

# Module 2

## Chapter 1

### Concept of Non-Handicapping Environments, Barrier-free Environments and Universal Design

#### General Planning and Design Considerations

No part of the built environment should be designed in a manner that excludes certain groups of people on the basis of their disability or frailty. No group of people should be deprived of full participation in and enjoyment of the built environment or be made less equal than others due to any form or degree of disability. In order to achieve this goal adopted by the United Nations, certain basic guiding principles need to be applied.

- a. It should be possible to reach all places of the built environment.
- b. It should be possible to enter all places within the built environment.
- c. It should be possible to make use of all facilities within the built environment.
- d. It should be possible to reach, enter and use all facilities in the built environment without being made to feel that one is an object of charity.

These basic guiding principles may serve as general requirements for consideration in physical planning and design. These requirements may be summarized as follows:

#### **I. Accessibility**

The built environment shall be designed so that it is accessible for all people, including those with disabilities and elderly persons.

#### **II. Access or accessible**

This means that everyone can, without assistance, approach, enter, pass to and from, and make use of an area and its facilities without undue difficulties. Constant reference to these basic requirements during the planning and design process of the built environment will help to ensure that the possibilities of creating an accessible environment will be maximized.

#### **III. Reachability**

Provisions shall be adopted and introduced into the built environment so that as many places and buildings as possible can be reached by all people, including those with disabilities and elderly persons.

#### **IV. Usability**

The built environment shall be designed so that all people, including those with disabilities and elderly persons can use and enjoy it.

## V. Safety

The built environment shall be so designed that all people, including those with disabilities and elderly persons, can move about without undue hazard to life and health.

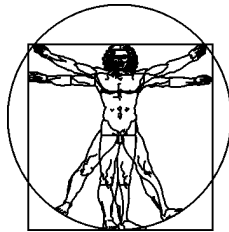
## VI. Workability

The built environment where people work shall be designed to allow people, including those with disabilities, fully to participate in and contribute to the work force.

## VII. Barrier-free or Non-handicapping

This means unhindered, without obstructions, to enable disabled persons free passage to and from and use of the facilities, in the built environment.

## Universal Design



Universal Design is defined as “the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design” (The Center for Universal Design, 1997).

In a Universal Design approach, the user consideration is different as it refers to products and buildings that are accessible and usable by everyone, including PwDs. Rather than providing separate facilities; integral solutions accommodate PwDs as well as the rest of the population.

Accessible Design is different from Universal Design. Accessible Design means products and buildings that are accessible and usable by PwDs. Buildings and products for disabled persons are therefore designed differently from the routine design practice. According to Accessible Design, designers are led to design separate facilities for PwDs, for example providing a ramp beside a stairway at an entrance or a second ‘special’ approach to enter the building.

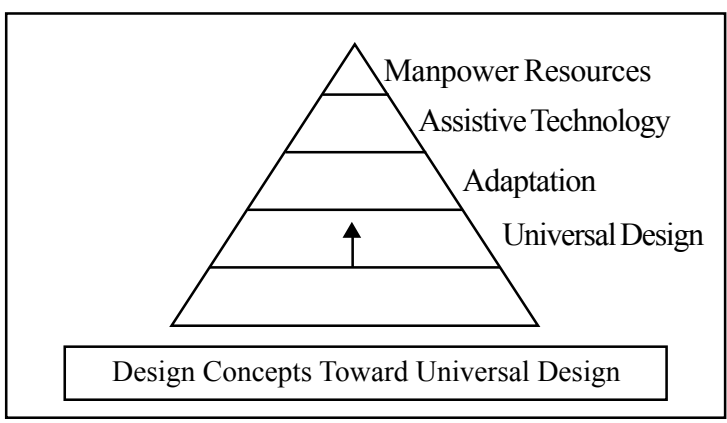
Universal Design means products and buildings that are accessible and usable by everyone, including PwDs. Moreover, Universal Design means ‘design for all’, including people with short stature, tall, obese, frail, elderly as well as young, women as well as men, left handed persons as well as right handed persons. For example, the conventional round handle doorknob is difficult to grasp and turn by persons with hand and upper body impairment (including arthritis). A lever handle can be operated without grasping and turning. This kind of handle not only benefits those persons whose hands are full; they can open the door with an elbow, forearm or back of the hand.

A wheelchair accessible toilet is larger than a ‘normal’ toilet. But a toilet room, designed with Universal Design may have larger space clearances in mind particularly for wheelchair users but for with additional facilities: changing tables for babies, grab bars for pregnant woman, etc. Besides providing accessible cubicles in a man and woman toilet room, there might be a unisex toilet (family toilet room). This kind of toilet avoids embarrassment when a man escorts his young daughter, a woman takes an older father or a wife takes her husband who is severely disabled. This washroom could meet the needs of people with a wide range of physical limitation.

<b>Principles of Universal Design</b>	<b>Six Essential Requirements of Good Design</b>
<ol style="list-style-type: none"> <li>1. Equitable Use</li> <li>2. Flexibility in Use</li> <li>3. Simple and Intuitive Use</li> <li>4. Perceptible Information</li> <li>5. Tolerance for Error</li> <li>6. Low Physical Effort</li> <li>7. Size and space for Approach and Use</li> </ol>	<ol style="list-style-type: none"> <li>1. Safety</li> <li>2. Accessibility</li> <li>3. Usability</li> <li>4. Affordability</li> <li>5. Sustainability</li> <li>6. Aesthetics</li> </ol>

(The Center for Universal Design, 1999)

(Dr. Satoshi Kose)



(Dr. Satoshi Kose)



Drinking water taps at Two Levels  
(Garden of Five Senses, New Delhi)



Counters planned at height accessible to all

## Chapter 2

### Functions of Access Features

It is not enough merely to know the dimensions that are commonly used for each type of access feature. It is equally important to understand why those dimensions have been accepted, as well as how access features can be used by disabled persons and by other user groups.

For example, invite the participants to try out models of ramps, mock ups of height reaches (placing objects at different heights and asking participants to reach for the objects), how to transfer to and from the toilet seat, position and usage of the grab bars.

Such understanding is essential for giving disabled persons the confidence to explain to the authorities the need for access provisions. The ability to explain clearly why and how these provisions benefit everyone will make it easier for the authorities to understand what action can be taken to meet those needs. Furthermore, if both disabled persons and the authorities understand the reasons, they will more likely to find local solutions that are best suited to problems that may not be found in existing document.

This section guides on:

- (a) Why one needs certain access features.
- (b) How one can acquire hands-on experience in understanding the need for those features.
- (b) How one can use this knowledge in conducting access surveys.

### Space Allowance

This refers to the space needs of a person in a stationary wheelchair and a person using bilateral crutches for mobility.

### Wheel Chair Dimension

There are two points to take into consideration when measuring a wheelchair, that is, do we only want to know the dimensions of the wheelchair or the space needed by a wheelchair user?

Actual dimensions are necessary to know and understand the types and sizes of wheelchairs used in our country. However it is more important to know the space required by a wheelchair user as this ensures that a wheelchair user has the sufficient space required to maneuver the wheelchair from point to point.

How to measure the wheelchair

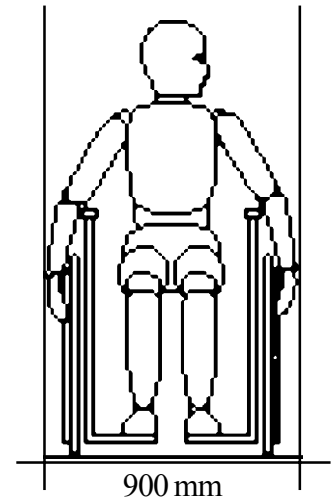
- Measure the outer rim of the left wheel to the outer rim of the right wheel (slip the measuring tape through the spokes of the wheelchair and space under the seat).
- Measure the edge of the footrest to the furthest edge of the back wheel.

How to measure the space required by a wheelchair user

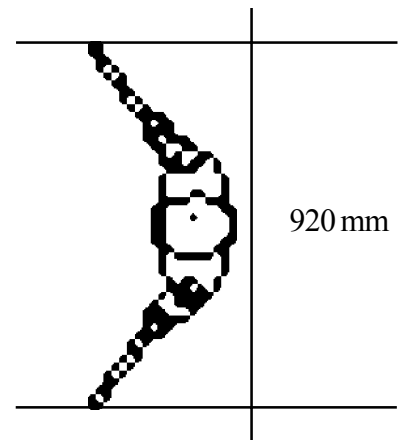
- Request wheelchair users to position their arms in push position and measure the distance from one elbow to other.

- Measure the distance from the edge of the foot to the furthest edge of the back wheel. Note that in most circumstances, when the foot is placed on the footrest, part of the foot would protrude from the footrest. Moreover, some wheelchair users are unable to place their feet on their footrests.

For the wheelchair user, the dimensions include the actual wheelchair size and additional space needed to safely accommodate the user's hands and feet.



For the ambulant disabled person, the space allowance is measured as the distance between the tips of both crutches when they are being used.



Also pay particular attention on how wheelchairs and other assistive devices are actually used by diverse users in daily life in their own environment.

# Chapter 3

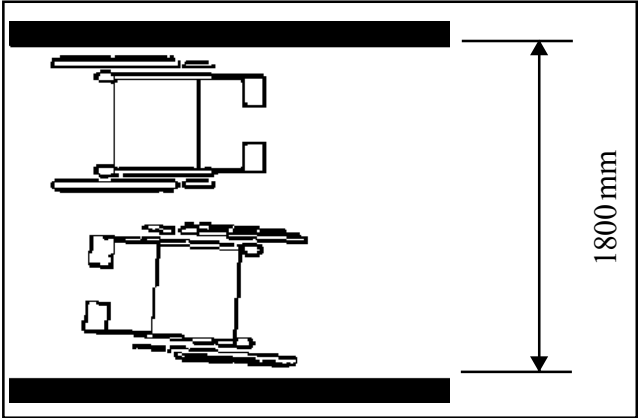
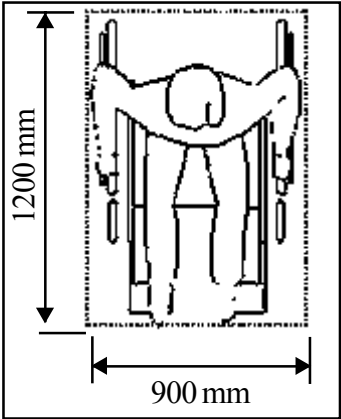
## Anthropometrics

### Scope

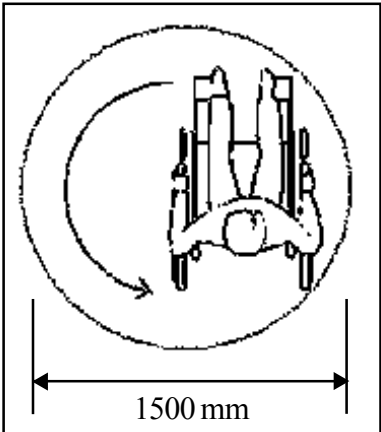
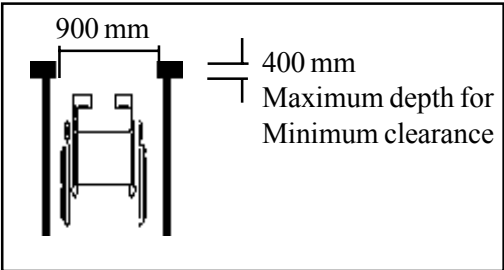
This chapter contains dimensions that can be used for guidance when designing facilities and equipment to be used by persons with disabilities.

### Space Allowance

- Adequate space should be allocated for persons using mobility devices, e.g., wheelchairs, crutches and walkers, as well as those walking with the assistance of other persons.

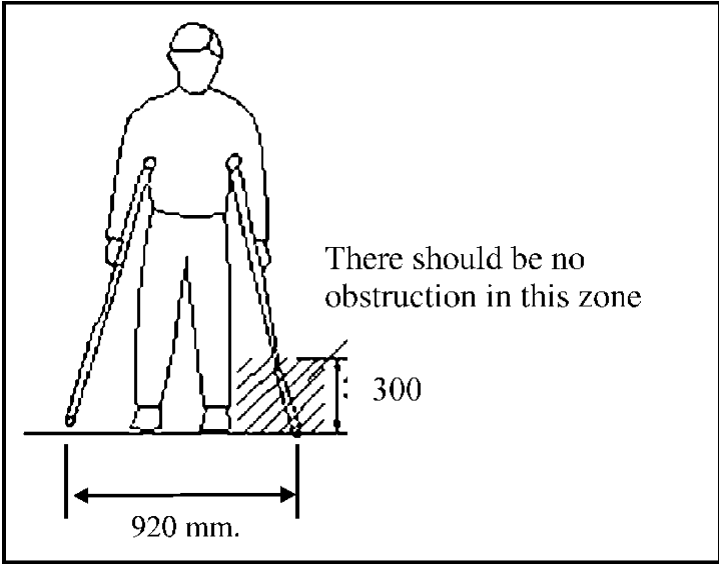


Minimum clear width for two wheel chairs

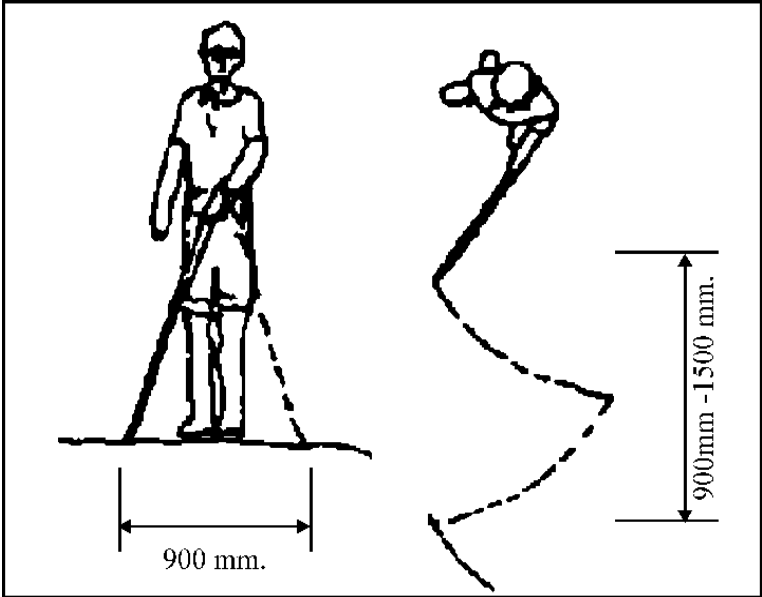


Minimum clear width for single wheelchair

**Dimensional Data on Crutch Users**



**Dimensional Data on Walking Stick / White Cane Users**

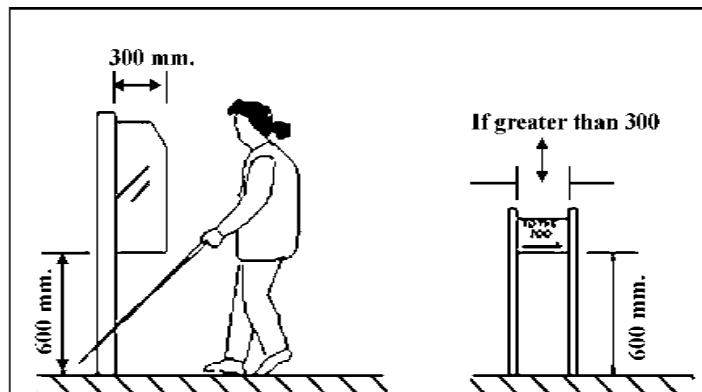
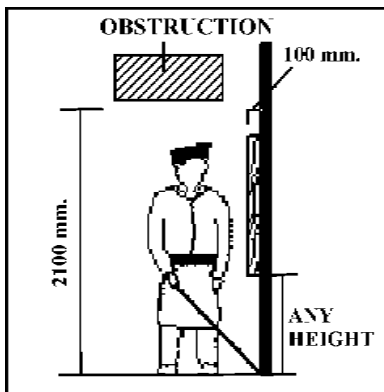


## Protruding Objects

- Protruding objects, such as directional signs, tree branches, wires, guy ropes, public telephone booths, benches and ornamental fixtures should be installed with consideration of the range of a visually impaired person's cane.
- A barrier to warn blind or visually impaired persons shall be provided under stairways or escalators.

Walkways, halls, corridors, passageways, aisles, or other circulation spaces should have clear headroom to minimize the risk of accidents.

## Free Standing Objects



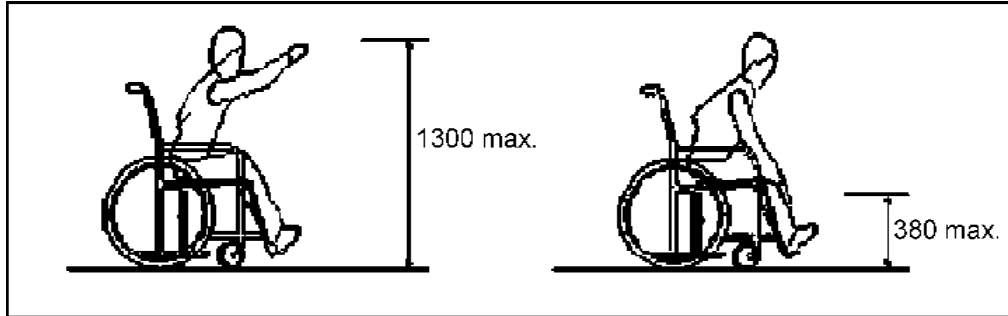
## Overhead Hazards



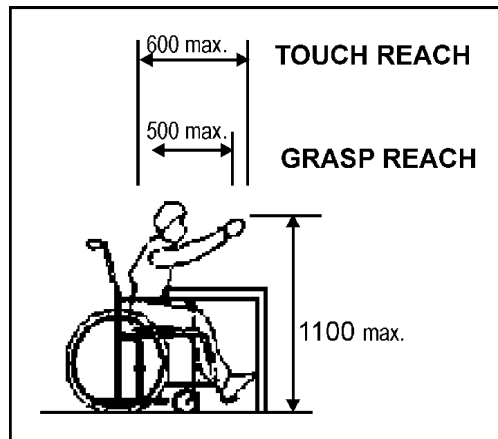
## Reach Allowance

- The range of reach (forward and side; with or without obstruction) of a person in a wheelchair should be taken into consideration.

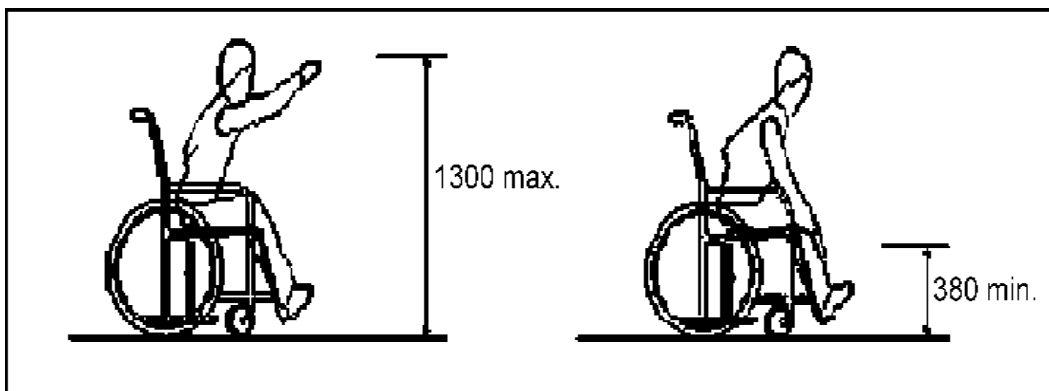
### Forward Reach Without Obstruction



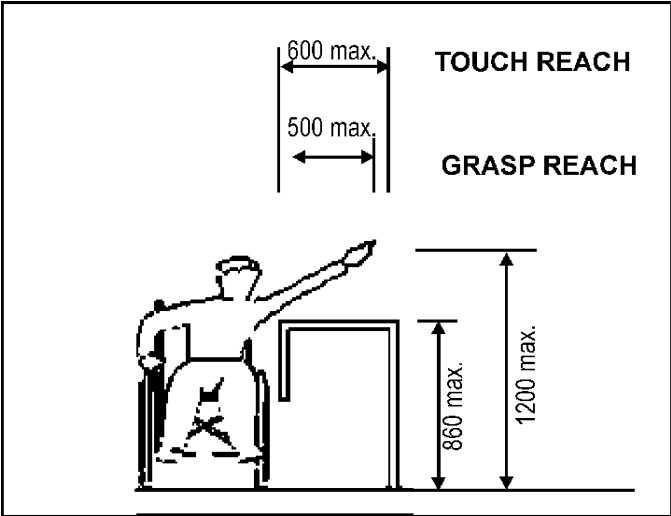
### Forward Reach Over Obstruction



### Side Reach Without Obstruction



**Side Reach Over Obstruction**



(Source : UN Guidelines)