

The "Long cycle" Fossa alterna

*The alternating composting pit system with
extended cycle of alternating pit use*



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The "Fossa alterna"

This is a development of the standard Fossa alterna in which pits are designed to fill up in a medium sized family situation in about 12 months. The cycle of alternating pits is therefore about 12 months. The capacity of each pit is about 1 cu.m. The area of the base is about 0.7sq.m.



Standard Fossa alterna in Epworth, Zimbabwe

The Long Cycle Fossa alterna (LCFA)

In the Long Cycle Fossa alterna the pit volume and area of the pit base are both doubled. This combination can increase the working life of the pit system considerably. This is made possible at low cost by using a brick corbelling technique on a round pit 1.5m deep.



The two corbelled brick lined pits

The LCFA

Using this new and specialised technique, two pits (each dug 1.7m in diameter and 1.5m deep), dug 2m apart, can be lined with fired bricks (800 total) using a single 50kg bag of Portland cement. The brick mortar is made with a ratio of 20:1 with pit sand and cement. The 1.2m diameter slab can also be made from the same bag of cement.



The specialised corbelled pit

The LCFA concrete slab

The concrete slab is flat and 1.2m in diameter and is made using a mix of 12 litres of Portland cement and 60 litres of clean sharp river sand (5:1). It is cast either in steel shuttering or a mould made of bricks. 3mm wire is used as reinforcing. A mould for the squat hole (30cm X 15cm) is placed 30cm from the rear of the slab. A vent pipe hole (diameter 110mm) is placed 110mm from the edge of the slab to one side and in line with the rear of the squat hole.



The LCFA concrete slab

The concrete mix is made up (a 10 litre bucket full to the brim is 12litres). Half of the mix is added within the mould or shuttering (taking care that the vent and squat hole moulds do not move. Then the 3mm wire is added in a grid formation. The second half of the concrete mix is added and levelled off and smoothed with s steel float or trowel. After an hour or two the moulds for the squat hole, and vent hole are removed. Steel shuttering can also be removed at this time. The slab is left to cure (under plastic) for at least 7 days and is kept wet throughout this period.



The LCFA - adding leaves to the pits

The twin pits of the LCFA are designed for composting.

Therefore a generous amount of compostable material should be added to both pits right from the start. Several bags of leaves are added to the base of both pits.



Leaves, wood ash, compost and even some animal manure can be added to the pits in addition to human excreta. These items are added as the pit fills up.

The LCFA - fitting the slab on one pit

A layer of weak cement mortar is laid on top of the brickwork. The cured slab is rolled into position on top of the pit which will be used first. The slab must rest on and be supported by this cement mortar. The slab should be level.



Preparing and fitting the concrete the slab

The LCFA - fitting the slab on one pit

The slab is carefully lowered on to the cement mortar, made level and an air tight seal made between pit and slab. An air tight seal is essential if the toilet is to be used as a VIP



Preparing and fitting the concrete the slab

The LCFA - covering the second pit

The second pit is also covered, in this case with an asbestos sheet. It can also be covered with a concrete slab. But it is essential (in the Fossa alterna) that only one pit is used at one time. During the time when the working pit is filling (which may be several years) the second pit is filled with a mix of leaves, manure, compost, and soil. Organic kitchen scraps can also be added.



Both pits are used for composting the added materials

The LCFA - fitting a portable superstructure

A portable superstructure is mounted over the used pit. There are many variations (these are shown on another slide show). In this case a rectangular steel frame superstructure has been fitted and covered with grass walling. Chicken wire has been fitted over the roof frame, which is covered with a plastic sheet and then grass.



The LCFA - use and maintenance

The interior is kept clean. A vent pipe is to be fitted. In this experimental unit, the family has been asked to use the unit as a bathroom. This is not normally recommended for the Fossa alterna, where composting of the pit materials is desired. However with a large pit base area and a liberal quantity of leaves being added, the potential of the "fossa" may be increased to include a bathing house as well as a toilet. In Zimbabwe Blair VIPs are used as bathrooms as well as toilets.



Interior of toilet house and the early pit contents - organic matter is being added.

In this system each pit may last for up to 5 years or more. Leaves and some soil, and ash are added regularly to the used toilet pit. Also the second (compost pit) is topped up with compostable materials, such as leaves, grass, animal manure, green kitchen scraps. It is also watered. The pit which is not used directly under the toilet makes pit compost for the garden. This pit compost can help trees and vegetables grow faster and more healthily.



When the toilet pit is full, the compost pit is emptied and the slab and structure moved across. The used pit is covered with soil and left to compost. This extended life of the LCFA may overcome some of the fears of worm eggs living beyond 12 months in the system.

