

Manual

Construction of simple improved pit latrines

Version: 090602 • By: Ton Teunissen • Manual Code: ST6.1

1 Select the location of the pit

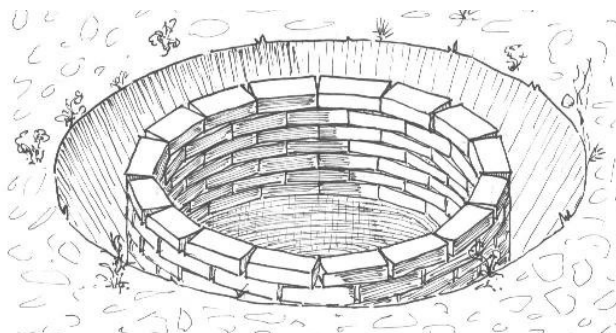
The location of the pit should be:

- between 10 and 30 meters from your house,
- at least 30 meters from any water source,
- downside the main wind direction.

2 Dig the pit

1. Dig a round pit of 90 cm. diameter and 2½ to 3 m. deep.

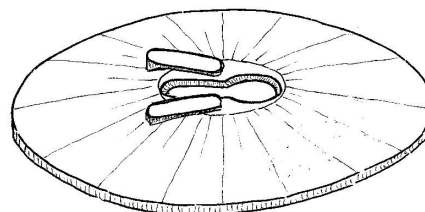
2. Consider that when the toilet is in use, and the pit fills up with faeces and pee, the sides of the pit are going to be more and more wet. May be the soil will not be strong enough in this wet situation and the pit can collapse! After all, there is, later on, a heavy slab pushing on the sides of the pit. When you are afraid this can happen, make the pit a little bit wider and build a surrounding “wall” of bricks in it. When you place the bricks carefully, there is no need to use any mortar. The moisture in the pit can go out through the joints between the bricks.



1. Brick lining for pit latrine

3 Description of the slab

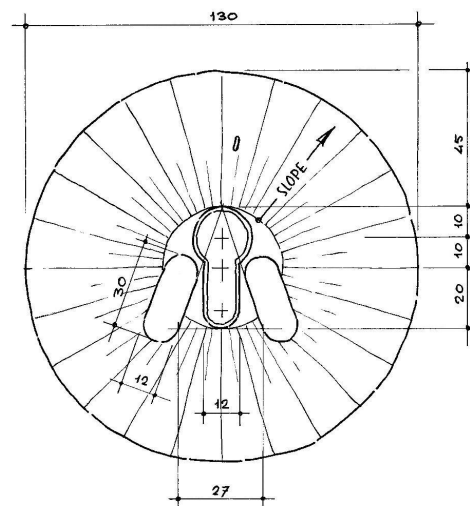
1. The circular concrete slab has a dome form to give it more strength (see figure 2 and 4)
2. There is reinforcement in the concrete in order to prevent cracking while the slab has to be removed (see figure 9).



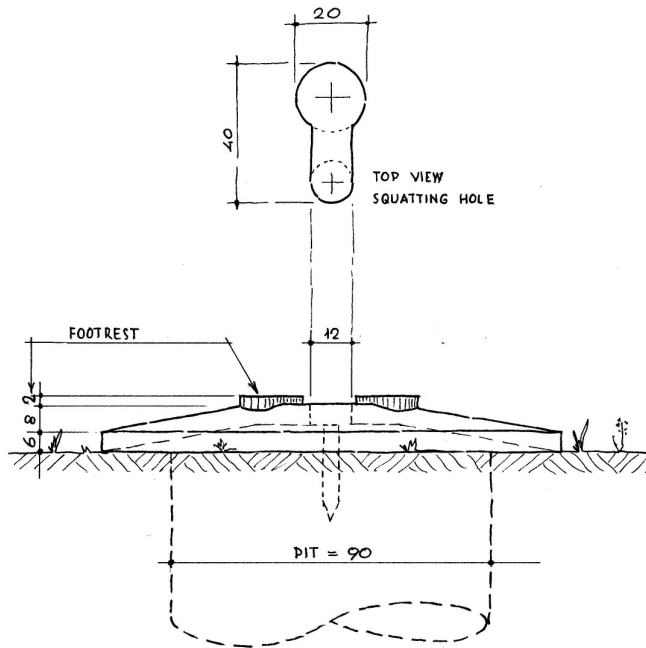
2. Slab for pit latrine

3. The dimensions are:

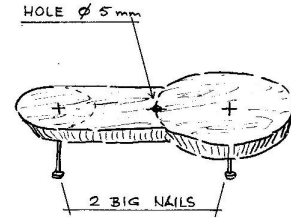
Diameter:	130 cm. (picture 3)
Thickness:	6 cm. (picture 4)
Height of the dome:	8 cm. (picture 4)
Squatting hole:	40x12/20 cm. (picture 4)
Weight:	about 190 kg.



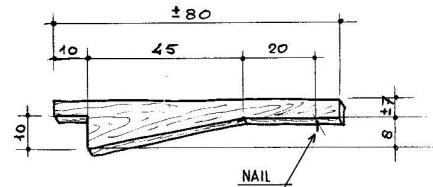
3. Top view slab



4. Front view slab



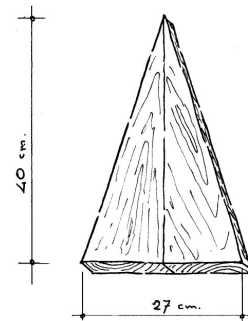
5. Gap mould



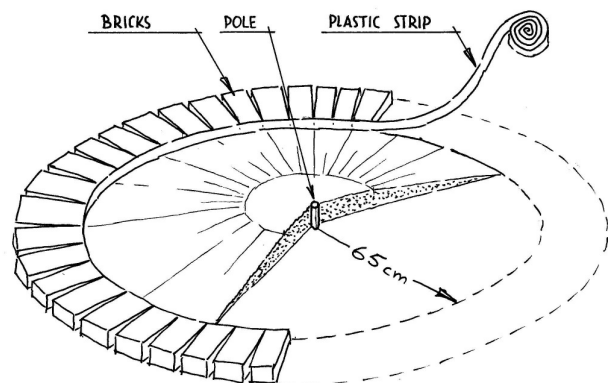
6. Slope mould

4 Preparing the form

1. Make a wooden gap mould for the squatting hole. For dimensions see figure 3. Thickness 6 cm. The bottom side should be all around 1 cm. smaller than the topside in order to get a conical section (see picture 5). Put two big nails in the bottom side in order to keep the mould in situ during the action mentioned in 8.3 On the top side of the mould there has to be a hole in the centre to put in the connection nail of the slope mould.
2. Make a slope mould out of a board (figure 6).
3. Make a triangle mould (figure 7) from 27 x 40 x 2 cm. fitting between the footrests you have to make later on.
4. Coat all the moulds with (old) oil in order to prevent sticking them onto the concrete.
5. Look for a nice level place to work on.
6. Put a small pole in the middle and let it stand out 8 cm. above the ground. (see figure 8) and sign around the pole a circle with a beam of 65 cm. in the ground (use the slope mould).
7. Make outside the circle a ring of bricks.



7. Triangle mould

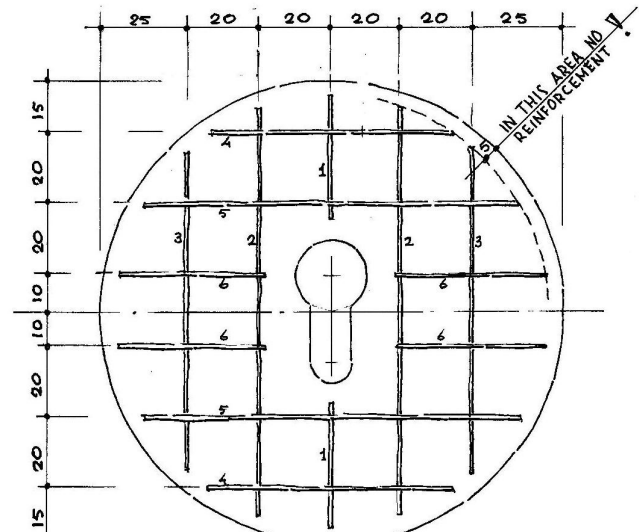


8. Making the slope

8. Make a dome of soil in the circle from the outside towards the pole. The top of the pyramid has to be flat in a diameter from 40 cm. Use the slope mould!
9. Put a 6 cm. wide (and about 410 cm long) strip of strong plastic against the inward side of the bricks in order to prevent seaming the mortar and the bricks together.
10. Moisten the soil inside the bricks to avoid leaking away later on the cement water out of your mortar.
11. Place the gap mould in the centre on the flat part of the soil.

5 Preparing the reinforcement

1. You will need 9,80 meter iron bars of Ø 6 mm.
2. Cut the bars into the following pieces (see the numbers in figure 9)
 1. 2 x 35 = 70 cm.
 2. 2 x 115 = 230 cm.
 3. 2 x 87,5 = 175 cm.
 4. 2 x 67,5 = 135 cm.
 5. 2 x 105 = 210 cm.
 6. 4 x 40 = 160 cm.
3. Tie the bars together with iron wire.



9. Reinforcement

6 Preparing mortar with gravel

1. The best concrete you will get by making a mixture 1:2:3 which means:
 - 1 part cement
 - 2 parts clean, sharp sand
 - 3 parts clean gravel **with no particles bigger than 3 cm.**
2. You will need about 80 litre wet mortar. In order to get this, you will need about 125 litre dry materials. So put the next quantities on a hard even surface and mix them very well (first mix the sand and the gravel than add cement):
 - 21 litre cement (half a bag of cement)
 - 42 litre sand
 - 63 litre gravel
3. Add as much clean water as necessary to get a mortar with the humidity of flabby ugali. If the sand and the gravel are totally dry you will need approximately 20 litres water, if not, you will need less water. The water should not be saline or contain organic materials. Don't add too much water, because it will leaking out of your slab into the soil before the mortar is hardened and it will take with it a part of the expensive cement!

7 Preparing mortar without gravel

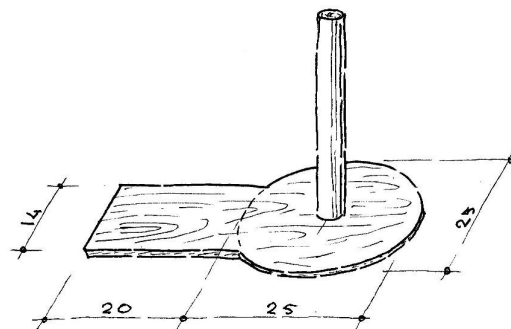
1. If there is no gravel available, you can make the mortar with only cement and sand. Nevertheless the concrete will be less strong! Use a mixture 1: 3 which means:
 - 1 part cement
 - 3 parts clean, sharp sand
2. You will need about 80 litre wet mortar and in order to reach that you will need about 115 litre dry materials. So put the next quantities on a hard even surface and mix them very well.
 - 29 litre cement
 - 86 litre sand
3. Add as much clean water as necessary to get a mortar with the humidity of flabby ugali. If the sand and the gravel are totally dry you will need approximately 27 litres water, if not, you will need less water. The water should not be saline or contain organic materials. Don't add too much water, because it will leaking out of your slab into the soil before the mortar is hardened and it will take with it a part of the expensive cement!

8 Making the slab

1. Put 1/3 of the mortar on the slope of soil, divide it equal in a layer of 2 cm thickness.
2. Place the iron bars on the mortar (see figure 9). Bent them before where necessary. Make sure using the correct distance between the bars themselves and between the bars and the outside surface of the concrete. The bars need at least 2 cm. concrete all around them in order to protect them against aggressive moisture (pee and cleaning water).
3. Put the rest of the mortar on the bars and divide it equal. To make a nice surface use the slope mould. Knock gently with a wood float on the surface to drive away all the air bubbles out of the mortar.
4. Throw some hands full of pure cement powder on the surface of the slab and polish it carefully into the surface with a steel trowel until you get a nice smooth surface.
5. After some hours, when the concrete has hardened a little bit, release the gap mould from the concrete but let it in situ.
6. Make two footrests near the squatting hole. See figure 3 how to use the triangle mould. The height of the steps is 2 cm. above the centre plate
7. Finally cover the slab with a sheet of plastic in order to avoid drying out the fresh concrete. To prevent blowing away the sheet by the wind put some stones on the sheet. If there is no sheet available, use paper, grass or something else.
8. The next day you can remove carefully the gap mould, the surrounding bricks and the plastic strip.
9. Clean the three moulds very thorough and coat them again with oil for the next slab you are going to make.
10. Now you have to wait 4 weeks until the slab has totally hardened. **Don't move it sooner!** The first two weeks you have to sprinkle the slab at least 3 times a day with sufficient water to keep the concrete wet. The concrete will harden sooner and better in wet circumstances! After sprinkling replace the plastic cover all the times.

9 Covering

In order to keep flies out of the pit make a cover out of a board like the figure on the right.



10 Placing the slab

1. After 4 weeks the slab can be removed carefully.
You can put it upwards and roll it to his destination



2. Mind the weight of the slab: about 190 kg! So handle the slab with enough strong people.



3. Put the slab carefully over the pit.

4. Now make a small house around your new pit latrine.



5. Also make a hand wash for the users of the latrine to wash their hands after each toilet visit. Because you know how important that is for good health!



