

CHAPTER 4

DESIGN REQUIREMENTS FOR PERSONS WITH A DISABILITY

4.1 ACCESS

This section aims to ensure that proper access to buildings is provided for the public and persons with a disability.

4.1.1. Obligatory Design Requirements

- (a) Access shall be provided from a point or points on the lot boundary, which is accessible to a public street or pedestrian way, directly to at least one entrance which is commonly used by the public or to a point directly adjacent to one entrance which is commonly used by the public and to a lift.
- (b) When car parking is provided, at least one car parking space shall be reserved for persons with a disability and accessible to at least one entrance and to a lift.
- (c) Such access shall be free from steps, kerbs other than dropped kerbs, steep ramps, doors or doorways which will impede the passage of a wheelchair, or other form of barrier which will prevent access by persons with a disability.

4.1.2. Recommended Design Requirements

- (a) Specific car parking spaces should be reserved for persons with a disability and be accessible from the spaces to a lift.

4.2 RAMPS

At changes in level other than when served by a lift or at kerbs, there shall be a ramp. Persons with a disability, particularly those using crutches, will find steep ramps difficult to negotiate. Wheelchair users will find steep and/or long ramps difficult to negotiate if there are not sufficient number of intermediate landings for them to take rest.

4.2.1 Obligatory Design Requirements

- (a) Ramps shall not be less than 1.05 m in width.
- (b) A space of not less than 1.5 m x 1.5 m shall be provided at the head and foot of every ramp.
- (c) No ramp shall be at a gradient steeper than 1 in 12.
- (d) Where a ramp is at a gradient of 1 in 20 or steeper (but not steeper than 1 in 12), a landing of not less than 1.2 m long shall be provided for each 10 m length of horizontal run or part thereof.
- (e) Any ramp with a rise greater than 200 mm, leading down towards an area where vehicular traffic is possible, shall have a railing or barrier across the full width of its lower end, not less than 1.5 m from the foot of the ramp.
- (f) All ramps shall be provided with handrails on both sides.
- (g) Raised directional signs shall be provided on handrails mentioned in subsection (f) in places where directional signs exist.
- (h) Tactile warning strips shall be provided at the head and foot of a ramp (see **Figure 3**).
- (i) The floor and wall along ramps shall be in contrasting colours.
- (j) No appliances, fixtures and fittings shall project beyond 90 mm from the surface of any wall below a level of 2 m above the ramp level unless they are unavoidable, in which case they shall also be extended downwards to the ramp level or be guided by tactile flooring materials.

4.2.2 Recommended Design Requirements

- (a) Width should be at least 1.2 m to enable a wheelchair to turn or preferably at least 1.5 m to allow 2 wheelchairs to pass.
- (b) Slopes should be reduced to a gradient not steeper than 1 in 20.
- (c) A kerb at least 100 mm high, or a rail 200 mm above ramp level should be provided to prevent wheelchairs from slipping over the edge.
- (d) Ramps should have non-slip surfaces. Raised traction strips should be avoided.

4.3 DROPPED KERBS

It is difficult for persons using wheelchairs or crutches to overcome sudden rises or falls at pavement where changes in level occur. For this reason, these sudden rises or falls should be minimized by providing dropped kerbs as set out below.

4.3.1 Obligatory Design Requirements

- (a) Changes in level at kerbs shall be by a dropped kerb. Dropped kerbs shall be provided at pedestrian crossings and at each end of the footpaths of a private street or access road. Kerbs separating footpaths or ramps from vehicular areas shall also be dropped kerbs. Dropped kerbs shall be constructed as follows:
 - i) dropped kerbs shall be not less than 1.2 m in length and 1.28 m in width;
 - ii) dropped kerbs shall be ramped at a gradient not steeper than 1 in 6 and there shall be a space of not less than 800 mm long behind the dropped kerbs;
 - iii) kerbs adjoining dropped kerbs shall be ramped at a gradient not steeper than 1 in 6;
 - iv) a 10 mm level change shall be provided at every interface of dropped kerbs and vehicular areas.

The layout of dropped kerbs shall comply with **Figure 4**.

4.3.2 Recommended Design Requirements

- (a) Dropped kerbs should be so located to enable users to have an unobstructed view of traffic approaching from any direction.
- (b) Dropped kerbs should be provided where necessary and in conjunction with pedestrian crossings, which should include visible, audible and tactile crossing devices with traffic lights.
- (c) Dropped kerbs should have non-slip surfaces and be cued by texture and colour contrasts. Raised traction strips should be avoided.

4.4 STEPS AND STAIRCASES

This section sets out the minimum requirements to help the ambulant disabled persons and persons with visual impairment to negotiate steps and staircases.

4.4.1 Obligatory Design Requirements

- (a) Staircases of a building shall:
 - i) be constructed with treads not less than 225 mm in width (measured at the centre of the flight) from the face of one riser to the face of the next riser and with risers not exceeding 175 mm in height;
 - ii) have not more than 16 steps in any flight without the introduction of a landing;
 - iii) be provided on at least one side with properly fitted handrails which comply with section 4.5; and
 - iv) be provided with non-slip nosing in contrasting colour.
- (b) Tactile warning strips shall be provided at landings and at both bottom and top ends of a staircase (see **Figure 5**).
- (c) Treads and walls of a staircase shall be in contrasting colours.
- (d) No appliances, fixtures and fittings shall project beyond 90 mm from the surface of any wall in a staircase below a level of 2 m above the treads of the staircase unless they are unavoidable, in which case they shall also be extended downwards to the level of the treads or be guided by tactile flooring materials.
- (e) Raised directional signs shall be provided on handrails mentioned in subsection (a)(iii) in places where directional signs exist.

4.4.2. Recommended Design Requirements

- (a) Risers should be vertical or with a receding face not exceeding 15 mm from the vertical, without a projecting nosing. Open risers should be avoided.
- (b) Risers should be reduced to 150 mm high and treads be increased to 280 mm wide for greater ease of use.

- (c) Individual flights should not exceed 1800 mm total rise or 12 risers.
- (d) Winders and splayed steps should be avoided.
- (e) The top nosing of any flight should not be less than 300 mm from the point at which the adjoining wall returns (see **Figure 6**).
- (f) All steps and staircases should have continuous handrails on both sides.
- (g) Both natural and artificial lighting should throw light towards and not down to staircases. The full tread should be lit to a minimum level of 120 lux.

4.5 HANDRAILS

Handrails help persons with a disability to use staircases, to pull themselves up inclines and check themselves on declines and to assist them in sitting down or getting up. Therefore, handrails should be of the correct size, strength and shapes and be conveniently located so that they can provide secure hand-grips for persons to take their entire weight when required.

4.5.1 Obligatory Design Requirements

- (a) Handrails to ramps and steps shall be fixed not less than 30 mm and not more than 50 mm clear of walls and with a clear height of 70 mm from the top of the bracket to the top of the handrail.
- (b) The top of handrails shall be at a height of not less than 850 mm and not more than 950 mm above any nosing, floor or landing.
- (c) Handrails shall extend horizontally not less than 300 mm beyond the first and last nosing of every flight of steps or beyond the ends of a ramp (see **Figure 7**).
- (d) Handrails shall be installed to resist a load of not less than 1.3 kN applied vertically or horizontally.
- (e) Handrails shall not rotate within their fixing fittings.

- (f) Handrails shall be :
 - i) tubular, not less than 32 mm and not greater than 40 mm in external diameter; and
 - ii) or any other case, such as to afford to the user a grip analogous to that specified in the case of tubular handrails.

Typical handrail sections are shown in **Figure 8**.

4.6 CORRIDORS, LOBBIES, PATHS

The object of this section is to enable persons with a disability to have the same freedom of movement as ordinary persons within a building or on external paths.

4.6.1 Obligatory Design Requirements

- (a) Space shall be allowed for manoeuvring wheelchairs in corridors, lobbies, paths and similar areas as follows :
 - i) areas shall have a clear width of not less than 1.05 m;
 - ii) a space not less than 1.5 m x 1.5 m shall be provided at or within 3.5 m of every dead end;
 - iii) any lobby in a corridor shall not be less than 1.2 m long, excluding space for door swings; and
 - iv) a level area, extending not less than 1.2 m beyond the swings of the doors and not less than 1.5 m in width shall be provided on both sides of every entrance of a building.

Provided that these items shall not apply to lobbies which lead only to staircases.

For the purpose of this section, "dead end" is a corridor, lobby or path where the means of exit for persons with a disability is in one direction only.

- (b) On footpaths, covers to a channel shall be flush with the surface of the footpath. Any hole in such cover or between such covers shall have a dimension not more than 20 mm.

- (c) No appliances, fixtures and fittings shall project beyond 90 mm from the surface of any wall in corridors, paths and lobbies below a level of 2 m above the finished floor level unless they are unavoidable, in which case they shall also be extended downwards to the finished floor level or guided by tactile flooring materials.
- (d) For turnstile controlled passages accessible to the public, there shall be at least one turnstile which is of minimum 800 mm in width for the use by wheelchair users and clearly marked as such, unless an alternative passage is provided.

4.6.2 Recommended Design Requirements

- (a) Width should be at least 1200 mm to enable a wheelchair to turn or preferably at least 1500 mm to allow 2 wheelchairs to pass. At right angle turns, inside corners should be splayed or rounded to at least 300 mm radius. These would allow a wheelchair user to pass anyone who is on the same path or to turn in a corridor easily.
- (b) All corridors should have non-slip surfaces.
- (c) Soft loose surfaces, such as gravel or stone, are hazardous and should be avoided.
- (d) Hazards on floors, caused, for instance, by unnecessary projections or by unexpected changes in level should be avoided.

4.7 DOORS

This section sets out the requirements to enable persons with a disability, the wheelchair users in particular, to enter and leave any room unaided and without undue difficulties.

4.7.1 Obligatory Design Requirements (see Figure 9)

- (a) Doors, including one leaf of a pair of a double doors, shall have a clear width of not less than 750 mm between the open door and opposite jamb or the other leaf.
- (b) The unobstructed area adjacent to the door handle on the leading face of a single door shall not be less than 380 mm in width.
- (c) Doors, if less than 380 mm from the corner of a room, shall swing from the side nearer that corner.
- (d) Double-action self-closing doors shall have a check mechanism to prevent the doors swinging beyond the closed position and a transparent vision-panel with a bottom edge not more than 1 m and the top edge not less than 1.5 m above the finished floor level.
- (e) Door handles shall not be less than 950 mm and not more than 1.05 m above the finished floor level, measured from the top surface of the grip.
- (f) Door thresholds shall not exceed 25 mm in height and shall be bevelled to facilitate passage of wheelchairs.
- (g) Door closing devices shall be designed to allow exterior and interior doors to be opened with forces of not more than 30 N and 22 N respectively. Closers for interior doors shall have a closing period of at least 3 seconds measured from an open position of 70° to a point 75 mm from the closed position measured from the leading edge of the door. Door closing devices include door closers, spring hinges and floor hinges.
- (h) In buildings intended to be used by the public, no frameless glass doors should be used unless unavoidable, in which case they shall be prominently marked so as to make them visible.

4.7.2 Recommended Design Requirements

- (a) External doors should be single-action and open outwards (to obviate high tension in spring closers in sustaining wind pressure).
- (b) Where doors are latched, lever-type handles should be used.

- (c) All doors which allow the passage of wheelchairs should have kickplates not less than 200 mm high fitted on the face which swings away.

4.8 TOILET AND W.C. CUBICLES

This section explains the requirements to enable wheelchair users to use as normally as possible the facilities provided in a w.c. cubicle without any assistance from others. The space requirements are set to enable a wheelchair user to turn and manoeuvre into position for frontal, side or diagonal transfer to and from the w.c. seat. A typical cubicle is shown in **Figure 10**.

4.8.1 Obligatory Design Requirements

Number of Water Closet Cubicles

- (a) The minimum number of water closet cubicles for use by persons with a disability on each floor, or in that part of a floor designed for access by those persons, shall be one where the total number of water closets provided on that floor or in that part of a floor is 20 or less, or two where the number of water closets exceeds 20. This item shall not apply to domestic buildings and the domestic parts of composite buildings.
- (b) When water closet cubicles for use by persons with a disability are accessible through a room with multiple cubicles, the minimum number of such cubicles for each sex shall be based on the number of water closets for each sex on that floor or in that part of a floor designed for access by persons with a disability.
- (c) The water closet cubicles required by this Manual shall be deemed to be included in the number of soil fitments required under the Buildings (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations (Cap.123 sub.leg.) and Part VII of the Education Regulations (Cap.279 sub.leg.).

Location of Water Closet Cubicles

- (d) Water closet cubicles shall be accessible -
 - i) directly from a public corridor which complies with 4.6; and
 - ii) when situated within a room containing other water closet cubicles, through a clear space not less than 1.5 m x 1.5 m immediately in front of the cubicle to allow manoeuvrability or by direct approach where no turning of the wheelchair is necessary.

Design of Water Closet Cubicles

- (e) The water closet cubicle for persons with a disability shall not be less than 1.5 m x 1.75 m in area and -
 - i) the cubicle shall have in it a water closet at a height not less than 450 mm and not more than 475 mm, measured to the top of the toilet seat. Water closets shall be equipped with a back support such as a seat lid and seats shall not be spring-actuated;
 - ii) flushing controls shall be mounted on the wide side of the cubicle at a height between 600 mm to 1050 mm above the finished floor level and shall be hand-operated or automatic. Hand-operated controls shall be capable of being operated with one hand and shall not require tight grasping, pinching or twisting of the wrist. The force required shall not be greater than 22 N;
 - iii) the cubicle shall be provided with a wash basin mounted with the rim not higher than 750 mm above the finished floor level. A clearance of 550 mm shall be maintained from the finished floor level to the bottom of the apron; and
 - iv) taps for wash basins shall be automatic or of lever control type without spring loading, subject to the approval of the Water Authority. Taps shall not require tight grasping, pinching or twisting of the wrist. The operating force required shall not be greater than 22 N.
- (f) No coin box shall be affixed to the door of the cubicle.
- (g) Any door fastening shall be capable of being operated from the outside in the event of an emergency.

- (h) There shall be at least 2 handrails which shall not be less than 32 mm and not more than 40 mm in external diameter and shall be fixed on the wall leaving a grip space of not less than 30 mm clear of that wall.
- (i) There shall be one handrail which shall not be less than 32 mm and not more than 40 mm in external diameter and shall be fixed on the surface of the door of the cubicle which faces the inside of the cubicle and leaving a grip space of not less than 30 mm clear of that surface.
- (j) There shall be one folding rail on the wide side of the cubicle adjacent to the water closet at a height of 750 mm above the finished floor level when lowered from the wall. The handrails, folding rail and wash basin shall be capable of carrying a static load of 150 kg.
- (k) An emergency call bell shall be provided in the cubicle in accordance with 5.4.

4.8.2. Recommended Design Requirements

- (a) W.C. cubicles should where possible be accessible from a corridor so that they can be used by either sex with assistance from members of the opposite sex if necessary.
- (b) Steps should be avoided for urinals. Wall hung urinals with a front rim not high than 400 mm should be provided. Vertical grab rails of 600 mm length should also be provided at a height of 1200 mm above the finished floor level for the use of the ambulant disabled.

4.9 SIGNS

The facilities provided for persons with a disability will serve no useful purpose if their existence and locations are not clearly shown. It is therefore essential that suitable signs are erected at prominent positions within and/or outside a building.

4.9.1 Obligatory Design Requirements

- (a) Signs shall be erected to indicate clearly the exact locations of facilities available for use by persons with a disability. They shall be identified by the international symbol for access for persons with a disability. The symbols shall be white on a blue background and be used for the purposes of identifying/advertising/signifying :
 - i) accessible entrance(s) to the building;
 - ii) accessible exit(s) from the building;

- iii) reserved car parking facilities; and
- iv) the location of disabled toilets.

For illustration, see **Figures 12 and 13**.

- (b) Signs shall be not less than the following sizes

Height	60 mm for doors
	110 mm for corridors
	200 mm for external use

Length to be in multiple units of height

- (c) Visual (such as LED) display boards shall be provided in buildings intended to be used by the public where there is an announcer to regularly inform persons inside of matters relating to the purpose of their entry. The board shall be able to display the essence of the information so announced. Examples include display boards to inform travellers of the arrival and destination of the MTR train.

4.9.2 Special Obligatory Design Requirements to Assist Persons with Visual/Hearing Impairment in Buildings intended to be used by the Public

- (a) Braille and tactile layout plan showing the main entrance(s), toilets and major common facilities shall be provided in a conspicuous place in that building where layout plans for the use of the public are provided.
- (b) Tactile guide path to lift zones and functional areas shall be provided.
- (c) International signs shall be provided to indicate the provision of an inductive loop system for persons with hearing impairment, if any (see **Figure 11**).
- (d) Tactile signs indicating whether the toilet is for male or female shall be installed either on the toilet door or on the adjacent wall.

4.9.3. Recommended Design Requirements

- (a) Signs should be erected to indicate clearly the locations of the following facilities in a building :

- i) accessible routes through the building;
 - ii) usable vertical circulation facilities;
 - iii) usable cloakroom facilities; and
 - iv) the availability of special services in the building.
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- (b) Lettering should be legible, e.g. Helvetica (medium) using lower case letters except for initial capitals.
 - (c) Corners of signs should be rounded.
 - (d) Chinese characters should be legible e.g. "Haak Tai" style.
 - (e) Signs should be of contrasting tone to its background.
 - (f) Signs should be in raised characters.
 - (g) Clear and consistent system of signs should be used.

4.10 MISCELLANEOUS DESIGN REQUIREMENTS

In addition to Sections 4.1 to 4.9, other miscellaneous design requirements are set out below.

4.10.1 Obligatory Design Requirements

- (a) At least one of the public service counters in a building intended to be used by the public, if such counters are provided, shall not be higher than 750 mm above the finished floor level.

4.10.2 Recommended Design Requirements

- (a) Manually operated gear (e.g. for windows) should be located not lower than 1100 mm and not higher than 1.2 m above the finished floor level.
- (b) Building finishes should be glare resistant.