

# TECHNICAL STANDARDS ON PHYSICAL ACCESSIBILITY INFRASTRUCTURE FOR PERSONS WITH DISABILITIES

Unofficial translation



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General Secretariat (DAC-SG)

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**KINGDOM OF CAMBODIA**  
**Nation Religion King**



**Ministry of Land Management,  
Urban Planning and Construction**

No. 248 SMB.BrK



**Ministry of Social Affairs, Veterans  
and Youth Rehabilitation**

**INTERMINISTERIAL PRAKAS**

on

**The Introduction of the Technical Standards on Physical Accessibility Infrastructure  
for Persons with Disabilities**

- Having seen the Constitution of the Kingdom of Cambodia
- Having seen Royal Decree NS/RKT/0918/925, dated September 6, 2018, on the Appointment of the Royal Government of the Kingdom of Cambodia
- Having seen Royal Kram NS/RKM/0618/012, dated June 28, 2018, promulgating the Law on the Organization and Functioning of the Council of Ministers
- Having seen Royal Kram NS/RKM/0699/09, dated June 23, 1999, promulgating the Law on the Establishment of the Ministry of Land Management, Urban Planning and Construction
- Having seen Royal Kram NS/RKM/0105/001, dated January 17, 2005, promulgating the Law on the Establishment of the Ministry of Social Affairs, Veterans and Youth Rehabilitation
- Having seen Royal Kram NS/RKM/0709/010, dated July 3, 2009, promulgating the Law on the Protection and the Promotion of the Rights of Persons with Disabilities
- Having seen Royal Kram NS/RKM/0912/007, dated September 20, 2012, promulgating the Law on the Approval for the Kingdom of Cambodia to Be a Party to the UN Convention on the Rights of Persons with Disabilities
- Having seen Sub-Decree 62 ANKr.BK, dated July 20, 1999, on the Organization and Functioning of the Ministry of Land Management, Urban Planning and Construction
- Having seen Sub-Decree 54, ANKr.BK, dated March 24, 2011, on the Organization and Functioning of the Ministry of Social Affairs, Veterans and Youth Rehabilitation
- Having seen Sub-Decree 86, ANKr.BK, dated December 19, 1997, on the Construction Permits
- Having seen Sub-Decree 42, ANKr.BK, dated April 3, 2015, on Urbanization of Capital, Cities and Urban Areas
- As deemed necessary by the Ministry of Social Affairs, Veterans and Youth Rehabilitation, and the Ministry of Land Management, Urban Planning and Construction



# HEREBY DECIDE

## **Article 1**

This Prakas is aimed at introducing the Technical Standards on Physical Accessibility Infrastructure for Persons with Disabilities as in the Annex of this Prakas.

## **Article 2**

The Technical Standards on Physical Accessibility Infrastructure for Persons with Disabilities shall apply to projects for the construction and modification of public physical infrastructure, structures, public service buildings, and public spaces such as road networks, walking routes, sidewalks, parks, parking lots, train stations, airports, schools' administrative buildings, educational institutions, hospitals and health facilities, and projects for construction of infrastructure, borey structures, houses, hotels, restaurants, markets, factories, and other private buildings in the Kingdom of Cambodia, to provide accessibility for persons with all types of disabilities, allowing them to move, enter and exit, move up and down and access facilities easily, safely, and without barriers.

## **Article 3**

Entities or units with the authority to issue construction permits shall require construction company owners to design physical infrastructure that is accessible by persons with all types of disabilities. This infrastructure includes entrances and exits, moving up and down, accessible connection paths, gratings, tactile paving surfaces, ramps, paths, safety handrails, stairs, doors and door handles, lifts and lift buttons, escalators, travelators, alarms, internal passages, resting rooms, signs, signal lights, service counters, urban- and rural-style toilets, urinals, hand-washing sinks, water sources, hand pumps, bathrooms, classroom or meeting hall furniture, and other safety equipment in accordance with the technical standards as in the Annex of this Prakas.

## **Article 4**

Any provisions contrary to this Prakas shall be abrogated.

## **Article 5**

Director of Cabinet, Director General, Inspector General, Department Director, Heads of Units under the Ministry of Land Management, Urban Planning and Construction, and the Ministry of Social Affairs, Veterans and Youth Rehabilitation, Disability Action Council Secretariat General, Governor of the Capital/Provincial Board of Governors, and Governors of the City/District/Khan Boards of Governors shall implement this Prakas based on their respective duties from the date of signature.



Phnom Penh, November 28, 2018

**Deputy Prime Minister**  
**Minister of Land Management, Urban**  
**Planning and Construction**  
**And Honorary President of the Disability**  
**Action Council**

**Minister**  
**Minister of Social Affairs, Veterans and**  
**Youth Rehabilitation**  
**And President of the Disability Action**  
**Council**

**Chea Sophara**

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- Cabinet of Prime Minister
- Capital of Deputy Prime Ministers
- All capital/provincial halls
- Royal Gazette
- As in Article 5
- Document-archived





## Document Preparation Team

<b>Disability Action Council Secretariat General of the Ministry of Social Affairs, Veterans and Youth Rehabilitation</b>	<b>Ministry of Land Management, Urban Planning and Construction</b>
1. H.E. <b>Em Chan Makara</b> , Secretary General of Disability Action Council Secretariat General	1. H.E. <b>Tith Chantarinne</b> Undersecretary
2. H.E. <b>Ung Sambath</b> , Deputy Secretary General of Disability Action Council Secretariat General	2. H.E. <b>Yos Chhomnarady</b> Undersecretary
3. Mr. <b>Chhorn Akhra</b> , Head of Disability Service Development Unit of Disability Action Council Secretariat General	3. Mr. <b>E Bunthoeun</b> Director of the Legislation Department
4. Official at the Disability Service Development Unit of Disability Action Council Secretariat General	4. Mr. <b>Chim Vanntha</b> Deputy Head of the Office of Judicial Affairs



# CONTENTS

<b>SECTION 1: PATHWAYS AND ENTRANCES.....</b>	<b>3</b>
<b>1.1. Access Routes.....</b>	<b>3</b>
1.1.1. Pathway, Connection Paths .....	6
1.1.2. Drainage and Gratings.....	8
1.1.3. Guardrails.....	9
<b>1.2. Changes in Level.....</b>	<b>10</b>
1.2.1. Ramps and slopes.....	13
1.2.1.1. <i>External ramps</i> .....	13
1.2.1.2. <i>Internal Ramps</i> .....	16
1.2.1.3. <i>Mobile Ramps</i> .....	19
1.2.1.4. <i>Slopes</i> .....	20
1.2.2. Handrails for Ramps and Slopes.....	22
1.2.3. Ramp Surface and Edge Protection.....	25
1.2.4. External Stairs .....	26
1.2.5. Internal Stairs .....	31
1.2.6. Passenger Lifts.....	33
1.2.7. Evacuation Lifts .....	40
1.2.8. Stair lifts .....	41
1.2.9. Escalators .....	41
1.2. 10. Travelators .....	44
<b>1.3. Surface Materials.....</b>	<b>45</b>
<b>1.4. Street Furniture.....</b>	<b>46</b>
1.4.1. Lighting and Signage .....	47
1.4.2. Placement of Street Furniture.....	48
1.4.3. Bins.....	50
1.4.4. Bollards .....	51
1.4.5. Gates .....	52
1.4.6. Drinking Fountains .....	52
1.4.7. Seating.....	53

<b>1.5. Pedestrian Crossing Points .....</b>	<b>56</b>
<b>1.6. Tactile Paving Surfaces .....</b>	<b>59</b>
1.6.1. Blister Surface for Pedestrian Crossing Points .....	60
1.6.2. Corduroy Paving for Hazards.....	64
<b>1.7. Entrances .....</b>	<b>66</b>
1.7.1. Entrance Lobbies.....	67
1.7.2. Reception and Waiting Areas.....	69
1.7.3. Queuing Areas and Temporary Barriers.....	71
<b>1.8. Horizontal Circulation.....</b>	<b>72</b>
1.8.1. Corridors .....	73
1.8.2. Internal Lobbies.....	76
<b>1.9. Doors .....</b>	<b>77</b>
1.9.1. Entrance Doors.....	79
1.9.2. Revolving Doors .....	82
1.9.3. Turnstile .....	83
1.9.4. Internal Doors .....	83
1.9.5. Door Ironmongery.....	84
1.9.5.1. Hinges .....	84
1.9.5.2. Handles, Latches and locks.....	85
1.9.5.3. Pull Handles and Rails .....	86
1.9.5.4. Finger Plate and Kick Plates .....	87
1.9.5.5. Door-Closing Devices .....	88
1.9.5.6. Emergency Exit Door Ironmongery .....	89
1.9.5.7. Other Ironmongery.....	90
1.9.5.8. Automatic Door Systems .....	91
1.9.5.9. Door Security and Entry Systems.....	92
<b>SECTION 2: CAR PARK ENVIRONMENT .....</b>	<b>95</b>
<b>2.1. General.....</b>	<b>96</b>
<b>2.2. Number of Vehicles.....</b>	<b>97</b>
<b>2.3. Car Parking Spaces and Dimension .....</b>	<b>98</b>

<b>2.4. Car Parking Signage.....</b>	<b>102</b>
<b>2.5. Parking Location .....</b>	<b>103</b>
<b>2.6. Parking Curbs.....</b>	<b>106</b>
<b>2.7. Multistory and Underground Car Parks .....</b>	<b>107</b>
<b>2.8. Paid Parking.....</b>	<b>109</b>
<b>2.9. Drop-Off Areas.....</b>	<b>110</b>
<b>2.10. Surfaces .....</b>	<b>111</b>
<b>2.11. Taxi Ranks.....</b>	<b>112</b>
<b>2.12. Existing Constructions .....</b>	<b>113</b>
<b>2.13. Number of Car Parks Compared to Building Size.....</b>	<b>115</b>

### **SECTION 3: BUILDING TYPES..... 119**

<b>3.1. Office Buildings .....</b>	<b>119</b>
3.1.1. Entrances and Circulation .....	120
3.1.2. Internal Environment.....	121
3.1.3. Workstations and Storage .....	122
<b>3.2. Transport Buildings.....</b>	<b>123</b>
3.2.1. Location .....	124
3.2.2. Size and Layout .....	125
3.2.3. Passenger Facilities .....	126
3.2.4. Travel Information .....	127
<b>3.3. Retail Outlets and Shopping Centers .....</b>	<b>128</b>
3.3.1. Internal Circulation .....	128
3.3.2. Display and Storage in Shops.....	132
3.3.3. Counters and Checkouts .....	130
3.3.4. Fitting Rooms .....	131
3.3.5. Equipment and Assistance in Shops .....	132
<b>3.4. Restaurants, Bars, and Cafés .....</b>	<b>133</b>
3.4.1. Layout and Seating in Bars and Restaurants.....	133
3.4.2. Self-Service Facilities.....	134
3.4.3. Customer Service and Management .....	136
3.4.4. Outdoor Smoking Areas.....	136

<b>3.5. Museums, Galleries, and Libraries.....</b>	<b>137</b>
3.5.1. Information and Interpretation .....	138
3.5.2. Displays and Exhibits.....	139
3.5.3. Study Areas .....	140
3.5.4. Library Shelving.....	141
<b>3.6. Entertainment, Conference, and Lecture Facilities.....</b>	<b>142</b>
3.6.1. Audience Seating .....	143
3.6.2. Performers’ Facilities .....	145
3.6.3. Speakers’ Facilities .....	146
<b>3.7. Religious Buildings .....</b>	<b>146</b>
3.7.1. Facilities for Seating and Prayer.....	147
3.7.2. Other Facilities in Religious Buildings .....	148
<b>3.8. Hotel, Guest, and Residential Accommodation.....</b>	<b>148</b>
3.8.1. Bedrooms.....	149
3.8.2. Bathrooms .....	155
<b>3.9. Housing.....</b>	<b>156</b>
3.9.1. External Environment .....	156
3.9.2. Entrances .....	157
3.9.3. Horizontal Circulation in Housing .....	158
3.9.4. Vertical Circulation in Housing.....	160
3.9.5. Services in Housing .....	161
3.9.6. Individual Rooms .....	162
<b>3.10. Historic Buildings and Sites .....</b>	<b>163</b>
3.10.1. Conservation Principles .....	164
3.10.2. Making Changes to Historic Buildings.....	164
3.10.3. Detailed Design of Historic Buildings .....	165
3.10.3.1 Entrances .....	165
3.10.3.2 Doors.....	166
3.10.3.3 Ramps.....	168
3.10.3.4 Staircases.....	169
3.10.3.5 Platform Lifts .....	170

<b>3.11. Outdoor Access.....</b>	<b>172</b>
3.11.1. Types of Landscape.....	173
3.11.1.1. <i>Natural Landscape</i> .....	173
3.11.1.2. <i>Tempered Landscape</i> .....	174
3.11.1.3. <i>Urban Landscapes</i> .....	176
3.11.1.4. <i>Tamed Landscapes</i> .....	176
3.11.2. Mountains.....	177
3.11.3. Peatlands .....	178
3.11.4. Beaches.....	179
3.11.5. Conservation Areas.....	179
3.11.6. Viewing Points .....	180
3.11.7. Country Parks.....	180
3.11.8. Woodlands and Arboreta.....	181
3.11.9. Picnic Areas.....	182
3.11.10. Campsites and Caravan Parks .....	182
3.11.11. Waterways .....	183
3.11.12. Archaeological Sites .....	184
3.11.13. Special Events .....	184
3.11.14. Parks .....	185
3.11.15. Cemeteries.....	186
3.11.16. Playgrounds, Play Structures, and Equipment.....	186
3.11.17. Gardens and Courtyards .....	187
<b>3.12. General Signage .....</b>	<b>188</b>
1. International Symbols of Accessibility .....	189
2. Direction Signs .....	189
3. Maps and Information Panels.....	189
4. Installation .....	190
5. Shape of Signboard .....	191
6. Color .....	191
7. Surface .....	191
8. Lettering.....	191

9.	Size.....	192
10.	General Guide.....	193
11.	Some Important Signage .....	193

## **SECTION 4: FACILITIES IN BUILDINGS ..... 197**

<b>4.1.</b>	<b>Reception Desks and Service Counters .....</b>	<b>197</b>
<b>4.2.</b>	<b>Waiting Areas and General Seating .....</b>	<b>200</b>
<b>4.3.</b>	<b>Storage Facilities .....</b>	<b>201</b>
<b>4.4.</b>	<b>Public Telephones.....</b>	<b>203</b>
4.4.1.	Payphones .....	203
4.4.2.	Textphones .....	205
4.4.3.	Telephone Booths.....	206
<b>4.5.</b>	<b>Coin and Card-Operated Machines.....</b>	<b>207</b>
4.5.1.	Ticket Dispensers and Vending Machines.....	208
4.5.2.	Automated Teller Machines (ATMs).....	209
<b>4.6.</b>	<b>Kitchen and Refreshment Facilities .....</b>	<b>210</b>
4.6.1.	Layout and Work Surfaces .....	211
4.6.2.	Storage in Kitchen and Refreshment Areas .....	212
4.6.3.	Sinks and Appliances.....	213
4.6.4.	Switches and Socket Outlets.....	217
<b>4.7.</b>	<b>Windows.....</b>	<b>218</b>
<b>4.8.</b>	<b>Appropriate Concepts in an Inclusive Classroom .....</b>	<b>221</b>

## **SECTION 5: SANITARY FACILITIES ..... 225**

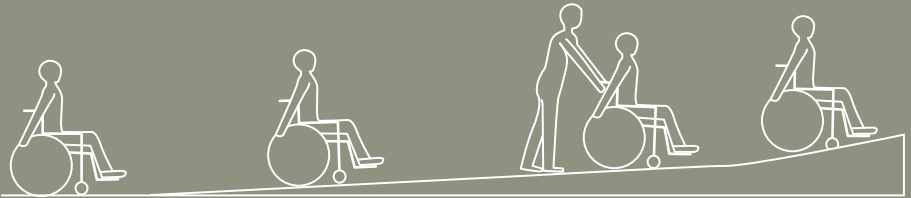
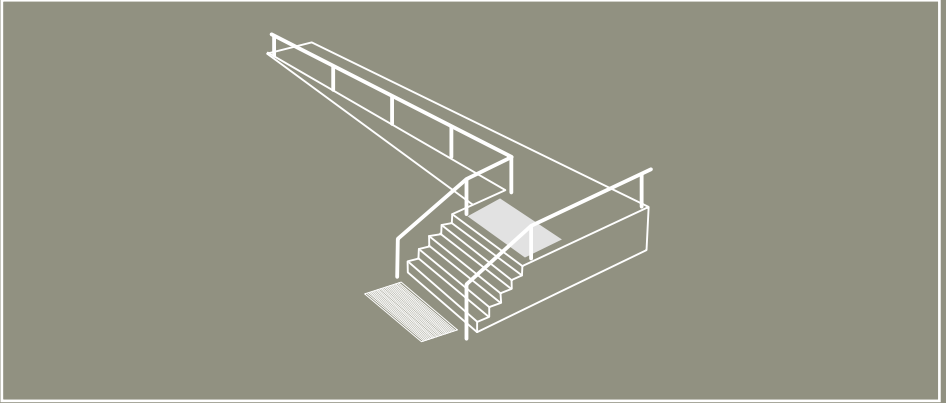
<b>5.1.</b>	<b>Single-Sex Toilets .....</b>	<b>225</b>
5.1.1.	Accessible Toilet Cubicles .....	226
5.1.2.	Enlarged Cubicles.....	229
5.1.3.	Urinals.....	230
<b>5.2.</b>	<b>Unisex Toilets .....</b>	<b>232</b>
5.2.1.	Accessible Unisex Toilets .....	232



5.2.2.	Toilet Pans and Cisterns.....	236
5.2.3.	Enlarged Unisex Toilet with Standing-Height Washbasin.....	237
5.2.4.	Family Toilets .....	238
5.2.5.	Baby-Changing Facilities .....	239
<b>5.3.</b>	<b>Toilets for People Who Need Assistance .....</b>	<b>239</b>
5.3.1.	Unisex Peninsular Toilet for Assisted Use.....	240
5.3.2.	Unisex Peninsular Toilet with Adjustable Changing Bench and Hoist Facilities .....	241
<b>5.4.</b>	<b>Shower Rooms and Bathrooms .....</b>	<b>242</b>
5.4.1.	Self-Contained Accessible Shower .....	243
5.4.2.	Accessible Shower with WC.....	246
5.4.3.	Shower and Peninsular Toilet for Assisted Use .....	248
5.4.4.	Bathroom for Independent Use.....	249
5.4.5.	Washbasin.....	250
5.4.6.	Toilet and Washbasin for Children at Schools and Health Facilities.....	250
5.4.7.	City Toilets .....	252
5.4.8.	Local Toilet.....	253
5.4.9.	Toilet Innovation in Rural Areas.....	254
<b>5.5.</b>	<b>Changing Areas .....</b>	<b>255</b>
5.5.1.	Self-Contained Accessible Changing Area.....	255
5.5.2.	Communal Changing and Shower Areas.....	257
<b>5.6.</b>	<b>Residential Toilets.....</b>	<b>257</b>
5.6.1.	Dwelling Toilets.....	258
5.6.2.	Domestic Bathrooms .....	261
<b>5.7.</b>	<b>Detailed Design of Sanitary Facilities.....</b>	<b>262</b>
5.7.1.	Assistance Alarms .....	262
5.7.2.	Clothes Hooks .....	263

5.7.3.	Doors and Locks .....	264
5.7.4.	Fire Alarm .....	265
5.7.5.	Grab Rails .....	266
5.7.6.	Hair Dryers .....	268
5.7.7.	Hand-Drying Facilities .....	268
5.7.8.	Heating.....	269
5.7.9.	Lighting .....	269
5.7.10.	Lockers.....	270
5.7.11.	Mirrors.....	270
5.7.12.	Shelves .....	271
5.7.13.	Signage.....	272
5.7.14.	Soap Dispensers.....	272
5.7.15.	Surfaces .....	273
5.7.16.	Toilet Paper Dispensers .....	273
5.7.17.	Vending Machines .....	274
5.7.18.	Waste Disposal .....	275
5.7.19.	Water Supply .....	275
5.7.20.	Hand Pump .....	276
5.7.21.	Tube Wells .....	279
5.7.22.	Ports.....	282

## SECTION 1: PATHWAYS AND ENTRANCES

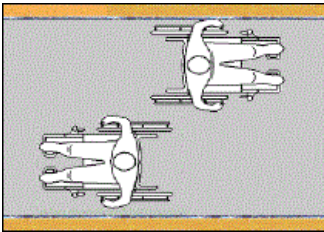




# SECTION 1: PATHWAYS AND ENTRANCES

## 1.1. Access Routes

Access routes refers to routes that persons with all types of disabilities can access, on foot and by wheelchair, including the area of the path, middle of the path, sidewalk, crosswalk routes, and shoulders.



*Picture 1.1.1. Wheelchair users using a route that is traversable and wide enough to accommodate other users*



*Picture 1.1.2. A wheelchair user using a normal route*

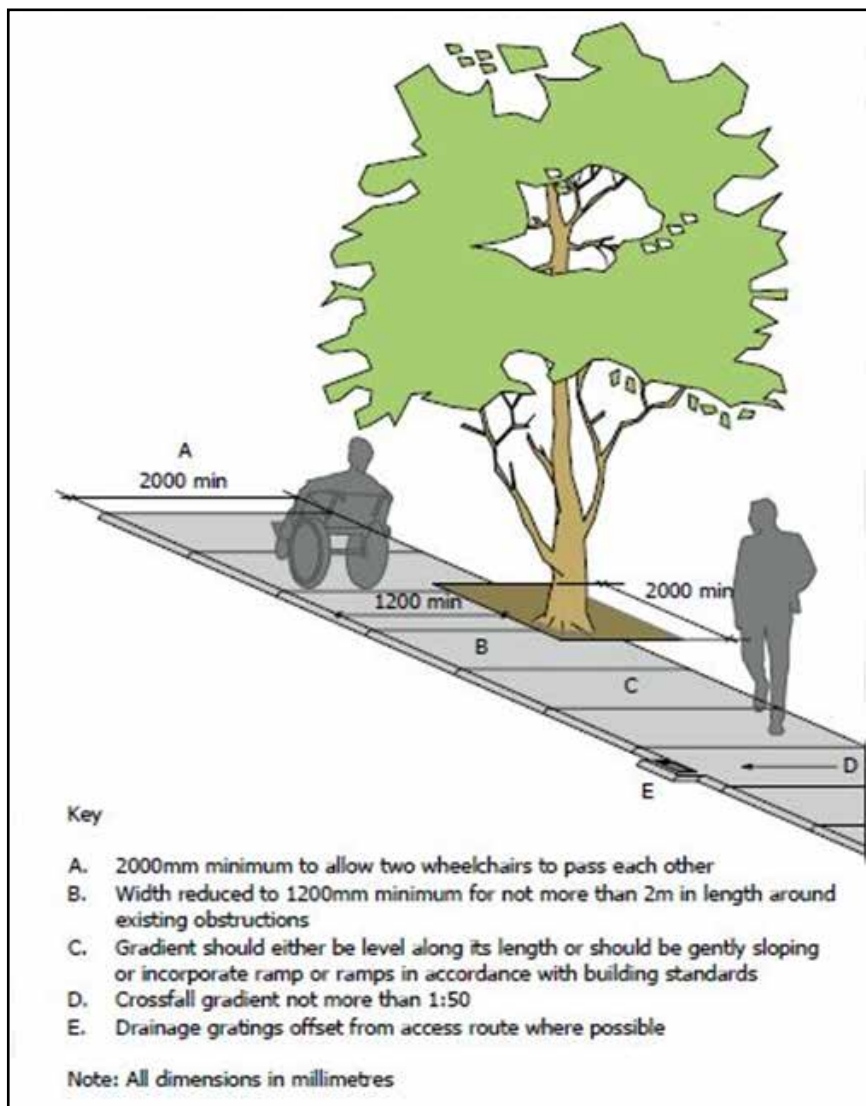


*Picture 1.1.3. A wheelchair user using a route connecting buildings*

- ❖ Standards and recommendations for access routes
  - Ensure that the access routes have appropriate width based on the number of people crossing

- Ensure that the route is 2,000 mm wide and does not have barrier at any point
- Shall have a passing space in case the width is less than 2,000 mm
- Shall have a resting place at regular intervals if the route is long
- Ensure that the width is not less than 1,200 mm for narrower point
- Have wide routes at the shopfront and at bus stops
- The route shall have hard and level surface with slopes of no more than 1/50
- Avoid leaving holes and tilt between bricks of larger than 5 mm
- Keep the bricks even on surface or from one to another such as those near the drainage pipes of no more than 10 mm and aligned with the flow lines
- Prevent danger at height changing places with appropriate ramps and guardrails
- The width of an access route shall have appropriate size for users to move to all directions and passing others with ease
- The route width shall be at least 2,000 mm wide for wheelchairs to pass one another easily. The size can be increased in case of routes in crowded areas
- In case it is too narrow, the routes with less than 2,000 mm wide shall have passing spaces with an area of 2,000 mm x 2,000 mm in every 25 meters
- In case of long routes, passing spaces can be in every 30 meters
- In case the routes have obstacles such as trees, power poles, walls, the wide can be decreased to 1,200 mm, which is large enough for one wheelchair to pass

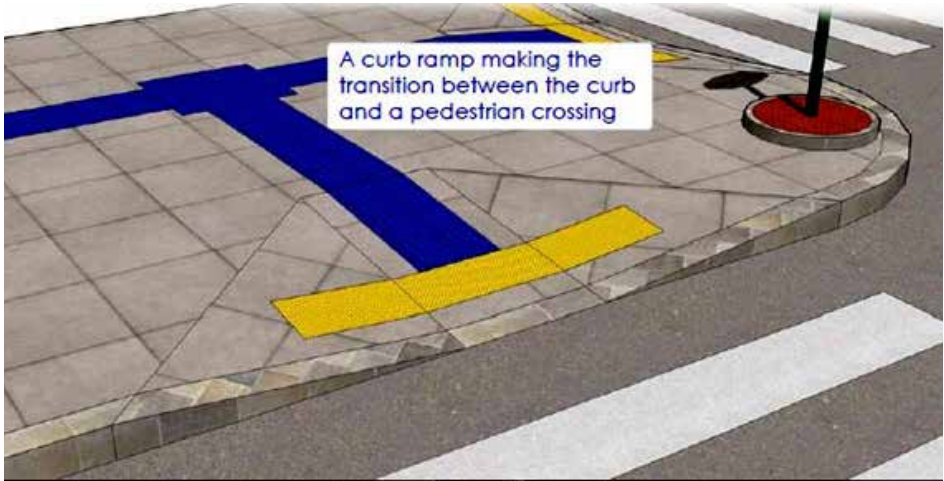
Picture 1.1.4. Preparation of route in urban area for walking



### 1.1.1. Pathway, Connection Paths

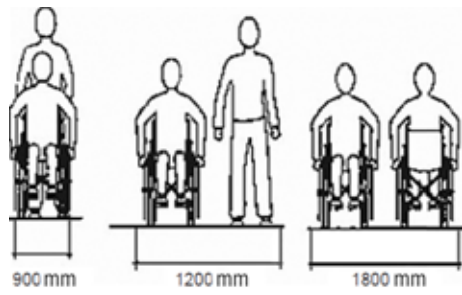
A pathway is an external route, e.g., a sidewalk near the road, which is for walking, or an internal route that connects one building to another, etc.

*Picture 1.1.1.1. Path connect one shoulder of a pedestrian path with a driving road at the crosswalk*



#### ❖ Standards and guidelines for pathways, connecting paths

- The minimum width for a pathway is between 1,500 mm and 1,800 mm.





- The minimum width for a pathway in an area that many people use, such as the paths to hospitals, train stations, schools, and flood safety hills is 2,500 mm.
- The minimum width for a small path connecting to a pathway or an internal entrance is 1,200 mm.
- There should be no obstacles for any user to access a path.
- Both routes and ramps for walking shall be level and not slippery, even with humidity or rain, but gaps in the rough surface shall not be more than 20 mm, because wheels may get stuck.
- Drainage holes shall be covered. There shall be level landings with a width of 1,200 mm every 30 meters for wheelchair users to rest.
- The surface shall be covered with bricks on the entrance into toilets, bathrooms, and safety shelters.
- Water usage areas, public buildings, shops, ramps connecting upper and lower floors, stairs, to prevent mud/sand from falling because of soil erosion especially during rainfall.
- On both level and sloping routes, there shall be tactile paving in standard shapes.
- The maximum slope for an entrance is 1:50 (2%).

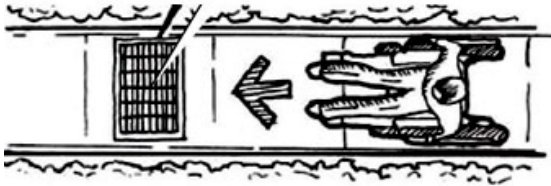
### 1.1.2. Drainage and Gratings



#### ❖ Standards and guidelines for drainage

- To prevent water from becoming stagnant, damaging the road, or causing other problems, drainage system should be installed along the roads.
- The drainage opening shall be 1,200 mm wide, with cement or stone cover.
- Based on the road conditions, there shall be a drain every 30 meters.
- Use pipes to drain water to prevent stagnant water along a road or ramp that has a drainage system below it.
- Net sheets used as covers should be 10 mm x 20 mm.
- The gaps between one metal net sheet to another should be smaller than 12 mm to prevent wheelchair wheels from getting stuck.
- These metal net sheets can be rectangular, square, or round, depending on the shape of the drainage holes.
- Metal net sheets must be securely attached to the metal frames.
- Ensure that the metal net sheets placed on drainage holes do not cause difficulties for any types of travel.

- Metal net sheets can be removed for cleaning or drainage system maintenance.
- Ensure that drainage pipes allow water to flow unobstructed.
- Drainage pipes and metal sheets for draining water should prevent water from becoming stagnant or pooling at the end of the ramps and slopes, at the top of the ramps and slopes, or in holes on uneven passages.



### 1.1.3. Guardrails

Guardrail refers to a piece of safety equipment attached to entrances, stairs, bridges, ramps, and other places.



## ❖ Standards and guidelines for guardrails

- Guardrails must be 1,200 mm tall and in bold colors to help persons with visual impairments.
- The size of the metals or materials used for guardrails must be 40 mm to 50 mm and round.
- Guardrails are not only used for walking; they can help people when standing up or when moving up or down ramps, slopes, or stairs.

## 1.2. Changes in Level

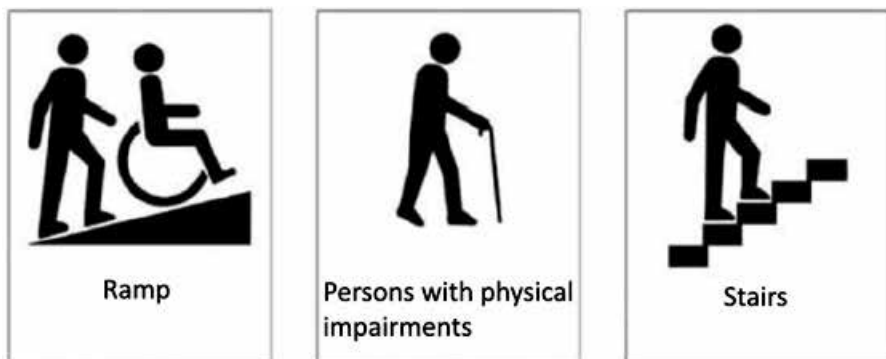
Changes in level refer to routes or places where people need to move up or down between one surface and another by means of routes, ramps, slopes, stairs, etc.



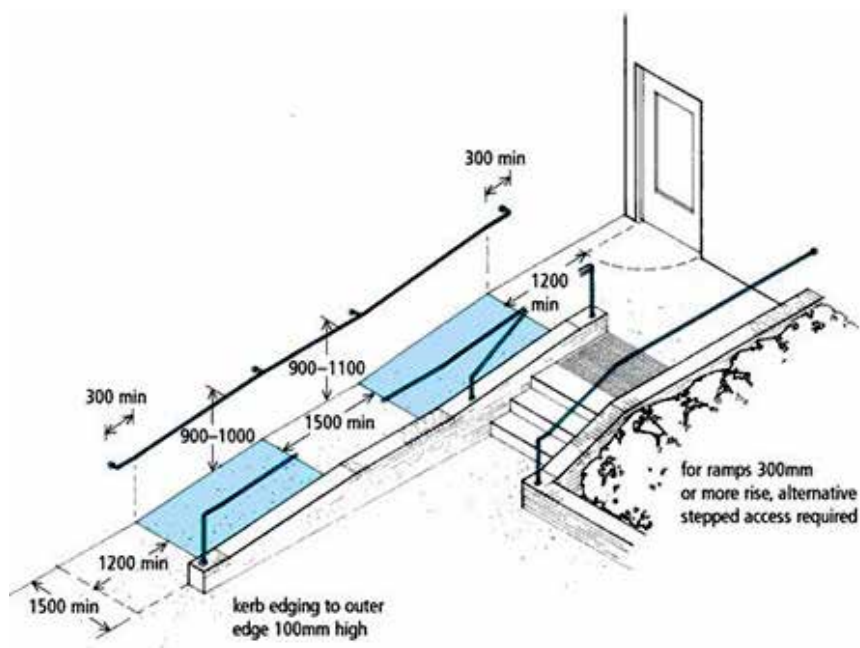
*Picture 1.2.1. Example of possible difficulty and danger in buildings that are not designed persons with disabilities*

Buildings accessible by persons with disabilities should have ramps in addition to stairs.

Picture 1.2.2. Drawings of setting signs for persons with physical impairments







Picture 1.2.3. Drawing of external ramps alongside stairs



## ❖ Standards and guidelines for changes in level

- Ramps shall have a slope of no more than 1:20, a width of 1,200 mm, and a wheelchair turning space at least 9 meters.
- Landings shall be 1,300 mm wide.
- They shall be equipped with railings on both sides along the ramps, with a height of 900 mm to 1,000 mm and a height of 900 mm to 1,100 mm at all landings.
- They shall be equipped with lower rails with a height of 600 mm to 750 mm along all ramps for short people and children.
- The railings shall be attached to the wall and shall extend 150 mm from the wall.
- The starting and the ending points of the ramps shall have an area of 1,800 mm x 1,800 mm.
- There shall be stairs alongside the ramps to provide users different options.
- There shall be kerb ramp on both sides of the ramps with a height of 75 mm.
- The ramp area shall not be smooth, because it presents a slipping hazard.
- Ensure that the routes between the grounds and the building entrance, between the parking lot and the grounds, and within the building are designed for all types of users.
- Think comprehensively when designing the building initially.
- When designing a route, make sure it is easy to use and provide options for users.
- Ensure that ramps and stairs along the routes have signs that can be seen clearly by all types of users.

### 1.2.1. Ramps and slopes

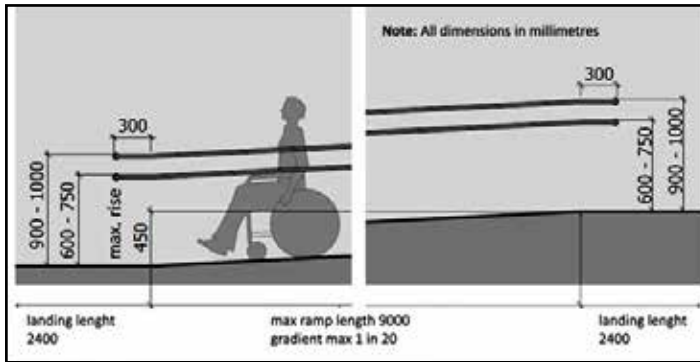
				
Ideal situation	<4% or <1:25 Passable ramp	<5% or <1:20 Accessible ramp	<8% or <1:12 Help needed	<12% or <1:08 Danger

#### 1.2.1.1. External ramps

External ramps refer to ramps, routes, entrances to buildings, shoulders (sidewalks or parking spaces), and other sloping spaces outside of most buildings, and they are longer than internal ramps. External ramps have surfaces where one point is higher than the other.



Picture 1.2.1.1. Drawing of external ramps

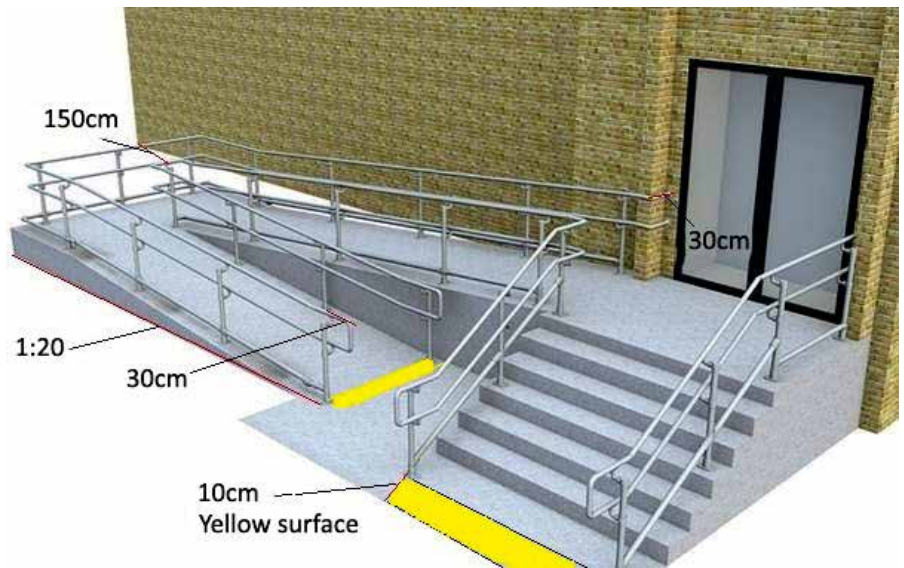


❖ Standards and guidelines for external ramps

- Short ramps may have a slope maximum 1:12 (for 1 unit of height, there shall be 12 units of ramp distance).
- Longer ramps may have a slope of 1:20 (for 1 unit of height, there shall be 20 units of ramp distance).
- If the ramp is higher than 2,000 mm, there shall be alternatives (such as lifts, escalators, etc.)
- Ramps shall be at least 1,200 mm wide (excluding the width of ramp edges) for less busy routes.
- Ramps shall be at least 2,500 mm wide (excluding the width of the ramp edges) for busy routes, such as entrances to hospitals, train stations, schools, restaurants, etc.
- At every height of 750 mm from the lowest point, equal to a ramp of 9,000 mm long (750 mm x 12 units), there shall be a landing of 1,500 mm for resting or changing directions.
- Every ramp shall have 50 mm borders/kerbs on both sides.



*Picture 1.2.1.2. Drawing of external ramp along building wall and the stairs*



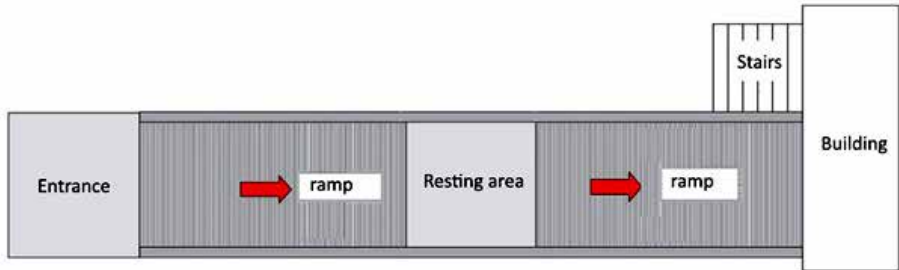
- All ramps, including sloping and level surfaces, shall have non-slip surfaces and shall have tactile paving with bold colors and a width of 300 mm in the middle for one-way routes and in the middle of each way for two-way routes.



*Picture 1.2.1.3. Drawing of ramps with tactile surfaces that can be used by blind people*

There shall be non-strip, raised lines painted on surfaces to let people know the points for starting, moving up, turning, or ending of the slope; the lines shall be 300 mm in size in the middle of the slopes.

Picture 1.2.1.4. Drawing of ramp in spacious area



Picture 1.2.1.5. Modifying ramp for a narrow area

### 1.2.1.2. Internal Ramps

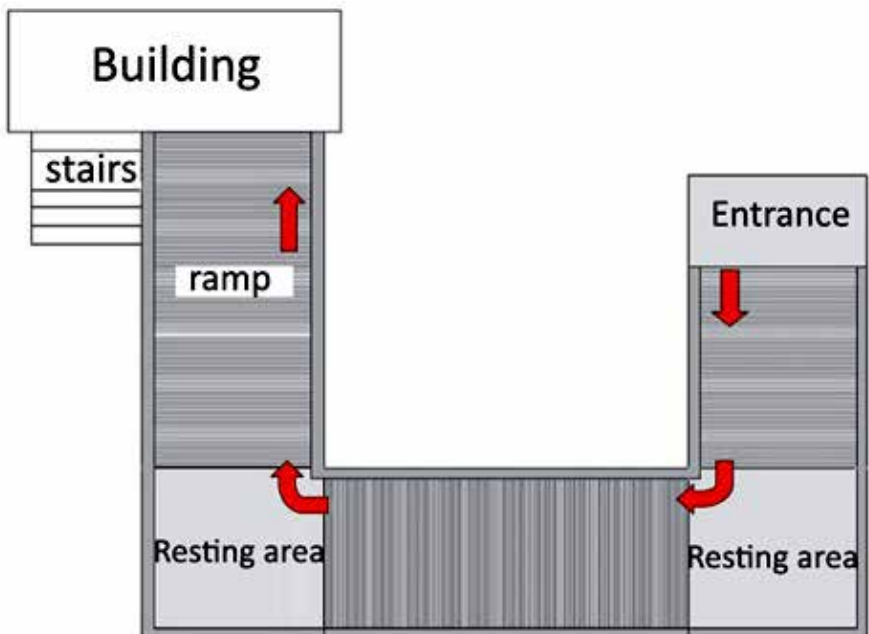
Internal ramps refer to ramps for moving up and down between changes in level within buildings; they are typically shorter than external ramps and slopes

#### ❖ Standards and guidelines for internal ramps

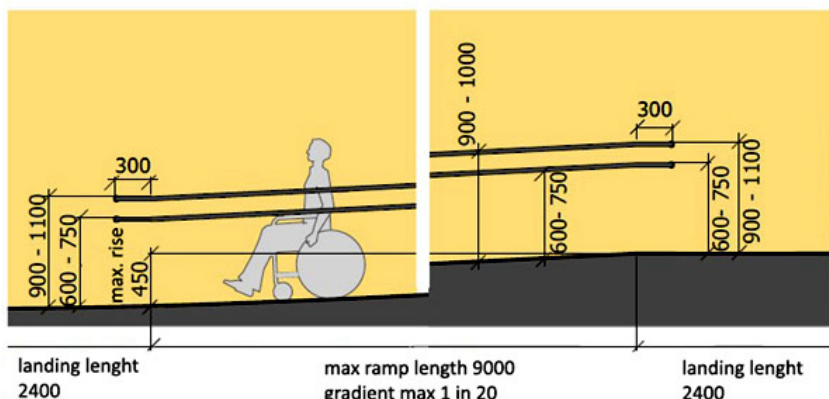
Types	Slope level	Maximum ramp lengths
Best sloped ramps	Less than 5%	12 meters
Average sloped ramps	5%-8%	6 meters
Steeply sloped ramps	8%-12%	3 meters
Very steeply sloped ramps	More than 12%	0.5 meter

- Internal ramps are beneficial for strollers, trolleys, and wheelchairs.
- Internal ramps can be used as routes for emergency exits.
- Internal ramps can connect part of one building to another, especially large buildings such as museums, airports, supermarkets, etc., instead of or in addition to escalators or lifts.
- Internal ramps shall not have a slope of more than 1:20—a height of 450 mm at most and a length of not more than 9 meters.

*Picture 1.2.1.2.1. Design of internal ramps in narrow space*



- In all cases, internal ramps shall not be smaller than 1,500 mm. In busy places, they shall have a width of at least 1,800 mm.
- The ramp's level landings shall be 2,440 mm x 2,440 mm for wheelchairs to turn around.
- Ramps are necessary at entrances of all places; if there is not enough space, ramps shall be constructed instead of stairs.
- So ramps can be used with ease, the slopes shall not exceed 8%.
- The ramp surfaces shall not be slippery.
- There shall be tactile hazard warning surface with contrasted color at each bottom and end of the ramps for people with blindness or visual impairment, respectively.
- If the ramps are long, there shall be landings every 6 meters.
- Landings can be the passing spaces and shall be at least 1,500 mm.
- All ramps shall have raised edges of 50 mm to 100 mm at the lower end, and guardrails to prevent wheelchairs from going off the ramps.



**Note:** All dimensions in millimetres

### 1.2.1.3. Mobile Ramps

Mobile ramps refer to ramps for entering and leaving, moving up and down within buildings or rooms that change in level. Most are made from metal or wood because of their portability. These ramps are generally installed temporarily for certain events when existing ramps are not available. Examples include platforms for music events, workshops, wedding parties, and other indoor and outdoor ceremonies that are raised above the ground.

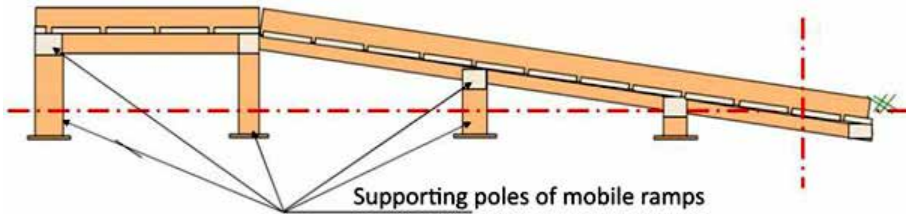


- Mobile ramps can be used for places that do not have permanent ramps.



- Mobile ramps can be made from metal or wood as needed, according to the guidelines and standards for ramps.

*Picture 1.2.1.3.1. Drawing of mobile ramps with supporting poles*

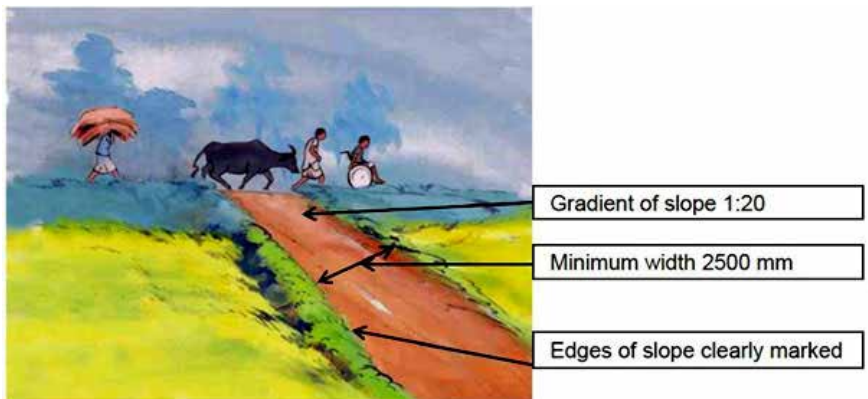


#### 1.2.1.4. Slopes



Slopes refer to routes that change in level and are typically wider than ramps (internal and external). Slopes are generally located in mountainous areas and valleys, beaches, highlands, roads between lower and higher roads, approaches to and from bridges, approaches to buildings and basements, etc. in both urban and rural areas. Slopes may be natural or man-made.

- Long slopes should not exceed 1:20 and should include turning points.
- The minimum width of a slope is 1,800 mm for one-way travel, and 2,500 mm for two-way.
- There shall be level landings of 2,500 mm long at every turning point or every 9,000 mm.
- Slopes must have a non-slip surface.
- All slopes shall have borders with a height of 50 mm to ensure that wheelchairs remain on the slope.
- The top and bottom edges of the slopes shall be at the same level as the ground to prevent stumbling.
- Brick flooring at the edges of the slopes is needed to prevent soil erosion and for edges to be level.
- For routes with changes in level, the slopes shall be between 1:33 and 1:25 if the routes are long.
- For routes with a slope of 1:25 and routes with a slope of 1:33, changes in level should be in every 19 meters and 25 meters, respectively.
- Sloping routes should provide handrails.



## 1.2.2. Handrails for Ramps and Slopes

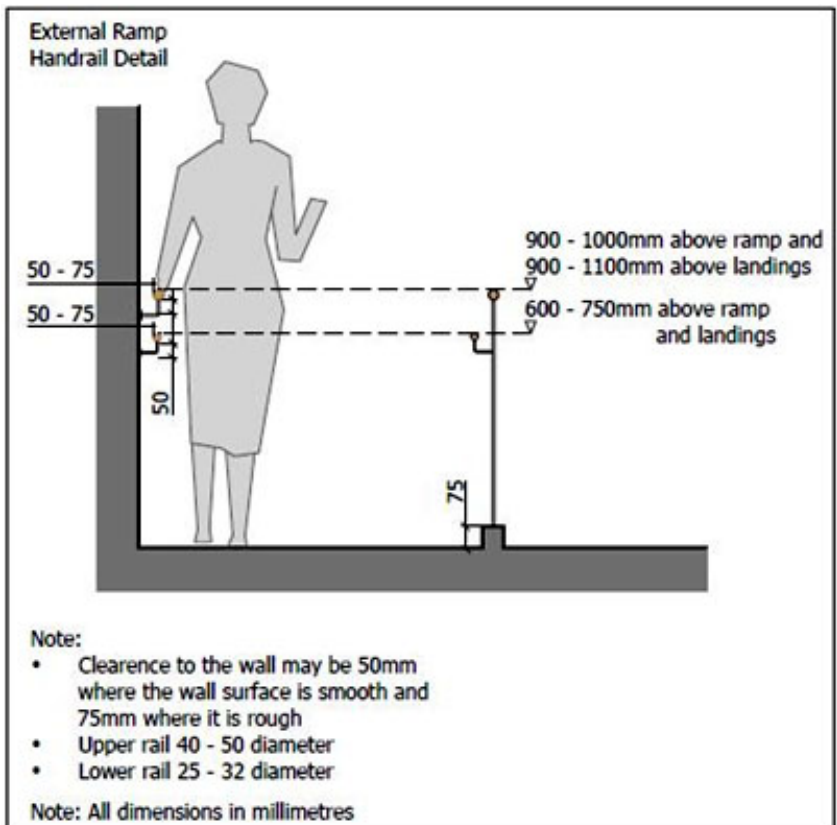


- ❖ Standards and guidelines for handrails
  - There shall always be handrails on both sides, from one end to the other and at the landings.
  - Handrails shall be provided even when ramps and slopes are along walls.
  - There shall be double handrails (high and low) for all ramps when the difference in level is more than 400 mm in length or longer.
  - The upper handrails shall be 900 mm to 1,100 mm above the ramp surface.
  - Handrails shall have round shape, which is easy to hold, and have a diameter of 40 mm to 50 mm.
  - The lower handrails shall have a diameter of 25 mm to 32 mm, which is easy to hold.
  - All handrails shall be at least 50 mm to 75 mm from the walls.
  - Additional handrail supporting tools shall be placed in the lower middle part so that people can drag and hold the tools along the handrails without any obstacles. If people have to release the handrails because of any obstacles, they do not feel safe.

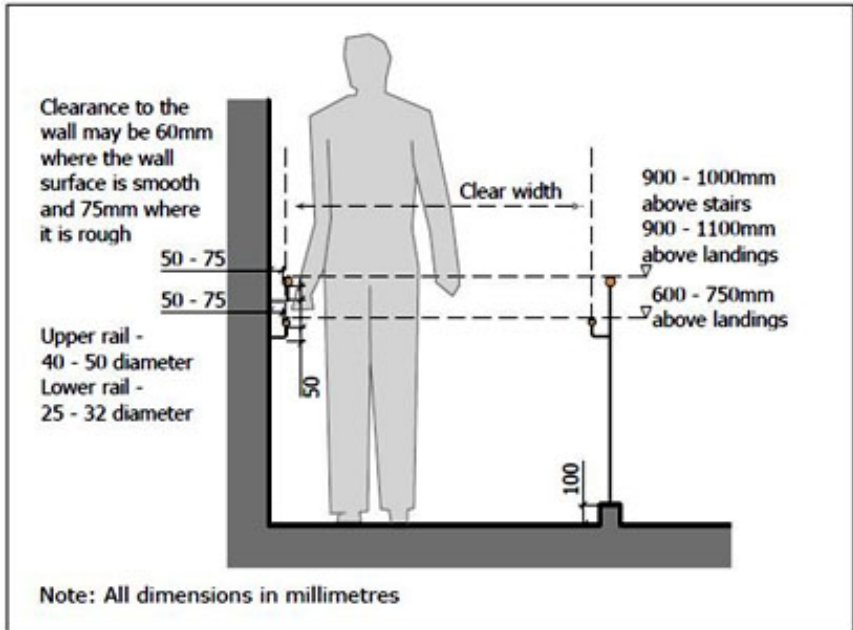


- Both ends of the handrails shall be rounded and smooth with an extended bar of 300 mm at the lower and upper ends of the ramps.
- The space between the vertical handrails at the lower ends and the additional handrail supporting tools should be 50 mm. At the end of the handrail, there shall be signs telling the users that they have reached the upper and lower ends of the handrails, and the size should be 150 mm.

*Picture 1.2.2.1. The handrails for external ramps and slopes*

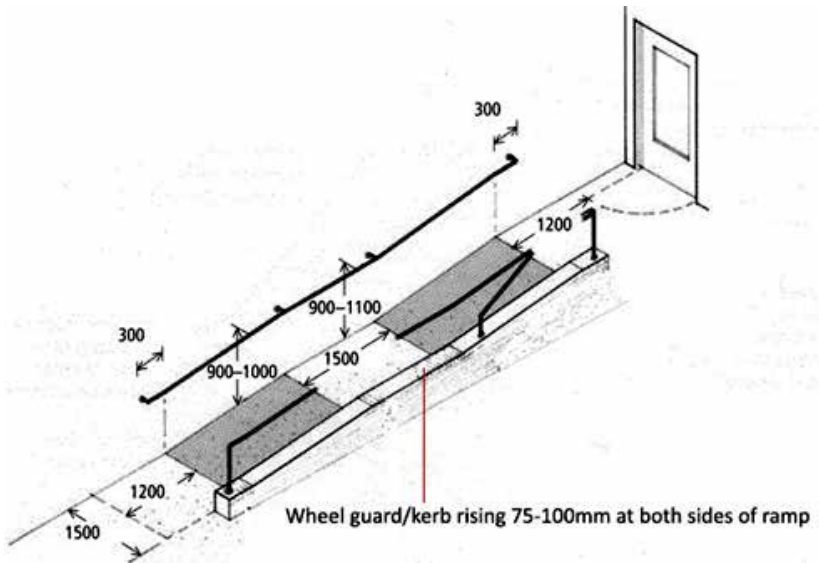


Picture 1.2.2.2. Handrail for internal ramps



- The size of the space between handrails and walls shall be 50 mm if the walls are smooth and 75 mm if the walls are rough.
- Handrails should have different colors from the surfaces and be clearly seen; the choices of materials used as handrails are very important, because they may have positive or negative impacts on users, depending on the types of disabilities.
- If possible, metal should not be used for the handrails, because it is easily affected by temperature and seasons, becoming too hot or too cold to use comfortably.

### 1.2.3. Ramp Surface and Edge Protection



- ❖ Standards and guidelines for ramp surface and edge protection
  - The ramp surface is used for walking or wheelchair traffic, and the edge protection is the surrounding frame, which is higher than the ramp surface to prevent wheelchairs from falling.
  - The ramp surface shall be slip-resistant whether it is wet or dry.
  - The surface of the ramp shall be painted in a clear color in the center to assist persons with low vision.
  - Lighting system shall be installed for nighttime use.
  - Edge protection shall be at a height of 50 mm to 100 mm.
  - Bottom and top ramp edges shall be at the same level as land surface to avoid stumbling.

### 1.2.4. External Stairs

External stairs comprise steps and handrails on both sides, for walking up and down on foot. Stairs can be made from stone, wood, steel, plastic, etc



*Picture 1.2.4.1. Example of corduroy (tactile) paving at the top of the stairs and double handrails with contrasting color.*



*Picture 1.2.4.2. Example of external stairs with stripe surface on top and bottom stair landings and with colored stripes at both handrail and landings*

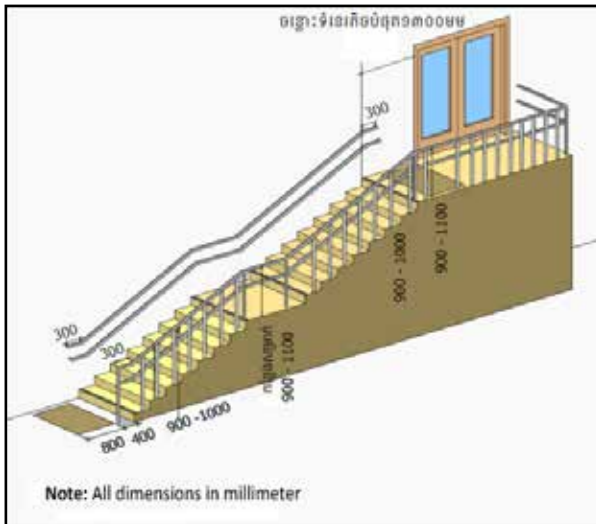


*Picture 1.2.4.3. Example of preparation of corduroy (tactile) paving surface for persons with visual impairment, at the beginning and the end of the external stairs*

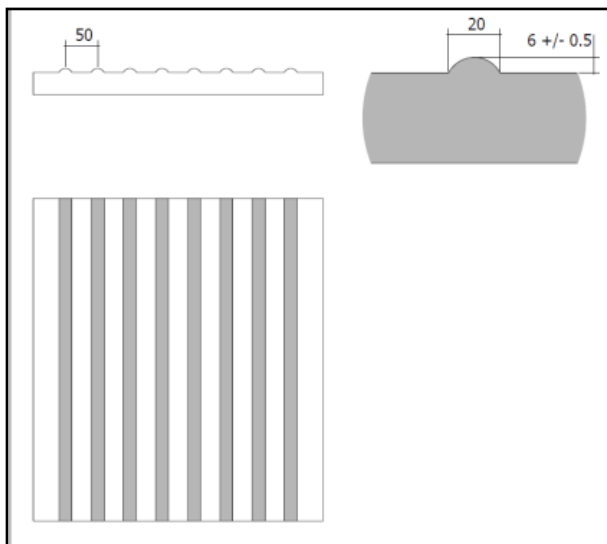


*Picture 1.2.4.4. Example of each step of the external stairs with handrails*

Picture 1.2.4.5. Example of standard size of external stairs



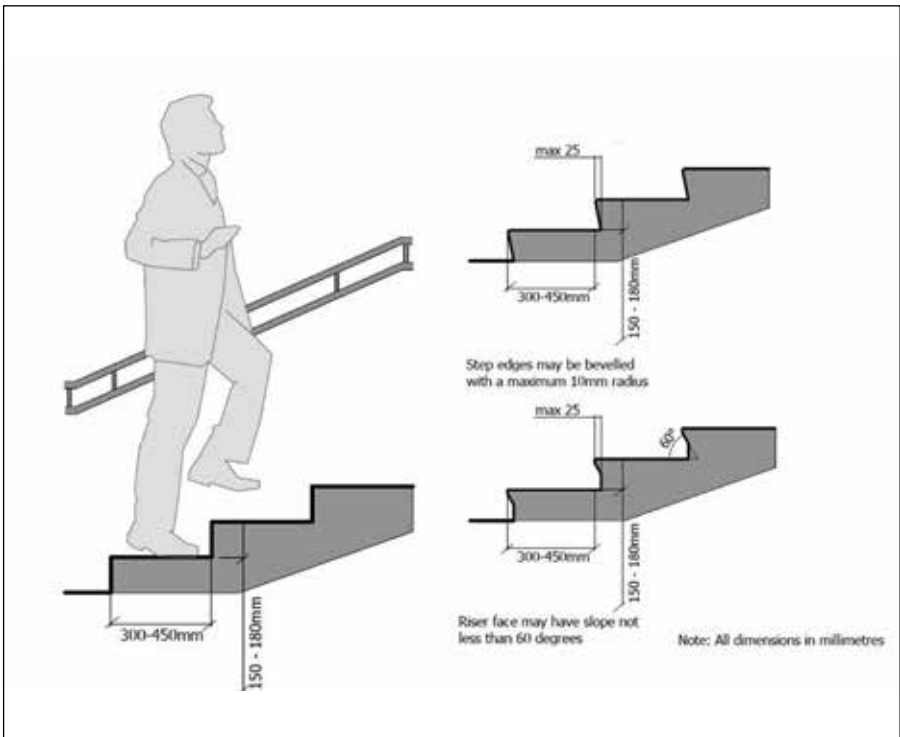
Picture 1.2.4.6. Example of standard size of surface indicating an obstruction ahead



❖ Standards and guidelines for external stairs

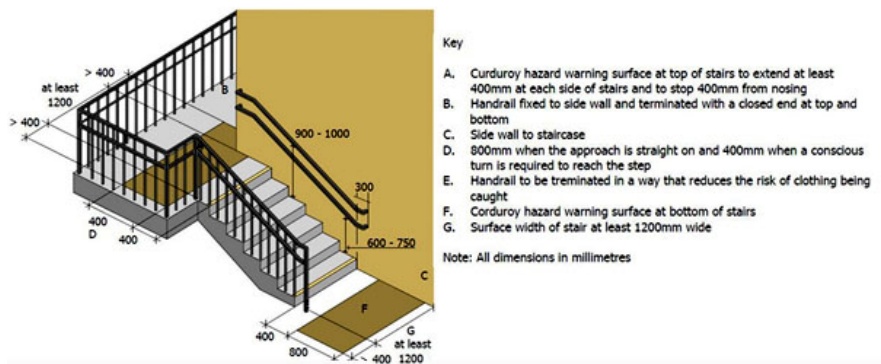
- Surface indicating an obstruction ahead shall be a contrasting color from the flat surface and shall not be red.
- External stairs shall be fixed or portable according to users' needs and can be made from wood, stone, steel, brick, etc.
- Stairs shall be provided in parallel with ramps.
- Each step shall have uniform riser heights and uniform tread widths, as illustrated below:

*Picture 1.2.4.7. Visibility of step edges*



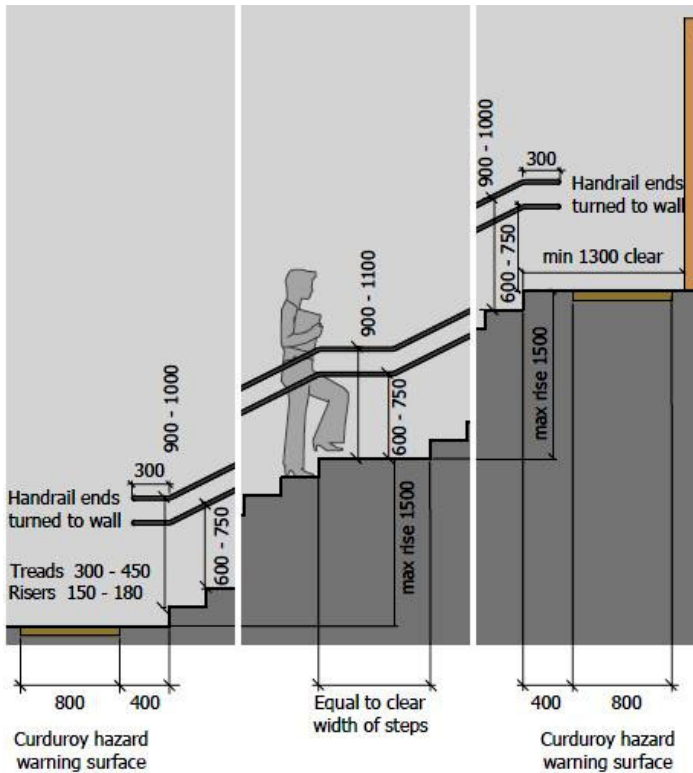
- Each edge of the stairs shall be painted.
- Avoid providing stairs permitting only one-way travel.
- Free space shall be provided at the beginning and the ending of the step where the riser equals the tread width.
- Notification signals shall be provided at the clear space at the beginning and the ending of each flight of stairs, as illustrated below.

*Picture 1.2.4.8. External stairs with notification signal at the beginning and ending points*



- Handrails shall be provided at all steps, including landings.
- Handrails shall be provided in the center if the width of the stairs is greater than 2,000 mm.
- The bottom surface of stairs smaller than 2,100 mm shall be protected.
- Lighting along steps and landing areas shall be 10 lux, and external stairs shall be installed along with ramps to provide options for users.

Picture 1.2.4.9. External stairs



Note: All dimensions in millimetres

- The dimensions of steps shall be uniform from the beginning till the end.
- The stair riser shall be 150 mm wide, and the tread shall be 300 mm wide.
- Open space between steps (i.e., the absence of risers) shall not be permitted.



- Tactile surface of 50 mm wide shall be provided in parallel to the front of each step in a distinct color.
- All steps shall have a length at least 1200 mm and shall be barrier-free.
- Level landings, at least 1200 mm x 1200 mm, shall be provided at every 10 steps and at every turning point.
- Tactile paving surface of 300 mm x 300 mm shall be provided at the beginning and ending points of the steps.
- Each step shall be built straight and level, without slant.
- Steps shall not be rounded; this will prevent slipping.
- For stairs with a height of 450 mm or three or more steps, double handrails shall be provided, where the taller handrail's gripping surface shall be mounted at 850 mm to 900 mm, and the lower handrail, which is for children, shall be mounted from 600 mm to 700 mm from the surface.

### 1.2.5. Internal Stairs

Internal stairs are a means for walking up or down between levels within a building. They could be made from stone, wood, steel, plastic, etc.

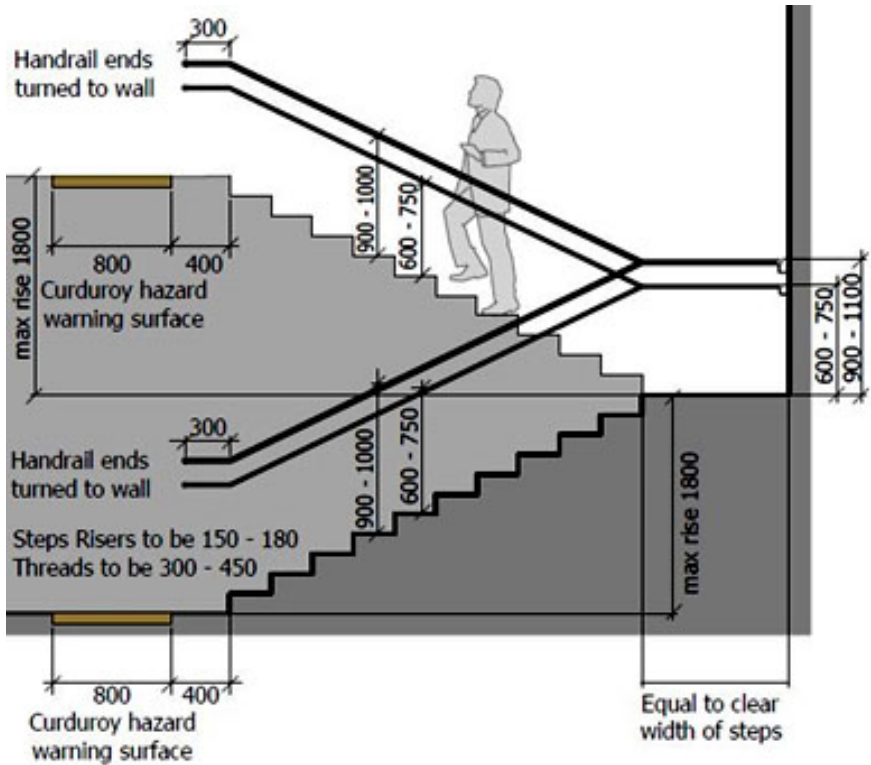


*Picture 1.2.5.1. Example of tactile paving surface used as a detectable warning at beginning and the ending of interior stairs*

❖ Standards and guidelines for internal stairs

- Level landings shall be provided every 10 steps or less.
- Landing areas of 1200 mm shall be at the beginning and ending of the stairs and shall not be affected by opening doors.

Picture 1.2.5.2. Internal stairs

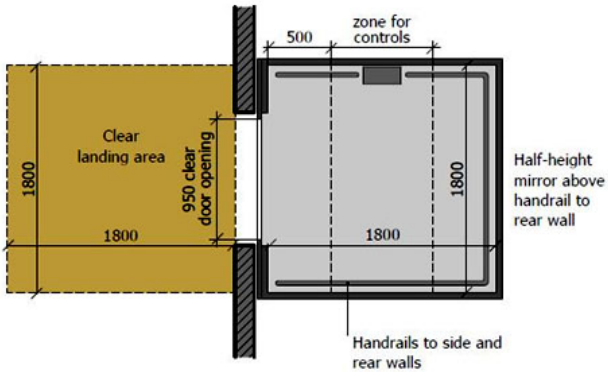


Note: All dimensions in millimetres

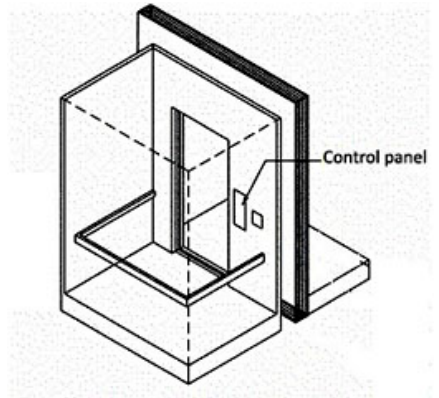
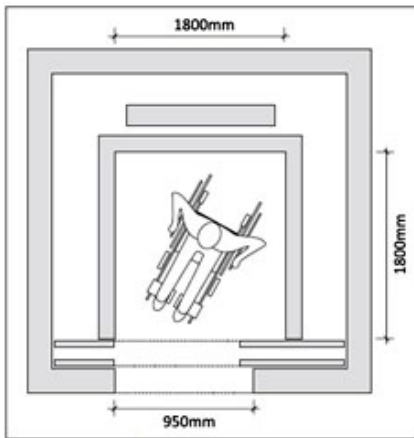
### 1.2.6. Passenger Lifts

Passenger lift refers to an electrical, rectangular-shaped mechanism used as a means of moving up or down between levels within a building. It is the best means to move vertically, particularly for those who cannot or do not want to use stairs or for buildings with many stories.

Picture 1.2.6.1. Example of dimensions of a passenger lift



Note: All dimensions in millimetres



## ❖ Standards and guidelines for passenger lifts

- Passenger lifts shall be installed at the most appropriate locations.
- The installed passenger lift shall be accessible to all; it shall be wide, flat, and it shall have a sound system, braille, and tactile signals. In other words, it shall be universally designed.
- Passenger lifts shall be installed along with the stairs.
- The dimension of passenger lifts in public areas such as railway stations, airports, and hotels shall be capable of carrying as many passengers as appropriate.
- Passenger lifts in hospitals shall be large enough to accommodate various equipment.
- Generally, the size of a passenger lift shall be 2000 mm x 1800 mm.
- For a small area, the width of passenger lift can be 2030 mm and the depth can be 1525 mm.
- If the size of the passenger lift cannot be provided as above, the width can be 1100 mm and the depth can be 1400 mm.
- Clear space of 1800 mm x 1800 mm (minimum 1500 mm x 1500 mm) shall be provided in front of the door and buttons of the passenger lift.
- Avoid sharp edge everywhere.
- For buildings with more than 3 passenger lifts, all lifts should be provided on every floor, all of which consist of at least one lift with the minimum internal size of 2000 mm x 1100 mm together with a barrier-free entrance of at least 900 mm.
- Using glaring and sound-proof walls can cause difficulty to persons with low vision or hearing loss.

❖ Bottom surface

- The height of the bottom surface of a passenger lift shall be between 10 mm and 20 mm from the external surface when it does not contain any passengers.
- The bottom surface of passenger lift shall be slip-resistant and shall have reflect light. It shall be textured and soft but not dark.

❖ Wall surface

- The walls of passenger lift can be made from either glass or other material, as different surfaces have advantages and disadvantages.
- The color of the internal walls of the lift shall be different from that of the roof and external surface to avoid light reflection.

*Picture 1.2.6.2. Examples of different color of the bottom surface, wall, and door*



- If a passenger lift has only one door, a mirror can be placed at the back.
- The mirror shall be safely mounted at a height of at least 900 mm above the floor surface.
- The mirror shall not cover the full dimensions of the wall to avoid confusion.
- If the walls of the lift are made of glass, marks or signage shall be provided at a height from 850 mm to 1000 mm or from 1400 mm to 1600 mm from the ground with contrasting color.

#### ❖ Door

- Lift doors shall be power-assisted panels or side doors operated automatically.
- The width of passenger lift doors shall be a minimum of 950 mm.
- Doors shall remain open at least 8 seconds and more for the elderly and persons with disability.
- Doors of passenger lifts shall be a contrasting color from the wall.
- Two doors, one on each side of the passenger lift, can be provided so passengers do not need to turn around to exit.
- Small passenger lifts, with a width of 1100 mm and depth of 1400 mm, may be provided for low-rise buildings.
- Emergency alarm system shall be provided to alert persons with disabilities included audio and text.
- An automatic sensor system shall be provided in the passenger lift to allow the door to re-open in the event the lift collides with any object or obstruction.
- The automatic sensor system shall be mounted from 500 mm to 600 mm high from the bottom surface of the lift.

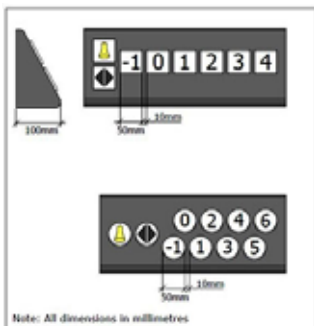
- Power-assisted door system should set appropriate times for persons with disability and the elderly.

#### ❖ External buttons

- Button for exterior lift door shall be placed at 500 mm to the side of the lift and 600 mm to 1200 mm above the bottom surface of the passenger lift.
- Buttons shall have a diameter of 50 mm or 50mm square.
- Braille and tactile indicators shall be placed above or at the right side of the control buttons.
- These braille and tactile indicators shall be designed as numbers, English or Khmer letters, or any symbols.
- Tactile indicators should be mounted at a height of at least 15 mm and shall be raised at least 1 mm.

#### ❖ Internal buttons

- Control buttons shall be provided in the interior of the lift to open or shut doors.
- The number of each floor on the buttons of the passenger lift shall be clear and tactile, along with audio signal.



*Picture 1.2.6.3. Example of control buttons of passenger lift*

#### ❖ Grab bar

- Besides the door of the passenger lift, a grab bar shall be provided on the other three sides and shall be attached horizontally to the wall with 900 mm high from the floor.
- The size of the grab bar shall be from 30 mm to 45 mm with a gap of 30 mm to 50 mm from the wall.
- The holding point of the grab bar shall be mounted from 850 mm to 950 mm high.

#### ❖ Emergency button and call in the passenger lift

- Emergency call button shall be mounted at a height from 900 mm to 1200 mm above the ground and 500 mm from the side of the door.
- The length of telephone wire shall be at least 900 mm.
- Audible and visual emergency warning systems and information transfer system shall be provided in each lift and shall be connected to building management office or care facility.
- If there are many passenger lifts in one place, control buttons shall be connected systematically.

#### ❖ Signage

- Signage shall be placed close to the passenger lift and be easily seen and understood.
- Signage shall be mounted at a height from 1800 mm to 2500 mm.

#### ❖ Audio and alarm systems

- Audible signals shall be provided in the passenger lift to inform passengers while using.



- Audio system shall be clear while going up or down.
- The audible sound level shall be from 35 dB (V) to 65 dB (A).
- Audible alarm systems shall be provided in all passenger lifts, and information transfer system shall be connected.
- Alarm lamps shall strobe close to the audible alarm to transfer information or notification. When the lamp strobes, it indicates that an emergency announcement has been received. Information in both English and Khmer language shall be placed close to the strobe light.
- The system shall be operated by power standby in case of electricity outage.

❖ Lighting

- Light in the lift shall be installed carefully to avoid reflection. The illumination level shall be 100 lux.



*Picture 1.2.6.4. Example of light in the lift*

## ❖ Folding seat

- Seats that can be folded toward the wall shall be provided in the lift for use as needed.
- The folding seat shall be 300 mm to 400 mm deep, 400 mm to 500 mm wide, and shall be mounted at a height of 500 mm above the ground, with weight capacity of 100 kilograms.

### 1.2.7. Evacuation Lifts

## ❖ Standards and guidelines for evacuation lifts

- Evacuation lift shall be provided to evacuate passengers during emergency.
- The evacuation lift shall give priority to the elderly, pregnant women, persons with disability, and children during emergency.
- The evacuation lift shall be equipped with electricity at all times.
- Control buttons shall be provided for only authorized users.
- Clear and easy-to-understand signage providing direction to the evacuation lift shall be provided everywhere.
- Size and capacity of evacuation lift shall be provided at appropriate location.
- The dimensions of bottom surface, doors, external buttons, internal buttons, grab bars, emergency call button, signage, sound, lighting, and folding seat shall be the same of those of the passenger lift above.

### 1.2.8. Stair lifts



*Picture 1.2.8.1. Example of a stair lift: A fixed seat attached to handrail*

- ❖ Standards and guidelines for stair lifts
  - Stair lifts shall be provided for existing buildings that cannot be equipped with lifts.
  - Clear and easy-to-understand guidelines shall be provided.
  - A clear space of 890 mm in width and 1525 mm in length shall be provided.
  - Control device shall be simple and easy to use.
  - Stair lift shall be as firm and safe as possible.
  - The stair lift shall be mounted at 600 mm to 1100 mm above the ground.
  - All lift devices shall be removable.
  - The stair lift shall have a minimum weight capacity of 100 kg.

### 1.2.9. Escalators



## ❖ Standards and guidelines for escalators

- Escalators are used for moving up or down in public buildings such as shopping malls, airports, railway stations, etc.
- Appropriate distance of the transfer step should be taken into account to ensure that passengers have enough time to step on or off the escalator.



*Picture 1.2.9.1. Example of escalator equipped with light on moving handrails*

- Escalators shall not be treated as normal stairs, as they can be hazardous.
- Therefore, hazard signage, guidelines, and guards should be provided.
- Movable handrails shall be mounted at a height from 900 mm to 1100 mm from the steps.
- The height of both lower and upper handrails shall be at least 700 mm above the step.
- The color of the handrails shall be different from that of surrounding objects.
- The speed of the handrails shall be in line with that of the steps.
- The minimum width of the escalators shall be 580 mm and the maximum shall be 1100 mm.
- The maximum height of each step shall be 240 mm.

- Each tread shall be firm, slip-resistant, and non-glare.
- Escalator treads shall be marked by a strip of clearly contrasting color, 55 mm in width, placed parallel to and on the nose of each step.
- A clear space of about 5 meters shall be provided at the entrance and exit of busy escalators.
- The minimum length of the upper movable part shall be 2000 mm, and the lower part shall be 1600 mm.
- A voice alert shall be installed at beginning and the ending points.
- The speed of the escalators shall be limited to 0.75 m per second.
- The speed shall be set more slowly if there are more users.
- The angle of the escalators shall be between 30 and 35 degrees.
- Emergency control buttons to stop the escalators shall be placed properly within the reach range.



*Picture 1.2.9.2. Example of escalators traveling in two opposite directions, a stop button attached to the stair in the center*

- Clear signage shall be provided.
- Ensure that the direction of the escalator is clearly indicated.
- Ensure that each step has proper color.
- A landing space at least 2000 mm on the top and 1600 mm on the bottom shall be provided.

## 1.2. 10. Travelators

### ❖ Standards and guidelines for travelators

- The minimum width of travelators shall be 1500 mm with a clear space of 2300 mm in front of the travelators.
- Travelators are part of a movable route designated in a clear space on long and flat surfaces, such as airport and train terminals, for persons who cannot walk long distances or who carry heavy luggage.
- The direction of this route shall be clearly indicated, and signage and guidelines shall be provided.
- The color of the handrails shall be unique.
- There shall be signage at least 6000 mm from the end of each travelator.
- The whole surface shall be slip resistant and non-reflective.



*Picture 1.2.10.1. Example of travelator*

- The speed of the travelator shall be set as low as possible. The appropriate speed is 0.5 meter per second. (The maximum speed is 0.75 meter per second.)
- Stop buttons shall be located properly within reach range.
- If there is slope, there should be 1:20



*Picture 1.2.10.2. Sample of travelator with signage*

- Bollards shall be installed properly at the ends of the travelator, and their color shall be bright and clear.
- Sound system shall be installed at the beginning, in the middle, and at the ending of the travelator.

### 1.3. Surface Materials



- ❖ Standards and guidelines for surface materials
  - Surface materials shall be used and installed properly to ensure that that the exterior view is appropriate.
  - Ensure that all surface is firm and slip-resistant.
  - Avoid bumpy, loose, or weak surfaces.
  - Be aware that some surfaces may become slick with wear.
  - Avoid using too many bold colors or lines on surfaces, which may cause confusion.
  - Consider the convenience of use and the need of future maintenance.

## 1.4. Street Furniture



- ❖ Standards and guidelines for street furniture
  - Street furniture, which includes streetlight poles, seats, tables, information boards, traffic lights, mailboxes, power boxes, junction boxes or poles, bollards, advertisement boards, etc., is mostly installed in public areas and must be installed properly to ensure safety.
  - All street furniture shall be placed or installed in a straight line.
  - Street furniture shall be placed on a straight route or behind the border of the route.
  - Ensure that street signage is placed above the street at a height of 2300 mm or more.
  - Ensure that the color of all street furniture is different from that of the background.
  - Panels that improve visibility shall be installed on street poles.
  - Horizontal signage shall be provided where there is a pole to avoid accidents for persons with low vision.
  - Bollards shall not be connected by chain or rope.
  - Drinkable water shall be provided close to seating or standing places.



- Seats shall be located at frequent and reasonable intervals and far from the vehicle route.
- Easy-to-use tables shall be provided along the route.
- The bottom surface of poles shall be raised to a height of 100 mm above the normal surface.
- Any object that protrudes into paths shall be mounted at least 2000 mm high.
- Tactile warning signage shall be installed on the route around the hazardous area.

#### 1.4.1. Lighting and Signage



#### ❖ Standards and guidelines for lighting and signage

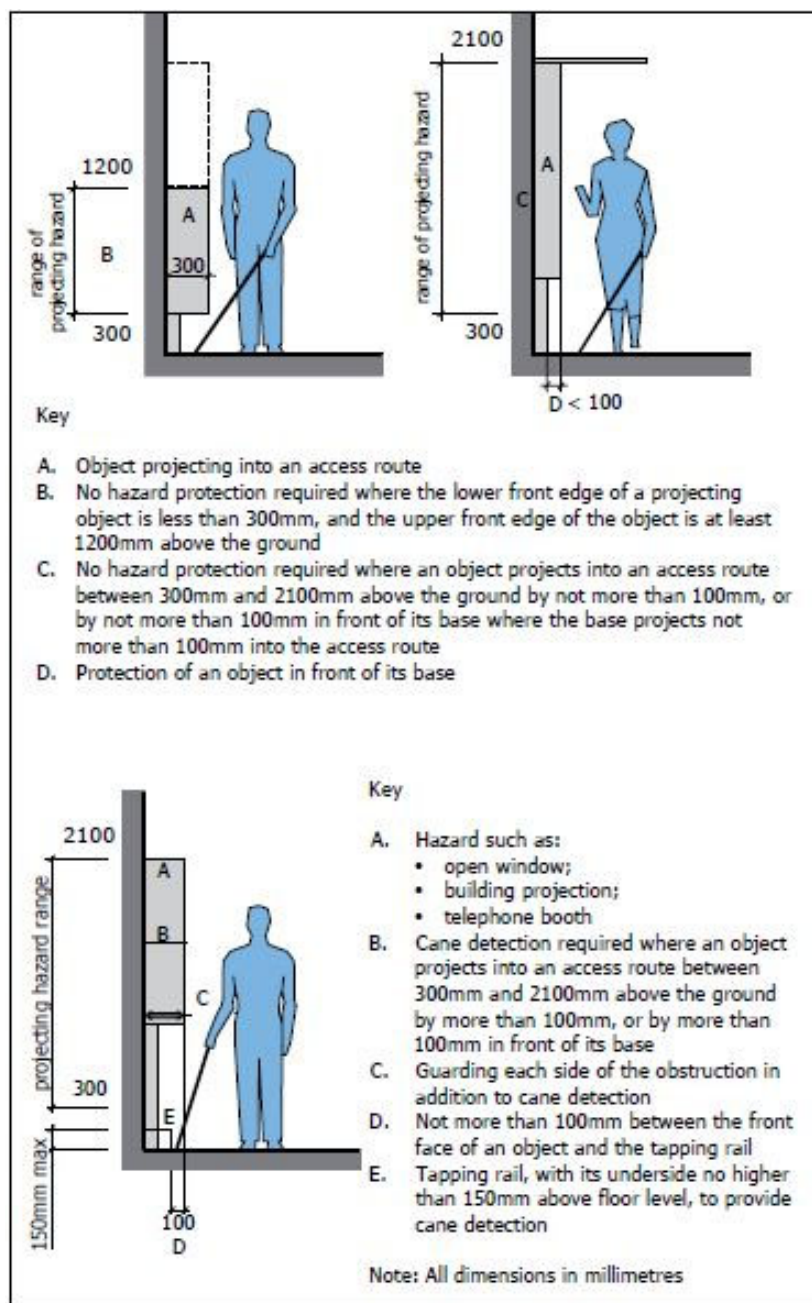
- Lighting and signage poles shall be attached to buildings or walls, based on location, as appropriate for the use of the route.
- If lighting and signage poles cannot be attached to a wall, they shall be installed behind the route at a maximum distance of 275 mm from the front part of the pole and the signage. If lighting and signage poles need to be placed close to the route, the minimum distance shall be 500 mm from the edge of the curb or 600 mm if the route is curved or steep.
- Lighting and signage poles shall be placed at a minimum interval of 1000 mm.

- Hanging signage and other objects above the route, such as lamps attached to walls or trees, shall be mounted vertically at a height of 2300 mm above the ground.
- Signage may be mounted at a height of 2100 mm for one-way pedestrian path at a railway station or bus station, but if the route is also used by drivers, the signage shall be mounted at a height of 2300 mm.
- If tree branches or bushes protrude into the route, they shall be trimmed to make the route wider, with a height of 3000 mm.

#### 1.4.2. Placement of Street Furniture



Picture 1.4.2.1. Placement of street furniture



## ❖ Standards and guidelines for placement of street furniture

- All street furniture shall have contrasting colors from bottom and side surfaces.
- The color of the street furniture shall not be grey.
- Other objects attached to vertical bars or poles shall be painted in different color from the bars or poles with the size of 150 mm and shall be mounted at 1500 mm high above the ground.
- Lamps shall be installed on top of the colored poles.
- Avoid installing various objects such as rubbish bins, telephones, or mailboxes on the pedestrian path, where they become obstacles.
- All attached objects shall face the route and be easily visible to pedestrians.
- Objects placed on the street, such as maps with two supports, shall be mounted from 250 mm to 400 mm high above the ground to be easily visible to pedestrians.
- Signage shall not be mounted higher than 150 mm, and the color of the poles shall contrast with that of that of side and bottom surfaces.

### 1.4.3. Bins



❖ Standards and guidelines for bins

- The height of bins shall be approximately 1300 mm above the ground and the covers shall be 100mm height from the ground.
- Bins with different sizes, colors, and locations shall be provided, taking the number of users into account.
- All bins shall always have lids.
- Bin signage or labels shall be provided.

**1.4.4. Bollards**

❖ Standards and guidelines for bollards

- Bollards can be in different shapes (straight, curved, or flexible) based on preferences.
- Bollards are provided to stop vehicles from entering a walking path, to divide a pedestrian path from other types of route, or any other purpose.
- If installed improperly, bollards can be an obstruction to persons in wheelchairs or with baby strollers, and they can be hazardous to persons with low vision.
- If bollards are required to be installed, they shall be easily seen by using a contrasting color, and they shall be mounted at a height of 1000 mm with a diameter of 70 mm to 200 mm.
- Crossing road from a bollard to the next shall be sized to 1200 mm wide from the 2 side curbs.
- Bollards shall not be connected using chains or ropes, as that can be hazardous to persons with low vision. If it is necessary to do so, the chains shall be painted in a contrasting color from that of the bollards, the bottom surface, and the background. The brighter the color, the better.



### 1.4.5. Gates

#### ❖ Standards and guidelines for gates

- Some gates have spring hinges that enable the gate to be self-closing, but ensure that the gate does not close too forcefully or quickly.
- Door-opening systems shall be firm and easy to use, and the path shall be extended to 500 mm at both sides. A latch shall be provided so it is easy to open the door.
- A clear space of 2000 mm long behind and in front of the door shall be provided to ensure that there is no obstruction.



### 1.4.6. Drinking Fountains



*Picture 1.4.6.1. Example of signage indicating a drinking fountain*

#### ❖ Standards and guidelines for drinking fountains

- The location of drinking fountains should be easily accessible to all. It should be easy to understand how to use the drinking fountains.
- A clear space of 430 mm to 500 mm below the drinking fountains shall be provided, and the height of the tap shall be from 750 mm to 915 mm.
- The drinking fountains should be installed in an unobstructed and safe area for users.

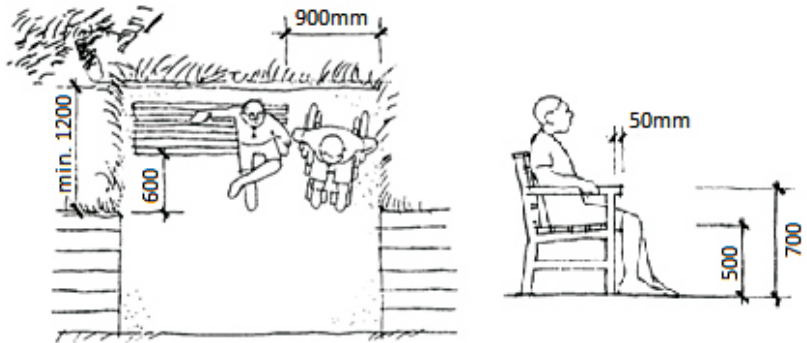
- If a place is equipped with two drinking fountains, both shall be mounted at different heights so they are accessible to short and tall users.
- The size of the space surrounding the drinking fountain shall be 800 mm x 1300 mm.
- The tap shall face the front and shall be mounted at a height of 100 mm above the tray surface.
- Wastewater shall be managed properly so it will not flow to the ground

#### 1.4.7. Seating



#### ❖ Standards and guidelines for seating

- Both outdoor and indoor public seats and benches shall be designed in accordance with dimensions as follows:
  - Seat shall be 400 mm to 450 mm high.
  - The height of backrests shall be 750 mm to 790 mm.
  - Seating shall be 400 mm to 450 mm deep.
  - The angle between seats and backrests shall be 100 to 105 degrees.
  - The height of armrests shall be 220 mm to 300 mm from the seating.
  - Armrests shall protrude 75 mm horizontally.
  - Vertical bars under the seating shall be 150 mm above the ground.



- Seating shall be provided at regular intervals along routes and shall be consistent with the height and route location, such as exterior staircases and ramps.
- At picnic and rural areas, seating shall be provided at resting areas and pedestrian areas.
- Bench should place 600mm in front of seating.
- The surface on which the seats are placed shall allow for water flow and shall be firm and well balanced.
- 900 mm of firm surface close to seats shall be provided to allow access for persons who use wheelchairs, carts, baby strollers, etc.
- The height of seats shall be at least 450 mm, and the width shall be at least 500 mm.
- Seats may be mounted at a height of 500 mm to 750 mm to provide alternative options for some persons.
- Foot space shall be at least 100 mm deep to facilitate seated persons standing up easily.
- Seats with backrests are beneficial, and grab rails shall be mounted at a height of 200 mm from the seating to assist users to sit down and stand up.



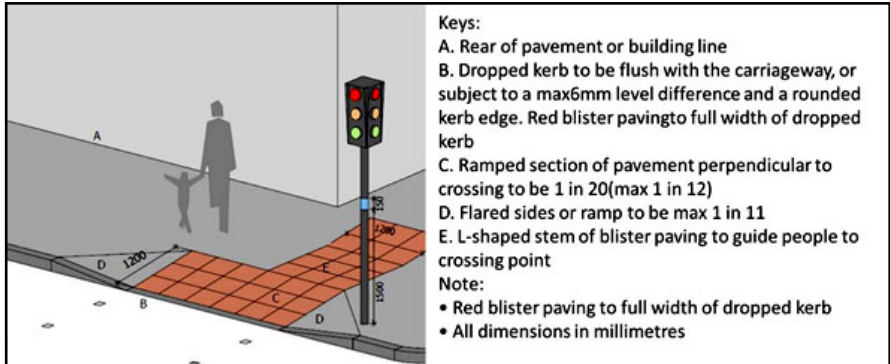
- Seating type should be consistent within one row, such as seats with or without armrests. Different types of seats in the same row may cause confusion, especially to persons with low vision.
- Dining tables shall be provided in a safe and proper area close to parking lots.
- Dining tables shall be provided under a roof with convenient and accessible route.
- Tables and seats shall be placed on a firm surface and well balanced.
- The height of the table shall be 700 mm from the bottom surface and 750 mm to 850 mm from the top surface to the ground, making them universally accessible.
- If table and seat are fixed, there should be adequate space to sit easily. Also, enough surrounding space shall be provided for persons with crutches, walking aids, or wheelchairs.
- Dining tables shall be 2000 mm wide, easily accessible for all, regardless of their age, size, or capabilities.

**Standard distances between one seating area to the next on public routes**

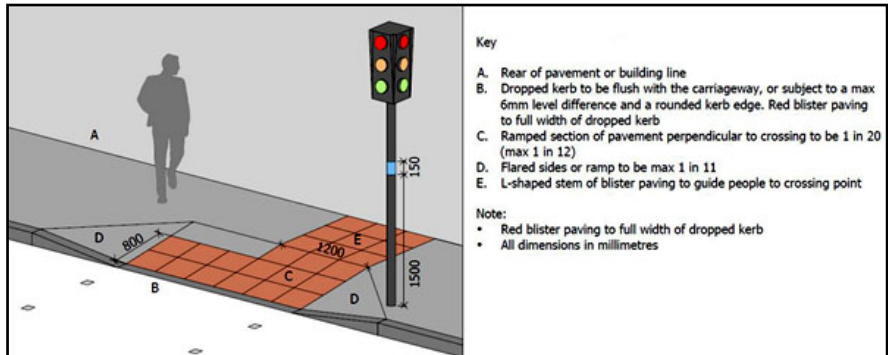
<b>For users who are</b>	<b>Distance in meters (m)</b>
Persons with visual impairment	150 m
Persons who use wheelchairs	150 m
Persons with disabilities who can walk without walking aid	100 m
Persons with disabilities who use crutches or other walking aid	50 m

## 1.5. Pedestrian Crossing Points

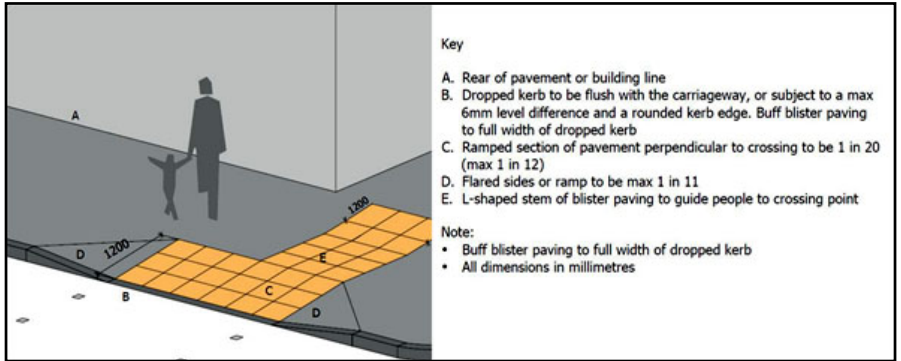
Picture 1.5.1. Pedestrian crossing points showing the slope of the curb and red surface at traffic-light points



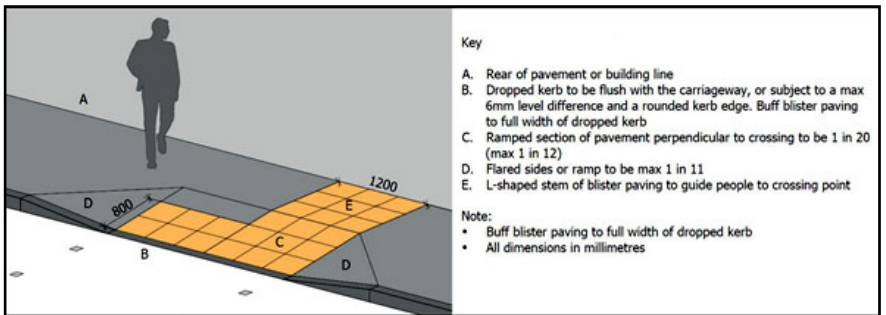
Picture 1.5.2. Pedestrian crossing points on dead end road, showing curb ramps and red surface at traffic-light points



*Picture 1.5.3. Pedestrian crossing points at road that has no dead end, showing slope of curb and brown surface at non-traffic-light points*



*Picture 1.5.4. Pedestrian crossing points on dead end road, showing slope of curb and brown surface at non-traffic-light points*



❖ Standards and guidelines for pedestrian crossing points

- Pedestrian crossing points shall be prepared to provide safety and independence for all persons, including those with disabilities, being easy to access, understand, and use. Pedestrian crossing points shall be provided on all small routes, main routes, streets, etc.
- Crossing points shall be prepared in consultation with road experts.
- Crossing points shall be located in safe and suitable areas, depending on the number of users.

- Crossing points should always be well drained.
- Ensure that crossing points are equipped with a slope or curb ramp as shown in the above pictures.
- Ensure that the width of crossing points is a minimum of 1200 mm.
- Ensure that crossing points allow for easy water flow, which shall be steeper than 1:50.



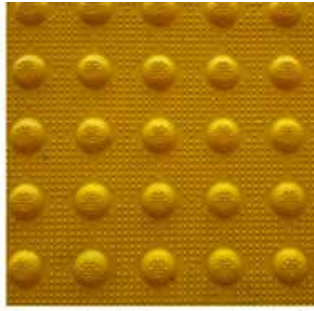
## 1.6. Tactile Paving Surfaces



- ❖ Standards and guidelines for tactile paving surfaces
  - Colorful pavers for persons with visual impairment shall be provided at all pedestrian routes (both interior and exterior), corridors (both interior and exterior), outdoor ramps, indoor ramps, mobile ramps, and slopes.



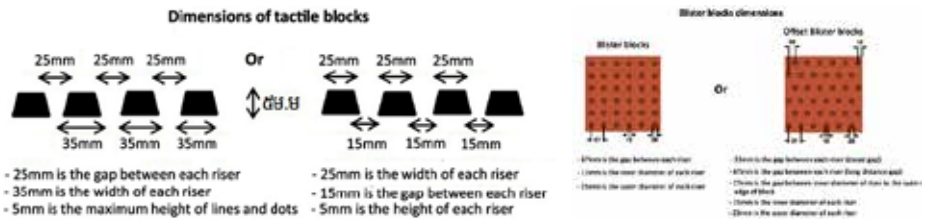
Line-type blocks indicate the correct path/route to follow



Dot-type blocks indicate warning signal of changing directions or warn of obstacles

- The above tactile pavers for persons with visual impairment shall be in any bold colors in contrast to route colors.
- Tactile paving surfaces shall be provided after consulting with persons with low vision or other visual impairment.
- Tactile paving surfaces shall be connected to one another following the instructions.
- Use tactile blister paving surfaces to denote that there is no curb.
- Red tactile blister paving surfaces shall be provided at crossing points with traffic light.
- Brown tactile blister paving surfaces shall be provided at crossing points without traffic light.
- Corduroy paving surfaces indicates the direction to travel straight forward.
- Round blister paving surfaces indicates that the route will turn left or right, a destination is near, or there is something ahead.
- Bricks of blister paving surfaces shall be 300 mm long and shall be located at an interval of 300 mm before entrances to stairs and ramps.

- Bricks of corduroy paving surfaces with a height of 300 mm shall be placed fully across exterior entrances of stairs and ramps. If ramps made of bricks are not available or are too expensive, wooden or metal frames can be provided as a mold to press on cement and paint in accordance with the requirements.
- The height or thickness of corduroy and blister paving surface bricks shall be only 5 mm. If it is higher than that, it may cause persons to stumble



### 1.6.1. Blister Surface for Pedestrian Crossing Points

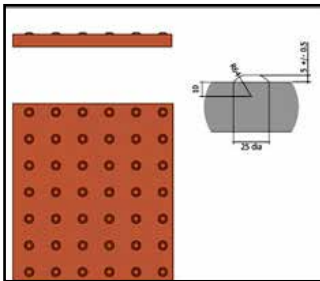


- ❖ Standards and guidelines for blister surface for pedestrian crossing points



*Picture 1.6.1.1. Example of red bricks used for crossing points with traffic light*

- Red bricks with blister surfaces for persons with low vision shall be provided at crossing points, especially at the end of one route and the beginning of another route where a curb is not provided.
- This type of tactile surface shall be provided at pedestrian crossing paths, curb ramps, and some routes where pedestrian paths and motorways are separated through the use of different colors and equipment.
- At the intersection with the traffic lights, the laying of colored round blister can lead the persons with visually impaired to cross the roads.
- The following pictures show the blister surface of colored bricks.



*Picture 1.6.12. Color and size of round blister*

- Round red blister surfaces shall be placed at only crossing points with traffic light.
- Round brown blister surfaces shall be placed at only crossing points without traffic light.
- Every part of the surface shall contrast with the color of the round blister brick to provide a signal for persons with visual impairment.
- At crossing points with traffic light at curb ramps in parallel with motorways, round red blister surface brick shall be placed at a length of 1200 mm and full width across the route at curb ramps.

- At crossing points with traffic light, red bricks shall be provided at one side with the size of 800 mm.
- At crossing points with traffic light, the crossing routes of blister surface shall be 1200 mm wide, expanded from curb ramps backward to the back of the route or building line to help pedestrian reach the crossing points.
- At crossing points without traffic light, surface of brown brick shall be expanded fully across the width of the curb ramp.
- The depth of blister surface depends on whether pedestrian route runs parallel with motorways or not.
- If pedestrian route runs parallel with motorways, colorful brick shall be 1200 mm deep, but if it does not run parallel with motorways, colorful brick surface shall be just 400 mm.



*Picture 1.6.1.3. Example of brown surface at crossing points without traffic light*



*Picture 1.6.1.4. Persons with visual impairment using a white cane on blister surface*



*Picture 1.6.1.5. Example of red blister surfaces*



- The end of each blister surface denotes the edge of the curb as well as the end of the route. Please note that the last blister of each blister surface of the bricks is very important.
- The corduroy paving surface shall be parallel with the edge of the curb and shall be placed approximately 500 mm from the edge.



*Picture 1.6.1.6. Example of round brown blister and corduroy paving surface*

- At the back of the edge of all colorful bricks in crossing points with or without traffic light, it shall be perpendicular to the lane of motorways which could be adaptable to the edge of the back of the route and direction of crossing points

## 1.6.2. Corduroy Paving for Hazards



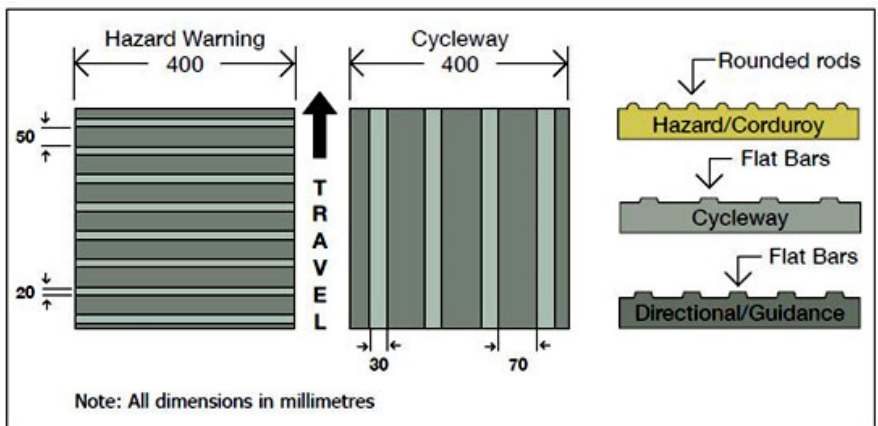
- ❖ Standards and guidelines for corduroy paving for hazards
  - Corduroy paving is used to signal pedestrians that they are close to or approaching hazardous areas and should walk cautiously.
  - It indicates hazardous areas needing caution, such as stairs, crossing points, ramps, etc.
  - Routes with corduroy paving surface shall not be provided on bus ramps to avoid any obstruction.
  - Bricks for corduroy paving surfaces shall contrast in color with the color of pathways, but red shall not be used for crossing points
  - Frame with corduroy paving surface shall be placed at all directions and in all situations.

Picture 1.6.2.1. Example of signal surface at edge of stairs



- Hazard warning paving shall be provided in the middle of route and mounted at a height of 6 mm to indicate hazardous areas such as the bottom or top of stairs and shall be parallel with the route.
- All bars installed on each road shall be in parallel.

Picture 1.6.2.2. Example of hazardous signage and vehicle signage



*Picture 1.6.2.3. Blister paving surface and corduroy paving surface in parallel with vehicle (bicycle) route (right) and pedestrian pathway (left)*



- Corduroy paving should extend to the full width of the steps, plus at least 400 mm to either side wherever possible. However, tactile paving with a corduroy surface should not be used on other ramps.
- Corduroy paving shall be provided at Corduroy paving should be positioned 400 mm from the first step and extend to a depth of 800 mm if the steps are in the direct line of travel or 400 mm if a deliberate turn through 90 degrees is required.
- These dimensions help persons to understand the danger and give them sufficient time to react.

## 1.7. Entrances



*Picture 1.7.1. Example of an entrance to a building*

## ❖ Standards and guidelines for entrances

- Entrances shall be clearly visible and stand out.
- Entrances and exits shall be universally designed.
- Clear space at entrances and exits, in both interior and exterior doors, shall be provided.
- The space of entrances to outdoor parking lots shall be 2440 mm x 2440 mm.
- A clear space in front of the entrance/exit shall be provided so that vehicles can stop.
- The thickness of door thresholds shall not exceed 10 mm, and ramps shall be provided.
- A clear space of 600 mm shall be provided at one side of the door.
- Entrances shall be large and accessible to all and shall be connected properly to various routes, such as from the route to the building or from the parking lot to the building, and signage or color shall be provided for easier navigation.
- Keep space in front of the entrance at least 1400 mm x 1400 mm for persons who use wheelchair.

### 1.7.1. Entrance Lobbies



*Picture 1.7.1.1. Example of entrance lobby*

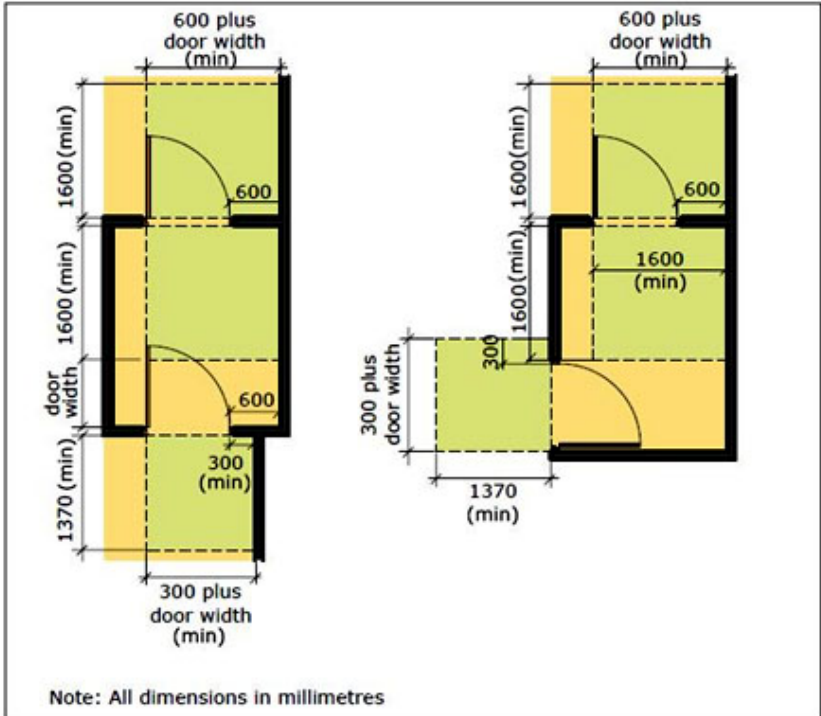


Picture 1.7.1.2. Example of sliding automatic door of entrance lobby



Picture 1.7.1.3. Example of entrance lobby with cover

Picture 1.7.1.4. Example of dimensions of clear space of entrance lobby



❖ Standards and guidelines for entrance lobbies

- Access to the waiting areas shall be located at important areas.
- Interior and exterior doors shall be convenient to use and accessible.
- Sliding doors shall be made between 1,600mm and 1,900mm.
- On the entrance to the waiting area, there shall not be any obstructions or barriers.
- Indoor and outdoor lighting shall be set up from place to place.
- Mirror or doors shall have apparent colors to prevent accidents.

**1.7.2. Reception and Waiting Areas**



*Picture 1.7.2.1. Example of two-tier reception desk*



*Picture 1.7.2.2. Other options of two-tier reception desk*



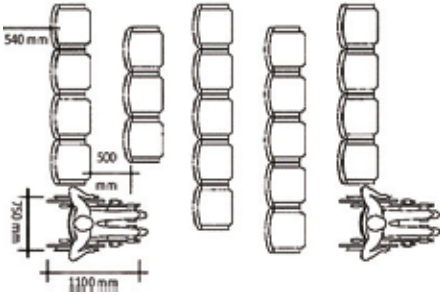
*Picture 1.7.2.3. Example of labeling to provide hearing aids on the reception desk*



*Picture 1.7.2.4. Example of labelling for hearing aids*



*Picture 1.7.2.5. Example of reception desk with normal lighting*



*Picture 1.7.2.6. Example of waiting areas*

Several adjacent seats are usually difficult to set up because those seats are heavy; therefore, separate seat is a better option.



*Picture 1.7.2.7. Example of dual-tier payphone*



- ❖ Standards and guidelines of the reception and waiting areas.
  - Reception and waiting areas shall be visible and easy to notice.
  - The reception desk shall be visible by locating in the entrance.
  - The reception desk shall be equipped with rotating features
  - The lighting shall be clear and luminous for effective communication.
  - Avoid glare that makes it difficult to control.
  - For the reception desk shall be placed at placed on a floor that is sturdy and nonslippery.
  - Provide comfortable seats that are spacious for wheelchair users, parents who push strollers, visually impaired people and those who use crutches.
  - Shall build a toilet near the reception area.
  - The important places shall be painted and labelled with good design and apparent signages.
  - The textphones shall be convenient to use.

### 1.7.3. Queuing Areas and Temporary Barriers



*Picture 1.7.3.1. Example of Placing the queue poles for people queuing*

- ❖ Standards and guidelines of the queuing areas and temporary barriers
  - In each floor, the queuing areas and temporary barriers shall be arranged with a side width of 1,100 mm.

- The queuing areas and temporary barriers shall have a strong handrail and the contrasting color from its original surface.
- Identify devices with barriers to use.
- Seats must be placed at the queuing areas.

## 1.8. Horizontal Circulation

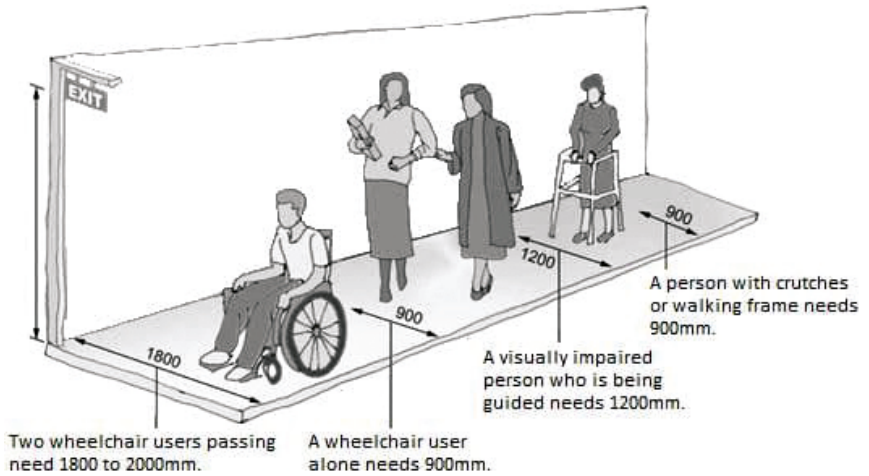


*Picture 1.8.1. Example of the corduroy paving areas for people with visual impairment at the beginning and end of the stairs*

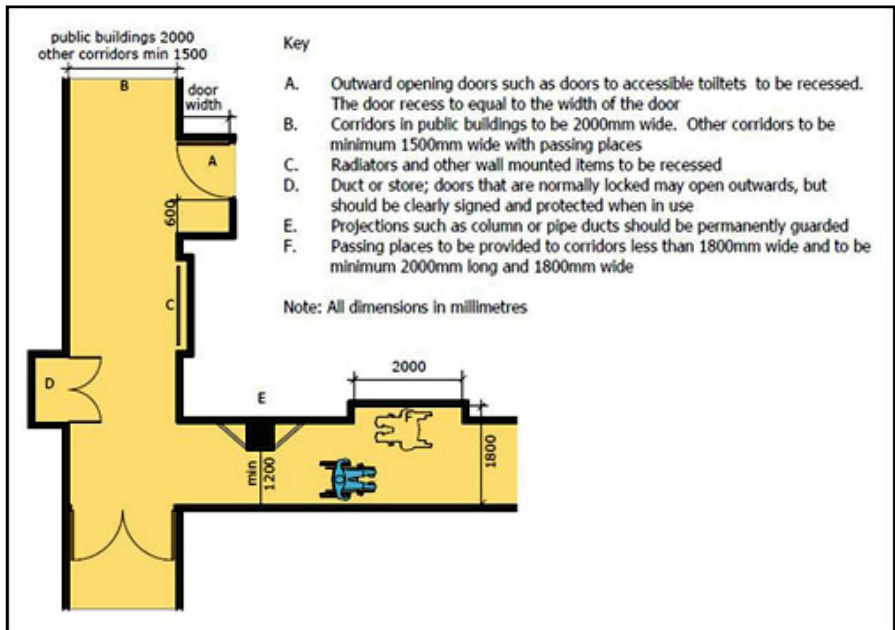
- ❖ Standards and guidelines of the horizontal circulation.
  - The horizontal circulation shall have the correct layout as possible.
  - Avoid altering any layout at the horizontal circulation.
  - Keep the entrance under precaution and keep things out of the way.
  - The horizontal circulation shall have a clear layout which is easy to find.
  - Walkways are often lengthy with handrails on both side and should incorporate seating at regular intervals.

### 1.8.1. Corridors

Picture 1.8.1.1. Example of Corridor in the University

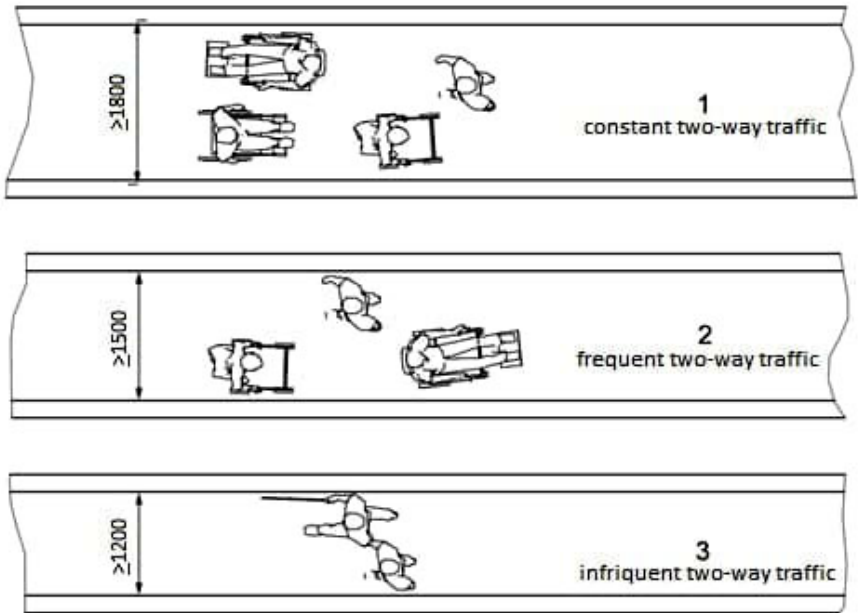


Picture 1.8.1.2. Example of dimension of the area requirement for the corridors



❖ Standards and guidelines of the corridors

- Corridors in public buildings are 2,000 mm wide.
- Corridors in other buildings are 1,500mm wide.
- For the space with a length of 2,000 mm x width of 1,800 mm, the corridor shall be less than 1,800mm wide.



- In case of narrowing the road, the width shall not be less than 1,200 mm.
- The lounge should be as close to the wall as possible.
- Wherever the place protrudes, make sure the width is wide enough.
- Handrails shall be equipped for buildings with a 20-meter corridor.
- Seats shall be placed on the corridors at a length of no more than 20 meters.
- Corridor shall be wide enough to facilitate commuting.
- Corridor width shall be from 1,400 mm to 1,900 mm if there are more people passing by frequently.
- Above the corridor with 2,100 mm high shall be left emptied, and there shall not be any disturbance along the corridor.



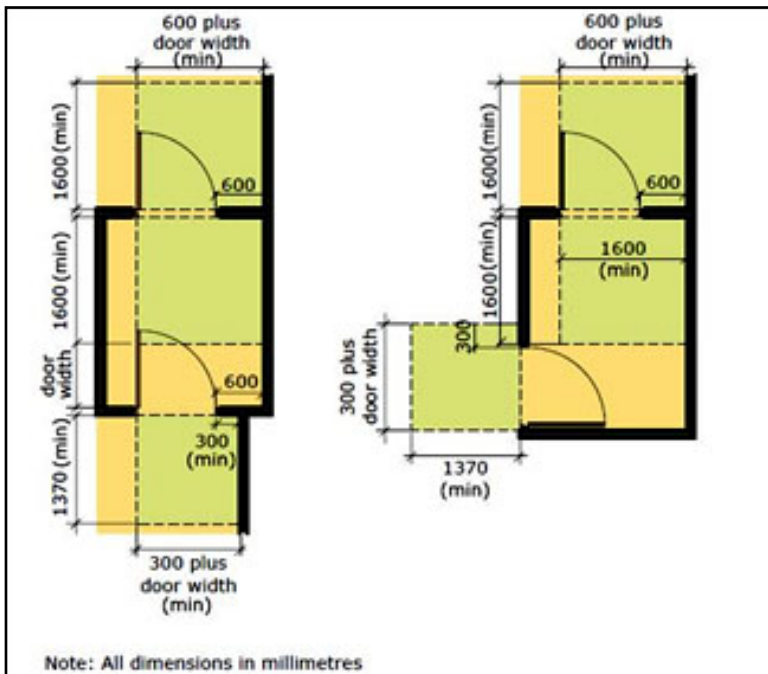
*Picture 1.8.1.3. Example of corridor in the upper floor building where two wheelchairs can avoid each other*

## 1.8.2. Internal Lobbies

❖ Standards and guidelines of the corridors.

- The internal lobbies can only be made if necessary.
- The appropriate internal lobby is carried out in accordance with the following picture.

*Picture 1.8.2.1. Example of the area requirements for the internal lobbies*



- Install floor surfaces that are firm and level.
- Ensure junctions between different floor finishes are fixed with threshold plates.

## 1.9. Doors



### ❖ Standards and guidelines of the doors

- Doors are gates with shutters or barriers for opening and closing, such as house doors, bedroom doors, etc.
- There are many types of doors, such as box doors, sliding doors, left and right sliding doors, panel doors, entrance and exit doors, etc. which can be used manually and automatically.
- A door is measured with a minimum width of should be 900 mm and a height of at least 2,000mm.
- All usable entrance gates should be of appropriate size depending on the needs of the building.
- Manual doors shall not be too tight. This friction depends on the door hinges and the friction between the door and the floor.

- For the automatic doors, it shall be ensured that the control system functions well.
- For folding doors, each fold shall be at least 900mm.
- All rooms (living room, office room, bedroom, dining room, bathroom) shall not have threshold at the door.
- If it is necessary to arrange a threshold at the door, the maximum height is 12 mm.
- All door's threshold higher than 12mm should be accompanied by the ramps on both sides (according to the ramp standard) so that they can move through without any obstruction or disturbance.
- All doors should not have a threshold at the bottom part, which obstructs the access, such as tripping, or wheelchairs couldn't pass by.
- If it is unavoidable, the threshold can only be 12mm high. In case thresholds higher than 12mm should be beveled with small mergers on both the sides.





### 1.9.1. Entrance Doors



*Picture 1.9.1.1. Example of entrance doors*

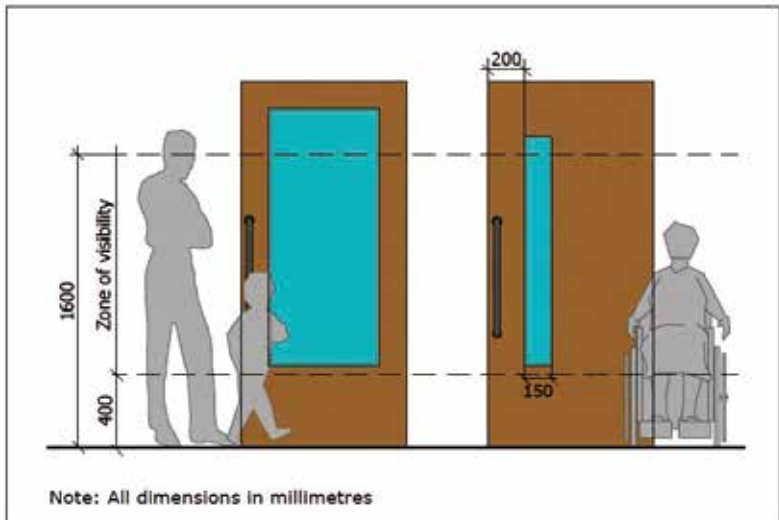


*Picture 1.9.1.2. Example of coloring the glass door to avoid confusion*

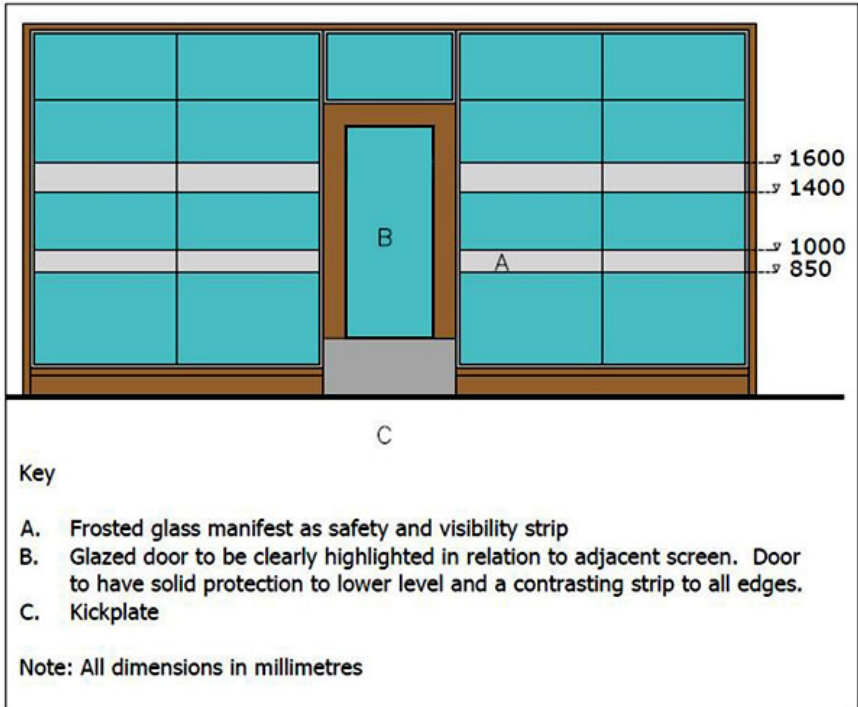
*Picture 1.9.1.3. Different types of doors*



*Picture 1.9.1.4. Surface with both inside and outside visibilities*

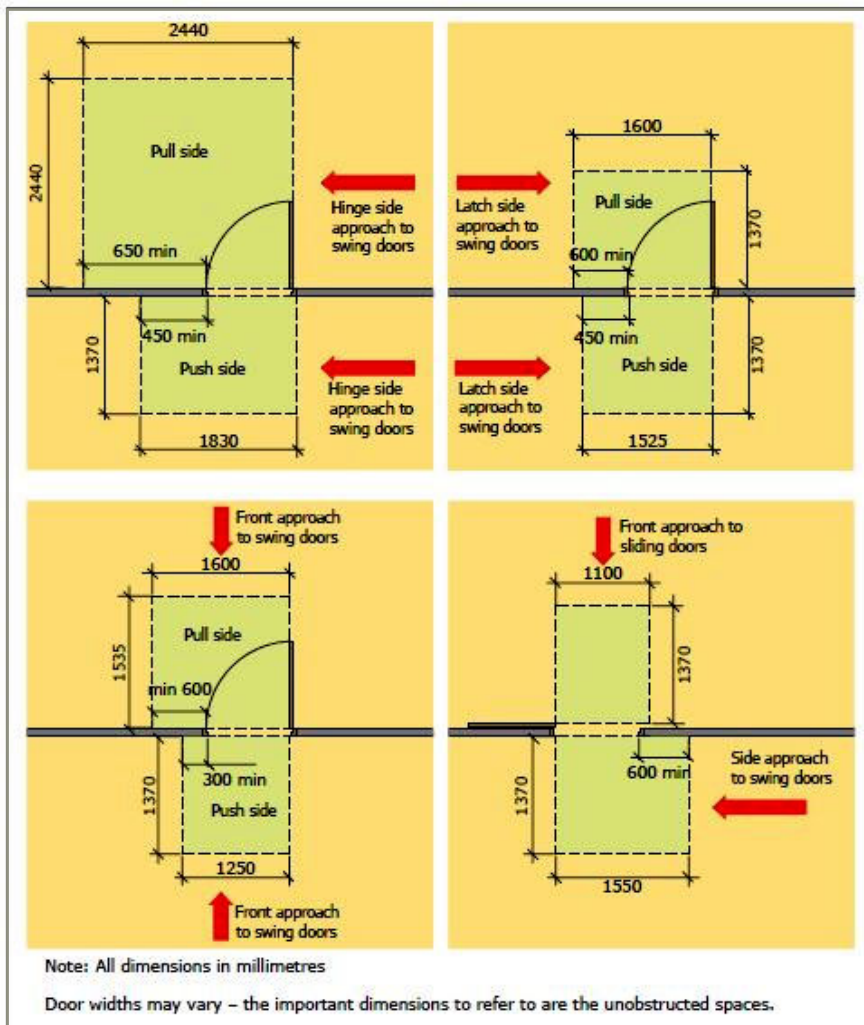


Picture 1.9.1.5. Coloring the glass for safety



- ❖ Standards and guidelines of the entrance doors
  - In new buildings, the entrance shall be 1000mm wide.
  - Entrance of the building shall not be less than 850mm.
  - There shall be enough space on both sides of the entrance.

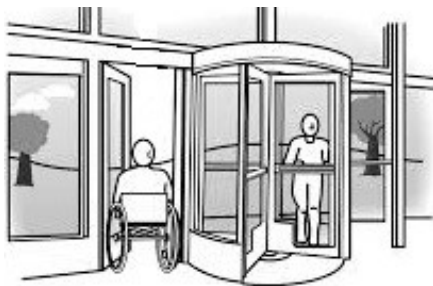
Picture 1.9.1.6. Example of unobstructed enclosure size at the internal entrance doors



- Each side of the door must be 900 mm wide.
- Incorporate vision panels into all entrance and entrance lobby doors that can help people with visual impairment.
- Incorporate visually contrasting markings at two levels on all glazed doors.
- Make sure entrance doors contrast visually with adjacent walls or screens.
- Shall include a highly contrasting strip on all edges of frame-less glass doors.
- Provide door protection to the lower 400 mm of glass doors.

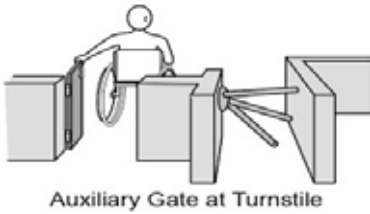
### 1.9.2. Revolving Doors

*Picture 1.9.2.1. Example of two-wing automatic revolving doors*



- ❖ Standards and guidelines of the revolving doors
  - Avoid using revolving doors in inappropriate locations.
  - In case there is a revolving door, there should also be a push or pull door as an option.
  - Shall replace revolving doors, whether manual or automatic ones, with the most convenient door for everyone.

### 1.9.3. Turnstile



*Picture 1.9.3.1. Example of turnstile accompanied by wheelchair-accessible entrance*

#### ❖ Standards and guidelines of the turnstile

- Any locations with the doors shall be equipped with the turnstile.
- The entrance shall be 950mm wide.
- The entrance shall be in contrasting color of the surrounding and shall be apparent.

### 1.9.4. Internal Doors

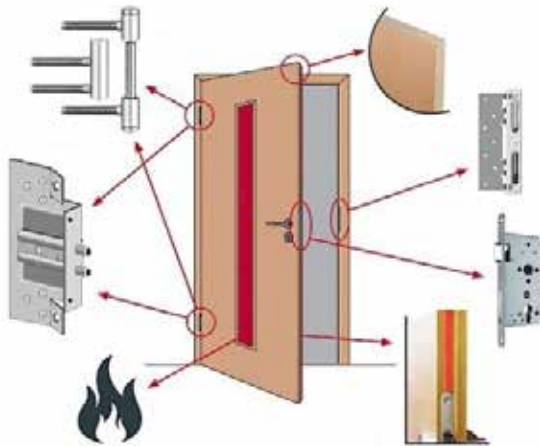


*Picture 1.9.4.1. Doors with visible panels*

#### ❖ Standards and guidelines of the internal doors

- The internal door with appropriate width is 900 mm.
- Both the entrance and exit doors shall be open to the wall.
- Ensure that all directions to open doors are the same in the entire building.
- Shall ensure that the door is in the contrasting color of the wall.
- Shall equip with contrast visually that can help people with visual impairment where needed.

## 1.9.5. Door Ironmongery



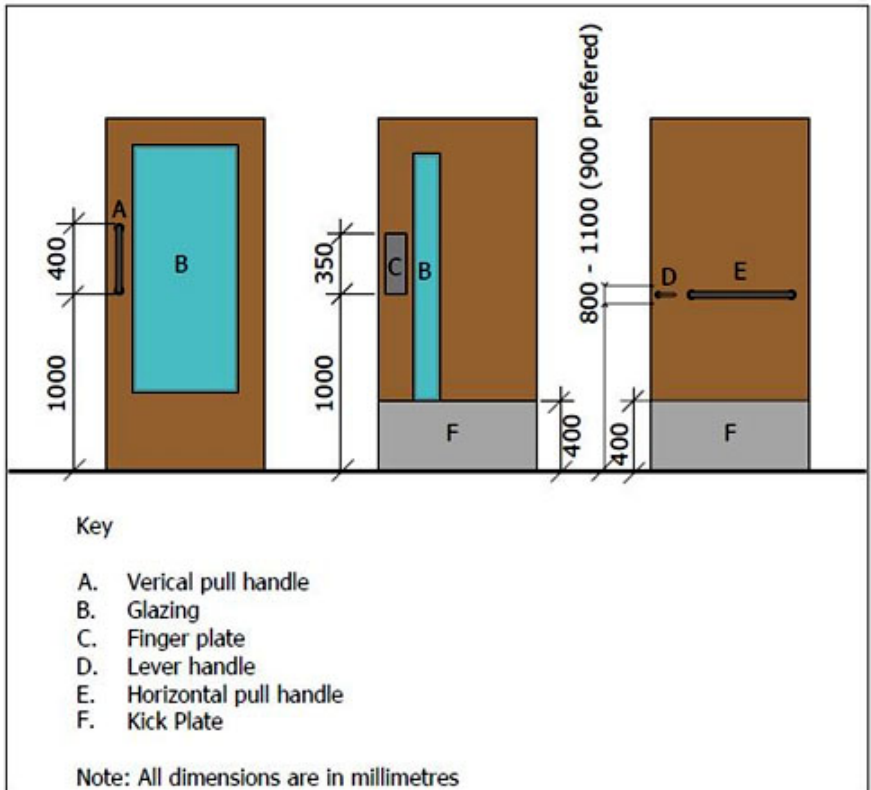
### 1.9.5.1. Hinges



- ❖ Standards and guidelines of the door ironmongery-hinges
  - Use door hinges which can be opened and closed with less friction, avoid using force to open and close the door.
  - Think of a door hinge which is difficult to open and close, and is not compatible with an automatic door system.

### 1.9.5.2. Handles, Latches and locks

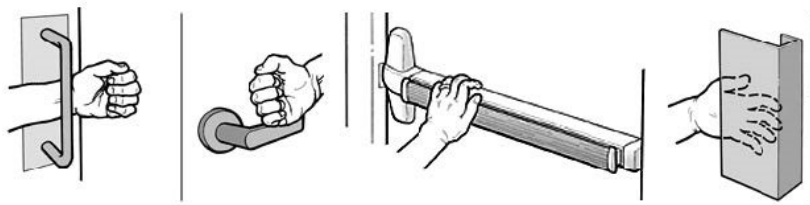
Picture 1.9.2.1. Door Ironmongery



- ❖ Standards and guidelines of the handles, latches and locks
  - The door handle is attached to the door, easy to hold, open and close, and use the door. The type, shape or size of the object used, and the place attached to the object vary according to the purpose and location of the door.
  - Shall equip the lock and handle in either D or L shape for convenient use.

- Shall equip the handle in between 850 mm and 1,100 mm from the bottom part.
- Avoid using turned handle since it might be challenging for people who have difficulties using hands.
- The button for automatic door and lifts shall be placed at the maximum height of 1,200 mm.
- The glass door shall be marked with a sign using different color from the door at 1,200 mm height from the bottom part.
- Paint the door with the contrasting color of the wall to enable convinces for people with visual impairment.
- In case of the push and pull doors, shall maintain a space between 450mm and 600 mm away from the edge of the door so that wheelchair users can rotate and reach the door handle.
- The floor areas shall be 1,500 mm x 1,500 mm on the pull side, and 1,200 mm x 1,200 mm on the push side.
- In case of the push and pull doors, shall equip horizontal shutter which can be held for pulling with at least 600 mm long and 700mm high for both inside and outside doors.

### 1.9.5.3. Pull Handles and Rails







- ❖ Standards and guidelines of the pull handles and rails
  - Using a rounded handle is where the door width can protect the handle.
  - Door rails shall be placed near the opening and closing place of the door.

#### 1.9.5.4. Finger Plate and Kick Plates



*Picture 1.9.5.4. Example of the door which can be opened manually or pushed using the wheelchairs*

- ❖ Standards and guidelines of the finger plate and kick plates
  - Finger plate and kick plates shall be put on the side.
  - Kick plates are recommended to extend the full width of the door and to 400mm above floor level.

### 1.9.5.5. Door-Closing Devices



*Picture 1.9.5.4.1. Example of the door with fire alarm system*



*Picture 1.9.5.4.2. Example of Device to keep the door opened*



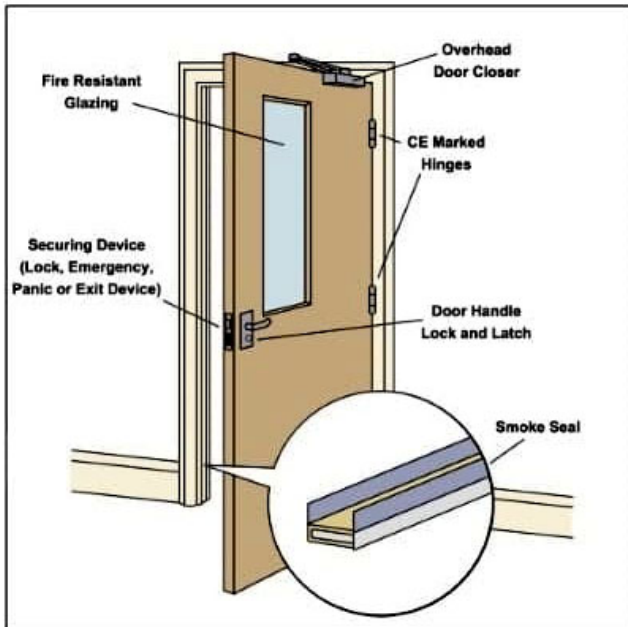
#### ❖ Standards and guidelines of the door-closing devices

- Door-closing device shall be placed where needed.
- Door-closing device shall be properly checked.
- Door closer to the room shall slightly reduce the open force.
- Shall enable convenience for all electronic devices in door opening and closing.

### 1.9.5.6. Emergency Exit Door Ironmongery



❖ Standards and guidelines of the emergency exit door ironmongery





### 1.9.5.8. Automatic Door Systems



*Picture 1.9.5.8.1. Example of two doors opening in and out at the entrance*



*Picture 1.9.5.8.1. Example of electric doors using a switch to open*

- ❖ Standards and guidelines of door automation system
  - Both sides of the doors shall have enough space.
  - Avoid building a narrow way to the automatic door.
  - Ensure that the process and safety system can protect slow-moving people or those who fall.
  - Ensure that automatic door opening system shall be 1,400mm far from people.
  - Shall ensure that door opening duration is appropriate for slow-moving people.
  - Shall place the automatic or manual door control system at a position that can be reached with proper and clearly visible signs.
  - Should consider for additional requirements of safety devices for electric-based door.

- Shall install the finger and body protection system to prevent any incident.
- Shall place the protection shield for the doubled-sliding doors adjacent to each other.

#### **1.9.5.9. Door Security and Entry Systems**

- ❖ Standards and guidelines of door security and entry systems
  - Equip the entry system at the position accessible to everyone.
  - Shall consider using video system as an aid for the identification and communication.
  - The card scanning point shall be placed vertically.
  - Incorporate raised buttons and embossed symbols, numbers or letters in keypads.
  - Ensure all devices contrast visually and are easy to identify.
  - Install doorbells and call buttons that provide visual indication of operation.

## SECTION 2: CAR PARK ENVIRONMENT





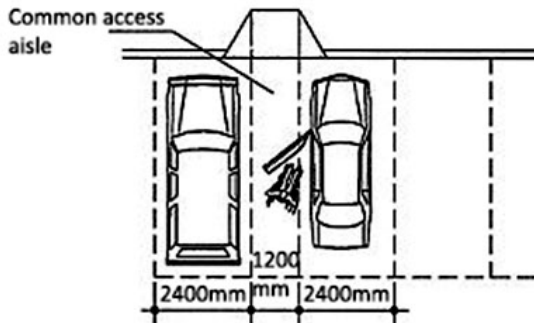


## SECTION 2: CAR PARK ENVIRONMENT

The car park is the organized place for all kinds of parking in different locations that are easiest and nearest. The car park for people with disabilities differs from other typical car park. The car park can be at the ground, underground or upper floors which are either inside or outside the building. It shall be easily accessible and has appropriate areas through the professional layout in order to respond the need of everyone. Prior to the construction, every car park takes into account the demands of users such as parents, baby cuddlers, people who carry heavy stuff, shoppers, people who can't walk far, people who can't carry heavy stuff for long time, people with visual impairment, people with hearing impairment, people who haven't recovered from injuries, pregnant women, elder people, and people who drives huge vehicles such as tourism buses, with tools to lift people with disability on wheelchairs at the back.



## 2.1. General



### ❖ Standards and guidelines for general parking areas

- Ensure that parking area is arranged based on number of vehicles to be parked.
- Arrange parking area for different types of people, including those with small children.
- Arrange appropriate space for those who need wide and/or adjacent parking spaces.
- Car parks may include internal, external, underground car, and multi-story car park areas.

- If internal car parking is multi-story, there shall be at least one passenger lift for each level.
- Car parking should be appropriate, accessible, and have enough space by original design to respond to the needs of different people.
- Car parking environment for persons with disabilities must consider numbers and size of parking spaces, parking location, parking space and special characteristics of each space.
- Car park signage and parking space signage for each vehicle should include permitted and not permitted parking, with consideration for drivers and passengers such as temporarily injured persons, pregnant women, and those with other limitations.
- Designer and constructor must carefully consider the needs of all people who need to use the car park with ease and safety.

## 2.2. Number of Vehicles

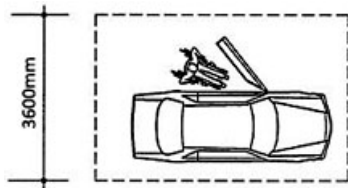
- ❖ Standards and guidelines for number of vehicles
  - For a car park of fewer than 10 vehicles, there shall be one accessible parking lot.
  - For a car park of 11-40 lot, 1 in 10 lots shall be designated for persons with disabilities (1/10).
  - For car parks with more than 40 lot, 1 in 8 lots shall be for persons with disabilities (1/8).

### 2.3. Car Parking Spaces and Dimension

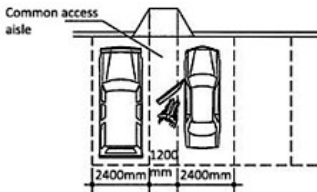


Picture 2.3.1. Sample of importance of side space arrangement of car parking space for persons with disabilities

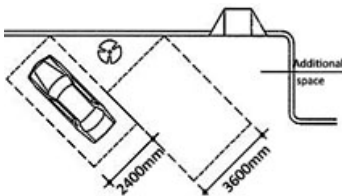
#### ❖ Standards and guidelines for car parking spaces and dimensions



- Each parking space must be at least 3,600 mm to 3,900 mm wide.



- Each wing has a width of 1,200 mm, which can be between two normal parking spaces.
- For internal parking for passenger cars, height shall be at least 2,400 mm.

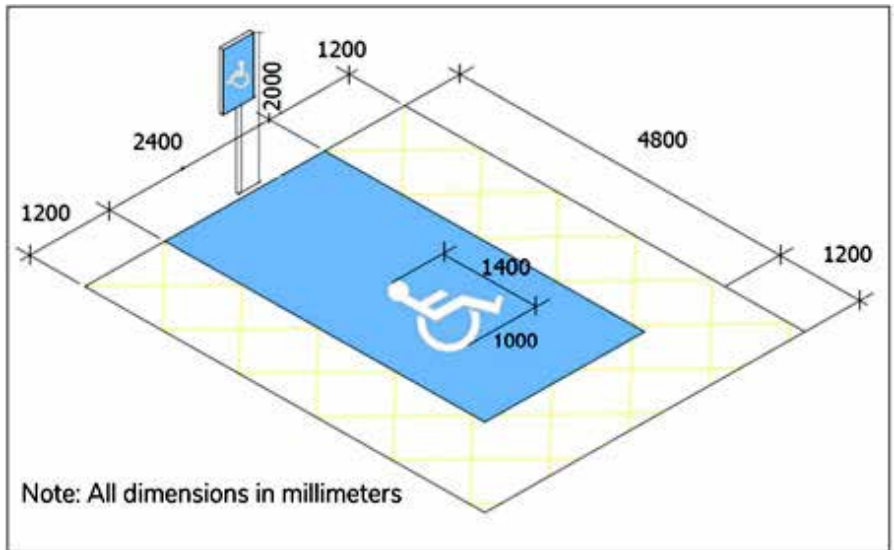


- For corner parking spaces, there must be additional side space at the end of the row for persons with disabilities.

- Normal car parking space is between 4,800 mm x 2,400 mm.
- Car parking for persons with disabilities must add 1,200 mm at all sides to allow passengers to open the car doors widely and to use wheelchairs getting in and out of the vehicle.

- Standard size of car parking space for persons with disabilities is at least 6,000 mm to 3,600 mm.

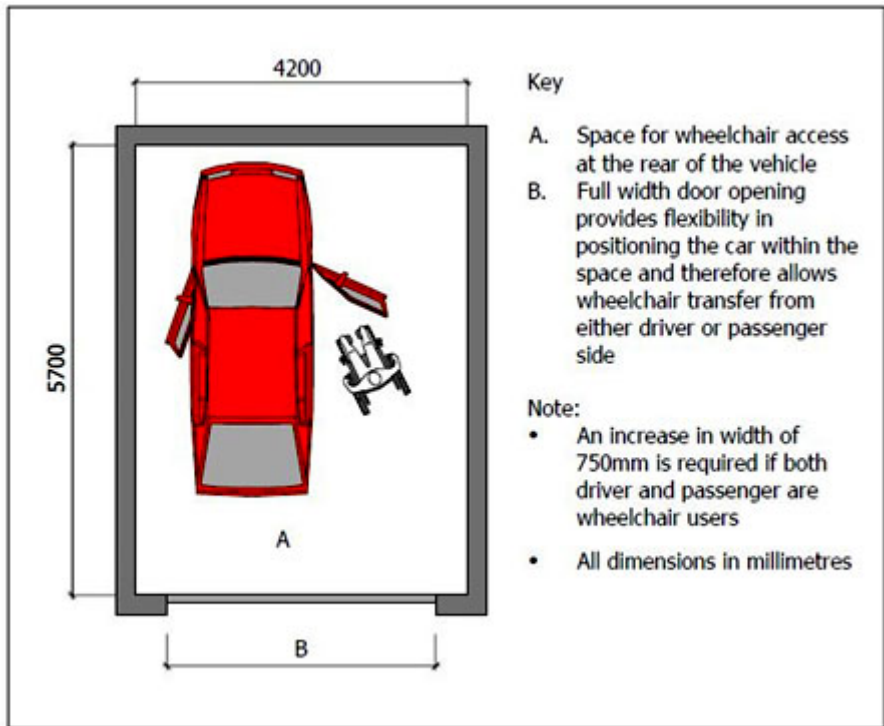
*Picture 2.3.2 Sample of car park and additional space for wheelchairs of persons with disabilities*



- For car park for persons with disabilities in which both drivers and passengers use wheelchairs, there must be additional space of 5,700 mm x 4,200 mm.

*Picture 2.3.3 Sample of additional space for parking*

*This picture explains why additional side space is needed for persons with disabilities.*



- All car parks with 10 spaces or more, both public and private, must keep at least one car parking space for persons with disabilities.
- For external car parking, it must be 30 meters from main entrance path.
- Arrange a safe route from main entrance path to car park according to the standards.
- Install appropriate equipment for persons with disabilities to easily enter and exit car park.

- Make it safe and convenient for pedestrians to enter and exit, e.g., passage and lighting, etc.



*Picture 2.3.4. Sample of appropriate space for car park*



*Picture 2.3.5. Sample of appropriate space for persons with disabilities.*

*It should be noted that this picture does not have international signage for parking location and ramps.*



*Picture 2.3.6. Sample of design arrangement for appropriate parking space for persons with disabilities*

- Multi-story internal car parks should have at least one lift on each floor according to the standard.
- Internal car park should be near passenger lift and exit.
- Parking for persons with disabilities should be arranged at the side.
- Keep empty space with the width of at least 1,200 mm from each car to another to allow persons with disabilities to move between wheelchair and vehicle.
- Keep space of at least 900 mm from parking spaces and path.

- Arrange space for getting into and out of vehicles of at least 600 mm and additional 1,200 mm to be able to park 2 cars.
- Ramps connecting to car park terrace must not exceed the standard slope of 1:12 for short ramps and shall not exceed 1:20 for long ramps.
- If car park has high terrace above the ground, there must be a standard ramp to allow persons with disabilities to use wheelchairs going up and down from path to vehicle.
- Arrangement of terrace ramps must be of a size for persons with disabilities to be able to move their wheelchairs.

## 2.4. Car Parking Signage



*Picture 2.4.1. Sample of international signage for persons with disabilities*



*Picture 2.4.2. Sample of sign for car park location for persons with disabilities*



*Picture 2.4.3. Sample of secondary option for signage that can be used for car park location for persons with disabilities*



## ❖ Standards and guidelines for car parking signage

- Use international symbols at all car parks.
- Car parks for persons with disabilities should use signage with international characters and arrows indicating the entrance.
- Restrict usage of special spaces to disabled people.
- All car parks, both internal and external, must have signage with visible color and adequate lighting.
- If car park and path have equal height, there must keep empty space at the size of at least 600 mm between the path and car park with different colors or corduroy paving.

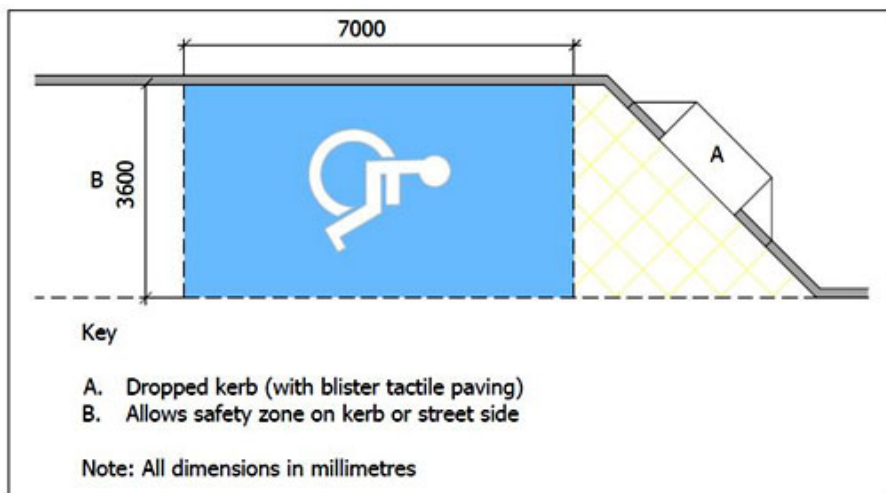
## 2.5. Parking Location

### ❖ Standards and guidelines for parking location

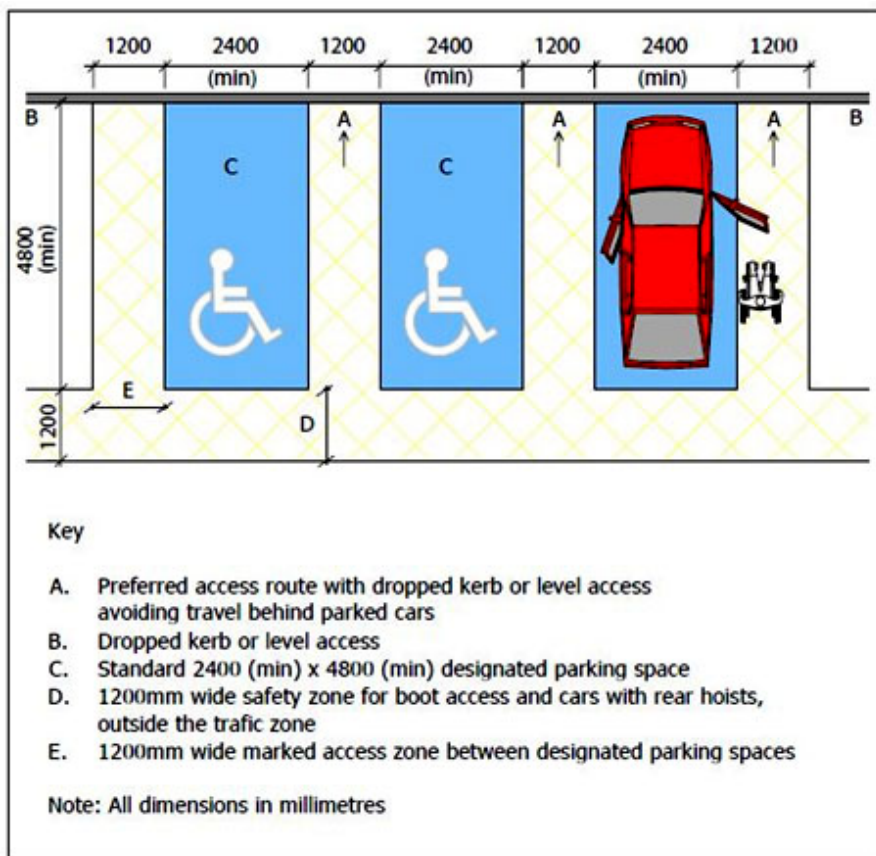
- For external car parks, parking space(s) for persons with disabilities must be no more than 50 meters from building entrance.
- For internal car parks, parking space(s) for persons with disabilities must be in front of passenger lift or as near to the exit as possible.
- The end of each row is convenient for cars with lifting equipment for persons with disabilities who are using wheelchairs.
- Arrange reserved parking space(s) for people with small children near building entrance or main location.
- Ensure that path between car park and building or location entrance is accessible.
- Have visible signage for parking spaces at each car park.
- Ensure having space, not a path, with the size of 2,400 mm x 1,200 mm at both sides of car park.

- Arrange space on the path with the width of 3,600 mm x length of 7,000 mm.
- Be careful not to place furniture along the path.
- Set up high and low places for drainage.
- Design surface with appropriate height and inclination of no more than 1:50.
- Car parking spaces at each corner should add space of at least 1,200 mm at the end for wheelchairs of persons with disabilities.
- Keep space of 1,200 mm between each vehicle.
- Signage for car park must be at least 300 mm x 450 mm at the height of 1,500 mm to 2,500mm from the ground.
- Directional signage must be at the height of at least 1,400 mm.

*Picture 2.5.1. Arrangement of car park for persons with disabilities, elderly persons, and children on the path*

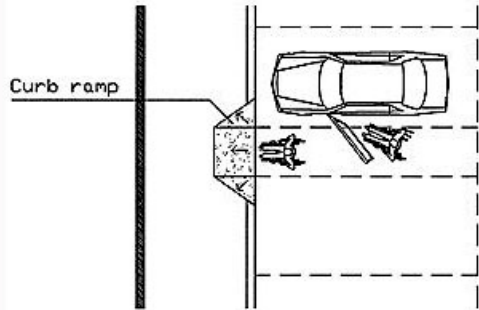
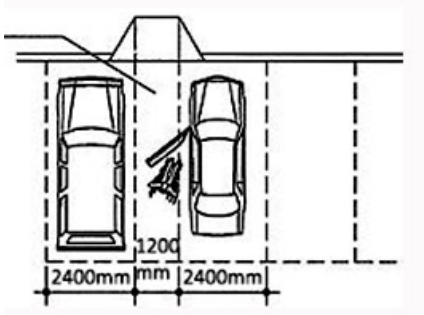


Picture 2.5.2 Arrangement of car park next to sidewalks

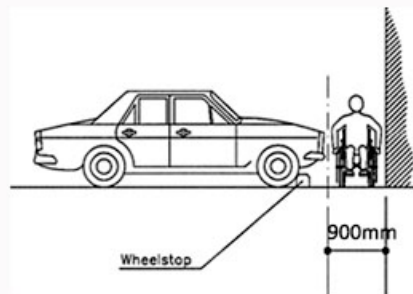
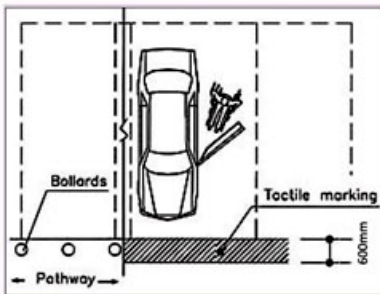


## 2.6. Parking Curbs

- ❖ Standards and guidelines for parking curbs
  - If there is curb, there must be ramp connecting parking space to path.



- If there is no curb, there should be a colored surface of 600 mm in width to distinguish between the pathway and parking location; otherwise, use bollards. Tire wedges (cement or plastic) can also be used to separate the pathway with the width of 900 mm.



## 2.7. Multistory and Underground Car Parks



*Picture 2.7.1. Sample of appropriate parking space*



*Picture 2.7.2. Other options of sample of appropriate parking space*



*Picture 2.7.3. Sample of setting parking space for persons with disabilities before entering the market*



*Picture 2.7.4. Entrance from the parking space to a market*



*Picture 2.7.5. Sample of regular information board on situation and overview of parking area*



*Picture 2.7.6. Space indicating parking space with appropriate height*



*Picture 2.7.7. Sample of parking payment machines at different heights*

- ❖ Standards and guidelines for multi-story and underground car parks
  - Set up car parking spaces at appropriate locations and according to location of entrance and exit of building.
  - Ensure that there is passenger lift on each floor.
  - Have empty space of 2,600 mm at each car park.
  - All ticket machines must be equipped with control system and be visible.
  - Set up advance payment machines at different heights for people using wheelchairs.
  - For internal car parks, roof should have a minimum height of 2,600 mm.
  - Multi-story and underground car parks should have ventilation equipment at all floors.
  - In case of underground car parks, the path from car park to building entrance should be convenient for all vehicle users.
  - Signage should be visible for parking for parents and children and those with disabilities, ticket machines, passenger lifts, floor numbers, exits, and building entrances.

- Make sure ticket dispensers are conveniently located, accessible, understandable and useable by all motorists.

## 2.8. Paid Parking



*Picture 2.8.1. Sample of parking ticket machines at two different heights*



*Picture 2.8.2. Sample of service equipment through voice communication*

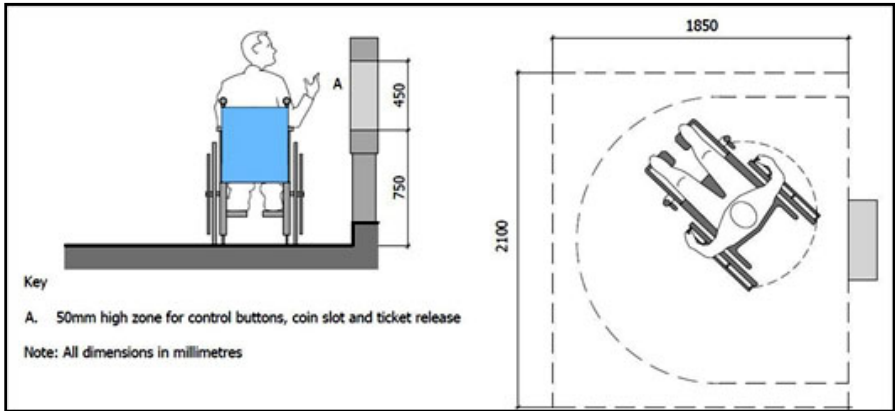


*Picture 2.8.3. Sample of parking ticket machine located at convenient spot at car park entrance*

### ❖ Standards and guidelines for paid parking

- Payment place or ticket machine should be placed at appropriate spots in terms of height, simple signage, and convenience for all drivers.
- Keep empty space in front of the payment place or ticket machine of 1,850 mm x 2,100 mm.

Picture 2.8.4. Parking ticket machine



- Card slot, button slot, ticket slot, and other command slots should be placed at the height of 750 mm to 1,200 mm from the ground and use colors to assist people with low vision.
- A person should regularly stand by in case a driver needs help.
- Ticket should be easily obtained without getting out of the car.
- If possible, ticket purchase should be available online.

## 2.9. Drop-Off Areas





#### ❖ Standards and guidelines for drop-off areas

- Drop-off areas are for picking up and dropping off passengers.
- Drop-off areas should be set up near spaces such as city bus stops and shall not exceed 30 meters from building entrance.
- Drop-off areas shall have minimum width of 3.6 meters with wing size of 1.2 meters and shall allow the length of at least two vehicles.
- Have ramps connecting roads to curbs to facilitate traveling across road surface.
- If there is no curb dividing between walkway and vehicle area, provisions for people with low vision is an utmost necessity, such as bollards and blister surface with the width of 600 mm at the side of the road to alert where vehicles stop.
- Open shed or protective roof with appropriate seating must be prepared at locations with many passengers.
- Appropriate signage must be set up for drop-off areas.
- Provide drop-off point close to building entrance.
- Ensure that drop-off area has protective roof at the height of 2,600 mm
- Ensure the road surface is flush with the path or pavement, with the appropriate tactile surface for persons with visual impairment.

### 2.10. Surfaces

#### ❖ Standards and guidelines for surfaces

- Surfaces of car parks should be the same and sufficiently smooth.
- Slope of all parking ramp must not exceed 1:20.

## 2.11. Taxi Ranks



- ❖ Standards and guidelines for taxi ranks
  - Set up taxi ranks at appropriate locations.
  - Arrange instruction on taxi ranks to inform passengers in advance before they arrive at the area.
  - Ensure that walkway is at least 4,040 mm to allow ramps for wheelchairs and space for moving wheelchairs.
  - Set up seat at all waiting areas.
  - Taxi ranks must be near train stations, city bus stations, and drop-off areas such as entrances and exits of airports. They should be near main entrances and exits and have signage visible internally and externally.
  - Taxi ranks should have accurate information to allow passengers to choose the nearest taxi.
  - Keep road size for taxi ranks of minimum width of 4,000 mm for wheelchair users.
  - When setting up taxi ranks, consider wheelchair users, persons with visual disabilities, people with low vision, and people using walking aids.

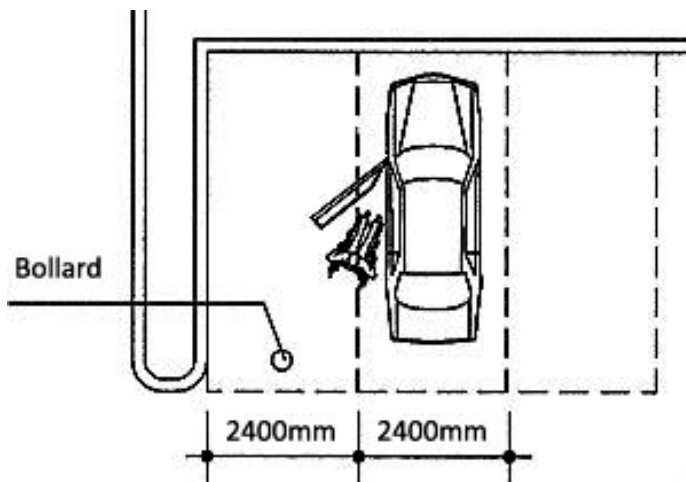
- Crossway for pedestrians with curb ramps and tactile surface should be set up nearest to the taxi ranks.
- At every taxi rank queuing place, there should be a roof and seating nearby.
- Provide taxi ranks in appropriate locations.

## 2.12. Existing Constructions

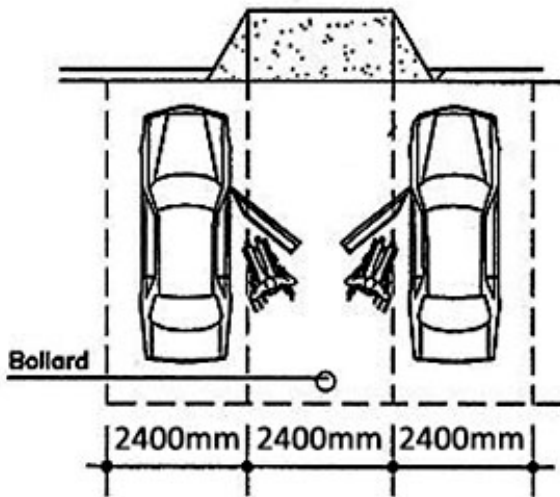
- If the parking area is more than 50 meters away from building entrance or drop-off areas, it must be adapted to be no less than 30 meters from building entrance.

If there is no parking space for persons with disabilities, the following measures must be implemented:

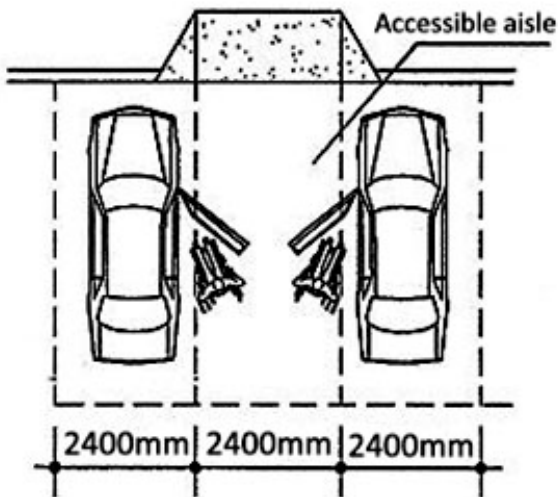
- a. Set up bollards to keep empty space for getting into and out of vehicle (no parking here).



- b. Place bollards in the middle to separate both sides of the parking space.



- c. Both wings of parking space are kept for persons with disabilities.



- Internal car parking space must have vertical height of less than 2,400 mm, providing external parking space for tourist buses carrying persons with disabilities with wheelchairs.

### **2.13. Number of Car Parks Compared to Building Size**

Number of car parks compared to size of different types of building here refers to general car parks, not car parks for persons with disabilities.

- Residential building of 100m<sup>2</sup> – 150m<sup>2</sup> must have 1 car park for small vehicles.
- Commercial building of 20m<sup>2</sup> – 50m<sup>2</sup> must have 1 car park for small vehicles.
- Industrial building of 250m<sup>2</sup> – 2,000m<sup>2</sup> must have 1 car park for small vehicles.
- Education and sport administration building of 100m<sup>2</sup> – 300m<sup>2</sup> must have 1 car park for small vehicles.
- Healthcare building of 100m<sup>2</sup> – 120m<sup>2</sup> must have 1 car park for small vehicles.
- Theatre, meeting hall, and cinema buildings of 30m<sup>2</sup> – 300m<sup>2</sup> must have 1 car park for small vehicles and 1 car park for big vehicles.
- 5 rooms hotel building must have 1 car park for small vehicles and 1 car park for big vehicles for 30 rooms hotel
- Guest house with 10 rooms must have 1 car park for small vehicles and 1 car park for big vehicle for 30 rooms guest house
- Gas station with surface of more than 10m<sup>2</sup> must have 1 car park for small vehicles.

- Gas station with surface of 100m<sup>2</sup> must have 1 car park for small vehicles and 1 for big vehicles.
- Transport building with surface of more than 100m<sup>2</sup> must have 1 car park for small vehicles.
- Transport building with surface of more than 500m<sup>2</sup> must have 1 car park for big vehicles.
- Other buildings with surface of more than 150m<sup>2</sup> must have 1 car park for small vehicles, and of more than 500m<sup>2</sup> must have 1 car park for big vehicles.

## SECTION 3: BUILDING TYPES







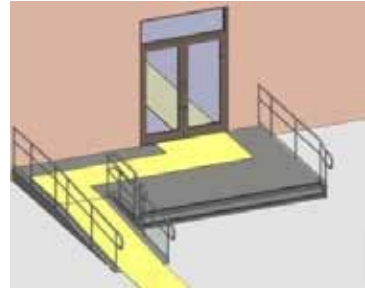
## SECTION 3: BUILDING TYPES

### 3.1. Office Buildings

Office buildings refers to administrative structures where people provide services to the public. These include state, private, humanitarian organization, and volunteer or commercial buildings.

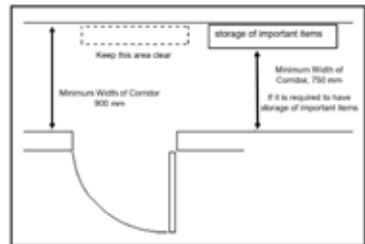
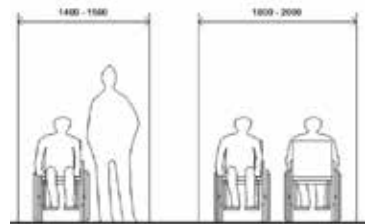


### 3.1.1. Entrances and Circulation



#### ❖ Standards and guidelines for office buildings

- Ensure that office entrances can be used by all, including service providers (officials, staff, and interns) and service receivers, people with and without disabilities.
- Ensure that interior space has appropriate width for people using wheelchairs to see clearly and move freely.
- Use colors at office entrances for people with low vision.
- If it is necessary to place obstacles along a route, please use alerting signage.



### 3.1.2. Internal Environment



- ❖ Standards and guidelines for internal environment
  - Allow movement of clean air and appropriate light and temperature.



- Ensure that all locations are well maintained.
- Allow clear lighting and have lighting control for each individual need.

- Set up rooms far from areas with loud indoor or outdoor noise.
- Organize indoor environment with appropriate sound considerations.
- Each room or office must be designed for working purposes, such as regular work, meetings, seminars, training, consultation, etc.
- Design both group workspaces and single rooms (staff, officials, senior officials, and leaders).

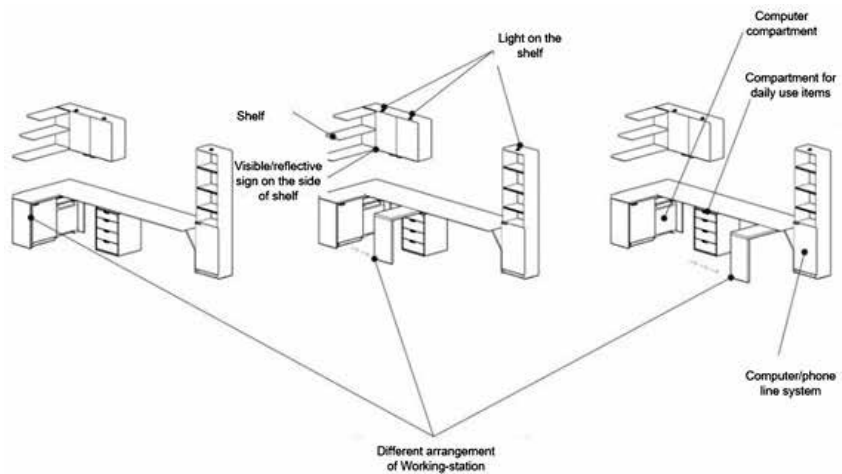
### 3.1.3. Workstations and Storage



#### ❖ Standards and guidelines for workstations and storage

- Ensure that workstations are appropriate for users' needs.
- Set up facilities and furniture according to the needs of different people.
- Each workstation must be adjustable or modifiable.
- Facilities at workstation (chair, table, shelf) shall be in L shape (square).





- If possible, avoid placing multiple staff in a location not proportionate to the number.
- Ensure that storage is designed to be strong, stable, without sharp corners, colorful, visible, adequately lit, and of appropriate height and size for all staff to use.
- If there are many shelves or pieces of storage equipment, they must be at least 1,400 mm and 1,200 mm excluding knee space.
- There shall be no barriers along entrance and exit of storage.

### 3.2. Transport Buildings



Transport buildings refers to buildings serving modes of public transportation, such as city bus stations, railway stations, ports, and airports. Universally designed transport services begin not from the point of boarding the city bus, train, ship, or airplane, but from the point where passengers with disabilities start from their homes and extend until they reach their intended destination, regardless of distance.

*Picture 3.2.1. Waiting areas at city bus station and stops*



### 3.2.1. Location



- ❖ Standards and guidelines for transport locations
  - Consider location in terms of various locations and public services available in that community, such as crowded and quiet areas.
  - Ensure that buildings for various means of transportation can be built close to each other.
  - Consider taxi ranks and other additional car parks.
  - Provide designated accessible car parking bays at railway stations, harbours, and airports.

### 3.2.2. Size and Layout



- ❖ Standards and guidelines for size and layout of transport facilities
  - Ensure that buildings are set up at a location that is convenient, easy to navigate, and avoids long walking distances.



- Ensure that services and locations are clearly visible.
- Set up passenger areas in the most central location possible.
- Ensure that arrival platform has roof against rain and sun.
- Connection with outdoor places, including whole facility location and entrances, must have accessible, wide, and safe routes for all passengers.

### 3.2.3. Passenger Facilities



#### ❖ Standards and guidelines for passenger facilities

- Set up appropriate seating at all waiting areas.
- Ensure that storage facilities for lost luggage are visible to all passengers (large signage).
- Build toilets for persons with disabilities near departure and arrival platforms.
- Build wide toilets for passenger with luggage and small children.
- Set up changing areas or other assistive equipment.
- Ensure public address systems extend to all toilet facilities.



### 3.2.4. Travel Information



#### ❖ Standards and guidelines for travel information

- Provide all travel information in as many forms as possible (sound, graphics, etc.)
- Ensure that all travel information is clear and easy to understand.
- Ensure that travel schedule is accurate, available, and easy to see.
- Display travel schedule at most appropriate places at suitable height and size.
- Provide travel information in commonly selected forms, including via mobile phone and other electronic services.
- Ensure that price table and payment information are clearly visible.
- Ensure clarity of information on departure and arrivals in all waiting areas, particularly at an appropriate time before departure.

- Ensure that information on arrival and transfer can be found everywhere.
- Ensure that latest travel information updates are available at all places and in all forms.
- Allow appropriate time for passengers to transfer.
- Prepare small vehicles or other means of transporting passengers at arrival platform to assist people who have difficulty walking, children, and those with other needs.

### 3.3. Retail Outlets and Shopping Centers



#### 3.3.1. Internal Circulation



❖ Standards and guidelines for internal circulation of retail outlets and shopping centers

- Organize retail outlets with appropriate entrances and exits.
- Ensure that all pathways are free of barriers and are designed properly.
- Ensure that hazardous places are clearly visible in signage.
- Ensure that display facilities and other retail spaces allow everyone to enter, exit, and move freely.

### 3.3.2. Display and Storage in Shops



*Picture 3.3.2.1. Shows shelves at shopping centers*



*Picture 3.3.2.2. Shows the front view of refrigerators at shopping center*

- ❖ Standards and guidelines for display and storage in shops
- Ensure that displays are strong, stable, and correctly lit.
  - Use refrigerators and freezers with rolling doors for ease of use.
  - Avoid using displays that are vertically too high.
  - Organize displays to be accessible while either standing or sitting.

### 3.3.3. Counters and Checkouts



*Picture 3.3.3.1. Shows person with disabilities checking items at a shopping center*



*Picture 3.3.3.2. Sample of exit with two counters*

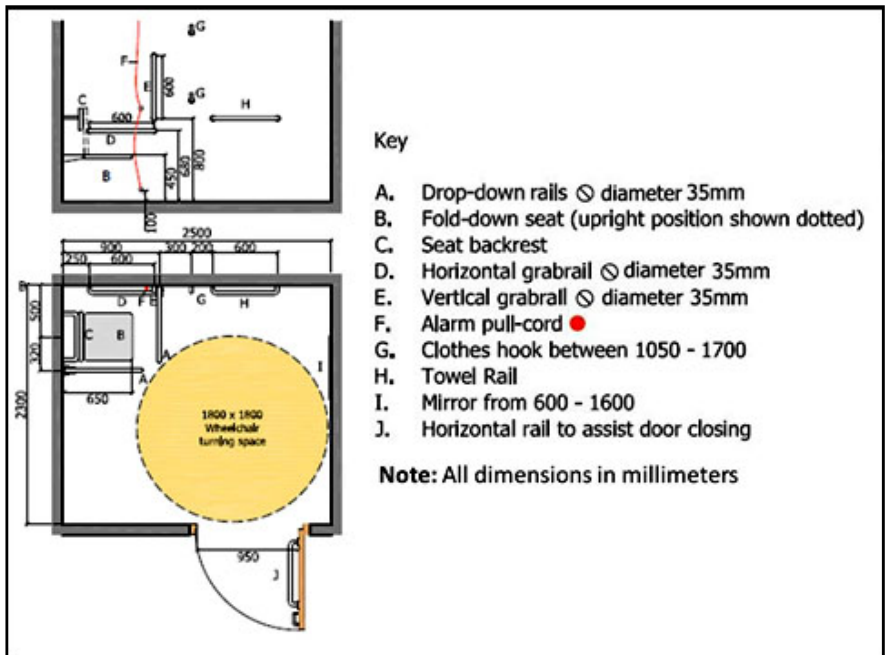
- ❖ Standards and guidelines for counters and checkouts
  - Design service counters that allow sitting and standing staff and customers to receive and provide services.
  - Set up service counters at different heights.
  - Have empty space of 2,400 mm x 2,400 mm in front of service counters.
  - Ensure that edge of checkout counter has a contrasting color to be easily noticed.
  - Ensure that main exit is big enough for all customers and facilitates picking up items from both left and right sides.
  - Set up sound system at all checkout counters.

### 3.3.4. Fitting Rooms

- ❖ Standards and guidelines for fitting rooms
  - Ensure that fitting rooms can be used by everyone.
  - Set up fitting rooms that can be used by both men and women as shown in the picture



Picture 3.3.4.1. Shows map and size of fitting room



- Allow adequate space at both sides of fitting room door.
- Set up full-body mirror and clothes hooks at appropriate heights.

### 3.3.5. Equipment and Assistance in Shops

*Picture 3.3.5.1. Sample of electric trolley with basket installed in the front*



- ❖ Standards and guidelines for equipment and assistance in shops
  - Ensure that there are trolleys in the market that can be used by all customers.
  - Prepare electric trolley with basket for customer to borrow.
  - Ensure that trolley is always well-maintained, clean, and dry
  - Provide scales for customers to self-measure goods.
  - Provide personal assistance when customers need it.

### 3.4. Restaurants, Bars, and Cafés



Restaurants, bars, and cafés are places for customers to eat and entertain; they include dining halls, dancing halls, cafeterias, pubs, and meeting places at hotels.

#### 3.4.1. Layout and Seating in Bars and Restaurants



- ❖ Standards and guidelines for layout and seating in bars and restaurants
  - Set up proper display to ensure accessibility of service, reception, and provision for everyone.
  - Ensure that pathways and walking corridors between seating are without barriers and are visible.
  - Locate facilities on the same level within a storey wherever possible.
  - Ensure that seating at all levels is accessible via ramps and stairs.
  - Ensure that all types of seating can be used by everyone.
  - Give options to all customers to choose the seating they prefer.
  - Set up tables and chairs with width to accommodate all customers.
  - Use moveable chairs if using fixed tables
  - Ensure that tables and chairs have different colors from the surrounding surfaces (wall and floor).
  - Provide some chairs with armrests.

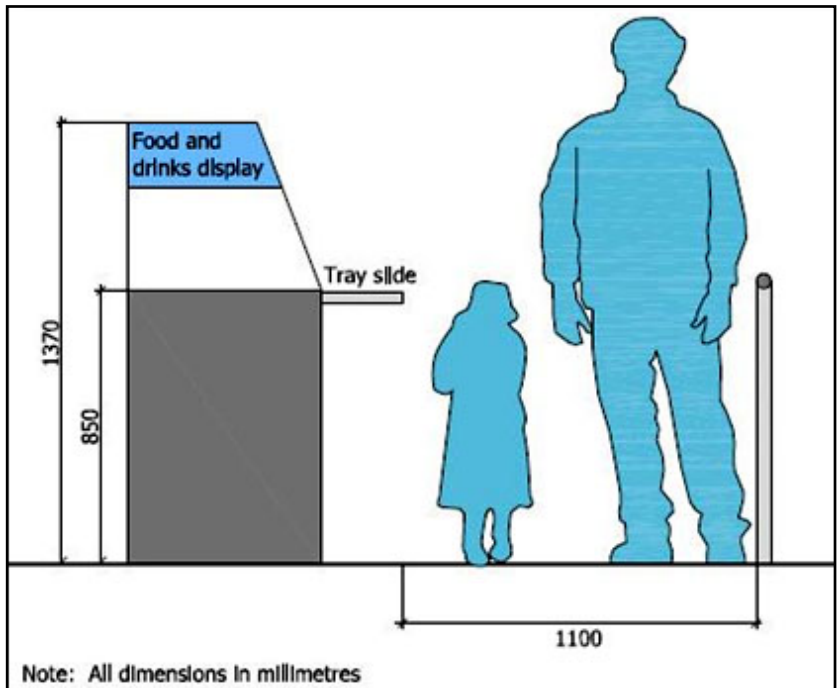
### 3.4.2. Self-Service Facilities





❖ Standards and guidelines for self-service facilities

- Ensure that self-service facilities are set up at appropriate places to serve customers as in this picture.



- Set up queuing handrails in places where many customers are waiting for service.
- Set stack of customers' food trays at the height of 850 mm from the ground.
- Display all food at the height of 1,370 mm.
- Waiting space for food must have a width of 1,100 mm.

### 3.4.3. Customer Service and Management



- ❖ Standards and guidelines for customer service and management
  - Ensure that all staff are trained to welcome customers.
  - Ensure that pathways and walking corridors between tables are wide and do not have barriers.
  - Toilets must be clean and have toiletries such as toilet paper, soap, and towels.
  - Use telephone or internet for bookings when possible.
  - Ensure that staff are trained to use the telephone and internet.

### 3.4.4. Outdoor Smoking Areas



*Picture 3.4.4.1. Sample of signage for smoking areas*

❖ Standards and guidelines for outdoor smoking areas

- Ensure that outdoor smoking areas can be used by everyone; they must be at least 2,440 mm x 2,440 mm in size.
- Ensure that outdoor smoking areas are accessible with clearly visible signage.

### 3.5. Museums, Galleries, and Libraries



❖ Standards and guidelines for museums, galleries, and libraries

- Ensure that the arrangement and design of buildings are uncomplicated.
- Ensure that book or document storage is convenient for staff and guests.
- Set up places such as waiting areas, rest areas, and eating areas for all.
- Ensure that usage and display areas are accessible for everyone.
- Give prior notice of long pathways between buildings.
- Have wheelchairs for persons with disabilities to use in the building.

- Set up equally spaced seating areas along pathways inside the building.
- Ensure that information provided to the guests is available in different forms (written, graphic, audio, etc.)

### 3.5.1. Information and Interpretation



- ❖ Standards and guidelines for information and interpretation
  - Ensure that all forms of information about places are prepared for all guests, including those with disabilities.
  - Have building and site maps with names and locations clearly indicated.
  - Prepare maps in braille for persons with visual disabilities.
  - Have audio guides with adjustable volume to assist persons with visual impairment and others who need them.
  - Include a volume control on audio soundtracks to suit a range of users who need them.
  - Install loudspeakers at appropriate locations in the building.
  - Consider using different sound systems as options for different people at various locations.

### 3.5.2. Displays and Exhibits



- ❖ Standards and guidelines for displays and exhibits
  - Install non-glare glass in the display cases.
  - Use lighting along pathway in dark areas.
  - Consider using line lighting along the floor.
  - Allow sufficient space for people using wheelchairs to use indoor equipment.
  - Install displays and other equipment on inclined surface when possible, and at no more than 1,000 mm from the ground.
  - Ensure that all exhibit labels are easy to locate and read.
  - Install labels at display areas at the height of 45 degrees.
  - Ensure text on labels is minimum 18 point sans serif font and text on printed information is 14 point.
  - Provide braille labels at as many places as possible.
  - Provide alternative formats for all written information.
  - Provide magnifying glasses for visually impaired guests.
  - Provide tactile images of pictures, images, graphics, and information.

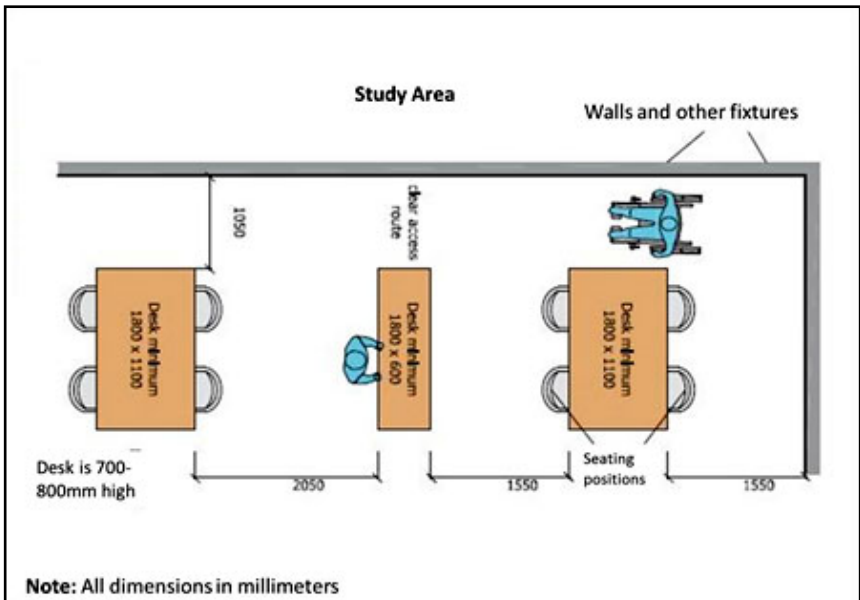
### 3.5.3. Study Areas



Picture 3.5.3.1. Sample of study areas

#### ❖ Standards and guidelines for study areas

- Set up study areas accessible for everyone that are close to books and other research documents.
- All tables must be accessible for everyone as in this picture.



- Face-to-face study desks must be a minimum of 1,800 mm in length and 1,100 mm in width.
- Single study desks must be a minimum of 1,800 mm in length and 600 mm in width.
- Study desks must be at the height of 700 mm to 800 mm and be accessible for people using wheelchairs.
- Keep space between desk and wall or bookshelves of 1,050 mm to be accessible for wheelchairs.
- Keep space between each desk of 1,550 mm.
- Install electronic devices at compatible height with desks.
- Have electrical outlets and lighting at all study areas.
- Ensure that computer screens can be adjusted according to individual needs.
- Consider providing other technical assistance.

#### 3.5.4. Library Shelving



*Picture 3.5.4.1. Sample of display of bookshelves*



*Picture 3.5.4.2. Sample of other options for displaying bookshelves*

### ❖ Standards and guidelines for library shelving

- Organize library shelving in aligned rows and with appropriate space between them.
- The gap between each stack of shelves, from shelves to wall and from shelves to other storage areas should be 1,400 mm.
- Designer should know about shelving and floor arrangement.
- Have space for people using wheelchairs of 1,200 mm.

### 3.6. Entertainment, Conference, and Lecture Facilities

Entertainment, conference, and lecture facilities include theatres, cinemas, concert halls, and training halls. These buildings must have seating areas for watching or listening, speakers' or performers' facilities, and other secondary supporting areas in the front, at the sides, or behind the stage.





- ❖ Standards and guidelines for entertainment, conference, and lecture facilities
  - Seating for audience, delegations, and all their members such as teachers, trainers, performers, supporting staff, and technicians, must be universally designed.
  - Arrangement of secondary supporting areas such as toilets, cafeteria, reception, and backstage areas must be arranged for full participation of everyone.
  - Every stage or platform above the ground must have ramps (fixed or mobile) for accessibility.
  - Every area/room of all buildings above must set up sound systems to assist the hearing.

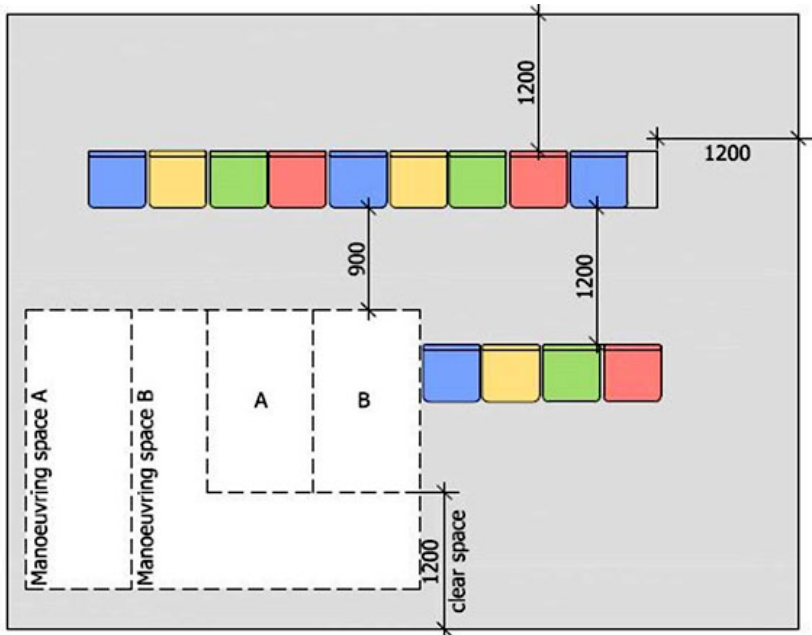
### 3.6.1. Audience Seating



❖ Standards and guidelines for audience seating

- Ensure that seating is aligned in rows and in proper condition.
- Ensure that aisles are without barriers and have visible signage.
- Set up exits and entrances for people using wheelchairs.
- Set up different areas according to viewing location as options for audiences.
- Set up seating for at least two people using wheelchairs as in the picture below.

*Picture 3.6.1.1. Shows appropriate size for people using wheelchairs*



Space allowances for people using wheelchairs and scooters, as spaces A and B:

**Note:** All dimensions in millimetres

- Ensure that audience seating is high at the back and low at the front and allows everyone to see.
- Have handrails at all ramps and stairs.
- Ensure appropriate space for entry and exit and for using toilets at every floor of building.
- Ensure that chairs or seating at all places are in contrasting colors from surrounding areas.
- Set up removable or folding chairs accessible for everyone.
- Set up many toilets for large numbers of people, especially during performances.
- Ensure that all toilets have visible signage and are clean.

### 3.6.2. Performers' Facilities

#### ❖ Standards and guidelines for performers' facilities

- Ensure that backstage is universally designed.
- Ensure that backstage entrance and exit are accessible for everyone.
- Ensure that pathways between house and backstage are convenient and have visible signage.
- Should provide changing areas and clean rooms accessible for everyone.



### 3.6.3. Speakers' Facilities



- ❖ Standards and guidelines for speakers' facilities
  - Have podium with adjustable height, slightly inclined top surface, and front edge at the height of 800 mm to 1,100 mm.
  - Ensure that laptop desk and projector are no higher than 800 mm.
  - Have desks for speakers with top surface height of 760 mm and 700 mm for different users.
  - Ensure that platforms and podiums have ramps or stairs, accessible for everyone.
  - Ensure that projector screen is at appropriate height and distance to visible to everyone.

### 3.7. Religious Buildings



- ❖ Standards and guidelines for religious buildings
  - Set up religious buildings and areas for all practitioners to participate in all religious activities according to their beliefs.
  - Every pagoda and religious building must have ramps for all above-ground places.
  - Other areas, such as waiting area, garden, dining hall, car park, restroom, toilet, etc., must be built for everyone including persons with disabilities, elderly people, pregnant women, and children.
  - Set up different areas according to religious practices and beliefs and also accessibility; especially older religious buildings should be modified, barriers minimized.
  - Use adjustable seating to give options and opportunities for everyone.

### 3.7.1. Facilities for Seating and Prayer



- ❖ Standards and guidelines for facilities for seating and prayer
  - Provide options for seating to all religious practitioners.
  - Add more space for people using wheelchairs, parents with baby trolleys, and people using assistive walking devices.
  - Set up low areas in prayer building to allow people to sit and stand during prayer.

### 3.7.2. Other Facilities in Religious Buildings



- ❖ Standards and guidelines for facilities for other facilities in religious buildings
  - Set up standard platforms and podiums for speaking.
  - Set up standard sound system for listening.
  - Set up standard toilets.

### 3.8. Hotel, Guest, and Residential Accommodation

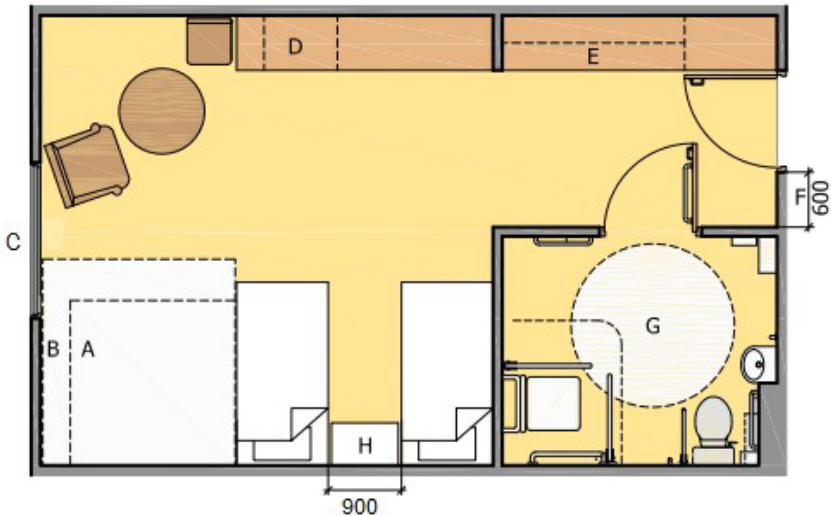


- ❖ Standards and guidelines for hotel, guest, and residential accommodation
  - Ensure that all areas at residential accommodation are accessible for everyone.
  - Should design rooms with doorways connecting one room to another as options for guests.
  - Ensure that working areas for staff are universally designed.
  - There shall be personal kitchen equipment, e.g., refrigerator, kettle, etc., for guests in each room.
  - Have parking space for persons with disabilities as established in Section 2.
  - Pathway from car parks to reception shall be accessible for everyone.
  - Pathway from reception to bedroom shall be universally accessible.
  - Have wheelchairs available for persons with disabilities during their stay.
  - Install clear and visible signage during day and night throughout the facility.
  - Ensure that public pools are accessible for all types of persons with disabilities and children.

### 3.8.1. Bedrooms



Picture 3.8.1.1. Sample of double-bed bedroom arrangement

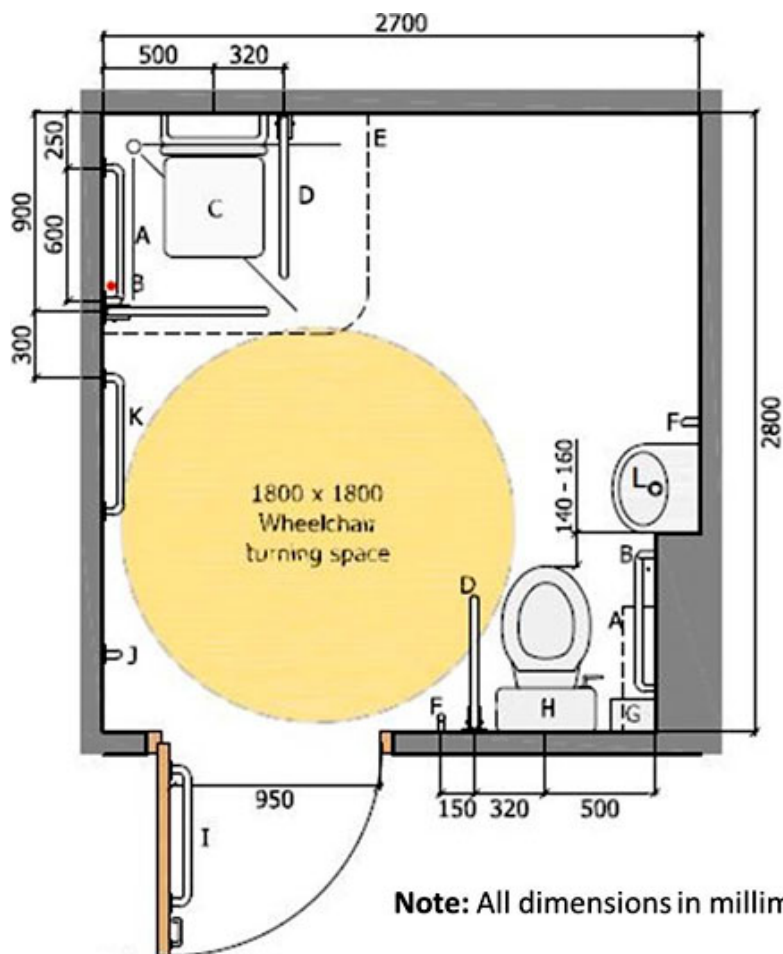


❖ Standards and guidelines for bedrooms

- Point A is space for moving wheelchairs to access bed with the size of 1,800 mm x 1,800 mm.
- Point B with the size of 2,250 mm x 2,100 mm is an extra space for lifting equipment for persons with disabilities moving between the bed and a wheelchair.
- Point C is a window at the height of 800 mm to 1,000 mm providing a view outside the building.
- Point D is a table with the height of 700 mm to 800 mm, ensuring knee space for persons with disabilities.
- Point E is a closet with shelves.
- Point F is an empty space with the width of 600 mm from the door to bathroom wall.
- Point G is a bathroom accessible for everyone.
- Point H is an empty space between each bed with the size of 900 mm for wheelchairs or for an assistant to lift persons with disabilities.

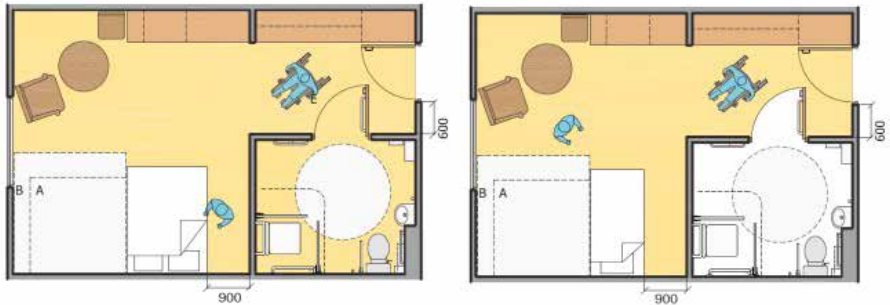


Picture 3.8.1.2. Sample of bathroom arrangement with indoor toilets



- Point A is a bar with diameter of 35 mm horizontally along the wall.
- Point B is an emergency pull string.
- Point C is a folding seat in shower area.
- Point D is a folding bar near the toilet.
- Point E is a shower curtain.
- Point F is a bar with diameter of 35 mm vertically along the wall.
- Point G is a shelf with the height of 950 mm near the wall for storage.
- Point H is the cistern for the toilet.
- Point I is a horizontal handle attached to the door to close the door.
- Point J is clothes hooks attached to the wall at the height of 1,050 mm to 1,700 mm.
- Point K is a towel hanger attached to the wall at the height of 1,050 mm to 1,700 mm.
- Point L is a washbasin.
- Ensure options for all types of bedrooms meet the needs of guests.
- All hotels or guesthouses with more than 15 rooms must have one big bedroom for people using wheelchairs or assistive walking devices, etc.

*Picture 3.8.1.3. Sample of other options for bedroom arrangement with indoor toilet*



- Point A is a space for moving wheelchairs to access bed with the size of 1,800 mm x 1,800 mm.
- Point B, with the size of 2,250 mm x 2,100 mm, is an additional space for lifting equipment for persons with disabilities moving between a wheelchair and the bed.
- Bed should be at the height of 450 mm to 480 mm from the ground to mattress' upper surface, and bed must have hard edge.
- If there is more than one room for people using wheelchairs, there should also be rooms for right-handed and left-handed people.
- Ensure that each room is equally clean, hygienic, safe, and convenient.
- Modify existing bedrooms to be accessible for persons with disabilities, especially those nearby passenger lifts.
- Ensure that bedrooms have minimal noise pollution, such as sound from cars or other machines.

- Ensure that there is lighting, ventilation, and a window to the outside of each bedroom.
- Install window handle at the height of 800 mm to 1,000 mm from the ground and ensure that it is easy to open and close.
- Install curtain bar at a height of 900 mm to 1,200 mm.
- Install adjustable lighting.
- Install lighting for reading or working near all tables and in closet.
- Ensure that all lighting has safety switches.
- For normal lighting, there must be two switches that can turn lights on and off, when first entering the room and at the bed.
- Ensure that all equipment and services in the room can be controlled from a sitting position.
- Provide remote control equipment for all electronic devices.
- Ensure that there is clean air ventilation in all bedrooms.
- Ensure that all bedroom doors are easy to open and close for everyone.
- Should use electronic card for opening and closing the door and automatic door locks.
- Choose beds for people using wheelchair and those with mobility issues, allowing easy transfer.
- Set up clothes hooks at accessible height for everyone.
- Have assistive hearing devices when watching television when requested.
- Install assistive devices such as an emergency signal in all bedrooms.

### 3.8.2. Bathrooms



- ❖ Standards and guidelines for bathrooms
  - When possible, have bathrooms accessible for everyone in each bedroom.
  - If there are not bathrooms in bedrooms, set up separate bathrooms for men and woman at the location closest to bedrooms.
  - Set up sanitary facilities for staff separate from those for guests.
  - All places, including bedrooms, reception, and bathrooms, must be accessible from outdoor pathway.
  - If there are many common bathrooms, there must be some rooms for people using wheelchairs and persons with disabilities using assistive walking devices.
  - Please see more details on standard bathrooms in Section 5.

### 3.9. Housing



Housing refers to all new housing, housing under construction, and modified housing, which must be universally designed appropriate to different needs of residents and guests.

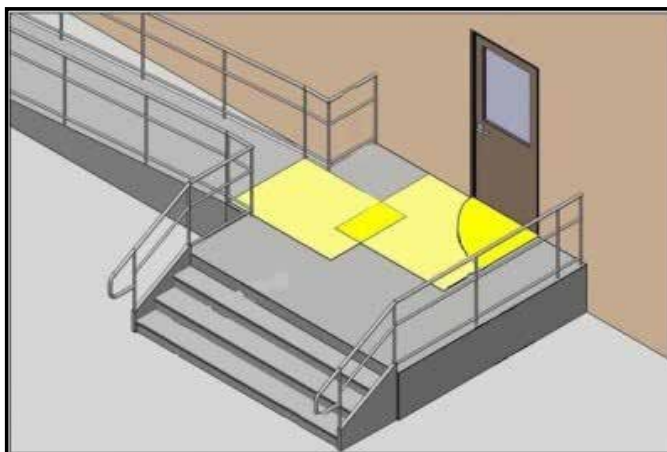
#### 3.9.1. External Environment

- ❖ Standards and guidelines for external environment
  - If each house has a front entrance with a door, it should have space for opening and closing as following:

<b>Smallest width of main door when opening</b>	<b>Direction of opening and closing door and width of walkway</b>
800 mm	Straight opening and closing
800 mm	Opening and closing from right corner to pathway with smallest width of 1,500 mm
825 mm	Opening and closing from right corner to pathway with smallest width of 1,200 mm
900 mm	Opening and closing from right corner to pathway with smallest width of 900 mm

- Should provide accessibility from all pathways to entrance door.
- Should have accessible pathway from personal area to common area.
- If the ground is uneven, there should be sloping corridor or ramps along walkway.
- Ensure that outdoor walkways, ramps, and stairs are designed to standards.
- Ensure that pathway to each housing has a width of at least 900 mm.
- Install gates that provide the clear opening width set out in the table above.

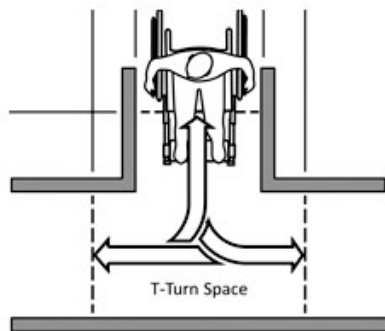
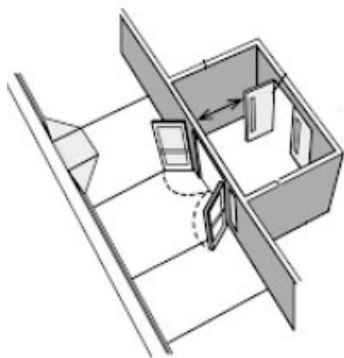
### 3.9.2. Entrances



- ❖ Standards and guidelines for entrances
  - Ensure that all entrances are visible and accessible.
  - Ensure that all entrances have outdoor lighting.
  - Ensure that all entrances are protected against weather.

- Set up resting areas with the minimum size of 1,500 mm x 1,500 mm in front of entrances of individual houses.
- Set up resting areas with the minimum size of 2,400 mm x 2,400 mm in front of entrances of common housing.
- Ensure the entrance hall in an individual house incorporates an area at least 1,500 mm x 1,500 mm.
- Ensure that entrances to the reception are consistently designed to standards.
- Install doorbells at no more than 1,200 mm above the ground.
- Ensure that entrances and outside doors have the most appropriate wedge.
- Ensure that doors of each house have the minimum width of 900 mm and 300 mm from the gate.

### 3.9.3. Horizontal Circulation in Housing





❖ Standards and guidelines for horizontal circulation in housing

- Standard width of doors for each residence as follows:

Standard door width	Direction of opening and closing door and width of pathway
800 mm	Straight opening and closing
800 mm	Opening and closing from right corner to pathway (corridor) must be at the width of at least 1,100 mm
850 mm	Opening and closing from right corner to pathway (corridor) must have the width of less than 1,150 mm

- Ensure that houses and flats are arranged and designed for everyone.
- Make sure there is enough space for people using wheelchairs, electronic bikes, baby trolleys, and assistive walking devices to enter and exit and turn 360 degrees.
- Ensure that corridors between flats have the minimum width of 900 mm.
- Ensure that corridors in residences with many people have the minimum width of 1,200 mm.
- Ensure that width of doors and corridors follows the table above.
- Ensure that doors between each flat are left with 300 mm to the edge of front door.
- Ensure that interior doors to the rooms open to the inside.
- Design bathroom and toilet doors to open outward and easily during emergency.
- Walls in bathrooms and bedrooms must be strong enough to safely install handrails.
- All ceilings must be strong enough to install or hang lifting equipment.

### 3.9.4. Vertical Circulation in Housing



- ❖ Standards and guidelines for vertical circulation in housing
  - Design standard stairs and staircase.
  - Have passenger lifts that can fit many people (especially emergency lift) for housing with more than 3 floors.
  - Ensure that there are passenger lifts at all floors including underground car parks and other places.
  - Should have one vertical passenger lift for buildings with 2 or 3 floors.
  - Design standard passenger lifts or elevators as in Section 1.2.6.
  - If passenger lifts or elevators are not installed at time of construction, service area must be kept, ensuring that lifts can be installed in the future without barriers.
  - Design each house to be able to install passenger lifts or lifting equipment in the future.

### 3.9.5. Services in Housing



- ❖ Standards and guidelines for services in housing
  - Set up electrical outlets and wiring that can be used in the future to install equipment and lighting as necessary.
  - Storage materials and counters should be at the height of 1,200 mm to 1,400 mm, which is accessible.
  - Install switch devices at 400 mm from the ground, except in the room with temperature-adjusting devices.
  - Store big water vaults at appropriate places and heights that are accessible.
  - Design standard electrical outlets, switches, and other control devices

### 3.9.6. Individual Rooms



- ❖ Standards and guidelines for individual rooms
  - Set up many types of bedrooms at each housing facility.
  - Set up living room, kitchen, and toilet near entrance.
  - Can set up sleeping area in living room if necessary.
  - Have accessible toilet and bathroom for showering.
  - Ensure that kitchen, living room, and at least one bedroom are accessible for people using wheelchairs, electric bike, and assistive walking devices.

### 3.10. Historic Buildings and Sites



- ❖ Standards and guidelines for historic buildings and sites
  - Ensure that historic buildings and sites are accessible for everyone including persons with disabilities, children, elderly people, and pregnant women.
  - At least some parts of historic buildings and sites must be arranged for persons with disabilities if the whole area cannot be modified.
  - Ensure that festivals and activities in historic sites are accessible for everyone.
  - Regularly check information (such as customer suggestion box) and customer service issues and respond to real needs.
  - Use accessible signage to assist navigation.
  - Take all measures and opportunities to modify physical environment for everyone, such as during repair and construction programs.
  - Ensure that modified and newly built places are universally designed.

### 3.10.1. Conservation Principles



#### ❖ Standards and guidelines for conservation principles

- Ensure that historic buildings are accessible at all times and places.
- Ensure that all historic buildings maintain their first purposes at all times and places.
- Should consider new modifications to ensure greater access to the buildings when possible.
- Ensure that all new modifications increase participation of everyone, especially persons with disabilities.
- Ensure that expansion and modification of historic buildings align with their original styles.

### 3.10.2. Making Changes to Historic Buildings



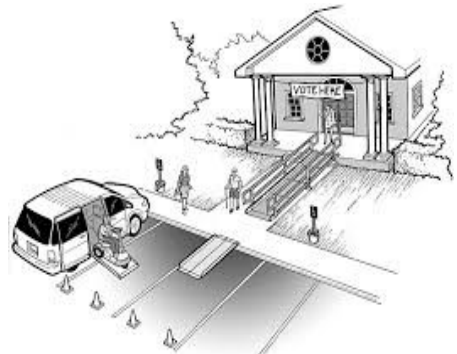
- ❖ Standards and guidelines for making changes to historic buildings
  - Use construction methods that can be modified more or less.
  - Use materials and labor appropriate to buildings or location.
  - Minimize effects on original styles of buildings or location.
  - View new modifications as beautiful and sustainable development of buildings or location.

### 3.10.3. Detailed Design of Historic Buildings



This section covers main elements of heritage building locations that should not be designed according to a standard that would destroy, damage, diminish the value or be incompatible with the location of the historic buildings. In every case, the renovation of each building should be done with great understanding.

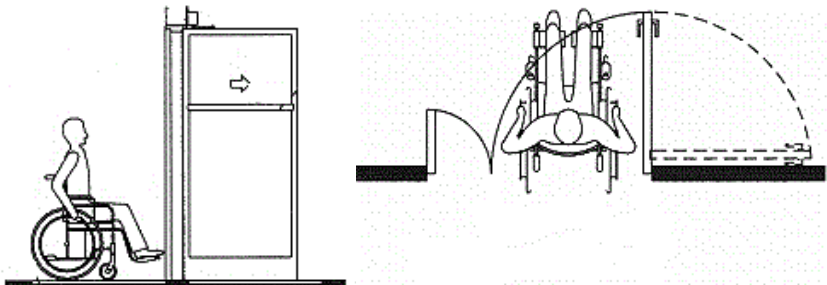
#### 3.10.3.1. Entrances



### ❖ Standards and guidelines for entrances

- All main entrances of buildings must be designed for everyone.
- Do not build entrance ramps for persons with disabilities at the back of building.
- Entrances should be accessible at all times, not having only temporary ramps.
- At most historic buildings, main entrances are built high above the ground because it was constructor's preference at that time.
- At some buildings, entrances and indoor surfaces are higher than outside surfaces to prevent flooding during rainy season.
- At big buildings, entrances are built high to promote the building's reputation and the entrance is part of a supporting terrace with stairs.
- When increasing accessibility of historic building entrances, ensure that facilities for persons with disabilities do not undermine the value of the buildings.
- Anywhere possible, there should be ramps in addition to the stairs to create opportunity for persons with disabilities to enter without losing the beauty of the buildings.
- In some cases, if entrance curbs are too high, they should be appropriately modified.

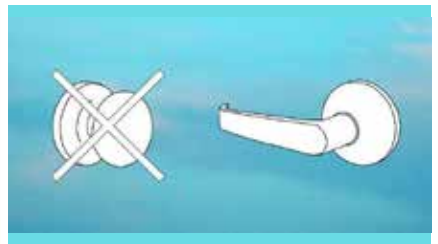
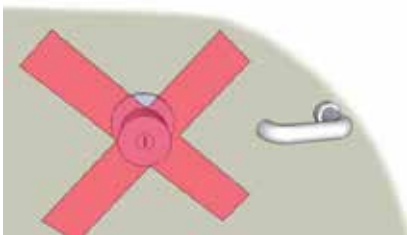
#### 3.10.3.2. Doors





## ❖ Standards and guidelines for doors

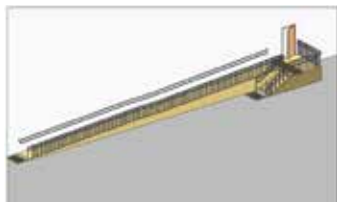
- At historic buildings, doors are designed according to style of the building.
- Most internal and external doors can be very heavy because of their size and density. Moving them is difficult for most people, but this can be modified by installation of automatic equipment or assistive devices to aid in opening and closing the door.
- Due to technological advancements, some assistive devices range from big to small.
- In some buildings, some doors should be opened to facilitate convenient entrance.
- Emergency exits must be opened by automatic devices during fire.
- All doors with threshold must ensure accessibility for the wheelchairs of persons with disabilities.
- For some buildings, door threshold can be high according to building type, and such design must consider accessibility of people using wheelchairs.
- Use horizontal door handles in preference to round doorknobs (see the picture below).



- The use of temporary rope at both sides of the door gives options in accessing high ground.
- If there is door threshold to prevent flow of water, other options must be protected by external modification to be level for accessibility of wheelchairs.
- Install external pipes and rubber plugs at the bottom of door surface.

### 3.10.3.3. Ramps

#### ❖ Standards and guidelines for ramps

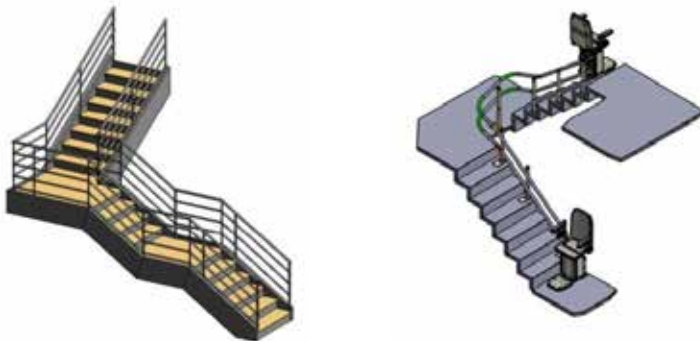


*Picture 1.10.3.3.1. Sample of external ramp with stairs*

- Set up ramps at places where people need to move vertically, making them independently accessible at all times.
- Platform lifts can be accessible when needed and during maintenance.
- Platform lifts are only for a building inaccessible for persons with disabilities.
- Ramps can consume big space especially if the surface that requires appropriate ramps is high.
- Platform lifts can be built for people using wheelchairs but also benefit others, including people pushing wheelchairs.
- Ensure ramps at historic buildings are carefully detailed, particularly where they abut features such as skirting boards, dado rails and panelling.

- Temporary ramps are usually not appropriate and are difficult to arrange, especially if they are mobile and can be installed when needed.
- Consider temporary ramps as a short-term or temporary solution rather than a permanent solution.
- Temporary ramps can be considered as a solution if there is no plan to build permanent ramps for buildings or rooms.
- Temporary ramps should meet the same standards as permanent ramps in terms of height, length, width, landing area, installation of handrail, etc.

#### 3.10.3.4. Staircases



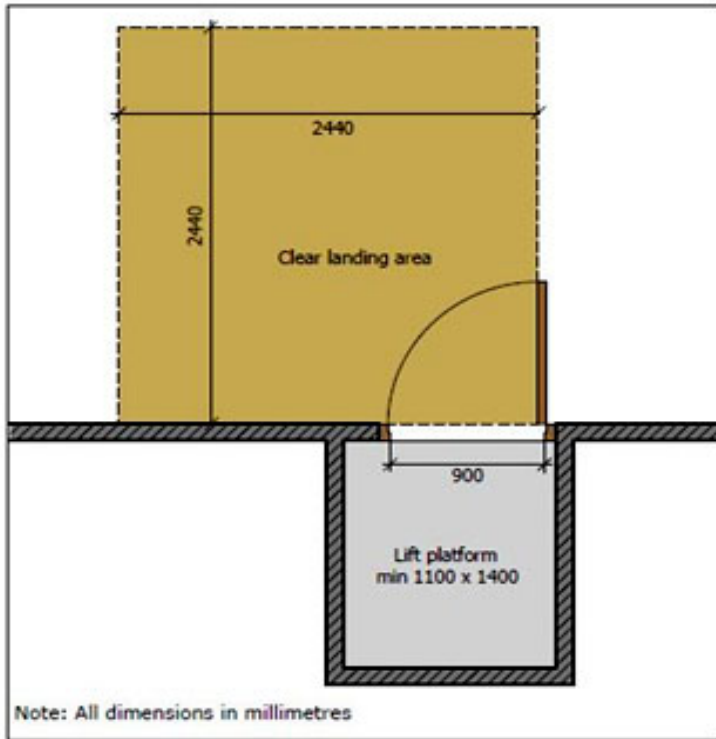
- ❖ Standards and guidelines for staircases
  - Many staircases in historic buildings are important features that show the uniqueness of the building. In some cases, modification is inappropriate, even if size and shape of staircases make them inaccessible to those with disabilities.
  - However, improvements may still be possible to the stair covering and artificial lighting.
  - Handrails and handrail bars are usually ornately decorated, and it is part of beauty of the staircases, but sometimes they are too high, too low, too big, or too small to serve disabled guests.

- In some cases, additional handrails are designed according to the form of the old handrails even though they are installed on the external wall or attached to the old handrails.
- It may be easier and more appropriate to undertake modifications to improve access to a secondary staircase in a building and to designate this as an alternative access route.
- The new staircases should not be designated as a route solely for people with mobility difficulties, but should be available to everyone using a building..
- Passenger lifts or staircases in case of emergency are built for multi-story buildings or those with basements; a better choice is to install staircases for emergency use.
- Placement of passenger lifts in historic building requires careful consideration to ensure accessibility at each floor; it can reduce modification of style of the whole building

#### **3.10.3.5. Platform Lifts**



Picture 3.10.3.5.1. Sample of surface of platform lifts



❖ Standards and guidelines for platform lifts

- Ensure that main entrances are universally designed and can be used permanently.
- Consider effectiveness of entrance modification to be compatible with the buildings.
- Consider external modification of the building to be consistent with other minor modifications.
- Check on the use and installation of door hinges or other door equipment for heavy doors.
- Should use fixed door blocker for doors or for emergency escape.

- Ensure door thresholds are level wherever possible or incorporate temporary fillets where they are required to be raised.
- Provide ramps in preference to platform lifts wherever possible to facilitate independent access for all.
- Can build mobile ramps at some places if necessary.
- Install more handrails for staircases with handrails that cannot be modified.
- Should have staircases as an option for everyone.
- Consider the practicalities of installing a passenger lift (preferably an evacuation lift) where it will minimize the need for structural changes to the building.
- Consider the use of a vertical rise platform lift where it is not possible to install a passenger lift.

### 3.11. Outdoor Access



*Picture 3.11.1. Sample of natural landscape*



*Picture 3.11.2. Sample of tempered landscape*

- ❖ Standards and guidelines for outdoor access
  - Provide information about environment in various forms accessible for audiences.
  - Provide information about service and accessibility for persons with disabilities.

### 3.11.1. Types of Landscape

#### 3.11.1.1. Natural Landscape



*Picture 3.11.1.1.1. Sample of natural landscape with artifacts*

#### ❖ Standards and guidelines for natural landscape

- Natural landscape refers to national parks, natural heritage areas, special areas of conservation, and natural sites such as beaches, mountains, and other remote areas.
- Even though it is not easy or necessary, there shall be accessibility to mountainous areas for people using wheelchairs, too, giving consideration to universal accessibility.
- At each landscape area, accessibility creates most opportunity for people with different capacities to visit.

*Picture 3.11.1.1.2 Sample of natural landscape*



- The majority of people visiting remote areas do not think it is adventurous or lonely when those areas are accessible.
- Furthermore, outside support is not generally expected in remote places and individuals and groups usually prepare to be self-sufficient.
- Main barriers such as staircases or mountain slopes should be accessible without any barriers.
- Road constructors must strive to make roads more accessible for everyone.
- This point does not mean that natural landscapes must be as accessible as urban landscapes, but they must be accessible or have signage at various places according to those natural locations.
- For display areas or any places requiring modification or being modified, they must be as accessible as possible.
- Changes in the environment should not inadvertently create obstacles to access, and existing obstacles should be removed where possible.
- Any accessible places should be properly maintained, providing safe and convenient access and use.

### 3.11.1.2. Tempered Landscape





❖ Standards and guidelines for tempered landscapes

- Tempered landscapes include rural parks, historical areas, plant areas, other parks and golf courses with permanent and temporary services.
- Even though those landscape are natural, they shall be properly managed to enable visitors to do all activities.
- In the past, people have cleared forests for timber and drained land for agriculture and this has changed the landscape.
- People have planted hedgerows and built walls to enclose land and corral animals, and woodlands have been planted to create shelter.



*Picture 3.11.1.2.1. Sample of tempered landscape and natural heritage area*

- Modifications at some attraction sites according to the standards for road construction, gates, and other accessible signages are improvements.
- These special features should be universally designed and provide best opportunities for everyone to visit those places and participate in activities.
- Tempered landscapes with buildings, presentation areas, public toilets, and cafés should be universally designed for entrance and exit and use.

### 3.11.1.3. Urban Landscapes



#### ❖ Standards and guidelines for urban landscapes

- Urban landscapes are created to serve human activities; thus, they must have sidewalks, staircases, ramps, bollards, signage, lighting, and outdoor car parks.
- These arrangements are for daily activities and showing national cultural identity.
- Universal design requirements should be included in the planning and construction process as well as modification of these environments.

### 3.11.1.4. Tamed Landscapes

*Picture 3.11.1.4.1. Sample of tamed landscapes*





*Picture 3.11.1.4.2. Sample of tamed landscapes and natural heritage area*

- ❖ Standards and guidelines for tamed landscape
  - There are many types of tamed landscape in villages and urban areas such as playgrounds sport areas, parks, cemeteries, pathways, and gardens.
  - Tamed landscape describes a place with human intervention, generally in the same condition as in city areas.
  - The natural and tempered landscapes are commonly visited by choice and characteristically involve a degree of challenge.
  - When there is a modification plan or new construction, it must include as much accessibility as possible.
  - Avoid creating more barriers after modification.
  - Ensure that existing roads and buildings are regularly maintained.
  - Ensure that all buildings with outdoor environment are accessible for everyone.

### **3.11.2. Mountains**



### ❖ Standards and guidelines for mountains

- Ensure that all means of transport are well maintained and do not have barriers to usage.
- Have roads with shallow ramps and rest areas in some places.
- Should provide maximum opportunities for every type of vehicles to pass through.
- Consider falling rocks blocking the road or causing severe accidents.
- Handrails or guardrails play important role in these areas.
- Roads with sharp turns must consider installing safety equipment for passengers.
- Signage must be installed as needed.

### 3.11.3. Peatlands



### ❖ Standards and guidelines for Peatlands

- Should build wooden trail for walking through Peatlands
- Ensure that all information locations, car parks, entrances, and exits are accessible for everyone.
- Handrails must be built according to the standard for ramps.
- Regularly check the wood on boardwalks for decay, which can cause accidents.

### 3.11.4. Beaches



#### ❖ Standards and guidelines for beaches

- Build wooden boardwalks or other adaptations to facilitate visits and walks along beaches for everyone.
- Have wheelchairs available for persons with disabilities when visiting beaches.
- Use flags or signal equipment to show prohibited and allowed areas.
- Have audible alert systems everywhere.
- Ensure that lifeguards are trained to communicate with all types of visitors, including people with disabilities and of all ages.

### 3.11.5. Conservation Areas



#### ❖ Standards and guidelines for conservation areas

- Ensure that all pathways in conservation areas are accessible for everyone.
- Install informational displays for people with different visual abilities.

- Set up seating areas for people using wheelchairs, electric bikes, with baby trolleys, assistive walking devices, and with guide dogs, etc.
- Have various forms of notification accessible for everyone.

### 3.11.6. Viewing Points



#### ❖ Standards and guidelines for viewing points

- Incorporate designated accessible car park spaces at viewing points.
- Ensure that detour routes or crossing roads have visible signage and are safe.
- Provide information on types of road and distances to viewing points.
- Provide an alternative step-free viewing area where access to the main viewing point is difficult and can not accommodate for all.
- Ensure reduction of barriers, especially high-level ground.

### 3.11.7. Country Parks



❖ Standards and guidelines for country parks

- Set up car parks near main areas.
- Establish a public transit bus station to bring passengers to the park area.
- Ensure access of heavy transports that provide services by building adequate roads to the park.
- Ensure that all roads have surfaces that allow everyone to drive safely.
- Provide a comprehensive system of signage throughout the park.
- Provide maps and guides in many forms.

**3.11.8. Woodlands and Arboreta**



❖ Standards and guidelines for woodlands and arboreta

- Ensure that there is information available in various forms for guests.
- Ensure that banners, signage, and information are easy to read.
- Facilitate close access to main places.

### 3.11.9. Picnic Areas



#### ❖ Standards and guidelines for picnic areas

- Set up picnic areas with roofing.
- Set up picnic areas near, but not in, the car parks.
- Set up eating tables that are strong and high and wide enough for people using wheelchairs.
- Arrange the areas with the width of 2,000 mm around eating tables.
- Have rubbish bins readily available.

### 3.11.10. Campsites and Caravan Parks



#### ❖ Standards and guidelines for campsites and caravan parks

- Ensure that campsites and caravan parks are set up with wide entrances and exits.
- Ensure that main areas are set up to be accessible for everyone.



- Ensure that electricity box and socket outlets are visible and safe.
- Can use moveable wooden surfaces for temporary campsites.
- Arrange wide areas with the width of 2,000 mm around barbeque areas.
- Have stove and barbeque equipment with adjustable heat.
- Ensure that fire extinguishers are nearby and accessible.

### 3.11.11. Waterways



- ❖ Standards and guidelines for waterways
  - Ensure that waterways have non-slip, strong, and level surfaces.
  - Install protection and caution signage at dangerous areas.
  - Ensure that roads, car parks, and bridges at ports and beaches allow persons with disabilities to access.
  - Ensure that car parks and toilets are near waterways and accessible for everyone.
  - Provide information and map in various forms accessible for everyone.
  - Guardrails must be built as needed for safety.

### 3.11.12. Archaeological Sites



- ❖ Standards and guidelines for archeological sites
  - Build and use new roads or wooden boardwalks for walking to protect sites from damage.
  - Use bus services from entrances to archeological sites.

### 3.11.13. Special Events



- ❖ Standards and guidelines for special events
  - Ensure that temporary event venues are as accessible as permanent places, including the environment.

- Ensure that routes are strong, non-slip, and at appropriate height.
- Ensure that sanitary facilities and other facilities are as accessible as permanent sanitary facilities
- If the area is big, there must be toilets at regular distances.
- Set up water system for temporary sites.
- Install signage throughout a temporary event venue.
- Ensure that all staff, volunteers, and organizers are trained on event management including interactions with people with disabilities.

### 3.11.14. Parks



- ❖ Standards and guidelines for parks
  - Ensure that facilities and furniture along pathways are not creating barriers.
  - Set up lighting along pathways throughout the park.
  - Modify and install equipment that can be used by persons, including children, with disabilities
  - Safety first at all locations of the park.

### 3.11.15. Cemeteries



- ❖ Standards and guidelines for cemeteries
  - Ensure that all pathways are accessible for everyone.
  - Ensure that all equipment, such as water taps, is convenient to use.
  - Have accessible space between pathways.
  - Every curbs must have ramps.

### 3.11.16. Playgrounds, Play Structures, and Equipment



- ❖ Standards and guidelines for playgrounds, play structures, and equipment
  - Ensure that play structures are designed to develop children both physically and intellectually.
  - Ensure that play structures are accessible for everyone.
  - Ensure that play structures have protective fences.
  - Ensure that entrances are the minimum width of 900 mm and open and close easily.
  - Cover sand box when not in use.
  - Ensure that surfaces of play structures are soft and meet high safety standards.

### 3.11.17. Gardens and Courtyards



- ❖ Standards and guidelines for gardens and courtyards
  - Set up gardens as informal recreational or meeting areas near buildings.
  - Set up gardens to attract attention and increase freshness.
  - Set up protections around any bodies of water in gardens.
  - Ensure that all garden areas are regularly maintained so that trees and leaves do not disturb the enjoyment.
  - Install appropriate furniture in gardens, accessible for everyone.

### 3.12. General Signage

There are many types, sizes, shapes, and colors of signage with different content and purposes. Signage is installed along roads, car parks, ports, airports, inside and outside buildings, etc.

Common signage includes that for direction, information, location, name, road number, room number, map, etc.

Signage gives instruction to those who find it difficult to tell others what they need and for those who find it difficult to obtain information. Examples include those who cannot hear or speak, who speak different languages, who do not trust advice of others, who find it difficult to remember and use spoken information. Moreover, signage is beneficial for everyone when they cannot ask for help. Clear and visible signage installed in many places should be at a level visible to those standing and also sitting in wheelchairs.



❖ Standards and guidelines for general signage

## 1. International Symbols of Accessibility

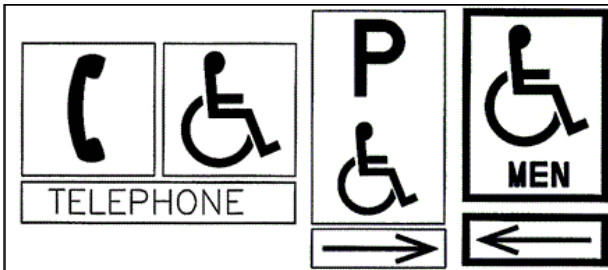
- Use international symbol of persons with disabilities



- a figure in a wheelchair in a rectangular or square shape.

## 2. Direction Signs

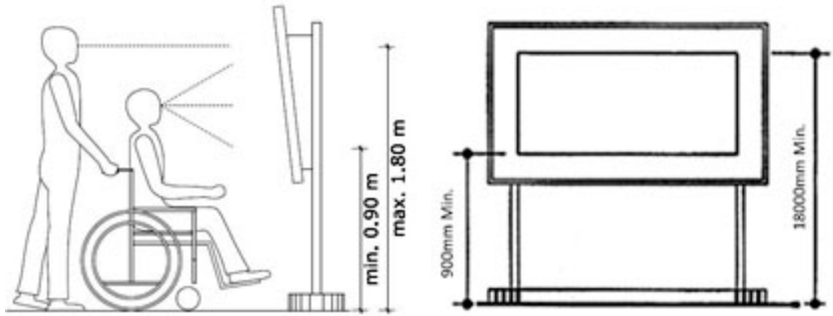
- Use direction signs in graphic or written form to clearly indicate those places.



- Direction signs should be installed at many places, including at entrances, in front of locations, and any places with turnings.

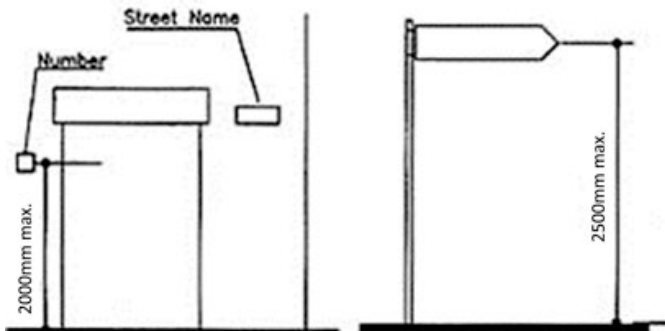
## 3. Maps and Information Panels

- All buildings should have maps of the whole building area.
- Should provide sufficient information (both in writing and in picture) to benefit everyone including those who are hearing impaired and people who have difficulty remembering information.
- Map and information panels at building entrances and along pathways must be at the height of 900 mm to 1,800 mm.



#### 4. Installation

- Signage can be installed on the wall, hung, or placed upright.
- Signage installed on the wall should be at the height of 1,400 mm to 1,600 mm from the ground.
- Hanging signage should be at the minimum height of 2,000 mm from the ground.
- Signage placed upright should be at the height of 1,400 mm to 1,600 mm from the ground.
- Outdoor signage should be at the height of 2,000 mm from the ground.
- Indoor signage should be at the height of 1,400 mm to 1,600 mm from the ground.
- Signage with road name and house number should be at the maximum height of 2,000 mm to 2,500 mm.





## 5. Shape of Signboard

- Information signboard should be square or rectangular.
- Emergency or caution signboard should be triangular.
- Prohibition signboard should be round.

## 6. Color

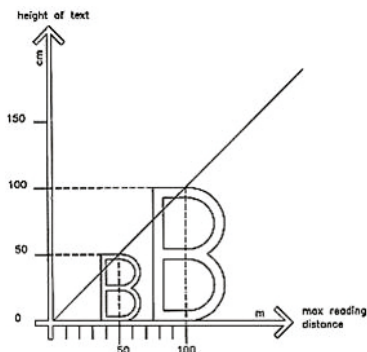
- Signboard color are often white, black, yellow, red, blue, and green.
- Choose colors to distinguish between the sign and background surface. (If the background is blue, the sign should be white, for example.)
- Do not mix colors such as red with green and yellow with blue, because these combinations are difficult to distinguish for people with low vision.

## 7. Surface

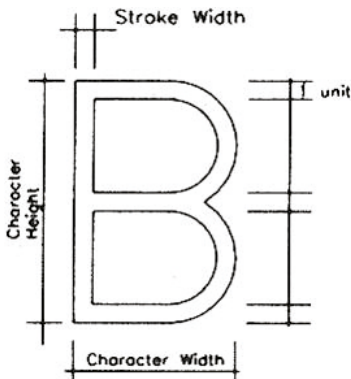
- Surface of signboards should be glare-free.
- Do not use raised letters, except when colored and replaced by braille.
- Main maps, direction signs, and buttons in platform lifts must be available in braille.

## 8. Lettering

- Should be of an appropriate size according to readable distance.



- The scale between width and height of letters should be between 3:5 and 1:1 and the scale between width thickness and height of letters should be at 1:5 and 1:10.



- Use short, concise words.
- For outdoor signboards, letters must be at the size (font size in computer) of 100 mm to 170 mm, in bold type and visible colors.
- Lettering must not be smaller than 15 mm.
- There must be spacing between each letter and word.
- For indoor signboards, letters must be at the height (font size in computer) of 15 mm to 50 mm and emerging at 1 mm to 1.5 mm in bold and visible colors.
- Be consistent; signboards with same meaning should be designed in the same manner.
- Signboards and/or building maps should be in braille if they are in a location where they can be touched.

## 9. Size

- Outdoor signboards shall be at the minimum size of 300 mm x 300 mm.
- Indoor signboards should be at the minimum size of 150 mm x 150 mm.

## 10. General Guide

- Do not put signs behind glass because it can be reflective.
- Signage must be visible and clear (easy to see and understand).
- Have proper lighting at night.
- Place and location for providing services should have proper signage with display of international symbols of accessibility.

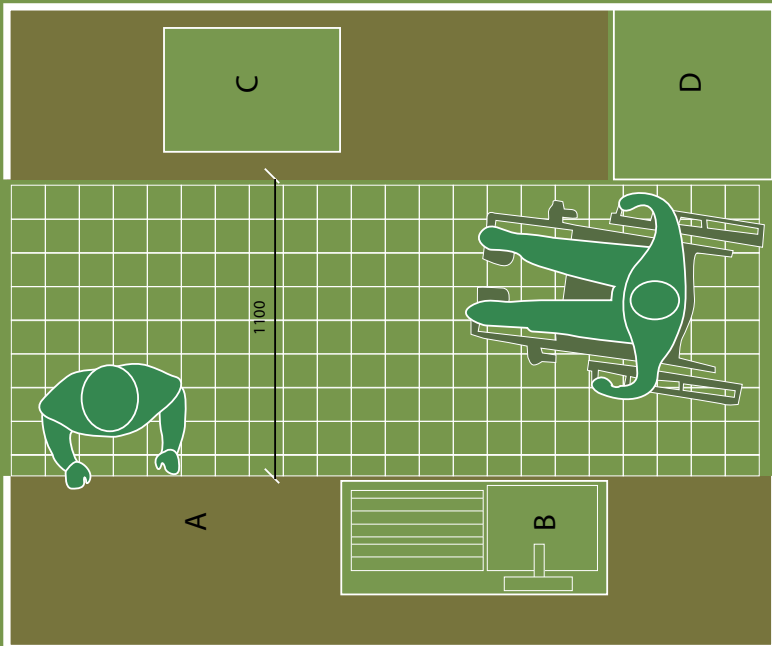
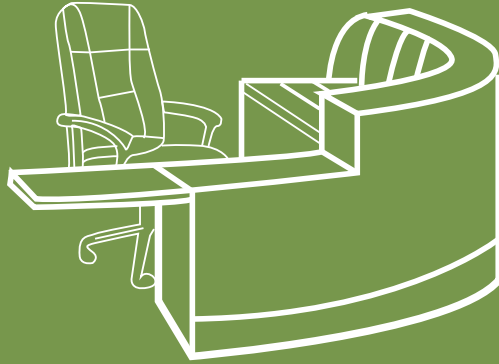
## 11. Some Important Signage



## Average size of accessible buildings or locations

- Shopping centers and retail outlets of daily goods of 300 m<sup>2</sup> to 1,000 m<sup>2</sup>
- Barbers, beauty shops, and public toilets of more than 500 m<sup>2</sup>
- City or village offices, branch offices of police, post offices
- Telephone and telecommunication offices, public health centers, public libraries, and health insurance offices of 1,000 m<sup>2</sup>
- Medical clinics, dental clinics, herbal clinics, maternity hospitals of more than 500 m<sup>2</sup>
- Children's community centers of more than 300 m<sup>2</sup>
- Service providers, restaurants, dessert shops of more than 300 m<sup>2</sup>
- Performance halls (play, movie, concert hall, circus, etc.) of more than 300 m<sup>2</sup>
- Meeting places (wedding halls, public halls, conference halls) of more than 500 m<sup>2</sup>
- Exhibition halls (museums, commemoration palaces, industrial exhibition halls, etc.) of more than 500 m<sup>2</sup>
- Animal parks, plant parks, aquaria of more than 300 m<sup>2</sup>
- Religious gathering places (pagodas, temples, praying halls) of more than 500 m<sup>2</sup>
- Funeral halls of more than 500 m<sup>2</sup>
- Training institutes, vocational training institutes, education institutes of more than 500 m<sup>2</sup>
- Libraries of more than 1,000 m<sup>2</sup>

## SECTION 4: FACILITIES IN BUILDINGS





## SECTION 4: FACILITIES IN BUILDINGS

### 4.1. Reception Desks and Service Counters



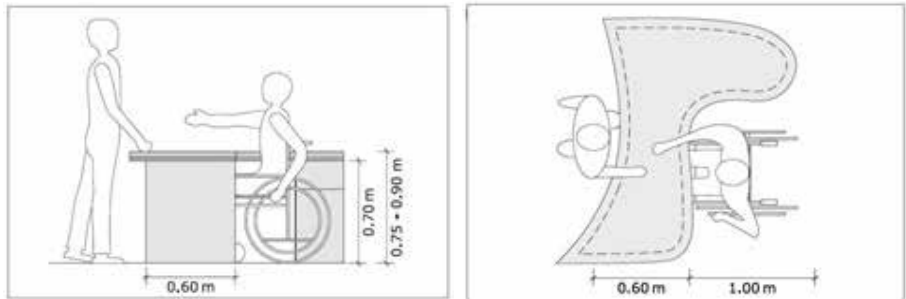
*Picture 4.1.1. Sample of reception desk with appropriate height for people using wheelchairs*

- ❖ Standards and guidelines for reception desks and service counters
  - Allow adequate knee space for people using wheelchairs.
  - Ensure that reception desks and counters are simple and accessible for both staff and guests.



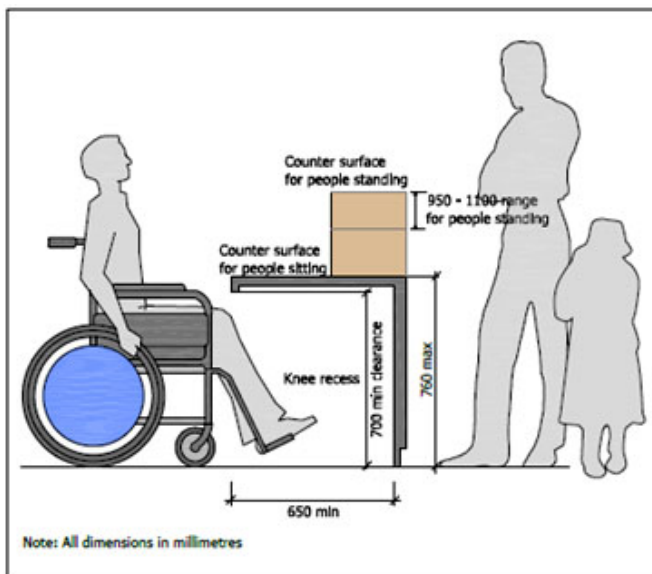
- Reception desks and service counters can be built at two levels (high/low) to allow persons with disabilities to use them.

Picture 4.1.2. Sample of reception desk designed in different forms



- Service and reception counters for persons with disabilities using wheelchairs should have maximum height of 760 mm from the ground and have a clearance to the underside of 700mm, and depth of 650mm for knee space to allow staff and customers to sit facing each other.

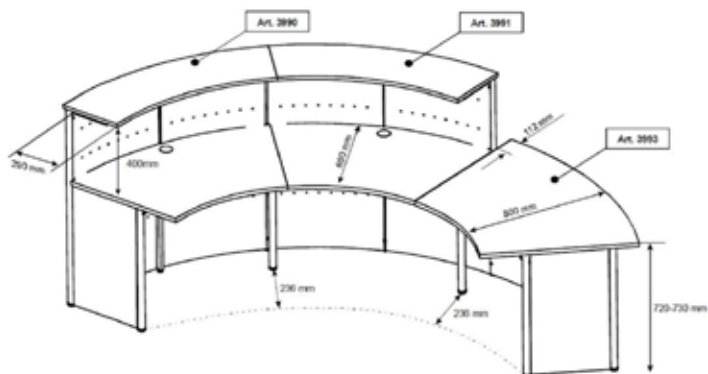
Picture 4.1.3. Sample size of service counter at reception desk





- Table width should be approximately 1,800 mm (minimum size of 1,500 mm).

*Picture 4.1.4. Sample size of reception desk or service counter accessible for everyone*

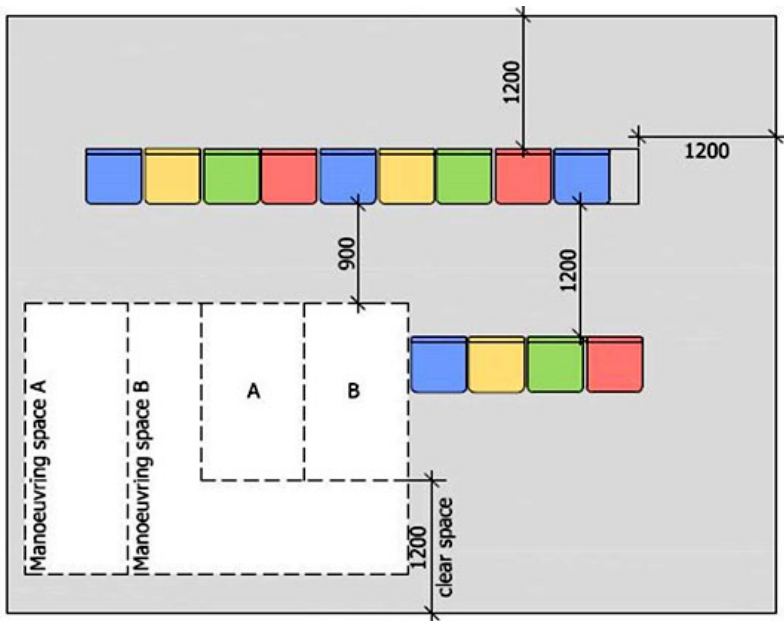


- Set up counters where they can be accessed straight from the main entrances.
- Build service counters at different heights as shown in the pictures.
- Keep unobstructed space of 2,440 mm x 2,440 mm in front of reception desks.
- Ensure that counters are visible and accessible by painting them different colors and using ramps if needed.
- Ensure glazed screens are clear and unobstructed.
- Consider use of sound system with counter screens.
- Have assistive hearing equipment for guests who request it and signage announcing availability of such equipment.
- Ensure that there is enough lighting at each counter (200 lux) and at the spot where faces of service staff are visible.
- Customer chairs must be at the height of 450 mm to 475 mm and width of 500 mm.

## 4.2. Waiting Areas and General Seating



Picture 4.2.1. Some sizes of seating



Space allowances for people using wheelchairs and scooters, as spaces A and B:

**Note:** All dimensions in millimetres

- ❖ Standards and guidelines for waiting areas and general seating
  - Ensure that all seating is easy to find and accessible for everyone.
  - Have seating at all reception and waiting areas.
  - Set up toilets and near reception or waiting areas.
  - At public transportation stations, there must be seating at all waiting areas.
  - Ensure that pathways or entrances to seating have no barriers.
  - Set up seating with wide space of chairs or benches for people with baby trolleys or luggage, people using wheelchairs and electric bikes.
  - Wing width and space between each chair must follow the picture above.
  - Set up chairs with different heights for different people.
  - If the area is small, there should be chairs at corner next to the wall.
  - Ensure that seating has different colors.

### 4.3. Storage Facilities



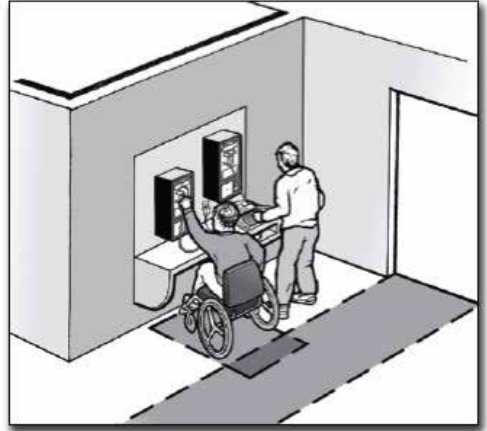
❖ Standards and guidelines for storage facilities

- Standard for shelving height at storage facilities as follows:

Shelf height in each storage room			
	Shelf height	Shelf depth	Space between each shelf
Entering with wheelchairs from the front	650 mm to 1,000 mm for frequent use	220 mm	1,200 mm with knee space
	650 mm to 1,150 mm for infrequent use		1,400 mm without knee space
Entering with wheelchairs from the side	665 mm to 1,060 mm for frequent use	220 mm	1,200 mm
	630 mm to 1,170 mm for infrequent use		
Walking or standing	750 mm to 1,500 mm for frequent use	Not available	1,200 mm
	700 mm to 1,625 mm for infrequent use		

- Ensure that pathways or entrances and exits of storage facilities is nearby, convenient, and has no barriers.
- Set up or install materials for storage facilities in a strong, stable manner and with no sharp edges.
- Install handles with contrasting colors from doors or shelves.
- Ensure that shelves and door handles follow the standard above.
- Ensure that wing width between doors and boxes is at least 1,400 mm.
- Avoid the use of a plinth below clothes rails.
- Avoid side of shelf of more than 1,000 mm.
- Store items vertically on the shelves for convenient use.

## 4.4. Public Telephones



### ❖ Standards and guidelines for public telephones

- Public phones shall be installed at locations in buildings serving the public, transit buildings, tourism centers, and retail buildings.
- Ensure that all public telephones are accessible and easy to understand whether they are available for a fee or free of charge to use.

#### 4.4.1. Payphones

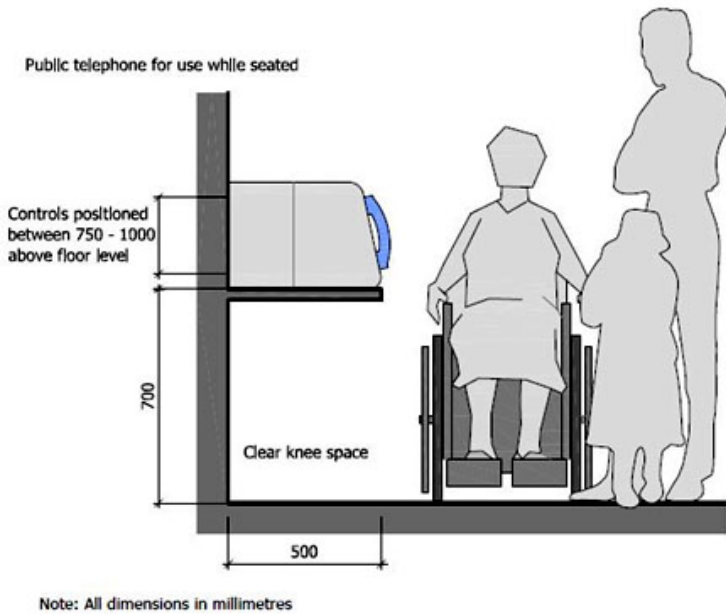


*Picture 4.4.1.1. Sample of payphones at different heights*



*Picture 4.4.1.2. Universal symbol for assistive hearing equipment*

*Picture 4.4.1.3. Public telephones for sitting users*



❖ Standards and guidelines for payphones

- Set up telephones at different heights.
- Install volume-adjusting button on all telephones.

- Set up space of 2,400 mm x 2,400 mm around the phone.
- Telephone cord must be at least 1,000 mm.
- Height of telephone handle should be the same as in the picture.
- Install braille in the middle of keyboard on number 5 or use tactile raised characters.
- Coin or card slots shall be in appropriate size.
- Set up lighting in telephone booth at least of 200 lux.
- Set up folded chairs or benches near the telephone.

#### 4.4.2. Textphones

*Picture 4.4.2.1. Some samples of textphones*



*Picture 4.4.2.2. Universal symbol for textphones*



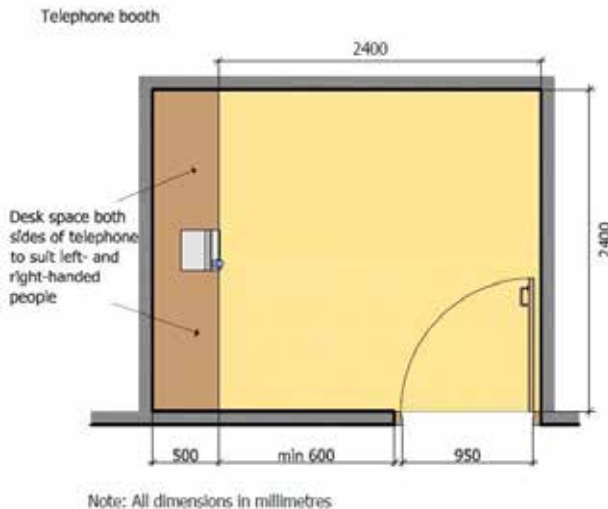
*Picture 4.4.2.3. Sample of textphones used as payment phone at public places*

❖ Standards and guidelines for textphones

- Set up textphones at all payment phone locations.
- Set up textphones at reception desks and service counters.
- Train staff on how to use textphones.
- Have shelves for textphones with the width of 250 mm and depth of 350 mm.
- Ensure that all phone service facilities have signage everywhere.

### 4.4.3. Telephone Booths

*Picture 4.4.3.1. Map of telephone booth*





#### ❖ Standards and guidelines for telephone booths

- Set up telephone booths for users' privacy and to avoid noise pollution.
- Telephone booths must have a door with a minimum width of 950 mm.
- Telephone must have long wire for convenient use.
- Have tables or shelves for right-handed and left-handed people.
- Have clear signage for location of telephone booths.

### 4.5. Coin and Card-Operated Machines



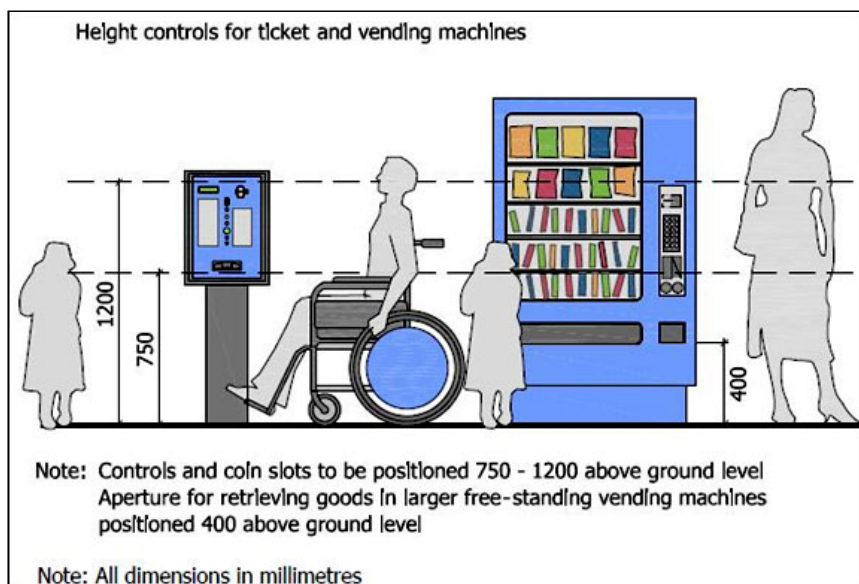
#### ❖ Standards and guidelines for coin and card-operated machines

- All coin and card-operated machines must be accessible for persons with disabilities in wheelchairs.
- Install user-friendly and convenient machines.
- Set up machines at appropriate locations.
- Have clear signage indicating location of ticket and ATM machines.
- Set up clear space of 2,400 mm x 2,400 mm for those using the machine.
- Avoid the use of plinths.
- Ensure that all signage is clear and easy to understand.
- Use font size of 16 on machine signage.
- Provide numbers for additional assistance where appropriate.
- Provide instruction in braille.

- Ensure that buttons are convenient to use even with single hand.
- Ensure that all buttons are at least 20 mm thick and with numbers slightly raised.
- All buttons shall not be too tight which is at 19.50.
- Have sufficient lighting of at least 200 lux.
- Have instruction leaflet for all usage.
- Have roofs over all outdoor automated machine booths.
- If there is a door, it must be at the minimum width of 900 mm and easy to open.

#### 4.5.1. Ticket Dispensers and Vending Machines

*Picture 4.5.1.1. Height of control button for ticket and item from machine*



❖ Standards and guidelines for ticket dispensers and vending machines

- These machines should adhere to the height as in the picture above.
- Ensure that there is sufficient space to be accessible for wheelchairs.
- Have instructions in writing or audio that are easy to understand and can be followed by everyone.

#### 4.5.2. Automated Teller Machines (ATMs)

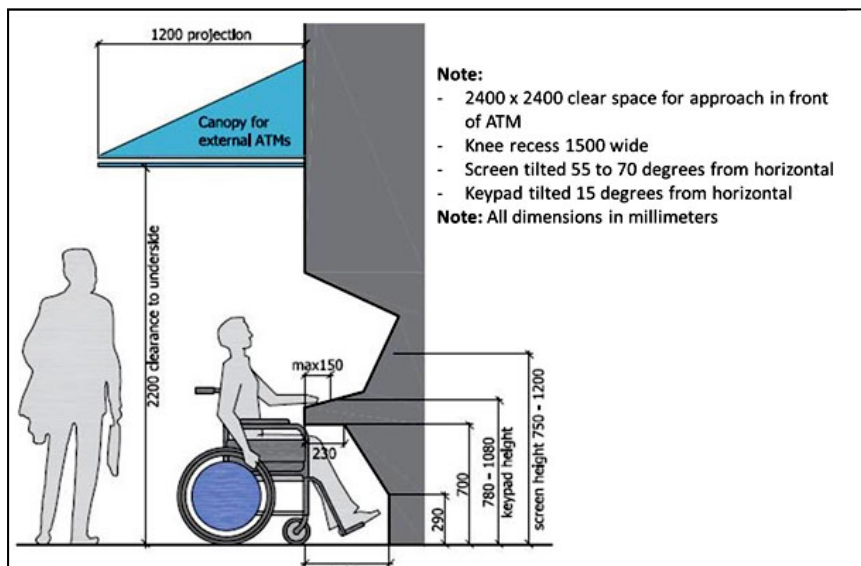
##### ❖ Standards and guidelines for ATMs

- Every ATM must be accessible by persons with disabilities in wheelchairs.
- Ensure that all signage is visible from the front and sides.
- Set up lighting for signage to be visible at night.
- Have empty space of 2,400 mm x 2,400 mm to ensure the machine is accessible.
- Have lighting at the ATM of at least 200 lux.
- Ensure that outdoor ATM booths have roof.
- Introductory screen glass must be clearly visible.
- The ATM screen must be clearly visible, adequately inclined to be accessible for everyone.
- Ensure that entrance and exit do not cause inconvenience for persons with disabilities using wheelchairs.
- Prepare simple and easy-to-understand instructions.
- Ensure that letters on the screen have font size of 18 and with clear colors.
- Ensure that every button works easily and does not stick.
- Install languages that can be used and understood by most users.



- Ensure that lighting on the screen is between 200 to 300 lux.
- Ensure that card, cash, and receipt are in appropriate size for reading.
- Install materials published in capital letters.
- If there is door, it must be at least 900 mm wide and easy to open and close.

*Picture 4.5.2.1. Some sizes of ATMs*



## 4.6. Kitchen and Refreshment Facilities



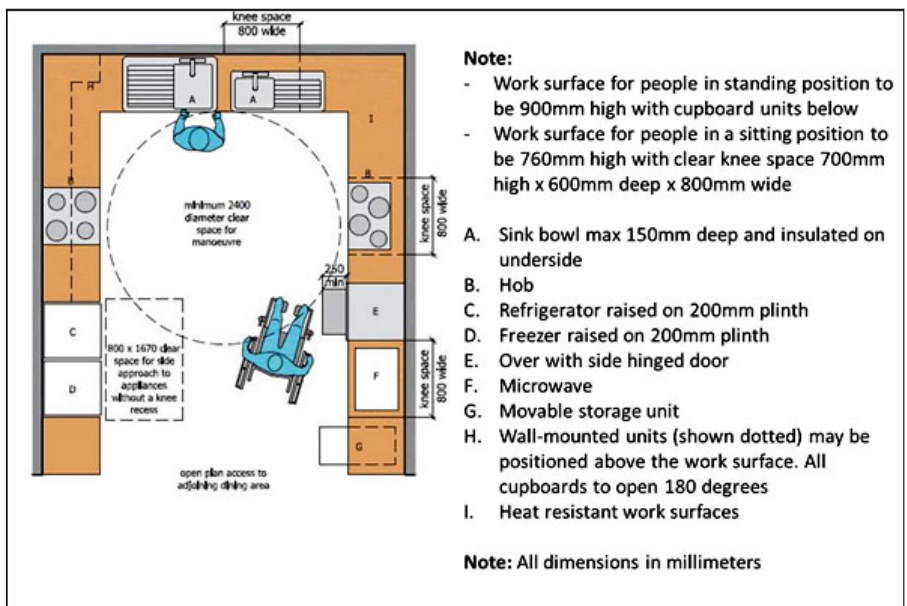
*Picture 4.6.1. Sample of kitchen that is appropriately designed and easy to use*

❖ Standards and guidelines for kitchen and refreshment facilities

- Set up kitchen and refreshment facilities near working areas.
- Set up instruction for opening at each pathway to facilitate entrance and exit of work surfaces and seating areas.
- Consider height of stove and leg space for people using wheelchairs.
- Dish and equipment storage must be set up at appropriate places and easy to use.
- Provide suitable lighting and ventilation.

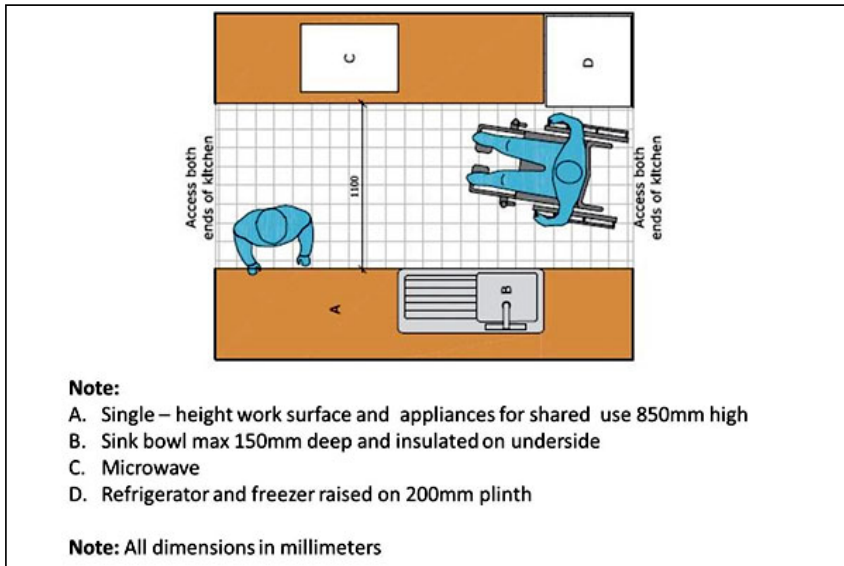
### 4.6.1. Layout and Work Surfaces

Picture 4.6.1.1. Arrangement of kitchen from above



❖ Standards and guidelines for layout and work surfaces

Picture 4.6.1.2. Kitchen with same height model on both sides



- Set up work surfaces as shown in the picture.
- Ensure that work surfaces have the height of 900 mm and chairs and benches have the height of 760 mm.
- Ensure that work surfaces and storage have space underneath for people using wheelchairs.
- Consider some places with adjustable heights for people with different needs.
- Allow space of 2,400 mm between work surfaces with L or U shape.
- Allow space with the width of 1,100 mm at each side of storage units.
- Install stoves next to one another to facilitate cooking.

- Can consider adding more stoves with adjustable panels.
- Ensure that work surfaces have different colors from walls and floors.

#### 4.6.2. Storage in Kitchen and Refreshment Areas



*Picture 4.6.2.1. Sample of drawers, cupboards, refrigerator, and oven with good design*



*Picture 4.6.2.2. Sample of dish drawers appropriate for persons with disabilities*

- ❖ Standards and guidelines for storage in kitchen and refreshment areas
  - Ensure that storage is safe when using, that items are easy to locate.
  - Set up upward-opening and side-opening cupboards.
  - Have wheeled storage for easy movement.
  - Install easy-to-use handles in different colors from shelves and front doors.
  - Ensure that dish and glassware storage drawers have door hinges that can open to 180 degrees.

### 4.6.3. Sinks and Appliances

#### ❖ Standards and guidelines for sinks and appliances

- Sinks should be in the central position, not closer than 460 mm from the wall or dish drawer.
- Washbasin of the sink must be at a height that people using wheelchairs can use, with no more than 150 mm depth.
- The area below the sink should be wide and contain nothing sharp that might be dangerous to wheelchair users.
- Water and waste pipes below sink must be next to the back wall as much as possible to avoid affecting knee space.
- Hot water pipe should be as distant as possible to avoid accidental touch.
- Sink and appliances must be at appropriate height, and the water and waste pipes should not be protruded below them.
- Water tap shall be in the middle of sink for draining.
- Water tap connector should be at appropriate height for draining water.
- Such change is a need for user to catch water.
- Water tap must be installed at place where it is easy to use, such as beside rather than behind the sink
- Tap controls must be convenient and visible for everyone and can be used with single hand.
- For safety, hot water tap should not be more than 40 degrees Celsius.
- Spraying tap should not splash user or the surface.





*Picture 2.6.3.1. Sample of sink appropriate for persons with disabilities and with adjustable height for raising up and dropping down according to the need of user*

- Gas stove and microwave must be separated in terms of height and appropriate space between each other.
- Ceramic stoves (using electricity) are common because of their convenience when using pots or pans for cooking.
- Work surfaces including stove and microwave should be heat-resistant, which makes it easy to pick up pot or pan directly.



*Picture 4.6.3.2. Sample of convenient electric stove for persons with disabilities*

- The area below a gas stove must be above knee height.
- Gas vault of stove must be easy to open and close, safe, and in the front, not at the side, for ease of use and to prevent danger when turning on.
- Electric stove must indicate when it is hot even after turning off.
- Gas stove users must be able to turn the stove on by themselves with a single hand.

- Microwave for sitting users must be on a surface at the height of 760 mm from the ground.
- Microwave for standing users must be on a surface at the height of 850 mm from the ground.
- Microwave door must open at one side only and open to 180 degrees.
- One-sided microwave door should be a heat-resistance metal panel that can stretch to at least 250 mm of the whole width.
- Shelves or support panels must be able to support weight of heavy dishes or trays.

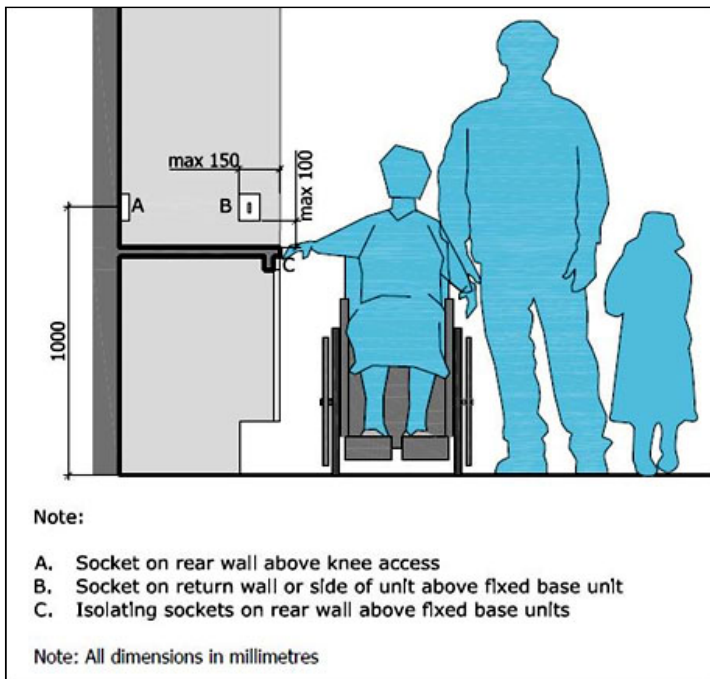
*Picture 4.6.3.3. Sample of kitchen appropriately designed for persons with disabilities*



- Controls of microwave must be between 750 mm and 1,050 mm from the ground, and the machine must not be higher than 1,200 mm.
- Controls must be visible, simple, and convenient in using with single hand.
- Microwave must be installed at a fixed place, the bottom surface of which must not be more than 850 mm from the ground.
- Controls on the upper part must not be more than 1,150 mm from the ground and easy to understand and use.

#### 4.6.4. Switches and Socket Outlets

*Picture 4.6.4.1. Installation of switches and socket outlets*



❖ Standards and guidelines for switches and socket outlets

- Ensure that switches and socket outlets are visible.
- Do not install switches and socket outlets higher than 1,000 mm from the floor and allow leg space for people using wheelchairs.
- Can install switches and socket outlets facing the front or wall if there is no leg space for people using wheelchairs.
- Install switches and socket outlets on adjustable places with extreme caution.
- Ensure that switches and socket outlet boxes have contrasting colors from wall colors.

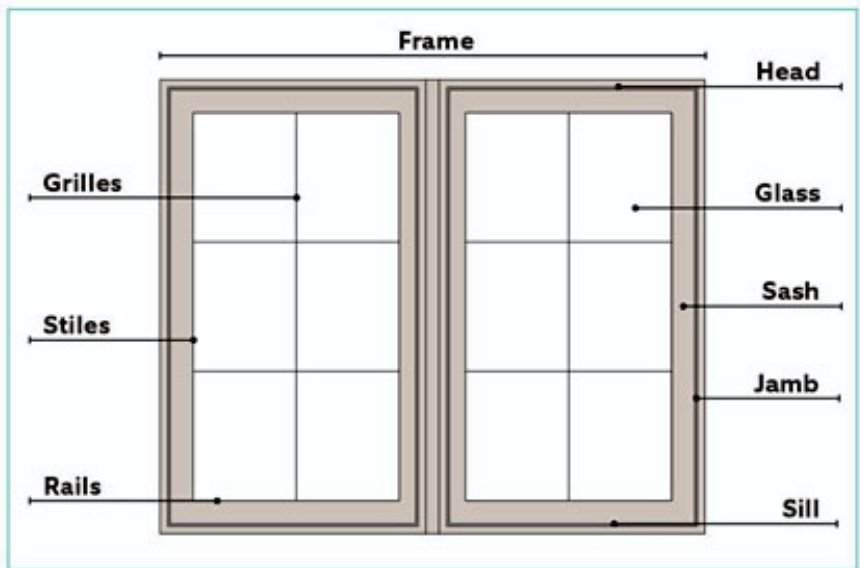
## 4.7. Windows



*Picture 4.7.1. Location of glass window panel*

❖ Standards and guidelines for windows

- Windows are important to allow adequate natural light and airflow.
- Location, size, type, model, design, style, form, and number of windows in each room or building vary according to the needs such as lighting, ventilation, security, safety, privacy, beauty, strength, price, etc.



- Manual windows must be easy to open and close and appropriate for persons with disabilities.
- Do not have small window on the door with the height of 900 mm and 1,200 mm from the ground.
- Install appropriate handles and latches that can be used with single hand, are easy to understand and use, and are at the height of 800 mm to 1,000 mm from the ground.



- Install manual latches that do not require much force to open and close; the force required to open or close a window should not be more than 5.5 to 8 newtons.
- Electronic window controllers can be installed in cases where manual equipment does not work; such window controllers must be at the height of 750 mm to 1,000 mm from the ground.
- Ensure that windows have no barriers or hazards when using.



- Ensure that windows at the first and higher floors cannot be opened more than 100 mm.
- Install remote electronic control devices for opening and closing if the windows are too high or far to reach.



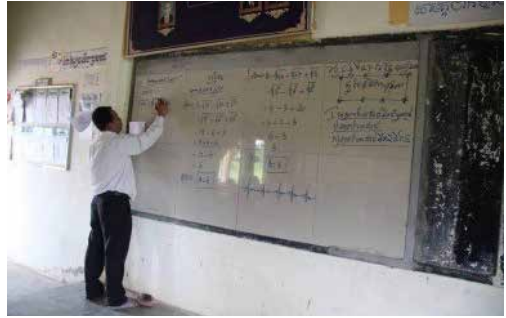
*Picture 4.7.2. Window with good lighting*

#### **4.8. Appropriate Concepts in an Inclusive Classroom**

- ❖ Standards and guidelines for appropriate concepts in an inclusive classroom
  - Children using wheelchairs need additional space to move and transfer from wheelchairs to chairs.



- Choose seating appropriate seating areas for students with disabilities. Consult with them on the most appropriate places.
- To increase participation of children with disabilities in the classroom, do not isolate them at a distance from classmates.
- Remove barriers in classroom in accessing desks and the board.
- Set up classroom with enough space for students using wheelchairs to move around.
- When needed, lower the height of board for children using wheelchairs.

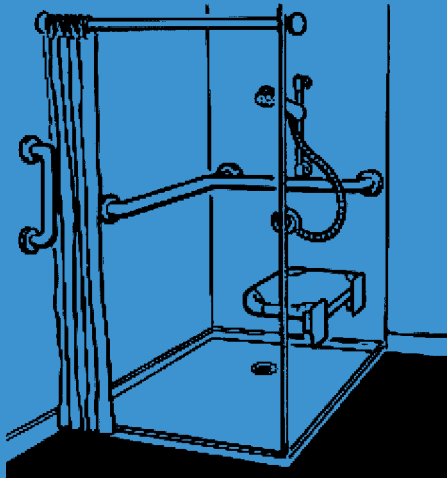


- If needed, in front of the board, build standard ramps for children to participate.
- The whole classroom must ensure that children using wheelchairs can move around anywhere.
- Ensure that children with low vision sit at an appropriate distance from the board.





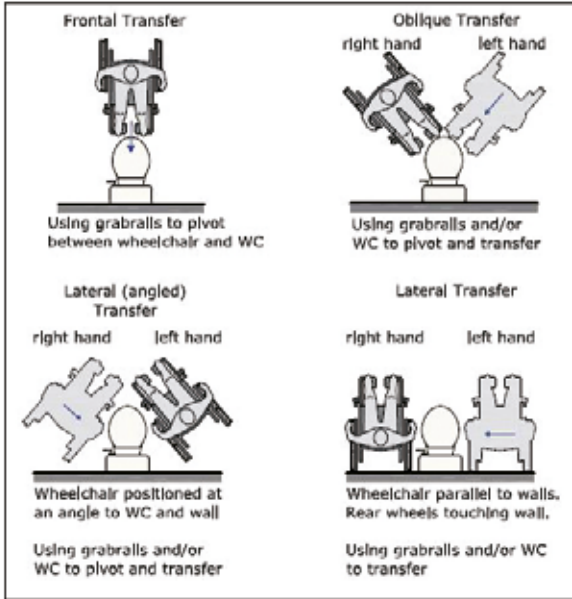
## SECTION 5: SANITARY FACILITIES





## SECTION 5: SANITARY FACILITIES

How to transfer between wheelchair and toilet



### 5.1. Single-Sex Toilets

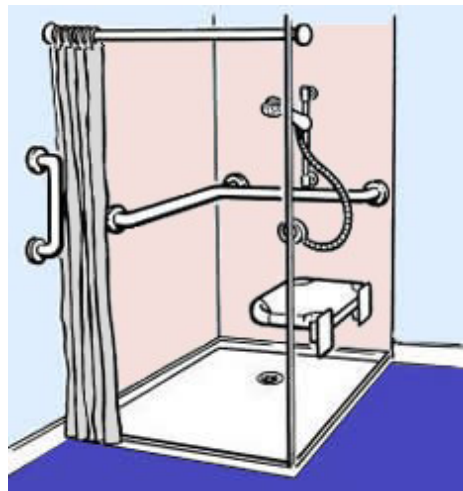


*Picture 5.1.1. Sample of single-sex toilet and female/male toilet*

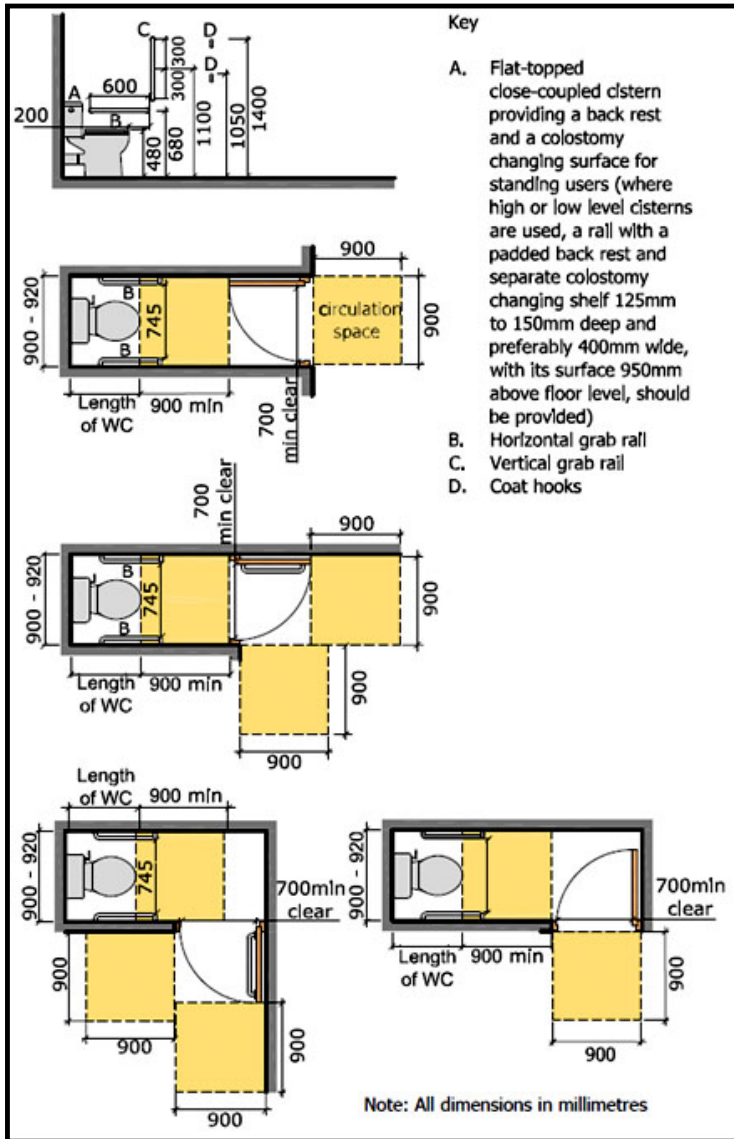
## ❖ Standards and guidelines for single-sex toilets

- Set up proper places for toilets, urinals, and sinks.
- Set up toilets that are accessible for everyone.
- Design stalls and rooms for persons with disabilities who have mobility issues.
- Allow sufficient room for those who need wide space.
- Install hinges appropriate to the doors.
- Install sinks at different heights.
- Sinks must have automatic controls or latches.
- Ensure that for every two toilets, there is one toilet designed for persons with disabilities using wheelchairs.
- Have most appropriate handrails in toilets for persons with disabilities

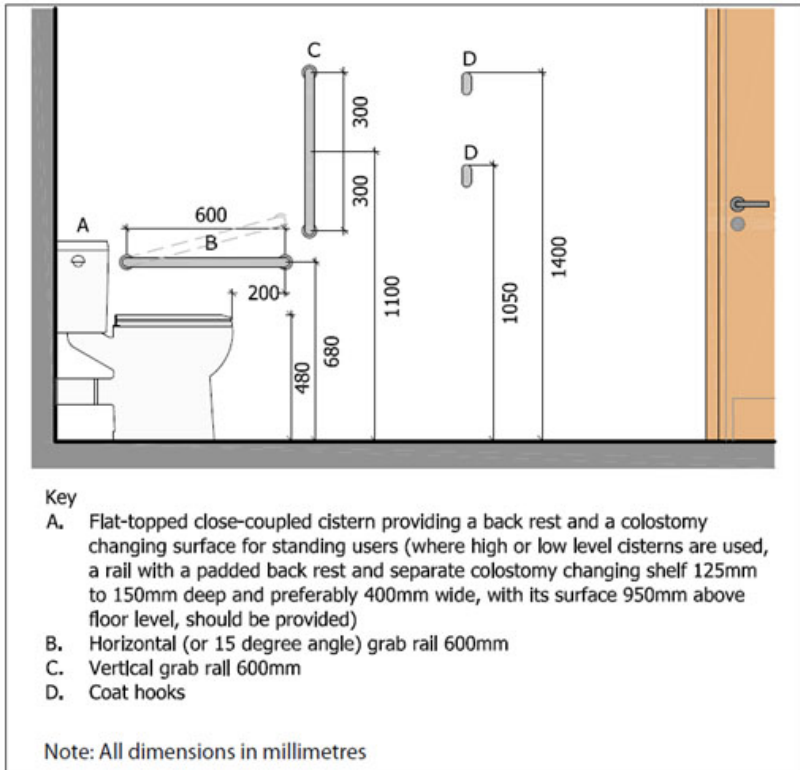
### 5.1.1. Accessible Toilet Cubicles



Picture 5.1.1.1. Size of accessible toilet cubicles for persons with limited mobility



Picture 5.1.1.2. Installation of handles in accessible toilet cubicles for persons with movement disabilities



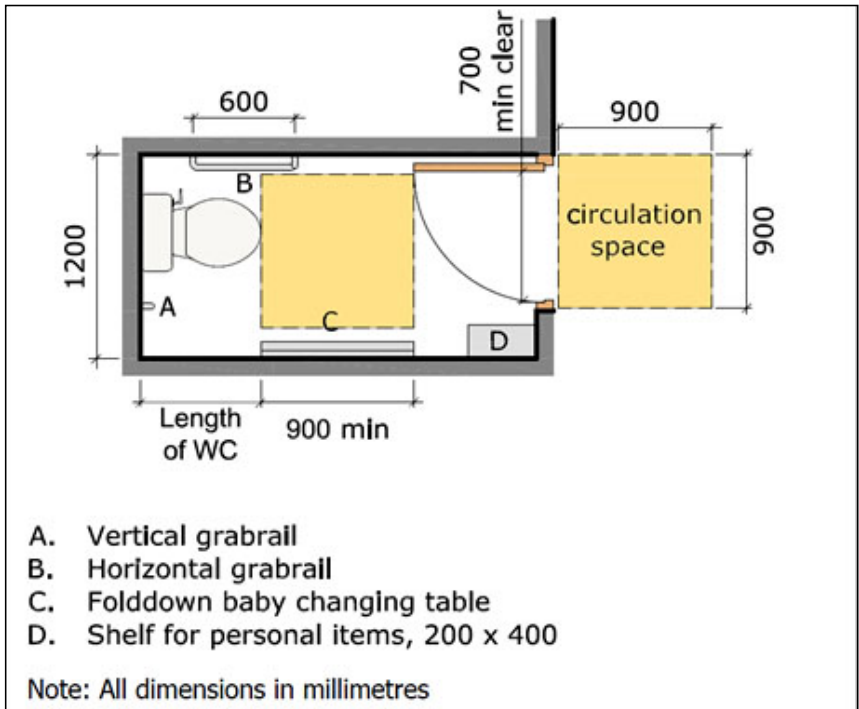
❖ Standards and guidelines for accessible toilet cubicles

- Place one rubbish bin in this cubicle.
- The room should be of the minimum size of 900 mm x 920 mm.
- Keep empty space for wheelchair of 900 mm x 900 mm, excluding space for the toilet and for opening and closing the door.
- Toilets must be at the height of 480 mm from the ground.

## 5.1.2. Enlarged Cubicles

- ❖ Standards and guidelines for enlarged cubicles
  - Enlarged cubicles can be easily used by everyone.
  - Enlarged cubicles are the size of 1,200 mm.
  - Keep empty space of 900 mm x 900 mm for moving wheelchairs.
  - Sink must be at the height of between 680 mm to 900 mm from the ground.

*Picture 5.1.2.1. Enlarged cubicles for persons with disabilities who need additional space*



### 5.1.3. Urinals

*Example: Urinals for children with separator*

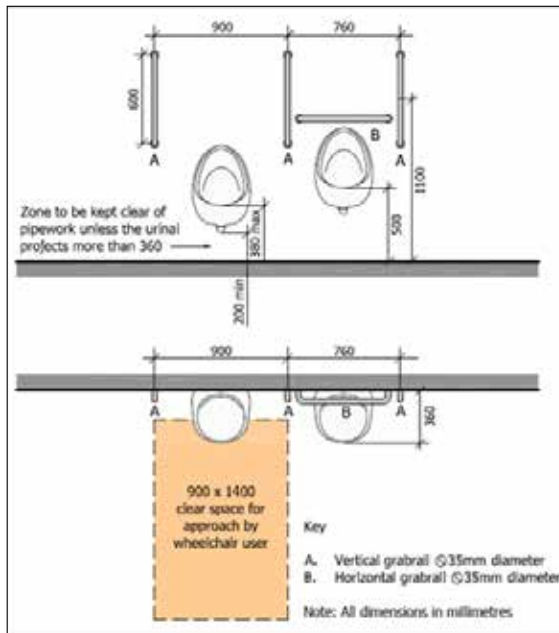


*Example: Urinals with handle*





Picture 5.1.3.1. Appropriate arrangement of urinals



❖ Standards and guidelines for urinals

- Urinals are installed or set at the height of 380 mm to 500 mm.
- Keep empty space of 900 mm x 1,400 mm around the urinals.
- Each urinal should have grab bars 500 mm from urinal base with chest support at 1,100-1,200 mm for adults and 700mm for children.
- Installed on each side: 600mm between bars, and in the front of the urinal to support people with disabilities who have difficulties walking and/or standing (for example people who use crutches).
- The front bar is to provide chest support; the sidebars are for the user to hold on to while standing.
- Fix urinals on the wall with long supporting edge at the maximum height of 430 mm from the ground.
- Should have wide space of 760 mm x 1,220 mm in front of the urinals to allow front entrance.
- All toilets must have signage (triangle for men and round for women) on a panel and braille hanging on the door.

## 5.2. Unisex Toilets



### ❖ Standards and guidelines for unisex toilets

- Ensure that the unisex toilet is appropriate for all people in the building if there is only one.
- Ensure that room diameter is at the minimum width of 2,300 mm x length of 2,500 mm.
- Add standing basin at the height of 780 mm to 800 mm with hand soap and dryer or towel.

### 5.2.1. Accessible Unisex Toilets



*Picture 5.2.1.1. Sample of accessible unisex toilets with sign*

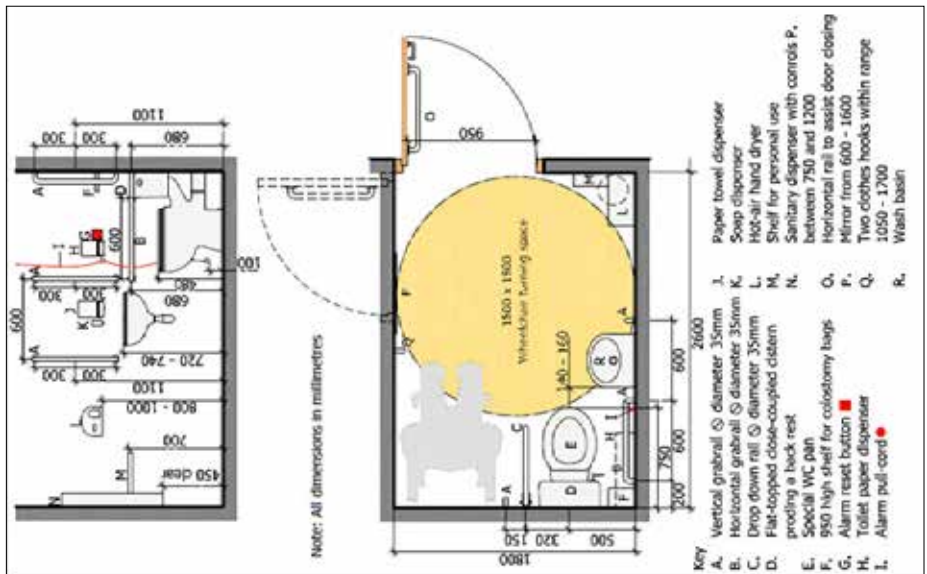


Picture 5.2.1.2. Sample of accessible unisex toilet

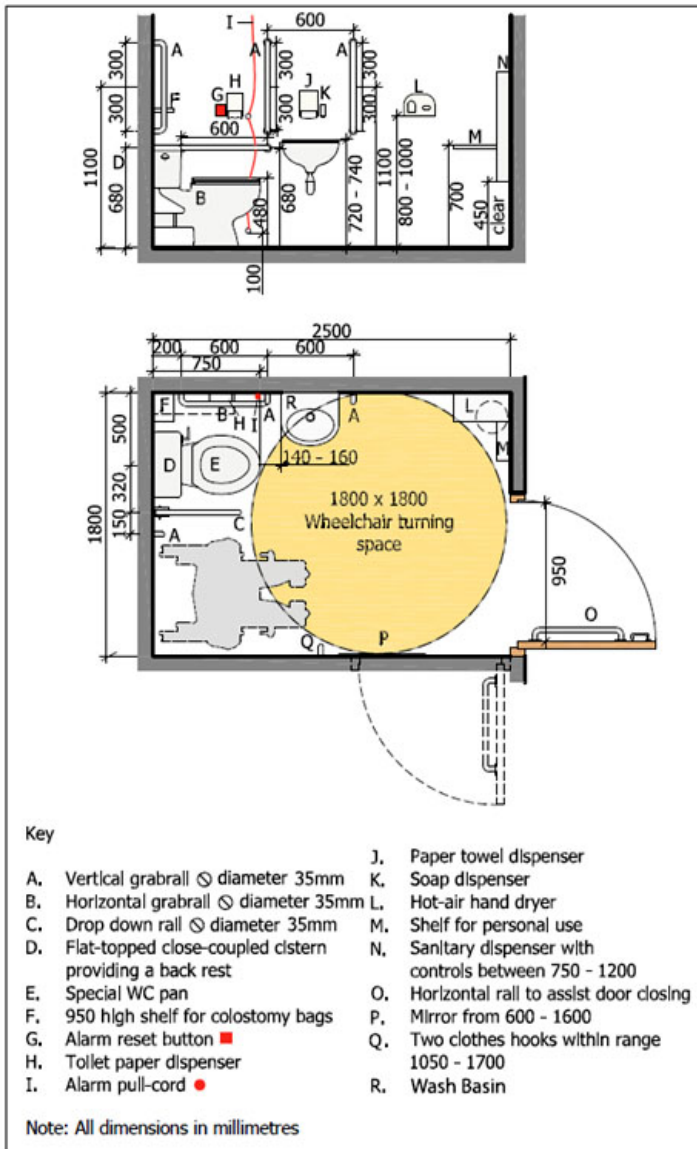
### ❖ Standards and guidelines for accessible unisex toilets

- A unisex accessible toilet (also termed a wheelchair accessible toilet) is designed to meet the needs of independent wheelchair users but is also equipped to suit persons with mobility difficulties and may be used by other people who require, for example, additional space, the support of grab rails, or integral hand-washing facilities.
- Room should be no less than 1,800 mm x 2,500 mm.

Picture 5.2.1.3. Accessible unisex toilets allowing for transfer on the right-hand side



Picture 5.2.1.4. Appropriate unisex toilets allowing transfer on the left-hand side



- In an accessible toilet, the washbasin should be within reach of a person seated on the wheelchair.
- The basin is typically small (approximately 450mm x 300mm) so that it does not take up too much maneuvering space or obstruct access for persons who use wheelchair.
- If room is available a larger sink should be provided.
- The location of the washbasin is crucial to enable a person to wash and dry their hands before adjusting their clothes. .
- Also, soap, toilet paper, and towel dispenser should be accessible for people using wheelchairs.
- The height of the washbasin should suit people using it in both a seated and standing position, with the rim 720 mm to 740 mm above floor level and a clear knee space beneath to enable seated approach.
- Water supply system and waste pipe should be fixed to the wall to maximize space below the basin.
- Water tap must be placed at the side of basin closest to the toilet.
- Water tap must have vertical or side handle or automatic controls, e.g., a sensor system.
- Central mixer taps should be avoided as they make it difficult to wash out urine bottles.
- The 750mm dimension from the front of the WC pan to the rear wall of the compartment is critical. This measurement enables a wheelchair user to position themselves in the transfer space to the side of the WC, parallel to the side walls and with the front of the wheelchair level with the front of the WC pan.
- Some wheelchair users are then able to move sideways onto the WC, without also having to move either backwards or forwards as they transfer.



*Picture 5.2.1.5. Sample of washbasin with multi-function water tap, soap dispenser, tissues, and handle*



*Picture 5.2.1.6. Sample of accessible unisex toilets with transfer on the right-hand side*

## 5.2.2. Toilet Pans and Cisterns

- ❖ Standards and guidelines for toilet pans and cisterns
  - Toilets with buried cisterns, which are easily maintained, create 750 mm of free space between the toilet pans and the wall or empty space at both sides of toilet pans.
  - Every decrease in space creates difficulty for people using wheelchairs to transfer, limiting movement of wheelchairs or ability to reach the handle near the toilet.
  - Toilets should have adjustable seat height accessible for users to clean themselves while sitting.
  - Toilet pans should be strong and attached to the floor rather than the wall.
  - Seating should be strong and fitted for people with mobility issues to facilitate their transfer.

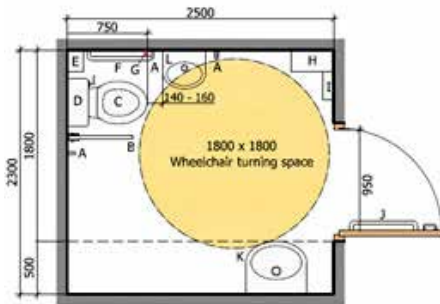
- Shape of the toilet should allow space below the pan for feet and to facilitate transfer from wheelchairs and be appropriate for male users.
- Toilet seat covers should be strong and firmly attached to avoid accidents, since they will be used as back support for sitting users.
- Where mid-level or high-level cisterns are used, or where the cisterns are concealed, a padded backrest should always be provided.
- A common error in the specification and installation of corner arrangement WCs is for the cistern flush-handle to be positioned on the wrong side, that is, adjacent to the side wall of the toilet compartment.
- If the flush-handle is on the wrong side, many people will be unable to reach or use the handle and the WC will remain unflushed, which is unhygienic and causes embarrassment to users.
- Flush buttons or levers should be easy to find and to reach.
- Flush levers are more convenient than buttons for people with hand problems.
- Some manufacturers now produce a cistern flush mechanism for use in accessible WCs that has a dual-flush capability.
- Dual-flush mechanisms that require operation with a single finger, or fine hand movement, should not be installed.
- Consider a big button that can be operated with the hand or elbow to flush and requires little force; it must be placed at a place that is convenient even after transferring from the toilet.

### 5.2.3. Enlarged Unisex Toilet with Standing-Height Washbasin

- ❖ Standards and guidelines for enlarged unisex toilets with standing-height washbasin
  - If there is adequate space, maintain empty space by designing for people who sit and stand.
  - Enlarged unisex toilets with standing-height washbasin should be at least 2,300 mm x 2,500 mm.

- Toilets at the corner must have high cisterns.
- Where there is more than one layout, the design can have many options to make unisex toilets.

*Picture 5.2.3.1. Sample of enlarged unisex toilet with standing-height washbasin*



**Key**

- A. Vertical grabrail Ⓞ diameter 35mm
- B. Drop down rail Ⓞ diameter 35mm
- C. Special WC pan
- D. Flat-topped close-coupled cistern providing a back rest
- E. 950 high shelf for colostomy bags
- F. Horizontal grabrail Ⓞ diameter 35mm
- G. Alarm pull-cord ●
- H. Shelf for personal use
- I. Sanitary dispenser with controls between 750 - 1200
- J. Horizontal rail to assist door closing
- K. Additional standing height washbasin with rim 680 - 700 high and clear knee space
- L. Washbasin

Note: All dimensions in millimetres

- The washbasin should be in the corner to facilitate hand or body washing and cleaning of personal hygienic devices.
- Basin should be at the height of 780 mm to 800 mm for standing and positioned such that it does not cause difficulty in transferring from wheelchairs.
- Soap dispenser and towel dispenser or dryer must be near washbasin.

### 5.2.4. Family Toilets



*Picture 5.2.4.1. Sample of family toilets*



## ❖ Standards and guidelines for family toilets

- Set up appropriately wide toilet for small group of people to use.
- Add one or more toilets if the space allows.
- Install washbasin and dryer or hand towels.
- Set up baby-changing facilities.
- Ensure that toilets are appropriate for people using wheelchairs, people with small babies, persons with visual disabilities, and persons using assistive walking devices.

### 5.2.5. Baby-Changing Facilities

*Picture 5.2.5.1. Sample of baby-changing facilities*



## ❖ Standards and guidelines for baby-changing facilities

- Set up unisex baby-changing facilities.
- Add baby-changing facilities in men's and women's toilets.
- Install baby-changing tables with two different heights.
- Provide washbasin and dryer or hand towels.
- Provide rubbish bin for baby diapers.
- Set up separate nursing room.

### 5.3. Toilets for People Who Need Assistance

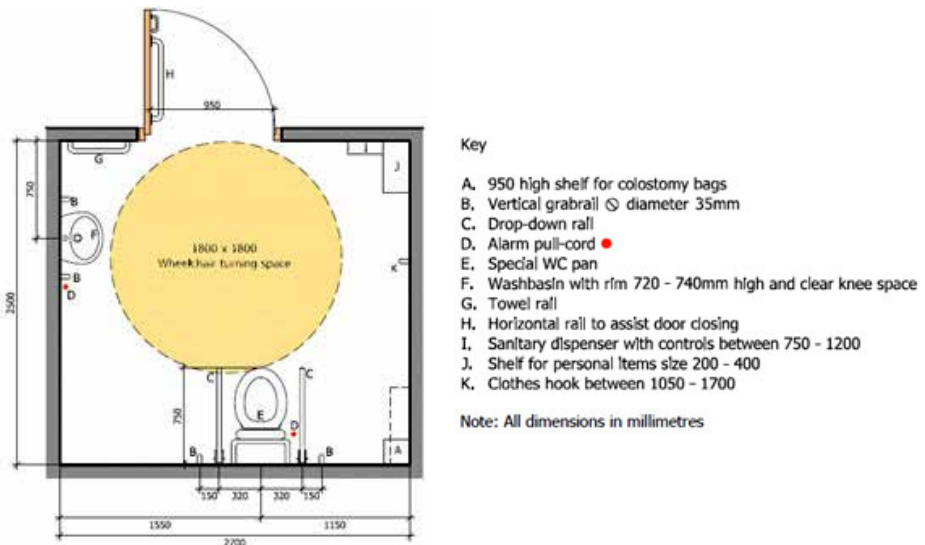
## ❖ Standards and guidelines for toilets for people who need assistance

- Ensure that toilets have width of 2,700 mm and depth of 2,500 mm.
- Install washbasin accessible for people using wheelchairs.
- Install curtains for each toilet.

### 5.3.1. Unisex Peninsular Toilet for Assisted Use

- ❖ Standards and guidelines for unisex peninsular toilet for assisted use
  - A peninsular toilet should protrude, like a peninsula, at least a meter from the walls on either side. This creates space on both sides of the toilet, allowing wheelchair transfers or assistance from caregivers.
  - Unisex peninsular-arrangement toilets provide convenience in transferring from all angles, and they should be installed at hospitals, accommodations, sport centers, or other recreational places.
  - The absence of fixed grabrails adjacent to the WC or wall often means there is insufficient support for independent use.
  - Overall size of toilets is width of 2,700 mm x length of 2,500 mm.

Picture 5.3.1.1. Unisex Peninsular Toilet for Assisted Use



- Cisterns in unisex peninsular toilets must be far from the pans.
- In a peninsular-arrangement toilet, a person is not expected to wash their hands while seated on the WC and the washbasin is positioned remotely to ensure there is sufficient space for assistants on both sides of the WC.
- The upper edge of washbasins should be at the height of 720 mm to 540 mm from the ground for those who sit and have wide space for knees underneath.
- Should install curtain around toilets for privacy of users and assistants.



*Picture 5.3.1.2. Sample of unisex peninsular toilet for assisted use*

### **5.3.2. Unisex Peninsular Toilet with Adjustable Changing Bench and Hoist Facilities**



*Picture 5.3.2.1. Sample of unisex peninsular-arrangement toilet with hoist facilities for persons with disabilities*



*Picture 5.3.2.2. Sample of unisex peninsular-arrangement toilet with assisted changing*



*Picture 5.3.2.3. Sample of assisted changing facility*

- ❖ Standards and guidelines for unisex peninsular toilet with adjustable changing bench and hoist facilities
  - Ensure that toilets have width of 3,500 mm x length of 2,500 mm.
  - Install benches with adjustable heights.
  - Put toilet papers in all toilets.
  - Set up hoist facilities on the ceiling or provide mobile hoist.
  - Install curtain in all toilets to ensure privacy.
  - Install hand-washing devices and dryer or hand towels.
  - Put most appropriate rubbish bins in all toilets.

#### **5.4. Shower Rooms and Bathrooms**

- ❖ Standards and guidelines for shower rooms and bathrooms
  - Ensure that bathrooms are a minimum of 2,300 mm x 2,500 mm.
  - Install shower head at appropriate height.
  - Use removable shower head.
  - Ensure that temperature-adjusting button/equipment is easy to use.
  - Install folding plastic seats in the shower stalls.
  - Add folding seats at drying area.
  - Install the most appropriate grab bars.
  - Install curtains in all shower rooms to ensure privacy of users.

- Install appropriate bathroom equipment such as towel hangers, clothes hooks, and mirror.
- Ensure that floor in shower room drains well and is non-slip.



*Picture 5.4.1. Sample of appropriately designed shower head*



*Picture 5.4.2. Sample of bathtub for persons with disabilities using wheelchairs*

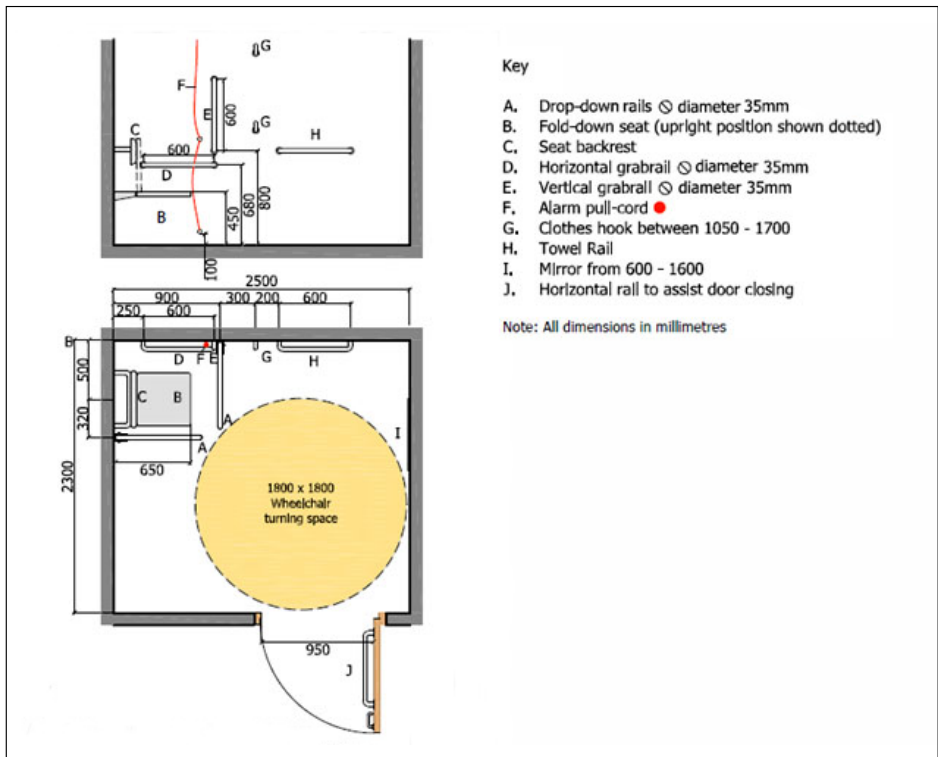
#### **5.4.1. Self-Contained Accessible Shower**



*Picture 5.4.1.1. Sample of shower head and folding seat*

- ❖ Standards and guidelines for self-contained accessible shower
  - Self-contained accessible showers designed for independent use should be at least 2,300 mm x 2,500 mm.
  - Showers accessible by everyone should include shower head that can spray water in a circle, to the walls and around the room, but ensure that the water is well-drained and does not accumulate on the surface and any slope in the floor should not exceed a 1:50 gradient.
  - Showers can control water pressure, big or small spray, and hot or cold water. All design of such systems must consider people with visual impairments.

*Picture 5.4.1.2. Arrangement of self-contained accessible shower*



- A tub can also be used on the available floor to replace a shower stall.
- All showers should have non-slip tile or coating, whether wet or dry.
- The area surrounding the shower should be at the size of 1,200 mm x 1,000 mm and wide enough on both sides for people using wheelchairs to transfer with the diameter of 1,800 mm.



*Picture 5.4.1.3. Sample of appropriate bathroom*

- Adjustable shower head should be installed on the wall above shower chair.
- Shower head should be at the height of 1,200 mm to 2,200 mm from the ground, and control device should be between 750 mm and 1,200 mm from the ground.
- Water temperature should not exceed 40 degrees Celsius (104 degrees Fahrenheit), and heat control devices should be accurate, convenient, and placed at an appropriate height for everyone.
- There should be folding plastic seat with attached or separate back support and firmly and stably installed.

- Attach seats to the wall with grab rails of 650 mm to facilitate transfer from wheelchair, and seats must be at the height of 450 mm to 480 mm and width of 500 mm.
- Have another reserved folding seat far from shower for users for drying and changing clothes; all chairs must be appropriate and safe for use.
- One or two shower curtains should be fully provided for privacy but not affect the use of shower.
- The shower curtain provides privacy to a person using the shower if a carer or companion is also in the room and also helps to keep belongings dry.
- Materials in the room, including towel hanger, clothes hooks, and mirror should have seats, handles, and other items that should have contrasting colors from the floor and wall.

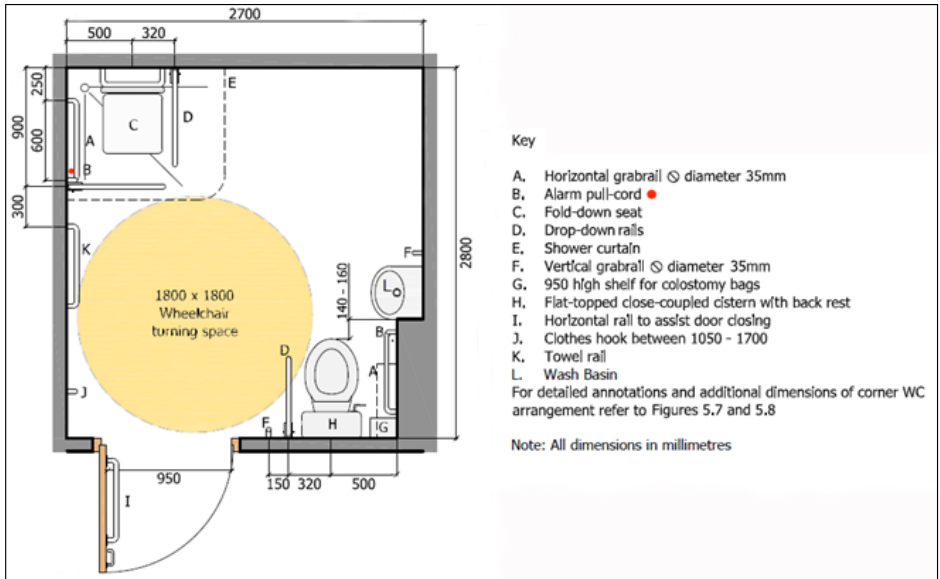
#### 5.4.2. Accessible Shower with WC



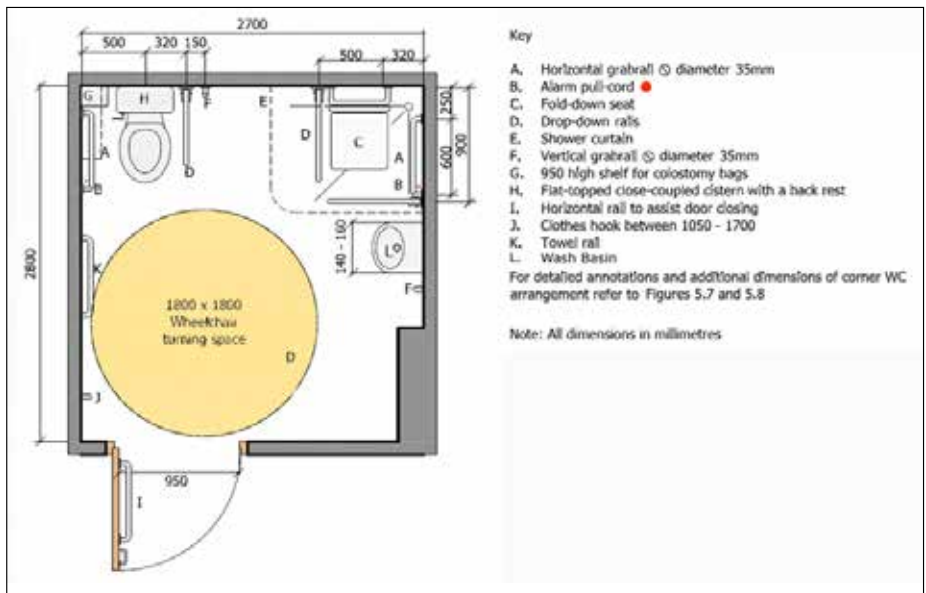
*Picture 5.4.2.1. Sample of accessible shower with WC without grab rail and with external pipe.*



Picture 5.4.2.3. Other options of map for accessible shower with toilet



Picture 5.4.2.2. Map of accessible shower with toilet

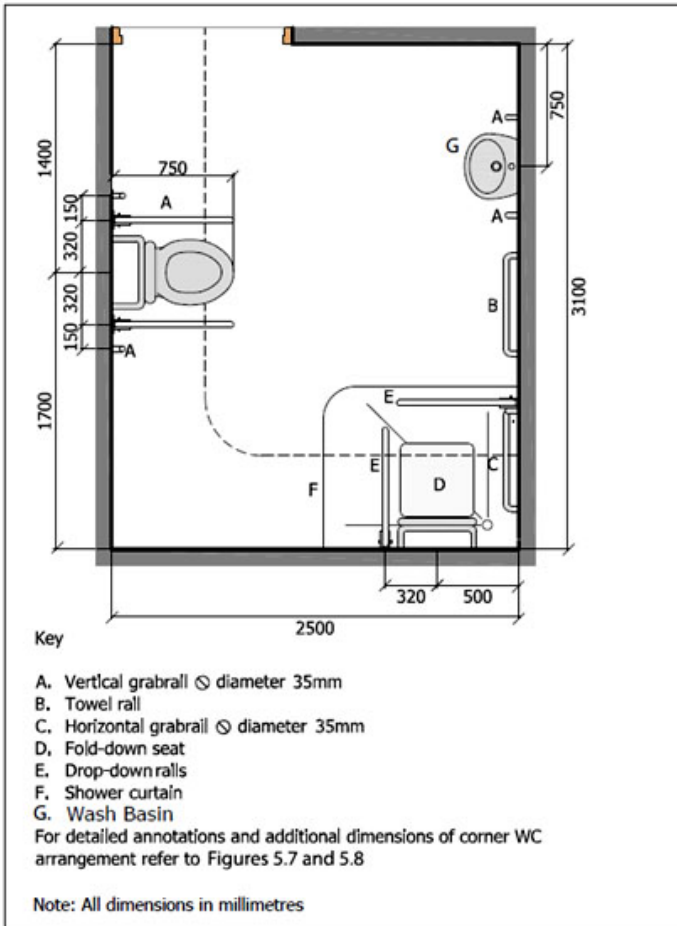


- ❖ Standards and guidelines for accessible shower with toilet
  - Shower must have diameter of 2,700mm x 2,800mm
  - Shall have a wide hand washbasin with a suitable toggle switch.

### 5.4.3. Shower and Peninsular Toilet for Assisted Use

- ❖ Standards and guidelines for shower and peninsular toilet for assisted use
  - Ensure that shower is at the size of 2,500 mm x 3,100 mm.

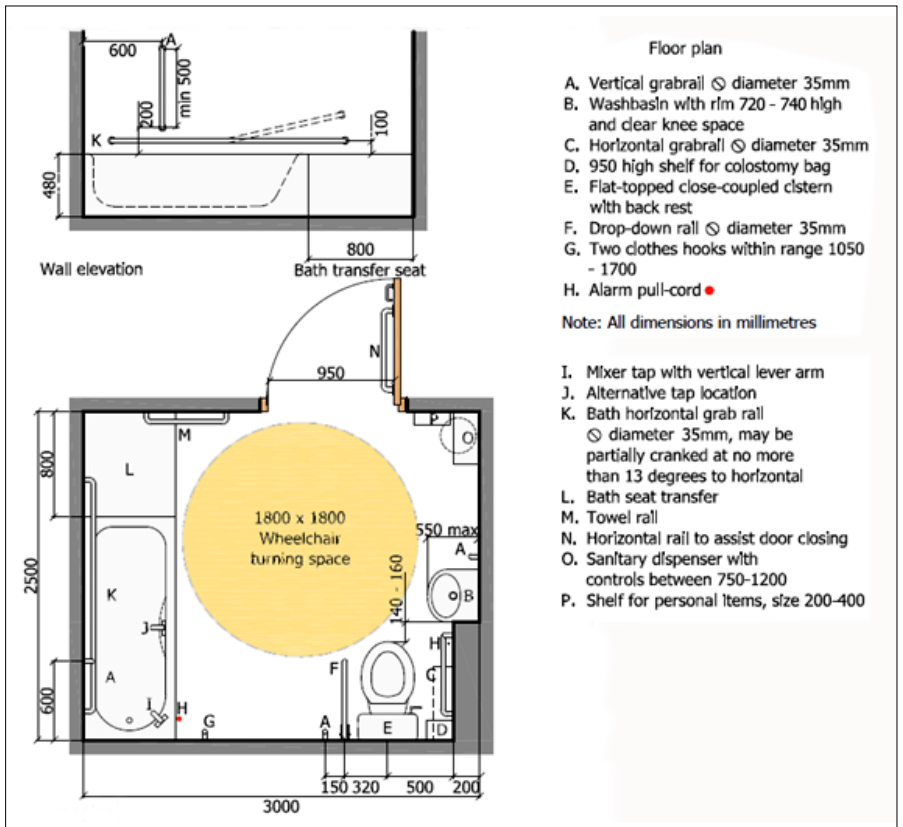
*Picture 5.4.3.1. Shower and peninsular toilet for assisted use*



### 5.4.4. Bathroom for Independent Use

- ❖ Standards and guidelines for bathroom for independent use
  - Ensure that bathrooms have an area of 3,000 mm x 2,500 mm.
  - Have mobile chairs as needed for showering.
  - Ensure that shower is installed at an accessible place.
  - Install convenient control devices.
  - Add wide washbasin with convenient controls.
  - Use appropriate bathroom devices such as towel hangers, clothes hooks, and mirror.

Picture 5.4.4.1. Bathroom for independent use and part of height and master plan



### 5.4.5. Washbasin

AVOID Knobs type handles for tap (difficult to use for people who have difficulty using arms and hands)



Lever type handles for tap is easy to use



Sensor tap best to use

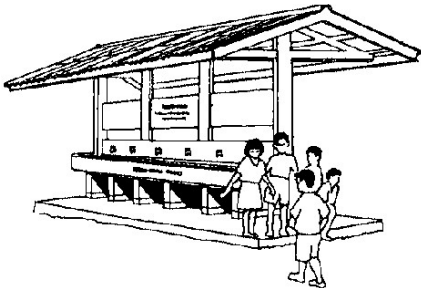


#### ❖ Standards and guidelines for washbasin

- Washbasin should be a minimum of 520 mm x 410 mm.
- Install with the highest surface at 700 mm to 800 mm from the ground.
- Allow knee space with the width of at least 760 mm and depth of 200 mm and height of 650 mm to 680 mm below washbasin.
- Avoid installing washbasin at the corner, which is difficult to use.
- Use turning taps instead of push taps.
- Place the bottom edge of mirror at 900 mm to 1,000 mm from floor surface with a slight lean to the front.

### 5.4.6. Toilet and Washbasin for Children at Schools and Health Facilities

#### ❖ Standards and guidelines for toilet and washbasin for children at schools and health facilities



- Ensure that toilets are in clean area without trees and bushes and with enough lighting to ensure that children are not afraid or harassed
- Ensure that toilets are in location where they can be heard and seen from school or other public buildings for children to call for help.
- Ensure that toilets have privacy, especially for girls.



- Other scales are the same as the above adult toilets, except horizontal pulling poles with length of at least 600 mm and height of 500 mm to 550 mm of internal door.
- Ensure that toilets are separated between boys and girls.
- Ensure that toilets are clean.
- Ensure that toilets are accessible for everyone including children with disabilities.
- Public washbasins must be at maximum height of 600 mm with convenient water tap, which allows people using wheelchairs to access and use.
- Set up washbasins at appropriate location with roof and pathway for everyone.
- If it is built on terrace to avoid flooding during rainy season, there must be ramps for people using wheelchairs.

### 5.4.7. City Toilets



#### ❖ Standards and guidelines for city toilets

City toilets are the same as the above adult toilets except

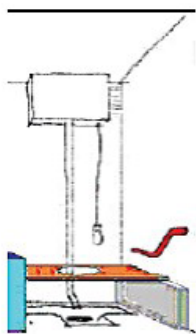
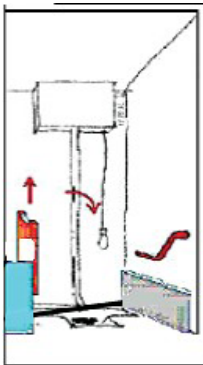
- The highest part of toilets should be at 300 mm to 350 mm from floor surface.
- Toilet pan sizes: length of 420 mm, width of 125 mm in the front, and expanding to a width of 200 mm at the back.
- Excessively large toilet pans can make children afraid of falling, which makes them not want to go to the toilet.
- Install handrails at the height of 500 mm to 550 mm from the ground and continuing 200 mm in front of toilet.
- On the wall, holding pole must be in L shape.
- Horizontal pole at the height of 500 mm from the floor surface, length of 600 mm and external diameter of 38 mm.
- Vertical pole of 500 mm from the floor surface, length of 700 mm and external diameter of 38 mm.

### 5.4.8. Local Toilet

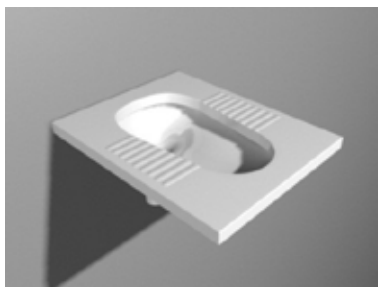


#### ❖ Standards and guidelines for local toilet

- Grab rails at the height of 500 mm to 550 mm in front of the toilet to balance when using, and on the sides to facilitate squatting and standing up.
- Consider installing a bamboo, wooden, or metal pipe attached from floor surface to ceiling in front of the toilet to balance when squatting and standing up.



- Install a low toilet pan with moderately sized hole in the middle on the toilet if children cannot squat.



- Consider not to install the big size of toilet hole as children might be frightening of falling into the toilet and prevent them to use the toilet.

#### 5.4.9. Toilet Innovation in Rural Areas

##### ❖ Standards and guidelines for toilet innovation in rural areas

Toilet innovation in rural areas and private houses must have:

- Cisterns
- Container with support to easily carry water from seating on the bench
- Bench for cleaning while sitting
- Materials to provide privacy
- Accessible low seat for users who have to transfer from a wheelchair because of inadequate space
- Big washbasin next to user sitting on chair
- Piped water from big container outside to avoid carrying water.



## 5.5. Changing Areas

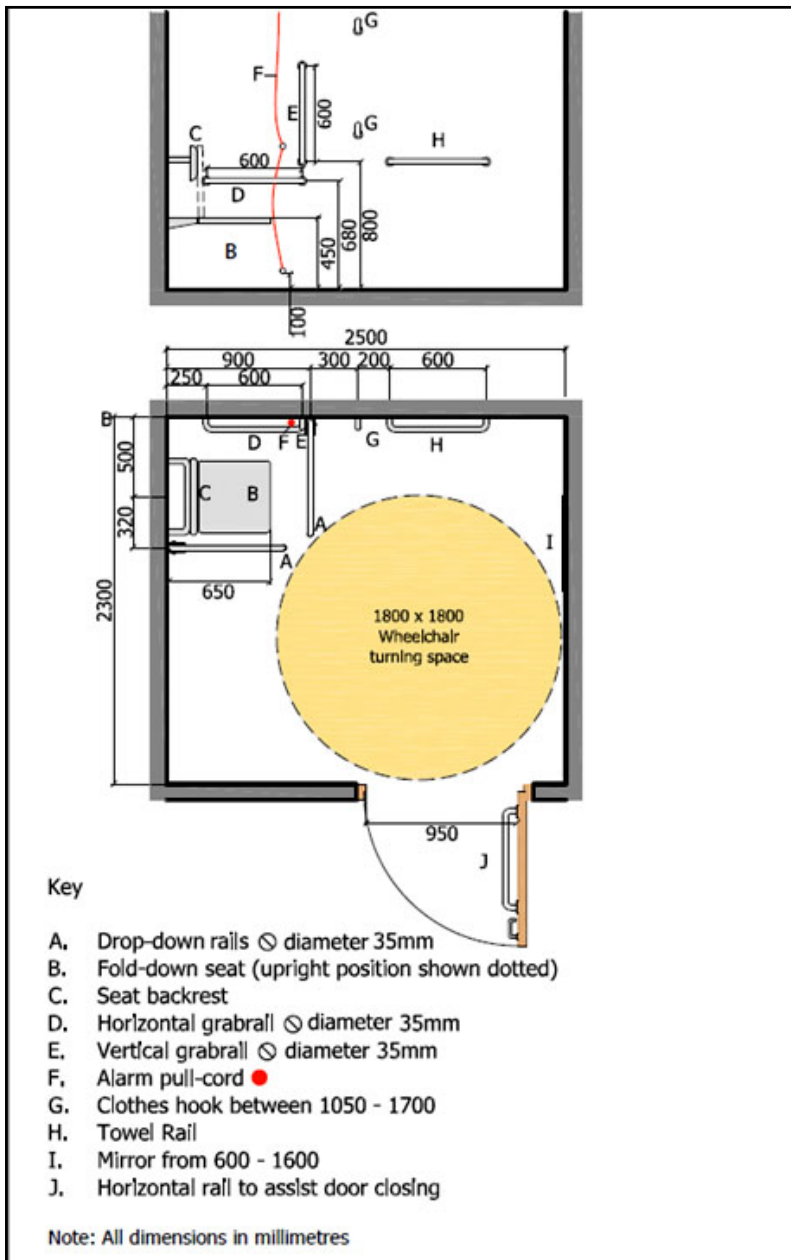


- ❖ Standards and guidelines for changing areas
  - Ensure that changing areas have visible signage.
  - Set up changing area at appropriate places.
  - Set up accessible spaces and equipment for everyone in the building.

### 5.5.1. Self-Contained Accessible Changing Area

- ❖ Standards and guidelines for self-contained accessible changing areas
  - Ensure that the rooms have a minimum area of 2,500 mm x 2,300 mm.
  - Set up signage if there is more than one changing area.
  - Have folding seats.
  - Install most appropriate grab rails.
  - Use appropriate devices such as clothes hooks and mirror.

Picture 5.5.1.1. A map of dimensions of self-contained accessible changing area

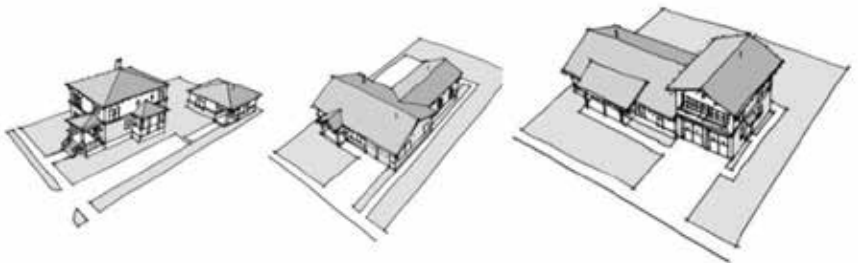


### 5.5.2. Communal Changing and Shower Areas



- ❖ Standards and guidelines for communal changing and shower areas
  - Ensure privacy at communal changing and shower areas.
  - Ensure that showers for before and after swimming in pools are accessible for everyone.
  - Install showers at accessible places for everyone.
  - Ensure that the water drains well, and mats and floors are non-slip.
  - Install showers and changing areas in single-sex toilets and add more in unisex toilets.

### 5.6. Residential Toilets

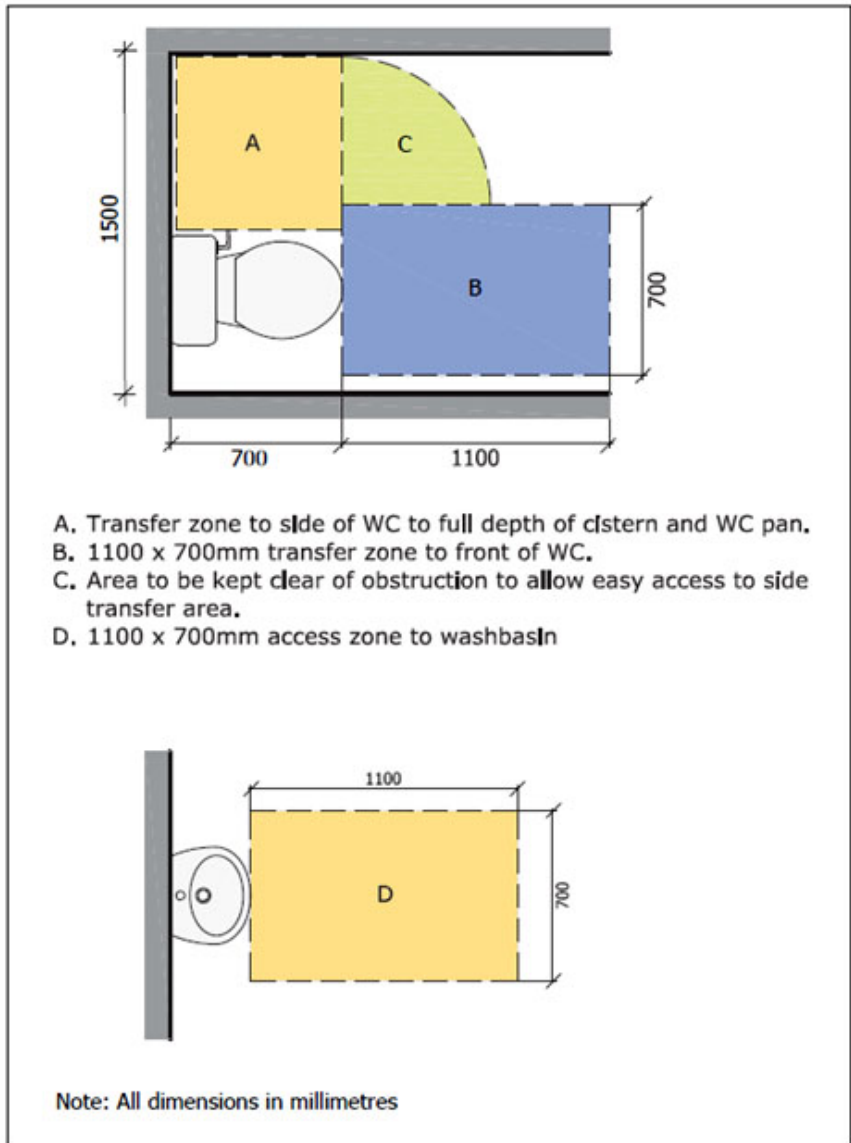


### 5.6.1. Dwelling Toilets

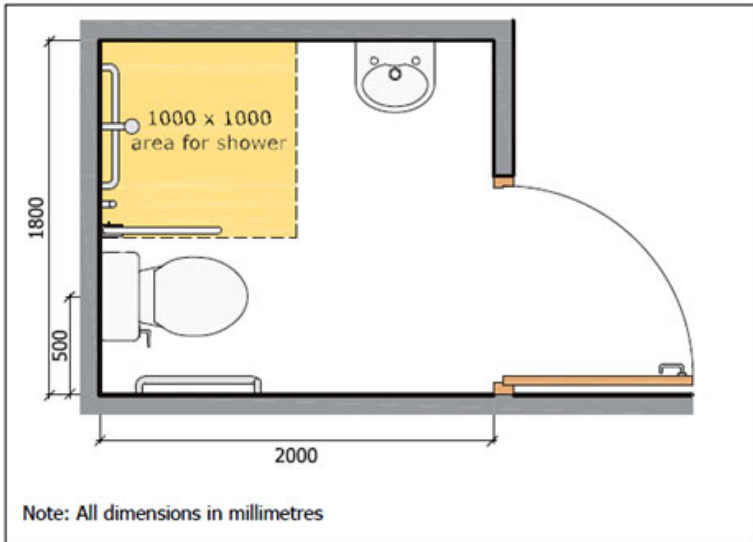
#### ❖ Standards and guidelines for residential toilets

- Toilets should be accessible for residents and guests, including people using wheelchairs, parents with baby trolley, people with low vision, and people using walking stick or who need other assistance. Toilets must have entrance with proper mat.
- Toilets must have a minimum area of 1,100 mm x 700 mm with wide space in front of toilet, with each side of the wall of 500 mm and 1,000 mm from other areas considering transferring techniques.
- Typical toilet size is 1,800 mm x 1,500 mm, which is wide enough for toilet pans with the back part protruding to 700 mm.
- Cisterns must be installed in convenient place for use with the size of 1,100 mm x 700 mm.
- The room should have an outward-opening door so that the transfer and access zones are not obstructed by the door swing.
- Toilets should have door opening outward to allow moving space without creating barriers.

Picture 5.6.1.1. Space arrangement for rural toilets

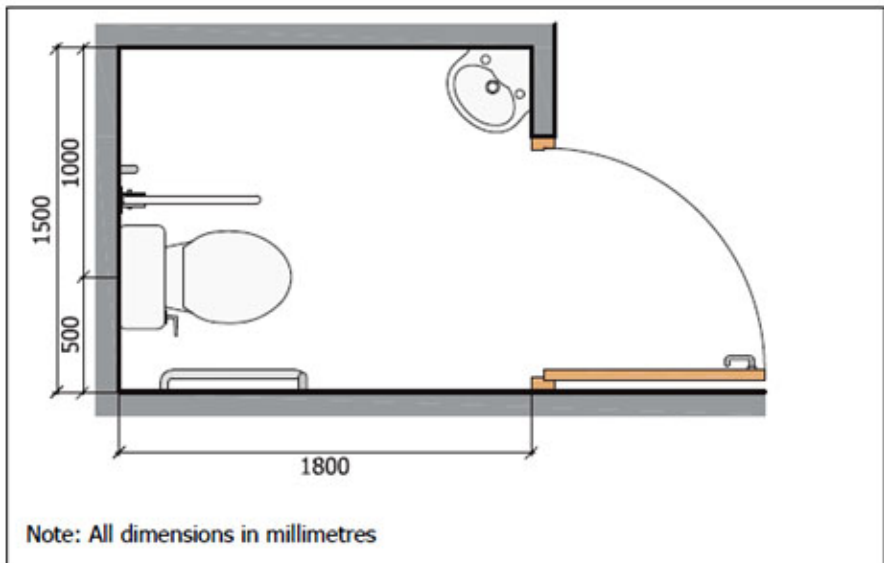


Picture 5.6.1.2. Map of rural toilet and shower



- Shower area should be at least 1,000 mm x 1,000 mm and toilet size 1,800 mm x 2,000mm.

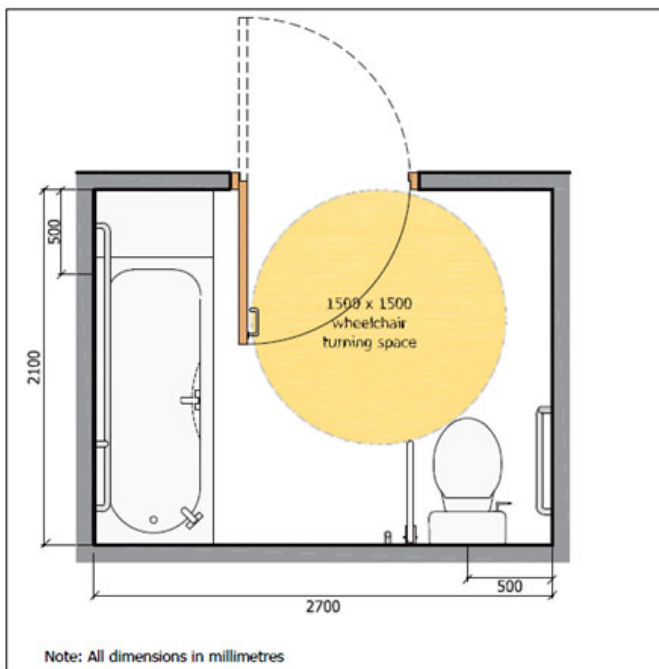
Picture 5.6.1.3. Rural toilet map



## 5.6.2. Domestic Bathrooms

- ❖ Standards and guidelines for domestic bathrooms
  - Set up accessible bathroom for everyone.
  - Install inward-opening door for convenient use.
  - Bathroom must be wide enough.
  - Ensure that wall is sturdy enough to safely install grab rail.
  - Consider installing additional assistive devices in the future.
  - Use adjustable shower head.
  - Set up shower all users can freely use.
  - Have wide washbasin for people using wheelchairs.
  - Use lever taps.
  - Use the same devices in all places in the building.
  - Hide and protect all pipes.

*Picture 5.6.2.1. Scale of domestic bathrooms*



## 5.7. Detailed Design of Sanitary Facilities

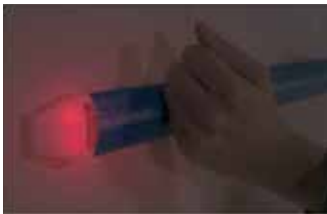
### 5.7.1. Assistance Alarms



*Picture 5.7.1.1 Sample of emergency pull string with two red rings in unisex toilet with left transfer*



*Picture 5.7.1.2. Sample of multi-colored light panel for emergency*



*Picture 5.7.1.3. Other options for sample of multi-colored light panel for emergency*

#### ❖ Standards and guidelines for assistance alarms

- Have assistance alarms in all toilets, bathrooms, showers, and changing areas designed for independent users.
- Install pull string according to detailed signage.



- In appropriate bathrooms and showers, there should be two emergency pull strings, one at shower area and another near toilets.
- All emergency pull strings must be red and spread across the room.
- Should have two red rings with diameter of 50 mm, one at the end of the string and another at the height of 800 mm to 1,000 mm.
- Should add visible and audio signage in and outside of bathroom about the assistance alarms.
- Should install call button at most appropriate place.
- Ensure that staff are trained in providing assistance when needed.

### 5.7.2. Clothes Hooks



*Picture 5.7.2.1. Sample of door with clothes hooks*

- ❖ Standards and guidelines for clothes hooks
  - Clothes hooks must be installed in all sanitary facilities and changing areas.
  - Attach to the most appropriate place and height according to detailed signage.
  - Ensure that color of clothes hooks is different from wall and door.
  - Twin hooks for jackets should be at the height of 1,050 mm to 1,700 mm from the ground.

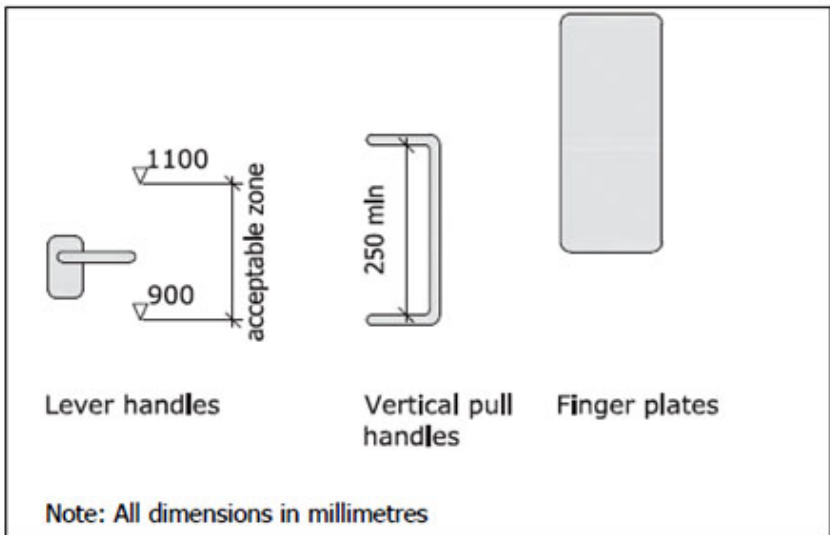
### 5.7.3. Doors and Locks

Picture 5.7.3.1. Opening and closing of door with multiple hinges



Picture 5.7.3.2. Sample of door locks

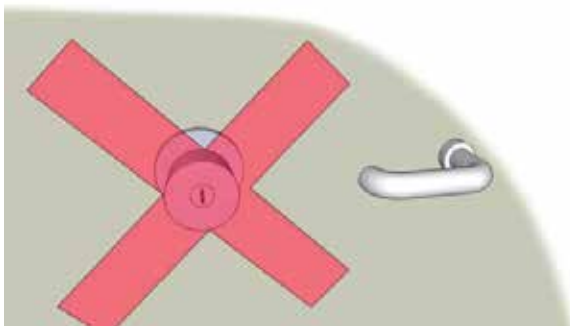
Picture 5.7.3.4. Door composition



#### ❖ Standards and guidelines for doors and locks

- In every bathroom, shower, and changing area with a one-piece or sliding door, the door must be able to open to at least 950 mm.
- All door locks should be convenient to use with single hand, suitable for persons with poor hand and finger movement.
- Locks should be at the height of 800 mm to 1,000 mm from the ground.
- L-shaped door handle is often used.
- Install outward-opening doors at all appropriate places.
- Ensure that outward-opening door does not affect the pathway, especially emergency exit.
- Install grab rail horizontally on the outward opening doors.
- Install emergency signage for inward opening door.
- Use door handles that are easy to hold.
- Ensure that locks are easy to use
- Ensure that lock signage for occupied and empty is properly installed to show whether the bathroom is in use.
- Do not use turning door handles, but use turning locks.

#### 5.7.4. Fire Alarm





❖ Standards and guidelines for fire alarms

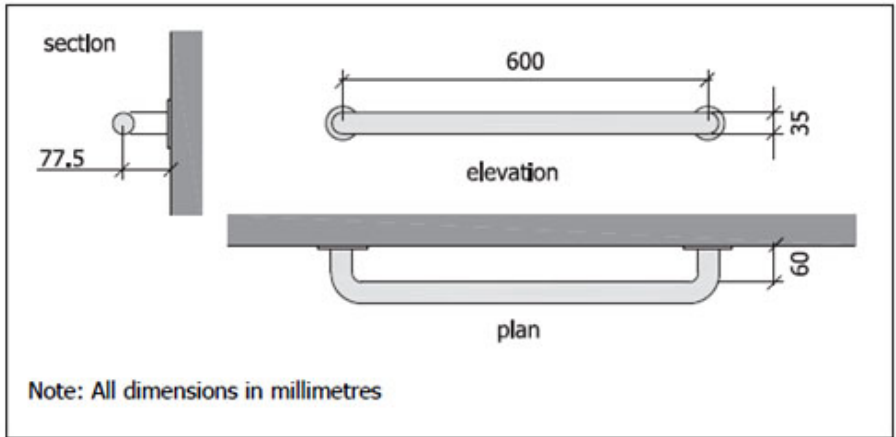
- Every single-sex toilet, unisex toilet, self-shower, shower area, and changing area must install fire alarm with visual and audio signage.
- Install visual and audio fire alarms at all sanitary facilities such as bathroom and toilets, etc.

**5.7.5. Grab Rails**



*Picture 5.7.5.1. Sample of grab rails attached to the door*

Picture 5.7.5.2. Grab rails



❖ Standards and guidelines for grab rails

- Grab rails are installed to help people maintain their balance when sitting, standing up, transferring from wheelchairs, and changing clothes.
- Ensure that grab rails are properly installed according to detailed signage.
- Use pipe bar with diameter of 32 mm to 35 mm and attach 50 mm to 60 mm from the wall.
- Use pipe with an appropriate surface that is easily handled especially when it is wet.
- Ensure that grab rails are firmly and safely attached to the wall.

### 5.7.6. Hair Dryers



#### ❖ Standards and guidelines for hair dryers

- If installing multiple hair dryers, they must be at different heights.
- Hair dryers must be at the height of 750 mm to 1,200 mm from the ground.
- Install hair dryers for people to use both when standing and sitting.
- Ensure that control devices are in place and at the height for everyone.
- Set up necessary seating area.
- Set up wide space for people using wheelchairs to enter and exit.
- Install adjustable mirrors.

### 5.7.7. Hand-Drying Facilities

*Picture 5.7.7.1. Sample of hand-drying facilities at different heights*



## ❖ Standards and guidelines for hand-drying facilities

- Install hand-drying facilities at the height of 800 mm to 1,200 mm from the ground and near washbasins.
- For toilets, bathrooms, and shower area, there must be hand-drying facilities accessible for people using wheelchairs.
- Install additional tissue paper and towel dispensers with hand-drying facilities.
- Set sound of hand-drying facilities in case there are multiple in the same place.

### 5.7.8. Heating Control

## ❖ Standards and guidelines for Heating Control

- Heating Control devices can be installed at necessary and accessible places.
- Install them at appropriate height.
- Ensure that the heating and cooling equipment is properly set up.
- Ensure that temperature in the room is no more than 40 degrees Celsius.



### 5.7.9. Lighting

## ❖ Standards and guidelines for lighting

- Lighting in bathrooms must have lighting level of 200 lux.
- Lighting in changing and shower areas must be at the level of 200 to 300 lux.
- Switches for lighting must be at the height of 900 mm to 1,200 mm from the ground and 150 mm away from door edge.
- Set up appropriate lighting levels.



- Install energy storage equipment and add automatic lighting.
- Set accurate timing for automatic lighting.
- Ensure that electric wiring is properly installed.
- Avoid using ultraviolet (purple) lighting.

### 5.7.10. Lockers

#### ❖ Standards and guidelines for lockers

- Appropriate lockers have the width of 300 mm x depth of 600 mm x height of 1,200 mm.
- Install lockers at the height of 400 mm to 800 mm from the ground.
- Install lockers at the most appropriate location.
- Install various sizes of lockers at different heights.
- Ensure that lockers are easy to use.
- Ensure that locks and keys are easy to use.
- Use sensible locker numbering system.

### 5.7.11. Mirrors



*Picture 5.7.11.1. Sample of mirror attached to the wall in front of washbasin in toilet*

#### ❖ Standards and guidelines for mirrors

- In single-sex toilets, there must be mirrors accessible for people of different heights.
- In all toilets, there must be mirror attached to the wall in front of washbasin 600 mm to 1,600 mm from the ground.



- If a mirror is attached above the washbasin with the height of no more than 1,600 mm to 1,800 mm from the ground and is adjustable, it can be used by people with different heights and people using wheelchairs.
- Do not install a mirror the size of the whole wall because it can cause confusion.
- Position mirrors in all WCs and changing areas at a suitable height.
- Avoid full-height mirrors and mirrors that may appear to cause confusion.

### 5.7.12. Shelves



- ❖ Standards and guidelines for shelves
  - In toilets, there should be two-level shelves: first level at the height of 950 mm from the ground and second level at the height of 700 mm from the ground, with the size of 200 mm x 400 mm near the washbasin.
  - Install shelves in all toilets, bathrooms, and shower areas according to detailed signage.

### 5.7.13. Signage

*Picture 5.7.13.1. Sample of signage at sanitary facilities*



*Picture 5.7.13.2. Sample of signage at single-sex toilets*

#### ❖ Standards and guidelines for signage

- All sanitary facilities must have visible signage.
- Ensure that sanitary facilities are easy to find.
- Use symbols and signage in braille.
- Ensure that push or touch buttons are easy to see and have numbers.

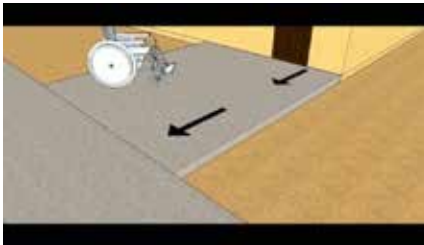
### 5.7.14. Soap Dispensers



#### ❖ Standards and guidelines for soap dispensers

- Soap dispensers must be installed on the wall above washbasins, shelves, or storage.
- Soap dispensers must have a big button to press for soap.
- Install soap dispenser at appropriate height, accessible for all users.
- In accessible WCs, position dispensers within reach of a person seated on a wheelchair.
- Position dispensers so as not to drip on floor.
- Ensure dispensers are easily operated by a pull lever.

#### 5.7.15. Surfaces



#### ❖ Standards and guidelines for surfaces

- Surfaces, wall, door, sanitary facilities, grab rails, and other facilities should be easy to clean and to see for people with low vision.
- Arrange firm surfaces with height (turtle back) and non-slip.
- Avoid excessively smooth and reflective surfaces.
- Arrange floor for persons with visual disabilities at all places.
- Ensure that indoor design is attractive.

#### 5.7.16. Toilet Paper Dispensers



## ❖ Standards and guidelines for toilet paper dispensers

- Toilet paper dispensers should be at accessible place in bathroom for use by those who stand or sit, with a single hand.
- If the toilet paper dispenser is round, there should be an easy and adjustable paper cutter or use toilet paper sheets instead.
- Dividers in single-sex toilets must have toilet paper dispensers that do not affect opening and closing of doors

### 5.7.17. Vending Machines



## ❖ Standards and guidelines for vending machines

- All vending machines must be visible and easy to use.
- All control buttons must be set up for people with low vision to be able to use.
- Install machines at the height of 750 mm to 1,200 mm from the ground.
- Below control buttons, there must be space at height of 450 mm for feet.
- Install vending machines equally both in single-sex and unisex toilets.
- Strictly follow instruction for use.

### 5.7.18. Waste Disposal



- ❖ Standards and guidelines for waste disposal
  - Have waste disposal bins in all toilets.
  - In toilets for persons with disabilities, there must be waste disposal bin near the toilet.
  - Ensure that each waste disposal bin is easy to use and wide enough.
  - Ensure that waste disposal bin for general waste is in place and easy to find.

### 5.7.19. Water Supply

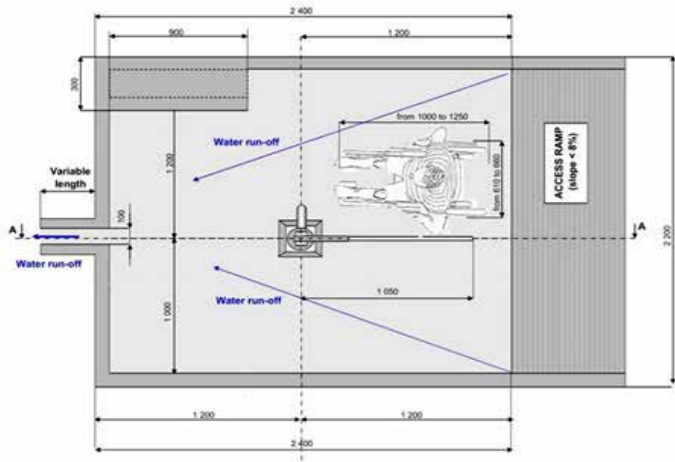


❖ Standards and guidelines for water supply

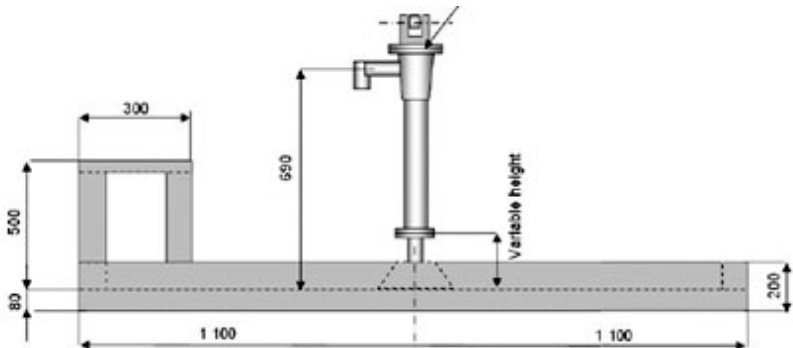
- Water used for washbasin must not exceed 40 degrees Celsius for safety.
- Water pressure in each pipe must be adjustable according to the need.
- Ensure that washbasin is compatible with connector.

### 5.7.20. Hand Pump

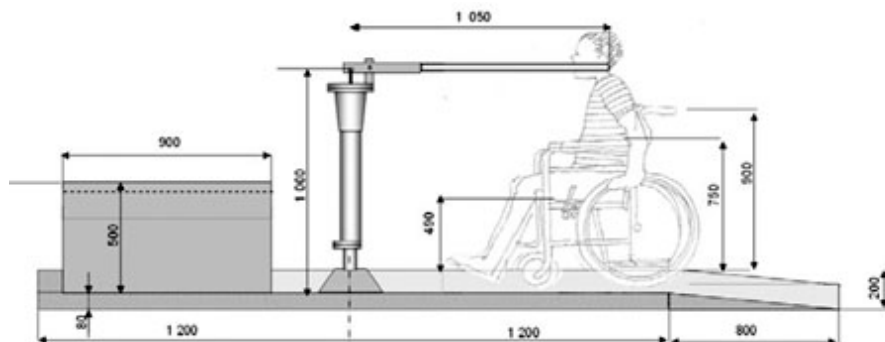
❖ Standards and guidelines for hand pump



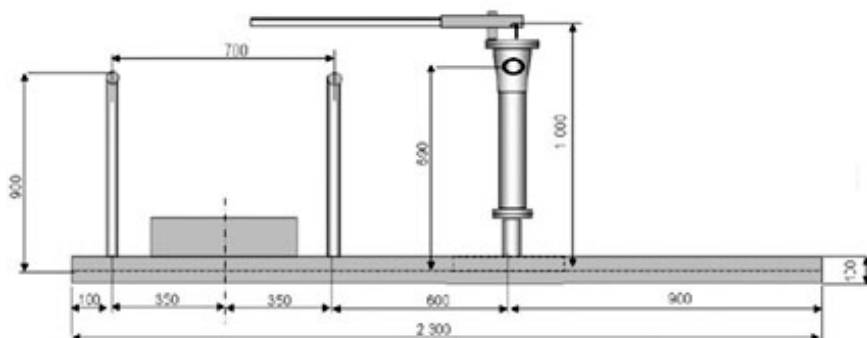
- Hand pump must be at a location with many users and in an appropriate area according to the number of users.



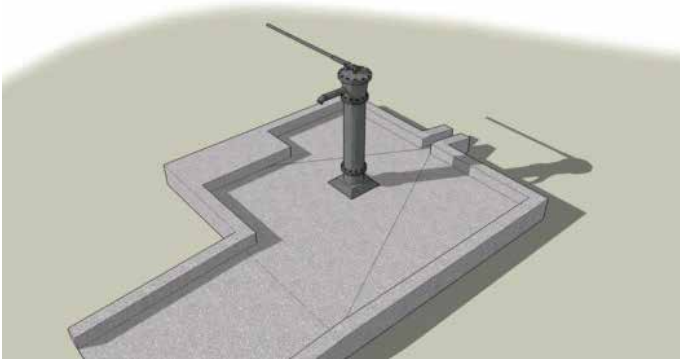
- Terrace of hand pump area can be low or high according to exact location (e.g., to avoid flooding during rainy season).
- Can use hand pump for taking water to use or clean.
- Build seating area for those who cannot stand.



- Build drainage area to avoid water accumulation on the surface of hand pump, which can be slippery and decay easily.
- Hand pump must be on a minimum surface of 2,000 mm x 1,750 mm (excluding drainage area and ramps).
- Hand pump area must be non-slippery and have surrounding edges as well as ramps.
- Drainage area is 100 mm to 300 mm, based on number of users and length according to land condition.

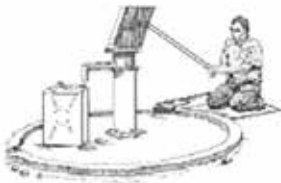
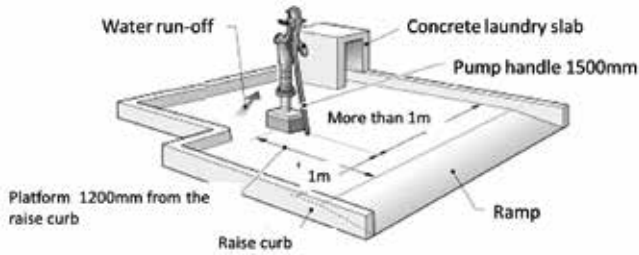


- Can install surrounding handrail according to the guidelines for ramp handrails.
- Build ramps connecting hand pump area with pathway, accessible for persons with disabilities according to the guidelines for ramp handrails.
- Build fixed or mobile seating area for usage in pump area with the size of 450 mm x 450 mm, height of 450 mm to 480 mm.
- Pump handle can be made from metal or wood according to the situation, with diameter of 30 mm to 50 mm and length of 1,050 mm. Ensure that pump handle is adequately lubricated and operates easily.
- Install pump handle at the height of 1,000 mm.



- Water pipe can be at the length of 300 mm to 600 mm by using pipe of 300 mm to 450 mm and at the height of 600 mm to 700 mm from the ground.
- Make sure space in the front and around this pipe is empty.
- To save space when using pump, there must be a terrace to keep water pipe to the side.

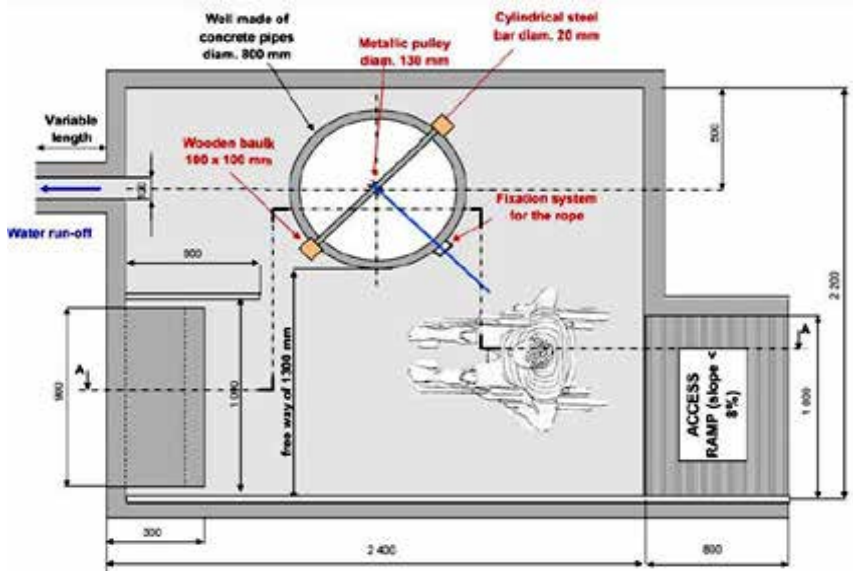




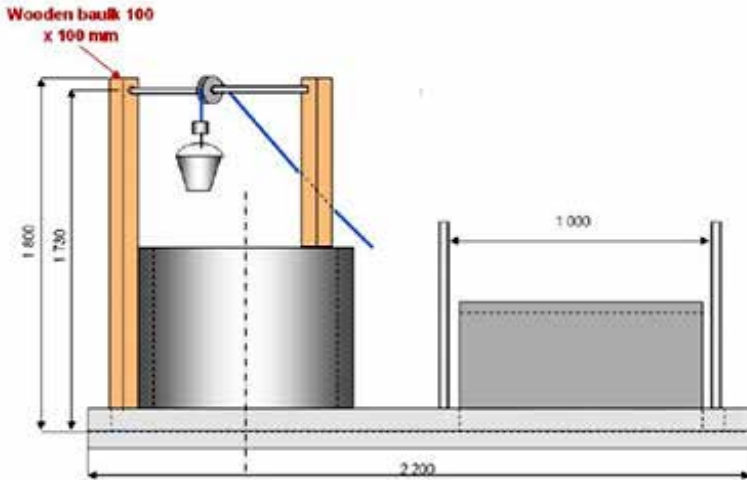
### 5.7.21. Tube Wells

#### ❖ Standards and guidelines for tube wells

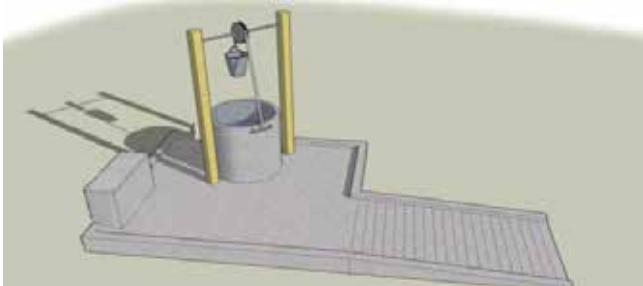
- Tube wells are a source of water that is dug; pipe is installed into the deep or shallow well according to area and need.
- Can use tube wells as source of water for use or cleaning.



- Tube wells must be built at a place with many users and in an appropriate area according to number of users.
- A tube well can be made from cement, metal, or wood.
- Terrace of the well area can be low or high according to the location (e.g., to avoid flooding during rainy season).



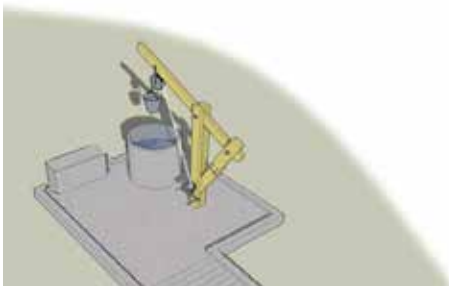
- To save space, there must be terrace with tube well in the corner.
- Tube well must be built on the land of minimum size of 2,200 mm x 2,400 mm (excluding drainage area and ramps).
- Drainage area is 100 mm to 300 mm, according to number of users and area and condition of land.
- Water pipe must be inclined upward at the height of 800 mm.
- Can install handrail around tube well according to guidelines for ramp handrails.



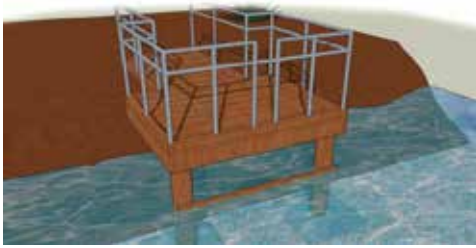
- Build connecting ramps from pathway to tube well area for persons with disabilities to access according to guidelines for ramps.
- Water pipe have with diameter of 500 mm to 1,000 mm.
- Build fixed or mobile seats for use in the tube well area with the size of 450 mm x 450 mm, height of 450 mm to 480 mm

### **About Water Drawing System:**

- Metal pulley with diameter of 130 mm.
- Bar connecting one pole to another with diameter of 20 mm.
- Install wooden or metal poles on both sides of well with the size of 100 mm x 100 mm, height of 1,700 mm to 1,800 mm from the ground.
- Use, appropriate size, strong, and heat-resistant rope.
- Establish a place to tie the rope after use.
- Use containers of 5 liters to 10 liters based on the needs of majority of users.
- Make other types of water-drawing devices available for persons with disabilities.

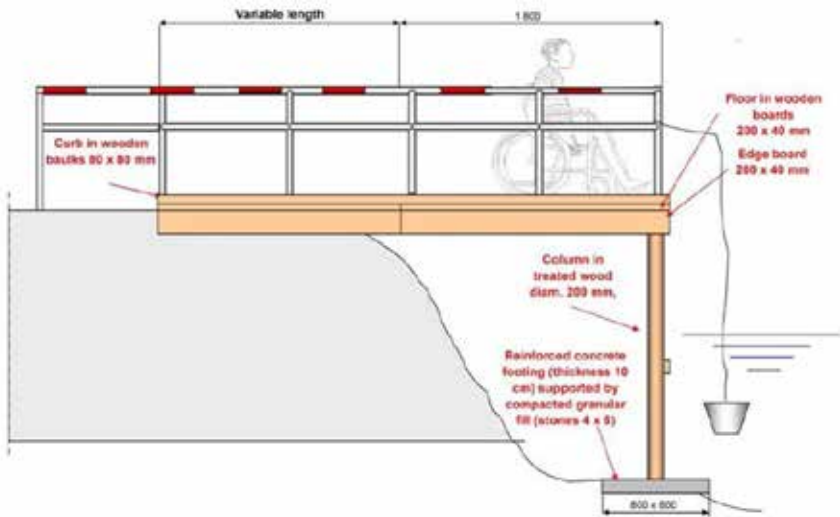


### 5.7.22. Ports

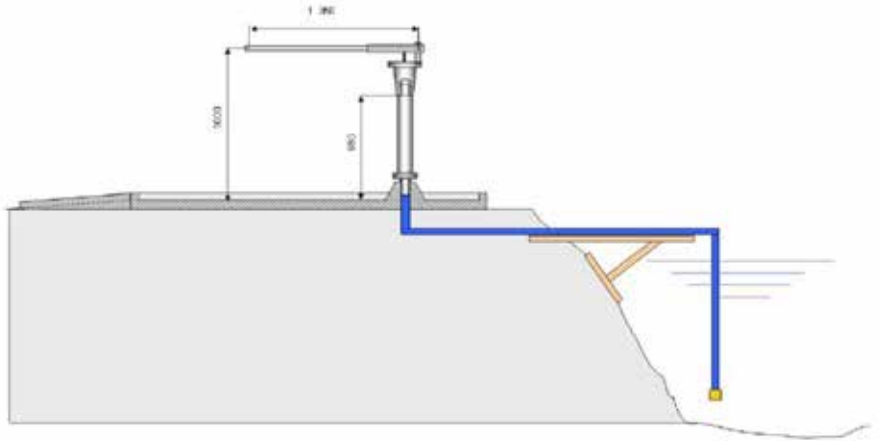


#### ❖ Standards and guidelines for ports

- They can draw water from rivers, lakes, or ponds using hand pumps or tube wells. Users do not get into the water directly; the port provides a place and system to pump or draw water from above.



- Ports can be made from cement, metal, or wood according to the situation and of varying height according to the area and location.
- Choose right equipment for safe, long-term use.



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## ANNEX

### Of Interministerial Prakas on .....Technical Standard of Accessible Physical Infrastructure for Persons with Disabilities No. 248 S.A.Y.PrK dated on 28 November 2018

#### Glossary

1. **Standard** refers to document developed with agreement and adopted by authorized institutions with character of principles, guidelines, or characteristic of activities or outcomes for common use or subsequently aim to achieve greatest point of a context.
2. **Persons with disabilities** refers to any persons who lack, lose, or damage any physical or mental functions, which result in a disturbance to their daily life or activities, such as physical, visual, hearing, intellectual impairments, mental disorders and any other types of disabilities toward the insurmountable end of the scale.
3. **Sidewalks** refer to the sides of roads in urban area for pedestrians to walk, planting trees, and equip facilities for the benefits of the public.
4. **Walkway** refers to a part of road which is built or assigned for pedestrians to safely walk.
5. **Road track** refers to part of roadway for all types of vehicles.
6. **Capital road or urban road** refers to road located in the geographical area of capitals and cities, including roadway, road, sidewalk, and walkway.

7. **Public places** refer to any premises, location, building and means of transportation in either state, public or private ownership that are open to and provide services for the general public; for instance, ministries, institutions, departments, roads, leisure and cultural centres, sport centres, recreational resorts, educational establishments, hotels, hospitals, health centres, restaurants, and transportation networks.
8. **Infrastructure** refers to systems, services, materials, facilities, or basic equipment needed for operational use and support of effective daily livelihood activities (such as buildings, roads, transportation services, energy, etc.).
9. **Housing** refers to buildings with the function of providing temporary and permanent accommodation such as separate housing (villa and semi-villa), attached housing (flat and attached houses), premium common residential buildings, average common residential buildings, and normal common residential building.
10. **Commercial building** refers to any buildings with the main function of serving the business sector and offering services such as offices, banks, cinemas, theatres, restaurants, bistros, clubs, hotels, shops, markets, shopping centers, gas stations, other business buildings etc.
11. **Industrial building** refers to the construction of buildings whose main function is to serve large-scale industries and services with high toxicity, such as factories, large-scale handicraft factories, warehouses, garages and personal storage buildings, etc.



- 12. Education and sports building** refers to any building with the main function of serving education, training, administration of education and sports including buildings for all levels of education, sport centers, vocational training centers, research centers, specialized schools, universities, colleges, kindergartens, etc.
- 13. Health building** refers to any building with the main function of serving health services for the people including buildings of health department, public hospitals, provincial hospitals, operational hospitals, health centers, health posts, private clinics, polyclinic hospitals, and health gyms.
- 14. Recreational building** refers to any building with main function of serving recreational services such as theaters, meeting halls, conventional or event halls, cinemas, and gathering halls.
- 15. Administrative and public service building** refers to any building with the main function of serving administrative and public services sectors such as ministries, departments, units, municipal hall, provincial halls, city halls, khan and district halls, sangkat and commune halls, schools, hospitals, libraries, health centers, post offices, etc.
- 16. Cultural and religious building** refers to any building with the main function of serving history, arts, culture, and religion such as temples, pagodas, religious buildings and schools, museums, buddhist schools, etc.
- 17. Tourism building** refers to any building with the main function of serving tourism and leisure sector including hotels, guest houses, restaurants, cafeterias, leisure areas, and resort or attraction sites, etc.

- 18. Transport building** refers to any building with the main function of serving the transportation and communication sector such as railway stations, airports, bus stations, water and dry ports, distribution and logistics centers, etc.
- 19. Public open space and green space** refer to places or areas arranged to serve the public such as for rest, leisure, entertainment, and public events including parks, gardens, children's parks, children's playgrounds, youth parks, elderly parks, gardens, recreation areas, etc.
- 20. Administrative and public service area** refers to any area with the main function of supporting administrative and public services such as ministries, departments, units, capital hall, provincial halls, city halls, khan and district halls, sangkat and commune halls, schools, hospitals, libraries, health centers, post offices etc.
- 21. Open space and green space** refer to any areas whose functions are for recreation, relaxation, entertainment and public events such as parks, gardens, zoos, children's parks, playgrounds, youth parks and old senior's parks, etc. which have been developed and built for the interest and benefits of the public.



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"Design for Everyone"

