GOVERNMENT OF NATIONAL CAPITAL TERRITORY OF DELHI
DIRECTORATE OF EDUCATION; INCLUSIVE EDUCATION BRANCH (IEB)
BEHIND LADY SRI RAM COLLEGE; LAJPAT NAGAR-IV; NEW DELHI-110024

No. F.275/DDE (IEDSS)/Admn.Cell/2019/2709-2716 **Date: 08/05/2019**

CIRCULAR

Directorate of Education has compiled the "Handbook on Barrier Free Access to School" to ensure the barrier free accessibility in the school buildings for children with disabilities. The handbook has been prepared by adapting the guidelines of Ministry of Urban development, GOI and the handbook on barrier free accessibility by Central Public Work Department as well as in consultation with the Office of State Commissioner for Persons with Disabilities, GNCTD. The hardcopy of this handbook is being distributed to all Govt. schools of Directorate of Education @ 2 copies per school by this branch. The same is also given as **Annexure- I** with this circular.

Section 16(ii) of the Rights of Persons with Disabilities Act, 2016 states that *the appropriate Government and the local authorities shall endeavour that all educational institutions funded or recognized by them provide inclusive education to the Children with disabilities and towards that end shall make building, campus and various facilities accessible.*

Section 89 of the said act states that *any person who contravenes any of the provisions of this Act, or of any rules made there under shall for first contravention be punishable with fine which may extend to ten thousand rupees and for any subsequent contravention with fine which shall not be less than fifty thousand rupees but which may extend to five lakh rupees.*

In view of the above, all the Heads of Govt. Schools are hereby directed to maintain/provide/renovate/repair the ramps, railings, modified toilets, tactile tiles, signages etc. as per the specifications given in the said Handbook in order to make the school building and environment barrier free and accessible to Children with Disabilities. This shall be done through Public Works Department by generating EOR. Further, all the Heads of Govt. Schools are also directed to ensure that no construction is done in the school without ensuring proper ramps, railings, modified toilets, tactile tiles, signages etc.

Any leniency or non-compliance of this circular/order will be viewed seriously.

This issues with the prior approval of the Director (Education).

8.5.19

(GANESH PRASAD)
DEPUTY DIRECTOR OF EDUCATION (IEB)

No. F.275/DDE (IEDSS)/Admn.Cell/2019/2709-2716 **Date: 08/05/2019**

Copy to:-

1. P.S. to Secretary (Education), GNCT of Delhi
2. P.S. to Director (Education), Directorate of Education, GNCT of Delhi
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8. OS (IT) for uplinking on DoE website.
9. Guard file

8.5.19

(GANESH PRASAD)
DEPUTY DIRECTOR OF EDUCATION (IEB)

HANDBOOK

OF

BARRIER FREE ACCESS TO SCHOOLS

FOR

CHILDREN WITH DISABILITIES

DIRECTORATE OF EDUCATION

GOVT. OF NCT OF DELHI

HANDBOOK

OF

BARRIER FREE ACCESS TO SCHOOLS

FOR

CHILDREN WITH DISABILITIES

(2017)

Compiled by:

Aseem Kumar Goel
Deputy Director (IEDSS)

DIRECTORATE OF EDUCATION
GOVT. OF NCT OF DELHI

ACKNOWLEDGEMENT

In pursuance to the Rights of Persons with Disabilities Act, 2016 and as suggested by the office of Commissioner for Persons with Disabilities, Directorate of Education, Govt. of NCT of Delhi took upon itself to prepare a handbook of barrier free access to schools for children with special needs.

The goal of education for children with or without special needs is to prepare them for a happy, productive and useful civil life. When education has become the right of every child whether with disability or without disability, it is important that every child of school going age receives education in the manner he is receptive to. To achieve this aim, education of all children including special children needs to be given importance. They must be provided optimal support in the regular schools. Special children need this all the more to supplement their different talents.

This handbook has been prepared by adapting the existing guidelines of Ministry of Urban Development, GoI and handbook on barrier free and accessibility by Central Public Works Department.

The exercise of preparation of this handbook was done under the overall leadership and guidance of Smt. Saumya Gupta, Director with support from Shri Mohammed A Abid, Special Director.

CONTENTS

LIST OF ILLUSTRATIONS

Chapter-1 BACKGROUND

United Nation Convention on Rights of Persons with Disabilities (UNCRPD, 2008)

CRPD came into force in India in May 2008. The UN Convention sees disability as an interaction of impairments and barriers that hinder effective participation in a society.

Article 9 of UNCRPD: Accessibility

To enable Persons with Disabilities to live independently and participate fully in all aspects of life, States shall take appropriate measures to ensure access to Persons with Disabilities, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas. These measures, which shall include the identification and elimination of obstacles and barriers to accessibility, shall apply to, inter alia:

a. Buildings, roads, transportation and other indoor and outdoor facilities, including schools, housing, medical facilities and workplaces;

b. Information, communications and other services, including electronic services and emergency services.

The benefits of accessibility are significant. Aside from responding to the needs of Persons with Disabilities, increasing accessibility leads to increased opportunities for Persons with Disabilities to access employment and to fully participate in the social, cultural, recreational, economic life of India.

During the design, planning and construction of accessible spaces and buildings a wide range of opportunities exist not only to optimize independent access to Persons with Disabilities but also to improve access for all. The major objective of the Barrier Free Design Guidelines, which are based on Universal Design principles, is to guide City authorities when considering or developing public projects.

The Barrier Free Design Guidelines have been made considering:

- a wide variety of internal and external building elements should be universally accessible to comply with universal design principles;
- retrofitting of old buildings and new buildings should ensure full accessibility from planning stage itself;
- an equivalent level of safety for everyone, including modes of ingress/egress/ communication in an emergency;
- the need to emphasize dignity and independence of persons with disabilities, (providing features that will allow people to function smoothly in their day-to-day activities); and
- to be non-institutional and successfully integrate with a building's function, for and architectural quality.

Chapter-2 RIGHTS OF PERSONS WITH DISABILITIES ACT, 2016

The Act replaces the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995. It fulfills the obligations to the United National Convention on the Rights of Persons with Disabilities (UNCRPD), to which India is a signatory. The Act came into force during December 2016.

Salient features of the Act

Disabilities covered

- Disability has been defined based on an evolving and dynamic concept.
- The types of disabilities have been increased from existing 7 to 21 and the Central Government will have the power to add more types of disabilities. The 21 disabilities are given below:-

1. Blindness
2. Low-vision
3. Leprosy Cured persons
4. Hearing Impairment (deaf and hard of hearing)
5. Locomotor Disability
6. Dwarfism
7. Intellectual Disability
8. Mental Illness
9. Autism Spectrum Disorder
10. Cerebral Palsy
11. Muscular Dystrophy
12. Chronic Neurological conditions
13. Specific Learning Disabilities
14. Multiple Sclerosis
15. Speech and Language disability
16. Thalassemia
17. Hemophilia
18. Sickle Cell disease
19. Multiple Disabilities including deafblindness
20. Acid Attack victim
21. Parkinson's disease

- Persons with "benchmark disabilities" are defined as those certified to have at least 40 percent of the disabilities specified above.

Rights and entitlements

- Responsibility has been cast upon the appropriate governments to take effective measures to ensure that the persons with disabilities enjoy their rights equally with others.
- Additional benefits such as reservation in higher education (not less than 5%), government jobs (not less than 4 %), reservation in allocation of land, poverty alleviation schemes (5% allotment) etc. have been provided for persons with benchmark disabilities and those with high support needs.
- Every child with benchmark disability between the age group of 6 and 18 years shall have the right to free education.
- Government funded educational institutions as well as the government recognized institutions will have to provide inclusive education to the children with disabilities.
- For strengthening the Prime Minister's Accessible India Campaign, stress has been given to ensure accessibility in public buildings (both Government and private) in a prescribed time-frame.

Guardianship

- The Act provides for grant of guardianship by District Court under which there will be joint decision – making between the guardian and the persons with disabilities.

Establishment of Authorities

- Broad based Central & State Advisory Boards on Disability are to be set up to serve as apex policy making bodies at the Central and State level.
- Office of Chief Commissioner of Persons with Disabilities has been strengthened who will now be assisted by 2 Commissioners and an Advisory Committee comprising of not more than 11 members drawn from experts in various disabilities.
- Similarly, the office of State Commissioners of Disabilities has been strengthened who will be assisted by an Advisory Committee comprising of not more than 5 members drawn from experts in various disabilities.
- The Chief Commissioner for Persons with Disabilities and the State Commissioners will act as regulatory bodies and Grievance Redressal agencies and also monitor implementation of the Act.
- District level committees will be constituted by the State Governments to address local concerns of PwDs. Details of their constitution and the functions of such committees would be prescribed by the State Governments in the rules.
- Creation of National and State Fund will be created to provide financial support to the persons with disabilities. The existing National Fund for Persons with Disabilities and the Trust Fund for Empowerment of Persons with Disabilities will be subsumed with the National Fund.

Penalties for offences

- The Act provides for penalties for offences committed against persons with disabilities and also violation of the provisions of the new law.
- Any person, who violates provisions of the Act, or any rule or regulation made under it, shall be punishable with imprisonment up to six months and/ or a fine of Rs 10,000, or both. For any subsequent violation, imprisonment of up to two years and/or a fine of Rs 50,000 to Rs five lakhs can be awarded.
- Whoever intentionally insults or intimidates a person with disability, or sexually exploits a woman or child with disability, shall be punishable with imprisonment between six months to five years and fine.
- Special Courts will be designated in each district to handle cases concerning violation of rights of PwDs.

Extract of Rights of Persons with Disabilities Act, 2016

Rights and Entitlements

Section 3:

(1) The appropriate Government shall ensure that the persons with disabilities enjoy the right to equality, life with dignity and respect for his or her integrity equally with others.

(2) The appropriate Government shall take steps to utilize the capacity of persons with disabilities by providing appropriate environment.

(3) No person with disability shall be discriminated on the ground of disability, unless it is shown that the impugned act or omission is a proportionate means of achieving a legitimate aim.

(4) No person shall be deprived of his or her personal liberty only on the ground of disability.

(5) The appropriate Government shall take necessary steps to ensure reasonable accommodation for persons with disabilities.

Section 4:

(1) The appropriate Government and the local authorities shall take measures to ensure that the women and children with disabilities enjoy their rights equally with others.

(2) The appropriate Government and local authorities shall ensure that all children with disabilities shall have right on an equal basis to freely express their views on all matters affecting them and provide them appropriate support keeping in view their age and disability."

Education

Section 16:

The appropriate Government and the local authorities shall endeavour that all educational institutions funded or recognized by them provide inclusive education to the children with disabilities and towards that end shall—

(i) admit them without discrimination and provide education and opportunities for sports and recreation activities equally with others;
(ii) make building, campus and various facilities accessible;
(iii) provide reasonable accommodation according to the individual's requirements;
(iv) provide necessary support individualized or otherwise in environments that maximize academic and social development consistent with the goal of full inclusion;
(v) ensure that the education to persons who are blind or deaf or both is imparted in the most appropriate languages and modes and means of communication;
(vi) detect specific learning disabilities in children at the earliest and take suitable pedagogical and other measures to overcome them;
(vii) monitor participation, progress in terms of attainment levels and completion of education in respect of every student with disability;
(viii) provide transportation facilities to the children with disabilities and also the attendant of the children with disabilities having high support needs.

Section 17:

The appropriate Government and the local authorities shall take the following measures for the purpose of section 16, namely:—

(a) to conduct survey of school going children in every five years for identifying children with disabilities, ascertaining their special needs and the extent to which these are being met: Provided that the first survey shall be conducted within a period of two years from the date of commencement of this Act;
(b) to establish adequate number of teacher training institutions;
(c) to train and employ teachers, including teachers with disability who are qualified in sign language and Braille and also teachers who are trained in teaching children with intellectual disability;
(d) to train professionals and staff to support inclusive education at all levels of school education;
(e) to establish adequate number of resource centres to support educational institutions at all levels of school education;
(f) to promote the use of appropriate augmentative and alternative modes including means and formats of communication, Braille and sign language to supplement the use of one's own speech to fulfill the daily communication needs of persons

with speech, communication or language disabilities and enables them to participate and contribute to their community and society;

(g) to provide books, other learning materials and appropriate assistive devices to students with benchmark disabilities free of cost up to the age of eighteen years;

(h) to provide scholarships in appropriate cases to students with benchmark disability;

(i) to make suitable modifications in the curriculum and examination system to meet the needs of students with disabilities such as extra time for completion of examination paper, facility of scribe or amanuensis, exemption from second and third language courses;

(j) to promote research to improve learning; and (k) any other measures, as may be required.

Section 18:

The appropriate Government and the local authorities shall take measures to promote, protect and ensure participation of persons with disabilities in adult education and continuing education programmes equally with others.

Section 40:

The Central Government shall, in consultation with the Chief Commissioner, formulate rules for persons with disabilities laying down the standards of accessibility for the physical environment, transportation, information and communications, including appropriate technologies and systems, and other facilities and services provided to the public in urban and rural areas.

Section 44:

(1) No establishment shall be granted permission to build any structure if the building plan does not adhere to the rules formulated by the Central Government under section 40.

(2) No establishment shall be issued a certificate of completion or allowed to take occupation of a building unless it has adhered to the rules formulated by the Central Government.

Section 45:

(1) All existing public buildings shall be made accessible in accordance with the rules formulated by the Central Government within a period not exceeding five years from the date of notification of such rules: Provided that the Central Government may grant extension of time to the States on a case to case basis for adherence to this provision depending on their state of preparedness and other related parameters.

(2) The appropriate Government and the local authorities shall formulate and publish an action plan based on prioritization, for providing accessibility in all their

buildings and spaces providing essential services such as all primary health centres, civil hospitals, schools, railway stations and bus stops. 46. The service providers whether Government or private shall provide services in accordance with the rules on accessibility formulated by the Central Government under section 40 within a period of two years from the date of notification of such rules:

Provided that the Central Government in consultation with the Chief Commissioner may grant extension of time for providing certain category of services in accordance with the said rules.

Offences and penalties

Section 89:

Any person who contravenes any of the provisions of this Act, or of any rule made there under shall for first contravention be punishable with fine which may extend to ten thousand rupees and for any subsequent contravention with fine which shall not be less than fifty thousand rupees but which may extend to five lakh rupees.

Section 90:

(1) Where an offence under this Act has been committed by a company, every person who at the time the offence was committed, was in charge of, and was responsible to, the company for the conduct of the business of the company, as well as the company, shall be deemed to be guilty of the offence and shall be liable to be proceeded against and punished accordingly: Provided that nothing contained in this sub-section shall render any such person liable to any punishment provided in this Act, if he proves that the offence was committed without his knowledge or that he had exercised all due diligence to prevent the commission of such offence.

(2) Notwithstanding anything contained in sub-section (1), where an offence under this Act has been committed by a company and it is proved that the offence has been committed with the consent or connivance of, or is attributable to any neglect on the part of any director, manager, secretary or other officer of the company, such director, manager, secretary or other officer shall also be deemed to be guilty of that offence and shall be liable to be proceeded against and punished accordingly. State Fund for persons with disabilities.

Explanation:—For the purposes of this section,— (a) “company” means anybody corporate and includes a firm or other association of individuals; and (b) “director”, in relation to a firm, means a partner in the firm.

Section 91:

Whoever, fraudulently avails or attempts to avail any benefit meant for persons with benchmark disabilities, shall be punishable with imprisonment for a term which may extend to two years or with fine which may extend to one lakh rupees or with both.

Chapter-3 INTRODUCTION

The goal of education for children with or without special needs is to prepare them for a happy, productive and useful civil life. When education has become the right of every child whether Child with Disability or without Disability, it is important that every child of school going age receives education in the manner he is receptive to. To achieve this aim, education of all children including special children needs to be given importance. They must be provided optimal support in the regular schools. Special children need this all the more to supplement their different talents.

The adoption of barrier free access is imperative so that the goal of 'Education for All' can be achieved. It serves as the catalyst for smarter practices and broader perspectives and to improve quality of life of children with special needs.

Barrier free access

The objectives of the Rights of Persons with Disabilities Act with reference to barrier free access are:

- To create a barrier- free environment for persons with disabilities.
- To make special provisions for including persons with disabilities in mainstream society.
- To lay down strategies that will ensure comprehensive programmes and services and equal opportunities for persons with disabilities.

Provisions under Chapter III of RPWD Act ensure that every child with a disability has access to free education in an appropriate and inclusive environment till he attains the age of eighteen years. It stresses on providing education both through formal education systems as well as through non – formal education systems and makes provisions for services in rural areas using locally available human resources. It also commits to ensure that every child with disability has access to using teaching aids and assistive devices that will support the child to learn better.

Barrier Free Access refers to universal access for all children and adults within the schools. This is particularly relevant in the context of children with special needs because they have variety of learning needs which need to be addressed as they face many problems in the society. It is a challenge to the family, society, teachers, administrators as well as institutional mechanism working in the field of education for all. The child may not come to school because of various barriers both social and physical. At the school level there are various barriers starting with the attitude of the teacher to the attitudes of the peer group and most importantly the physical barriers. This should not be limited only to buildings and physical infrastructure, but also to curriculum and teaching learning processes. When physical factors pose barriers to learning and participation, simple ramps and internal classroom arrangements can easily help the situation.

Chapter-4 ANTHROPOMETRICS

This chapter contains dimensions that can be used for guidance when designing facilities to be used by Persons with Disabilities. Adequate space should be allocated for persons using mobility devices, e.g. wheelchairs, crutches and walkers, white cane etc. as well as those walking with the assistance of other persons.

Wheel chair

Some of the typical dimensions of a standard wheelchair are extremely important and helps to get standards for space allowance, reach range, etc. of a wheelchair user. Electric wheelchairs may be of a larger dimension, much heavier and do not have the same maneuverability/capability as manual wheelchairs.

Manual wheelchairs dimensions are as follows:
(Figure 4.1)

- Length : 1000-1200 mm
- Width : 650 - 720 mm
- Height : 910 - 950 mm
- Wheelchair footrest : 350 mm (deep)
- Wheelchair castor Width : 12 mm
- Seat height : 480 mm
- Arm Rest height : 760 mm
- Lap height : 675 mm

When the wheelchair is folded

- Width : 300 mm
- Height of armrest : 760 mm

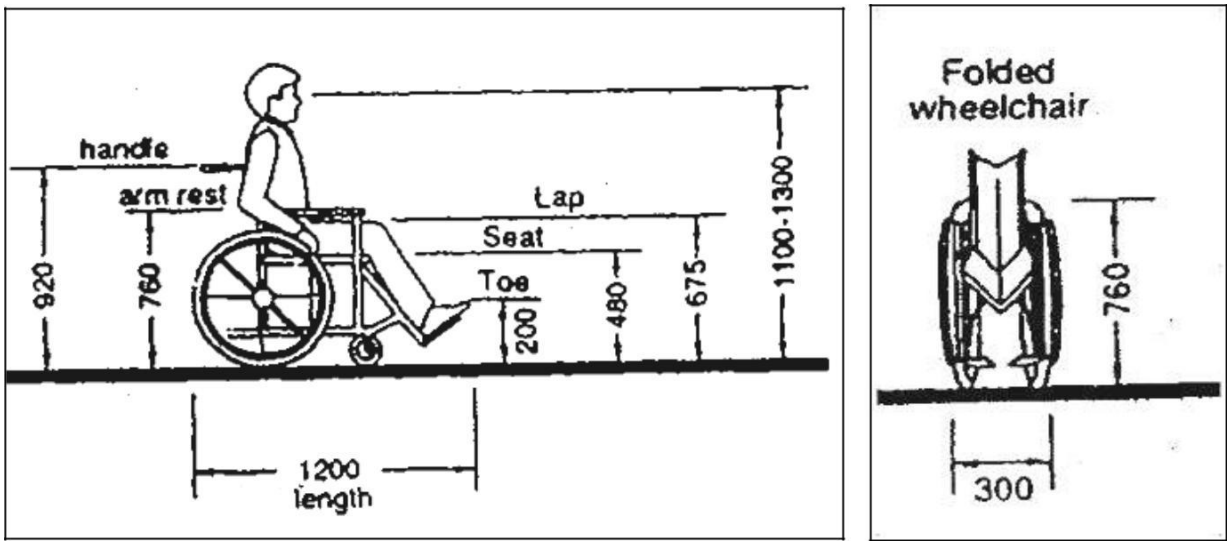


Figure 4.1: Dimensions of manual wheel chair in usable and folded position

A wheelchair has a footplate and leg rest attached in front of the seat. (The footplate extends about 350 mm in front of the knee). The footplate may prevent a wheelchair user from getting close enough to an object. Hence, at least 350 mm deep and 700 mm high space under a counter, stand, etc. should be given.(Figure 4.2)

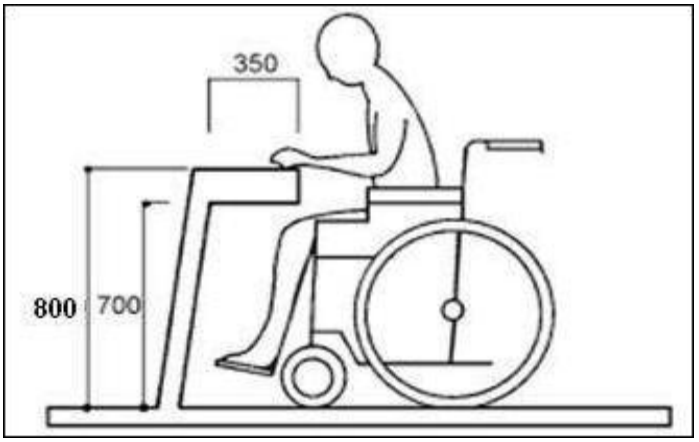


Figure 4.2: Knee clearance

Wheelchair user

The minimum clear floor or ground area required accommodating a single, stationary wheel chair and occupant is 900 mm x 1200 mm. (Figure 4.3)

- Width : 900 mm
- Length : 1200 mm

Circulation dimensions

The minimum clear floor ground area for a wheelchair to turn is 1500 mm whereas it may be ideal to provide 2000 mm. (Figure 5.4)

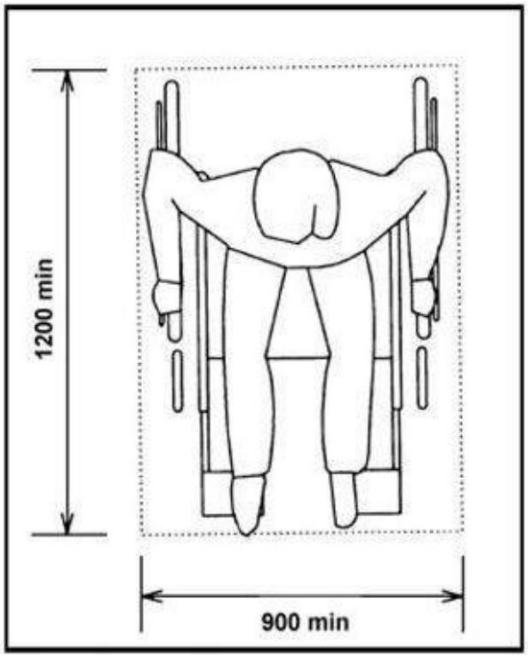


Figure 4.3: Clear floor space

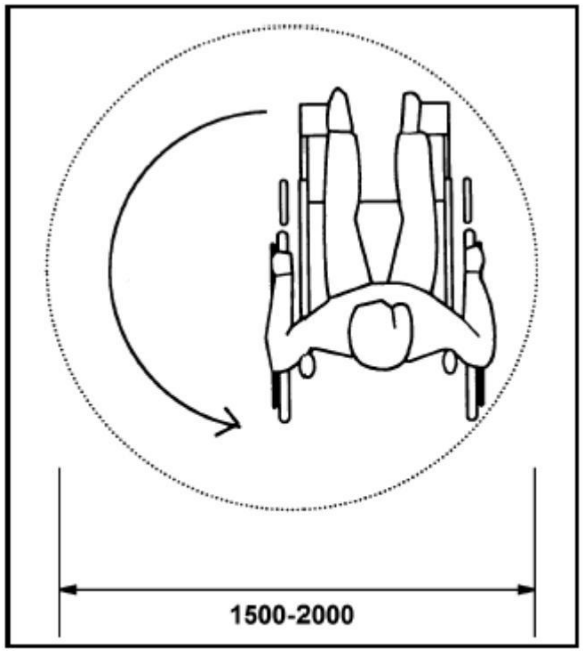


Figure 4.4: Turning radius

Space Allowance for crutch user

Although people who use walking aids can manoeuvre through door openings of 900 mm clear width, they need wider passageways 920mm for comfortable gait (Figure 4.5).

Crutch tips, often extend down out at a wide angle, are a hazard in narrow passage-ways where they might not be seen by other pedestrians.

- Width: 920 mm
- With no obstruction up to 300 mm height

Space allowance for white cane users

- Protruding objects, such as directional signs, tree branches, wires, guy ropes, benches and ornamental fixtures should be installed with consideration of the range of a person with visual impairment white cane;
- A barrier to warn blind or Persons with Visual Impairment should be provided under stairways or escalators;
- Walkways, halls, corridors, passageways, aisles or other circulation spaces should have clear headroom to minimize the risk of accidents;
- The radial range of the white cane is a band 900 mm wide; (Figure 4.6)

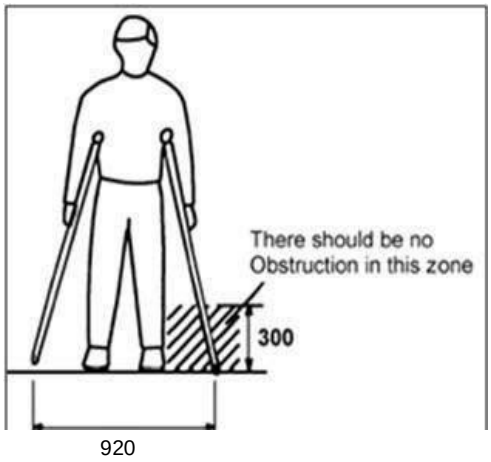


Figure 4.5: Space for crutch user

- Any obstacle above 600 mm cannot be detected by the white cane. If there are projections, above this height then the projections have to be reflected at the floor level in terms of level or textural differences. (Figure 4.6)

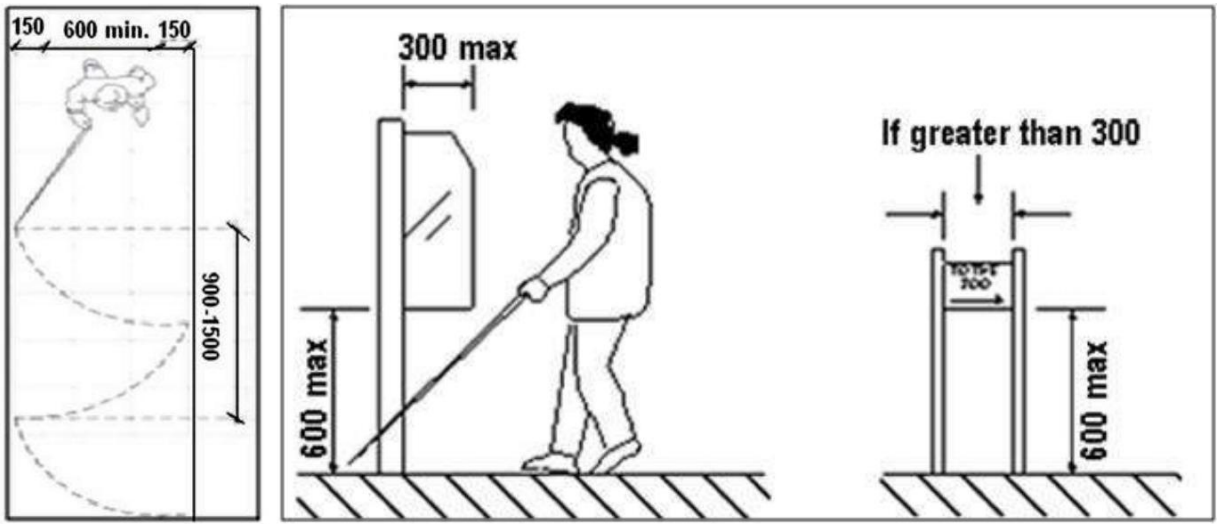


Figure 4.6: Radial range and object detection by the persons with visual impairment

Heights and widths

Wheelchair Users

The average height of a person seated on a wheelchair is generally less than 1200 mm.

Standing Person

The average height of a standing person seated is generally less than 2000 mm.

Height of controls

Height of controls from floor level: 400-1200 mm
Height for switches (power) : 400- 500 mm
Height of switches (light) : 900-1200 mm
Height of doors handles : 900-1000 mm
Opening controls for windows : 900-1000 mm
Space required under the counter for wheelchair footrest: 350 mm deep

Entrance/ exit door

Minimum width of entrance/exit door : 900 mm
Minimum front approach doorways space : 600 mm
Minimum latch approach doorways space : 1250 mm

Persons with hearing impairment

Persons in this category are totally deaf or have difficulty in hearing. They are generally using their sight to gather information in public places.

Design requirements

- Provision of information board in an easily understandable manner
- Provision of illuminated signages, layout diagrams to help the persons easily reach the desired place

Persons with Visual Impairment

Persons in this category are totally blind or with limited vision. Persons with Visual Impairment make use of other senses such as hearing or touch to compensate for the lack of vision. It is necessary to give instructions accessible through the sense of touch (hands, fingers or legs).

While walking with a white cane to spot their feet near the tip of the cane the persons may bump his or her head or shoulder against protruding objects.

Persons with limited vision may be able to discriminate between dark and bright shades and difference in primary colors.

Design requirements

- Use of guiding blocks for persons with visual impairment to guide them within the buildings and facilities and outside the building. (Refer details of guiding/warning blocks).
- Installation of information board in Braille
- Installation of audible signages (announcements)
- Removal of any protruding objects and sufficient walking space for safe walking.
- For persons with limited vision use of contrasting color arrangements

Chapter-5 SITE PLANNING

To accommodate the persons with disabilities and elderly people each building and its site should be planned and designed as an integral unit from the very beginning of the design process.

Walks and Paths

- Walks should be smooth, hard level surface suitable for walking and wheeling. Irregular surfaces as cobble stones, coarsely exposed aggregate concrete, bricks etc. often cause bumpy rides.
- The minimum walk way width would be 1200 mm and for moderate two way traffic it should be 1650 .mm - 1800 mm.
- Longitudinal walk gradient should be 3 to 5% (30 mm - 50 mm in 1 meter)
- When walks exceed 60 Meter in length it is desirable to provide rest area adjacent to the walk at convenient intervals with space for bench seats. For comfort the seat should be between 350 mm - 425 mm high but not over 450 mm.
- Texture change in walk ways adjacent to seating will be desirable for persons with visual impairment.
- Avoid grates and manholes in walks. If grates cannot be avoided then bearing bar should be perpendicular to the travel path and no opening between bearing bars greater than 12 mm in width.

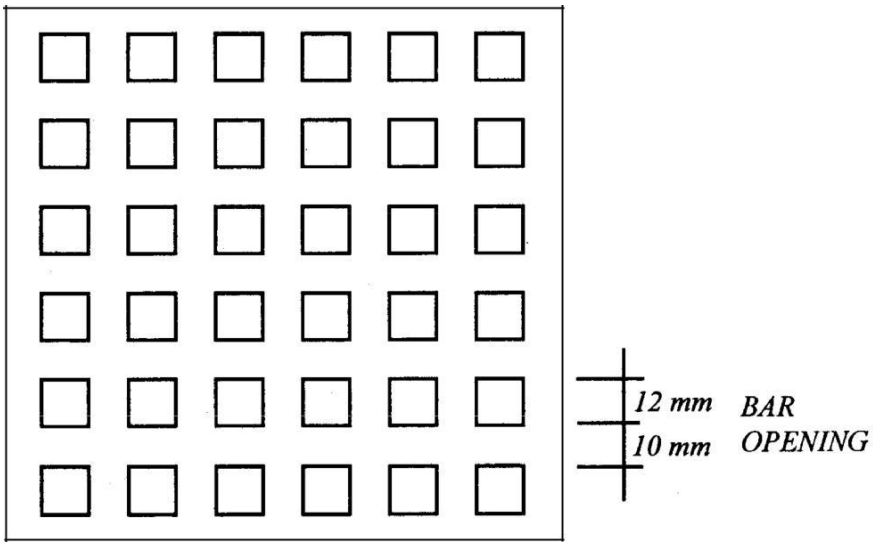


Figure 5.1: Details of Grating

Levels and Grooves

(Passing over different levels and grooves)

- The casters on a wheelchair are about 180 mm in diameter. Therefore, a wheelchair can only get over a small level difference.
- Vertical level changes up to 6 mm may not need edge treatment. Changes in level between 6 mm and 12 mm should be leveled off with a slope no greater than 1:2.
- To prevent a wheelchair from getting its casters caught in a drainage ditch or grating cover, install grating with a narrow slots not more than 10mm wide, perpendicular to the direction of movement.
- Grating should be flushed with finished ground level.
- Treat the grating with a non-slip finish.
- Reduce the gap between an elevator floor and the landing.

Tactile Pavers: guiding & warning blocks

Tactile guiding blocks (Line-type)

This block indicates a correct path/route to follow for a person with visual impairment (Figure 5.5). It is recommended to install one/two rows of tactile guidance tiles along the entire length of the proposed accessible route (Figure 5.3). Care must be taken to ensure that there are no obstacles, such as trees, poles or uneven surfaces, along the route traversed by the guidance blocks. Also, there should be clear headroom of at least 2.1 meters height above the tactile guidance blocks, free of protruding objects such as overhanging tree branches and signage, along the entire length of the walk.

Tactile warning blocks (Dot-type)

This block indicates an approaching potential hazard or a change in direction of the walkway, and serves as a warning of the approaching danger to persons with visual impairments, preparing them to tread cautiously and expect obstacles along the travel path, traffic intersections, doorways, etc. (Figure 5.4). They are used to screen off obstacles, drop-offs or other hazards, to discourage movement in an incorrect direction, and to warn of a corner or junction. Two rows of tactile warning tiles should be installed across the entire width of the designated accessible pathway, before intersections, building entrances, obstacles such as trees, and each time the walkway changes direction (Figure 5.2). Warning blocks should be placed 300mm at the beginning and end of the ramps & stairs, at landings and entrance to any door.

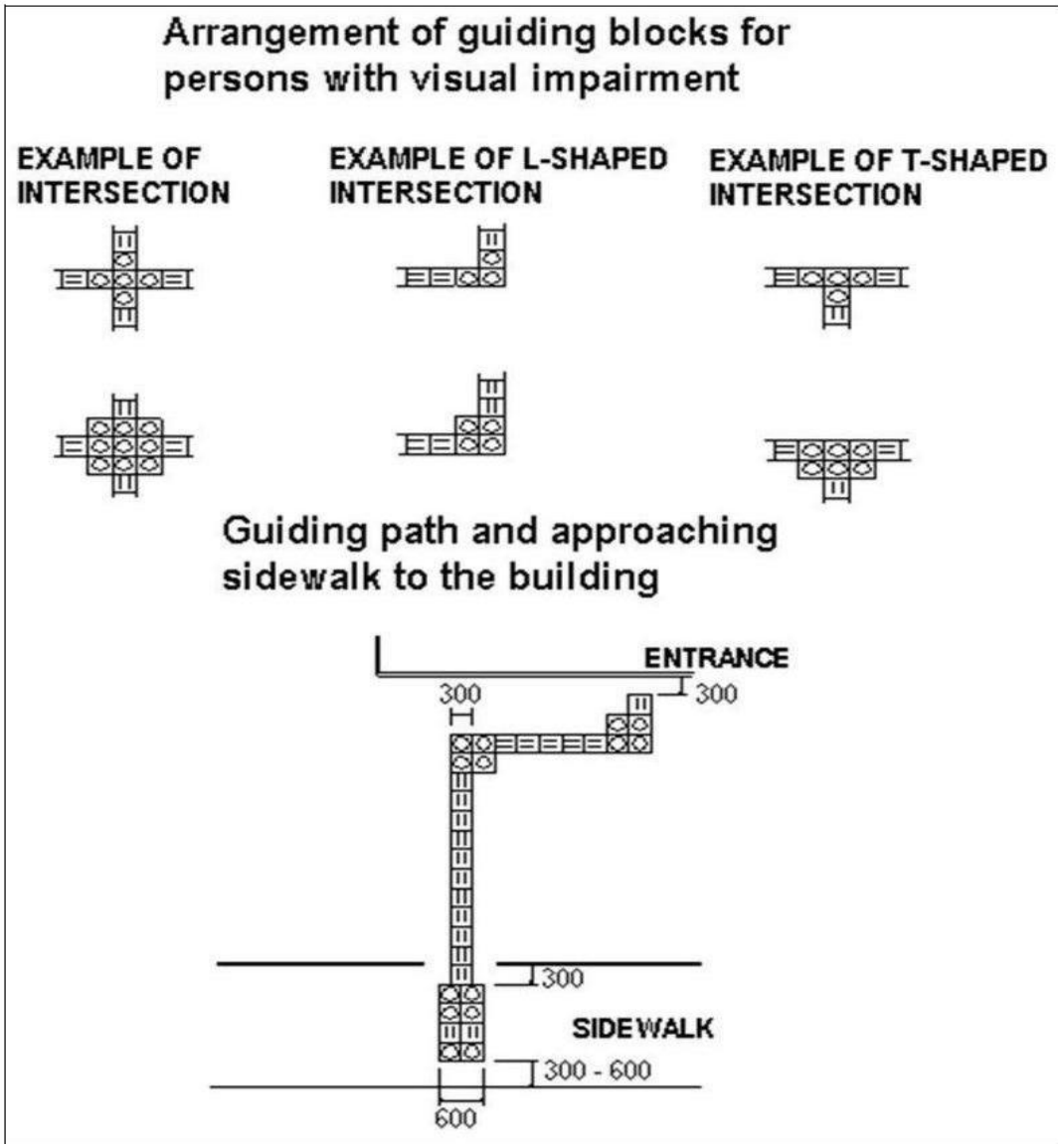


Figure 5.2: Configuration and layout of tactile pavers: (Guiding and Warning)

Figure 5.3: Chequered Tiles

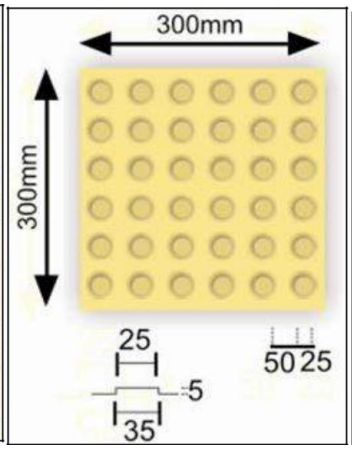


Figure 5.4: Warning Blocks

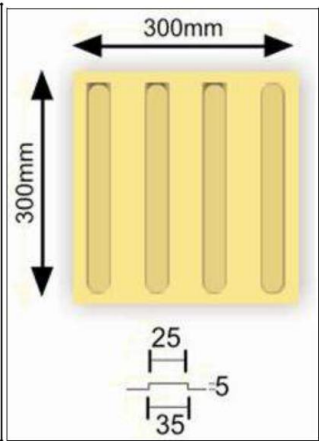


Figure 5.5: Guiding Blocks

Chapter-6 ACCESS TO BUILDING

Every school building should have at least one entrance accessible to the Persons with disabilities and shall be indicated by proper signage. This entrance shall be approached through a ramp together with the stepped entry.

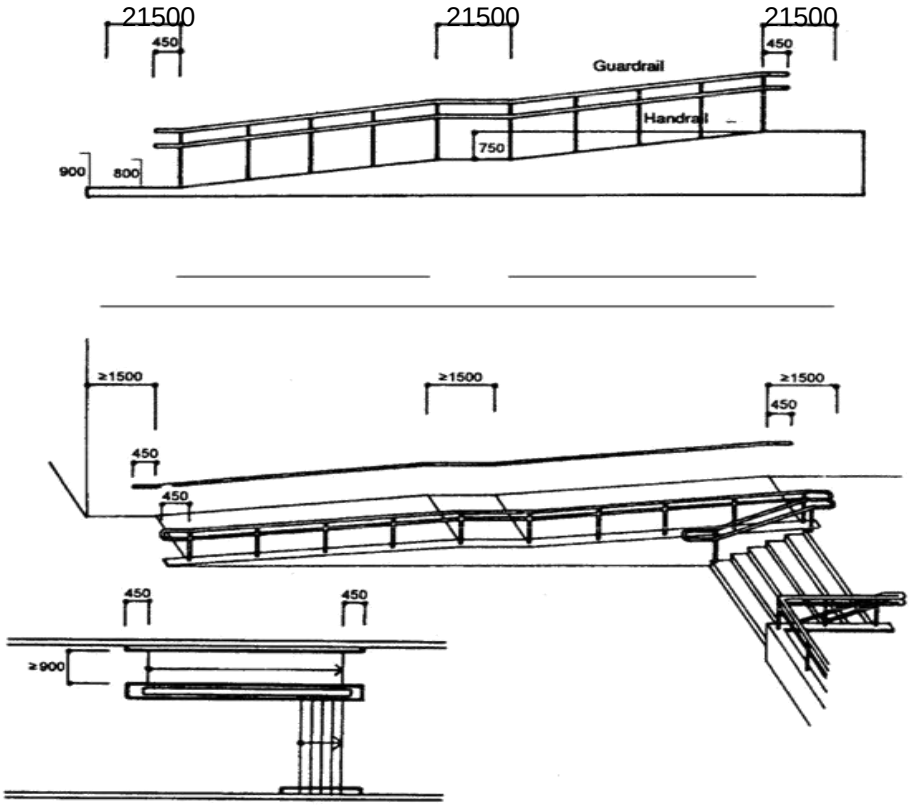
Ramped Approach: Ramp shall be finished with non slip material to enter the building. Minimum width or ramp shall be 1800 mm. with maximum gradient 1:12, length of ramp shall not exceed 9.0 M having double handrail at a might of 800 and 900 mm on both sides extending 300 mm. beyond top and bottom of the ramp. Minimum gap from the adjacent wall to the hand rail shall be 50 mm.

RAMPED APPROACH

Side Elevation of Ramp

Overall View of Ramp

Ramp Combined with Staircase



Cross section of ramp

When climbing a ramp in a wheelchair, the upper limbs must bear the burden of propelling the body up the ramp.

When descending a ramp in a wheelchair, especially on steep ramps, there is a possibility of the wheelchair running out of control because the user must manually control the speed.

Prevent the installation of steep ramps. (Figure 6.1)

(a) Make sure the grade of a ramp is a moderate rise of 10 mm to each 120 mm of travel.
(b) Provide a flat surface 1500 mm or more in length at the top and bottom of the ramp for a wheelchair to pause and prevent it from going out of control.

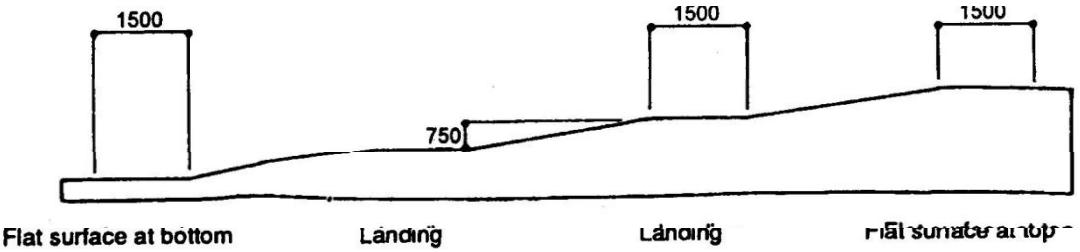


Figure 6.1: Cross Section of Ramp

Stepped Approach: For stepped approach size of tread shall not be less than 300 mm and maximum riser shall be 150 mm. Provision of 900 mm high hand rail should be made on both sides of the stepped approach similar to the ramped approach.

Entrance Landing

Entrance Landing: Entrance landing shall be provided adjacent to ramp with the minimum dimension 1800 x 2000 mm. The entrance landing that adjoins the top end of a slope shall be provided with floor materials to attract the attention of persons with visual impairment (limited to colored floor material whose color and brightness is conspicuously different from that of the surrounding floor material or the material that emit different sound to guide persons with visual impairment. Finishes shall have a non slip surface with a texture traversable by a wheel chair. Curbs wherever provided should blend to a common level. (Figure 6.2)

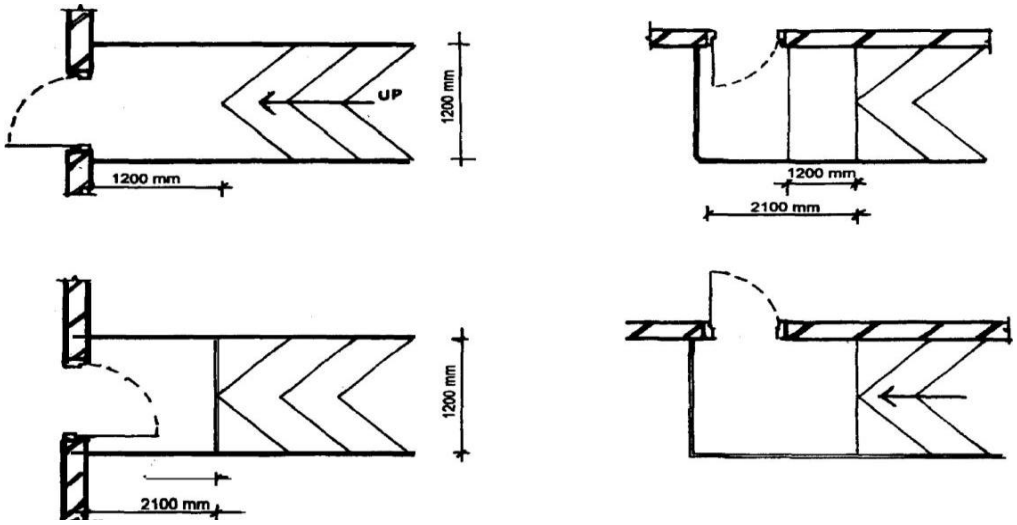


Figure 6.2: Entrance Landing

Corridor

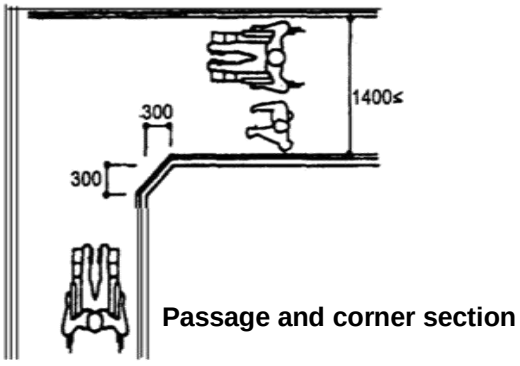
Corridor connecting the entrance/exit for the persons with disabilities: The corridor connecting the entrance/exit for persons with disabilities leading directly outdoors to a place where information concerning the overall use of the specified building can be provided to persons with visual impairment either by a person or by signs, shall be provided as follows:

a. 'Guiding floor materials' shall be provided or devices that emit sound to guide Persons with Visual Impairment.

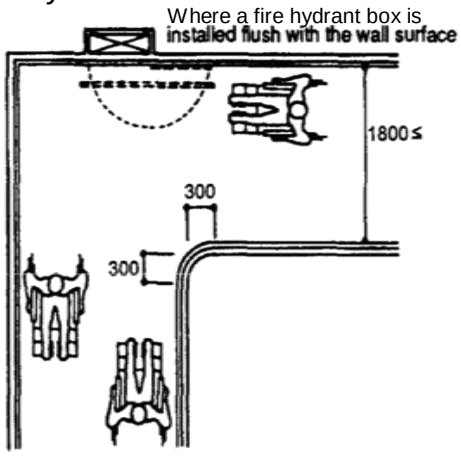
b. The minimum width shall be 1500 mm.

c. In case there is a difference of level slope ways shall be provided with a slope of 1:12.

d. Hand rails shall be provided for ramps/slope ways.



Passage and corner section



Passage for facilities visited by many wheelchair users

Limit for difference in levels

Required width for passage of wheelchair (Figure 6.3)

(1) The wheelchair body itself is about 650 mm wide. Allowing for the use of hands and arms outside the wheelchair, the passage must be as wide as 900 mm or more.

(2) Locations such as entrances and exits can be 900 mm wide. However, a continuous passage (e.g. a corridor) must at least be 900 mm wide to allow for slight side-to-side movement of the wheelchair as it travels.

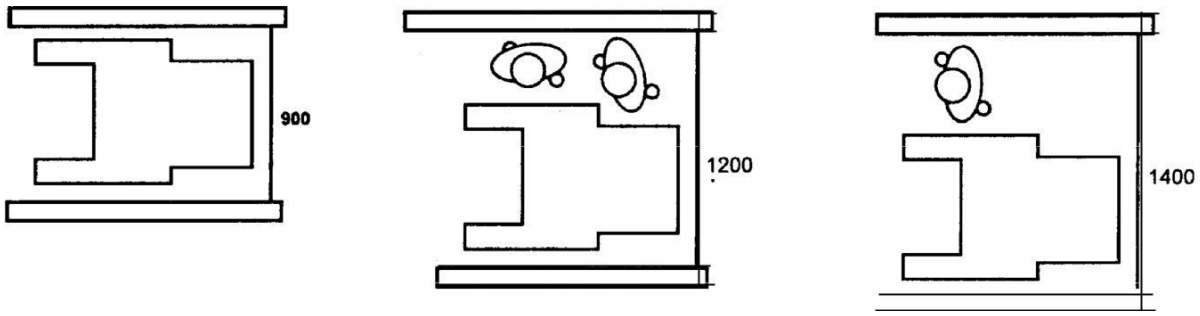


Figure 6.3: Required width for passage of wheelchair

Access to building

- The accessible entrance, if different from the main entrance, should be located adjacent to the main entrance and not at the rear of the building. The accessible entrance should be clearly signed and easy to locate.
- Symbol should be displayed at all other non-accessible entrances to direct Persons with disabilities to the accessible entrance.
- Internal floor surfaces should be anti-skid/non-slip and of materials that do not impede the movement of wheelchairs/other mobility aids.
- Persons with visual impairments find it easier to locate doors if there is a texture difference in the floor around the doorway from the rest of the flooring. It is generally good practice to recess foot mats in the floor on either side of the door but care must be taken to ensure that the top end of the mats are flush with the rest of the flooring.

Internal Corridors and Accessible Routes

Width

- The minimum clear width of an accessible route should be1500mm minimum to allow both a wheelchair and a walking person to pass except when additional maneuvering space is required at doorways.
- Where space is required for two wheelchairs to pass, the minimum clear width should be 1800mm.

Protruding objects

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

Floor surfaces in corridors

Avoid carpeting. If carpet is used, it should be fixed firmly with a pile not higher than 12mm

Lighting in corridors

Lighting in a corridor should be even, diffused and without glare, reflections or shadows.

Minimum illumination level in the corridor should be 150 Lux.

Doors leading into corridors

- Doors should not open outwards from rooms directly into a frequently used corridor, with the exception of doors to accessible toilets and service ducts.
- Where a door opens into an infrequently used corridor such as emergency exit, the corridor width should allow a clear space of 900 mm within the corridor when the door is open. Such doors should be located clear of any sloping floor surfaces in the corridor.
- Any door that opens towards a frequently used corridor should be located in a recess at least as deep as the width of the door leaf.
- The leading edge of any door that is likely to be held open should “contrast visually” with the remaining surfaces of the door and its surroundings to help identification by persons with visual impairment. The architrave should contrast visually with the wall surfaces surrounding the doorway.

Tactile guidance Path along the internal corridors and accessible routes

Along the accessible corridor and route connecting the entire building, a tactile floor guidance path for independent movement of persons with visual impairments should be provided. Tactile guidance path have to be laid out in the entire building premises connecting all the public utilities and locations and building entrance and exits.

Chapter-7 DOORS

Doors and doorways shall be designed to enable all people especially wheelchair user to enter and leave any room unaided or without undue difficulties.

General

- Doorways should be leveled.
- Wherever revolving doors or turnstiles are installed they should be supplemented with an auxiliary side-hung (swing type) door with 900mm minimum clear opening width.
- Bathroom (toilets/washroom) doors should swing out/ should be two way opening type so that the person inside does not fall against the door and block it. In case there is not much space available, consideration should be given to the use of sliding or folding doors, which are easier to operate and require less wheelchair maneuvering space.
- Door should not be too heavy to operate and should not require a force of more than 20 N to operate.
- Automatic doors should have a push button system to open them.
- All external doors should have warning blocks installed 300mm before entrances.

Clear width

The minimum clear opening of doorways should be 900mm, measured between the face of the door and the face of the door stop with the door open at 90 degree.

Thresholds

- There should be no thresholds.
- If thresholds are unavoidable, they should not exceed 12 mm and those exceeding 5 mm should be leveled.

Double-leaf doors

In case the door has two independently operated door leaves, at least one active leaf should comply with clear width given above.

Maneuvering space at doors

A distance of 650 mm should be provided beyond the leading edge of door to enable a wheelchair user to maneuver and to reach the handle.

Wheelchair maneuvering spaces should be free of any obstructions and space should be provided on the side of the door handle in the following manner:

On the pull side, a minimum space of 650 mm
On the push side, a minimum space of 300 mm;

Door hardware

Operable devices such as handles, pulls, latches and locks should:

- Be operable by one hand;
- Not require fine finger control, tight grasping, pinching or twisting to operate; and
- Be mounted at a height of 850 mm to 1100mm from the floor.
- For easy identification by persons with visual impairment all door furniture should contrast visually with the surface of the door.
- The location and design of latch and push/pull handles should be consistent throughout a building**.**
- To facilitate the closing of a door by wheelchair users (for example, a water-closet compartment, that does not have a self-closing mechanism), the door should have a horizontal handle, provided on the closing face of the door, approximately 760 mm from the floor.

Door handles

The following characteristics are recommended:

- Push –pull mechanisms that require no grasping;
- Lever handles to be preferred on latched doors;
- It is safer to use D shaped handles as they reduce the risk of catching on clothing, or injuring from the exposed lever end.
- Doorknob is not recommended, as it does not provide adequate grip for persons with hand function difficulties

Sliding/folding doors

Operating hardware should be exposed and usable from both the sides when the door is fully open.

Door opening Force

The maximum force for pushing or pulling or sliding a door should be 20N

Door Closure

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

Chapter-8 DROPPED KERBS

A dropped kerb is a ramp built on a footpath or pavement to accommodate the change in level towards vehicular areas. Dropped kerbs shall be of appropriate design and provided with adequate visual and tactile warning.

General Provision

Kerb ramps (Figure 8.1)

- are provided where the vertical rise is less than 150 mm;
- should have a slip-resistant surface;
- should be designed not to allow water accumulating on the walking surface;
- do not require handrails;
- should not project into the road surface;
- should be located or protected to prevent obstruction by parked vehicles; and
- should be free from any obstruction such as signposts, traffic lights, etc.
- should not be used if they project in

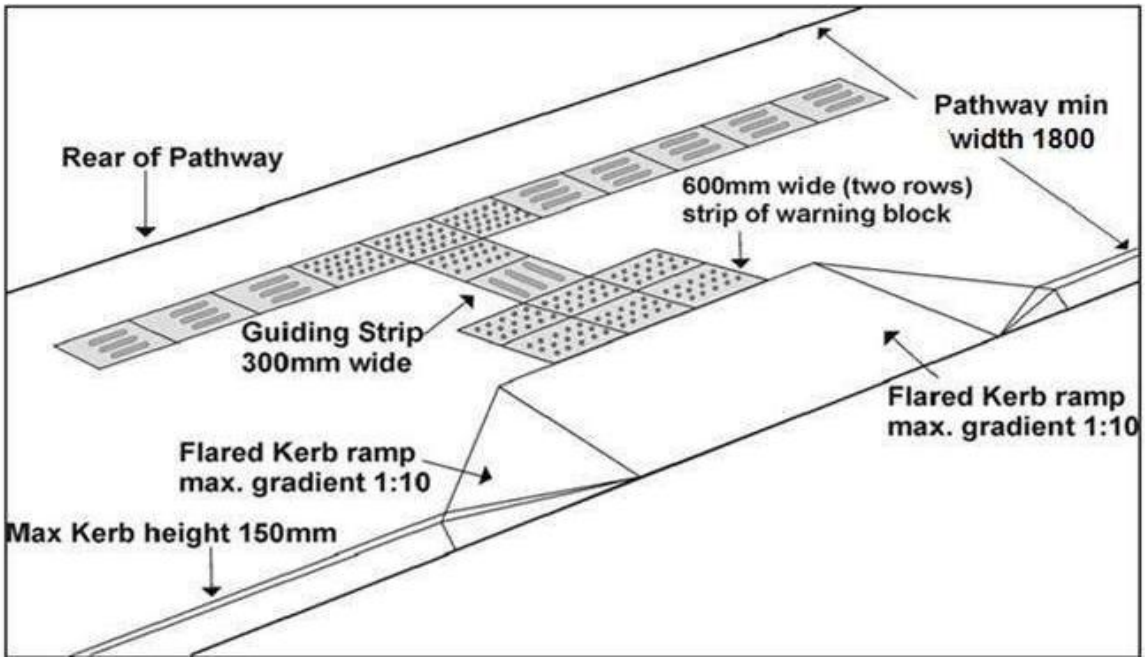


Figure 8.1: Kerb ramp detail

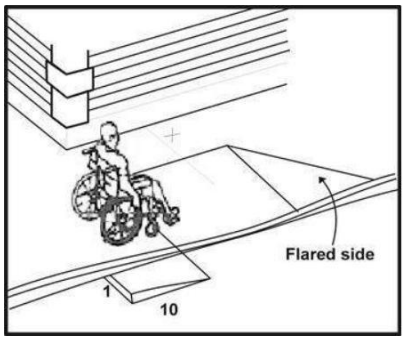


Figure 8.2: Kerb extension at street intersection

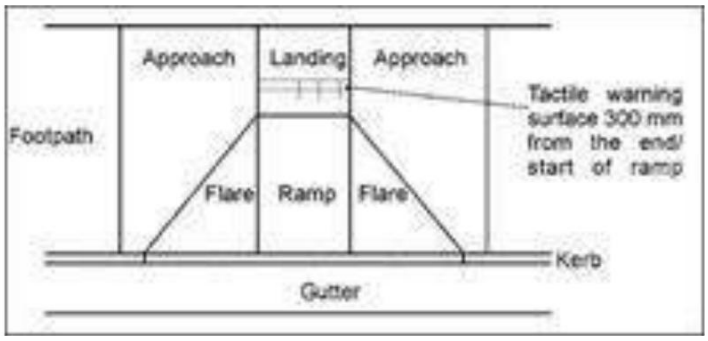


Figure 8.3: Typical kerb ramp requirements

Gradient

The gradient of a kerb ramp should not be steeper than 1:12; the flared sides should not be more than 1:10.

Width

The width should not be less than 900mm min.

Flared Sides

- Kerb ramps should have flared sides where pedestrians are likely to walk across them as shown in the figure 8.4; and
- The gradient of the flared side should not be steeper than 1:10.

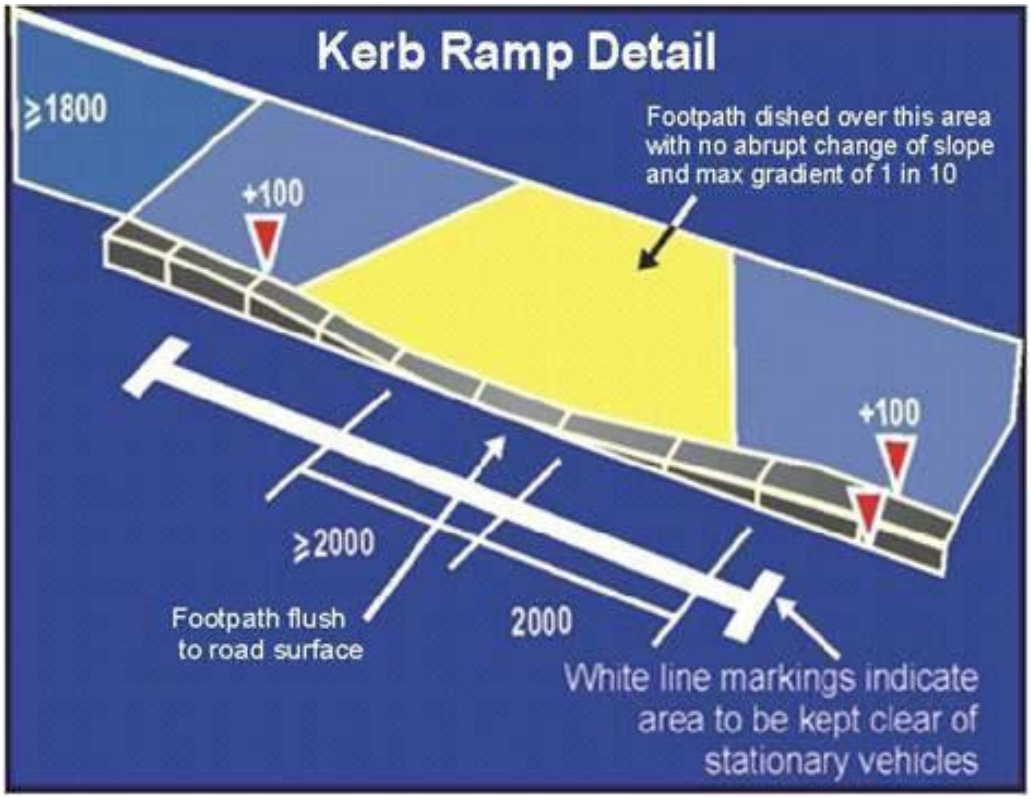


Figure 8.4: Kerb ramp detail

Chapter-9 RAMPS

A ramp is a sloping walkway leading from one level to another. Ramps of an appropriate design shall be provided at all changes in level other than those served by an accessible lift or accessible lifting mechanism accommodating the specific requirements of persons with a disability.

General Provision

- Ramps allow persons in wheelchair to move from one level to another. However, many ambulant persons with disabilities negotiate steps more easily and safely. Hence, it is preferable to provide accessibility by both steps and ramps.
- Where the horizontal run of the approach ramp exceeds 9000 mm length, an alternative stepped approach, in addition to the ramp approach, should be provided for people with ambulatory disabilities.
- Where there is a large change in elevation that requires multiple ramps and landing combination, other solutions such as elevators should be considered.
- Single row of tactile warning blocks should be placed at beginning and end of each ramp at also at the beginning and end of each run.

Gradient

It should be noted that the gradient should be constant between landings. The recommended gradients for ramps are given in the table 9.1.

Table 9.1: Minimum specifications for Ramps

Level difference	Minimum gradient of Ramp	Ramp Width	Handrail on both sides	Comments
≥ 150 mm ≤ 300 mm	1:12	1200 mm	√	
≥ 300 mm ≤ 750 mm	1:12	1500 mm	√	Landings every 5 meters of ramp run.
≥ 750 mm ≤ 3000mm	1:15	1800 mm	√	Landings every 9 meters of ramp run.
≥ 3000 mm	1:20	1800 mm	√	Landings every 9 meters of ramp run.

Width

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

Surface

- Ramps and landing surfaces should be slip resistant as described in the and
- Outdoor ramps and their surface should be designed to prevent water from accumulating on the walking surfaces.

Landings

- Ramps should have a level landing at the top and bottom of each run and also where the run changes direction as shown in the figure 5.1.
- Landings should:-
  - Be provided at regular intervals of not more than 9000 mm of every horizontal run as shown in the figure 9.1;
  - Have a level platform of not less than 1500 mm; and

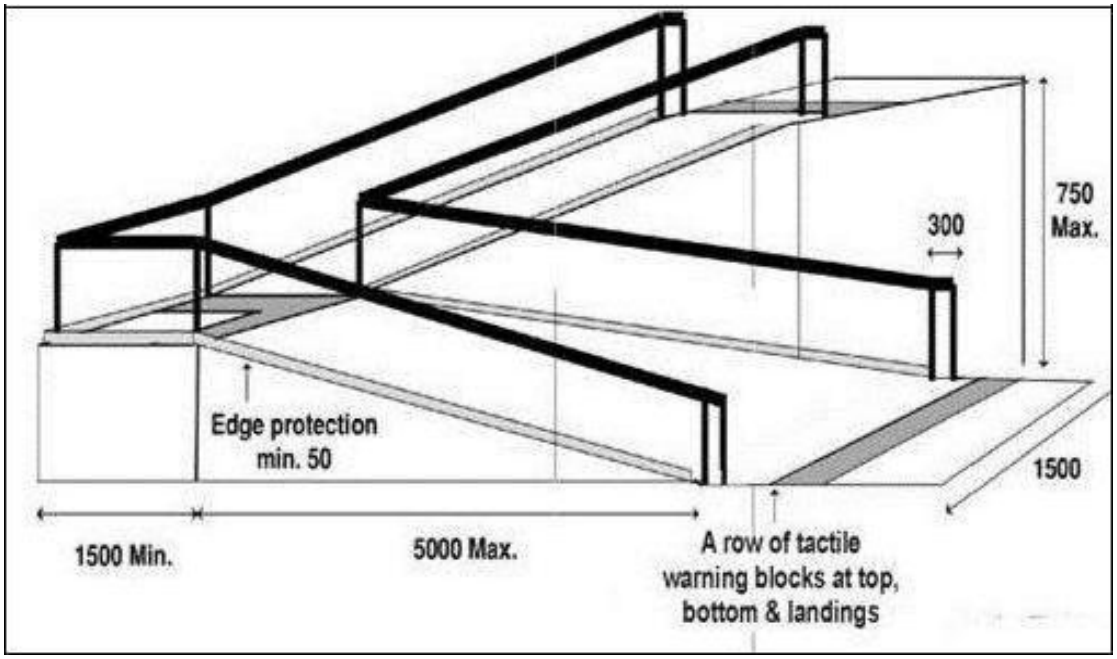


Figure 9.1: L-shape ramp with landing

Handrails

A ramp run with a vertical rise greater than 150 mm should have handrails that:

- **a**re on both the sides;
- are placed at a height of between 760 mm and 900 mm above the floor level;
- handrails must be continuous on both sides & even at landings.

Chapter-10 HANDRAIL/GRAB BARS

Handrails provide support for everyone and are especially helpful for persons with a disability and the elderly to use staircases, to pull themselves up inclines, check themselves on declines and to assist them in moving within the building.

General Provision

- 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.
- Many persons with disabilities and elderly rely upon handrails/ grab bars to maintain balance or prevent serious falls.
- Handrails may be provided with Braille/ tactile markings (Figure5-27) at the beginning and the end to give information to people with visual impairment.

Handrails should:

- be slip-resistant with round ends;
- have a circular section of 38-45 mm in diameter (Figure 10.1);
- have a minimum clear space of 50 mm from the walls (Figure 10.1);
- be free of any sharp or abrasive elements; and
- have continuous gripping surfaces, without interruptions or obstructions that can break a hand hold.

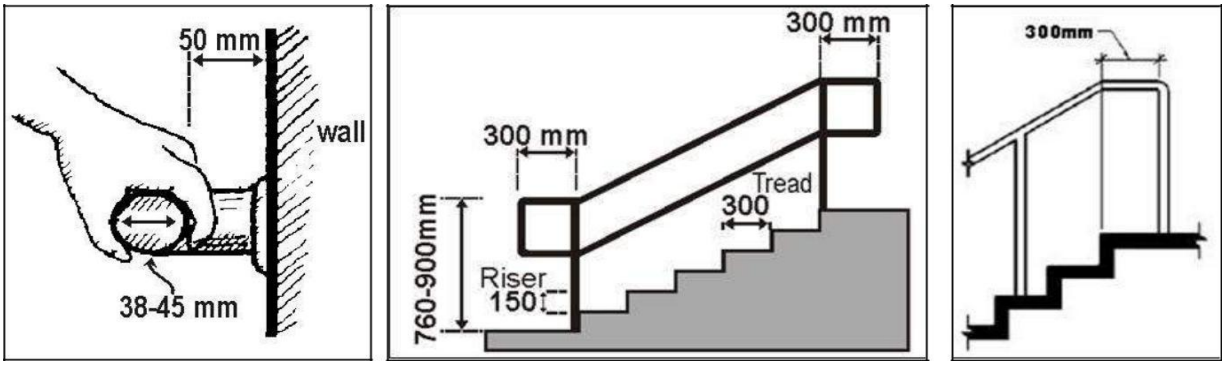


Figure 10.1: Grab Bar details **Handrail for steps** **Handrails for extension**

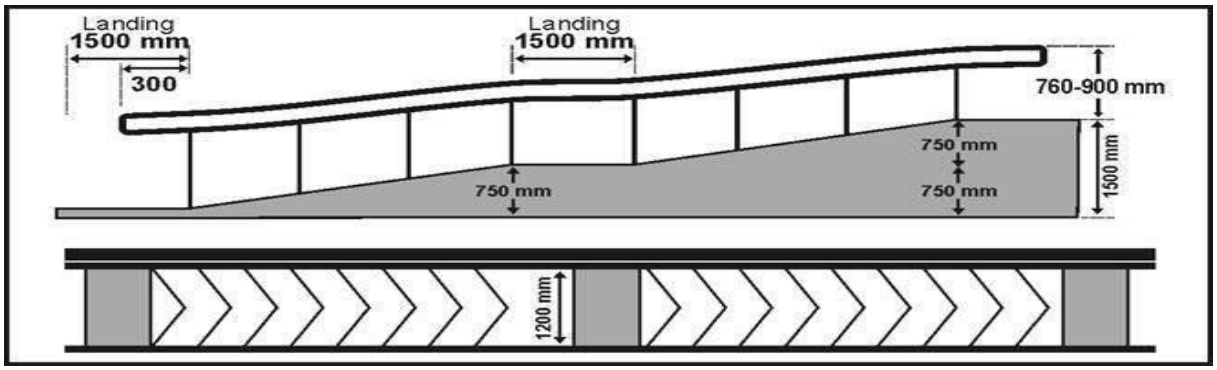
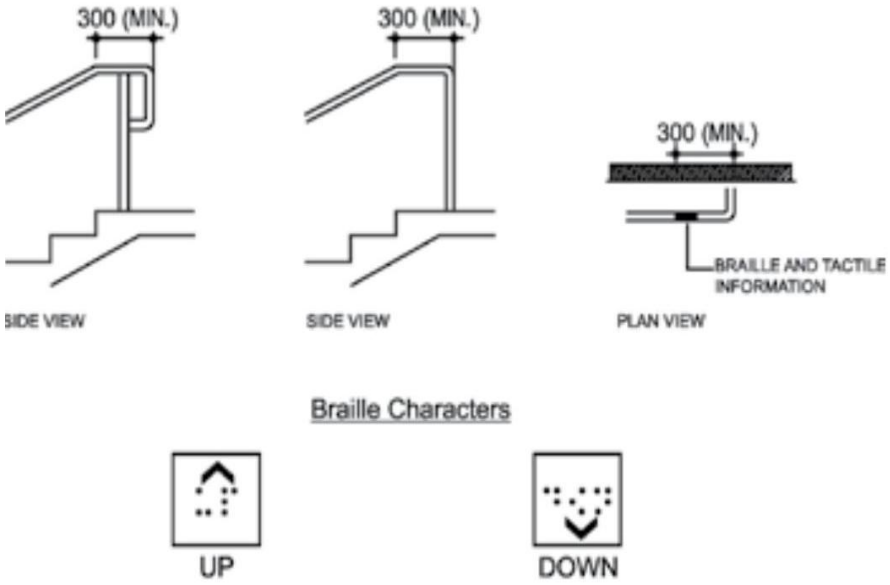


Figure 10.2: Handrail for ramps

Handrail extensions 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 and terminate into a closed end which shall turn down or return fully to end post or wall face and which shall not project into a route of travel.

Typical Handrail Extensions



Grab Bars

Grab bars/ rails should be manufactured from a material which contrasts with the wall finish (or use dark tiles behind light colored rails), be not too warm/cold to the touch and provide good grip. It is essential that all grab rails are adequately fixed, since considerable pressure will be placed on the rail during maneuvering. In rural areas, indigenous materials such as bamboo/ wood/ other can be used for making grab bars in toilets.

Grab bars should:-

- be slip-resistant with round ends;
- preferably have knurled surfaces;
- have a circular section of 38-45 mm in diameter;
- be free of any sharp or abrasive elements;
- have a minimum clear space of 50 mm from the wall;
- be installed at a height of 760 mm to 900 mm;
- be able to bear a weight of 250 kg.

Chapter-11 STAIRCASES

Steps and staircases shall be intended as an alternative to lift access in buildings and shall be of adequate design to allow all persons, with or without a disability, to travel safely and independently.

Stairs

- Stairs should not be the only means of moving between floors. They should be supplemented by lifts and /or ramps.
- Treads should be 300 mm deep and risers not higher than 150 mm.
- There should be no more than 12 risers in one flight run.
- The stairs landing should be minimally 1200mm deep.
- The stairs should have minimum 1500mm clear width.
- Steps should be of a consistent height and depth throughout the staircase.
- Projecting nosing and open stairs should not be provided to minimize the risk of stumbling. Also, spiral stairs should be avoided.
- Handrail for stairs should: -
  - Comply with chapter on Handrail/Grab bars;
  - Extend not less than 300 mm beyond the top and bottom step.

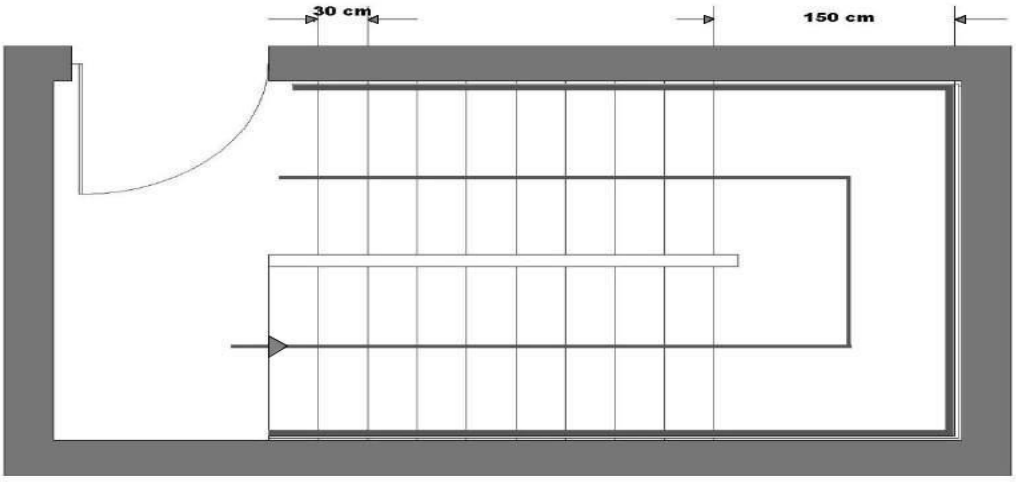


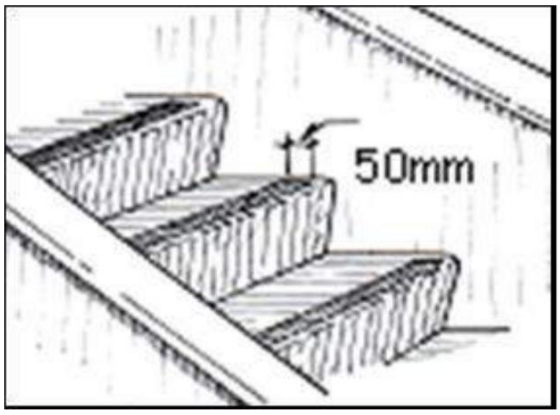
Figure 11.1: Continuous and extended handrail

- There should be color contrast between landings, and the steps.
  - Where steps or stairs are in an accessible route, complementary ramps, lifts or escalators should be provided.

- Tactile warning blocks should be installed 300 mm before the beginning and 300 mm after the end of each flight of steps (Figure 11.2 and 11.3) to aid people with visual impairments complying with chapter Access to Building.

Figure 11.2: Warning Blocks Figure 11.3: Placement of warning blocks for steps

- Step edges must contrast in color to the risers and the treads. Contrast color bands 50 mm wide should be provided on edge of the tread (Figure 11.4)



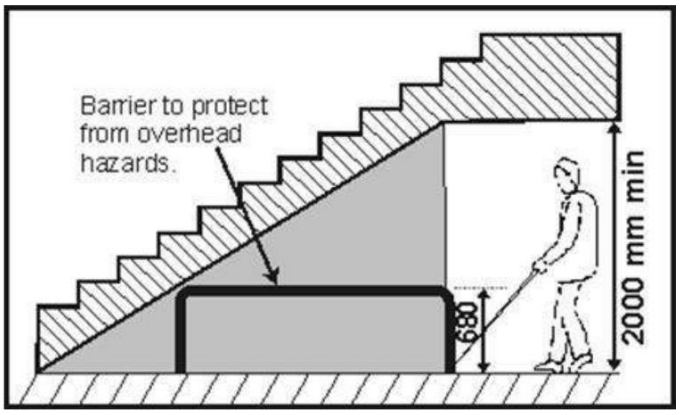


Figure 11.4: Color contras step edges **Figure 11.5: Guard rail under soffit**

- All steps should be uniform.
  - Circular stair and sloped landing should be avoided.
  - It is necessary to provide safe and well-dimensioned staircase for the comfort of all people, especially those with mobility problems.
  - When ascending a stair, people who wear calipers or who have stiffness in hip or knee joints are particularly at risk of trapping the toes of their shoes beneath projecting nosing.
  - Stair should be designed with more generous dimensions, e.g. wider tread, and shorter travel distance is recommended. Open risers should be avoided.

Wheelchair Stair-lift and Platform Lift

- Where it is impracticable to provide a lift or a ramp, a wheelchair stair-lift or platform lift should be considered as a reasonable alternative for vertical circulation within the building.

- Platform lifts are special passenger elevating devices for people with disabilities.

- Platform lifts can have either a vertical or an inclined movement.

  - *Vertical Movement Platform Lifts*
    - For maximum level changes of 2500 mm, vertical movement platform lifts may be installed.
    - For level changes of more than 1200 mm, the lift should be placed in a closed structure with doors at different accessible levels.
    - Vertical platform lifts can have a variety of openings for entry and exit.
    - Minimum size should be 1200 X 1000 mm.

  - *Inclined Movement Platform Lifts*
    - Inclined movement platform lifts consist of three elements: a railing, an electric generator and a moving platform or seat.
    - Inclined movement platform lift can be installed along the stair wall as long as they do not obstruct the required width of the exit. The seat or platform can be folded when not in use.
    - The Minimum width of the stairs should be 900 mm to allow the installation of the lift. Platform lifts can be installed on all types of stairs including switch back stairs i.e. those with a rotation of 180 and spiral staircases
    - Inclined movement platform lifts are usually used to connect one or more floors or to overcome split levels in existing buildings

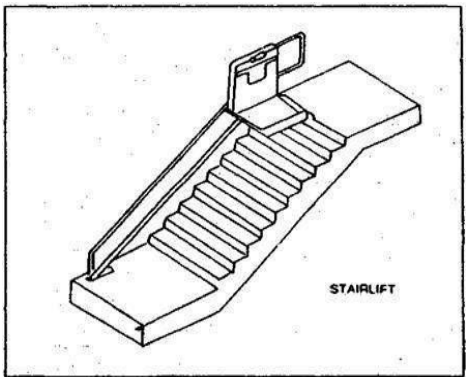


Figure 11.6: Stair lift

Figure 11.7: Platform chair lift

Figure 11.8: Platform lift

Chapter-12 TOILETS

This chapter explains the requirements to enable persons with a disability, including wheel- chair users to use the facilities provided in a toilet independently as far as possible. Sufficient, properly designed and located toilet and W.C. cubicles shall be available for use by everybody including people of either sex, people with babies and small children, persons with a disability, wheelchair users and the elderly and elderly with frailty, etc. with or without any assistance from others.

Unisex Accessible Toilets (multi-use)

- Unisex accessible toilet allows Persons with disabilities to be assisted by carers of the same or opposite gender. In all public buildings, one unisex accessible toilet should be provided in each toilet block on each floor. Apart from this all toilet blocks must have one cubicle suitable for use by persons with ambulatory disabilities.
- The unisex toilet should have: -
  - Minimum internal dimensions of 2200 X 2000 mm minimum (Figure 12.2);
  - The layout of the fixtures in the toilet should be such that there is a clear maneuvering space of 1800mm x 1800mm in front of the water closet and wash basin in the accessible toilet unit (Figure 12.1);
  - All fixtures and utilities should provide a clear space of 900mm x 1200 mm for wheelchair users to access them;
  - Have clear space of not less than 900 mm wide next to the water closet;
  - Have the toilet roll dispenser and hand water faucet mounted below the grab bars and at not more than 300 mm from the front edge of the seat and at a height between 50 mm and 200 mm from the top of the water closet seat;
  - Be equipped with a cloth hook mounted on a side wall not more than 1200mm from the floor and projecting not more than 40 mm from the wall; and
  - Where possible, be equipped with a shelf of dimensions 400mm x 200mm fixed at a height of between 900mm and 1000 mm from the floor.

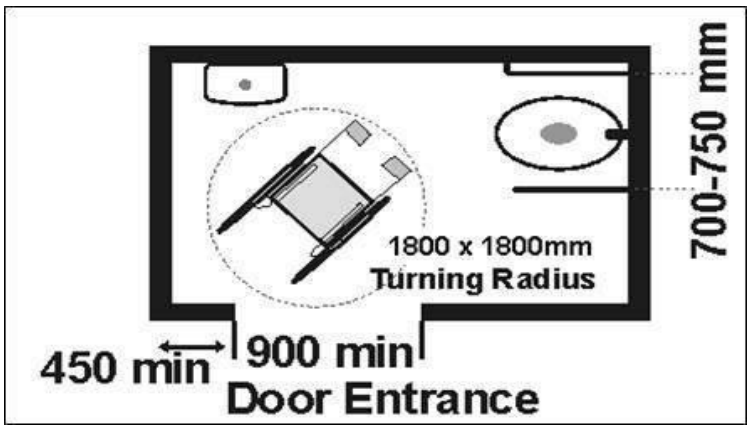


Figure 12.1: Wheelchair maneuvering Space in toilet

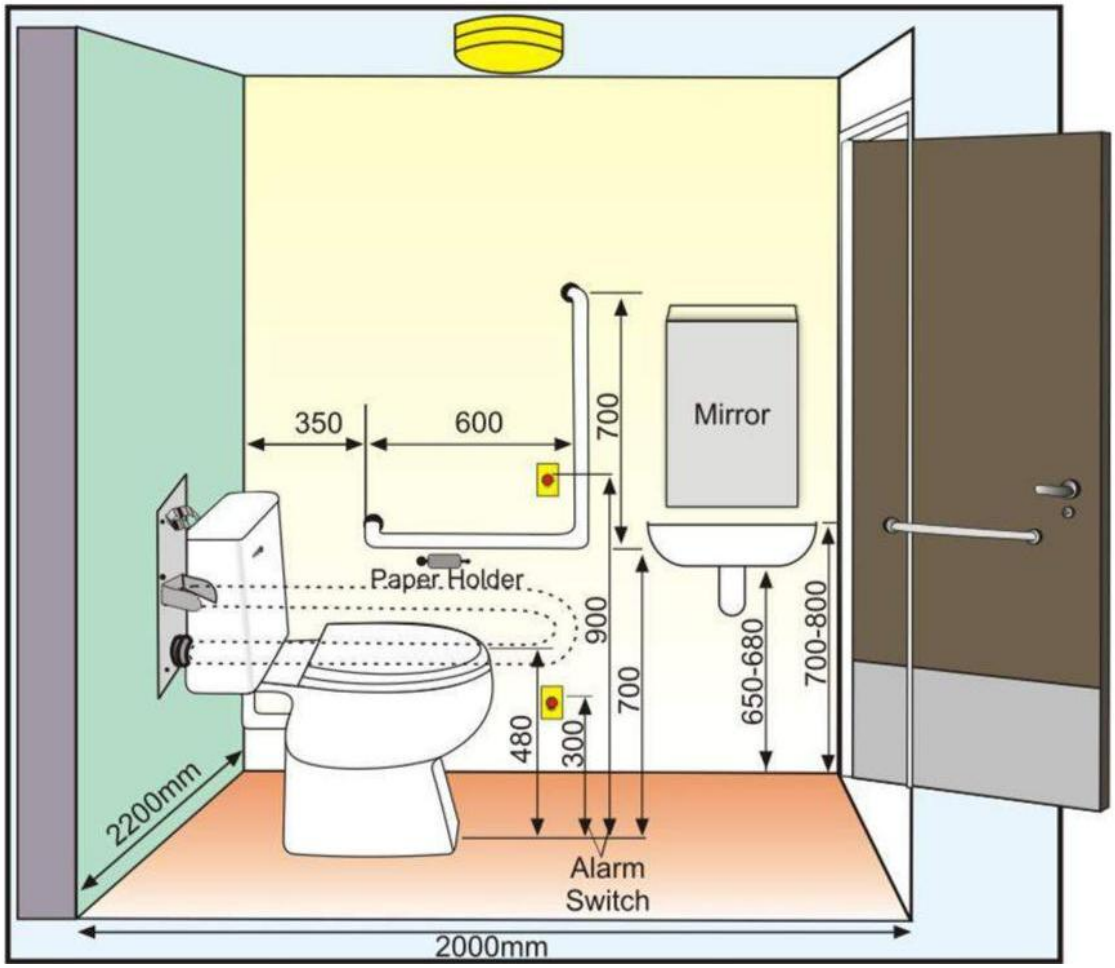


Figure 12.2: Layout plan of unisex accessible toilet

Toilet Doors

Essential requirements for toilet door

- The toilet door should be either an outward opening door or two-way opening door or a sliding type and should provide a clear opening width of at least 900 mm.
- Be provided with a horizontal pull-bar, at least 600 mm long, on the inside of the door, located so that it is 130 mm from the hinged side of the door and at a height of 1000 mm.
- Be capable of being locked from the inside by a device that is operable by one hand, activated by a force not more than 22N and which does not require fine finger control, tight grasping, pinching or twisting of the wrist.

Water Closet

- Be located between 460 mm to 480 mm from the centreline of the water closet to the adjacent wall;
- It should have a clear dimension of 750 mm from the front edge of the water closet to the rear wall to facilitate side transfer;

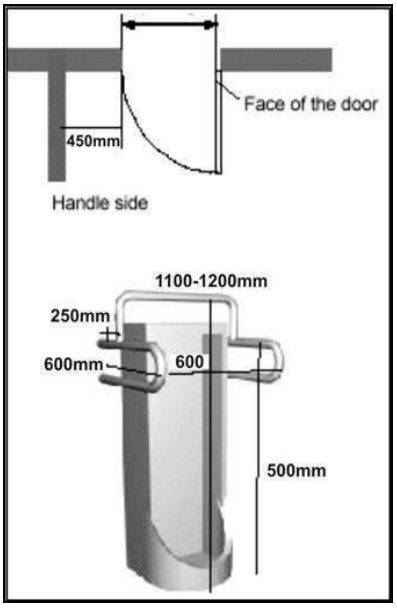
- The top of the water closet seat should be 450 to 480 mm from the floor, as shown in the figure 12.2, when the water closet does not have the required height, the necessary height may be obtained by providing a circular base under the water closet. The base so provided must not protrude beyond the circumference of the base of the water closet;
- There should be an adequate clear floor space of at least 1350 mm depth and 900 mm width, both in front and on the transfer side, adjacent to the water closet;
- Have a suitable back support to reduce the chance of imbalance or injury caused by leaning against exposed valves or pipes;
- Preferably be of wall-hung or corbel type as it provides additional space at the toe level;
- Where water cistern is used, the cover should be securely attached;
- The flush control should either be lever type or automatic, and located on the transfer side of the water closet. The flush control should not be located more than 1000 mm from the floor; and
- Where more than one accessible toilet is provided, a left and right hand transfer option should be made available.

Water Closet Grab Bars

- Water closets should be provided with grab bars, be mounted at a height between 200 mm and 250 mm from the water closet seat;
- One L-shape grab bar: 600mm long horizontal and 700mm long vertical should be mounted on the side wall closest to the water closet;
- A hinged type horizontal grab bar should be installed adjacent to the water closet; at a distance of 320mm from the centre-line of the WC, between heights of 200 mm - 250 mm from the top of the water closet seat and extending 100 to 150 mm beyond the front of the water closet.
- An emergency alarm cum call switch should be provided within easy reach on the wall near water closet at two levels: at 300mm and 900mm from the floor level to allow user to call for help in case of an emergency.

Urinals

- At least one of the urinals in the Gents toilets on each floor should have grab bars installed on each side and in the front of the urinal to support ambulant Persons with disabilities (for example: crutch users).
- The front bar is to provide chest support; the sidebars are for the user to hold on to while standing.
- Urinals shall be stall-type or wall-hung, with an elongated rim at a maximum of 430 mm above the finish floor.
- A clear floor space 760 mm by 1220 mm should be provided in front of urinals to allow forward approach. Urinal shields (that do not extend beyond the front edge of the urinal rim) may be provided with 735 mm clearance between them.



Urinal with chest support grab bar

Chapter-13 SIGNAGE

It is essential that suitable signs are placed at prominent and required positions inside and outside a building to indicate clearly the exact locations of facilities that are available for use by persons with a disability. To design an effective signage system, the needs of different types of users in a building and the complexity of the building layout must be considered.

A signage system also increases person's awareness of their surroundings and aids orientation within the environment. The location of signs should ideally be part of the process of planning the building and environment. A good and successful sign system should minimize anxiety and confusion. It must be easy to understand and not place Persons with disabilities at a disadvantage. Universal signage cuts across the regional/cultural and language barriers as even a common lay man can understand the symbols and pictograms.

The effectiveness of information on the use of a building is determined by:

a. the location, accessibility, layout and height of signs;
b. the size of lettering, symbols and their reading distances;
c. the use of tactile letters and symbols;
d. visual contrast and lighting;
e. the finished surfaces of materials used for signs and symbols;
f. the simultaneous use of audible cues;
g. integration with any other communication systems.

Signage Provisions

- Information and direction signs should be provided at junctions of circulation routes and key destinations such as doorways, at reception points, at facilities such as drinking water facility, toilets, and in areas where hearing enhancement systems are fitted.
- Directional signs should readily identify and provide a logical sequence from a starting point to a point of destination and a clear indication of return routes to named exits. The names of destinations should be consistent throughout the signing system.
- A clear indication of the existence of steps or ramps on a route should be provided at both ends of the route.
- Signs to facilities for Persons with disabilities should incorporate the International Symbol for Accessibility.
- Universally recognized symbols/pictograms should be used to replace text, wherever possible. Other symbols should supplement text, but should not be used in isolation. Symbols are an essential aid for people with learning difficulties.
- A wall mounted or ceiling hung information board should be provided at floor level landings of staircases and at other major decision points (junctions/intersections) in main circulation routes.

Types of Signages

According to the purposes it serves, Signage can be of following types:

(a) Directional
(b) Information
(c) Identification
(d) Instructive
(e) Health & Safety

Directional Signage

(For Way-finding - with arrows along travel routes) are usually wall mounted or overhead signs and include directional arrows to direct users to specific areas or elements within an area (Figure 13.1). This can incorporate provision of signage at navigational decision points (Figure 13.2).

DIRECTIONAL SIGNAGE

Figure 13.1: For Ramp

Figure 13.2: For Rooms

Information

(Provide detailed info - includes maps & directories with “You are Here" labels), inform users about the features and facilities of a place or space. Information signs include directions, maps, building identification signs, notices and interpretative signs.

Figure 13.3: Information Signage

Identification

(To signify arrival, also called Destination Sign) usually identify entrances, street addresses, buildings, rooms, facilities, places and spaces.

Instructive

To give instruction for operating a device, way finding, etc.

Figure 13.4: Instructive Signage

Health & Safety

Provide lifesaving directives and/ or mandatory rules to be followed

Figure 13.5: Health & Safety Signage

Location

Signs should be provided at all sites, campus, developments and buildings in appropriate locations including approach to building / facility / service, entrance / exit, main lobby or reception, facilities such as library, toilets etc., departments and offices, fire exits and parking.

Universal Signage

To make signage universally usable, following components must be kept in mind:

a. Color contrast Signs
b. Character, Content and Layout
c. Pictograms and accessibility symbols
d. Positioning
e. Viewing Distance
f. Lighting (measured in Lux)
g. Material and surface finish
   Alternative formats etc. embossed letters with Braille (Audio/ Visual information, Maps and models)

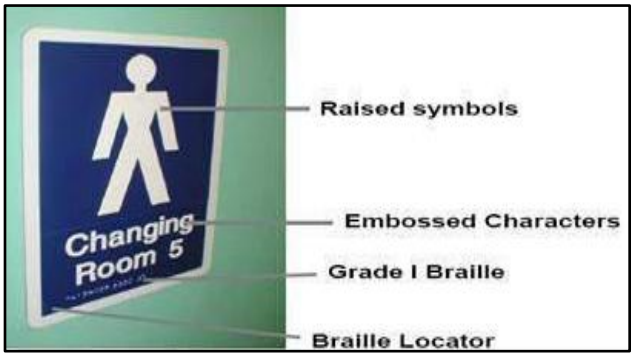


Figure 13.6: Embossed & Pictogram Sign

Color Contrast Signs

Contrasting colors should be used to differentiate the figures from the background on the signboard. The commonly employed colors are white for the figure and blue for the background. The colors of signboard should also contrast with the surrounding surface so as to be clearly distinguishable. The color combinations red/green and yellow/blue should not be used in order to avoid confusing persons who are color blind. Avoid using shades of the same color in the sign and avoid using same colors as safety signs. The recommended color contrast between the letters and background is a 70 point LRV difference.

Basic principles for Color Contrast:

- Text should contrast with sign background
- Sign should contrast with environment
- Light levels (measured in Lux)
- 70% contrast between wall and sign panel
- Avoid shades of colors
- Avoid using same colors as safety signs
- Maximum 5 colors
- Non-reflective surface

Character, Content and Layout

Signage Typeface and Style

- Sign typefaces must be standard, legible and clearly discernible.
- Should be mix of Upper and lower case
- Should be Left justified
- Should be Tactile embossed with Braille
- Minimal use of bold
- Consistent font stem widths
- Avoid italics, condensed text, light stems

Upper and Lower Case Lettering

- Signs are more effective when they employ both upper and lower case lettering. This is because people recognize word shapes rather than literally reading every letter to build up the word and must be left justified.
- The height and boldness of the lettering can be used to indicate the nature of the information that the sign imparts.

Line spacing

- The spacing between lines should be 50% of the line height.
- A style should be chosen based on a character width-to-height ratio within 3:5 and 1:1 and the stroke width-to-height ratio between 1:5 and 1:10. It should be consistent for each sign.

Pictograms

- Ideally any signage should incorporate a combination of lettering and symbols.
- This will empower persons with Autism, intellectual disabilities and multiple disabilities as well as those with language barriers.

Figure 13.7: Access Symbols

Figure 13.8: Information Signage

Positioning the Signage

- Signs should be located where they are clearly visible. A person with low vision may be able to read a sign if they can approach the sign for close up viewing. Wall-mounted signs that contain detailed information, timetables, maps or diagrams, should be centered around 1400mm from the ground, with the bottom edge not less than 900mm from the finished floor level and the top edge up to 1800mm from the finished floor level.

- Braille and tactile signage should be placed at a height between 900 mm to 1500 mm (ideal location at 1050 mm) above the finished floor level.

- Duplicating detailed signs and instructions, especially safety notices, should be located at high and low levels, i.e. at 1600 to 1700mm and at 1000 to 1100mm to allow convenient close viewing by wheelchair users.

- Signs should be positioned in way that the reader does not obstruct circulation paths. Position projecting or ceiling suspended signs above head height at 2300mm from floor level. Although it is important that the sign does not create a head height obstacle, it is equally important that the size of the lettering increase in proportion to the distance from the reader.

- Signs should be located where they are clearly visible (Figure 13.9).

- Room number and identification signage to be at 1400mm from the finished floor level to bottom of the sign, and 50mm from the door frame. In case of tile wall, the closest horizontal joint should be used.

- Detailed signs and instructions, especially safety notices, should be located at both high and low levels, i.e. at 1600-1700mm and at 1000-1100mm to allow convenient close viewing by wheelchair users.

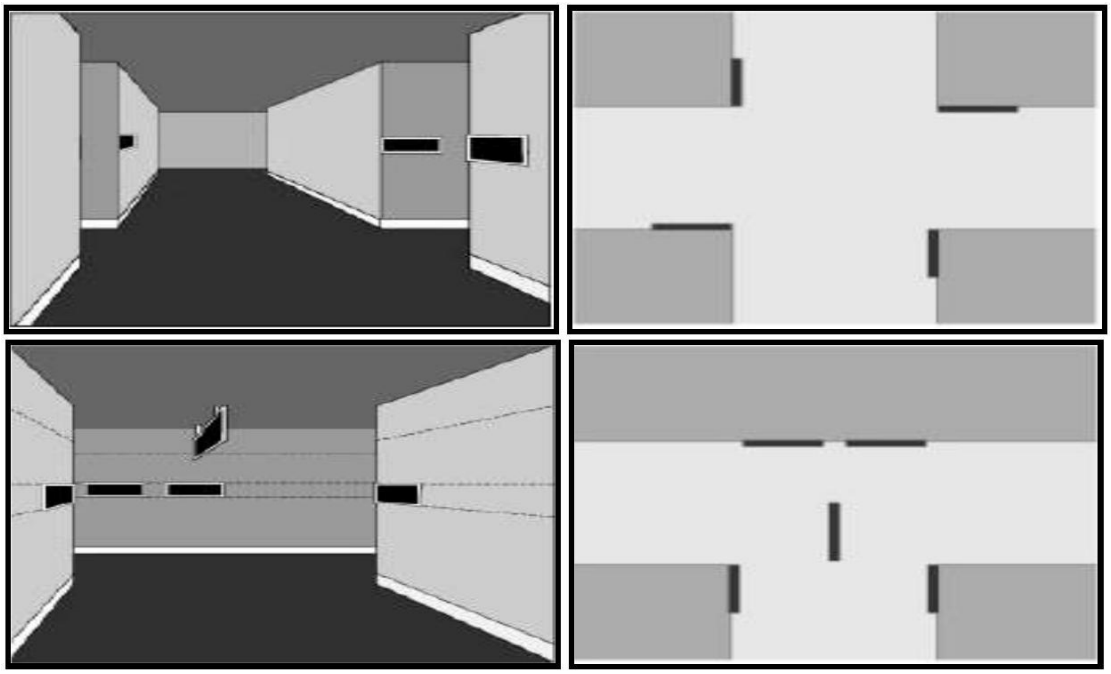


Figure 13.9: Preferred location of signages

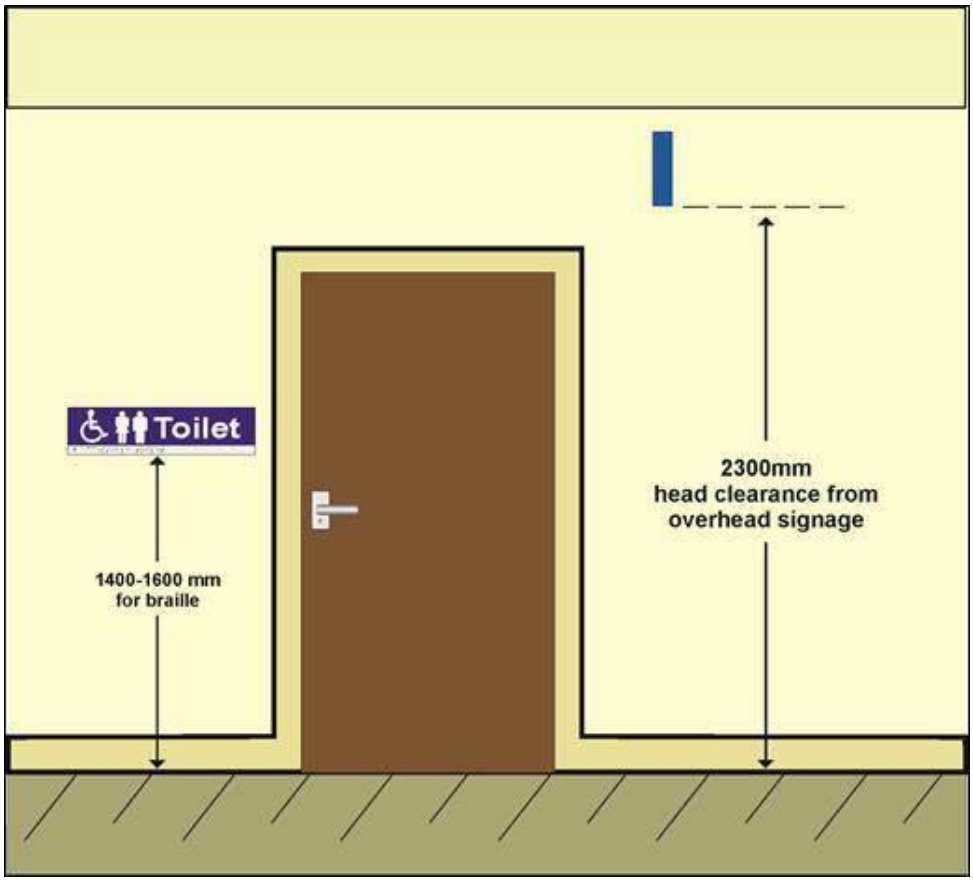


Figure 13.10: Height and placement of signages

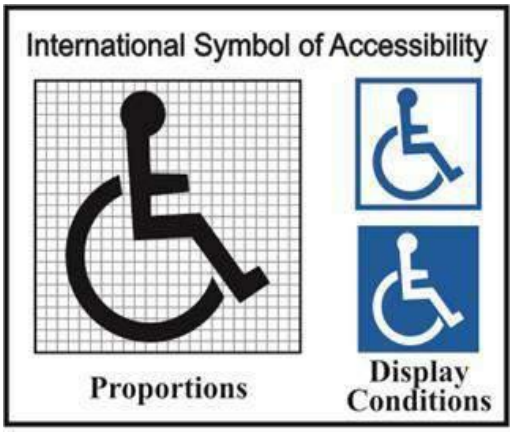
Signage material

- Signage Material should be non-reflective, preferably matt finish. It should have non-glary and non-glossy surface. Natural and artificial light should be such so as not to produce glare on the signage surface.

- The material of all signage should be chosen so as to reduce wear and tear and possible damage by vandalism and at the same time easy to maintain. Some suggested materials for signage are wood, acrylic, Aluminum Composite Panel (ACP).

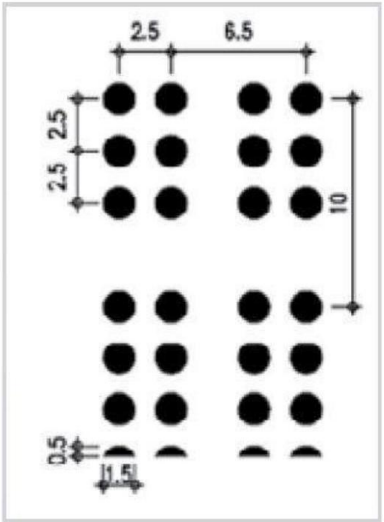
International Symbol of Accessibility

The International Symbol of Accessibility must be displayed at all accessible entrances. If an entrance is not accessible, directions to an accessible route, including the symbol, must be provided. Similar guidelines refer to elevators, evacuation and refuge areas, restrooms and bathing facilities. Symbols of accessibility are also required to identify volume control telephones, text telephones, and assistive listening systems.



Braille specification

A system of touch reading for people who are blind or with visual impairment employs raised dots, evenly arranged in quadrangular letter spaces or cells. Braille symbols are formed within units of space known as Braille cells. A full Braille cell consists of six raised dots arranged in two parallel rows each having three dots (Figure 13.11). The dot positions are identified by numbers from one through six. Sixty-four combinations are possible using one or more of these six dots. A single cell can be used to represent an alphabet letter, number, punctuation mark, or a whole word.



Dot Spacing:	**2.5 mm**	**Character Spacing:**	**6.5 mm**
Dot Height:	**0.5 mm**	**Line Spacing:**	**10.0 mm**
Dot Base Diameter:	**1.5 mm**		

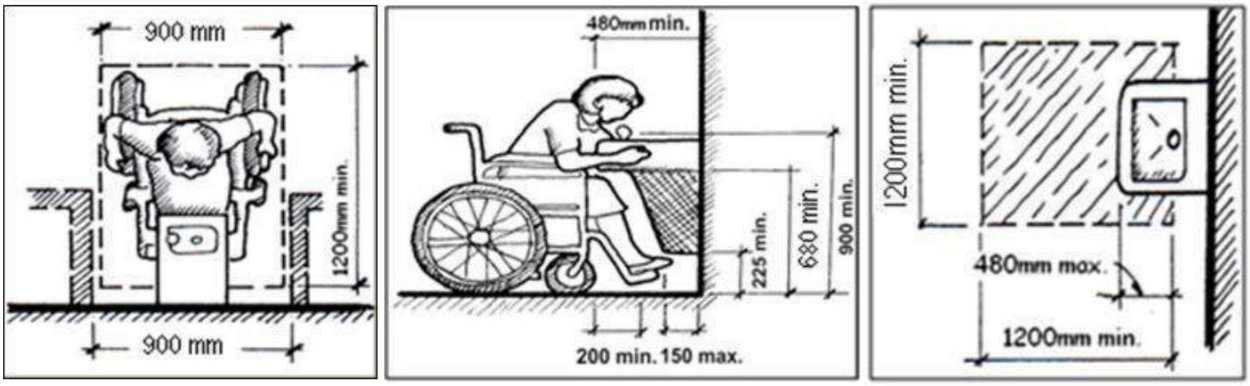
Figure 13.11: Braille Specifications

Chapter-14 MISCELLANEOUS

Drinking Water Fountain

Drinking water fountain/unit should have:

- a clear floor space of at least 900mm x 1200mm as (Figure 14.1);
- have a clear knee space between the bottom of the apron and floor or ground of at least 750mm wide, 200mm deep and 680mm high (Figure 14.1);
- have a toe space not less than 750mm wide, 230mm high
- have a water glass provision;
- free standing or built -in-drinking water coolers or taps not having a knee space should have a clear floor space of at least 1200mm wide x 1200mm in front of the unit (Figure 14.1);
- All wall-mounted drinking water provision in an alcove is preferred, because it does not create a hazard for persons with visual impairments.
- The provision of two drinking facilities at different heights is very convenient for standing adults, people in wheelchairs and children.
- The 100mm high water flow is to allow for the insertion of a cup or glass.



Front Approach **Accessible drinking water unit** **Space for front approach**

Figure 14.1: Drinking water fountain

Electrical points, Controls and Outlets

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

- located adjacent to the clear floor space;
- located at a height of between 600 mm to 1100 mm from the floor with the exception of vending machines where the upper limit is relax-able by a maximum of 100 mm;
- to cater for wheelchair users, controls should be placed not less than 400 mm from room corners.;
- 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.

Faucets/taps

Faucets and other controls designated for use by Persons with disabilities should be hand-operated or electronically controlled.

- Hand-operated controls should:
- be operable by one hand;
- require no tight grasping, pinching or twisting of the wrist;
- require a force less than 22 N to activate; and
- have handles of lever type (not self-closing) operable with a closed fist (Figure 14.2 and Figure 14.3).

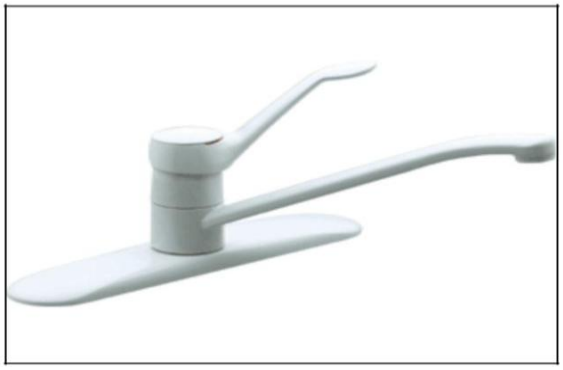


Figure 14.2: Long Handle tap

Figure 14.3: Lever handle tap

FIRE EVACUATION NEEDS

Emergency Egress

Provision of accessible means of egress from all public use areas and facilities is as vital a component as accessible ingress.

Alarm Panels/ Evacuation Plans

- Placement (accessibility) and visibility of alerting devices is very important.
- Fire alarm boxes, emergency call buttons and lighted panels should be installed between heights of 800mm and 1000 mm from the finished floor surface.
- These should be adequately contrasted in color and tone from the background wall and should be labeled with raised letters and also in Braille.
- Audible alarms with "Voice Instructions" should be installed that can help/guide Persons with disability to the nearest emergency exit.
- Non – auditory alarms (visual or sensory) to alert persons with hearing impairments should be installed at visible locations in all areas including toilets.
- Evacuation plans that clearly indicate the designated emergency evacuation routes should be displayed at prominent places.
- Designating evacuation routes shall be at least 1500 mm wide, to ensure a wheelchair user and an able bodied person are able to pass each other along the route.
- The route should be free of any steps or sudden changes in level and should be kept free from obstacles such as bins and flower pots etc.

GLOSSARY

Accessible- A site, building, facility, or portion thereof that complies with these Guidelines and that can be approached, entered and used by all people.

Accessible Route- A continuous unobstructed path connecting all accessible elements and spaces in a building or facility that can be negotiated by a person with severe disbaility using a wheelchair and that is also safe for and usable by people with other disabilities. Exterior accessible routes may include parking, access aisles, curb ramps, walkways and ramps. Interior accessible routes may include corridors, ramps, elevators, lifts, and dear floor space at fixtures.

Accessible Signage- Any visual way finding system incorporates architecture, landscape design, lighting, landmarks and orientation points. Signage is one key element of an effective way finding system and should be accessible to all users including people with disabilities.

Automatic Door- A door equipped with a power operated mechanism and controls that open and close the door automatically upon receipt of a momentary signal. The switch that begins the automatic cycle may be photoelectrical device, floor mat, sensing device, or manual switch mounted on or near the door itself.

Braille- The Braille system is a method that is widely used by people with blindness to read and write.

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

Clear - Unobstructed

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

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

International Symbol of Access- Also known as the (International) Wheelchair Symbol, the International Symbol of Access consists square overlaid with a stylized image of a person using a wheelchair. The symbol is often seen where access has been improved, particularly for wheelchair users and other persons with loco-motor impairment. The symbol denotes a barrier free environmental, such as steps, to help also older people, parents with prams, and travellers with luggage. The wheelchair symbol is "International" and therefore not accompanied by Braille in any particular language. Specific uses of the ISA include:

Kerb - A side barrier to a trafficable surface or is the edge where a raised sidewalk/footpath, road median, or road shoulder meets an unraised street or other roadway.

Kerb Ramp- A short ramp cutting through a curb or built up to it or a Kerb is a drop, with walk way, at a gradient no greater than 1:10 on both sides of necessary and convenient crossing points (figure 2 & 5). Width should not be less than 1200mm. If width (X) is less than 1200mm, then slope of the flared side shall not exceed 1:12.

LRV- Light reflectance value (LRV) is the total quantity of visible light reflected by a surface at all wavelengths and directions when illuminated by a light source.

Lux - Is the standard unit of illumination. It is used as a measure of perceived intensity of light.

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

Ramp- An inclined way connecting one level with another.

Signage- Any room number, name tag, building directory, or similar object containing a printed message and/or symbol. Signage and signs are used synonymously in this document.

Space- A definable area (for example, toilet room, hall, assembly area, entrance, storage, room alcove, courtyard, or lobby).

Tactile (CRC, 2007)**-** Tactile means information and interpretations derived from the sense of touch. This involves sensory transfer through physical contact of the hands or feet with other surfaces, as well as sensory transfers received by contact with non-physical elements such as pressure, wind and temperature.

Tactile paving/tiles- (also called Tactile Ground Surface Indicators) provide a distinctive surface pattern of “strips” and "truncated domes" or cones (which are small domes or cones that have had their tops cut off, or truncated) detectable by long cane or underfoot which are used to guide/alert persons with visual impairments of their approach to facilities, streets and hazardous drop-offs. People who have blindness or visual impairment are alerted of impending danger from vehicle impact or a grade change.

Tactile Guiding Blocks - These are 300 x 300 mm tiles that incorporate bars that are 5mm (± 0.5mm) high, 20mm wide and spaced 50mm from the centre of one bar to the centre of the next. These flat topped bars that are easily detectable underfoot by people with visual impairments. They are used externally to guide people with visual impairments along the circulation path. They may also be used internally in large busy areas such as railway stations and airports.

Tactile Warning Blocks - In order to warn persons with visual impairments of the approaching danger, it is recommended to incorporate Tactile Ground Surface Indicators (TGSI) along the approach path to unavoidable obstacles and hazards. TGSI, also commonly known as „Tactile Warning Blocks‟, are 300 mm x 300 mm tiles that incorporate

rows of 5 mm (± 0.5 mm) high flat-topped blister like domes that are easily detectable underfoot by persons with visual impairments. These tactile warning blocks are recognized internationally as a sign of approaching hazards.

Universal Design- Defined as "the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design".

Wheelchair User -A person who depends on a wheelchair for mobility

White Cane - A white cane is a long rod-like device used by travelers with blindness or visual impairment to give them information about the environment they are traveling through.

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