Chapter 9

Case studies

The case-studies in this section are examples of real life situations. The disabled people concerned found the ideas described helpful for them. However, it is not suggested that they would be suitable for everyone.

Where appropriate, the drawbacks of particular facilities or equipment have been identified, and improvements suggested that would make them more suitable for a wider range of users.

Angela Martin

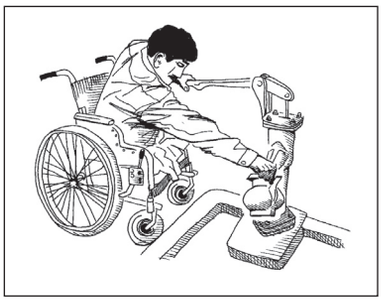


Figure 9.1. Spout and handle at 90° make it easy to pump and hold a water container at the same time.

9.1 Wheelchair user's handpump and toilet (Example 1)

Mohammed Ramizuddin Miah is 35 and lives with his wife and children in a rural village in Tangail District, Bangladesh. He was previously an agricultural worker; now he is a poultry trader.

Five years ago both his legs were amputated above the knee. He uses a wheelchair to move around the family compound. He can get in and out of his wheelchair independently.

Accessible handpump apron

Description

- A square concrete apron is bounded by a low concrete wall. The handpump is installed next to the edge of the apron, suitable for use by a person standing or seated near the ground.
- Pump handle and spout are at 90° to each other.
- A low concrete sitting platform is constructed on the apron edge.

Figure 9.2. Ramizuddin operates the handpump from his wheelchair.

Dimensions

- Apron: 135cm x 135cm;
- Height of boundary wall from apron: ~10cm; height from surrounding ground: between 5cm – 20cm (the ground is uneven).
- Platform: L: 38cm x W: 38cm x H: 17cm.

Approach

- Located ~3m from the kitchen. A smooth earth path leads to a level area next to the apron.
- Ramizuddin maintains the path by annually replacing any earth that is eroded by rain.

Use

- Ramizuddin wheels to the edge of the apron in his wheelchair, pumps water with one hand, into a jug held in the other hand.
- He can also get down from his wheelchair onto the low sitting platform and pump water from the platform, especially when water is for use at the pump. He sits on the platform to bathe himself or his children, or to wash clothes or dishes.

Figure 9.3. Sitting on low concrete platform to bathe.

Key features

- One basic design with minor adaptations for individual households/ users, e.g. the dimension and location of the platform can be changed.
- Proximity of a water source to the house reduces the time spent fetching water by the whole family, and also reduces the need to carry and store water.
- Level ground allows the wheelchair to wheel right up to the edge of the apron.
- Pump spout and handle at 90° allow user to pump and collect water at the same time.
- The pump can be used from a chair or from low concrete platform, i.e. sitting or standing.
- Minimal additional cost compared to a standard concrete apron.

Suitable for

- Users with good sitting balance, but with difficulty squatting or bending, e.g. wheelchair/crutch users, frail elderly people.
- Users with strong enough arms to lower themselves to the sitting platform.
- The whole family, no separate facility is needed. The platform is convenient for other family members, e.g. women washing clothes or bathing children.

Unsuitable for

- People with poor sitting balance. People with weak arms, weak or stiff legs would need help lowering themselves onto the low platform and back.

Figure 9.4. Raised brick toilet platform with inset PVC pan.

Pour-flush latrine with raised sitting platform

Description

- Brick built structure with smooth cement- plastered walls and tin roof. Smooth concrete floor. Holes high in the wall for ventilation and light. A tin door on a wood frame opens outwards. A chain on the inside of the door hooks over a nail to keep the door closed.
- A commercially available PVC toilet pan is set into a cement-plastered brick platform, constructed the full width of the cubicle. Two raised concrete blocks on each side of the toilet pan are for sitting on.

Approach

- ~5m from the house via an earth path. There is a level area in front of the door. The toilet floor is only 1-2cm above the surrounding yard. (Ramizuddin regularly replaces any earth washed away by rain).

Support features

- Two horizontal handrails are cemented to the side walls, one on each side of the platform.

Dimensions

- Internal: L: 180cm, W: 106cm.
- Entrance W: 90cm.
- Handles: 20mm Ø g.i. pipe, L: 45cm, H: 74cm.
- Toilet seat: W: 106cm, D: 74cm, H: 42cm (same as wheelchair seat).
- Gap between sitting blocks: 27cm.

Use

- Ramizuddin enters the latrine in his wheelchair, closes the door by turning slightly in the chair (which he finds awkward). With the wheelchair facing the toilet, he moves across onto the sitting blocks, holding the handrails for support. When finished, he transfers back to his chair and reverses out of the toilet.

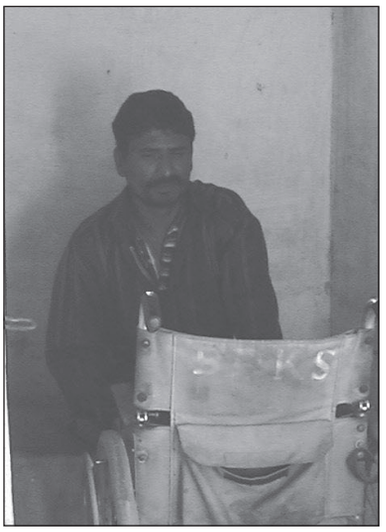


Figure 9.5. Transferring from wheelchair to toilet.

Key features

- Durable. Materials are available locally.
- The basic design is adaptable to suit individual needs, e.g. the location of handrails.
- The entrance is wide enough for a wheelchair to enter.
- Height of platform is suitable for wheelchair transfer.
- Twin sitting blocks are convenient for anal cleansing.
- Handrails provide support for balance while transferring onto toilet.
- Light, well ventilated, easy to keep clean – pleasant for all the family to use.

Drawbacks and comments

- High cost. Reducing the width of the platform would reduce the quantity and cost of materials used.
- The concrete absorbs urine and is unhygienic, so it would be better to paint it for moisture resistance, making it easier to keep clean and hygienic.
- The door is difficult to close from inside in a wheelchair.
- The cubicle is too narrow to turn the wheelchair, so Ramizuddin must reverse out. A wider cubicle would allow space to turn, and to shut the door more easily.
- Handrails on side walls would be too wide apart for many users, and could instead be fixed to the floor, or a rope hung from a roof beam.
- No water for cleansing. User must carry water from the hand pump.

Suitable for

- People with difficulty squatting; wheelchair users; people with some sitting balance.

Unsuitable for

- People who need a support person to help them, as there is not enough space.

Benefits

Self-reliance and independence: According to a neighbour, Ramizuddin used to be very dependent on his wife, which prevented her getting on with her work and caused tension between them. He is now no longer dependent, and tension between them has reduced.

Ability to contribute to the family: Ramizuddin can now contribute to household chores, by washing clothes, dishes, bathing the children.

Time-saving: Before the well was built, his wife spent at least an hour a day collecting water from neighbours' wells. (He didn't contribute to this). She now spends the time saved on other economic activities, including going out to work. The new latrine is also more comfortable and less work – it is easier to keep clean than their old pit latrine.

Status in the community: Not only family members but also neighbours and passers-by (around 15-20 people a day) use the toilet and well (the house is near the road). This means extra cleaning, which he and his wife share, but Ramizuddin not only doesn't mind, but feels proud to provide this community service.

Process for obtaining adaptations/external support

Bangladeshi Protibandhi Kallyan Somity (BPKS), a national cross-impairment DPO in Bangladesh, implemented an Accessible Tube-well and Sanitary Latrine Programme for families with a disabled member. The criteria for selecting beneficiaries were severe disability and poverty. Local disabled people's groups of NDPO (Nagarpur Disabled People's Organization to Development) held discussions among their members to decide who would benefit first from the project. Members in this group agreed that Ramizuddin fitted the criteria, and would benefit the most.

The total cost was 9,000 taka (~ 150 US dollars). BPKS paid 7,000 taka ($117); the family paid 2,000 taka ($33). The family also bears the cost of maintenance. Ramizuddin thinks the money was a good investment, because the family is economically better off than before.

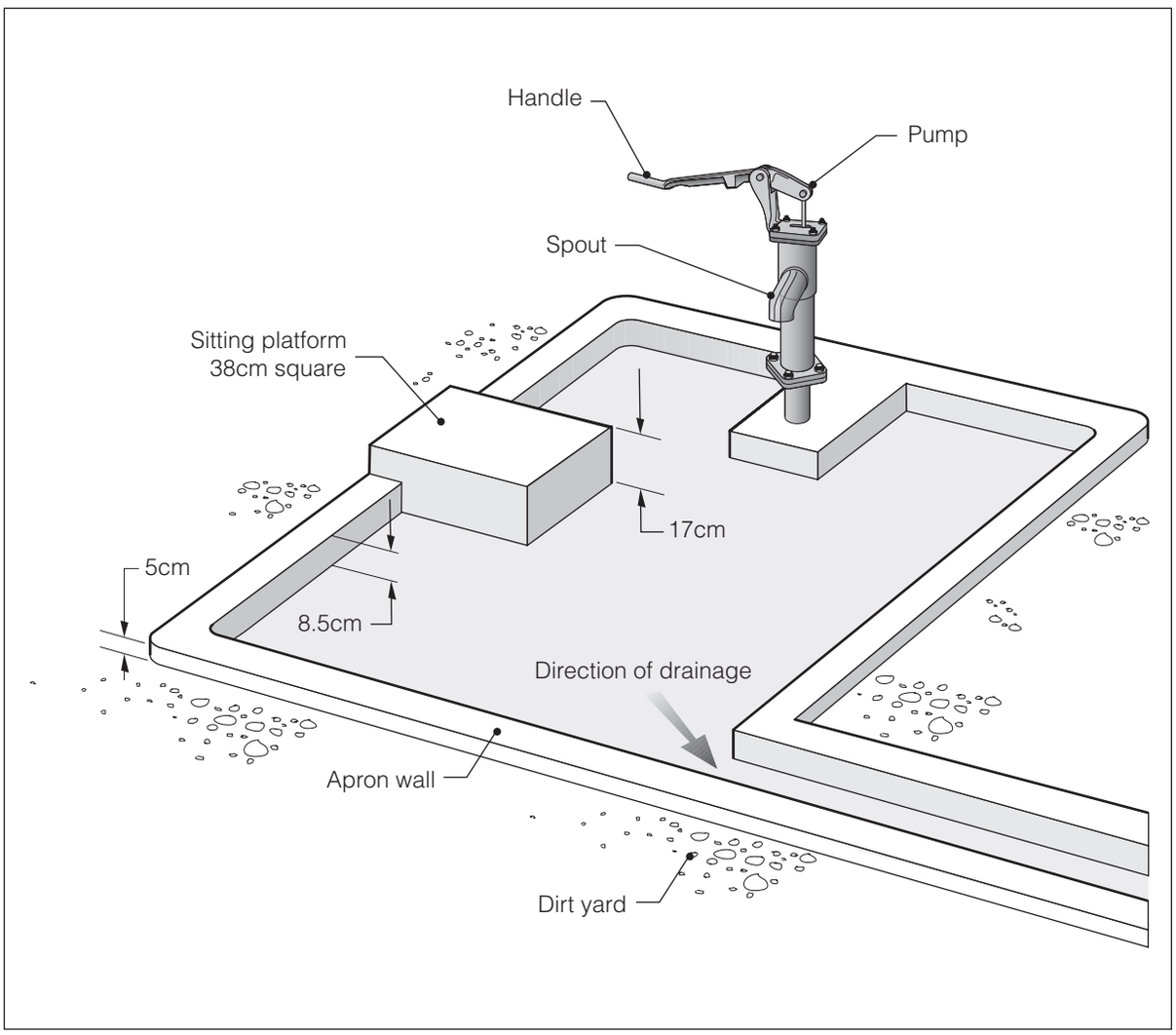
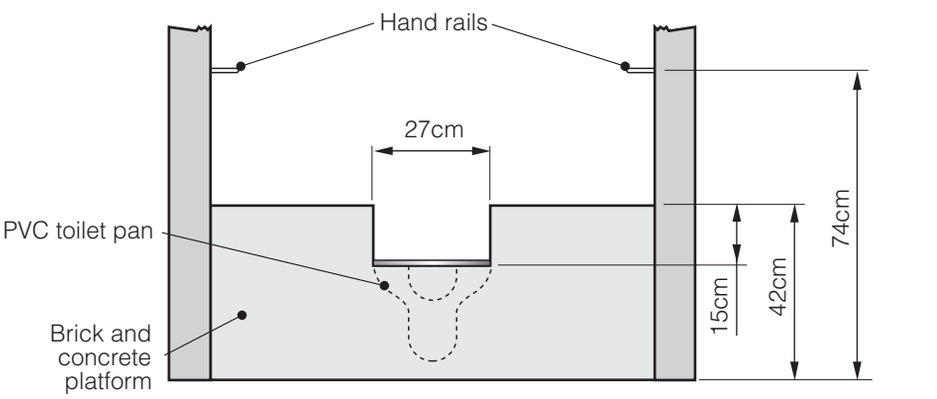
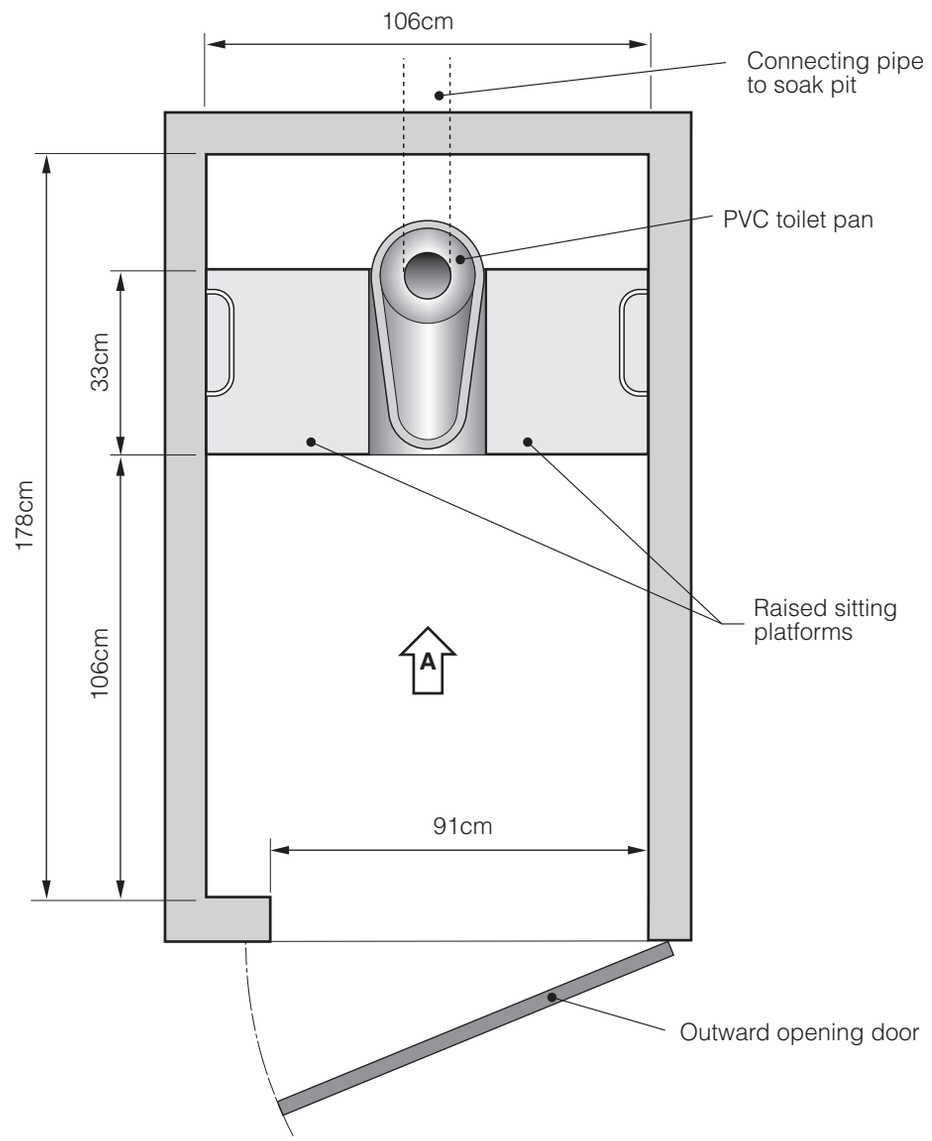


Figure 9.6. Handpump apron with sitting platform.

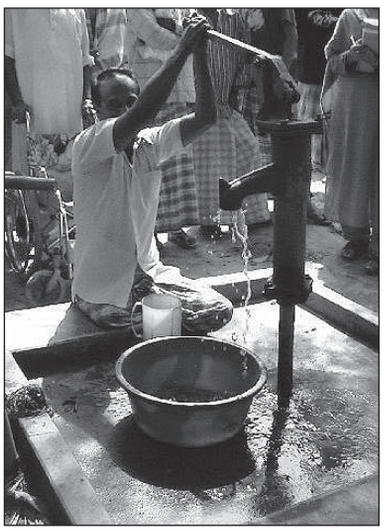


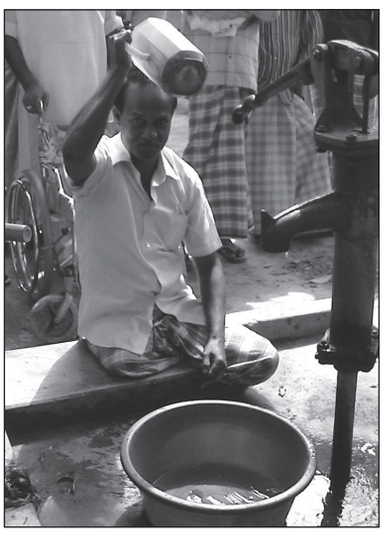
View on arrow A



Plan view of toilet cubicle

Figure 9.7. Pour-flush latrine with raised sitting platform.





Figures 9.8 and 9.9. Mofizuddin sits on low platform to pump water and bathe or wash clothes.

9.2 Wheelchair user's handpump and toilet (Example 2)

Mr Mofizuddin is 45 and lives with his wife Bibi Hawa in a rural area in Tangail District, Bangladesh, in a compound shared by his extended family. The family business is poultry raising, and Mofizuddin makes bamboo household items. He has four children.

Both his legs have been amputated, and he has several fingers missing on each hand. He moves around outside the house using his wheelchair. He can get in and out of his chair independently.

Accessible handpump apron

Description

- This is similar to the handpump apron in 9.1, with some minor differences of dimension and design.
- Two concrete sitting platforms are constructed on the edge of the apron.
- The pump is installed so that the handle can be reached by Mofizuddin when sitting on a low platform.

Dimensions

- Apron: 135cm x 135cm; height of boundary wall from apron: ~10cm; from the surrounding ground: 5cm – 20cm. Sitting platforms: L: ~30cm, W: 80cm, H: 10cm.

Approach

- A smooth earth path leads to a level area next to the pump.

Use

- Mofizuddin parks his wheelchair on the edge of the apron, gets down onto the sitting platform. He pumps water into a container placed on the apron in front of the platform. He bathes in this position.

Key features

- A basic design with minor adaptations to suit individual users, e.g. dimension and location of platform and pump.
- The level ground allows a wheelchair to wheel right up to the edge of the apron.
- Proximity of water source to the house reduces the time spent by the whole family fetching water and reduces the need to fetch and store quantities of water.

Figure 9.10. The pump is easy for the rest of the family to use.

Figure 9.11. Entering the toilet in wheelchair.

- The pump can be operated from sitting on the low platform or from standing.
- Two sitting platforms allow more than one person to use the apron at the same time, e.g. women washing clothes or bathing children.
- Minimal additional cost compared to a standard concrete apron.

Suitable for

- Users with good sitting balance, but with difficulty squatting, bending, e.g. wheelchair/crutch users.
- Users with strong enough arms to transfer from wheelchair to platform.
- Whole family, no separate facility needed. Concrete platform convenient for other family members, e.g. women washing clothes or bathing children.

Unsuitable for

- People unable to sit without support.
- Users with weak arms/legs would need help transferring from wheelchair to low platform.

Pour-flush latrine with raised sitting platform

Description

- Same design as in Section 9.1.

Drawbacks and comments

- Others bring water for Mofizuddin to wash himself. He intends to arrange water storage inside the latrine, e.g. in an overhead tank, so that he would not need to ask others to fetch water for him.

Benefits

Before, Mofizuddin used a bed-pan. The latrine is much more comfortable and convenient to use.

Three people in his immediate family use the latrine. The toilet pan has a water sealed trap, and the latrine is well ventilated, so there is no bad smell, and the latrine is therefore pleasant for all to use.

His wife has benefited in particular. The new latrine is easy to keep clean. It is much less work and more pleasant than emptying and cleaning a bed-pan, which was an unpleasant and tedious job.

Time-saving: Previously his wife spent an hour and a half a day fetching water. The pump has saved her a lot of time.

After the well was found to be arsenic contaminated, his brother installed another tube-well about 5m away. He copied the idea of the low concrete platform for the new apron, because the rest of the family, especially the women, found it comfortable and convenient.

Process for obtaining adaptations

Both latrine and tube-well were provided by a local branch of BPKS. Mofizuddin, his wife and other members of the family were involved in discussion about their requirements from the facilities. For example, the BPKS project officer sat down and discussed step by step his requirements for the tube-well and latrine: How would he move from the chair to the toilet pan? What height should handrails be? etc.

The total cost was 9,000 taka (~150 US dollars*). Mofizuddin paid 2,000 taka ($33); BPKS paid the rest. Maintenance of both facilities are his responsibility, e.g. replacing parts of the pump.

* @ US$1 = 59.49 Bangladesh taka, at time data collected.

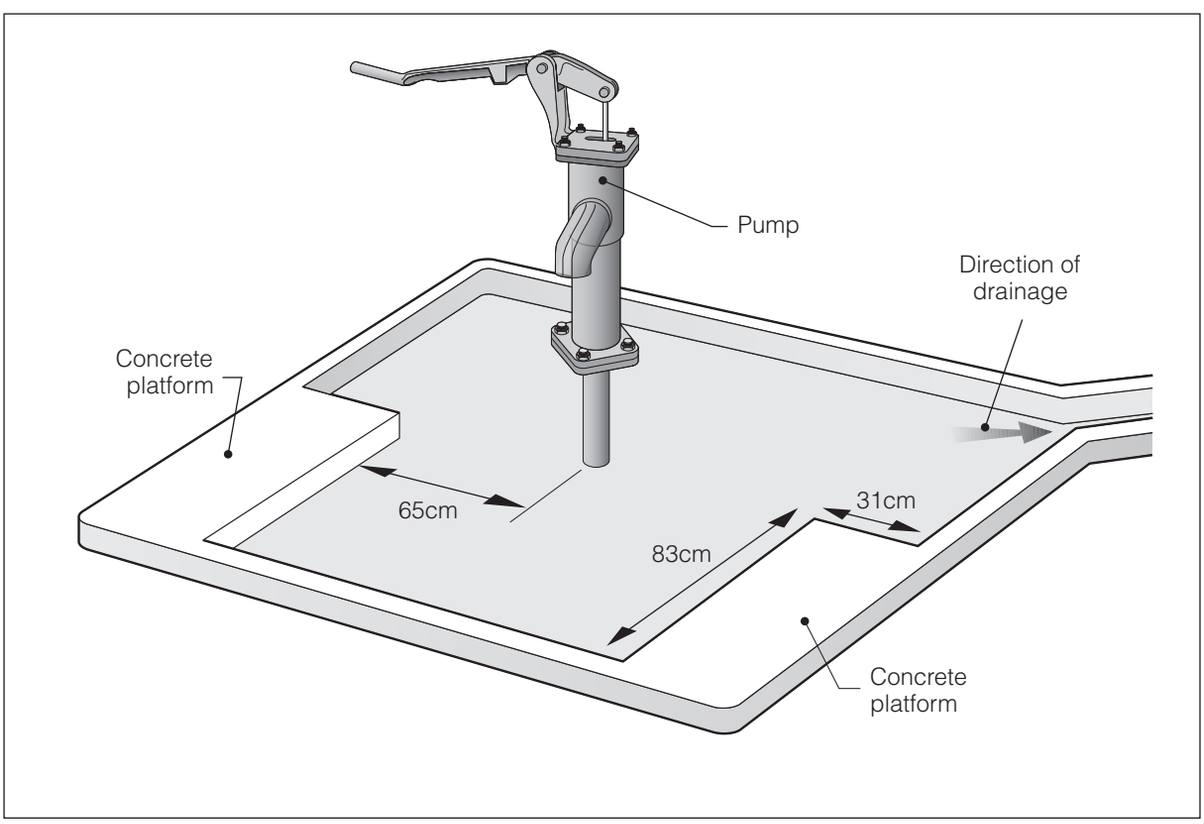


Figure 9.12. Handpump apron with two sitting platforms.

Figure 9.13. Handpump with wide concrete apron for easy wheelchair access on three sides.

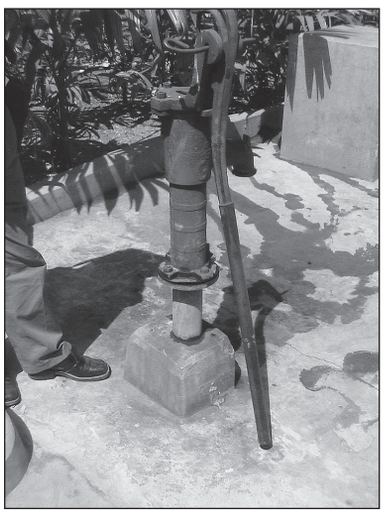


Figure 9.14. Water drains away from the apron.

Figure 9.15. A wheelchair user operating the handpump from his wheelchair.

9.3 Handpump, bathroom/laundry and toilet for wheelchair users

The Centre for the Rehabilitation of the Paralysed (CRP) in Dhaka, Bangladesh, provides treatment and rehabilitation mainly for people with spinal cord injuries. After treatment and before returning home, patients spend 15 days at CRP's transit hostel. They practise using the kind of facilities they will use when they go home, with supervision and advice from therapists.

Handpump with wide concrete apron

Description

- The handpump is surrounded by a wide concrete apron, with enough space to allow wheelchair access from three sides. A concrete ramp leads onto the apron. The drainage slope is in the opposite direction to the approach ramp.
- The pump handle has an extension to make it longer than normal.

Dimensions

- Pump handle L: 105cm.

Use

- The user can wheel right up to the pump in a wheelchair, pump water and hold a water container at the same time, whilst sitting in the wheelchair.

Key features

- The pump handle and spout are at 90° to each other, which makes it easy to pump water and hold a container at the same time.The lengthened pump handle gives more leverage for pumping.The concrete ramp onto the apron makes wheelchair access easy.

Suitable for

- All users, especially wheelchair users.

Drawbacks and comments

- The large area of concrete is expensive.
- The longer pump handle means larger action needed when pumping – difficult for those with limited arm movement.

Figure 9.16. Concrete laundry slab located on edge of handpump apron.

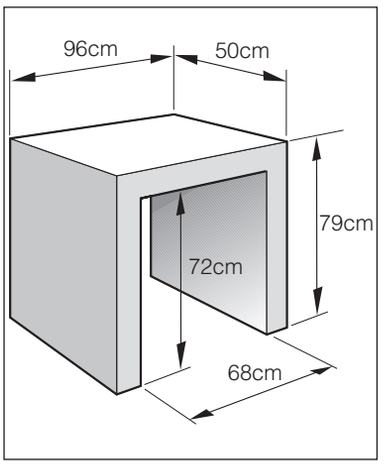


Figure 9.17. Dimensions of laundry slab.

Figure 9.18. Multi-purpose bathroom with toilet in corner.

Concrete slab for washing clothes

Description

- Brick-built, cement-plastered structure. One is located outside near the handpump, another in a bathroom near a tap.

Dimensions

- H from ground to underside of horizontal slab: 72cm.W of knee hole: 68cm.

Use

- A wheelchair user can sit to wash clothes.

Key features

- Users can stay in their wheelchair and get close enough to the slab, with their knees under the shelf.

Drawbacks and comments

- Locating the slab next to a water source would avoid the need to fetch water from the water source.

Suitable for

- Wheelchair users, people who prefer to sit on a chair to wash clothes, crutch users and others with difficulty bending.

Multiple use bathroom

Description

- Brick-built, with cement-plastered walls and a smooth concrete floor.
- A pour-flush toilet is installed in one corner of the room. The ceramic toilet pan is level with the floor. A horizontal handrail is attached to one wall beside the toilet.
- Water is piped to an inside tap.

Approach

- A concrete approach path level with the bathroom entrance. Double doors open inwards.

Dimensions

- 200cm x 184cm; Entrance W: 90cm.
- H of tap: ~50cm.
- Handrail: 35mm o/s Ø g.i. pipe; H: 80cm.

Use

- To bathe: the bather enters the room in his wheelchair, replaces his wheelchair cushion with a tyre inner tube (see below). He fills a bucket with water from the tap and scoops water over himself with a mug.
- To use the toilet, he either transfers from his wheelchair to a toilet chair placed over the toilet hole, or positions his wheelchair over the toilet, and uses it as a toilet chair.

Key features

- The entrance is smooth, level and wide enough for a wheelchair to enter.
- There is enough space inside for a wheelchair to enter and turn, and for a helper. The toilet pan in the corner and the double doors also reduce obstruction.
- There is space beside the toilet to move the toilet chair to one side after use.
- The smooth concrete floor is easy to keep clean.
- The internal water source means there is no need to carry water for bathing.

Drawbacks and comments

- High cost.
- The smooth floor may get slippery and become unsuitable for crutch users and others who are unsteady on their feet.
- A lower or diagonal handrail would provide support for a person squatting on the toilet.

Suitable for

- Whole family.

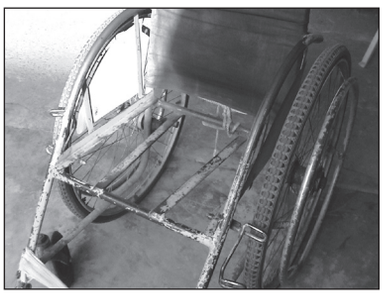


Figure 9.19. Wheelchair with cushion and seat board removed.

Wheelchair convertible to a bathing seat

Description

- The wheelchair has a removable seat board and cushion. These are replaced by a small tyre inner tube, which is supported on two metal struts, but with a wide enough gap for drainage.

Use

- The bather enters the bathroom in the wheelchair, replaces the seat with the inner tube, which he or she sits on while bathing.

Figure 9.20. Tyre inner tube in place.

Key features

- Inner tubes are durable, easy to clean, and hygienic, and are widely available at reasonable cost.
- The user does not need to transfer out of the wheelchair to bathe.
- The chair back and side-rails help support bathers with poor balance.

Drawbacks and comments

- High cost.
- The wheelchair gets wet, which could contribute to corrosion of the frame.
- The bather needs to move his or her weight off the seat to swap the inner tube, so may need help to do this.

Suitable for

- Users with poor sitting balance, but with some arm strength.

Benefits

Benefits are indirect and long-term. Disabled people who spend time at the transit hostel get ideas to use when they return home, like Mr Bakul (Section 9.5).

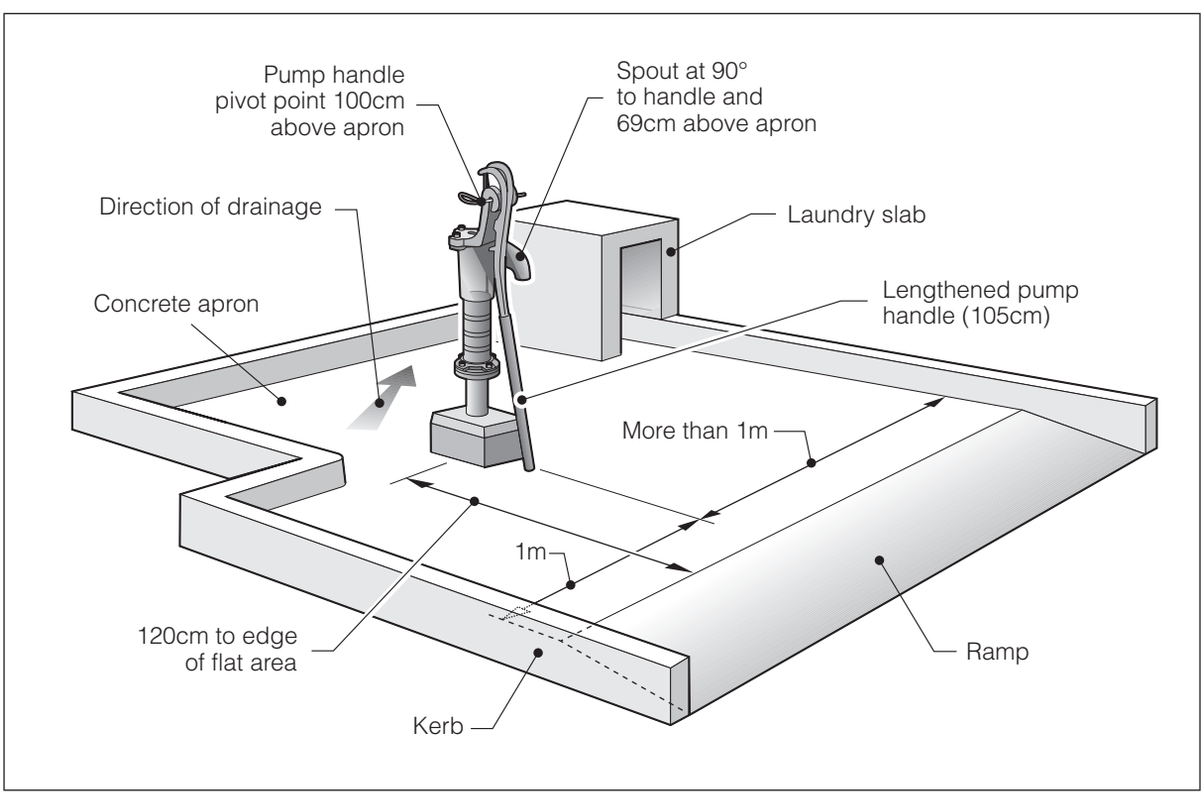


Figure 9.21. Layout of CRP handpump apron.

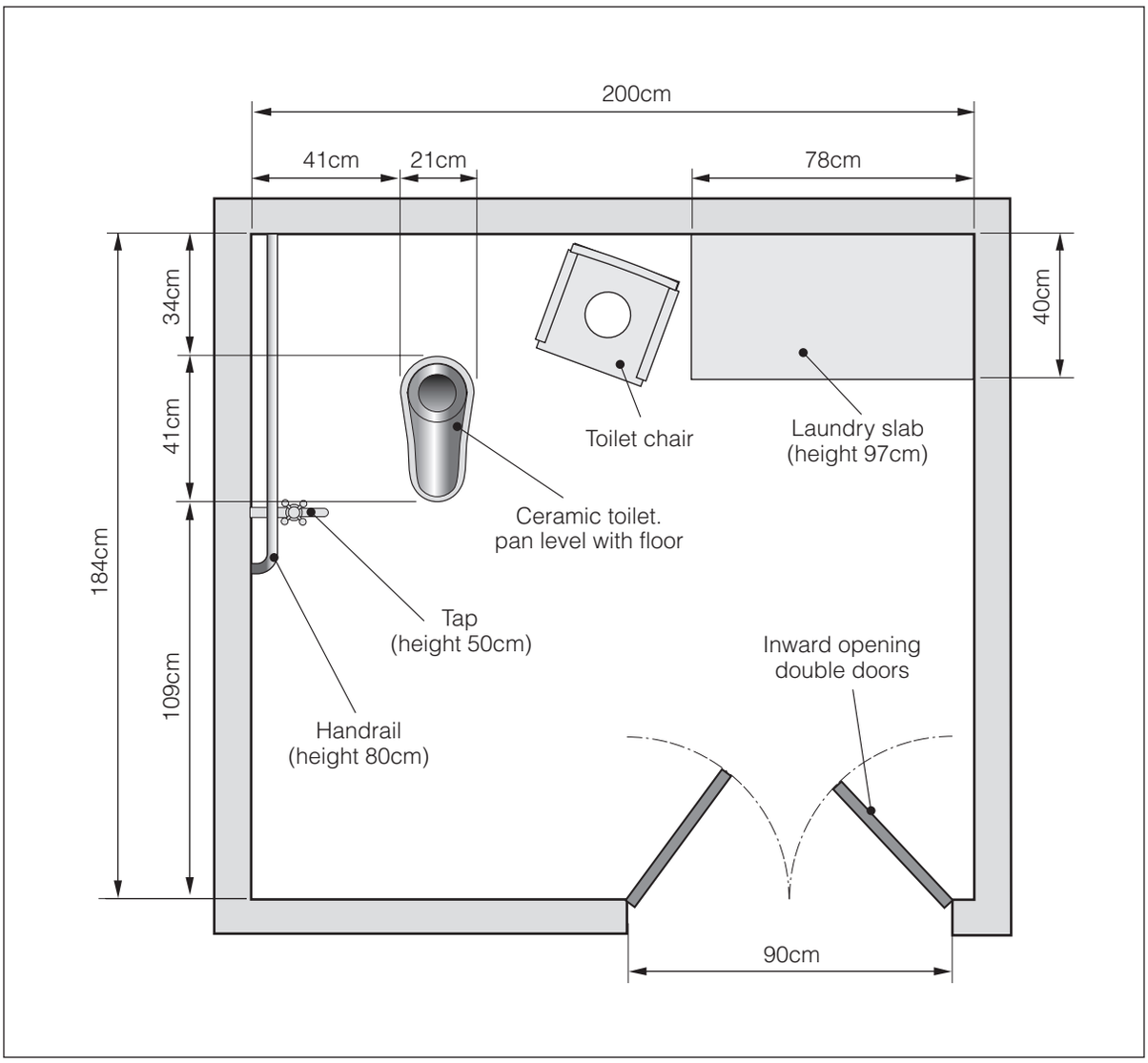


Figure 9.22. Dimensions and layout of CRP multiple use bathroom.

9.4 Bathroom/ laundry and toilet for wheelchair and crutch users

CRP Women's Hostel is in a peri-urban area 30km from the centre of Dhaka city. Disabled women stay here to learn vocational skills. The facilities aim to be of a similar standard to the average household in Bangladesh, but accessible, so that the women learn to cope with such facilities independently. Two women staying at the hostel showed how they used the facilities.

Ms Fatema Akhter Popi is 20 and a trainer in tailoring. Both her legs are weak: she can move around slowly in a squatting position, but mostly uses a wheelchair. She can get from her wheelchair to the floor and back again.

Ms Anwara is 15, and is learning embroidery. She has a mild impairment in her left leg, and walks with a limp. She does not need to use a wheelchair.

Figure 9.23. Bathing and laundry room

Figure 9.24. Flood prevention threshold has been rounded for easier wheelchair access.

Multiple use bathroom/laundry room

Description

- Corrugated tin walls and roof on a wooden frame. The floor is smooth concrete. The tin door opens inwards. Water is piped to an inside tap.

Dimensions

- Overall: L: 270cm, W: 145cm.
- Door W: ~90cm; Tap H: 1 metre.

Approach

- Along a concrete path level with the bathroom floor. A flood prevention threshold is rounded and minimised to make it wheelchair accessible.

Use

- Popi enters in her wheelchair, and transfers to a low stool in front of the tap and bucket. To bathe, she uses water straight from the tap, or fills the bucket which stands under the tap. She uses a plastic jug with a handle to scoop water over herself.
- She washes clothes directly on the floor.

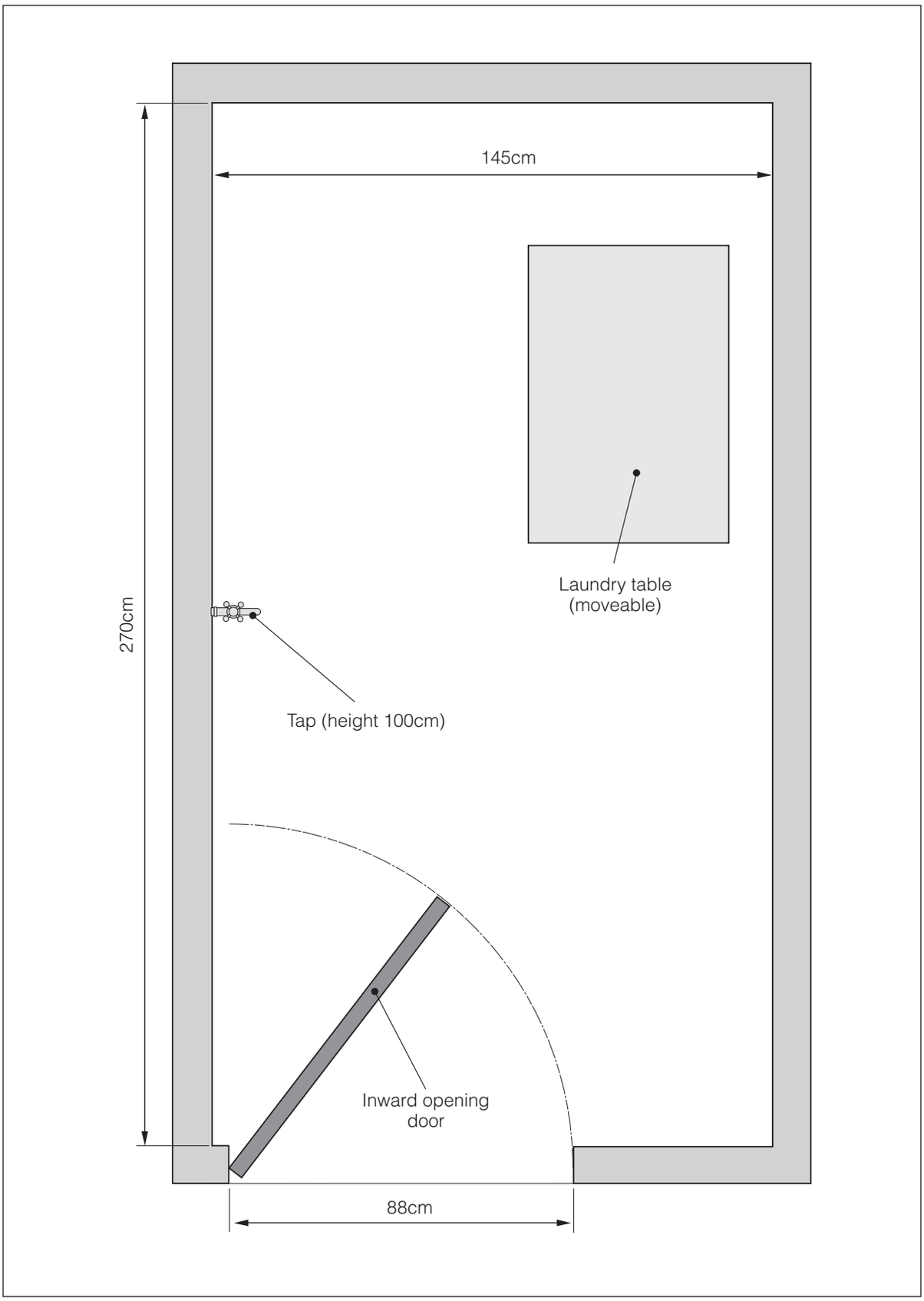


Figure 9.25. Layout of laundry/bathroom.

Key features

- The entrance is wide and smooth enough for a wheelchair to enter.
- There is space inside for a wheelchair to turn, and for a helper.
- The internal water point means there is no need to fetch water for bathing.
- The tap can be operated either from a wheelchair or from floor level.

Drawbacks

- High cost of piped water and concrete floor.

Floor-level washing up sink

Description

- In one corner of the concrete floored kitchen is a floor-level rectangular trough or sink, formed by a low cement-plastered brick wall. There is a tap over the sink. Water drains to the outside through a hole in one corner of the sink (Figure 9.26).

Dimensions

- Sink area: W: ~ 60cm, D: 40cm.
- Low wall: H: 12cm, W: 12cm.

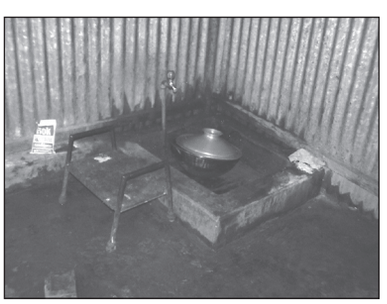


Figure 9.26. Floor level washing up sink with low concrete wall.

Approach

- Smooth concrete floor level with concrete path outside.

Use

- Popi enters the kitchen in her wheelchair, which she parks near the sink. She transfers to sit next to the sink (Figure 9.27) on a low stool (Figure 9.29).

Figure 9.27. Popi sits on a low stool to wash dishes.

Key features

- The user is raised off the floor, which prevents her clothes getting wet and dirty.
- Concrete is durable and easy to clean.
- The sink could also be used from a low trolley (Figure 7.54) or other low mobility devices.
- The tap means there is no need to carry water.

Drawbacks

- Many people find it difficult to lower themselves and get up again.

Figure 9.28. Popi sits on metal framed stool to bathe.

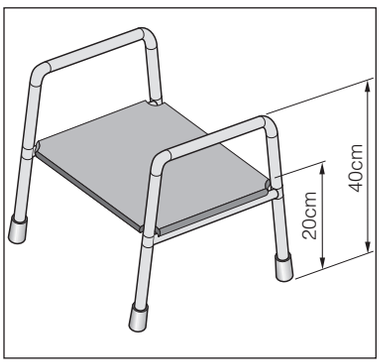


Figure 9.29. Metal-framed low wooden stool.

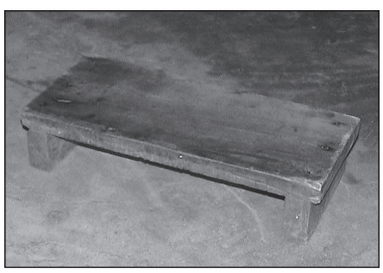


Figure 9.30. Low wooden stool.

Figure 9.31. Popi sits on a low stool to wash laundry.

Assistive devices - Metal framed stool

Description

- Low metal-framed stool with a wooden seat

Dimensions

- Seat H: ~20cm; side-rails H:~40cm.

Use

- For bathing: bather sits on the stool in front of the tap and bucket. She places her clothes on laundry table to keep them dry while bathing.
- For washing dishes: user sits on the stool on the edge of a floor level washing up sink (Figure 9.27).

Key features

- Durable materials; easy to clean.
- Side-rails provide stability and extra support to the user, and also allow the seat to be easily picked up and moved with one hand.
- The bather is comfortable – not sitting in dirty water.
- The low height is convenient for a wide range of low-level tasks, including using a bucket or bowl on the floor.

Drawbacks and comments

- Metal frame is high-cost.
- Strength and balance are needed to transfer to/from stool.
- The stool is constantly wet, so a painted seat would help resist moisture and slow down deterioration.

Suitable for

- People with good sitting balance.

Low wooden stool

Description

- Low wooden stool which is only slightly higher than if the user were squatting

Dimensions

- L: ~30 x W: ~15 x H: ~10cm.

Use

- Popi sits on the stool to wash clothes at floor level.

Figure 9.32. Washing clothes on the laundry bench.

Key features
- Durable, low-cost, locally available.
- When washing clothes, the stool prevents the user's clothes getting wet and dirty.

Drawbacks
- Very low - difficult to get up and down from.

Suitable for
- People with good sitting balance, including children.
- Widely used by non-disabled people in Bangladesh to carry out floor-level tasks.

Assistive devices used – laundry table

Description
- Laundry table with metal frame and aluminium top.

Dimensions
- H: ~60cm.

Use
- The user sits on the table and washes clothes on the table beside her. It is also used by bathers to put their clothes on while bathing.

Key features
- Durable, locally made.
- There is enough space on the bench for the user to have all the equipment she needs beside her.
- The user is raised off the floor, which prevents her clothes getting wet and dirty.
- The table could also be used for other tasks.

Drawbacks and comments
- High cost.
- Takes up a lot of space.
- The user has to twist the upper body to one side to wash clothes (Figure 9.32), which may be difficult for some disabled people.

Suitable for
- People with good sitting balance.

Figure 9.33. Bakul sits in his wheelchair to bathe. Note toilet pan in the corner on the right.

9.5 Wheelchair user's bathroom with toilet

Mr Aziz Ahmed Chowdhury (Bakul) lives in a rural area of Moulavibazar District, Bangladesh. He is 38, unmarried, and economically quite well off.

He is paralysed below the waist due to a spinal cord injury, and cannot walk or stand. He uses a wheelchair for mobility inside and outside the house. His upper body is strong – he can transfer from his wheelchair to bed or bench and back again. He employs a support worker.

Bathroom used with a convertible wheelchair

Description

- Brick-built structure with cement-plastered walls and a smooth concrete cement screed floor which is painted.
- A water flush toilet is located in one corner of the room. The ceramic toilet pan is installed level with the floor. Water is piped to an inside tap.

Approach

- A concrete approach path is level with the bathroom entrance.

Dimensions

- Overall: L: 226cm; W: 178cm.
- Doorway W: 71cm (this is less than usually recommended, but suited this user and his particular wheelchair).
- H of tap: 92cm.

Use

- Bakul enters in his wheelchair, and replaces his wheelchair seat with a tyre inner tube.
- To bathe: He fills a plastic bucket on the floor with water from the tap and scoops water over himself with a mug.
- To use the toilet: he positions his wheelchair over the toilet pan and urinates or defecates directly into the toilet beneath.

Key features

- The entrance is smooth, level and wide enough for a wheelchair to enter.
- The toilet pan in the corner allows enough space inside for a wheelchair to enter and turn, and for a support person.

Figure 9.34. Bakul positions his wheelchair over the toilet.

- The door hinge next to the wall allows the door to open flat against the wall, also minimising obstruction.The smooth painted floor is easy to keep clean.The internal water source means there is no need to fetch water for bathing.

Drawbacks

- High cost.
- The water flush system depends on piped water.

Suitable for

- Whole family – no separate facility is needed.

Unsuitable for

- Crutch users and others who are unsteady on their feet as the smooth floor is slippery when wet.

Comments

Bakul's support worker washes his clothes for him. If the bathroom had a raised washing shelf or slab, he could wash his own clothes.

A flexible plastic hose attached to the toilet tap could enable him to carry out anal cleansing more easily.

Benefits

His support worker, Ismail, said that when Bakul had no assistive devices he spent at least three hours a day on support tasks. Now the time taken is half that.

Process for obtaining adaptations

The bathroom was designed according to Bakul's requirements after his accident. He got the idea from CRP and Comfort Nursing Home, Dhaka.

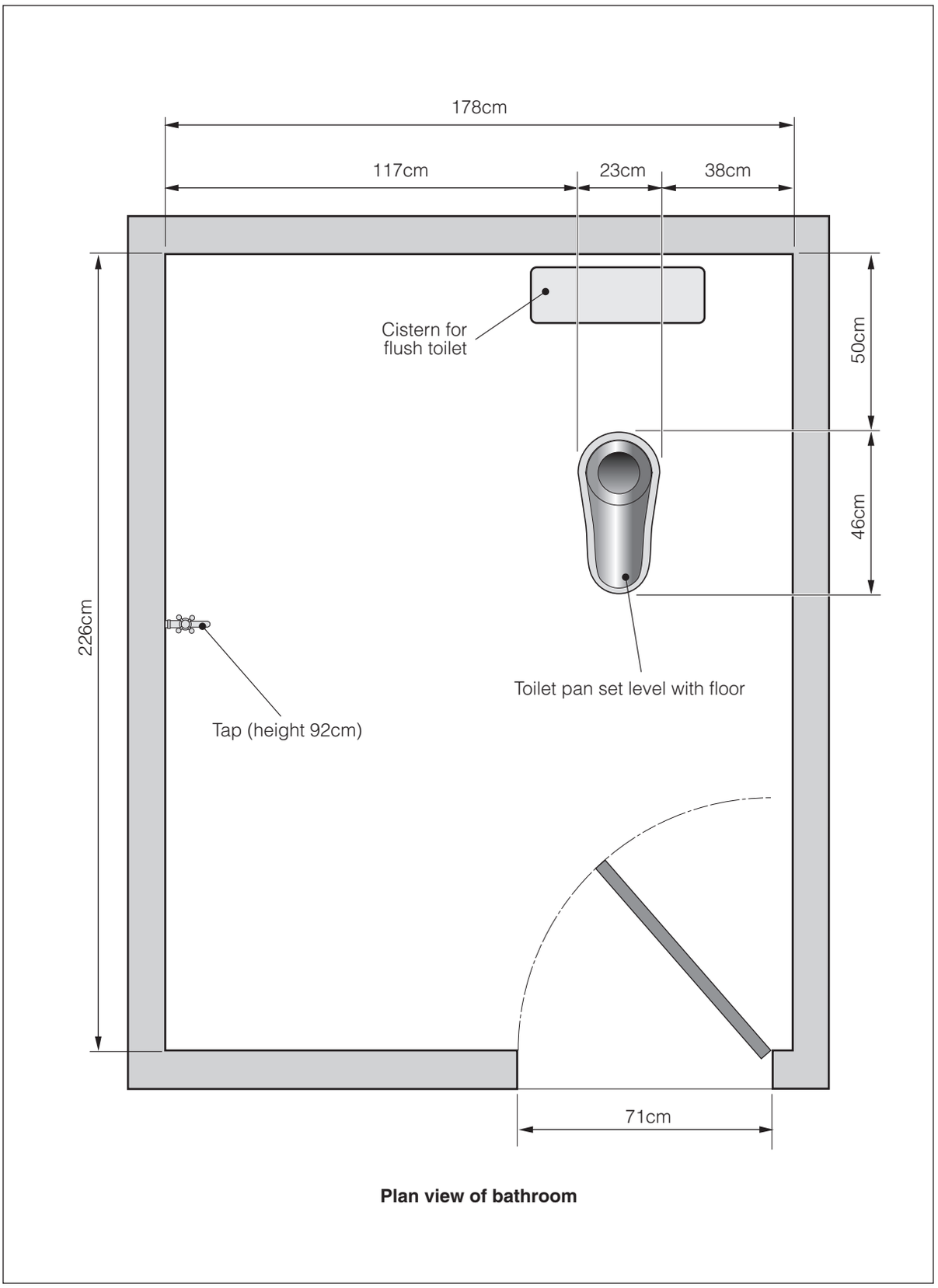


Figure 9.35. Dimensions of Mr Bakul's bathroom/toilet.

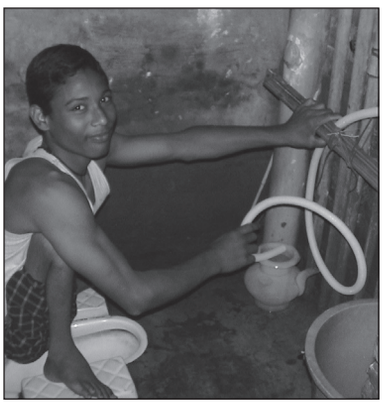


Figure 9.36. Ibrahim holds on to the wooden bar for support.

9.6 Support bar for young man with difficulty squatting

Ibrahim is 16 and lives with his sister-in-law and her family in a 5th floor apartment in a peri-urban area of Dhaka, Bangladesh. Both his legs are weak as a result of polio. He walks using both his hands and feet and has very strong arms and shoulders as a result. He can get up and down the five flights of stairs in this way. He keeps his wheelchair, which he uses for going outside, locked up at the bottom of the stairs.

The apartment has piped water and a toilet/ bathroom. The pour-flush toilet has a ceramic pan with footplates for squatting.

Figure 9.37. Close-up of wooden bar.

Description

- A horizontal wooden bar is tied with string to existing vertical pipes against the wall in front of the toilet.
- A hose is attached to the bathroom tap.

Dimensions

- H of bar: ~70cm

Use

- Ibrahim holds the wooden bar with one hand, while he squats to use the toilet.
- He uses the hose to fill a water jug on the floor with one hand, while holding the wooden bar for support. He then holds the jug on the floor leaning on it for support, whilst tipping water into his other hand, which he uses for anal cleansing.

Figure 9.38. Filling the water container with one hand.

Key features

- Low/no cost wooden bar and string.
- Ibrahim decided on the height of bar most suitable for him.

Drawbacks and comments

- There is no choice of distance for the bar – it would be more comfortable for Ibrahim if the bar were nearer.

Suitable for

- Person crawling or shuffling.
- People who can squat but need support, e.g. frail elderly people, people with weak legs, poor co-ordination or balance, pregnant women.
- People who can grasp a rail.

Benefits

Before, Ibrahim had to place both his hands on the toilet floor to balance, which was difficult and made his hands wet and dirty. Now he can keep his hands clean.

Process for obtaining adaptations/external support

Centre for Services and Information on Disability (CSID) is a local DPO with a CBR programme in the Dhaka slums. A CBR worker visited Ibrahim and suggested adapting the toilet in this way.

Additional information/comments

Based on his own experience, Ibrahim often makes suggestions to other children about how to make their toilet comfortable for their needs. For example, for children who have difficulty using their family's *hanging latrine* (see Figure 2.8 for an example) he suggests adding a handrail or a seat for support. These ideas could be suitable not only for children like himself, but also for other people such as amputees.

Before intervention by CSID, he earned a living by begging. He has since received training in leatherwork, and now makes key-rings, purses, etc., to sell.

Angela Martin

Figure 9.39. Miraz holds the rope to squat.

Figure 9.40. Rope hanging from roof beam.

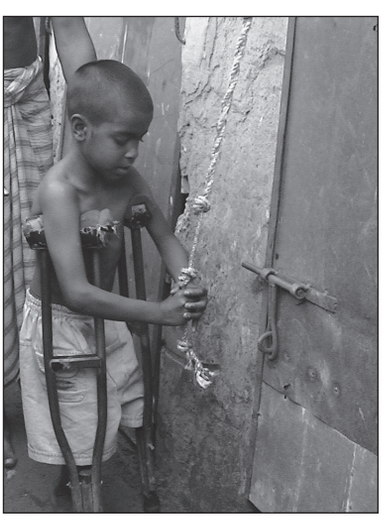


Figure 9.41. Miraz holds the rope as he hops into the toilet.

9.7 Support rope in communal latrine for child using crutches

Mohammed Miraz Hawlader is 8 and lives with his parents and baby sister in a slum area of Dhaka, Bangladesh. Miraz's left leg is bent and weak and he cannot stand on it. His upper body and arms are strong. He uses crutches to get around, or hops.

The family use a communal latrine 30m away from their one-roomed living space.

Description

- A row of brick-built latrines with a tin roof and door. The floor is smooth concrete, which is slippery when wet. Two brick footplates 30cm apart are for squatting. The floor slopes towards a hole in the back wall, through which the waste slides out into an outside drain.
- In one cubicle, a sisal rope hangs from a roof beam above the latrine door, to within 40cm of the ground. It is knotted at intervals to prevent Miraz's hands slipping when he holds it.

Use

- Miraz carries a water jug, which he fills with water at the handpump near the latrine. He takes this to the toilet with him. He holds the rope as he hops into the latrine and while he squats. He puts all his weight on his strong leg, and the rope helps him balance. He then uses the water in the jug for anal cleansing.

Key features

- Low-cost rope, locally available.
- The rope takes up no space; it can be hooked out of the way when not in use so as not to inconvenience other users.

Drawback and comments

- This solution is only possible where a strong overhead beam is available.
- There is no roof beam directly above the toilet, so the rope hangs from a beam over the door. This pulls Miraz slightly off-balance when he holds the rope. Also the rope could get caught in the door and become damaged.
- It would be more comfortable for Miraz if the rope hung directly above the toilet. A handrail fixed to the wall could provide support to Miraz and to other users as they enter the toilet.

Suitable for

- People who can squat but need support, e.g. frail elderly people, people with weak legs, poor co-ordination or balance, pregnant women.
- People who move by crawling or shuffling.
- People with good grip to hold a rope.

Benefits

Before the rope, Miraz used to support himself on his hands. It is not a sanitary latrine, and this was uncomfortable, unpleasant and unhygienic. He prefers using the rope: it's more comfortable, squatting while hanging onto the rope doesn't hurt his leg, and he can keep his hands clean.

Before, his mother used to go with him to the toilet and hold him while he squatted. Now he can go by himself, which saves her time and energy.

Process for obtaining adaptations

Centre for Services and Information on Disability (CSID) is a local DPO with a CBR programme in the Dhaka slums. A CBR worker visited the family and provided the crutches, and suggested the rope. Miraz tried it in different positions until they found which worked best.

Figure 9.42. Shathi in her padded chair with a tray.

9.8 Commode chair for child with no sitting balance

Shathi is aged 9, and lives with her parents and three sisters in one room in a slum area of Dhaka, Bangladesh. She has cerebral palsy, with both legs severely affected. She is unable to stand or walk, but can sit with support. Her hands can grip.

Shathi's mother, Mrs Rasheda, is her sole carer. She used to work in a garment factory, but had to give up work to take care of Shathi when she was born. She spends twice as much time looking after Shathi as her other children. For example, feeding and drinking take about an hour, toileting takes about 20 minutes, and so on.

Shathi has a special supporting chair with a tray, where she sits to eat and drink and play (Figure 9.42). It supports her head and she can easily move her mouth, so food does not fall down. In this position, she can drink water by herself if her mother puts a mug of water in her hand.

Figure 9.43. Metal commode chair.

Commode chair

Description

- A commercially available metal commode chair with a plastic inset toilet pan. A 'collecting bowl' attaches to the outlet pipe of the pan, which is removable for emptying and cleaning.

Support features

- For additional support, the family have added a wooden plank to the chair back, and attached an elastic belt to the back of the chair, which ties round Shathi's waist.
- Also, a plastic covered sitting ring stuffed with straw is placed on the seat for extra padding.

Key features

- Metal is very durable and easy to clean.
- Commercially available locally.
- The chair can be placed in the most convenient location, inside or outside.
- Shathi sits on the toilet without support of a carer, and can be left in privacy if desired.
- The plastic covering makes the ring easy to clean.

Drawback and comments

- High cost (500 taka = US $8.4).
- A seat with side-rails would provide more support.
- Metal is hard and uncomfortable.The sitting ring often slides out of place.

Suitable for

- People unable to squat, but with some sitting balance, e.g. wheelchair users, frail elderly people, people with weak legs, poor co-ordination or balance, pregnant women.

Benefits

Before, Mrs Rasheda had to help Shathi to go to the toilet into a drain behind the house, and support her the whole time. The toilet chair is more hygienic and more comfortable. Also, Mrs Rasheda now spends less time, energy, and effort than before. The saved time is very important for her – she now has time to take Shathi to the therapy centre and for other domestic work. Sometimes she works in her vegetable garden, which is a source of family income, and of better food.

Before getting the padded chair it was difficult to feed Shathi.

Shathi used to lie on the bed, and her mother would be afraid she would fall off, so someone always had to keep an eye on her. Now if Mrs Rasheda wants to work outside, she sits Shathi outside in the chair, and can keep an eye on her while she works. This also has social benefits. Other children who are passing stop to chat and play with Shathi.

Process for obtaining adaptations

CSID provided all the special equipment – the special chair and table, and the toilet chair – about 8-9 months ago. The family adapted the toilet chair themselves.

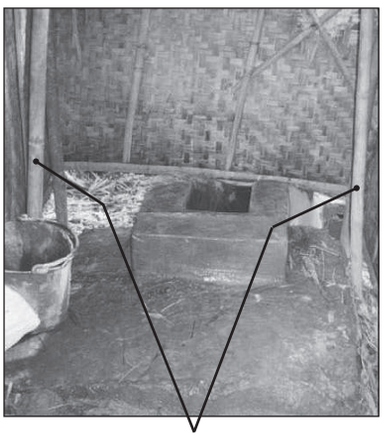


Figure 9.44. Vertical bamboo support poles one on each side of the concrete slab. (CRP)

9.9 Latrine support poles for child with difficulty squatting

Miss Nasima Akter Tinni is 9, and lives with her family in a rural village in Moulavibazar District, Bangladesh. Both Tinni's arms and her right leg are weak because of cerebral palsy. She can walk, but carefully, as she often falls over. Her grasp is weak.

Bathing

Tinni bathes in a pond, except in the rainy season. There is a fixed horizontal bamboo rail leading into the pond, supported by two vertical poles inserted into the ground. She holds this rail to get down to the pond, with support from her brother or other children. She scoops the pond water while standing holding the rail. She has a long-handled bath brush, which she uses to wash her back.

In the rainy season when the path to the pond is too muddy, Tinni bathes in front of the house.

Latrine support poles

Description

- The family latrine is in a bamboo-screened cubicle with a bamboo door and no roof.
- The concrete latrine slab has a rectangular raised squatting plate. The surface is rough.
- Two bamboo poles are stuck vertically into the ground, one on each side of the concrete slab.

Approach

- Located ~20m from the house along an earth path, which slopes gently to ~5cm below the edge of the latrine slab.

Dimensions

- Overall internal: 82cm x 84cm.
- Entrance W: 82cm.
- Distance between the edge of the raised squatting plate and poles: R: 23 cm, L: 18cm (no reason is given for the difference).

Use

- Tinni enters the toilet unaided. She holds one pole with each hand while squatting on the toilet. In the rainy season the path becomes slippery, so she needs help walking to and from the toilet.

Key features

- Low/no cost bamboo.

Drawbacks and comments

- A narrower latrine slab would allow the support poles to be located nearer the user, as in Figure 9.45.
- A lower squatting plate would reduce the risk of Tinni falling and hurting herself.

Suitable for

- People who can squat but need support, e.g. people with weak legs, poor co-ordination or balance, pregnant women.
- People who can grasp a pole.

Benefits

Before, Tinni's mother had to hold her while she squatted, otherwise she risked falling. Now she does not need to do this, which has reduced the amount of time she spends each day caring for Tinni.

Process for obtaining adaptations/external support

Occupational therapists from CRP visited the family and gave them advice and design ideas, such as the bamboo support poles in the toilet and pond. The family provided materials and labour.

Figure 9.45. Bamboo support rail.

9.10 Latrine support rail for frail elderly man

Mr Mohammed Ramiz Miah is 65 and lives in a rural area of Moulavibazar District, Bangladesh. He had a stroke five years ago, and since then he has gradually become weaker. He cannot stand or walk independently, so family members usually support him.

Latrine support rail

Description

- The family latrine is behind the house, with leaf screen walls, no roof and no door. The latrine slab is a commercially available round concrete slab with raised footplates.
- A handrail has been constructed by sticking two bamboo poles vertically into the ground in front of the slab. A third pole is tied horizontally between the two vertical poles.

Dimensions

- Pole L: 60cm, H: ~50cm from the surface of the slab.

Approach

- Along an uneven brick laid path.

Use

- Mr Ramiz holds onto the horizontal pole for balance while he squats.

Key features

- Low/no cost materials.

Drawbacks and comments

- A walking stick or other support device would enable Mr Ramiz to get to the toilet independently. Horizontal support rails on both sides of the slab would enable Mr Ramiz to step onto the slab unaided.

Figure 9.46. Mr Ramiz demonstrates the use of the handrail.

Suitable for

- People who can squat but need support, e.g. frail elderly people, people with weak legs, poor co-ordination or balance, pregnant women.
- People who can grasp a pole.

Unsuitable for

- People unable to squat, people lacking or with weak grasp.

Benefits

Before, Mr Ramiz needed support from his wife while squatting on the toilet. Now he can squat independently without relying on a family member to stay with him the whole time.

Process for obtaining adaptations/external support

A CRP occupational therapist visited Mr Ramiz Miah several times, and made suggestions for adaptations. The family paid for and implemented the adaptations themselves.

Figure 9.47. Ratchet and pawl lifting device.

9.11 Ratchet and pawl water-lifting mechanism for man with one arm

Mr Ath lives with his wife and four children in a rural village, which is one hour by ox-cart or 20 minutes by motorbike from the main road. They have lived here five months. Mr Ath was injured by a landmine when he was in the army. His left hand has been amputated and he has only his thumb and two fingers on his right hand. He is also blind in one eye. This has not prevented him building his new house, and digging and constructing (with his brother's help) his family well and water-lifting mechanism.

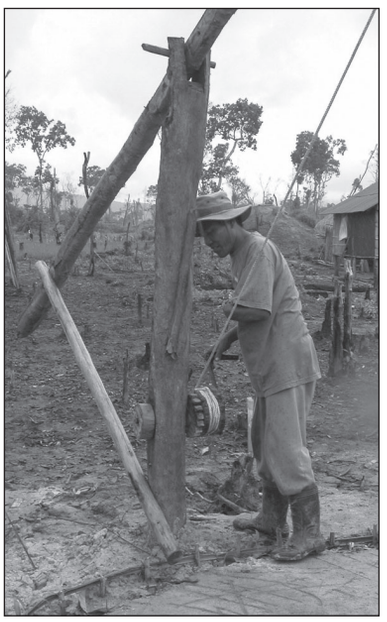


Figure 9.48. Mr Ath turns handle of winding mechanism to lower and lift bucket.

Shallow well with ratchet and pawl lifting mechanism

Description

- The shallow well is concrete lined, with a concrete platform surround sloping away from the well, and a drainage outlet.
- The lifting device is made from a wooden cantilever frame overhanging the well. A rope passes through a small pulley suspended over the well to a ratchet and pawl (winding and locking mechanism) attached to the upright of the frame. A bucket is suspended by the rope over the well.
- The winding mechanism consists of a rope wound round a wooden core, which rotates around a metal spindle. A metal handle is attached to the core. The locking mechanism consists of a ratchet (like a cog) carved from wood, with a metal pawl (bar or large nail) which engages with the notches to prevent onward movement.

Approach

- The well is ~20m from the house along a rough earth path.

Dimensions

- See Figure 9.51.

Use

- Using one hand, Mr Ath removes the pawl and turns the handle of the ratchet to lower the bucket into the water to fill it, then turns the ratchet to raise the bucket.

Figure 9.49. Ratchet and pawl locking mechanism. The metal pawl is engaged with the notches of the ratchet to prevent onward movement.

- When the bucket is clear of the well wall, he uses his stump to flip the pawl to engage with the notches of the ratchet, which locks it, so that the bucket is suspended above the well. He walks to the well, pulls the bucket and rope over to the outside of the well, and pours the water into another bucket placed beside the well.

Key features

- Adapted by Mr Ath to suit his needs, based on a cantilever design widely used locally.
- The winding and locking mechanism are made from local wood and a few pieces of metal.
- The cantilever takes the weight of the water, so both disabled and non-disabled users avoid rope-burn on their hands.

Drawbacks and comments

- Wooden ratchet wheel sometimes loses its teeth. It would be more durable if it were made in metal.

Suitable for

- Users with one arm or weak grip; wheelchair users.
- A child, with a smaller water container.
- Locking mechanism could benefit non-disabled people for use with deep wells.

Other water issues

Carrying water

Usually Mr Ath carries two buckets using a wooden yoke across his shoulders. He hangs two full 20-litre buckets from the yoke by a piece of knotted rope tied to their metal handles. He then lifts the yoke and buckets onto his shoulder and carries them to the house.

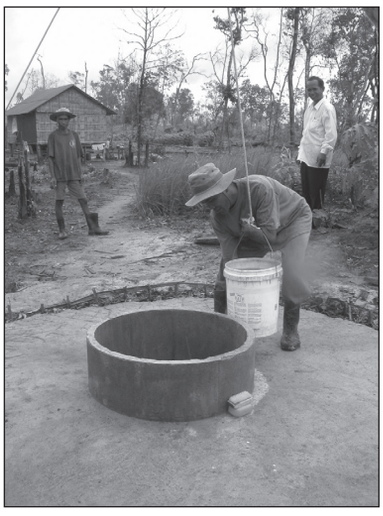


Figure 9.50. Lifting the bucket over the well wall.

Watering the garden

Carrying two buckets of water on the yoke, he uses a mug to scoop water over plants. He would prefer a watering can, but cannot afford one at the moment.

Bathing

The family all bathe next to the well by scooping water from a bucket to pour over themselves using either a plastic cup or a bowl. Mr Ath is able to bathe using his one hand, but to wash his right arm thoroughly he asks for help from his wife, or he uses the upright pole of the lifting mechanism to rub his arm against after splashing water on it.

Disposal of wastewater
In the dry season, they dig a hole and pour wastewater into it, plus any waste vegetable matter, ash, etc. When it is full they plant a mango tree on it.

Benefits

Before, drawing water from a shallow well was sometimes difficult for Mr Ath as the rope burned across the stump of his arm. This is why he designed this new lifting device.

His wife, Mrs Phoun, said she finds this well easier to use than a hand-over-hand well, where the rope can burn your hands. If a smaller bucket is used, a child can use the lifting mechanism.

She is excited and proud that her husband constructed the well. It is something that many non-disabled people could not do.

Process for obtaining adaptations

The village of Veal Thom is a community of disabled people and their families, established in 2000 by Save Cambodian Disabled People's Association (SCDPA). SCDPA is an NGO set up to help former soldiers disabled by conflict, and other disabled people, and their families. The land for the village was donated to SCDPA by the government. The land is divided into individual plots, which are allocated to disabled people and their families to live on and to cultivate. There are over 200 families now living there.

Only the land is provided by SCDPA. Families dig their own well, build their own house and grow their own food. Those who are very needy may be provided with rice and other donations while they get settled.

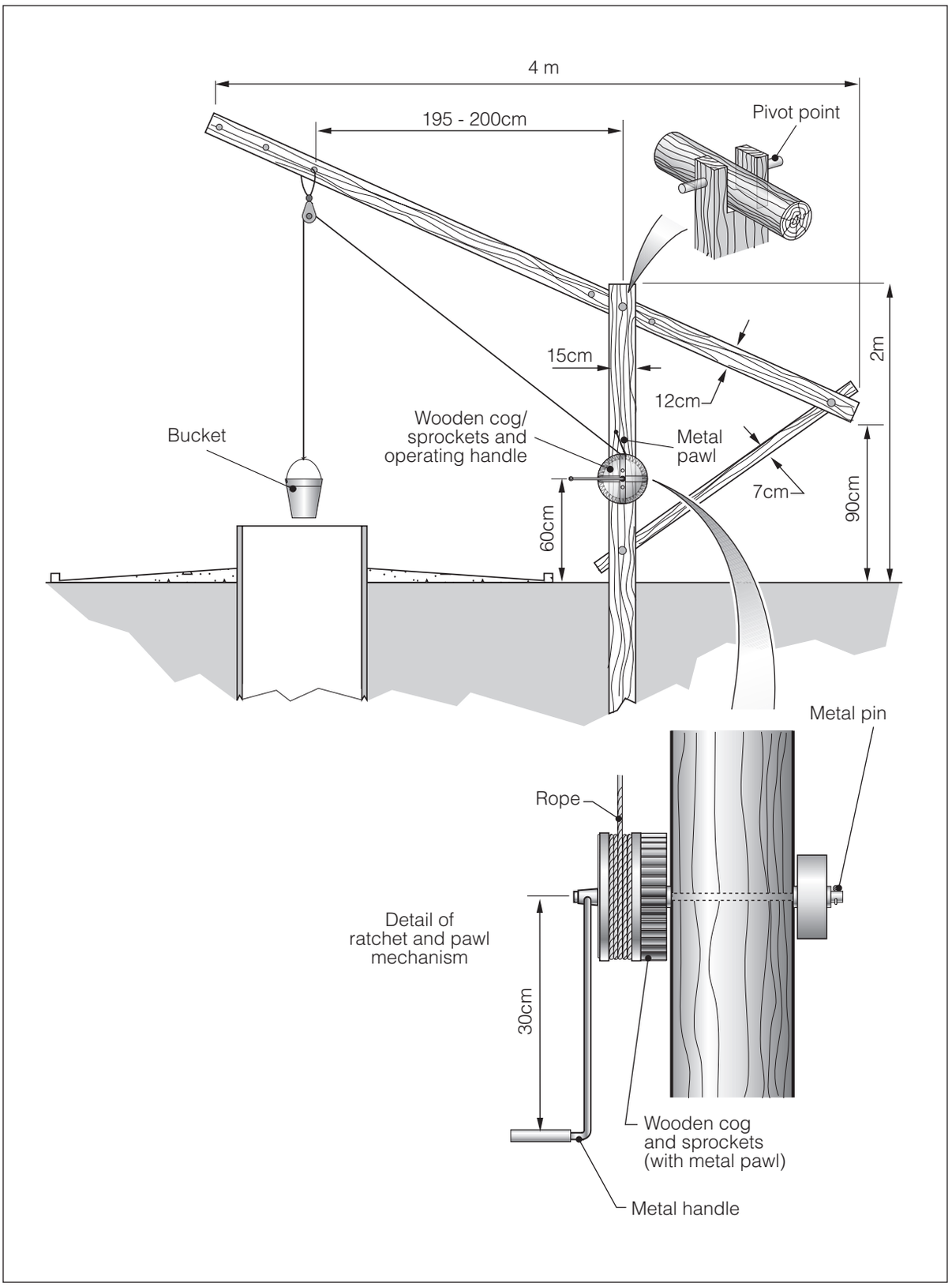


Figure 9.51. Well with ratchet and pawl lifting mechanism.

Figure 9.52. Locally made wood and metal pulley.

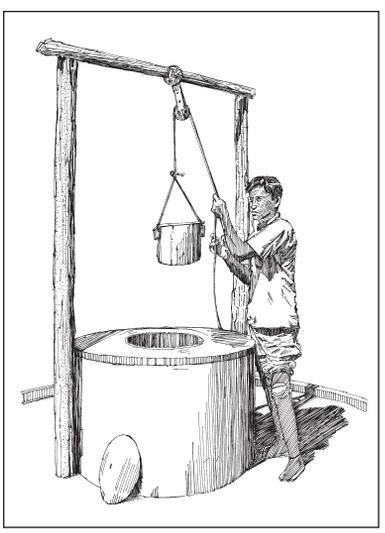


Figure 9.53. Mr Tu lifting water.

Figure 9.54. Bamboo dish drying rack.

9.12 Rope and pulley water-lifting mechanism for man with one leg

Mr Tu Chen is a 40-year-old farmer who lives with his wife and 12 children in a rural village in Siem Reap Province, Cambodia. Mr Chen lost one leg below the knee when he stepped on a landmine not far from his village. He has an artificial leg and appears to manage most activities well.

Description

- Shallow household well with a concrete apron around it. A rope and pulley are suspended from a wooden frame over the well. The frame is two upright poles with one horizontal pole nailed between them. The pulley is locally made: a wooden roller and spindle through a piece of flat metal bent as a hanger. At the top of the flat metal hangers is a hook which is tied to the horizontal bar of the frame using rubber rope (made from old inner tubes).

Dimensions

- H of frame ~2m.
- H of well wall: ~80cm.
- Water container: ~5 litres.

Approach

- Located 10 – 20m from the house.

Use

- A rope passes from Mr Chen's hand through the pulley and is attached to an old metal kettle (~5 litres). This is dropped into the well and used to draw water by pulling on the rope. Water from the kettle is poured into a larger bucket for carrying to the house.

Key features

- Proximity to the user's house makes it an easy distance to walk to fetch water.
- The pulley means less strength is needed to lift the same quantity of water.
- Could be operated from a standing or sitting position – no need for the user to bend over the side of the well.
- The pulley is simple and locally made.
- Any size of container could be used.

Drawbacks

- The locally made wooden pulley is not as good as the original pulley.

Suitable for

- People with little strength, e.g. elderly, children, those with weak grip.

Process for obtaining adaptations

Social workers from Siem Reap Provincial Rehabilitation Centre referred Mr Chen to the Jesuit Services, an NGO which gives priority to the poorest, and had a programme to install wells in the local area. The Jesuit Services provided the concrete well rings and Mr Chen hired someone to dig the well.

Figure 9.55. Treadle pump.

Figure 9.56. Mrs Nourn operates the treadle pump with her feet.

Figure 9.57. Mr Lann operates the pump with his hands.

9.13 Treadle pump for man with one leg and his blind wife

Mr Lann Khorn and Mrs Nourn Sariam live on a small island accessible only by boat, in Kandal Province, Cambodia. They have three children.

Mr Lann has impairments as a result of leprosy (now cured). His right leg has been amputated below the knee and he wears an artificial leg. He has recently had surgery on the other foot, so was wearing a plaster cast at the time of interview. Both hands are bent and stiff in a claw shape. He still manages to undertake quite intricate work such as maintaining his pump.

Mrs Nourn is blind. She manages daily tasks well around the house and compound, but to go across the island she needs one of her children to go with her.

Description

- The treadle pump frame is made of wood, with the upright pillars of concrete. The downward movement of the wooden beams is softened by a flip-flop cut in half and placed on the wooden 'stopper' bar.

Dimensions

- See Figure 9.60.

Use

- The pump is designed to be operated with the feet by pushing down on two long pieces of wood, which rotate about a pivot point. The rising and falling wood pulls and pushes on a plunger, which works with a valve to pump water.
- Water is pumped into open metal buckets (~15l). Mrs Nourn listens for the sound of water overflowing the bucket to let her know when to stop pumping.

Approach

- Located in the family compound ~5m from the house via a path of packed earth.
- An area with brick-laid hard-standing is constructed in front of the pump to improve drainage and reduce slipperiness. The area is screened with plastic sacking.

Key features

- The pump can be operated using either feet or hands.

Figure 9.58. Spare parts for the pump.

- Initial cost and maintenance costs are lower than for a UNICEF installed handpump at the nearby school (an India Mark II).
- Simple technology, easy for user to maintain as moving components are above ground. Moving parts can be easily removed and replacements purchased cheaply locally.

Suitable for

- Children can use the pump easily.

Drawbacks

- Requires a lot of user effort to pump for the amount of water produced.
- It operates as a suction pump, so is only suitable for shallow water table areas, as it can only pump from a maximum depth of 7m.

Figure 9.59. Sand water filter.

Water filter

Description

- Concrete vertical sand water filter.

Use

- Well water is poured into the top and filtered water trickles into another bucket below the spout. This is used for drinking. The filter materials are removed and cleaned once or twice a month.

Benefits

Time saved: Before installing the pump, the family water source was the river, 15 minutes walk away on the other side of the island. The slope to the river was steep and slippery (especially in the rainy season) and the water turbid. It would take Mrs Nourn a whole morning to fetch 4 x 15l buckets of water. One of the children (then aged 1½) always had to guide her there and back.

Now, both husband and wife can draw water independently from the pump, and save a lot of time. They have a lot more water, in much less time.

Improved health: In the past, the family were often sick with stomach aches and diarrhoea. Since starting to use the water filter the couple have noticed a clear improvement in their family's health. For example, their son was often absent from school because of illness; now he is rarely sick, so goes much more regularly to school. Also, they have more water which they can use when growing vegetables and fruit; they wash their vegetables, so they are cleaner before eating them.

Improved finances: Because they are sick less often, they save money which they would have spent on medicines. They can now afford school fees, and to pay for transport for the children to go to school.

Mr Lann and Mrs Nourn can now grow vegetables and keep chickens. They have earned enough money from one season of vegetable growing to recover the cost of the pump. In the future they would like to also connect a hose-pipe to be able to water their vegetable garden.

Reduced workload for the children: The son would get upset when asked to guide his mother to the river, because he would rather play with his friends. Now that the mother can draw water without a child to guide her, all the children can go to school, and they have free time to play.

Increased self-reliance and role in the community: Mr Lann watched carefully when they installed the pump, as he knew he would need to repair the pump himself. He now maintains the pump himself, replacing valves and pipes. He also mends his neighbours' pumps and receives payment in cash or in rice. They hold spare parts at home which they buy from local suppliers (Figure 9.58).

Process for obtaining adaptations

The borehole and pump were provided in 1999 by a Japanese NGO called International Volunteers of Yamagata (IVY).
Mr Lann and Mrs Nourn were considered a priority because of their impairments, so were the first to receive a borehole, but eventually all the neighbours also got their own boreholes and pumps.

IVY drilled the borehole and provided the initial materials for the treadle pump, but the family paid for the materials. The family completed the pump installation themselves following instructions provided by IVY.

Adapted from IDE

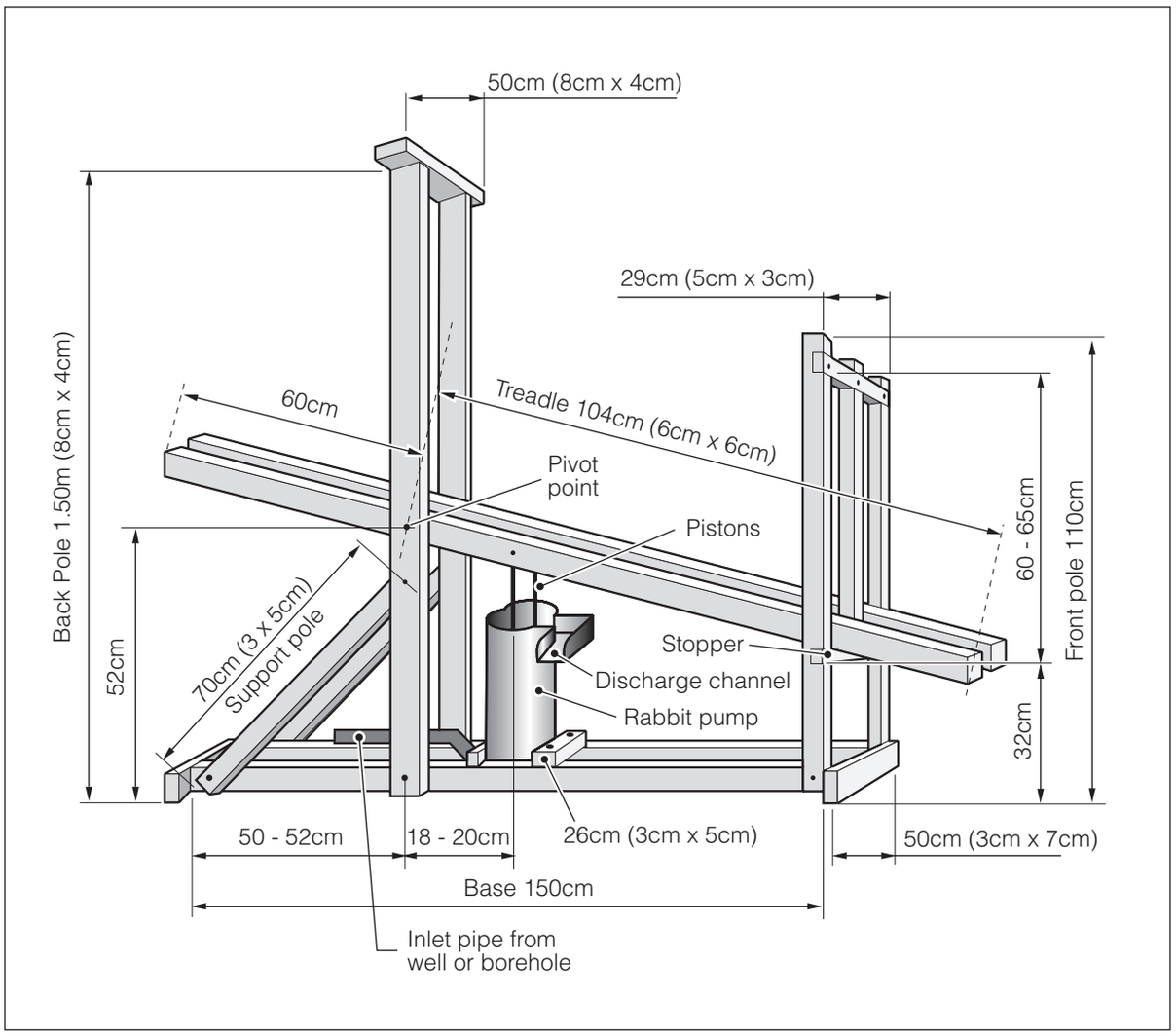


Figure 9.60. Treadle pump.

More information about the pump can be found on http://www.ideorg.org/html/gallery/treadle.html or from IDE (see Appendix 2 for contact details).

Figure 9.61. Bathing area with leaf screen and plastic sheeting for a door.

Figure 9.62. Mrs Rong transfers from her wheelchair to the bench.

9.14 Bathing area with water storage for wheelchair user

Ms Rong Ry is 34 and lives with her husband and children in a rural village in Siem Reap Province, Cambodia. She is paralysed below the waist and uses a wheelchair to move around.

The family have two water sources: in the rainy season, rainwater from the roof of the house is channelled by guttering into two large ferrocement storage jars. In the dry season the family collect water from a neighbour's well to fill the jars.

Screened bathing area

Description

- The outdoor bathing area has a screen of palm leaves and plastic sheet on a bamboo frame. The door is a plastic sheet hung over a horizontal piece of wood hung between two posts. No roof.
- The floor is earth and stones.

Dimensions

- There is room for a bathing bench, water storage jar (see below), and for a wheelchair to enter and turn.

Use

- Mrs Rong enters the bathing area in her wheelchair and parks it beside the bench. She transfers from wheelchair to bench.
- To bathe, she scoops water from the storage jar over herself, using a plastic cup.
- To wash clothes, she places a washbowl on the bench beside her, and scoops water into it from the storage jar.
- Wastewater drains or is thrown onto the floor and drains away on the bare earth.

Key features

- Materials are locally available and low cost.
- It was constructed by the family based on the needs of their mother.

Drawbacks

- Leaf screen is not durable, and needs to be replaced regularly.

- Poor drainage means water lies in pools on the floor, leading to deterioration of the floor, making it more uneven. This makes it difficult for the wheelchair to manoeuvre, and to stabilise the wheelchair, so it is difficult to transfer without help. Improved drainage would reduce these problems.

Suitable for

- Wheelchair users; people with good sitting balance; people with difficulty bending, pregnant women, frail elderly people.

Figure 9.63. Hose with a tap for filling water storage jar.

Internal water supply and storage

Description

- The main water storage jar has a small outlet pipe of flexible reinforced hose, with a tap near the end (Figure 9.63). This leads to a smaller clay storage jar in the bathing area ~2m away and positioned at a lower level.
- The secondary jar is raised on a wooden block next to the bathing bench, so that Mrs Rong can easily reach into it. It is kept in place with a rubber strap.

Dimensions

- Main jar: 200 - 500 litre. Secondary jar: 20 - 50 litre. 20mm flexible reinforced hose with plastic tap.

Use

- Mrs Rong sits on the bench next to the water jar. She fills it with water by directing the hose into the jar and turning on the tap. She then scoops water from the jar using a plastic cup.

Key features

- Mrs Rong fills the water jar as she needs it.
- The storage jar is raised to a suitable height for the user.
- The open-necked jar is easy to clean.
- The main storage jar needs to be filled by hand in the dry season, which the family can do when it is convenient for them, rather than on demand.

Drawbacks

- Lack of cover or lid on the storage jar increases the risk of water contamination, which is important to avoid if the water is used for drinking.

Suitable for

- All users. Those with weak arms may need help scooping water from the top of the jar.

Suggestion

- A tap inserted near the bottom of the storage jar would allow the user to draw water without raising their arm to scoop.

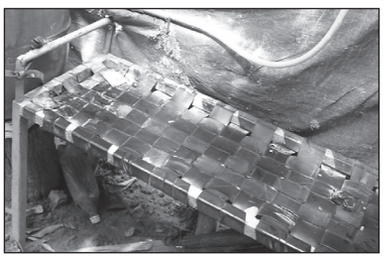


Figure 9.64. Metal framed bathing bench.

Bathing bench

Description

- The bench has a metal frame, with a seat woven from strips of rubber inner tube. There is a rail at each end of the bench.

Dimensions

- L~ 120cm, W~40cm, H~50cm (level with the wheelchair seat).
- Height of end rails from seat: ~15cm.

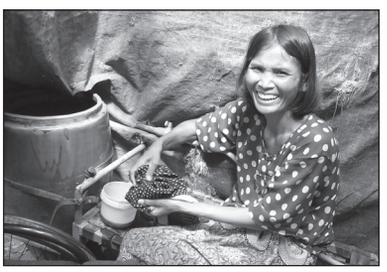


Figure 9.65. Mrs Rong sits on the bench to wash clothes.

Use

- Mrs Rong transfers from her wheelchair to sit on the bench to bathe.
- Wastewater drains through the rubber webbing of the bench, or is thrown on the floor and drains away on the bare earth.

Key features

- Rails on the bench are for holding onto for support.
- Rubber webbing of the bench is durable, easy to clean, and provides good drainage.
- Bather is not sitting in her own bathwater.

Drawbacks

- Rubber webbing is not very supportive.

Suggestions

- If the bench had a back it would provide more support for the user.

Benefits

Before, Mrs Rong stayed upstairs in the raised house. She could not move much and developed pressure sores. She depended on her husband for washing and all other activities. The bathing area has allowed her to be more independent.

Process for obtaining adaptations

A social worker from Siem Reap Provincial Rehabilitation Centre visited Mrs Rong to discuss her problems and needs, and provided information about what services were available. She was referred to the Spinal Cord Injury (SCI) Centre in Battambang, where they helped her with ideas and advice, including the bathing bench and toilet.

Social workers assessed the family situation and reached agreement over what the family could contribute to adaptations, e.g. labour to dig a toilet pit, local materials.

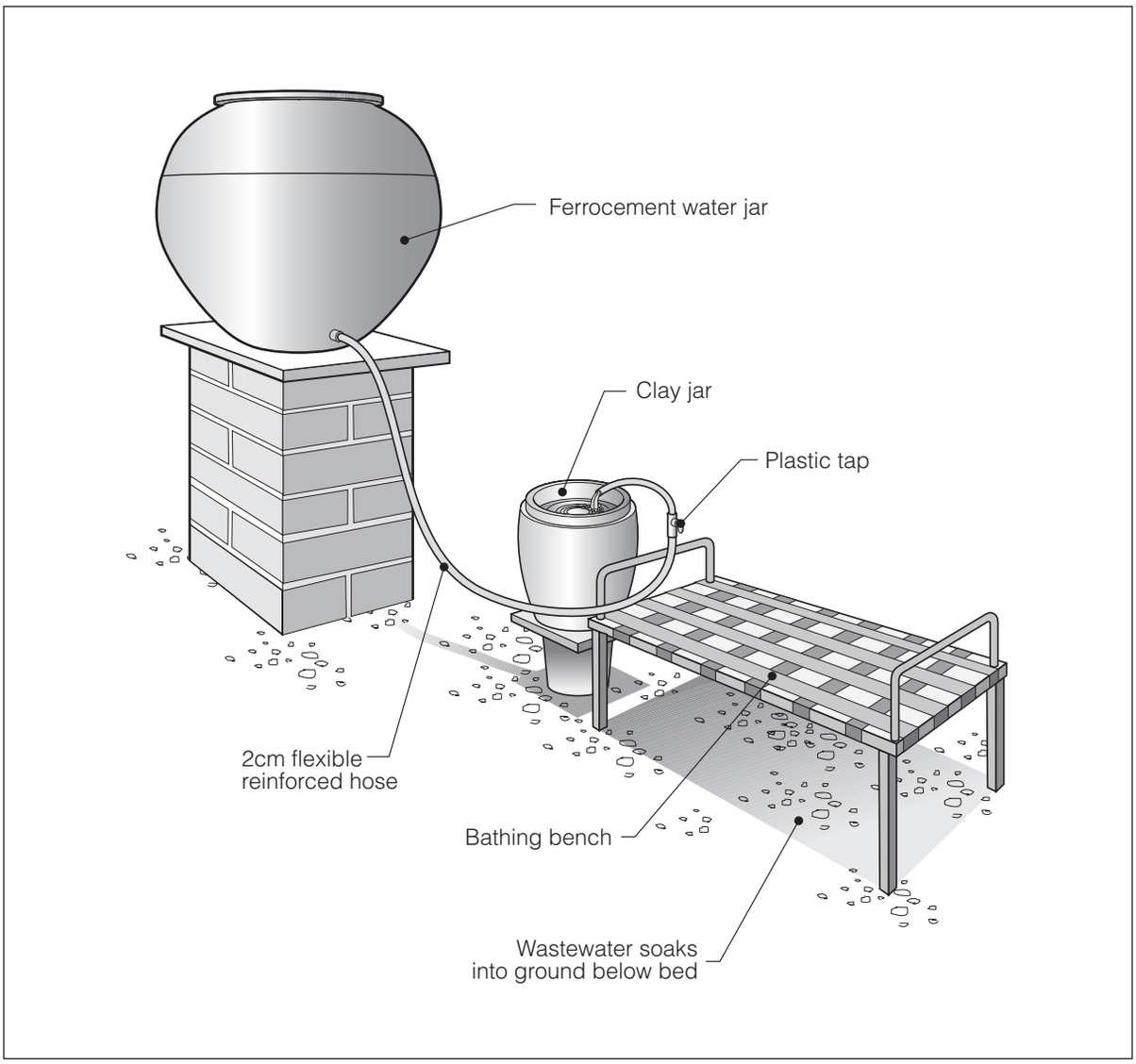


Figure 9.66. Layout of Mrs Rong's gravity fed water source (privacy screen not shown, for clarity).

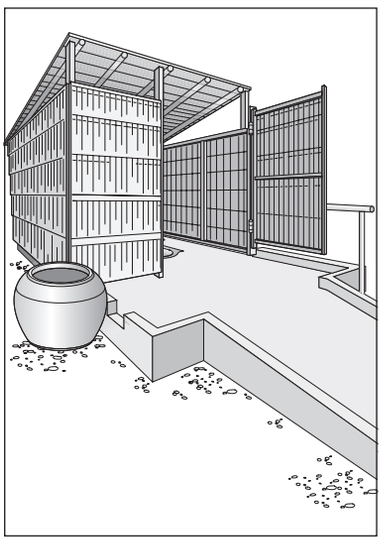


Figure 9.67. Toilet cubicle and bathing area.

Figure 9.68. Concrete ramp leading to bathing area.

Figure 9.69. Heng sits on the wheelchair footrest to bathe.

9.15 Toilet and bathing area for child who uses a wheelchair

Chea Sok Heng is 11 and lives with his parents and six siblings on the rural outskirts of Kampong Thom, in Cambodia. Their economic situation is poor.

Heng has weak legs and a weak arm as a result of polio. He moves around independently by shuffling on his buttocks, and pulling himself up with his arms. He has a wheelchair to move around outside, which he can get in and out of without help.

The family fetch water from a well across the road to store in their own large ferrocement jars.

Bathing area with a water storage jar

Description

- A flat concrete platform with a large ferrocement water storage jar next to it. The jar is positioned lower than the platform.
- A concrete kerb goes all round the platform, with a drainage outlet in one corner.
- A bamboo rail on the side opposite the water jar is for hanging clothes.

Approach

- Accessed via a concrete ramp which leads from the house.

Dimensions

- Platform: 134cm x 100cm.
- Concrete kerb: H: 6cm.
- Ramp: W: 75cm, gradient 1 in 15.
- Water jar: 50 – 500 litres.

Use

- Heng wheels himself up the ramp to the bathing platform. He removes his clothes and hangs them on the rail.
- He positions his wheelchair facing the water jar and lowers himself to sit on the footrest. From here he can reach into the jar with a scoop and splash water over himself.

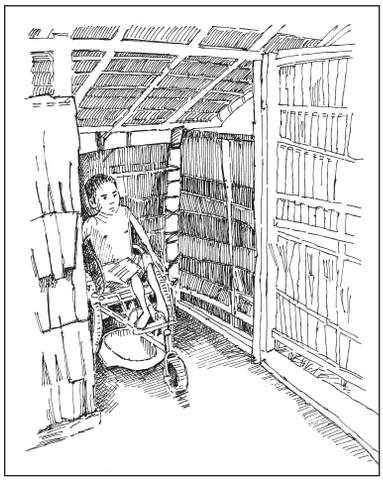


Figure 9.70. Heng positions his wheelchair over the toilet.

Key features

- The concrete kerb prevents the wheelchair rolling off the platform.
- Concrete is easy to clean, water drains easily, clothes are kept dry on the rail.
- The low position of the water jar makes it easy for Heng to reach into from a sitting position on the platform.
- The family fills the storage jar as convenient to them, rather than on demand.

Drawbacks and comments

- The storage jar needs to be filled regularly by other family members.
- The risk of water contamination could be reduced by using a cover on the storage jar, and by using a two-cup system to scoop water. This is a crucial issue if the water is used for drinking.

Figure 9.71. Flat platform in front of toilet door.

Wheelchair accessible household toilet

Description

- A wood framed toilet cubicle, with leaf screen walls. A wide leaf screen door swings shut without pulling. There is no door fastening.
- The floor is smooth concrete. A ceramic pour-flush toilet pan is set level with the floor. 2 moulded cement mortar shapes have been stuck on the floor next to the toilet pan, for the wheels of the wheelchair to slot into.
- There is space for a water storage jar (~30 litres) beside the toilet.

Approach

- Along a concrete ramp leading from the house (Figure 9.68). There is a flat platform in front of the toilet door, also used as a bathing platform (Figure 9.71).

Figure 9.72. Heng manoeuvres his wheelchair to open the toilet door.

Dimensions

- Overall internal: L 100cm x W 140cm.
- Entrance W: 88cm.
- Flat platform: 134cm x 100cm.

Use

Heng pushes himself up the ramp, manoeuvres the wheelchair on the level platform to open the door. He reverses into the latrine in his wheelchair. He slots the wheels of his chair

Figure 9.73. Water jar next to toilet pan. Note moulded cement mortar shapes for correct wheelchair positioning.

Figure 9.74. Mekong wheelchair with foot-rest, also used as a transfer-seat.

Figure 9.75. Wheelchair seat with central plank removed.

into the cement mouldings, so that the seat of his chair is positioned directly over the toilet hole.He removes the wheelchair cushion and a central plank from the seat (Figure 9.75). The wheelchair then acts as a toilet seat, with urine and faeces dropping directly into the toilet hole. Heng carries out anal cleansing using a special tool (Figure 9.76) and water from the jar beside the toilet.

Key features

- Enough space inside for a wheelchair to enter, and space for an internal water supply.
- The internal water supply allows Heng to wash in private.
- The self-closing door means no effort is needed to close the door.
- The smooth concrete floor is easy to keep clean.
- Moulded cement shapes help with accurate wheelchair positioning over the toilet hole.

Drawbacks and comments

- High cost of materials – ceramic and concrete.
- A pour-flush toilet depends on water always being available. The water jar needs to be filled by others.
- There's only just enough room on the platform to manoeuvre the wheelchair round the door. For minimal additional cost, the platform could have been made wider, which would be usable in the future when Heng grows up and needs an adult size wheelchair.

Suitable for

- Users with a convertible wheelchair

Unsuitable for

- Pour-flush toilet would be unsuitable for areas where water is scarce.

Wheelchair used for bathing and as a toilet chair

Description

- The 'Mekong' wheelchair has a wooden footrest located behind the small single front wheel. It is also used as a mid-level 'transfer' seat. A metal rail keeps the feet in place and also acts as a seat back.
- A central plank in the wooden seat slides out, leaving a gap ~10cm wide. This allows it to be used as a toilet chair.

Dimensions

- Height of footrest: ~25cm.

Key features

- The main part of the chair does not get wet, which would happen if the bather stayed in the seat to bathe.
- Saves money: one piece of equipment serves more than one function.
- Saves space: the toilet cubicle can be smaller as there is no need to provide space for a wheelchair next to the toilet.
- Saves effort – no need to transfer to a separate seat.

Drawbacks and comments

- Not suitable for persons with poor sitting balance or lacking arm strength.
- This wheelchair is not designed to be used as a toilet seat. The main frame is directly under the seat, which will inevitably become fouled*.
- Unsuitable for wheelchairs with a footrest in front of the front wheels, as they may tip up with the weight on the footrest.

Suitable for

- Users with good sitting balance and arm strength.

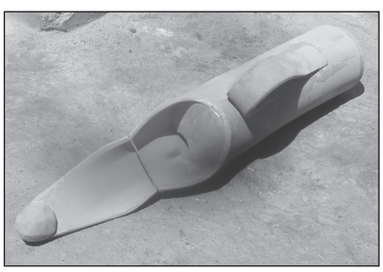


Figure 9.76. Anal cleansing device.

Anal cleansing tool

Description

- A soft plastic cylindrical container with a restricted opening and a handle. Has an elongated soft rubber 'finger'.

Use

- The user fills the container with water, then holding it from in front between the legs, uses the soft rubber 'finger' to clean the anus, letting water slowly trickle out.

Key features

- Locally designed and made.

Drawbacks and comments

- Needs regular washing.

Suitable for

- Suitable for a user with limited flexibility or reach.
- Could be used by a support person to help a disabled person with anal cleansing.

* Heng received this new wheelchair one day before the researchers' visit, so could not comment on this aspect of its use.

Benefits

Before, Heng used to defecate in the surrounding area, and needed someone to help him. His father had to carry him to the field, to go to the toilet, and help him bathe. Sometimes his father was in a hurry to go to work in the fields, but he would have to spend an hour or more helping his son.

Heng prefers this toilet as he doesn't need anyone's help. He's proud of it and has invited his friends to see it. He uses the same water source and facilities as the rest of the family, so he is not isolated.

In fact, the whole family uses and benefits from the hygienic new facilities. His mother said it is more convenient, comfortable, and private, and there is no need to worry about snakes!

His father now worries less about his son. He also has more time for working in the fields.

According to his mother, the neighbours are a bit jealous, but they understand why the family needed a toilet because of their disabled child.

Process for obtaining adaptations

CABDIC ('Capacity building of people with disabilities in the community') is a programme to support disabled children and adults in the community. It was set up by Handicap International Belgium.

CBR workers of CABDIC discussed with the family, introduced the idea of accessible facilities, and showed them examples of equipment. The CBR worker supported the father to apply to UNICEF local office for the toilet pan. The family provided labour to build the ramp and toilet.

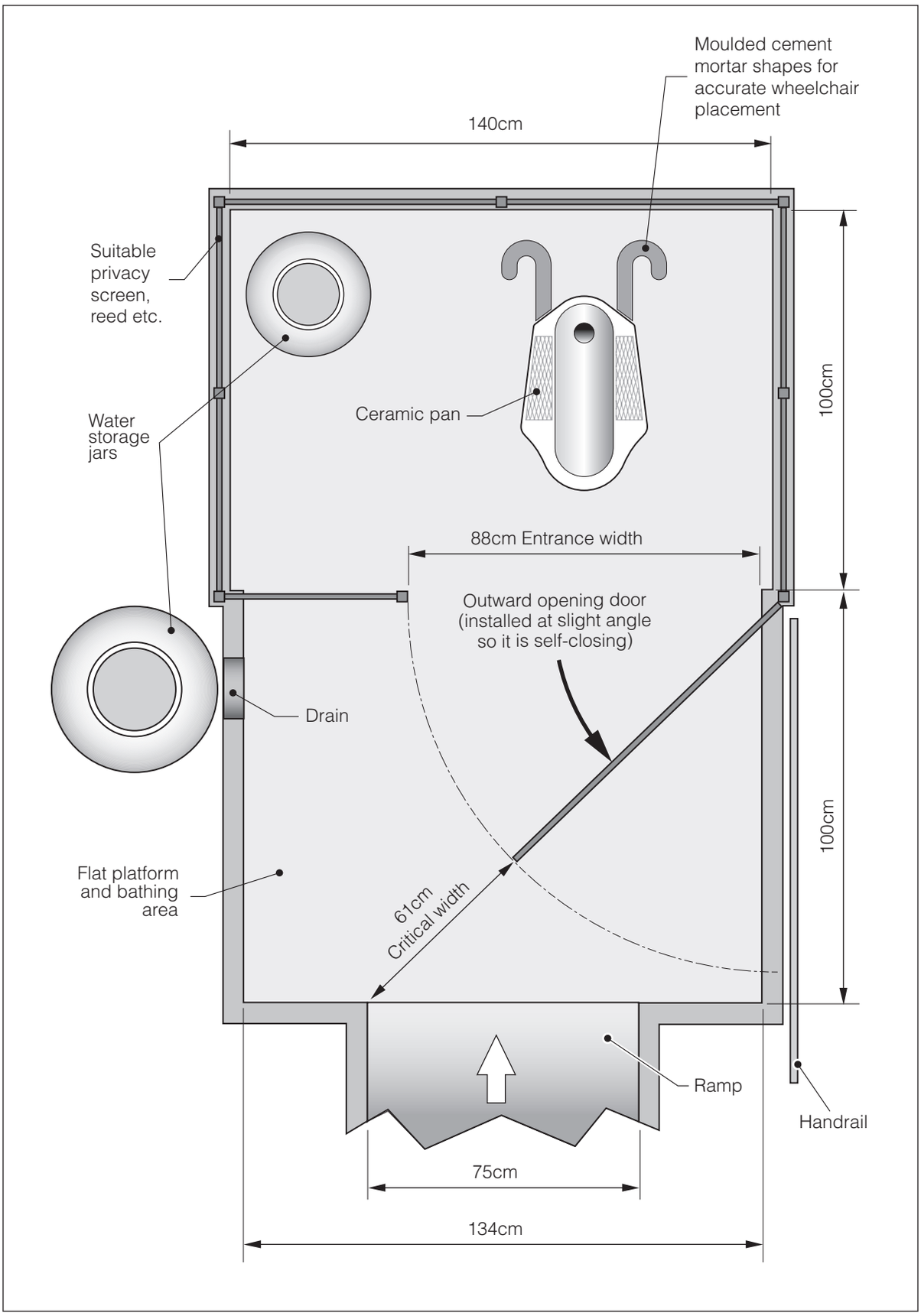


Figure 9.77. Plan view of Heng's toilet and bathing area.

Figure 9.78. The access ramp to the toilet with long grass in the way.

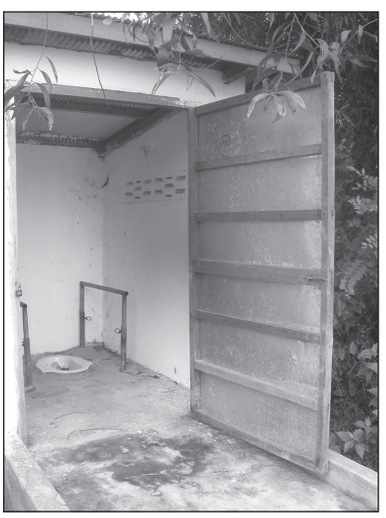


Figure 9.79. Smooth entrance to toilet. Note lack of flat platform in front of door which is a problem.

9.16 Primary school toilet designed for wheelchair access

Heng (see Heng's story in Section 9.15) goes to the local primary school, which previously had no toilets for pupils, who all used the surrounding bushes and fields as a toilet. Heng found this difficult, so the CABDIC programme installed an accessible toilet.

Description

- A brick-built cement-plastered structure with a corrugated tin roof and tin door on a wood frame. A ceramic pour-flush toilet pan is set level with a smooth concrete floor. The door opens outwards and is stopped from opening more than 90° by the ramp kerb.
- A concrete water tank is built inside next to the toilet, which is filled by hand from a handpump nearby.
- To close the door, a string is fixed to the inside of the door, passed through a hook screwed to the top of the door frame and tied to a handrail beside the toilet (Figure 9.82 but not shown in photos).

Approach

- It is located behind the school ~10m from the nearest classroom. It is reached by a concrete ramp with a raised kerb on each side. Around the ramp is rough grass.

Support features

- There are two handrails cemented to the floor, one on each side of the toilet. The height is adjustable.

Dimensions

- Internal: L: 176cm, W: 150cm.
- Entrance W: 95cm.
- Handrails: 30mm Ø g.i. pipe, L:82cm; W between rails: 72cm.
- Distance from door to handrail: 90cm.
- Ramp: W: 115cm, kerb H:10cm, gradient: ~1:15.

Use

- Heng gets to and up the ramp and enters the latrine in his wheelchair. He pulls on the string to close the door and ties it to a handrail. He gets down from his chair and squats using the handrails for support.
- All pupils can use the latrine, but Heng has his own key.

Figure 9.80. Adjustable handrails.

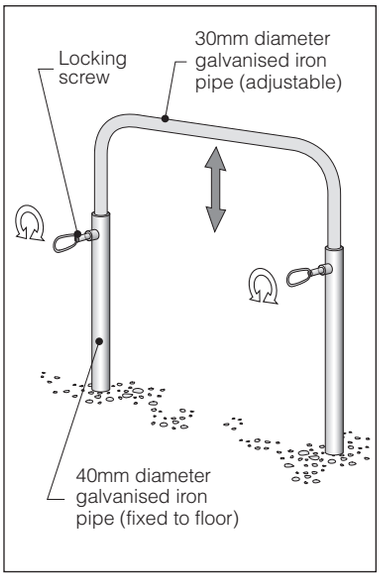


Figure 9.81. Adjustable handrail mechanism. Metal pegs or nails inserted into holes at different heights would be more robust

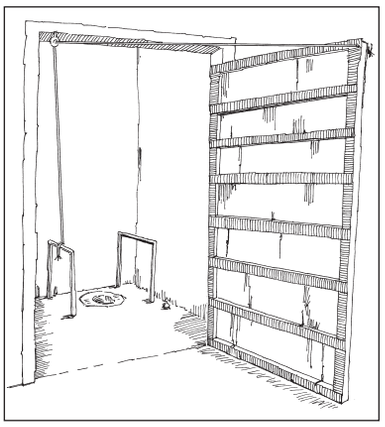


Figure 9.82. String door closing device.

Key features

- The door is wide enough for a wheelchair to enter.
- Water is provided inside the toilet for personal hygiene.
- The string door-closing mechanism enables the user to close the door without a lot of manoeuvring.
- A kerb on each side of the ramp prevents the wheelchair rolling over the edge.

Drawbacks and comments

- High cost.
- A flat platform in front of the door would allow Heng to open the door without his wheelchair rolling backwards.
- The pour-flush toilet needs water always available, otherwise it becomes blocked and unusable.
- More space inside the toilet cubicle would allow a wheelchair to turn and exit forwards, which is easier than reversing out.
- The long grass in front of the ramp makes it difficult for Heng to get to the ramp.
- School staff did not take responsibility for maintaining the toilet, possibly because it was installed, and perhaps seen as owned, by the CABDIC programme.
- It might have been more productive to consult the teachers more fully about the idea, to address hygiene and sanitation as a whole school issue, rather than installing ‘special’ facilities for one child.

Benefits

All children in the school could use the toilet, so it benefited all the pupils.

It is currently out of use, because a kitchen has recently been built between the classrooms and the toilet, and an alternative path has not yet been cleared. Heng now can’t get to the toilet so he goes outside again as before.

In addition, during the school holidays, people living nearby broke the lock on the door and used the toilet without flushing it. Now it is dirty and blocked and unusable.

Process for obtaining facility

The staff of the CABDIC programme introduced the idea, provided and constructed the latrine.

SCI Centre design

Figure 9.83. Wooden bathing bench.

9.17 Bathing bench and toilet seat for elderly wheelchair user

Mr Kong Chea is aged 69 and lives with his wife in a stilt house in a rural village near Battambang, Cambodia. They have 3 children who are married and live nearby. Their compound and the surrounding area floods for four months a year, at which time they get around by boat.

Mr Kong was injured in the war; his legs are paralysed. He uses a wheelchair to get around outside the house. He can get up the steps to the house on his buttocks.

For bathing and washing clothes, his wife fetches water from a pond over 50m away and stores it in large jars under the house. Rainwater is used for drinking. There is no latrine, so the rest of the family urinate and defecate in the surrounding fields and bushes.

Wooden bathing bench

Description

- A rectangular wooden bench, with a solid wood plank surface. There is a handrail at each end of the bench.
- Water is stored in large ferrocement storage jars with concrete lids, beneath the raised house. The bench is placed next to them.

Dimensions

- H: level with wheelchair seat.
- L~ 120, W ~45 cm, H~ 60cm. height of rail above seat ~15cm.

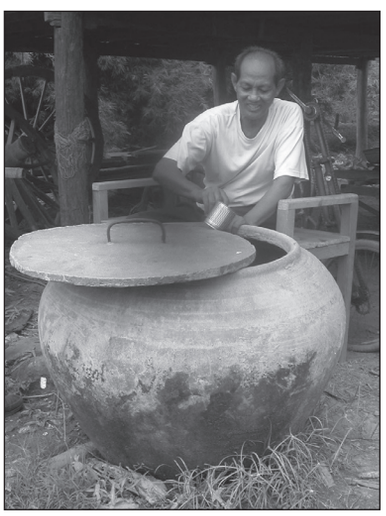


Figure 9.84. Mr Kong using the bathing bench.

Approach

- Packed earth.

Use

- Mr Kong positions his wheelchair beside the bench. He transfers to sit on the bench facing the water jar. He removes his clothes and pours water over himself using a tin scoop.

Key features

- Locally made, reasonable cost. Wood is fairly durable and easy to clean.
- A rail at each end is useful for the user to hold on to for balance.

- Movable: the location can be changed depending on the user's needs, e.g. nearer the water source, or to a more private location. It could also be used for other functions, e.g. eating, washing clothes.

Drawbacks and comments

- The wide solid surface makes drainage poor; so the wood may deteriorate if it is always wet. It would be more durable if painted or varnished. If it was longer, a person lying down could use it.

Suitable for

- People with good sitting balance and some upper body strength for transferring.
- People with difficulty squatting or bending.

Unsuitable for

- People with poor sitting balance, as there is no back or side support.

SCI Centre design

Figure 9.85. Wooden toilet seat, not yet installed.

Wooden box toilet seat

Description

- A solid wooden box with a rectangular hole in the top. A wooden lid with a handle covers the hole when not in use.
- There is a wooden handrail on each side of the seat.

Dimensions

- Dimensions suited to Mr Kong's needs, e.g. height level with wheelchair seat for easy transfer.
- H of handrails: 18cm above the seat.

Use

- A small latrine pit is dug and the seat is placed over the hole. It is designed to be dug into the ground to a depth of 10cm for stability.
- Mr Kong's idea for using the new toilet seat is different. He intends to place it underneath the house and use it with a container underneath it. When his compound floods, the seat can be moved upstairs, and used in the same way. The container will then be emptied into the floodwater below (and also provide fish food!).

Key features

- Made from local materials, durable. It may be painted or varnished for extra durability and ease of cleaning.

Figure 9.86. Proposed location for toilet pit.

- Handrails on the seat provide support to the user.
- Flexible use. It can be installed as a fixed seat over a latrine, and then moved when the pit becomes full. Alternatively it can be used as a commode seat with a container underneath.

Drawbacks and comments

- The heavy solid box make it difficult to use as a commode seat with a container, also there is a long drop from seat to container, with risk of fouling inside the box and the floor.
- If the back side of the box were left open, a container could be removed for emptying more easily, without the need to lift the whole seat.

Suitable for

- People with good sitting balance.
- Wheelchair users.
- People with difficulty squatting or bending.

Benefits

Mr Kong had just returned home with new equipment provided by the SCI Centre (see below), so it was too early to identify actual benefits.

Before, Mr Kong used an ordinary bench underneath the house to sit on while bathing. It was not near a water jar so he always had to ask someone to fetch water for him. Now he can bathe without help.

Process for obtaining adaptations

Mr Kong was referred by a social worker to the Spinal Cord Injury Centre (SCI) in Battambang, where he spent three months. Staff assessed his condition, gave him physical exercises, and trained him to use certain equipment. He was provided with the toilet seat, bathing bench and a standing frame free of charge. These were all designed and made at the Centre.

Once he starts using the equipment at home, he can inform the occupational therapist of any problems.

Figure 9.87.Brick path from house to toilet.

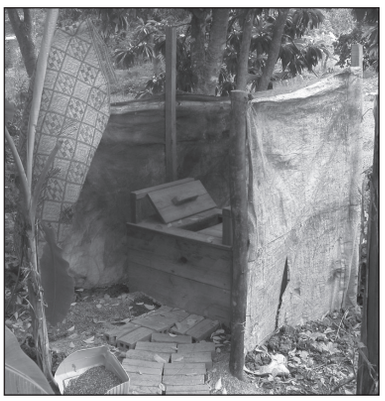


Figure 9.88. Family latrine behind house accessed via brick path. Woven mat used as a door.

Figure 9.89. Wooden toilet seat showing the lid removed from the toilet hole.

SCI Centre design

9.18 Bathing bench and toilet for woman with weak legs

Mrs Hien Phee is 49 and lives with her husband Mr Srey and their nine children in a rural village in Battambang Province, Cambodia. They live in a wooden stilt house, with a ladder to reach it. The area around the house is roughly paved with left-over bricks from the nearby brick factory. The family fetch water from a pond 1km away, and store it in one large storage jar.

Mrs Hien has weak legs from spinal cord injury as a result of a traffic accident. She can walk slowly as far as the toilet and bathing area, using a stick. If she wants to go further she uses a wheelchair.

Wooden box toilet seat

Description

- The family have a pit latrine, which is screened using poles and rice sacks. There is no roof. A woven mat covers the entrance.
- The toilet seat is a wooden box with four solid sides and a rectangular hole in the seat. A wooden lid with a handle covers the hole when not in use.
- The seat is installed over a latrine pit dug 5cm narrower than the seat all the way round. The seat is dug into the ground to a depth of 10cm for stability.
- There is a wooden handrail on each side of the seat.

Approach

- The toilet is behind the house, ~10m away along a brick path.

Dimensions

- Toilet seat: W: 70cm x D: 54cm.
- Toilet hole: W: ~10cm x D: ~40cm.
- Distance from seat to toilet entrance: 30cm.
- Handrails: H: 18cm above seat.

Use

- Mrs Hien walks with a stick along the path, enters the latrine and uses the toilet unaided.
- Ash from burnt rubbish is shovelled into the hole to cover the faeces, using a scoop made from an old jerry-can (Figure 9.90).

Figure 9.90. Ash scoop made from an old jerry-can.

Figure 9.91. Mrs Hien using her bathing bench.

Figure 9.92. Mrs Hien uses the bench to wash clothes.

Key features

- Made from local materials, durable, may be painted or varnished for extra durability and ease of cleaning.
- Can be treated as a fixed seat, but relocated to a new pit when this pit becomes full.
- The dimensions have been decided to suit Mrs Hien, e.g. the height is suitable for easy sitting down/ standing up.
- The handrails are useful to grasp for balance when transferring.

Drawbacks and comments

- Painting the toilet seat would make it resistant to water and urine, and so easier to clean, more hygienic and more durable.
- A water source inside the latrine would allow Mrs Hien to carry out personal hygiene tasks in private. The family could fill the water container at their convenience, instead of on demand.
- It is only used by Mrs Hien. The rest of the family continue to defecate in the open, as they say the pit would fill up too fast if everyone used it.

Suitable for

- People with good sitting balance.
- People unable to squat.

Bathing / laundry bench

Description

- See Case-study 9.17 for full details.

Use

- A family member brings a bucket of water and places it on the floor beside the bench. Mrs Hien sits on the bench and washes clothes in a bowl on the bench beside her.

Drawbacks and comments

- Painting the bench would make it water-resistant, and so more durable.
- Locating the bench next to a water source would reduce Mrs Hien's reliance on her family to fetch water for her.

Benefits

Before, Mrs Hien needed family support to do everything. She used a walking frame to move around. She would bathe lying

on the floor of the house, with help from her husband and daughters. For toileting her husband and daughter would carry her and sit her on a bed-pan, which they emptied afterwards.

Now her mobility has improved and she only uses a stick to walk. She can bathe with minimal help and go to the toilet by herself. She used to be depressed; now she feels better that she can help herself more. She has increased self-reliance, dignity and well-being.

Time-saving for the family: Mr Srey said it used to be a full time task to care for his wife, including during the night. Now it takes less than half the time, and he worries less about leaving her.

Increased family income: Both Mr Srey and their daughter So Pheap have now returned to work full time at the nearby brick factory, so their earnings have increased.

Improved family well-being: Before there was always too much to do. Now life does not feel so hard or stressful, and family members relax and smile more.

Process for obtaining adaptations

Mrs Hien was taken straight to the SCI Centre in Battambang after her accident, which is why she made such a good recovery. There she was given physiotherapy, and trained in self-care and use of assistive devices. The Centre's occupational therapist continues to visit and monitor her progress.

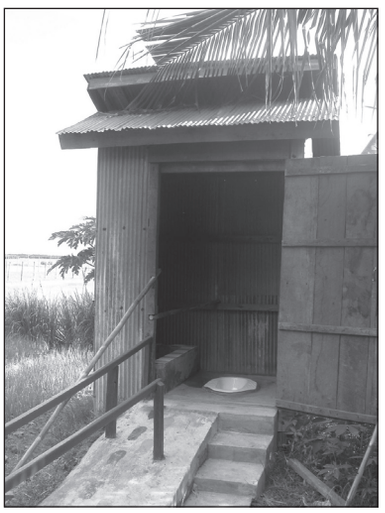


Figure 9.93. Household toilet with concrete ramp and steps. Colourful painted footprints make it more child-friendly.

Figure 9.94. Horizontal parallel bars enable child to walk from house to toilet with minimal help

Figure 9.95. Wooden handrail from door to back wall of toilet.

9.19 Household toilet, parallel bars for child learning to walk

Tuan is 11 and lives with her parents, grandmother and sister in a rural village in Kampong Thom Province, Cambodia. She has cerebral palsy, which makes her legs and hands weak.

Her grandmother often looks after Tuan while her mother goes out to work. Tuan needs support with nearly everything – washing, using the toilet, dressing and undressing, eating and drinking, and also physical exercises.

Tuan can move around by shuffling on her bottom, and can walk very slowly on level ground using handrails. She is gradually getting stronger.

Description

- The household toilet is on a raised concrete platform; the cubicle has corrugated tin walls and roof on a wood frame. A wooden door opens outwards.
- A ceramic pour-flush toilet pan is level with the smooth concrete floor. There is a water trough beside the toilet, made of tiled and cement-plastered brick.

Approach

- A pair of parallel wooden handrails, painted blue, follow a concrete path leading from the house to the toilet. A concrete ramp leads up to the toilet entrance, with three concrete steps beside the ramp. Coloured foot-prints are painted along the route.
- The RH handrail finishes ~1m before the entrance, to allow room for the door to swing outwards.

Support features

- Inside the cubicle, a single horizontal wooden handrail extends from the door to the back wall on one side of the toilet.

Dimensions

- Parallel handrails: H: ~70cm, ~35cm apart.
- Inside handrail: H: ~50cm.

Use

- Tuan walks unaided from the house to the toilet on the level path between the parallel rails, which she holds onto for support.

- She sits on the edge of the toilet by herself, uses the toilet and then washes herself. She needs help getting to the parallel rails and walking up the ramp, and to dress after using the toilet.

Key features

- High cost.
- Grandmother has less distance to carry Tuan.
- Inside support rail helps Tuan lower herself to sit on the toilet.
- The inside water source allows users to wash themselves in privacy.
- The toilet is made attractive to a child, with bright colours painted inside and out.

Drawbacks and comments

- A seat over the toilet would be helpful for Tuan who has difficulty squatting.
- A flat area is needed in front of the door, to allow the user to stand in balance while opening it.
- It is more time-consuming than before for her carer to take Tuan to the toilet.

Suitable for

- Only suitable for a person who can think at least 10 minutes ahead, otherwise they might wet themselves before they get there!

Benefits

Before the family had the toilet, Tuan sat on a bowl, which her mother would empty into a small hole dug in a field, then cover over.

The whole family benefits from using the new toilet.

Tuan's mother says the new toilet does not yet save much time, but she hopes that the exercise will help Tuan get stronger, and gradually need less and less help. She feels encouraged by her child's progress.

Process for obtaining adaptations

CABDIC programme provided the toilet, as well as a standing frame and special chair. When Tuan has made progress using the parallel bars, they will think about a toilet seat for her.

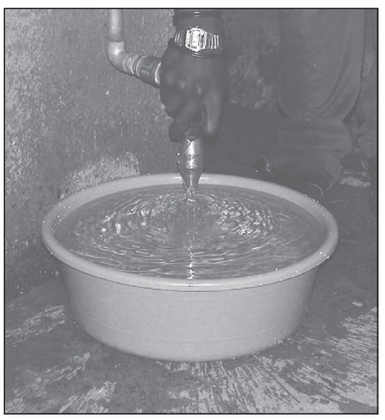


Figure 9.96. Low level tap for use by people who crawl or use low trolleys.

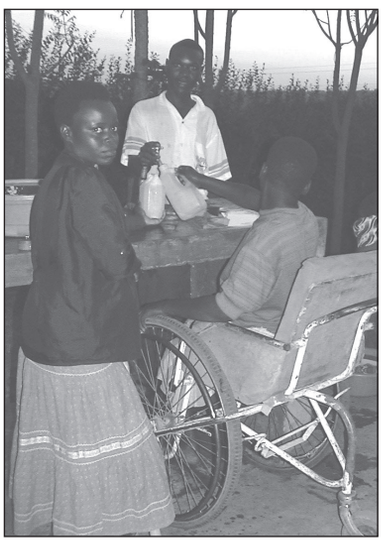


Figure 9.97. Knee-hole under concrete shelf allows wheelchair user to get close to reach tap.

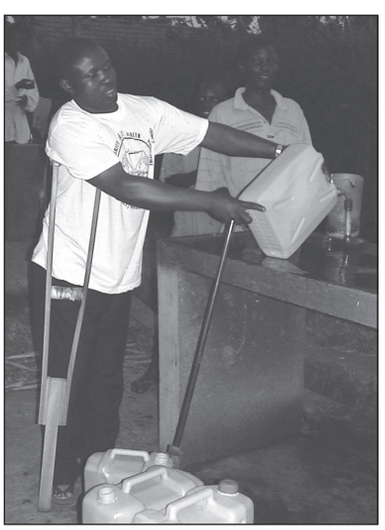


Figure 9.98. Raised tapstand with shelf to rest containers on.

9.20 Tapstand and bathroom in institution for disabled people

Masaka Vocational Rehabilitation Centre in Uganda caters for 68 young men and women aged 14 – 25 with physical impairments. It has concrete ramps and paths which are accessible to people using wheelchairs, crutches or who crawl.

Communal tapstand

Description

- Central communal tapstand, with a long concrete slab at waist level.
- Press-action taps, with spouts ~25cm above the slab. A low level tap is also provided, H: ~30cm.
- Concrete surround, and reached via concrete paths.

Use

- Can be used by persons standing with crutches, or sitting in a wheelchair, or crawling.

Key features

- The slab is high enough for a person in a wheelchair to get their knees under, so they can get close enough to reach the tap (Figure 9.97).
- The concrete slab provides a surface to stand a container on, which takes the weight of the water while filling.
- People who crawl can use the low tap.
- Press-action taps are easy to use by people with poor grip and stiff wrists (but see below).

Drawbacks and comments

- The taps should be higher above the slab and ground, to allow 5 or 10 litre jerry-cans to stand upright to be filled (Figure 9.98).
- Press-action taps make it difficult to control the flow of water, and need continual pressure, so are difficult for users who lack strength. Lever action taps should also be provided which are easier to use by many people.

Suitable for

- Wheelchair and crutch users, people with difficulty bending, people who crawl, people with stiff wrists.

Unsuitable for

- People who lack hand/arm strength.

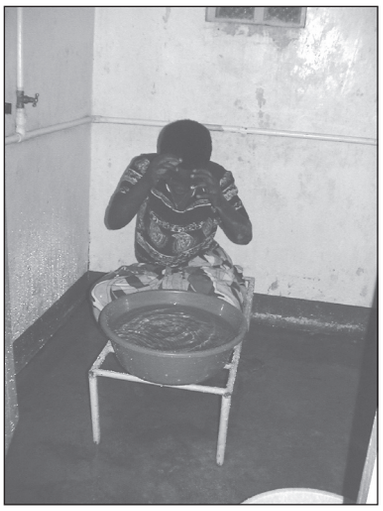


Figure 9.99. Bathroom with room for bathing bench and wheelchair beside it. Tap is within reach of bather.

Bathroom with bathing frame

Description

- The bathroom is brick-built with a tin roof. The concrete floor is level with the concrete approach path. The entrance is wide enough for a wheelchair to enter.
- Water is piped to a shower with a tap.
- There is a metal frame with horizontal struts for bathing.

Dimensions

- Bathing frame: H: 30cm, W: 50cm, L: 100cm.
- Shower tap H: 110cm.

Use

- Bathers sit on the metal bathing frame under the shower, or fetch a basin of water from the tapstand, to place on the frame in front of them.

Key features

- There is enough space for a wheelchair to enter and turn, and for a helper if needed.
- Sitting on the frame prevents bathers sitting in dirty water.
- Metal struts of the frame allow water to drain easily.

Drawbacks and comments

- High cost.
- Shower tap is too high for a person crawling to reach it.
- If the shower is not used, bathers must fetch their water from outside, as there is no tap inside.
- Metal struts are uncomfortable, so a wooden board needs to be used to make it comfortable.

Suitable for

- Wheelchair users, people with weak legs, people with good sitting balance.

Unsuitable for

- People with poor sitting balance, people unsteady on the feet (as there are no handrails for support).

Based on an interview with Ogwang Martin, Centre Manager, employed by USDC. The visit was at the end of the day, it was getting dark, and not all facilities could be observed as they were in use by students.

Figure 9.100. Mrs Nalukwago fills her 5 litre jerry-can at the low tap.

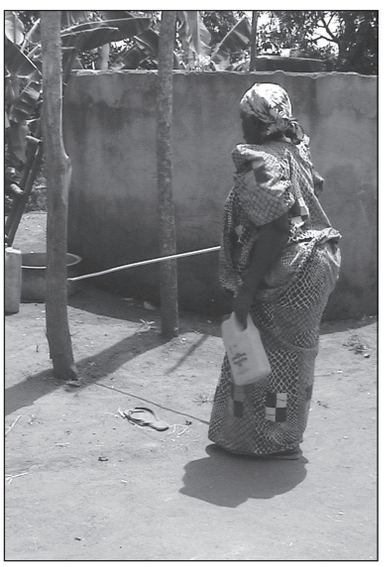


Figure 9.101. Finding her way back to the house.

Figure 9.102. The tap can be padlocked.

9.21 Rainwater tank and mobility approach for elderly blind woman

Mrs Annete Bugirwa Nalukwago lives with several of her children in a rural village in Mubende District, Uganda. She is over 50 years of age and blind, but very active, and can find her way around, both inside and outside the house.

Rainwater storage tank with tap

Description

- The family have a circular brick-built rainwater storage tank beside the house. Two wooden posts support the gutter which takes rainwater from the roof to the tank.

Dimensions

- Tap H: ~30cm (Figure 9.100).

Approach

- ~8m from the house via rough but level ground.

Use

- Mrs Nalukwago finds her way to and from the water tank using a white cane, and using the two wooden posts as landmarks. By locating the posts with her cane, she can identify the direction of the water tank, and after filling her 5 litre jerry-can, she can find her way back to the house (Figure 9.101).

Key features

- The low tap allows a container to be placed on the ground while being filled. No water is wasted as the spout is close to the tap (Figure 9.100).
- The tap can be padlocked to prevent non-family members using the water (Figure 9.102).

Drawbacks and comments

- A pit could be dug below the tap to allow larger containers to be filled. Providing a low stool would mean Mrs Nalukwago could sit instead of bend to use the tap.

Bathing

Mrs Nalukwago bathes in her own bathroom next to her bedroom. A cloth on the floor outside the bathroom door is a landmark to indicate the doorway. This works for her, and is unlikely to be moved by family members as only she uses this part of the house.

She has a specific place for each item – bucket, basin and towel, so she knows where everything is. She carries water for

Figure 9.103 Floor cloth at the bathroom door.

Figure 9.104. Mrs Nalukwago's orderly bathroom.

bathing to the bathroom in a small jerry-can, which she pours into a bucket.

Benefits

Before learning mobility, Mrs Nalukwago was helpless. She would often bump into things and hurt herself. Family and community members helped her too much, which also disabled her. Mobility outside the house was the main problem. She felt depressed and a burden on her family.

Now after only three months of learning to use her white cane, she has increased mobility and choice, she can move around and do things for herself, including going to church by herself.

The whole family has benefited from their mother's independence. Her daughter said that before, someone always stayed with their mother. Now they no longer worry about her, and they have more time to do other things. Not only can she look after herself, she can also contribute to the family, including cooking for them, while they go to the fields.

She also keeps poultry, including fetching grass and water for them.

Process for obtaining adaptations

Uganda National Association of the Blind (UNAB) provided the white cane. Mrs Nalukwago received mobility and orientation advice and support from Mr Opoya, District mobility officer. Her son paid for construction of the rainwater tank.

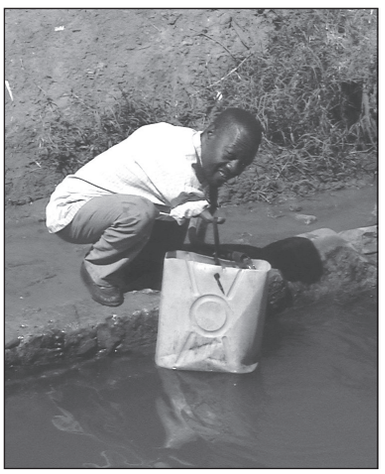


Figure 9.105. Kiwanuka draws water from the spring.

Figure 9.106. Kiwanuka carries water back to the house.

9.22 Adapted jerry-can used by man without arms

John Kiwanuka is 42 and a trained accountant. He was interviewed in the house where he used to live, in a peri-urban area of Kampala. Kiwanuka was born with only one very short arm with a partially developed hand. He describes himself as 'a person without arms'. He has no difficulty walking.

Adapted jerry-can for collecting water

Description

- Water is drawn from a nearby spring about 30m from Kiwanuka's house.
- Kiwanuka has adapted a 15 litre jerry-can. He has cut the top off, pierced a hole on each side, and tied a rope through it to form a handle.

Use

- Kiwanuka collects about 5 litres of water at a time; any more would be too heavy.

Key features

- The plastic of the jerry-can is robust but flexible enough to be cut and adapted.
- The open top makes it easy to fill, and to clean inside.
- The length of handle can be adjusted to suit the user.

Drawbacks and comments

The open top makes the jerry-can more vulnerable to contamination than an ordinary jerry-can with a lid. This can be avoided by pouring water immediately into covered containers for storage, and by cleaning the jerry-can regularly.

Suitable for

- People who have weak grasp, or stiff fingers, which make it difficult to hold the handle of a jerry-can.
- People without hands - a longer handle could enable it to be carried over the arm or even over a shoulder.

Long wash-cloth

Description

- A wash-cloth made of sisal, with a loop at each end: 120cm long, and 20cm wide.

Use

- Kiwanuka pours water for bathing into a plastic bowl and wets the wash-cloth using his feet. He holds the loop at one end in his hand, the other end with his foot. He can wash his whole body by manipulating his body and the cloth.

Key features

- Low-cost materials, locally available.

Suitable for

- Bathers with limited use of their arms.

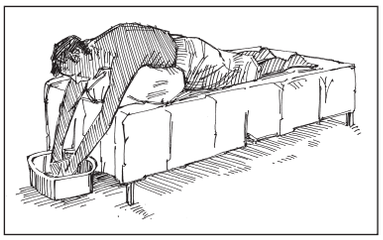


Figure 9.107. Lubega bathes lying on his front, with a washbowl on the floor.

9.23 Bed bathing method for man with paralysed legs

John Lubega is 43 and a shoe repairer. He lives in a village in Nakaseke, Uganda. He is paralysed below the waist after a road accident. His upper body is strong. He uses a three-wheeled wheelchair made in Kampala, with a single small rear wheel.

Lubega draws water at a handpump 1 mile from his home. It is on a raised concrete platform, which prevents him getting close, so he has to lean over to pump which is awkward. He accepts help if it is offered. There are boreholes nearer, but they are accessed by steep, narrow or rough pot-holed tracks, whereas the way to this one is accessible.

He can carry a 20 litre jerry-can of water between his feet on the footrest of his wheelchair (width 33cm x depth 23cm). This is more convenient and easier to manoeuvre than a trailer.

Bathing

To bathe, Lubega lies on his front in bed, with a plastic sheet under him to avoid the bed-sheets getting wet and having to wash them each time. He puts a basin of water on the floor, and uses a cloth to wash himself. His bed at home is too low to allow him to stretch his arms out straight and it causes pain. To solve the problem, he places cushions under his chest to raise his upper body.

Benefits

Using the plastic sheet minimises his family's workload, in terms of washing bedclothes.

Process for obtaining adaptations

The wheelchair and bed-pan are provided by the hospital. The hospital introduced him to the idea of bed-bathing, but directly onto the bed-sheet, which made it wet, and needed frequent washing. He had the idea of using a plastic sheet, which he bought himself locally.

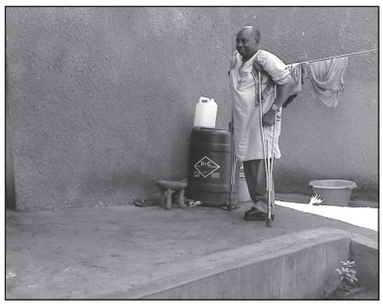


Figure 9.108. Concrete ramp leading from the house.

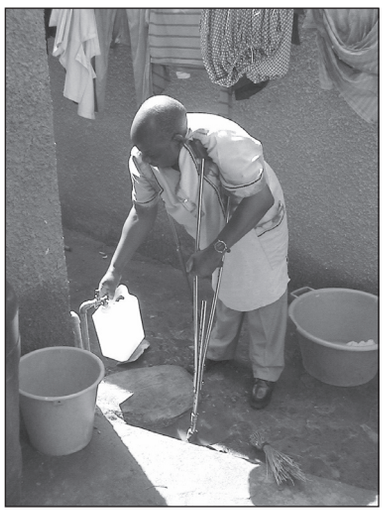


Figure 9.109. Kiyaga using the household tap.

Figure 9.110. Carrying a jerry-can.

9.24 Toilet and bathing area for man using crutches

John Ndiraba Kiyaga lives with his wife and six children in urban Kampala, Uganda. He is Director of his own NGO – Action to Positive Change on People with Disabilities (APCPD). He has weak legs and uses crutches and a wheelchair to move around in. He wears rigid leg braces, and so cannot bend his legs.

Kiyaga designed and constructed a family bathroom and toilet that he can also use. He installed a concrete ramp leading from the house to the compound so that he could reach the tap, bathroom and toilet easily in his wheelchair or on crutches.

Household tap

Description

- The house has a piped water supply with an outside tap. A container nearby is kept filled in case of breaks in the supply.

Approach

- ~3m from the back door along a concrete ramp.

Dimensions

- H of tap: ~30cm.

Use

- Kiyaga can draw and carry water in a half-full 5 litre container while using his crutches. He is strong enough to hold the container in his hand whilst holding the handle of the crutch. He can carry water for up to ½ mile this way.
- In the past he used a tricycle wheelchair to travel around. He could carry 2 x 25 litre containers of water on it (Figure 9.111).

Key features

- Proximity – Kiyaga fetches water as he needs it.
- Cost: the monthly cost of water is similar to what he used to pay the water vendor at the public tapstand.

Drawbacks

The tariff for the household connection had to be paid as a lump sum rather than incrementally.

Figure 9.111. Two jerry-cans under the seat of Kiyaga's old wheelchair.

Family bathroom

Description

- Built of cement-plastered brick, with a concrete floor and no roof or door. The entrance is wide enough to enter on crutches.

Approach

- A concrete ramp and path lead from the house to the bathroom and toilet.

Dimensions

- Approach path W: 80cm between two walls.
- Interior: L: 210cm, W: 110cm.
- Entrance W: 80cm.
- Bathing seat: H: 14cm.

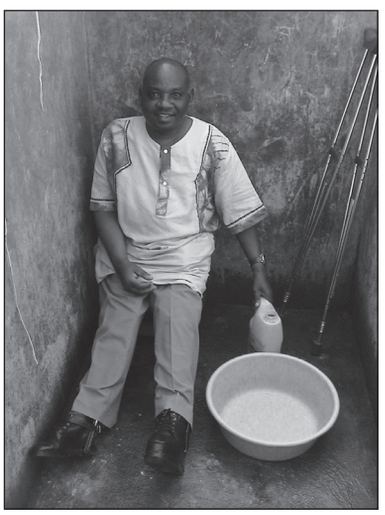


Figure 9.112. Kiyaga sits on a low stool to bathe.

Use

- Kiyaga sits on a wooden stool in the corner of the bathroom, with legs straight. Water is placed in a bowl on the floor (usually by a family member). Wastewater drains through a hole in the wall and into a drainage system.

Key features

- There is space for Kiyaga to sit with straight legs.
- The whole family uses the bathroom; no separate facility is needed.
- Different seating can be used depending on the support needs of the user.

Drawbacks and comments

- The approach path is currently too narrow for wheelchair access, especially where the path turns a corner (see Figure 9.116). Designing and constructing it wider would have added minimal extra cost, but made it accessible both in a wheelchair and on crutches.
- Adding a door would increase privacy.
- An internal water source would avoid the need to fetch water from the tap outside.

Suitable for

The whole family.

Figure 9.113. Kiyaga's toilet seat.

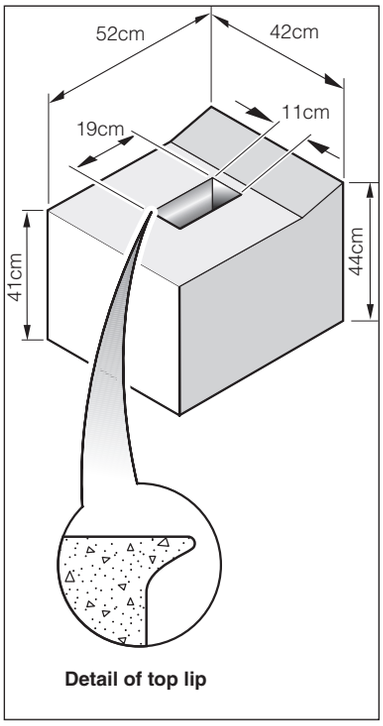


Figure 9.114. Dimensions of toilet seat.

Household toilet with fixed raised seat

Description

- Brick-built cement-plastered cubicle with a smooth concrete floor. A wooden door opens outwards.
- A cement-plastered brick seat, painted red, is installed over a pit latrine. The seat is raised slightly at the back (Figure 9.114) and has a rectangular hole.
- There is a container of water in the toilet. Water for handwashing is also kept in a container outside the toilet (Figure 9.115).

Approach

- Along a concrete ramp and path, which is level with the toilet floor.

Dimensions

- Internal cubicle: L: 125cm, W: 96cm.
- Door W: 62cm.
- Seat: W: 42cm, L: 52cm, H: 41 – 44cm.
- Toilet hole: 19cm x 11cm.

Use

- Kiyaga gets to the toilet on crutches.

Key features

- The painted cement-plastered seat is easy to clean.
- The raised rear of the toilet seat provides support when sitting.
- A lip around the top of the toilet hole helps prevent fouling of the drop-hole walls (Figure 9.114).
- The outward opening door leaves more space inside the cubicle to move around, to shut the door and to sit with straight legs.
- Internal water supply is convenient for anal cleansing and for cleaning the seat.
- The separate toilet is designed to suit Kiyaga's needs without obstructing other family members.

Drawbacks and comments

- High cost of two toilets. A cheaper option would be a single spacious toilet, with a squat plate and a wooden or plastic toilet seat over it, which could be moved to one side when not required.

Figure 9.115. Water for handwashing outside the toilet (location shown in Figure 9.116).

- Making the hole in the toilet seat larger would make anal cleansing easier, especially if water is used.
- Internal water supply needs to be regularly filled by hand.

Suitable for

- People with difficulty squatting, but who can bear weight on their legs.

Benefits

Kiyaga's wife Christine said that before the adaptations were in place, someone always had to be at home in case her husband needed help. For example, without ramps he could not fetch water for use in the bathroom or toilet, so he depended more on his family.

The adaptations allow Kiyaga to be independent, so Christine can safely leave him alone, to go to work or to visit relatives for example.

Process for obtaining adaptations

All adaptations were planned and paid for by Kiyaga. He commissioned a local builder to construct them according to his instructions. He based the toilet design on one he saw in an international hotel.

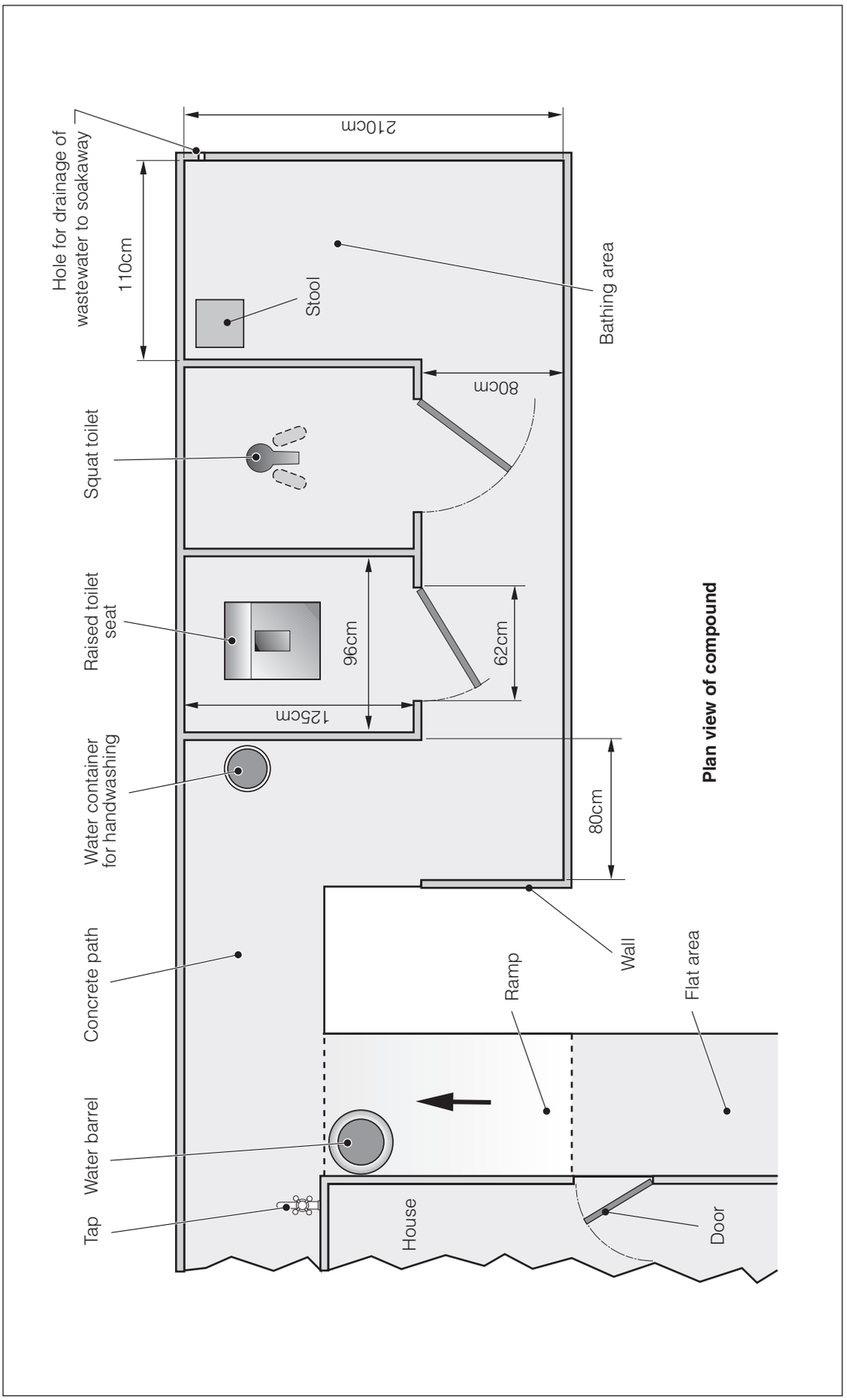


Figure 9.116. Layout of the Kiyaga family's toilet and bathing area.

Figure 9.117. Wheelchair accessible toilet on the right. Arrow shows concrete ramp.

Figure 9.118. Door with a two-way hinge.

Figure 9.119. Painted cement screed brick toilet seat with handrail on the left from the door.

9.25 Primary school toilet accessible for wheelchair users

This is a primary school in a peri-urban area of Kampala, Uganda. It was set up by John Kiyaga's NGO, APCPD, and accepts both disabled and non-disabled children aged 6 to 18. The disabled children have mostly physical impairments, and use wheelchairs, callipers and/or crutches. The school has one latrine for disabled pupils. Unfortunately the researchers' visit was in the holidays, so no children were present.

Description

- Brick-built toilet with a concrete floor. The wide wooden door has a two-way hinge, so opens outwards and inwards. It has slide bolts outside and inside.
- There is a square cement-plastered brick toilet seat in one corner, painted black.

Approach

- Along a packed earth path up a gentle slope to a short steep concrete ramp.

Support features

- Handrails on both sides of the toilet. On the left, the rail starts just inside the door and extends to behind the toilet. Painted g.i. pipe, concreted into the floor and walls.

Dimensions

- Overall: L: 225cm, W: 125cm.
- Door W: 70cm.
- Toilet seat: W: 48cm, L: 52cm H: 37cm.
- Toilet hole: L: 22, W: 12cm.
- Handrails: 25mm o/s Ø g.i. pipe. H: 80cm.

Key features

- The raised seat is suitable for easy transfer from/to a wheelchair, and for users unable to squat or with poor balance.
- The painted cement screed seat is water repellent, so is durable, easy to clean and hygienic.
- There is space for a wheelchair to enter and turn, and for a helper to move around.
- A handrail from door to toilet provides support to users who walk but have poor balance.
- The 2-way hinge allows the door to be pushed open from outside or from inside.

Drawbacks and comments

- A larger toilet hole would make anal cleansing easier, especially if water is used.
- An internal water source next to the seat for personal hygiene is a high priority.
- Rails on both sides of the toilet prevent sideways transfer from a wheelchair parked beside the toilet.

Process of implementation

The need for an accessible latrine was recognised when a disabled pupil was having difficulty using the existing latrines. An occupational therapist designed it for them. APCPD installed it.

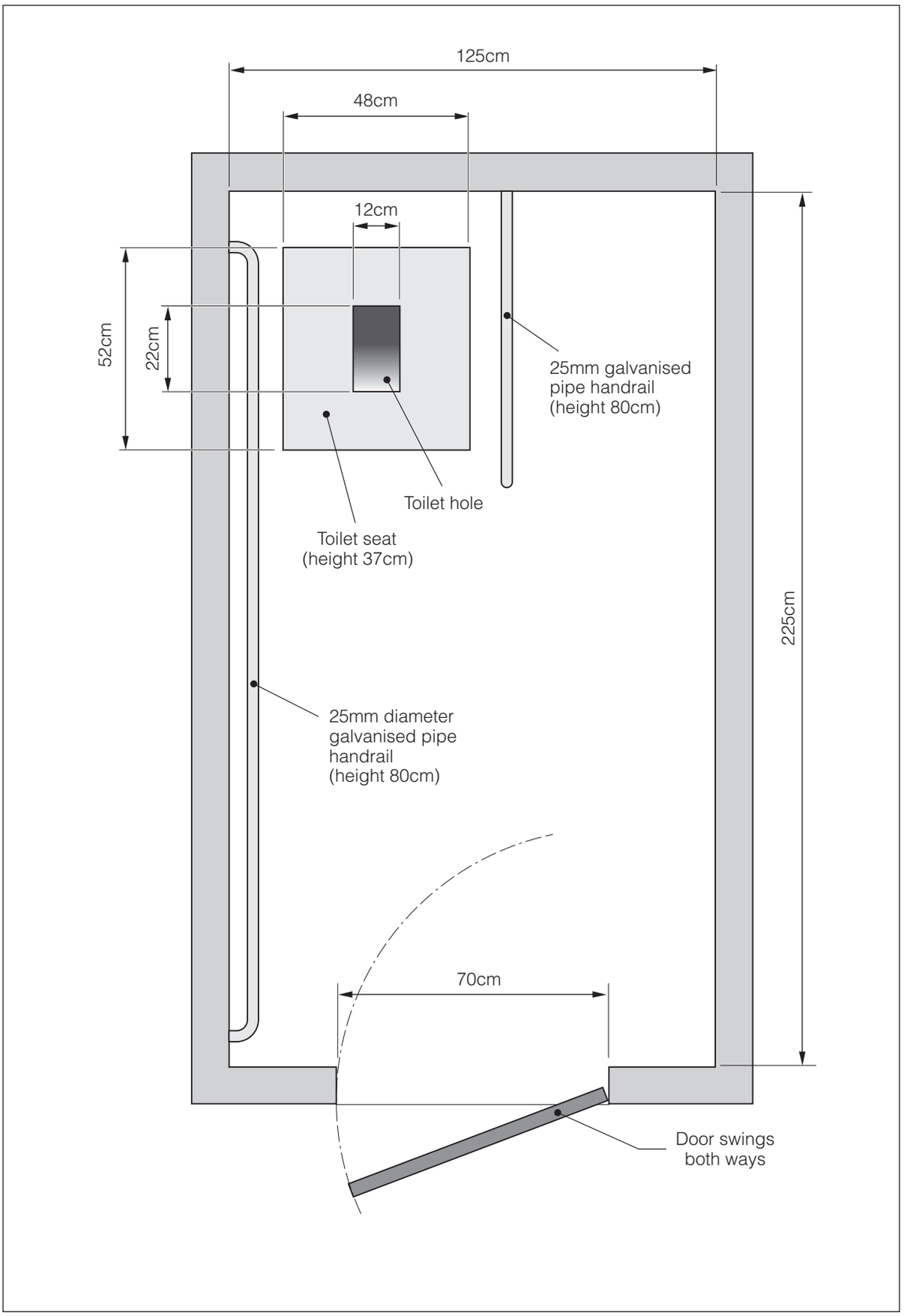


Figure 9.120. Plan view of accessible school toilet.

9.26 Bathroom and toilets in residential school for disabled children

The school is on the outskirts of Kampala, Uganda, and caters for 78 children with physical impairments, aged from 7 to 18 years. Primary education and vocational training are provided. Most of the children have mobility and co-ordination problems, and many use wheelchairs.

The school has some concrete ramps, but most access is via earth paths. Facilities are designed to be universally accessible, rather than suited to individual children's needs. The school has a range of latrines, which have been built at different times during the school's history, with varying levels of accessibility.

Communal bathroom with sitting blocks

Description

- Walls of cement-plastered brick create three bathrooms: one for girls, one for boys and one for housemothers. The floor is rough concrete. There are no doors or roof. Entrances are wide enough for wheelchairs to enter.
- Fixed cement-plastered brick blocks are for children to sit on while bathing.

Approach

- A concrete approach path finishes level with the bathroom floor.

Dimensions

- Sitting blocks: 23cm x 23cm.
- Heights vary 10 – 18cm.

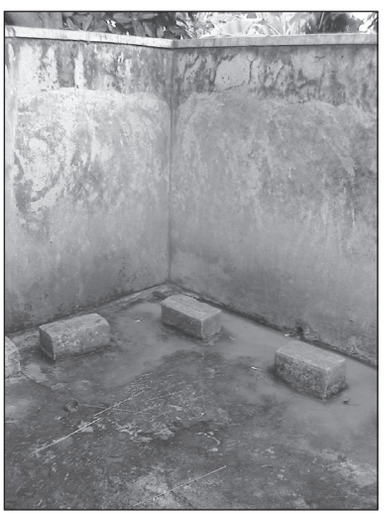


Figure 9.121. Fixed concrete sitting blocks for bathing.

Use

- Most children can transfer unaided from a wheelchair on to a sitting block. They wash from a basin of water placed on the floor in front of them by housemothers, who fetch water from outside.

Key features

- There is space for wheelchairs to enter and turn, for helpers and for children to sit with straight legs.
- The blocks are narrow so water drains off easily.
- The low height of the blocks reduces the risk of injury if a child falls, and allows children to keep their feet on the ground for support.

- Children can choose the block with a height that best suits them.
- Children sit raised above their dirty bathwater.

Drawbacks and comments

- Children with poor balance need a support worker to help them. Some children, especially older boys, get embarrassed at being helped by a woman. A bathing chair with back and side-rails, e.g. of plastic, would provide more support. and allow children to bathe independently and with more dignity.
- The low height of the blocks mean most children need help getting back into their wheelchairs.
- An internal water source would reduce reliance on support workers to collect water from outside.

Suitable for

- Children with good sitting balance.

Figure 9.122. Concrete ramp to latrine block with handrail both sides.

Figure 9.123. Large slide bolt for easy grip.

VIP 'model' fixed raised seat latrine, squat latrine and twin sitting blocks

Description

- Brick-built cement-plastered block of three cubicles with a tin roof. Rough finish concrete floor.
- Wide entrance, wooden doors opening outwards, with a large slide bolt on the inside for easy grip.
- A hole in the door allows the door to be opened from outside if needed (Figure 9.123).
- Each cubicle has a different type of toilet:

  Cubicle A: Circular raised fixed toilet seat of unpainted cement-plastered brick (Figure 9.124).

  Cubicle B: Concrete squat footplate installed level with the floor (Figure 9.125).

  Cubicle C: Twin cement-plastered sitting blocks, unpainted (Not shown but similar to Figure 9.126).

Approach

- Concrete ramp with handrail on both sides. Level area in front of the toilet doors.
- Handrail attached to the outside wall for support while opening the door.

Figure 9.124. Raised toilet seat with handrails for support.

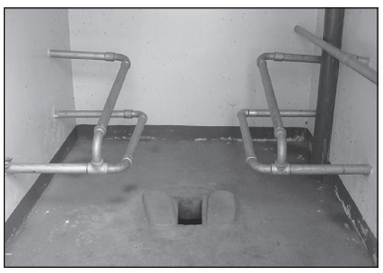


Figure 9.125. Squat latrine with handrails for support.

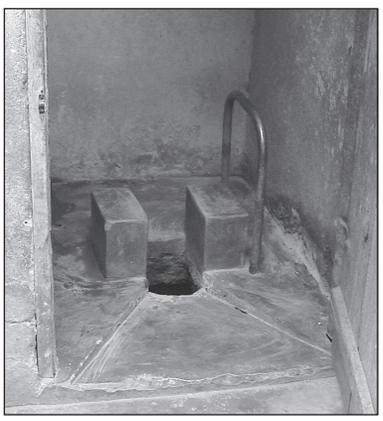


Figure 9.126. Twin sitting blocks, similar to those in cubicle C.

Internal dimensions and layout

- Cubicle W: 180cm.
- 80cm between toilet and back wall; 150cm between toilet and door.
- A. Raised seat H: 41cm. Toilet hole: L: ~25cm, W: ~18cm.
- B: Squatting plates raised 3cm from floor.
- C: Twin blocks: H: 25cm, gap between blocks 14cm.

Support features

- Horizontal rails fixed to both side walls at different heights. Additional horizontal handrail extends from front to back of RH wall.
- Painted 50mm Ø g.i. pipe.Lowest rail H: 38cm.

Key features

- Enough space for wheelchairs to enter and turn, and for a support worker to hold a child from in front or behind.
- The non-slip rough concrete floor prevents crutches slipping.
- Rails at different heights suit different users.
- Rail from door to toilet supports users with poor balance who enter without a wheelchair.
- Painted pipe rails resist corrosion from pit fumes.
- A: Raised seat is convenient for wheelchair transfer.
- The short distance between the front of the seat and the toilet hole reduces the risk of fouling the seat.
- B: Squat plates were reportedly preferred by support workers, who found it easier to support a child squatting than sitting.
- C: Twin blocks: the gap between the blocks makes anal cleansing easy. These were reportedly preferred by girls.

Drawbacks and comments

- High cost.
- The rough concrete floor absorbs water/urine making it difficult to clean. An alternative would be to make the floor smoother but create ridges for a non-slip surface.
- Painting the concrete seat/blocks would make them resistant to urine and water and easier to keep clean.
- Rails on both sides prevent sideways transfer from a wheelchair.

- Providing an internal water source is a high priority for anal cleansing.
- Raised seat: Anal cleansing using water is more difficult on a seat than when squatting.
- Twin blocks: for small children the gap between the blocks needs to be narrower for comfort and safety.

Suitable for

- Raised seat: People unable to squat, including wheelchair users.
- Squat toilet: People who need support to squat, and are able to grasp a handrail.

Unsuitable for

- People unable to sit without full support.

Process for obtaining adaptations

The issue of accessible latrines in mainstream schools has arisen because of the recent introduction of Universal Primary Education in Uganda, which entitles all children, including disabled children, to enrol in school. Many disabled children have been rejected or dropped out because of a lack of facilities.

The Disability and Rehabilitation Section at the Ministry of Health proposed the idea of a pilot project to trial different designs of accessible latrines, to develop a model for use in all schools. This is funded by UNICEF, with the Ministry of Education (Special Education) also involved.

Benefits

The immediate benefit is that the school has accessible facilities, but the main benefit of the pilot project is long-term: disabled children will be able to attend mainstream schools.

Lessons from the pilot could also be relevant to the family situation; parents could observe the facilities and take ideas home.

The information was provided by Joy Mwesigwa, Director, Fred Semakula, Assistant Director, and Rachel Kansiime, Occupational Therapist.

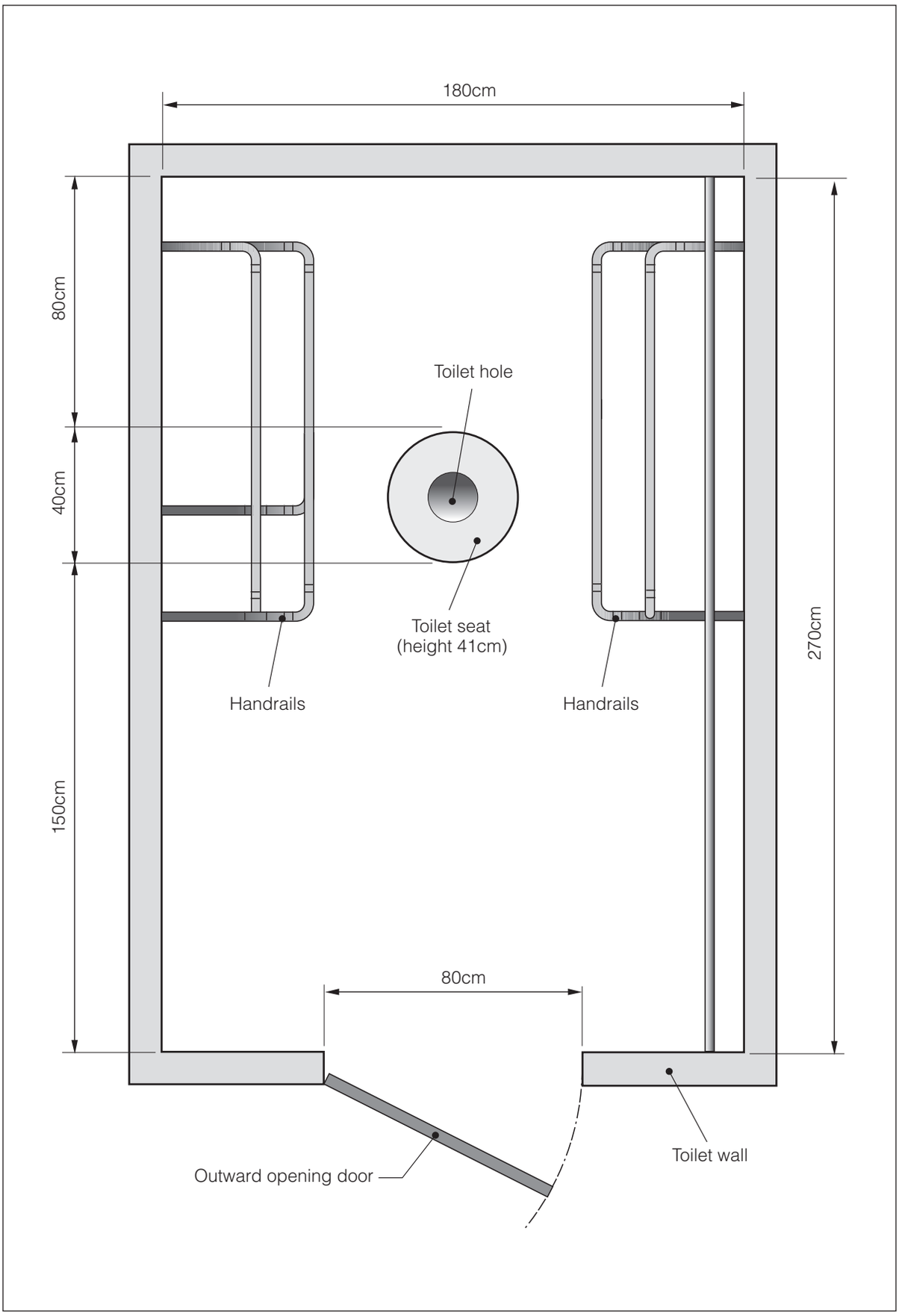


Figure 9.127. Plan view of VIP latrine with fixed raised seat.

Figure 9.128. Household bathing area.

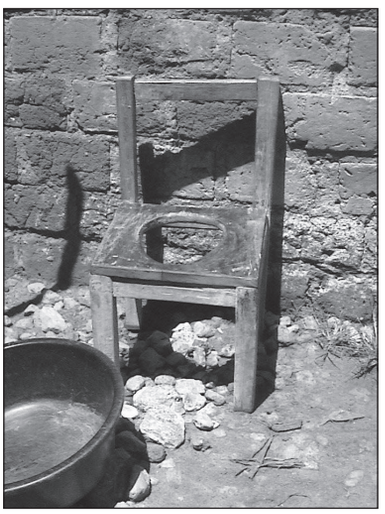


Figure 9.129. Wooden bathing/ commode chair.

Figure 9.130. Adapted jerry-can shower.

9.27 Shower, bathing chair and implement holder for girl with limited movement

Eva Nakatudde is 19 and lives with her parents, grandmother and siblings in a rural village in Luweero District, Uganda. She has rheumatoid arthritis, which has gradually made all her joints stiff. She still has movement in her neck and a little in her thumbs. For mobility, a family member pushes her around in a wheelchair.

Simple shower arrangement

Description

- An outside shelter has been constructed against the side of the house for bathing. The floor is stony earth. Vertical rough planks and branches form two sides, leaving the front open.
- There is enough space for a bathing chair, for the wheelchair to be positioned next to it, and for a helper to stand on either side.
- Eva described her shower which broke recently:
- A pole extended from one side of the shelter to the other. Two 4 litre jerry-cans, which each had about 10 holes near the top, were filled with water and the top screwed on. The jerry-cans were suspended from the pole by a rope tied to the handle. A second rope was tied with one end round the bottom of the jerry-can, and looped over the pole. Eva held the other end of the rope.

Use

- Her sisters pushed Eva to the shelter, helped her undress and transfer from wheelchair to bathing chair. She sat under the shower holding one end of the rope. She pulled on the rope, making the jerry-can tip and water shower out. When one jerry-can was empty, she did the same with the second. Her sisters help her wash where Eva can't reach. She wipes and dries herself as much as she can, and either 'air dries' the rest, or asks for help.

Key features

- Low cost – all materials were available locally. The only purchases were nails and rope.
- The jerry-cans could be filled by family members when it was convenient for them.

Figure 9.131. A rough path leads to the family latrine.

Drawbacks and comments

- The lack of roof on the bathing area left the jerry-cans exposed to the sun, and as a result they cracked recently. Eva's father intends to repair the shower, this time with a tin roof for protection.
- Time-consuming for family members – the jerry-cans need filling and preparing each time.

Suitable for

- Bathers with limited arm movement.

Figure 9.132. The packed earth floor of the pit latrine.

Bathing/commode chair

The family has a pit latrine about 10m from the house along a rough path. Eva does not use the toilet chair in the latrine, because it is hard to get there in her wheelchair. The latrine floor is of packed earth and she would be worried that the toilet chair would break through the floor and fall into the pit.

Description

- A wooden chair with a hole in the seat, a back but no side-rails.

Dimensions

- Seat H: 40cm, W: 35.5. D: 33cm.
- Oval hole in seat 24 x 18cm.

Use

- Eva sits on the chair while bathing.
- She also uses it as a commode chair in the bathing shelter, with a bucket underneath. A family member empties the contents into the latrine, then cleans the bucket with water and soap powder.

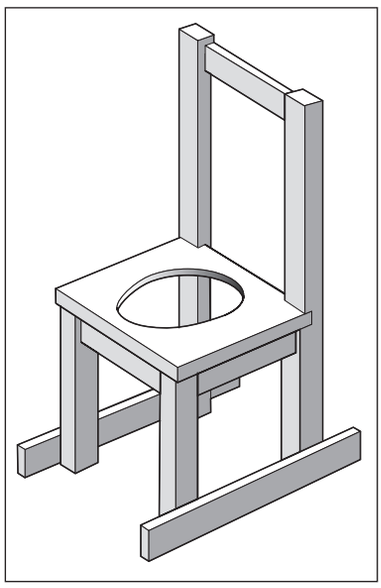


Figure 9.133. Bars attached to chair legs on each side.

Key features

- The chair back provides support for Eva who has poor sitting balance.
- The hole in the seat allows access for anal cleansing and for the bather to wash her buttocks and genital area.
- The chair is multi-purpose, used for both bathing and toileting, and therefore cost-effective.

Drawbacks and comments

- Adding side-rails to the chair would help prevent Eva falling sideways.

Suitable for

- People with difficulty squatting but with some sitting balance, such as people with weak legs or pregnant women. People who get tired easily when standing up, such as elderly or sick people.

Suggestions

The chair was made five years before, so it is now less comfortable for Eva. Now she would prefer it to be wider, with side-rails.

To reduce the risk of the chair breaking into the latrine pit, a bar could be attached to the legs on each side, to spread the weight of the chair. This could also improve its stability, and make it easier to move the chair by sliding it, if required. The path to the latrine would also need to be levelled, and the entrance widened.

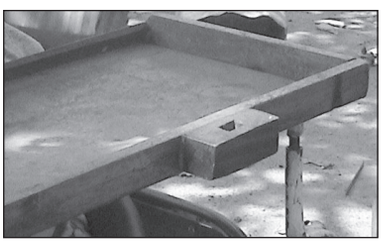


Figure 9.134. The hole in the wheelchair tray to insert the upright post of the implement holder.

Implement holder – tray attachment

Description

- An 'arm' swivels on a vertical post which slots into a hole attached to Eva's wheelchair tray. The 'arm' has a cleft end which can hold a spoon or other implement.

Use

- Eva holds the spoon handle in her mouth and scoops food (Figure 9.136). She then places the handle in the cleft of the implement holder (Figure 9.137), then takes food off the spoon with her mouth (Figure 9.138).

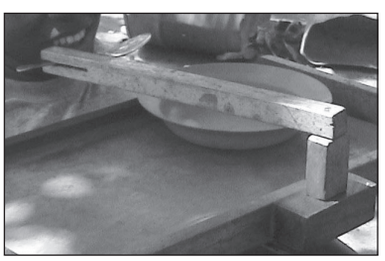


Figure 9.135. Implement holder.

Key features

- Low cost, locally made.
- Can be used to hold a sponge, toothbrush, comb, or other household implement

Drawbacks

- The 'arm' rotates, which makes it unsuitable for use with items that need to be held rigid such as a toothbrush.

Suitable for

- Users with no/limited use of arms or hands.

Benefits

Eva liked the shower, which gave her more control. Without it, she has to wait for her sisters to come home from school to help her.

Figure 9.136. Eva scoops food with the spoon held in her mouth,

Figure 9.137. wedges the spoon handle in the cleft of the holder,

Figure 9.138. and takes the food off the spoon with her mouth.

Before she had the tray and implement holder, she relied on family members to feed her or give her a drink. They sometimes rushed, gave her the food while it was still hot, or stopped before she was full. Now she can take her time, and eat till she is satisfied. It is better for her sisters too – now they have more time for other household tasks or to rest.

Process for obtaining adaptations

The ideas for the jerry-can shower, trays and spoon holder were introduced by an occupational therapist from the District Hospital. The family bought the materials and built the shower area and shower.

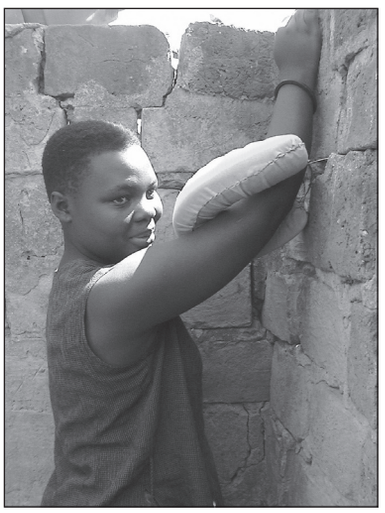


Figure 9.139. Joweria shows how she washes her arm.

9.28 Bathing ring for young woman with one arm

Joweria Nakivumbi is 18 and lives with her family in a rural village in Masaka District, Uganda. Her left arm is amputated above the elbow. She has no mobility problems.

Joweria fetches water in a 10 litre jerry-can from a communal borehole across the road from the house. She is not strong enough to pump water with only one arm, but there is usually someone around to pump water for her.

The family have a brick-built bathroom behind the house.

Description

- A 'bathing ring': a ring of steel wire padded with 'mattress sponge' i.e. latex foam, and then covered with cotton fabric and stitched. One end of the ring is wedged into a crack in the brick wall of the bathroom.

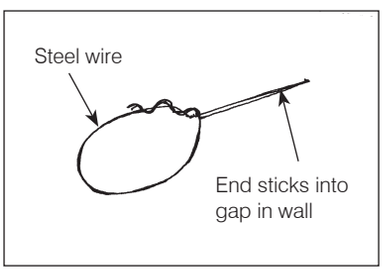


Figure 9.140. Basic construction of bathing ring.

Use

- Joweria can wash herself all over with her one arm. Finally, to wash her arm, she passes her arm to and fro through the ring to rub her arm clean.

Key features

- Low cost, locally available materials.
- Washable, durable, hygienic.

Drawbacks and comments

- Joweria finds the ring is not rigid enough and moves when she rubs her arm against it.

Suitable for

- People with one arm, limited arm movement, or poor grip.

Process for obtaining adaptation

The occupational therapist from Masaka District Hospital designed the ring, the materials were provided by the family, and the physiotherapist made it.

Richard Mutabazi, SC/UK

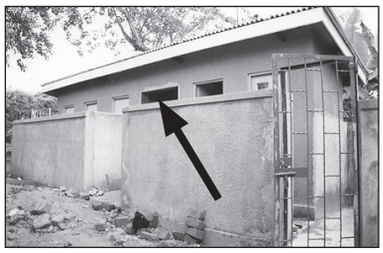


Figure 9.141. Toilet block (under construction). Arrow shows wider doorway of accessible toilet in the centre.

Richard Mutabazi, SC/UK

Figure 9.142. Accessible toilet cubicle.

Richard Mutabazi, SC/UK

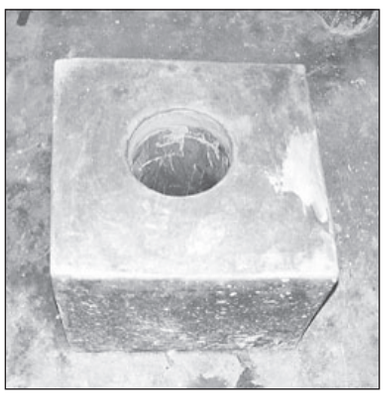


Figure 9.143. Fixed toilet seat. Note PVC pipe lining drop-hole.

9.29 Primary School toilet designed for wheelchair access

New Bubajjwe Primary School is in a low-income, peri-urban area of Kampala, Uganda, with poor overcrowded housing, much of it on marshy land. There is poor water supply, poor sanitation, drainage and refuse disposal.

The most interesting aspect of this case-study is the process of implementation, which involved collaboration between several different agencies – education, international NGO, and local NGO disability service provider. The process is described in detail below.

Description

- A brick-built row of six VIP latrines, with three cubicles for girls, two for boys, and one urinal.
- A square cement-plastered brick seat has a drop hole lined with heavy duty PVC pipe (same as used for the ventilation pipe) (Figure 9.143).
- Two handrails are attached, one to each side wall, for the length of the toilet seat.

Approach

- Concrete ramp approach with a high wall on each side.
- Entrance wide enough for a wheelchair to enter. The door opens outwards.

Dimensions

- Seat H: ~35cm.
- Handrails: 35-40mm Ø g.i. pipe, L:~50cm, H: ~ 80cm.
- Toilet hole Ø: 15cm PVC pipe.

Key features

- Space for a wheelchair to enter, and for a helper.
- Space for a child to sit with straight legs.
- A raised seat is convenient for transfer from a wheelchair.
- PVC pipe makes the drop-hole easy to clean.
- Handrails provide support for users while lowering themselves onto and getting up from the toilet seat.
- The accessible cubicle was planned from the beginning of the project, so the extra cost incurred was negligible.

Richard Mutabazi, SC/UK

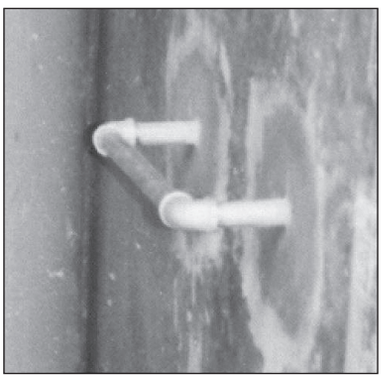


Figure 9.144. Handrail cemented to the wall.

Drawbacks and comments

- Locating the toilet in one corner of the cubicle could free up enough space for a wheelchair beside the toilet to enable sideways transfer.
- A toilet hole which is longer front to back would make the seat easier less likely to be soiled.
- Handrails may be too high in relation to the seat, and too wide apart for some child users. Additional handrails fixed to the floor on both sides of the toilet would provide choice of support.
- A handrail extending from the door to the toilet would provide support for users with poor balance.

Suitable for

- Wheelchair users; people unable to squat.
- People who can sit with some support.
- People able to grasp handrails.
- Very young children, many of whom don't like to use an ordinary squat latrine.

Process of implementation

Save the Children/UK (SC/UK), an international NGO, was implementing a project to improve Primary Health Care services in the area, including improved WATSAN.

This created demand from primary schools for latrines. New Bubajjwe School insisted their latrine be accessible for disabled pupils. They had a disabled pupil at the school, and they'd had to refuse admitting disabled pupils in the past because of lack of suitable facilities. COMBRA is a local NGO providing training in CBR throughout Uganda. A COMBRA occupational therapist provided design and detailed measurements of accessible latrines, including miniature 3D models made of cardboard and wire to show to teachers and SC/UK staff. These were given to the contractors for guidance. Although the SC/UK project engineer had no previous experience of accessibility, this gave him more confidence. He discussed with the contractor how to incorporate the suggestions into the existing standard design for school latrines, so the middle boys' cubicle was re-designated as the accessible latrine, for use by both disabled girls and disabled boys. He also explained the details of construction.

Factors contributing to this initiative

Introduction of Universal Primary Education in Uganda has meant that disabled children now have a right to attend

school. COMBRA had a community-based project with disabled children in that area. One school Board member was a staff of COMBRA.

Constraints to implementation

SC/UK staff did not know how to go about making facilities accessible, had never come across such facilities and initially felt helpless. They considered it a risk, because they lacked previous experience in this area. After construction of this facility they would need feedback on its usage before incorporating it as part of the design. (This would be considered good practice, and enable design improvements to be made.)

Different innovations would have to be made for latrines in areas with a high water-table, where the latrines are raised and there are no ramps for wheelchairs.

(NB: For accessibility of raised latrines, SC/UK installed steps with handrails.)

This information was collected in an interview with Richard Mutabazi, former WATSAN Project Officer for SC/UK, supplemented by Moses Kiwanuka, occupational therapist from COMBRA.

Figure 9.145. Barbara fetching water.

9.30 Toilet stool for child with weak legs

Barbara Namaanda is 7, and lives with her grandmother, Mrs Veronica Alibazewa Mbabali, and the rest of her family in a village in Masaka District, Uganda.

Barbara has weak legs as a result of an accident. Her upper body is unaffected and strong. She has been using crutches for 10 months and is becoming increasingly mobile. She uses them to go to school, which is at least 500m away.
She can draw water from the family's rainwater storage tank, which has an ordinary tap, using a 1 litre jerry-can (Figure 9.145). She can carry the jerry-can in her hand whilst moving with her crutches.

The family have their own pit latrine. There are no special adaptations to the structure itself.

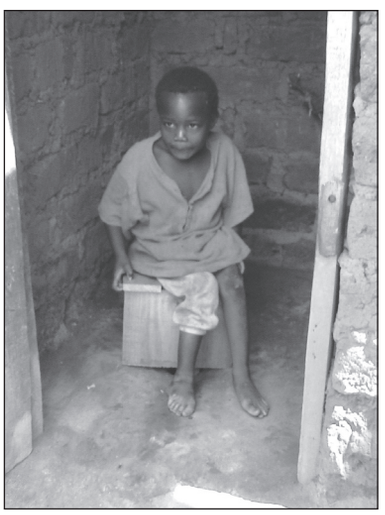


Figure 9.146. Barbara sitting on her toilet stool.

Wooden toilet stool

Description

- Barbara's wooden toilet stool is made of unpainted wood. The seat is two planks with a gap between them. There are no sides or back.

Use

- The stool is placed in the latrine over the toilet hole. Barbara sits on the stool to use the toilet. Urine and faeces fall directly into the hole.

Dimensions

- L: 40cm, W: 30cm, H: 25cm.
- Gap between planks: 10cm.

Key features

- Fairly durable, locally made, moderate cost.
- The front plank acts as a splash-guard against urine splashes.
- The narrow gap in the seat suits a child.
- The stool can be removed from the latrine when not required, so it does not obstruct other users.

Drawbacks and comments

- Painting or varnishing the seat would make it moisture resistant and easier to keep clean.
- A slightly larger cubicle would provide enough space to move the stool to one side of the toilet when not required.

Angela Martin

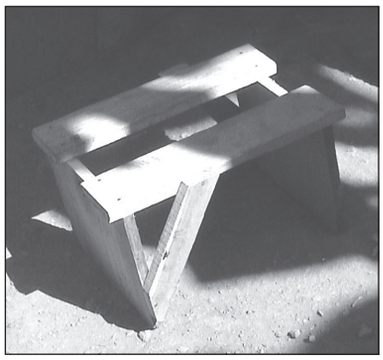


Figure 9.148. Wooden toilet stool.

Suitable for

- Users unable to squat, e.g. with weak legs, but with good sitting balance.

Adaptation

- Could be used as a commode seat with a container underneath (see page 118, Section 7.6. Commode seats).

Benefits

Before, Barbara used a child's potty, which her grandmother would empty into the latrine. Barbara said the potty was too low and it made her legs go numb.

She likes the new seat, because she can just sit on it comfortably, and she doesn't need to depend on others for the toilet. She uses the same toilet as the rest of the family, so she has privacy and there is no feeling of being different.

Other family members do not have to empty the container any more.

Process of implementation

The occupational therapist employed by Uganda Society for Disabled Children (USDC) designed, constructed and provided the commode chair in consultation with the family.

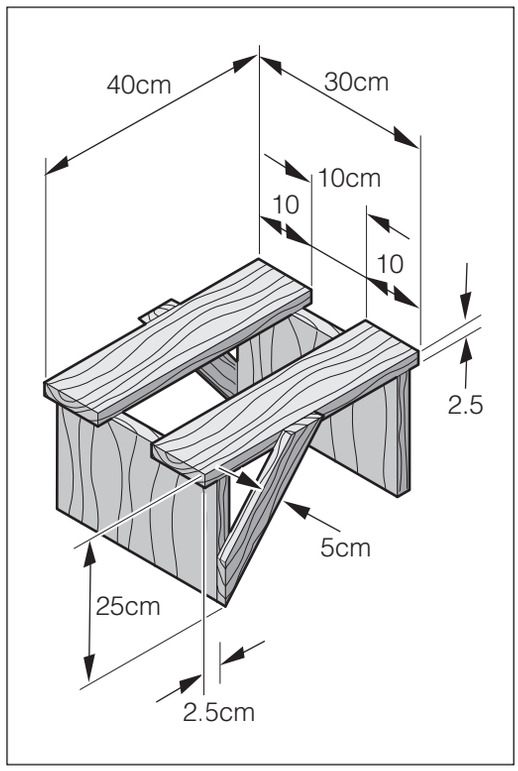


Figure 9.147. Dimensions of wooden toilet stool.

HITS, Uganda

Figure 9.149. Movable wooden ramp.

9.31 Demonstration equipment: wooden ramp, wheelchair trailer, bathing area, toothbrush stand, toilet chair, hand-walkers and knee protectors.

Uganda Society of Hidden Talents (HITS) was set up by its Chairman, Elijah Musenyente, who is himself a wheelchair user. HITS' mission is to develop the skills and talents of disabled and non-disabled people, to support poor communities to identify their needs and implement programmes to address these. Current projects include vocational skills training, income-generation, hygiene and sanitation awareness and low-cost locally made equipment and facilities.

Movable wooden ramp

Description

- Movable wooden ramp for wheelchair access to facilities with steps, with a raised kerb on both sides.

Dimensions

- W: 80cm, L: 3 metres.

Key features

- Flexible – can be placed wherever needed.
- Cheaper than concrete.
- Kerb on each side prevents wheelchair rolling over the edge.

Drawbacks and comments

- Less durable than concrete.
- User needs helpers to move the ramp as needed.

Suitable for

- Wheelchair users with helpers available only.
- Temporary use.
- Crossing open drains or ditches.

HITS, Uganda

Figure 9.150. Two-wheeled wooden trailer.

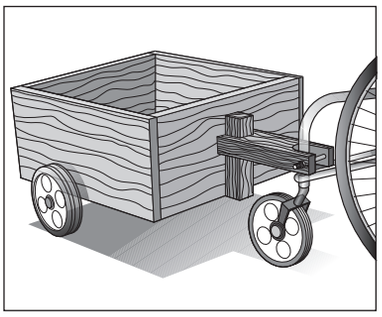


Figure 9.151. Detail of trailer hitching arrangement.

HITS, Uganda

Figure 9.152. Demonstration bathing area.

Two-wheeled wooden trailer

Description

- Two-wheeled wooden trailer hooks onto the back of a wheelchair with a single rear small wheel.

Dimensions

- None given.

Key features

- Locally made, moderate cost.
- Can be easily hooked and unhooked from the wheelchair.
- Multi-purpose – can be used to carry water, goods to and from market, babies, etc.
- More weight can be pulled than can be carried directly on a wheelchair.
- Could also be used as a hand-drawn trailer, with a different pulling arrangement, e.g. rope.

Drawbacks and comments

- It may be difficult for some disabled people to attach the trailer themselves.
- May not be suitable for rough paths.
- Not suitable for all types of wheelchair.

Demonstration bathing area

Description

- The bathing area is screened by leaves on a wooden frame, with no roof or door. The floor is earth and stones.
- A wooden stand holds a washbowl which 'slots in' to four side supports ~30cm off the ground.
- A wooden bathing stool has a solid seat and sides (H: 25cm, L: 30, W: 20cm).

Key features

- Low-cost materials.
- Water drains away into the rough floor.
- Wash-stand holds a bowl firmly in place at a suitable height for the bather.
- The narrow seat allows water to drain off easily.

Drawbacks and comments

- Not durable – the leaf screen needs replacing regularly.
- The rough floor makes it difficult to use for wheelchairs and people unsteady on their feet.
- The wash-stand is suitable for one size of bowl only.
- Unpainted wood absorbs moisture and is less durable.

Suitable for

- People with good sitting balance.
- People with poor co-ordination, or unsteady on their feet.
- People who get easily tired when standing for any length of time, e.g. elderly people, pregnant women.

Unsuitable for

- Wheelchair users.
- People with poor sitting balance.

Adapted from HITS photo

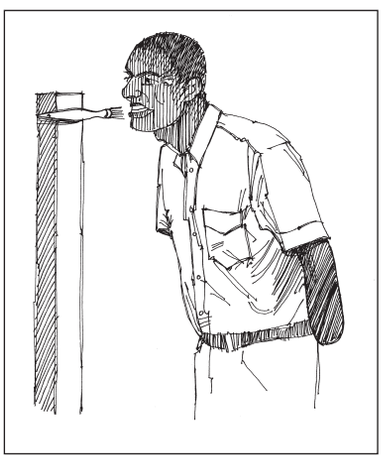


Figure 9.153. Toothbrush stand.

Toothbrush stand

Description

- Vertical wooden pole, with a cross-piece for standing on the floor. A toothbrush is nailed to the post at the required height.

Key features

- Could be made to any height.
- Could be adapted to stand on or be fixed to a table.

Drawbacks and comments

- Floor-standing version uses a lot of wood.
- Not fixed to anything, so may be unstable.

Suitable for

- Person with limited or no use of their hands.

HITS, Uganda

Figure 9.154. Wooden toilet chair.

Wooden toilet chair

Description

- Unpainted wooden chair with back and side-rails, and a hole cut in the seat, used over a pit latrine.

Key features

- Low cost, fairly durable.
- Arms and back provide support while sitting.

Drawbacks and comments

- The small hole is set quite far back in the seat, increasing the risk of fouling the seat.
- No splash-guard at the front of the chair means there is a risk of the user's clothing getting splashed with urine.
- Unpainted wood absorbs urine.

Figure 9.155. Man using hand walkers and knee-pads.

Wooden hand walkers

Description

- Pieces of unpainted wood with a handle on top.

Use

- The user holds one handle in each hand and 'walks' with them when moving around on hands and knees.

Key features

- Locally available materials, low cost, durable. Easy to clean.
- Reduces soiling of hands and knees and thereby reduces the risk of infection.

Suitable for

- People who move by crawling or shuffling.
- Wheelchair users where facilities are inaccessible to a wheelchair.

HITS, Uganda

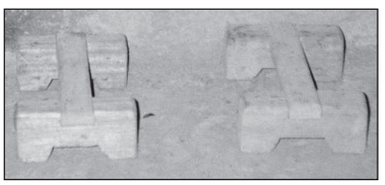


Figure 9.156. Wooden hand walkers.

Figure 9.157. Knee protector.

Knee and stump protectors

Description

- Rubber pads made from recycled car tyres that fit over the knee or a leg stump. Rubber laces run through loops and tie around the leg to hold the pad in place.

Use

- The user places them over their knees/stumps to protect them when walking.

Key features

- Low-cost materials.
- Durable, easy to clean.

Figure 9.158. Stump protector.

Process

These items of equipment and facilities have been developed as examples, so that when disabled people attend events organised by HITS, they can observe and try them out at HITS' demonstration area, and apply the ideas in their own home. No information is available, however, about whether or not this approach has been effective, what has worked and what has not worked.

Awareness-raising may be needed to convey the benefits of the devices, e.g. by running workshops where disabled people and their families use a problem-solving approach to improving access.

Based on information provided by Mr Musenyente, including interviews, photos and video.

Adapted from Mike Toole

Figure 9.159. Using the 'back-happy' tapstand.

9.32 'Back happy' tapstand

Description

- An adaptation of a traditional tapstand, with a waist-high shelf and an extra, higher tap added.
- The shelf has a slight slope which drains water down to the splash apron at ground level.

Context

- Rural areas of Tibet.

Use

- Communal tapstand, from which women fetch water in 15 – 20 litre metal jars, carried home on their backs.

Key features

- No need to bend from the waist when collecting water.
- Only slightly more expensive than the original model (given that most of the water system's budget is spent on piping to get water to the stand).
- Repairs and maintenance are similar to the original designs.

Drawbacks

- Minor factor: The higher level of the outlet requires slightly higher system pressure, meaning any leaks in the pipeline would be more severe. The pressure would make no difference to a well-constructed facility, and in terms of pipe pressure rating would amount to < 2% increase.
- The ground level splash apron is the same as in the original design, where washing or soaking clothes is carried out. It would be good to have these washing areas higher as well, but there could be a risk of cross-contamination from whatever is being washed there with containers being filled at the lower tap.

Mike Toole

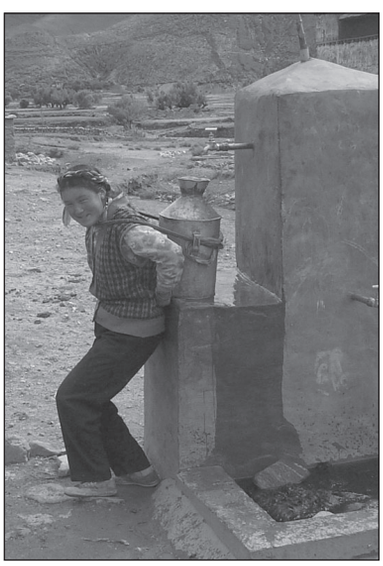


Figure 9.160. 'Back-happy' tapstand in use. Note direction of water drainage into ground-level splash apron.

Suitable for

- People with difficulty bending, including those with lower back pain.

Mike Toole

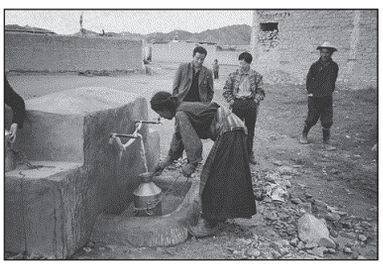


Figure 9.161. Original tapstand, with low taps only. Difficult to use for people with back problems.

Benefits

According to the women, the new design has improved their quality of life. The original tapstand involved bending to collect water, which made it difficult for people with lower back pain, as bending was the main activity that both caused and aggravated their back pain (see Figure 9.161).

Based on information from: Hoy, D. et al (2003) 'Low back pain in rural Tibet', The Lancet, Vol. 361, Issue 9353, pp.225-226, with supplementary technical information provided by Damien Hoy, Project Manager and Harry Beyer, Project Engineer.