
BUILDING ACCESS
A DESIGN MANUAL FOR A BARRIER FREE ENVIRONMENT

AT SOME POINT IN OUR LIVES, WE ARE ALL PHYSICALLY DISABLED[1]. Disability was previously seen as a physical attribute of oneself, but now is seen as a context dependent. A tourist, an individual with a broken limb, an elderly individual, etc. are all disabled in one way or another when put in certain environments. As far as the built-up environment is concerned, it is important that it should be barrier-free and adapted to fulfill the needs of all people equally. As a matter of fact, the needs of the disabled coincide with the needs of the majority, and all people are at ease with them. As such, planning for the majority implies planning for people with varying abilities and disabilities.

1. It should be noted that a handicap is not a synonym for disability. A disability refers to a physical, sensory or mental limitation that interferes with a person's ability to move, see, hear or learn; a handicap refers to a condition or barrier imposed by the environment, society or oneself. As such, physical obstructions of the built-up environment constitute a handicap to a disabled person.

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PURPOSE

This manual serves as a design tool for accessibility, made for the purpose of providing architects and designers with recommendations and guidelines for a barrier-free environment.

APPLICATION

The manual does not cover all the requirements of disabled individuals in detail, but rather serves as recommended guidelines for the future to create an equitable, inclusive, and diverse environment for all. In my opinion it is impossible to design something that is a perfect fit for the entire population since the needs of some can create a disability for the other, and vice versa, but inclusive design researches the target market and creates an appropriate response to address the diversity in this target population. It is all about putting the users at the heart of the design process, to invert the balance from thinking of accessible design as addressing the disabled individuals as a means to accommodate, to asking it to address the entirety of the population, guaranteeing everyone's autonomy regarding the use of the built environment.

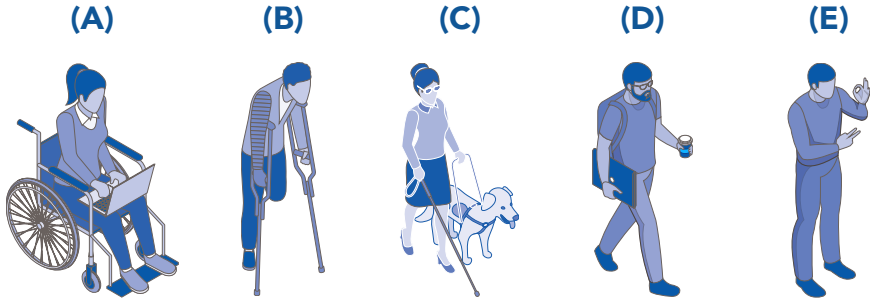
AIM

The social aim of the manual is to fully integrate disabled people into society by allowing people with disabilities to take an active part in society and lead a normal life. To be active, a disabled person should be able to commute between home, work and other destinations with the technical aim to provide a barrier-free environment for the independence, convenience and safety of all people.

TARGET GROUP

The target group is composed of five major categories:

(a) Wheelchair users
(b) People with limited walking abilities
(c) The sightless
(d) The partially sighted
(e) The hearing impaired



The design guidelines are to provide autonomy for the target group, but can also impact others of similar needs who can benefit to some extent from the proposed measures include the mentally disabled, people susceptible to physical fits, people with extreme physical proportions, and people with functional disabilities of the arm or hand.

II.
URBAN DESIGN CONSIDERATIONS

This section deals with the design requirements of open spaces, recreational areas and pedestrian routes. It introduces solutions to the principal problems in the design of an accessible outdoor environment. It is subdivided into six categories:

1. OBSTRUCTIONS
2. SIGNAGE
3. STREET FURNITURE
4. PATHWAYS
5. CURB RAMPS
6. PARKING

URBAN DESIGN - OBSTRUCTIONS

1. PROBLEM IDENTIFICATION

- Obstacles and protruding elements in the path of travel
- Low overhanging signs
- Lack of warning signs around obstructions

2. PLANNING PRINCIPLE

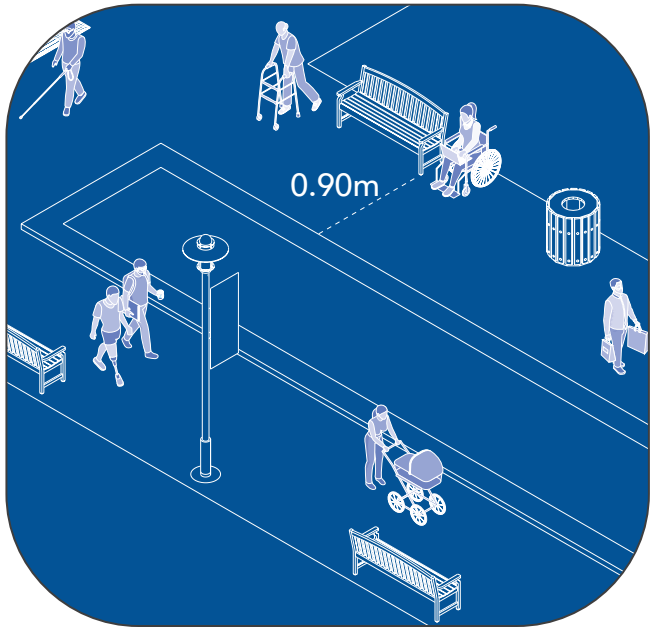
To design a barrier-free path for the safety and independence of disabled people, especially the sightless

3. DESIGN CONSIDERATIONS

3.1 General
3.2 Obstructions on the pathway surface
3.3 Overhanging obstructions
3.4 Fixed poles
3.5 Spaces below ramps and stairs
3.6 Wires and Bollards
3.7 Roadworks

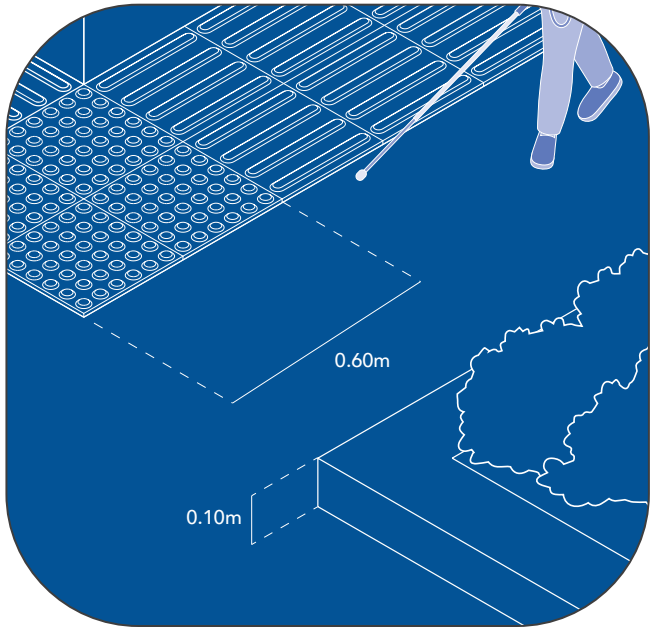
4. EXISTING CONSTRUCTIONS

Existing obstructions within the path of travel should be redesigned to conform to all the above requirements



3.1 GENERAL

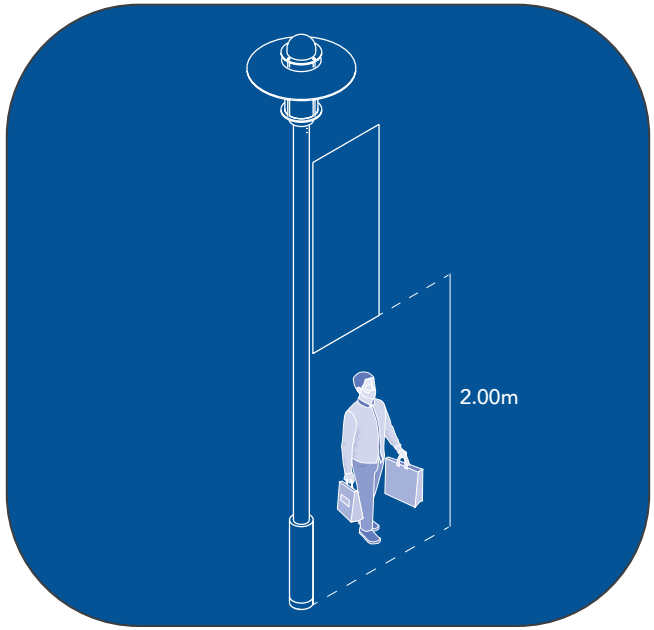
- Obstructions include street furniture, traffic signs, direction signs, street plans, bollards, plants, trees, shop awnings and advertising signs, etc.
- Obstructions should be placed outside the path of travel wherever possible
- Obstructions in the pathway should be easy to detect, and if possible, should be placed along one continuous line
- Protruding elements should be avoided
- The minimum width of a clear unobstructed path should be 0.90 m



3.2 OBSTRUCTIONS ON THE PATHWAY SURFACE

• Obstructions on the pathway surface should have one of the following design features in order to be detected by the cane of a sightless person:

- A straight shape rising from the pathway surface
- A 0.10 m raised platform
- Tactile warning markings on the ground around the obstruction. The warning markings should extend over a width of at least 0.60 m outside the projected area at the base of the obstacle

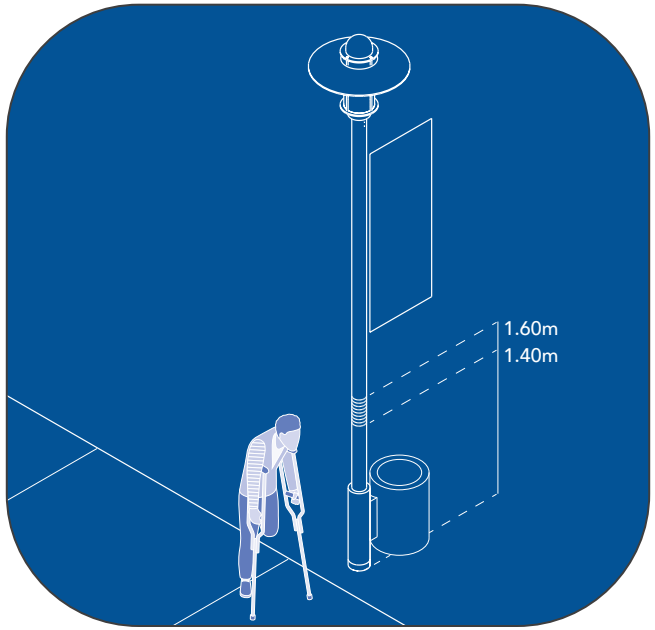


3.3 OVERHANGING OBSTRUCTIONS

• Overhanging signs in accessible pathways should be mounted at a minimum clear height of 2.00m to allow a sightless person to pass safely

• Overhanging vegetation should be clipped to a minimum clear height of 2.00 m

• Undetectable obstacles mounted lower than 2.00 m may project a maximum distance of 0.10m into the pathway Otherwise they should be recessed or covered



3.4 FIXED POLES

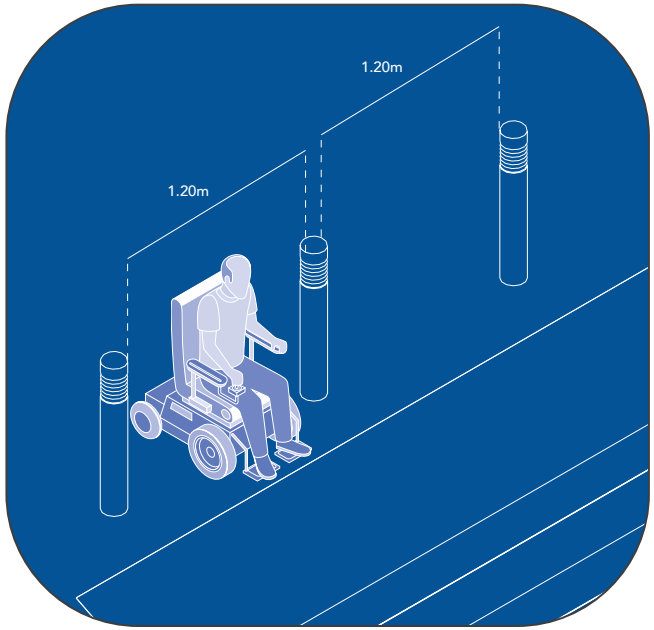
• Fixed poles should have contrasting durable color marking strips of at least 0.30 m in length, placed with the center line at a height between 1.40 m and 1.60 m, to warn pedestrians with limited vision

• Garbage bins attached to lampposts should not face the line of pedestrian flow so as to minimize collisions and should be painted in a contrasting color so that people with limited vision may easily identify them



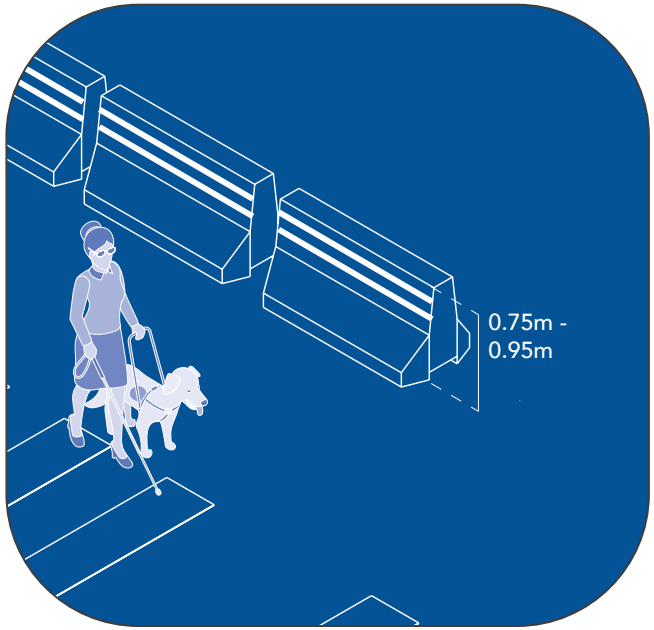
3.5 SPACES BELOW RAMPS AND STAIRS

• Spaces below ramps and stairs should be blocked out completely by protective rails or raised curbs or marked with a tactile surface



3.6 WIRES AND BOLLARDS

• Stabilizing wires and wire netting should be painted in a contrasting color or blocked out.
• Bollards should be painted in a contrasting color or in colored stripes
• The distance between guiding posts should be around 1.20 m



3.7 ROADWORKS

• Excavations and roadworks form temporary obstructions within the route of travel. They should be protected by easily detected continuous barriers, scaffolding, and fences for safety reasons
• Barriers should be identified by stripped color markings and should be lit at night, to guide people with limited vision
• The barrier height should be between 0.75 m and 0.95 m. The distance between the bottom of the barrier and the pathway surface should not exceed 0.10 m

URBAN DESIGN - SIGNAGE

1. PROBLEM IDENTIFICATION

- Orientation difficulties resulting from illegible directional signs, street names and numbering and/or the lack of them
- Hazards due to lack of warning and traffic signals
- Non-identification of access routes and accessible facilities

2. PLANNING PRINCIPLE

To facilitate orientation mainly for the disabled

3. DESIGN CONSIDERATIONS

- 3.1 General
- 3.2 International symbol of accessibility
- 3.3 Direction signs
- 3.4 Street names
- 3.5 Building Numbers
- 3.6 Maps and information panels
- 3.7 Installation
- 3.8 Color
- 3.9 Lettering

4. EXISTING CONSTRUCTIONS

The international symbol of accessibility should be added to mark accessible spaces and facilities. Directional signs should be added to indicate clearly the location and function of accessible spaces and facilities.



3.1 GENERAL

- Signage include direction signs, signs of locality, street names and numbering, information signs, etc.
- All types of signs should be visible, clear, simple, easy to read and understand, and properly lit at night
- In general, signs should not be placed behind glass because of possible reflection
- Signage placed on the pedestrian path of travel are considered obstructions; thus, they should be detectable



3.2 INTERNATIONAL SYMBOL OF ACCESSIBILITY

• Accessible spaces and facilities should be identified by the international symbol of accessibility
• The symbol is composed of a wheelchair figure facing right with either a square background or a square border
• Contrasting colors should be used to differentiate the figure from the background. The commonly employed colors are white for the figure and blue for the background
• For completely accessible buildings, it is enough to have one explanatory sign at the entrance



3.3 DIRECTION SIGNS

• Graphic or written directions should be used to indicate clearly the type and location of the available facility
• Directional signs need not be excessive in number, but they should be placed at main entrances and doors and in places where changes in direction or level occur



3.4 STREET NAMES

• Fixed signs indicating street names should be placed at a maximum height of 2.50 m



3.5 BUILDING NUMBERS

• Fixed signs indicating house numbers should be placed at a maximum height of 2.00 m



3.6 MAPS AND INFORMATION PANELS

• Maps and information panels at building entrances, along roads, and on public buildings should be placed at a height between 0.90 m and 1.80 m



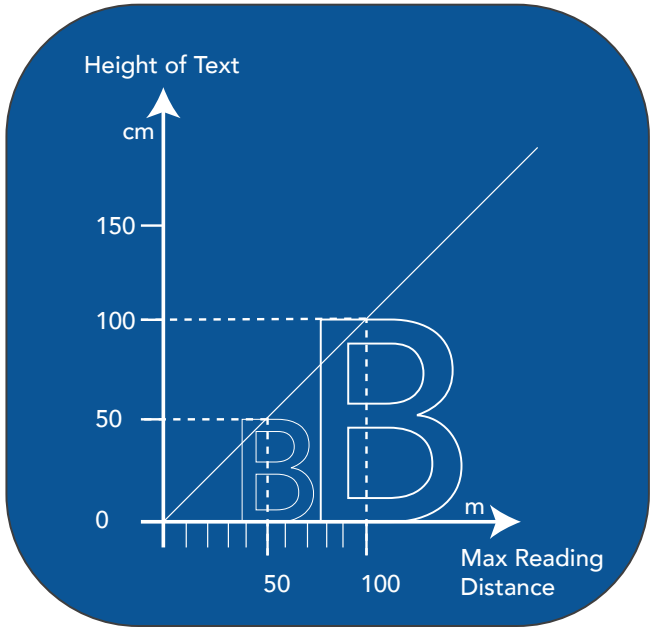
3.7 INSTALLATION

• Signs can be wall-mounted, suspended or pole-mounted.
• Wall-Mounted signs: Wall-mounted signs, such as those indicating room numbers, should be placed with the center line at a height between 1.40 m and 1.60m from the finished floor level
• Overhanging signs: Overhanging signs should allow a minimum clearance of 2.00 m
• Pole-Mounted signs: (See Obstructions)



3.8 COLOR

• The color of signs should contrast with the surrounding surface so as to be clearly distinguishable
• The commonly used colors are white, black, yellow, red, blue and green
• The color combinations red/green and yellow/blue should not be used in order to avoid confusing color- blind persons



3.9 LETTERING

• The size of letters should be in proportion to the reading distance
• Character width-to-height ratio should be between 3:5 and 1:1 and the character stroke width-to-height ratio should be between 1:5 and 1:10
• The letters and signs should preferably be raised at least 1 mm from the background, to enable sightless people to read the information using the tips of their fingers
• The smallest letter type should not be less than 15 mm

URBAN DESIGN - STREET FURNITURE

1. PROBLEM IDENTIFICATION

- Lack of or improper design of street furniture
- Obstructed pathways
- Inaccessible street facilities

2. PLANNING PRINCIPLE

To design accessible amenities convenient to all people, without obstructing the free passage of pedestrians along travel routes.

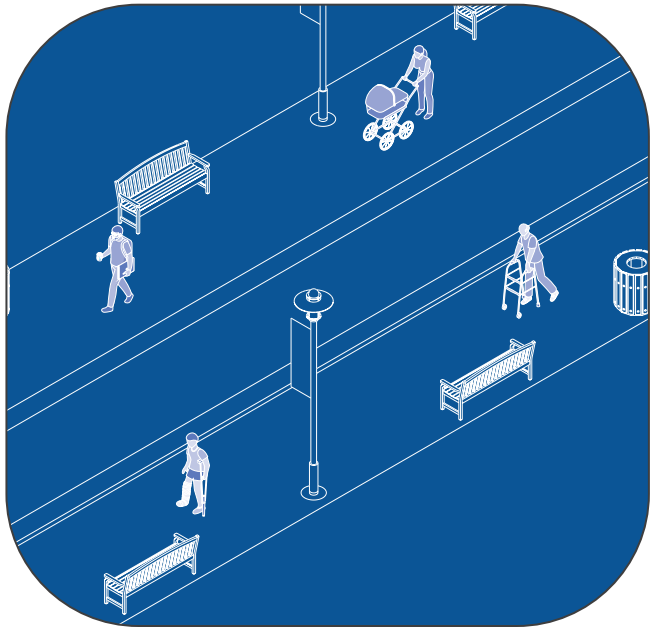
3. DESIGN CONSIDERATIONS

3.1 General
3.2 Location[1]
3.3 Resting facilities
3.4 Public telephone booths[2]
3.5 Water Fountains
3.6 Signs (See Signage)
3.7 Garbage bins (See Obstructions)
3.8 Public toilets (See Restrooms)

4. EXISTING CONSTRUCTIONS

Resting facilities should be rearranged where possible to allow an adjoining space for a wheelchair. Facilities mounted at a maximum height of 1.40 m are acceptable, while those located at a higher level should be modified.

1. Landscaped strips act as a buffer zone between pedestrian and vehicular zones, and street furniture can be located within these strips.
2. Public telephone requirements also include those in hotels, information booths and other public areas.



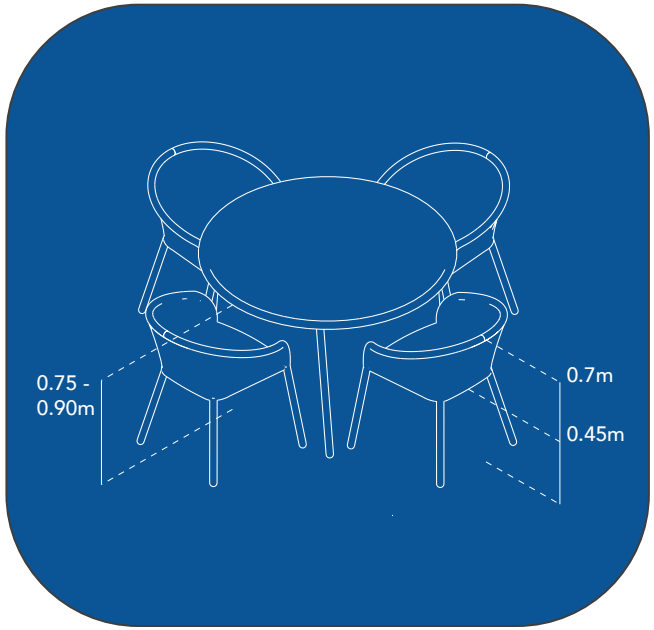
3.1 GENERAL

- Street furniture includes bus stops, benches, mail boxes, lampposts, signboards, telephone booths, public toilets, newspaper kiosks, planting tubs, garbage bins, etc.



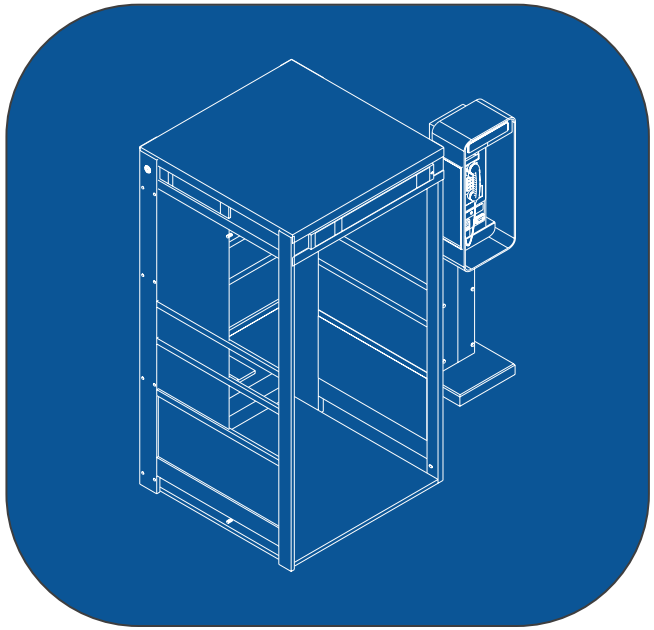
3.2 LOCATION

• Street furniture should be located so as to allow for the free passage of all people without creating hazards
• Textural changes in the footpath surface help sightless people to identify the location of public amenities (See Obstructions)



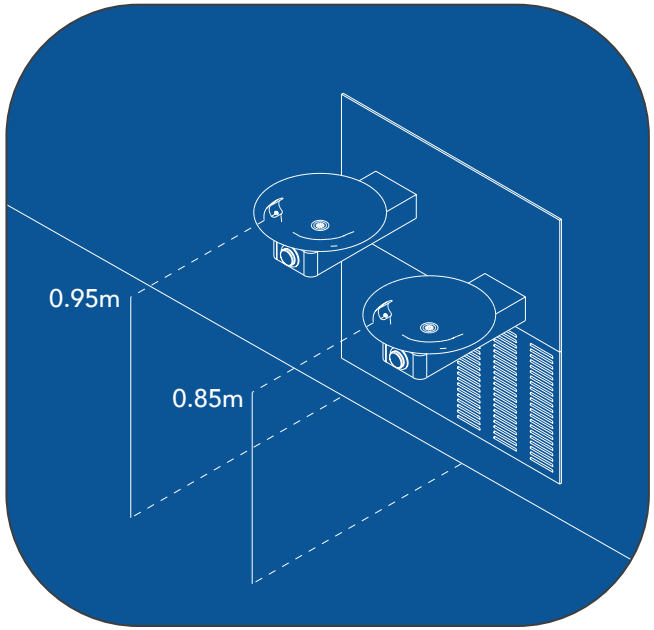
3.3 RESTING FACILITIES

• Resting facilities should be placed outside the main circulation paths and placed close to public toilets, telephones, etc.
• Resting facilities should be provided at regular intervals between roughly 100.00 m and 200.00 m
• Public seats and benches should be approximately 0.45 m above floor level, with backrests at approximately 0.70 m above floor level
• The height of a table should be between 0.75 m and 0.90 m and a minimum depth under the table should be 0.60 m



3.4 PUBLIC TELEPHONE BOOTHS

• At public telephone booths, one telephone should be accessible to a wheelchair user and another to a person with a hearing impairment
• Telephones for the hearing impaired should be equipped with hearing aid devices and amplifiers. The location of telecommunication devices should be indicated by signs
• A folding seat should be provided in accessible telephone booths for the convenience of people with mobility problems



3.5 WATER FOUNTAINS

• Drinking fountain spouts should be located at an approximate height of 0.90 m
• Drinking fountains can have two spouts located at different heights, one convenient to wheelchair users at approximately 0.85 m, and one at approximately 0.95 m for non-disabled people

URBAN DESIGN - PATHWAYS

1. PROBLEM IDENTIFICATION

- Uneven curbs with obstacles and holes
- Inconvenient or dangerous interruptions in the path of travel
- Insufficient width
- Changes in level

2. PLANNING PRINCIPLE

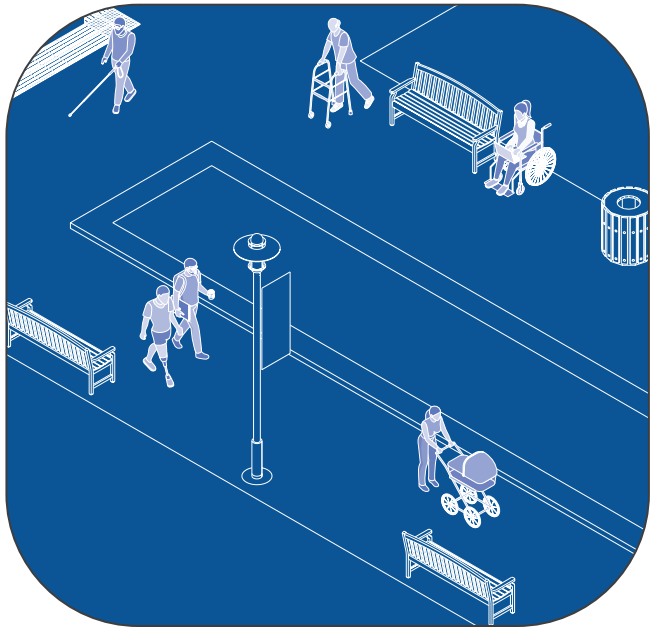
To provide clear, obstruction-free, level and wide pathways for the convenience of all users, especially the sightless and people with mobility problems

3. DESIGN CONSIDERATIONS

3.1 General
3.2 Tactile marking
3.3 Curbs
3.4 Width
3.5 Slope
3.6 Gratings
3.7 Guards
3.8 Obstacles and Signs (See Obstructions)

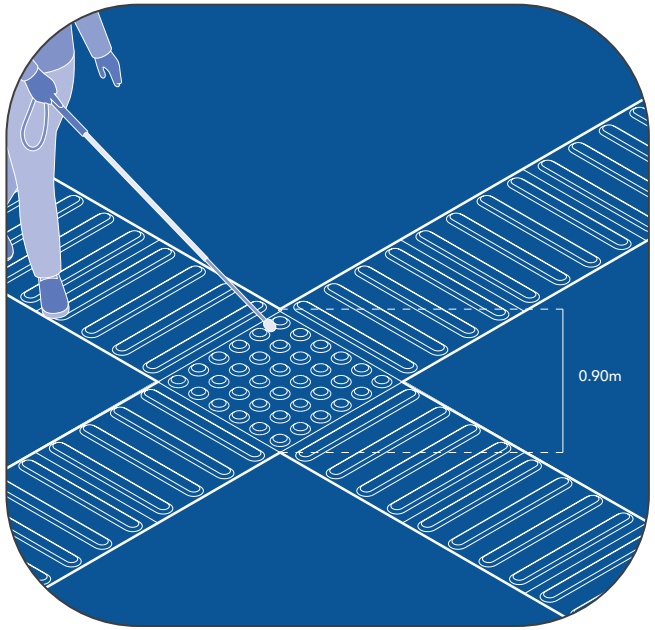
4. EXISTING CONSTRUCTIONS

Textured rubber adhesive tiles can be applied to existing pavement to avoid slipping and to warn sightless people. Existing pathways with steps, stairs or steep slopes need not be modified if an alternative accessible route exists.



3.1 GENERAL

- Street pavements, pedestrian passages in open spaces and recreational areas, pedestrian underpasses and overpasses are all considered pathways or ramps
- Pedestrian routes in recreational areas and open spaces should be broken regularly by detectable obstructions such as plants and/or by changing the alignment to discourage bicyclists (See Obstructions)



3.2 TACTILE MARKING

• Tactile tiling on the pedestrian route of travel should be placed at the following locations:

  • On a guide strip where alternative routes exist or at a junction of guide strips

  • At a pedestrian crossing (See Curbed Ramps)

  • Around obstructions which are difficult for the sightless to detect (See Obstructions)

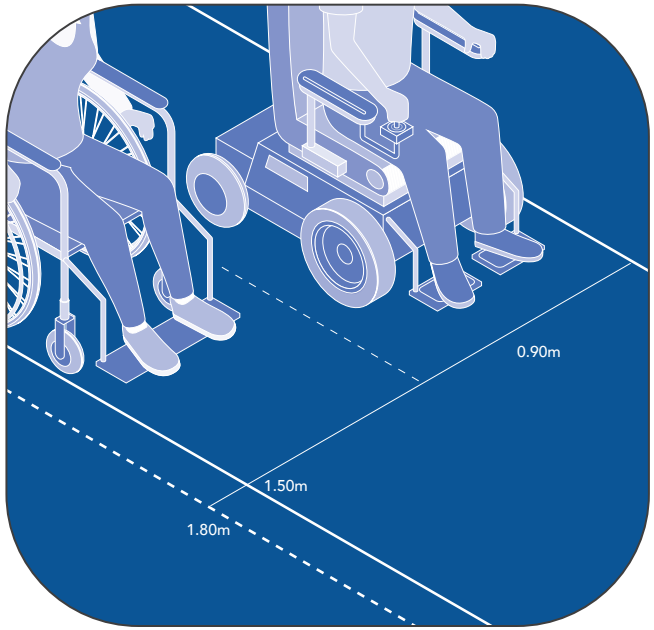
• A tactile guiding area, preferably of rubber tiles with minimum dimensions of 0.90 m x 0.90 m



3.3 CURBS

• The height of a curb should be between 0.07 m and 0.15m

• Stepped curbs should be avoided, as they are hazardous to all pedestrians, especially in darkness



3.4 WIDTH

• The minimum width of an unobstructed pathway should be 0.90 m
• The minimum width of a two-way wheelchair traffic passage is 1.50 m. The preferable width is 1.80 m



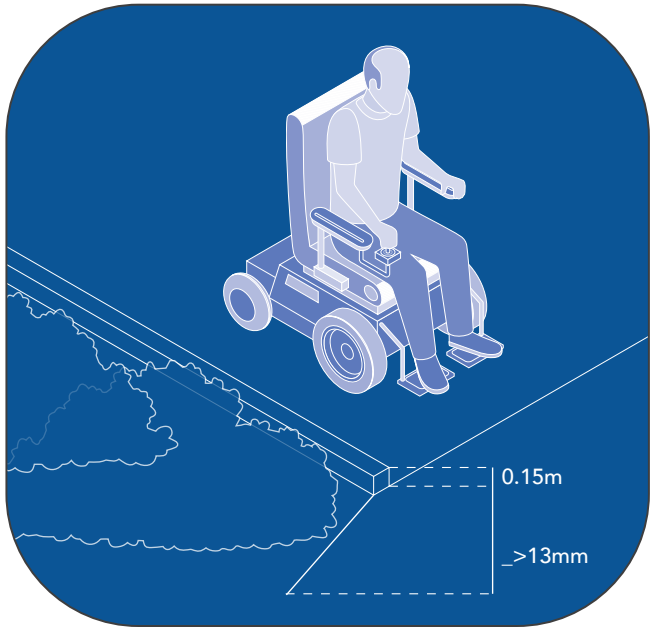
3.5 SLOPE

• The slope of an accessible path should not exceed 1:20. Pathways with a slope of more than 1:20 should be designed as ramps (See Ramps)
• The slope across a path should not exceed 1:50



3.6 GRATINGS

• Gratings can be hazardous to wheelchair users, cane and crutch users, parents with prams and women with high heels
• Manholes, drains and gratings should generally be placed outside the pedestrian pathway
• Gratings should be flush with the pathway surface and should have narrow patterns of not more than 13 mm
• Elongated grating openings should be perpendicular to the pedestrian travel path



3.7 GUARDS

• For changes in level of more than 13 mm between the pathway and the surrounding surface, guards, up-stands or other types of barriers should be used
• Guards with a minimum height of 0.15 m should be used to separate pathways from planting areas, pools and landscape features
• Plant varieties and locations within the travel route should be chosen with caution
• Trees with shallow roots are hazardous as the roots may breakthrough the pathway surface

URBAN DESIGN - CURBED RAMPS

1. PROBLEM IDENTIFICATION

• Improperly designed transition or no transition at all between the curb and the street at pedestrian crossings and in the vicinity of building entrances

2. PLANNING PRINCIPLE

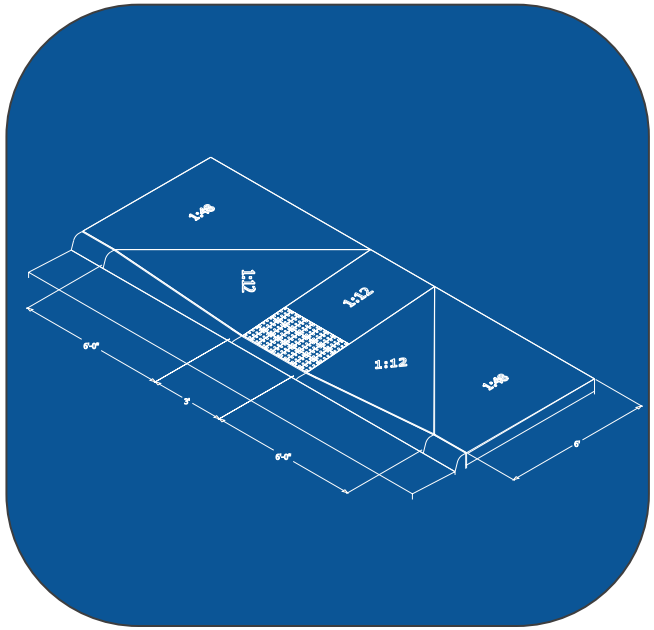
To overcome changes in level between the pavement and the road surface and also on the pavement itself

3. DESIGN CONSIDERATIONS

- 3.1 General
- 3.2 Types
- 3.3 Application
- 3.4 Curb ramps at intersections
- 3.5 Narrow pavement
- 3.6 Width
- 3.7 Slope
- 3.8 Guide strips
- 3.9 Surface and color

4. EXISTING CONSTRUCTIONS

The maximum allowable slope for a curb ramp constructed along high pavements should not be more than 1:10. The maximum slope of the flares should also be 1:10. If existing curb ramps do not comply with the above mentioned requirements, they should be modified.

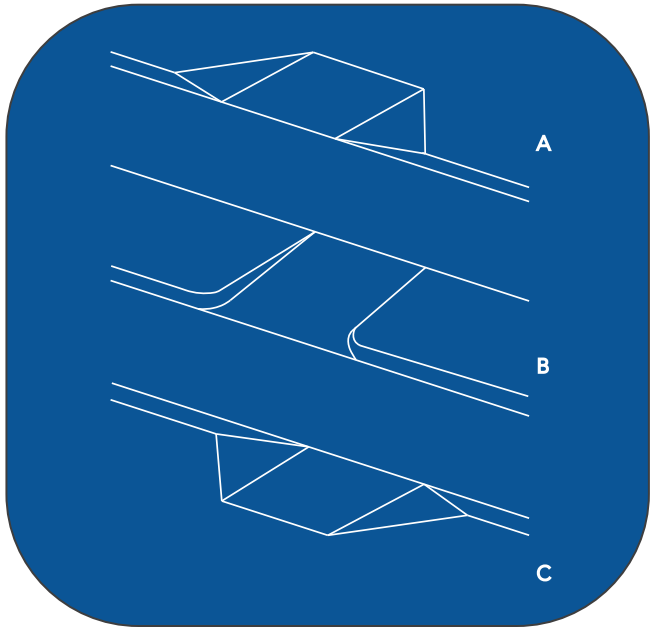


3.1 GENERAL

• Curb ramps are used wherever there is a difference in level on pedestrian paths or cross paths

• To avoid confusing sightless pedestrians, curb ramps should be positioned out of the usual line of pedestrian flow. The unobstructed width of the pathway should be not less than 0.90 m (See Pathways)

• Curb ramps should be located away from places where water accumulates



3.2 TYPES

• (A) Standard curb ramps: Cut back into the pavement with flared sides providing transition in three directions
• (B) Returned curb ramps: Providing slope in one direction. This could be a dangerous measure if the sides are not protected
• (C) Built-up curb ramps: Usually with flared edges



3.3 APPLICATION

• At each quadrant of each street intersection
• At each pedestrian crossing, on opposite sides of the street
• At drop-off zones, near building entrances
• Between accessible parking areas and pathways



3.4 CURB RAMPS AT INTERSECTIONS

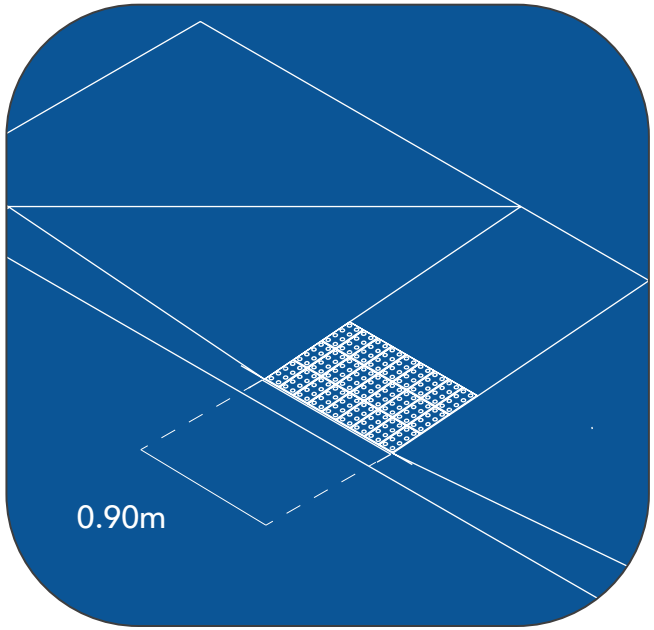
• At intersections, curb ramps can be installed in any of the following ways:

- Directly in the path of travel
- Diagonally across the corner
- Continuously wrapped around the corner



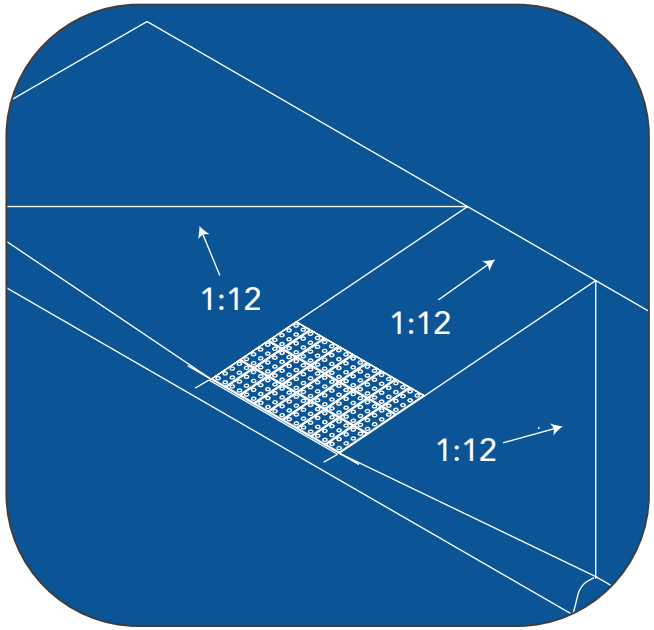
3.5 NARROW PAVEMENT

• Where the construction of curb ramps would affect the width of the travel route, the whole pavement should be lowered, at a maximum slope of 1:12, to provide the necessary level transition



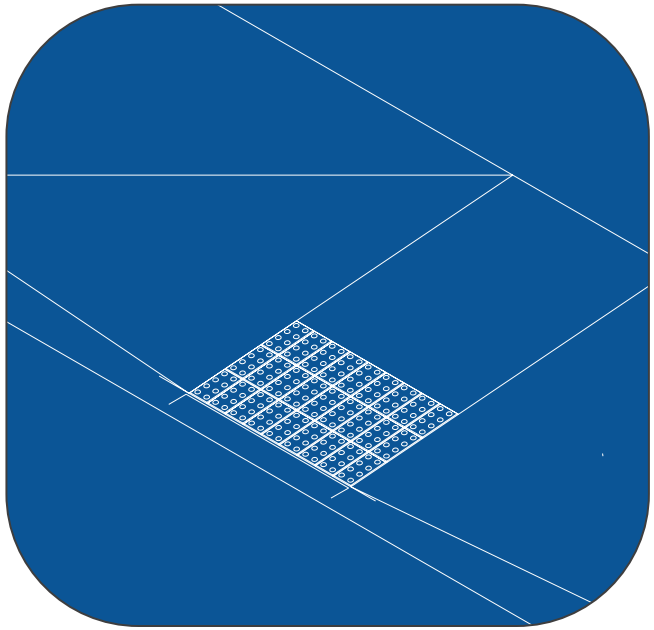
3.6 WIDTH

• The minimum width of a curb ramp should be 0.90 m, excluding the sloping sides. The recommended width is 1.20 m



3.7 SLOPE

• The maximum slope of a curb ramp should be 1:12
• The maximum slope of flares should be 1:12
• Level transfer is recommended between the curb ramp and the surface of a pathway. A lip not exceeding 15 mm can be used



3.8 GUIDE STRIPS

• A guide strip painted in a contrasting color should be constructed to guide sightless and partially sighted pedestrians to the location of the curb ramp (See Pathways)
• Guide strips should be constructed to indicate the position of pedestrian crossings for the benefit of sightless pedestrians (See Pathways; Curbed Ramps)
• A guide strip should lead to pedestrian light poles with push buttons for the benefit of the visually disabled



3.9 SURFACE AND COLOR

• Curb ramps, including flares, should have a rough texture or ground pattern to make them detectable and slip-resistant
• The surface color should be distinct and should contrast with the surrounding surfaces to guide pedestrians with limited vision

URBAN DESIGN - PARKING

1. PROBLEM IDENTIFICATION

- Poor parking facilities
- Insufficient width of the parking aisle
- No allocation of parking space for the disabled

2. PLANNING PRINCIPLE

To provide accessible parking facilities as close as possible to the point of destination.

3. DESIGN CONSIDERATIONS

3.1 General
3.2 Number
3.3 Location
3.4 Dimensions
3.5 Parking curb
3.6 Drop-off areas
3.7 Signs

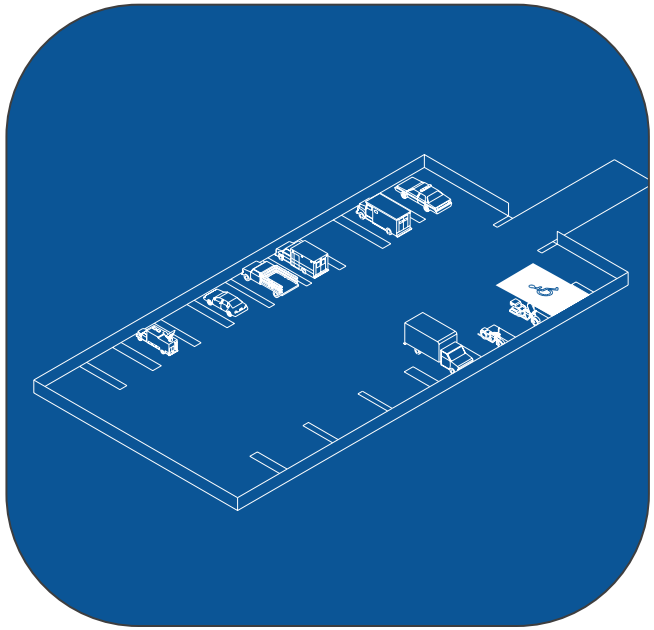
4. EXISTING CONSTRUCTIONS

If the parking area is more than 50.00 m from the building entrance, a vehicular drop-off area within 30.00 m of the entrance should be built or an accessible parking space close to the entrance should be constructed. For indoor parking spaces with clear height of less than 2.40 m, alternative outdoor provisions for vans carrying disabled people should be provided.



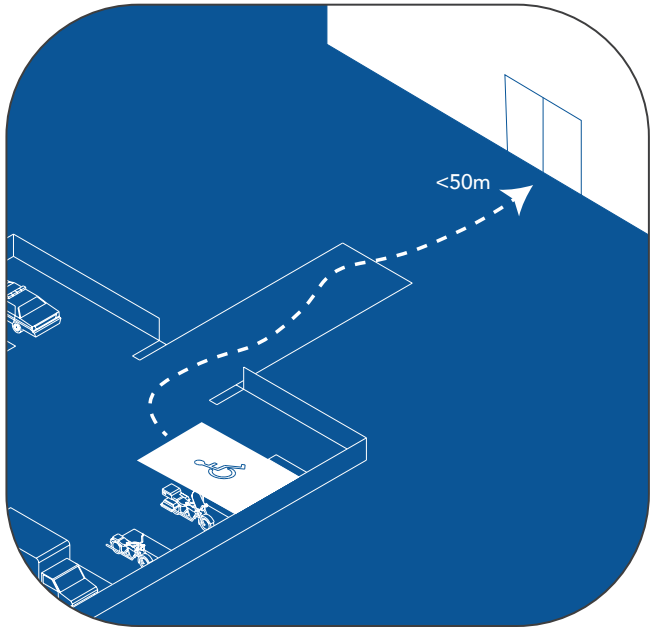
3.1 GENERAL

- Accessible parking provisions apply to both outdoor and underground facilities
- For multi-story indoor parking facilities, at least one level should be served by an accessible elevator



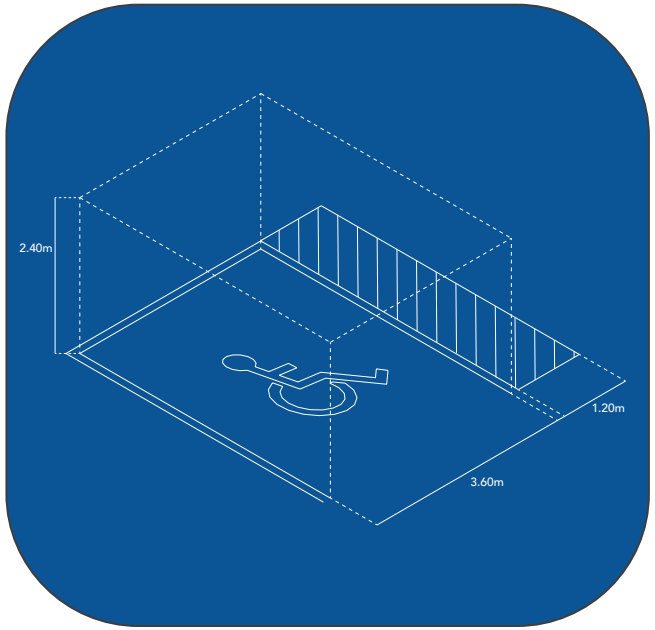
3.2 NUMBER

• For parking facilities of less than 50 cars, at least one accessible parking space should be provided in every parking facility
• For parking facilities of a maximum number of 400 spaces, accessible parking spaces should at least be provided in the ratio of 1:50 (one accessible space for every 50 spaces)
• For parking facilities of more than 400 spaces, at least 8 accessible parking spaces should be provided plus 1 space for each additional increment of 100 cars over 400



3.3 LOCATION

• For outdoor parking, accessible parking spaces should be located not more than a 50 m path of travel from accessible building entrances
• For indoor parking, accessible parking spaces should be located right next to accessible elevators, or as close as possible to exits
• The ends of rows are preferable for vans with lifts for wheelchair users



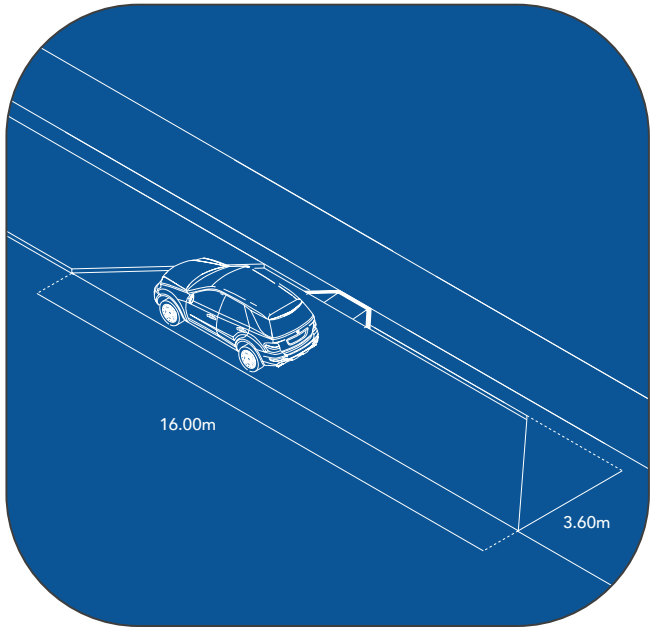
3.4 DIMENSIONS

• The minimum width of an accessible parking space is 3.60 m. The recommended width is 3.90 m
• An access aisle 1.20 m wide can be located between two ordinary parking spaces
• For indoor parking, the minimum height clearance for vans with hydraulic lifts is 2.40 m
• Where parking spaces are angled, the extra space at the end of a row can be used as a parking aisle for disabled persons



3.5 PARKING CURB

• If a curb exists, curb ramps should be provided to link accessible parking spaces to accessible pathways
• If no curb exists, a textured surface at least 0.60 m wide is needed to separate the pathway from the vehicular area; otherwise bollards should be used (See Street Furniture). Pre-cast wheelstops can also be used to set apart a passage at least 0.90 m wide



3.6 DROP-OFF AREAS

• Drop-off areas are beneficial for picking up and dropping off people with physical limitations, parents with children, people carrying loads, etc.
• Drop-off zones should be provided at public transport stops such as bus stops, and not more than 30.00 m from accessible building entrances
• The drop-off area should be at least be 3.60 m wide and incorporate an aisle 1.20 m wide to allow for maneuvering. The length should accommodate at least two cars



3.7 SIGNS

• Accessible parking areas should be marked by the international symbol of accessibility
• Accessible parking spots should be clearly marked by both sign and markings of the space extend needs

III.
ARCHITECTURAL DESIGN CONSIDERATIONS

This section deals with the design requirements of vertical and horizontal access in both new and existing constructions. It is subdivided into eight categories:

1. RAMPS
2. ELEVATORS
3. PLATFORM LIFTS
4. STAIRS
5. ENTRANCES
6. DOORS
7. CORRIDORS
8. RESTROOMS

ARCHITECTURAL DESIGN - RAMPS

1. PROBLEM IDENTIFICATION

- Inaccessible building entrances due to terrain difference
- Lack of or improper design of ramps
- Very steep and/or long ramps with no resting landings

2. PLANNING PRINCIPLE

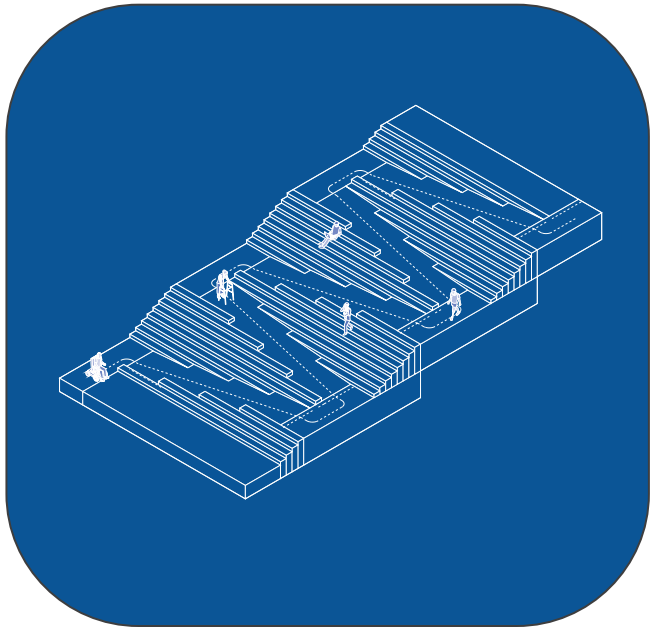
To provide ramps wherever stairs obstruct the free passage of pedestrians, mainly wheelchair users and people with mobility problems

3. DESIGN CONSIDERATIONS

3.1 General
3.2 Configuration
3.3 Slope & Width
3.4 Handrail
3.5 Tactile Marking

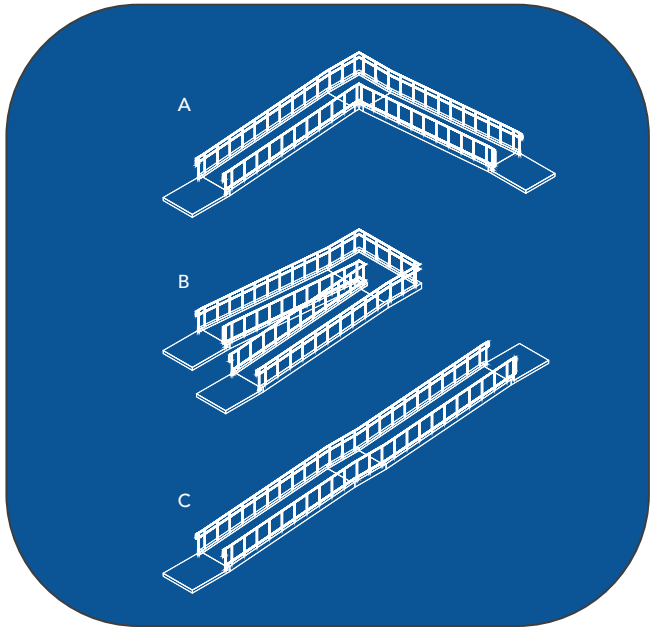
4. EXISTING CONSTRUCTIONS

If the topography or structure of the existing building is restrictive, minor variations of gradient are allowed as a function of the ramp length. A non-slip surface finish should be added to slippery ramps.



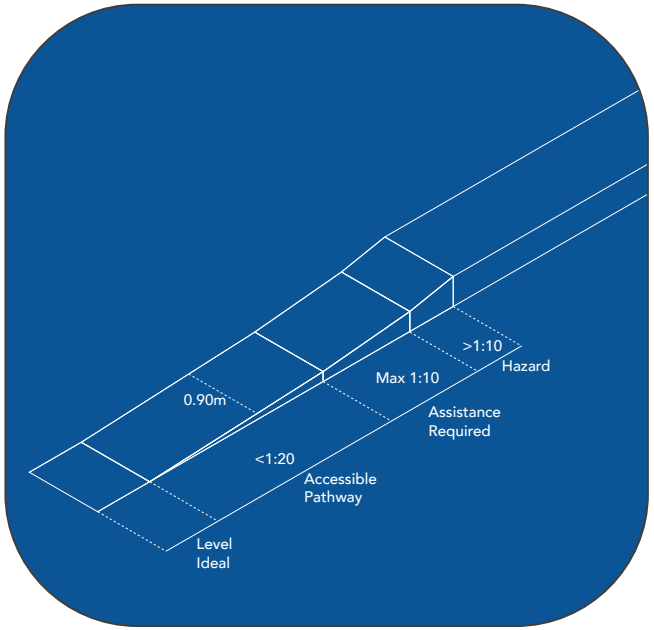
3.1 GENERAL

- When applicable, the entrance to a ramp should be immediately adjacent to the stairs
- When level changes occur to enter building thresholds a ramp should be provided, either as the main entrance pathway or similar



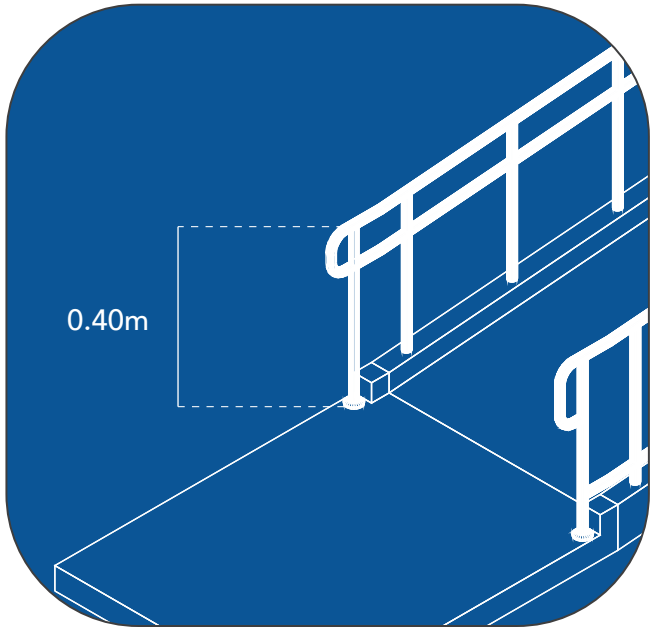
3.2 CONFIGURATION

- Ramps can have one of the following configurations:
  - (a) 90 turn
  - (b) Switch back or 180 turn
  - (c) Straight run
- Landings should be provided every 10.00 m if slope is greater than 5%, at every change of direction and at the top and bottom of every ramp
- The landing should have a minimum length of 1.20 m and a minimum width equal to that of the ramp



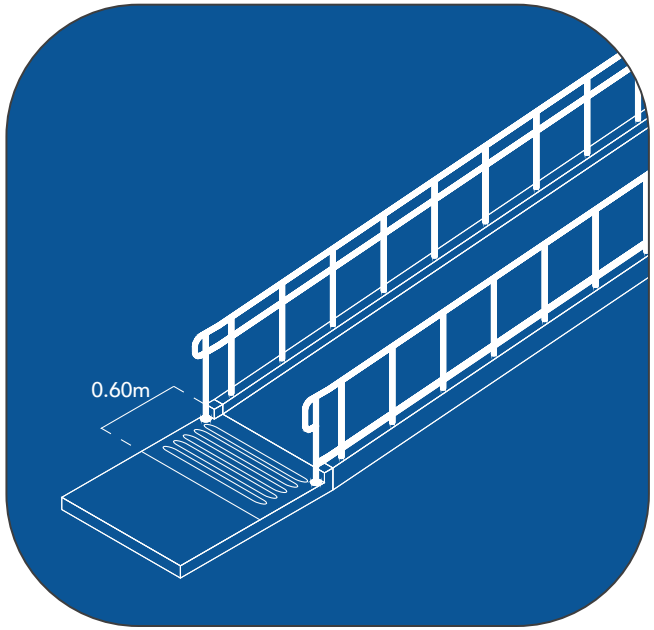
3.3 SLOPE & WIDTH

- Width varies according to use, configuration and slope, however the minimum width should be 0.90 m
- The maximum recommended slope of ramps is 1:20. Steeper slopes may be allowed in special cases depending on the length to be covered



3.4 HANDRAIL

• A protective handrail at least 0.40 m high must be placed along the full length of ramps
• For ramps more than 3.00 m wide, an intermediate handrail could be installed



3.5 TACTILE MARKING

• There should be a colored textural indication at the top and bottom of the ramp
• The marking strip width should not be less than 0.60 m

ARCHITECTURAL DESIGN - ELEVATORS

1. PROBLEM IDENTIFICATION

- Inadequate space inside the elevator cab
- High position of switches, buttons and control panel
- Narrow entry doors
- Insufficient opening time interval

2. PLANNING PRINCIPLE

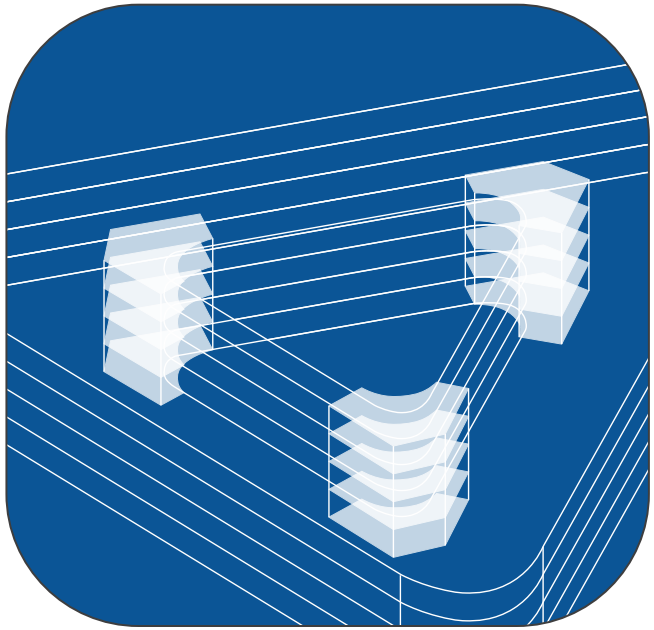
To provide well-dimensioned elevators, that disabled people can use conveniently

3. DESIGN CONSIDERATIONS

3.1 General
3.2 Elevator Cabs
3.3 Control Panel
3.4 Signals
3.5 Color

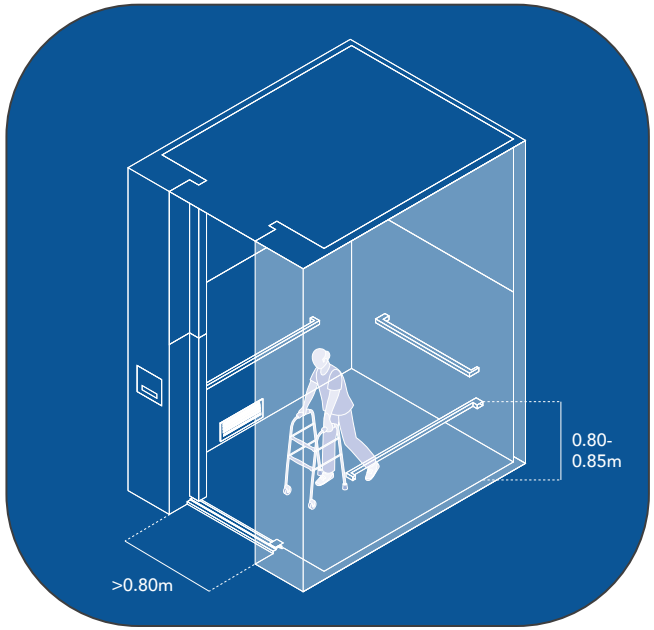
4. EXISTING CONSTRUCTIONS

The minimum acceptable size of an existing elevator cab, allowing for a single wheelchair passenger, is 0.95 m x 1.25 m. Smaller cabs should be replaced. The minimum acceptable width of an existing elevator door opening is 0.75 m. Controls mounted higher than 1.40 m should be replaced.



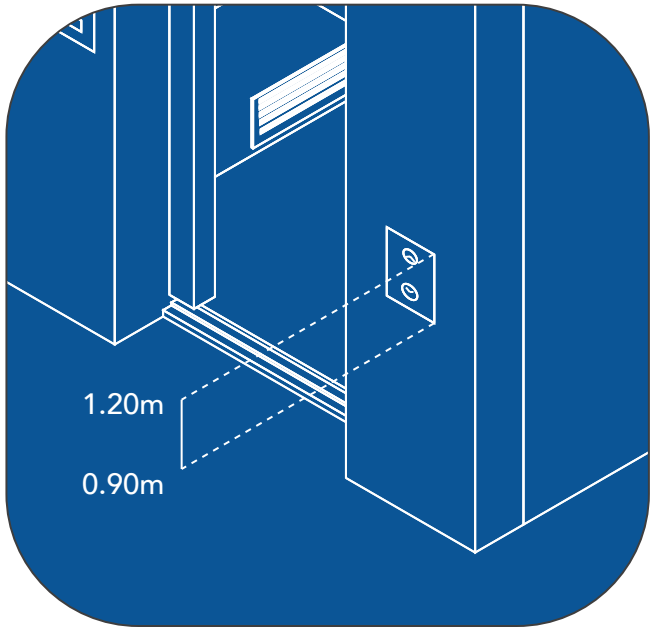
3.1 GENERAL

- The accessible elevator should serve all floors reached by the public
- Elevators which require a key should be used only in private facilities or when an elevator operator is present



3.2 ELEVATOR CABS

• The minimum internal elevator dimensions, allowing for one wheelchair passenger alone, are 1.00 m x 1.30 m
• The door opening should not be less than 0.80 m
• The inside of the elevator should have a handrail on three sides mounted 0.80 to 0.85 m from the floor



3.3 CONTROL PANEL

• For ease of reach, the control panel should be mounted 0.90 m to 1.20 m from the floor
• Control buttons should be in an accessible location and illuminated
• The numbers on the buttons should be embossed so the number can be easily identified through touch



3.4 SIGNALS

• The elevator should signal arrival at each floor by means of a soft sound and a visual to alert sightless and hearing-impaired passengers simultaneously



3.5 COLOR

• The color of the elevator door on the exterior should contrast with the surrounding surface so as to be easily distinguishable by persons with visual impairments
• Materials should be selected to minimize reflectance and glare on users

ARCHITECTURAL DESIGN - PLATFORM LIFTS

1. PROBLEM IDENTIFICATION

- Changes in level between indoor and outdoor areas
- Changes in level inside a building
- Insufficient space for ramps

2. PLANNING PRINCIPLE

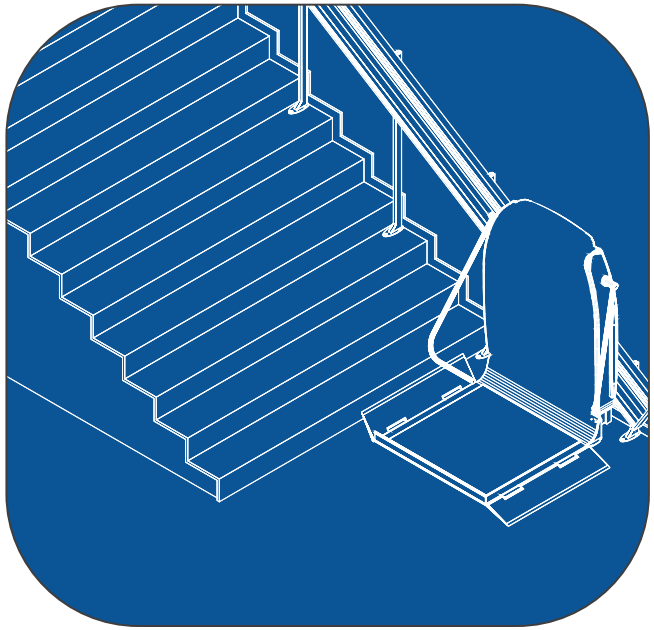
To allow people with mobility problems to have free vertical access between different levels

3. DESIGN CONSIDERATIONS

3.1 General
3.2 Vertical Movement
3.3 Inclined Movement

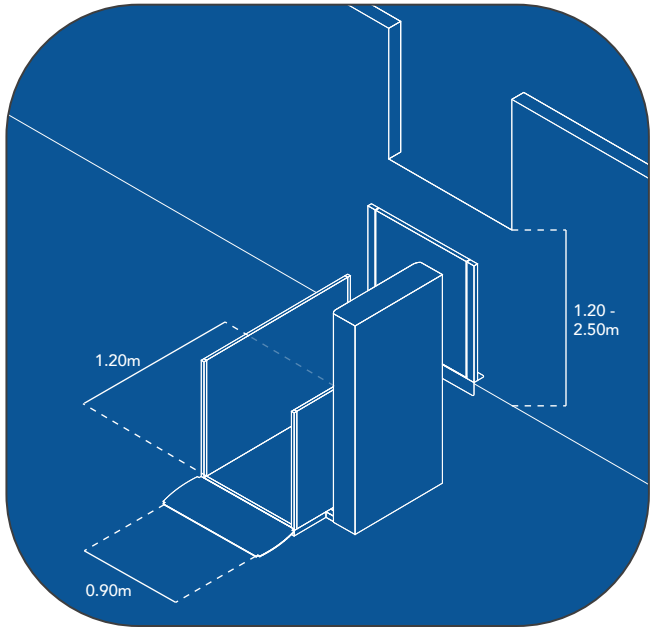
4. EXISTING CONSTRUCTIONS

Also known as stairway lifts or wheelchair lifts, platform lifts can provide access to existing buildings where it would be difficult or unfeasible to install a ramp or an elevator. In buildings that are or would be frequently used by persons with mobility problems, such devices should not be utilized, but rather be spatially reconfigured for accommodation



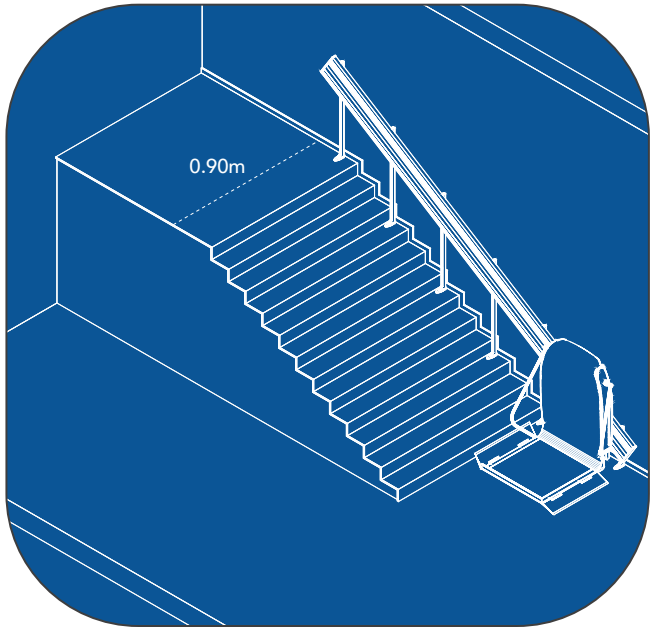
3.1 GENERAL

- Platform lifts are special passenger-elevating devices for the disabled
- Platform lifts can have either a vertical or an inclined movement
- Platform lifts should be considered as a secondary solution if accommodation of ramps or elevators are unfeasible



3.2 VERTICAL MOVEMENT

• For maximum level changes of 2.50 m, vertical movement platform lifts may be installed adjacent to the stairs
• For level changes of more than 1.20 m, the lift should be placed in a closed structure with doors at the different accessible levels with a variety of openings for entry and exits
• Minimum width of the lift platform should be 0.90m
• Minimum length of the lift platform should be 1.20m



3.3 INCLINED MOVEMENT

• Inclined movement platform lifts consist of three elements: a railing, an electric generator and a moving platform or seat
• Inclined movement platform lifts 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 0.90 m to allow the installation of a lift

ARCHITECTURAL DESIGN - STAIRS

1. PROBLEM IDENTIFICATION

- Steep staircases
- Poorly designed steps that hinder foot movement

2. PLANNING PRINCIPLE

To provide safe and well-dimensioned staircases for the comfort of all people, especially those with mobility problems

3. DESIGN CONSIDERATIONS

3.1 General
3.2 Width
3.3 Landing
3.4 Nosing
3.5 Handrails
3.6 Tactile Marking
3.7 Surface

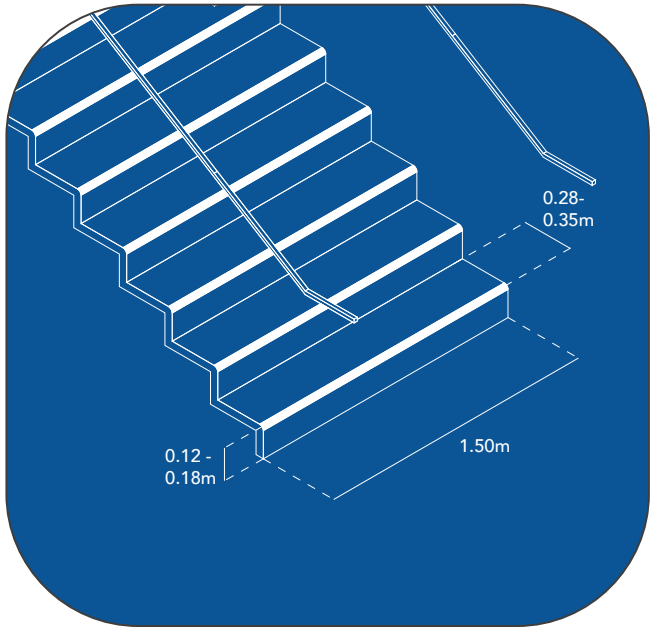
4. EXISTING CONSTRUCTIONS

When the configuration of the nosing cannot be modified, slip-resistant strips could be applied to the nosing as an alternative solution. Slip-resistant strips should be 40 mm wide and should not extent more than 1 mm above the tread surface. To guide people with sight problems, the color of the strips should contrast with that of the stairs.



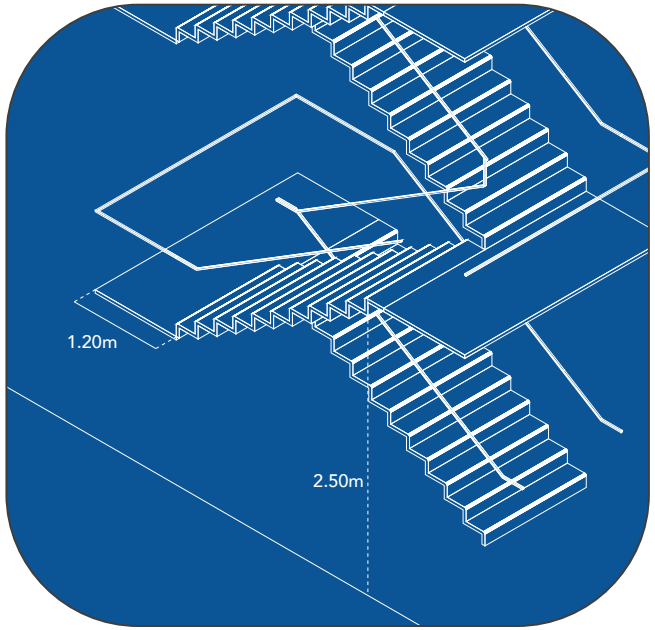
3.1 GENERAL

- Differences in level should be illuminated or minimized as much as possible for the comfort of disabled people
- A complementary ramped route, elevator or lift should be provided where there are steps in an otherwise accessible path
- All steps should be uniform in their rise and run
- Circular stairs and stepped landings should be avoided
- Open risers are not recommended



3.2 WIDTH

• The minimum width of a stairway should be 0.90 m for one-way traffic and 1.50 m for two-way traffic
• For indoor stairs, the riser should be between 0.12 m and 0.18 m, and the tread between 0.28 m and 0.35 m
• For outdoor stairs, the maximum riser should be 0.15 m and the minimum tread should be 0.30 m



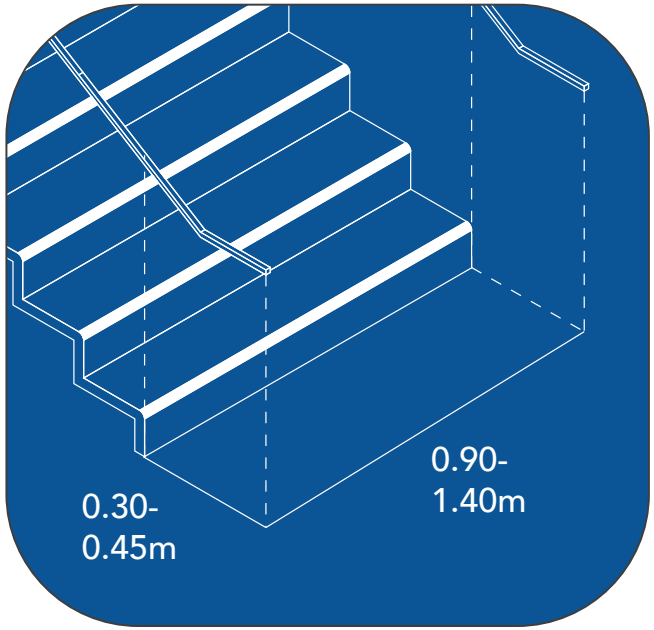
3.3 LANDING

• An intermediate landing should be provided when the stairs cover a difference in level of more than 2.50 m
• The length of the landing should be at least 1.20 m extending along the full width of the stairs



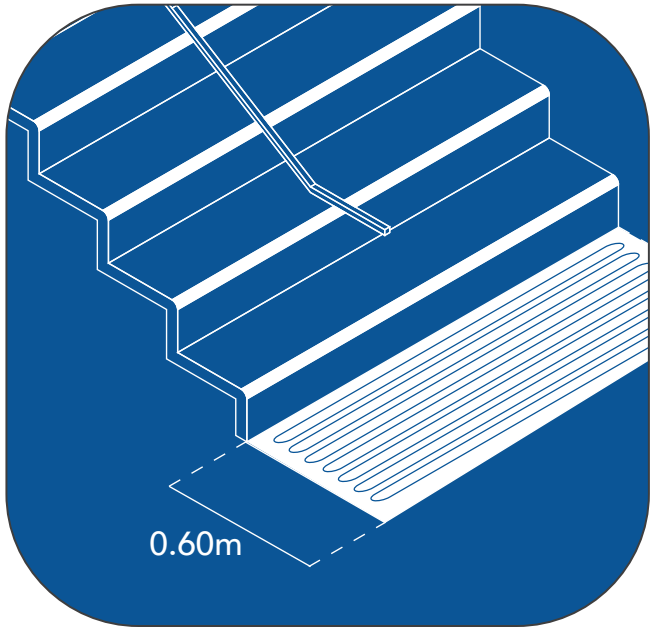
3.4 NOSING

• Sharp edges and overhanging nosing should not be used for treads
• Nosing should be flush or rounded and should not project more than 40 mm



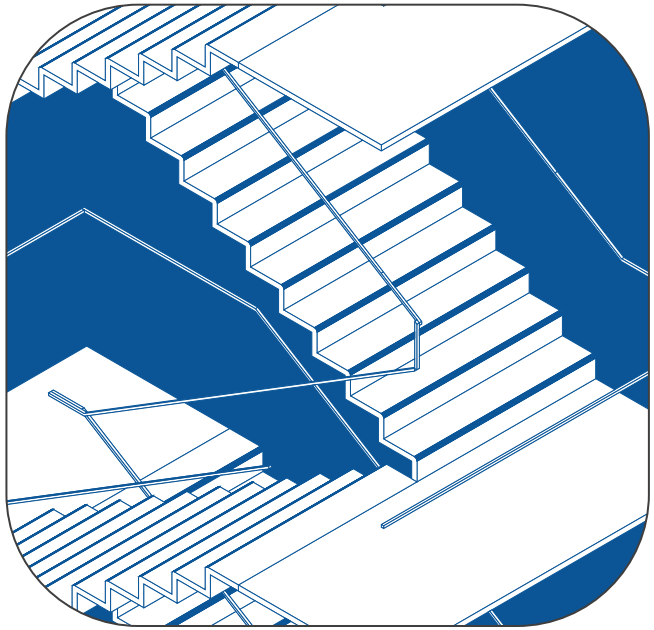
3.5 HANDRAILS

• Handrails must be installed on both sides of the stairs and around the landing for gripping
• For stairs more than 3.00 m wide, one or more intermediate handrails could be provided
• The distance between the handrails when both sides are used for gripping should be between 0.90 m and 1.40 m
• Handrails must extend a distance between 0.30 m and 0.45 m at the top and bottom of the stairs



3.6 TACTILE MARKING

• A textural marking strip should be placed at the top and bottom of the stairs and at intermediate landings to alert sightless people as to the location of the stairs
• The tactile marking strip should be at least 0.60 m wide and should extend over the full width of the stairs
• To guide users with poor vision, the color of the strip should contrast with the surrounding surface
• Emergency stairs should be identified by tactile marking



3.7 SURFACE

• Landings, treads and nosing should be slip-resistant and free of projections
• Exterior stairs should be pitched forward at 10 mm per meter to drain surface water
• Slip-resistant stair nosing should be used to fix carpets on stairs

ARCHITECTURAL DESIGN - ENTRANCES

1. PROBLEM IDENTIFICATION

- No distinct accessible entrance
- Inadequate space in front of the entrance

2. PLANNING PRINCIPLE

To provide accessible and easy-to-find building entrances

3. DESIGN CONSIDERATIONS

- 3.1 General
- 3.2 Entrance Landing
- 3.3 Color
- 3.4 Signage (See Signage)
- 3.5 Threshold (See Doors)

4. EXISTING CONSTRUCTIONS

Public buildings should have at least one accessible entrance. Wherever possible, this should be the main entrance intended for use by the general public. If for architectural or technical reasons the main entrance cannot be made accessible, an alternative accessible entrance should be provided. The location of the alternative entrance should be clearly indicated by signs. To allow for an accessible entrance, one of the following solutions can be adapted:

(a) Ramps, bridges or mechanical lifts be used (See Ramps)

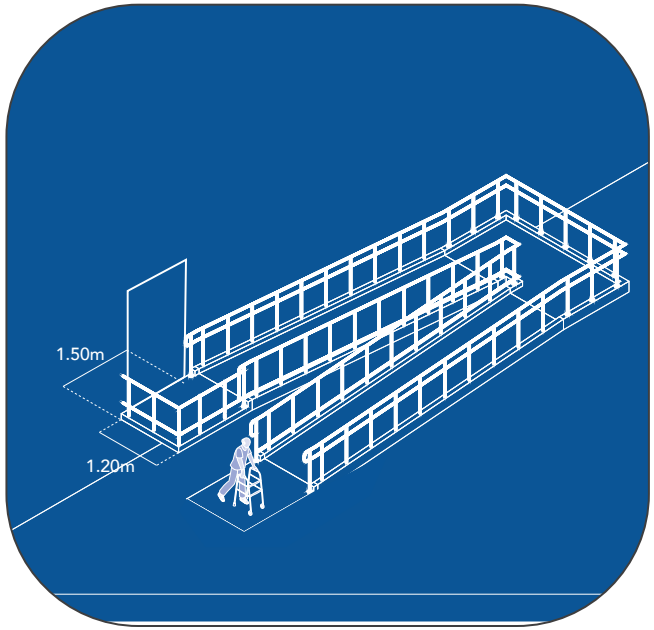
(b) The entrance level change of grade of the landscape

(c) A window or another door at ground might be converted into an accessible entrance



3.1 GENERAL

- At least one entrance per facility should be accessible to a wheelchair user. In new buildings, the accessible entrance(s) should be the main entrance(s) intended for use by the general public
- Each accessible entrance should be connected by accessible pathways to accessible indoor or outdoor parking areas, local public transit stops, drop-off areas, and main public thoroughfare
- In multi-story buildings, the accessible entrance(s) should have a clear accessible path to an accessible vertical path



3.2 ENTRANCE LANDING

• Where the entrance door opens outward, the minimum landing dimensions should be no less than 1.2m deep by 1.5m wide
• Where the entrance door opens inward, the minimum landing dimensions should be no less than 1.2m deep by 1.5m wide
• The surface of the landing should have a slope of 2% for drainage and should have non-slip material finish
• Sheltered landings are preferable



3.3 COLOR

• The entrance door should contrast with the surrounding surface so as to be distinguishable by people with sight problems

ARCHITECTURAL DESIGN - DOORS

1. PROBLEM IDENTIFICATION

- Narrow doorways
- Doors hinged on the wrong side
- Doorways with high thresholds
- Heavy and hard-to-operate doors

2. PLANNING PRINCIPLE

To facilitate the passage of a wheelchair user through doors

3. DESIGN CONSIDERATIONS

- 3.1 General
- 3.2 Types
- 3.3 Openings
- 3.4 Manual Door Hardware
- 3.5 Automatic Door Hardware
- 3.6 Thresholds
- 3.7 Glazing & Glazed Doors
- 3.8 Signage
- 3.9 Color

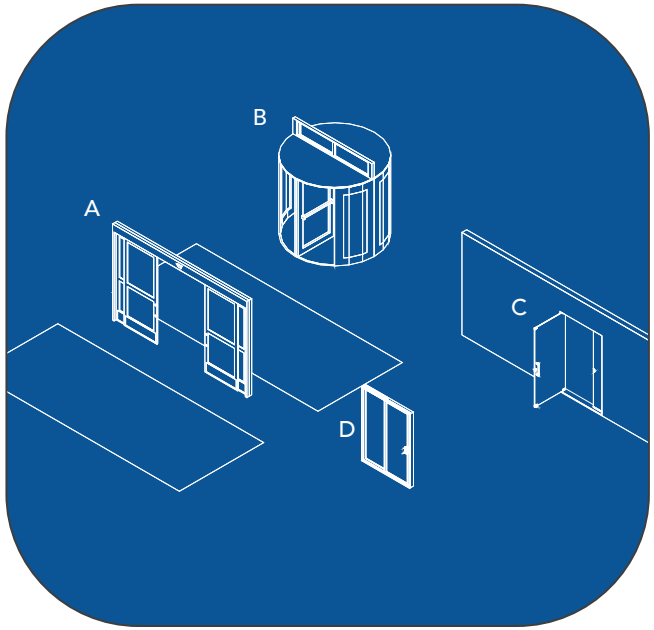
4. EXISTING CONSTRUCTIONS

It is recommended that automatic doors replace heavy, hard-to-open swinging doors. Door openings narrower than 0.75 m should be widened. A swing-clear hinged door may be used to slightly enlarge an opening. Hardware should be replaced by ergonomic options where applicable.



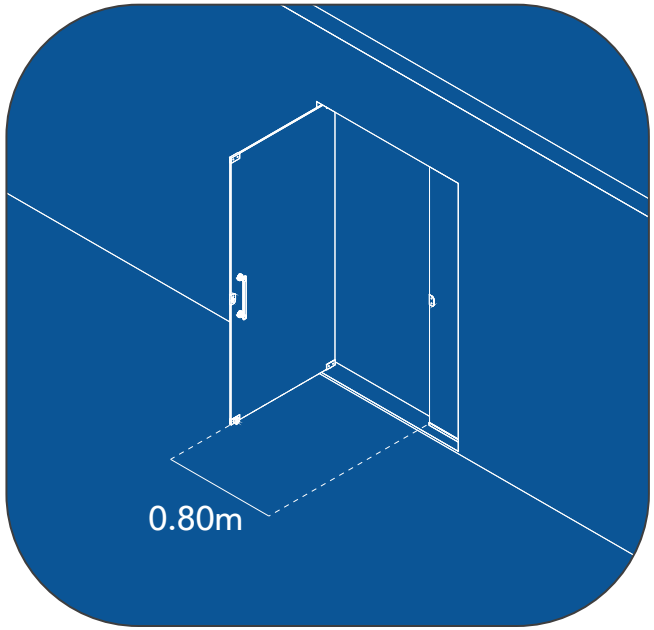
3.1 GENERAL

- Accessible doors should be so designed as to permit operation by one person in a single motion with little effort
- Power-operated doors are the best for people with disabilities. The activator system should be automatic or placed within easy reach
- An accessible door should have the following features: a sign, a door handle, an extra pull handle, glazing and a kick plate



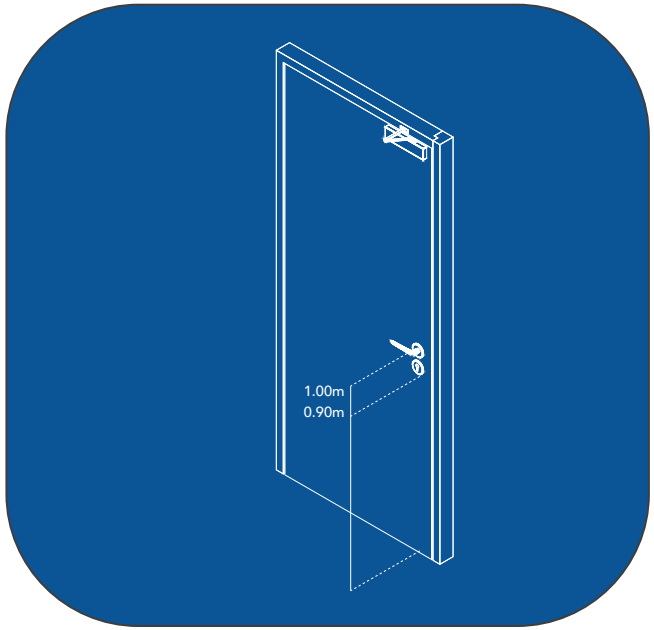
3.2 TYPES

• (a) Automatic doors: - Can be of the sliding or swinging type. Automatic doors are useful when traffic is heavy Automatic doors should have an adequate opening interval
(b) Revolving doors: Not suitable for the use of disabled people or people pushing or pulling carts. An accessible swinging or sliding door should be provided alongside
(c) Pivoted doors: - Should swing away from the direction of travel wherever possible
(d) Sliding and folding doors: Recommended for narrow spaces not heavily used by the public



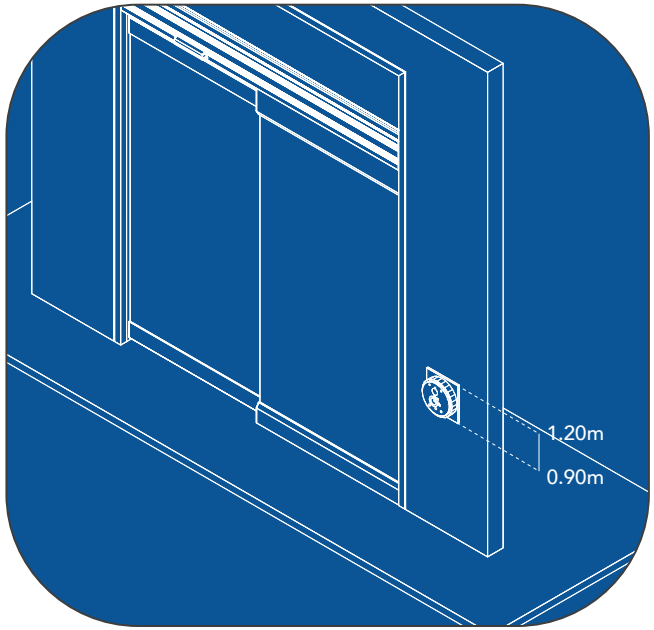
3.3 OPENINGS

• For exterior doors, the minimum opening is 0.90 m when the door is open
• For interior doors, the minimum opening is 0.80 m when the door is open
• The minimum door opening can be 0.75 m if the access is straight or if the door can stay open by itself
• The minimum door width of restrooms should be 0.75 m
• For double-leaf doors, at least one leaf should have a minimum clear width of 0.80 m



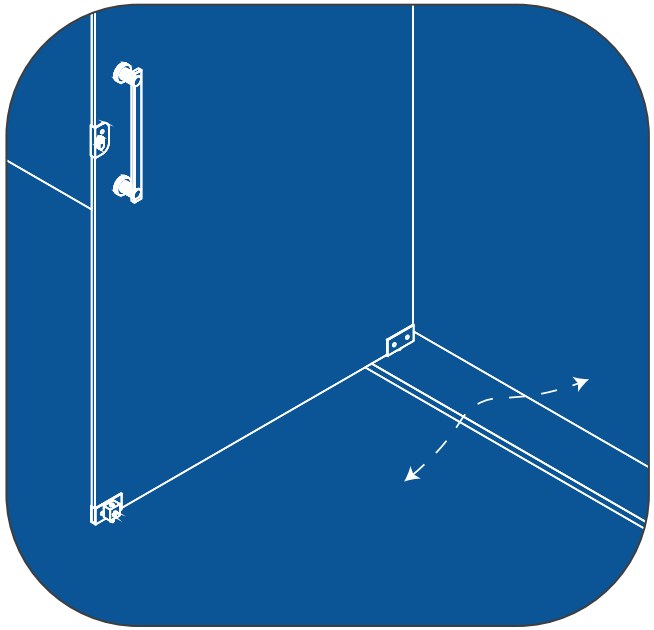
3.4 MANUAL DOOR HARDWARE

• Operational devices on doors, such as handles, pulls, latches and locks, should be easy to grasp with one hand
(a) Handles: Lever-type handles, push plates or pull handles are recommended for swinging doors for their ergonomics. Round knobs are not recommended. Door handles should be located at a comfortable height between 0.90 m and 1.00 m from the floor surface
(b) Locks: On entrance doors should be mounted at a comfortable height from 0.90 m to 1.00 m from the floor



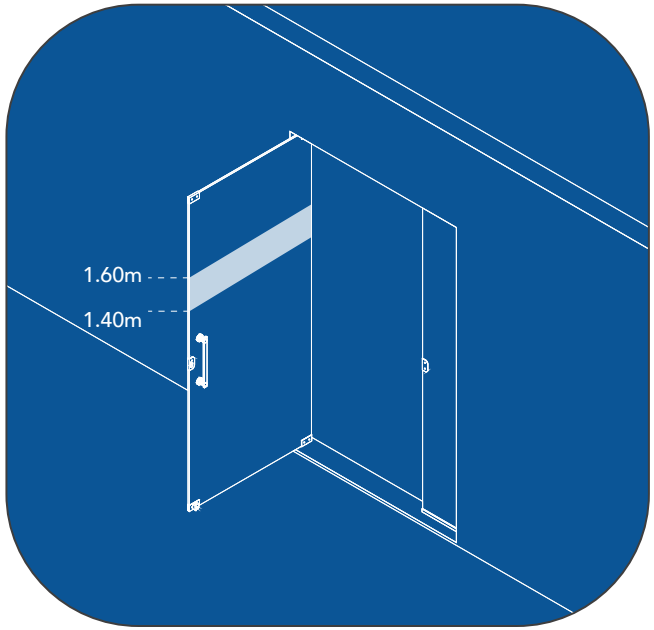
3.5 AUTOMATIC DOOR HARDWARE

• Automatic doors can be activated by:
(a) Push buttons located at a comfortable height between 0.90 m and 1.20 m
(b) Activating mats, which can also serve as a location cue
(c) Card-insert switch
(d) Remote control



3.6 THRESHOLDS

• Thresholds should be omitted wherever possible. Weather-stripping at the door bottom is preferred to thresholds
• The threshold should not be more than 20 mm higher than the finished floor level
• Thresholds higher than 6 mm should be beveled or have sloped edges to facilitate the passage of a wheelchair



3.7 GLAZING AND GLAZED DOORS

• Outward swinging doors and doors in public corridors should have low windows to enable users to see oncoming traffic. The bottom edge of the window should not be higher than 1.00 m from the finished floor level
• Completely glazed doors should be avoided in buildings frequented by people with visual impairments
• Glazed doors should be clearly marked with a colored band for the benefit of all users at a height between 1.40 m and 1.60 m



3.8 SIGNAGE

• In public buildings, the function or room number, incorporating international symbols should be identified at eye level, roughly between 1.40 m and 1.60 m
• Room numbers should be placed on door frames and not on doors themselves so that the room number is visible even when the door is open



3.9 COLOR

• The door or the door frame should contrast with the adjoining wall to facilitate its identification by people with visual impairments

ARCHITECTURAL DESIGN - CORRIDORS

1. PROBLEM IDENTIFICATION

• Long and narrow corridors creating orientation difficulties

2. PLANNING PRINCIPLE

To provide well-dimensioned corridors to facilitate the passage and maneuvering of a wheelchair

3. DESIGN CONSIDERATIONS

3.1 General

3.2 Width

3.3 Obstructions

4. EXISTING CONSTRUCTIONS

Narrow corridors should be widened along their full length if feasible; otherwise, passing areas should be located at appropriate intervals along the corridor length. The minimum width of the passing area should be 1.50 m and the minimum length should be 2.40 m. In highly restricted spaces, the height of an obstacle or sign can be dropped to 1.95 m



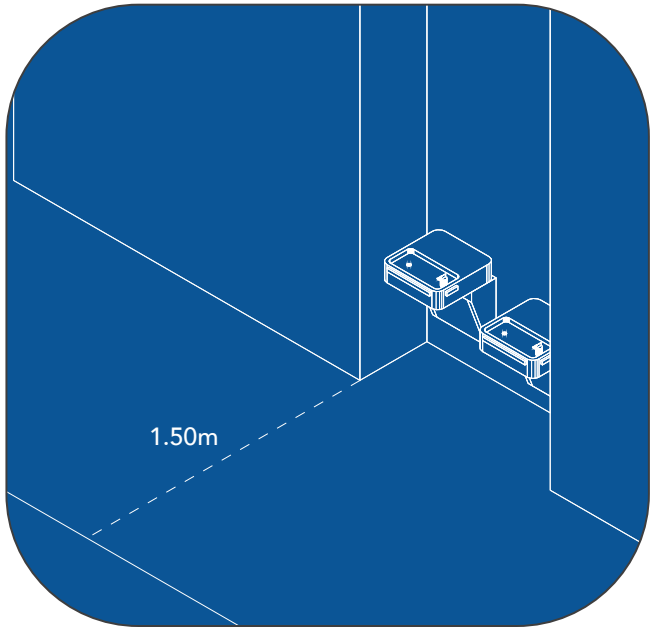
3.1 GENERAL

• Wide corridors are useful for wheelchair users, service equipment, high traffic areas, etc



3.2 WIDTH

• The unobstructed width of a low-traffic corridor should not be less than 0.90 m. This also allows maneuverability in 90 turns
• The unobstructed width of a public corridor should not be less than 1.50 m. The recommended width is 1.80 m
• To allow maneuverability in 180 turns, the minimum circulation space should be a minimum of 1.20m wide
• The corridor width should allow maneuverability through the doors located along its length



3.3 OBSTRUCTIONS

• Obstacles protruding into the corridor, such as drinking fountains or public telephones, should be placed outside the circulation path, in alcoves
• Overhanging signs and obstacles should be mounted at least 2.00 m high

ARCHITECTURAL DESIGN - RESTROOMS

1. PROBLEM IDENTIFICATION

- Insufficient space inside a rest room
- Poor design and positioning of fixtures and fittings

2. PLANNING PRINCIPLE

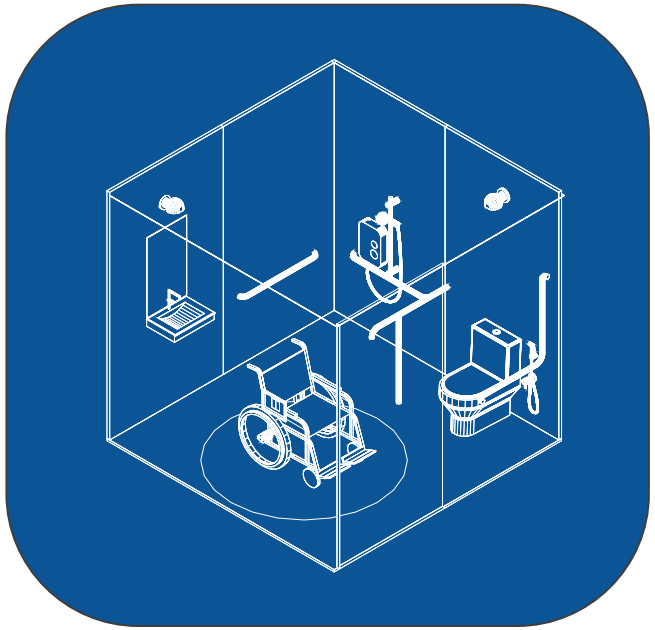
To provide sufficient accessible space inside rest rooms, with all fixtures and fittings being within easy reach

3. DESIGN CONSIDERATIONS

3.1 General
3.2 Public Restrooms
3.3 Special Public Restrooms
3.4 Residential Restrooms
3.5 Fixtures - Water Closets
3.6 Fixtures - Sinks
3.7 Fixtures - Bathtubs
3.8 Fixtures - Shower
3.9 Fixture - Urinal
3.10 Restroom Doors
3.11 Accessories
3.12 Grab Bars
3.13 Mirrors

4. EXISTING CONSTRUCTIONS

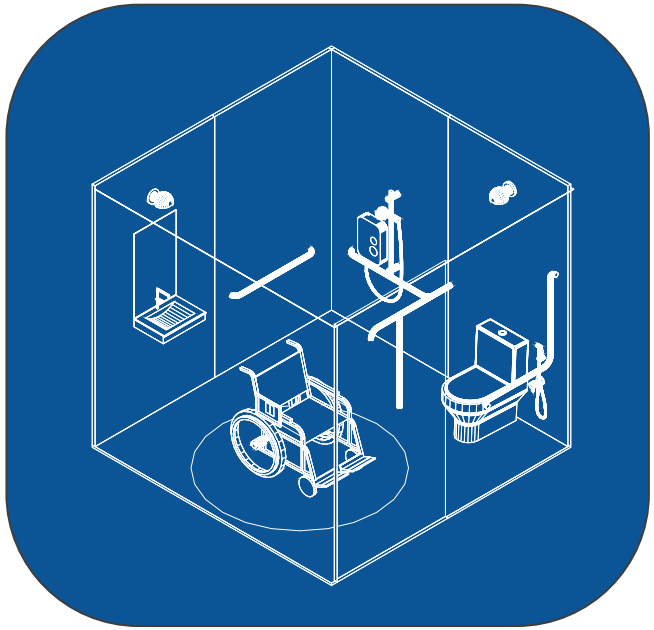
To obtain an accessible toilet combine two adjacent stalls by removing one water-closet and the mutual partition, given that the remaining is sufficient for the floor population.
For narrow vestibules, replace doors with automatic door openers or use swing clear hinges.



3.1 GENERAL

- Turning circles of 1.50 m diameter are recommended inside the rest room to allow for full-turn maneuvering of a wheelchair
- The ease of transferring from a wheelchair to a toilet seat or bidet depends on the approach. In general there are four different approaches:

(a) The parallel approach
(b) The diagonal approach
(c) The perpendicular approach
(d) The frontal approach



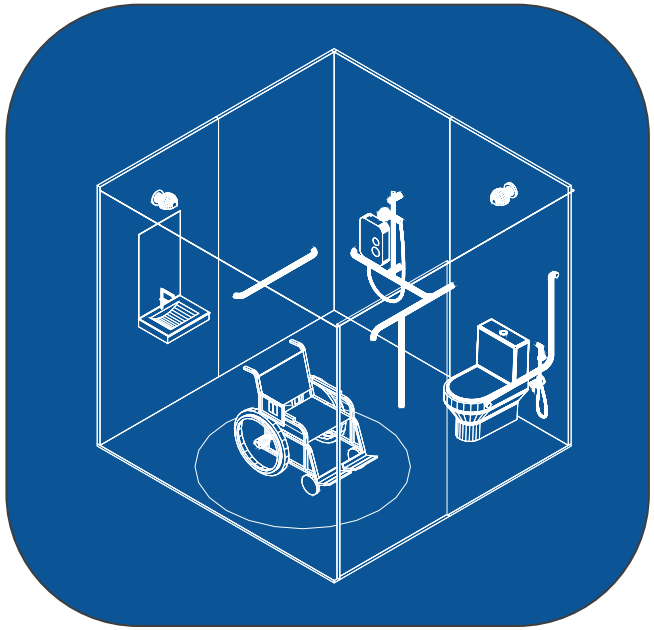
3.2 PUBLIC RESTROOMS

• In any public rest room, at least one compartment for each sex should be accessible to an ambulant disabled person
• In any public rest room at least one unisex compartment should be accessible to a wheelchair user
• Accessible rest rooms should be marked with the international symbol of accessibility. No indication is needed if all rest rooms are accessible
• Pivoted doors should open outward unless sufficient space is provided within the toilet stall



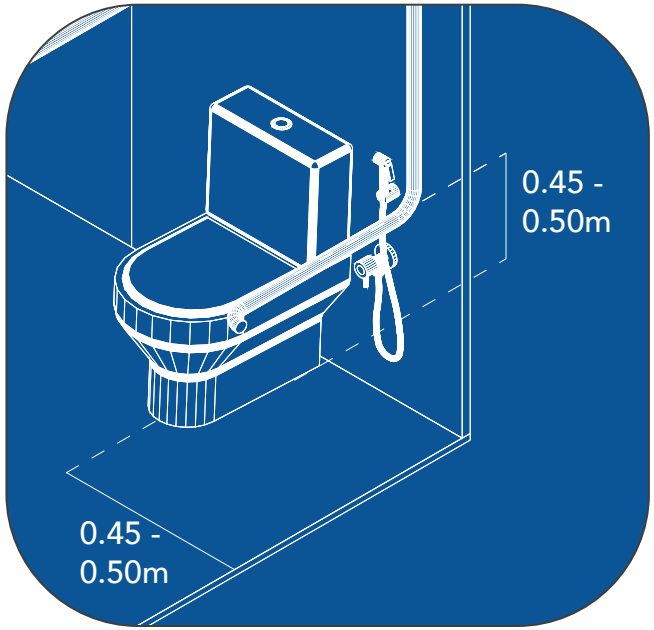
3.3 SPECIAL PUBLIC RESTROOMS

• Installation of a separate unisex unit is always desirable in public buildings, even when all rest rooms are accessible, so as to allow a disabled person to be assisted by an attendant of the opposite sex
• Special rest rooms should be marked with the international symbol of accessibility but should not be the only accessible rest rooms
• A water-closet and a lavatory should be provided within special rest rooms and should comply with the minimum requirements



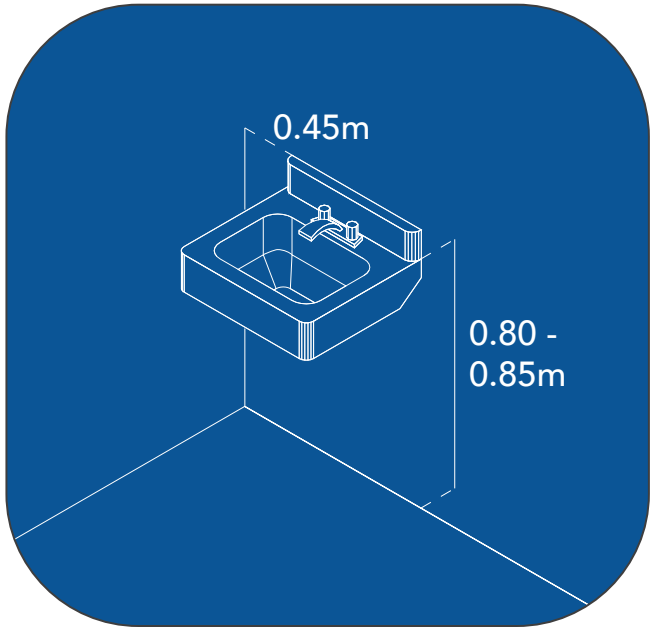
3.4 RESIDENTIAL RESTROOMS

• Residential bathrooms are usually equipped with a toilet, a wash-basin, and a bathtub or shower
• In multiple-rest-room arrangements (such as dormitories):
(a) Only one wash-basin per rest room needs to be accessible
(b) At least one shower stall and one toilet stall should be designed for a wheelchair user
• The size and layout of residential rest rooms should comply with the minimum requirements



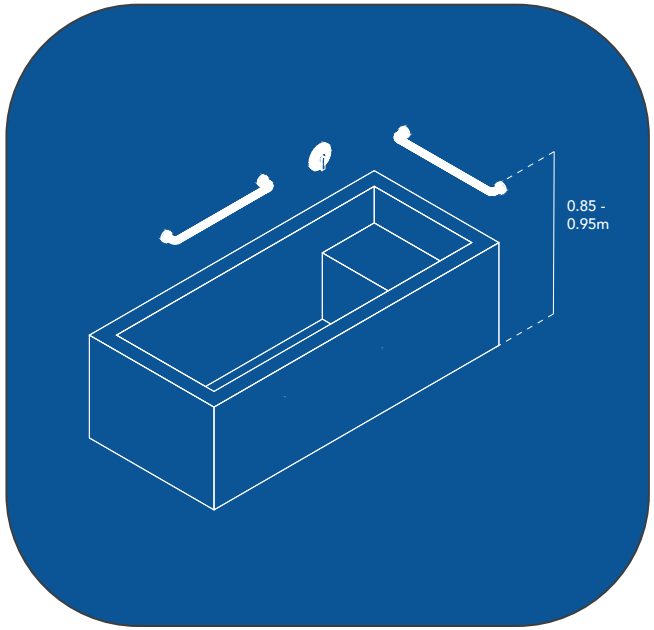
3.5 FIXTURE - WATER CLOSETS

• The height of the toilet seat should be between 0.45 m and 0.50 m from the finished floor level
• The distance between the center line of the toilet seat and the adjacent wall, if provided with a grip bar, should be between 0.45 m and 0.50 m
• Flushing arrangements and toilet paper should be placed within reach at a height between 0.50 m and 1.20 m
• Accessible hand-operated flushing controls, located on the open side of the water-closet, are recommended
• Wall-mounted water closets are recommended



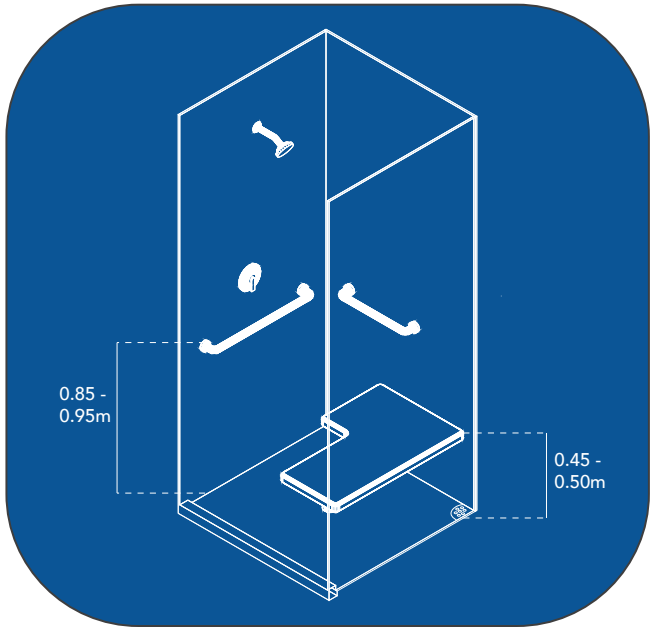
3.6 FIXTURE - SINKS

- The dimensions of lavatories should comply with the minimum requirements
- The height of a wash basin should be between 0.80 m and 0.85 m above the finished floor level
- The distance between the center line of the wash-basin and the adjacent side wall should at least be 0.45 m
- The wash-basin may be drawn forward from the wall a distance between 0.15 m and 0.20 m
- No shelves must be located above the wash- basin



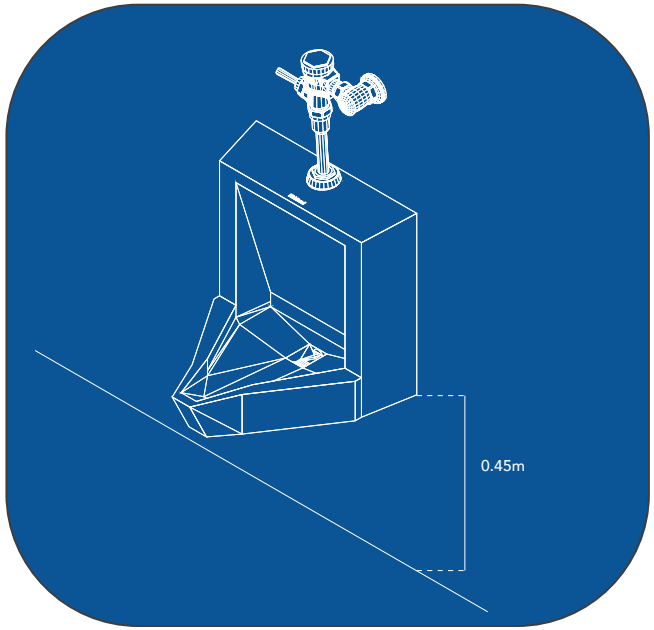
3.7 FIXTURE - BATHTUBS

- In general bath-tubs are difficult to use by those confined to a wheelchair without the help of an attendant.
- The minimum dimensions of the bath-tub should be 1.60 m x 0.70 m
- The height of the tub should be between 0.45 m and 0.50 m from finished floor level.
- An in-tub seat or a seat at the same height of the tub should be provided at the head side of the tub
- A grab bar should be mounted on the wall between 0.85 m and 0.95 m from the finished floor level



3.8 FIXTURE - SHOWERS

- The shower should have a seat conveniently positioned for the shower head at a height of 0.45 m and 0.50 m
- A grab bar should be placed on the wall opposite the seat and around the back wall, mounted at a height between 0.85 m and 0.95 m
- Drain openings should be placed in a corner of the stall so that slip-resistant rubber mats can be used.
- The floor of the shower stall should not be more than 20 mm below the level of the surrounding floor area.
- There should be a beveled threshold not exceeding 13mm



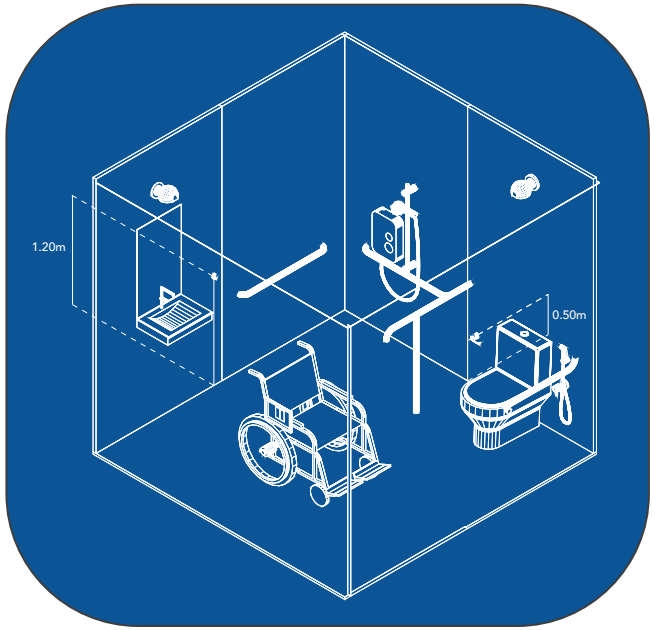
3.9 FIXTURE - URINALS

- At least one accessible urinal should be provided in public rest rooms
- Urinals should have a clear space on both sides
- A full-length urinal is the most accessible
- Urinals with a protruding lip should be mounted at a height of 0.45 m from the finished floor level



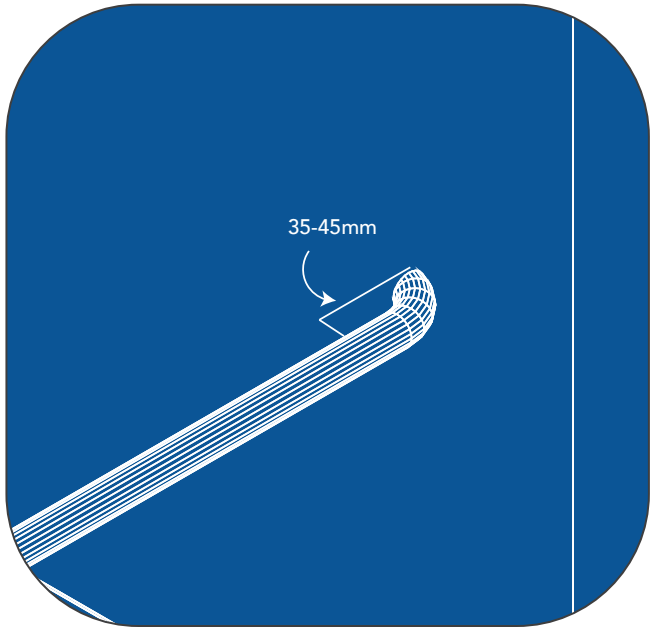
3.10 RESTROOM DOORS

• The clear door opening should be at least 0.75 m with the door in the open position
• Doors should be lockable from inside and releasable from outside under emergency situations
• Regardless of the door type, a handle should be placed on the door from the inside to facilitate closing. Another handle should be provided on the outside (See Doors)



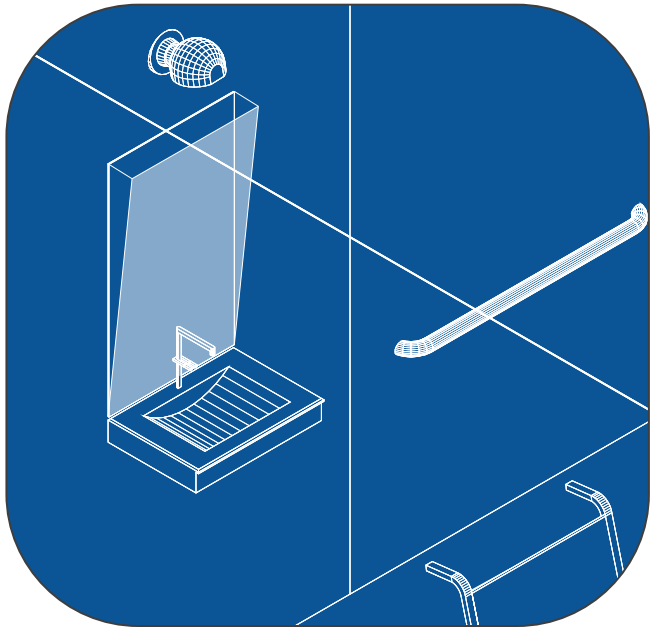
3.11 ACCESSORIES

• All accessories, such as soap, towel and toilet paper dispensers, should be placed at a height between 0.50 m and 1.20 m from the finished floor level



3.12 GRAB BARS

• Grab bars should be installed in water-closets, bath-tubs and showers to assist disabled persons to use the facilities safely and easily
• Grab bars should have a diameter of 30 mm to 40 mm
• Wall-mounted grab bars should extent between 35 mm and 45 mm from the wall
• Grab bars should be firmly fixed with stand loads and should have non-slip surfaces



3.13 MIRRORS

• Mirrors should be suitable for use by both standing and seated persons. Low mirrors or downward tilted mirrors can be used
• The bottom edge of mirrors should be located at a maximum height of 1.00 m from the finished floor level

IV.
BUILDING TYPES

This section deals with the design requirements of different building typologies and programs in both new and existing constructions. It is subdivided into 11 categories:

1. GENERAL
2. OFFICE BUILDINGS
3. COMMERCIAL USES
4. ASSEMBLY HALLS
5. CAFETERIAS AND RESTAURANTS
6. HOSPITALS AND HEALTH FACILITIES
7. EDUCATIONAL BUILDINGS
8. LIBRARIES
9. SPORTS BUILDINGS
10. PUBLIC TRANSIT BUILDINGS
11. INDUSTRIAL BUILDINGS

BUILDING TYPES

1. PROBLEM IDENTIFICATION

• Lack of special provisions for the disabled regarding accessible buildings and facilities

2. PLANNING PRINCIPLE

To design, where possible, public buildings accessible to all

3. DESIGN CONSIDERATIONS

3.1 General
3.2 Residential
3.3 Office
3.4 Commercial
3.5 Assembly Hall
3.6 Cafeterias and Restaurants
3.7 Hotels
3.8 Hospitals and Health Facilities
3.9 Educational Facilities
3.10 Libraries
3.11 Sports Buildings
3.12 Public Transit Buildings
3.13 Industrial Buildings

4. EXISTING CONSTRUCTIONS

The highest degree of accessibility to all people should be provided to the extent possible in accordance with the requirements mentioned above. For historic buildings, where its impossible to adapt to the requirements of disabled people without affecting the historical character, innovative methods should be found that do not conflict with preservation requirements.

3.1 General

• Buildings types that have to comply with all accessibility requirements for the disabled include all public buildings, governmental facilities and institutions, office buildings, residential buildings, commercial buildings, health facilities, educational institutions, restaurants, recreational facilities, sports facilities, religious buildings and all other building types normally used by the general public

• Some buildings fall under exceptions from meeting all accessibility requirements, however must design with any potential user in mind, thus highly recommended to utilize such standards. Those exceptions include buildings for private use, i.e single family residents, clubs, private offices, etc.

• For accessible buildings, at least one entrance per facility should be accessible to a wheelchair user. For new buildings, the accessible entrance(s) should be the main entrance(s) intended for use by the general public

• Wherever waiting areas, coffee shops, display areas, merchandising departments, service areas, ticket counters, refreshment stands, etc. are provided for public use, these facilities should be accessible to disabled people, such as those considered in this manual

• All work areas in which physically disabled persons may be employed should be accessible

• In any public restroom, at least one unisex compartment should be accessible to a wheelchair user

3.2 Residential buildings

• Private single-family residences may be left inaccessible to a wheelchair user. However, it is desirable to consider a minimum of accessibility requirements so as to accommodate disabled guests

• In new apartment buildings either rented or sold, provisions for disabled persons should comply. All shared facilities, circulation routes, and thresholds should be compliant. When it comes to the individual residential units, all units should be designed to either accommodate disabled users before the first user moves in or have the ability to be readily converted to meet the needs of a disabled user

3.3 Office buildings

• New office buildings should be as accessible as possible so as to accommodate all persons and not hinder employment of disabled persons

• New low-rise office blocks two-levels or more should be accessible to wheelchair users. Office space at ground level, if any, should be accessible

• For small office buildings where the floor area limits the provision of accessible restrooms on each floor, one accessible restroom could be provided to serve the entire building. The accessible restroom should be located adjacent to an accessible elevator

• Where an office building is subdivided among various tenants, wheelchair restrooms should be provided on each floor

3.4 Commercial uses

• Accessibility requirements for wheelchair users should be applied to all new large specialty shops having a sale area of 100 square meets or more. In small shops, provisions for wheelchair users should be applied wherever possible

• In large multi-story department stores and supermarkets, accessible elevators should be installed to provide access to lower and/or upper levels for the benefit of wheelchair users and people with mobility problems

• Merchandise display areas in accessible shops should be as conveniently located as possible to a wheelchair user. Angled mirrors can be placed above high shelves for visibility

• In accessible clothing shops, at least one changing room should allow for a full 360 turn of a wheelchair

3.5 Assembly halls

• Under this category programs such as movie-theaters, lecture halls, spectator seating in sports arenas, and other assembly halls with fixed seating are categorized

• The number of spaces designated for wheelchair users in a seating area can be estimated according to the following: For areas with up to 600 seats a minimum of 6 seats for wheelchair users apply or 1 for every 100. For spaces with up to 1000 seats a minimum of 10 seats for wheelchair users apply. For areas over 1000 seats, 10 seats should be added for each additional increment of 1000 seats

• For areas which section of seating arrangements, a minimum of 2 accessible seat should be provided per section or division

• Seats with removable or flip-up armrests should be provided at some row ends for accommodation
• A level floor area for wheelchair users should be placed at row ends and should be scattered on different levels so as to have a variety of seating and viewing locations

3.6 Cafeterias and restaurants

• New restaurants or parts of new restaurants and eating spaces should be as accessible as possible to a wheelchair user
• In self-service restaurants tray slides and counters should be mounted approximately 0.90 m from the floor
• Food shelves should be mounted at a maximum height of 1.20 m from floor height
• Cantilevered tables or tables with straight legs at each corner are preferable to central pedestals that might restrict wheelchair access
• Stools and high tables are not suitable for wheelchair users. Low tables should be provided as well

3.7 Hotels

• New hotel or motel rooms should be accessible to a wheelchair user. Bathrooms connected to these rooms have to be fully equipped. The layout should allow a lateral transfer to the toilet seat
• All amenities should be accommodating
• In hotels where space is permitted, a minimum of one room per level should be accessible to a wheelchair user. It is recommended that most ground level rooms should be accessible

• Rooms designated for wheelchair users should, where possible, be placed at ground level so as to have a direct means of escape in case of fire

3.8 Hospitals and health facilities

• All entrances should be accessible to a wheelchair user
• All rooms should be accessible for the benefit of patients, disabled visitors and disabled staff members
• All clinics on all floors should be accessible
• All patient restrooms should be accessible to wheelchair user and have accommodations for all disabled users
• All administrative departments should be accessible to staff members confined to wheelchairs

3.9 Educational buildings

• All teaching, administrative and common areas should be accessible
• Suitable arrangements should be made for stepped lecture halls or auditoriums as seen in assembly halls
• At least one accessible unisex restroom should be provided in each building other than student dormitories and residential accommodations
• All recreational facilities should be usable by disabled people, to the extent possible
• Colleges for physical education, police or military training and other activities requiring full physical abilities need not be accessible to disabled people. However, provisions should be made for disabled administrative staff members

3.10 Libraries

• All open book stacks should be accessible
• All library facilities and equipment should be accessible
• A room should be provided for sightless and for hearing-impaired people who need assistance while reading

3.11 Sports buildings

• Sports halls should be as accessible as possible to a wheelchair user
• At least one shower room, one restroom and one changing room per facility should be accessible
• Spectator seating areas should be provided for wheelchair users as specified above
• In areas of physical activity, equipment should be accommodating wherever possible
• Sports fields should accommodate wherever possible

3.12 Public transit buildings

• All public areas used by passengers such as banks, shops, waiting areas, customs areas, baggage halls, booking halls, waiting areas, inquiry offices, etc. should be accessible to a wheelchair user, wherever possible
• In bus, air and sea terminals, adjoining spaces next to seating facilities should be provided for wheelchair users.
• Ramps and platforms should be provided for transitional spaces from transit to space

3.13 Industrial buildings

• Arrangements for disabled employees are directly related to the type of work they perform. Arrangements for disabled people need not be considered in heavy manufacturing factories
• Arrangements for all disabled people should be incorporated into the design of new light manufacturing factories where disabled people may be employed
• Safety measures should be met in all cases of industrial manufacturing

V.
APPENDICES

This section deals with the perimeters for the guidelines:

1. TROUBLESHOOTING
2. ANTHROPOMETRICS
3. GLOSSARY

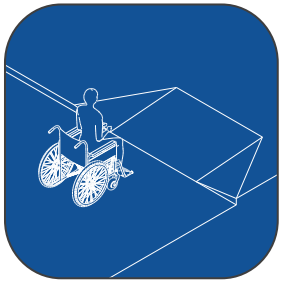
WHEELCHAIR USERS

BARRIER



Overcoming differences in level between road and pavement

SOLUTION



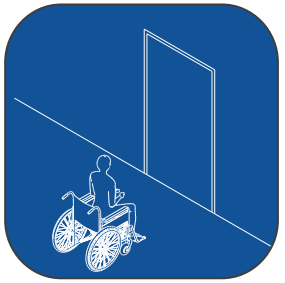
Install curb ramps

BARRIER

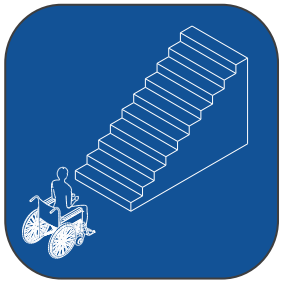


Passing through narrow door openings and over high thresholds

SOLUTION



Provide sufficiently wide door openings with low beveled thresholds or none at all



Bridging great differences in height usually tackled by providing stairs



Provide ramps, wide elevator cabs or platform lifts



Reaching high-mounted controls and objects



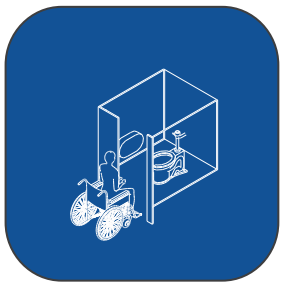
Provide low-mounted controls



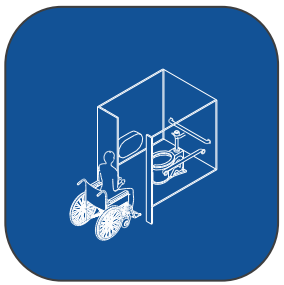
Maneuvering in tight spaces



Provide wide routes and spaces



Maneuvering in restrooms



Install grab bars, bath-tub and shower seats

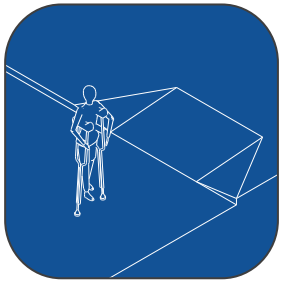
PEOPLE WITH LIMITED WALKING ABILITIES

BARRIER



Overcoming differences in levels

SOLUTION



Provide curb ramps, ramps, elevators or platform lifts



Maneuvering in situations requiring speed



Increase the pedestrian crossing time interval



Climbing stairs and ramps



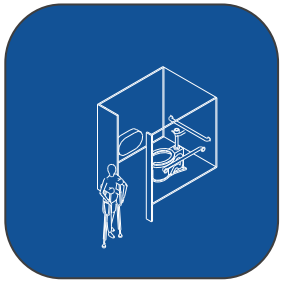
Provide handrails for gripping

BARRIER



Maneuvering in restrooms

SOLUTION



Provide sufficiently wide restrooms and grab bars

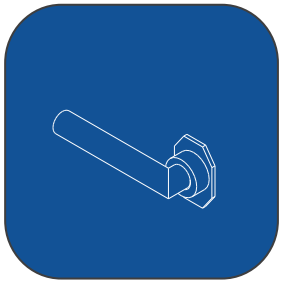


Passing through narrow door openings and over high thresholds



Provide sufficiently wide door openings with low beveled thresholds or none at all

PEOPLE WITH LIMITED USE OF HANDS/ARMS

BARRIER	SOLUTION
	
Opening heavy doors	Use automatic or easy-to-open doors
	
Gripping door knobs	Use lever-type door handles
	
Gripping faucets	Use lever-type, push-buttons, or sensor faucets

THE HEARING IMPAIRED

BARRIER	SOLUTION
	
Crossing roads	Provide clearly visible colored signs and traffic signals
	
Managing in situations involving the use of speech messages, verbal transmission and interaction	Use clearly written messages, especially in emergency situations
	
Not hearing door, elevator and emergency	Provide flashing light signals

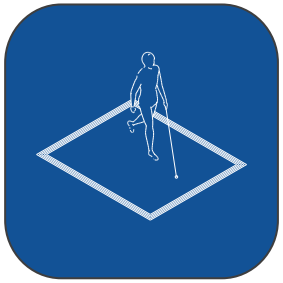
THE SIGHTLESS

BARRIER



Orientation

SOLUTION



Provide guide strips within the pathway surface, raised curbs and other detectable guiding elements



Identifying obstructions within the path of travel



Provide textured paving or tactile marking strips around obstructions



Crossing roads



Provide audible traffic signals

BARRIER



Maneuvering in elevators

SOLUTION



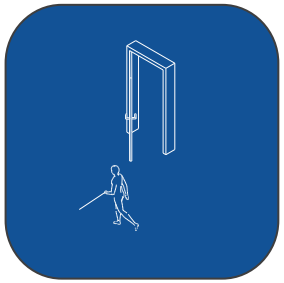
Provide audible signals and call buttons with tactile text



Recognizing emergency situations



Provide audible alarm signals



Locating exit doors and stairs



Provide tactile marking around the knobs of exit doors and the handrails of exit

THE PARTIALLY SIGHTED

BARRIER



Identifying obstructions within the path of travel

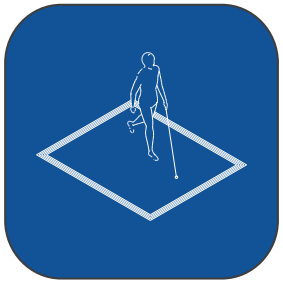
SOLUTION



Provide bright-colored markings or signals to identify obstructions



Orientation



Provide clearly legible lettering and sufficiently large dimensions for direction signs

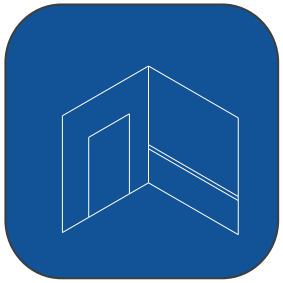


Crossing roads



Provide audible traffic signals

BARRIER



Maneuvering in elevators and in emergency situations

SOLUTION



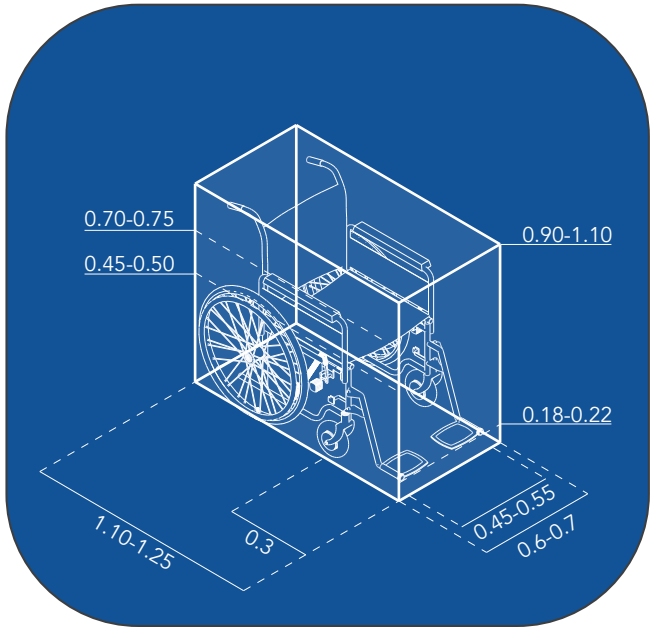
Use contrasting colors for doors, handrails, tactile signs, etc



Locating emergency facilities

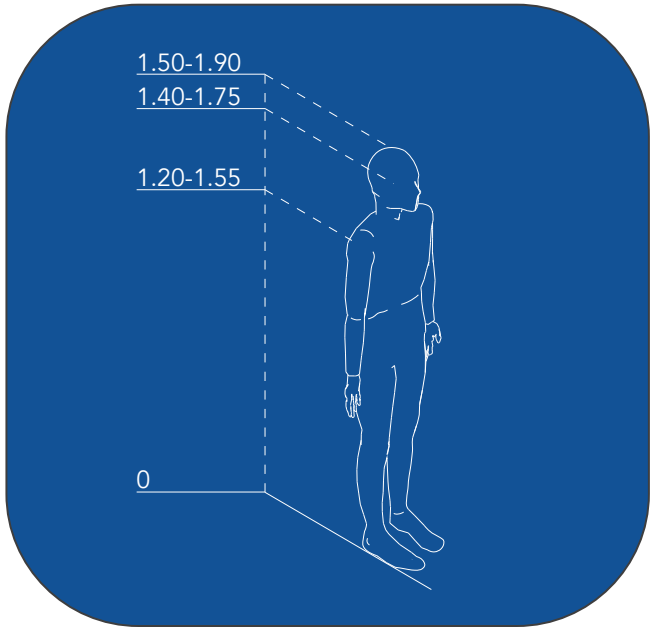


Provide alarm signals



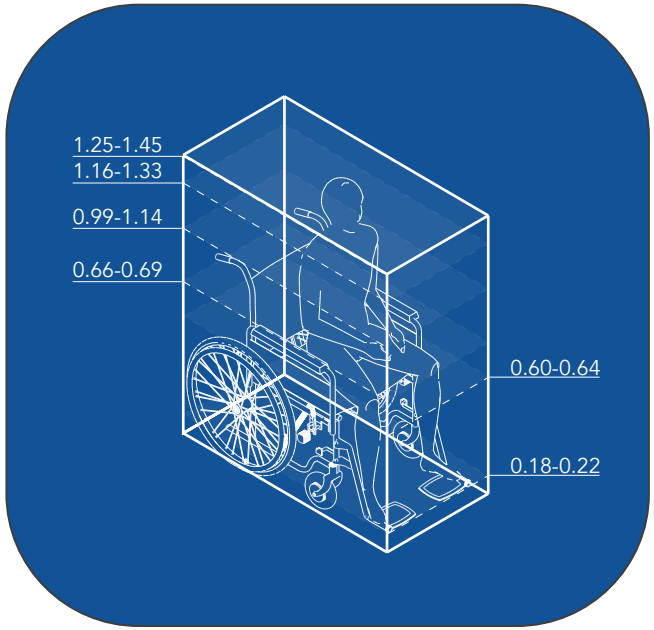
WHEELCHAIR DIMENSIONS

- Dimensions shown are of conventional manual wheelchair



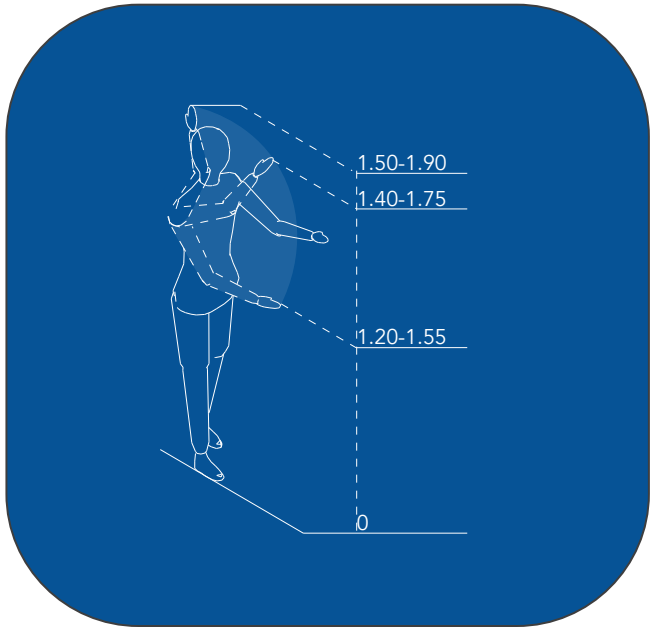
DIMENSIONAL DATA OF A NORMATIVE FIGURE

- Normative figure (95%)
  - Height: 1.50m - 1.90m
  - Eye: 1.40m - 1.75m
  - Shoulder: 1.20m - 1.55m



DIMENSIONAL DATA OF A WHEELCHAIR USER

• Dimensions shown are of conventional manual wheelchair in use by a normative wheelchair-bound figure



REACHING ZONES OF A NORMATIVE STANDING FIGURE

• Normative figure (95%)
  • Maximum Reach Up: 1.85m - 2.10m
  • Oblique Reach Up: 1.65 m - 2.00m
  • Forward Reach: 1.30 M - 1.45m



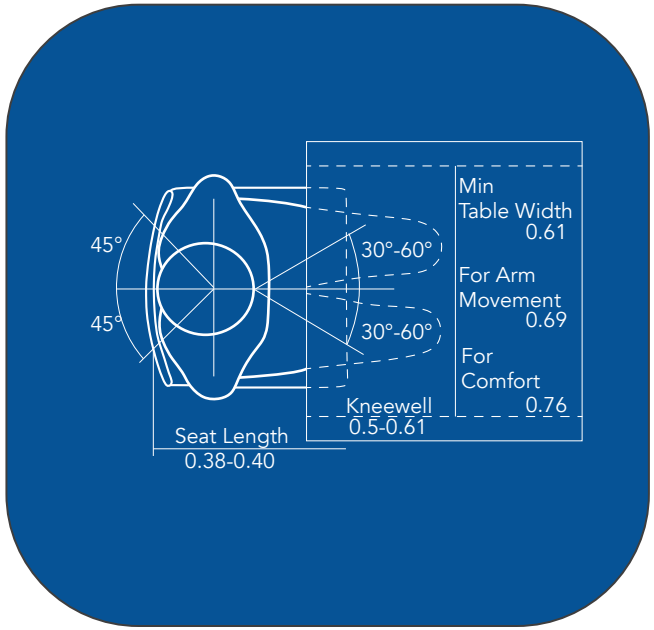
VERTICAL REACHING ZONES OF A WHEELCHAIR USER

• Dimensions shown are of conventional manual wheelchair in use by a normative wheelchair-bound figure



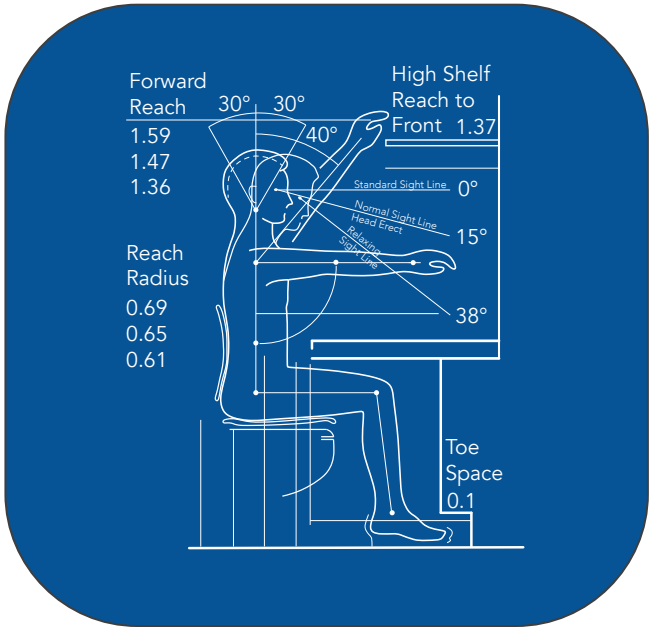
HORIZONTAL FORWARD REACH OF A WHEELCHAIR USER

• Dimensions shown are of conventional manual wheelchair in use by a normative wheelchair-bound figure
- Eye Level: 1.16m - 1.33m
- Shoulder Level: 0.99m - 1.14m



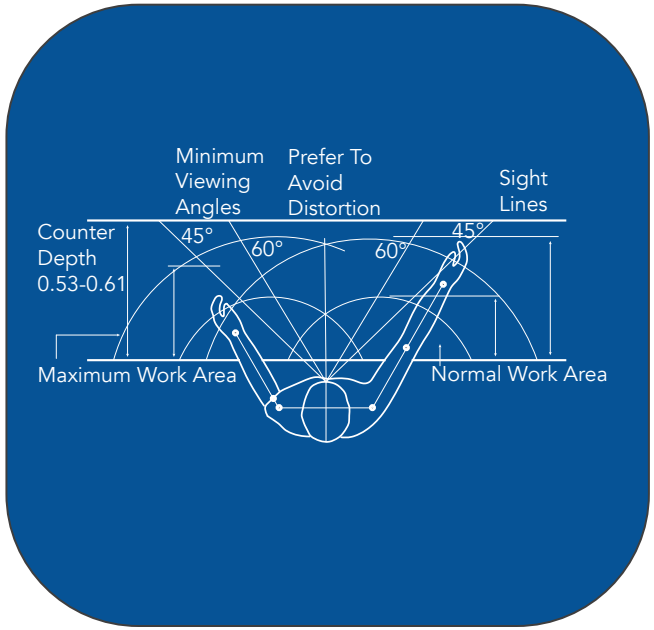
COMMON DESK CLEARANCE

- Dimensions shown are of normative figure extents



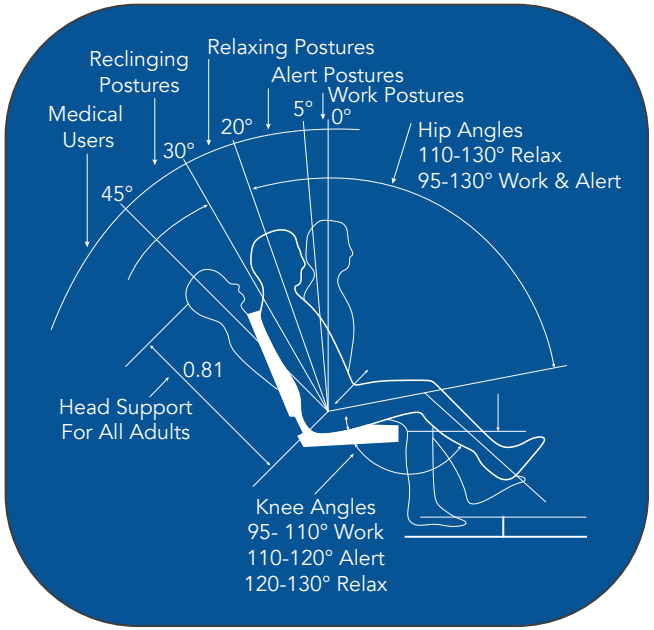
COMMON REACHING ZONE

- Dimensions shown are of normative figure extents



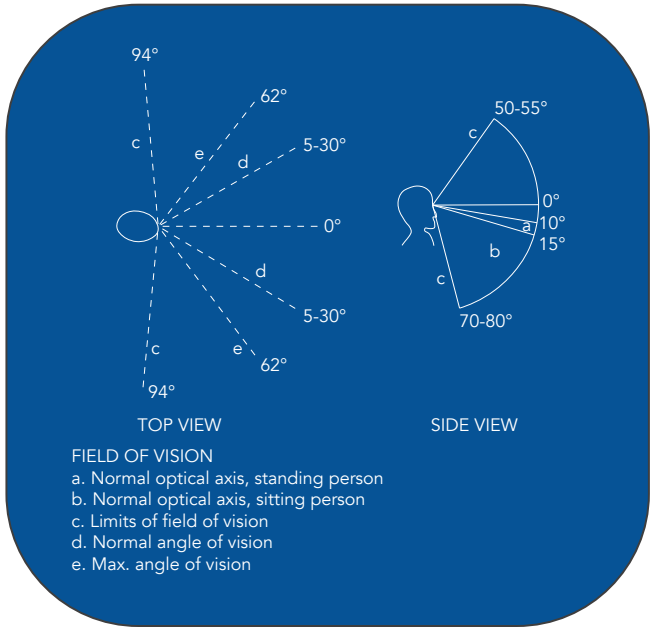
COMMON WORK AREA DIMENSIONS

- Dimensions shown are of normative figure extents



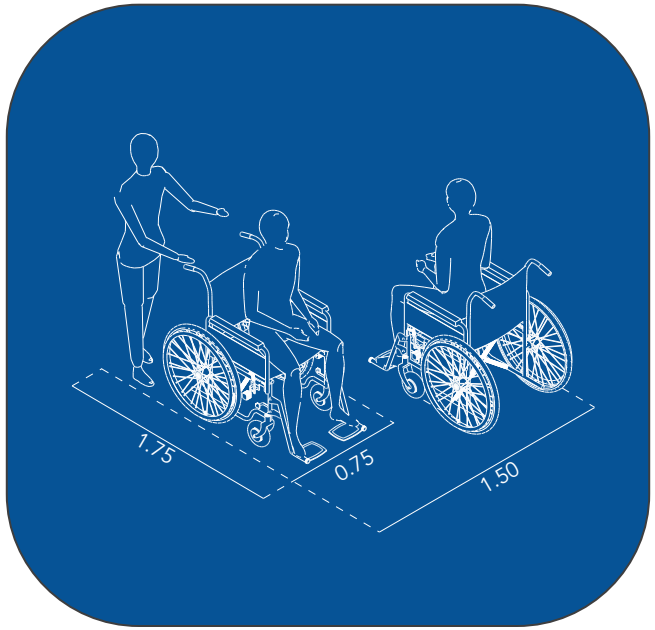
SEATING ANGLES

- Dimensions shown are of normative figure extents



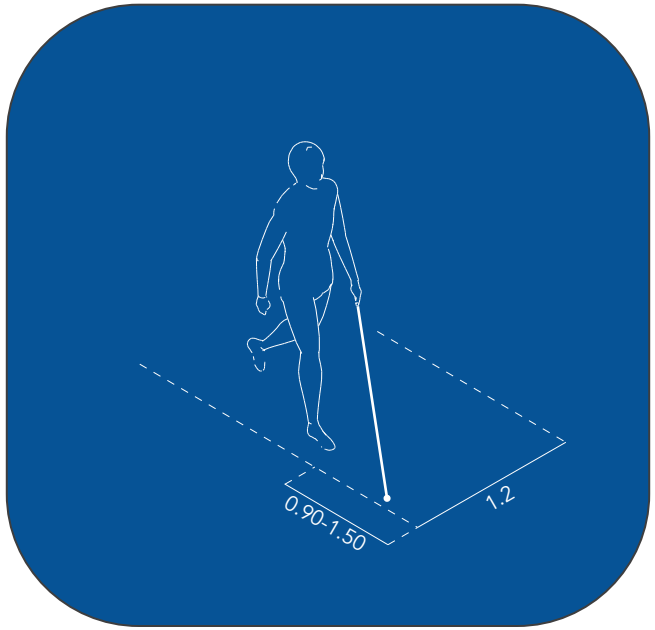
FIELD OF VISION

- Dimensions shown are of normative figure extents



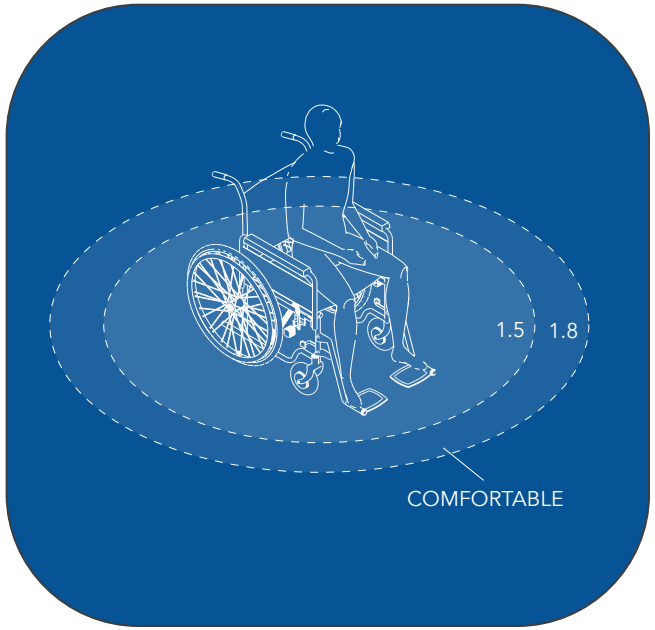
PATHWAY DIMENSIONS - WHEELCHAIR USER

- Dimensions shown are of conventional manual wheelchair in use by a normative wheelchair-bound figures



PATHWAY DIMENSIONS - PERSONS WITH A CANE

• Dimensions shown are of conventional walking cane lengths



WHEELCHAIR MANEUVERING DIAMETER

• Dimensions shown are of conventional manual wheelchair in use by a normative wheelchair-bound figure

GLOSSARY

Access barriers: Any obstruction that prevents people with from using facilities, equipment and resources.

Access: Suitability of a building or other structure for use by people with disabilities. In a broader sense, access also included making forms and information accessible to people with visual or cognitive disabilities; making alarms and signals accessible to people who are deaf or hard of hearing; and making services such as education and transport accessible to people with disabilities.

Accessibility: The degree to which a building or other structure provides access for disabled people.

Accessible: capable of being reached, used, seen, understood, influenced, and adapted to people with disabilities

Accessible route: A continuous unobstructed path connecting all accessible parts of a building or facility.

Activity: The execution of a task or action by an individual.

Adaptability: The ability of certain building spaces and elements, such as kitchen counters, sinks and grab bars, to be added or altered so as to accommodate the needs of persons with different types or degrees of disability.

ADA: The Americans with Disabilities Act signed into law on July 26, 1990 is one of America's most comprehensive

pieces of civil rights legislation that prohibits discrimination and guarantees that people with disabilities have the same opportunities as everyone else to participate in the mainstream of American life; to enjoy employment opportunities, to purchase goods and services, and to participate in State and local government programs and services.

Amputation: Removal of a limb or other appendage from the body.

Amputee: Someone who has had one or more limbs amputated.

Auditory: Relating to the sense of hearing

Barrier: Obstacle preventing a person from living independently, working, traveling and/or having access to buildings, services, forms and information.

Blindness: Total inability to see.

Braille: System of printing/writing for people who are blind – consists of raised dots that can be interpreted by touch, each dot or group of dots representing a letter, numeral, or punctuation mark.

Clear floor space: The minimum unobstructed floor or ground space required to accommodate a single, stationary wheelchair and occupant.

Communication: Includes languages, display of text, Braille, tactile communication, large print, accessible multimedia as well as written, audio, plain-language, human-reader and augmentative and alternative modes, means and formats of communication, including accessible information and communication technology

Communication disabilities: Any visual, hearing, or speech difficulties that limit a person's ability to communicate.

Congenital condition: Condition present at birth.

Developmental disability: General term for a number of conditions involving mental and/or physical disabilities arising before the age of 18 years.

Disability: The result of the interaction between persons with impairments ,attitudinal, environmental, or physical barriers. Persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which, when in interaction with various barriers, may hinder their full and effective participation in society on an equal basis with others.

Deaf: The loss of or ability to hear

Discrimination: Refers to any distinction, exclusion or restriction on the basis of disability which has the purpose or effect of impairing or nullifying the recognition, enjoyment or exercise, on an equal basis with others, of all

human rights and fundamental freedoms in the political, economic, social, cultural, civil or any other field. It includes all forms of discrimination, including denial of reasonable accommodation.

Diversity: Recognizing and valuing differences between individuals and groups of people - an important concept in terms of the integration of people with disabilities into society.

Environmental barrier: Obstacle preventing a person with a disability from traveling and/or having access to buildings.

Environmental factors: The physical, social and attitudinal environment in which people live and conduct their lives. These are either barriers to or facilitators of the person's functioning.

Equalization: The process whereby people with disabilities take their rightful place in society alongside non-disabled people, brought about through many means, including legislation, promotion of barrier-free environments, community-based rehabilitation services, education and training and employment.

Equality: the idea that all people should, have access to education, employment, goods, services, facilities, transport and resources; to also enjoy participation in any area of economic, social, political, cultural and civil life on an equal basis with any other person in society.

Impairment: Problems in body function and structure such as significant deviation or loss.

Inclusion: the idea which addresses first and foremost, the need for cultural transformation, advocates that any person with a disability should be accommodated freely, openly and without pity, without restrictions or limitations of any kind, and emphasizes universal design for policy-oriented physical accessibility issues

Inclusive Design: a design process in which a product, service or environment is optimized for a specific user with specific needs.

Integration: The inclusion, participation and acceptance of people with disabilities in society at large.

Mainstreaming disability: Describes a strategy for making the concerns and experiences of people with disabilities an integral part of the design, implementation, monitoring and evaluation of policies and programs. The goal is to achieve disability equality in all political, economic and societal areas so that people with disabilities benefit equally.

Non-disabled: Person or people without a disability and preferred antonym for disabled.

Participation: Involvement in a life situation.

Physical Difficulty: General term that covers a wide range

of conditions including arthritis, muscular dystrophy and paralysis.

Quadriplegia or tetraplegia: partial or total paralysis of all four limbs and torso.

Rehabilitation: Planned process with defined goals, time-frames and means in which professions and/or services co-operate in assisting the efforts of a person to achieve best possible functioning and coping capabilities, thereby promoting independence and participation in society.

Sensory impairment: A disability that affects touch, sight and/or hearing.

Universal design: Refers to the design of products, environments, programs and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

7 Principles of Universal Design: The design of the building, product, communication or service:

1. (Equitable Use) - Is useful and marketable to people with diverse disabilities
2. (Flexibility in Use) - Accommodates a wide range of individual preferences and abilities
3. (Simple and Intuitive Use) - Is easy to understand regardless of the user's experience, knowledge, language skills, or current concentration level
4. (Perceptible Information) - Communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities
5. (Tolerance for Error) - Minimizes hazards and the adverse consequences of accidental or unintended actions
6. (Low Physical Effort) - Can be used efficiently and comfortably, helping reduce fatigue
7. (Size and Space for Approach and Use) - Is of the proper size and provides appropriate space for approach, reach, manipulation, and use, regardless of the user's body size, posture or mobility

Visual impairment / visual disability: Fully or partially reduced functioning in one eye's or both eyes' ability to detect and/or process images.

Wheelchair: Mobility aid used by people with physical disabilities that make walking difficult or impossible.

White cane / white stick: This long white walking-stick provides sufficient information to the blind traveler to ensure safe, efficient and independent travel in both familiar and unfamiliar environments. The cane, when used appropriately, previews the environment to detect obstacles and/or surface changes in one's path of travel, allowing the traveler sufficient time to stop or change course as necessary.

VI.
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BUILDING ACCESS

As Julia McMorrough, Associate Professor of Practice in Architecture, states in her 2019 thesis studio, All Access, that, "in forefronting our thinking about design for accessibility, we ask architecture to lead instead of follow. By not defaulting to a delayed reaction to accommodation, this thesis proposes that architecture has the opportunity to become more, and not less, inventive."

1990, the Americans with Disabilities Act was passed into law, making it the world's first comprehensive declaration of equality for people with disabilities and illustrated a commitment to full and equal opportunity for all. However, nearly three decades after its implementation, the built environment still creates barriers for the disabled. As Selwyn Goldsmith states in his book, Designing for the Disabled, "the idea that architecture was previously responsible for the creation of disabling environments, and, further, that the architect can prevent people from being disabled when they use buildings."

When it comes to future working environments, the issue no longer lies in the design of a singular workplace, but rather the entirety of the built environment and the integration of the dynamic workforce. Building Access explores the inter-sectional needs of abled and disabled users in the form of a manual which offers design standards and data necessary for a barrier- free environment. Its intent is to establish standards, principles and recommendations that will not only influence the development and reconstruction of the built environment but assume global importance in creating an equitable future.

Through this understanding, by designing universally accessible environments, the needs of the few are synonymous of the many; Building Access brings forth the ideology that meeting these needs can address all, asking design to orient its process around the users and the entire population, guaranteeing everyone's autonomy regarding the use of the built environment.

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