

Appendix A

Anthropometrics

APPENDIX A

ANTHROPOMETRICS

(All dimensions are in mm)

A.1 Objective:

This Appendix contains dimensional data which can be used for guidance when designing facilities and equipment that enable use by persons with a disability.

A.2 Considerations:

The dimensions of the individual human being vary with time and from one person to another. In addition, the average dimensions vary from one country to another.

When carrying detailed design, consideration should be given to size variation between males and females as well as between different ages.

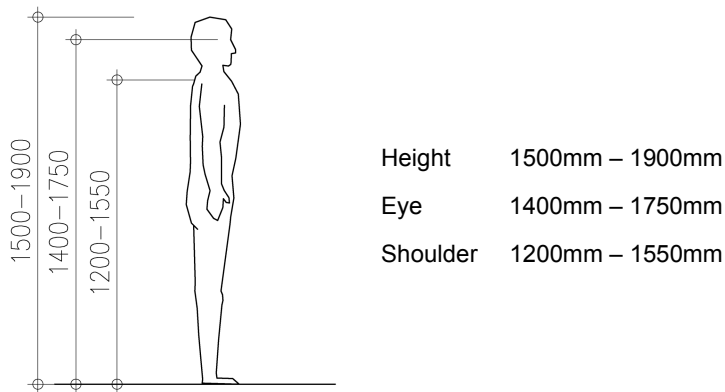


Figure A1 - Dimensional Data to an Average Person

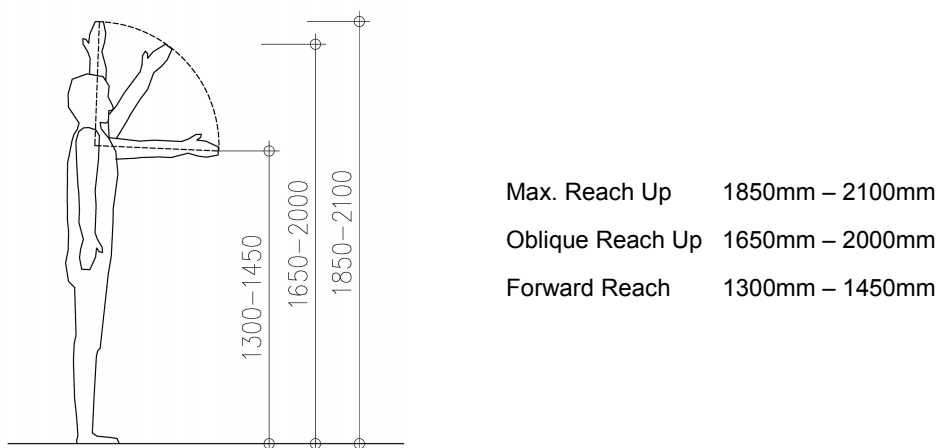


Figure A2 - Reaching Zones of an Average Person

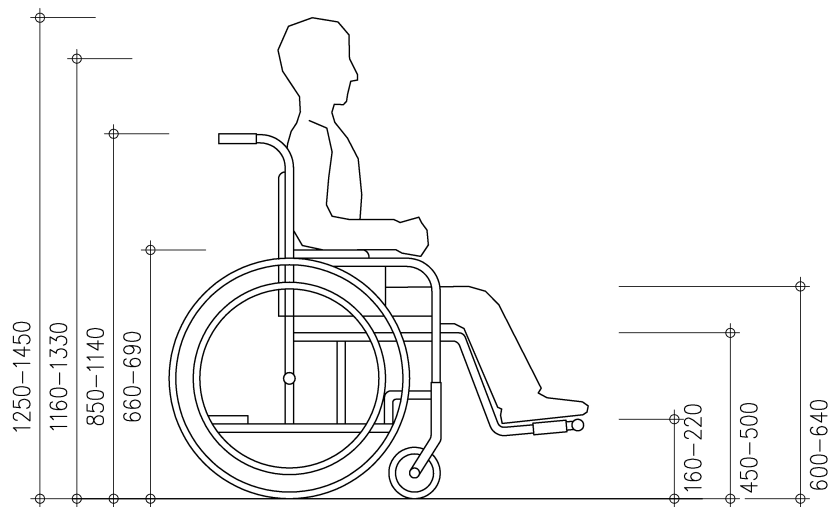


Figure A3 - Dimensional Data of a Wheelchair User

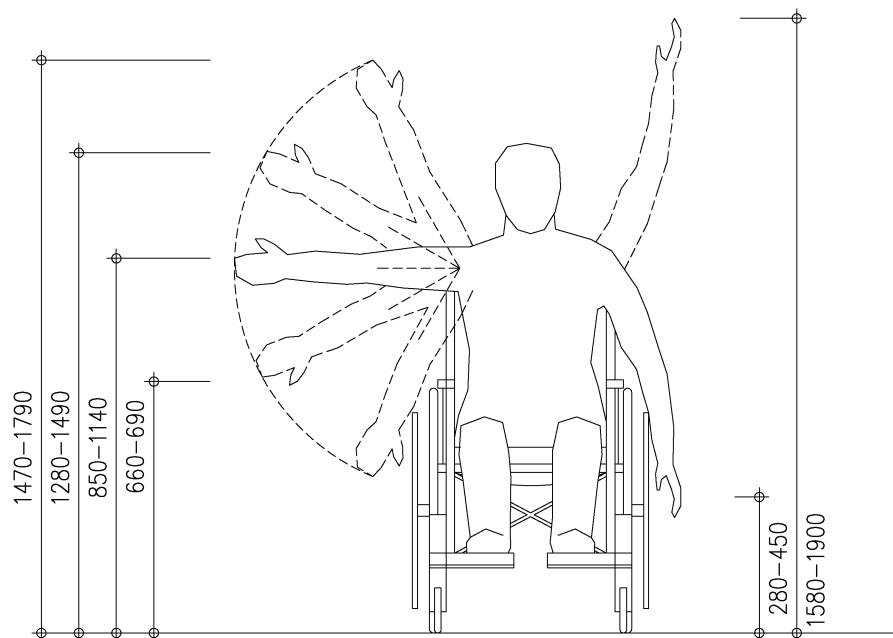


Figure A4 - Vertical Reaching Zones of a Wheelchair User

A.3 Forward reach of a wheelchair user

The maximum forward reach, without obstruction, is 1200 mm from the floor and the minimum forward reach is 400 mm from the floor as shown in **Figures A5 & A7**.

The maximum forward reach over an obstruction 500 mm deep is 1100 mm from the floor as shown in **Figure A6**.

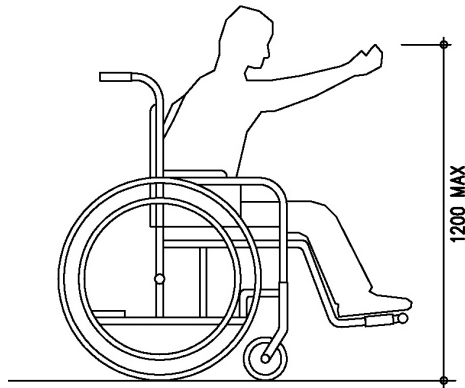


Figure A5 - Forward Reach

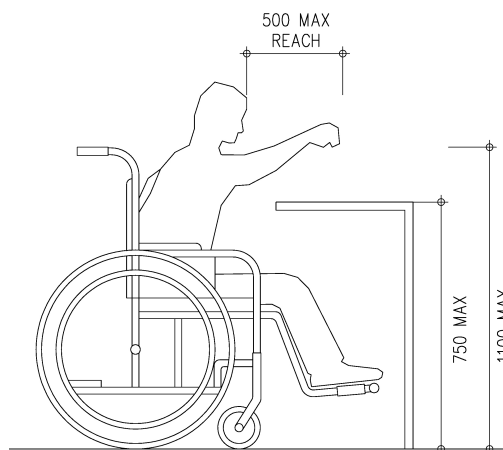


Figure A6 - Forward Reach Over Obstruction

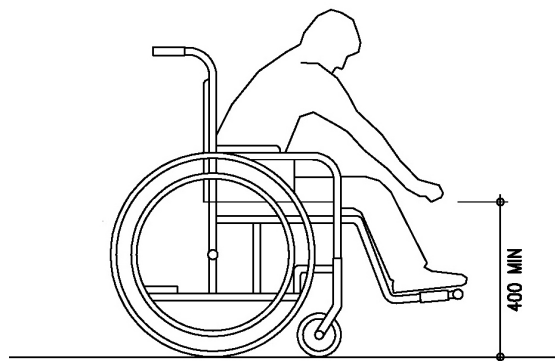


Figure A7 - Forward Reach Without Obstruction

A.4 Side reach

The maximum side reach, without obstruction, is 1300 mm from the floor and the minimum side reach is 250 mm from the floor as shown in **Figure A8 & A9**.

The maximum side reach over an obstruction 860 mm high by 500 mm deep is 1200 mm from the floor as shown in **Figure A10**

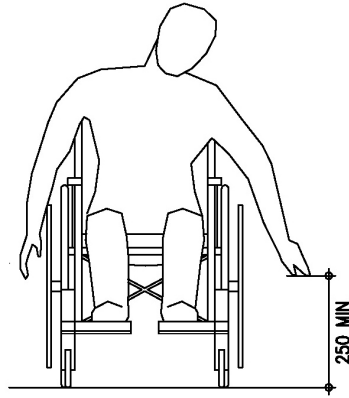


Figure A8 - Side Reach Without Obstruction

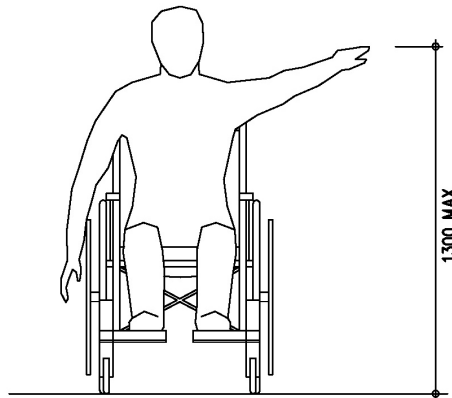


Figure A9 – Maximum Side Reach

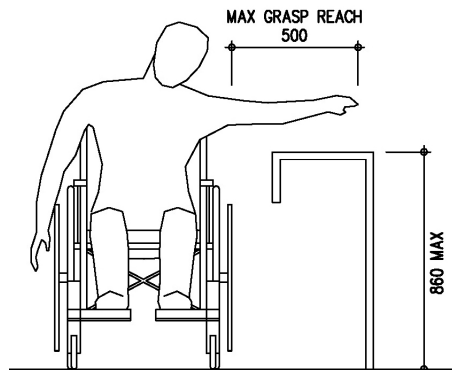
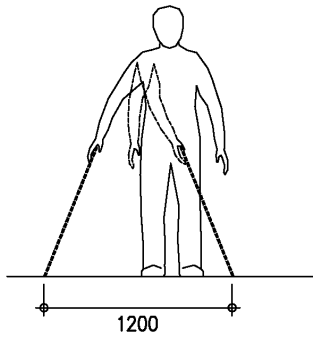
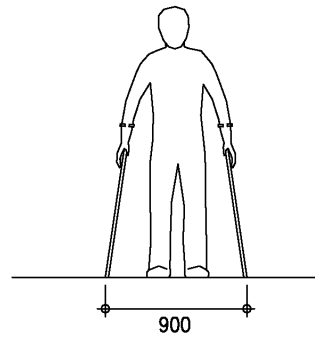


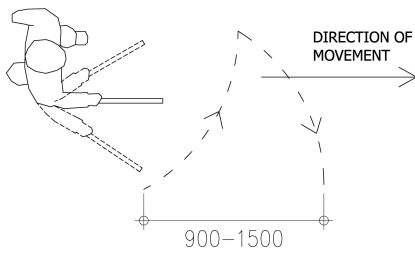
Figure A10 – Maximum Side Reach over an Obstruction



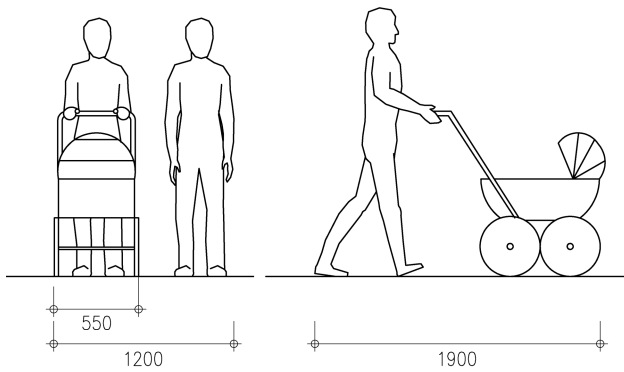
Persons with visual impairment using a long white cane



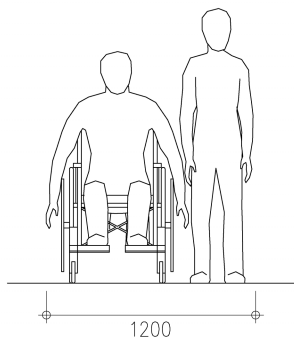
Persons using crutches



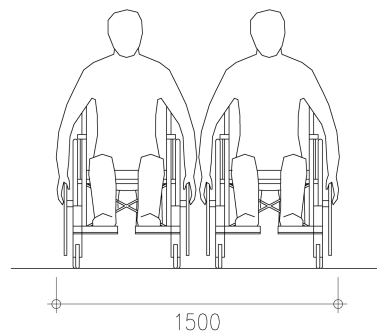
Detectable path dimension



Person with baby cart



Path width for a person together with a wheelchair user



Path width for two wheelchair users

Figure A11 – Dimensions Required for General Pathway

Appendix B

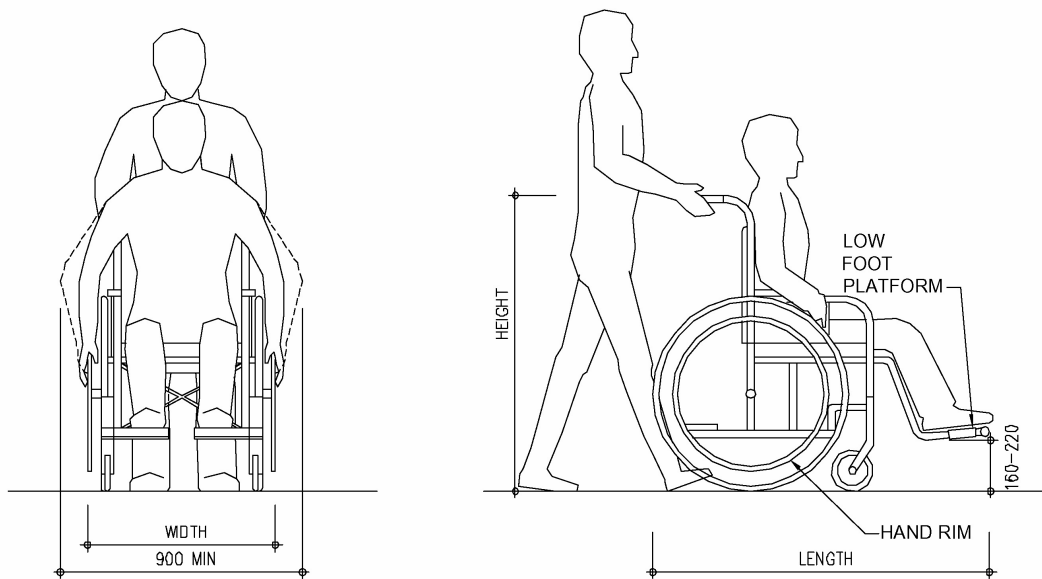
Guidelines for Wheelchair Transfer and Movement

APPENDIX B

GUIDELINES FOR WHEELCHAIR TRANSFER AND MOVEMENT

B.1 Dimensions Of Wheelchairs

The dimensions of wheelchairs commonly used by persons with a disability in Hong Kong are provided at **Figure B1**.



Type of Wheelchair	Width	Length	Height	Weight
Manual Wheelchair	510-725 mm	665-1100 mm	850-1140 mm	10-27 kg
Electric Wheelchair	520-700 mm	1060-1200 mm	1010-1400 mm	36-100 kg

Figure B1 - Dimensions of Wheelchair

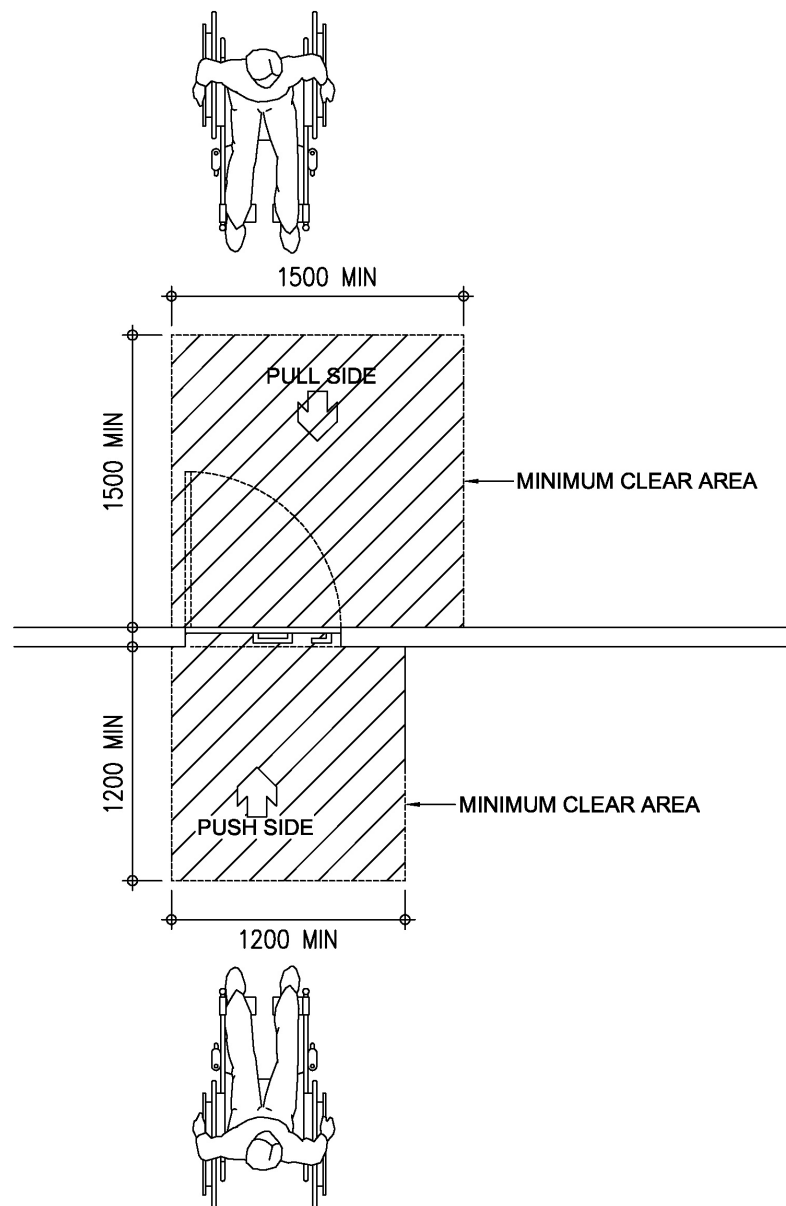
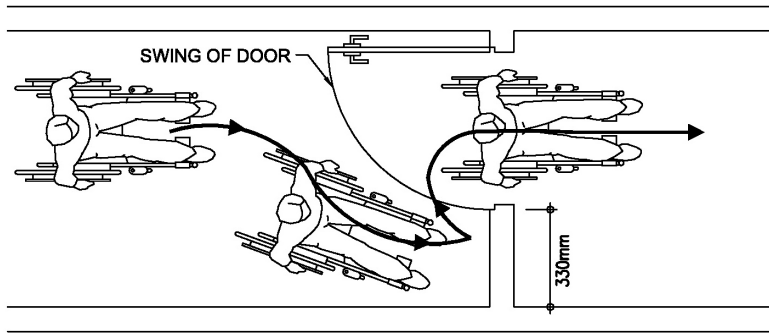


Figure B2 – Manoeuvring Spaces for Doorway

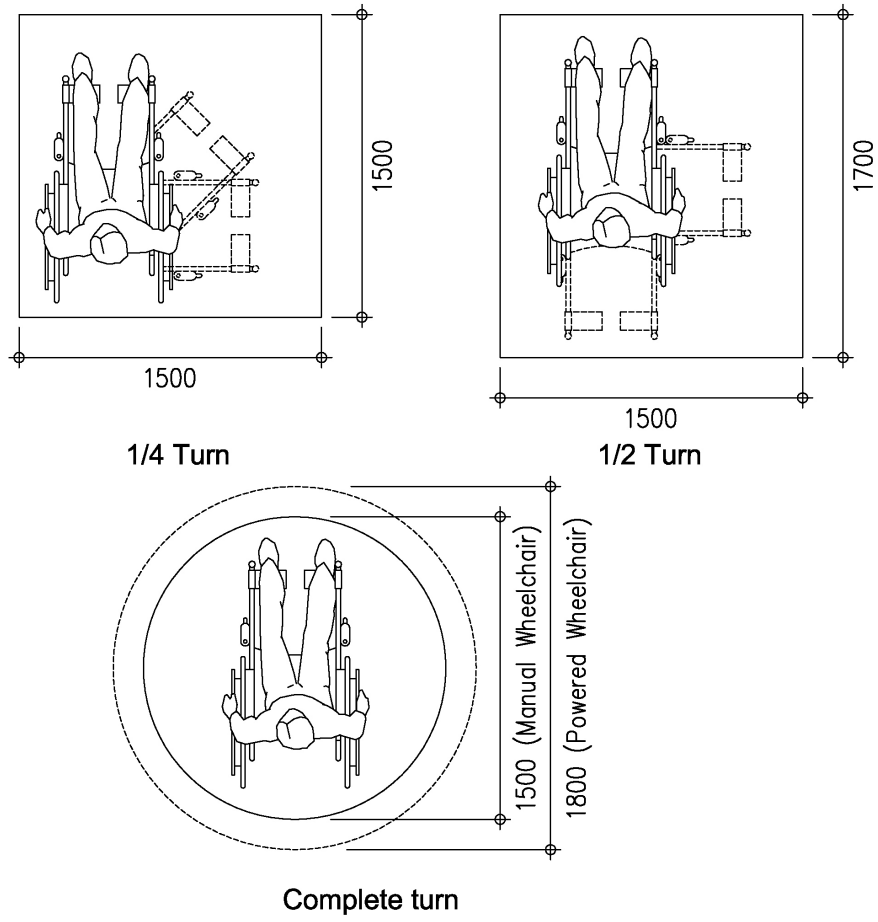


Figure B3 – Wheelchair Manoeuvring Space

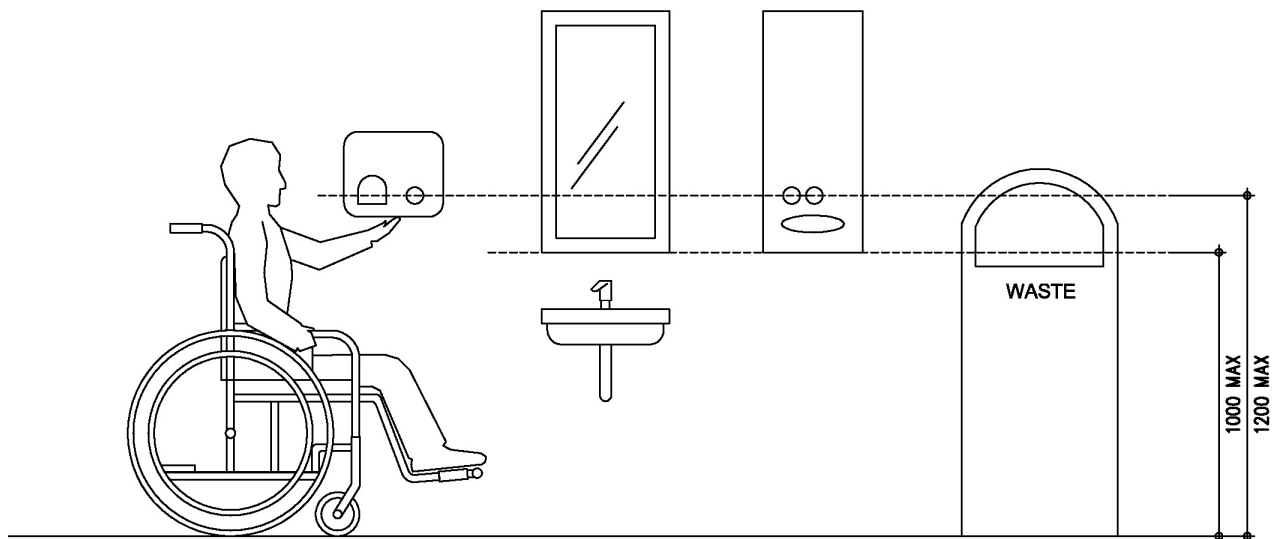
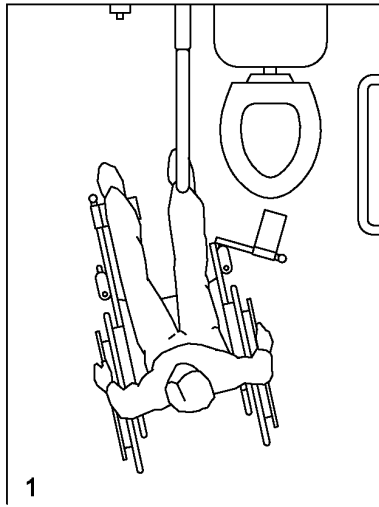
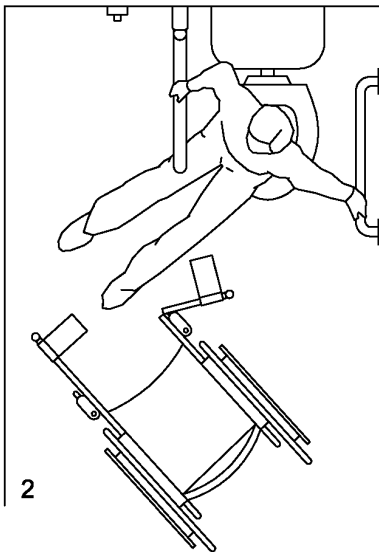


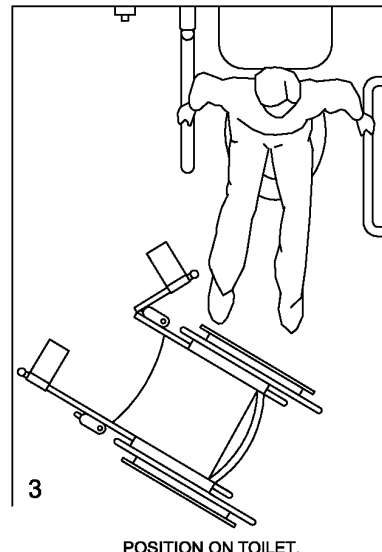
Figure B4 – Design Heights for Various Features



TAKES TRANSFER POSITION,
SWINGS FOOTREST OUT OF THE WAY,
SETS BRAKES

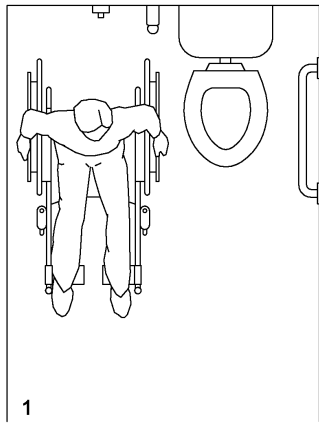


MOVES WHEELCHAIR OUT OF THE WAY,
CHANGES POSITION (SOME PEOPLE FOLD
CHAIR OR PILOT IT 90° TO THE TOILET)



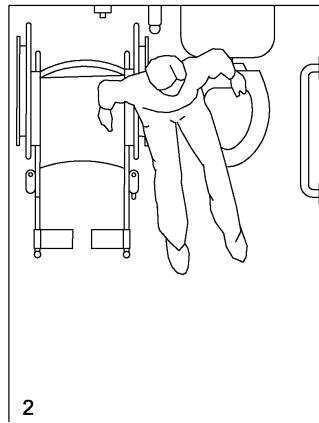
POSITION ON TOILET,
RELEASES BRAKES

**Figure B5 – Diagonal Approach for Transferring from a wheelchair
to a W.C. (Diagonal Approach)**



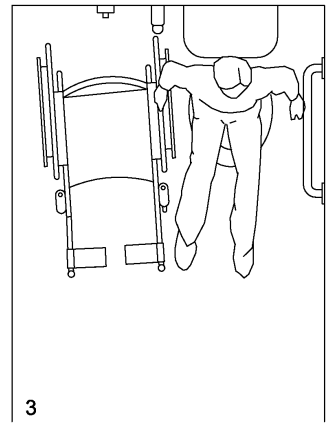
1

TAKES TRANSFER POSITION,
REMOVES ARMREST,
SETS BRAKES



2

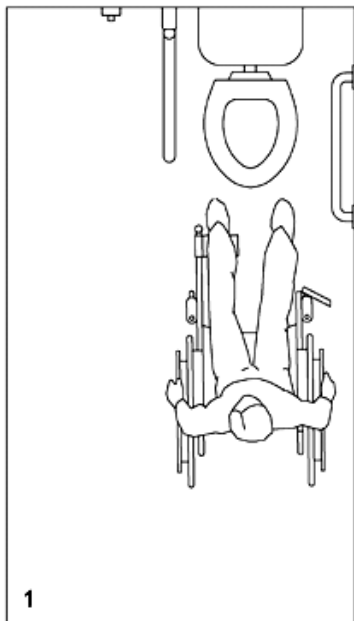
TRANSFERS



3

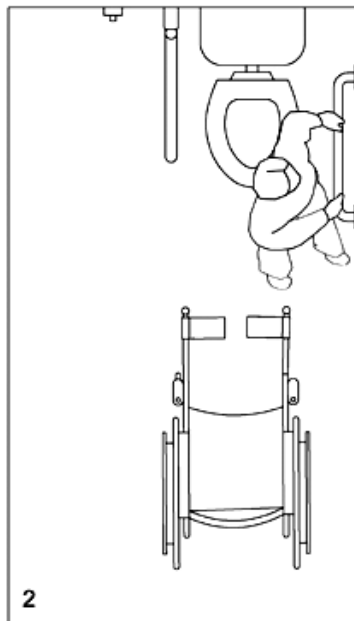
POSITION ON TOILET

Figure B6 – Side Approach for Transferring from a Wheelchair to a W.C.



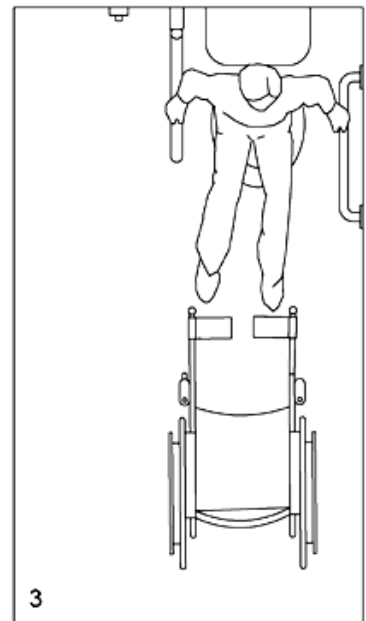
1

TAKES TRANSFER POSITION,
REMOVES ARMREST,
SETS BRAKES



2

TRANSFERS AND POSITION ON TOILET



3

TRANSFERS AND POSITION ON TOILET

Figure B7 – Frontal Approach for Transferring from a Wheelchair to a W.C.

Appendix C

Slip Resistance of Flooring Materials

APPENDIX C

SLIP RESISTANCE OF FLOORING MATERIALS

This appendix aims to provide design references of slip resistance for typical flooring materials and floor finishes.

Materials and finishes are graded under dry and wet conditions. The gradings given herein are for reference only, actual value of “static coefficient of friction” shall subject to the manufacturer’s recommended characteristics.

Gradings based on “coefficient of friction” are classified by: -

- “Very Good” - Material surface suitable for use in areas where special design care is required, with an approximate static coefficient of friction value of 0.80 or above.

- “Good” - Material surface satisfactory for normal use with an approximate “coefficient of friction” value between 0.5 to 0.8.

- “Fair” - Material surface with moderate potential for slip, with an approximate “coefficient of friction” value between 0.2 to 0.5.

- “Poor” - Unsafe material surface with high potential for slip, with an “coefficient of friction” value below 0.2.

Material	Slip resistance		Remarks
	Dry and Unpolished	Wet	
Artificial granite tiles	Good	Poor	
Carpet	Very Good	Good	Loose carpet can present a trip hazard.
Ceramic tiles (glazed and highly polished)	Fair	Poor	
Ceramic tiles (matt)	Good	Poor	Wet slip resistance is dependent on surface roughness.

Material	Slip resistance		Remarks
	Dry and Unpolished	Wet	
Clay pavers	Good	Fair	
Clay tiles	Good	Fair	When surface is wet and polished, the slip resistance value can be poor.
Clay tiles (carborundum finish)	Very Good	Very Good	Suitable for external stairs
Clay tiles (textured)	Very Good	Good	Suitable for external stairs.
Concrete	Good	Fair	If textured finish or a non-slip aggregate is used, slip resistance value when wet may be increased to good.
Concrete (power float finish)	Good	Fair	Surface dust may cause problems particularly on new floors.
Concrete pavers (interlocking)	Good	Fair	
Cork tiles	Very Good	Good	
Granite	Good	Fair to Poor	

Material	Slip resistance		Remarks
	Dry and Unpolished	Wet	
Granolithic	Good	Fair	
GRP profiles (chequer plate)	Good	Fair to Poor	
Homogeneous tiles (non-slip)	Good	Good to Fair	
Linoleum	Good	Fair	Edges of sheets can present a trip hazard.
Marble	Fair	Poor	
Mastic asphalt	Good	Good	
PVC vinyl sheets / tiles	Very Good	Poor	Edges of sheets / tiles can present a trip hazard.
PVC with non-slip granules	Very Good	Good to Fair	
Resin with slip resistance	Very Good	Good	

Material	Slip resistance		Remarks
	Dry and Unpolished	Wet	
Rubber sheets / tiles	Very Good	Poor	Edges of sheets / tiles can present trip hazard.
Terrazzo	Good	Fair to Poor	Slip-resistant inserts such as non-slip nosing are necessary on stair treads. Polished terrazzo should not be used for stair treads.
Timber (finished)	Good	Poor	
Timber (Unfinished)	Good	Fair	

Commentary:

Slip resistance is based on the frictional force required to keep a shoe heel or crutch tip from slipping on a walking surface. While the dynamic coefficient of friction during walking varies in a complex and non-uniform way, the static coefficient of friction, which can be measured in several ways, provides a close approximation of the slip resistance of a surface. However, it is generally recognized that the static coefficient of friction varies considerably due to the presence of contaminants, water, floor finishes, and other factors not under the control of the designer or builder and not subject to design and construction guidelines and that compliance of which would be difficult to measure on the building site. For details of method of measuring slip resistance, readers are suggested to make reference to some available overseas standards such as AS/NTS 4586-2004, AS/NTS 4663-2004, ASTM 1679, ASTM 1677, BS 7976-2, BS 8204 etc.