

# nature LOO<sup>®</sup>

*It's only Natural.*

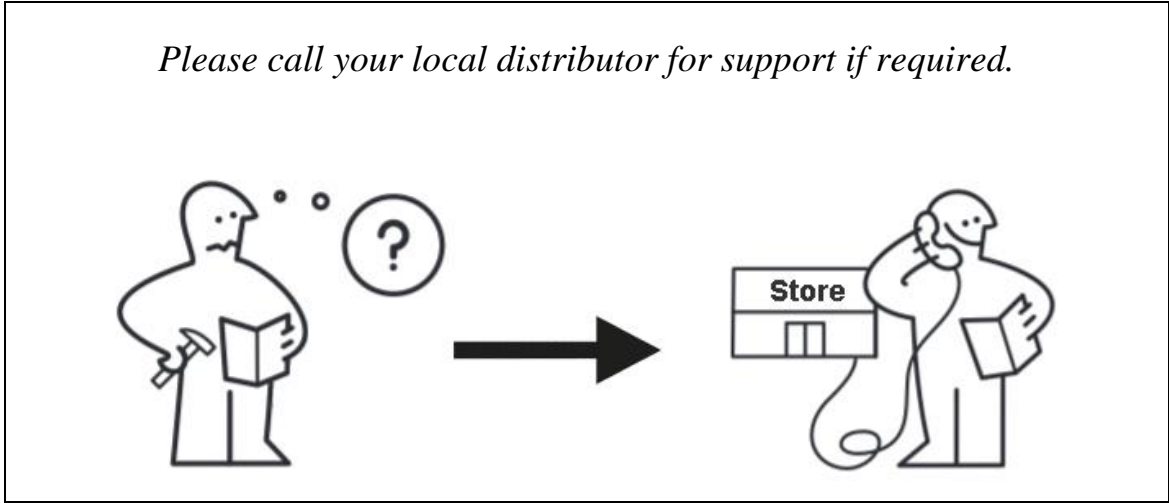
## CLASSIC 650 MANUAL

*Ver.170512*



Phone: 07 3889 6144 • Phone: 1300 138 182  
Email: [info@ecoflo.com.au](mailto:info@ecoflo.com.au) • Web: [www.ecoflo.com.au](http://www.ecoflo.com.au)  
ABN 33 606 583 895

*Please call your local distributor for support if required.*



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## COMPONENTS

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The components of the Nature-Loo Classic 650 are:

- 2 x Nature-Loo Classic 650 Composting Chambers
- 1 x 'In Service' lid with 250 mm diameter hole for waste chute
- 1 x 'Out-of-Service' lids, with mesh breather hole
- 1 x Toilet Pedestal
- 1 x Toilet Seat
- 1 x 250 mm diameter x 730mm long Waste Chute Pipe
- 1 x Brush seal-fitted to the in service lid
- 1 x 12 Volt Fan in Housing
- 1 x 240 volt to 12-volt Transformer
- 2 x Crimps/ Wire Connectors
- 1 x 40 mm Breather for 'Out of Service' chamber external pipe
- 1m 65mm flexible vent pipe & 65 joiner
- 1 x 100 mm Sewer Vent Cap
- 1 x 100mm 'T' Junction Moisture Trap
- 1 x 1.5 metre of 19mm liquid drain hose & fitting
- 1 x 50mm slotted pipe Connector
- 2 x 19mm liquid drain valves
- 2 x 55 to 40 mm reducer
- 2 x Nature Quick Microbe starter packs (Kraft paper bags)
- 1 x 125ml Nature Flush Enzymes & spray flask
- 2 x Bags of bedding material \bulking agent

***Please check to ensure that everything has been delivered and if anything is missing, please notify your supplier immediately.*** If you have a Classic 650-3 or 4 there will be 1 or 2 additional 'Out of Service' chambers and associated fittings to allow for longer composting time.

*What you will need:*

- Wall brackets to fix the vent pipe to the building
- A length of 100mm vent pipe (to connect to the air exhaust) (length depending on specific installation)

*You will also require the following materials for the Excess Fluid Absorption Trench (check with your local Authority):*

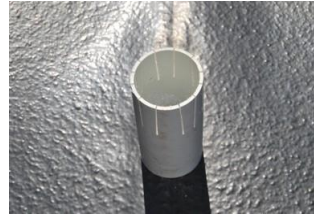
- 2.0m length of 100mm diameter agricultural pipe
- 2.0m x 0.5m synthetic or hessian Geotextile Mat
- 0.30 cubic metre 25mm Aggregate
- 50mm PVC pipe to connect the hose to the ag pipe



Fan in Housing



Vent Cap



Slotted Pipe Connector



Breather with cap



240 to 12-volt Transformer



'T' Junction Moisture trap



Hose clamp



Connector with rubber seal



19mm Liquid Drain Hose



65mm Flexible Air Hose



Connectors



Breather



Classic 650 chamber with 'In service' lid and 'out of service' lid, respectively.



Liquid drain valve



65mm Joiner



Bulking Agent



125 ml Nature Flush Enzymes

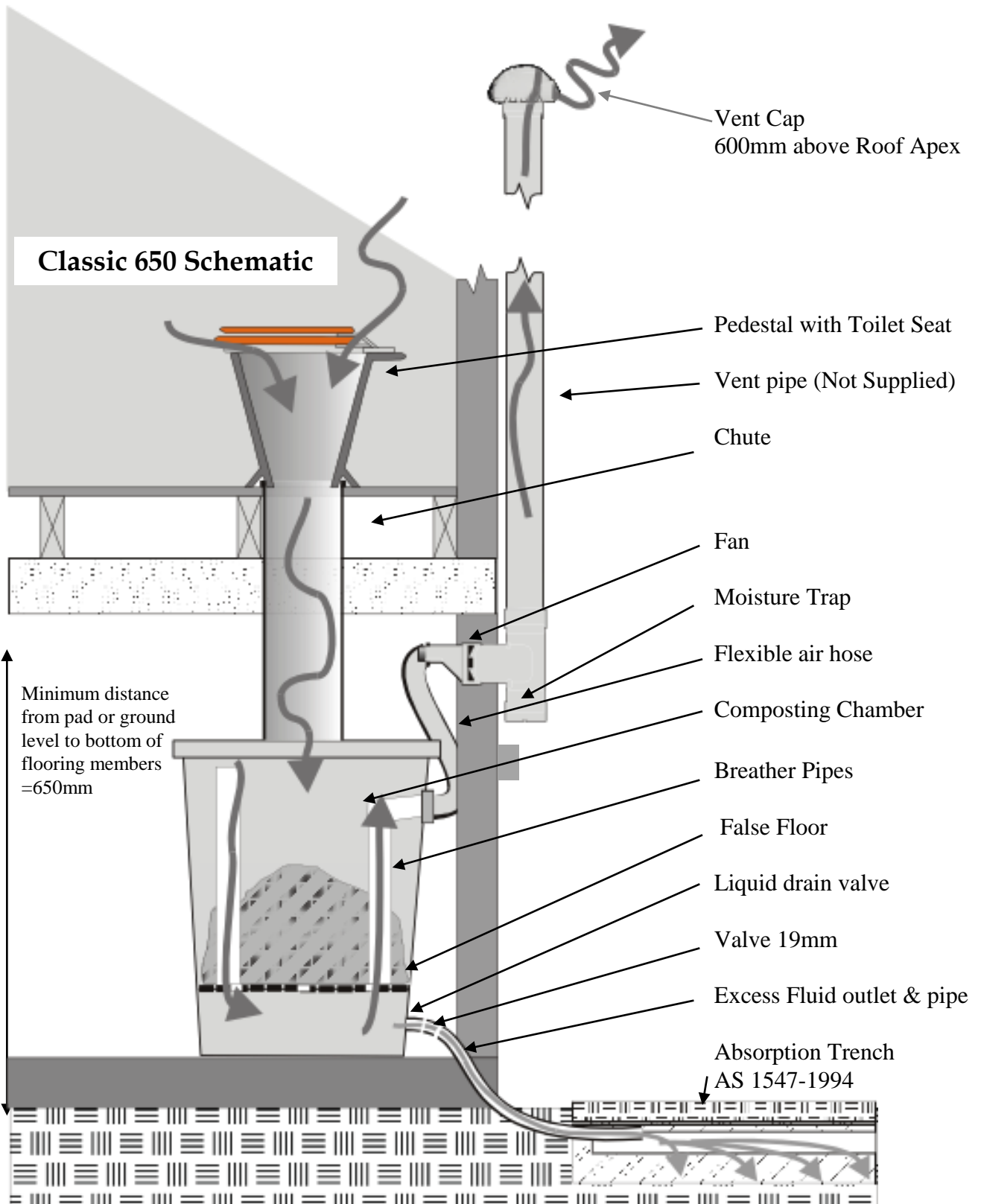


Nature Quick



Spray flask

# INSTALLATION



### **Installation of the internal breather to the false bottom of the chamber**

Ensure that the chamber is empty and the breather holes are unobstructed.

1. Undo the connector and 40 mm washer from the internal breather. Tread the washer onto the connector.
2. Insert the breather into the hole in the false bottom and the connector and washer into the outside of the hole on the side of the chamber.
3. Tighten the two pieces together (hand tight).
4. Repeat steps 1-3 for both chambers.
  - For the 'out of service' chamber:
5. Place the breather with cap onto the connector- to allow for air flow during composting.



Before going any further with the 'In service' chamber, ensure that there is a minimum clearance of 650mm beneath the toilet room floor for the Nature-Loo composting chambers.

***If you are planning to excavate an area under the house for the compost chambers, please ensure that the area is well-drained and that any retaining walls are built to the satisfaction of the local authority.***

### **Locating the Toilet Pedestal in the Toilet Room:**

The pedestal is connected to the composting chambers, below the floor, by the Waste Chute. A 250mm diameter (~ 10 inches) hole must be cut in the toilet room floor to accommodate the waste chute.

***To ensure a snug fit, you must use the waste chute as a template for cutting the hole.***

The ***centre*** of the waste chute hole should be about 300mm from the wall to ensure that the pedestal will fit and the seat stays open when raised. The ***edge*** of the hole to be cut should then be 125 mm closer to the back wall.

Locate the approximate area where you want the pedestal to go, then check under the floor area you have chosen for any potential problems or hazard; i.e., ***electrical wiring, plumbing or floor framing members.***

### ***Caution – Hazard – Danger***

***Under-floor areas harbour electrical and plumbing lines.***

***Proceed with Caution!***

Mark out the hole with a pencil, using the waste chute as a template, and drill one small (6mm,  $\frac{1}{4}$  inch) test hole in the centre of the marked circle.

Go to the under-floor area again and look for the hole you have drilled. Check to see if there is a floor joist, water pipe or electrical wiring under the area you are going to cut.

***If there is wiring or a pipe in the way, you will need to engage a plumber or electrician to re-route the necessary line.***

If there are electrical or water lines close, but not in the way, ***cut the hole in the floor with extreme caution.***

***If there is a floor joist in the way, you will have to cut the joist on each side of the waste chute hole, add trimmer joists to each end of the cut joist, and fix all connections with galvanised framing anchors with 4 nails each leg. (See ‘Positioning the Pedestal’ diagram.)***

Drill a 10mm hole inside the edge of the waste chute area for the insertion of an electric jigsaw blade and cut out the chute hole.



### **Locating the Composting Chamber under the Toilet Room**

You will need access to your Nature-Loo Composting Toilet for changing the chambers. You can prepare a pad for the In Service chamber, or let it sit on bare earth if weather and drainage conditions are suitable.

If you prefer a pad, lay a small, one square metre pad with either concrete, pavers or recycled brick or block directly beneath where the pedestal will finally reside.

***The centre of this pad will line up with the centre of the waste chute and ceramic pedestal. Ideally the pad area will have a small incline or fall (20mm over 1000mm, ¾ inch over 3 feet) and fall down toward where the excess liquid pipe will be to aid the draining of the tank.***

An alternative base is a couple of treated timber sleepers positioned such that, when it is time to rotate the chambers, the chamber can slide down the length of the sleepers until it is clear of the house.

## Positioning the Pedestal Diagram

The usual position for toilet pedestals is centred between the side walls.

If your pedestal is too far away from the back wall, when you open the toilet seat, it will fall back and hit the pedestal - and could break it!

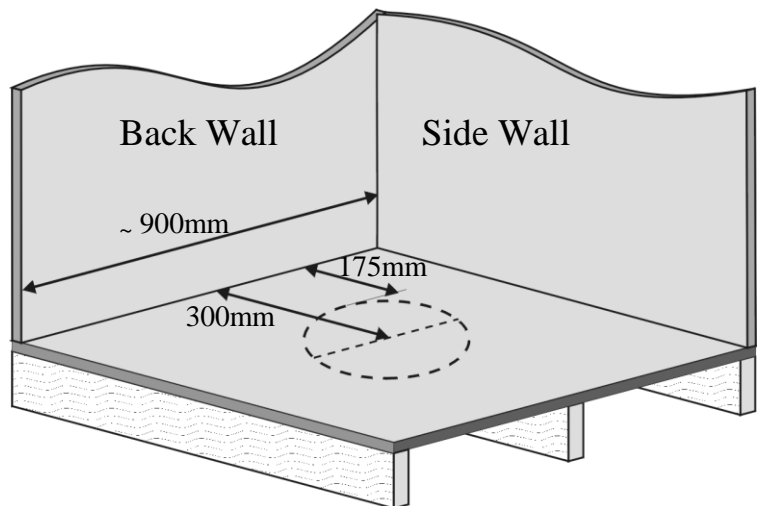
The measurements are offered as a guide only.

Locate the position for the Waste Chute, then use your Waste Chute as the template for drawing the hole to be cut.

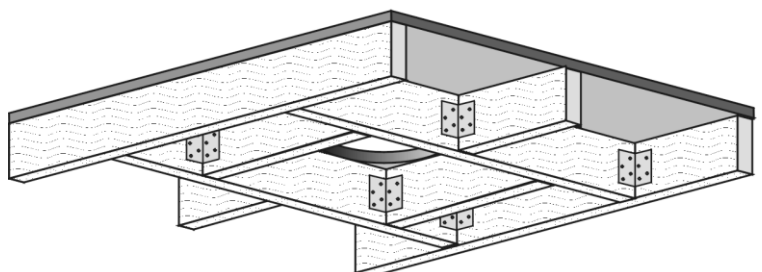
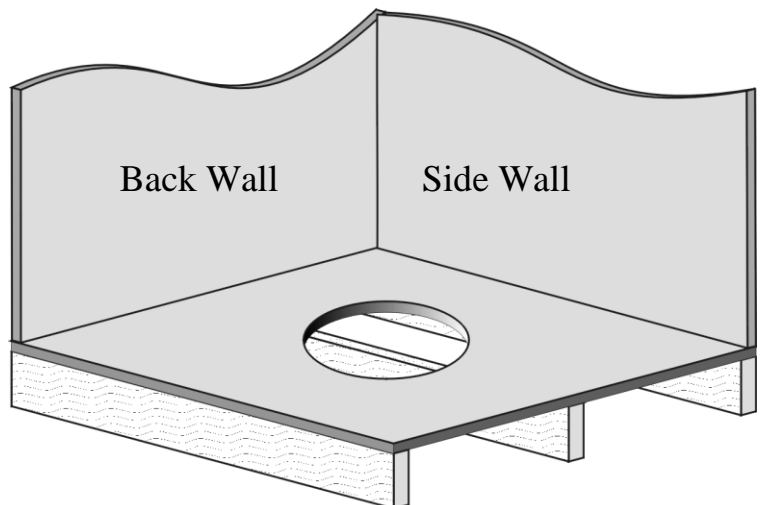
Drill a hole inside the perimeter for inserting the jigsaw blade, then cut the hole section.

If there is a joist in the way, you will have to cut it on each side of the Waste Chute hole.

Install trimmer joists as shown and fix with framing anchors - 4 nails each leg.



Toilet Room Schematic Section View



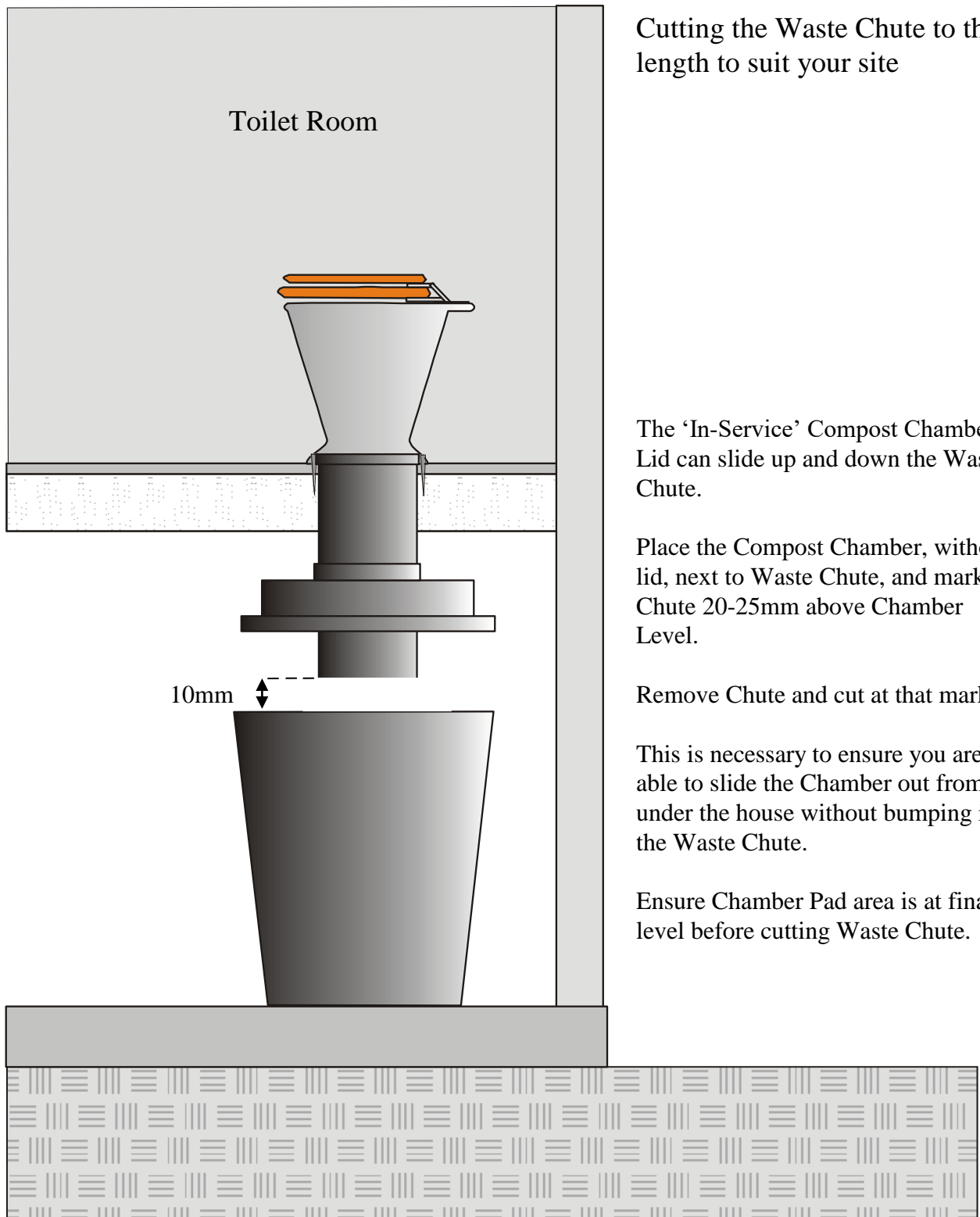
View from under floor

### Installing the Waste Chute

*First ensure that the pad or ground level on which the 'In Service' chamber will reside is at its final level beneath the toilet room.*

1. Insert the waste chute into the hole cut into the toilet room floor. *The flange will stop the pipe from falling through.*
2. Remove the 'In Service' compost chamber lid (*the one with the hole in the top*) from the chamber.
3. Position the chamber next to the waste chute, which is hanging from the hole already cut above.
4. Mark the position of the top of the chamber on the waste chute. Then mark the *cut* position 20-25 mm up the waste chute.
5. Remove the waste chute and cut off the excess length. The waste chute pipe can now be re-inserted through the hole in the toilet room floor.

**A brush seal is supplied & fitted to the in service lid and acts as a seal to prevent any odour emitting from the chamber.**



Cutting the Waste Chute to the length to suit your site

The 'In-Service' Compost Chamber Lid can slide up and down the Waste Chute.

Place the Compost Chamber, without lid, next to Waste Chute, and mark Chute 20-25mm above Chamber Level.

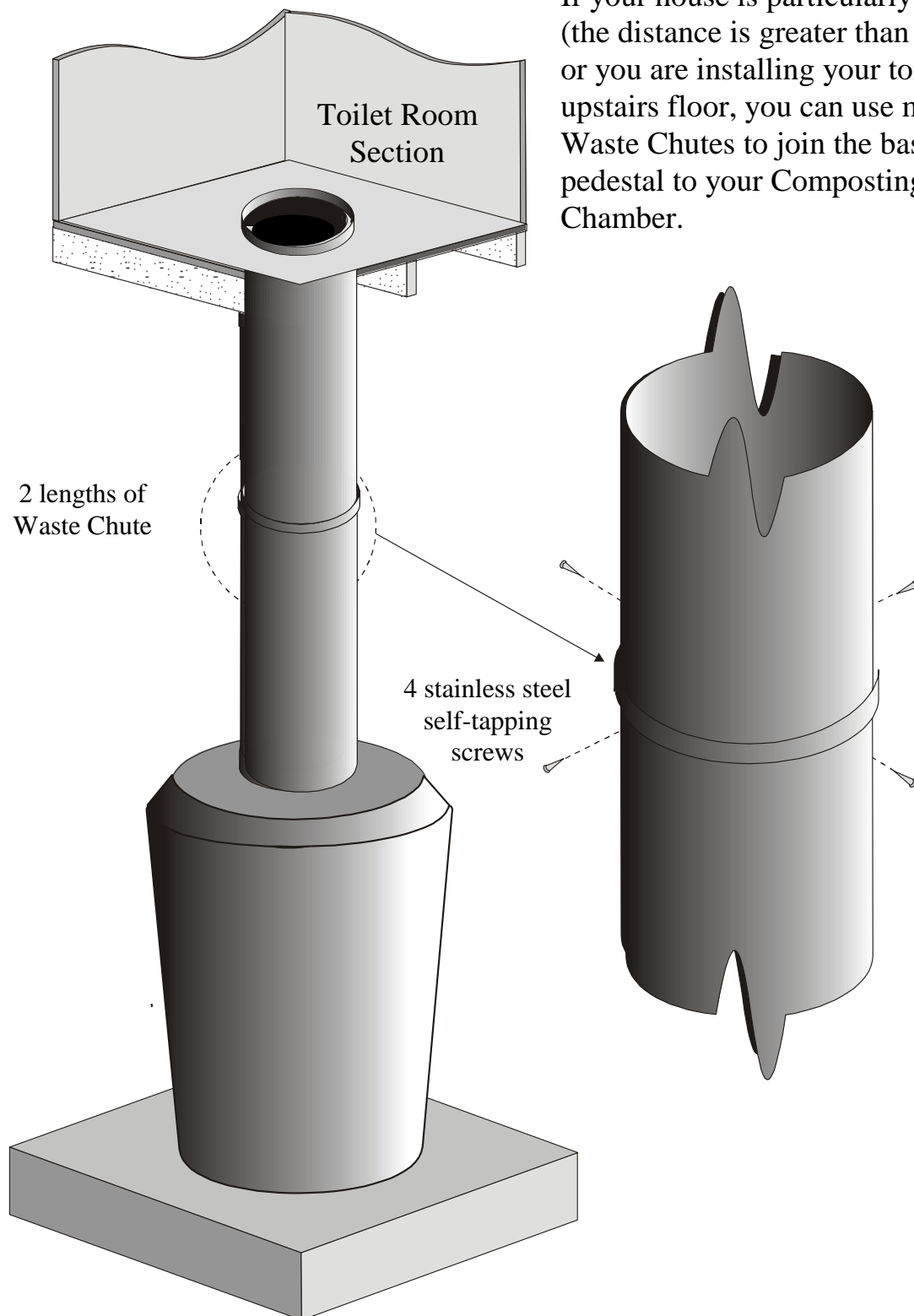
Remove Chute and cut at that mark.

This is necessary to ensure you are able to slide the Chamber out from under the house without bumping into the Waste Chute.

Ensure Chamber Pad area is at final level before cutting Waste Chute.

## Waste Chute Detail

If your house is particularly high-set (the distance is greater than 730 mm) or you are installing your toilet on an upstairs floor, you can use multiple Waste Chutes to join the base of your pedestal to your Composting Chamber.



### **Installing the Pedestal**

The waste chute should be placed into the hole in the toilet room floor with the waste chute flange sticking up about 30mm.

The pedestal can now be placed in position, over the waste chute flange, with the seat mounting flange to the back wall of the toilet room.

If the pedestal does not sit flush on the floor, it is likely that the waste chute flange may be a little too long for your pedestal (*the pedestals are all hand-made and there are minor differences in each*).

Remove the pedestal again and trim the waste chute flange with a sharp knife, rasp, file or hand plane.

***Trim a small, even amount of material off the waste chute flange and replace the pedestal to check the position. Repeat the process until the pedestal sits flush on the floor.***

*Do not trim off too much at once or the waste chute and pedestal may leak.*

Replace the pedestal and mark the positions of the screw holes on the toilet room floor with a pencil. Remove the pedestal once more and drill out the mounting screw holes with an undersized drill bit.

Before replacing the pedestal and fixing it to the floor, run a 10mm bead of sealant around the waste chute flange at the floor level and work it into the joint with your finger. Also, fill the flange of the ceramic pedestal with waterproof sealant to ensure that there will be no leaks.

Replace the pedestal and screw it down. *Be very careful not to tighten the screws too much as you can crack the base of the pedestal.*

It is advisable to do this by hand. Power tools are known to have caused problems.

### **Installing the Compost Chamber**

Back under the toilet room floor, slide the 'In Service' compost chamber lid up onto the waste chute from underneath.

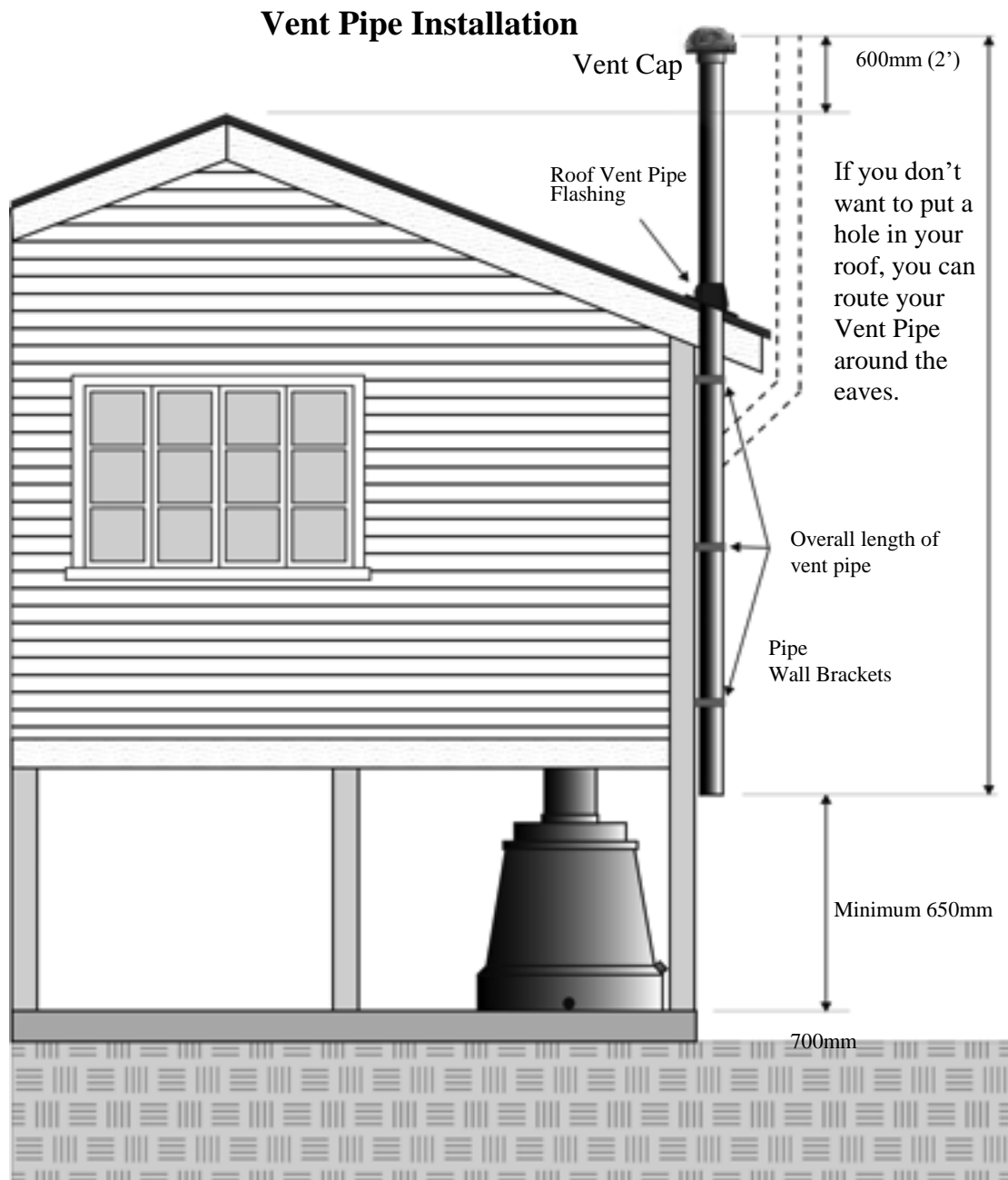
The compost chamber can now be put into position. Locate it directly under the toilet pedestal so the waste chute pipe is vertical. Slide the lid down to fit on the chamber.

## Connecting the Vent Pipe and 12volt Fan

*The fan runs 24 hours a day to continuously circulate air through the compost heap. Air is drawn down the toilet pedestal through the compost chamber and out the vent pipe.*

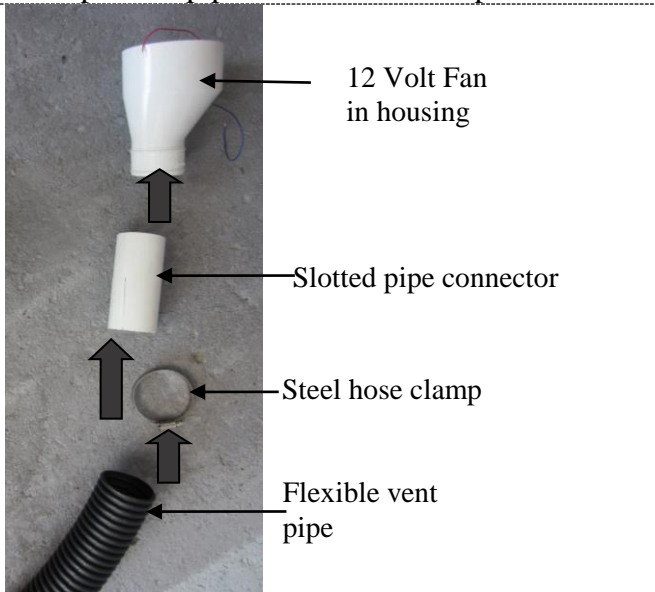
### **What you will need:**

- A length of 100mm ventilation pipe. The length needs to be from 1m above the base of the compost chamber to 600mm above highest point of roof.
- Brackets for fixing the pipe to the side of the building.



### *Vent pipe and 12 Volt fan to the 'In service' chamber-step by step instructions*

1. Attach the Vent cap to the top of the 100mm vent pipe.
2. Secure the vent pipe to the building. It can be located on an outside wall, or through an inside wall. Where it is located will be totally site dependent- the only critical factor is that the top of the pipe has to clear the top of the roof by at least 600mm.

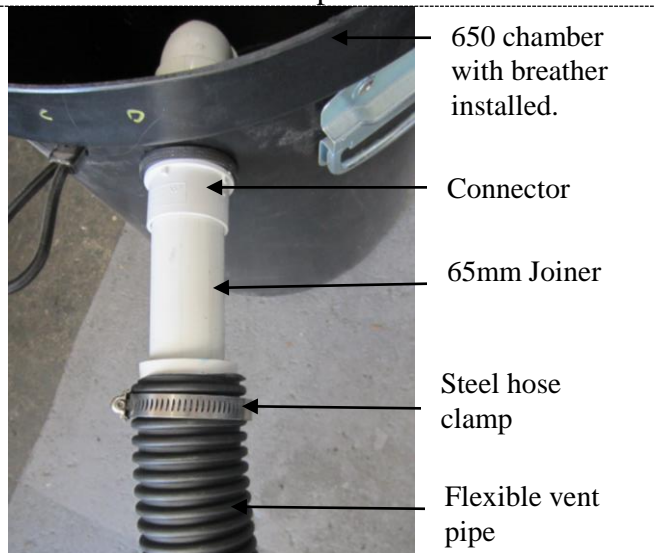


3. Put the steel hose clamp onto the flexible vent pipe.
4. Put the slotted pipe connector into the flexible vent pipe.
5. Tighten the steel horse clamp.
6. Put the 12-volt fan onto the slotted pipe connector- ensure that the fan is inserted with the 'top' facing up and the other end facing down (ease of drainage condensation)- ensure that the wires are not trapped. Use silicone sealant to make the seal. Do not glue



7. Connect the 'T' Junction moisture trap onto the assembled parts- cap facing down.
8. Connect the other end of the 'T' Junction onto the 100mm vent pipe.
9. check that the air is flowing away from the chamber.

Ensure that the fan is kept out of the weather to increase its longevity.



10. Put a steel hose clamp onto the other end of the flexible vent pipe.
11. Put it onto the 65mm Joiner. (50mm end onto the flexible vent pipe).
12. Tighten the steel hose clamp.
13. Attach the reducer to the connector on the chamber.
14. Glue all the of the joints (except the fan, as you will have to remove it later to exchange the fans) to prevent the intrusion of moisture. In colder climates, this vent pipe should be insulated to stop any condensation.



## POWERING YOUR FAN

### Mains Power

A 240/12 volt regulated transformer is included to run the fan from mains power. Connect the fans to the transformer as follows:



1. Remove the red tops from the crimps (shown on left) with your fingers/nails and keep safe until step 5. *Do not depress the top into the crimp before you are ready since the top can't be removed once you have pressed it in.*

*Ensure there is half a cm or so of bare wire coming out from the fan and transformer cables*



2. Insert the red (positive) wire from the fan into any hole in the first crimp
3. Insert the wire from the transformer with the white line (positive) into another hole within this first crimp.
4. Replace the top of the crimp with the metal “teeth” perpendicular to the direction the wires were inserted. Press down firmly until the top clicks down into place and is depressed so that it cannot be removed.
5. Repeat the above instructions with the second crimp (matching the blue (negative) wire with the solid black transformer wire).



*Ensure that the transformer is located in a cool, dry and airy location.*

**We recommend that a spare fan is kept on hand at all times, particularly after a year of use.**

Call Ecoflo for replacement or spare fans: 07 3889 6144 or 1300 138 182

### Solar Power:

If your house is powered by solar, you will have a battery bank that will generally be either 12 volt or 24-volt DC. If you have a 12-volt system, just connect the battery directly to the fan. Don't forget to put a 0.5-amp fuse in line to the fan.

If you have a 24-volt system, ask us for a 24-volt fan which will allow you to run the fan directly from your 24-volt battery bank. The fan will use about 6 amp-hours of power on a 12-volt system.

If you have an inverter, **don't use it**. The inverter will run very inefficiently when it is powering only the small fan and you will waste a lot of precious power. It may even flatten your batteries.

***If you have 12 Volt solar power, you do not need the transformer.*** Simply connect your 12 Volt supply to the junction box, ensuring that you connect the positive to the red lead and the negative to the black lead.

### **No power:**

- Small Solar Panels

A 20-watt solar panel connected to a controller regulator and sealed lead acid 12 volt 33-amp battery should give you continuous power to the fan.

- Whirly Birds

Wind assisted ventilators can also help with the airflow required for a Nature-Loo. If your site doesn't have power, but gets a reasonably steady supply of wind, then a whirlybird on top of the vent pipe can pull air up through your vent pipe. They have been known to work very well in conjunction with small solar panels.

- Nature Flush Enzymes

If your site is only intermittently powered by solar or wind, using enzymes with your Nature Loo will accelerate processing, and help deal with odours. See Composting Accelerators detailed later in the manual for more information.

### **Important – Please Read This Before Connecting the 12 Volt Fan to Power**

The 12-volt fan supplied with your Nature-Loo is designed to function 24 hours a day. If you intend to leave the fan switched off for longer than two weeks, we recommend leaving the lid open. Failure to do this may result in damage to the pedestal paint which will void your pedestal warranty. If you intend to leave the lid open for a long time, insert a piece of vinegar fly mesh, obtainable from us, between the pedestal opening and the seat.

With proper installation and care the fan will provide several years of reliable service. **However, experience has shown that improper installation may result in the failure or greatly reduced life of this product.**

Powering the fan by unregulated power sources such as some solar-based systems or other sources in excess of a regulated 12 volts will reduce the life of this fan and may result in immediate failure. ***If you are considering connection to a source other than a transformer or solar panel as supplied by Nature-Loo, you should read the warranty conditions below.***

Limited warranty conditions - 12-volt fan

The 12 volt fans supplied with your Nature-Loo come with a three-month manufacturer's warranty. Nature-Loo doubles the term of this warranty to six months and will replace any fan that fails during the warranty period but only under the following conditions:

- The fan must be connected and powered by either a 12-volt transformer or solar panel supplied or otherwise recommended by Nature-Loo. Connecting your fan directly to a power source other than one supplied or specified by us may result in immediate damage to the fan and will void all warranties.
- The fan must be installed as specified in the owner's manual supplied with the Nature-Loo and must not be modified or altered in any way.
- In the event of failure during the warranty period, the faulty fan must be returned to Nature-Loo who will ship a replacement by regular mail service on the next business day providing that the above conditions have been met.

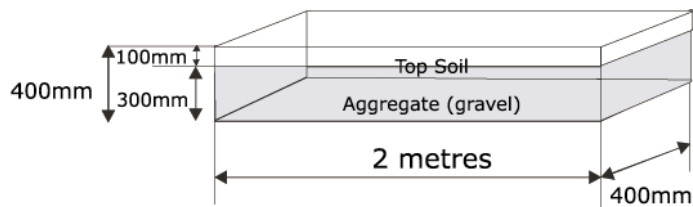
# EXCESS LIQUID ABSORPTION TRENCH

*The liquid discharge connection must be permanently connected to a small absorption trench.*

Simply screw the 19 mm liquid drain valve into the thread of the compost chamber (located near the floor) with the **washer between the valve and the chamber**. Next connect the valve to the 19 mm hose supplied. A standard absorption trench for excess liquid is shown in the enclosed drawing.



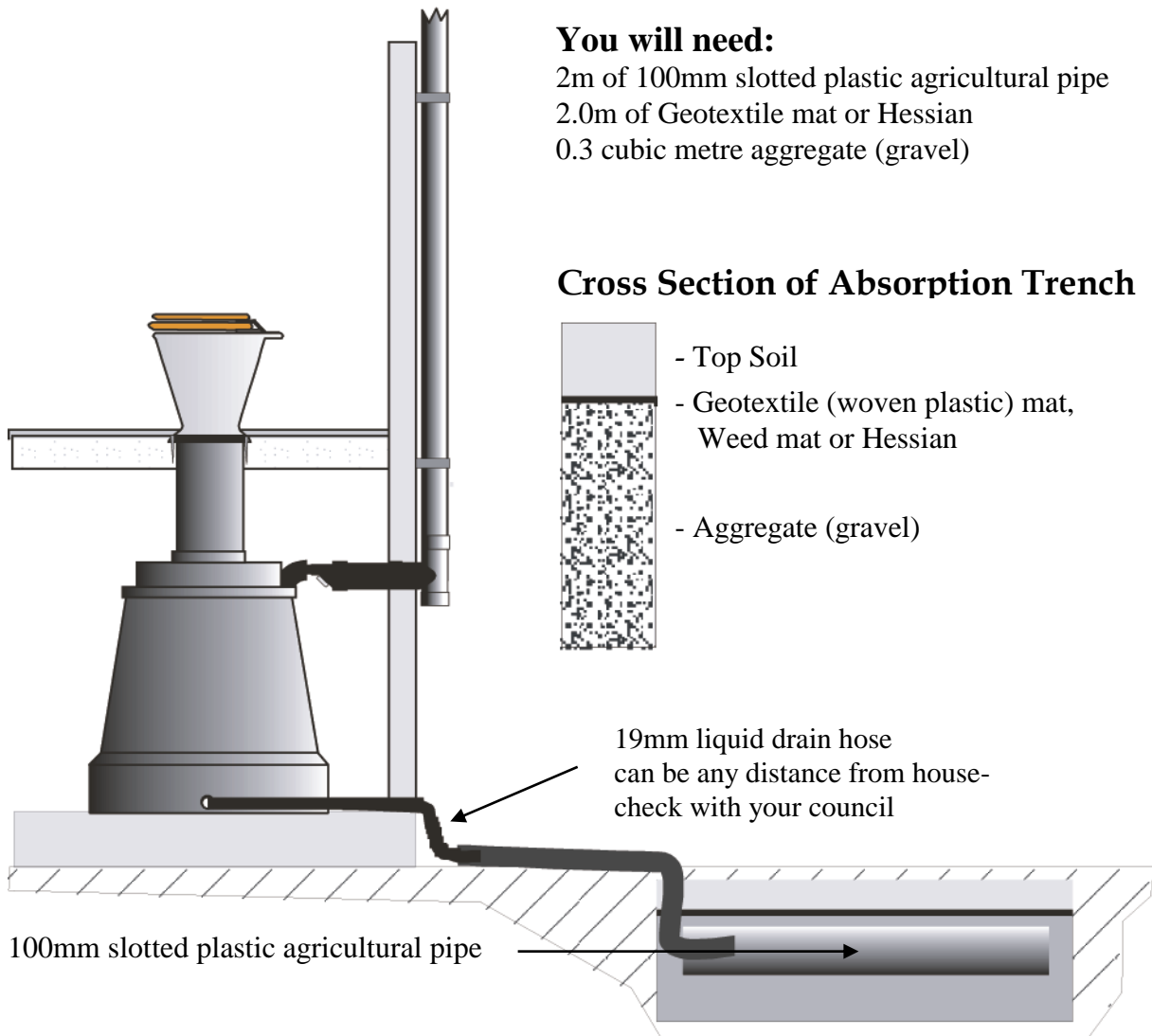
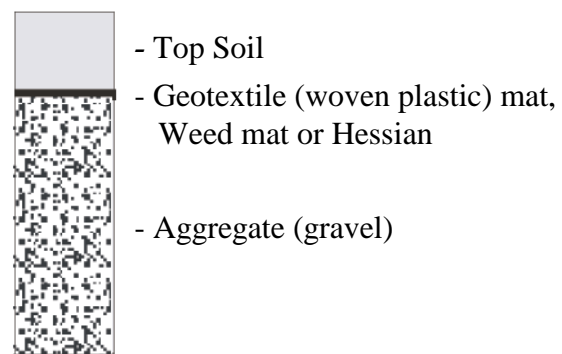
*Ensure that the valve is in the open position.*



## You will need:

- 2m of 100mm slotted plastic agricultural pipe
- 2.0m of Geotextile mat or Hessian
- 0.3 cubic metre aggregate (gravel)

## Cross Section of Absorption Trench



## PREPARING THE NATURE LOO FOR USE

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### **Bedding Material / Bulking Agent**

First, lay approximately 25mm of bedding material (hemp stalks or sugar cane mulch is supplied) on the floor of the compost chamber. Clean chopped up straw can also be used. The same material can be used as a bulking agent as described later. Do not use cypress, cedar or eucalypt wood shavings due to their antimicrobial properties.

### **Nature Quick (microbe mix)**

After you have been using the toilet for around 3-4 days add half the contents of the packet into a bucket containing 500ml of warm water. Mix and pour the contents of the container into the toilet. Reseal the bag after every use & store at room temperature out of direct sunlight. Two weeks later add the rest of the contents of the bag mixed with 500ml of warm water. Please contact Nature Loo for further supplies when required (see 'Rotating Chambers').

## COMPOSTING ACCELERATORS

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Whilst Nature Loo users report successful composting without the use of any additives, we strongly recommend the use of the following in order to optimise composting, particularly when the toilet is in permanent use by more than two people.

### **Bulking Agent**

Bulking agent should be added on a regular basis, preferably a handful after each bowel movement. Alternatively add the equivalent of this on a daily or weekly basis. The bulking agent (same as bedding material) can be added through the pedestal. The bulking agent supplied is hemp stalk or sugar cane mulch. If you cannot find this locally we recommend finely chopped up chaff or wood shavings (not sawdust and not cedar, eucalypt or cypress).

### **Nature Flush Enzymes**

An enzyme is a substance that acts as a catalyst and initiator in chemical reactions. While enzymes are excellent at accelerating the composting process, they also have a remarkable ability to kill odours. So, if your site is only intermittently powered by solar or wind, using enzymes with your Nature Loo will accelerate processing, and help deal with odours.

A 125 ml bottle of enzyme concentrate is supplied with the toilet. This should be diluted with 20 parts of water. A spray flask is provided. We recommend that after each solids deposit several squirts of the enzymes are sprayed into the waste chute. Any staining of the pedestal can also be removed with the spray.

Please contact Ecoflo or your local dealer for supplies of Nature Flush enzymes.

### **Nature Quick Microbes (small brown Kraft paper bag)**

The aerobic bacteria in Nature Quick will also accelerate composting. *They should be used each time a chamber is changed in order to kick start the process in the new chamber. We also recommend an application every 2 weeks in colder climates and where more than 2 people are using the toilet.*

## CARE & MAINTENANCE

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### **Initial Maintenance:**

Your Nature-Loo should be examined at regular intervals to ensure that the fan is working, and the liquid discharge connection is not blocked. If either is not working, there will usually be a tell-tale odour. To compost effectively, the pile should be kept moist (see 'the composting process'). If it seems there is never any liquid in the liquid chamber, it may be from lack of use or high temperatures. You can overcome this by pouring extra water into the chamber each week.

### **Fan Motor and Insect Screens:**

You will need to clean the insect screen at regular intervals. If the dust builds up on the screen, it will reduce the air flow, which reduces the efficiency of the Nature-Loo. Site conditions will determine the frequency of cleaning, but it is recommended to inspect it every month. If you are in a very dusty area, you may need to increase inspection rates. While you are cleaning the insect screen, you should also check that the fan is clean and rotating freely.

### **Foreign Objects:**

The system should not be used for the disposal of sanitary napkins or disposable diapers.

### **Replacement of Chambers:**

It is very important to observe safety procedures when dealing with fresh human waste. Please ensure that you wear protective clothing (gloves and old clothes). Depending on the individual, a face mask and glasses may also be necessary.

Every few weeks you will need to shine a torch down the toilet pedestal to see if it is full. The Nature-Loo composting toilet chambers will need to be changed on a regular basis. If they are used consistently by the same number of people, you will soon see how often the 'In Service' chamber needs to be replaced.

When the 'In Service' chamber is full, you will need to swap it with the 'Out of Service' chamber. First, prepare the spare chamber with 15mm (1/2 inch) of bedding material. Ensure these materials are insect-free. Returning to the full chamber; disconnect the fan assembly, close the liquid discharge hose valve and disconnect the hose at the base of the chamber. Lift the lid and slide the compost chamber to one side and immediately put the spare, sealed lid on it. Before removing the full chamber, you may want to put a small bucket of clean mulch, i.e., sawdust, straw or sugar cane, down the chute to cover up the waste pile. This will reduce the odour.

***The empty chamber can then be placed into position under the toilet pedestal, the lid lowered and the fan assembly and hose reconnected with the valve in the open position.*** Failure to open the valve will turn the chamber anaerobic and block the vent pipe, leading to very unpleasant odours.

***You now have an empty chamber in service and a full chamber out of service. This full chamber is best placed in an airy sunny position.*** The insect-screened air intake cap must be attached to the fitting previously connected to the in Service chamber vent system. ***The blue valve should be left closed whilst out-of-service to avoid insects entering the system.*** After a few days add the second sachet of Nature Quick to the pile in the In Service chamber as per the instructions on the sachet. ***For hints on effective composting techniques, see ‘The Composting Process’.***

### **Removal of Compost**

When the second chamber is full, the first chamber should be well and truly composted. This ‘humus’ must then be disposed of as per the local health department regulations. This normally means placing the humus in a trench 300mm deep and covering with soil. It is also recommended to wear rubber gloves and protective clothing when emptying a container. Ensure burial is not within 100m of a potable water supply.

Always leave a small amount of this humus to ‘kick start’ the composting process when it goes back into service. Use it in the same way as when you commissioned your Nature-Loo. Alternatively, you can buy a bag of Nature Quick please contact Ecoflo.

### **Returning a Chamber to Service**

When the compost chamber has been emptied, you can put it back into service. Before you do this, it is a good idea to wash it with a hose to remove any solid particles. Also, ensure that all hose and vent connections are clear. Place 15 mm of bedding material on the floor and spread the humus in the centre of the chamber. It is then ready for exchanging.

If your chambers are filling up too quickly, it is very likely that your Nature-Loo is being overloaded. Contact your supplier about purchasing another composting chamber.

### **Cleaning the Pedestal and Seat**

Just like any other toilet system, you will need to clean it occasionally. To do so, use our Nature Flush enzymes, or a small amount of water with biodegradable detergent. Do not use abrasive cleaners.

## THE COMPOSTING PROCESS

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Organisms and microorganisms present in the open environment, bacteria, fungi and insects, will begin to inhabit and feed on the material, beginning the decomposition process to break down all organic materials.

As the material decomposes, its mass will greatly reduce. It's a basic, natural process that occurs wherever organic material accumulates, such as on a forest floor.

Composting is simply a way of speeding up that process. Through the design of the Nature-Loo, we control that process to ensure maximum efficiency and safety.

### Ingredients

The essential ingredients of a compost heap are organic materials, microorganisms, moisture, oxygen and temperature.

### Organic Materials

In the Nature-Loo, the organic material used for the composting is human waste. It is not advisable to add vegetable matter, as it will attract fruit flies (or 'vinegar flies' to your compost heap.

If possible, use recycled unbleached toilet paper.

### Micro-organisms

Some hundreds of species of microorganisms, mostly bacteria, fungi and antinomies, are involved in decomposing organic materials. Most organic materials already have a native population of microorganisms. With the Nature-Loo, we use this natural population, as well as introducing a large supply of microorganisms (Nature Quick) to 'kick start' the breakdown process. These microorganisms start their work of decomposition as soon as moisture and oxygen levels are favourable.

### Moisture

The moisture content of a compost pile is very important. Below 40%, organic matter will tend to dry and not decompose rapidly. Over about 60%, not enough air can get into the pile and it can become anaerobic (no oxygen).

A moisture content of approximately 50% is ideal for composting. The Nature-Loo maintains this optimum condition in 2 ways. First, the liquid waste (urine) is separated from the solid waste immediately, by displacing it through a perforated floor into the liquid chamber. This prevents the process from becoming anaerobic. Next, the semi-sealed nature of the chamber tends to keep the humidity high. This high humidity ensures that the compost pile maintains an optimum level of moisture.



## Oxygen

Microorganisms that require oxygen to survive are called aerobes; those that do not are called anaerobes. Organic materials are decomposed most rapidly by aerobes (much quicker than the anaerobes used in septic systems).

Aerobes need plenty of air – many cubic metres/day – for rapid breakdown. Inadequate aeration allows anaerobes to supplant aerobes inside the compost pile, which leads to foul odours and slow decomposition rates. The Nature-Loo supplies ample oxygen for efficient composting with a small ventilation fan that supplies up to 420 litres of air/minute. This has the added advantage of acting as a highly efficient extractor fan whenever the toilet lid is open.

## Temperature

The heat coming from piles of organic materials is generated by the feeding and multiplication of millions of microorganisms. Technically, the stage of the temperature cycle below 40 degrees C is termed mesophilic; above 40 degrees C is thermophilic. Composting is most rapid in the thermophilic stage.

As the temperature rises over 40 degrees C, mesophilic organisms die out and are replaced by an upsurge in the population of thermophilic organisms (the agents of fastest decomposition). Later, as the temperature drops, mesophilic organisms re-invade the centre of the pile from the cooler outer layer.

The Nature-Loo keeps the temperature in the thermophilic stage in several ways:

- 1) The containers are black. This means that they are an excellent absorber of heat, especially if they are located in natural sunlight.
- 2) The incoming air is entering via your toilet room. The air in most houses is warmer than the outside air (especially in winter). This warmer air tends to increase evaporation and aids in the composting process.
- 3) Compost chambers not exposed to direct sunlight can be insulated by wrapping thermal insulation around it to hold in the heat generated.

## Pathogens

An important function of the composting process is the destruction of pathogens. Most are killed in the thermophilic stage, as composting at temperatures above 55 degrees C for 1 day kills almost all pathogens.

As the Nature-Loo chamber is in use for a minimum of 6 months, there is little chance of any pathogens surviving. In addition, our unique use of isolated chambers ensures no recontamination from fresh waste.

## TROUBLE SHOOTING

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*Please read this section carefully before using your toilet*

Nature Loo toilets have proven themselves to be one of the easiest systems to manage. However, being a natural process, reliant on a number of factors beyond our control, it can occasionally need some help to maintain an appropriate balance. The following suggestions should assist you to sort out any problems which may arise.

### **The In service chamber is filling too quickly:**

This may be caused by a number of factors;

The temperature is too low for effective composting. With the Classic 650 you can improve this problem by wrapping the chamber in insulating material (including the base).

Insufficient air flow. This can be caused by a broken fan or the chamber being too full. Check the fan is operating and that the level of the pile is not too high. This problem could also be caused by a blocked insect screen. On current models the positioning of the main screen is in the body of the fan housing which makes it a simple matter to clean.

The pile being too wet. This could be the result of the outlet of the liquid chamber being blocked and causing the upper chamber to flood. (This would also cause the fan to malfunction). Check the drain hose is not blocked and flush with a hose if necessary. If this does not seem to be the cause of the problem, then the exit from the liquid chamber is probably blocked. If this is the cause of the problem, you will need to change chambers and thoroughly flush out the contents of the liquid chamber.

**Disinfectants will slow down or stop the process.** Restart the composting by reintroducing microorganisms. Call Ecoflo for a supply of Nature Quick.

In many of these situations Nature Flush enzymes will help solve inefficient composting by breaking down the solids and thereby speeding up decomposition. (Enzymes also reduce odours emitted from the vent pipe).

### **The Out-of-Service chamber is composting too slowly:**

This may happen as a result of one or more of the problems described above. At this point the most effective course of action is to aerate the pile by turning it over with a pitchfork. You could also add 500ml of Nature Flush enzymes from a domestic spray bottle as you turn the material and add a quantity of Nature Quick microbes.

Check the out of service chamber fan is working and replace if necessary by calling Ecoflo as per the contact details.

You should consider locating the chamber where it has a greater exposure to direct sun light. However, if you find the pile is drying out too quickly put the chamber in a shadier position.

You can also introduce worms to the out of service chamber which will have the added benefit of enriching the resulting humus. Please note however that in some locations the worms may not survive because of the high temperature inside the chamber.

If none of the above suggestions is giving the desired results it is possible that the pile is too compact or the carbon/nitrogen ratio is too low. Follow the instructions in the 'Composting Accelerators' section. This will redress the imbalance and improve air flow. Alternatively increase the amount of toilet paper that you use. Please note that adding these materials will increase the speed at which the chamber fills. Alternative materials are shredded newspaper, rice hulls, chopped straw or wood shavings (not sawdust, nor eucalypt, cedar or cypress).

If you find none of the above measures are effective, it means that the local climatic conditions are less than ideal. This can happen in cold or humid conditions and you will need to purchase an additional chamber in order to provide an extended composting period.

If you need to change your in service chamber and the out of service chamber is not yet composted dispose of the waste as normal and order a new chamber from Ecoflo.

***The odour from the out of service chamber is unpleasant:***

If the out of service chamber is not connected to the vent pipe it may smell immediately after it has been taken out of service. Odours can be greatly reduced or eliminated by covering the top of the pile with straw or dry grass clippings. You may wish to do this before disconnecting the chamber.

***The odour from the in service chamber is unpleasant:***

If this is not caused by a failed fan or associated screen it has been caused by a blockage in the liquid drain hose or fitting. Please see the 'In service chamber is filling too quickly' section for how to resolve this problem.

***The power has failed resulting in toilet room odours***

Cover the pedestal with cling film until the power is restored. To avoid a recurrence of this problem, have us send you our uninterrupted power source

(UPS). The UPS will cut in with power from a 7-amp hour battery whenever the mains power goes down. Please call Ecoflo for details.

**The full chamber is too heavy to move**

We can supply you with a purpose built 2 wheeled cross frame trolley. The chamber sits on the trolley whilst in service and is then wheeled away when full to a suitable location, where it slides off the trolley and composts away until needed again, by which time it will have lost most of its weight. Meanwhile the trolley is placed under the new 'in service chamber'.

**Vinegar Flies:**

Sometimes vinegar flies are attracted into the chamber and can breed. Should this problem occur in your system refer to our information on 'How to deal with vinegar flies'.

Commonly this can be a sign that the compost pile is too dry. A good compost pile is 50-60% moisture. A dry pile is attractive to vinegar flies for laying eggs. You will need to break the bread cycle and also add moisture to the pile.

It is possible for flies to enter the system via the pedestal opening. If flies get into your system in this way, we would suggest that your toilet room is insect screened with **midge mesh**. Regular insect screens are not fine enough. If, for geographical reasons, you have not been supplied with seat and lid seals we can supply you with these components, which should eliminate the problem.

As the pile builds up it is more difficult for air to circulate and as a result processing is slowed down. Slowly composting piles attract flies. This situation can be improved by adding bulking agents (for best results this should be done from the start) as described above. Changing the chambers more often, if practical, will be beneficial. The use of Nature Flush enzymes can also be very helpful (for best results this should be done from the start).

Please note that broken fans should be replaced immediately in order to avoid flies entering the system. We **recommended that you keep a spare fan on hand at least from when the toilet has been in use for a year.**

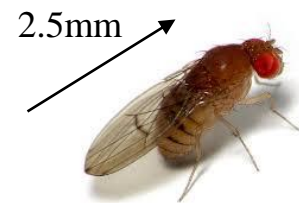
**Please make sure you use protective clothing and gloves when handling any human waste.**

## HOW TO DEAL WITH VINEGAR FLIES

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Vinegar flies are very small and can penetrate standard fly screens. Use midge mesh. They are active during the warmer months of the year and are attracted to materials which are decomposing. To minimise the risk of them being attracted into your toilet chamber you must **ensure that the seat and lid are closed at all times, except when the toilet is in use.** It is important to avoid flies entering the system because once they have moved in they can multiply.

Use the following remedies to eliminate or reduce the problem:



### **Yates Tomato Dust**

Available from nurseries. The active ingredients are sulphur and spinosad. The latter is derived from naturally occurring beneficial soil bacteria. The microbes in your toilet will break the spinosad down into carbon dioxide and water. Spinosad is effective thru contact and ingestion.

If you know vinegar flies are active in your area we suggest you dose your toilet twice per week from October to April, otherwise wait till they appear. The most effective method of dosing is to sprinkle liberally directly into the chamber having lifted the lid. Alternatively sprinkle down the pedestal before use (when dry)

### **Comfrey**

Comfrey grows prolifically. It accelerates composting and deters vinegar flies. Drop a handful of comfrey leaves into the chute once per week.

### **Garden lime**

A light covering of lime, available from nurseries, sprinkled over the pile weekly. Lime does not kill flies but deters them by neutralising the urine.

# MAINTENANCE SCHEDULE

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*Please place this maintenance schedule close to your In-Service Chamber and complete the table as you rotate your chambers.*

**Model:** Nature Loo Classic 650

**Date First Put into Service:** \_\_\_\_/\_\_\_\_/\_\_\_\_

*The out-of-service chamber must compost for a minimum of 5 months from the date it was first rotated out of service*

**Date chambers were last rotated:**


**Caution:**

*Wear protective clothing including gloves and eyewear when servicing, rotating or emptying chambers.*