

## Introduction

When designing and constructing latrines, it is useful to have a criteria with which to determine appropriate sanitation facilities for the end user. A minimum design criteria can also serve as a maximum design criteria, with which to determine appropriate subsidies. Latrines can be made of traditional or manufactured materials, or a combination of those materials. The choice of which materials to use must come from the user.

## Latrine standards

The basic standard for a satisfactory excreta disposal system includes the following.

- No human contact with the waste material within the system.
- Excreta should not be accessible to flies, other insects and animals.
- Ground water, spring, river water supply should not be contaminated.
- No strong odour or smell.
- The system shall be simple, inexpensive to construct, use and maintain.
- Acceptable to users
- The design shall cater for personal cleansing practices of the users.

## Minimum design guideline

The minimum acceptable standard is; Sealed – Covered – Vented.

## Maximum subsidy guideline.

Only some sub-structure materials are subsidised;

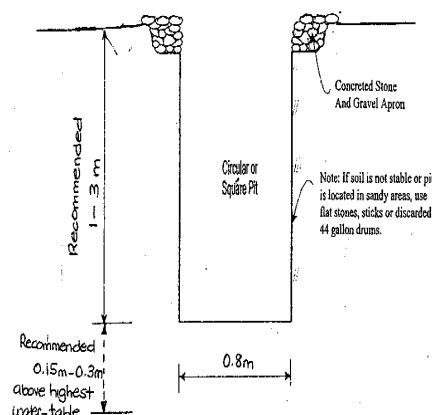
- Sealed traditional pit or concrete sanitation platform – hole cover – ventilation pipe.
- Sit-down toilet

No subsidies given for superstructures or septic tank systems, unless they are of local materials.

## Traditional Latrine pit

In choosing a site, ensure that it is downstream of existing wells (25m from ground water sources).

A latrine for a family has a pit of 0.8m<sup>2</sup> or diameter holes and vary from 1 – 3m in depth.



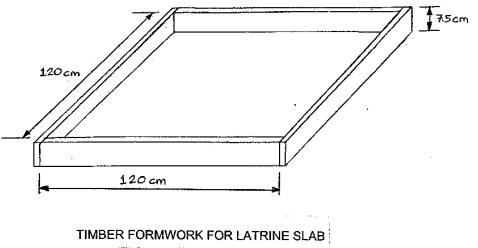
First dig a shallow, square trench for the foundation of your latrine slab. This need only be two or three courses of brick or one concrete block in depth. Build the foundation wall, let it become hard and then dig your pit down inside the foundation wall. If you are lining the pit after it has been dug, make a guide frame by tying or nailing together pieces of wood or bamboo to the chosen size. This will help you dig straight, reducing the amount of lining material required. An octagon (8 sides) is a good guide for a round hole. If you are lining part of the pit, stop digging when you get to the chosen depth of lining, then build the lining before you continue digging down. The pit can be lined with stones, sticks or discarded 44 gallon drums in sandy areas or unlined in places where soil is stable such as clay. The excreta falls directly through a hole in the sanitation platform, into the pit. Liquids such as urine, cleaning water, etc., seep into the subsoil while solid substances will gradually fill up the pit. Once 80% of the pit is filled, it is covered with soil and the slab is transferred onto a new dug out pit. After two years, the pit filling can be used as compost, and slab returned to the original pit.

No.	Activity	Materials	Cost
1	Dig latrine Pit	Labour Shovel	In-kind Up to K 10.00
Total			Up to K 10.00

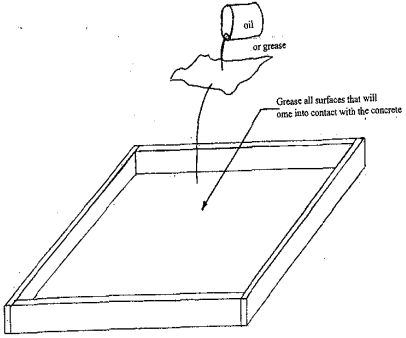


**Sanitation Platform (Sanplat) Construction**

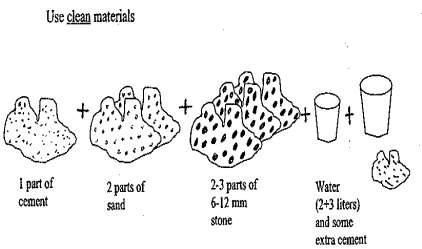
The sanplats are made of reinforced concrete for durability and safety. 1.2 m<sup>2</sup> is adequate. The slab must be larger than the pit to avoid collapse, and contain two holes for the vent pipe and the squat hole. The squat hole must be too small for a young child to fall through. A brick is a useful as a guide. Start by building the formwork for the slab.



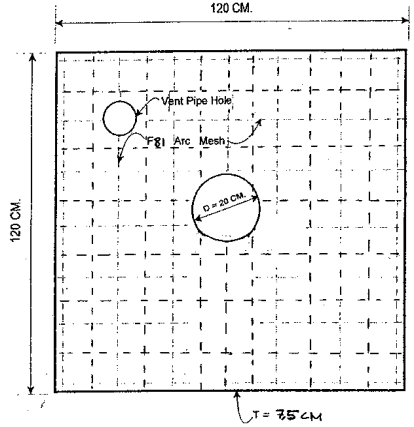
Grease the insides of the formwork with motor oil or grease on a cloth. The oil will protect the formwork from being destroyed by the cement.



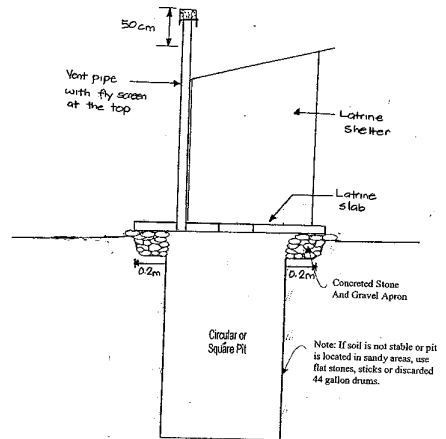
Wash the sand and stones if there are doubts about purity and let it dry. Dust and impurities weaken the concrete. Mix cement with dry, clean sand and stone in ratios of 1:2:2 or 1:2:3 Add very little water and mix well. Divide into two parts and add extra water and cement to the softer one of the heaps to make it liquid. Stir well in a bucket.



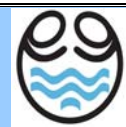
Pour the liquid concrete into the formwork and tap gently on the formwork with timber to release air bubbles to the surface. Put in reinforcement bars / F81 mesh as required before adding the very stiff concrete to fully cover the reinforcement. Compact the concrete with a piece of wood until the cement water comes up the surface.



Write the date, initials and number of slab constructed in the fresh concrete. This will help to monitor production and progress. Allow the slab to harden for one or two days. Then turn the mould very gently over soft sand or grass to get the slab out of the mould. Don't let it fall! It is still very weak. Clean the formwork and it is ready to be used again.



# RWSSP: Technical Advisory Note 4.1 Sanitation - Constructing Latrines



## Costs

No.	Activity	Materials	Cost
1	Build formwork	Labour Timber ( 3"x 6m length) Oil/Grease	In-kind Up to K30.00 In-kind
2	Prepare Reinforcement	F81 Mesh (1.2m x 1.2m)	Up to K30.00
3	Mix & Pour Concrete	Cement (1/2 a bag) 6-12mm Stones Sand Water	Up to K 15.00 In-kind In-kind In-kind
Total			Up to K 75.00

thus increasing the flow of air up the vent pipe and consequently assist in the control of odour in the latrine. VIP latrines should preferably be located in an open area, away from trees that could obstruct the wind flow. The shelter may be a rectangular shape with a door. If people are unlikely to keep the door closed, a better design is to build a spiral shaped shelter. This does not need a door but still provides privacy.

No.	Activity	Materials	Cost
1	Construct Shelter	Labour Woven pit-pit walls Roughly sawn timber Thatched roof	In-kind In-kind In-kind In-kind
Total			In-kind

## Ventilation Pipe

A ventilated improved pit (VIP) latrine is a latrine with a vent pipe. The vent pipe carries foul smell out of the pits and away from the structure and serves as an insect trap, stopping flies from coming in from the top and from getting out once they are accidentally trapped from the inside. The vent pipe must include fly screen at the top for this purpose. The vent pipe works better when painted black, located outside of the superstructure and on the sunniest side. The vent pipe should at least be 50cm higher than the highest point on the roof of the shelter. Vent pipes can be made from a wide variety of different materials, such as polyvinyl chloride (PVC), bricks, ferro-cement, bamboos, etc. 4 - 6 inches diameter is recommended

No.	Activity	Materials	Cost
1	Vent pipe (or) Bamboos	PVC - 4" x 5.8 m In-kind	Up to K 30.00 In-kind
2	Black paint	half Litre	Up to K 10.00
3	Fly screen	900 mm wide per meter	Up to K 1.00
Total			Up to K 41.00

The latrine shelter can be built from local building materials such as roughly sawn timber, woven pit-pit walls, thatched roof etc. The superstructure opening must also face the prevailing wind to increase the air pressure within the superstructure

Total costs = Up to K126.00, Subsidy = K12.60

Note: The costs of materials will vary from place to place.

## Operation & Maintenance

The latrine must be sealed, covered with a lid, and vented. A traditional slab of timber and soil would require regular brushing to keep clean. A concrete slab would require a couple of cups of water and a light brushing to clean each day. A sit down latrine may require five or six cups of water and some detergent or soap to clean. The lids or covers must always be replaced after each use. The vent pipe should be periodically checked to ensure it is clear right through from the fly-trap to the base.

## Concluding Comments

As long as the minimum standards are met, the work requires only community labour. Individual decisions to later improve the latrines should be encouraged. Reinforced Latrine slabs, are considered a better option than a traditional slab, as they are easier to clean, and give higher social status to the owner. Traditional slabs made from thick logs, with a sheet cover backfilled with earth or sand-cement mix are equally effective, so long as a hole cover and vent pipe are included. Sit down latrines are more expensive to buy and maintain. Additional cost is borne by the user.



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