parking lots.
- 9.1.4 Accessible parking lots shall be identified by the Symbol of Access in accordance to Clause 9.3.1. Such signs shall not be obscured by a vehicle parked in the designated lot.



Figure 47
Directional Signs

- 9.1.5 Vertical signs shall be provided to make it readily visible.
- 9.1.6 Vertical signs shall :-
- have dimensions of at least 450 mm x 450 mm; and
 - be installed at a height of at least 1500 mm from the floor surface to the centre of the sign.

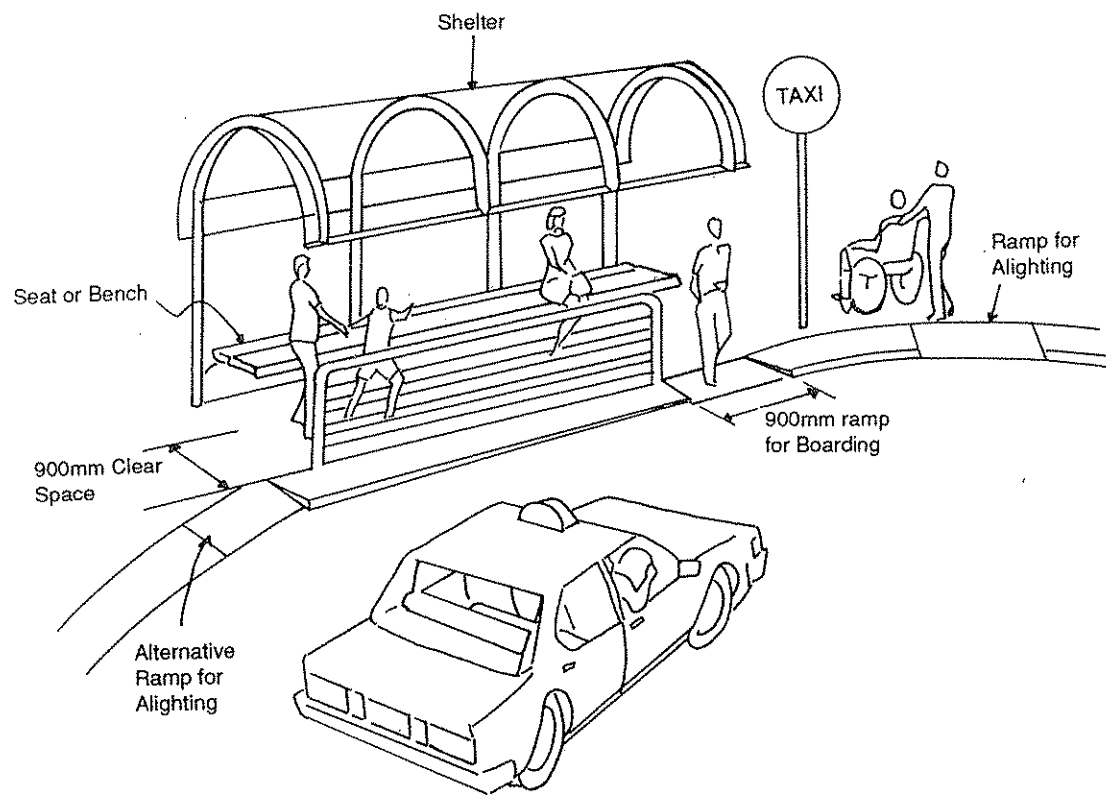


Figure 46
Taxi Stand

CHAPTER 8

TAXI STAND

8.1 GENERAL

- a. At least one accessible route shall be provided from the alighting and boarding point of the taxi stand to the walkway which leads to the accessible building entrance.
- b. The Symbol shall be installed to direct people with disabilities to an accessible entrance.

8.2 LOCATION

- a. Taxi stands should be located nearest to an accessible entrance.
- b. A taxi bay should, where possible, be provided at the level of approach for the disabled to alight and to board the vehicle.
- c. Where transfer has to be made from a vehicular surface to a pedestrian surface, the driveway, pathway or walkway shall be blended to a common level or ramped.

8.3 WIDTH

A clear passageway with a minimum width of 900 mm shall be provided.

8.4 HANDRAILS

Handrails shall :-

- a. comply with Clause 3.6.2; and
- b. be placed at a height of 900 mm from the floor level.

8.5 RAMPS

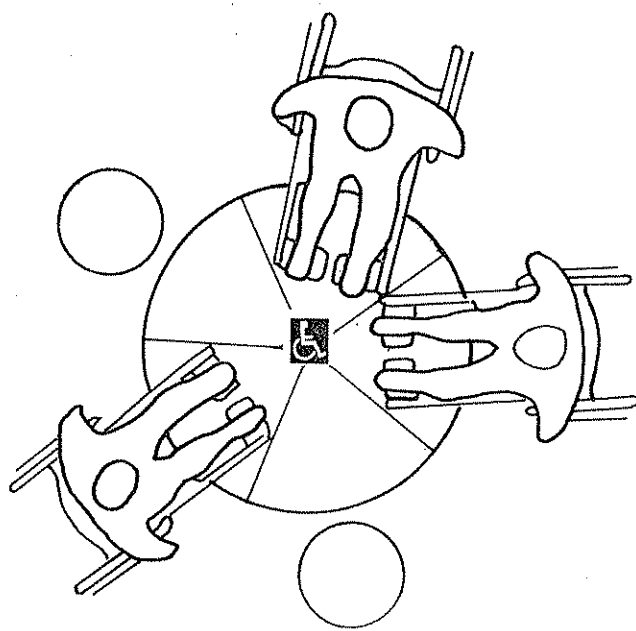
- a. Where a taxi stand is not on the same level with the walkway or pathway, it shall have two separate ramps for boarding and alighting which shall conform with Table 1 as shown in *Figure 46*.
- b. Where there are kerbs between the access aisle and the vehicle pick-up space, it shall have a kerb ramp complying with Clause 3.7.

8.6 SEATS

Seats shall be provided at the taxi stand for the ambulant disabled and these shall not impede the movement of the wheelchair user.

8.7 SHELTER

A shelter shall be provided at taxi stands for protection against the elements.



750 min. measured
along the edge

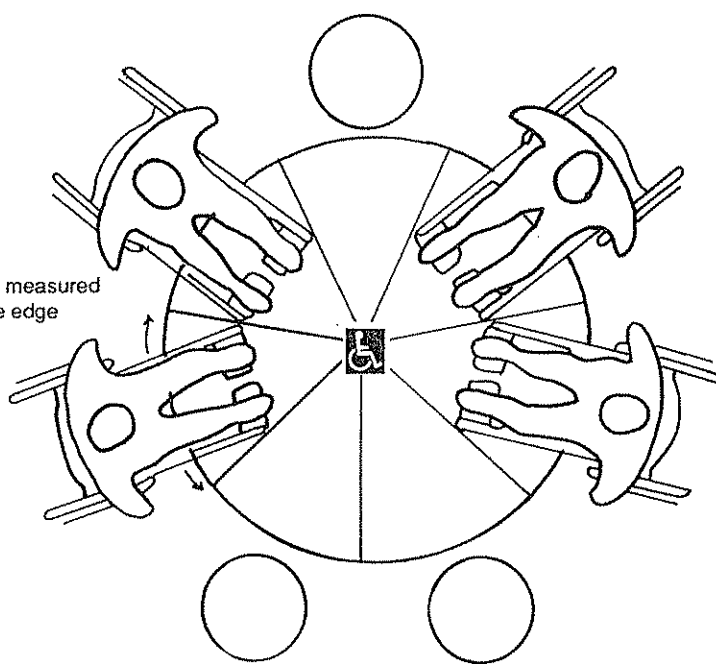
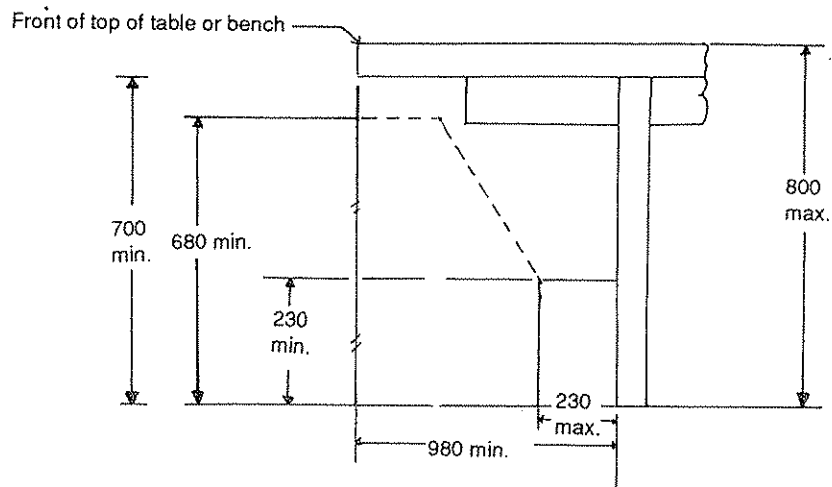
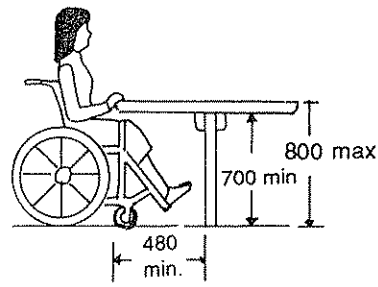


Figure 45
Seating Arrangements



Outer limit of any obstruction beneath table, bench or counter at wheelchair seating spaces

Figure 44
Table Dimensions

CHAPTER 7

EATING OUTLETS

7.1 GENERAL

Provisions of access shall be made available to people with disabilities at all eating outlets and establishments, such as hawker centres, food courts, fast food outlets and restaurants.

7.2 WALKWAYS WITHIN OUTLET

- a. A circulation path of at least 1200 mm wide shall be provided in front of the stalls.
- b. An accessible route with a minimum clear width of 900 mm shall be provided from the circulation path to the tables reserved for people with disabilities.

7.3 SEATING ARRANGEMENT

- a. The height of the table reserved for people with disabilities shall not be higher than 800 mm with a minimum clear knee space of 700 mm high and 480 mm deep as shown in *Figure 44*.
- b. Where the eating outlet or establishment is provided with fixed seats, the minimum clear space between the seats shall be 750 mm measured along the edge of the table as shown in *Figure 45*.

Footnote :

- a. Where fixed seats are provided, it is advisable to provide empty spaces between the seats to accommodate the wheelchair user.
- b. It is recommended that about 40% of the total table capacity be provided with fixed stool.
- c. The fixed seats will cater to the ambulant disabled as well as family/friends who may accompany them.

7.4 SIGNAGES

- a. Directional signs shall be displayed to direct people with disabilities to the reserved table.
- b. A symbol for disabled shall be placed on the table reserved for people with disabilities as shown in *Figure 45*.

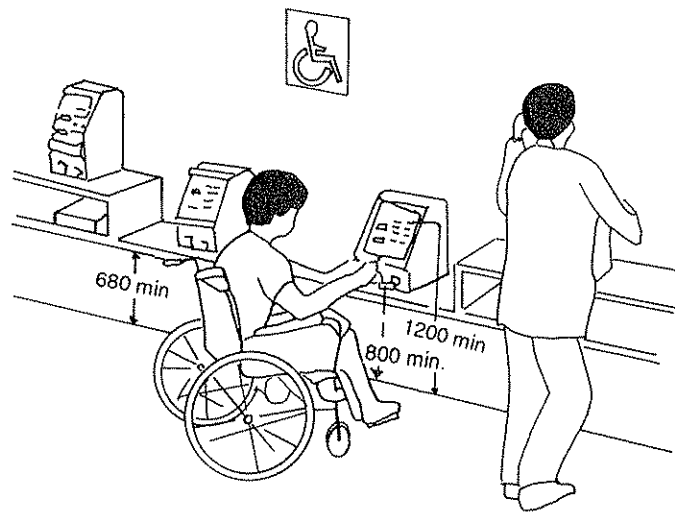


Figure 42
Counter Top Telephone

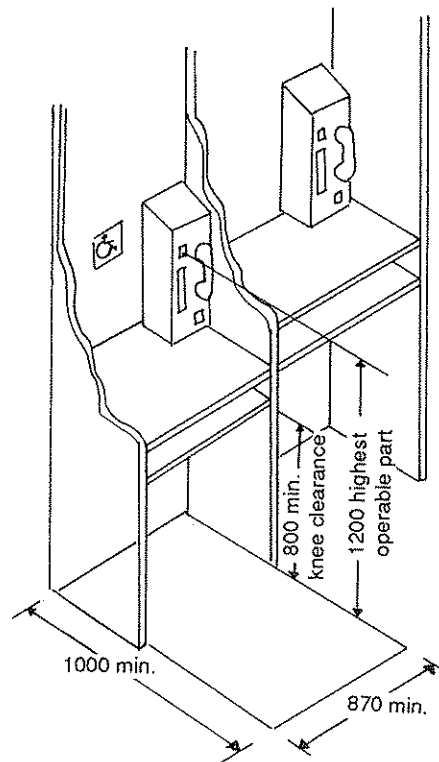


Figure 43
Telephone Booth

CHAPTER 6

PUBLIC TELEPHONE

6.1 GENERAL

- a. Where payphones are provided, at least one payphone shall be made accessible.
- b. A seat adjacent to the payphone is recommended for the ambulant disabled but shall not impede the approach by the wheelchair user to the telephone.

6.2 CLEAR FLOOR SPACE

A clear floor space of not less than 900 mm by 1200 mm shall be provided in front of the telephone booth or counter.

6.3 COUNTER TOPS

- a. Counter tops, where provided, shall be between 700 mm and 800 mm from the floor and have a minimum clear knee space of 680 mm.
- b. The depth of the counter top shall be not less than 480 mm as shown in *Figure 42*.

6.4 TELEPHONE BOOTH

- a. The opening of the telephone booth shall have a clear width of at least 870 mm.
- b. The enclosed space shall have dimensions of at least 870 mm by 1000 mm which shall not be restricted by fixed seats as shown in *Figure 43*.

6.5 HEIGHT

The height of all operable parts of the telephone shall be between 800 mm and 1200 mm.

6.6 TELEPHONE CORD

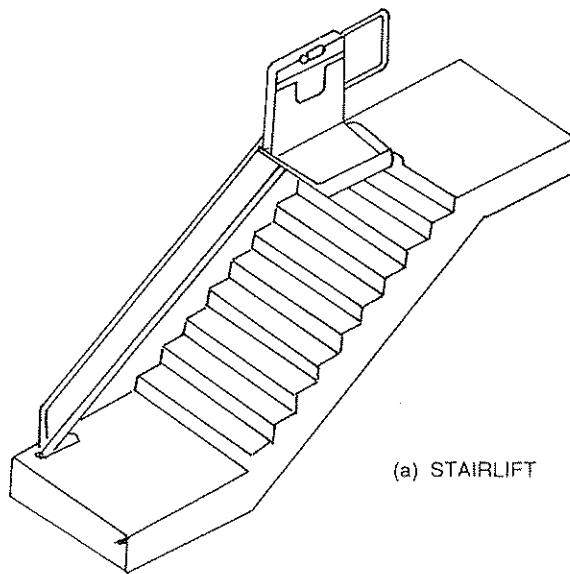
The minimum length of the telephone cord shall be 900 mm.

6.7 TELEPHONE BOOKS

Telephone books, if provided, shall be located within reach of a wheelchair user.

6.8 SIGNAGES

The Symbol shall be displayed to identify the location of such telephones.



(a) STAIRLIFT

(b) PLATFORM LIFT

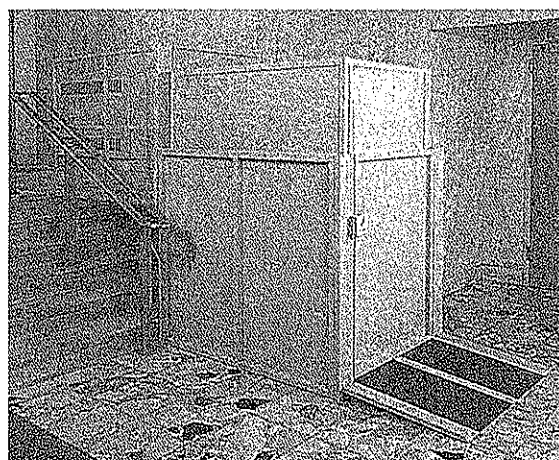
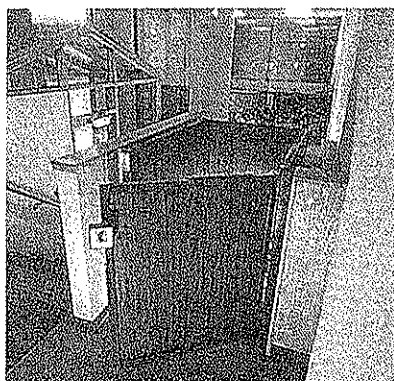


Figure 41
Stairlift and Platform Lift

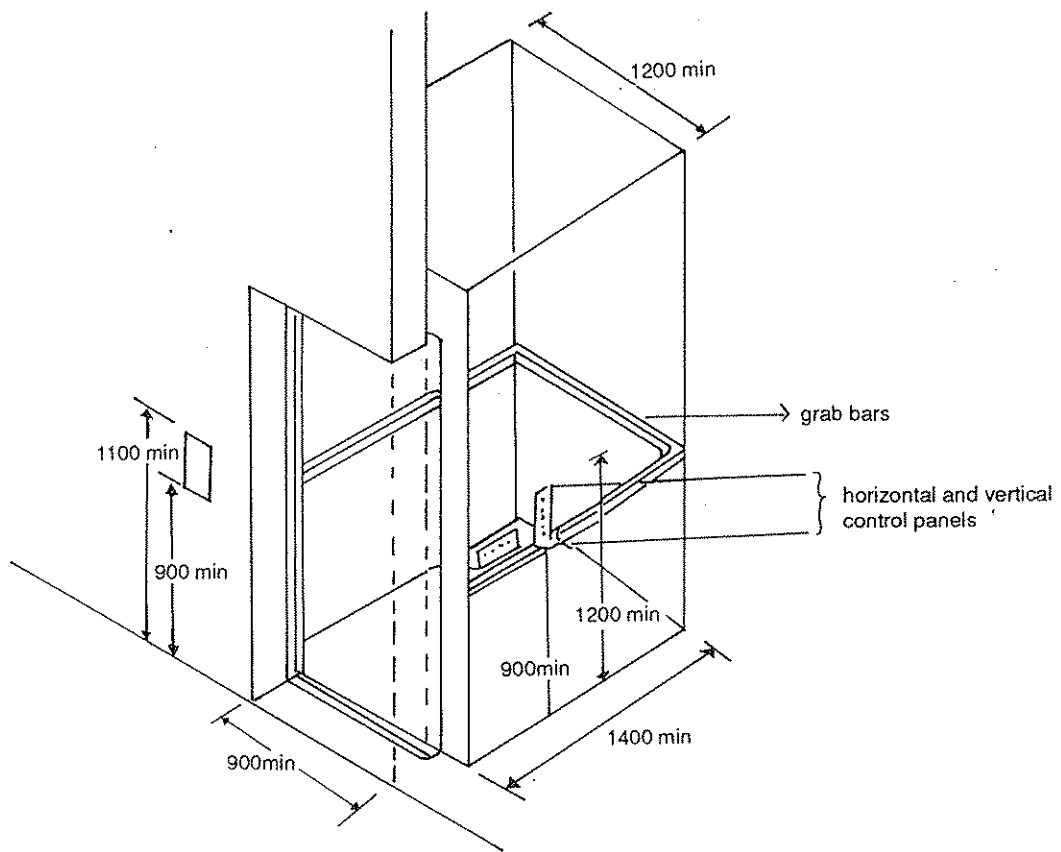


Figure 40
Lift for Disabled

CHAPTER 5

LIFT

5.1 GENERAL

- a. Where lifts are provided in a building pursuant to the Building Control Regulations (Cap 29 Reg 5), at least one lift shall be made accessible from the entrance level for vertical circulation.
- b. The lift shall serve all the levels intended for access by people with disabilities.
- c. Lifts designated for use by the disabled are illustrated in *Figure 40*.

5.2 LIFT SIZE

The minimum size of the lift shall be 1200 mm wide by 1400 mm deep.

5.3 DOOR WIDTH

The lift shall have a clear opening of not less than 900 mm.

5.4 CALL BUTTON

The call button located outside the lift shall :-

- a. have a clear floor space of at least 900 mm x 1200 mm with no obstruction placed to prevent a wheelchair user from reaching the call button; and
- b. The lift control panel may be placed vertically or horizontally, or both vertically and horizontally.

5.5 CONTROL PANEL

- a. The lift control panel shall be placed at a height of between 900 and 1200 mm from the floor level.
- b. The lift control panel may be placed vertically or horizontally, or both vertically and horizontally.

5.6 GRAB BARS

Grab bars shall:-

- a. comply with Clause 3.6.2;
- b. be placed at a height of 900 mm from the floor level; and
- c. be fixed on both sides and at the rear of the lift car.

5.7 SIGNAGES

The symbol identifying the location of such lifts shall be provided.

5.8 WHEELCHAIR STAIRLIFT AND PLATFORM LIFT

Where it is impracticable to provide a lift or a ramp, a wheelchair stairlift or platform lift as shown in *Figure 41* should be considered as a reasonable alternative for vertical circulation within the building.

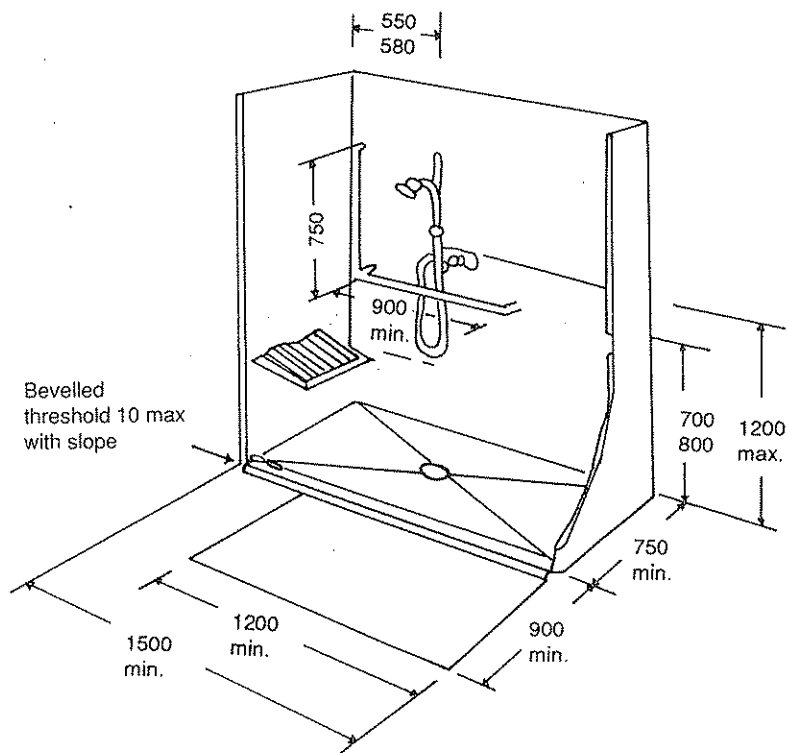
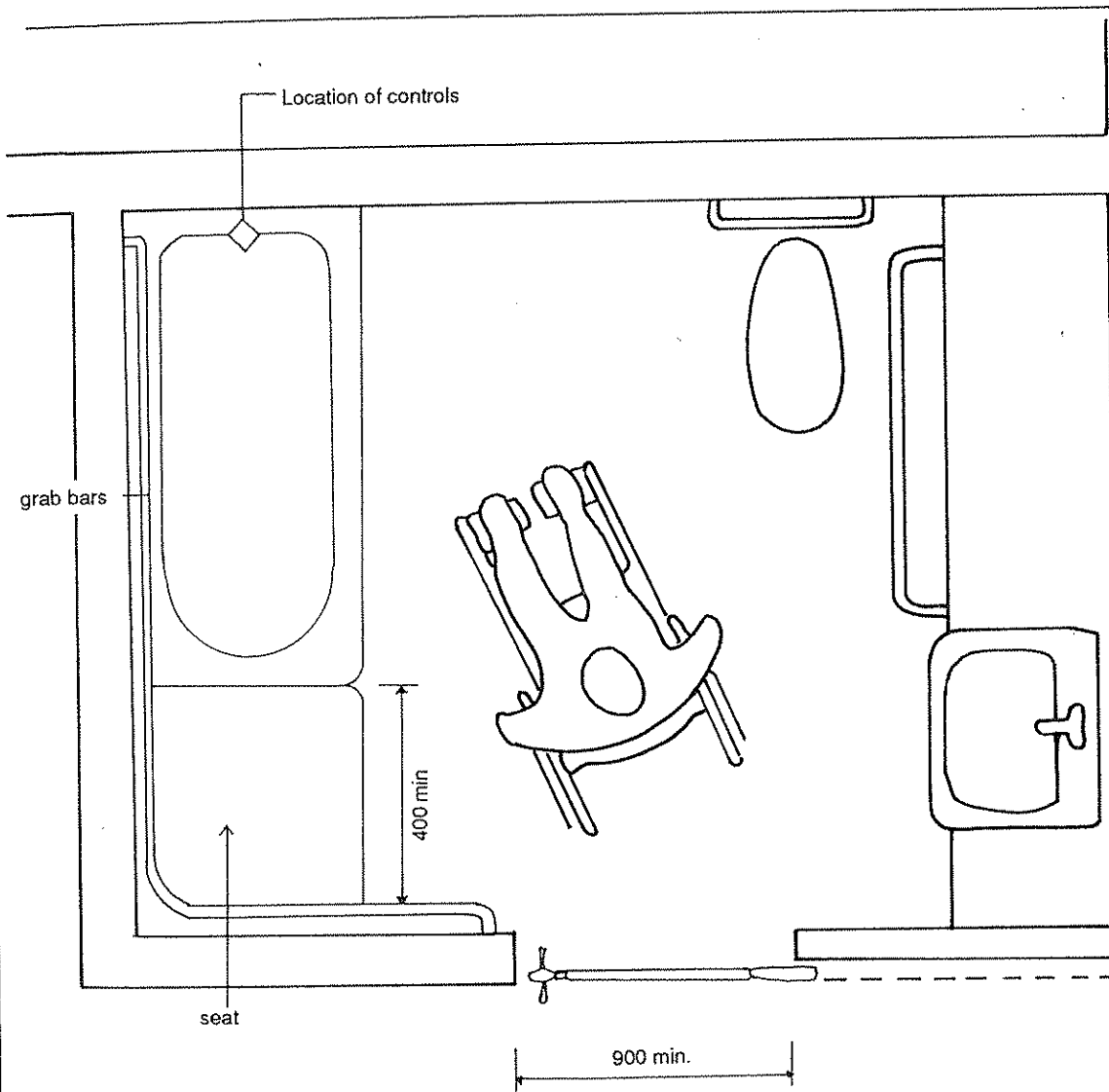


Figure 39
Roll-in Shower Stall for Wheelchair Users

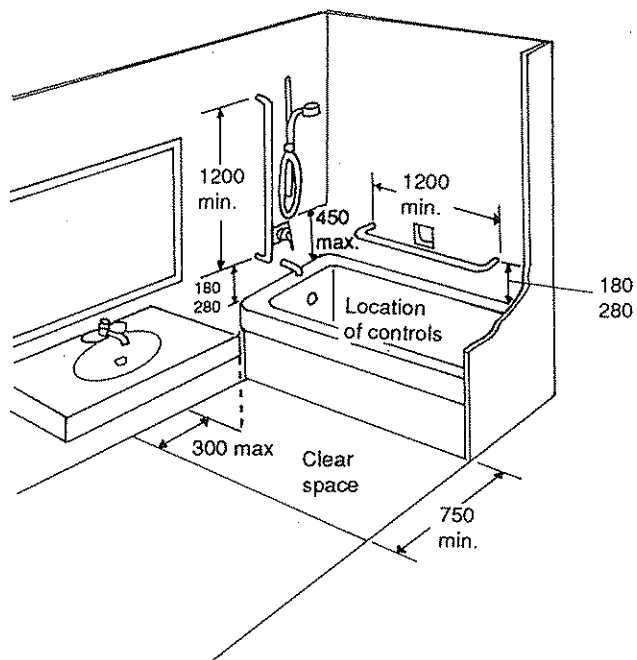
4.11.3 Roll-in Shower Stall For Wheelchair User

- 4.11.3.1 Roll-in shower stall shall have interior dimensions of at least 1500 mm x 750 mm.
- 4.11.3.2 The minimum clear floor space in front of the shower entrance shall be 1200 mm by 900 mm with the 1200 mm dimension parallel to the shower entrance as shown in *Figure 39*.
- 4.11.3.3 The floor of the roll-in shower stall shall be slip-resistant.
(See *Appendix B* for additional guidance on slip-resistance).
- 4.11.3.4 Grab bars for roll-in shower stall shall :-
- comply with Clause 3.6.4;
 - have one L-shaped bar or two grab bars in L-shaped configuration between 700 mm and 800 mm from the shower floor as shown in *Figure 39*; and
 - have one grab bar at least 750 mm long installed vertically with another at least 900 mm long mounted horizontally as shown in *Figure 39*.
- 4.11.3.5 Controls for roll-in shower stall shall comply with Clause 3.10.3 as shown in *Figure 39*.
- 4.11.3.6 A shower head shall :-
- be of the handheld type;
 - be provided with a hose not less than 1500 mm long; and
 - allow use in fixed position.
- 4.11.3.7 Where the shower head is mounted on a vertical bar, the bar shall be installed so as not to obstruct the use of grab bars.
- 4.11.3.8 Kerbs for roll-in shower stall shall not be more than 10 mm high, bevelled at a slope of 1 : 2.
- 4.11.3.9 In shower stall with a seat, the seat shall :-
- have a self-draining, non-slip seat with rounded edge;
 - be on the wall nearest to the controls;
 - have a minimum dimension of 400 mm wide extending the full depth of the stall, less a space allowed for the shower curtain; and
 - have its top 450 mm - 480 mm from the floor.
- 4.11.3.10 Enclosures for shower stalls shall not obstruct controls or obstruct transfer from wheelchairs onto shower seats.

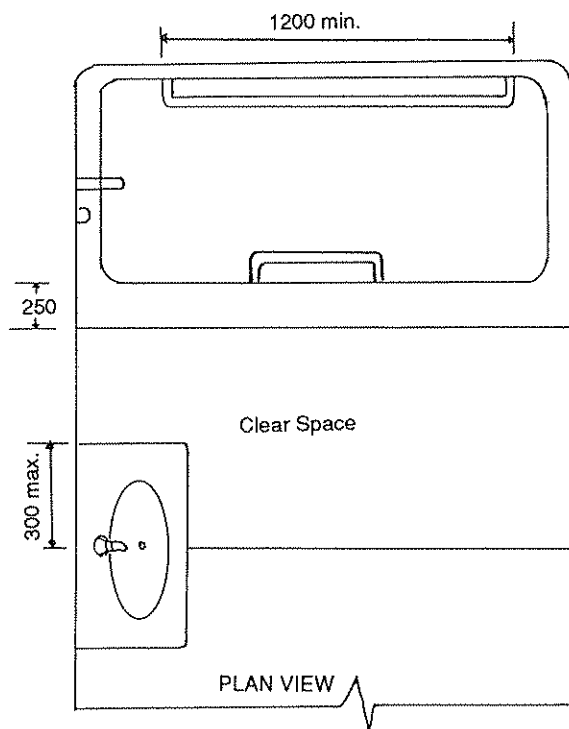


ALTERNATIVE LAYOUT PLAN OF BATHROOM

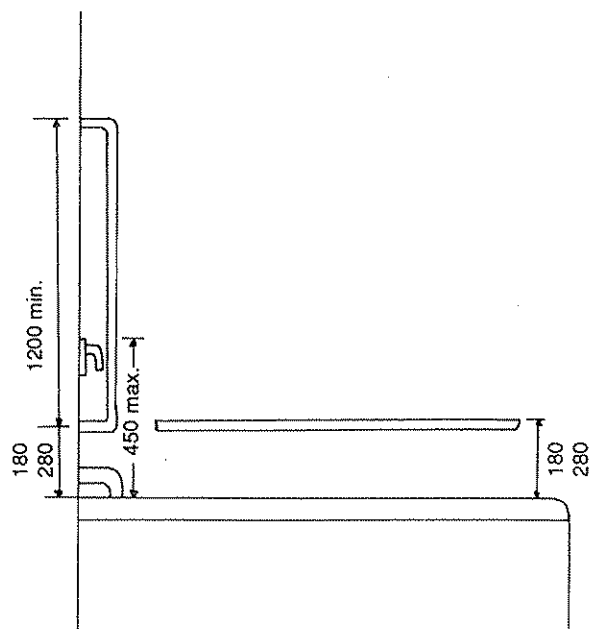
Figure 38



(a) Bathtubs for the Disabled



(b) Layout Plan of Bathtub for the Disabled



(c) Front View of Bathtub for the Disabled

Figure 38

4.11.2.5 Faucets and other controls shall :-

- a. comply with Clause 3.10.3;
- b. be located at the foot of the bathtub between the centreline and to the outer edge; and
- c. be not more than 450 mm above the bathtub rim.

4.11.2.6 A shower head shall :-

- a. be of the handheld type;
- b. be provided with a hose not less than 1500 mm long; and
- c. allow use in a fixed position.

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

4.11.2.8 Enclosures for bathtubs shall not :-

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

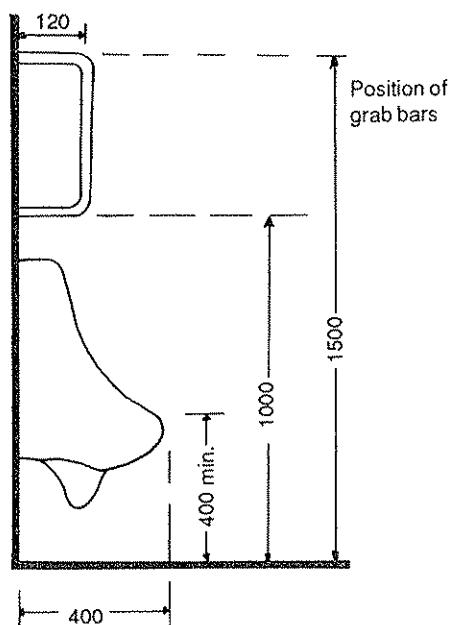


Figure 37
Wall Hung Urinal

4.11 BATH FACILITIES

4.11.1 Hotel guest rooms or hostel rooms which are required to be accessible to the disabled under Chapter 2, shall be provided with bathtubs/shower stalls complying with Clauses 4.11.2 and 4.11.3.

4.11.2 Bathtub

4.11.2.1 There shall be a clear floor space of at least 750 mm wide in front of the bathtub. The wash basin may encroach to a maximum of 300 mm into this space provided there is a clear knee and toe space under the wash basin as shown in Figure 38.

4.11.2.2 The bathtub shall be provided with a seat of at least 250 mm wide along its entire length or with a seat of at least 400 mm deep across its width. The seat shall be located at the opposite end of the controls to allow easier access.

4.11.2.3 The base of bathtubs shall be slip-resistant. Where it is not possible, a slip-resistant rubber mat shall be provided.

4.11.2.4 Grab bars shall :-

- comply with Clause 3.6.4;
- be at least 1200 mm long, located horizontally along the length of the bathtub, 180 mm - 280 mm above the bathtub rim; and
- be at least 1200 mm long, located vertically at the foot end of the bathtub adjacent to the clear floor space with the lower end 180 mm - 280 mm above the bathtub rim as shown in Figure 38.

4.9 WASHROOM ACCESSORIES

4.9.1 Where washroom accessories are required to be provided under Clause 4.1.6, they shall comprise the following :-

- a. a mirror positioned at a height of not more than 1000 mm from the bottom edge of the mirror to the floor as shown in *Figure 36*;
- b. towel and soap dispensers, hand dryer, waste bin and sanitary bin positioned such that the operable parts and controls are between 1000 mm and 1200 mm from the floor.

Footnote :

Accessories should be placed in close proximity to the accessible basin, to avoid having a person wheeling a chair with wet hands.

4.10 URINALS

4.10.1 Where urinals for the ambulant disabled are to be provided under Clause 4.1.6, they shall comply with the following as illustrated in *Figure 37* :-

- a. be of the wall-hung type with a rim not more than 430 mm from the floor;
- b. have a minimum clear floor space of 750 mm wide by 1200 mm deep without steps in front of the urinals;
- c. not have privacy shields extending beyond the front edge of the urinal rim unless such shields allow a clear width of not less than 750 mm; and
- d. have grab bars on both sides of the urinals :-
 - (i) extending from 1000 mm to 1500 mm above the floor level; and
 - (ii) with a clear space of 120 mm between the handrail and wall surfaces.

4.10.2 Flush controls shall :-

- a. comply with Clause 3.10.3; and
- b. be located not more than 1200 mm from the floor.

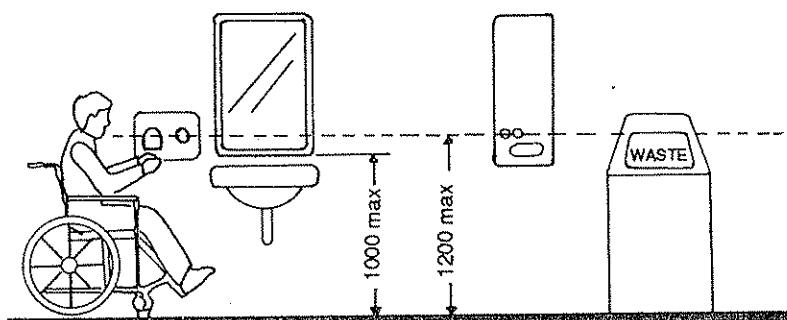
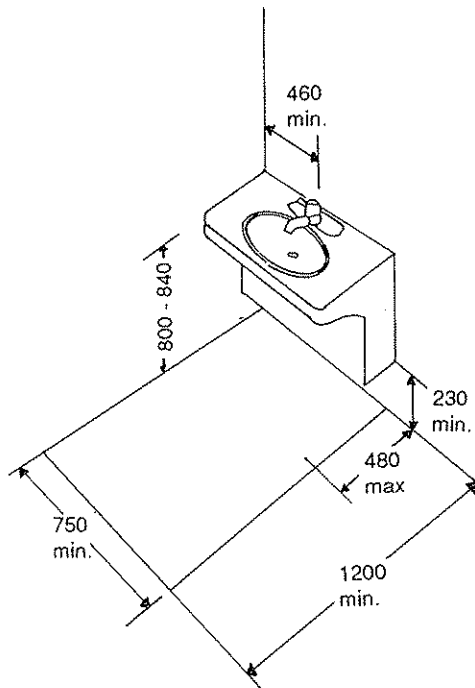
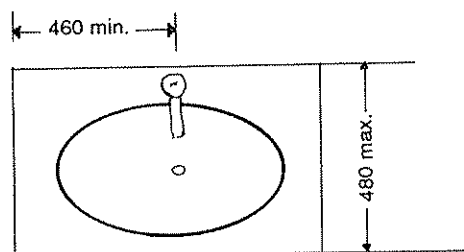


Figure 36
Washroom Accessories

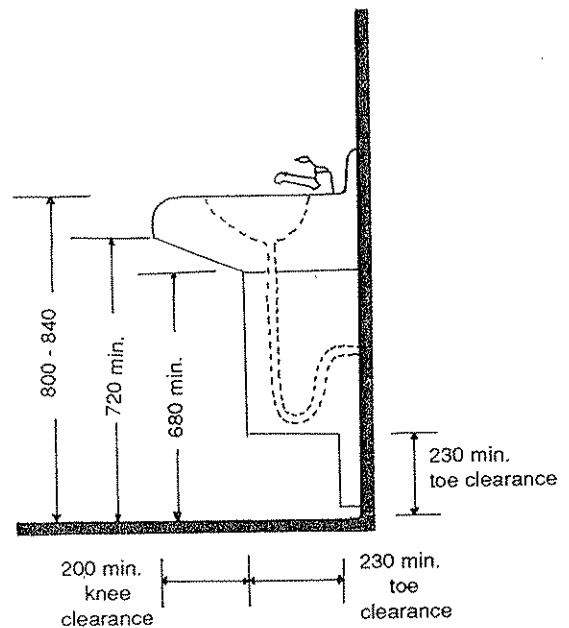
4.8.3 The front apron of a vanity counter shall have a minimum clearance of 750 mm wide by 720 mm high.



(a) Wash Basin for the Disabled.



(b) Layout Plan Of Wash Basin



(c) Side View of Wash Basin

Figure 35

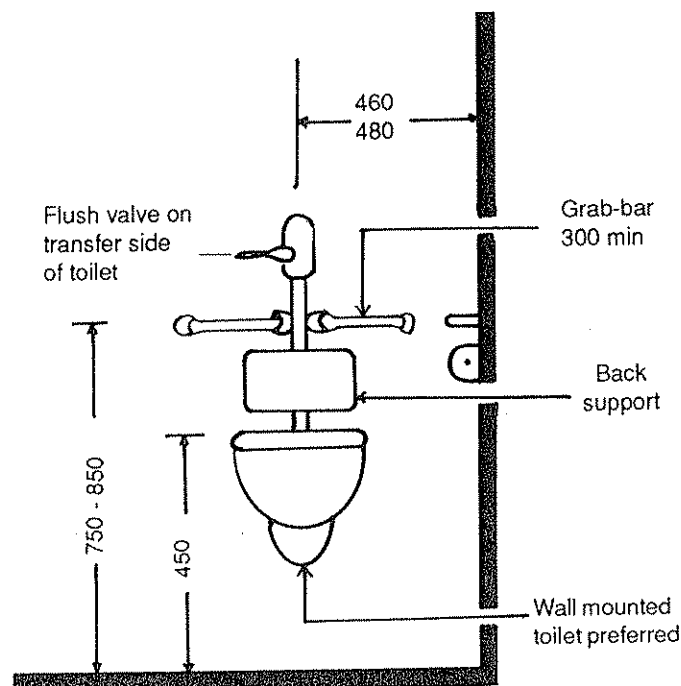


Figure 34
Wall Hung Water Closet

4.7 WATER CLOSET GRAB BARS

4.7.1 Water Closets shall be provided with grab bars as illustrated in *Figures 31* and *32* which shall comply with the following :-

- be in accordance with Clause 3.6.4;
- be mounted at a height between 280 mm and 300 mm from the top of the water closet seat;
- one horizontal grab bar to be mounted on the side wall closest to the water closet extending from the rear wall to at least 450 mm in front of the water closet seat;
- another horizontal grab bar to be mounted on the wall behind the water closet and be at least 750 mm long; and
- where possible, a vertical bar should be provided on the side wall closest to water closet as illustrated in *Figures 31b* and *32c*.

4.8 WASH BASIN

4.8.1 Wash Basins, as illustrated in *Figure 35*, shall :-

- be of a standard size with dimensions of approximately 520 mm x 410 mm;
- be mounted such that the minimum distance between the centreline of the fixture and the side wall is 460 mm;
- be mounted such that the top edge is between 800 and 840 mm from the floor;
- have a knee space of at least 750 mm wide by 200 mm deep by 680 mm high with an additional toe space of at least 750 mm wide by 230 mm deep by 230 mm high;
- have a minimum clear floor space of 750 mm wide by 1200 mm deep, of which a maximum of 480 mm in depth may be under the wash basin; and
- have the hot water and drain pipes within the knee space or toe space properly insulated.

4.8.2 Faucets and other controls shall comply with Clause 3.10.3.

- g. have flush control
 - (i) complying with Clause 3.10.3;
 - (ii) which is hand-operated and located on the transfer side of the water closet; and
 - (iii) located not more than 1200 mm from the floor.

Footnote :

- (i) Preferences for toilet seat heights vary considerably. Higher seats may be an advantage to some ambulatory disabled but a disadvantage to persons in wheelchairs. Toilet seats of 450 mm high offer a reasonable compromise. Thick seats and filler rings are available to adapt standard fixtures to these requirements.
- (ii) Major problems are encountered by disabled persons, using wheelchair, entering and leaving washrooms. Within the washrooms, sufficient space is required to allow persons in wheelchairs to move freely to and from the various fixtures (Figure 31 a).

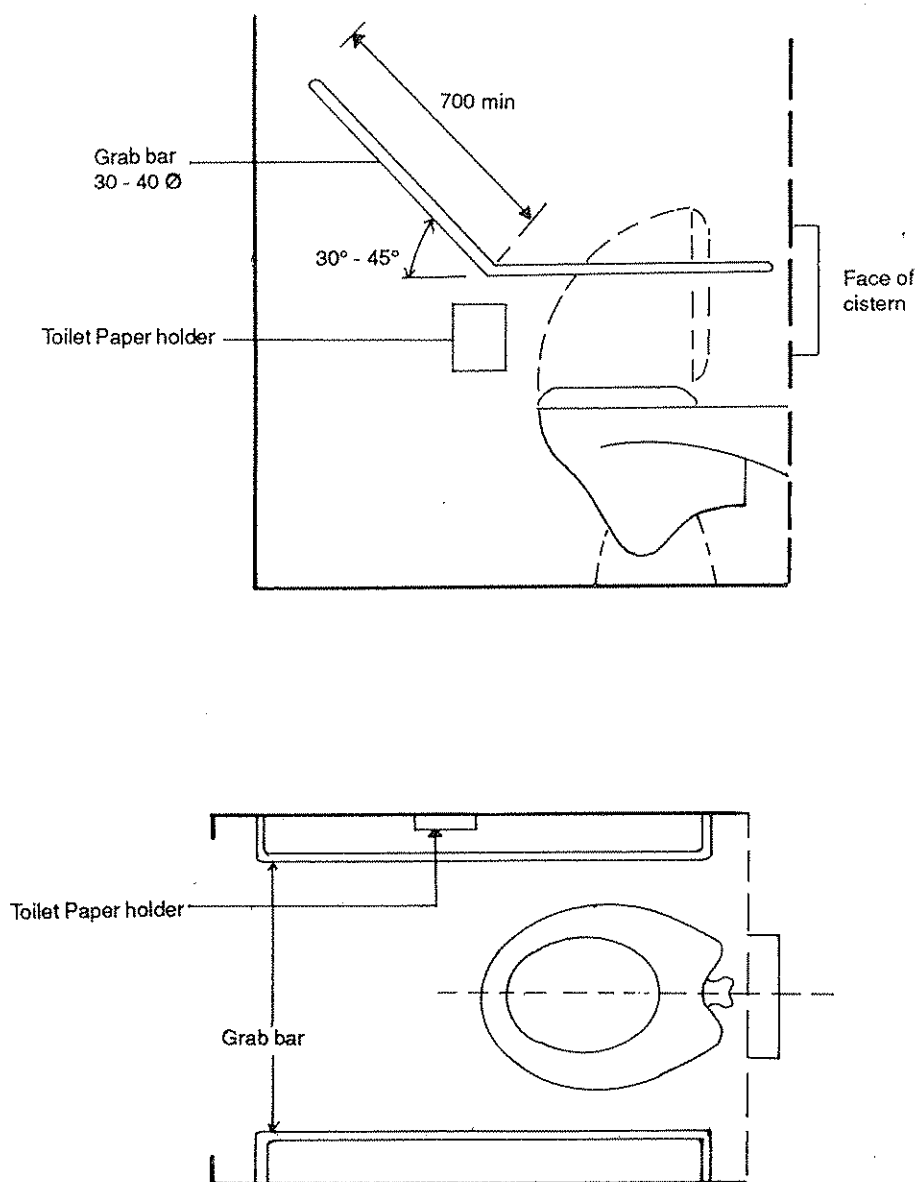


Figure 33
Alternative Plan and Side View of Water Closet
Compartment for the Ambulant Disabled

4.4 WATER CLOSET COMPARTMENT FOR AMBULANT DISABLED

- 4.4.1 Where a water closet compartment for the ambulant disabled is provided under Clause 4.1.3, it shall comply with the following :-
- have internal dimensions of a standard compartment;
 - have grab bars on both sides of the compartment to act as handhold for ambulant user to stand as illustrated in *Figure 33*;
 - not have spring-activated seat;
 - be equipped with a door complying with Clause 4.5; and
 - have a sign placed on the outside of the door indicating that the compartment is suitable for use by persons who require grab bars.

Footnote :

Water closet compartment for the ambulant disabled is not suitable for the wheelchair users and shall not be taken as an alternative to individual washroom and water closet compartment for the wheelchair user.

4.5 WASHROOM AND WATER CLOSET COMPARTMENT DOOR

- 4.5.1 Washroom and water closet compartment doors shall :-
- provide a clear opening of at least 900 mm with the door in the fully open position in accordance to Clause 3.5.2;
 - swing outwards, unless an additional space of 600 mm is provided within the compartment for the door swing or be provided with a sliding/folding door;
 - be provided with a horizontal pull-bar, at least 600 mm long, on the inside of an out-swinging door, located so that the end closer to hinge is 130 mm from the hinged side of the door and at a height of 1100 mm as shown in *Figure 32*; and
 - be provided with a vertical/horizontal pull-bar at least 140 mm long, on the outside, near the latch side of the door and at a height of 1100 mm as shown in *Figure 32*;
 - be provided with spring-type or gravity hinges so that the door closes automatically; and
 - be capable of being locked from the inside by a device that is operable with one hand, activated by a force not more than 22N and which does not require
 - fine finger control,
 - tight grasping, and
 - pinching or twisting of the wrist.

4.6 WATER CLOSET

- 4.6.1 Water closet shall comply with the following requirement :-
- be located between 460mm to 480 mm from the centreline of the water closet to the adjacent wall and have a clear dimension of 750 mm from the front edge of the water closet to the rear wall to facilitate side transfer;
 - the top of the water closet seat shall be between 450 mm and 480 mm from the floor as shown in *Figures 31b* and *32c*;
 - have no spring-activated seat;
 - have a back support where there is no seat lid or tank. A back support reduces the chance of imbalance or injury caused by leaning against exposed valves or pipes;
 - preferably be of the wall-hung or corbel type as it provides additional space at toe level as shown in *Figure 34*;
 - where water cistern is used, the cover shall be securely attached; and

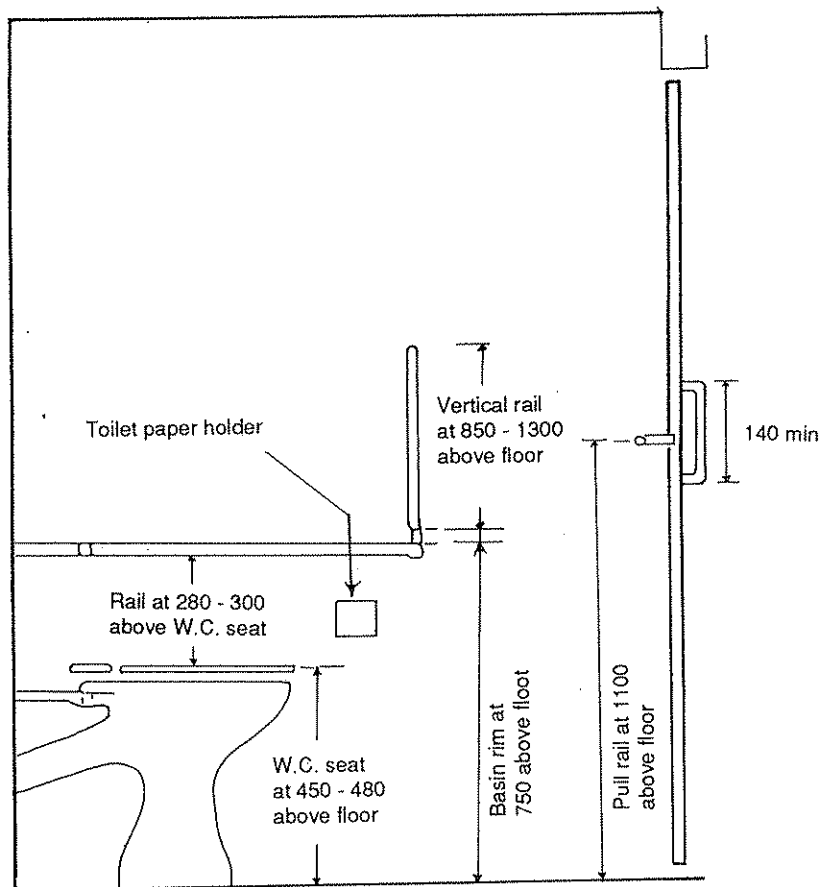


Figure 32 (c)
Side View of Water Closet Compartment

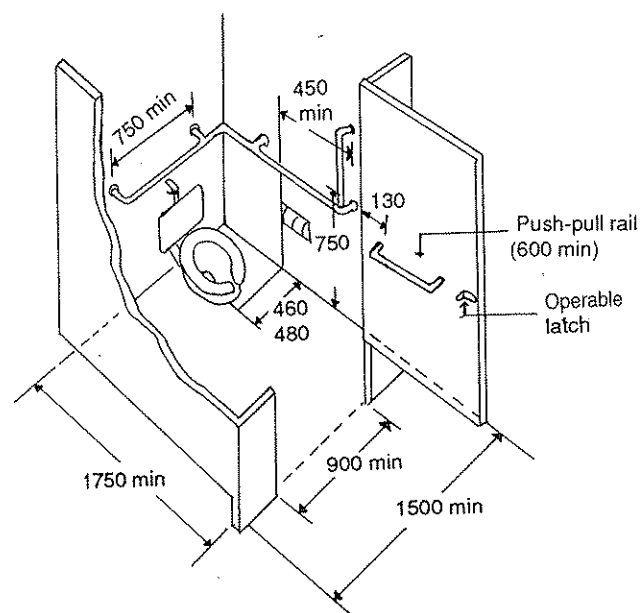


Figure 32 (d)
Water Closet Compartment for the Wheelchair User

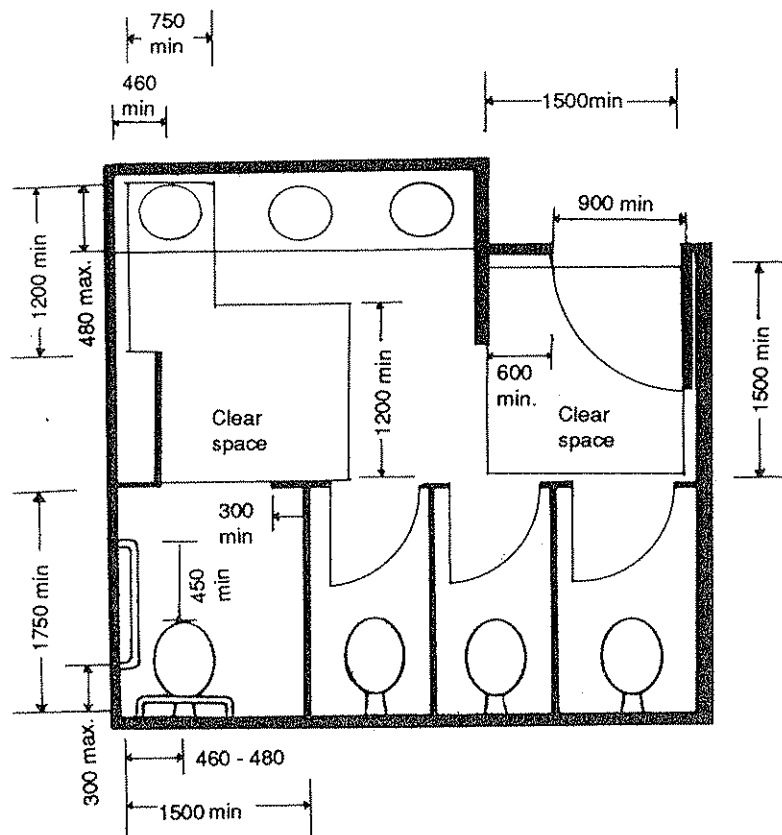


Figure 32 (a)
Example Layout of a Water Closet Compartment

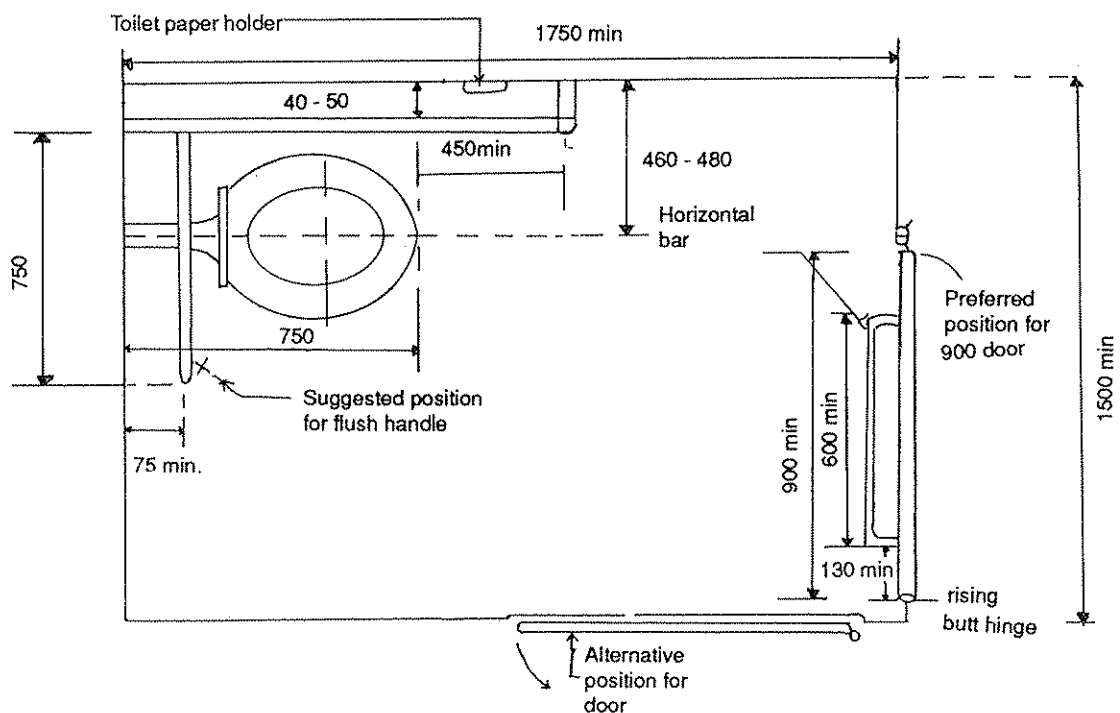


Figure 32 (b)
Layout Plan of Water Closet Compartment
for the Wheelchair User

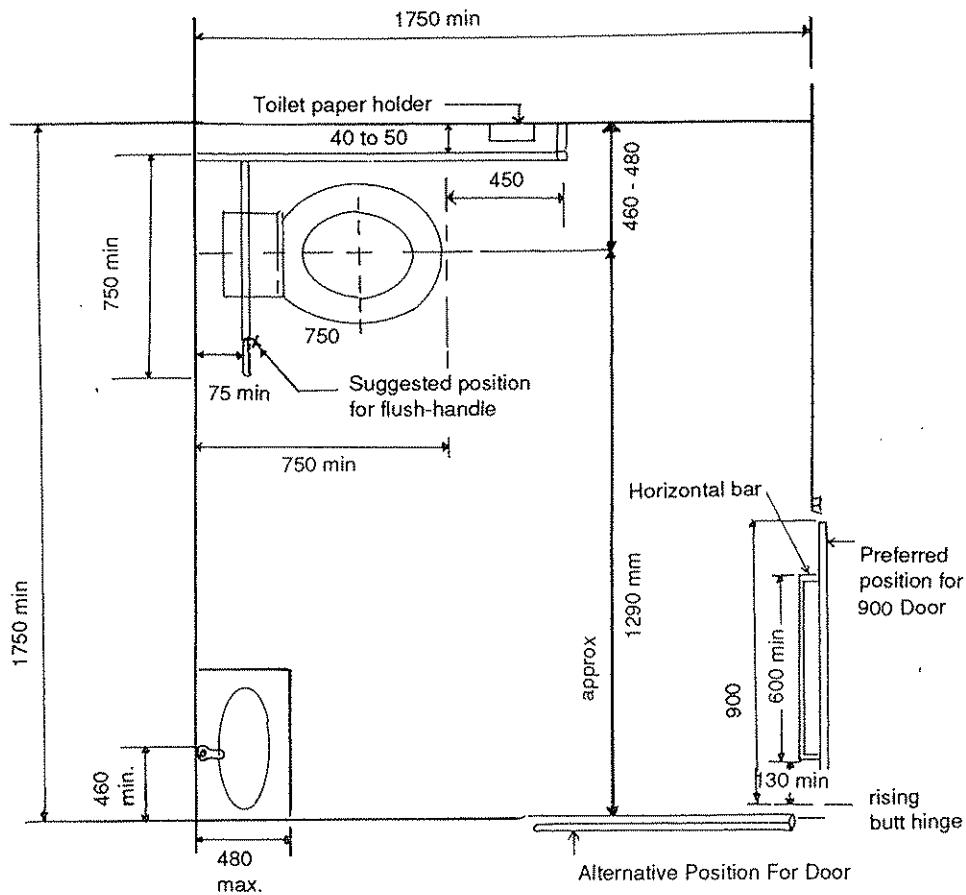


Figure 31 (a)
Layout Plan of an Individual Washroom

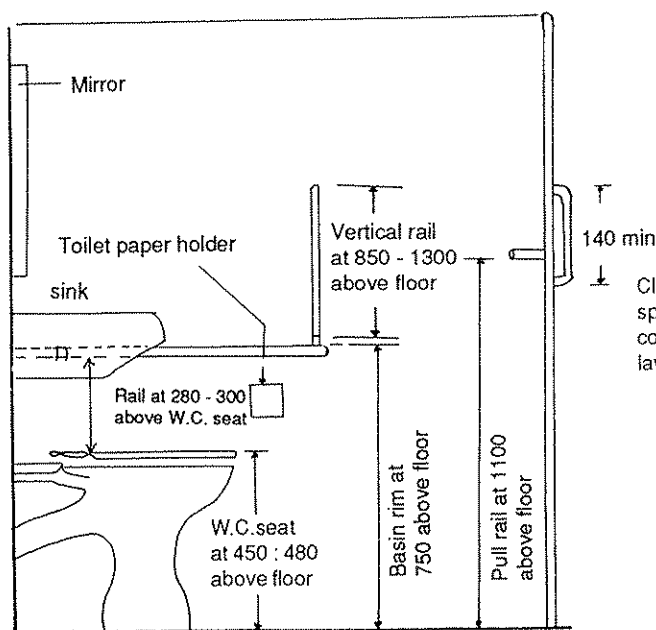


Figure 31 (b)
Side View of an Individual Washroom

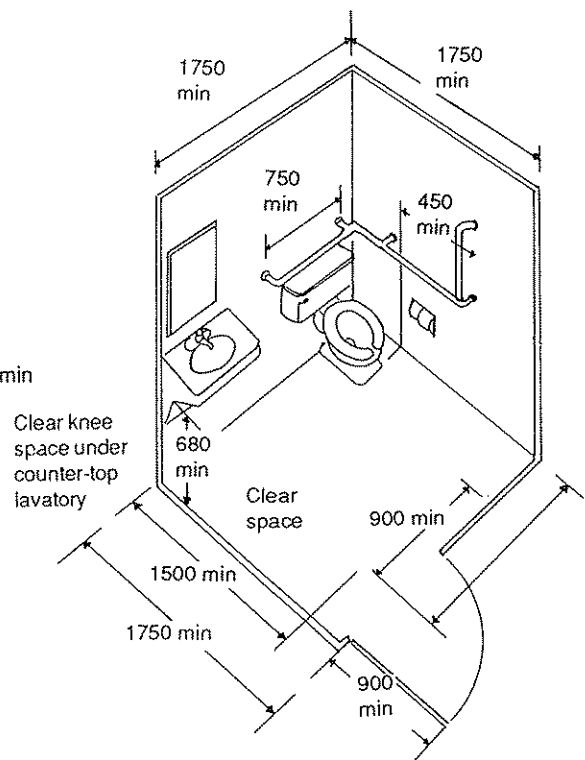


Figure 31 (c)
Example Layout of an Individual Washroom

4.2.2 An individual washroom for the wheelchair user is illustrated in *Figure 31*.

Footnote :

- (a) An individual washroom is used by people with different disabilities, including a disabled person with an attendant or parent with a disabled child.
- (b) It may be desirable to equip this type of washroom with an emergency call switch that activates an alarm.

4.3 WATER CLOSET COMPARTMENT FOR WHEELCHAIR USER

- 4.3.1 Where a water closet compartment for the wheelchair user is provided under Clause 4.1.2 (b), it shall :-
- a. have clear internal dimensions of not less than 1500 mm x 1750 mm;
 - b. be equipped with a door complying with Clause 4.5;
 - c. have a water closet complying with Clause 4.6;
 - d. have grab bars complying with Clause 4.7;
 - e. have a toilet roll dispenser mounted below the grab bars and not more than 300 mm from the front edge of the seat and at a height between 50 mm to 250 mm from the top of the water closet seat; and
 - f. be equipped with a coat hook mounted on a side wall not more than 1300 mm from the floor and projecting not more than 40 mm from the wall.

4.3.2 A water closet compartment for the wheelchair user is illustrated in *Figure 32*.

CHARTER 4

SANITARY PROVISIONS

4.1 GENERAL PROVISION

- 4.1.1 Signages at washroom entrances shall be visible and shall comply with the Symbol of Access for the Disabled Person as described in Clause 10.2.
- 4.1.2 At every level of the building where toilets are required to be provided by the Public Health Authority, at least :-
- one individual washroom for the wheelchair users shall be provided for both the male and female; or
 - one water closet compartment for the wheelchair users shall be provided in both the male and female toilets.
- 4.1.3 In addition to Clause 4.1.2, it is recommended that a standard water closet compartment with railings on both side walls shall be provided for the ambulant disabled at every level where toilets are required to be provided by the Public Health Authority.
- 4.1.4 Where two or more clusters of toilets are provided at the same level but at different locations, the corresponding number of individual washrooms or water closet compartments shall be provided.
- 4.1.5 At least one wash basin in the toilet shall comply with Clause 4.8.
- 4.1.6 Where washroom accessories are provided, at least one of each type shall be made usable to the wheelchair user as in accordance to Clause 4.9.
- 4.1.7 Where urinals are provided, at least one shall comply with Clause 4.10 to cater to the ambulant disabled.

4.2 INDIVIDUAL WASHROOMS

- 4.2.1 Where an individual washroom for the wheelchair user is provided under Clause 4.1.2(a), it shall :-
- have clear dimensions between opposite walls of not less than 1750 mm;
 - have a clear space of not less than 900 mm wide adjacent to the water closet;
 - be equipped with a door complying with Clause 4.5;
 - have a water closet complying with Clause 4.6;
 - have grab bars complying with Clause 4.7;
 - have a wash basin complying with Clause 4.8;
 - have essential washroom accessories complying with Clause 4.9;
 - have a toilet roll dispenser mounted below the grab bars and not more than 300 mm from the front edge of the seat and at a height between 50 to 250 mm from the top of the water closet seat;
 - be equipped with a coat hook mounted on a side wall not more than 1300 mm from the floor and projecting not more than 40 mm from the wall; and
 - where possible, be equipped with a shelf of dimensions 400 mm x 200 mm, fixed at a height of between 900 mm and 1100 mm from the floor.

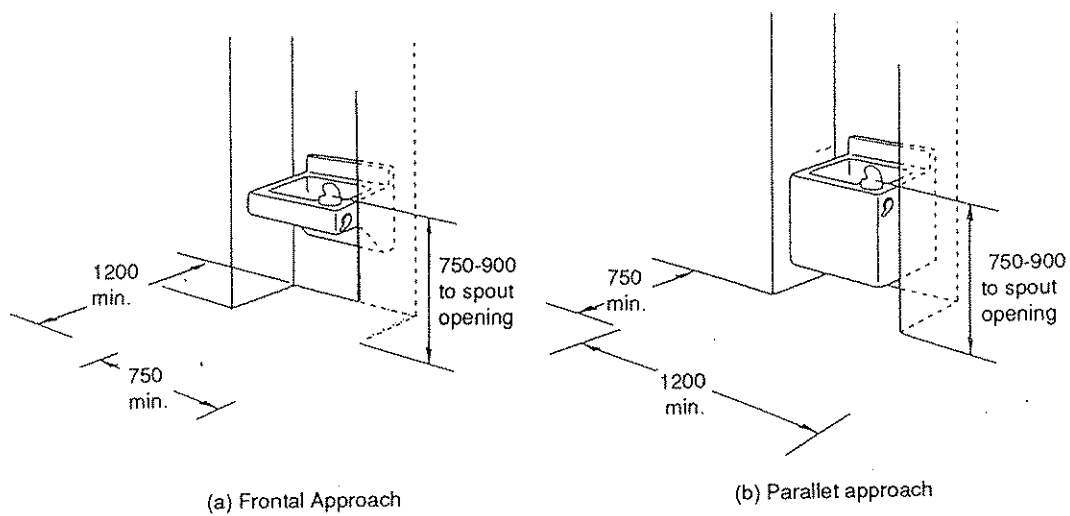


Figure 29
Built-in Drinking Fountain

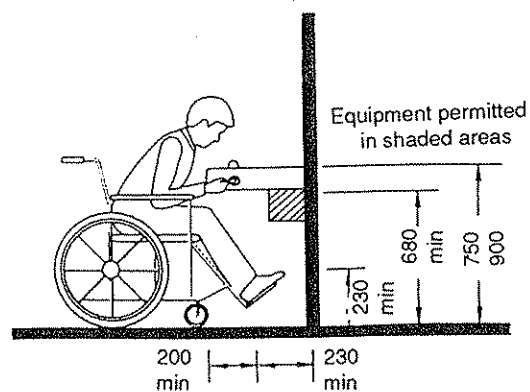


Figure 30
Spout Height and Knee Clearances

3.12 DRINKING FOUNTAIN

3.12.1 The fountain spout should :-

- a. have an opening located between 750 mm to 900 mm from the floor or ground surface as shown in *Figure 29*;
- b. be located at the front of the unit;
- c. direct the water flow in a trajectory that is parallel or nearly parallel to the front of the unit; and
- d. provide a flow of water at least 100 mm high.

3.12.2 Controls should comply with Clause 3.10.3.1 and 3.10.3.2 and be at or near the front of the fountain.

3.12.3 Cantilevered drinking fountains should :-

- a. have a clear floor space of at least 750 mm x 1200 mm as shown in *Figure 29a*;
- b. have a clear knee space between the bottom of the apron and floor or ground of at least 750 mm wide, 200 mm deep and 680 mm high as shown in *Figure 30*; and
- c. have a toe space not less than 750 mm wide, 230 mm deep and 230 mm high as shown in *Figure 30*.

3.12.4 Freestanding or built-in drinking fountains not having a knee space should have a clear floor space of at least 1200 mm wide x 750 mm in front of the unit as shown in *Figure 29b*.

Footnote:

A wall-mounted drinking fountain in an alcove is preferred, because it does not create a hazard for persons with visual impairments. Drinking fountains that extend into corridors and have an open space underneath the fountain 680 mm in height should be protected by a wall guard. The provision of two drinking fountains at different heights is very convenient for standing adults, people in wheelchairs and children. The 100 mm high water flow is to allow for the insertion of a cup or glass.

3.11.2 Clear Knee Space

Where a forward approach is used, a clear knee space of at least 900 mm wide, 480 mm deep and 700 mm high shall be provided, which may overlap the clear floor space by a maximum of 480 mm as shown in *Figure 28a*.

3.11.3 Counter Tops

Writing surfaces or service counters shall not be more than 800 mm from the floor as shown in *Figure 28b*.

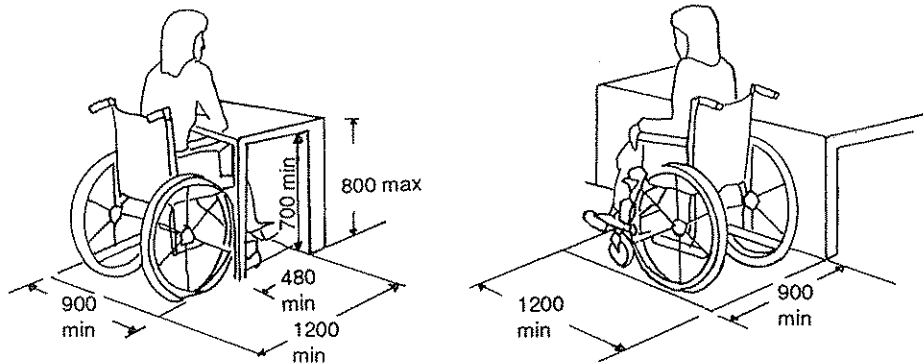


Figure 28a
Forward and Side Approach to Table or Counter

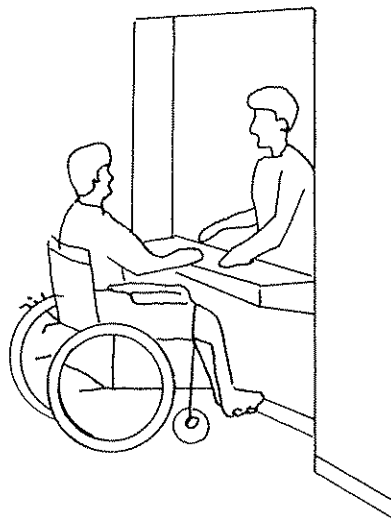


Figure 28b
Writing Surface and Service Counters

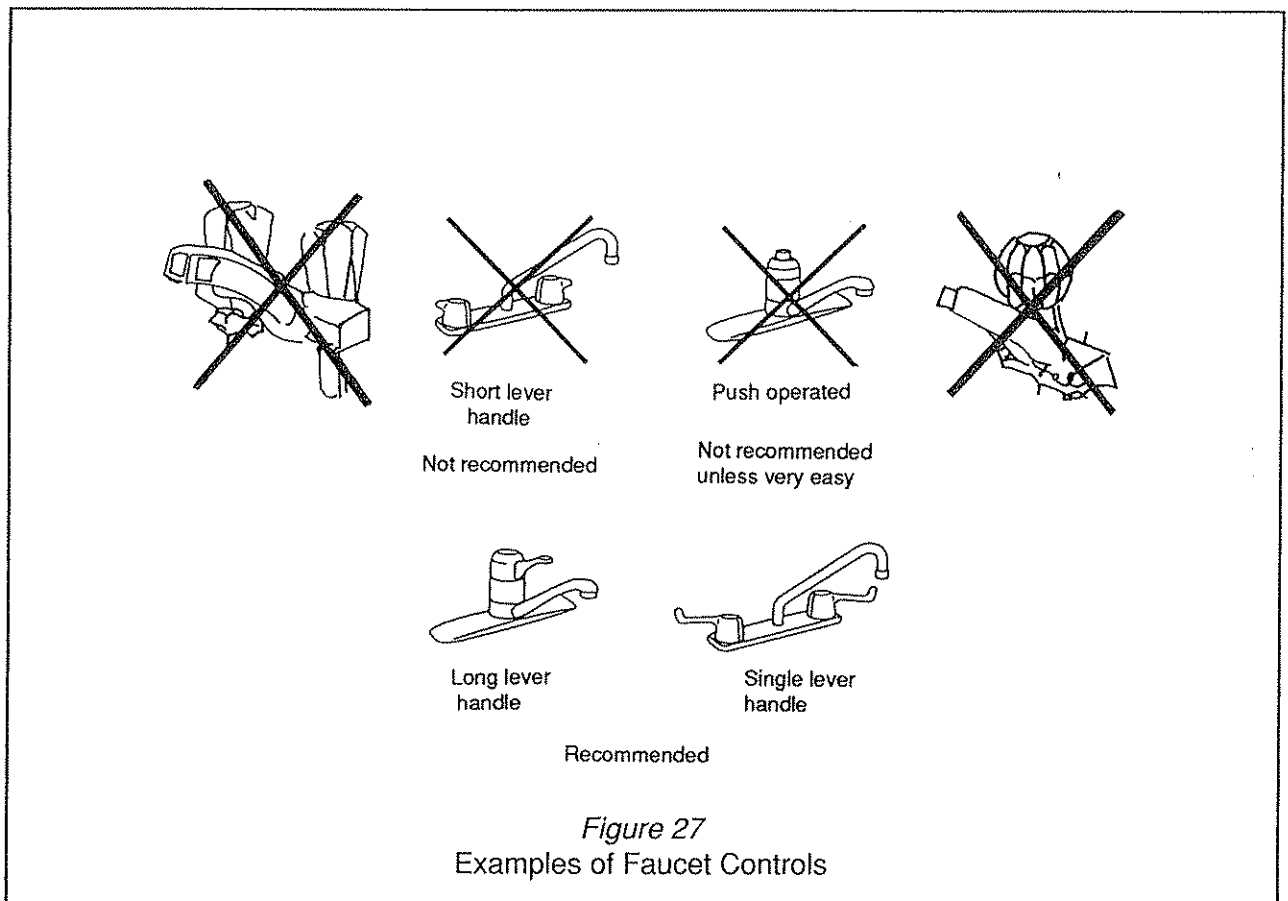
3.10.3 Controls

3.10.3.1 Faucets and other controls designated for use by disabled persons shall be hand-operated or electronically controlled.

3.10.3.2 Hand-operated controls shall :-

- a. be operable with one hand;
- b. require no tight grasping, pinching, or twisting of the wrist;
- c. require a force less than 22 N to activate;
- d. have handles of the lever type (not self-closing) operable with a closed fist as shown in *Figure 27*; and
- e. not be of the self-closing type.

3.10.3.3 The temperature of hot water supplied to the shower shall be controlled by a pressure-equalizing valve or by an automatic, thermostatically controlled valve.



3.11 SEATING SPACES

3.11.1 Clear Floor Space

Seating space, such as those provided at counters, tables, or work surfaces for persons in wheelchairs, shall have a clear floor space not less than 900 mm x 1200 mm.