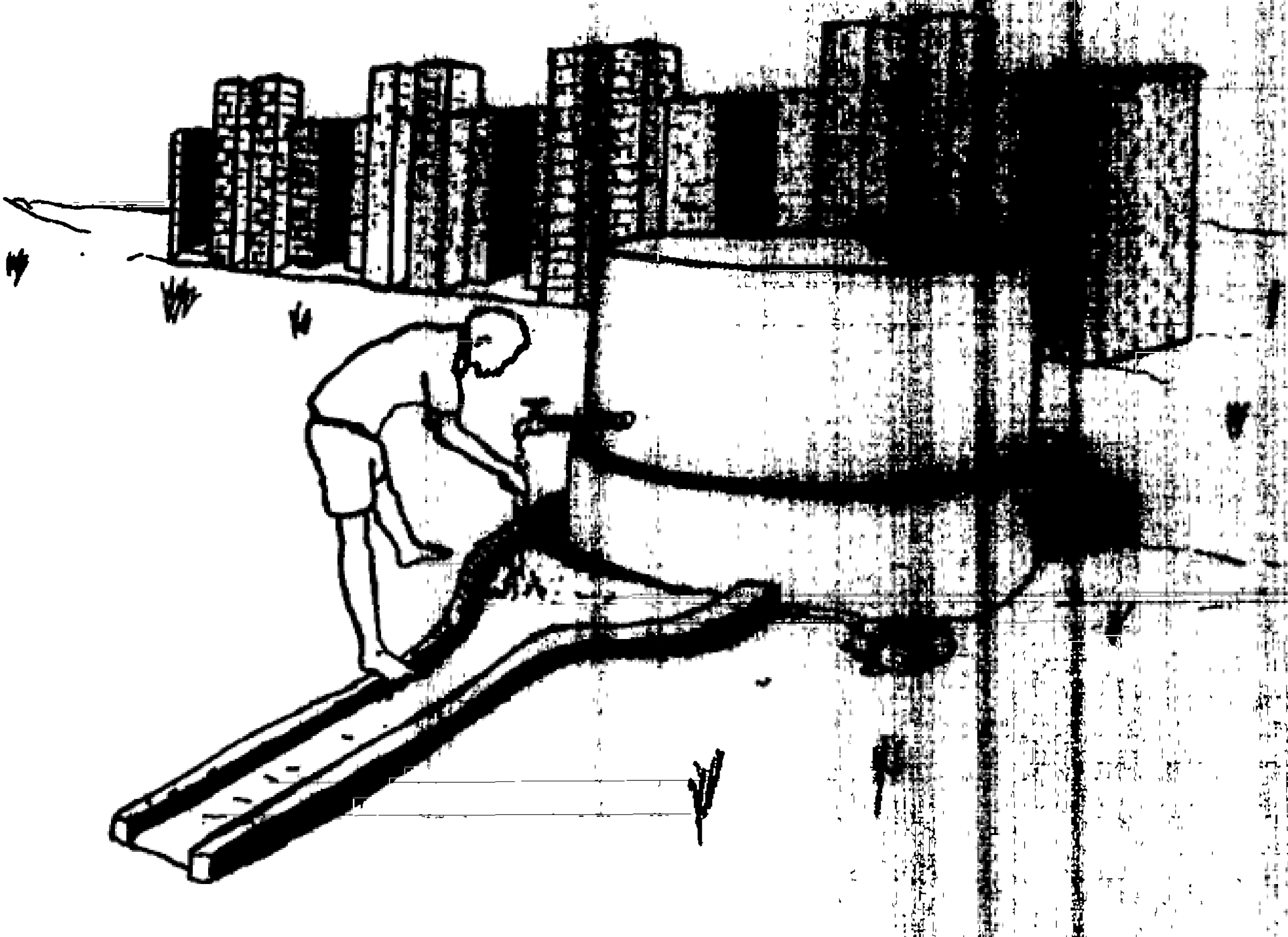
MAKING A [illegible] FACIL[illegible]

BUILDERS MANUAL FOR [illegible] HANDWASHING UNIT



MVURAMANZI TRUST

INTRODUCTION

Handwashing forms a vital part of any personal hygienic behaviour, and yet most latrine facilities built in the rural areas are not equipped with any handwashing facility.

The time has come to promote these simple facilities far more, as the advantages of handwashing become more well known.

This manual describes how a handwashing facility designed for a school can be built and maintained. It is based on work carried out by the Ministry of Health and Child Welfare, particularly the efforts of the staff of the Environmental Health Department.

Since water is rarely piped to rural schools, raw water is carried by hand by the children from the nearest water source, whether it be a hand pump or a well or stream. Since the source of water may be dirty and possibly contaminated, the hand washing unit is equipped with a sand filter, which cleans the water physically and also has some effect at improving the quality. However, the handwashing facility should not be used as a drinking water source, unless there is no other better source in the area. Ideally a handpump fitted to a protected well or a borehole should be used as a water source for drinking at a school.

The handwashing tank is raised above ground level on a tank stand, and both are made of bricks. The tank itself is filled with river sand to form a water filter. Water is led off through a slotted steel pipe to the tap on the side of the tank. The facility is made with a strong Apron and water run-off mounted below the tap so that waste water can drain away two or three meters from the location of the stand. The tank is covered with a concrete lid which has an access hole caste it it. This is fitted with a lid. A man should be able to enter the hole in order to inspect and even replace the sand if it becomes too dirty and needs to be thoroughly cleaned.

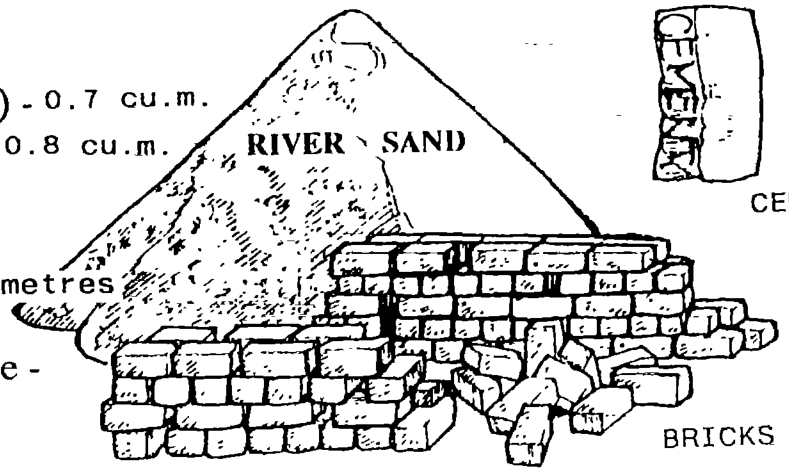
Ideally every school should be fitted with a handpump, a series of multicompartment Blair Latrines, as well as a handwashing facility. In addition, the importance of good hygienic practice should be taught at schools. When sound hygiene education and practice are backed up by good facilities, then improvements in health can be expected.

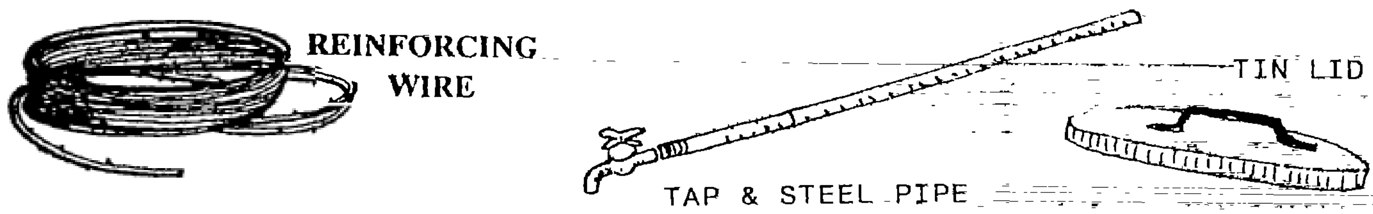
Peter Morgan
NAC Technical Subcommittee
June 1994

MATERIALS REQUIRED TO BUILD A SCHOOL HANDWASHING FACILITY

Cement - 8 Bags
River sand (for building) - 0.7 cu.m.
River sand (for filter) - 0.8 cu.m.
Pit sand - 0.8 cu.m.

Reinforcing wire - 120 metres
Bricks - 500
Tap and 20mm steel pipe -
Tin lid -





SITING AND SERVICING THE HANDWASHING FACILITY

Obviously the handwashing facilty should be sited near to the latrines and in a convenient place between the latrines and the classrooms.

Since water is hand carried to the facilities a suitable step is built on the tank to give easy access to the water access hole in the tank roof. Ideally classes should fetch water on a rotation basis during the week, or alternatively children can carry some water each day to the school from a suitable source on their way to the school. Experience has shown that where the water flow through the tap is regulated a tank full of water will serve a school of 500 children for one week.

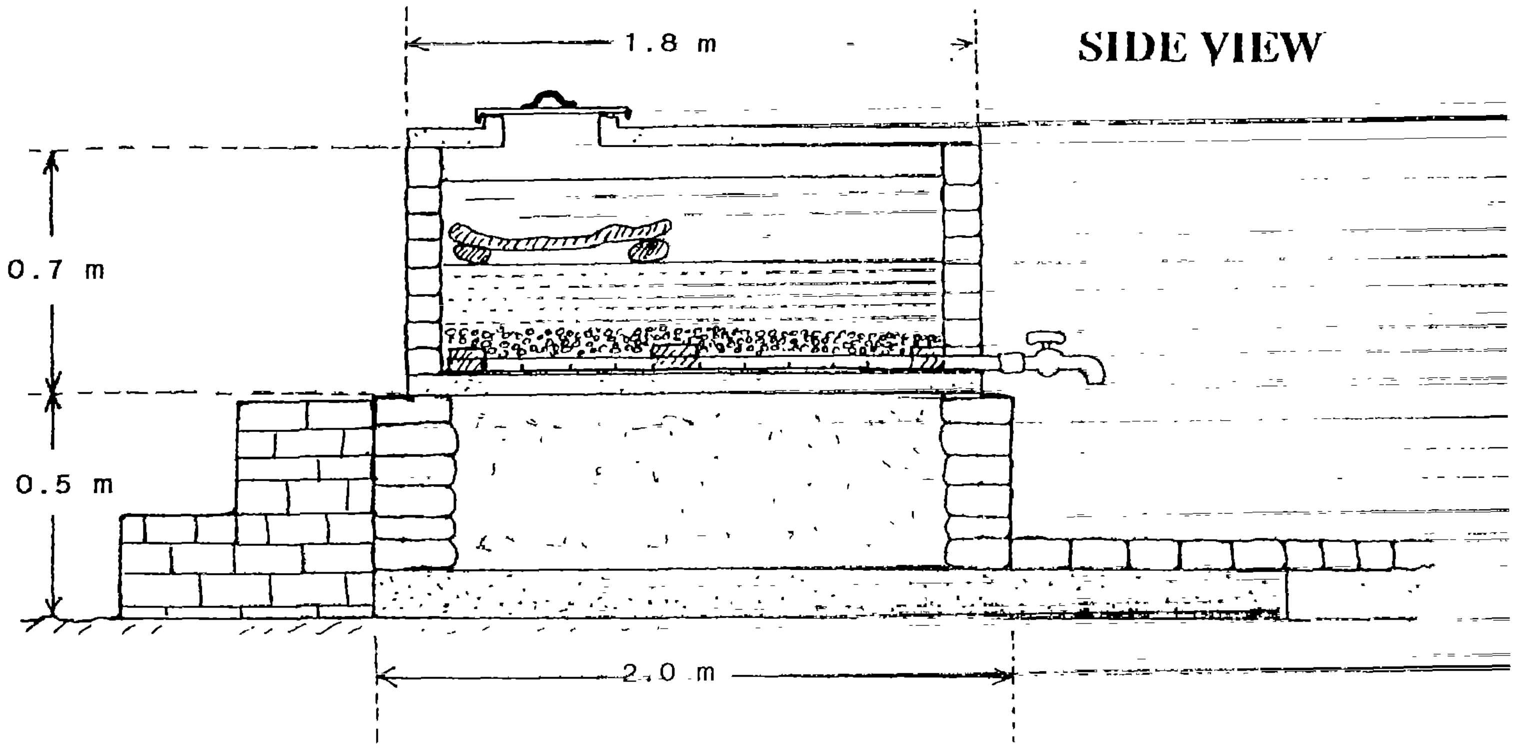
Children should be taught to be sparing with the water so that as little is wasted as possible. A simple regulator on the tap ensures this. The use of soap should be taught as this increases the effciciency with which the hands can be cleaned.

MAINTENANCE

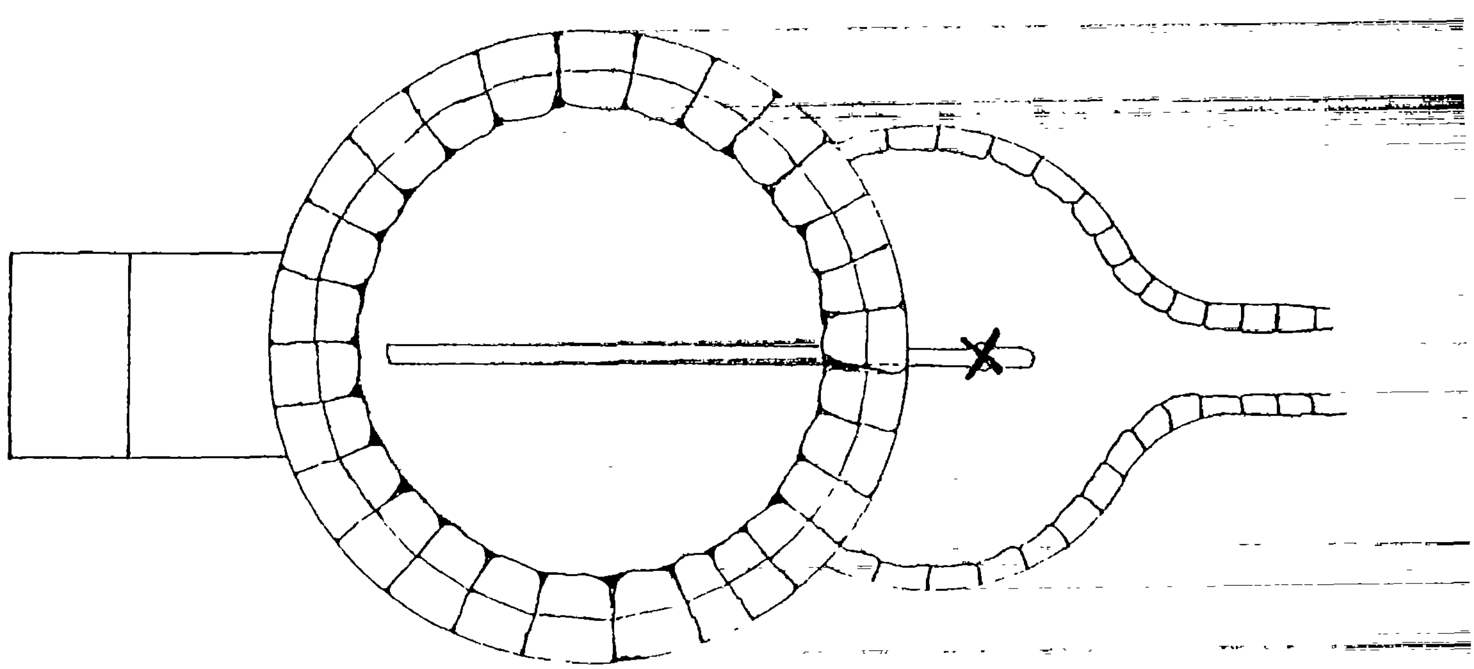
The filter/handwashing tank should run well with little maintenance. Once the flow starts to slow down the sand in the tank needs cleaning. Remove the sand with a bucket and rope. Once the level of the sand is reduced a small person can get inside and clean out the interior. The sand and stone are thoroughly washed and replaced into the tank.

DIAGRAM OF THE HANDWASHING FACILITY INCLUDING MEASUREMENTS

SIDE VIEW



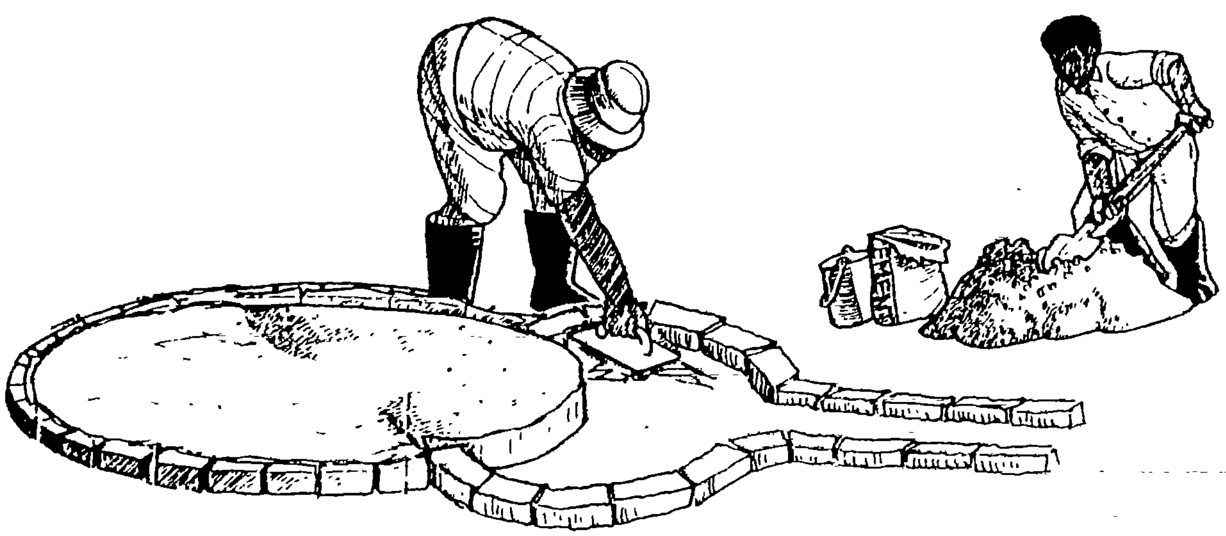
OVERHEAD VIEW



STAGES IN THE CONSTRUCTION OF A HANDWASHING FACILITY

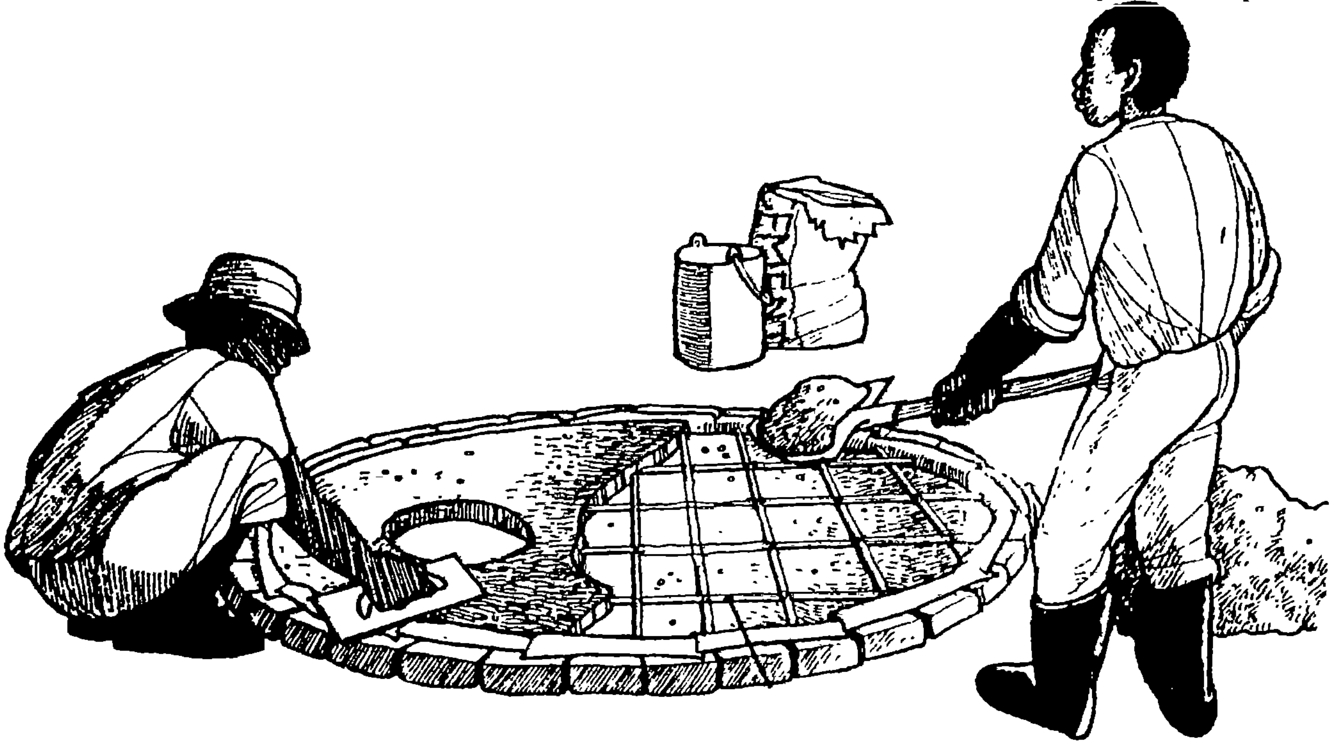
Stage 1. Caste base slab for tank, apron and water run-off

The base slabs for the tank, apron and water run-off are caste on the ground in one piece. A circle is marked on the ground 2m in diameter for the tank base. On the water run-off side of the tank a half circle is marked on the ground with a radius of 0.75m (see diagram). The water run-off is marked on the ground 450mm wide and 2m long. A mould of bricks is now laid around the marks made on the ground for the tank base, apron and water run-off. A mixture of 5 parts of river sand and one part cement is mixed, the total volume using 2 bags of cement. Half of this is laid within the brick mould and wire reinforcing is added. The reinforcing can be made of barbed wire or 3mm wire and is usually cut first. The wire is cut so that if forms a grid with 150mm spaces. Once the wire has been laid the remainder of the concrete is added and rammed down hard.



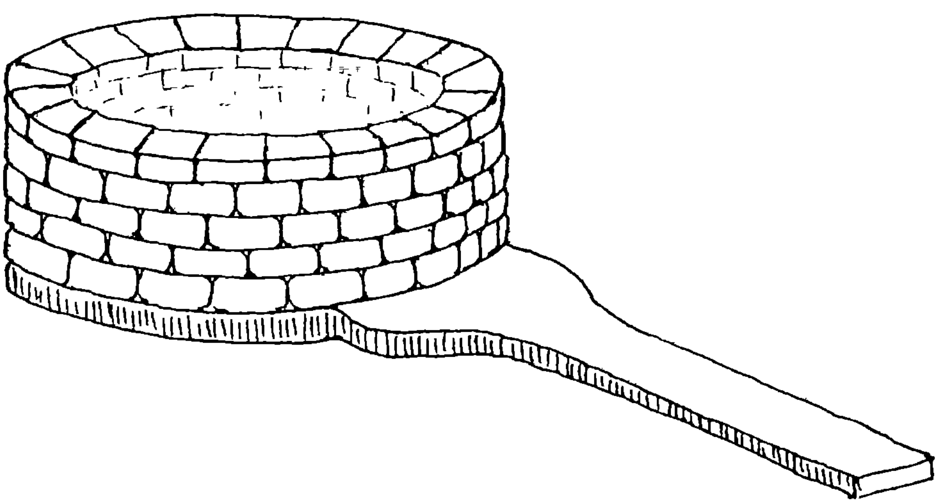
Stage 2. Caste the tank roof

This is caste in the same way as the tank stand base, but is made over a layer of plastic or paper so that it can be lifted. The tank roof slab is made 1.8m in diameter and about 70mm thick with 4 parts river sand and one part cement. One bag of cement is used. It is reinforced at 100mm intervals with 3mm steel wire placed in a grid formation. This slab is made with a tank access hole 40cm in diameter surrounded by a raised rim 55cm in diameter (outside). The hole is caste 300mm from the edge of the slab. A tin lid fits over the hole. The slab is left to cure for 5 days and kept wet.



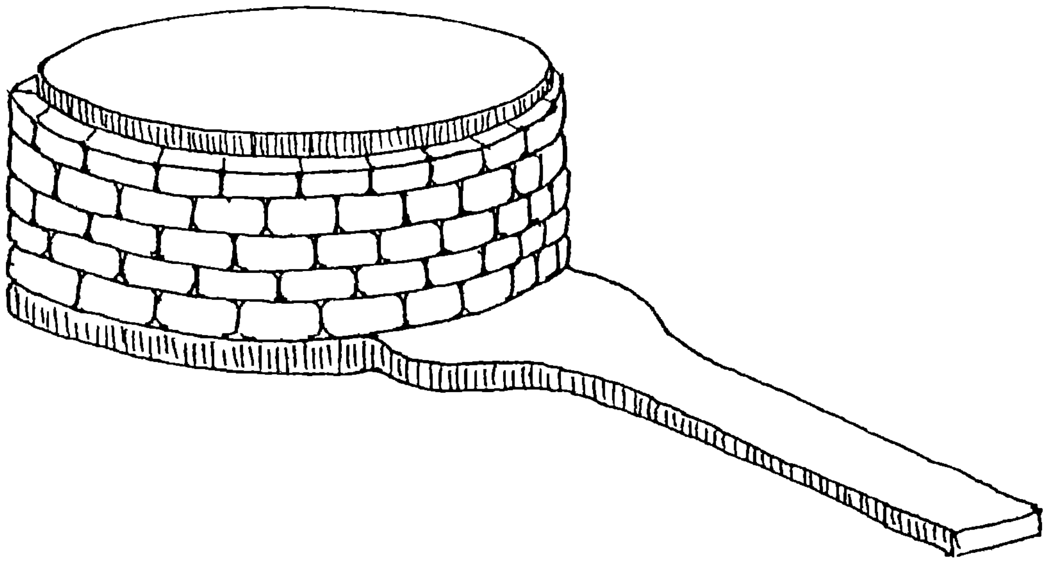
Stage 3. Build up the tank stand

Once the concrete tank stand base has begun to cure, after one or two hours the tank stand can be built in bricks. The tank stand is built up 500mm high above the slab with an outer diameter of 2m. The bricks are laid and bonded with cement mortar so the wall is 500mm high and is 225mm (9") thick. This is about 6 courses of bricks. The first and sixth courses of bricks are laid radially.



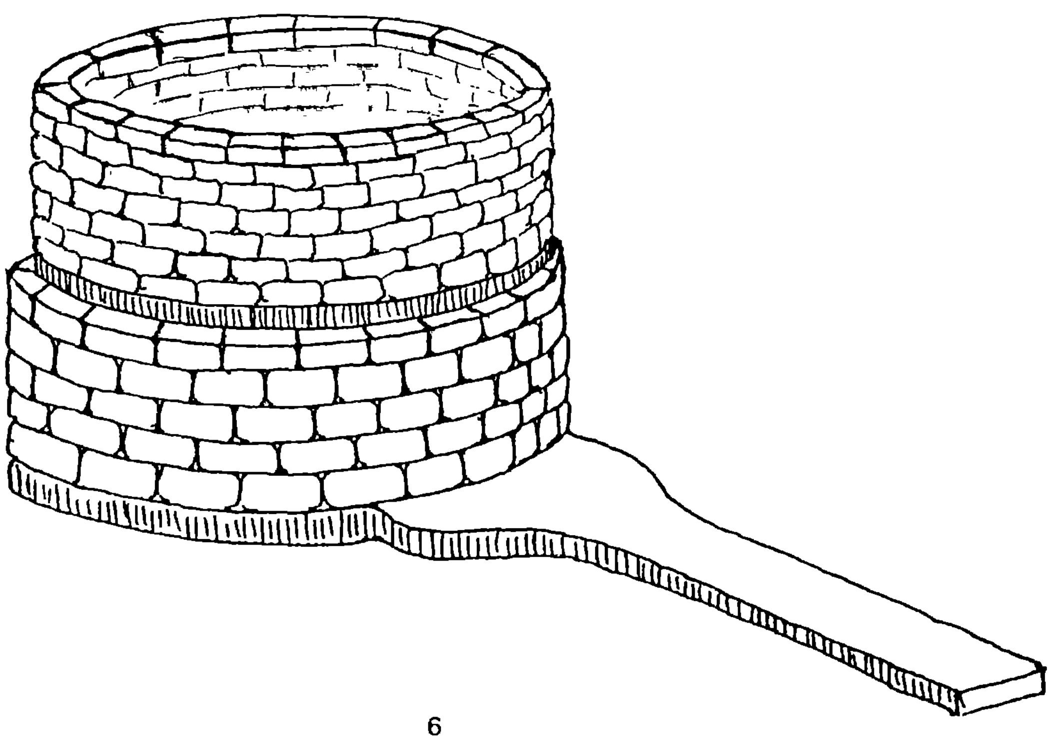
Stage 4. Caste the tank base

This is caste in situ onthetank stand. First the inside of the tank stand if filled with earth and rubble to the height of the wall (500mm)and rammed down. A plastic sheet is now laid over the backfill and the wall. Next a ring of bricks is laid around the outer rim of the 225mm thick wall to form a mould into which concrete can be poured for the tank base. The ring of bricks can be held in place with wire. The tank base is caste 1.8m in diameter and is made about 75mm thick with a concrete mix containing 4 parts river sand and one part cement. It is reinforced at 100mm intervals with 3mm steel wire placed in a grid formation. It is left to cure for at least 2 days and kept wet. One bag of cement is used.



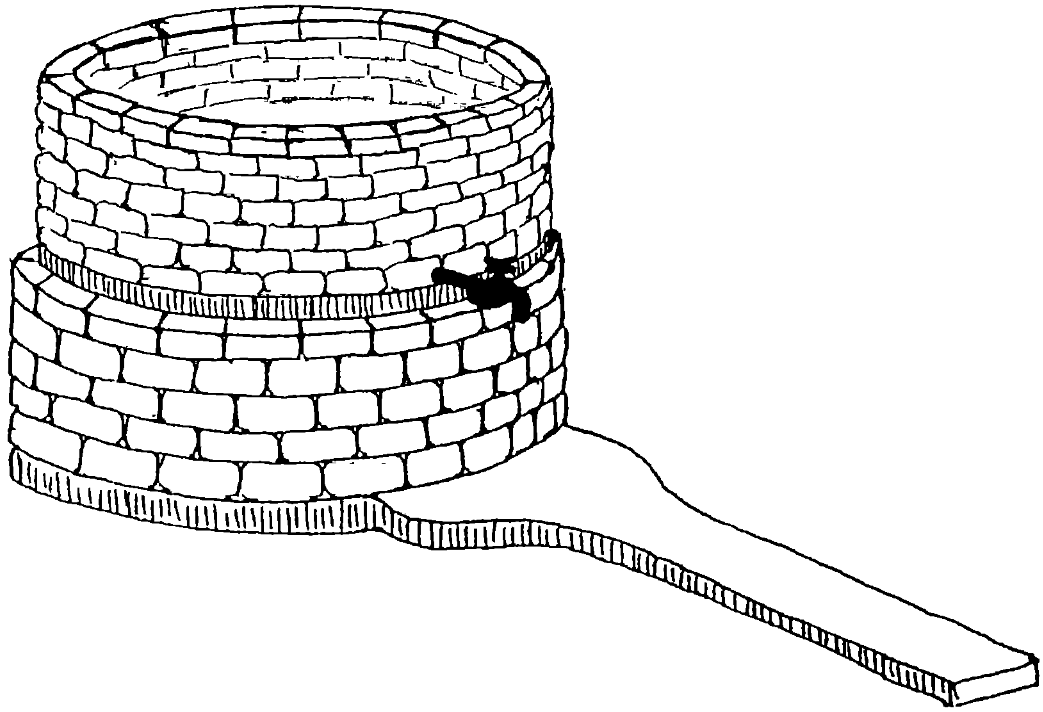
Stage 5. Build up the tank

The tank itself is now built up in cement bonded brickwork 700mm high above the tank base. The wall thickness is about 110mm. The inside and bottom of the tank are plastered with cement mortar (3 parts pit sand to 1 part cement). The tank plaster is skimmed with cement powder to make it water tight.



Stage 6. Add the pipe and tap and plaster the tank

A 1.5m length of 20mm galvanised pipe is threaded at one end so that a brass tap can be fitted through a galvanised pipe socket (20mm to 12mm). Several slots are cut into the lower side of the pipe at 50mm intervals with a hacksaw. Water will flow from the tank into the pipe through these slots. The pipe is passed through the brick wall and positioned so that the tap extends out about 150mm and about 25mm above the bottom of the tank. The pipe should be supported in at least three places by cement bonded brickwork to make it secure along its length. The cement mix should be made with 3 parts pit sand and 1 part cement for added strength where the pipe is supported. To reduce water flow, and thus economise of the use of water a flow restrictor should be added to the tap. One method is to cut a short length of narrow bore rubber tubing and fit within the threaded end of the tap. The tube can be expanded with plastic tape to form a good fit.



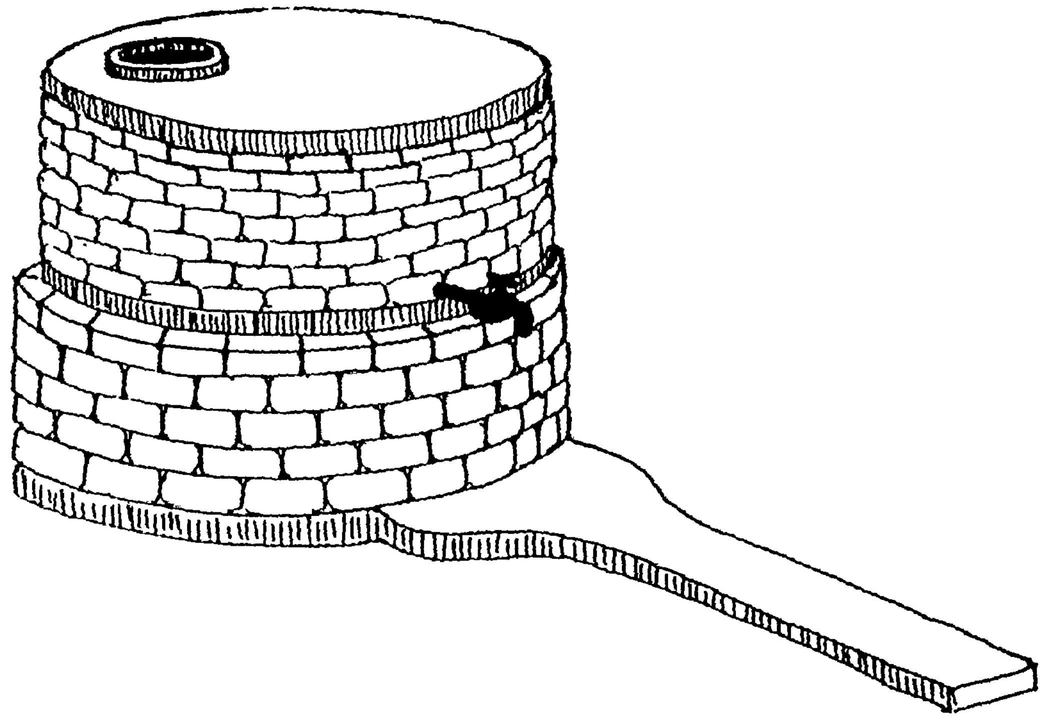
Stage 7. Add the washed river sand

If the supply of water for the tank comes from a pump or protected well then there may be little need to add a filter. However if the water comes from a contaminated source a sand filter may help.

Washed river sand is added to the bottom of the tank to a depth of 300mm. The sand is spread evenly over the bottom of the tank and around the steel pipe. A large stone is added above the sand below the water access hole.

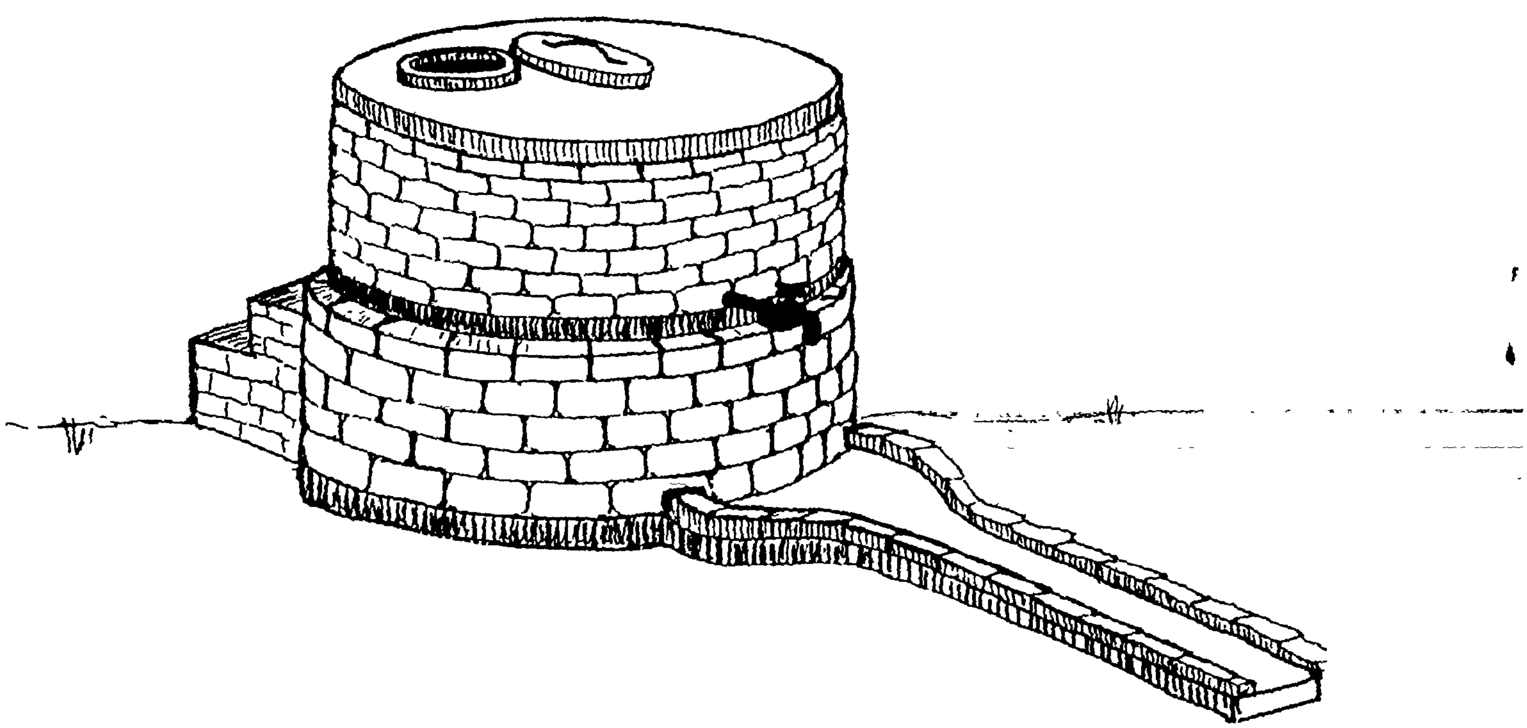
Stage 8. Add the tank roof

The concrete roof is carefully added to the tank so that the access hole is placed near the back end of the tank so that children standing on the step can pour water easily. The tank roof is cement mortared to the tank wall which is then plastered with cement.



Stage 9. Adding a brick step.

A step is constructed from bricks on the side opposite to where the tap will be placed. Two steps are made, one about 350mm high, the second 500mm high so that children can pour water into the tank..



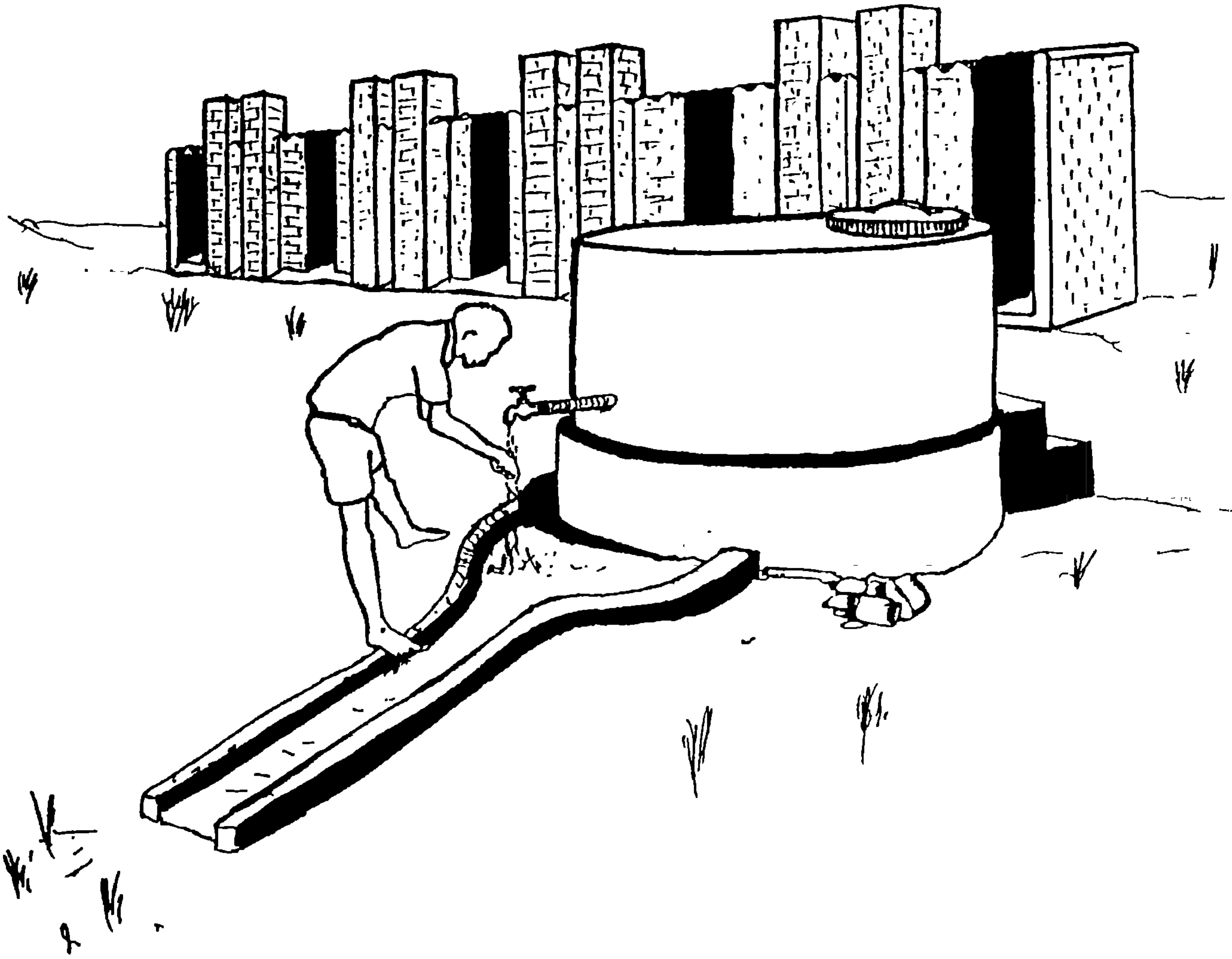
Stage 10. Filling with water

Once the tank and plaster work have been allowed to cure for a few day's the tank is filled with water. First fill with water to just above sand level and let the sand settle. Next arrange some large stones just beneath the access hole so that water being poured into the tank will not disturb the sand too much. Finally fill up the tank with water. Test by turning the tap on and run some water through the system. The water may be cloudy at first, but should clear as the filter is put to use.

Health Education

It is very important that the pupils are taught how to use and maintain the tank. This training can be undertaken by the teachers with the help of the local Environmental Health Technician. The tank should be filled regularly by the pupils and all pupils should develop a habit of using the tank after every visit made to the toilet.

MAVOKO ANOBATA TSVINA YAKAWANDA



NDEDZIPI NGUVA DZATINOSUNGIRWA KUGEZA MAVOKO:

-NGUVA DZOSE TISATI TADYA
-NGUVA DZOSE TAPEDZA KUDYA
-TISATI TABATA CHOKUDYA CHOSE
-NGUVA DZOSE TABVA MUKUSHANDISA CHIMBUZI

PRINT HOLDINGS