Your Wheelie-Batch Composting Toilet

Manufactured and Available From:
GARRY SCOTT
COMPOST TOILET SYSTEMS
MULLUMBIMBY NSW 2482
Ph/FAX (02) 6684 3468

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Original Design (Patent) and Development by Dr Leonie Crennan and Dr Stewart White of Preferred Options (Asia-Pacific)Pty Ltd, PO Box 243 Lismore NSW 2480

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This manual outlines the main features of the toilet operation and maintenance. Should any queries or problems arise please contact the manufacturer, Compost Toilet Systems.

Introduction

With the Wheelie- batch you have a toilet system that when well managed will be odourless and produce fertiliser for the garden. The Wheelie-Batch is a multi-batch composting toilet, which utilises modified mobile garbage bins as the composting chambers. No water will be consumed, wasted or Poo-luted. Despite the Wheelie-Batch not as yet having the approval of the NSW Health Department, this system has been shown to provide excellent service protecting both environment and health.

The designer, Preferred Options, has made application to the NSW Health Department for approval and submitted documentation and pathology test results. Two installations of this toilet design have been under test since May and August 1993, and the analysis of composted material has shown nil detection of the three pathogens required to be monitored by the Department. The trial of these toilets has been under the supervision of Dr. Leonie Crennan, Dr Stuart White, initially Mark Norris, Environmental Health Officer, Lismore City Council and more recently Tony Kohlenberg, Senior Health Officer, Lismore City Council.

Faeces and urine can be composted into safe humus for garden use. By composting our excrement, valuable nutrients can be safely returned to the soil while protecting human health and the environment. Human excrement is commonly called 'Waste', our excrement is only a 'waste' when it is not simply and safely returned to the soil. Use the words, Human manure or Humanure, Composted Poo or Garden Fertiliser, rather than Human Waste, Wastewater, or Sewage, to describe the material that you will be recycling back to the soil.

The 'flush toilet', traditional 'dunny can', and 'pit toilet' produce 'waste'. This 'waste' is, at best partly treated, and then is disposed into the environment with detrimental affect.

Over the millenniums micro and macro-organisms have evolved along side ourselves that given the right conditions will safely recycle our excrement to the soil. Prior to the humans being civilised (?) (a very short time in evolution time) our excrement as a land dwelling animal was deposited on the ground. Here there was oxygen and usually dead plant material, this with our excrement became the essential diet of the recycler/decomposer organisms. As the human population grew, disease organisms evolved as one of the natural population control mechanisms. Now, like you, I like to think that there are better ways of limiting our population than this particular form of natural control (disease).

Raw excrement does contain disease pathogens which will prosper when conditions are right. These pathogens such as harmful bacteria, viruses, fungi, intestinal parasites and others are destroyed by composting. Destruction is a function of time and heat. Compost that generates high heat requires less time to destroy pathogens and low heat compost a long time. Heat is generated by the microbes that initially inhabit the compost and as material decomposes the low heat organisms take over, finishing the process.

The Basic Principle of the Wheelie-Batch System

The Wheelie-Batch uses the multi batch composting toilet process. The bins aerobic (oxygen) environment where excrement combines with high carbon material (woodshavings) provides the favourable conditions for the safe decomposition of the excrement by a diverse community of microbes. These microbes are not the foul smelling dangerous ones of putrification when excrement is in an anaerobic (non oxygen) such as when in water.

The process in the Wheelie-batch is most like the nutrient recycling process that evolved over the millennlums, while being contained and isolated until safe.

Excrement collects in one bin at a time until it is full, it is then removed from below the toilet pedestal and isolated from contact with humans. A second (or as many as required) bin is brought into service and fills allowing sufficient time for the fallow bin to sit and complete its process. When complete, compost can be used in the garden and the bin can again go back to the active position under the toilet pedestal.

Good Compost/Humanure

- Does not have a foul odour
- Is not unsightly
- Generates heat in the initial stages
- Is not difficult to produce or manage
- Does not breed house flies or vermin
- Is not a health or environmental risk

Basic Requirements for Good Composting of Human Excrement or Humanure

- The addition of high carbon containing organic matter to balance the high nitrogen levels of excrement. The decomposer organisms diet is such and will not prosper without this carbon. With your Wheelie-Batch the addition of a hand full of sawdust or woodshavings is ideal after each visit to the toilet (for both a defecation or urination).
- Keep flies and vermin out, keep caps, screens and lids of bins closed. Flies and other vermin can transmit pathogens to other people, food and household surfaces.
- Allow aeration of compost, vents in bins need to remain clear.
- Moisture, neither too dry or too wet, sawdust/shaving are an ideal addition to compost to dry out an over wet, slushy pile while water may need to be added to the fallow bin should conditions be very dry or fallow time extended.
- Young children should be prevented from having access to compost bins, ingesting or playing in finished compost.

- Addition of kitchen organic scraps together with the same volume of sawdust/woodshavings can be added.

WARNING

- **When handling either fresh or fully composted humanure, normal sanitary procedures need to be followed so hands and implements etc. do not contaminate or provide vectors for pathogens. Gloves and clothing will prevent direct contact. It is important not to inadvertently spill material that may contact oneself or others and so possibly cause illness. All material must go through the composting process to be safe. To ensure safety, even when handling finished compost, introduction of pathogens to the body can be prevented by normal procedures of protecting open wounds and cuts, and washing yourself, especially before eating.**

Organic Material of Balanced Carbon and Nitrogen Content, some Moisture and Oxygen -Essential Ingredients of Good Compost

- Throughout these instructions it is stated that woodshavings are required. These have a high content of the element Carbon which is essential to balance the Nitrogen providing the diet of the microbes we want to prosper in the humanure. Our excrement has a very high level of Nitrogen.
- Woodshavings is generally available free for the asking from, timber yards, woodworkers, and joinerys. Some shavings/dust is from chemically treated timbers, this is not good. You could try using dry mulch, straw, dry leaf/organic matter found under plants or similar.
- The design of the bins and vent system provides for sufficient oxygen and moisture from urine for good composting.

Operation and Maintenance of Your Wheelie- Batch Toilet

Starting a new bin

- Check the area under the raised floor of the bin and the excess liquid drain is clear.
- To the new bin, organic matter of the depth of 200mm must be added to ensure an adequate barrier and absorption of the first excrement deposits.
- The raised floor of the bin is best covered by first coarse material such as straw, long grass or large leaves and then finer material such as woodshavings, leaf mulch or compost to make up the 200mm depth.
- **The addition of active compost from either the general garden compost pile or previous toilet compost helps to activate organic activity in the bin.**
- Check the operation of the fan and remove any build up of spider webs that can constrict air flow in the vent system.
- Secure bin lid and chute, connect flexible vent pipe and liquid drain line.

Using the toilet

- After using the toilet add a cup or handful of woodshavings on top of your excrement and toilet paper. **THIS IS IMPORTANT AND VITAL FOR THE COMPOSTING PROCESS TO HAPPEN.** You can not put too much woodshavings in the toilet, you can put too little.
- The best toilet paper for the job, the compost, your garden and the wider environment is a recycled, unbleached, and uncoloured paper. This is not always available and any toilet paper will very quickly breakdown and work.
- Close the toilet lid immediately after toilet use.
- No cigarettes, rubbish, nappies or sanitary napkins in the toilet.
- Tampons and sanitary pads without plastic if not too numerous can be deposited in toilet.
- The odd bit of plastic or inorganic material will I not impair the compost process.
- **Be aware of the growing level of compost in the bin and change bins before the level reaches the bottom of the chute.** The piling up or blocking with excrement of the chute prevents air flow through the system and will result in odour in the toilet room and poor composting. A large amount of material in the chute will make bin change over difficult and messy.

When the active bin is nearly full

- Check to see if the fallow bin is ready to empty into the garden. It is generally ready when material near the top of this fallow bin has changed in appearance and no longer has an offensive faecal or urine odour.
- For interest you could take a sample of this material to a laboratory to be tested for faecal coliforms, faecal streptococci, and salmonella.
- Should the fallow bin material only be partially composted, a third bin will be required to allow for sufficient composting/fallow time. The number of bins required is dependent on the number of toilet users and climatic conditions. Warm conditions favour composting.

Emptying the fallow bin

- Composted material is required to be buried under at least 75mm of top soil.
- Invert the bin to empty contents.
- Side air ducts can be slide partially out to allow the removal of the bins floor and removal of any material underneath.
- It is unnecessary to wash out bin, in fact it is advantageous that material remain on the interior surfaces providing a culture to assist the composting process when this bin returns to the active the position.

Changing the active bin

- Add woodshavings to the toilet to cover fresh material at top of bin.
- From the toilet room raise pedestal and chute sufficiently to clear bin. Pedestal will in some case where chute is long stay put in the raised position. In other cases chock pedestal block of wood or similar.
- Unscrew and remove flexible vent pipe.
- There will be a pool of liquid inside the bin level with the outlet pipe. Tip bin slightly backwards and chock with a small block, before disconnecting outlet. The tipping raises the outlet above the liquid level preventing liquid escape.
- Block off the liquid outlet with the blocked fitting from the fallow bin.

- Transfer the screw on insect screen from the fallow bin to the lower vent outlet (previously connected to the flexible vent pipe.
- Unclip shock cord and remove fibreglass cowling, close bin lid and secure.
- Wheel the bin to a location where any odour emanating from the bin does not cause nuisance. The bin should be located away from childrens play areas.
- **It is important any washing water not contaminate other water, or contact directly or indirectly humans.**

Your Wheelie Operation and Maintenance of Vent System

- The 12 volt DC fan provided can without harm run at any DC voltage under 12 volts. This enables it's speed and so air flow to be regulated. The vent system provides oxygen for composting and most importantly removes odours. Fan speed should be such to adequately prevent any odours entering the toilet room. There should be a constant down draft in the toilet pedestal. This can be checked by smoke testing using incense, a cigarette, extinguished candle or similar. The switch on the 240volt transformer provided enables fan speed setting. Minimise the fan speed to reduce noise while still providing sufficient odour removal. For solar powered installations there are a number of ways to regulate fan speed. Please contact me for this information
- The vent pipe needs to be high enough to allow odours to mix with free flowing air above the building. The aerodynamics of the building, vegetation and landscape need to be considered.
- Check and remove constrictions such as spider webs from vent stack, fan and flexible ducting.

Trouble shooting

- Blocking of drain can occur when too much material has fallen through bin grate. This material could be removed through the vent opening and the garden hose used to unblock the drain pipe.
- Odour apparent outside the house
  - This is usually occurs when there is insufficient mixing of toilet gases with the free flowing air above the roof. Vent pipe must then be increased in length or relocated.
- Odour in toilet room
  - check that fan is operating, vent pipes are clear, bin is not full, and sufficient wood shaving have been added.
  - In case of power or fan failure sealing of the toilet pedestal with 'Glad Wrap' over the pedestal between uses is a short term solution.
- Soggy or Foul Smelling Compost
  - Add more woodshavings or sawdust and allow more time for process.
  - aerate and loosen pile with garden fork or stake.
- Flies in Toilet
  - Although a gap exists under the toilet seat the lack of odour when fan is at sufficient speed should not attract flies.
  - Add extra wood shavings.
  - Insect spray of low toxicity can be used sparingly.
  - A light trap can be added to the system. This simple device can be obtained from the manufacturer.
- Maggots in Compost
  - It is frequent to have a large compost fly inhabit compost. This fly/pupae/maggot (it goes through these 3 stages) is 2 cm plus in length, very much longer than a common house fly. This maggot does an excellent job of breaking down fresh material and the flies tend not to come in the house, crawl on our food, bodies or faces. Despite large numbers of these maggots, often very few make it through to the fly stage. As long as these flies are not exiting the toilet, these maggots could be left to do their work without fear. House flies/pupae/maggots should be prevented.

Further Information

Please feel free to contact me, Garry Scott at Compost Toilet Systems ph (066) 843468.

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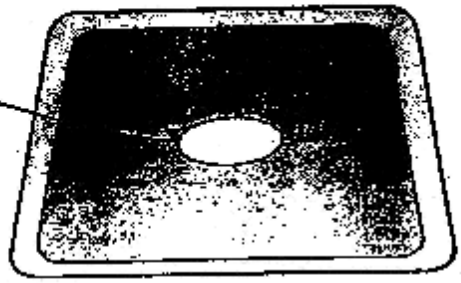
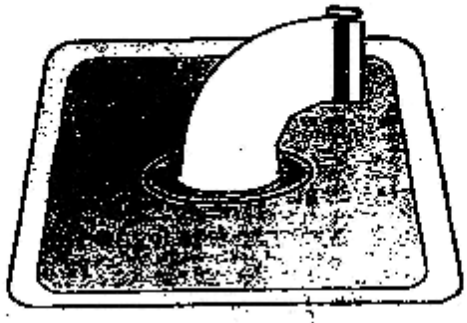
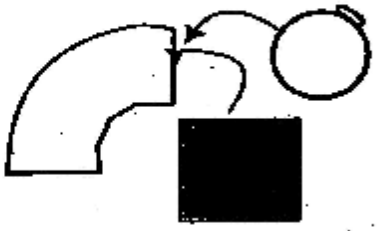
Flange (x2) for 90mm pipe.
Drill 3 holes.





In Wheelie Bin lid, cut 90mm hole
Attach flange with stainless bolts,
clip on 90° elbow
Attach flyscreen with hose clamp



Flyscreen, doubled over

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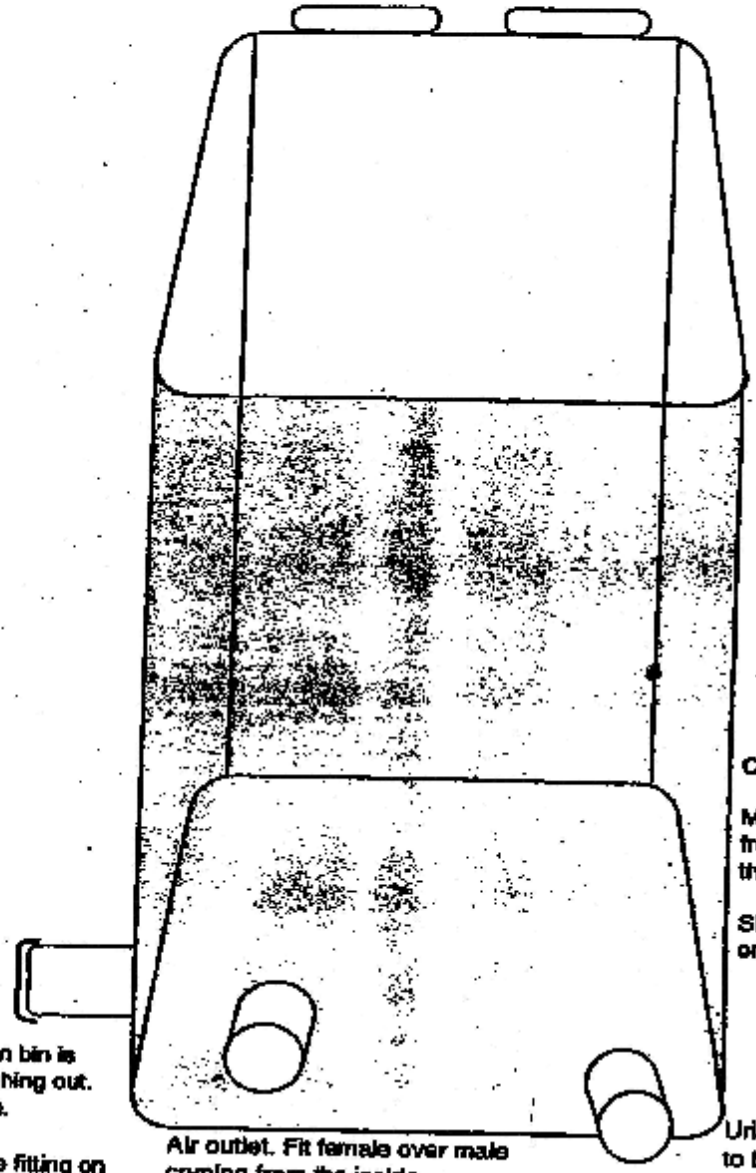


The three outlet
be placed wherever
convenient - sides, fr
The main princi
- one is for urine, so h
be as low to the floor
possible,
- one is for air, so mus
below grate level, but
floor,
- and the third is for flu
out when finished, so
beanywhere below gra

Cut three 50mm holes.

Male 50mm sections - ins
from the insideof the
three holes.

Shortened male section go
on inside of urine outlet.

Used when bin is
full for flushing out.
the bottom.

The female fitting on
side needs to be able
o accept 50mm cap.
I sited it near the
ottom-70mm from
ery bottom edge,
nd 200 from side).

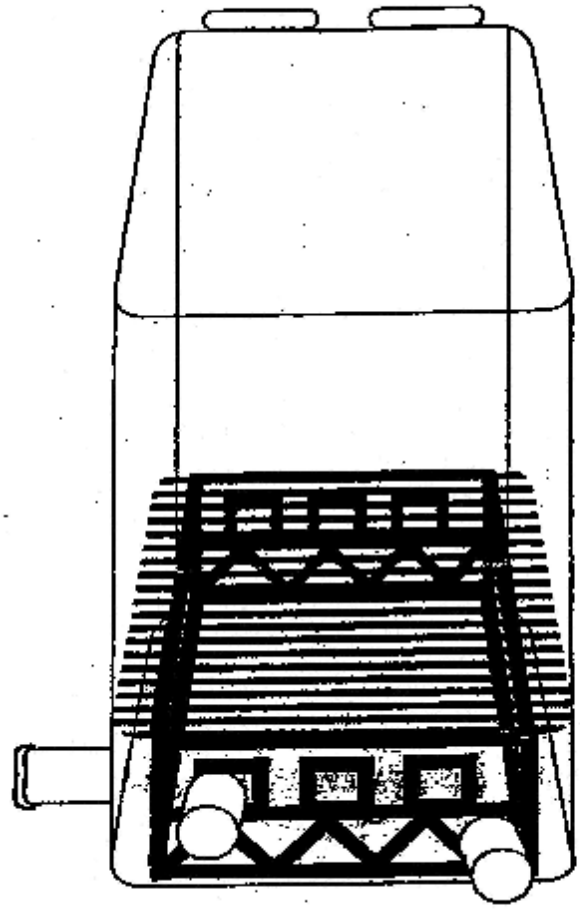
Air outlet. Fit female over male
coming from the inside.

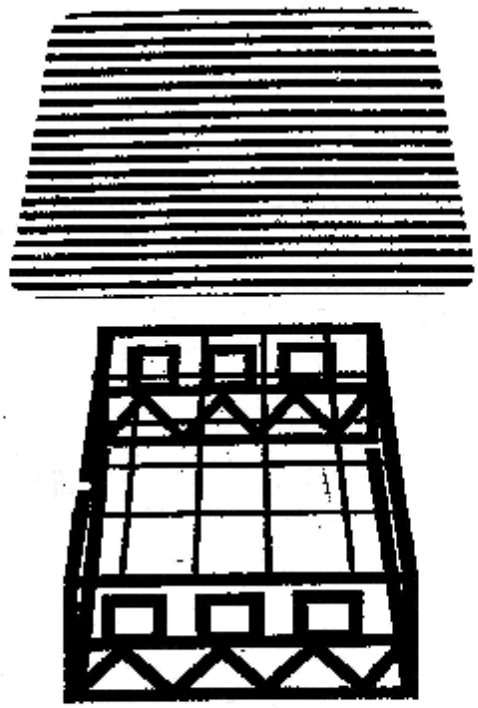
Flyscreen (folded double/triple) will
go over this, attached with worm
clamp)
(I sited it at 140mm in from side
edge, 140mm from very bottom
edge of bin)

Urine outlet, female fitting n
to be able to accept 50mm
inserted later. Make as clos
floor of bin as possible

(I sited it at 6ml from very bo
edgeof bin, 80mm from vert
edge)

Compost Toilet Page 4





Place cut off milk crate on floor, then put gal grate on top

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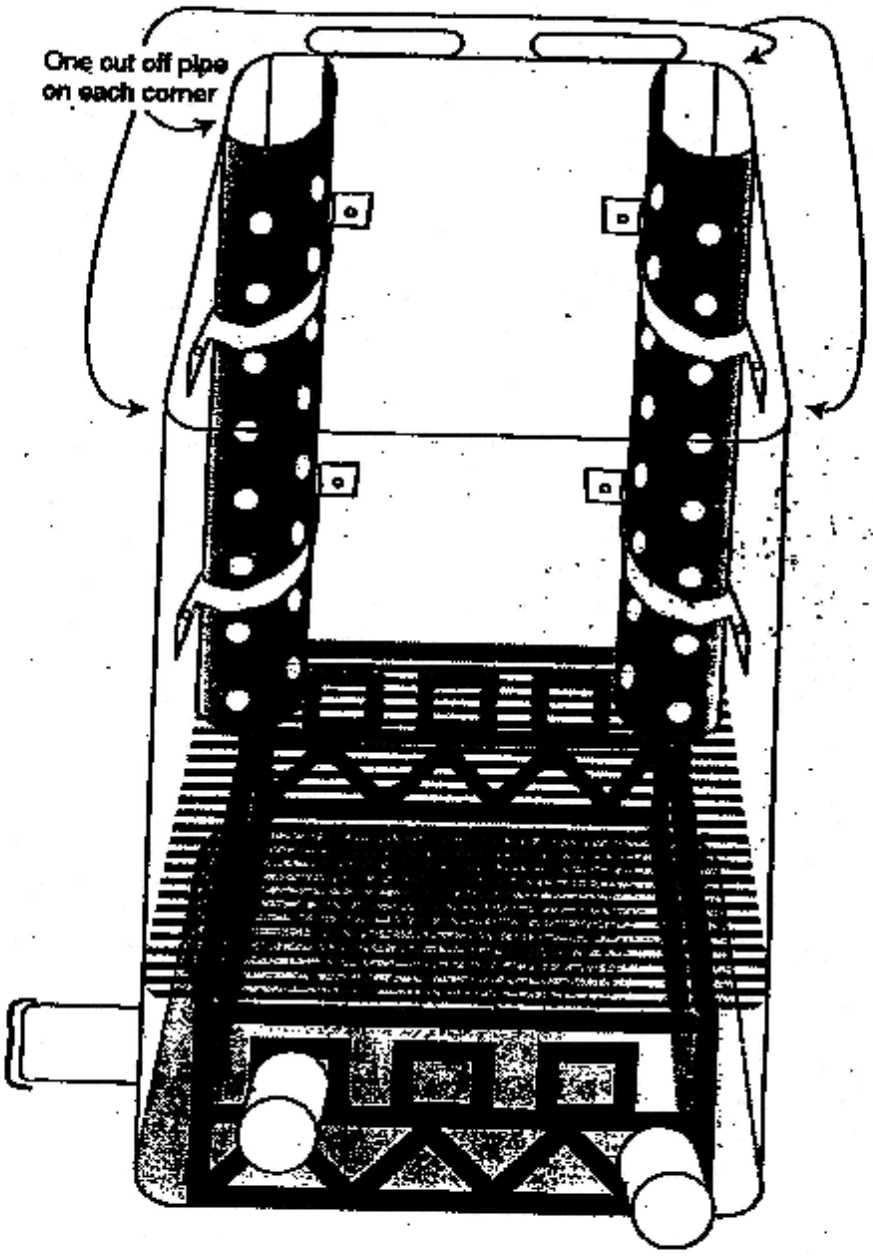
Attach 4 cut sections of 100ml pipe to corners, using stainless stripsand stainless bolts.



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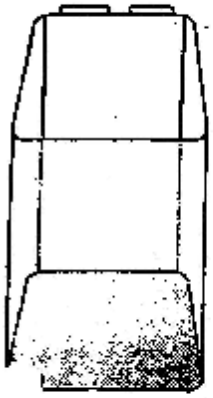
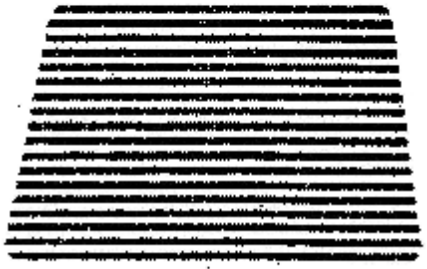
Compost Toilet Page1

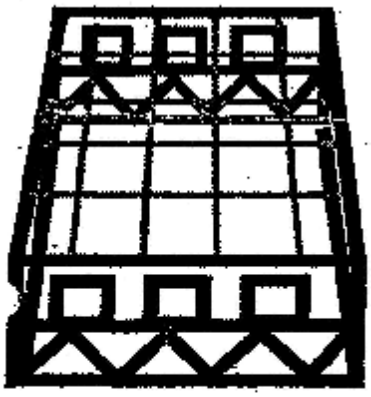


Start with Wheelie Bin
Need two of these

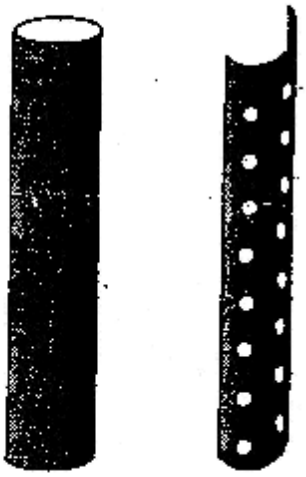


Get B & D Grate(x2), 12/16 Raised
They cut to 465 x 515
Then you cut to template

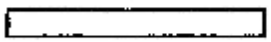
Cut back male end of one 50mm joiner (x2) so that only 5mm protrudes this will be the inside of urine outlet



Milk Crate(x2)
Cut 105ml off the bottom

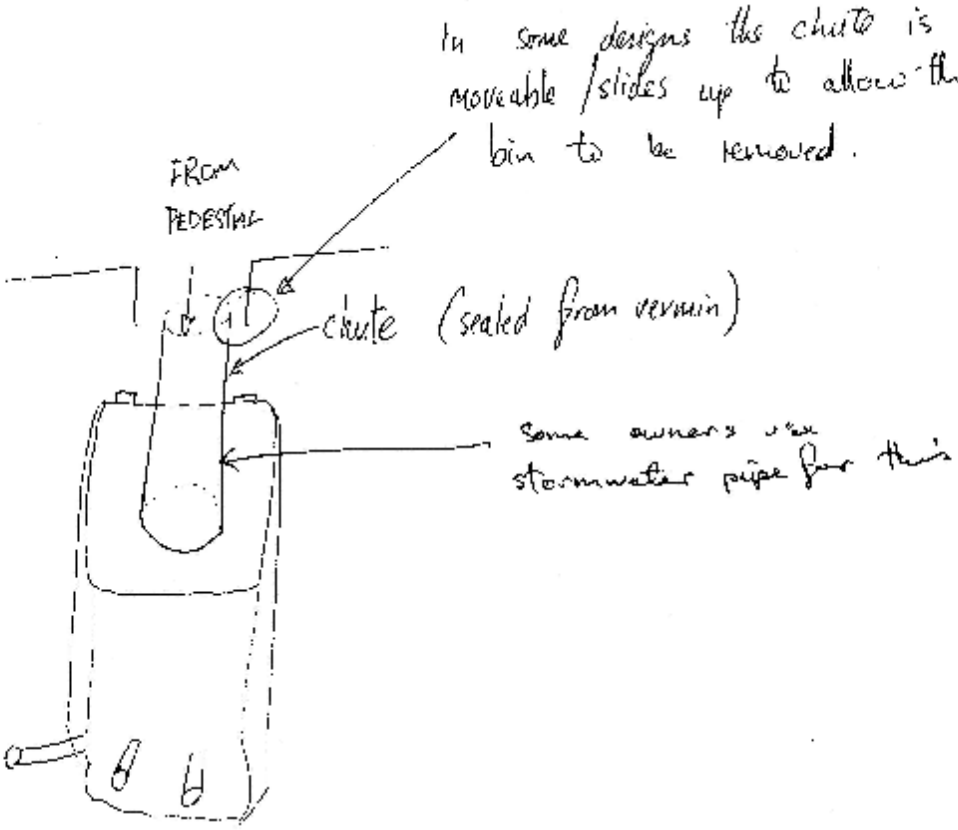


100ml stormwater pipe 3mtotal langt
Cut into 750mm sections (4), then cut in half longways (giving 8 pieces)
Next drill holes, 100mm vertically spaced, 50mm between holes horizontally



3.6 metres stainless steel strip, 25mm wide, 1mm thick. Cut into 16 strips. Bend as shown, drill holes (3/16)

.....or (untried) you may be able to use strong plastic strips, cut out in a similar fashion, would need to be very strong plastic



Some designs use a chute on the lid of the wheelie bin. When the bin is replaced the lid with the 90° angle is fitted & the bin placed in the sun to heat up. Please prevent rain from entering