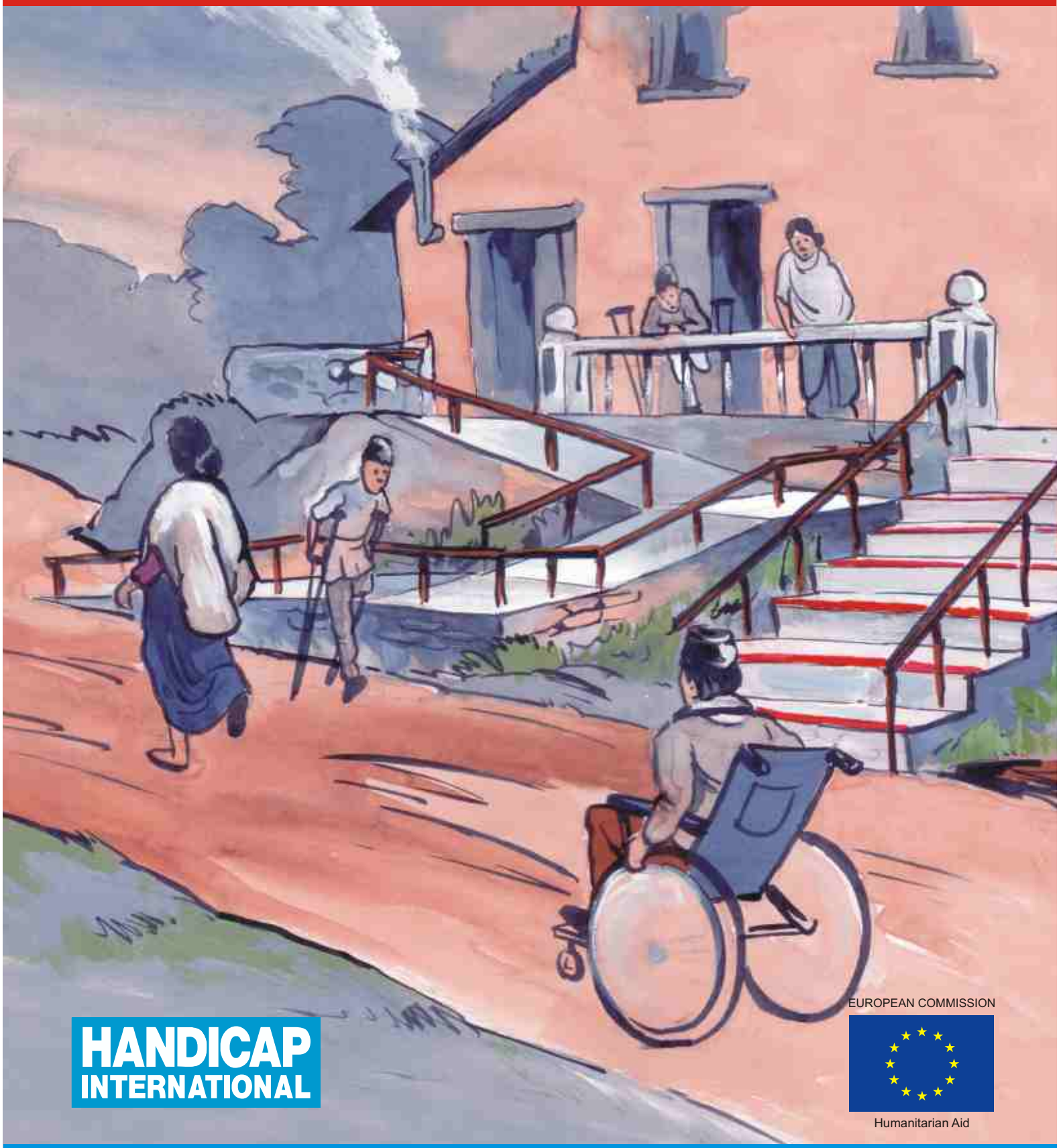
Guidelines for Creating Barrier-free Emergency Shelters



HANDICAP INTERNATIONAL

EUROPEAN COMMISSION

Humanitarian Aid

By Handicap International-Nepal Programme,
with financial support from the European Commission, Humanitarian Aid Directorate.

Publication funded by the European Commission Directorate General for Humanitarian Aid (ECHO) under 4th DIPECHO South Asia Action Plan. The content of this publication is the sole responsibility of Handicap International and can in no way be taken to reflect the views of the European Commission.

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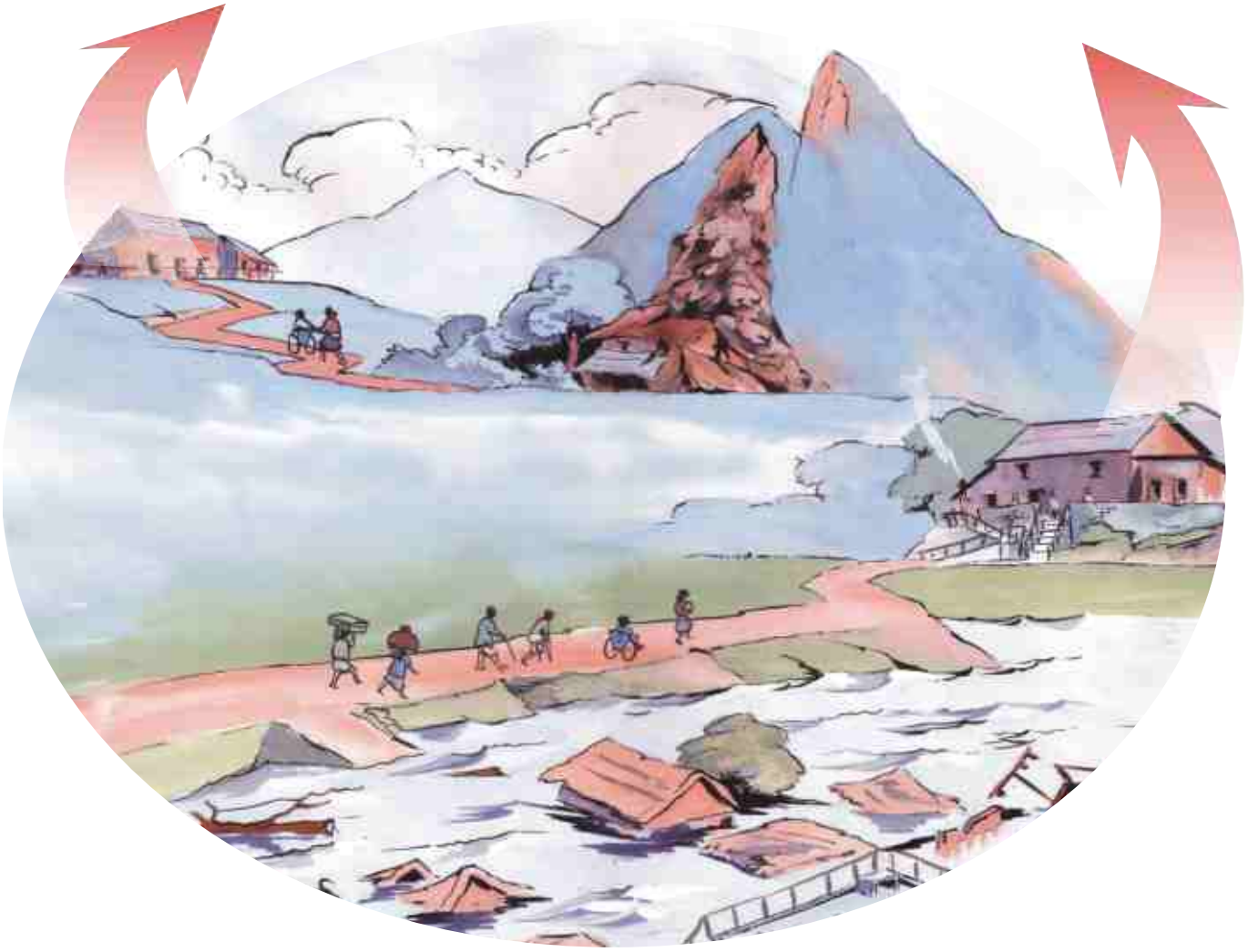

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Published in : February 2009

Published by : Handicap International Nepal
Disaster Preparedness and Disability Project
Narayan Gopal Chowk – Sallaghari
P.O. Box : 10179, Kathmandu, Nepal
Phone : +977 (1) 4378482 / 4374609
Fax : +977 (1) 4376983
Email : hinepal@hi-nepal.org
Website : www.handicap-international.org

Prepared by : Michael Curtin with the "Disaster Preparedness and Disability" Project Team, Handicap International-Nepal program.

Design, Graphics & Print Production : The Creative Hands

Introduction

A barrier-free environment allows the free and safe movement of all people regardless of age, gender and ability. A barrier-free environment does not just refer to making a building accessible with a ramp. It includes making the whole area, including buildings, pathways, transport, services and facilities, easily accessible by all people.

Making an environment barrier-free does not only entail making changes to the built environment, but also involves a change of attitude by community members so that they accept that all people have a right to move about freely. This means that persons with disabilities should feel welcomed by all members of the community.

An environment that is barrier-free supports the dignity and independence of all people. This type of environment does not only benefit people with disabilities, it is beneficial for many other people, such as children, pregnant women, people carrying heavy objects, elderly people, anyone who may have a medical condition (e.g. a heart problem) or who might be overweight, or anyone who is temporarily impaired (e.g. broken leg). It is for this reason that it is important that all emergency shelters are built in a barrier-free way.

Purpose of these guidelines

These Guidelines have been developed as part of the DIPECHO funded project,"Mainstreaming disability and people with disabilities into disaster management in Nepal" implemented by Handicap International. Their purpose is to provide guidance on the design and building of barrier-free emergency shelters that may be used by all people within a community following a natural disaster, such as a flood or landslide. These Guidelines do not provide detailed technical specification (that might be found in other reference manuals, see "resources" chapter below, page 17) rather they provide essential information on, and examples of, aspects to be considered when designing and building barrier-free emergency shelters.

These guidelines are to be used when designing and building permanent emergency shelters in areas of Nepal that experience regular natural disasters.

- Emergency shelters in flood-prone areas need to be built on raised land above the known area of flood dispersion. In addition, this type of emergency shelter needs to be built off the ground to ensure that it is above the flood

Emergency shelters in flood-prone area

- Emergency shelters do not always need to be built off the ground, particularly if the area is not affected by flood, such as hill and mountain regions.

Emergency shelter in hill or mountain area

Emergency shelters may only be required for a small part of each year due to the nature of disasters. Hence, an emergency shelter can also be used for other purposes throughout the year, such as a school building or a health centre or a meeting place for various community committees. Rather than build a new building, it may be possible to adapt an existing building, such as a school, to make it barrier-free and suitable to use as an emergency shelter.

General requirements for barrier-free environment

It is very common to only think of designing a barrier-free environment for people with physical impairments. Often it is thought that constructing a ramp is all that is required to solve access problems. While it is true that people with physical impairments do have access issues and a ramp can contribute to better access, it must be remembered that barrier-free environments need to be designed for all people, including those with visual, hearing, speech, mental and intellectual impairments.

In this section of the Guidelines general information is given to assist with the design of barrier-free environments that will accommodate people with different impairments. This information should be considered when applying the more specific information provided later in the Guidelines.

People with vision impairment

Ensuring that people with severe vision impairment can move around the emergency shelter easily will be beneficial to many other people who may have moderately impaired vision, such as older people who may have deteriorating vision or people who wear glasses. Ensuring a barrier-free emergency shelter for people with vision impairment might include:

- Marking the front edge of steps with a contrasting strip so that they can be easily identified.
- Ensuring that all areas are well lit.
- Ensuring that all signage is clear, in large letters and at eye level, preferably with raised letters which can be felt.
- Ensuring all pathways and commonly used areas are clear of any objects or debris.

People with hearing and/or speech impairments

Although people with hearing and/or speech impairment do not necessarily have mobility difficulties,

moving around the emergency shelter can present them with problems. For example, a person with hearing impairment may not hear auditory early warning signals or any public announcements that might be relevant to his safety; a person with speech impairment might have difficulty communicating what she needs and asking for other relevant information. Ensuring a barrier-free emergency shelter for people with hearing and/or speech impairments might include:

- Clear and visible signs identifying the location of facilities.
- Provision of written information.
- Good glare-free lighting to aid lip-reading and also the visibility of signs and written communication.
- Alternative methods of communicating, such as a paper and pencil, so that a person with speech impairment can write questions down.

People with intellectual or mental health impairments

People with intellectual and mental impairment can sometimes find unfamiliar environments, such as an emergency shelter, confusing. If the emergency shelter is cluttered, noisy and the signage is unclear or non-existent they may feel intimidated and may feel excluded from what is happening. Ensuring a barrier-free emergency shelter for people with intellectual or mental health impairments might include:

- Taking steps to reduce overall noise levels or creating some quiet spaces that are uncluttered and calm.
- Providing clear and frequent signage to direct people around the environment to decrease the need for assistance.

People using a wheelchair or hand-propelled tricycle, crutches, walking sticks or who have difficulty walking

Not all people with mobility impairment use a wheelchair or hand-propelled tricycle. Some use a walking stick or crutches or move about slowly. If an emergency shelter has full wheelchair or hand-propelled tricycle access it will usually cater for people with other mobility difficulties. Ensuring barrier-free emergency shelter for people with mobility issues might include:

- Making sure ramps and verandas are wide enough to allow a wheelchair or hand-propelled tricycle to move around.
- Placing things such as wash basins, tables, benches, and other facilities so that they can be reached from a sitting position and have sufficient space under them so a chair can be wheeled right up to them.
- Locating toilets and washing facilities so that they are accessible both in terms of location and design.
- Securely fixing handrails to assist with walking up and down slopes and steps/stairs.
- Making seats/benches available so that people with mobility impairments can rest.

People who have difficulty using their arms and hands

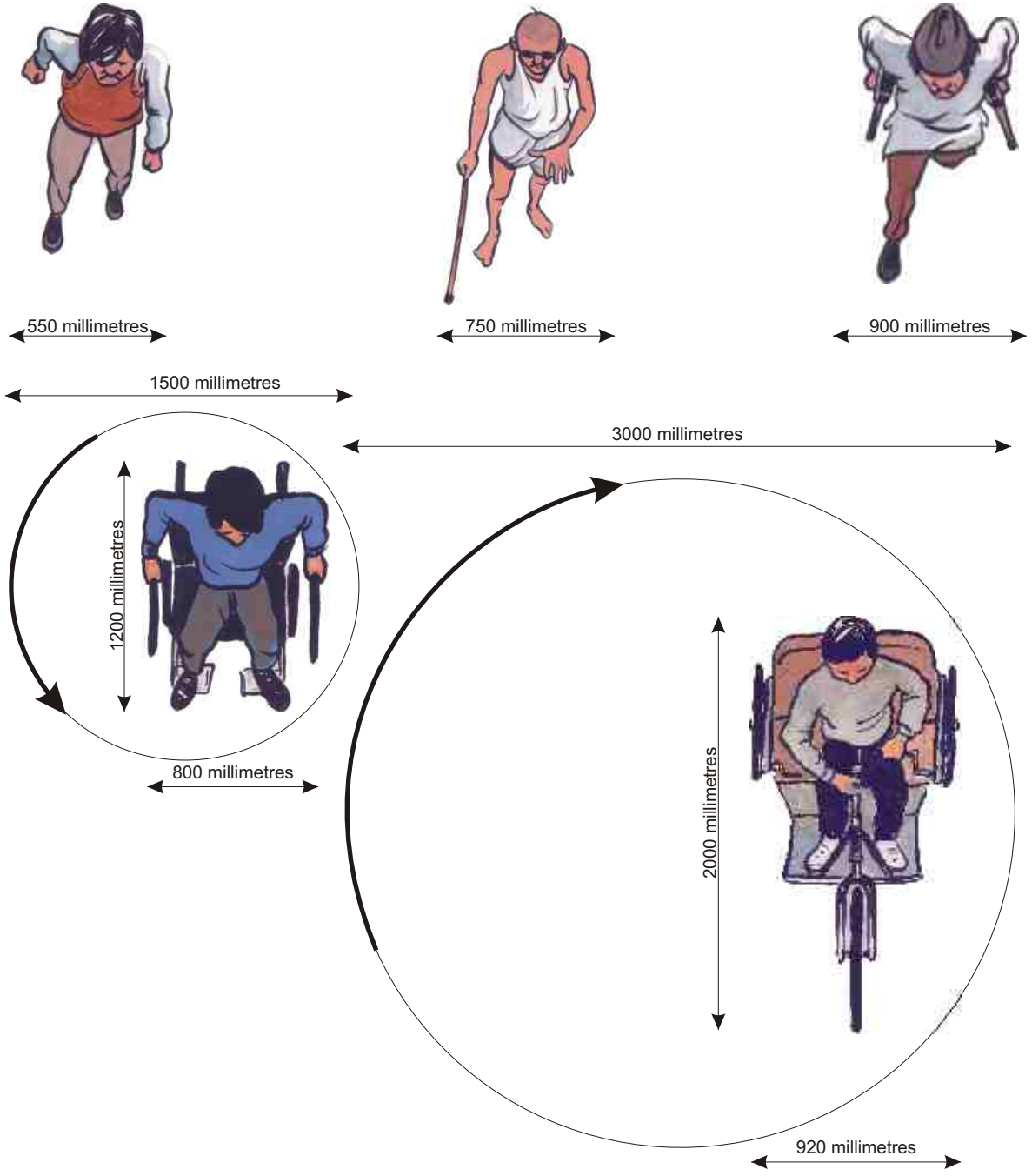
People who have difficulty using their arms and hands may have problems holding and/or moving things, opening a door, turning a tap, or using a water pump. Creating a barrier-free emergency shelter for people who have difficulty using their arms and hands, might include:

- Using levers rather than knobs for door handles, taps.
- Extending the length of the pump-handle on water pumps to make the pump action easier.
- Considering the placement of handrails so that they can be easily grasped or leant on by a person with minimal use of their hands.

Space considerations

When creating a barrier-free environment it is important to consider the size of people with the equipment that they will be using, such as wheelchairs, crutches etc. This is because when the size of these things is considered then it is possible to decide on things such as the width of the ramps and doorways, the height of benches and toilets, the placement of cupboards etc.

The size differences can be illustrated by looking at the difference in size of a person not using any equipment, a person using a cane, a person using crutches, a person using a wheelchair, and a person using a hand-propelled tricycle.



It is easier to design emergency shelters to accommodate a hand-propelled tricycle as these are the largest mobility aids and are more commonly used in villages in Nepal than wheelchairs. However, this will make aspects of the emergency shelter quite big. For example, ramp widths, turning landings and doorways will have to be wide enough to fit a hand-propelled tricycle.

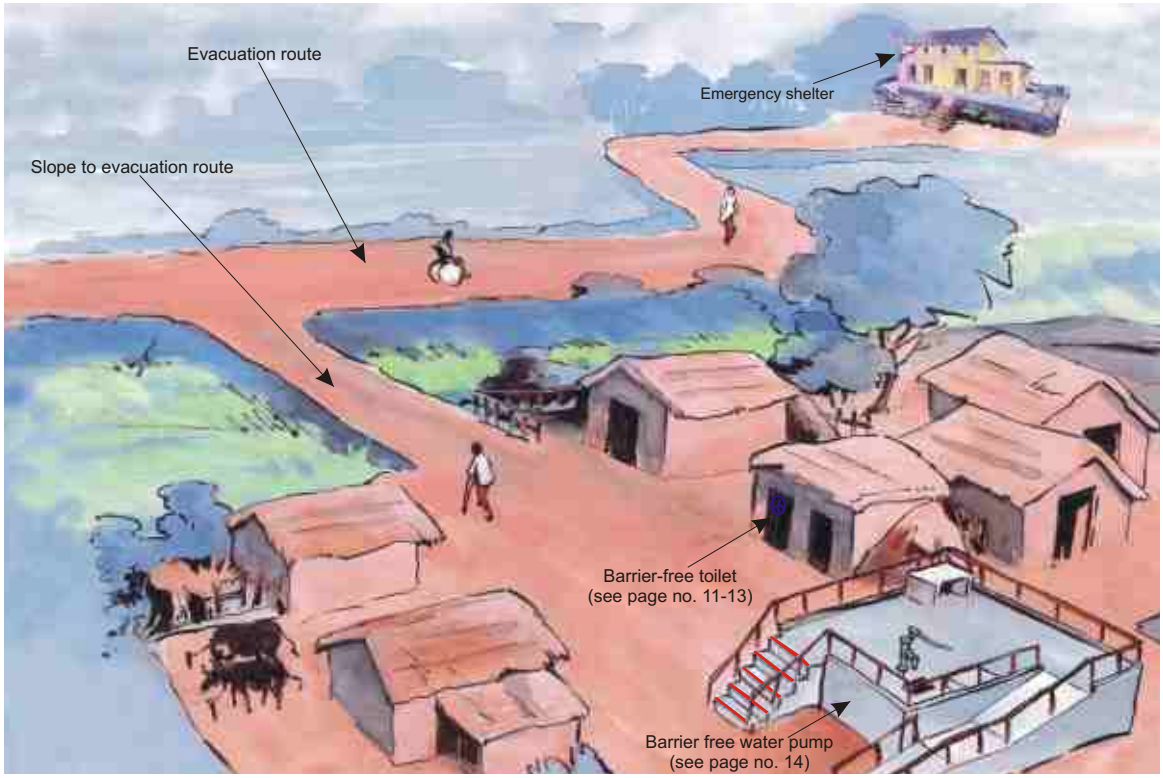
An alternative would be to design the ramp and veranda to be suitable for a hand-propelled tricycle. Then the hand-propelled tricycle could be stored on the veranda and the person using this transfer onto a wheelchair to be used to moved about the rooms of the emergency shelter.

In these Guidelines, measurements for ramps and verandas are given to accommodate a wheelchair and a hand-propelled tricycle. All other measurements such as doorway widths, are given to accommodate a standard sized wheelchair.

Consideration also needs to be given to the size and number of rooms in an emergency shelter. This should be based on the number of people that the shelter needs to cater for in the case of a natural disaster. It should also be based on what the building will be used for throughout the year.

Note: The illustrations in this book are not to scale. They are only examples of possible options. When designing a barrier-free emergency shelter, detailed plans need to be drawn up and the principles and measurements provided in these Guidelines applied.

Evacuation routes



Barrier free water pumps, toilets, facilities applicable not only in shelters but within community environment and infrastructure.

- Evacuation routes should be smooth, firm, stable and made of material that will not wear away or deteriorate.

- The width of the evacuation route should be a minimum of 2500 mm wide to accommodate different types of non-vehicular traffic. This will allow enough space for people to walk beside or to pass a hand-propelled tricycle.

- It may be necessary due to the terrain of the land or the placement of buildings, to make evacuation routes narrower. If this is the case it should not be narrower than 1200 mm wide. Wider passing places will need to be built every 20 metres if the narrower pathway extends a long way, to allow space for people to pass.

- There should not be any obstacles or hazards in the path of travel that either prevent mobility or create danger. Protruding objects, such as tree branches, wires and ropes, should be contained if they pose a risk to the people traveling past who may not see them.

- Obstacles or potentially dangerous areas should be fenced off and clearly marked in bright, clear colours.

- Where an evacuation route rises it will be necessary to build slopes to make it easier for people, especially those people using a wheelchair or hand-propelled tricycle, to continue using the evacuation route.

- The width of a slope should the same as the evacuation route.

- When building a slope the least possible gradient shall be used for the route:

  - The ideal gradient for a slope will be 1:20. This means for every 20 horizontal units the path would rise up one unit. If the 1:20 slope is relatively straight and continues for a long way a level landing for resting will be required every 10 metres.

  - The maximum gradient of the slope should not exceed 1:15. This means for every 15 horizontal units the path would rise up one unit. If the 1:15 slope is relatively straight and continues for a long way a level landing for resting will be required every 5 metres .

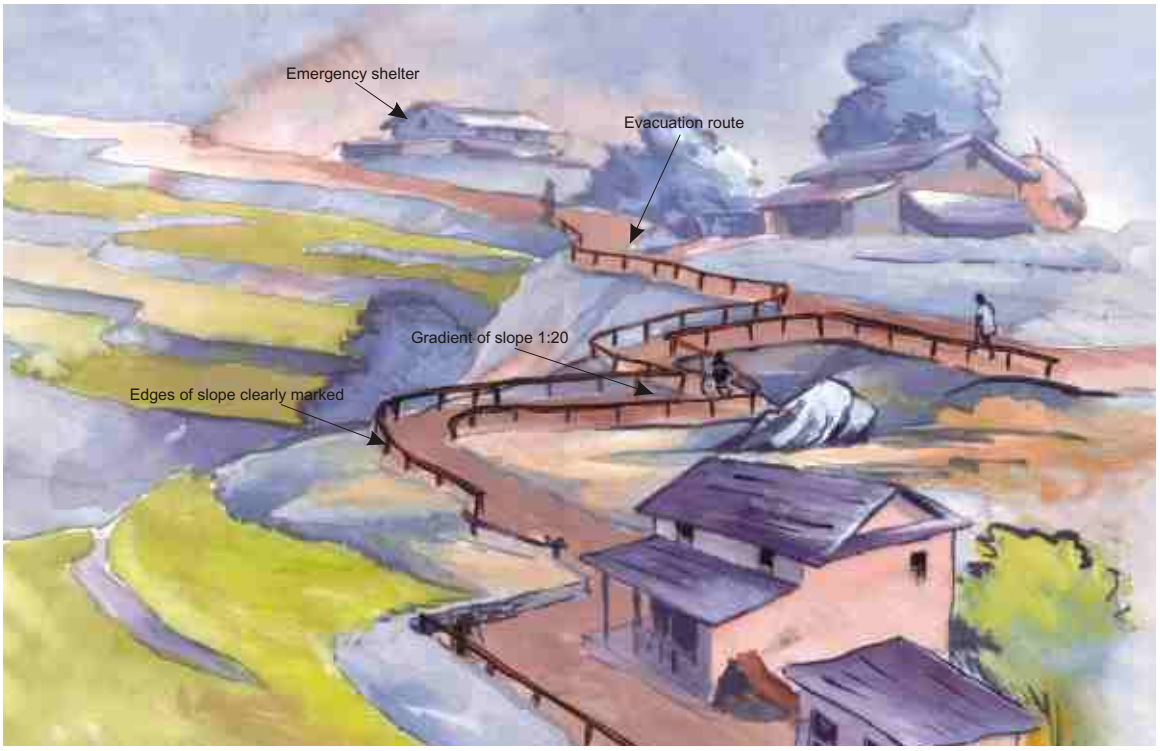
  - A landing will be at least as wide as the route and will be a minimum of 2500 millimetres in length to accommodate the length of a hand-propelled tricycle.

  - The edges of the slope should be clearly marked by raised ledges or if the sides are steep by fences or railings. This will make it safer for all people to use.

- If the rise in the land is not great (e.g. up the side of a raised road) then it may be possible just to build a straight slope – remember to build in level platforms every 5 to 10 metres depending on the gradient.

Straight slope to evacuation route

- If the rise in the land is great (e.g. up a hill side) then it might be more effective to build a slope that zig-zags back and forth – remember to build a level platform every time the slope changes direction.

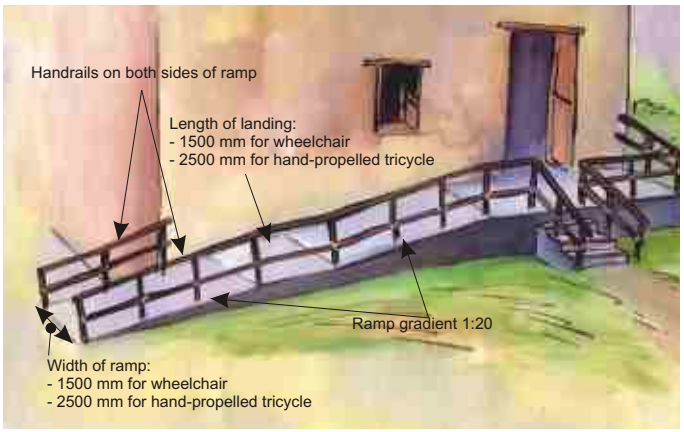


Zigzag slope up a hill

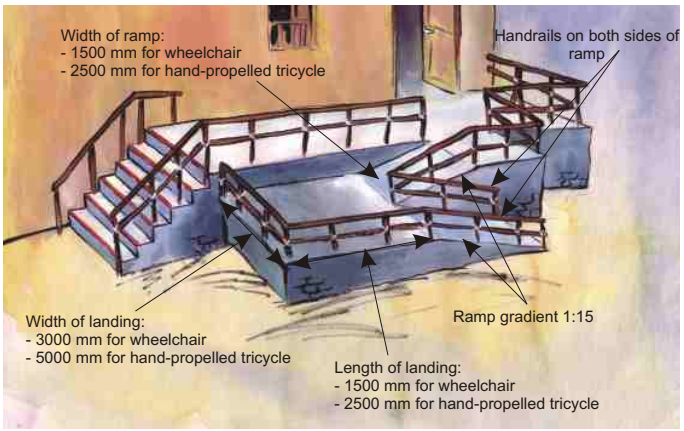
Ramps

- It will be necessary to build a ramp to provide access to verandas of buildings as verandas are usually raised.
- Ramps should be smooth, firm, stable and made of material that will not wear away or deteriorate.
- The width of a ramp should be 1500 millimetres to 2500 millimetres depending on whether it is to accommodate a wheelchair on the wide hand-propelled tricycle.
- When building a ramp the least possible gradient shall be used:
  - The ideal gradient for a ramp will be 1:20. This means for every 20 horizontal units the ramp would rise up one unit. If the 1:20 ramp is relatively straight and continues for a long way a level landing for resting will be required every 10 metres .
  - The maximum gradient of the ramp should not exceed 1:15. This means for every 15 horizontal units the path would rise up one unit. If the 1:15 slope is relatively straight and continues for a long way a level landing for resting will be required every 5 metres.
  - Landings are required as rest areas and in places where the ramp changes direction. Landings will be at least as wide as the ramp and will be 1500 millimetres in length to accommodate a wheelchair or 2500 millimetres in length to accommodate hand-propelled tricycle.

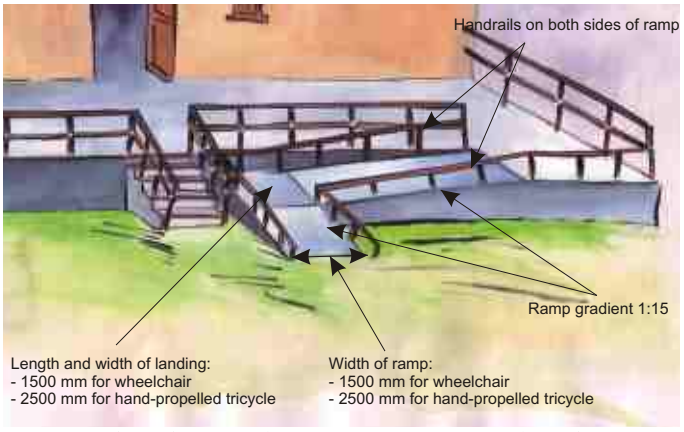
- All ramps should have handrails on both sides.
- There are different styles of the ramps depending on the space available and the height of the rise:



A straight ramp may be appropriate where there is a lot of space and/or the ramp is going up a small rise.



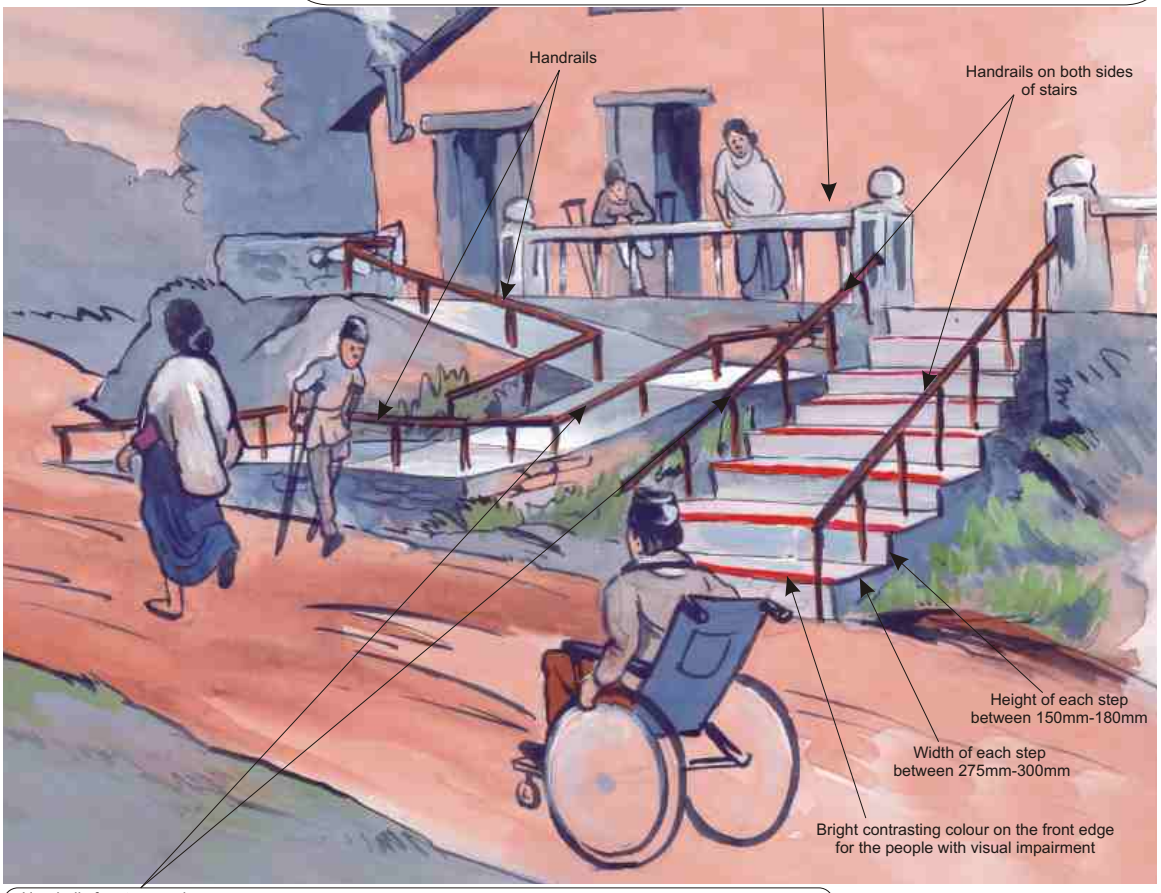
A switchback ramp is appropriate when trying to save space and/or when the rise is higher



A ramp that changes direction to accommodate the space around a building.

Steps, handrails, verandas and doorways

Veranda:
- should be level, smooth and made of material that will not wear away or deteriorate, that is stable, firm and not slippery.
- should have railings or a wall along the edges for safety.
- the width of the veranda should be 2500 millimetres wide to allow enough space for a hand-propelled tricycle.
- doorway entrances from the veranda should be level with the veranda – there should be no step from the veranda into any rooms.



Handrails for steps and ramps:
- should be round for better grip with diameter between 35mm - 45mm
- top hand rail should be between 860mm - 920mm above step or ramp surface.
- a second hand rail can be placed at between 700mm - 750mm above step or ramp surface.
- the ends of the handrails should extend for at least 300mm beyond the bottom and top of the ramp or stairs.
- should be painted in the contrasting colour to the surroundings for the people with visual impairment.

Doorways should have a minimum clear width of 900 millimeters to`allow unrestricted access for wheelchair users and those using an assistant.

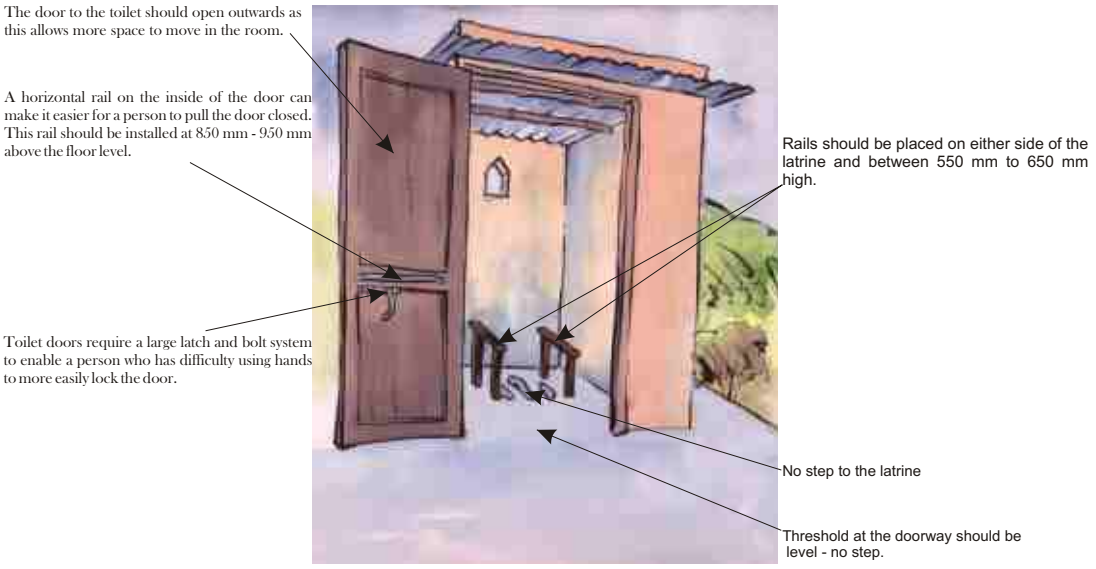
Lever door handles are recommended as these are easier to use for a person with reduced strength and hand use. Handles should be installed at 800 to1000 millimeters above the floor level.

The use of colour to distinguish doors from surrounding walls is very useful for people with visual impairments.

Threshold of the doorway should be level - no step.

Toilets

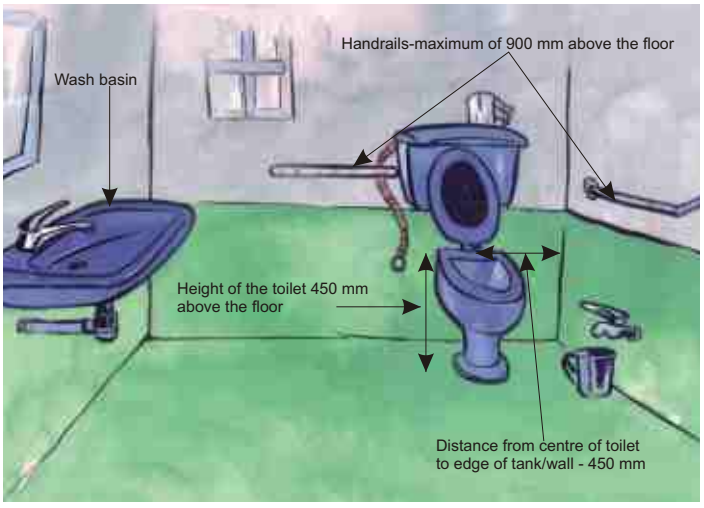
- Many people will prefer to use an Asian-style latrine but may have difficulty squatting down and standing up again. They may find it easier to do this if rails were placed on either side of the latrine. The height of these rails should be between 550 to 650 millimetres. There should be no steps into these toilets and no steps up to the latrine. The size of the room to accommodate this style of toilet would be the standard size for these facilities in Nepal.



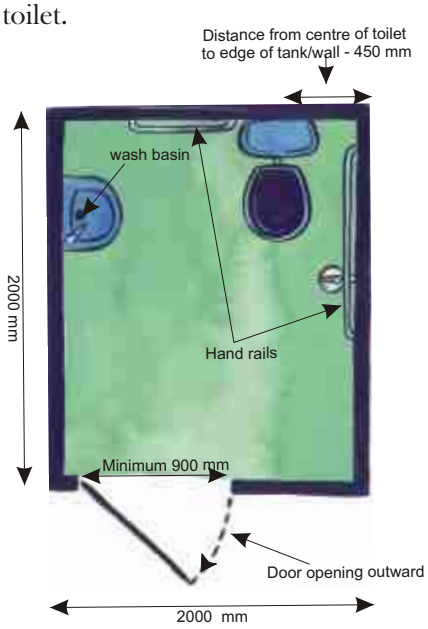
Asian-style latrine with rail

- At least one toilet accessible for persons with disabilities should be provided. This should be a Western- style toilet if water and plumbing is available for flushing or adapted form of the Western-style toilet where flushing is not possible. With the adapted form of Western-style toilet, the plumbing would be the same as the Asian style latrine shown in the illustration above.

If flushing water is available it will be possible to use a Western-style toilet.

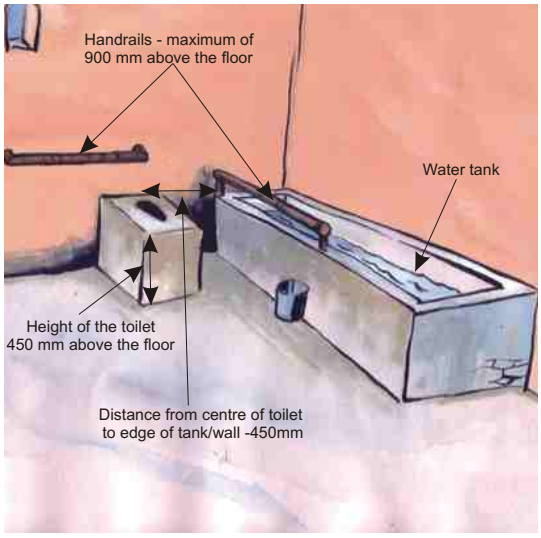


Western-style toilet front view

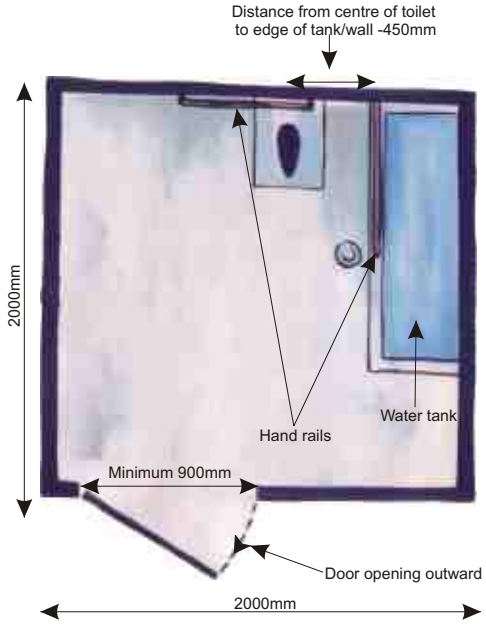


Western-style toilet aerial view

If flushing is not possible, it will be appropriate to use an adapted form of the Western-style toilet.

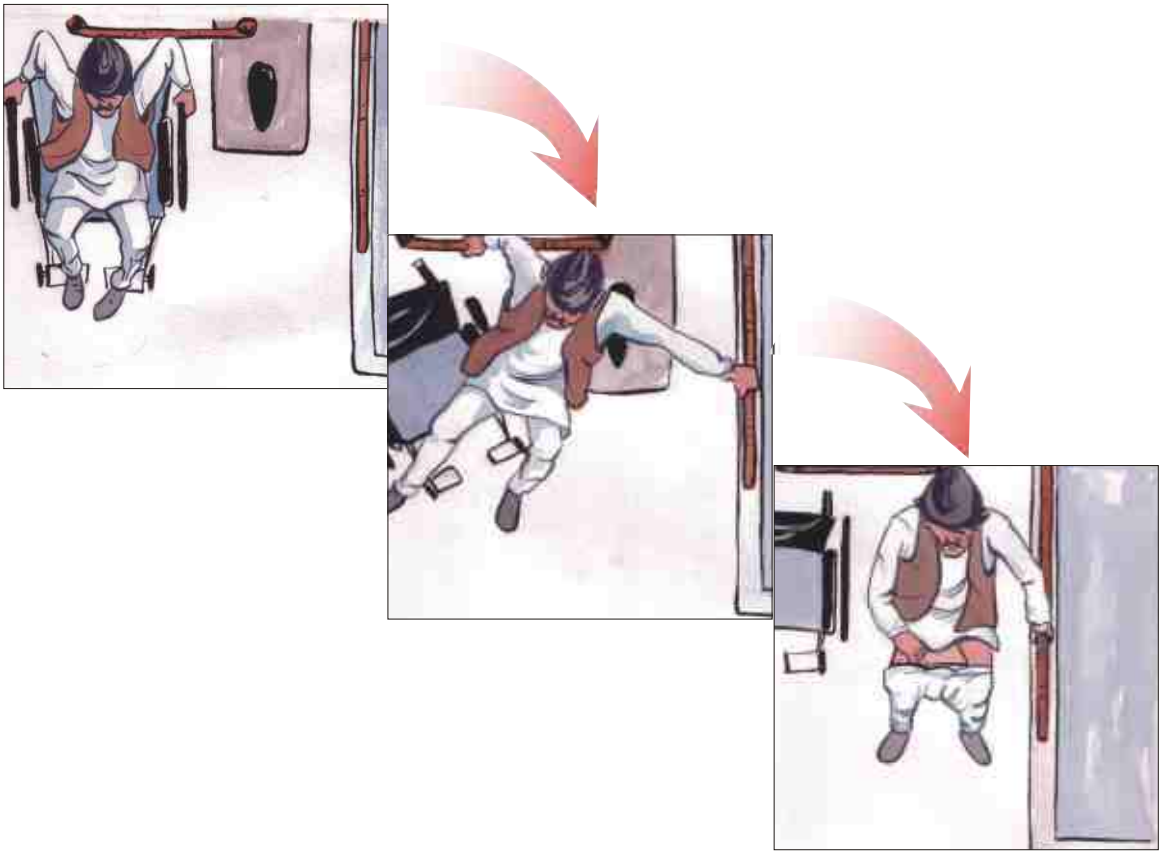


Adapted form of Western-style toilet (front view)



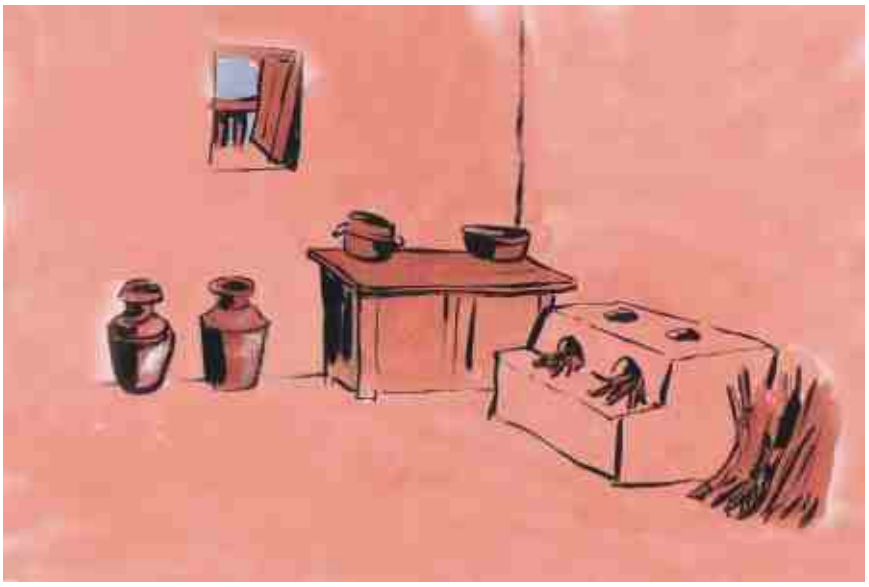
Adapted form of Western-style toilet (aerial view)

- When using a wheelchair one way to transfer onto a toilet is from the side, as shown in the illustrations below:



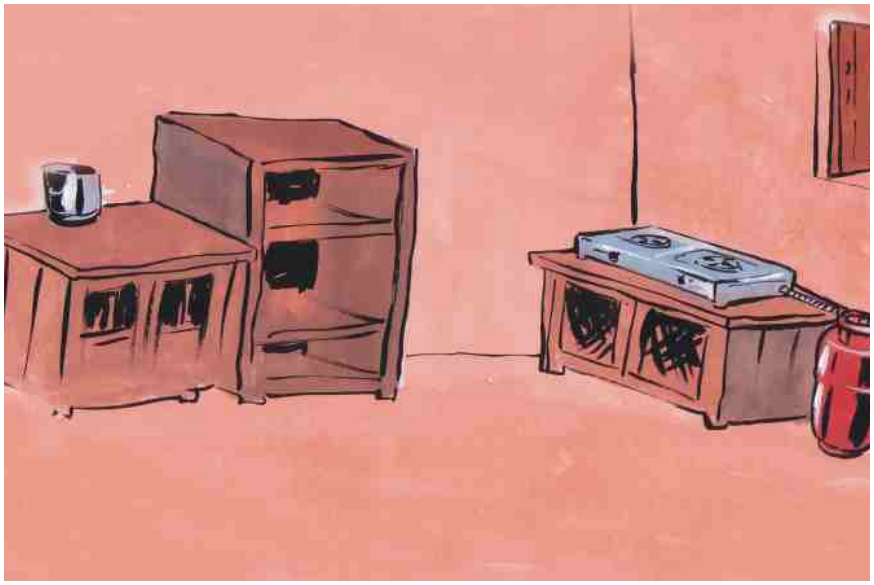
Cooking

- Within the emergency shelter there should be space allocated for cooking. It is easier for many people, including people with a disability to cook while standing or sitting, compared to cooking on the ground. Hence cooking facilities should be raised off the ground.



Raised mud-ovens can be ideal in an emergency shelter as long as a supply of wood is available

It is common in villages in Nepal to use mud ovens for cooking. This type of cooking facility can be ideal in an emergency shelter if it is built off the ground and a supply of wood is available.

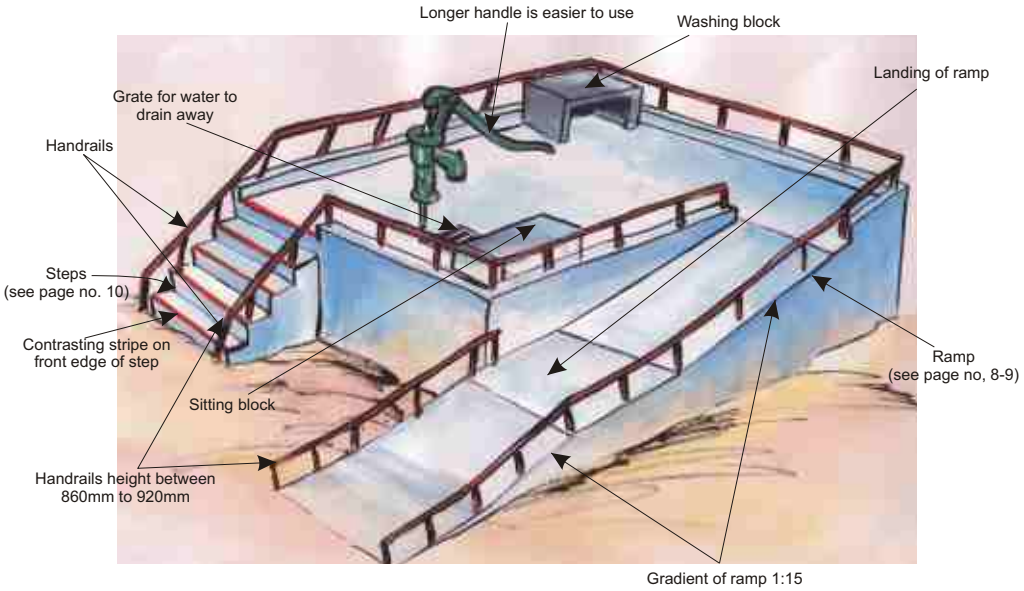


Gas stoves, if available, need to be placed on a table to ensure it is high enough to people to easily use

It may also be possible in some villages to have a gas stove. This will need to be placed on a table to ensure it is high enough for people to easily use.

Waterpumps

- In flood affected areas water pumps should be raised off the ground to protect the water source from being contaminated by the flood waters. This will mean that steps and ramps will be required so that all people can use the water pump.



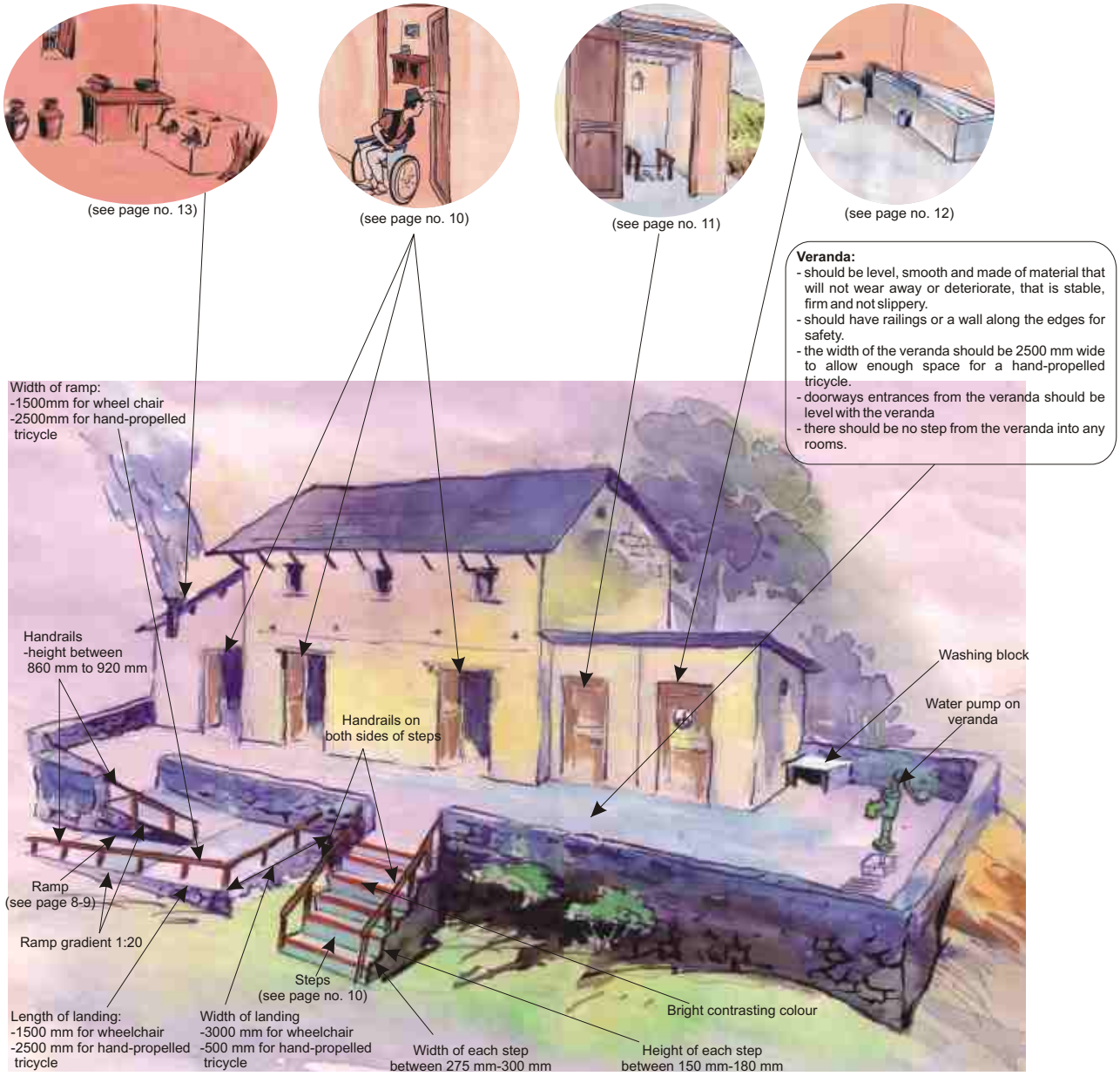
- In areas not affected by flood it is also important to build water pumps that can be accessed by all people. This may mean installing a low ramp and removing the lip from one side of the water pump apron.

- In emergency shelters, it will be easier for all people if a water pump is installed on the veranda. This can be placed near the cooking area and/or near the toilet area.

- If water pump is placed near the toilet area, it must not be near the soak-away and septic tank. Sphere guidelines (see Resources on page 17) recommend that the soak-away and septic tank is at least 30 metres from the groundwater source and bottom of any latrine is 1500 millimetres above the water table.

Emergency shelter in flood-prone area

Emergency shelters in flood-prone areas need to be built on raised land above the known area of flood dispersion. In addition, this type of emergency shelter needs to be built off the ground to ensure that it is above the flood level. Guidelines for ramps, steps, handrails, verandas, doorways, toilet, cooking and water pumps are given earlier in this book.

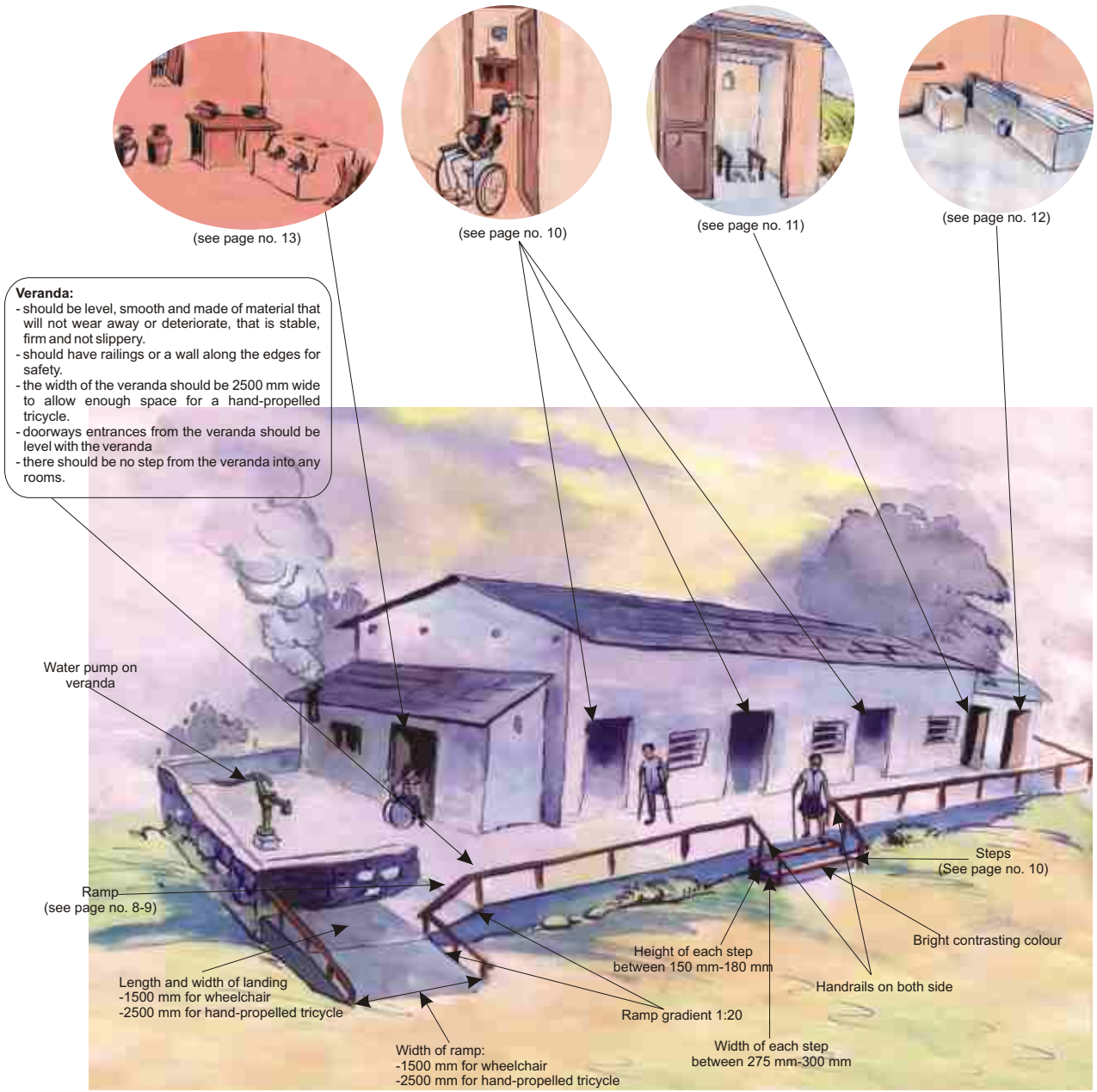


Example of emergency shelter in flood-prone area

Emergency shelters can be used for other purposes throughout the year, such as a school community, health centre or a meeting place for various committees. Rather than build a new building it may be possible to adapt an existing building, such as a school, to make it barrier free and suitable to use as an emergency shelter.

Emergency shelter in hill or mountain area

Emergency shelters in hill and mountain areas (i.e. not effected by floods) need to be built in safe locations. These shelters do not need to be built off the ground, particularly if the area is not affected by floods. Guidelines for ramps, steps, handrails, verandas, doorways, toilet, cooking and water pumps are given earlier in this book.



Example of emergency shelter in hill and mountain areas

Emergency shelters can be used for other purposes throughout the year, such as a school community, health centre or a meeting place for various committees. Rather than build a new building it may be possible to adapt an existing building, such as a school, to make it barrier free and suitable to use as an emergency shelter.

Resources

Canadian Human Rights Commission (2006) *International best practices in universal design: A global review.* Ottawa: Canadian Human Rights Commission.

Center for Universal Design
College of Design
North Carolina State University
Campus Box 8613
Raleigh, NC 27695-8613
United States of America
Web address: http://www.design.ncsu.edu/cud/index.htme

Handicap International (2008) *Introduction to accessibility: Resource Kit (Version 2, September 2008).* Lyon: Handicap International.
Web address: http://www.handicap-international.org

Jones, Hazel, and Reed, Bob (2005) *Water and Sanitation for Disable People and Other Vulnerable Groups: Designing Services to Improve Accessibility.* Leicester: Water, Engineering and Development Centre, Loughborough University.
Web address: http://wedc.lboro.ac.uk/

The Sphere Project (2004) *Humanitarian Charter and Minimum Standards in Disaster Response.* Geneva: The Sphere Project.
Web address: http://www.sphereproject.org

United Nations (2006) *Convention of the Rights of Persons with Disabilities.* New York: United Nations Department of Economic and Social Affairs
Web address: http://www.un.org/disabilities/default.asp?navid=12&pid=150

UNNATI Team (2004) *Design manual for a barrier-free built environment.* Ahmedabad: UNNATI Organization for Development Education. Web address: http://www.unnati.org/index.html

These guidelines have been developed as part of the DIPECHO-funded project for "Mainistreaming Disability-people with disabilities into disaster management in Nepal."

Humanitarian values and goal

The "Disaster Preparedness and Disability" project's central goal is that the prepareness and response to natural disasters are designed, developed and implemented for and with people with disabilities, while Mainstreaming Disability into Disaster Risk Reduction as a cross-cutting issue. Therefore, the project ensures that partners and stakeholders recognize and meet the particular needs and value the specific assets before, during and after disasters.

Ultimately, considering people living with disabilities as human beings with the same rights and needs and with specific capacities and assets will create an environment conducive to disability-inclusive Disaster Risk Reduction, without discrimination and with full dignity for all.