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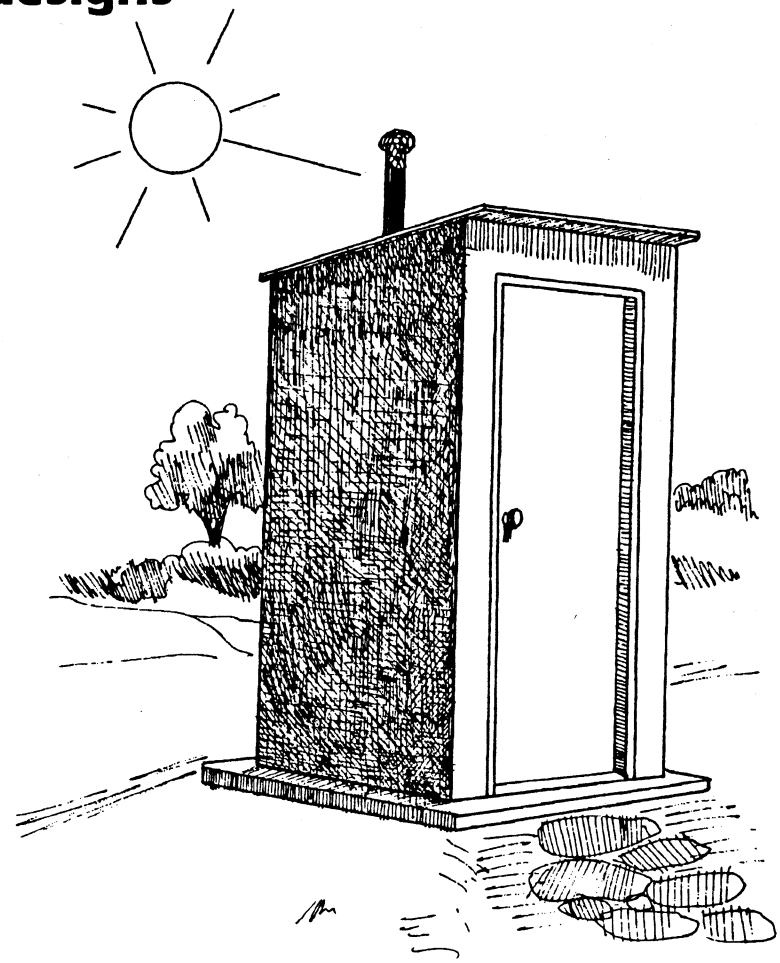
Ventilated Improved Pit Latrines

Siting the VIP latrine

Constructing the VIP latrine

Alternative designs



INTRODUCTION

The Ventilated Improved Pit Latrine, or VIP latrine, is probably the simplest structure that you will be building. Consider building some of these as your first target, so that:

-It could demonstrate several important building techniques.

-You could practice following plans.

-You get practice in organising labour.

-You find out how good your local materials are.

-You could see how good your Supervisor is.

-You find out how good your skilled labour is.

You can then use the lessons you have learnt when constructing other, larger buildings.

HOW A VIP WORKS

The VIP is designed to do 2 things:

(1) Not smell.

-The sun warms up the vent pipe and so the air inside the vent pipe gets hotter.

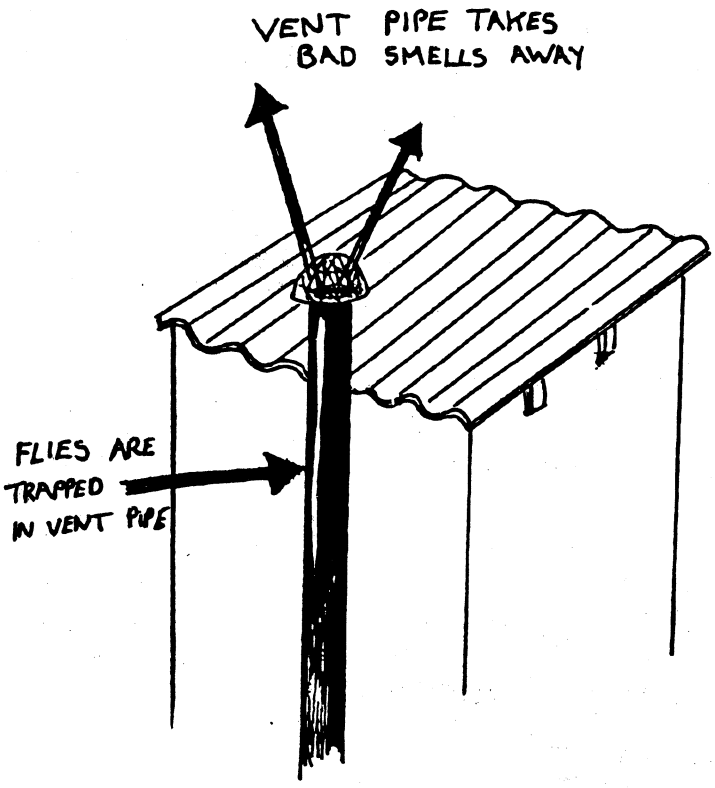
-This causes the air inside the pipe to rise up and out through the top of the pipe. Because the vent pipe goes into the pit, fresh air is sucked down the squat hole.

-This keeps the air fresh, inside and outside the VIP.

(2) Trap flies which would spread disease.

-Flies are attracted down the squat hole by the smells.

-When the flies want to leave the pit they fly towards the light.



-Since the inside of the VIP should be dark, the only light the flies in the pit can see is up the vent pipe. The flies fly up the vent pipe, are trapped by the mesh at the top and die.

-This stops the flies spreading disease and keeps the inside of the VIP free of flies.

To make all this happen it is important to follow the designs carefully.

ACTION	REASON
Do not put windows in the VIP, or	the flies will see the light through the squat hole and come out this way.
Paint the vent pipe black, because	black absorbs more heat, so the pipe will get hotter and cause the bad air to rise.
Position the vent pipe on the sunny side of the VIP, so that	the pipe gets as hot as possible.
Put the door facing the prevailing winds, so that	the air moves through the VIP correctly.

THE PIT

The pit should be large enough to last a long time before filling up. If it is made according to the plans it should last a family up to 15 years. At a public building, such as a school or health centre, a VIP should last 5-6 years, although it depends how many people are using it.

HOW TO BUILD A VIP LATRINE

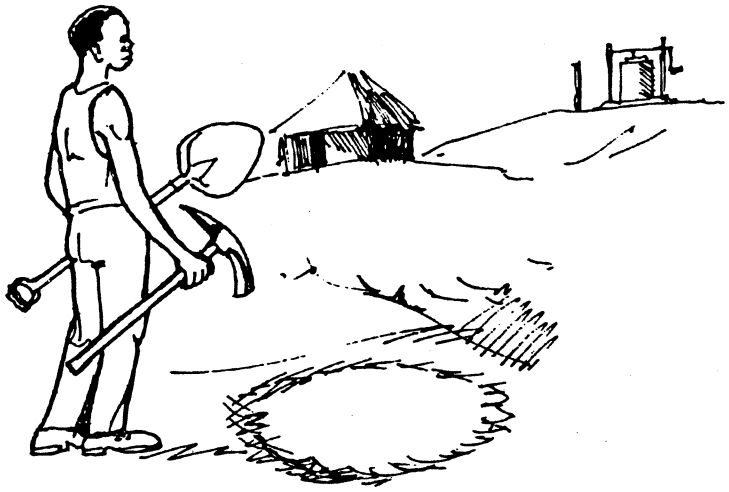
VIP's are simple structures, but there is still a lot of detail to follow if they are to work correctly.

Follow each step carefully:

(1) Siting the VIP

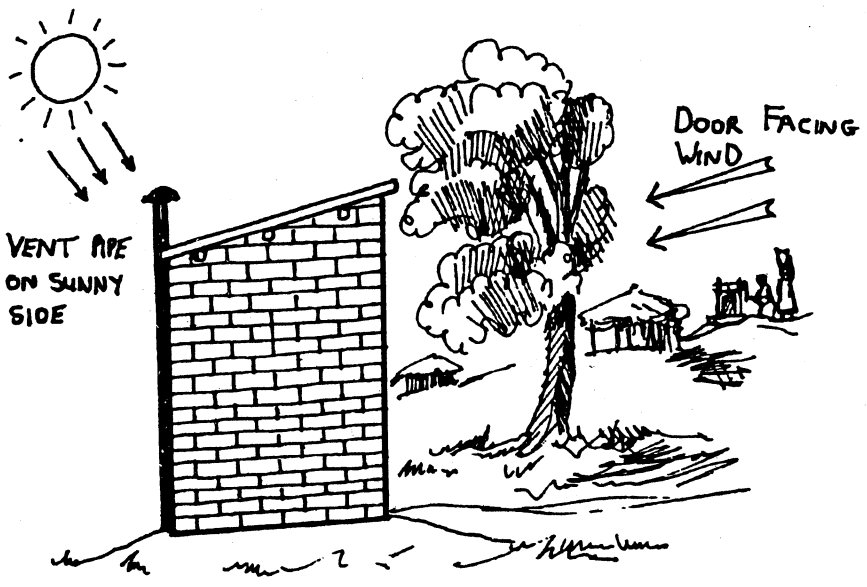
-Avoid sites with very sandy soil if possible, because the pit is more likely to collapse.

-The VIP must be at least 15 metres but ideally 100 metres from any well. Build the VIP downhill from the well to reduce the chances of polluting the water.



-The bottom of the pit should be at least 2 metres above the water table, even in the rainy season.

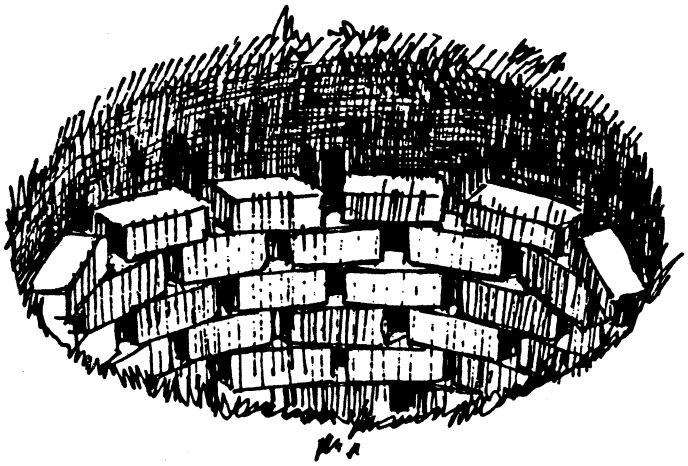
-Site the VIP so that the vent pipe is on the sunny side and the door faces the direction of the prevailing winds.



(2) Digging the Pit

-dig the pit 0.9 metres wide and at least 3 metres deep.

-ensure the sides are vertical and will not collapse.



-in unstable soil dig the pit 1.2 metres wide and line it with bricks, built up on top of a 50mm deep ring of concrete. The lining must have holes in it to let liquids soak out of the pit.

(3) The Foundation

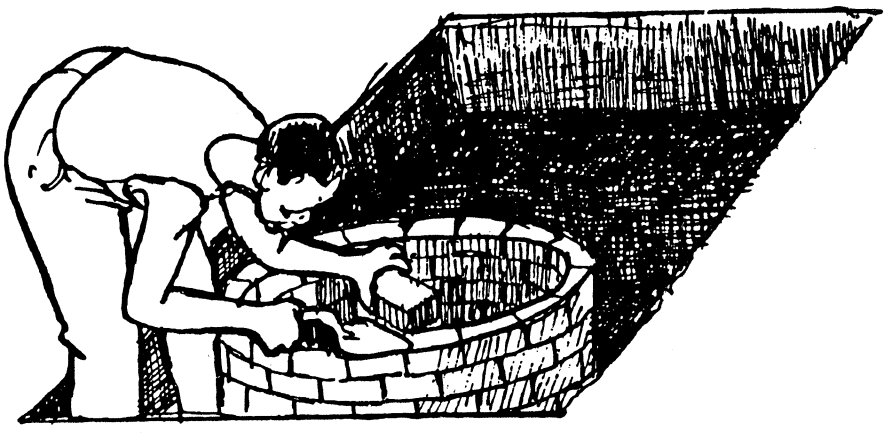
The foundation of the VIP has 2 purposes:

-it reinforces the top of the pit, stopping the pit from collapsing,

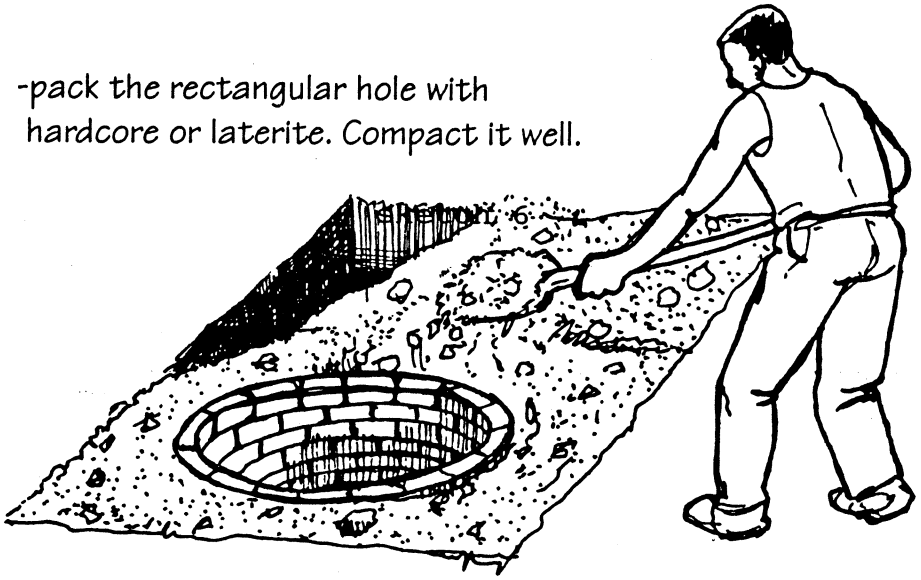
-it supports the walls of the VIP.

-remove the top soil above the pit as shown in the plans. For a single compartment VIP the hole should be a rectangle, about 2.5 metres long, 1.5 metres wide and 0.3 metres deep. It is not central over the pit.

-in unstable soil, make a 100mm deep ring of concrete around the top of the pit. Build a circular wall on top of this up to ground level.



-pack the rectangular hole with hardcore or laterite. Compact it well.

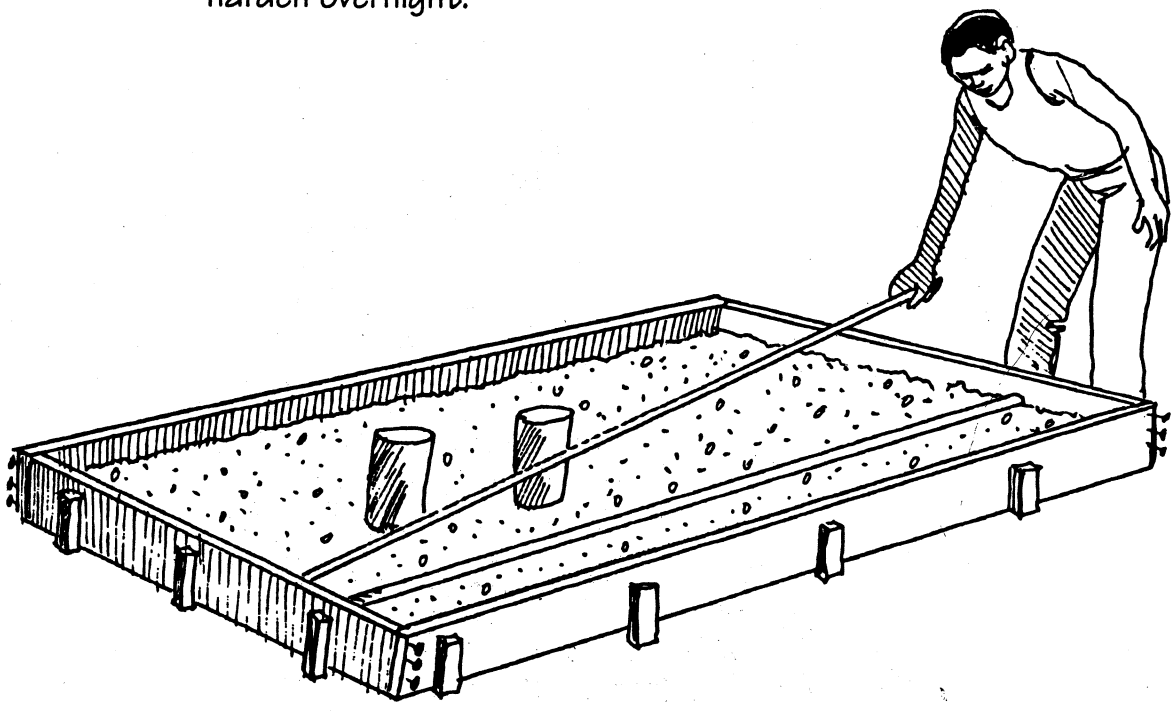


(5) The Slab

The slab is reinforced concrete and supports the main structure.

-you can either cast the slab in-situ over the pit, or make a pre-cast slab and lift it into position.

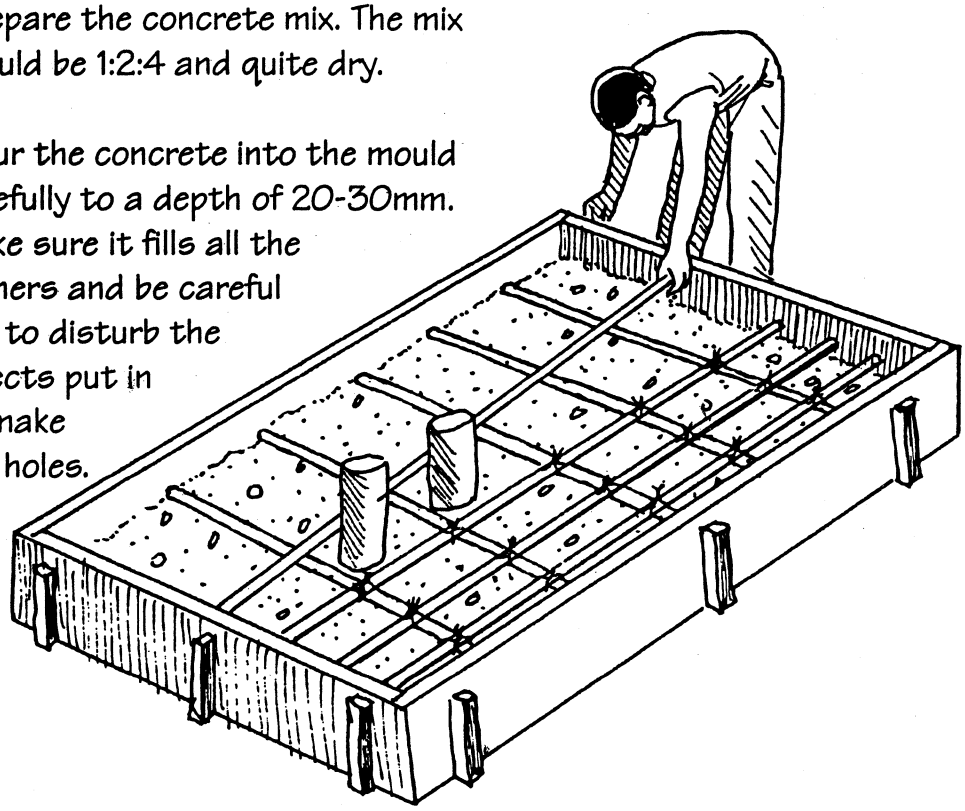
-there will be two holes in the slab, the squat hole and the vent pipe hole. Block the position of these holes. The vent pipe hole can be made with a short length of pipe. You can make the shape of the squat hole with a damp cement:sand mix (1:10). Leave it to harden overnight.



-metal reinforcing bars are required to give the slab strength. The bars should be 10 or 12 mm in diameter. Cut the reinforcing bars to fit the slab.

-prepare the concrete mix. The mix should be 1:2:4 and quite dry.

-pour the concrete into the mould carefully to a depth of 20-30mm. Make sure it fills all the corners and be careful not to disturb the objects put in to make the holes.



-place the reinforcing bar on the concrete, as shown in the illustration above. The bars should be about 200mm apart. Tie the bars together where they cross.

-fill the rest of the mould with concrete, making a slight depression down to the squat hole.

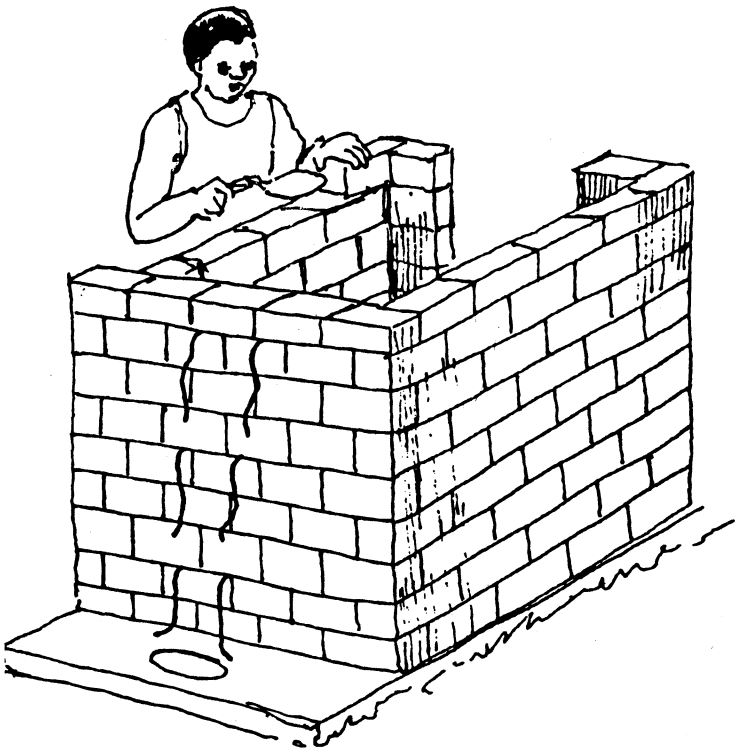
-compact the concrete using tampers until moisture comes through. This gets rid of all the air bubbles in the concrete.

-smooth and polish the surface to make it easy to clean

-when the surface is firm, cover the concrete with a sand layer about 30mm deep. Leave the concrete to cure for several days, but make sure the surface is kept moist while curing is taking place.

-if you made a pre-cast slab, lift it into position when the concrete is completely cured.

(6) The Structure



-leave the sand layer on the slab. It will protect the surface while the VIP is being completed.

-build the walls of the pit latrine as shown in the plans. Build wire ties into the walls to secure the vent pipe.

-the roof sheets are supported on purlins. Soak the purlins with termite protection, such as creosote, before fitting them. The roof should slope from front to back.

-plaster the walls and whitewash the outside of the VIP with a lime and cement mix. By adding 1 part of cement to 9 parts of lime the whitewash will last much longer.

(7) The Vent Pipe

-the vent pipe should be long enough to extend at least 500mm above the highest part of the roof.

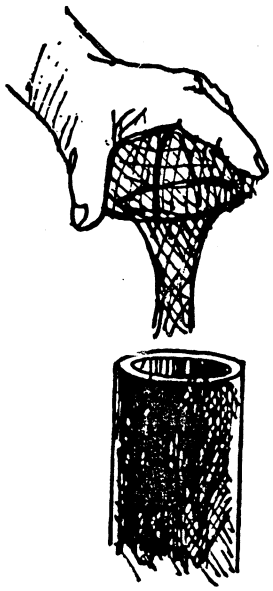
-metal or asbestos pipes should have an inside diameter of at least 100mm. Brick vent pipes should be 200mm square and the inside should be smoothly plastered.

-paint the vent pipe black.

-remove the blocks used to make the holes and place the vent pipe in position. Secure the vent pipe to the wall with the wire ties.

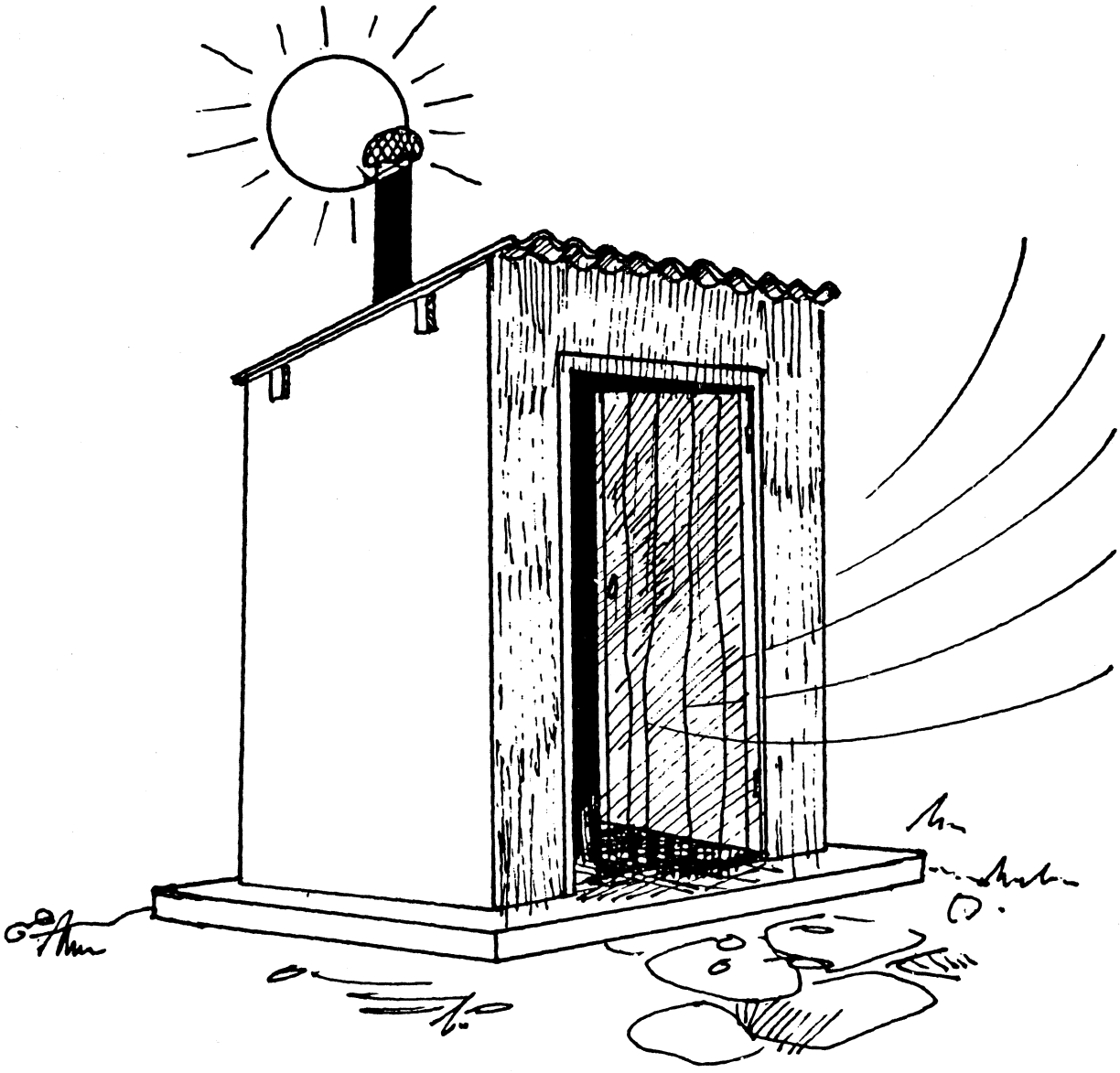
-make sure the joint between the vent pipe and slab is well sealed, to stop flies and bad air escaping.

-fix a fine mesh fly screen over the top of the pipe. This is VERY IMPORTANT. The mesh traps the flies, preventing them from escaping. Use nylon mesh if possible, since this will not rust.



-break open the squat hole and brush the floor clean.

The VIP is now complete and ready to use.



ALTERNATIVE DESIGNS

There are several different types of VIP:

- single and double compartments,
- with and without doors,
- double pits and so on.

Ask your Regional Officer about these and decide which is the most suitable type for your project.

(1) Urban Areas

If your project is in a densely populated area, or if you are very near a well or water source, you may have to make a solid pit lining. Some Councils have equipment that can pump out the contents of the pit when it becomes full.

If your project is in an urban area, have your plans approved by the Council.

(2) Extra Light

The inside of the VIP must be dark and some people, especially children, may not like using them. If the standard design is not popular in your area you can consider putting in a window or opening, provided you include one of the following modifications:

(a) Put shutters on the opening. When someone uses the VIP they can open the shutter to let in more light. They MUST close the shutter when they leave the VIP or flies will come out of the squat hole.

(b) You can have openings without shutters, provided you make a cover to go over the squat hole. Have a long handle on the cover so it is easy to move. The user MUST replace the cover whenever they have finished and the cover must be a good fit to prevent the flies being attracted by the light.

Remember, if you use either of these methods you must educate the users to close the shutters or replace the cover when they leave the VIP.

(3) Other Changes

You can make other changes to the VIP to suit local preferences. For example, you can mould small platforms on the slab to stand on. Make the shape of the squat hole to suit yourselves. You can even build the hole up into a seat, like a flush toilet.

Choose the design which is most appropriate to your project, but educate the community about how to use the VIP properly.

KEY POINTS

- keep VIP's as far away from wells as possible
- make sure the pit is deep and stable
- reinforce the slab
- do not put windows in your VIP
- put the vent pipe on the sunny side of the VIP and paint it black
- have the door facing the prevailing winds
- ALWAYS cover the vent pipe with mesh to trap flies