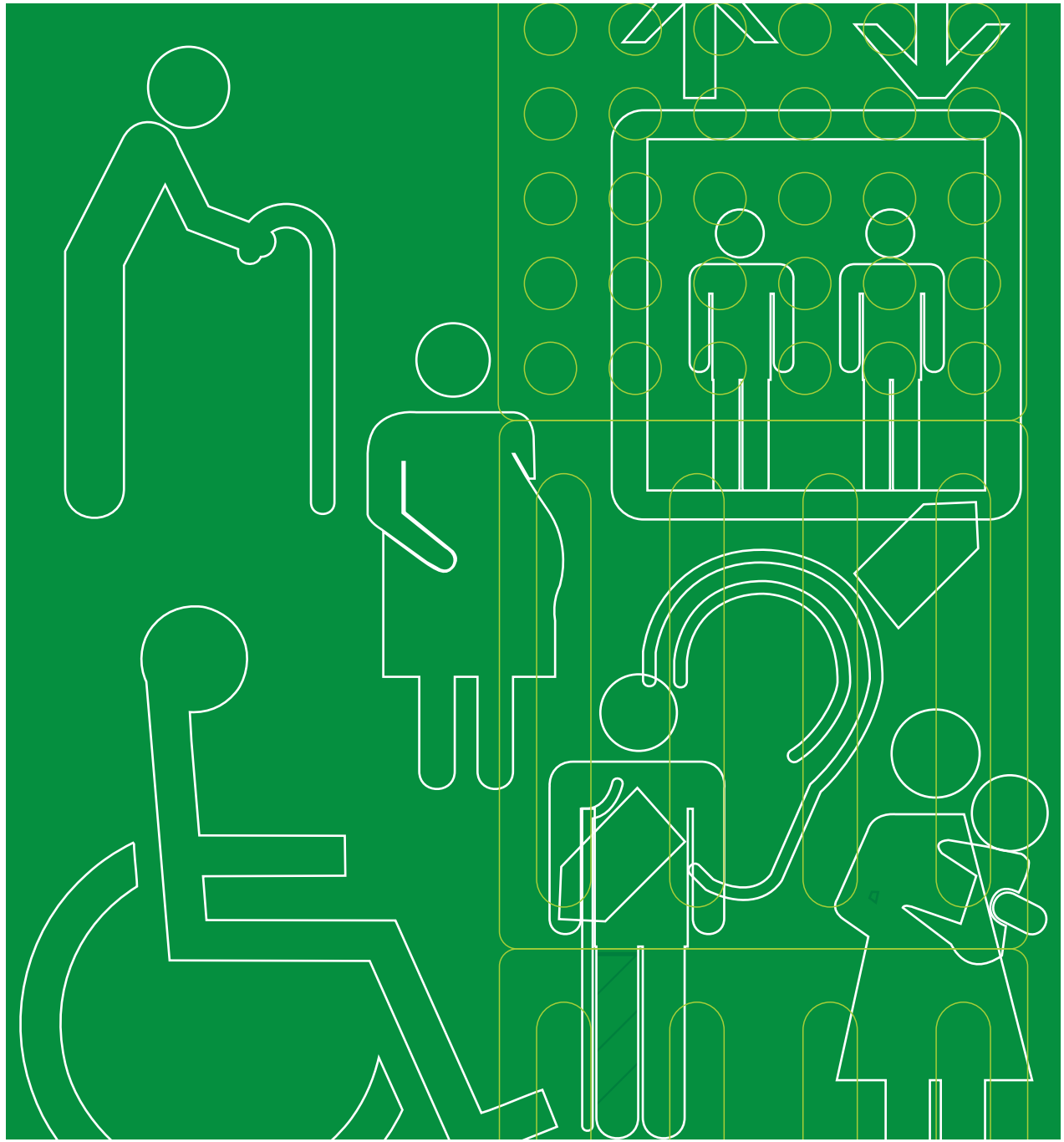
Design Considerations



5 Introduction

The design considerations are formulated to bring to the attention of the designers in applying the universal accessibility design principles and requirements to buildings and facilities. They can also be used to identify barriers in existing buildings. The design considerations are categorised into sub groups and presented as bullet points for ease of reference. The respective best practices section for key issues in each sub-group has been indicated. In addition to academic principles and theories, these considerations have also incorporated practical findings as discussed in Section 4 in the case studies, the analysis from the surveys, and the interviews with users and professionals.

These considerations are intended as a design guideline and planning tool in respect of universal accessibility, the designer shall refer to relevant Ordinances and Design Manuals for compliance to statutory and other requirements. In addition, the designer shall also seek relevant advice from the client of the project and cater for any specific design requirements and standards.

It is recommended that building projects and community facilities, especially those frequently accessed by the public or intended for international visitors, should take into account the content of these considerations from the inception design stage.

5.1 Access to facilities

5.1.1 Access strategy

- Develop access strategy at an early stage of the design.
- Facility should be accessible to the widest spectrum of users.
- Consider means of escape for users of different needs, abilities and disabilities.
- Collaborate with users and operators for client's needs.
- Prepare an Access Plan and an Evacuation Plan.

Best Practices Reference 6.1

5.1.2 Connection with public street

- Identify the connection routes from road, pavement, footbridge and subway at various directions.
- Consider connection from major transportation drop-off and for pedestrian access.
- Consider vehicular access from the public street to the carpark or loading/unloading facility.
- All accessible routes should be connected to a major entrance of the facility.
- Integrate or segregate the accessible routes for different user groups as appropriate.

Best Practices Reference 6.1

5.1.3 External signage

- Provide sufficient directional signage at prominent locations.
- Allow ancillary lighting for good visibility of the signage at night time.
- Signage should be pictorial in addition to words and letters, and should be easy to comprehend.
- Signage should have contrasting colours and be eye-catching.
- Words and letters should be of suitable size and colour for good legibility.

▪ Include directional signage for access for the disabled from the major transportation drop-off point.

Best Practices Reference 6.8

5.2 Pathways

5.2.1 Configuration

- Pathway width should be sufficient to allow at least two wheelchair users to pass each other.
- Straight pathway is preferred.
- If winding pathway is provided, turning should be with the largest possible radius and with sufficient turning space, avoid acute turning.
- Pathway edges should be conspicuous and protected to avoid wheels from dropping off.
- Projections should be of suitable height and projecting width to avoid accidental bumping, and should not obstruct the pathway users.
- Channel grating slots should not be parallel to the major traffic direction, slot sizes should be small enough to avoid trapping of crutches or wheels.
- Effective lighting should be provided.

Best Practices Reference 6.2, 6.4

5.2.2 Changes in level

- Ramps, dropped kerbs or sloping grounds should be used to connect changes in level, in addition to steps and stairs, if any.
- Warning should be provided at a suitable distance before the change in level.
- For slight change in level, a full width continuous sloping ground accessible for all is preferable than a separate ramp.
- Effective lighting or footlight should be provided to make the change in level clearly visible.

Best Practices Reference 6.2, 6.7

5.2.3 Ramps and sloping grounds

- Gradients should be as gentle as possible.
- Straight ramps or sloping grounds are preferred.
- If winding ramps or slopes are provided, turning should be with the largest possible radius and with sufficient turning space; avoid acute turning or turning with steep gradient.
- Sufficient intermediate landings for rest, preferably with chairs or benches, should be provided.
- Continuous handrails should be provided for assisted walking, preferably with two mounting levels.
- Channel grating slots should not be parallel to the traffic direction, slot sizes should be small enough to avoid trapping of crutches or wheels.
- Effective lighting or footlight should be provided to make the ramp or sloping ground clearly visible.

Best Practices Reference 6.2, 6.4

5.2.4 Stairs and steps

- Handrails should be provided on both sides.
- Central handrails should be provided for stairs and steps of excessive widths.
- Sufficient intermediate landings, preferably with chairs, should be provided for rest and regaining strength, especially for long consecutive stairs.
- Warning should be provided at a suitable distance before the first and last step.
- Every step of a single flight of stair should be of constant tread width and riser height.
- Nosings should be of contrasting colours to the tread and riser.
- Effective lighting or footlight should be provided to make every step clearly visible.
- Natural lighting and light fixtures should be so positioned as to avoid glare or the walking person's own shadow casting on the steps.
- Underside of staircases with less than 2000mm headroom should be blocked by guardrails or other form of barriers to stop people from walking underneath.

Best Practices Reference 6.7

5.2.5 Floor surface materials

- External ground surface materials should be non-slippery.
- Floor materials should not be too rough to make the surface too bumpy or to give wheels flat tires.
- Surface materials with less glare are preferred.
- Material joints should be smooth with minimum recess/projections and minimum width.
- Floor surface should be level and even.
- Types of surface materials should preferably be different for the main pathway and other pathways, but too many different surface materials may cause confusion.

Best Practices Reference 6.4

5.2.6 Handrails

- Handrails at two-level mounting heights should be provided for places frequently visited by children.
- Handrails should be continuous with recessed brackets.
- Ends of handrails should be returned to the wall, floor or post so that they do not become obstructions.
- Handrails should be securely fixed and durable to avoid posing danger to users relying on them for assisted walking.
- Materials should be smooth and offer a firm grip.
- Size and shape of handrails should offer a firm grip.
- Materials for external handrails should not retain large amount of heat or coldness.
- Braille, tactile or 3-dimensional signage at top and bottom ends of handrails can provide direction and location information.

Best Practices Reference 6.5

5.2.7 Tactile surfaces

- Continuous tactile guide paths should be provided to entrance/major facilities, information counters, braille maps/directories and lifts.
- Directional, positional, location and hazard warning tactile surfaces should be correctly laid to convey correct information.
- Tactile surfaces should be laid at a distance from wall surfaces to facilitate left handed or right handed persons with guiding sticks.
- Avoid any door swings into the tactile surfaces.
- Tactile surfaces should preferably be segregated from pathways for wheelchair users to avoid conflict between the two user groups.
- Contrasting colours can make the tactile surface noticeable.

Best Practices Reference 6.9

5.2.8 Luminous contrast

- Luminous contrast should be provided to distinguish floor and wall surfaces.
- Luminous contrast should be provided at changes in levels.
- Too strong luminous contrast is undesirable to low vision persons.
- Natural lighting provision at passageways or corridors provides clues and stimulation for day and night orientation.

Best Practices Reference 6.16

5.3 Parking and loading/unloading areas

5.3.1 Run-in/out

- Location of parking areas and loading/unloading areas should be conspicuous at the run-in/out, with adequate directional signage wherever necessary.
- Signage for the direction to way out should be conspicuous from the parking areas and loading/ unloading facilities.

Best Practices Reference 6.3

5.3.2 Accessible carpark

- Disabled carparks should be in close proximity to access the lifts.
- A smooth and safe accessible route should be provided from the disabled carparks to the major facilities, entrance or lift lobbies.
- Sufficient side space and headroom should be provided for the wheelchair user to get on and off the car, and for picking up and setting down the wheelchair.

Best Practices Reference 6.3

5.3.3 Loading/ unloading areas

- Loading/ unloading areas for vehicles with wheelchair passengers should be provided near the access to main entrance or lift zone.
- A smooth and safe accessible route should be provided from the loading/ unloading areas to the major facilities, entrance or lift lobby.

Best Practices Reference 6.3

5.4 External areas and landscaping

5.4.1 Street furniture

- Street furniture should be positioned so as not to obstruct the passageways.
- Lighting posts or columns should be conspicuously marked at eye-level.
- Low-level bollards and chain-linked posts are hazardous and should be avoided.
- Bollards should have a colour or luminance contrast feature.
- Litter bins should be of a big opening for easy dumping of litter with one hand.

Best Practices Reference 6.4

5.4.2 Trees and plantings

- Tree branches and plantings at sides of pathways should be trimmed to avoid obstructing the users.
- Ends of tree stakes should be properly trimmed to avoid hurting people.
- Plants and flowers with fragrance and bright colours are preferable as sensory stimulation to visitors.
- Flower beds are preferably to be tilted for enjoyment by children and wheelchair users.
- Raised flower/planting beds can be provided to allow visitors to approach the flowers without bending.

Best Practices Reference 6.4

5.4.3 Rest places

- Sufficient seats and benches should be provided for rest.
- Seating and benches are preferably with shades or covers.
- A side space should be provided to benches to allow the companion to sit next to a wheelchair user.
- A clear space should be provided to allow a wheelchair user to access and turn at the rest place.
- A wind-resistant shelter is preferable.

Best Practices Reference 6.4

5.4.4 Visual access

- Trees and flowers of aesthetic quality should be planted within the sight line from benches or rest places.
- Framed vistas are preferable.
- Flower beds with distinctive colours can provide sensory stimulation to visitors.

Best Practices Reference 6.4

5.4.5 Water areas

- Disposition of water areas should be conspicuous to prevent persons falling into water accidentally.
- Water areas can be raised to allow wheelchair users to touch the water surface.
- Protective barriers at shorelines should not obstruct the sight line and accessibility.

Best Practices Reference 6.4

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5.5 Entrances and exits

5.5.1 Configuration

- The entrances should be at prominent locations.
- Entrances should be marked in a special, recognizable and welcoming way.
- Effective lighting should be provided to make the entrances visible.
- Entrances should not have any crossover with vehicular traffic.
- Entrances/exits should be on level ground to allow the widest spectrum of users to pass through.

Best Practices Reference 6.5

5.5.2 Doors

- Door location should be prominent with sufficient space for access.
- Doors should be easy to operate.
- Door for wheelchair access should have a level landing area after the door swings.

Best Practices Reference 6.5

5.6 Lifts

5.6.1 Operation

- Call button at foot level in addition to hand-operated level should be considered.
- Call buttons should be of sufficient size and conspicuous.
- Opening time of the doors should be sufficient for wheelchair access/exit or slow-walkers.
- Extended door open button is preferable.

Best Practices Reference 6.6

5.6.2 Interior

- Mirror or high reflective wall surfaces should be avoided to reduce hallucination.

Best Practices Reference 6.6

5.7 Way finding, signage and guidance

5.7.1 Information counters

- Information counters should be at a prominent location near the entrance.
- Tactile guide path should lead from the entrance to the information counter, and from the counter to major circulation route, lift zone or major

- Audio aid should be provided for information transmission to hearing impaired persons.
- High and low counters should be provided.
- Low counter should be with a projecting counter top to provide knee space for wheelchair users.
- Notches at sides of counter tops are preferable for holding crutches, guiding sticks, and umbrellas

Best Practices Reference 6.15, 6.10

5.7.2 Orientation

- Internal layout for public facilities should be able to communicate itself to orient visitors with a sense of direction within the space.
- Major functional points should have a heightened design language to tell its location.
- Spatial treatment of different facilities should be able to reflect their relative significance.

Best Practices Reference 6.8

5.7.3 Landmarks

- Landmark objects can assist at wayfinding decision points.
- Examples of landmarks include a sculpture, a wall painting, a tree or planting, or a water feature.

Best Practices Reference 6.8

5.7.4 Signage disposition

- Signage should be adequately provided at eye-catching locations at an appropriate height and with an appropriate size.
- Directional signage should be provided at wayfinding decision points.
- Effective lighting should be provided to make the signage noticeable at all times.
- Warning signs should be provided for all clear glazed panels and glass doors.

Best Practices Reference 6.8

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5.7.5 Information transmission

- Directional and location signs should be provided to give information on accessible routes, lifts and escalators, entrances and exits, information counters, sanitary facilities, health care facilities, communication facilities, and functional areas.
- Assistive listening systems should be provided for hearing impaired persons.

Best Practices Reference	6.8, 6.10

5.7.6 Maps and directories

- Adequate maps and directories, with graphical and text display, braille and audio types, at both entrances and inside spaces can help users to recognize their present position and assist in orientation and wayfinding.
- Maps can be of a series of scales to convey different information.
- Accessible routes to major functional areas for the disabled user groups should be indicated, including positions for dropped kerbs, ramps, and lifts.

Best Practices Reference	6.8

5.7.7 Graphical details

- Contrasting colours should be used for the signs against its background.
- Pictorial signs should be provided in addition to words and letters.
- Words and letters should be of adequate size, height, boldness and suitable fonts for legibility.
- Graphics and wordings should be informative and easy to comprehend.

Best Practices Reference	6.8

5.8 Sanitary and health care facilities

5.8.1 Facilities to be provided

- Accessible toilets should be provided.
- Unisex disabled toilets are preferable for the carer to assist the wheelchair user.
- Baby care facilities should be provided for places with public visits.
- Breastfeeding rooms should be provided for places with public visits and located away from the toilets.
- Family toilet cubicles with adult and child size water closets, high and low basins, and a baby safety seat is preferable.
- Drinking fountains of two mounting heights should be provided and preferably located away from the toilets.

Best Practices Reference 6.11. 6.15

5.8.2 Special features in accessible toilet design

- Floor surface material must be non-slippery but should not trap dirt or water.
- Effective floor drainage should be provided to maintain a dry floor surface.
- Floor drain covers should be fixed flat on the floor surface without any projections to prevent people from tripping over.
- Cubicle locks should be easy to operate without the need of strong finger force.
- Basins should be provided with counters or a flat surface for placing things.
- Notches at basin counter edges are good for holding walking sticks, umbrellas and alike.
- Soap dispensers should be placed within the range of reach by persons of tall and short stature.
- Hand dryers should not be positioned as an obstruction or a hazardous projection.

Best Practices Reference 6.11

5.8.3 Provisions for visually impaired persons

- A braille map at entrance wall to the toilet is useful to tell the location of basins, cubicles, urinals, hand dryers and exit.
- Guidance should be provided to lead the visually impaired persons to get out of the toilet.
- At least one urinal should be floor-mounted to facilitate tapping by the visually impaired person's foot or guiding stick.

Best Practices Reference 6.11

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5.8.4 Provisions for persons of physical disability

- Grab bars should be provided to one urinal, one basin and inside one toilet cubicle.
- At least one basin and mirror and one urinal should be mounted at a lower level.
- Hand dryers for wheelchair users should be protruding to provide knee space but should not become an obstruction.
- Mirror inside disabled toilet should be tilted towards the floor for use by the wheelchair users.

Best Practices Reference	6.11

5.8.5 Provisions for baby care and children

- At least one basin and mirror and one urinal should be mounted at a lower level for children.
- One water closet is preferably to be with a lower seat height for children.
- A basin, a small counter top, hooks or notches for holding handbags, and a litter bin should be within arm's reach from the nappy-changing mattress.
- Family toilet cubicles and spaces for breastfeeding are preferable, see 5.8.1 above.

Best Practices Reference	6.11

5.9 Furniture, fixtures and fittings

5.9.1 Configuration

- Furniture, fixtures or fittings should not obstruct a route.
- Fixtures and fittings should be easy to operate by all users.
- Furniture, fixtures or fittings should be approached without any barriers or changes in level.
- Adequate space should be allowed to access the furniture, fixtures or fittings.
- High and low mounting levels should be allowed for fittings like drinking fountains, public telephones, vending machines, door bells, lift call buttons.

Best Practices Reference	6.15, 6.13

5.9.2 Provisions for different user groups

Best Practices Reference	6.12, 6.14

- Furniture depths and heights should cater for the range of reach by wheelchair users, the elderly, as well as children and avoid reaching over an obstruction.
- Seating and benches should be provided with side space to allow a companion to sit right next to the wheelchair user.
- Chairs should be provided with removable types in association with tables to facilitate wheelchair use.
- Knee space and sufficient height for wheelchair armrest should be allowed for wheelchair users to use the facility.
- Notches at table edges are preferable for holding crutches, guiding sticks, umbrellas, handbags and and alike.
- Braille signs or audio guide should be provided to facilitate operation of the fittings by visually impaired persons.

5.10 User requirements and building management

Best Practices Reference	6.17

5.10.1 Client's support

- Integration of universal design issues as normal design standards should be communicated to the client for better understanding and management support.
- Early dialogue between the designer, the client, the users and the maintenance agent would facilitate implementation of universal design.

Best Practices Reference	6.17

5.10.2 User requirements

- Close collaboration with the client and co-ordination of the user's requirement should be carried out at an early design stage.

Best Practices Reference	6.17

5.10.3 Furniture and equipment planning

- Co-ordinate and advise the users on their procurement of furniture and equipment, taking into account the universal design provisions.
- Position of furniture and equipment, especially the movable ones, and temporary display panels should not obstruct the accessible routes and the use of facilities.

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5.10.4 Records

- Document the facilities and provisions for universal design elements.
- Building plans showing tactile paths, designated carparking spaces, entrances, wheelchair manoeuvring spaces, accessible toilets, major directory signs should be kept as record.
- User manual for the project should be prepared for the client and users.

Best Practices Reference 6.17

5.10.5 Building management

- Establish a building management plan to preserve and keep the universal design provisions in good working conditions.
- Building management should periodically monitor and review to upkeep the standards of provisions.

Best Practices Reference 6.17

5.10.6 Maintenance

- Establish a maintenance plan including inspection, maintenance and record of the works.
- Special attention should be given to timely repair and maintenance of essential universal design elements, for example, broken tactile surfaces, so as to prevent the defects from becoming a hazard to the users.

Best Practices Reference 6.17

5.10.7 Alteration and addition works

- Preservation of the existing universal design provisions should be taken into consideration when planning for alteration and addition works.
- Considerations should be given to improve and upgrade existing accessible facilities in major refurbishment works.

Best Practices Reference 6.17