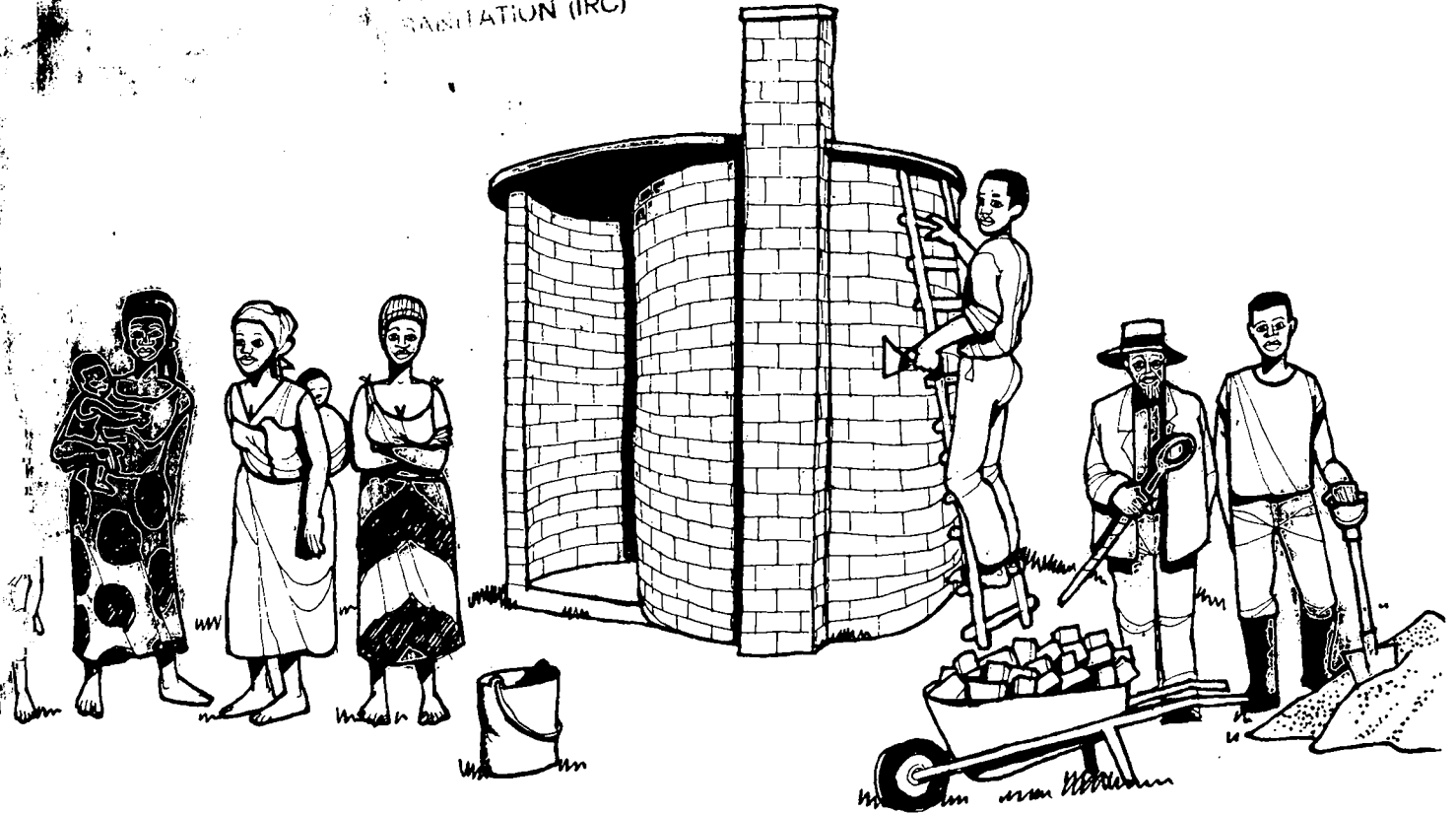


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Ministry of Health

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Blair Latrines Builders Instruction Manual

Blair Research Laboratory
P.O.Box 8105
Causeway, Harare



Acknowledgements

These training materials were written by Sue Laver Dept. of Community Medicine University of Zimbabwe and are based on Technologies developed by the Blair Research Laboratory, Ministry of Health, Republic of Zimbabwe. The development of the training materials and printing was supported by the Technology Advisory Group (TAG) of the World Bank and Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). The text was illustrated by Kors de Waard and/or Colleen Cousins.

So many people are building
Blair latrines!

Join them!

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Many people in Zimbabwe are now proud owners
of a Blair latrine. They like these latrines, because:

- When properly constructed they do not smell or attract flies
- They are easy to maintain
- They are safe for children to use
- They are private and can also be used for a hygienic bathing place
- They are inexpensive to build

It is the wish of the Government that each family
in the community should have their own latrine!



This is a Blair latrine

Roof

Makes the latrine dark inside. Flies usually keep away from dark places

Flyscreen

Prevent flies from entering or leaving the pipe

Ventpipe

Bad air rises through here and escapes into the wind

Walls

May be built in a spiral or square shape

Doorway

Fresh air is drawn through the doorway

Squatting-hole

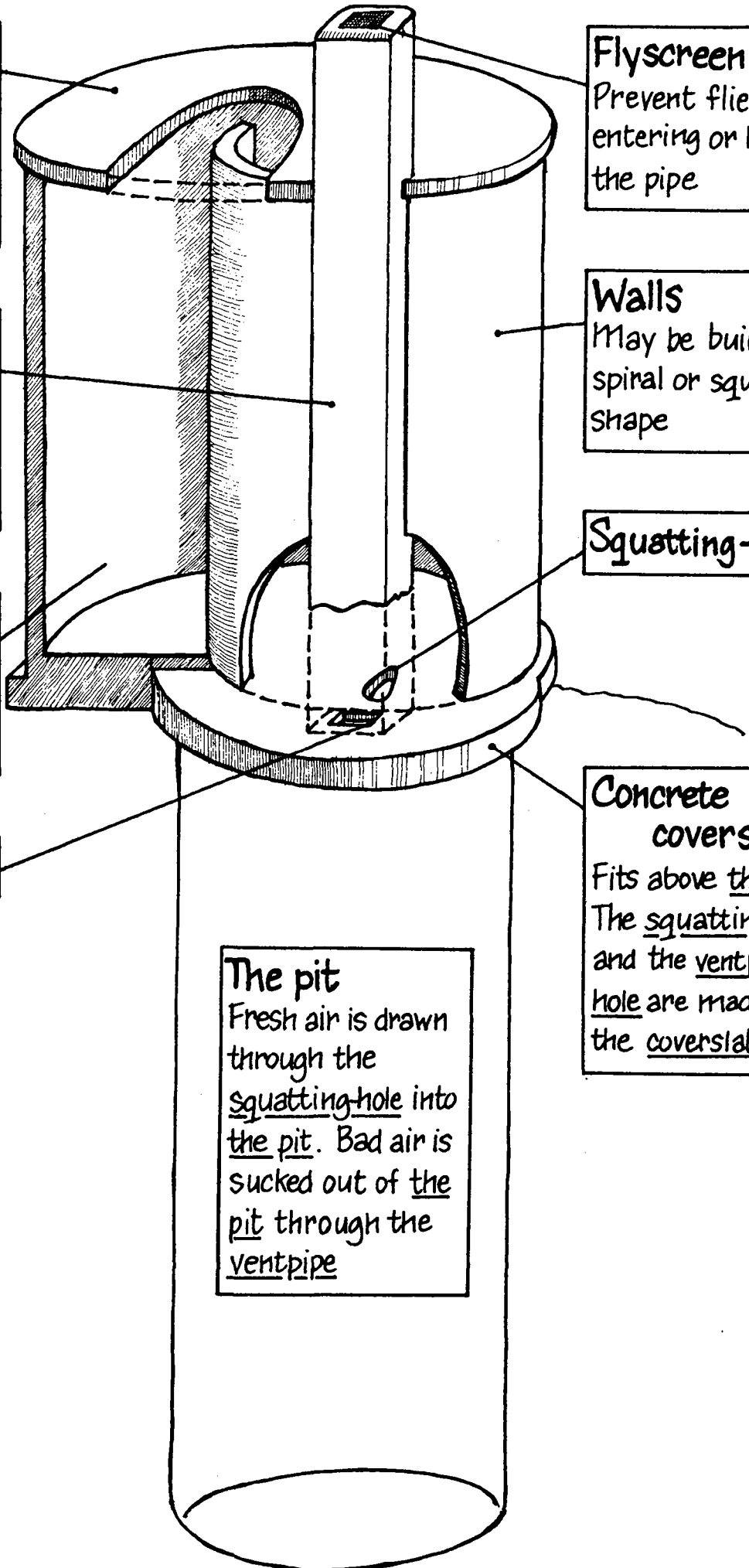
Ventpipe hole

Concrete coverslab

Fits above the pit. The squattinghole and the ventpipe-hole are made in the coverslab.

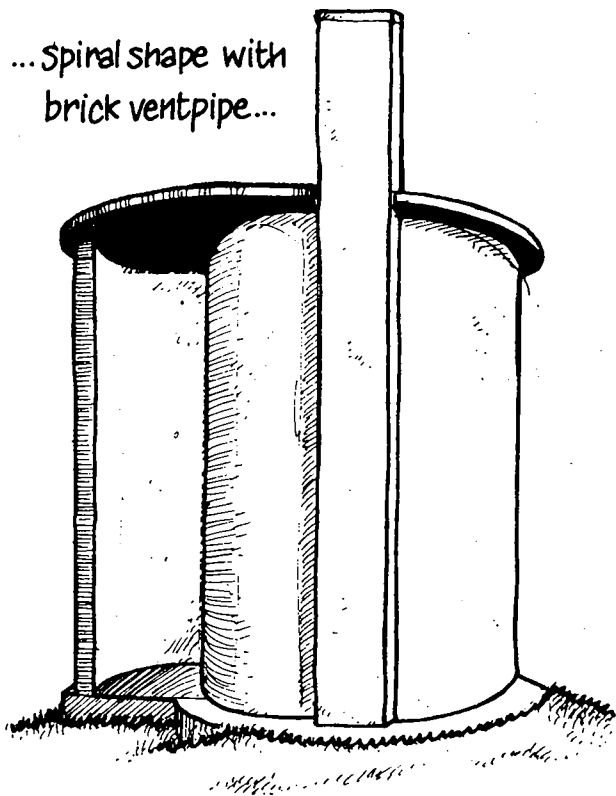
The pit

Fresh air is drawn through the squattinghole into the pit. Bad air is sucked out of the pit through the ventpipe

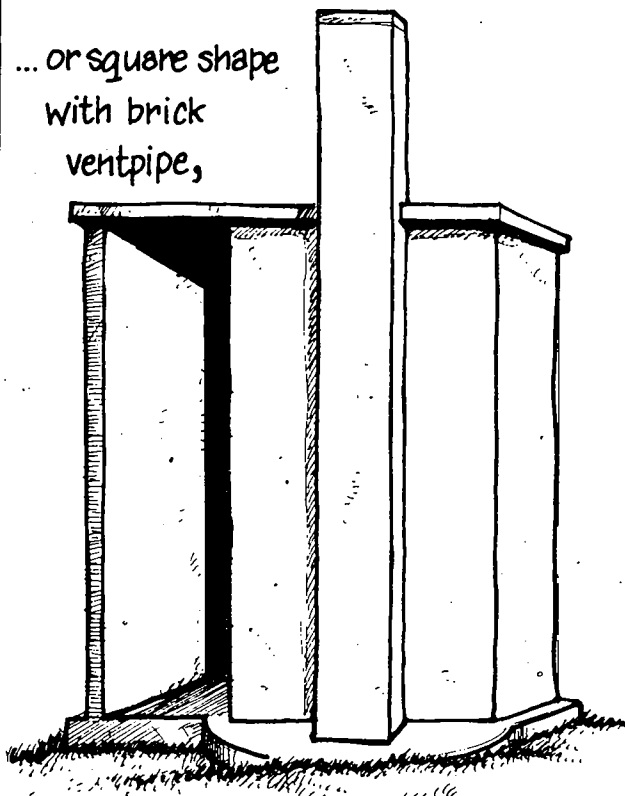


Blair latrines can be built...

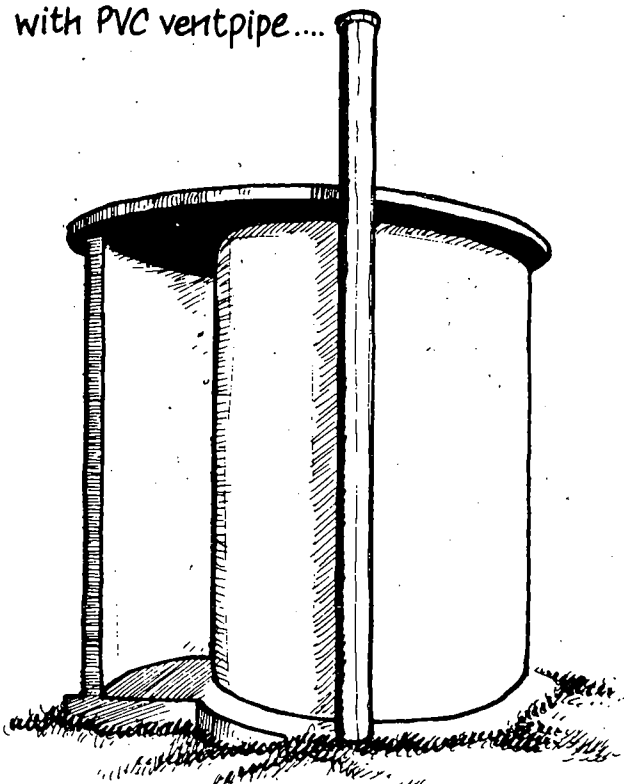
... spiral shape with brick ventpipe...



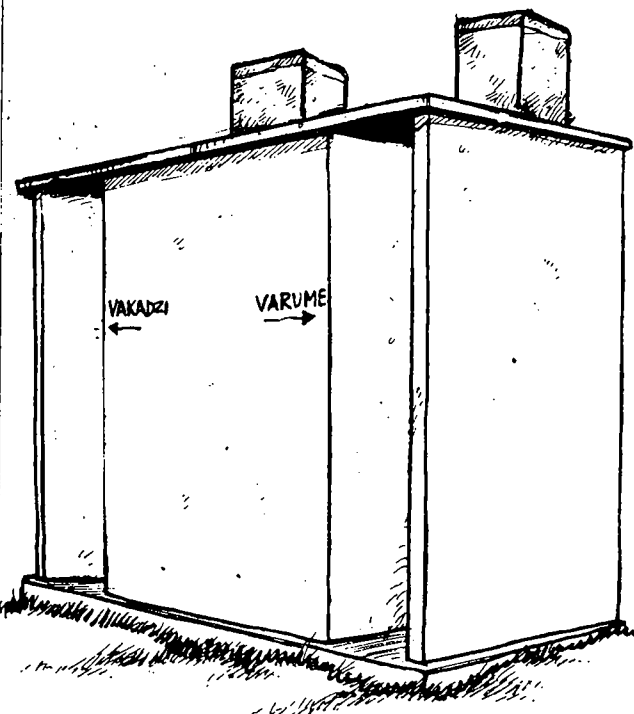
... or square shape with brick ventpipe,



spiral or square shape with PVC ventpipe....



... square shape, double compartment; one for men and one for women.





There are many people in the community who can share information about building latrines.

To find out more:

- Talk to health workers
- Talk to community leaders
- Talk to people who have already built latrines
- Read this book which contains information about building latrines!

Also ask about helper organisations who offer assistance with latrine building projects in your area!



Join others in building projects!

It is easier!

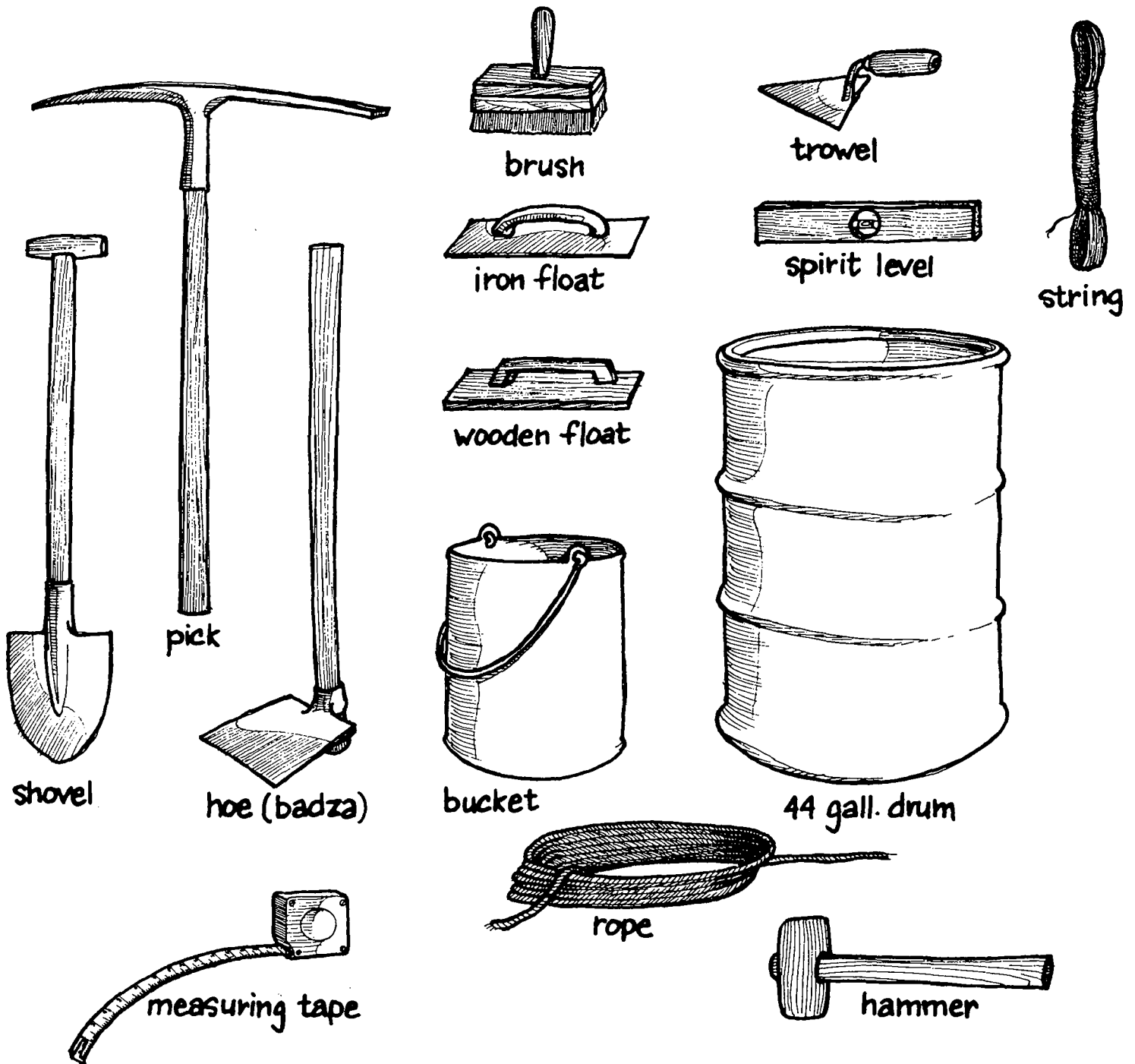
Group helpers can also assist to:

- Dig the hole for the latrine
- Provide water for building
- Provide some food for builders
- Collect sand and stones at the building site

What else ?

- Mix the concrete
- Mix the mortar
- Lift the concrete slabs

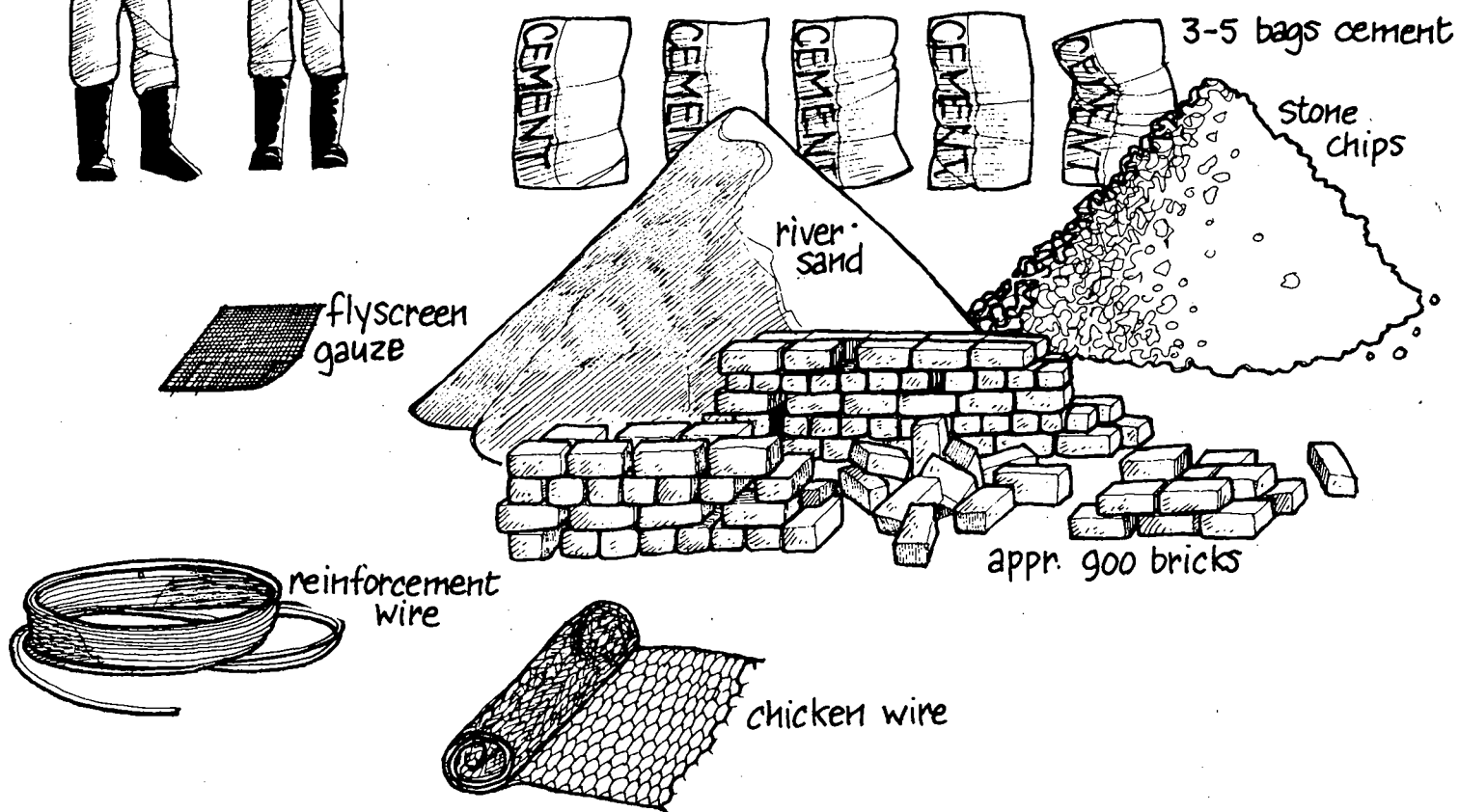
Different equipment is necessary for building a latrine!



Have this equipment ready before the building programme starts



A builder needs different materials for building a latrine

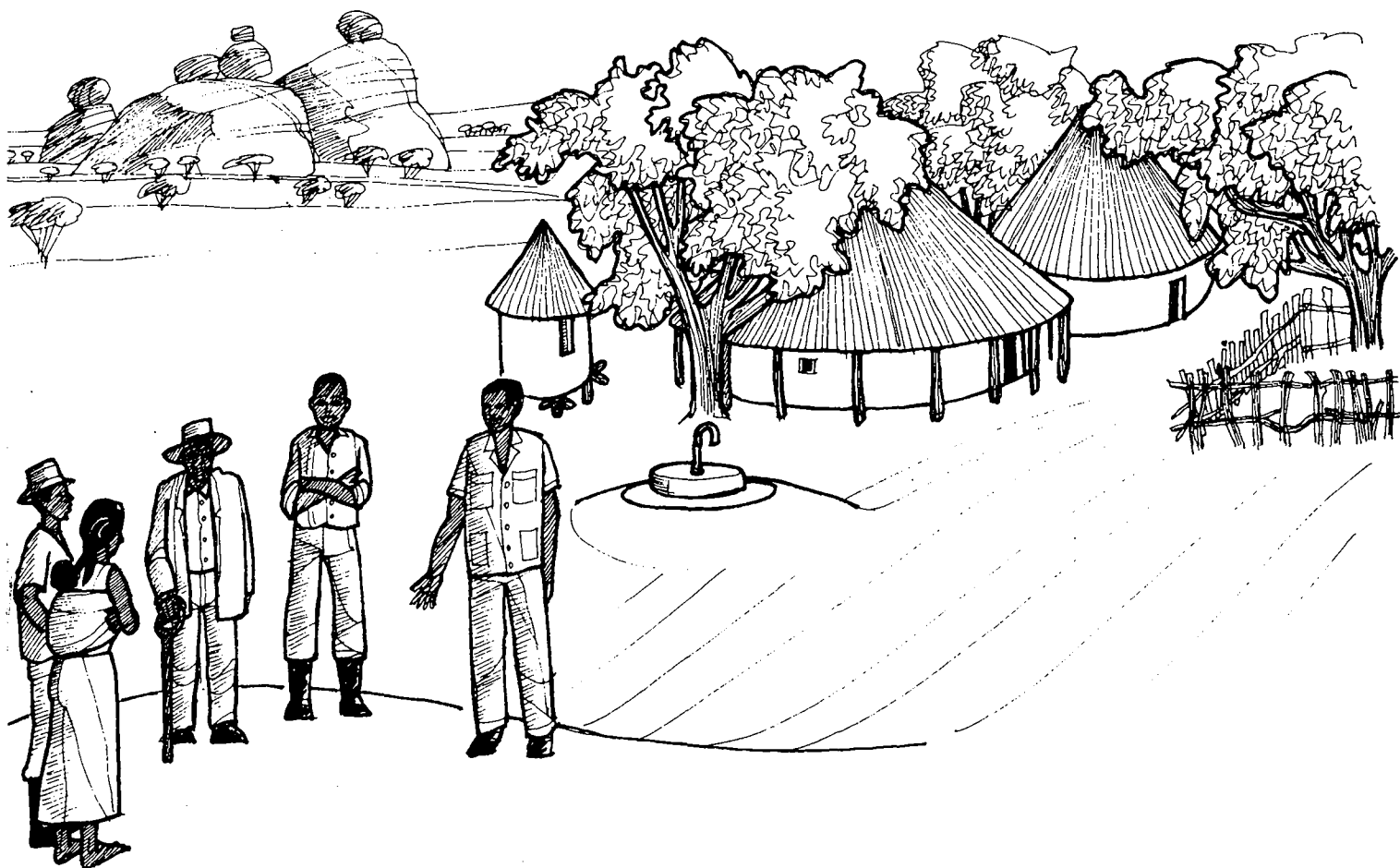


The builder decides about the quantities of materials for building one latrine.

These are approximately:

- 5-6 bags cement (this quantity depends on amount required for lining the pit and this step is described on page 12)
- Clean river sand
- Gravel chips or small stones
- Re-inforcing wire (chicken wire, barbed wire or 8 gauge wire can also be used)
- Flyscreen gauze
- About 1000 bricks (stones are sometimes also used for lining the pit)

PVC-ventpipes are used by builders in some areas in Zimbabwe



Choose the building site together!

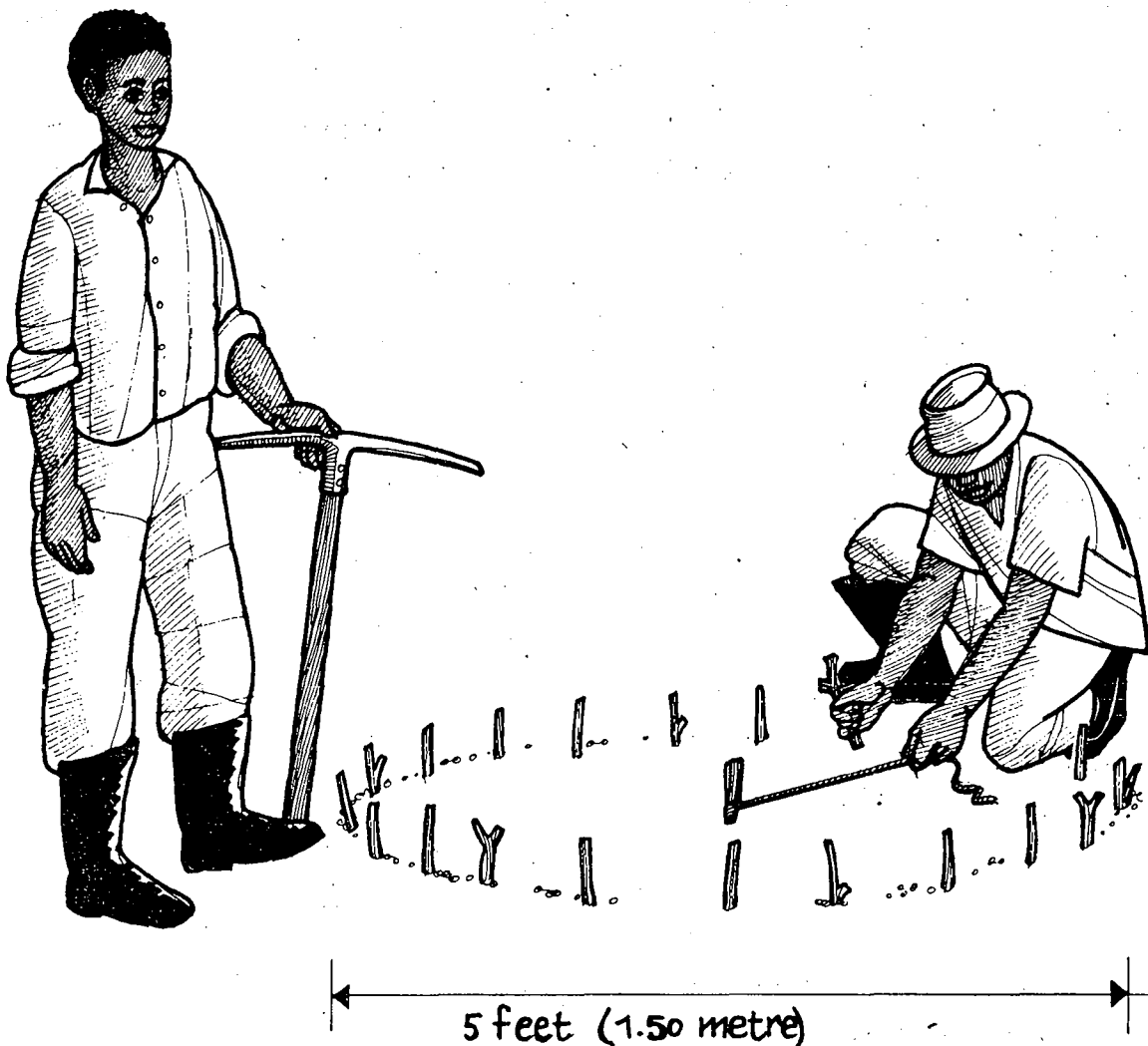
The family should choose the building site together, with assistance from the health worker

Choose a site that is:

- Downhill from the well
 - so that waste from the latrine does not drain into the watersupplies
- Near the house
 - so that the latrine can be easily reached at night
- Where the soil is firm
 - so that the building will not collapse
- On slightly raised ground
 - so that rain water can drain away easily
- In a space where there are not many trees
 - so that air can move freely

Step 1

Before digging:
Mark the shape of the pit



Before you start to dig, mark the diameter of the pit.

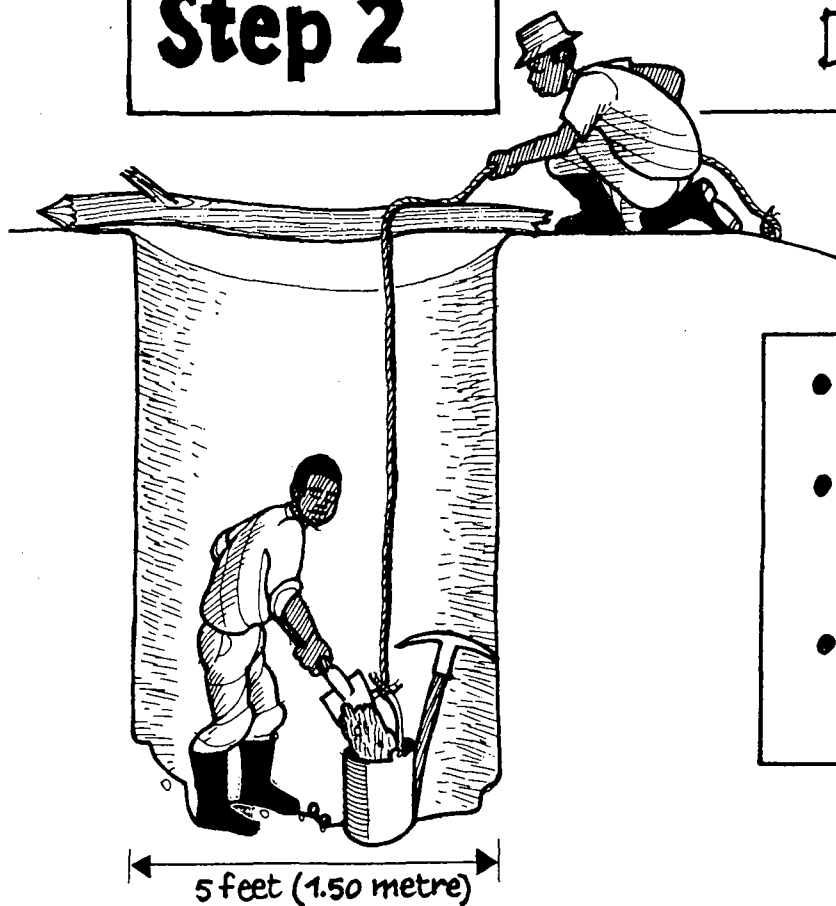
To do this:

- Place a peg in the ground
- Tie a piece of string, which measures 2.5 feet (0.75 metre), onto the peg
- Walk around the peg and mark a circle in the ground

This marks the shape and the diameter of the pit

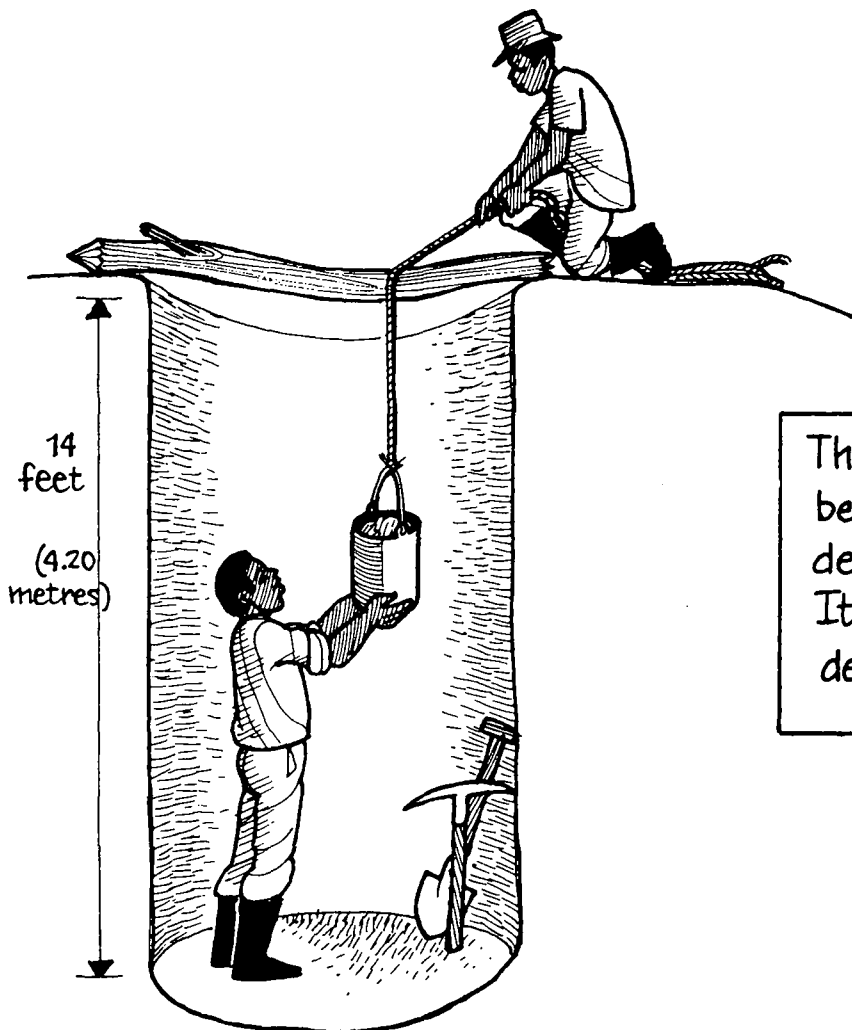
Step 2

Dig the pit



- Keep the walls of the latrine straight
- Keep the pit diameter 5 feet (1.50 metre) from top to bottom
- Remove soil and rock from the pit as you dig

Build according to the instructions

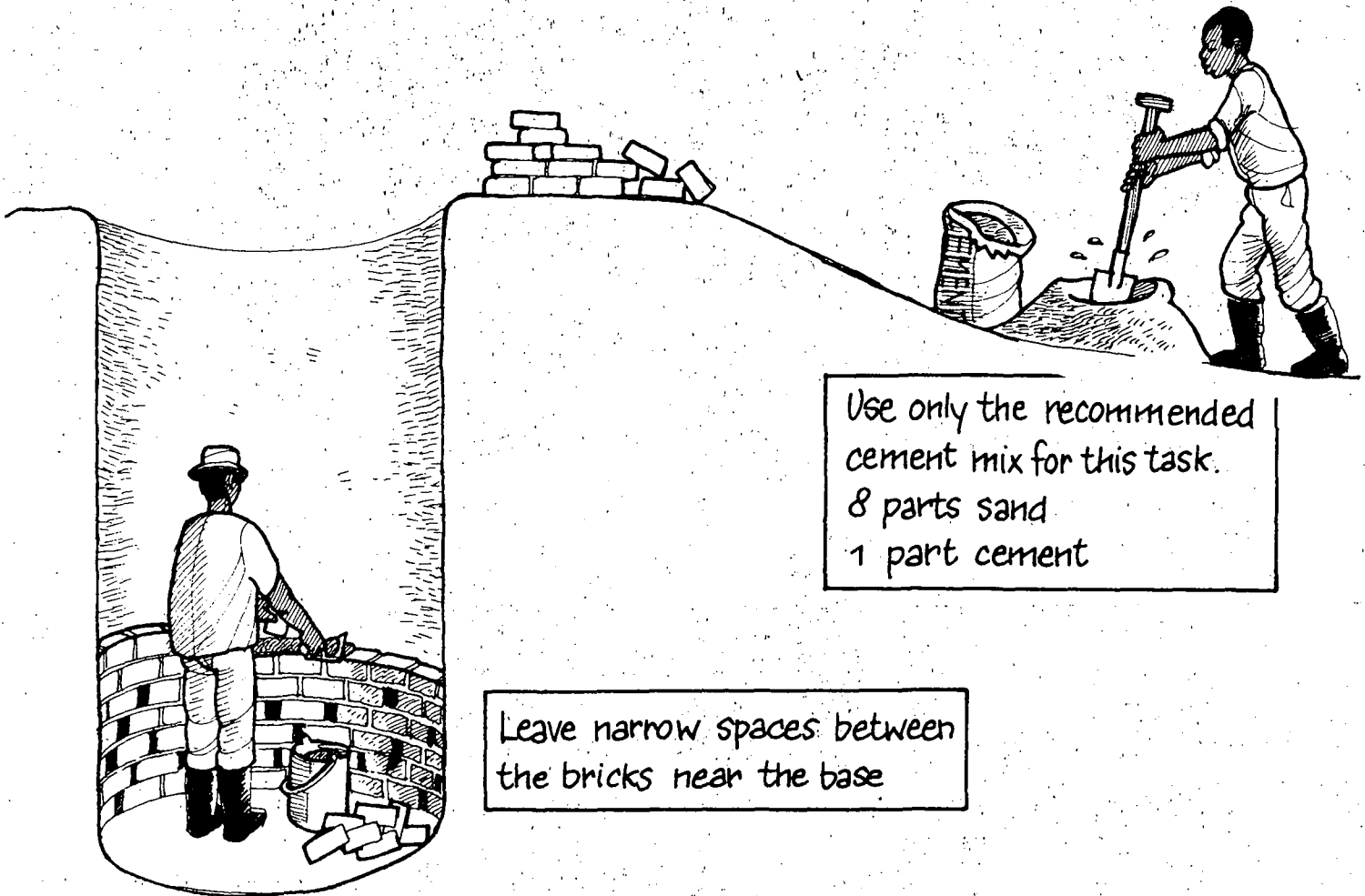


The pit for a latrine must be at least 14 feet (4.20 metres) deep. It will last longer if it is deeper.

Step 3

Line the pit
to prevent collapse!

Build according to the instructions



Use only the recommended
cement mix for this task.
8 parts sand
1 part cement

Leave narrow spaces between
the bricks near the base

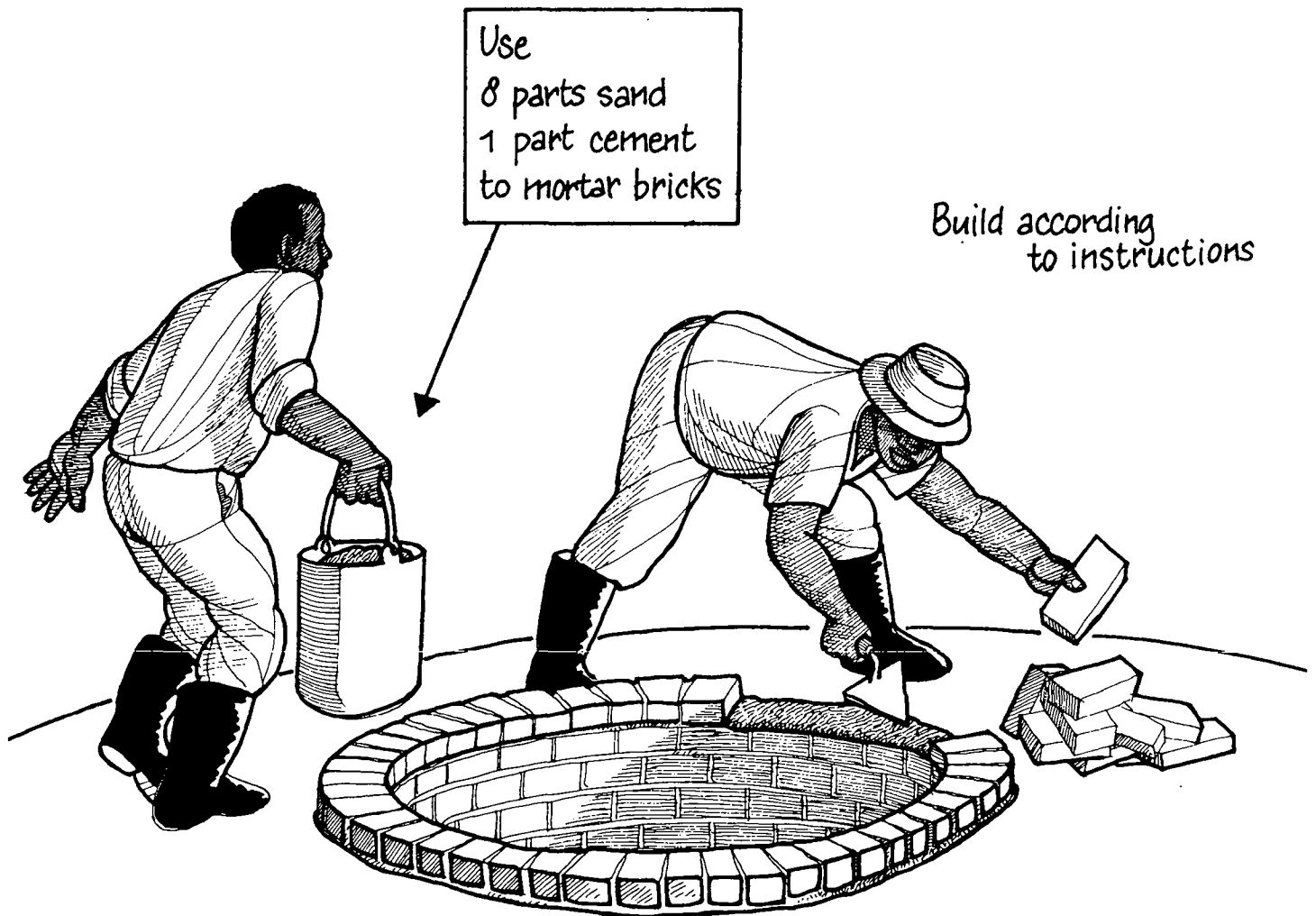
Line the pit properly to prevent collapse. This is very important! Do this in all soil conditions, except solid rock.

Line the sides only, do not line the base of the pit.

Leave narrow spaces between the bricks near the base.
This allows waste to drain.

Step 4

Make the brick collar
after lining the pit



To make the brick collar:

- Lay one course of bricks around the edge of the pit
- Mortar the bricks together

The recommended mixture for mortar is:

8 parts sand
1 part cement

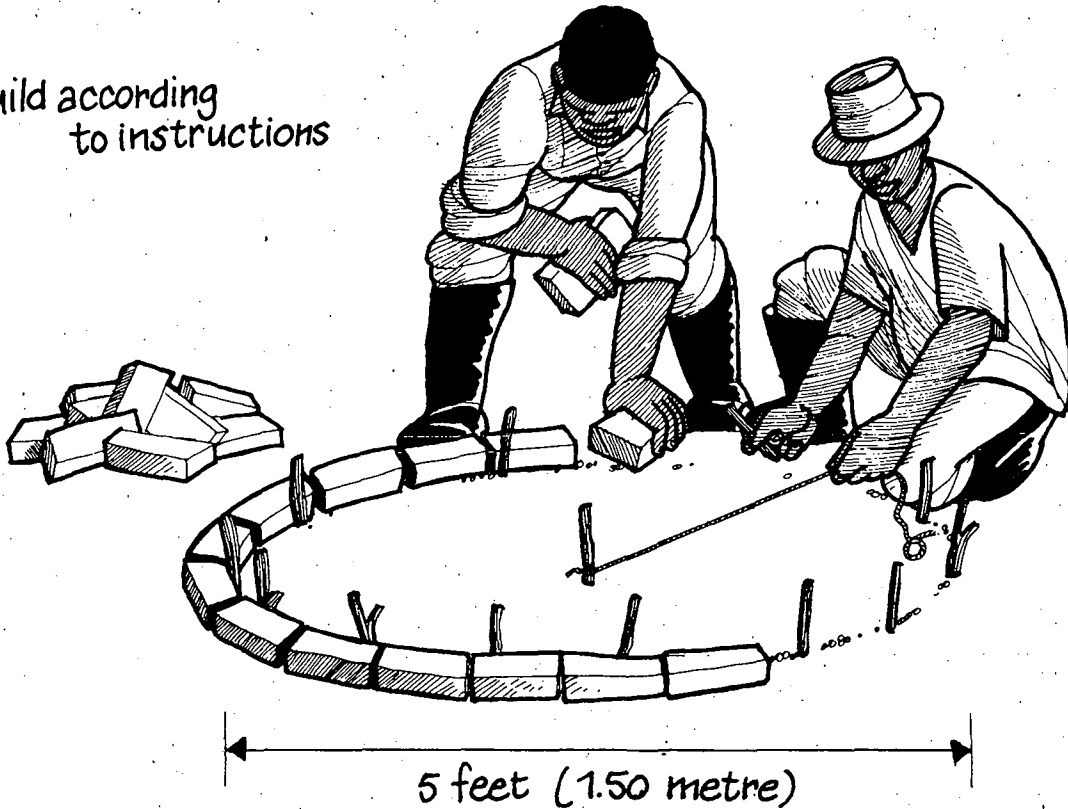
The brick collar is very important. It provides:

- A strong foundation for the cover slab
- A good seal under the slab

Step 5

Mark out the shape
of the coverslab

Build according
to instructions



- Choose a clean, sandy, level place near the pit
- Use string or tape to mark out the cover slab (as for Step 1)
- The circle is 5 feet (1.50 metre) in diameter
- Place bricks around the circle to mark the edge of the mould

To prevent the cover slab sticking to the ground:
Place old bags inside the mould before concrete is poured!

Step 6

Make the coverslab

- Use bricks (or tin cans or a piece of PVC-pipe) to mark the places for the squatting hole and the ventpipe.
- Check the measurements carefully with the instructions given in the picture:
- Make the concrete mixture for the cover slab.

Use: 4 parts stonechips

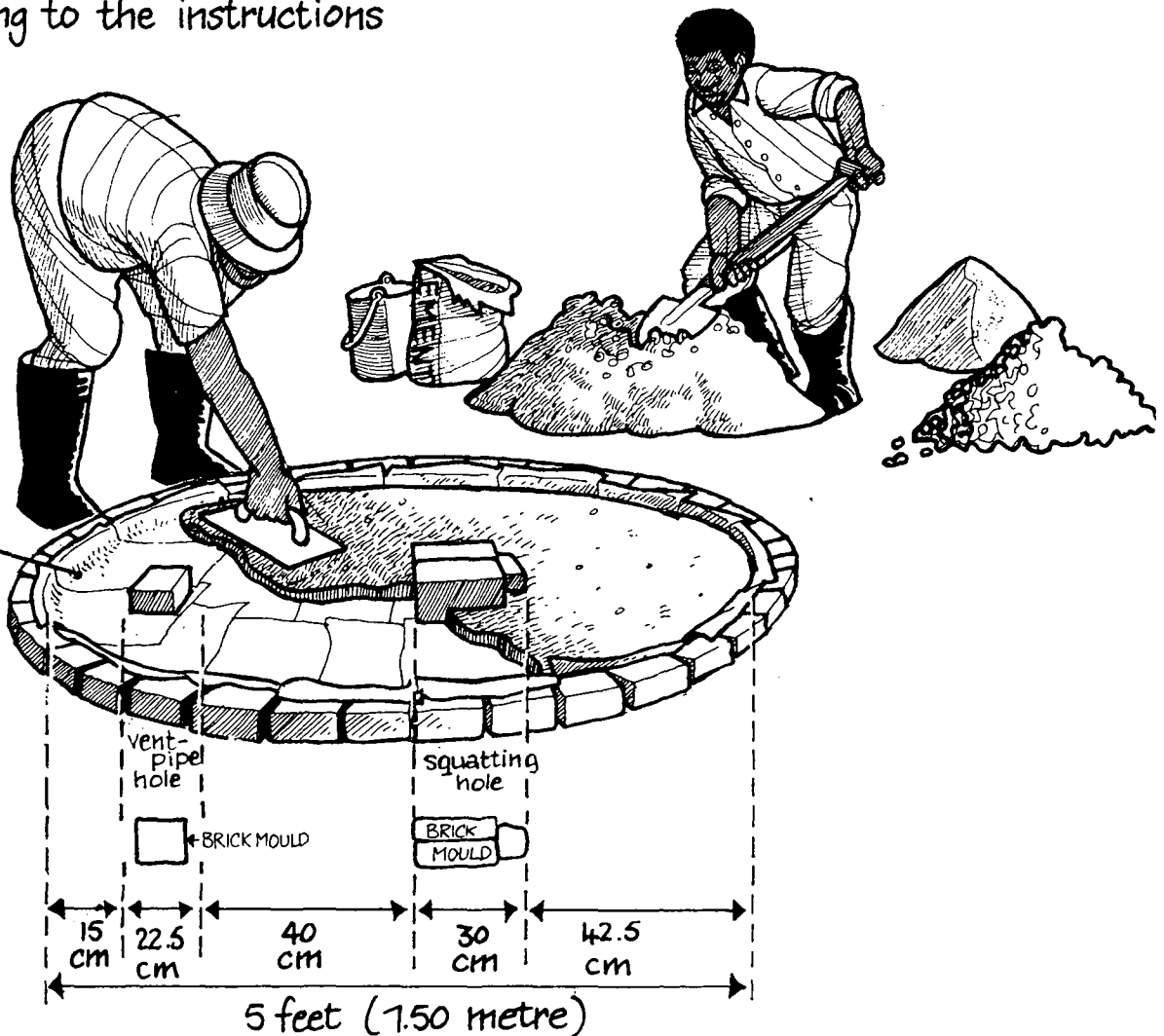
2 parts sand

1 part cement

- Place half the concrete mixture around the bricks (or tins or PVC-pipe) which mark the places for ventpipe and squatting hole.

Shape the squathole correctly so that it is a suitable size for children and adults to use

Build according to the instructions



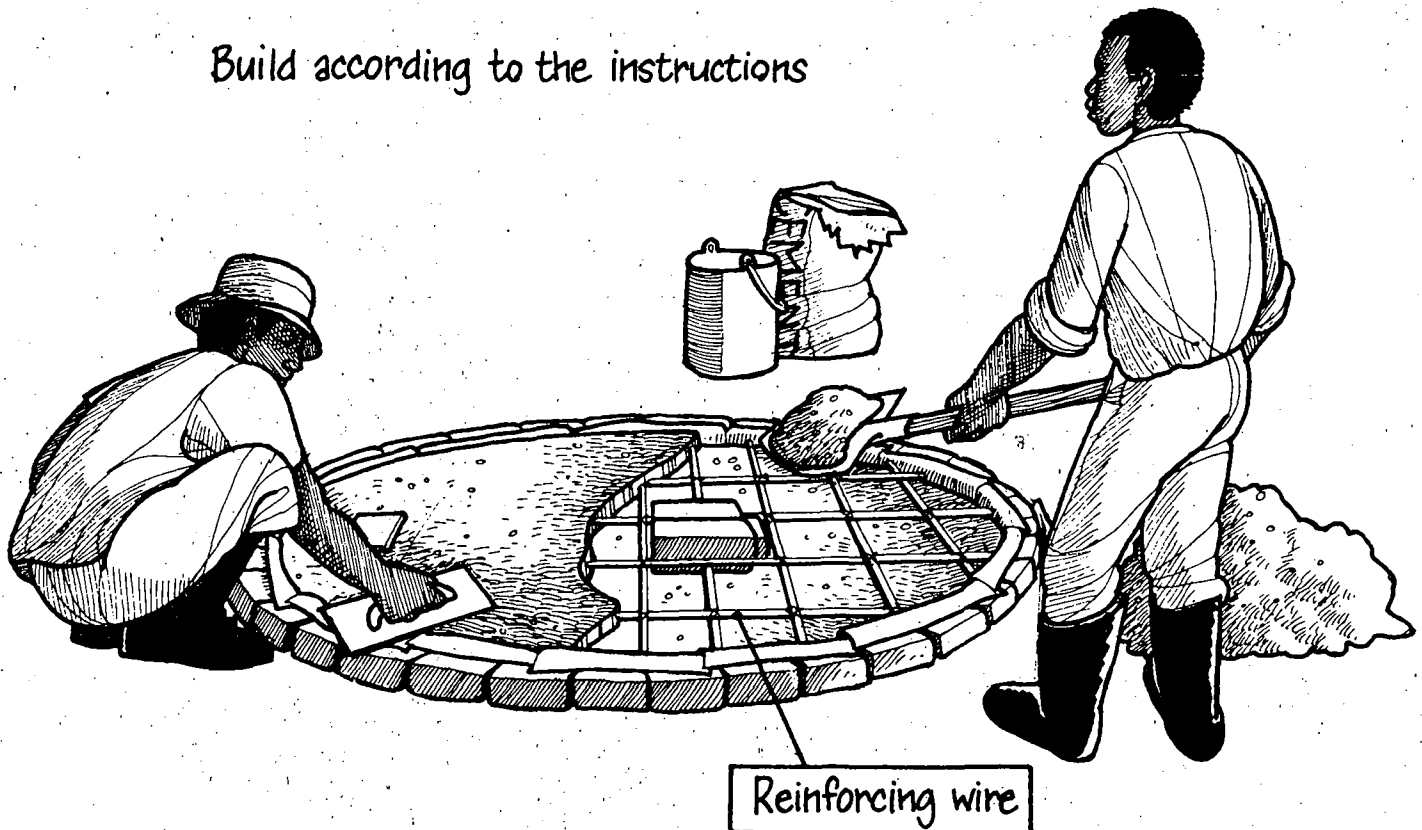
Step 7

Complete the coverslab

- Cut the reinforcing wire to size
- Place reinforcing wire on top of the concrete inside the mould
- Place reinforcing wires 6 inches (15 cm) apart
- Pour remaining concrete over reinforcing wire
- The thickness of the completed slab is 3 inches (7.5cm)

Cover the completed slab with wet sacks or wet sand.
Allow to dry for 5 days.

Build according to the instructions



Remember!

Loosen the bricks (or tins or PVC-pipe), used to mark places for the ventpipe-hole and the squathole.

Step 8

Position the cover slab

First put cement mortar onto the brick collar. Then place the cover-slab over the collar above the pit. The cover slab and the collar must fit tightly together.

Position the slab so that the ventpipe hole faces the wind. The ventpipe hole is on the same side as the doorway.

Make sure that the ventpipe hole is over the pit!



Important!

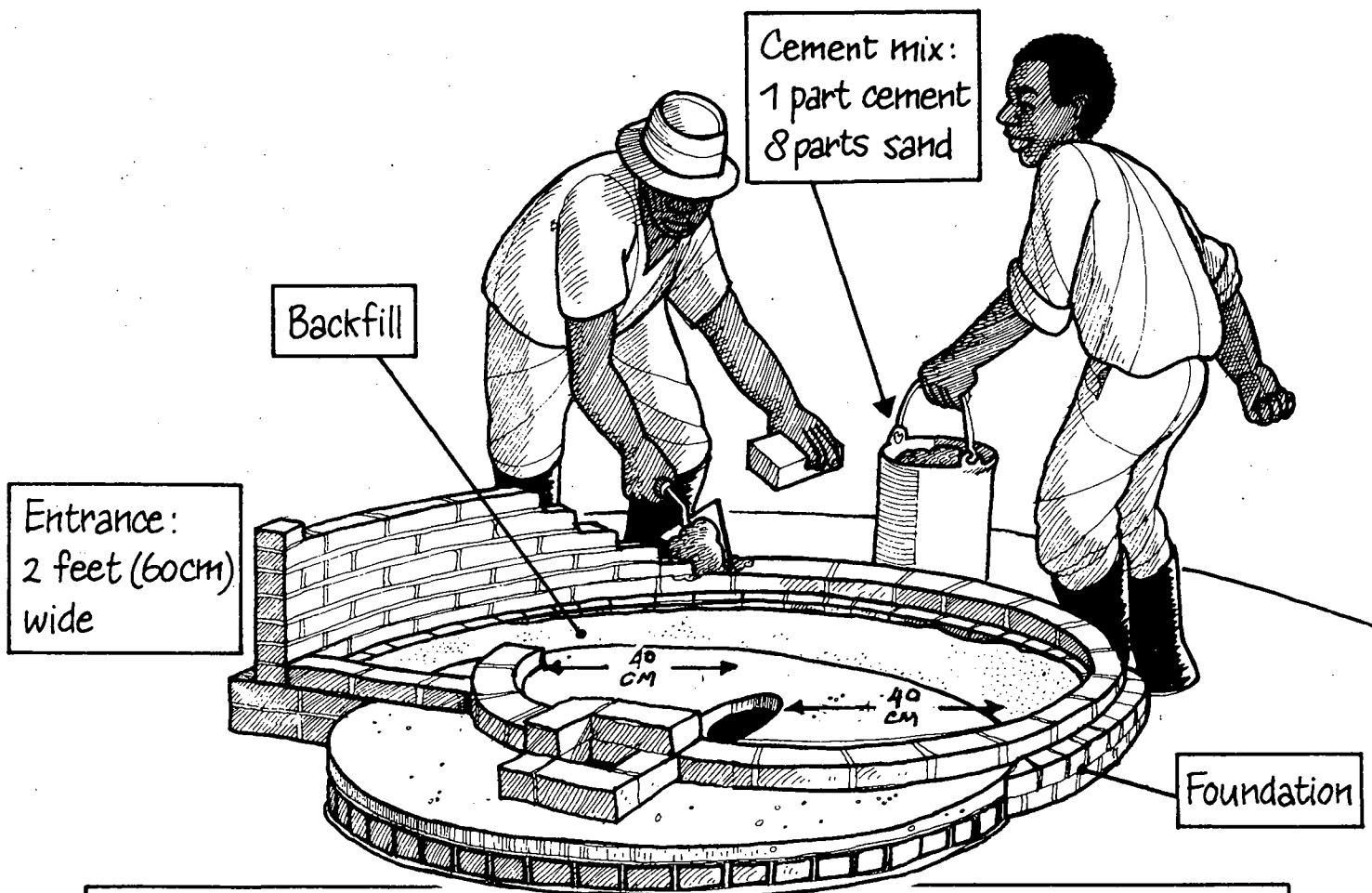
A good seal between the coverslab and the collar prevents flies from entering the pit.

It also prevents smell coming from inside the pit.

Step 9

Shape and build the foundation

The latrine structure may be spiral or square.
Mark out the shape before building the foundation.
Half of the latrine structure rests on the cover slab.
The entrance and ventpipe face the wind.
The width of the entrance measures 2 feet (60 cm).



- Build a 9 inches brick foundation to a height which is level with the coverslab.
- Backfill the space between the foundation and the coverslab with soil, half bricks or stones.
- To cover the backfill and coverslab, use:
 - 1 part cement
 - 3 parts sand

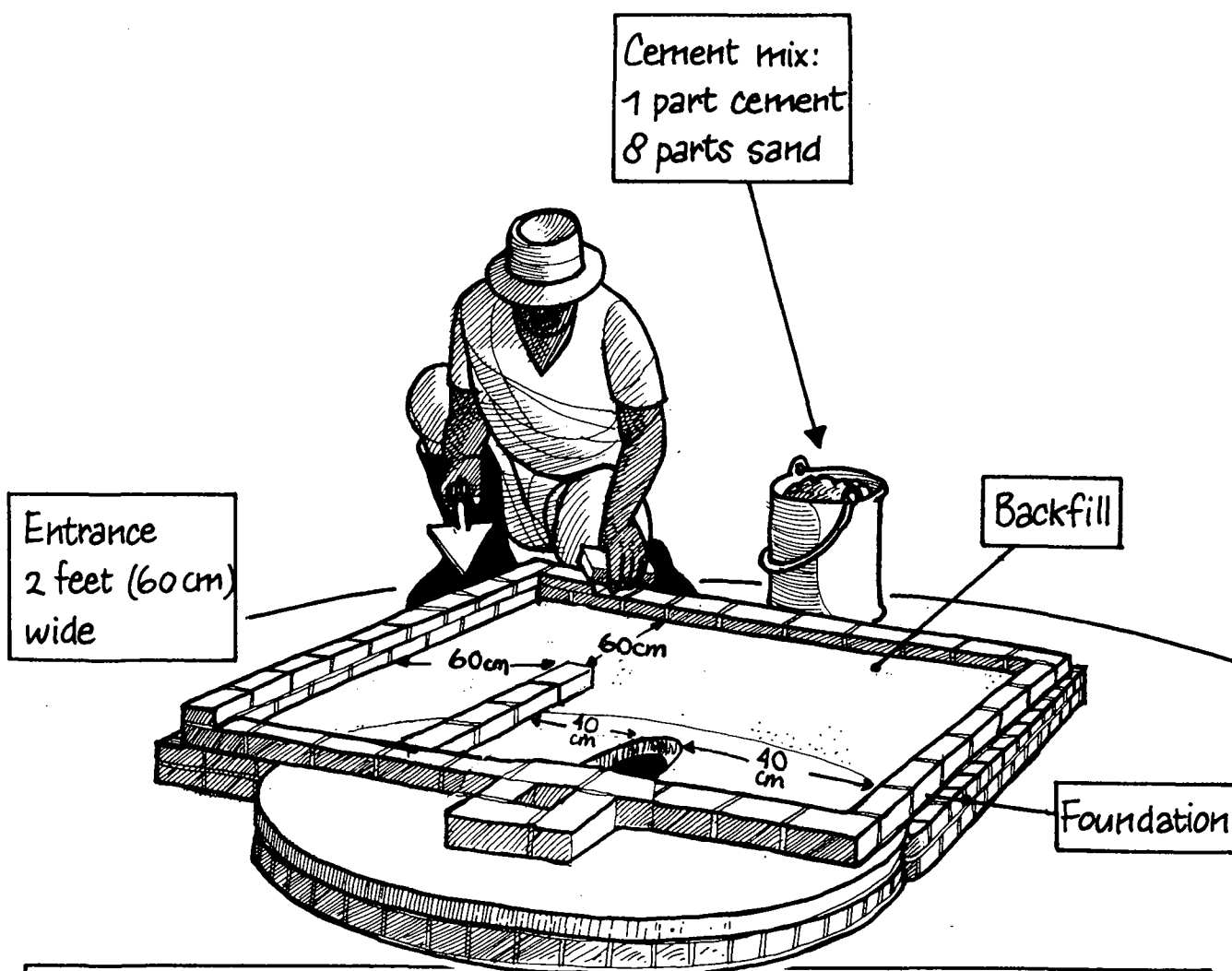
Step 9

Shape and build the foundation

The latrine structure may be spiral or square. Mark out the shape before building the foundation.

Half of the latrine structure rests on the coverslab.

The entrance and ventpipe face the wind. The width of the entrance measures 2 feet (60 cm).

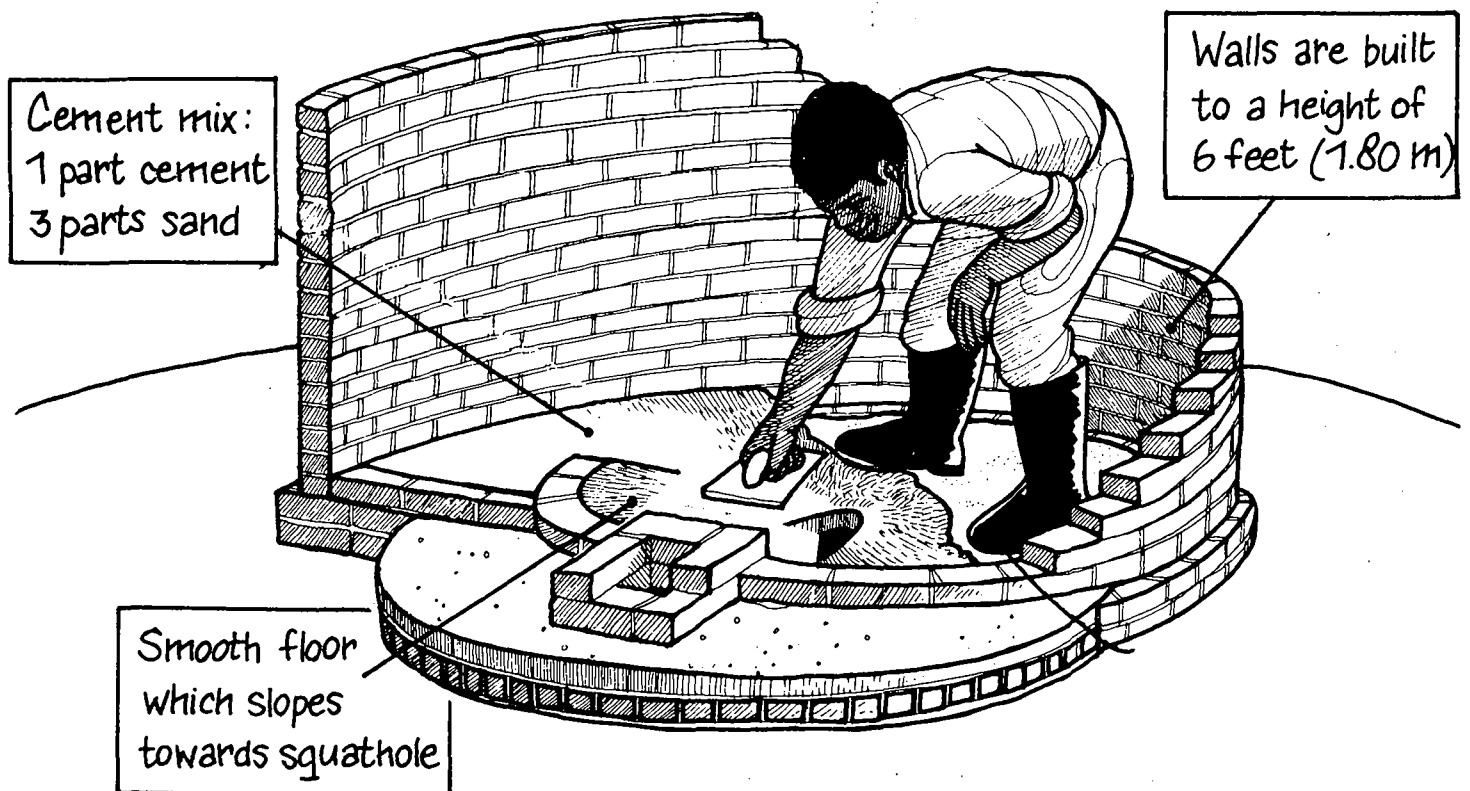


- Build a 9 inches brick foundation to a height which is level with the coverslab.
- Backfill the space between the foundation and the coverslab with soil, half bricks or stones.
- To cover the backfill and coverslab, use:
 - 1 part cement
 - 3 parts sand

Step 10

Build the walls and the ventpipe

- Build the latrine walls to a height of 6 feet (1.80 metre) above ground level
- At the same time build the ventpipe to a height of 8 feet (2.40 metres) above ground level. When completed, the ventpipe rises 2 feet (60 cm) above the completed wall.
- Plaster the inside walls with cement mortar.
- Plaster the latrine floor and slope it towards the squathole! This allows waste to drain easily.
- Smooth the plaster on the floor. The floor is then easier to clean.



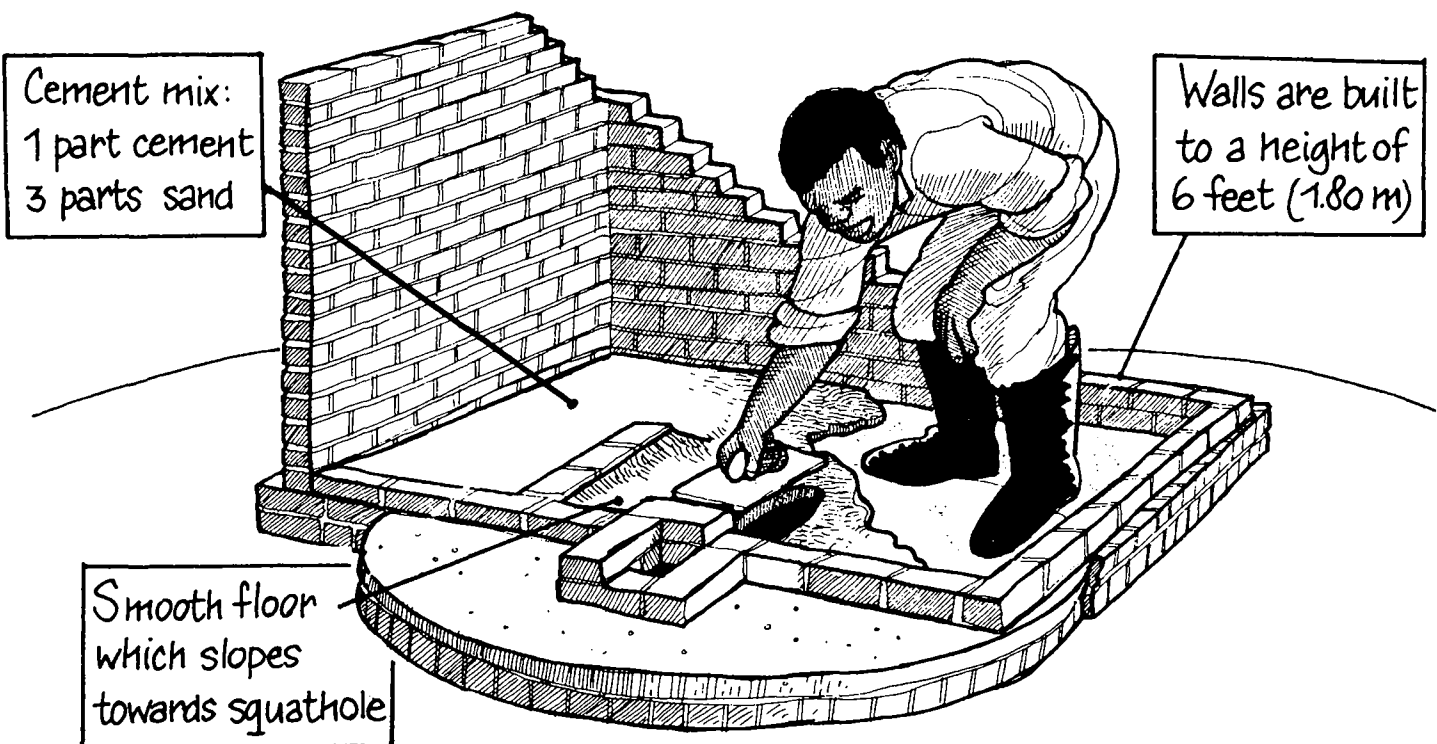
Important!

Air needs to move freely through the ventpipe. Do not block it with mortar when building!

Step 10

Build the walls and the ventpipe

- Build the latrine walls to a height of 6 feet (1.80 metre) above ground level.
- At the same time build the ventpipe to a height of 8 feet (2.40 metres) above ground level. When completed, the ventpipe rises 2 feet (60 cm) above the completed wall.
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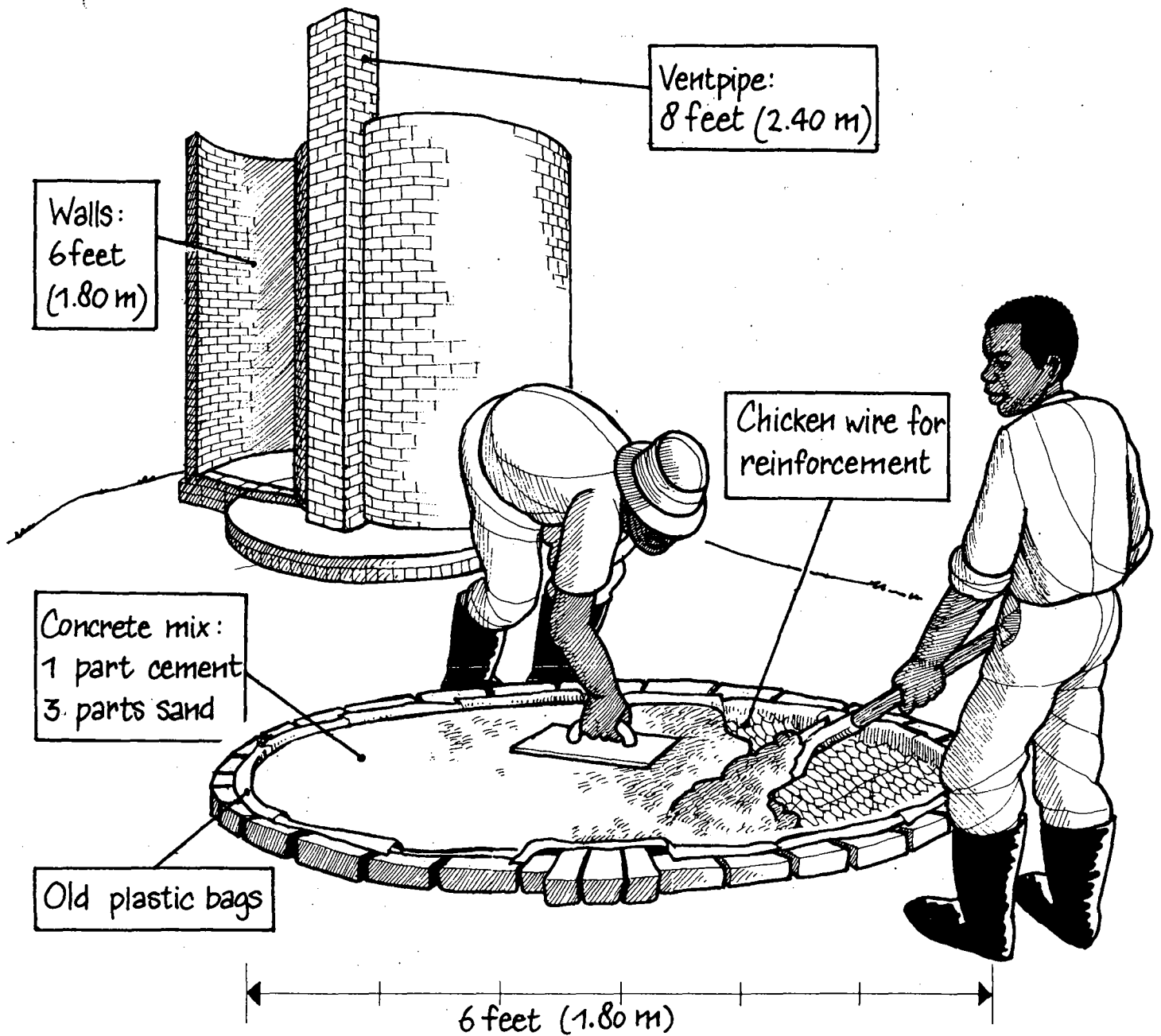
Important!

Air needs to move freely through the ventpipe. Do not block it with mortar when building.

Step 11

Make the roof slab

(Spiral)



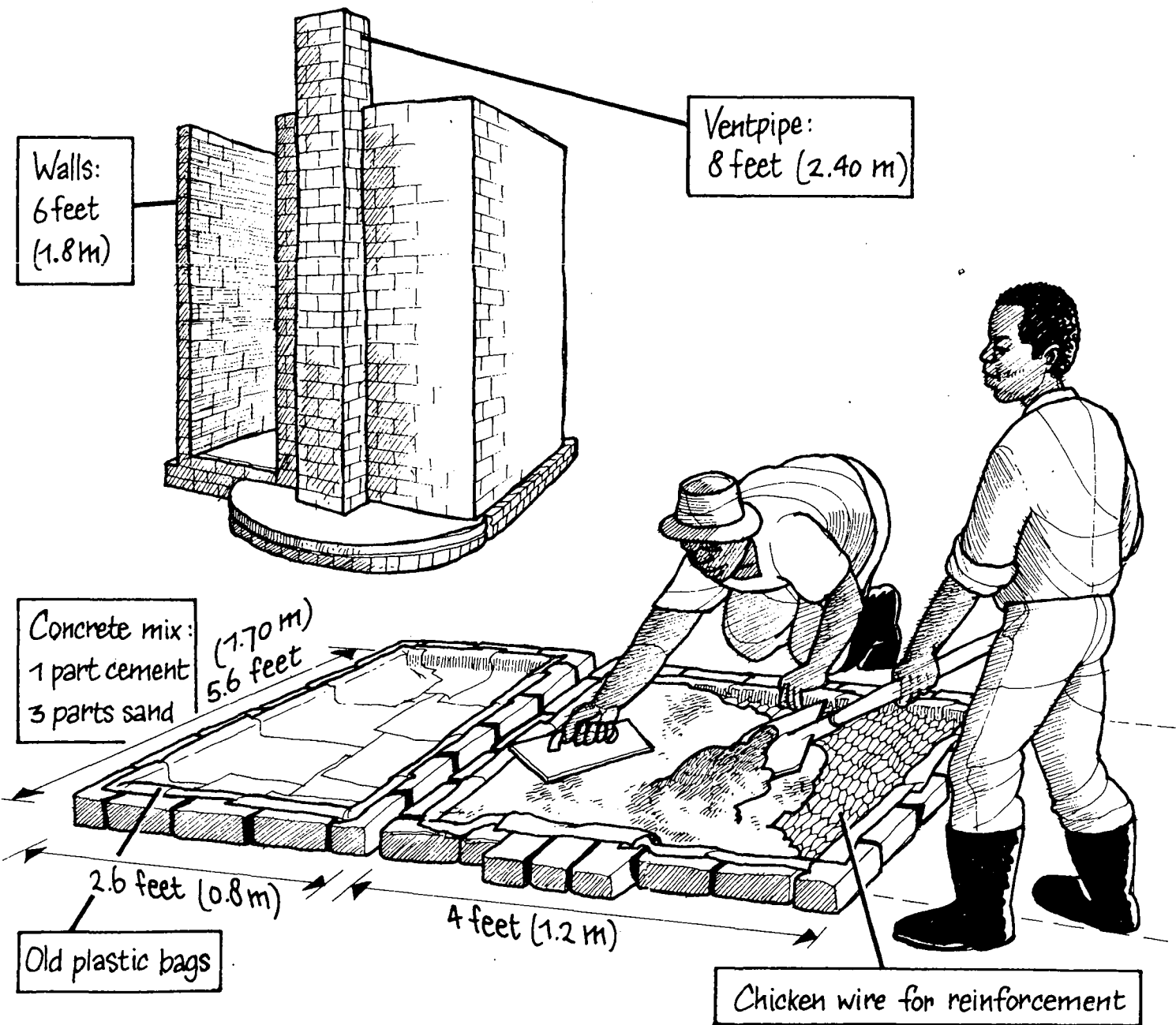
Prepare the roofslab in the same way as the coverslab (Step 5). Use a piece of chicken wire, cut to size, for reinforcement.

The shape and measurement for the roof slab depend on shape and size of the structure. The roof slab usually measures 6 feet (1.80 metres) in diameter with a 2 inch (5 cm) allowance for overhang. The roof slab is 1 inch (2.5 cm) thick when completed.

Step 11

Make the roof slab

(Square)



Prepare the roof slab in the same way as the cover slab (Step 5), but in 2 pieces. Use chicken wire cut to size for reinforcement.

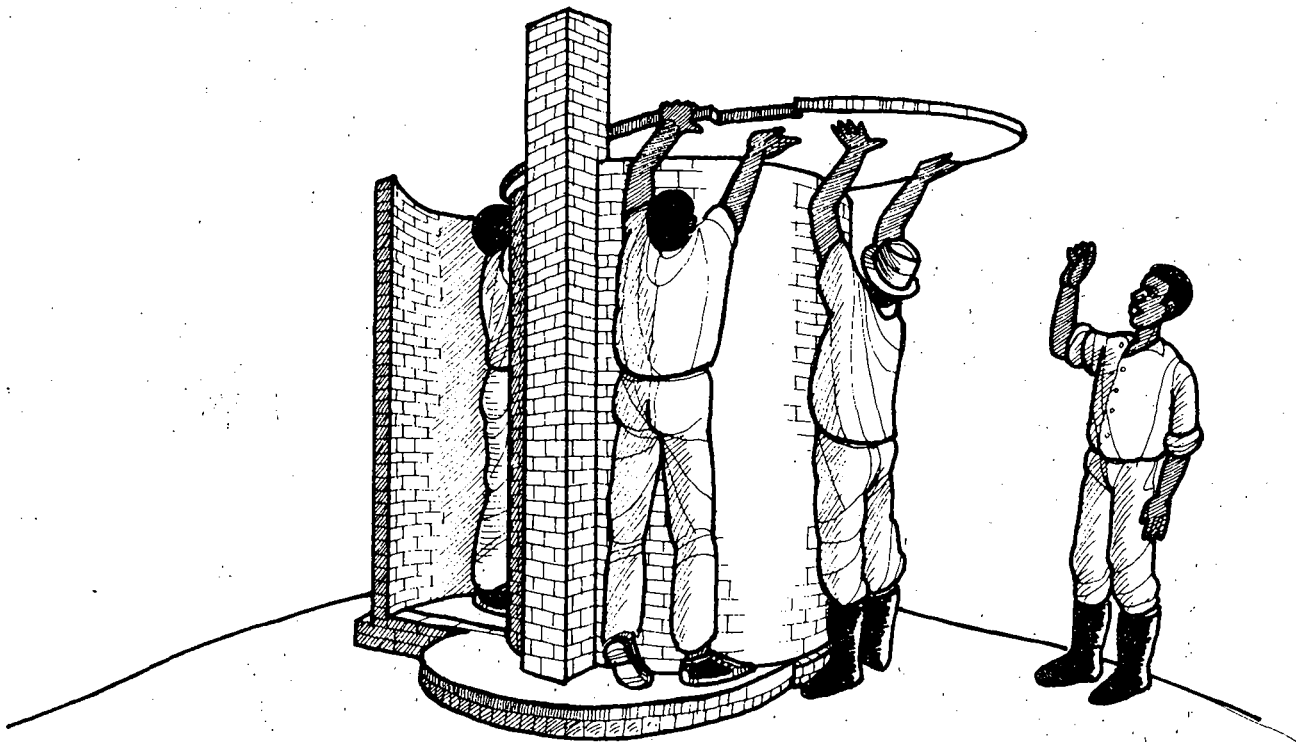
The shape and measurements for the roof slab depend on shape and size of the structure. The slab pieces usually measure 2.6 x 5.6 ft (0.80 x 1.70m) and 4 x 5.6 ft (1.2 x 1.70 m) making a roof of 6.6 x 5.6 ft (2.00 x 1.70m), with a 2 inches (5 cm) allowance for overhang. The roof slab is 1 inch (2.5 cm) thick when completed.

Step 12

Fit the roof
onto the structure

Use mortar to fix the roof slab in position.
Lift the roofslab carefully to avoid cracking.

Assistance is needed when lifting the roof slab

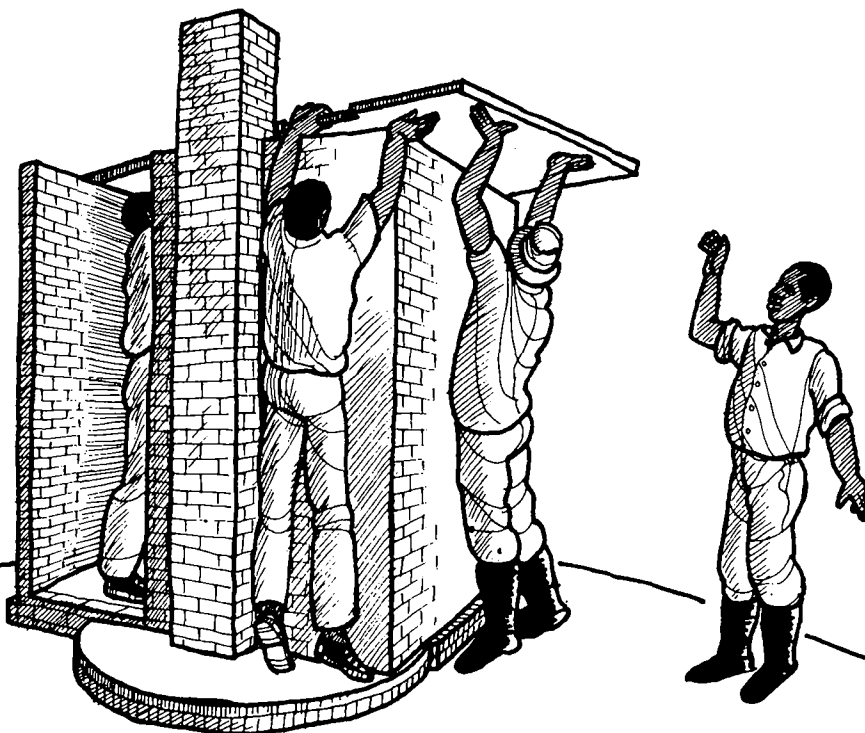


Step 12

Fit the roof
onto the structure

Use mortar to fix the roofslab in position.
Lift the slab pieces carefully to avoid cracking.

Assistance is needed when lifting the roof slab.



Step 13

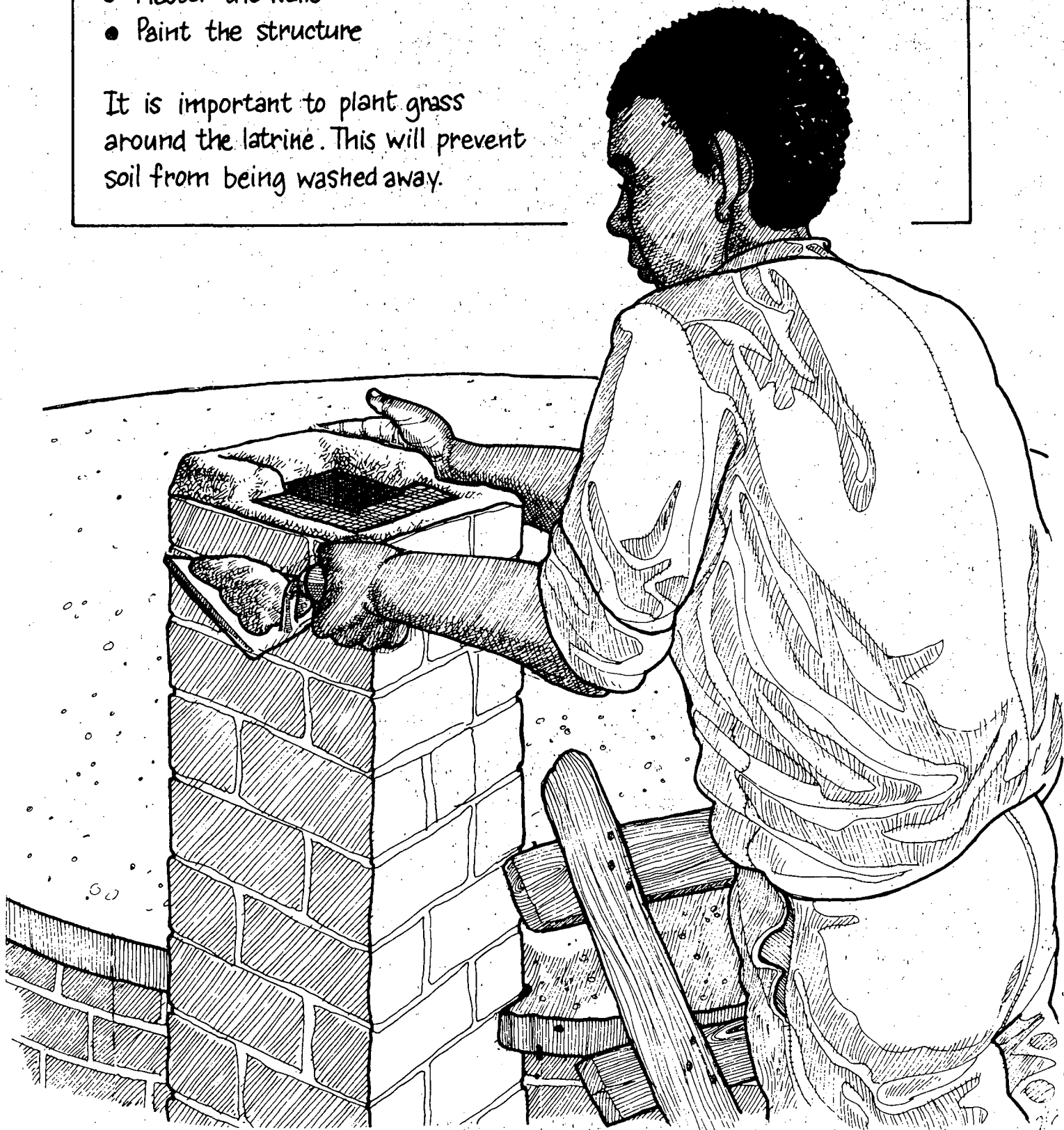
The latrine is completed when the flyscreen is fitted

Cut a piece of stainless steel or fibre glass flyscreen to measure
Fix the flyscreen onto the ventpipe with mortar.

The latrine will last longer and look better if you

- Plaster the walls
- Paint the structure

It is important to plant grass
around the latrine. This will prevent
soil from being washed away.



Builders checklist:

Use this list to check that you have everything ready for building and that each step has been completed !

Plan

Mark here: ▼

- People informed _____
- Helpers ready _____
- Site chosen _____
- Tools ready _____
- Materials ready _____

Dig the pit

- Dig to dept 14 feet (4.20m) _____
- Dig to width 5 feet (1.5 m) _____
- Dig straight sides _____
- Line with bricks, using 1:8 cement to river sand mixture. _____
Do not line the base, leave spaces between bricks near base

Brick collar

- Mortar one course bricks around the rim of the pit _____

Concrete cover slab

- Mark the diameter, 5 feet (1.5m) _____
- Use bricks to mark edge of mould _____
- Arrange bricks inside mould to mark places for _____
squat hole and ventpipe hole
- Check dimensions carefully _____
- Concrete mix : 1 part cement, 4 parts stone chips, _____
2 parts sand for cover slab
- Reinforce slab with strong wire _____
- Keep cover slab wet until cured (5 days) _____

Fit the cover slab onto brick collar

- Position slab correctly onto collar, use cement _____
- Ventpipe windward _____
- Entrance windward _____
- Use mortar to fix slab onto collar _____

Shape and build the foundations

- Decide on latrine shape (spiral or square), mark out the bricks _____
- Half structure will rest on the slab _____
- Width of entrance 2 feet (60 cm) _____
- Build up retaining wall level with cover slab _____
- Backfill with building rubble _____
- Cement mix : 1 part cement, 8 parts river sand _____

Complete the brickwalls

- Build walls to a height of 6 feet (1.8 m) _____
- Build ventpipe to a height of 8 feet (2.4 m) _____
- Internal diameter of ventpipe $q'' \times q''$ (22.5 cm x 22.5 cm) _____
- Keep ventpipe free of mortar _____
- Plaster inside the latrine if possible _____

Slope the latrine floor

- Use cementmix: 1 part cement, 3 parts river sand for floor _____
- Slope the floor towards squathole _____
- Smooth off the floor _____

Make the roof slab

- Mark out the diameter, approx. 6 feet (1.8 m) _____
- Allow 2" (5 cm) for overhang _____
- Use concrete mix: 1 part cement, 3 parts river sand _____
- Use chicken wire for reinforcement _____
- Leave to cure for 5 days _____

Lift up the roof slab

- Use mortar to secure slab on top of structure _____
- Position roof slab correctly _____

Fit the flyscreen

- Secure flyscreen to ventpipe, using mortar _____

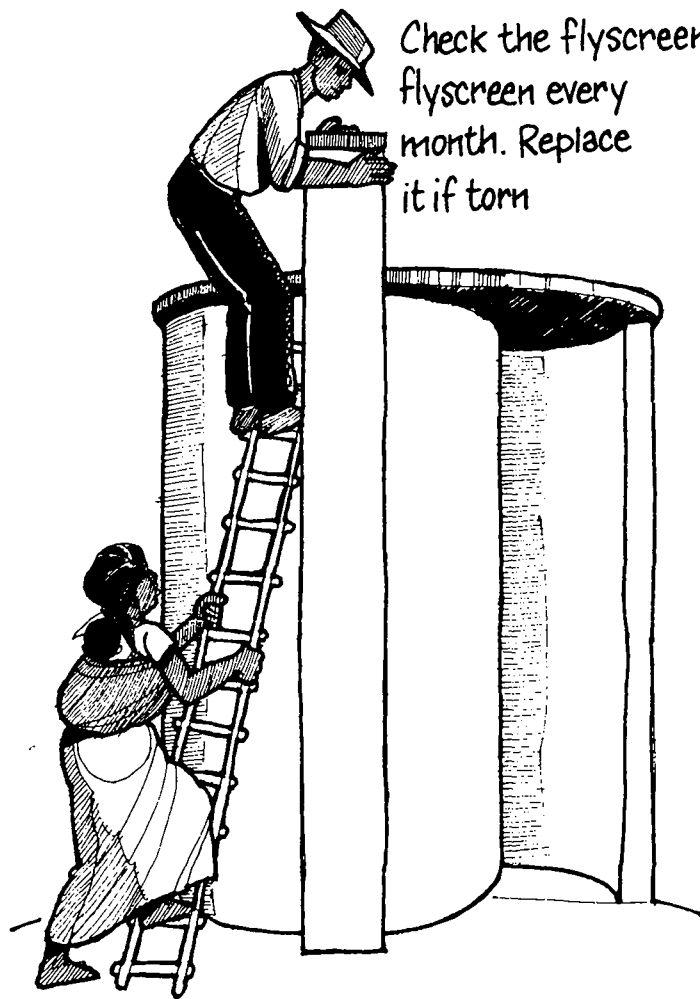
Finish off

- Plant grass around latrine _____
- Plaster the walls if possible _____

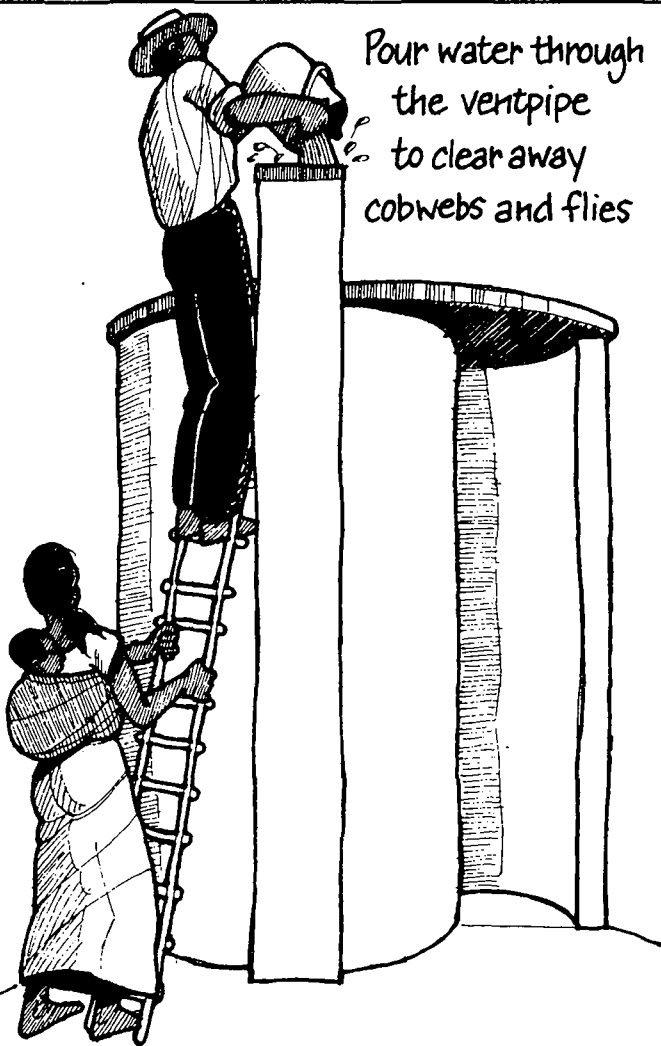
Care for your latrine!



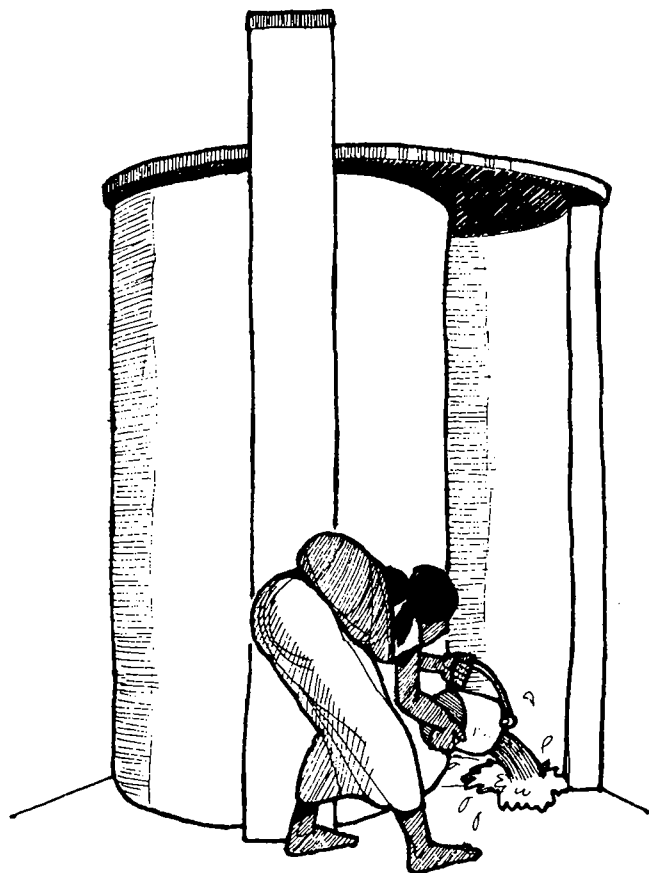
Check the flyscreen
flyscreen every
month. Replace
it if torn



Pour water through
the ventpipe
to clear away
cobwebs and flies



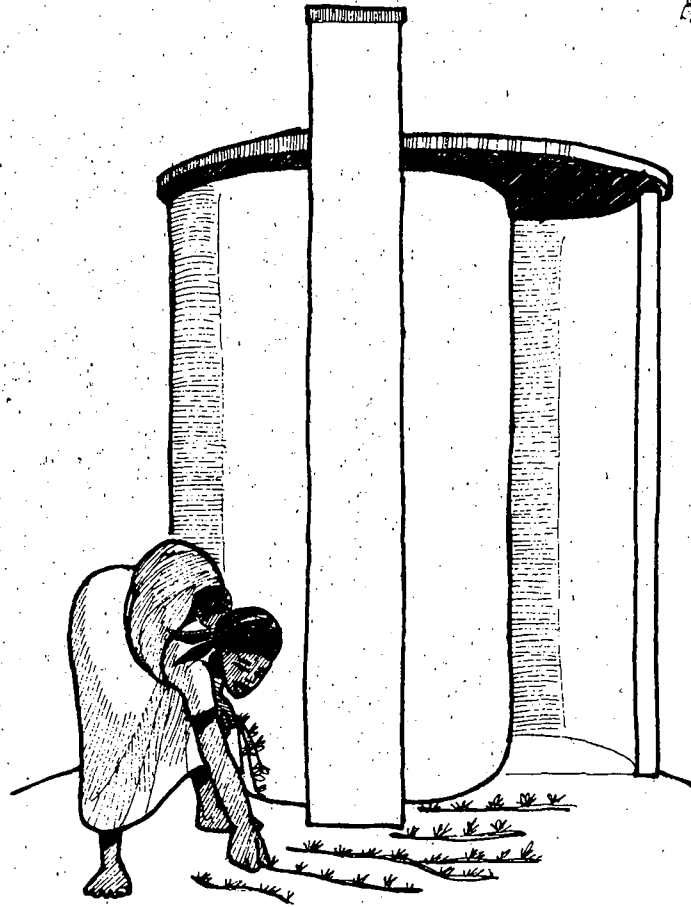
Clean the inside of the latrine
daily with water



Clean around the
squatting hole daily



Plant grass outside the latrine
to prevent erosion



Help young children
to use the latrine



Wash your hands
after using
the latrine



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