



BUILDING RESEARCH NOTE

B.R.N. 83

DESIGN GUIDE LINES FOR ACCESSIBLE BUILDINGS FOR THE PHYSICALLY HANDICAPPED

The goal of barrier-free design is to provide an environment that supports the independent functioning of physically handicapped. Access to the handicapped should be improved to the activities education, health care leisure, Sports, Public transport and Parks etc. so that they can also enter in public buildings get to and participate in everyday activities without assistance. The important design parameters to be considered for accessible buildings are as follows:

EXTERNAL DESIGN ELEMENTS:

- Roads and footpaths
- Parking areas
- Kerbs
- Surface finishes

INTERNAL DESIGN ELEMENTS

- Ramps
- Entrances
- Staircase steps
- Public conveniences
- Toilet fixtures
- Electrical controls
- Lifts
- Visual alarm

A. EXTERNAL DESIGN ELEMENTS

Roads and footpaths :

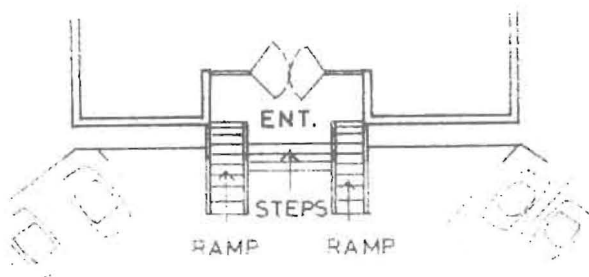
- A review of road construction should be made including visibility distance and alignment in which consideration is given to the profile of disabled.
- Uneven floor and level differences should be avoided.
- Readily understandable road information should be provided in which consideration is given to the handicapped and elderly.
- Efforts should be made to improve the pedestrian environment by installing electric wires underground and properly covered manholes.
- Provide rolled curbs which offer if correctly designed, a continuous accessible transition between sidewalks and streets.
- Walkways should not have a gradient more than 1:20
- In lengthy or busy walkways spaces should be provided at some

point along the route so that a wheelchair may pass another or turn around. These spaces should have a minimum dimension of 1.5m and should be placed at a maximum distance of 12m between stops.

- Walkways should be kept as level as possible and provided with slip resistance material.
- To allow for the wheelchair users pavement width should be kept minimum 1.2m.
- The important considerations for the visually handicapped are-
 - Directional box should be made on sidewalks for convenience of Visually handicapped.
 - Tactile flooring shall be made between side walk and main road.
 - Protruding objects shall not be given on footpaths.

Parking areas :

- Accessible parking spaces should be located as close as possible to accessible building entrances.
- Parking spaces for the disabled should never be located at ramped or sloping areas.



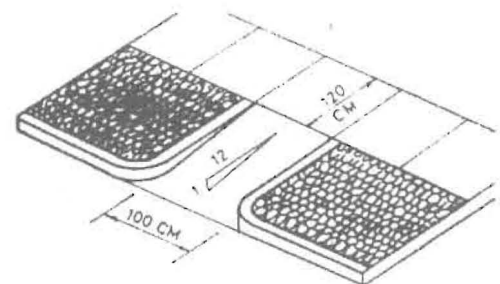
CLOSE PARKING FOR HANDICAPPED

- Accessible parking space should have a minimum width of 3.9m including a space for a person to transfer to a wheelchair from the vehicle.
- Accessible route of minimum 1m should be given between parking space and building.

Kerbs :

For the disabled and particularly for users of wheelchairs it is very difficult to overcome sudden rise or falls in pavement levels. It is essential that these should be reduced by means of dropped kerbs.

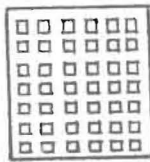
- Dropped kerbs should be located so that users have an unobstructed view of traffic approaching from any direction.
- The length of dropped kerbs shall be not less than 1.2m.
- Dropped kerb shall be ramped towards adjoining kerb with a gradient not more than 1:12.



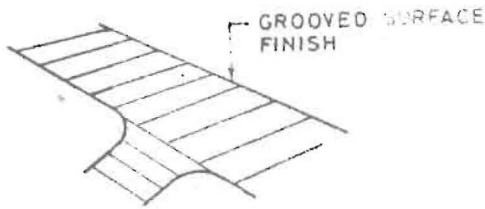
KERB RAMP

Surface finish :

- Ramps should have non slippery surfaces and should be cued by texture and colour contrast.
- For blind people it is advantageous if the ramp has a distinguishing texture, e.g. a patterned surface or coarse aggregate finish.



AVOID SMOOTH SURFACE

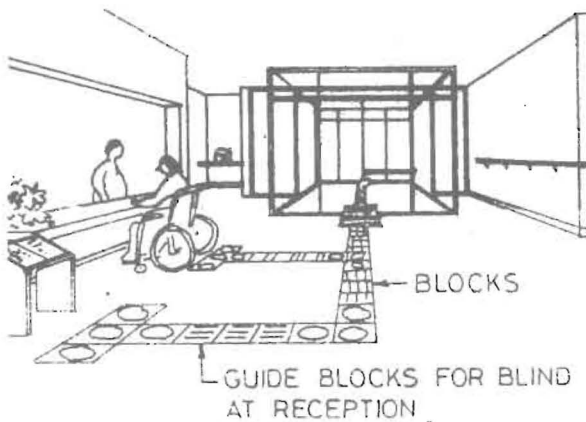


SURFACE FINISH

B. INTERNAL DESIGN ELEMENTS

Entrance :

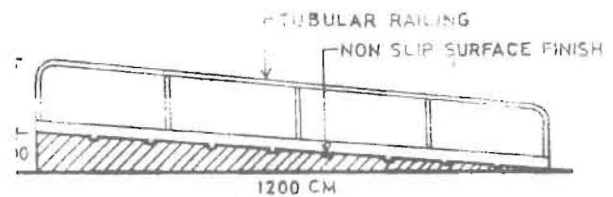
- One entrance level should be provided where elevators are accessible.
- Entrances should be accessible from arrival and departure points to the interior lobby.
- Every entrance/ exit in a building shall be such that a wheelchair user can use it with ease.
- Entrance /exits within a building shall be constructed so that a wheel chair user can pass through them and their width shall be minimum 90 cm or more.
- For the convenience of blind guide blocks etc. should be installed from the entrance/exit to the reception etc.



Ramps:

To permit access to buildings by wheelchair users a level or suitably ramped entrance is essential. Where a stepped approach is incorporated, an alternative level or ramped approach should be provided.

- Handrails should preferably be provided to each side of the ramp.
- A level platform of minimum length 1.5m should be provided at the top of the ramp.
- Width of ramp should be atleast 1.2m to enable a wheelchair to turn preferably at least 1.5m to allow two wheelchair to pass.
- Hand rail should extend a minimum 45cm beyond top and bottom of ramp.
- The maximum gradient should be 1:12



RAMP GRADIENT

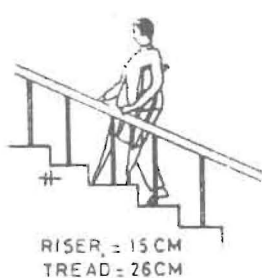
- To allow for Wheelchair users a level platform in front of the entrance door should be provided at the head of any ramp. The depth of ramp should be minimum 1.2m.
- The hand rails should have bright contrasting colour to surroundings for convenience of blinds

Stairs :

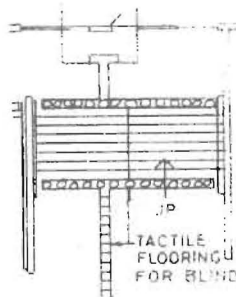
The design of staircase is crucial for the use by an ambulant person.

- The steps should have all the same tread and the same rise.
- It is also crucial that treads are neither sloping nor slippery.
- Protruding nosing should be avoided, however, if this is not possible, it should not project more than 15mm and be chamfered, not square edged.
- The staircase must be properly illuminated.
- No door should open directly on the top of a staircase or swing so as to obstruct the top or bottom of staircase.
- Stairs should have handrail on both sides. A handrail needs to have a good shape as for ramps, to grip.
- Risers should be reduced to 15cm high and treads should be 30 cm wide.
- The full tread should be lit to a minimum level of 100 lux and not be partially in shadow.
- Winders and splayed steps should be avoided.
- For visually handicapped the points to be considered are-

- For the blind at the top of staircase a different floor surface texture should be provided



STAIR CASE



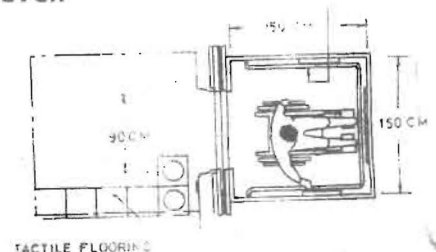
- For visually handicapped it is advantageous if the

colour of the tread contrasts with the colour of the riser.

- A tactile strip 30cm wide shall be installed before hazardous areas at the top and bottom of staircase.

Lifts :

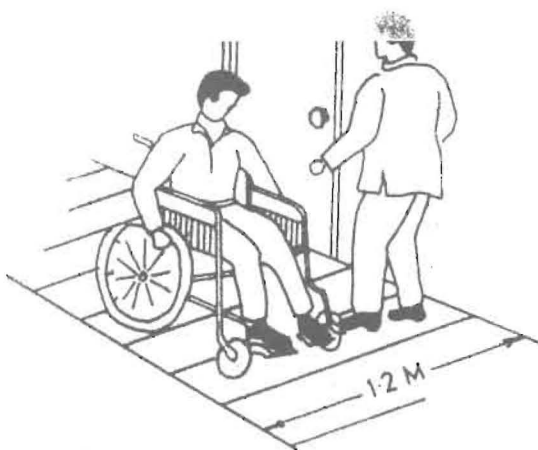
- Space for the lift should be located near main entrance. There should be a clear area in front of the lift of at least 1.5m x 1.5m.
- Lobby having the lift should be connected to emergency stairs and safe route should be provided, in case of fire.
- Control panels and emergency systems of accessible elevators shall be within reach of the wheelchair user. The top most button shall be between 90cm to 120cm.
- The principal entrance shall have exits/entrances with a width of 90 cm or more.
- To allow a wheelchair to be turned inside the lift the minimum dimension should be 1.5m x 1.5m wide.
- The audible signals should be provided for the visually handicapped.
- Button controls shall be provided with braille signs to indicate floor level.



LIFT DETAIL

Corridors :

- Spaces shall be allowed for manoeuvring wheelchair in corridors.
- Corridors shall have a minimum clear width of 1.2m. The recommended width of corridor is 1.8 m for easy circulation.
- Waiting areas and other facilities shall not obstruct the minimum clearance requirement.
- Corridor should have the same level and slip resistant surface.
- A space not less than 1.5sq m shall be provided at or within 3.5m of every dead end.
- Recesses or turn about spaces should be provided for wheelchairs to turn around or to enable another wheel chair to pass. These spaces shall have a minimum area of 1.5m x1.5m. and shall be placed at a maximum of 12.0m



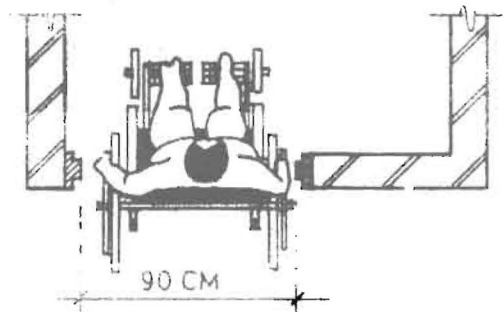
WIDTH OF CORRIDOR & PASSAGE

- Corridors should not have any protruding objects for the convenience of blinds.
- Railing at 80cm height should be provided in corridors in the

homes specially designed for elderly.

Doors / Opening :

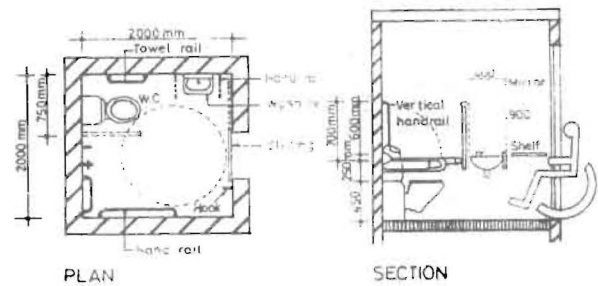
- The minimum door width should be 90 cm to enable wheelchair user pass through the door.



WIDTH OF DOOR

- Doors opening out in corridor and in circulation spaces should be avoided.
- Side hung doors in room corner are easy to operate.
- Door handles shall not be less than 90cm and not more than 1.0m above floor level, measured from the top surface to the top of the grip.
- Clear openings shall be measured between the surface of the fully open door at the hinges and the door jamb at the stop.
- Doors along major circulation routes should be provided with kick plates made of durable material at a height of 30cm to 40cm.
- Doors should not be difficult to open. Lever handles are preferred to knob handles because lever can be used with one or more fingers only.
- Doors should not be placed in such a way that door swings conflict.

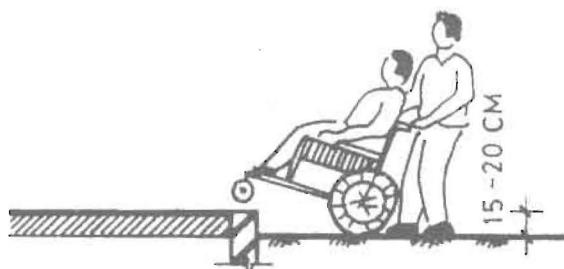
- For the blind, side hung doors left partially open are a hazard; suitable door closers should be specified.
- Swing doors are hazardous to wheelchair users, the blind, and semi-ambulant users using sticks or crutches.
- Single leaf sliding doors are satisfactory for the wheelchair user.



TOILET SIZE & FIXTURES

Thresholds :

- It should be avoided. If they are needed, they should be well designed not to form barriers to the disabled.
- It should be kept to a minimum whenever necessary. The height of thresholds should not exceed 25mm.
- They must be clearly defined for example by contrasting colour, to the adjacent floor surface.



PLINTH LEVEL

Public conveniences :

Toilets

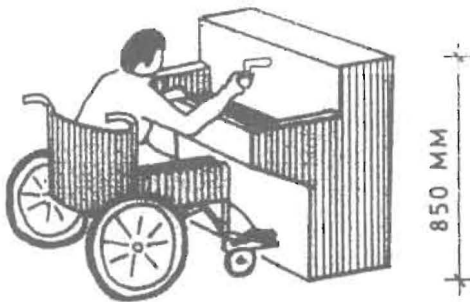
Minimum one toilet of adequate size for wheelchair movement inside should be given for handicapped person in public buildings, having all the fixtures convenient for the disabled.

- Toilet should be accessible from a public corridor, so that they can be used by the disabled easily.
- The minimum space for disabled with wheelchair is 1.5m x 2.0m in toilet.
- It is essential to plan extra space for helper since some disabled can not use lavatories by themselves.
- The floor should be non-slippery and there should be no obstacles to prevent turning, or access to the seat.
- A lavatory should be provided with appropriate handrails. The height of hand rail should be 80 cm near water closet.
- The maximum height of water closet should be 45cm, and flush control should have a maximum height of 1.2 m.
- Any door fastening shall be capable of being operated from the outside in the event of an emergency.
- The grab bars should not be less than 2.5 cm nor more than 5.0cm in external diameter and should be fixed not less than 3cm clear of the walls.
- The chain should not extend more than 1.35m above floor level where high level cisterns are used.

- All water supply and drainage lines should be concealed to avoid the accident.
- In principal, 2% or more of toilet stalls on each storey of toilet building should be toilet stalls for wheelchair user.
- Hooks for walking sticks should be provided.

Drinking fountain :

- There should be at least one accessible fountain per floor.
- In front of drinking fountain unit minimum clear space should be 75 x 120 cm in front of drinking fountain unit.
- There should be adequate knee space and foot clearance beneath the drinking fountain unit.



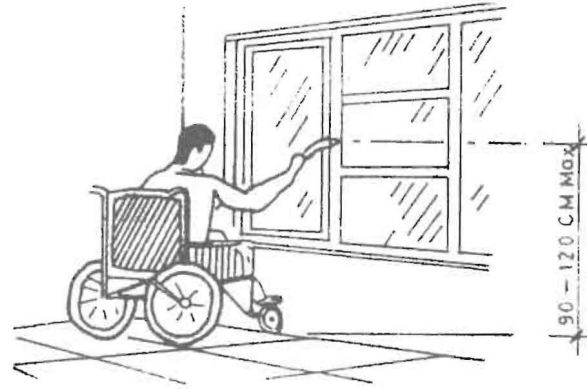
DRINKING WATER FACILITY

- The spout height should be 90cm high or less.
- Controls should be able to be used with one hand and with a minimum of effort without twisting.
- The spout and controls should be located at the front.

Controls :

- Electric controls should be in the zone 90cm to 120cm from the floor for convenience of disabled.
- The height of window controls for

operation should be maximum 120 cm from the floor level.



HEIGHT OF WINDOW OPENING

- Switches should not be located at a distance more than 20 cm from the latch side of the door.

Public telephones:

- The maximum height of operable instruments should be 120 cm.
- The telephone directory should be accessible.
- In front of telephone minimum clear space should be 90cm x 120 cm.
- The telephone cord should be sufficiently long for convenience of wheel chair user.



PUBLIC TELEPHONE

Assembly spaces :

- Accessible space should be reserved for the wheelchair users in auditorium, cinema halls etc.

Signage :

- The international symbol of accessibility should be used to identify accessible space and elements.



INTERNATIONAL SYMBOL OF ACCESS

- All emergency information, direction, and identification signage should be easy to read.
- For visually impaired persons the international symbol of men and women toilet should be given on door.

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