

FADY G. EL-MADHOUN

NAHER EL BARED REFUGEE CAMP INCLUSIVE ACCESSIBLE DESIGN

STANDARDS' GUIDE FOR ARCHITECTS



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Standards' guide for architects



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THE INCLUSIVE DESIGN

Refers to a barrier-free environment. It means identifying and removing barriers and creating an environment so that its usage and interaction with people, is maximized regardless of cultures or abilities.

Preface:

Driven by its vision that a healthy development for all people can only be found on a society that is built on human rights, social justice, equity and solidarity, LPHU has been actively working to influence national policies of reform and reconstruction aiming at making them **inclusive** and **accessible** for all.

Precisely working at two levels:

1) Targeting the process of reconstruction to ensure it includes inclusive criteria which would enable all citizens to use the space without having to put an additional effort, nor to be excluded or hurt and to use it with dignity and independence. The Naher el Bared Camp is part of this process as it is being rebuilt after it has been destroyed .It is this pilot experience we are about to present in this guide.

2) Advocating at implement law 220 for the rights of people with disability by issuing a decree for **accessibility** measures. This decree should have been have been completed since eight years in order to become legal reference law for building regulation in implementing part four of law 220/2000.

The strategic approaches that LPHU has taken while working in these two levels were mainly: providing tools and resources, capacity building, implementing pilot initiatives through networking and building partnership with the main relevant actors to promote inclusion.

Our experience at the Naher el Bared Camp is one of the best practices by all means. It presents a comprehensive model for inclusive development. The constructive dialog it created between Palestinian and Lebanese community members and decision makers; the joint effort brought together by free will to support and lobby by several actors is itself another model. It opened up choices, where opportunities were limited for inclusion. Once the camp is built with the modification measures that this guide provides, it is going to positively affect the lives of many people who are living in the camp, especially people with additional needs. It is a model of an inclusive environment that should greatly encourage and increase opportunity to endorse the decree of accessibility and may be then we can start to witness an inclusive

rebuilding process. This documented experience holds in its various positions of modification inventive methods and principles.

What we mean by **Inclusive Design**?

It refers to barrier-free environment. It means identifying and removing barriers and creating an environment so that its usage and interaction with people, is maximized regardless of culture or abilities.

However, it should be acknowledged that "inclusive design" is not a fixed criterion, but a constantly evolving philosophy.

Therefore, in going back to LPHU's process of work in targeting reconstruction process in Lebanon and due to the fact of different actors were and are being involved, plus the fact that no decree is yet issued to be the legal framework for all involved in rebuilding Lebanon. LPHU's team had to negotiate for various levels of criteria which might be identified as accommodation rather more than inclusive.

Accommodation refers to providing the tools or practical measures that create access and is required when barriers have not or cannot be removed. In keeping with the human rights principles, accommodation is to be provided in a way that respects the individual's dignity, encompasses self respect and self-worth, and entail such things as privacy, confidentiality autonomy, and integrity. It recognizes that no two communication barriers are exactly the same and therefore, each person is entitled to an accommodation that best suits his or her individual needs.

Sylvana Lakkis

Introduction:

To assist UNRWA⁽¹⁾ in their design process, LPHU⁽²⁾ created this handbook to provide a design guideline on accessibility matters for the persons with disability.

Those standards will be used in the design process of Naher-el-Bared camp in Northern Lebanon as a reference for architects. The reconstruction process is being undertaken now, based on the adaptation of those standards during the design process for the general public benefit.

This handbook does not cover every single requirement for accessibility design in detail; but it is a simple and clearly indexed booklet that could be consulted during the design process.

Designing within a city is completely different than designing for a refugee camp, which is considered as an informal residential agglomeration. The major constraints that have been reported by architects could be categorized as:

- Severe lack of adequate spaces
- Very high density of the population
- Irregularities in the shapes and size of the plots (historical context)
- Delicate habitat consideration
- Limited time for design
- Difference of levels within the main camp field

Therefore, most of the dimensions and codes are internationally accepted; but some of the regulations included have been modified and adapted to fit to the general characteristics of the camp.

(1) UNRWA: United Nations Relief and Work Agency

(2) LPHU: Lebanese Physical Handicapped Union

The selection of standards has been made based on problem identification from the designing architects and based on field visits conducted and needs expressed by the residents.

The targeted groups consist mainly of two major categories:

- 1- Persons who use the wheelchair and people with limited walking abilities.
- 2- People with visual impairments

Designing for those targeted groups does imply making changes and modifications that are completely fit and serve all human needs. Therefore, all the ground level of Naher el Bared Camp will be designed taking into consideration the potential use by a person with disability.

The main purpose is to create a friendly Ground Floor level all over the old camp, which is free of obstacles and barriers; and thus, proving that with minor efforts and adjustments, people with disabilities can be fully integrated within their society; commute between home, work, friends and neighbors; be independent and lead a normal life; briefly, complying with the theory of a trip chain based on the R.E.C.U⁽¹⁾ concept.

Some of the graphics are taken from known sources⁽²⁾ and some graphics have been designed specifically for the Naher el Bared Refugee Camp.

(1) R.E.C.U.: Reach, Enter, Circulate, Use

(2) Some graphics were taken from the Codes of Federal Regulations Standards for Accessible Design Published by the department of Justice, 28CFR Part 36, July 1, 1994 and from Accessibility for the Disabled, the Design Manual for a Barrier Free Environment published by Solidere in 1998. The dimensions on the graphics were customized to fit the purpose they serve during the design of Naher el Bared Refugee Camp. The author does not proclaim the design or the creation of those graphics.

Description:

The contents of this handbook have been prepared to be accessed as fast as possible by designing architects. The standards are categorized based on design needs.

The standards are divided into the following sections:

SECTION I: Architectural design standards

This section deals with circulation issues and aspects, vertical and horizontal access within the buildings.

SECTION II: Public and urban design standards

Design requirements and standards for open spaces, public areas, and outdoor barrier-free circulation.

APPENDIX A: Data and recommendations

This section shows different dimensions of equipments and humans, reference tables and other useful standards.

APPENDIX B: Supplement

In this section is gathered some apartment belonging to an identified persons with disabilities along with a clarification of the modifications applied to its plan.

APPENDIX C: Architectural details

This section shows some architectural details that would be used in the execution drawings.

In some cases, the standards are divided into two groups:

First Group: Standards for accessible home design.

Second Group: Standards for person with disabilities home design.

Dimensions are given in centimeters; all the dimensions should be the minimum allowable and sometimes a range of dimensions is given.

Acknowledgment:

This guidebook is made possible through the help and contribution, whether material or intellectual or both, of many people; thus, enriching the guidebook through advice, support and encouragement.

Many thanks to:

-The Lebanese Physical Handicapped Union's staff, and particularly to:

Ms. Sylvana Lakkis,

Program and Project Manager of the Lebanese Physical Handicapped Union (LPHU)

Eng. Bashar Abdel Samad,

Architect & Urban Planner (LPHU)

Dr. Marwan Al-Bast,

Project Coordinator of the "Inclusive Development and Self Advocacy Project" (LPHU)

-UNRWA's Design Unit engineers and particularly to:

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Head of Camp Improvement Division, UNRWA HQ - Amman

Arch. Aditya Kumar,

Head of Design Unit, UNRWA/PMU

Arch. Abdalnasser Ayi,

Architectural Designer, Design Unit-UNRWA

-HANDICAP INTERNATIONAL

-CHRISTIAN AID

- A special thanks for members of the "Committee for NBC Accessibility", the Palestinian Disability Forum, Norwegian People Aid, and the Community Based Rehabilitation Program (CBR), for their support and involvement in this experience.

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**SECTION I:
PUBLIC AND URBAN DESIGN STANDARDS**

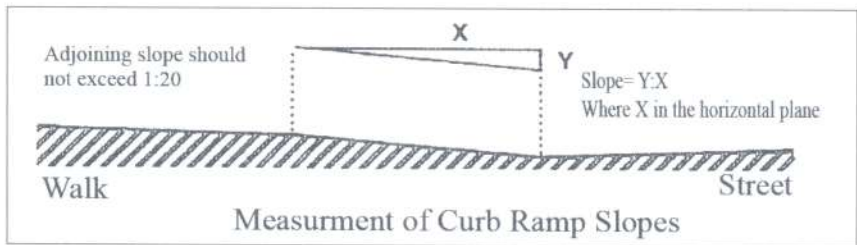
1-CURB RAMPS AND HEIGHTS

1.1- General notes:

- Curb ramps are used to overpass change in levels between two surfaces along a pedestrian access; curb ramps reduce effort needed for the passage of a person using the wheelchair independently.
- The accessible passage width of a curb ramp should not be less than 90cm.

1.2- Slopes:

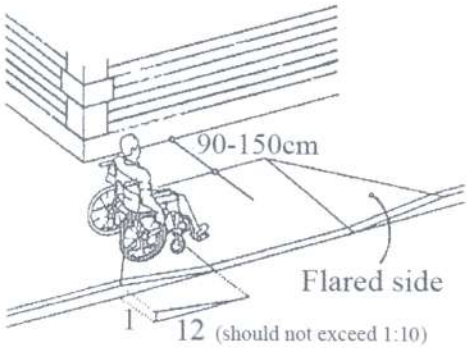
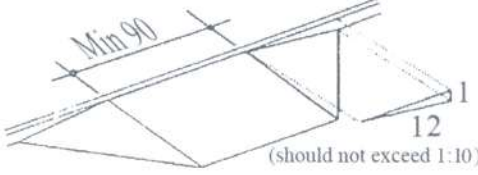
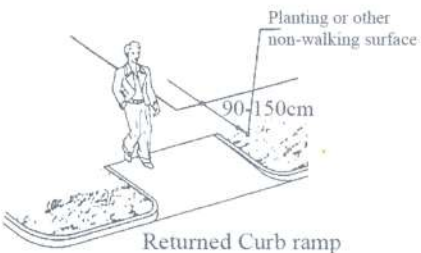
- The maximum accessible slope used for a curb ramp should not exceed 1:12; the recommended slope is 1:16 for a person using the wheelchair.
- The maximum slope for flared sides should not exceed 1:10; the recommended slope is 1:12 for a person using the wheelchair.
- The maximum allowed slope of any immediately adjacent surface (pathway or gutters) should not exceed 1:20.
- Design of the slope should comply with the following diagram.



1.3- Applications:

- Curb ramps should be used at each pedestrian crossing/pavements, on opposite sides of the street.
- Curb ramps should be used at car drop zones, near building entrances (wherever it applies).
- Curb ramps should be used at each quadrant of streets intersections.
- Curb stones should be used between accessible parking areas and pathways.
- Curbed ramps should be used on any raised island in crossings; the surface should be lowered to the street surface.

1.4- Types of curb ramps:

Flared sides curb ramp: • Cut back into the pavement, it provides transition in three directions. • Doesn't need handrail protection. • Is located along pedestrian pathway/pavement.	 Flared side 1:12 (should not exceed 1:10) Flared sides curb ramp
Built-up curb ramp: • Should not project into vehicular traffic lane. • Not recommended. • Has flared edges.	 Min 90 1:12 (should not exceed 1:10) BuiltUp Curb Ramp
Returned curb ramp: • Used where pedestrian would not normally walk across the ramp. • Provide slope in one direction. • Should have protected edges.	 Planting or other non-walking surface 90-150cm Returned Curb ramp

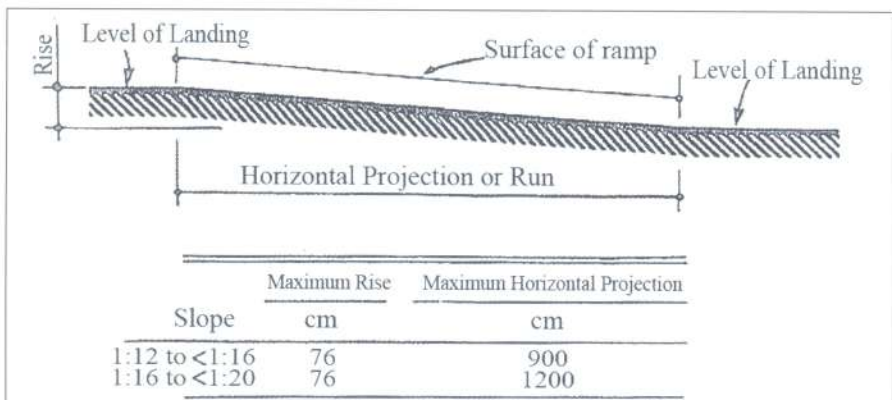
2-Ramps

2.1- General notes:

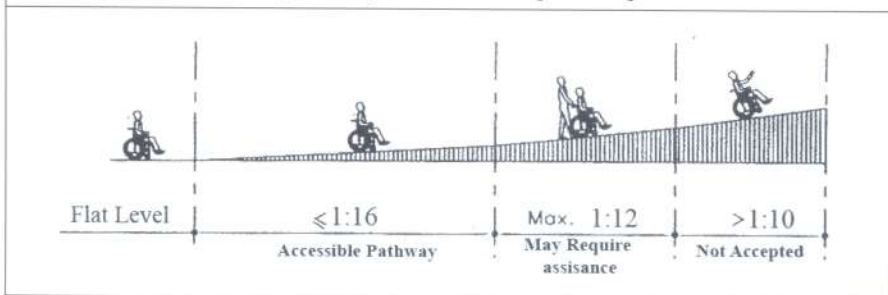
- Used to facilitate mobility for persons using the wheelchair mainly used in exterior, interior ramps are not recommended, because it takes a great deal of space.
- In Naher el Bared camp, internal ramps are used below staircases within recommended dimensions.

2.2- Slopes and rise:

- Slopes are calculated based on the height to rise and the distance to travel.
- Many ratio for calculating the slope are accepted but the recommended slope is 1:16
- The maximum accessible accepted slope is 1:12.



Components of a Single Ramp Run and Sample Ramp Dimensions



2.3- Clear Width:

- The minimum clear width of a ramp shall be 90cm.

2.4- Landings:

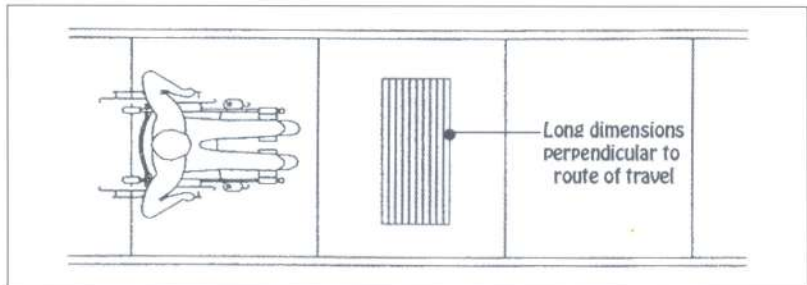
- Ramps should have horizontal landings at both top and bottom of the ramp.
- The landing width should be at least 90cm
- The landing width should not be less than the ramp width.
- If the ramp changes direction at landing, the landing size should not be less than 150x150cm.
- If an entrance door is located at a landing than refer to section A5.3.

3-Obstacles' Reduction

Obstacles' reduction in landscape design could be very beneficiary to people who are completely or partially visual impaired, for persons using the wheelchair, for people with limited waling abilities, for pregnant women and the elderly.

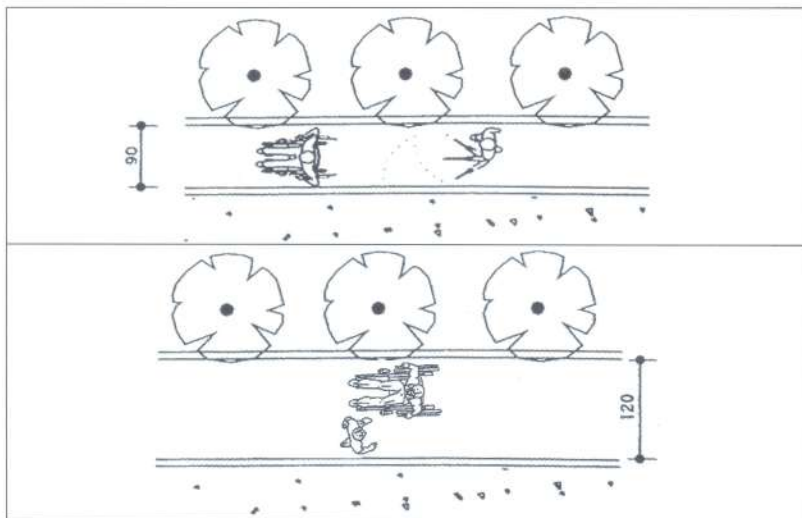
3.1- Gratings:

- Gratings can be hazardous to persons using the wheelchair, cane, and crutches, for the elderly and parents with a baby pushchair.
- If gratings are located in walking surfaces, then they should have spaces less than 13mm in one direction only.
- If gratings have elongated openings, then they should be fixed so that the long dimension is perpendicular to the main direction of walking.
- Manhole drains and gratings should usually be placed away from the pedestrian walkway/pavement.
- Gratings, drains and manhole should be at the same surface level with the walkway.

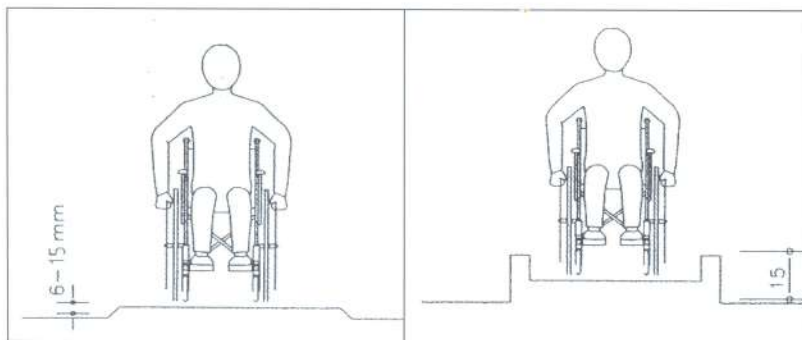


3.2- Walkway width:

- Minimum accessible walkway width for the passage of a person using the wheelchair or a cane is not less than 90cm.
- Recommended walkway width for comfortable wheelchair passage and pedestrian passage is 120cm.

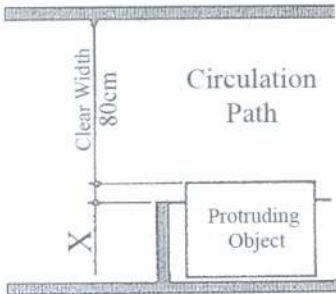
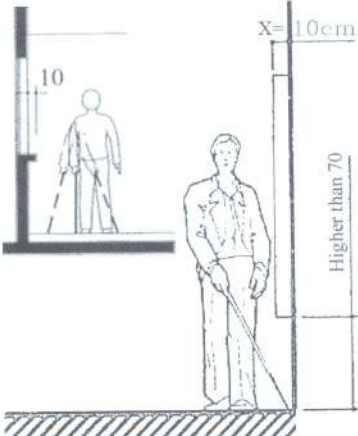
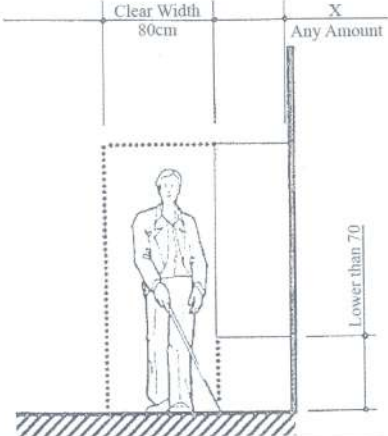


- The edged of the pathway should be beveled if the level change is above 5mm and less than 15mm.
- For a raised pathway of more than 15mm edges or barriers should be added to its boundaries.
- A 15cm edge should be added to pathway to separate it from planting area or other landscape features.



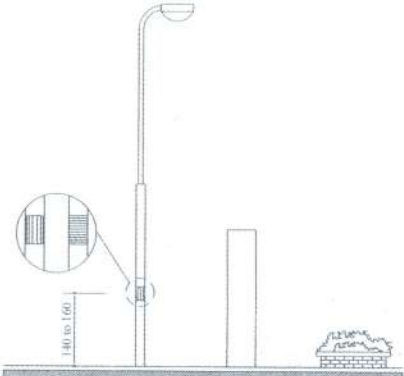
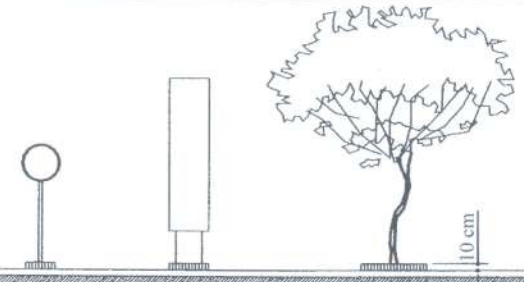
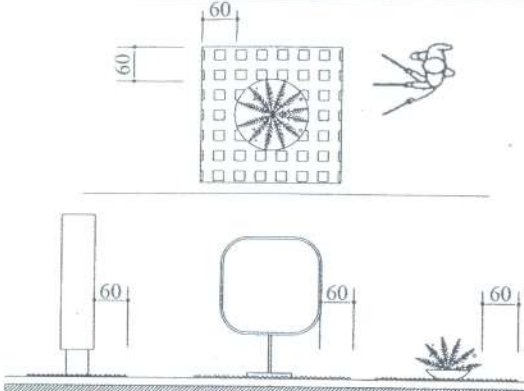
3.3- Pathway Items:

3.3.1- Protruding objects

 Circulation Path Clear Width 80cm Protruding Object X	
 X=10cm Higher than 70 10	 Clear Width 80cm X Any Amount Lower than 70
If the protruding object should have its lower edge higher than 70cm, than protruding dimension should not exceed 10cm.	If the protruding object should be lower than 70cm than the protruding dimension could be of any amount as long as the clear width of the passing person is respected.

3.3.2- Obstructions on the pathway:

Obstructions on the pathway surface should have one of the following design features in order to be detected by a person with visual impairments using a cane.

	A straight shape rising from the pathway surface. Equipment with a tactile marking (of 30cm) at a level between 140 to 160cm. these markings warn persons with limited vision.
	A 10cm platform below obstructive items on pathways
	Tactile marks should be placed around the obstruction on the floor. The marking (warning) should extend over a width of at least 60cm outside the projected area at the base of the obstructive object.

**SECTION II:
ARCHITECTURAL DESIGN STANDARDS**

1-OPENINGS

1.1- Doors

1.1.1-The standard size of doors:

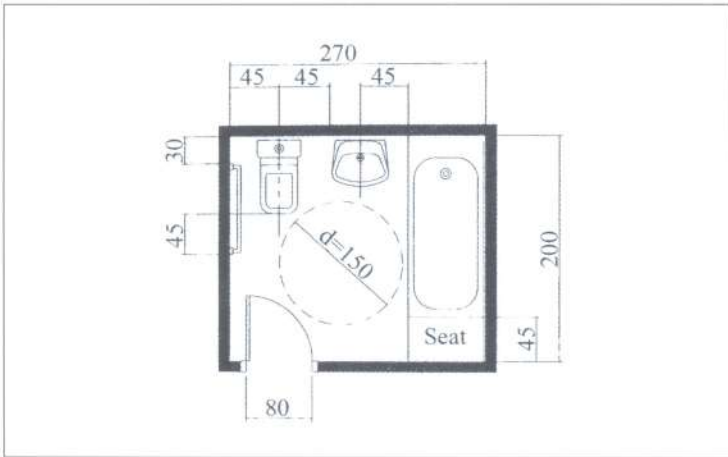
Home of People with Disability	
For exterior door the minimum required opening's clearance is 90cm	
For interior doors the minimum required opening clearance is 80cm	
In case of double leaf swinging doors at least one leaf should have an opening's clearance of 80cm	
In case of sliding and folding doors, the minimum required opening's clearance should be 80cm	

Accessible apartment	
For exterior door the minimum required opening's clearance is 85cm	
For interior doors the minimum required opening clearance is 75cm. (only if the access is straight)	
In case of double leaf swinging doors at least one leaf should have an opening's clearance of 75cm	
In case of sliding and folding doors, the minimum required opening's clearance should be 75cm	

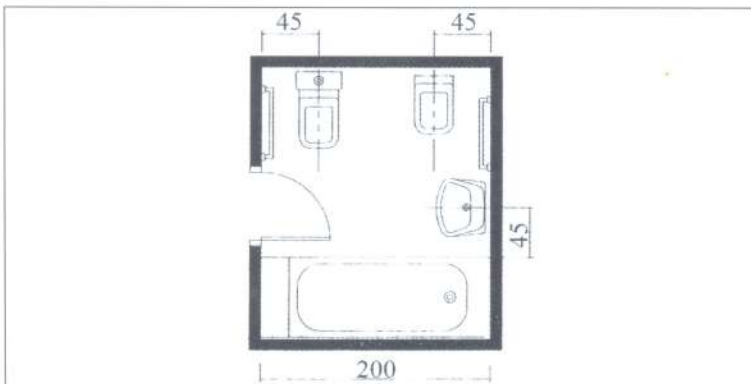
2- BATHROOMS

2.1-Bathroom design for the person with disability

- Residential bathrooms are usually equipped with a WC, a bidet, a wash basin and a tub or shower.
- The dimension and layout of a bathroom for use by a person with disability should comply with the following design and minimum requirements.
- A residential bathroom, within Naher el Bared camp, should not necessarily comprise a bidet and a bath tub. Designs are generally accepted with wash basin, WC and a shower cabin.

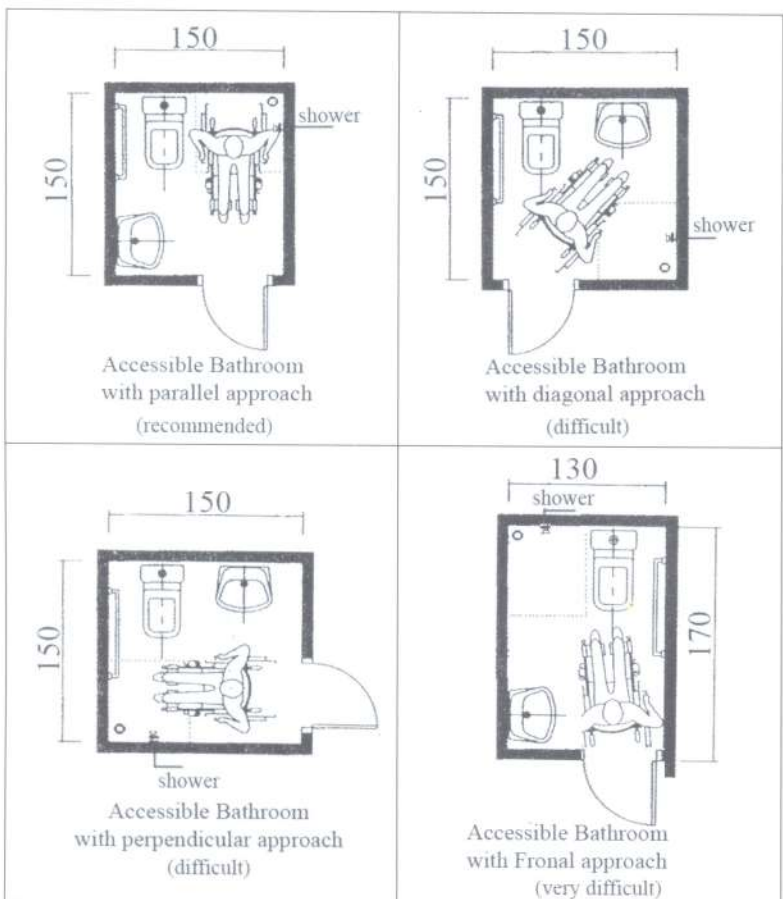


D=150cm, necessary space for easy wheelchair maneuvering.



2.2-Approaches for accessible bathrooms:

- Dimension for reachable bathroom's space which is considered as accessible for future disabled use, may vary based on the available space and design. The design should at least be accessible to persons using the wheelchair with the help of an attendant.
- There are several accessible approaches and maneuvering, each are considered based on the difficulty level of maneuvering inside the bathroom.
- Dimensions should not be lower than 130cm in width and 170cm in length.



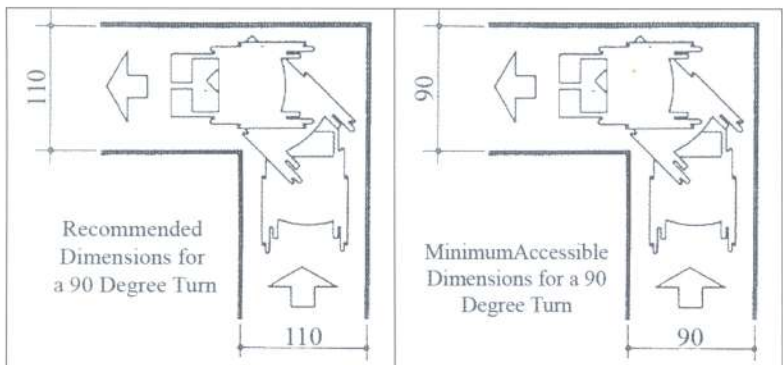
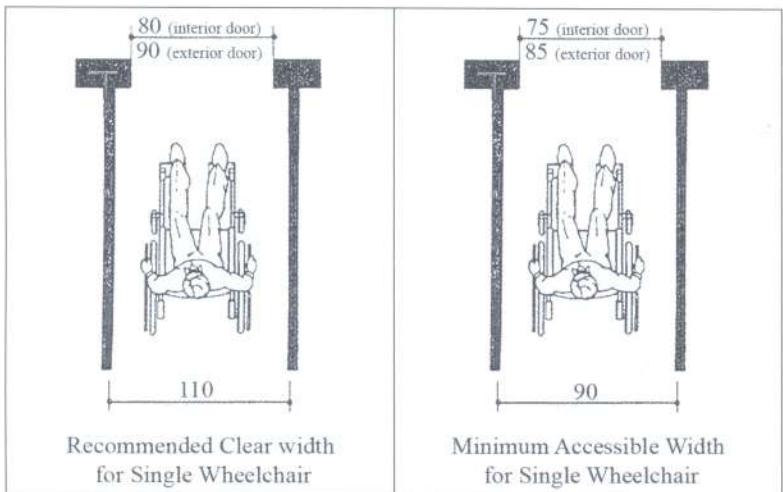
2.3-Examples from Naher el Bared camp:

ACCESSIBLE BATH: Bathroom could serve a person using the wheelchair, without assistance.	ACCESSIBLE BATH: Bathroom could serve a person using the wheelchair, assistance could be needed.	ACCESSIBLE BATH: Bathroom could serve a person using the wheelchair, without assistance.
BATH FOR PERSON USING THE WHEELCHAIR: All standards have been applied including a free 1.5m diameter circle for easy maneuvering. Grab bars should be added on execution drawings.	BATH FOR A PERSON WITH WALKING PROBLEMS: Some standards have been applied due to the extreme small dimensions and available space. Grab bars should be added on execution drawings.	BATH FOR PERSON USING THE WHEELCHAIR: All standards have been applied including a free 1.5m diameter circle for easy maneuvering. Grab bars should be added on execution drawings.

3-SPACE ALLOWANCE AND REACH RANGE

3.1-Corridors:

- The minimum accessible width for a pathway or a corridor for one person using the wheelchair and an able-bodied person shall not be less than 90cm.
- The recommended passage width for a person with disability on a wheelchair shall not be less than 110cm.
- The minimum space required for a person who uses the wheelchair to make a 90 degree turn shall not be less than 90x90cm.



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**SECTION I:
PUBLIC AND URBAN DESIGN STANDARDS**

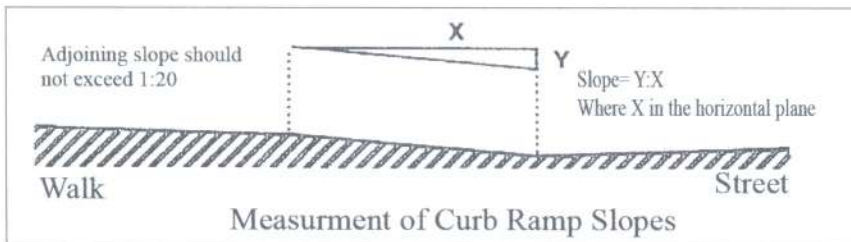
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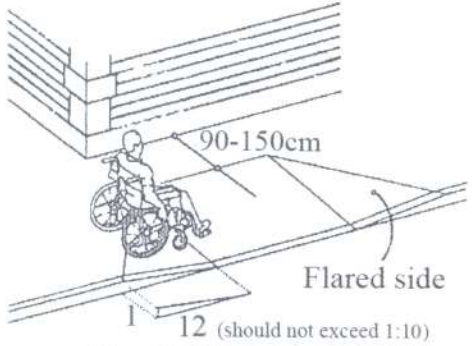
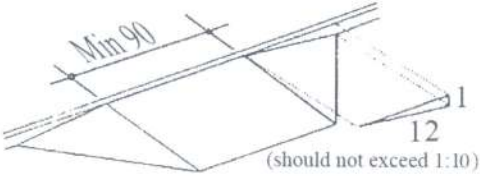
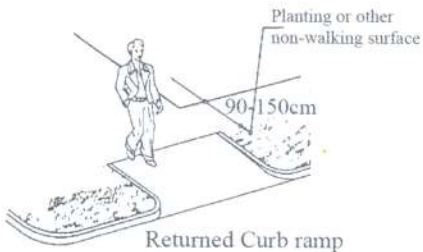
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1.3- Applications:

- Curb ramps should be used at each pedestrian crossing/pavements, on opposite sides of the street.
- Curb ramps should be used at car drop zones, near building entrances (wherever it applies).
- Curb ramps should be used at each quadrant of streets intersections.
- Curb stones should be used between accessible parking areas and pathways.
- Curbed ramps should be used on any raised island in crossings; the surface should be lowered to the street surface.

1.4- Types of curb ramps:

Flared sides curb ramp: • Cut back into the pavement, it provides transition in three directions. • Doesn't need handrail protection. • Is located along pedestrian pathway/pavement.	 90-150cm 1 12 (should not exceed 1:10) Flared side Flared sides curb ramp
Built-up curb ramp: • Should not project into vehicular traffic lane. • Not recommended. • Has flared edges.	 Min 90 1 12 (should not exceed 1:10) BuiltUp Curb Ramp
Returned curb ramp: • Used where pedestrian would not normally walk across the ramp. • Provide slope in one direction. • Should have protected edges.	 Planting or other non-walking surface 90-150cm Returned Curb ramp

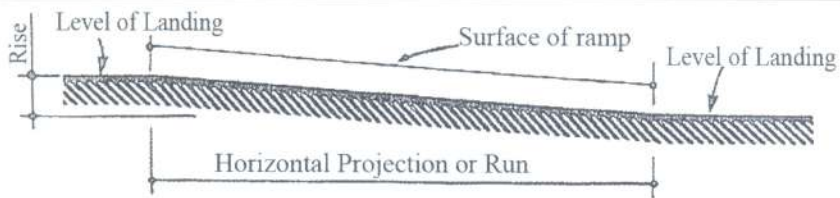
2-Ramps

2.1- General notes:

- Used to facilitate mobility for persons using the wheelchair mainly used in exterior, interior ramps are not recommended, because it takes a great deal of space.
- In Naher el Bared camp, internal ramps are used below staircases within recommended dimensions.

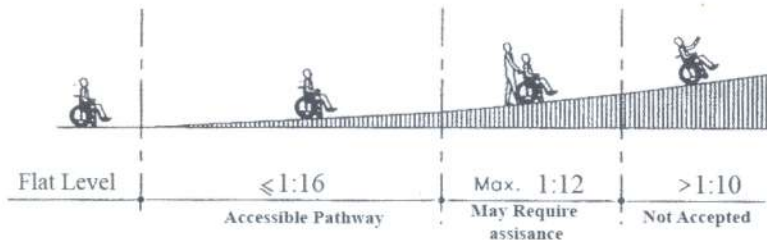
2.2- Slopes and rise:

- Slopes are calculated based on the height to rise and the distance to travel.
- Many ratio for calculating the slope are accepted but the recommended slope is 1:16
- The maximum accessible accepted slope is 1:12.



Slope	Maximum Rise	Maximum Horizontal Projection
	cm	cm
1:12 to <1:16	76	900
1:16 to <1:20	76	1200

Components of a Single Ramp Run and Sample Ramp Dimensions



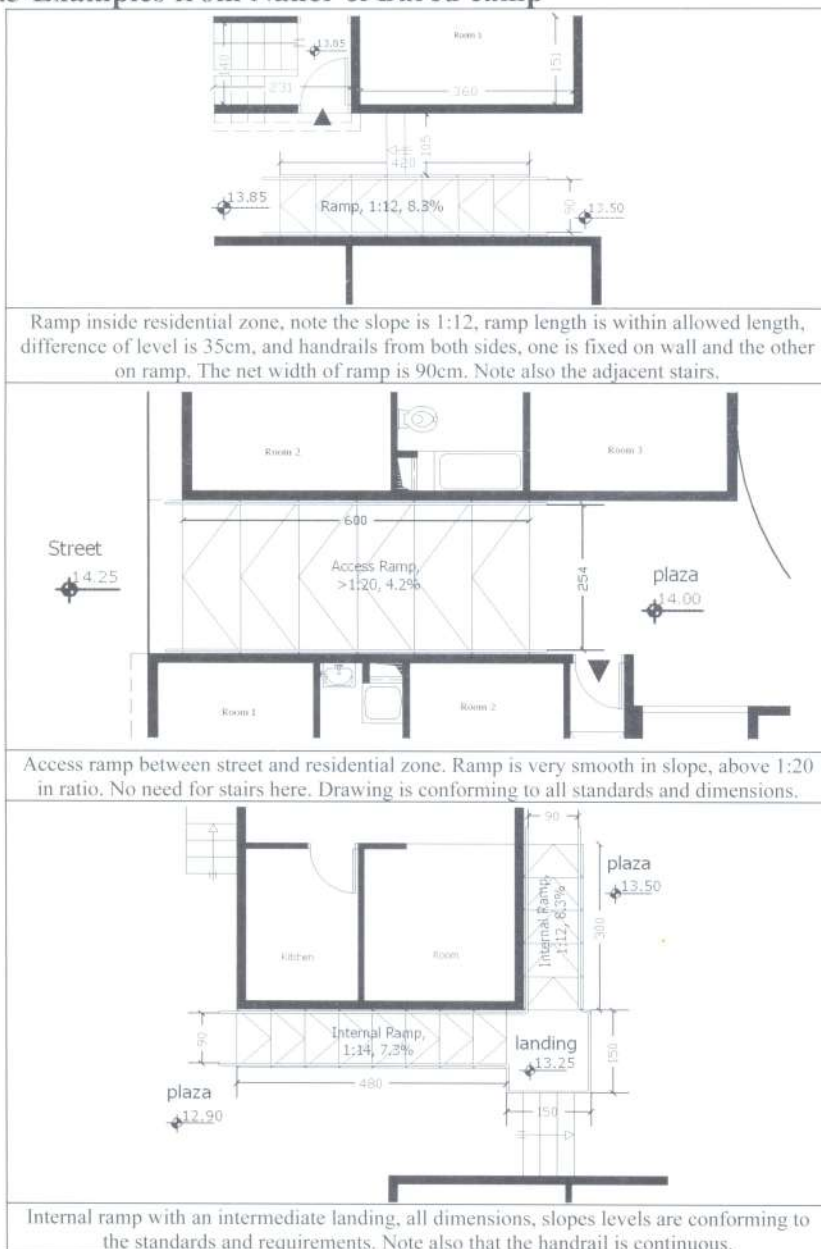
2.3- Clear Width:

- The minimum clear width of a ramp shall be 90cm.

2.4- Landings:

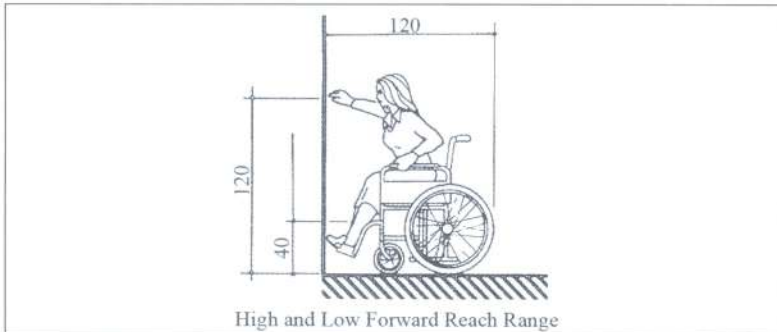
- Ramps should have horizontal landings at both top and bottom of the ramp.
- The landing width should be at least 90cm
- The landing width should not be less than the ramp width.
- If the ramp changes direction at landing, the landing size should not be less than 150x150cm.
- If an entrance door is located at a landing than refer to section A5.3.

2.5-Examples from Naher el Bared camp

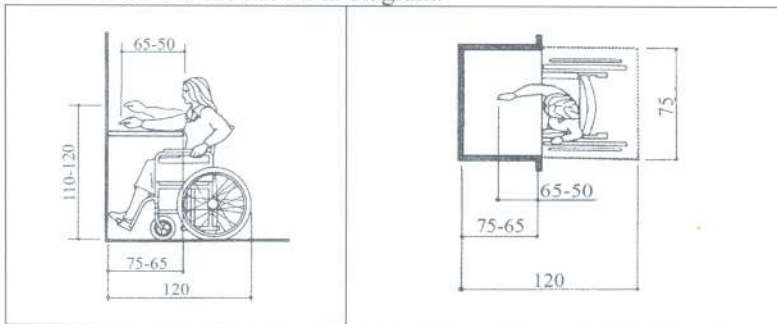


3.2-Reach range:

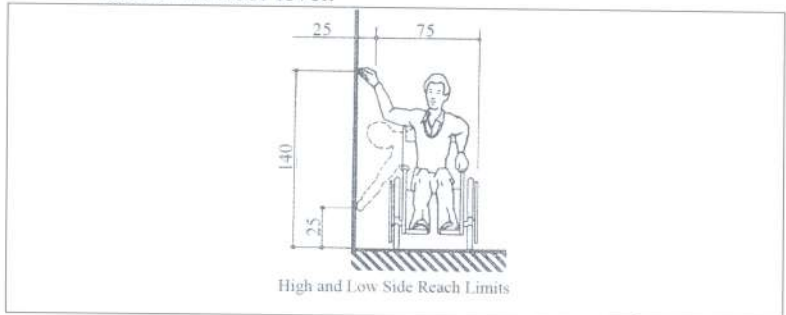
- All equipments should be fixed within the reach range of a person with disability.
- If the clear floor space allows only forward approach to equipment, the maximum height forward reach should be 120cm.
- If the clear floor space allows only forward approach to equipment, the maximum low forward reach should be 40cm above floor level.



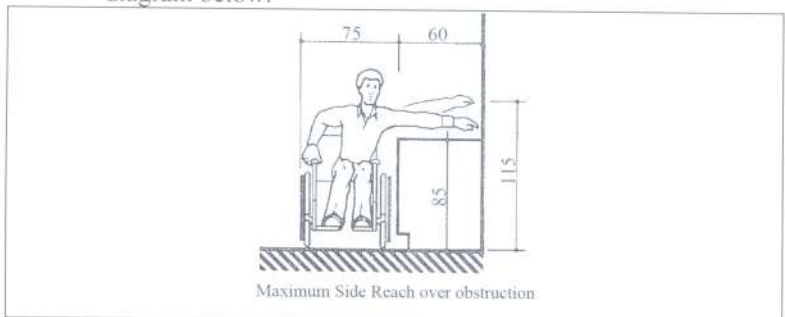
- If the forward reach is over an obstruction (dinning bar, kitchen table, cooking counter) then the reach and clearance should be as shown in diagram.



- If the clear floor space allows only parallel approach to equipment, the maximum height side reach should be 140cm.
- If the clear floor space allows only parallel approach to equipment, the low side reach should be no less than 25cm above the floor level.



- If the side reach is over an obstruction (i.e. kitchen counter) then the reach and clearance should be as shown in the diagram below.



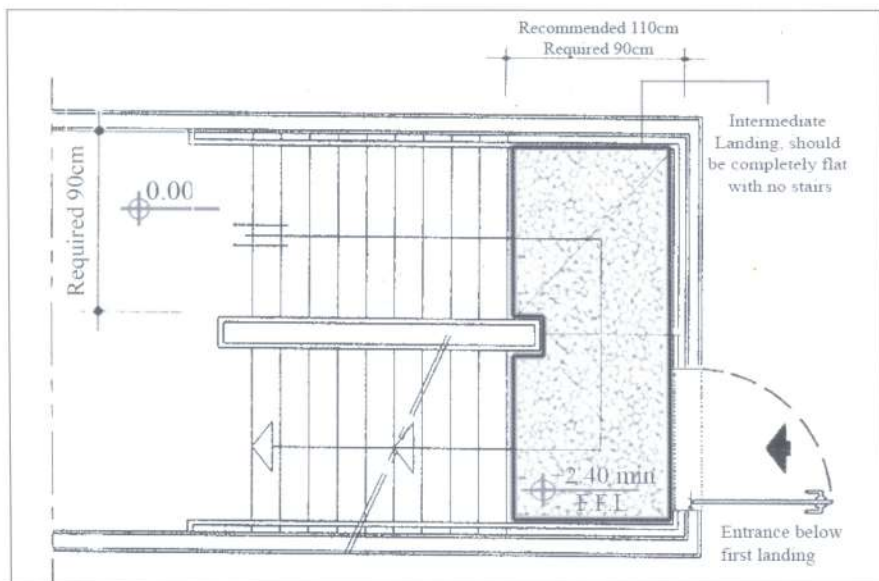
4-STAIRS:

4.1- Treads and risers:

- Within a certain stair flight, all risers should have uniform height; all treads should have uniform width.
- Dimensions apply for internal stairs and public stairs
- Treads' width should not be less than 28cm measured from riser to riser. (not from riser to nosing).
- Risers' heights should not be less than 14.5cm and not more than 17.5cm.

4.2- Flight and Landing:

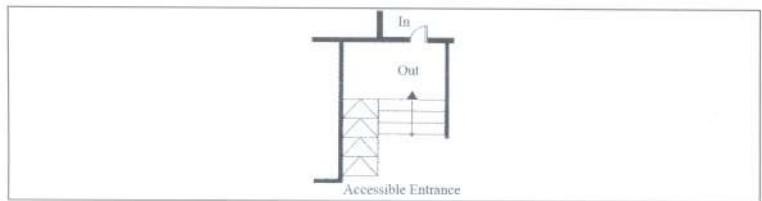
- Maximum number of stairs per flight should not exceed 11 stairs. An intermediate landing should be supplied if the stair covers a height over 250cm.
- The width of the flight should not be less than 90cm.
- Landing should be at least the size of the flight width. Recommended landing length should be 110cm.
- If an entrance should be placed below the first flight, the minimum accessible clearance should not be less than 210cm (floor finish level to ceiling finish level).



5-ENTRANCES

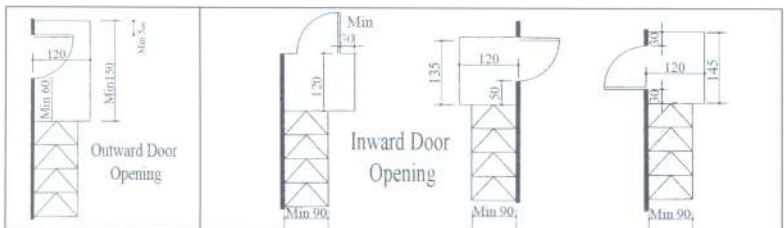
5.1- Notes:

- All public entrances to a building considered accessible should be reachable by persons with disabilities using a wheelchair.
- In a residential building, at least one entrance should be accessible for a person who uses the wheelchair.
- The accessible entrance of a residential building should be the main public entrance to that building.
- In case of lack of space at the main entrance, the building should have a secondary accessible entrance.
- All accessible entrances should be connected to accessible landings.

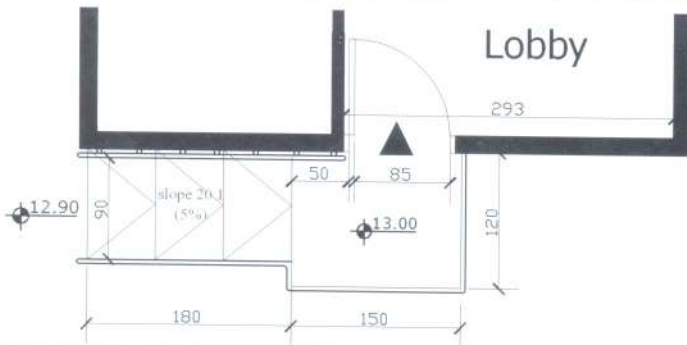


5.2- Landing Space:

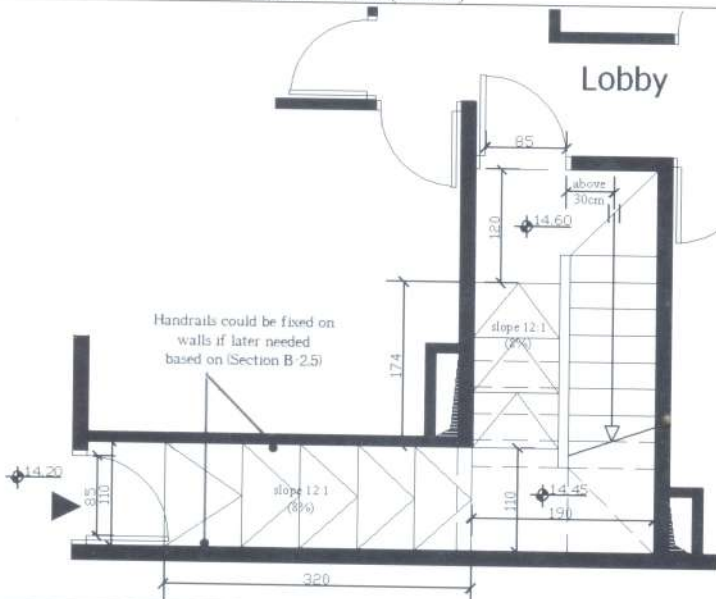
- The landing space should be designed according to the door side opening.
- If the entrance door opens outward, then the landing dimensions should be 150x120cm.
- If the entrance door opens inward, then the landing should be based on the approach type.
- Thresholds should be avoided.
- If necessary threshold height should not exceed 1.5 with a chamfered edge.



5.3-Examples from Naher el Bared camp



ACCESSIBLE ENTRANCE: The landing is totally accessible all standards Have been applied. Note that the net clearance of the ramp is 90cm Without counting the handrails. Design complies with section (A-1.1.2) and section (A-5.2)

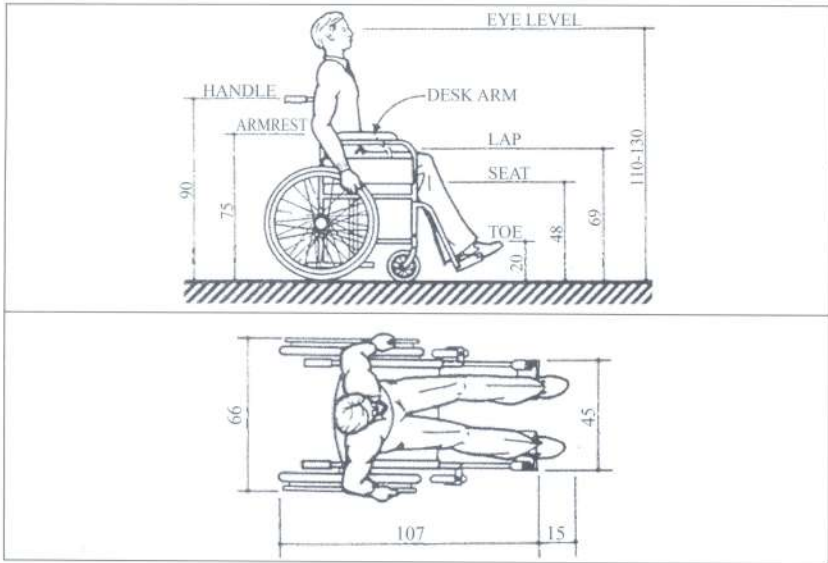


ACCESSIBLE ENTRANCE: The landing is totally accessible, note that the 1st landing has the same width of the slope. Note that the entrance has a frontal approach. Design complies with section (A-1.1.2), section (B-2.4) and section (A-5.2)

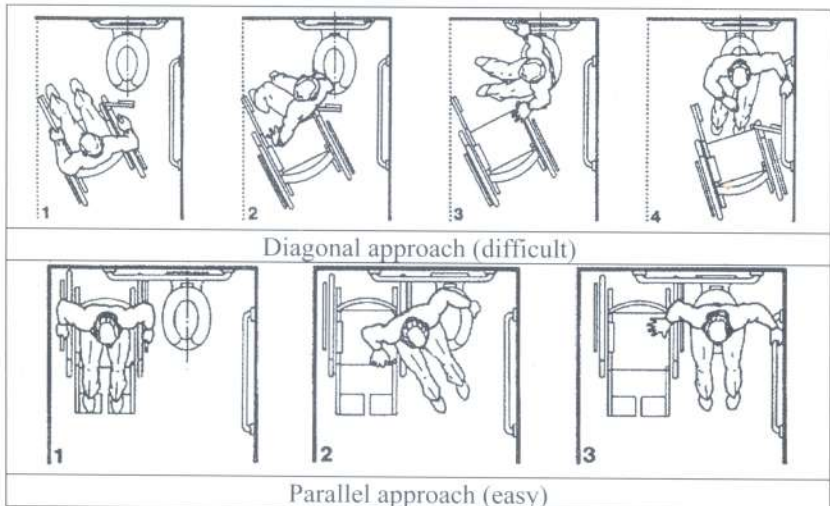
APPENIX A: DATA AND RECOMMENDATIONS

1-Wheelchair Dimensions:

Dimensions of an adult-sized wheelchair are given to correlate with the standards given throughout the guidebook.

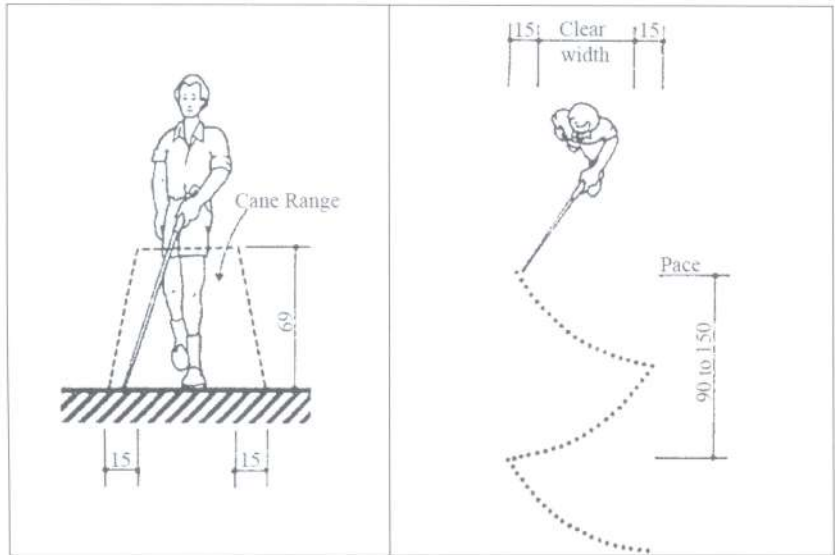


2-Wheelchair Transfer:



3-Cane Techniques:

Understanding how a person with visual impairments uses the cane to walk and circulate, makes it easy for the designer to understand and correlate his design to this technique.



4- Design recommendation for People with Visual Impairments:

In orientation

- Provide guide strips within the pathway surface.
- Provide raised curbs and other detectable guiding elements.
- Provide tactile marking strips to indicate changes in direction and the location of stairs and ramps.

In identifying obstructions within the path of travel

- Provide textured paving or tactile marking strips around obstructions.

In locating exit doors and stairs

- Provide tactile marking around the knobs of exit doors and the handrails of exit stairs.

In maneuvering in elevators and emergency conditions

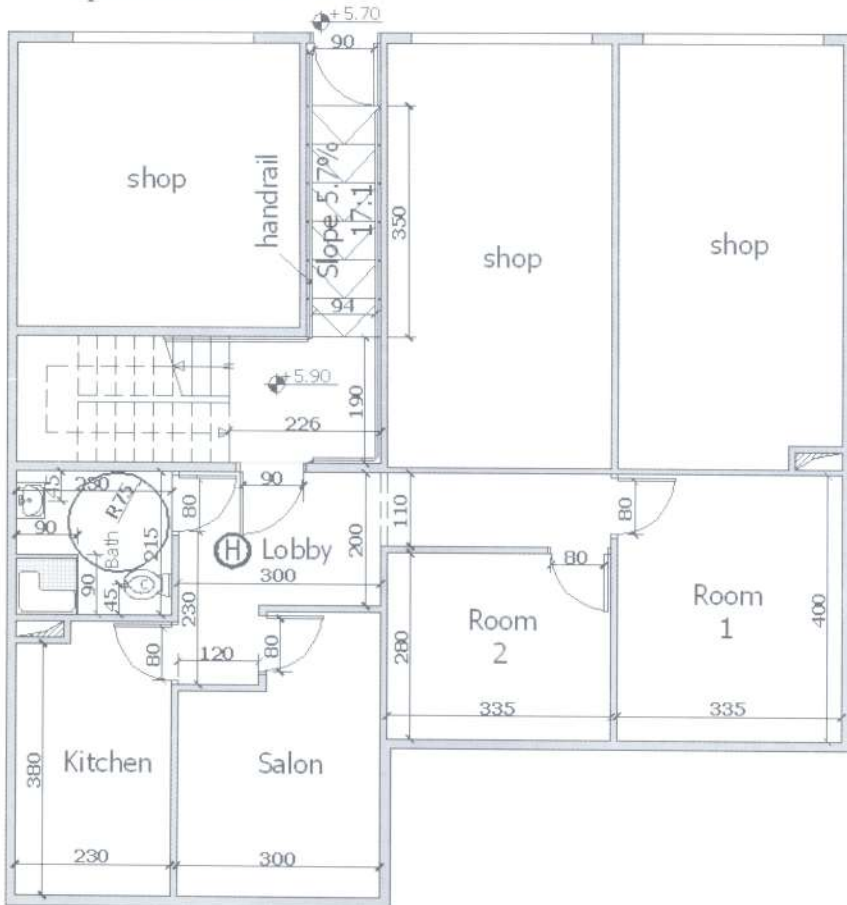
- Provide audible signals and tactile text on call buttons.
- Provide alarm signals.

APPENDIX B: SUPPLEMENT

2-Package Two, Zone N.11 Ground Floor Plan

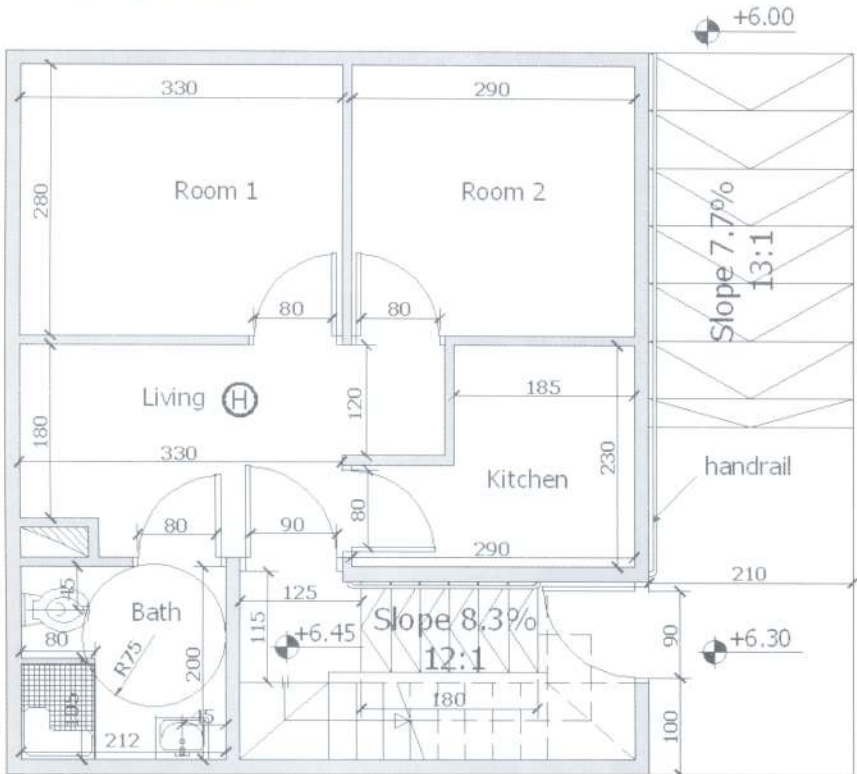


2.1- Apartment #1: N.11.4



- Apartment area 67m² (staircase excluded)
- Exterior Building Door Clearance: 90cm
- Exterior Apartment Door Clearance: 90cm
- Interior Doors Clearance: 80cm
- Level difference: 20cm
- Slope Steepness: 5.7% around 17:1
- Handrail Available
- External Lobby Dimensions: 190x226cm
- Bathroom Dimensions: 230x215cm (all standards applied)
- Internal Lobby Width Between Kitchen and Salon: 120cm
- Corridor Width: 110cm

2.2- Apartment #2: N.11.19



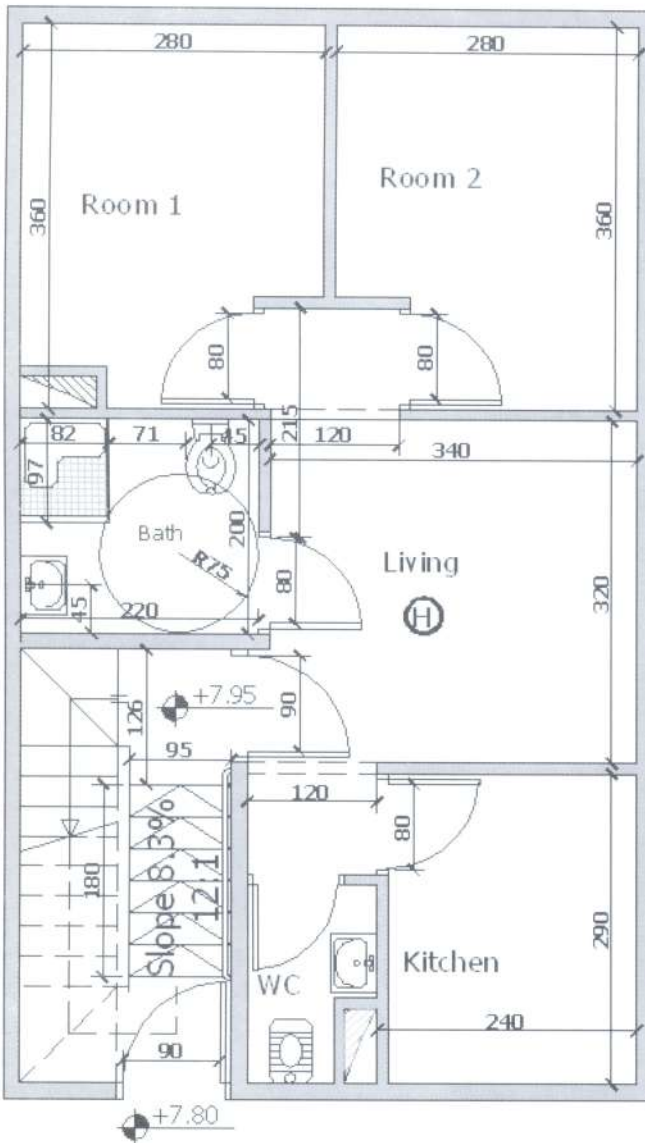
- Apartment area 41m² (staircase excluded)
- Exterior Building Door Clearance: 90cm
- Exterior Apartment Door Clearance: 90cm
- Interior Doors Clearance: 80cm
- Level difference: 15cm
- Slope Steepness: 8.3% around 12:1
- Handrail Available
- External Lobby Dimensions: 115x125cm
- Bathroom Dimensions: 212x200cm (all standards applied)
- Internal Lobby Width Between Room and Living: 120cm
- Ramp Slope to Building Access: 7.7%

2.3- Apartment #3: N.11.21



- Apartment area 43m² (staircase excluded)
- Exterior Building Door Clearance: 90cm
- Exterior Apartment Door Clearance: 90cm
- Interior Doors Clearance: 80cm
- Level difference: 15cm
- Slope Steepness: 8.3% around 12:1
- Handrail Available
- External Lobby Dimensions: 105x127cm
- Bathroom Dimensions: 170x197cm (all standards applied)
- Internal Lobby 140x270cm.

2.4- Apartment #4: N.11.17



Apartment area
53m² (staircase
excluded)

Exterior Building
Door Clearance:
90cm

Exterior
Apartment Door
Clearance: 90cm

Interior Doors
Clearance: 80cm

Level difference:
15cm

Slope Steepness:
8.3% around 12:1

Handrail
Available

External Lobby
Dimensions:
95x126cm

Bathroom
Dimensions:
220x200cm (all
standards applied)

3- Package Two, Zone N.7 Ground Floor Plan

