



Assembly Manual

for a

Bio-mass Activated Filter

3/6 FLUSH COMPOST TOILET

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Introduction

This Manual for a 3/6 Flush Compost Toilet provides the Owner Builder with step by step instructions for the assembly of a "Bio-mass Activated Filter" to produce a Secondary Quality effluent suitable for sub-surface dispersal via gravity or pump.

The sizing of the 3/6 Flush Compost Toilet is designed for all blackwater and greywater from up to 8 persons (1200lts/day) in a residential dwelling assuming that the household is fitted with standard water reduction features including dual flush 3/6 litre flush toilet, shower-flow restrictors, aerator taps and water-conserving automatic washing machines.

The 3/6 Flush Compost Toilet system is built inside a standard plastic (septic) tank with gravity discharge to Transpiration Mound/Trench or Sub-Surface Irrigation. The Gravity Outlet may be connected to a Pump Well and the effluent pumped to a suitable Effluent Dispersal Area (EDA). See Fig 4. (Page 12), Schematic of System, for an overview of the System.

It is possible to incorporate a Pump Well into the main tank and this is not within the scope of this Manual.

The Manual assumes that the persons using this Manual have a reasonable level of skills in the use of hand & power tools and associated equipment and have knowledge of safe working procedures with regard to the relevant State's Occupational Health & Safety Standards. It is strongly recommended that ear & eye protection be used when ever using any power tools. It is also advised that an extra person be present when a person is working inside the plastic (septic) tank and that the tank be well ventilated.

Any aerobic (with air) composting system relies on adequate ventilation and good drainage, both to maintain correct aeration and moisture levels for efficient composting. This 3/6 Flush Compost Toilet system has been designed to control both these major composting requirements in a balanced way. The addition of compost worms is as essential component of the system.

The Compost Removal Auger may not be required, however it is strongly suggested putting in the 150mm DWV PVC pipe anyway, in case it may be needed and to assist ventilation and inspect worm activity. The auger is used to remove compost from the system if needed. In 5-6 years in installing the Flush Compost Toilet systems the biggest complaint received from customers was that there was too little to no compost to remove. Even the manufacturers of the commercial Flush Compost Toilet systems acknowledged that there was in fact very little, if any, compost to remove but that it was good in promoting the product to say that the compost could be used for the garden. The reason for this was that the actual solid waste component that goes into a toilet system is 80% moisture and the worms and other biological action converts the 20% solid to mainly water soluble nutrients and the balance moved through the system as suspended solids generally less than the 120 micron membrane filters. So nearly all the waste in fact goes into the sub-

surface dispersal system that is used by the vegetation in the dispersal area. If you are irrigating fruit trees then the full cycle is completed, producing food whose waste goes back to the system. What mainly enables this to happen, ironically, is the extra volume of water being processed through the system from the greywater and toilet flushing. The flushing composting systems now available, A&A Worm Farms & Biolytix (a re-invented DOWMUS), do not have any facility for removing compost with both relying on the water flows to do the continual cleaning maintenance required. A&A say "Q. Does the system require a lot of maintenance? A. No. Virtually no maintenance. The system is designed to be self cleaning. In seven years we have never de-sludged one chamber."

So, the auger probably will not be required and a simple auger could be made from stainless steel by a metal fabricator IF ever needed.

If using this Manual to fit out a CONCRETE Septic Tank some adaptations will need to be made. The main adaptations will be making holes in the concrete tank and the fixing of various components to the concrete tank. :

- The making of holes in the Concrete tank wall is a fairly laborious process of drilling many holes with a masonry drill (as close as possible to each other) just inside of a hole circumference marking (i.e. 100mm pipe) and then using a cold chisel & hammer to adjust the hole to the required finished size. This takes about an hour to complete the hole. Use plenty of water to keep the masonry drill cool. If metal reinforcing rod is contacted you may need to change to a metal drill just to get through the reinforcing rod.
- The fixing of various components to the concrete tank is achieved by using Raw Plugs and a masonry drill, and then the Stainless Steel Self Tappers.

Please read & REREAD this Manual before you even think about starting. Obtain all the Components and assemble them as required. Some procedures and parts assemblies may seem unnecessary however you are strongly advised to do as recommended. It is all part of maintaining the balance of ventilation and drainage referred to above.

Components Required

- 1 x ReIn or Everhard plastic septic tank with lid – no baffles needed.
- 2 x 1200mm x 100mm DWV PVC pipe as vertical internal Breather/Drain Pipes
- 2 x 100mm DWV 45 degree bend fittings
- 2 x Insect Filter tubes: made from 600mm x 100mm Slotted Ag-drain covered with Geotextile sock and sealed on one end by “stuffing” 300mm of extra Geotextile sock in one end. Wrap the other end with Geotextile fabric strip 100mm wide to fit snugly inside the socket of a 100mm DWV 45 degree bend fitting. Secure the strip with a band of duct tape to hold in place and secured in the socket of the 100mm DWV 45 degree bend fitting with 3 x 1”SS screws.
- 1 x Centre Post: made up of 300mm x 100mm DWV PVC pipe and 2 x 100mm End Caps.
- 2 x 2m x 100mm Slotted Ag-drain pipe. Wrap both ends of each tube with Geotextile fabric strip 100mm wide to fit snugly inside the socket of the 100mm DWV PVC 90 degree T-junction fitting. Secure the strip with a band of duct tape to hold in place.
- 3 x 100mm DWV 90 degree T-junction fittings (2 for vent tubes & 1 for drain tube)
- 8 x 100mm PVC Saddle Clamps
- 1 x 300mm x 100mm DWV PVC pipe for drain outlet
- 1 x 150mm DWV PVC pipe for Auger Chute (length up to 2 mts to suit tank type/Brand used)
- 150mm DWV PVC End Cap for Auger Chute
- 3 x 100mm DWV PVC Pipe Collars
- Filtration Media: 0.65 cubic metres of 50mm Slotted Ag-drain pipe cut into 100mm lengths (about 10 x 20mt rolls)
- Filtration Membrane: 2m x 1.8m 50% shade cloth
- 3 x tubes of Roof & Gutter Silicon Sealant
- 5.5m x 16mm HDPE pipe
- At least 30 each of 1/2” + 3/4” + 1” SS self tapping screws.

Tools Required

- Electric drill
- Cordless Drill with Philip’s driver bit
- Power Jigsaw
- Hole saw 108mm or carefull use of jigsaw using an 8mm drill hole as a starting point.
- Silicon cartridge gun
- Saw to cut plastic pipe, a normal cross-cut tooth timber hand saw will suit.
- Heat Gun (a Hair Dryer may work) for bending toe of Auger Chute.
- Sharp Knife (Stanley type knife)

PLEASE NOTE:

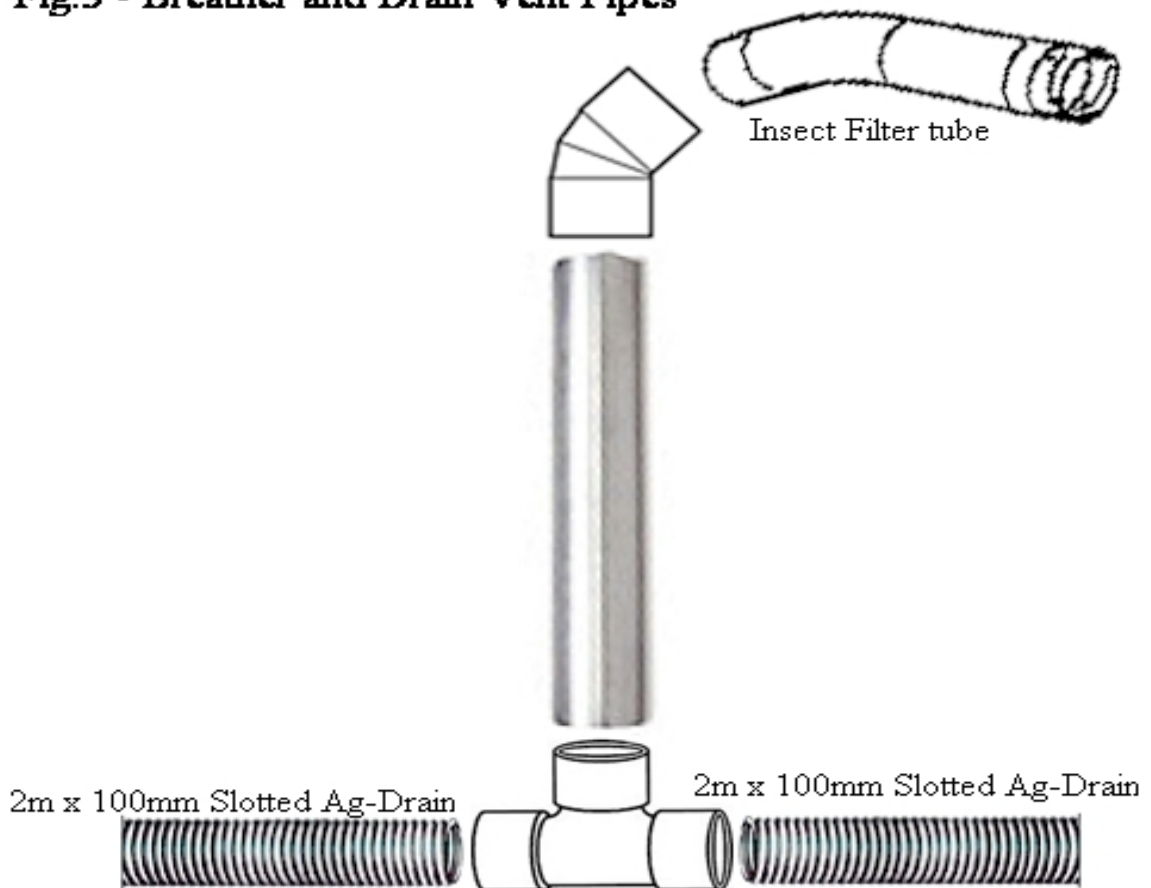
- 1. Any perforation to the tank must be sealed to prevent leakage. If a screw is driven into the wrong position then seal with silicone or leave the screw in place and use another screw.**
- 2. When screwing into plastic avoid over tightening and stripping the thread. Best to use a low torque setting on the drill (if available) to prevent overtightening.**

PROCEDURE

I. Breather and Drain Vent Pipes (DO NOT GLUE FITTINGS) Fig 2. below

1. Assemble each of the two "Breather Pipes" by pushing on a 100mm x 45 degree DWV Bend on one end of a 1200mm length of DWV pipe.
2. Assemble the Insect Filter tubes by pushing into one end of the Insect Filter tube into the 100mm x 45 degree DWV PVC Bend, and secure with 2 x 1" SS screws. Place the other socket of the 45 degree Bend onto a 1200mm length of 100mm DWV internal breather pipe (do not secure yet). Insert the other end of the 1200mm pipe into the centre socket of the 100mm DWV T- junction fitting and secure with a 1/2" SS screw. See Fig.3 below for assembly detail.
3. The Breather & Drain Vent pipes are secured inside the tank with G clamps when positioned correctly inside the tank.

Fig.3 - Breather and Drain Vent Pipes



Continuous Wet Composting Cycle System using a 3/6 Flush Toilet

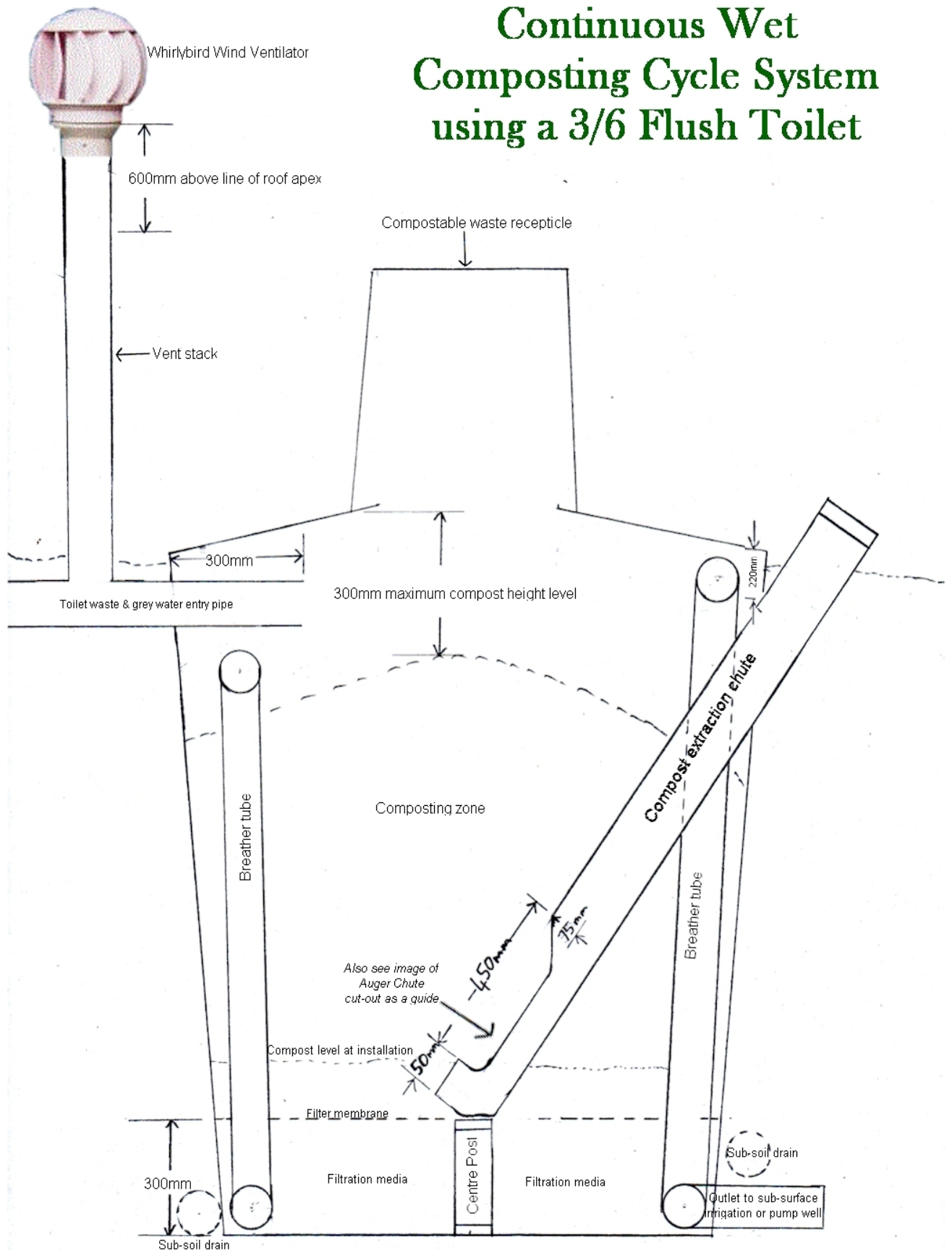


Fig. 4 – Schematic of System