



Learning From Experience:
Guidelines for locally sourced and
cost-effective strategies to modify existing
household toilets and
water access

Background to this Learning Resource

These guidelines are the result of a partnership between World Vision Australia and CBM Australia that aims to improve inclusion of people with disabilities in World Vision's Water, Hygiene and Sanitation (WASH) initiatives, including in Sri Lanka. They are based on experiences and observations from World Vision's implementation of the Rural Integrated WASH 3 (RIWASH 3) project in Jaffna District, Northern Province, funded by the Australian Government's Civil Society WASH Fund 2. The five-year project commenced in 2014. It aims to improve the ability of WASH actors to sustain services, increase adoption of improved hygiene practices, and increase equitable use of water and sanitation facilities of target communities within 11 Grama Niladari Divisions (GNDs) in Jaffna District. The project focuses on the most vulnerable groups, including female-headed households and people with disabilities, to address inclusion issues in WASH design, implementation and management.

To support disability inclusion within the project, World Vision partnered with CBM Australia. CBM Australia has focused on building capacities of partners for disability inclusion, fostering connections with local Disabled People's Organisations, and providing technical guidance on disability inclusion within planned activities. World Vision also partnered with the Northern Province Consortium of the Organizations for the Differently Abled (NPCODA) for disability assessment, technical support and capacity building on inclusion of people with disabilities in the project.

About Us

World Vision is an international Christian development organisation with a long history of community empowerment and development work in Sri Lanka, including supporting large-scale rural WASH programs. World Vision has a strong commitment to social inclusion and seeks full integration of marginalised and neglected members of the community into development programs.

CBM Australia is Australia's largest implementer of disability-specific and inclusive development activities worldwide. CBM is an independent Christian development organisation, whose primary purpose is to improve the quality of life of the world's poorest people with disabilities and those at risk of disability, who live in the world's most disadvantaged societies.

Contact Us

For further information, please contact us at:

World Vision: feedback@worldvision.com.au or srilanka@wvi.org

CBM Australia: idresources@cbm.org.au

List of Acronyms

CRPD	Convention on the Rights of Persons with Disabilities
DPO	Disabled People's Organisation. <i>(Note: In Sri Lanka DPOs are disability organisations where the President and Secretary have a disability. It is common for other Board members, staff and voting members to be people without disabilities).</i>
CBO	Community Based Organisation
NGO	Non-Government Organisation
GND	Grama Niladari Divisions
RIWASH	Rural Integrated Water, Sanitation and Hygiene
UN	United Nations
WASH	Water, sanitation and hygiene

Contents

Introduction	7
Background	7
Who is this guide for?	8
How to use this guide	9
1. Getting There	10
Path Obstacles	12
Difficult to Follow Path	14
Slippery Path	17
Raised Platform Paths	19
Poor Lighting	21
2. Getting In	23
Steps are too high, too narrow or have an uneven surface	25
Narrow Doorway	33
Door Opens Inwards	34
Difficult to Close and Lock Door	35
3. Getting On	37
Squatting and Sitting	39
Grab Rails	45
4. Hygiene and Water Access	51
Water Transport	53
Water Point Access	59
Water Taps	61
Conclusion: How to apply these strategies through an individualised approach ..	62
WASH access at home: how an individualised approach is different to universal design for public spaces	62
Working together with individuals and households to remove or reduce WASH barriers...	62
Steps for Working with Individuals and Families to Facilitate WASH Access	63
Annex	65
Annex One: How this learning resource was developed	65



SDG Goal 6 Target:

By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.

Introduction

The 2030 Agenda for Sustainable Development identifies the need for hygienic sanitation and water access for all.¹ However, many people with disabilities do not have access to these basic rights. The reasons for this are unique to each circumstance, including the physical environment of a person with disability's home, the relationship they have with other members of their household, their economic and social status, their access to assistive equipment, the functional impact of the person's impairment, and the water, sanitation and hygiene (WASH) resources and facilities available within their community.

This resource, based on learning from World Vision's RIWASH 3 project, identifies starting points which can be used with individuals with disabilities and their families to create and implement practical strategies to remove or reduce such barriers to basic WASH access. The focus is on households that already have WASH facilities such as a toilet and water point, but where a variety of barriers might be preventing or restricting household members with disabilities from being able to access these facilities.

The United Nations Convention on the Rights of Persons with Disabilities (CRPD), the guiding international framework in understanding and approaching disability, states that people with disabilities include 'those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others.'

Of key importance to the conceptualisation of disability set out in the CRPD is the understanding that experience of disability arises not from impairments (i.e. problems in body functions or structures) alone, but from the interaction between a person's impairment and the barriers they face to full participation in their community on an equal basis of others.²

Background:

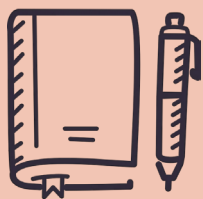
One of the activities of World Vision's RIWASH 3 project has been to build accessible toilets for selected individuals with disabilities in the project areas. By getting to know people with disabilities in Jaffna, and learning about the barriers they experience in accessing WASH, the project also generated valuable lessons for creation of a Learning Resource that outlined locally sourced and cost effective strategies to adapt existing toilets and water points.

World Vision, together with CBM Australia, partnered with Engineers without Borders Australia, Agile Development Group and Northern Province Consortium of the Organizations for the Differently Abled (NPCODA) to trial, document and compile strategies between January – April 2018 in the Jaffna District. The learnings from this process form the basis of this resource. For more information on the methodology used for this process, refer to Annex One.

¹ Sustainable Development Goal 6: Ensure availability and sustainable management of water and sanitation for all. <https://sustainabledevelopment.un.org/post2015/transformingourworld>

² Plan and CBM Australia/Nossal Institute for Global Health, (2015). Practice note: Collecting and using data to inform disability inclusive development. Melbourne, Australia

This Learning Resource is also informed by the Sri Lankan Disabled Persons (Accessibility) Regulations, No. 1 of 2006 and Ministry of Health, Directorate for Youth, Elderly and Persons with Disabilities (2013) Design Considerations on Accessibility for Persons with Disabilities- referred to throughout the document as ‘the Sri Lankan Standards’. Although the Sri Lankan Standards refer to universal access in public buildings, public places, buildings built by government and places where common services are available, some of these principles are also applicable to making modifications for WASH access within private domestic dwellings when using an individualised approach (refer to the Conclusion at the end of this document).



Due to the methodology used, this learning resource is not a complete or comprehensive list of all strategies that may assist to remove or reduce barriers to WASH access. There are many other important areas to consider that have not been addressed in this learning resource, as they were beyond the scope of learning for this aspect of the RIWASH 3 project. They include: hand washing, insect protection, drinking water and water tank installation.

Who is this guide for?

This learning resource is designed for use by organisations and individuals who are working directly to address WASH needs in the community. This may include:

- Individuals with disabilities and their families.
- Community development workers
- DPOs.
- Government staff.
- UN agencies.
- CBOs and NGOs.

This resource provides principles and strategies that can be drawn upon when trying to solve problems of how to remove or reduce barriers to WASH access for people with disabilities. We encouraged you to work with individuals and households to problem-solve, create and trial what is most suitable for the person, their household and the local social, economic and environmental context. You may want to consider using each of the sections as prompts to identify potential barriers, including those not listed in the document. Refer to the Conclusion at the end of this document for suggested steps to take in your engagement and planning with households and the people in them.

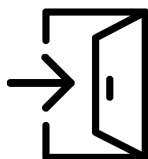
How to use this guide

This learning resource encourages the user to take an individualised approach of creating strategies for WASH access that are specific to the person and their environment. Its focus is to enable everyone in the household to access and improve their existing toilet. The guide outlines examples of locally sourced and cost-effective strategies to modify existing household toilet and water facilities to enable independent access by people with disabilities. It is broken into four areas of access to toilets and water:

Getting There



Getting In



Getting On



Hygiene and Water Access



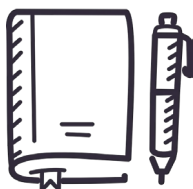
For each, key information about the strategy is provided as well as the materials required and examples of how to make items. This may include guidance on measurements, details and dimensions relating to the strategy. Ensure you read this section prior to proceeding with implementing strategies.

There are also a number of icon boxes to assist with key information:

Potential Hazard



Take Note



Skilled Labour Required



Barrier



Impact



Strategy



Potential Hazard



Potential hazards are highlighted in green boxes at the end of each strategy and at the beginning of each section. Make sure you read these and consider these potential hazards to ensure that you do not create more barriers or risks for the person and other household members.



1. Getting There



This is the process of getting from the inside of the house to the toilet. It includes barriers that may be encountered inside or leaving the house, as well as traveling from the house to the toilet. If the toilet is inside, this part of the task will be inside the house only. It is recommended to start considering barriers along the path to the toilet from the place in the house where the person usually sleeps.

Description of common barriers to getting to the toilet:

Access to the toilet includes the path that a person travels to the toilet, which frequently involves leaving the main house and travelling outside along a path to the toilet. There are a range of barriers which impact how a person can safely move along this path which need to be considered. Common barriers include poor lighting, obstacles in the path, slippery steps, animals, distance/location of toilet and uneven path surfaces.



- Weather changes, particularly heavy rainfall and monsoon weather, will affect pathways. Consider the durability of the materials used and always take measures to ensure that the surface is non-slip.
- Steep ramps are very unsafe for people who use wheelchairs and people with mobility impairments. Wheelchairs can easily tip over if the ramp is steep and people who have difficulty walking will be more likely to fall on a steep ramp than a flat surface or steps. Remove or replace ramps that are too steep. Do not install ramps with an incline of less than 1:12 (for example, if the ramp needs to be one foot high, then it must be at least twelve feet long)



Getting There Outline

Situation	Barrier	Impact	Strategy
Path obstacles	The path to the toilet has obstacles.	The person finds it difficult to travel safely from the house to the toilet.	Clear pathways are free of clutter and have a level surface.
Difficult to follow path	The path to the toilet is not clearly marked	The person finds it difficult to travel safely from the house to the toilet.	Install tactile and/or visual markers to assist the person to travel on the path.
Slippery path	Path is slippery	Slippery surfaces make it difficult and unsafe to travel between the house and the toilet.	Create non-slip surfaces on paths
Raised platform path	Path to the toilet from the house requires transfer down from level of house and then up to level of toilet.	Multiple heights along the path make it difficult to travel safely from the house to the toilet because the person will use ramps or stairs twice.	If there is an access point from the house to the toilet that is relatively close and at the same above-ground height, it may be appropriate to create a raised pathway rather than two ramps.
Poor lighting	Poor lighting makes it difficult to travel safely from the house to the toilet.	A person cannot see the path or the toilet and may fall because of obstacles and hazards, including animals. A person may be at more risk of attack or assault if the path does not have adequate lighting.	Install lighting for the path and the toilet



Path Obstacles



Barrier: The path to the toilet has obstacles.



Impact: The person finds it difficult to travel safely from the house to the toilet.



Strategy: Ensure pathways are free of clutter and have a level surface.

Key considerations

- If dry, pathways can be regularly swept, raked and/or compacted in order to keep the path level and clear of small rocks and items.
- Holes that appear in paths can be filled or smoothed over with compacted dirt.



Above: a broom is used to sweep the path clear of obstacles. Note the raised pipe on the ground creates a trip hazard.

- Small steps or mounds in concrete paths can be levelled using a concrete sanding machine.
- Keep items in the yard well-ordered so that objects are not left obstructing the path.
- Consider using a surfacing material that will keep the path compacted. Planks of wood and palm fronds can sometimes be used during wet season where dirt paths have become muddy. These are solutions that need to be regularly adjusted or reviewed, particularly when there is a change in weather or season.



Above: a small threshold step at a doorway has been levelled to reduce the risk of falling over the small step. A sanding machine and a small amount of concrete were used.

List of materials and equipment

- Broom or rake
- Concrete.
- Shells or rocks
- Sticks, wood or palm fronds
- Concrete sanding machine for levelling small concrete steps or mounds.



Above: Shells and small rocks can also be compacted onto paths



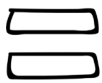
If using materials to create a path, ensure that the surface is compacted and flat enough so that there are no raised areas, which could become a trip hazard. Ensure materials are strongly fixed flat to the ground to reduce this risk.



Difficult to Follow Path



Barrier: The path to the toilet is not clearly marked.



Impact: The person finds it difficult to travel safely from the house to the toilet.



Strategy: Install tactile and/or visual markers to assist the person to travel on the path.

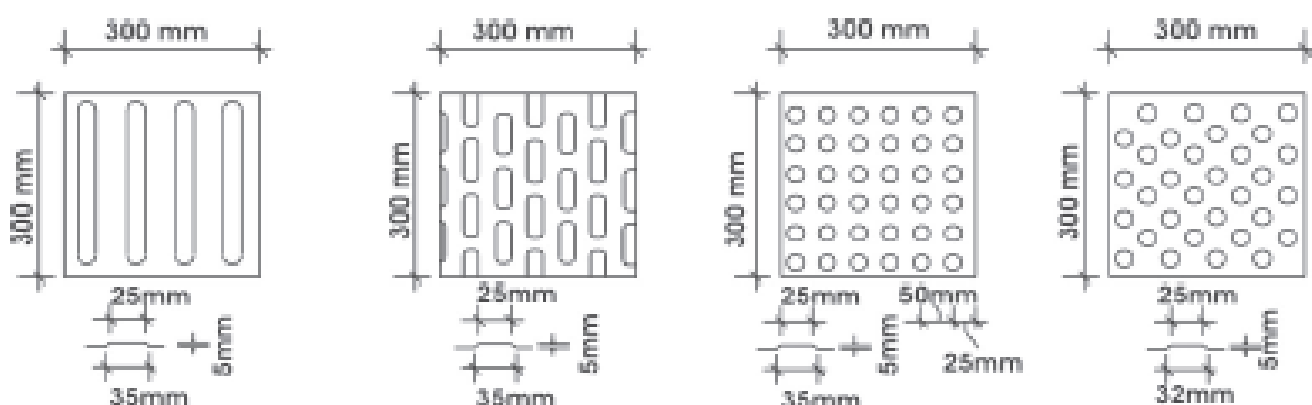
Key considerations

- Tactile markers are indicators that can be felt by a person. They are useful for people who cannot see or who cannot see well.
- Tactile markers can be small markings on paths that can be felt under the feet, or everyday objects, such as string or plants, that are positioned to assist the person to know where to go or to avoid areas where they may be at risk (such as at the corner of a step or veranda edge).
- Visual markers are indicators that can be seen easily by a person. They are useful for many people, including people who cannot see well.
- Visual markers are high contrast colours that are used to mark a path or hazard (such as the edge of a platform, ramp or step). For example, if there is a concrete path, high contrast paint can be used to mark the edges. For a dirt path, brightly coloured stones or pebbles can be placed along the edges of the path.



Above: a new concrete path with tactile guide markings along path from house to toilet

- If creating a concrete path, markings can be made to assist a person to know the direction of the path and when to expect a change, such as a turn or doorway. These markings are referred to as 'guiding blocks' in the Sri Lankan Disabled Persons (Accessibility) Regulations, No. 1 of 2006 and Ministry of Health, Directorate for Youth, Elderly and Persons with Disabilities (2013) Design Considerations on Accessibility for Persons with Disabilities. Guiding blocks can be purchased commercially, but it is also possible to make your own tactile markings.
 - When a concrete path is being made, tactile markings with river stones and etchings can replicate the markings on the 'guiding blocks.'
 - Surfaces should be firm and even after inserting tactile markings.



Above: Examples of tactile guide blocks reproduced from the Ministry of Health, Directorate for Youth, Elderly and Persons with Disabilities (2013) Design Considerations on Accessibility for Persons with Disabilities.

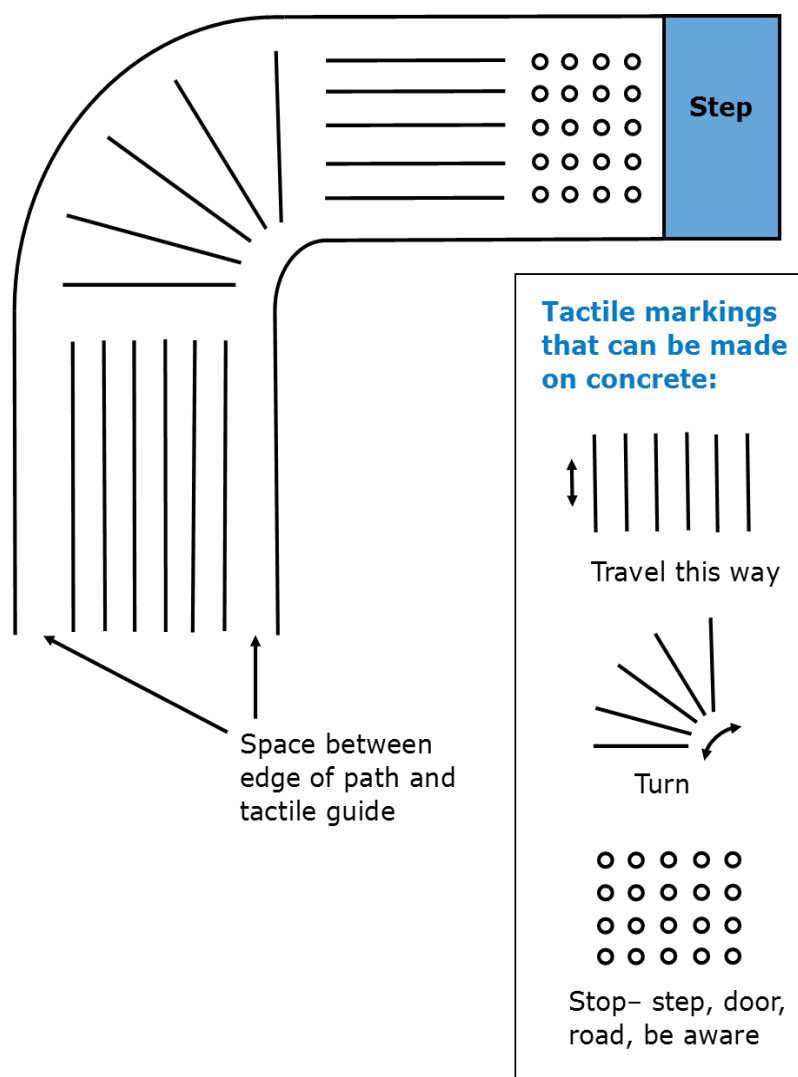


Above: Tactile guide blocks used in a public place to mark a path. Notice the raised circles are used when turning is required or when the path comes to the end. The spacing for these circles may be different for turning or stopping.

- Patterns used in tactile markings on paths can provide guidance to a person with a vision impairment about the direction to travel on the path (refer to diagram below for example).
 - For example, traveling straight along the path can be symbolised by lines that are in the same direction of the travel.
 - When there is a corner in the path, the lines can change direction to be perpendicular to the person and fan out in the direction in which the person needs to turn.
 - Dots or raised circular bumps (for example, using river stones in the concrete) can provide warning when the path is ending, such as when approaching a step, door, ramp or other obstacle.
 - Talk to the person with a vision impairment about what markings will be useful and any systems that they may prefer. You can use sand to draw and feel examples before making permanent concrete markings.

List of materials and equipment

- River stones.
- Concrete, objects to make markings into concrete.
- Prefabricated guiding blocks.
- Plants.
- String.
- Rocks, wood, small mounds of concrete.



Above: Example of tactile markings that can be made in concrete path.



Ensure that tactile and visual markers do not create a falls risk. Tactile and visual markers under foot can sometimes present this risk, so take care to ensure that any markers at feet level are located in safe positions/heights so that people do not fall over them.



Slippery Path



Barrier: Path is slippery.



Impact: Slippery surfaces make it difficult and unsafe to travel between the house and the toilet.



Strategy: Create non-slip surfaces on paths.

Key considerations

- Existing concrete surfaces can be made non-slip by making etchings into surface, eg grinding small hatchings/lines into concrete.
- Surfaces can be made non-slip when new concrete is setting by making small non-slip markings.
- An additional non-slip layer/covering surface can be added to an existing surface to make it non-slip, however this must be very strongly fixed in place.
- Using sand and waterproof paint on the top of concrete can also create a non-slip surface. See the following page for more information on how to do this.
- Consider installing handrails or grab rails in areas that may be slippery (refer to page 45 'Grab Rails').



- A non-slip surface that is not strongly fixed will likely cause an increased risk in falls.
- Ensure any measures to make the surface non-slip do not cause a falling hazard to the person. All etchings and markings should be small enough not to cause a person to trip on them or to cause water to collect into a pool within the etching.
- If using a rubber or carpet surface to create non-slip, ensure that it is securely fixed and there is no threshold step onto the rubber or carpet. This may result in a falls risk if someone trips on the edge of the rubber or carpet, or if the rubber or carpet moves on the surface when wet.

How to make non-slip surfaces with sand and waterproof paint



1. Layer the concrete with waterproof paint



2. Sprinkle fine sand over the wet paint.



3. Smooth out the sand so it is flat and even across the concrete. Brush away excess sand.



4. Allow to dry before use.

List of materials and equipment

- Grinder.
- Knives/thin metal/thin stick.
- Concrete.
- Sand and waterproof paint.
- Rubber matting or carpet (only if it can be strongly fixed to ground and does not cause a trip hazard).

Images reproduced from: www.wikihow.com/Make-Non-Slip-Concrete-Steps



Raised Platform Path



Barrier: Path to the toilet from the house requires transfer down from level of house and then up to level of toilet.



Impact: Multiple heights along the path make it difficult to travel safely from the house to the toilet because the person will use ramps or stairs



Strategy: If there is an access point from the house to the toilet that is relatively close and at the same above-ground height, it may be appropriate to create a raised pathway rather than two ramps.

Key considerations

- A raised path can use rubble or other items collected from the yard to build up the foundation underneath a concrete path.
- Wooden or metal decks can create a raised path from the house to the toilet. Ensure that the materials are weatherproof and structurally sound.
- Consider different pathway options of getting to the toilet which may have a shorter path distance, for example access through different doors in the house (ensure door widths are accessible: refer to page 33 'Narrow Doorway').



Above: the toilet is the small room on the left side of the building. The side door in the middle was not used. Access to the toilet was from the front of house on right side picture (not visible on picture).

Right: Raised concrete platform path was installed from nearest door to toilet. Note: both doors were also widened for wheelchair access.



- Rails on the edge of the raised path provide safety and support for stability and transfers. If rails are used, ensure that they do not block other access ways (for example, other household members may want to step up onto the pathway to access the toilet, but may not be able to do this if continuous railing is installed).
- ‘U’ shaped rails attached to the concrete path may be an alternative solution to a continuous rail along the edge of the path (refer to page 45 ‘Grab Rails’).
- Ensure that the path has a raised edge of approximately 75mm and has high contrast markings (refer to page 31 ‘Install a Ramp’).
- Ensure that the raised path allows for drainage and water flow.
 - Avoid constructing a path that will cause flooding.
 - The 75mm raised edge on the path needs sufficient gaps to ensure water does not collect into a large puddle on path.
- Ensure that the path is made of waterproof materials that are securely positioned so that the structure will not be weakened due to flooding or rain.
- Ensure that the path has non-slip surface markings (refer to page 17 ‘Slippery Path’)

List of materials and equipment

- Concrete.
- Rubble.
- Railing or ‘U’ shaped rails.
- Wood and/or metal if appropriate and secure.
- Rust-proof, long bolts sufficient for secure positioning of rails.



Above: rubble collected from the yard can be used to build up the foundation underneath a concrete path.



- Raised paths from the house to the toilet should not block other access ways.
- Raised paths should be at a height that is safe for all household members, including children.
- Raised paths must be wide enough to allow sufficient turning space for wheelchairs, where relevant, and movement of multiple people. The Sri Lankan Standards recommends that path width should be 1500mm for adequate turning space.



Poor Lighting



Barrier: Poor lighting makes it difficult to travel safely from the house to the toilet.



Impact: A person cannot see the path or the toilet and may fall due to obstacles and hazards, including animals. A person may be at more risk of



Strategy: Install lighting for the path and the toilet.

Key considerations

- The path to the toilet should have adequate lighting across all points. This includes the house exit, travelling the path from the house to the toilet, the entrance of the toilet and inside the toilet.
- Adequate lighting at entry/exit points to the toilet is important to prevent falls at stairs or ramps.
- Consider using solar-powered lighting options at night. These may incur a cost initially but should be cheap to operate in the long term.
- When installing electrical lighting, consider the right location for switches. Ensure that the person has access to the light switch and that it can be turned on and off easily before entering the dark space. Consider that people who use wheelchairs, children or those who are short in stature may need light switches at a low height.
- Natural lighting can also be used during the day to assist with visibility inside the toilet. This can be done by creating a skylight or windows in the toilet whilst maintaining weatherproofing. Use transparent/coloured fibreglass or plastic roof panels, or a small number of glass blocks/bricks in the walls, which allow natural light to enter the toilet.
- Contrasting colours can also be used on the path to assist with visibility.
 - For example, painting the edges of paths, steps, ramps and verandas in a contrasting colour can assist some people with low vision to have better visibility of the path. For dirt paths, brightly coloured river stones can be used to create a highly visible border to the path.



Above: Transparent roof panels provide natural light during the day and a light is switched on from the house during night.

List of materials and equipment

- Switches, wires, lightbulbs and wire protections.
- Solar powered and natural lighting systems.
- Fibreglass or plastic roof panels, glass blocks/bricks.
- Waterproof paint for contrast markings, painted river stones.



Above: Natural lighting from a transparent roof panel can significantly improve visibility inside the toilet.



If the electricity is extended from the house to the toilet, ensure that this is done safely. This should be done by a skilled tradesperson, such as an electrician. The electricity mains should always be turned off before making any electrical work occurs.



2. Getting In



This is the process of getting into and out of the toilet building. This section focuses on the toilet entrance: what happens when the person is at the toilet and needs to get inside to use it, as well as after the person uses the toilet and has to get outside again.

Description of common barriers to getting in and out of the toilet

If an entrance into a toilet is not accessible, then some people will be unable to safely get in and out of the toilet.

Steps at the entrance of a toilet or coming from the house towards the toilet are a potential barrier for people with disability, people who are elderly, children, and people who have an illness or injury. The impact of this barrier could be that they fall or are forced to crawl up the steps which contaminates their hands and clothes, posing a hygiene and safety risk.

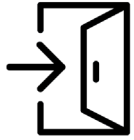
The width of the doorway is very important, as narrow widths can prevent a person who is using a wheelchair or other mobility aids, such as crutches or walking sticks, from getting into the toilet. People who are being carried or supported by another person are also impacted by narrow door widths, as they may not fit through the toilet entrance safely whilst being supported.

A door that opens inwards into the toilet can also cause difficulties, as there is less space inside the toilet. In some situations, the door cannot be closed once a person is inside the toilet, resulting in poor privacy and dignity.



Getting In Outline

Situation	Barrier	Impact	Strategy
Steps are too high, too narrow or have an uneven surface.	The size or shape of steps make it difficult and unsafe to get into the toilet	The person has difficulty using the steps and cannot safely get in and out of the toilet or house.	Install grab rails outside the toilet attached to the wall at the top of the stairs.
			Install or adjust steps that are at the right height, width and depth for the person.
			Install a ramp from the house to ground level and/or install a ramp from ground level to the toilet.
Narrow doorway	The doorway is too narrow	The person cannot enter the toilet in a wheelchair or when being supported by others (for example, being carried or assisted to walk)	Widen the doorway width to 900 mm to allow most wheelchairs or at least two body widths to pass through the doorway.
Door open inwards	The toilet door opens inwards, not leaving enough room to enter and shut the door	Increased risk of falls due to small turning space; people may not be able to close the door, resulting in a lack of privacy/dignity	Position door to swing outwards to allow space for turning and for assistive equipment, such as over-toilet frames and grab rails, to be placed inside the toilet and used.
Difficult to close and lock door	The toilet door is difficult to close and lock	The person may fall when attempting to close and lock door and cannot use the toilet with privacy	Install easy to use lock and handle to close door.



Steps are too high, too narrow or have an uneven surface



Barrier: The size or shape of steps make it difficult and unsafe to get into the toilet.



Impact: The person has difficulty using the steps and cannot safely get in and out of the toilet or house.



Strategy: Install grab rails outside the toilet attached to the wall at the top of the stairs.



Strategy: Install or adjust steps that are at the right height, width and depth for the person.



Strategy: Install a ramp from the house to ground level and/or install a ramp from ground level to the toilet.

There are three key strategies for addressing this barrier. Also refer to strategies in the section 'Getting There' when identifying the most appropriate approach: in particular, a raised path from house to toilet.

How the person moves, their preferences, the preferences of others in the household and the physical environment around the toilet and house needs to be considered when deciding on the strategy. Install grab rail and install/adjust steps are strategies that are often used together. Build a ramp should be selected if the person is unable to use steps at all.

Be aware that installing a ramp may not always be the best solution. Some people may find appropriate sized steps with a hand rail safer and easier to use than a ramp. This strategy will also take up less space, be less intrusive for other household members and will likely cost less.



Above: some steps are too high or oddly shaped to get up safely.



Strategy: Install grab rails outside the toilet attached to the wall at the top of the stairs.



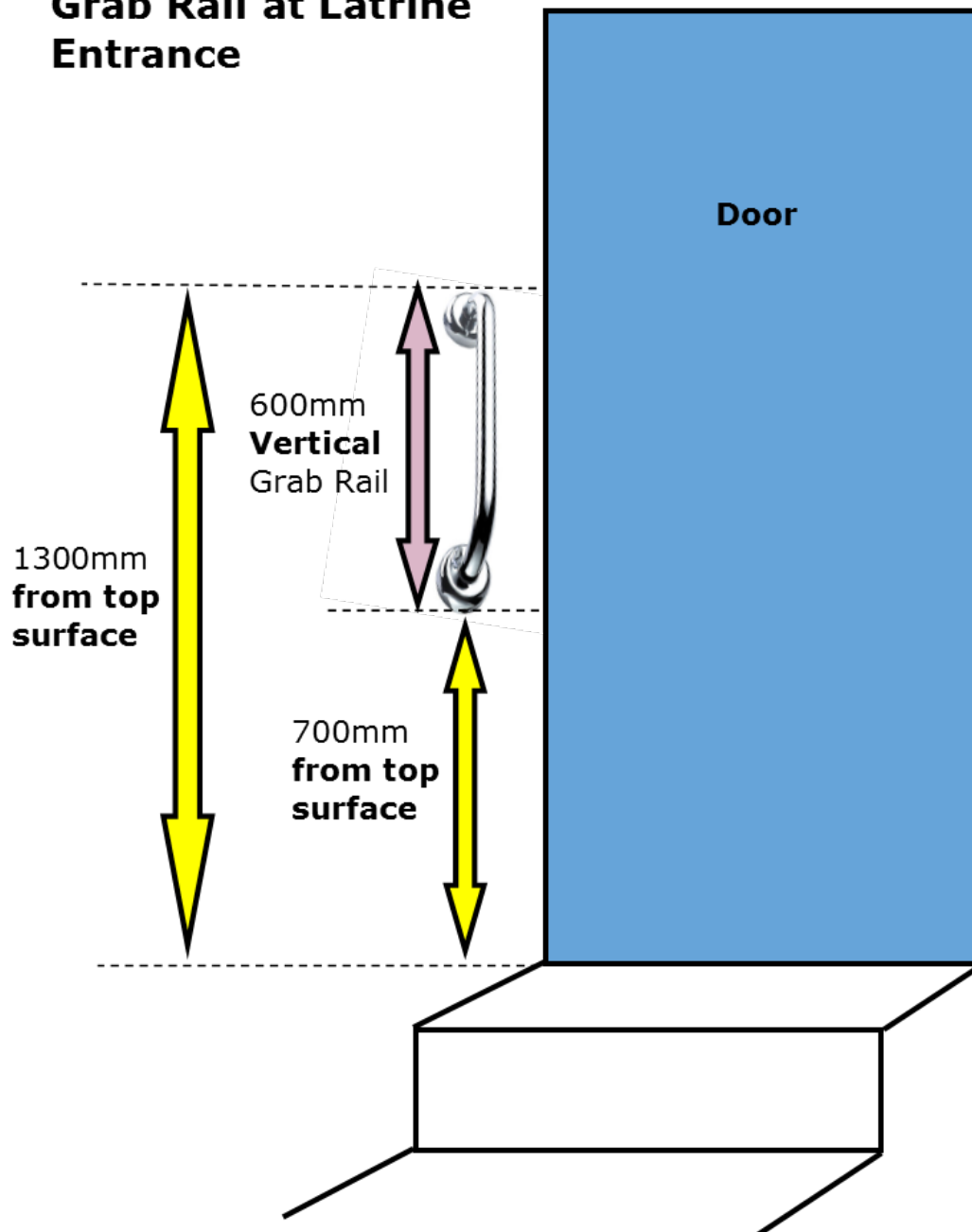
Key considerations

- This strategy is useful for people who are able to use steps with some support, as rails assist the person to stabilise while moving up the steps.
- The rail must be strong enough to take the weight of the person repeatedly over time. The rail must be securely attached to a wall that can withstand repeated pulling force on the rail. Bolts must be long and strong.
- If the wall is hollow or made of a flimsy material, then there will need to be an alternative mounting point for the rail. This could be a thick plank of wood concreted into the ground and wall structure, or the rail may need to be 'U' shaped and concreted directly into the ground.
- The rail may become hot to touch if it is positioned outside in direct sunlight:
 - Consider using light coloured waterproof paint if the rail is metal.
 - Consider wrapping with fabric or padding as insulation, whilst maintaining at least 38mm space between the inside of rail and the wall.
- Adjust the height of the rail placement to suit the person's reach at both the bottom of the stairs and at the top of the stairs.
 - Consider the person's height and arm strength/mobility
 - The rail should be placed on the opposite side to the door hinge. Ensure that the rail does not get covered by an outward opening door.
 - Ask the person if they have a stronger/preferred arm to assist in correct placement. If possible, place the rail on the side of their preferred arm when they are approaching/entering the toilet but ONLY if door opening does not block access to the rail.
 - The person should not have to strain to reach or hold the rail at any point on the entrance.
- If there is one step or the height is small, consider placing the lower end of a 300mm vertical rail approximately 900mm above the top surface (normally the toilet floor). If there are two to three steps or the height is larger, consider placing the lower end of a 600mm vertical rail approximately 700mm above the top surface (normally the toilet floor) (see diagram).



Above: a grab rail at the top step into the toilet.

Installation of 600mm Vertical Grab Rail at Latrine Entrance



Ensure that the rail is positioned close to the doorway so it can be used when coming out as well as coming in.



- If metal rails are outside in direct sunlight, they are likely to become hot and this may cause a fall if a person tries to grab the hot rail. Ensure rails are heatproof or insulated.
- Rails that are not mounted properly will not be able to hold the weight of the person. This can cause falls if the rail wobbles or falls out during use. The installation of a grab rail needs to be much stronger than the installation of usual fixed items in a house. Ensure adequate bolts and strong mounting points to reduce this risk.

List of materials and equipment

- Prefabricated grab rails sold commercially or galvanised steel pipe with width of 30-45 mm welded into grab rail.
- Strong bolts for secure fastening (ensure adequate length: there should be 3-5 bolts inserted at each end of the rail to ensure stability).
- Wood/bricks and concrete if the wall is made of tin, board or another flimsy material to make strong alternative mounting points.
- Insulation and/or light-coloured paint if rails are likely to become hot outside.



Above: grab rails can also be used for steps inside the house.



Strategy: Install or adjust steps that are at the right height, width and depth for the person.



Key considerations

- The Sri Lankan Standards recommend a stair width of at least 900mm.
- The height of each stair should be no more than 150mm.
- The depth of each stair should be at least 300mm.
- When considering height and depth of stairs it is important to consider both the person and the environment.
 - Ensure the step size accommodates any aids that the person may use, such as walking sticks, crutches or walking frames.
 - Consider the preferences and needs of other household members.
- Consider whether existing steps can be extended to increase accessibility. It is not always necessary to demolish the steps, but adjustments can be made to the size of the steps to make the steps easier to use.
- Steps must have a tread that is non-slip (refer to page 17 'Slippery Path').
- Contrasting colours on the edge of the steps can aid visibility.



Above left: large and uneven steps into the toilet make it difficult to enter.



Above middle and right: new steps make it easier to enter the toilet.

- Hand rails on both sides of the staircase are beneficial for stability and support when the person is using the stairs. Consider the overall length of the staircase when planning handrails. Rails should extend beyond the staircase and onto the staircase landing. It may be necessary to consider alternative positioning of the stairs and railing. Some examples include:

- A vertical 600mm grab rail installed to a wall at the top of the stairs near the doorway, instead of handrails on both sides of the steps (refer to page 45 'Grab Rails'). This can be used if there are less than three steps and the person is able to safely reach and hold this rail while walking up and down the stairs.
- Positioning the stairs along the side of the building rather than at a 90 degree perpendicular angle from the door. This will enable grab rails to be installed along the building wall. This may require an extension of the top landing platform.

List of materials and equipment

- Concrete.
- Suitable rubble from local environment.
- Durable metal or wood that can be securely constructed into steps. Ensure that these are strong and will not move – especially in heavy rain. Affix the metal or wooden step with multiple deep bolts into the existing structure. Ensure that the metal or wood can bear weight, is weather-proof and can withstand repeated force.
- Etching tools to ensure non-slip markings are made on the step.
- Grab rails, 'U' shaped rails (refer to page 45 'Grab Rails') or long handrails.
- Waterproof paint for contrast markings.



Ensure the length of the step extensions does not block access paths that other household members may use.



Strategy: Install a ramp from the house to ground level and/or install a ramp from ground level to the toilet.



Key considerations

- A low incline ramp can be helpful for many people, but it may not always be the best solution.
 - Check first whether the person can walk up steps with support. If they can, it is possible that steps with a vertical grab rail or rails on the sides of the steps will be sufficient.



Above: raised lips on the ramp edges are important for safety

- If there is a need to install a ramp to the toilet, such as for a person who uses a wheelchair, also consider how the person will get out of the house and whether a ramp is needed.
 - There may be situations where it is more appropriate to make a level platform from the house to the toilet rather than two ramps (refer to page 19 'Raised Platform Paths').
- A ramp may become slippery, particularly if it is an area that gets wet.
 - Ensure that there is a non-slip surface on the ramp and consider installing rails on both sides of the ramp for stability (refer to page 17 'Slippery Path').
- Installing rails on both sides of the ramp gives optimal stability and safety. If it is not possible to install rails on both sides, at least ensure there is a raised lip on both sides of the ramp of 75 mm. Use contrasting colours on the edge of the ramp to aid in visibility.
- Ramps that are too steep are very difficult to use and can be dangerous. Ensure a gentle gradient of at least 1:12 for ramps.³
- Ramps should be at least 900mm wide.

³ If the step is one foot high, then the ramp must be at least twelve feet long. If it is the step is two feet high, then the ramp must be at least 24 feet long.

- Ramps may need to be quite long to ensure the right gradient (angle of ramp).
 - Check that the length of the ramp will not cause other problems, such as blocking other access paths or creating a fall hazard.
 - If the ramp is long, ensure that there is a flat landing at mid-points so that the person can take a rest. There may also need to be a flat landing at the top and bottom of the ramp, particularly if there is a door that needs to be opened and closed at the top of the ramp.
 - If a long ramp is required, consider installing a 'zig-zag' design with sufficient turning space on flat landings where the ramp turns.
- If using wood, ensure that the ramp is stable and that there is not a risk of the wood planks slipping during use.
 - This could be done by constructing a supported triangular wedge that is fixed to the step or ground and fitted at the exact height. Ensure that the triangular wedge is sufficiently supported by weight bearing supports and there is a flat landing at the base of the ramp.
 - Check alternative access points. For some houses with an attached outdoor toilet, it may be better to construct a new doorway directly into the toilet. Alternatively, use a door closer to the toilet with a raised platform for access rather than a ramp (refer to page 19 'Raised Platform Paths' and page 33 'Narrow Doorways').



Above: a ramp at the front of the house may be needed as well as into the toilet.

List of materials and equipment

- Concrete.
- Suitable rubble from the local environment.
- Durable metal or wood planks that can bear weight, are weather-proof and can withstand repeated force.
- Etching tools to ensure non-slip markings are made on the ramp.
- Waterproof paint for contrast markings.



Steep ramps are very dangerous and are not easy to use. Wheelchairs can tip on steep ramps and it is very unsafe for a person with a mobility impairment to walk on them. The gradient of ramps needs to be at least 1:12. For example, if the ramp needs to be one foot high, then it must be at least twelve feet long.



Narrow Doorway



Barrier: The doorway is too narrow.



Impact: The person cannot enter the toilet in a wheelchair or when being supported by others (for example, being carried or assisted to walk).



Strategy: Widen the doorway width to 900mm to allow most wheelchairs or at least two body widths to pass through the doorway.

Key considerations

- The toilet door should be wide enough for a wheelchair to move through or to accommodate two people side by side (someone assisting a person to get in). This space should be sufficient for a person using other mobility aids, such as crutches or walking sticks, to move through.
- The Sri Lankan Standards recommend doorway widths of at least 900mm. However, many wheelchairs will fit through doorways of 820mm.
- When modifying the home environment, there may be situations where it is not possible to widen the doorway width to 900mm due to the existing structures in place.
 - Measure the width of the wheelchair with the person seated in it. Take the measurement from the most outer part of the wheelchair wheel rims.
 - Consider the space that the person may need to propel the wheelchair. Whilst the minimum of 900mm width is recommended, this measurement of the wheelchair can also be used to make a door width that meets the need of the individual.
- If the person is a child, consider that they may use a larger wheelchair with increased size and width as they grow.



Above: doorway to toilet is widened so that a person using a wheelchair can enter.



Ensure that any structural work to the building, such as widening the door, is completed by a skilled mason or builder. Care must be taken to ensure that widening the door width does not compromise the integrity of the building structure.

Door Opens Inwards



Barrier: The toilet door opens inwards, not leaving enough room to enter and shut the door.



Impact: Increased risk of falls due to small turning space; people may not be able to close the door, resulting in a lack of privacy/dignity.



Strategy: Position door to swing outwards to allow space for turning and for assistive equipment, such as over-toilet frames and grab rails, to be placed inside the toilet and used.

Key considerations

- Some people, in particular people using wheelchairs and people using over-toilet frames, will not be able to close a toilet door that opens inwards because there is not enough space inside the toilet. This can result in negative impact on the dignity and privacy of people with disabilities who use the toilet.
- If over-toilet frames or other assistive equipment inside the toilet are removed by household members in between use, an outward opening door and wide doorway make it easier for the equipment to be moved.
- If there are steps or ramps leading to the toilet, ensure there is enough landing space (flat area of ramp used to stop or turn wheelchair) to accommodate outward opening doors.
- It may be important for some people in the household that the door opens inwards, possibly to ensure that the weather does not degrade the door prematurely if it opens outward. Outward opening doors are preferred for accessibility when possible, so consider a two-way hinge that allows the door to open both ways and waterproofing the door in such situations.



Above: An outward opening door provides more space to move inside the toilet.

List of materials and equipment

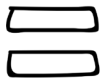
- Door hinges and bolts. Consider two-way hinges if available.
- Waterproof paint/coating for wooden doors to protect from weather if opening outwards.



Difficult to Close and Lock Door



Barrier: The toilet door is difficult to close and lock.



Impact: The person may fall when attempting to close and lock door and cannot use the toilet with privacy.



Strategy: Install easy to use lock and handle to close door.

Key considerations

- An outward opening door needs to be easily closed by the person inside the toilet. This can be done by installing appropriate handles or pull strings to the toilet door.
- Locks on the inside of the door need to be easy to use. Often, large simple locking systems can be easier to use than smaller locks. Consider how the person uses their hands when deciding on what lock to use.
- Self-closing mechanisms on doors (such as spring hinges) can be useful for some people, but it is important that the mechanism closes the door slowly.
 - Self-closing mechanisms can be problematic if the door is too heavy or closes too quickly, resulting in the door pushing against the person.

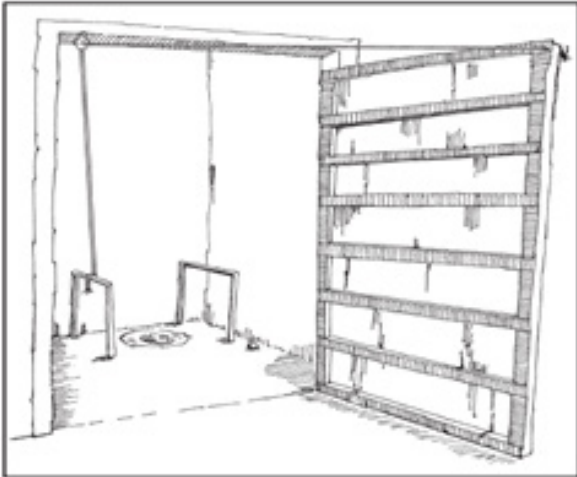


Above: an easy to use lock made from local materials. Below: a standard lock may be appropriate for some households, but may be difficult to use for others.



List of materials and equipment

- Door handles (not grab rails) to install on the inside of the door.
- Easy lock systems.
- String and hooks to create a pull-to-close mechanism.



Examples of a rope used to create a pull to close mechanism inside the toilet (left) and an easy-to-use lock mechanism (right), in Jones, H. & Reed, R. (2005). Water and sanitation for disabled people and other vulnerable groups: Designing services to improve accessibility. UK: WEDC, Loughborough University.



Never attach a weight-bearing grab rail to a door (refer to page 45 'Grab Rails'). A door is not strong enough to take the weight of a person and, because a door moves, it is not a secure point. This creates a hazard for the person using the grab rail and increases risks of falling. Attach grab rails securely on the wall next to the door frame.



3. Getting On



This is the process of using the toilet once inside the toilet building. It includes how the person balances, transfers, adjusts clothing, squats or sits down, gets up and cleans. This process will be different for each person. Understanding how the person prefers to use the toilet is essential in order to consider strategies that may assist.

Description of common barriers to getting on and off the toilet

A person who is heavily pregnant, someone who has a movement or sensory impairment (including from illness or injury), young children and older people may have difficulty lowering themselves to squat or sit over the toilet and to stand up again. This could be due to limited leg strength or difficulty balancing.

Some people may require supports to assist them to lower themselves and get up again. Without these supports, the person may be at risk of falling, or may be forced to use their hands on the ground and sit over the hole in squat toilets. This poses both hygiene and safety risks.

It is important to consider that toilets are areas where water is used, and that this may result in the area being slippery. How people adjust their clothing and use anal cleansing facilities is also a core part of getting on and off. This should be considered in all strategies that are intended to make the process of getting on and off safer and easier.



- Considering the likelihood of water on the floor and uneven surfaces in many toilets, over-toilet frames must be strong and stable. Use rubber feet at the end of the over-toilet frame legs for better grip.
- There is a significant risk of harm if an over-toilet bench or grab rails are not strongly fixed into the walls. Do not install a bench or rails into walls that are not concrete/brick. A bench or rails should only be installed by somebody appropriately qualified and skilled to do so.
- Seat supports need to align directly over the toilet hole. The support must be positioned in a way which assists the person to lower/raise themselves from the toilet safely, hygienically and as easily as possible. The door may need be changed to outward opening for this to occur.



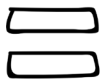
Getting On Outline

Situation	Barrier	Impact	Strategy
Squatting and sitting	The toilet hole or toilet seat is too low for the person to use.	The person cannot squat or safely get on and off the toilet seat which results in the person crawling on the ground, having to place hands on the ground or toilet pan to support themselves or having to sit directly on the toilet pan/hole.	Construct a moveable 'Over-Toilet Frame' which has a hole that allows both urination/defecation into toilet and ease of reach for anal cleansing.
			Build a 'Drop Down Over-Toilet Bench' that is permanently fixed to the toilet wall, with hinges that allow it to be folded down and safely secured against the wall when not in use.
Grab rails for balance or stability when squatting	There are no supports to hold within the toilet.	The person cannot support themselves when adjusting clothing, conducting anal cleansing and getting up and down.	Install grab rails on the walls inside the toilet.

Squatting and Sitting



Barrier: The toilet hole or toilet seat is too low for the person to use.



Impact: The person cannot squat or safely get on and off the toilet seat which results in the person crawling on the ground, having to place hands on the ground or toilet pan to support themselves or having to sit directly on the toilet pan/hole.



Strategy: Construct a moveable ‘Over-Toilet Frame’ which has a hole that allows both urination/defecation into the toilet and ease of reach for anal cleansing.



Strategy: Build a ‘Drop Down Over-Toilet Bench’ that is permanently fixed to the toilet wall with hinges that allow it to be folded down and safely secured against the wall when not in use.

There are two strategies for addressing this barrier discussed below. Also refer to the strategies listed under the section ‘Getting In’ when identifying the most appropriate approach, as well as strategies for widening doorways and outward opening doors.

Over-Toilet Frames may be an appropriate solution that does not require installation into the toilet walls.

Drop Down Over-Toilet Benches may be suitable in households where other household members want to use the squat hole and the bench can be securely put away when not in use.

Consider how the person moves, their preferences, the preferences of others in the household and the physical environment around the toilet and house when deciding on the strategy.



Strategy: Construct a moveable ‘Over-Toilet Frame’ which has a hole that allows both urination/defecation into the toilet and ease of reach for anal cleansing.



Key considerations

- The over-toilet frame structure needs to be stable and durable, and easy to clean.
- Over-toilet frames should have raised side rails to be used as arm rests for the person to support themselves as they stand up and sit down.
- Frames need to be able to be positioned over the toilet hole in a stable position.
 - Toilet areas will become slippery when wet. Over-toilet frames need to have non-slip feet that prevents slippage when positioned on wet ground. Rubber feet or towel/sponge at the end of the frame’s legs can act to reduce slippage.
 - Be aware that the flooring of toilets may not be on one equal level. Rubber feet of different sizes can be used to get a stable position of the seat. Consider putting adhesive fill in between the leg ends and the rubber feet to change the height of the chair a small amount to accommodate for uneven ground surfaces.
- Consider building a splash guard from a plastic bucket or other container to prevent faecal matter and urine spilling onto the floor around the toilet hole, if necessary.



Photo of over toilet and over squat hole with horizontal grab rail on one side of wall

List of materials and equipment

- Bamboo poles, wood or galvanised metal.
- Equipment for cutting/shaping bamboo poles, wood or metal.
- Welding equipment and skilled welder, if constructing from metal.
- Toilet seat with hole (prefabricated plastic or constructed from wood).
- Straps for reinforcing joints (leather, canvas, rope or reed).
- Rubber feet, towel or sponge to reduce slippage.
- Bucket or large plastic container to be constructed into splash guard if required.



- Over-toilet frames must be strong and stable and at an appropriate height for use. Frames or seats that are not strong and stable (such as plastic chairs with cut out holes) may result in an increased risk of falling.
- Consider that there is likely to be water on the floor in many toilets and that the floor surface is unlikely to be even. Use rubber feet, towel or sponge at the end of the over-toilet frame legs to prevent slipping.



Strategy: Build a ‘Drop Down Over-Toilet Bench’ that is permanently fixed to the toilet wall with hinges that allow it to be folded down and safely secured against the wall when not in use.



Key considerations

- Drop down over-toilet benches are benches that can be used to provide access to a seated position in the toilet, and then raised and stored against the wall when other household members require squatting access to the toilet.
- Ensure that the structure is strong and stable enough to safely hold the weight of a person sitting on the bench. For example, the bench could be made of rustproof metal in the base, legs, fixtures and hinges with a wooden seat that has a waterproof coating.
- Ensure that the structure is securely and safely stored on the wall, for instance with a sliding bolt or hook and eye, so that it will not fall and cause injury to a person squatting inside the toilet.
- Ensure that the structure is securely bolted into the wall by a skilled tradesperson with bolts that are long. There must be at least four points when the bench is in use that support the bench and the weight of the person. For example, two hinges into the wall and two strong fold-down legs (that can be locked into place). This structure can only be secured to walls that are strong enough to hold the weight of the bench and a person (such as brick or concrete). It is not safe to attach this structure to wood or tin walls and this solution should not be used in such circumstances.



Above: a drop down toilet seat securely fastened to the back wall of the toilet in down (left) and up (right) position.



Above: a drop down toilet seat ready for use

- The bench seat depth should be approximately 500mm and sufficient to cover the squatting pan. The bench seat should extend between both walls in small toilets. The height of the seat will depend on the person's height, but is approximately 400mm – 450mm.
- Consider the location of the hole in the toilet bench and its alignment with the squat pan hole. Ensure that the holes line up so that waste goes directly into the squat pan hole and does not land on the floor of the toilet.
- Consider the door and accessing the toilet when designing a fold-down seat – ensure that the door can be closed and opened with someone on the seat and think about how they will use it. It may fold down from the back wall or from the side wall, depending on the layout of the toilet.
- Consider using plastic splash guards made from thick plastic (for example, empty 5 litre water bottles cut at both ends) to prevent splashing when faeces or urine lands in the toilet pan. These should sit on a base positioned on the toilet hole edge and then the seat can be lowered over the top of the splash guard.
 - Install handles or grips on the outside of the splash guard so that the contaminated inner plastic is not handled when the guard is removed.
 - Ensure that splash guards are cleaned regularly and handled hygienically – particularly if they are removed in between toileting. The family must be aware that splash guards will be unhygienic if they are not handled and cleaned appropriately.
- Consider the hygiene of the underside of the bench when it is stored on the wall.
 - Consider how the household will manage cleaning any splashback of urine or faeces on the bench.
 - A bench fitted to the back wall rather than a side wall may be less likely to be touched by others' hands when they are squatting, but ensure there is sufficient space so that the bench does not touch the backs of other household members when they squat.

List of materials and equipment

- A skilled tradesperson is required to fabricate and install over-toilet benches.
- Bolts with sufficient length.
- Galvanised/rustproof metal or wood with waterproof coating.
- If using metal for the seat, consider whether the seat will heat up, particularly if the toilet is located outside. It may be better to use wood to construct the seat if there is a possibility that a metal seat will become hot.

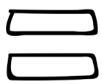


- There is a significant risk of harm if the over-toilet bench is not strongly fixed into the walls. Do not install a bench or rails into walls that are not concrete/brick. Do not install a bench or rails without appropriately qualified skills. There should be at least four secure points at which the structure is supported when it is used.
- Consider how the seat will be secured when not in use. The fold down seat may be made from wood and steel, so will be very dangerous if not stowed safely after every use. Consider any potential and safety hygiene risks if the bench is stored in a place where others may touch or grab it.

Grab Rails



Barrier: There are no supports to hold within the toilet.



Impact: The person cannot support themselves when adjusting clothing, conducting anal cleansing and getting up and down.



Strategy: Install grab rails on the walls inside the toilet house.

Key considerations

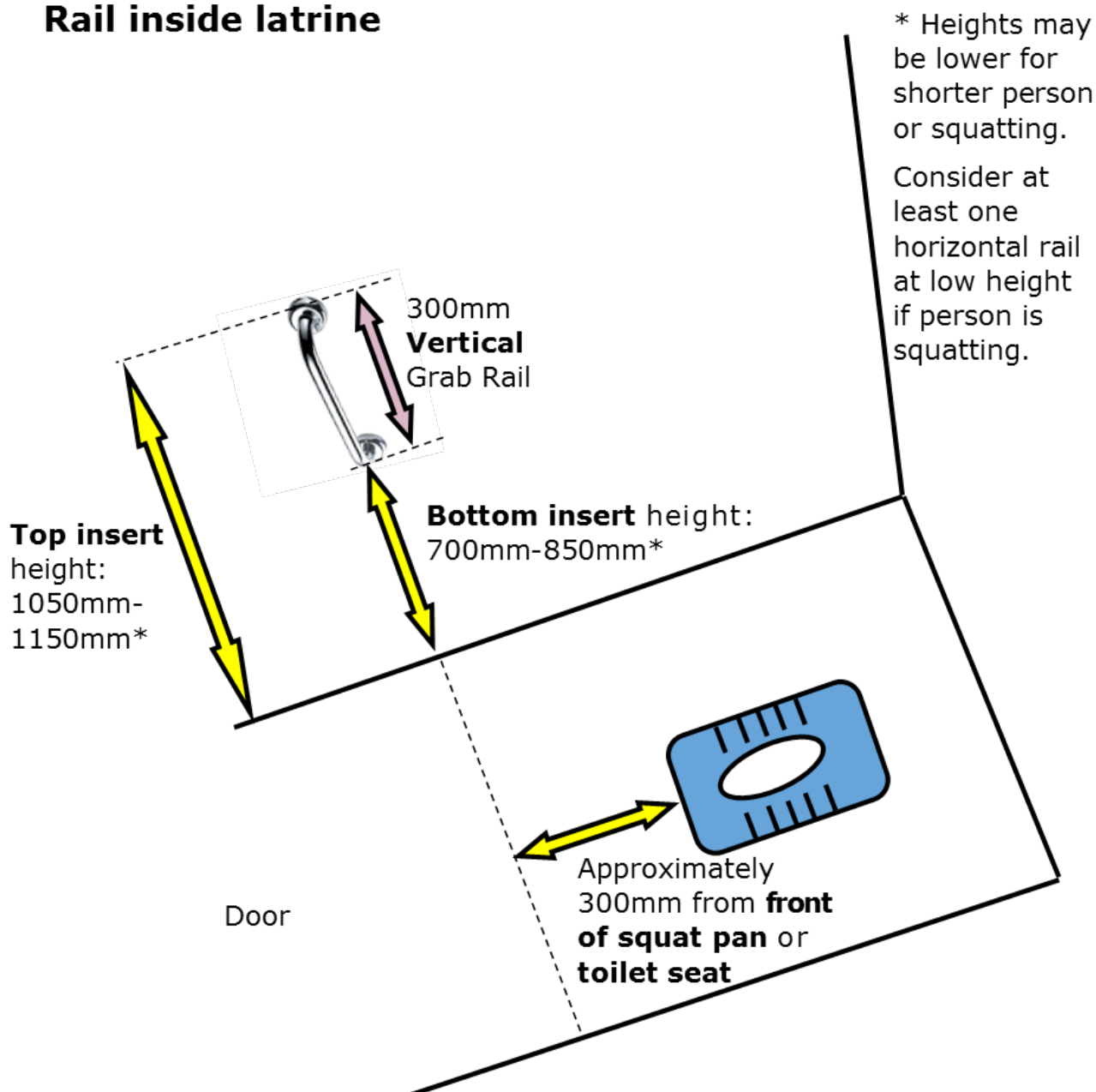
- Appropriately located and strongly attached grab rails provide support and stability whilst inside the toilet.
- Grab rails are useful for multiple activities inside the toilet, including closing/opening the door, adjusting clothing, anal cleansing and squatting or transferring on/off seat.
- Grab rails should be positioned at a height and angle that is determined by the person's movement and the environment/toilet design.



Above: a horizontal 600mm grab rail provides support for a person when they are turning, standing and squatting/sitting inside the toilet

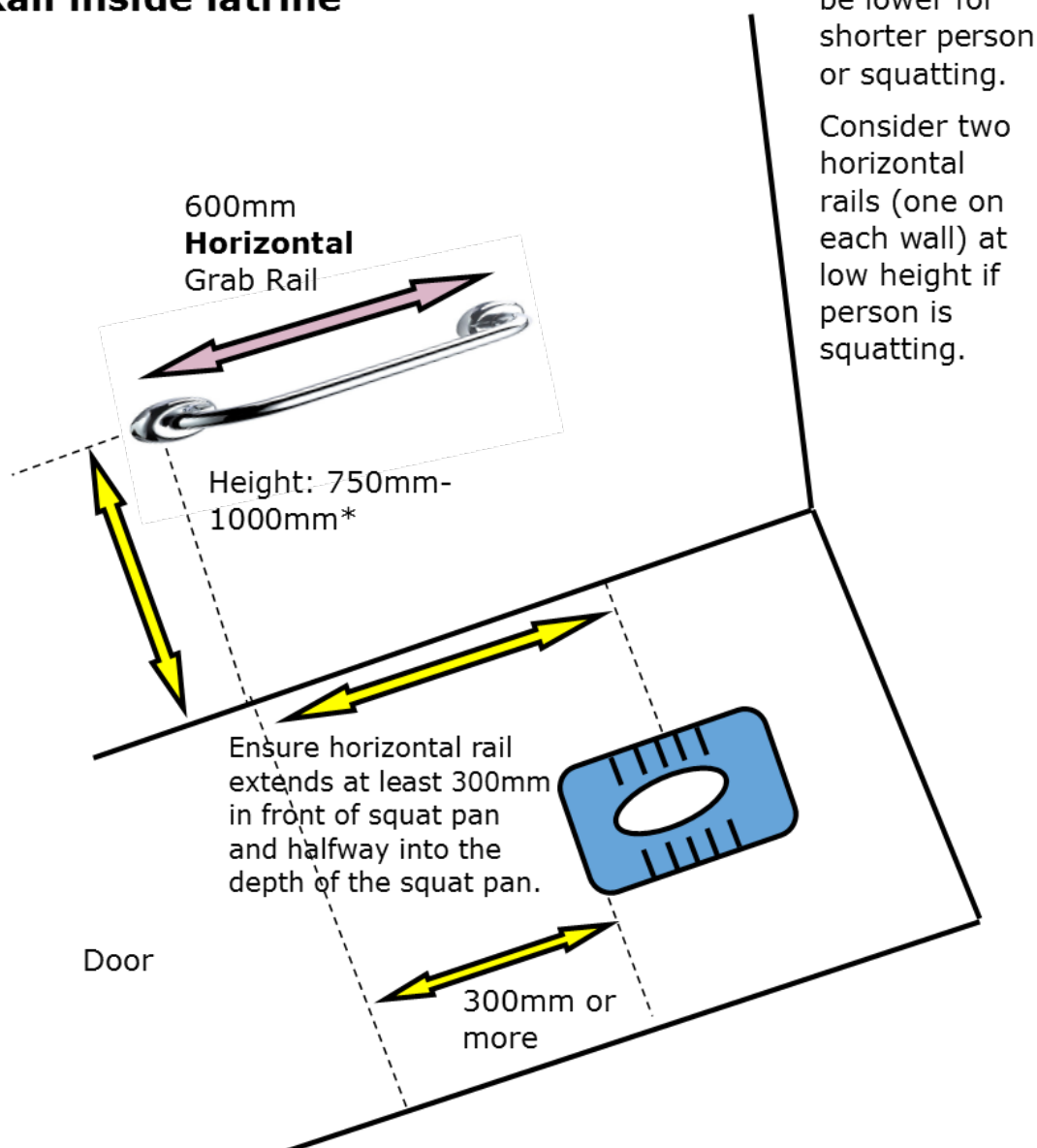
- Vertical grab rails.
 - Vertical grab rails are useful when there is a pulling action required, such as pulling up to stand from sitting, transferring from a wheelchair to a toilet seat or pulling with arms to climb up stairs. They can also be useful for descending movements, such as sitting down, lowering to squat or walking down one or two stairs.
 - Vertical grab rails are often located on the side wall inside the toilet building, approximately 300mm forwards from the front of the front edge of the squat pan hole or Western style commode seat.
 - The height of the vertical grab rail depends on its length.
 - When using a vertical grab rail to help a person stand up from a sitting position, use a rail with 300mm length. Depending on the person's height, place the bottom end of the grab rail at a height of approximately 700mm above the floor (shorter person) to approximately 850mm above the floor (taller person). These heights will vary depending on the person and how they move.
 - Test the height of the rail by seeing the person in the toilet space standing if possible. The middle of the vertical rail should be approximately the height of the elbow on a relaxed arm (note: this is the middle point of the rail, not the bottom or top of the rail)

300mm Vertical Grab Rail inside latrine



- Horizontal grab rails
 - Horizontal grab rails are useful when a person requires stability, such as whilst standing and adjusting clothing, standing whilst closing and locking the door, standing whilst urinating (for men), walking along paths or for stability during squatting.
 - The length of the horizontal grab rail depends on its purpose, the wall that the rail is being attached to and the location of doors and other items in the area. It is common for 600mm length rails to be used inside toilets for stability.
 - Unlike vertical grab rails, horizontal grab rails will be placed at the same height regardless of their length.
 - Horizontal grab rails are placed at a height of approximately 750mm (shorter person) to 1000mm (taller person), but this will vary for different people. The Sri Lankan Standards recommend placing horizontal rails at a height from 800mm – 950mm above the floor.
 - You can determine the height of the rail by observing the person in the standing position with their arm slightly bent at approximately 45 degrees from straight. If the person makes a fist, the middle of the fist is approximately the height that the horizontal rail should be inserted to support themselves.

600mm Horizontal Grab Rail inside latrine





Above: a horizontal grab rail and tap inside a squat toilet.

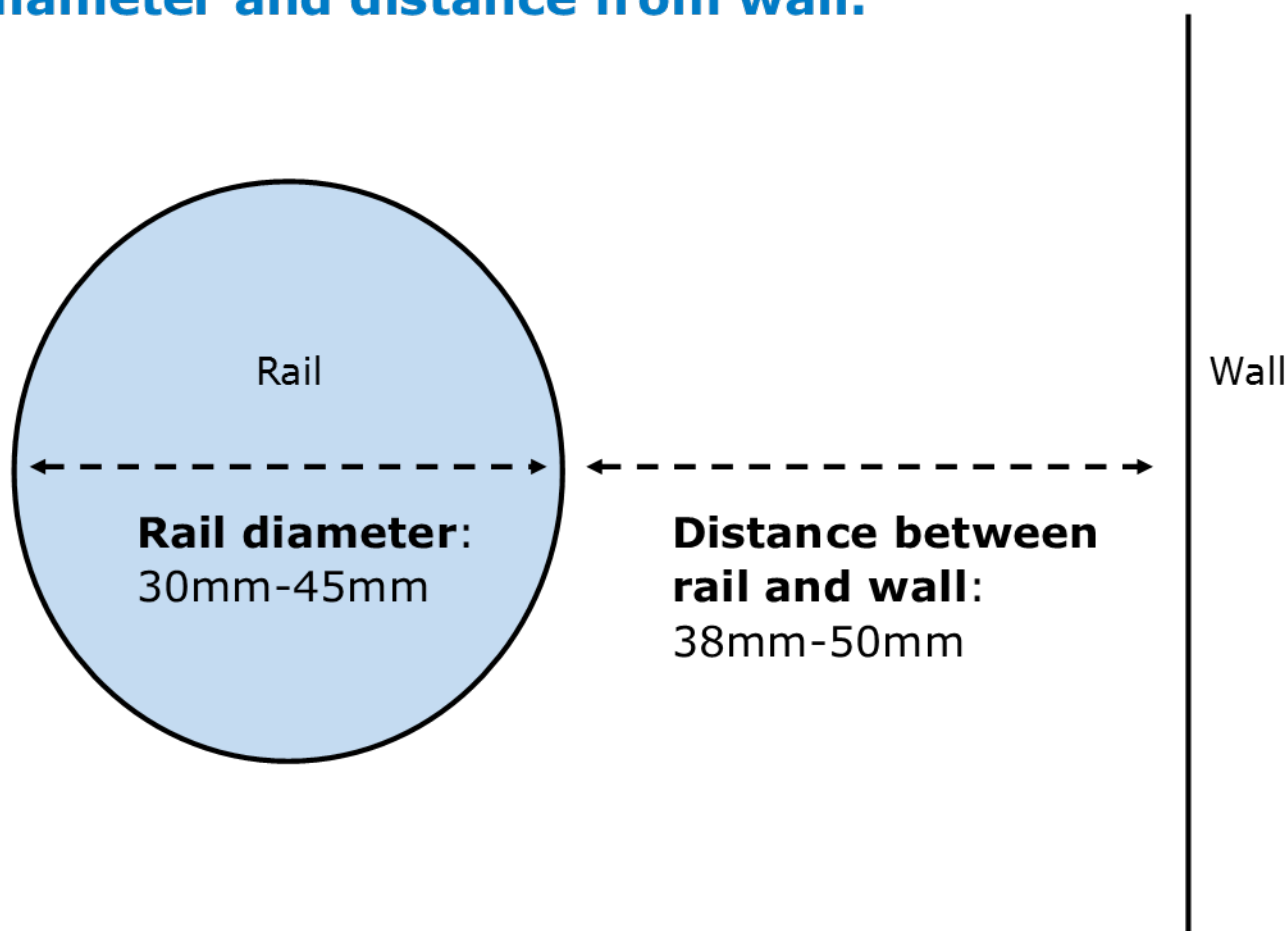
- 'U' shaped rails
 - 'U' shaped rails are shaped like an upside down 'U' (see picture).
 - 'U' shaped rails can be used when it is not possible to install grab rails into the wall. These rails are inserted strongly into concrete flooring or cemented strongly into dirt ground.
 - The height of 'U' shaped rails is determined in the same way as horizontal grab rails.
 - 'U' shaped rails can be more expensive than vertical and horizontal grab rails as more material and time is required to make and install the rails.



Above: 'U' shaped rail at a water point

- The Sri Lankan Standards recommend that the width of grab rails should be 30mm to 45mm in diameter. They recommend a clearance space of 38mm – 50mm between the rail and the wall (where the fingers are placed when holding the rail).

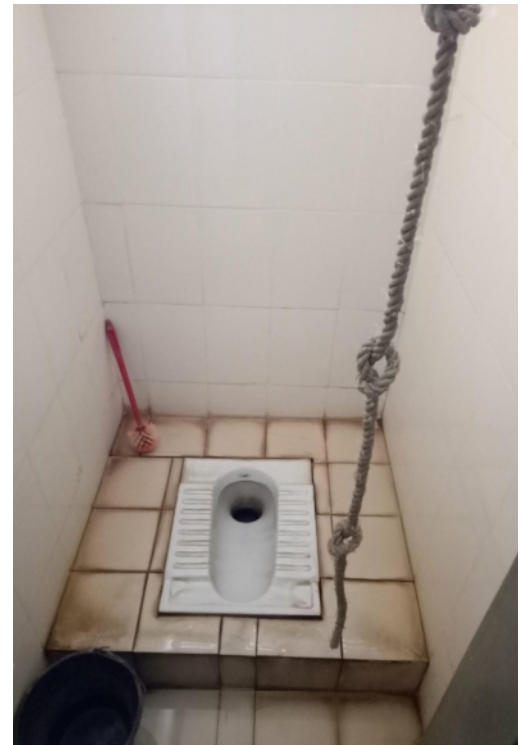
Sri Lankan Standards recommended rail diameter and distance from wall.



- Consider the person when deciding on the position of the grab rails.
 - Ask the person which arm is their strong arm. It may be beneficial to install a vertical rail on the side of their strong arm when they are squatting/using the toilet as this arm will likely be used in pulling actions, such as pulling up from sitting.
 - Consider that some people may not have any strength in one or both of their arms. For example, some people who have had a stroke may not be able to use one arm.
 - A horizontal rail on the opposite wall to the vertical rail can be useful for stability turning and moving inside the toilet.



Left: galvanised steel grab rails made in Jaffna: 300 mm and 600 mm (fabrication cost January 2018: Rs 1000 and Rs. 1200)



Above: a securely fastened rope can also be helpful for support. It is better if the rope is fastened to the ground and securely to a roof

- An alternative strategy to inserting handrails, which may be more affordable, is to use rope which is strongly secured to an overhanging structure in the toilet. If using rope, it can be helpful to secure the rope at both the top and bottom. This will reduce the amount that the rope swings and moves during use, increasing its safety.

List of materials and equipment

- Prefabricated grab rails sold commercially (not plastic).
- Waterproof/galvanised steel piping with width of 30mm – 45mm.
- Waterproof/galvanised steel plates for attaching grab rail to wall (approximately 130mm diameter depending on width of piping/rail) with 4 – 5 holes for bolt insertion. Square plates may be easier to fabricate than circles.
- Skills of qualified welder.
- Wooden or bamboo grab rails may also be constructed, however there may be risks for stability if the rails are not strongly installed. These materials may be better for 'U' shaped rail construction.



- Ensure that doors are not blocked by the insertion of grab rails behind the door. Consider outward opening doors to enable insertion of rails inside the toilet.
- Never install a grab rail onto a door. This is very dangerous as the door moves and the door's hinges are not strong enough to support a person's weight.
- Grab rails require strong mounting to the wall with at least 3 – 5 mounting points on each end of the grab rail. A rail should not move when it is grabbed. A loose rail is dangerous and can result in the person falling and hurting themselves.
- Only install grab rails into concrete or brick surfaces. Ensure long bolts that have sufficient strength are used.



4. Hygiene and Water Access



This is the process of getting to a household water source and using the water for hygiene purposes. The focus in this section is on transferring water from the water source to the toilet, but it is also important to consider that bathing, clothes washing and other WASH activities may occur at the water point. In this section, you may also need to draw from some of the strategies that are discussed in the Getting There, Getting In and Getting On sections as appropriate (for instance, non-slip surfaces, paths to the water point).

Description of common barriers to getting to a water point

A water point and the path to the water point may present difficulties for people with disabilities, including people with vision impairments and mobility impairments.

Good hygiene is reliant on accessible handwashing facilities and a source of water for flushing toilets. A person who has mobility difficulties may not be able to carry water from their water point to the toilet and so is unable to maintain their own hygiene. This may result in some people becoming reliant on family members to carry water for them.

Some people may try carrying water without their usual mobility aid (such as crutches or walking sticks), because they cannot use the aid and carry water at the same time. This presents many safety risks and may prevent the person using the toilet safely, hygienically and independently.

A water point has wet surfaces that can often be slippery/muddy. Water points are also often in an open space where there are no walls or other built structures that can be used for support and stability. Many water points require a 'step up' to get to access the water. These are significant barriers for many people with disabilities.



People may use a strategy of getting other household members to fill water buckets/containers close to the toilet, but this may bring risks around leaving still water in an area where mosquitoes breed and spreading disease. Relying on family members also hinders the person's independence and ability to immediately address hygiene needs when they arise.



Water and Hygiene Outline

Situation	Barrier	Impact	Strategy
Water transport	Water is transferred from water point to toilet by carrying buckets whilst walking.	The person cannot independently carry water from the water point to the toilet in order to flush toilet and clean self hygienically.	Install homemade water piping to the toilet.
			Use of easy-to-carry water containers that can be used at the same time as using mobility aids.
Water point access	Steps, slippery wet/ muddy surface and lack of support makes it difficult to access water point.	Person unable to access water for cleaning, toileting and bathing tasks.	Concrete step extensions and ramps with 'U' rails.
Water taps	Taps require dexterity and strength of hands to turn on/off.	Person cannot access water through tap-based systems.	Installation of tap with tap extensions.



Water Transport



Barrier: Water is transferred from water point to toilet by carrying buckets whilst walking.



Impact: The person cannot independently carry water from the water point to the toilet in order to flush toilet and clean self hygienically.



Strategy: Install homemade water piping to the toilet.

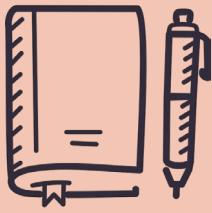


Strategy: Use easy-to-carry water containers that can be used at the same time as using mobility aids.

There are two strategies for addressing this barrier discussed below.

Installing homemade water piping to the toilet involves creating a piping system with available materials. This is a significantly low-cost option, but may require ongoing replacement and repair depending on construction. Using easy-to-carry water containers is a simple strategy that could assist some people to carry water whilst using mobility aids, but will not remove the barrier entirely.

How the person moves, their preferences, the preferences of others in the household and the physical environment around the toilet and house need to be considered when deciding on the strategy.



- Installation of a water tank and pump at the toilet building or close to the toilet building is a key strategy to consider when addressing water access. This is a preferred strategy if possible.
- Installation of piping and taps inside the toilet building at a height and position that is accessible for household members is also recommended.
- The installation of a water tank, pump and taps needs to be completed by an appropriately qualified person. Instructions on how to do this are beyond the scope of this learning document.



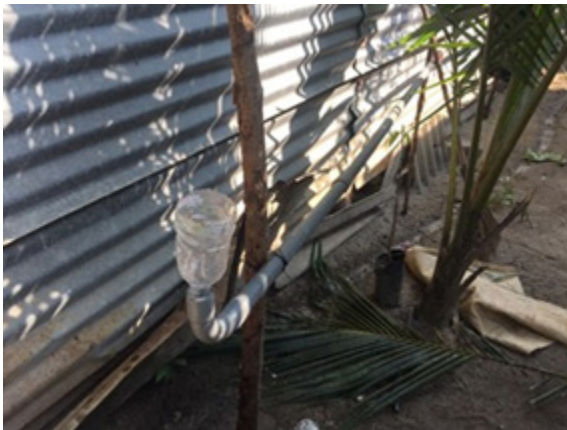
Above: appropriately placed water taps from watertanks placed on top of toilets with strong roof and wall structures remove many barriers to water access.



Strategy: Install homemade water piping to the toilet.

Key considerations

- A water transport system can be created in some homes where water can be poured into a piping system at the water point and accumulated at the toilet.
- People can pour water into the piping system whilst bathing, cleaning or doing another task at the water point. Water then accumulates in a container at the toilet that can be used for flushing and cleaning.
- Ensure that pipes are securely positioned and they do not block any access paths or present a risk of falling to anyone in the household.
- This is a gravity-fed system which will only work effectively over a short distance where water travels downwards through the pipes.
 - The pipes need to be positioned on a descending angle which means that the point where water is poured into the pipes may need to be high above the ground.
 - Ensure that this is not too high for the person to use comfortably. Ensure that the person can pour the water into the system whilst seated (if required) or with other necessary stability support.



A home made piping system transporting water from the waterpoint to the toilet.

List of materials and equipment

- Large water bottle (cut as shown in picture).
- Stabilising posts to mount water bottle and piping system.
- PVC pipes, joiners and accessories.
- Flexible Hose.
- String or wire.
- Valve or tap.
- String.
- Sticks.
- Bucket.



- Ensure that water does not accumulate at the toilet point for prolonged periods to prevent the collection of mosquito larvae.
 - Create a drainage system e.g. drainage ditch to manage overflow, to prevent muddy or wet areas that are slip hazards.
- Ensure that piping does not cut across paths. This will be a trip hazard and people may fall over the piping. Attach piping along fences and away from pathways.



Strategy: Use easy-to-carry water containers that can be used at the same time as using mobility aids.

Key considerations

- If water has to be carried, consider the use of containers that are likely to minimise spill and that are easy to carry.
- If the person uses a mobility aid such as a wheelchair or three wheeled trike, consider how they can safely carry the water container without disrupting balance.
- Consider using cleaned plastic containers that have easy-to-hold handles at the top of the container. Ensure a large enough hole at the top of the container to allow water to be easily poured into it (see image).
- Containers that have a large mouth and a lid are helpful. Having a lid or a closable container makes it easier to carry the water and will reduce water spills that may contribute to the person slipping.
- If possible, consider loading water containers onto a platform or basket on a wheelchair or three-wheeled-trike to transfer the water from the water point to the toilet.
 - Note that this strategy requires a smooth path and the person on the wheelchair or trike will need to have hands available to propel themselves.
 - For some people who use wheelchairs, narrow containers could potentially be placed on the foot plates in between the legs and secured with Velcro or elastic strapping.
 - This strategy will be different for different people and environments, and may not be possible in every situation.
- Creating a bag that can sit on a person's back to carry water containers can be effective for some people to help maintain balance whilst using mobility aids and carrying water. This can be done by attaching straps to a water container or by putting smaller water containers with secure lids into a backpack bag.
- Consider if it would be helpful to use wheeled structures, such as carts or wheelbarrows, to transport water. Ensure that wheeled structures have sufficient stability and support to be used safely.



Above: Homemade water container

List of materials and equipment

- Cleaned used plastic containers that are easy to carry or fasten to wheelchair/trikes.
- Velcro or elastic strapping to keep container in place on wheelchair or trike.
- Bag straps/backpack bag and water containers.



Carrying water containers while using mobility aids is still hazardous, even if the container is easier to carry or can be fitted to a wheelchair. The weight of the container will make balance more difficult and if spillage occurs then there are additional hazards associated with the surface becoming slippery.



Water Point Access



Barrier: Steps, slippery wet/muddy surfaces and lack of support make it difficult to access water point



Impact: Person is unable to access water for cleaning, toileting and bathing tasks.



Strategy: Concrete step extensions and ramps with 'U' rails.

Key considerations

- Step extensions extend the flat area of a step or landing which a person can use to step up and down at water points. Step extensions at water points must have non-slip surfaces/markings.
- Ramps can be used by people who use wheelchairs and people who cannot use steps.
- “U” shaped rails are strongly secured rails that are fixed to the concrete or concreted securely into the ground. These rails are very important for stability when installing ramps or step extensions at water points.
 - Step extensions may be safer than ramps for some people at water points (refer to page 29 ‘Install or Adjust Steps’).
 - If a person does not use a wheelchair, assess whether it is safer for the person to step up one or two appropriately sized steps (with a “U” rail) or to walk up/down a ramp.
 - As the surface will likely be wet, a ramp may be more slippery than a step extension for a person who is walking and carrying water.
 - Because the surface is flat, a step extension may also allow the person to put down the bucket of water they are carrying whilst stepping and then pick up the bucket before leaving the area. If using a ramp, the person may need to carry the bucket whilst walking/ moving up and down the ramp, which may be more difficult.



Left: a wooden branch is used as a rail before modification.
Right: installation of 'U' shaped rail at the same water point

- If the person uses a wheelchair to access the water point, or cannot use one or two steps, then a ramp may be more appropriate for water point access.
 - Ensure that the ramp has a non-slip surface (refer to page 17 'Non-slip Path'), raised edging at 75mm and is at a gradient of incline that is no more than 1:12, to ensure that the ramp is not too steep (refer to page 31 'Install a Ramp').
 - Ensure a landing at the base of the ramp and access from the top of the ramp into the water point.
- Consider the importance of non-slip landings and paths when installing step extensions or ramps at water points.
 - It is important to consider how the water moves when the area is wet. Check for areas of potential flooding. Redirect water movement away from the paths/areas where the person may require access. This can be done through concreting or placement of rocks/blocks to create alternative water flow pathways and drainage. Ensure these items do not block existing pathways or create new obstacles.
- 'U' shaped rails can be used to provide support to the person. These rails must be fixed securely to the ground (refer to page 45 'Grab Rails').
 - Ensure the bolts used have sufficient length for stability and are made from rust-proof metals. Immediately replace the bolts if they become weak or if the rail begins to wobble.
 - Concreting directly into the ground may also provide sufficient support as long as there is enough depth of the rail under the concrete and there is enough concrete between and around the insertion points.
 - Metal rails may get hot in the sun. Paint rails in white or light colours to reduce heat. Alternatively, consider binding with rubber padding and material securely so that the rail can be touched without being too hot.

List of materials and equipment

- Concrete with non-slip etchings.
- Welded 'U' shaped rail and concrete for installation.
- White or light coloured rust proof paint.
- Old rubber tyres, fabric padding, fabric, tape to affix to rail to prevent the conduction of heat if the rail is in the sun.
- Pipes, rocks and blocks for creating alternative water flow pathways, a prefabricated drain may also be appropriate.



- Be aware of the impact of flooding and monsoon rains on the position of the 'U' shaped rail, particularly if the rail is concreted into the soil ground.
- Most 'U' rails at water points will be in sunlight, which may make the rail hot. Ensure appropriate padding or paint in white or light waterproof paint to reduce the transfer of heat.
- 'U' shaped rails must be securely fixed to the ground in order to provide adequate support to the person. A rail that wobbles is unsafe to use. Ensure that the rail is in the correct position for the person.



Water Taps



Barrier: Taps require dexterity and strength of hands to turn on/off.



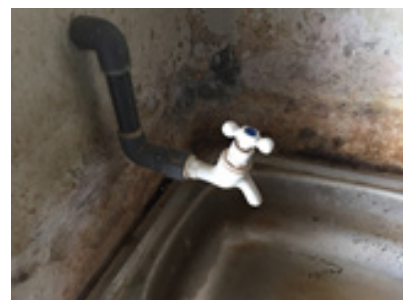
Impact: Person cannot access water through tap based systems.



Strategy: Installation of tap with tap extensions.

Key considerations

- Installing a tap inside the toilet may increase access to water within the toilet.
- Some people may have difficulty turning taps because of low strength in the hands (for example, people with neurological conditions), pain in their hands and arms (for example, people with arthritis) or the control they have of the muscles in their hands and arms (for example, people with cerebral palsy). This can be made easier by constructing a simple tap extension or purchasing long handled taps.
- People who do not have hands (for example, people with amputations, burns or congenital conditions) may also be able to use a suitable tap extension by pushing it with the stump/contraction part of their upper limb or with their feet or head.
- Ensure the tap is at a height that can be easily reached by the individual. Ensuring space for a bucket to be placed under the tap is important.
- Ensure that the tap is not located in a position which will block access within the toilet, such as space required to walk safely into the toilet and close the door or space required for placement of an over-toilet frame within the toilet.
- Ensure that the material used in the tap extension is strong enough to withhold the strength of being turned repeatedly.
- Ensure that the tap extension is strongly fixed to the tap and will not fall off after or during using.
- Do not remove or hide any markings which may indicate temperature of water (if relevant).



List of materials and equipment

- Strong piping or wood.
- Knife or saw to cut piping or wood.
- Commercial tap.

Above: Examples of a simple tap extension to an existing tap using plastic pipes.

Conclusion: How to apply these strategies through an individualised approach

WASH access at home: How an individualised approach is different to universal design for public spaces

WASH access at home for people with disabilities and others in their households needs to be considered through an individualised approach. Universal design principles and accessibility standards for public community spaces can inform this approach, but there are differences.

The key difference between universal access in public places and modifying private domestic dwellings for WASH access is that the priority of modifying a domestic dwelling is for all the people within the household to have WASH access, whereas the priority of universal access is to enable as many people as possible across the whole community to have access. This principle of universal access is essential in public spaces. However access strategies should be more specific to the needs of individuals when modifications are being implemented within private domestic dwellings.

Tactile guides, for example, are essential in public community places to support universal access (to provide access for people with vision impairments), but may not be necessary within a home where a person with a mobility impairment unrelated to vision is living. However, in a home where a person with a vision impairment lives, the installation of tactile guides may be essential to facilitate WASH access. The strategy is individualised to meet the needs of the people in the household.

Working together with individuals and households to remove or reduce WASH barriers at home

Essential to the process of removing or reducing WASH barriers in domestic dwellings is listening to and engaging with people with disabilities, as well as their family and household members. Both the person and their environment (social, economic and physical) must be considered when addressing barriers to WASH access. As people, families, households and homes are unique and diverse, there is never a one-size-fits-all solution. Strategies work differently for different people and within different places. Take time to consider the context within the household, prior to making suggestions or implementing strategies.

It is equally important to follow up after any strategies have been implemented, to check if the strategy works for the person and the household. It is not unusual for strategies to work differently than planned, and alternatives may need to be investigated. Keep undertaking problem-solving with the person, their family and household members to find what works best, particularly to address any unintended outcomes or problems as they arise. This may require ongoing engagement rather than a single visit or series of visits, and should be planned for in determining a timeframe and budget for activities seeking to address household level WASH barriers.

It is also strongly advised to consult with other government and community services in the area, as a part of the iterative process of problem-solving. These services may be keen to collaborate around addressing WASH barriers, and they may have existing strategies and skills that can be drawn upon.

Steps for working with individuals and families to facilitate WASH access

An example of steps for working in households using an individualised approach includes:

1. Conduct first visit: Introduction and consent.

- a. Meet with the person with a disability and their household to introduce yourself.
- b. Learn about the person and their household.
- c. If appropriate, ask if they are interested in working with you to facilitate WASH access at their home. If so, make a second appointment.
- d. Before leaving ask if it is possible to quickly see the toilet and water point so you can plan for your next visit. (Note: be respectful that some people may decline and this may be related to feeling embarrassed or wanting to clean the area before showing it to you).

2. Plan for your second visit using what you have learnt about the person, their household and the physical environment of their home.

- a. Review and mark relevant sections of this learning guide
- b. Prepare to bring a camera/phone camera, measuring tape and paper and pencil
- c. Consider whether you will require technical/building expertise on your next visit (it may be more appropriate on another visit, particularly at households where there are sensitive issues).
- d. Book an appointment time with household and relevant technical/building expertise.

3. Conduct second visit: Barrier identification and problem-solving to remove or reduce barriers.

- a. Ask the person to show you what they do at each stage of using the toilet, bathing and accessing water. It is important for them to show you rather than simply talking about it. This will help you understand potential barriers better.
 - Ask if the person has fallen over before and, if so, ask to be shown where this occurred. Areas where the person has fallen are often where there are barriers.
- b. Use strategies and examples from this document to generate discussion and demonstrate some of the ideas that may assist. Focus first on the most important barriers that the person encounters and the strategies that may be easiest to implement.
- c. Provide education about strategies and ask how the person and household members feel about this. Have they tried this before? Why did it work or not work? Can they think of a way that this strategy could work better for them? Do they have ideas about a different strategy? Be flexible and encourage the person and members of their household to engage in the problem-solving process.
- d. With the technical/builder expertise, take measurements and photographs and make drawings of the building and any modifications to be made. You may not have time to do this in one visit and may require third or fourth visits.

4. Conduct further visits as necessary to implement strategies to remove or reduce barriers. Remember to prioritise and address the most significant barriers first. You may not have the resources or time to address all the barriers immediately.

5. Conduct monitoring visit after implementation of strategies.

- a. Ask the person and household members if the strategy is working. If it is not working, ask why. Request if the person can demonstrate the strategy to help identify where the problem is occurring.
- b. Problem-solve with the person and household to see if the strategy can be adjusted or if a new strategy may be necessary.
- c. Repeat the process of barrier identification and problem-solving.
- d. Make any changes that are required. Engage technical expertise as necessary.
 - Always check work completed by technical expertise to ensure that the modifications have been constructed as required. It is helpful to meet onsite during the construction period to offer further clarification in order to avoid misunderstandings.
- e. Return to the household for another monitoring visit and repeat process as required.

Annex One: How this learning resource was developed

As part of the RIWASH 3 project being implemented in Jaffna District, World Vision together with CBM Australia engaged with Engineers without Borders Australia, Agile Development Group and Northern Province Consortium of the Organisations for the Differently Abled (NPCODA) to identify strategies to improve WASH access at household level for people with disabilities. Together the organisations trialled, documented and compiled strategies for addressing household-level barriers to WASH access, between January-April 2018 in Jaffna District.

Field visits

The trials took place in 17 households of people with disabilities and their families from Jaffna District, including four people with high support needs and/or incontinence. During home visits, the team and participants explored barriers to accessing water, hygiene and sanitation and came up with cost-effective strategies to remove or reduce these barriers.

Human centred design workshop

Fourteen people with disabilities attended a two-day Human Centred Design Workshop facilitated by Engineers Without Borders and Agile Development Group to develop cost-effective and locally sourced solutions to current access barriers to the existing water points and toilets of participants. On the second day, Technical Officers from the Provincial Government and World Vision Lanka attended to provide technical input around the viability and technical design of some of the ideas generated at the workshop.

Consultation with government staff, DPOs and social service workers

Meetings were held on the first and last day of the trip to learn from the experience from government and community stakeholders and ensure that activities aligned with local priorities.

Engagement of local business/skills

The project drew on the services of a local carpenter, welder, mason and plumber to construct the designs recommended throughout the visit. The labour costs of the tradespeople were covered by the project, as well as the material costs such as concrete, galvanised steel, piping and timber. Through DeafLink, a local DPO, five local tailors were engaged for sewing and product design services, including production of incontinence products. The DeafLink tailors had an essential role in advising on locally available materials and developing product designs.

