The Ventilated Arborloo

A hybrid between the Arborloo and the Blair VIP

An early ventilated Arborloo with portable superstructure built in Epworth in 2010

Peter Morgan

Aquamor Pvt Ltd
Research and Development

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Introduction

The *Arborloo* is a simple pit toilet using a shallow unlined pit between 1m and 2m deep, depending on soil type and firmness, which is protected at the surface with a ring beam made of concrete or cemented fired bricks. The ring beam is caste first, allowed to harden and cure and the pit is dug inside the ring beam. Normally the diameter of the pit is 1m and the outer diameter of the ring beam lies between 1.3m and 1.6m depending on soil type and method of construction. A concrete slab is made to fit over the ring beam, normally 1.1m in diameter. In the ventilated version a 110mm hole is made for a 110mm PVC vent pipe as well as an aperture made for the squat hole or a pedestal if one is fitted. A suitable portable superstructure fitted with a roof is made for privacy.

The *Arborloo* differs from the ventilated pit toilet (VIP) in that some soil, leaves and wood ash are added to the contents. These do not necessarily need to be added after every visit. When the excreta is mixed with soil, leaves and ash the pit contents slowly change into a medium in which plants can grow. When the pit is nearly full the toilet superstructure and slab are moved to a new location where a new ring beam and pit system has been prepared. Sometimes the ring beam can be moved as well to the new site and the slab and structure mounted on top. Normally, however, the ring beam may be left in place and the slab and superstructure moved on to a new ring beam and pit system. The ring beam will be more stable if it is freshly built at each site. If the ring beam is made of bricks, these can be taken apart and rebuilt on the new site.

The used pit is topped up with soil, preferably fertile soil and a young tree is planted in this soil. It is best to plant trees at the beginning of the rainy season if regular watering is not possible. The young tree may need protecting from animals. At first the roots of the tree will grow within the soil added to the pit, but as the pit material changes its form, the roots will invade the lower layers of the pit absorbing the nutrients found in the former excreta. Thus the old toilet site becomes the site of a new tree. Hence the name *Arborloo* – tree toilet.

All previous *Arborloo's* did not use ventilation pipes and fly and odour control were carried out by adding soil, leaves and wood ash regularly. Large numbers of *Arborloo's* have been built in Africa and have proved to be popular since they are low cost, ecologically friendly and produce trees which have great value for the family and the environment. However the addition of a screened vent pipe can enhance the control of flies and odours and reduce the need to add so much soil prolonging the pit life. The vent pipe can be made from a 2.5m length of 110mm PVC pipe (preferably thick walled) and the fly screen from a locally made type of shade cloth (see later).

The system is very simple and relatively cheap to make and can eventually result in a woodlot or an orchard of fruit trees, or isolated trees in a garden or woodland location. Obviously space is required for this concept to work, as the *Arborloo* site moves about. For a family the pit may take about two or more years to fill up, depending on the volume of the pit, number of users and not putting garbage down the pit. size of the pi. It is possible to build one or more *Arborloo's* to support a single homestead which means the pit will last longer. Larger pits can be made and more than one unit built.

The first trial of the ventilated *Arborloo* with portable superstructure was undertaken in Epworth, near Harare, in 2010. The concept is entirely Zimbabwean and may offer a valuable addition to the type of toilet used in the Zimbabwe rural sanitation program. Much information is available on the original *Arborloo* on various websites. The ventilated *Arborloo* can also be described as a low cost and ecologically friendly version of the Blair VIP (ventilated improved pit) latrine. The method can be used with or without a pedestal. Low cost pedestals can be made and commercial units are also available. Since the unit described here uses a vent pipe, the interior of the toilet is odourless. If the vent pipe is fitted with a fly screen, flies will also be controlled if the interior is semi- dark. This means a roof must be fitted and a door, if fitted, should only be opened when entering or leaving the toilet.

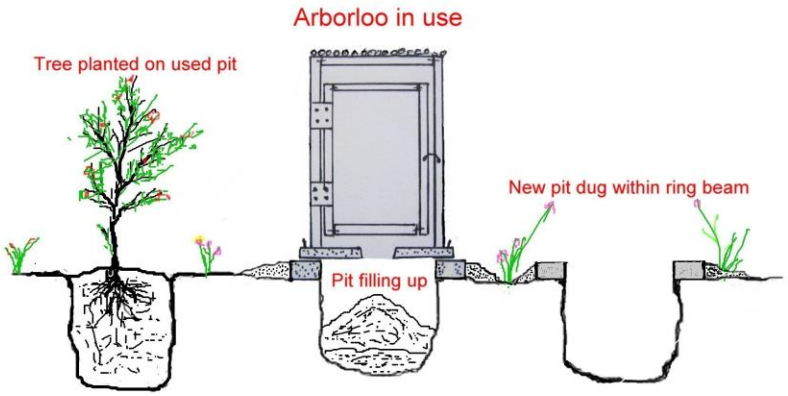
The superstructure can be constructed in many ways to suit the family. A number of alternative designs are shown in this report. The main features of the superstructure are that they should offer privacy, should be relatively light weight and portable, strong and be fitted with a roof. A steel framed structure, where the side walls can be made from many types of material including grass, reeds, bamboo, shade cloth etc, is strong, versatile and long lasting. The frame can also be made of wood, but is subject to termite attack. It is also possible to build a spiral steel framed structure, where no door it fitted. But the ring beam must be extended to suit the size of the superstructure.

The concept of the *Arborloo* is that the site of the toilet moves about over time. So the main feature is that the superstructure is light weight and portable and can be easily moved about over time from one location to another. Steel frame structures are very versatile and can be easily and quickly moved from one site to another. They have a long life, as the writer can testify. The first ventilated *Arborloo's* were built in Epworth in 2010 using a steel framed superstructure. A steel frame is a good investment.

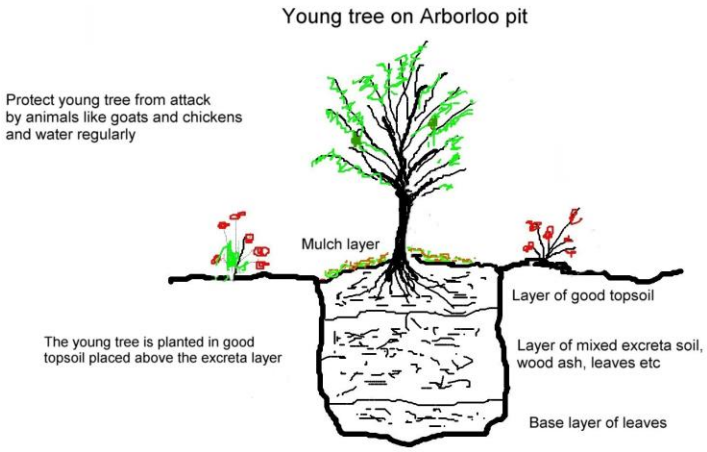
The *Arborloo* is ecologically friendly. The excreta is never touched and when mixed or in contact with soil changes its form underground and out of site. The advantage over the normal brick lined pit toilet or even standard Blair VIP toilet is that the excreta comes into contact with soil along the side walls of the pit as well as the base. Heavier ventilated Blair toilets made of bricks, must have a brick lined pit to support the weight of the superstructure. Adding some soil and leaves and wood ash to unlined pits, as they fill up can accelerate conversion of excreta into a product which tree roots will accept. The standard brick built Blair toilet is expensive to build for poorer members of the community and a lower cost structure and concept is required. If a toilet can be converted to a tree that can have several additional benefits. This method may offer an alternative approach.

However *Arborloo* pits are smaller than brick lined Blair VIP pits, which may last a family for 10 to 15 years. The smaller pits fill up more quickly and garbage must not be added to the pit as this decreases the pit life. When standard Blair VIP toilet pits are full the toilet is normally abandoned. But the contents of even old Blair toilets can be reused by removing the structure and slab and adding soil to the pit, covering all the contents to the top and covering for safety. The process of conversion takes much longer but eventually it will take place – 5 or more years. The process is biological.

Simple illustrations of the *Arborloo* method



The *Arborloo* moves on a never ending journey leaving behind a series of fertile pits filled with a mix of human excreta, soil, wood ash and leaves etc which provide a suitable planting medium for trees when composted. Nutrients in the excreta are used by the tree to enhance its growth.



Many types of tree will grow on *Arborloo* pits. The most valuable are fruit trees of many types. These can be built in sites which can later become orchards. Trees can also be planted in areas which will later become woodlots, which can growing into trees useful for fuel or timber for construction. Trees can be planted for shade, making the environment more pleasant to live in.

The concept of upgradeability

Whilst the ventilated *Arborloo* is itself an upgrade on earlier unventilated *Arborloo's*, there are many ways for starting simpler and then upgrading. The ventilated *Arborloo* unlike the earlier *Arborloo,* does require a squat hole and a vent pipe hole. But if it is upgraded further with a pedestal the pedestal hole must be larger. So this will vary a little depending on whether the toilet is used for squatting or sitting on a pedestal. For the more elderly a pedestal will be preferred. The method of making the ring beam, from circles of bricks or concrete may vary depending on the type of soil. The ring beam is important because it protects the erosion of the soil beneath it. Perhaps the greatest range of upgradeable options is the superstructure itself. This may vary from very simple, made from locally available materials to portable framed steel structures fitted with roofs. The aim is that the superstructure should be light and portable or easy to rebuild. The side walling of the portable framed structures can also vary from grass, reeds, bamboo or even shade cloth. Vent pipes for this concept are made from 110mm PVC pipe, which must pass through the roof as the vent is placed inside the structure. Formerly fly screen was made from stainless steel and then aluminium. These are not commonly available in Zimbabwe, so the screen can be made from a type of locally available shade cloth (40% black) see later.

These same superstructures, especially the steel framed superstructures can also be fitted to larger deeper brick lined pits. *Arborloo* pits are narrower and shallower. They fill up much faster than deep pits. So they require moving from one location to another at more frequent intervals. But in the rural areas there is space to move a pit from one location to another. Deep pits can also be made, but they are best lined with bricks.

The starting point in the upgradeable series will clearly depend on the resources available to the family living in the rural areas. Some will be very poor, whilst others will not be so poor and others quite well off. These better off or related families may assist those who are not so well off. In any event the methods used and demonstrations of the types of *Arborloo* or ventilated *Arborloo* must be available for people to see.

This may be the responsibility of the MoH and Child Welfare, operating at district or village level, or NGO/s or training institutions linked to water and sanitation programs. Also trial runs of the ring beam or partly lined pits need to be evaluated in various locations with different types of soil type from sandy to more stable red or other soils.

In effect the end result of the use of the *Arborloo* concept is to leave an "organic plug" of rich medium – that is converted excreta, in which plants like trees can grow. The so called waste and offensive material is thus put to good use, by a process of natural recycling which actually occurs within Nature itself. And to covert a smelly life threatening material like excreta into a tree which may bear juicy and health giving fruit, building material, shade and great beauty is surely most commendable.

But as always, the concept should be tried on a small scale first, evaluated by the users so that a possible future which benefits the users and the environment can be safely assured. Growing more trees is a very popular and a well discussed topic these days.

Photos of a range of ventilated *Arborloo's*

A steel framed superstructure which is light enough to move and has a roof. In this case covered with hessian material and built in Epworth in 2010. Well-made steel framed superstructures can last for many years – even generations - and can be covered again and again with the most suitable walling and roof material. They can be used not only on shallow pits, but also on deeper lined pits. The purchase of such a frame is an excellent family investment.

The steel framed superstructure is very versatile, and far more durable than wood, although will cost more than the home made wooden framed structure. Both will required a roof which can be made in a number of different materials like the side walls of the structure. Since the vent pipe is placed inside the structure a hole must be made in the roof to accept the vent pipe. On the right a ring beam protected pit with concrete slab and a commercially made pedestal and PVC vent pipe fitted with fly screen made of 40% shade cloth.

Ventilated *Arborloo* structure with treated gum poles and reeds and shade cloth


The ring beam is made in concrete and the pit dug down inside to a depth of between 1m and 2m. The firmer the soil the deeper one can dig


Poles are used as uprights and should be treated against termite attack. A steel door frame can be made and suspended on car tyre rubber hinges or strong metal hinges.


The completed toilet fitted with pedestal and screened vent pipe. However this structure will required dismandling and rebuilding rather than moving in one piece.

Some more portable superstructures

A steel framed square spiral structure covered with hessian. A wooden structure

Portable structures made in Malawi

A simple vented *Arborloo* made for a child

Making the parts of the ventilated *Arborloo*

These consist of the concrete cover slab, the ring beam, bricks, the portable superstructure, the vent pipe with fly screen and preferably a simple suitable hand washing device. Generally the concrete slab is made first as it must be allowed to cure and kept wet after it has hardened and is best covered with plastic sheet during the curing process.

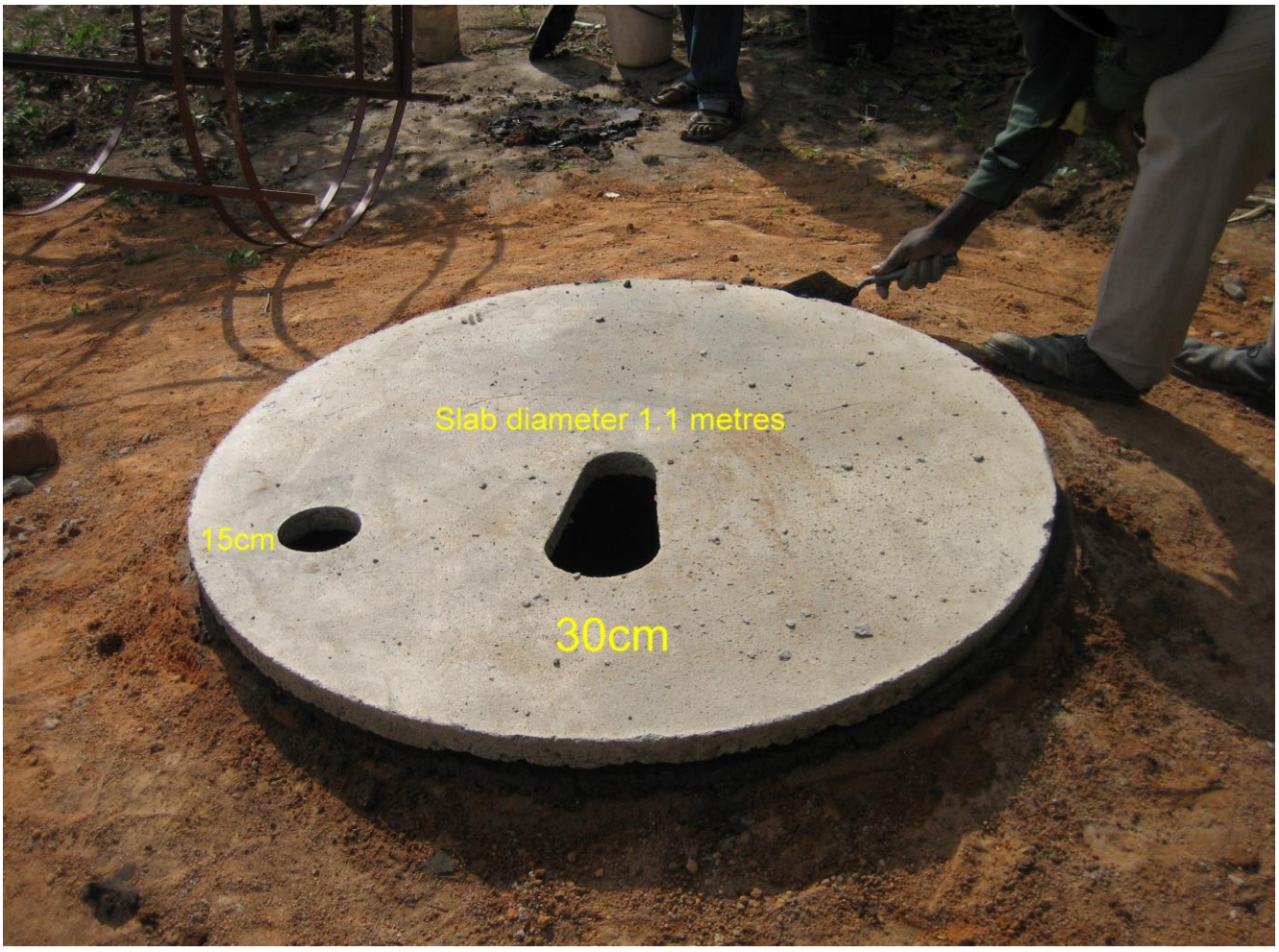
Making the 1.1m diameter concrete cover slab

This is made in concrete using clean river sand and Portland cement at a ratio of 5 parts sand to one part cement. A 9 or 10 litre bucket can be used as a measure – 5 buckets sand to one bucket cement. The slab is caste with two holes, one for the 110mm PVC vent pipe and one for the squat hole. Reinforcing wire such as 3mm wire or barbed wire placed in a grid formation or chicken wire can be used. Add half the concrete mix first, then the reinforcing wire, then the remainder of the mix and level off. Then leave the mix to harden and cure for at least a week and best 2 weeks before moving.


A circular mark is made on the ground 1.1 metres in diameter which is wetted first. Then a circle of bricks is laid around the mark, so the final slab will be 1.1m in diameter. The mould for the vent pipe is made from a short length of 110mm PVC pipe and the mould for the squat hole can be made from an old bucket with the bottom taken off and shaped by adding a wire to form a horseshoe shape as shown in the photos above. The wide end of the bucket is placed 30cm from the brick mould. The 110mm short PVC pipe is laid 15cm from the brick mould and to one side as shown in the photos. The greater the number of wire or barbed wire strands used the better for reinforcing. It is best to make the slab on a plastic sheet.


Filling the mould with the concrete mix

The completed 1.1m diameter concrete slab. After overnight hardening, the slab should be kept wet and covered with a plastic sheet for at least week and better 2 weeks before moving.



The 1.1m concrete slab cured. The squat hole is 30cm from the back of the slab. The 110mm vent pipe hole is 15cm from side of slab - to one side.

Making the ring beam for a 1.1m concrete slab

The ring beam is designed to protect the upper end of the toilet pit and is used where a light weight superstructure is used. The internal diameter of the ring beam is 1 metre when used with a 1.1metre slab. The width of the ring beam varies depending on the type of soil it is mounted on. For looser sandy soils it will need to be wider compared to harder more stable soils. In most cases the ring beam is about 225mm wide, the same as a brick. The mould for the ring beam can be made with bricks or steel moulds. It is made using a 5:1 mix of clean river sand and Portland cement, the same as the slab. It can be reinforced with a loop or two of 3mm wire or barbed wire. These are laid when half the mix has been added to the ring beam and then the remainder of the concrete mix is added and smoothed down. The ring beam is best caste on slightly higher ground and away from any water wells. Once the ring beam has cured the pit is dug down inside the ring beam to a depth of 1m to 2m.


In this case bricks have been used as moulds. Special bricks have been caste in halves to make the internal wall more rounded. Full bricks or half bricks can also be used.


Half the concrete mix is added first then the wire reinforcing, followed by the final mix which is smoothed down. Once the ring beam has hardened and cured the pit is dug down inside the ring beam. The soil taken out of the ring beam is place around and built up around ring beam. It is dug down to the required depth. In stable soil it can be dug down to 2m depth.

Making the ring beam with fired bricks

The ring beam can also be made with fired bricks. 2 or more courses should be made with a mix of pit sand and Portland cement (10:1 mix) to bond them together.


Once again the brick ring beam is made with an internal diameter of 1m. 2 or more courses are made. The ring beam is plastered with cement mortar to avoid erosion from rain.


Once the ring beam has hardened, the pit can be dug down inside to the required depth. The removed soil, is placed around the ring beam. This stabilises the site against rain water erosion.


A layer of weak cement is laid on top of the ring beam (about 20 parts sand to 1 part cement) This forms a seal between the ring beam and the slab which is important in ventilated pit toilets. The slab can also be levelled at this stage.

A deeper brick pit lining for loose or vulnerable soils.

The early experiment of the ventilated *Arborloo* carried out in Epworth in 2010 had to contend with looser sandy soils. The brick ring beam was thus made with more courses and the pit dug down deeper (to about 2m) below the brick lining. The soil extracted from the pit below the brick lining was then spread around the upper raised brickwork, thus helping to protect the site against erosion. The photos taken in 2010 are used below. Normally the concrete slab is caste and allowed to cure first whilst the ring beam or pit lining is made and the pit deepened. The concrete slab will require at least a week of curing before it can be fitted over the pit. 2 weeks are better. The mix is 5 parts river sand and 1 part PC15 cement with wire or barbed wire reinforcing.

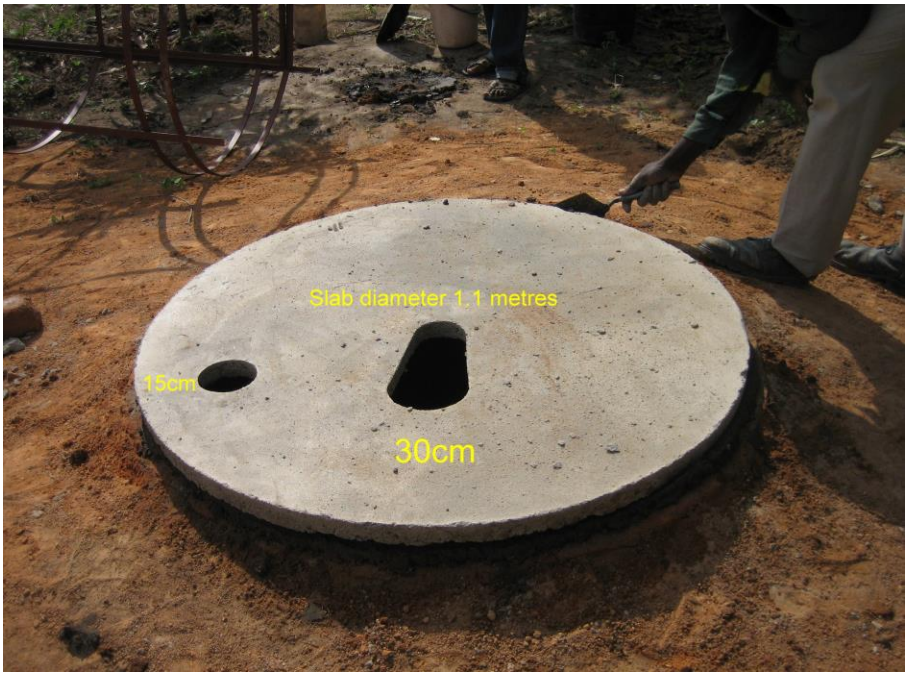
Making a 1.1m diameter concrete slab for the ventilated *Arborloo*

In the Epworth case a special mould was available to make the slab and the squat hole, but these may not be available on site. In this case the photos shown earlier in this manual can be used.


Steel moulds were used in this case to cast the slab and make the squat hole


However such moulds may not be available so the standard method uses bricks


The most convenient method must be used to make the slabs



The 1.1m concrete slab cured. The squat hole is 30cm from the back of the slab. The 110mm vent pipe hole is 15cm from side of slab - to one side.

Preparing the pit and upper brick lining (Epworth 2010)


After the site was chosen on slightly raise ground the topsoil was removed and placed to one side. Then a ring was marked on the ground one meter in diameter.


Then a circle of fired bricks was built up bonded with mortar (10:1 mix pit sand and PC 15 cement).


The first 2 courses were laid in a radial pattern as shown. Further courses of bricks were laid with brick ends joining and mortared together as shown. The pit is deepened below the brickwork. The firmer the soil the deeper it can be dug. This can only be decided on site and local judgements made.


Also the courses can be stepped in (corbelled) as shown to reduce the diameter of the brickwork. In this case the internal diameter of the radially placed bricks can be increased slightly increasing the capacity of the pit. The uppermost course of brickwork should be able to fully support the concrete slab which in this case is 1.1m in diameter and has holes cast in it for the 110mm vent pipe and the squat hole. If it is intended to fit a pedestal then the size of the squat hole should be changed to suit the pedestal.


Soil from the deepened pit and the removed topsoil is now spread around the brickwork and rammed down hard. This will help to reduce erosion around the site. The method itself raises the the toilet above surrounding ground level.


The slab is then moved onto the partially brick lined pit and levelled on the cement mortar laid on the top layer of bricks.


The pit has been dug down. A seal made between the slab and ring beam and the slab levelled. Soil from the pit has been placed around the ring beam and rammed down hard. The pit structure and slab are now ready for fitting the superstructure

The light and portable superstructure

There are many ways of making the superstructure of the ventilated *Arborloo*. Because the pit is unlined, it is best that the structure is lightweight, strong and portable, as it will need to be moved every few years to a new site. An earlier part of this report shows some of the range of structures which are suitable for the *Arborloo*. Where a vent pipe is fitted it will pass through the roof of the structure. The choice must be left to the home owner which will depend on his or her decision based on what they can afford. Low cost structures made of timber do require more maintenance compared to framed structures made of steel and are more difficult to move. Termite attack of wooden structures can take place. If a vent pipe cannot be fitted at first the hole for the vent pipe can be plugged with a suitable plug made of cement. In this case the odour and fly control methods must follow those of the unvented *Arborloo*. But once a screened vent pipe is fitted, the method of fly and odour control changes.

I now show a series of photos which record the construction of one of the first ventilated *Arborloo's* built in Zimbabwe in Epworth near Harare in 2010, using a steel framed superstructure. These steel frames can be made in the rural areas copying the methods shown here. They have the advantage of being easily moved from one pit to another and also the walls and roof can be covered with many different materials. The roof area is fitted with a wire mesh, which can be covered with plastic sheet and then grass or some other material. It is a good plan to make the structure smart.

Building a ventilated *Arborloo* in Epworth, Zimbabwe, 2010

These photos show the design of the steel frame structure, fabricated by V&W Engineering. It is light and strong enough to be carried by 4 people. Its legs sit on the ring beam surrounding the slab. The materials used for the walls and roof are optional.

The lower end of the steel framed structure.


The 110mm PVC vent pipe is being lowered into the vent pipe hole in the slab.


The walls have been covered with hessian for privacy which has been painted with a slurry of cement and sand. Many options are open for covering this type of framed structure. These include grass, reeds, bamboo, shade cloth etc. The roof ring has been fitted with thick black plastic sheet laying on a chicken wire base. This could be covered with materials to protect the plastic. Ideally the roof can be made with thin corrugated iron sheeting using a squared shade rather than round as shown here.

Whilst this concept cannot be considered as low cost, welders in the rural areas can make and sell these items once they are familiar with the design. Their advantage is that they are durable, light enough to move and can be covered with a variety of materials. They can even be placed onto deeper brick lined pits. In using a door, the structure cannot guarantee semi darkness within the structure, which is important for the correct functioning of the Blair VIP. So the door must be self-closing (in this case using rubber hinges), or should be kept in the closed position when not in use.

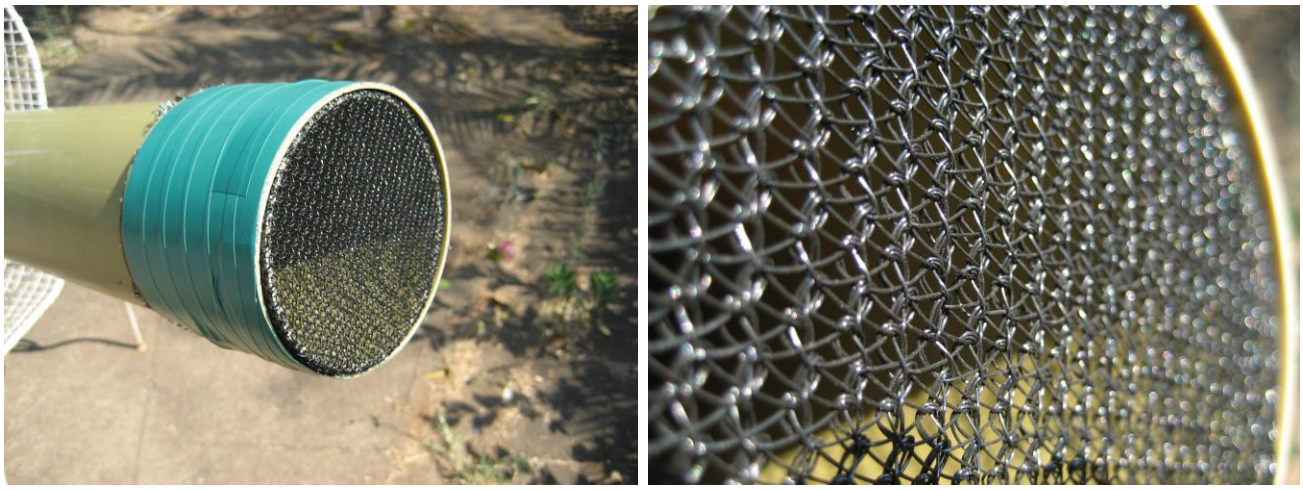
The vent pipe

This can be made with 110mm PVC piping. The colour does not matter, but the thicker the walling of the pipe, the longer it will last. Formerly stainless steel and aluminium screens were used as fly screen, but these are either expensive or not easy to find. The pit gas rising up the pipe is corrosive and can erode steel screens. An alternative which looks promising for the fly screen is a certain type of shade cloth made in Zimbabwe which is available on the market and is low cost. It is the screen which allows most light through (40% shade cover in.black).

Low cost screen which may be suitable as fly screen on the PVC vent pipe

Fitting the fly screen to the vent pipe

One method of attaching the shade cloth to the pipe



The final pipe and screen

Upgrading with a pedestal

Whilst most *Arborloo's* and Blair VIPs are designed for squatting, there is an increasing demand for fitting a pedestal for sitting. These are now available on the marker in Zimbabwe. If a pedestal is used the hole for squatting is too small and this hole should be larger as shown in the diagram below. Pedestals are very desirable for older folks.

The slab design if used with a pedestal. The distance between the hole for the vent pipe and the edge of the slab is 15cm.

Types of pedestal.

Home made.


Two versions of a homemade pedestal. On the left one made with a plastic bucket and concrete. On the right one made with a bucket, a pedestal seat (with lid) and concrete. The method of construction can be viewed on other manuals on this website

The original simple bucket and concrete homemade pedestal.

Commercially made pedestals

Several types of commercially made pedestals for Blair toilets are now available on the market


Some pedestals have lids and some without lids


Photos of a rectangular steel framed portable superstructure lined with dried grass. These units have been in operation for several years and have proved to be very effective and long lasting. In the photos shown above, another ecological unit, called a "*Skyloo*" using a steel framed superstrcture is in use. The slab is rectangular in shape. The steel framed structire has also been used for another ecological toilet called a *Fossa alterna*. The *Fossa alterna* in this case uses a rectangular ring beam. Two of these ring beama are made near to one another and alterate at yearly intervals. Soil, ash and leaves are added to the pit alongside human excreta. The resulting pit material can be dug out and dug into and mixed with soil in small vegetable gardens. In the case of the *Arborloo* principle, the converted excreta is never removed or touched but used to fertilse trees. And trees of many types will grow on *Arborloo* pits.

Time to move the ventilated *Arborloo site*

Once the pit is dug and the ventilated *Arborloo* is completed, The toilet can be used like a normal pit toilet. With the simpler *Arborloo*, which is not fitted with a screened vent pipe to protect against odours and flies, the simpler method uses a technique where soil, wood ash and leaves are added regularly to the pit contents to control fly and odour problems is used. The addition of these materials obviously hastens the filling of the pit. When odour and fly problems are controled with a screened vent pipe, there is no need to regularly add these materials, altough an occasional addition of soil will help. This means the pit will fill up more slowly and the pit, although smaller than the Blair VIP toilet will take longer to fill up.

The conversion of excreta into a product which the tree roots can penetrate and thrive on depends on the microbes and fungi present in the soil invading the excreta and convertring it into a more valuable product. In *Arborloos* and ventilated *Arborloos* (even those with partially lined pits with bricks as described earlier) most of the pit is unlined and the pit contents are directly in contact with soil. Thus the conversion of excreta into a material which the tree roots can tolerate starts by soil organisms invading the excreta from the side walls of the pit. In addition, when the pit is nearly full (say 40 or 50cm from the top of the pit) and the slab and superstructuire are moved to a new site, the soil added to the pit will also start converting the excreta beneath. So the invasion of the excreta by soil organisms start from the top dowwards as well as from the side walls. Even better if it is fertile soil.

When trees are planted in the soil placed above the excreta and if the young tree is protected and watered the young tree roots enter and grow in the soil above the lower layers of excreta. At the same time the lower lays of this soil are making changes to the excreta below to make it more acceptable to the tree roots. The decision to enter the lower layers is made by the tree itself. That is Nature's way.

Since there is no flush water mechanism when pedestals are used, some side wall fouling of the pedestal shute will occur and will need cleaning off with water. The black colour of the pedestal shute helps disguise this a bit. But water thrown down the pit from time to time helps to level off the pit contents.

Also some soil, wood ash and leaves can be thrown down the pit from time to time to form a combination of excreta and these additional products. But not so frequently as in the simpler *Arborloo* These various products will react with each other and the beneficial bacteria in the soil and fungi in the leaves will contribute to the conversion of the excreta. The ash also adds potassium to the product.

The screened vent pipe should eliminate fly and odour nuicance. The vent should be washed down with water from time to time to flush out spider webs which interfere with air movement.

The protective effects of the upper brick pit lining will mean the pit can be dug deeper where the soils are more compacted.

When the pit is nearly full the *Arborloo* or ventilated Arborloo (superstructure and slab) should be moved to a new nearby site. The new pit structure is made in the same way as the old pit stricture. The old pit site is topped up with soil or best fertile soil. The site can be left for a while for the contents to settle and new soil added to top up the pit. At a suitable time, preferably at the start of the rainy seaon, a suitable young tree can be planted in the top soil. In fact young trees can be prepared beforehand in bags or pots or buckets so they are already growing before they are transplanted into the old *Arborloo* site. Young trees will require some protection from animals and it's a good ideas to add leaf mulch on the soil within the ring beam area to reduce evaporation from the soil. .

Where the *Arborloo* or ventilated *Arborloo* is placed in a rural homestead many types of tree can be planted. These will often be fruit trees or trees planted for shade, beauty or timber for various purposes.

At first the young tree roots will grow in the topsoil added to the pit. Then they will invade the converted organic contents of the pit. The pit with its converted contents can be thought of as an organic plug or pit which may offer better growing conditions within lands which are more barren or sandy or less fertile. The *Arborloo* or ventilated *Arborloo* is a toilet which becomes a tree. The toilet itself is short lived compared to the tree which is planted and if cared for may live and be of great comfort and value for decades. The fruit will be beneficial for improving health, the timber for contruction. Trees are wondrous living things which improve the enviroment and the beauty of Nature.

A great deal of information about the *Arborloo* and other ecological toilets, and the use of urine and converted excreta and recycling, as well as on-site and ventilated pit toilets such as the Blair VIP toilet together with many aspects of rural water supplies, sanitation and hygiene developed in Zimbabwe can be found on the website https://drpetermorgan.com/

Trees grown on *Arboloo* pits

A great variety of trees can be grown on *Arborloo* pits

Hand washing

Hand washing a a vital part of maintaining personal health. A hand washer should accompany every toilet, of what ever type. In most modern homes water will come from a tap, but this is not the case for countless millions of people. So a simple hand washer must be made and what better than using a article which is normally thrown to waste - the alloy can. This can be converted at almost no cost into an excellent hand washer. Descriptions on this web site show how this can be done. The method also uses a covered bucket filled with water or a mix of water and some additives like small amounts of a disinfectant like “dettol” and washing up liquid added.


A bucket with lid, preferably filled with some disinfectant and washing up liquid is used as a reservoir. The alloy can is prepared with holes and wire to form a handle. This is dipped in the water and hung on a peg.

The water drains out slowly to wash the hands. Full description on the website.