


Rota-Loo 2000 Installation Manual

*This Manual should be read in conjunction
with the
ROTA-LOO OPERATIONS MANUAL*

*If you have any queries please contact your
Rota-Loo supplier or Kiel Industries Pty Ltd*



 <p>IAPMO R&T OCEANA OceanaMark OMK30059 AS/NZS 1546.2</p>	<p><i>AS/NZS 1546.2:2008 is the Standard that sets out the requirements for the design and performance of Waterless Composting Toilets to assure of safe, effective and efficient operation.</i></p> <p><i>Authorities regulating the installation of Waterless Composting Toilets (local Councils etc) require Certification to the Standard to approve the installation of a system like Rota-Loo</i></p>
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QUICK GUIDE

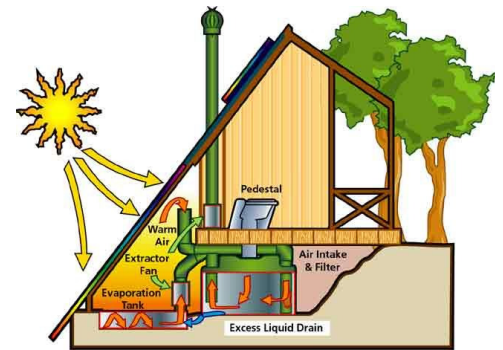
INSTALLATION PLANNING

It's all in the planning!

For proper operation of the Rota-Loo you should consider a number of issues during the building design stages to enable the natural composting processes the best chance to give trouble-free operation.

The design of the site and building needs to allow for:

- The location of the toilet pedestal(s) in the building and any structures that may be required to have the Rota-Loo below floor level.
- Space for the Rota-Loo and a firm, dry and sheltered base for it to sit.
- Adequate access to service and maintain the Rota-Loo.
- Warmth to assist the composting process by locating the Rota-Loo in a sunny place and maybe installing insulation, particularly in cooler climates
- Good ventilation to provide oxygen and evaporate liquids
- Electrical supply (240VAC or 12VDC) to the fan location
- Excess Liquid (urine) that may occur in high use areas



NOTE: The Rota-Loo is not designed for handling bathroom, kitchen and laundry wastes. A separate Grey Water system will be required for these wastes from your building

PLEASE READ Pages 2-4 OF THIS MANUAL DURING THE PLANNING FOR INSTALLATION OF A ROTA-LOO

INSTALLATION

The Rota-Loo RL2000 is supplied as a kit containing most of the components required and can be installed using basic building tools and materials available at plumbing suppliers or hardware shops

See the Appendix (page 10) for a list of supplied parts and required materials and tools.

Installation of the Rota-Loo involves:

- Positioning the Pedestal and Rota-Loo to ensure a vertical drop from the pedestal to the waste bins
- Preparing a flat, level and firm base for the Rota-Loo to sit
- Installing the ventilation pipe-work, including vent pods, inlet, fan and Turbo Vent
- Connecting the Pedestal, waste chute and Rota-Loo
- Final checks before use.

Installation should be by a competent person(s) who is experienced with at least basic building and plumbing skills.

Setting out the site and ensuring the components are installed correctly is essential for proper operations and validation of the warranty.

Most problems with the operation of a Rota-Loo are a result of poor or incorrect installation so you should be careful to read and follow all the installation instructions.

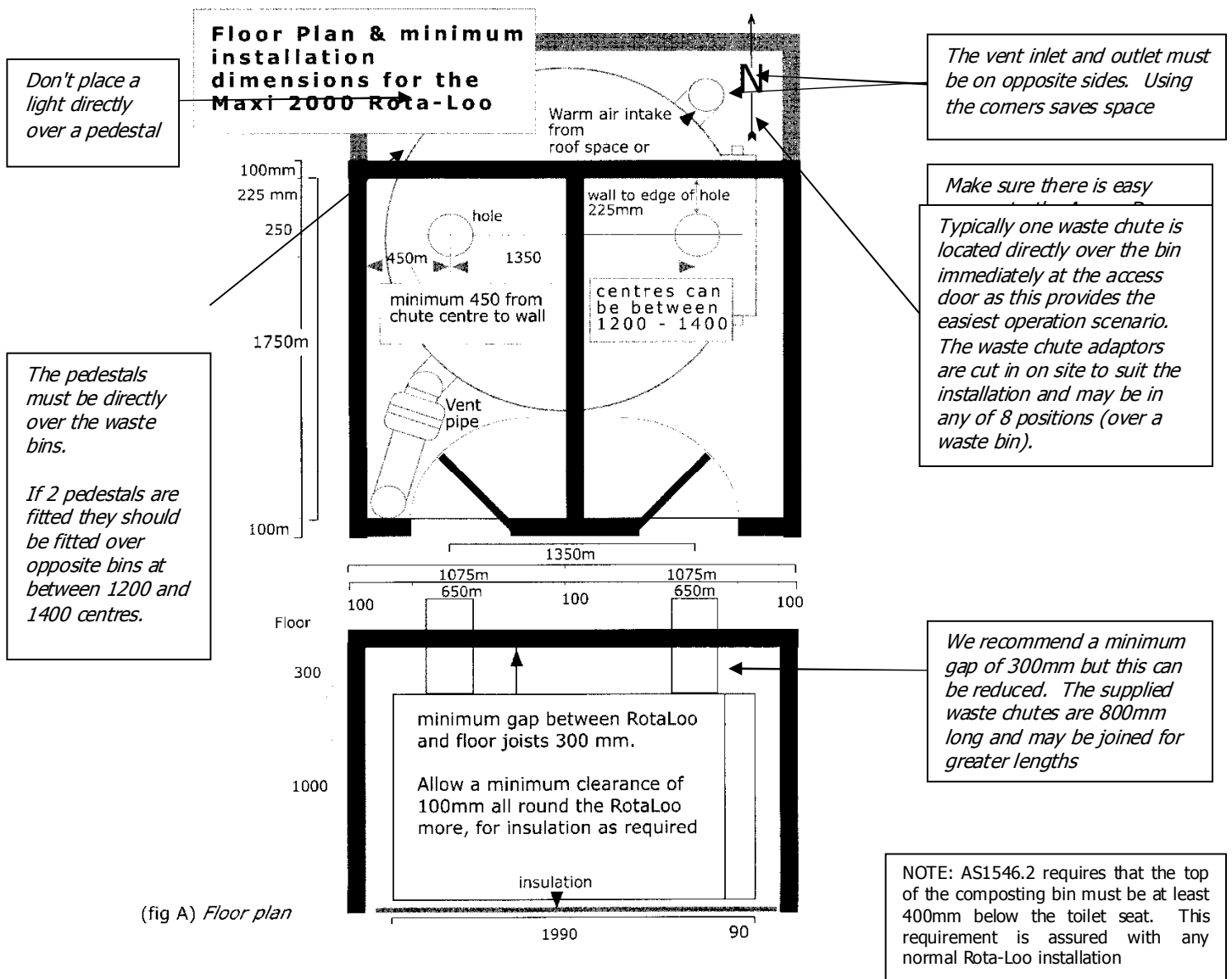
PLEASE READ ALL INSTRUCTIONS (Pages 5-9) BEFORE STARTING

INSTALLATION PLANNING

Space Required

The RL2000 is intended for high use, public environments and may be used in numerous configurations of 1 or 2 pedestals. If 2 pedestals are to be used, they should be located over opposite buckets.

The basic dimensions of the floor plan and minimum clearances of your building must be the same (or larger) as that shown in the picture below to accommodate your Maxi Rota-Loo. Allowing additional space for insulation, particularly in cooler climates is recommended.



(fig A) Floor plan

Location and Building Considerations

Maximising Heat

Do not underestimate the importance of acquiring and maintaining heat in the Rota-Loo. The heat is used to increase composting efficiency, help evaporate liquids and kill pathogens.

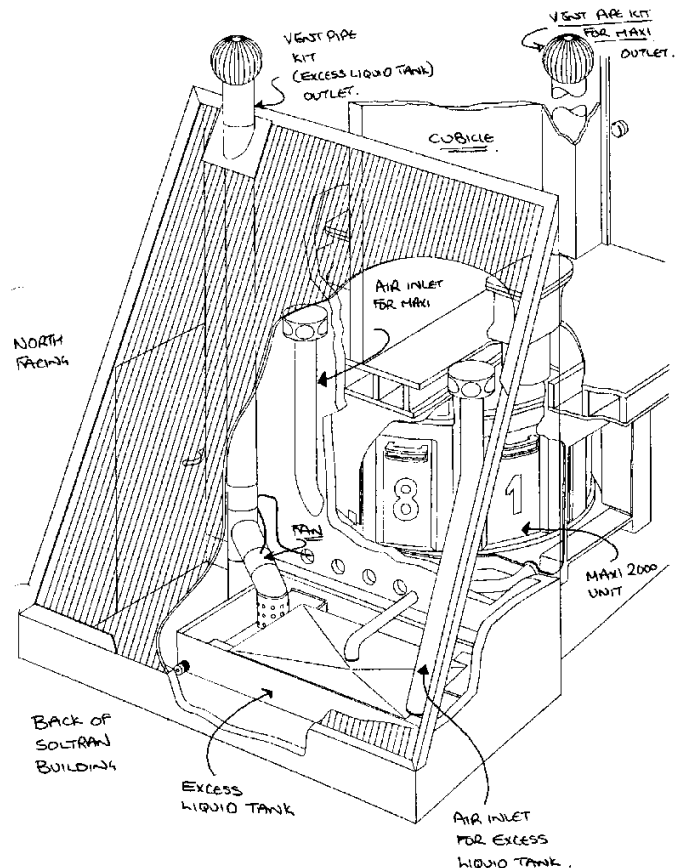
Locating the Rota-Loo in a sunny location, with a clear north facing building (in the southern hemisphere) should be considered

- The Vent inlet pipe should be located on the North side. Utilising a solar collector (Soltran module or similar) is recommended to improve the efficiency of operation and evaporation of excess liquids and may be necessary in cold climates.
- If your RL2000 is going to have a solar powered fan there needs to be northern exposure and a clear view of the sun.



Locations where the monthly average temperature falls below 10°C for 3 months or more each year, provision must be made to use a solar collector and insulation

Locations where the monthly Relative Humidity exceeds 80% at any time, a vent drain and insulation of the outlet vent should be installed to ensure condensate does not re-enter the Rota-Loo. (see page 7 below)



Excess Liquid

Many public installations will require an Excess Liquid System to deal with high liquid loads.

This may be done by using a Rota-Loo Excess Liquid Tank installed in a sunny location as shown above or similar. Alternately an Absorption Trench System may be suitable.

Structural Issues

The Rota-Loo is installed sub-floor. It may be installed under a concrete slab or bearer and joist floor, in a full or partial cellar as desired in the building design. Consider the spacing of joists or concrete slab penetrations to allow for the waste chute. Consult a relevant Engineer to ensure support spacing and floor spans are adequate for the size and position of the Rota-Loo.

Most Rota-Loos are installed in a location largely protected from the elements and can sit freely on the base. If your installation is likely to experience extremes, you may need to consider anchoring the Rota-Loo to the ground to prevent it moving in the event of weather events. Rota-Loo is not designed to be fully immersed in water so should not be installed where severe flooding may occur without flood protection.

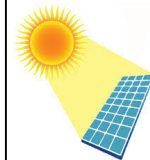
AS1546.2 requires that access to a WCT be prevented from unauthorised people. Consider whether your installation needs access restriction methods (like locks) to prevent young children or vandals from access.

Vent System

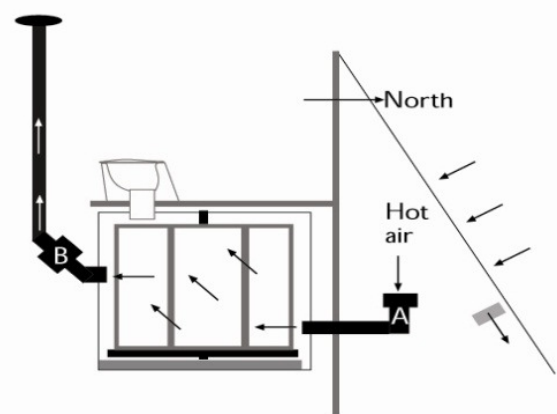
The Rota-Loo airflow requirement is provided by DWV piping (not supplied) from an inlet filter (supplied) to a Turbo Vent (supplied) and incorporates a continuous running fan (supplied).

- The RL2000 comes with 2 Pods for the vent piping. These may be placed as suits the installation. The Inlet (100mm DWV) needs to be fitted low and opposite the Outlet (150mm DWV), which will be higher (for more detail see installation section 3 - page 11)
- The fan is to be fitted on the outlet side. Consider how the fan will be powered (240VAC or 12VDC) and ensure the fan housing is accessible for maintenance.
- The air inlet (inlet Filter) needs to be located lower than the Pedestal, otherwise you will draw air from the toilet cubicle rather than where the air inlet is located. (To draw warm air down from ceiling cavities typically requires a second fan)
- Warm air naturally rises and that sharp bends restrict airflow - designing the vent piping correctly will improve natural operation.
- Warm air holding moisture entering cold air can result in condensation. Consider insulating the outlet vent piping, or providing a condensate trap, particularly in cold climates.

If a 240VAC fan is to be installed, a standard single GPO needs to be provided close to the fan position and installed according to AS/NZS3500 & AS/NZS3820.



If solar power is planned, consult a solar installer to provide a system that will keep the fan running 24/7 - the 12VDC fan power consumption is 3.0W



INSTALLATION

Prepare Base for Rota-Loo

- The Maxi must be placed on a level, hard dry foundation. If you don't wish to pour concrete, paving slabs on 100mm of compacted sand are quite adequate. In damp areas it is advisable to put a vapour barrier (black builder's plastic) between the sand and concrete or slabs. In addition to this, insulation is required between the Maxi and the floor; this can be Masonite, builders plywood or cement sheeting. The pallet on which the Rota-Loo is delivered may serve as part of the base and insulation for the installation

Take the door off and remove all the bins from the Maxi and set them aside.

Position Pedestals and Rota-Loo

- Mark the holes in the floor of the toilet cubicle. These are located over diagonally opposite chambers at between 1200mm and 1400 mm centres - recommended is 1350mm.
- Drill a small hole in the centre of the marked chute hole, position the RL2000 under the floor. Check with a plumb bob that the hole centre aligns with the eventual centre of the chute on the top of the Rota-Loo. Also check before you cut the holes that you don't have to shift or trim the floor joists.
- When the location of the waste chute centres are confirmed, cut a hole in the floor to allow the waste chute to fit through (260mm diameter)

The Pedestals must be directly above the Rota-Loo and the waste chutes must be vertical

Ensure that the waste chute hole positions are clear of floor joists and do not impact the structural integrity of the floor.

Place the pedestal in position and check that with the waste chute centre lines up and there is adequate clearance of the pedestal to walls.

Position and Fix Vent Connectors

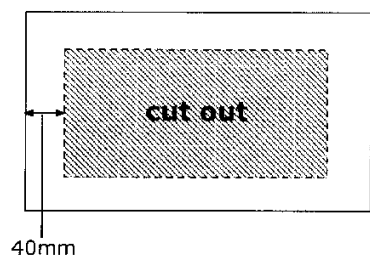
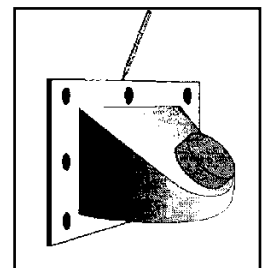
DO THIS BEFORE FIXING THE WASTE CHUTES

Determine the position for the vent connectors and fix them to the Rota-Loo.

The air Inlet (cut for 100mm) should be located approx. 200mm from the bottom.

The air Outlet (cut for 150mm) has to be located diagonally opposite the inlet pipe, approx. 550mm from the bottom.

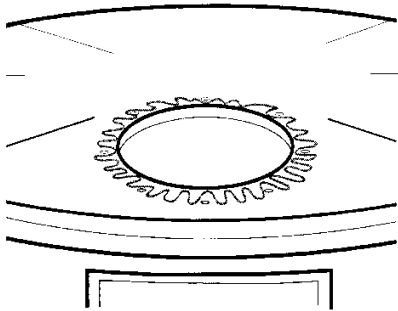
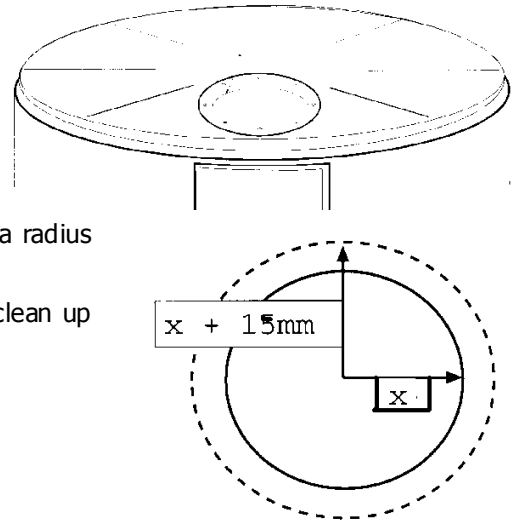
- Place the connector on the side of the Maxi where it is to be fixed.
- Scribe around the connector.
- Remove the connector and inscribe a line 40mm inside your marked line.
- With a jigsaw cut out the inner area.
- Liberally apply sealant and attach the connector to the Maxi. Drill pilot holes and fix with the stainless steel self tapping screws provided.



Fit Waste Chutes to Rota-Loo

NB - Never cut the chute holes in the top of the Rota-Loo before you cut the holes in the floor.

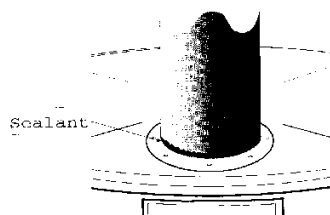
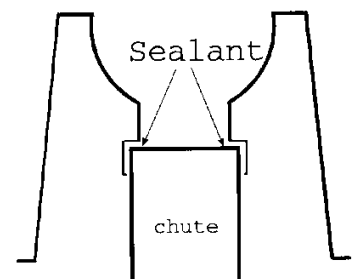
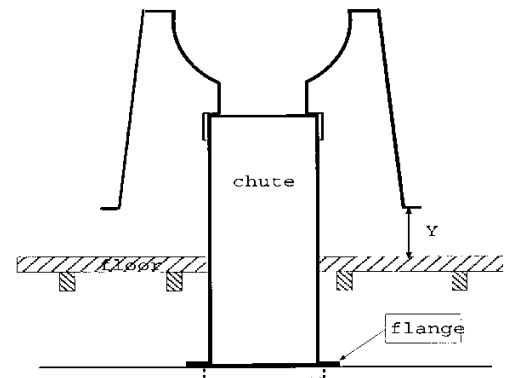
- Using the centre point determined by the plumb bob, or by inserting the waste chute through the floor, locate the Waste Chute Adaptor in position on the Maxi RL2000 lid directly under the chute
- Scribe the size of the internal hole in the Waste Chute Flange
- Remove the flange and scribe a second circle that has a radius 15mm larger than the first.
- Cut out around the larger circle ($x+15\text{mm}$ radius) and clean up around the hole.
- Liberally apply sealant around the edge of the hole



Spread sealant on flange

TIP we have found that Silkaflex 15 LM is the best for sealing polyethylene to polyethylene

- Place the flange in the hole. Drill pilot holes and fasten in place with the stainless steel self tapping screws provided. Check that the Waste Chute fits vertically through the floor before finally sealing and screwing.
- Place the Waste Chute in position and place the toilet pedestal onto the Waste Chute. Measure the distance Y (height of Pedestal above floor).
- Remove the Waste Chute and cut off the measured distance from the length of the Waste Chute. NB - one end of the Chute has a socket, which is provided for when more than one Chute are joined together - this end should be cut off so the final Chute is smooth and straight.
- Replace the waste chute. Seal with sealant the inside pedestal lip, where the waste chute meets the pedestal. Fix the pedestal to the floor.



Fixing Vent Pipes

NOTE:

- the vent pipes are not supplied with the kit as each installation will be unique. All connections are designed to fit standard 100 and 150 DWV PVC pipe.
- Keep bends in vent pipes to 45 degree - 90 degree bends are too sharp and slow the airflow unnecessarily.

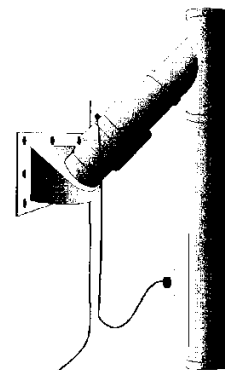
As far as possible try to keep the vent pipe at direct run between the fan and the vent cap or wind turbine.

INLET PIPE (100mm DWV)

- From the connector run the air intake pipe to wherever there is a source of warm air. This might be at the northern side of the building or from a Soltran module (the warmer the better). Do Not fit a vertical pipe from the roof space to the air intake. This may over load the fan and cause equalisation of the air flow and cause internal odour.
- A 100mm filter cap is provided in the kit - this is to go on the inlet pipe to prevent insects entering the Rota-Loo.

OUTLET PIPE (150mm DWV)

- The Fan housing will be fitted directly after the connector at the 45° of the outlet connector.
 - Fit 150 DWV pipe over the housing spigots, seal with Sikaflex and screw through using the stainless steel screws provided
 - Take care to ensure the fan is installed in the correct flow direction. This should be marked on the housing and can also be found as an arrow on the side of the fan itself.
 - Connect the fan to an appropriate power source. It is designed run at all times.
- It is advisable to fit a drain after the fan to divert any condensate away from the fan and Rota-Loo. Fit a Y-junction and continue the vent pipe down to the floor (drawing to right). This will support the fan motor assembly and act as a condensation collector. Fit a 20mm drain outlet.
- Make sure the vent outlet is at least 600mm above the ridge line of your roof, so that you don't experience down drafts. Trees close to the vent cap can also cause down draft problems even though the vent pipe may be well above the ridge line.
- The wind turbine (supplied) has been included to improve the air flow. Don't ever be tempted to substitute it with a conventional insect screen as this could impact on the operation of the vent and turbine.



To Ensure that your installation is Noise Free it is important to make sure that the vent pipe is insulated against causing vibrations to any surface with which it may have contact. Areas that may cause vibration noise are the vent pipe being in contact with floor, walls, joins etc. If "stand off " brackets are used on the outside of the building ensure that foam strip or a similar material is used to absorb any vibration.

Fan Electrical Connection

Mains Powered - 240VAC Fan



A single GPO needs to be installed by an electrician to the relevant electrical standards in close proximity to the fan housing.

The fan is supplied with a lead ready to be plugged into the GPO

Solar Powered - 12VDC Fan (or 24VDC if specified)



The 12VDC fan comes with bared wires ready to connect to the 12V power supply (controller). This must be done in accordance with the instructions of the supplier of the solar power system.

It is important to check the fan rotation to ensure it provides air flow in the correct direction.

Insulation

The outer tank acts to insulate the eight internal composting bins, but in very cold regions additional insulation is beneficial. To aid the composting process wrap the Maxi in fibreglass or Rockwool insulating material. Remember that the warmer you keep your Rota-Loo, the more efficient it will operate. In cooler climates we recommend at least 50mm of insulation

The vent pipe should be insulated where it runs up the outside of the building and in the roof space (not critical in arid regions but important in cold climates) In general, it is preferable to have the vent pipe inside the building, to reduce the possibility of condensation of evaporating liquid. In colder areas to improve efficiency, you may wish to insulate the vent pipe even if it runs inside the toilet room.

Excess Liquid Equipment

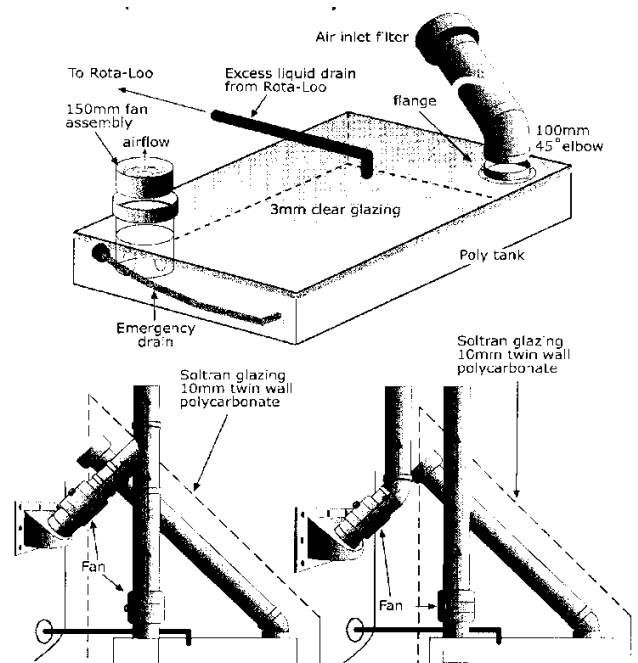
Fit any Excess Liquid equipment required.

EXCESS LIQUID TANK

The Excess Liquid Tank (ELT) comes as a kit which accepts liquids drained from the Rota-Loo via the 40mm pipe outlet provided in the Rota-Loo (either side of door) and has a air vent system similar to the Rota-Loo

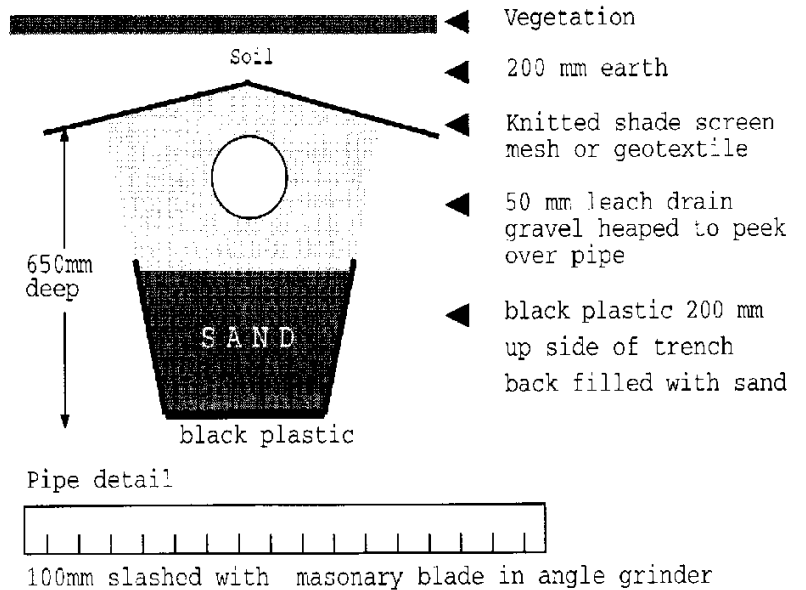
- Install the ELT flat on the ground next to and slightly lower than the Rota-Loo - on the North side under a Soltran enclosure.
- Connect the Rota-Loo to the ELT via 40mm pipe (rigid or flexible)
- Connect the inlet and outlet vent pipes, fan housing and turbo vent using the same principles as those for the Rota-Loo

Ensure an emergency drain is fitted to ensure liquid cannot reach the fan



ABSORPTION TRENCH

A simple absorption trench may be suitable for some installations (see below). The trench must have a capacity of at least 95 litres. Connection to the trench is facilitated via the 40mm pipe fitting fitted into your Maxi at the front next to the entry hatch. There are left and right 40 mm pipe fittings on the Rota-Loo.



Final Checks and Start Up

- Check that the turntable rotates freely
- Place the geotextile filters as supplied in position in the bottom of each bin.
- Replace the bins and door and position Bin No.1 under the pedestal
- Check the fan operates when turned on.
- Fit stickers ("please close the seat") and wall signs provided to encourage proper use of the Rota-Loo.

The RL2000 Maxi has 8 bins - 2 sets marked 1-4.

With 2 pedestals in use, the bins should be used in sequences of 1&1, 2&2, 3&3, 4&4.

We recommend leaving the Rota-Loo for 24 hours to allow the Sikaflex to fully cure before use.

Mushroom or good garden compost can be used as a start-up accelerator. A shovel full in each bin is all that is required. See the Operations Manual

**IF YOU HAVE ANY DOUBTS OR QUERIES ABOUT YOUR INSTALLATION OR MAINTENANCE
PLEASE CONTACT YOUR SUPPLIER OR Kiel Industries Pty Ltd**

APPENDIX

CHECKLIST

A copy of our Batch Release/Packing List will be attached to the Rota-Loo. Please check that all the products you ordered have arrived. If any items are missing or any items damaged please contact the supplier or Kiel Industries immediately.

Claims for shortages or damages must be made within seven days of receipt of goods.

NON COMPLYING COMPONENTARY WILL INVALIDATE YOUR WARRANTY.

Kit Parts List

Part	Description	Qty
1	RL2000 Chamber	1
2	RL2000 Turntable	1
3	RL2000 Access Door	1
4	RL2000 Lid	1
5	Waste Chute Adaptor	2
6	RL2000 Bin (Bucket)	8
7	RL2000 Filter Pack of 8 filters	1
8	Air Inlet Filter	1
9	Inlet Pod (100mm pipe size)	1
10	Outlet Pod (150mm pipe size)	1
11	Fan Housing and Fan	1
12	Waste Chute	2
13	Wind Turbine Sewer Vent	1
14	Bin Trolley	1
15	1L Bottle Biostimulant	1
16	RL2000 Document Pack	1



Options any optional items ordered will be shown on the Batch Release/Packing List

Items and Materials not Supplied

Other items needed not supplied with the Rota-Loo kit:

- Sand/crushed rock for level base and water proof board or similar to place the Rota-Loo on.
- PVC piping needed to build the air vent system - 100mm DWV pipe and 45° elbows to suit
- Pipe brackets as required to secure vent piping and PVC Pipe Glue and Priming Fluid
- Sikaflex 221 for sealing the waste chute (silicone tends to go brittle after a time)
- Material to attach the waste chute to flooring joists (hoop iron or similar)
- Power source for the fan

If additional screws are required, use Stainless Steel only - (8g x 20 or 8g x 25 SS304 screws)

Optional Materials

- Insulation for the Rota-Loo and/or vent piping
- Paint for DWV pipe-work (black to absorb heat or coloured for desired finish)