

Building the EcoWaters Twin-Bin with Net Composting Toilet System



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Ecowaters Projects



**Ecological Wastewater
Transformation System**

Building the Ecowaters Twin-Bin with Net Composting Toilet System

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Check Your Plumbing and Environmental Health Codes

Before installing your composting toilet, consult your local plumbing and environmental health codes to determine if any particular guidelines are applicable. The information contained herein is for informational purposes only and might not conform to your local laws. Ecowaters Projects shall not be liable for your use of this information.

Check your state's requirements for graywater irrigation and the 1994 Uniform Plumbing Code, Appendix G. Your local library will have a copy of the Uniform Plumbing Code (UPC) published by the International Association of Plumbing and Mechanical Officials (IAPMO), 2001 Walnut Drive South, Walnut, CA 91789 (Phone: 1-917-989-2825). This excellent reference book is a wealth of valuable information, specifications, and drawings for effective and safe plumbing practices.

If in doubt, have your plan checked by a licensed plumbing installer. You might also consider having a licensed installer or plumber install your composting toilet system.

But first, read the entire guide to decide whether that is your preference.

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EcoWaters Twin-Bin with Net CTS

c/o EcoWaters Projects

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Building the EcoWaters Twin-Bin Composting Toilet System

Sales of this guide help support Ecowaters Projects, which conducts tours and workshops and publishes plans and publications to inform the public about ecological approaches to managing and using wastewater.

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Building the Ecowaters Twin-Bin with Net Composting Toilet System

The Ecowaters Composting Toilet System is designed to compost (aerobically decompose) excrement and toilet paper. The final product removed from the system resembles rich earth, and can be used as fertilizer on nonedible plants.

David Del Porto, one of the authors, designed the Ecowaters Twin-Bin Net Composting Toilet System for a Greenpeace initiative in the Pacific Islands. The system uses a heavy-gauge fishing net suspended by hooks from the sides of each bin. The net is inexpensive and nonbiodegradable. It flexes as the mass changes shape — creating more surface area to improve diffusion of oxygen through the composting material.

The Twin-Bin Net Composting Toilet System has been successfully introduced in the Micronesian islands and Fiji in projects sponsored by Greenpeace, island medical schools, and government agencies. In Pohpei, Fiji, the design has been duplicated by islanders, and the public utility assists in some installations. Some systems have been coupled with evapotranspiration beds to handle leachate and graywater from washing facilities. These systems were working well when visited years after their installation.

Note: A composting toilet system is a mini-wastewater treatment plant. Construct it well, buy the best materials you can, and do not make design shortcuts; this system has been designed based on the successes and failures of several other systems. Take the time to do it right, because you will not enjoy the results of a composting toilet that was not designed well.

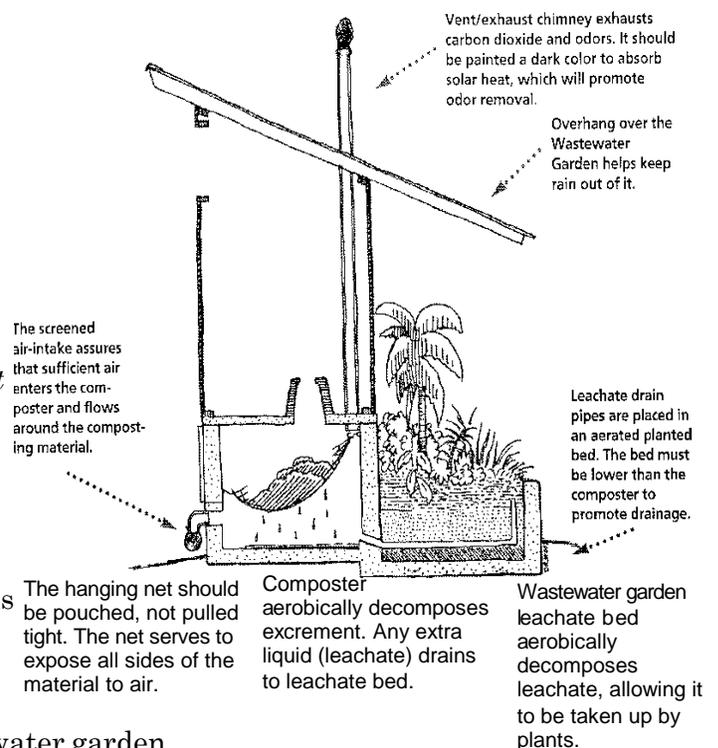
A Leachate Bed (Optional)

Leachate (unevaporated urine) is the bane of many composters, because it drowns the aerobic bacteria that do the main work of turning the excrement into humus. If there is too much leachate, the result will be odors and incomplete processing.

If you are building a composting toilet, it is best to position yourself for success by building the leachate bed. In researching *The Composting Toilet System Book*,¹ we both visited and heard reports of hundreds of “composting toilets” that had gone bad due to excessive liquid from urine.

What to Plant

Choose very thirsty salt-loving plants. (Salt cedar is a good one.) Often these plants are large and have broad leaves. Or, choose reeds and grasses known for requiring a lot of water and nutrients. Valuable plants, such as bamboo, can be planted in a wastewater garden leachate bed. However, do not plant edible root crops in the leachate bed.



¹ Del Porto, David, and Carol Steinfeld. *The Composting Toilet System Book*, Ecowaters Projects, Concord, MA, 2000

Whether to Line the Leachate Bed

It is usually best to contain the leachate bed in a concrete trench or a polyethylene-lined trench, as the leachate could otherwise run unprocessed into ground water. However, in areas where there is good soil drainage and no proximity to water, you can safely install the leachate bed directly in the ground.

Caring for the Leachate Bed

If the system is contained, be sure to put a roof overhang on it to keep out rainwater that could flood it. The best roofing is clear lexan. Be sure the system still gets sun. You might have to water it, if it looks dry.

Urine Diversion (Optional)

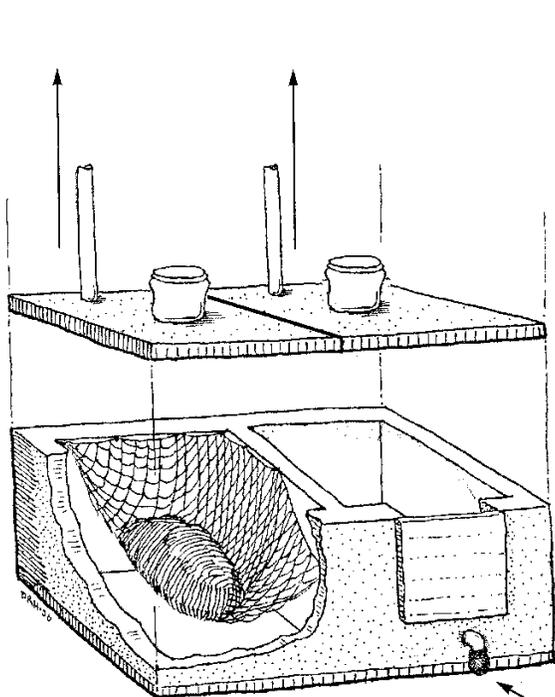
Another way to expand the capacity of the composting toilet system and to keep it from filling with leachate is to divert urine.

Urine can be diverted with a special toilet and men's urinal to either a contained rock-filled trench or to the wastewater garden. A good idea is to mix sink water with urine to irrigate the wastewater garden. Or, collect urine in a container and mix it with washwater to irrigate plants elsewhere. Urine is usually sterile, and it contains most of the nutrients found in excrement.

For more information on urine diversion and utilization, see *The Composting Toilet System Book*.

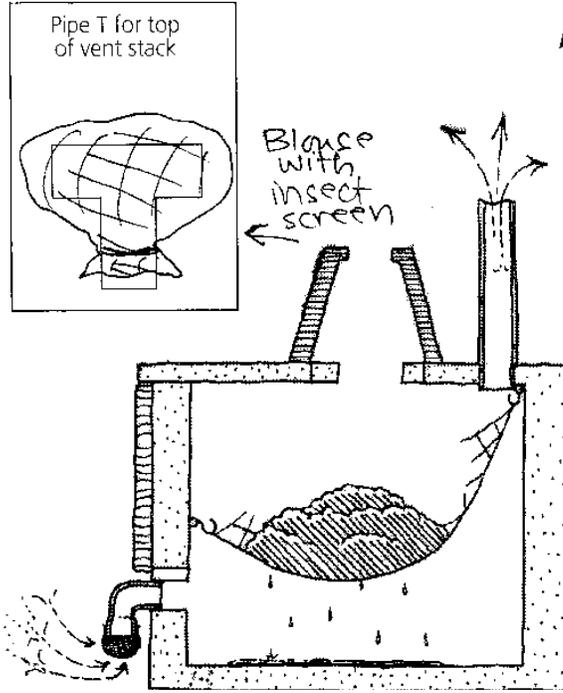


A commercially available urine diverting toilet stool



Air-intake is screened to keep out flies

The hanging net should be pouched, not pulled tight. The net serves to expose all sides of the material to air.



Air comes in through the air intake and out through the exhaust chimney, which should be kept as warm as possible (painted black and exposed to the sun) to promote chimney effect.

Concrete

Provide 1:2:4 mix (cement, sand, coarse aggregate). Mix with clean fresh water, in an amount to produce a fairly stiff, yet workable consistency. Mix sand and cement, add water then add aggregate for greatest strength. Note: Too much water produces weak concrete.

Poured-in-Place Base Slab

Prepare ground by grading to a smooth surface. Build a form on the perimeter to control dimensions. Place support reinforcing mesh. Provide a smooth, steel float finish, except where block walls will sit which should be fairly rough. Press in vertical wall reinforcing rods when concrete achieves a plastic consistency.

Cast-on-Site Floor Slabs (2)

In a convenient place, prepare a smooth ground surface. Place a plastic sheet smoothly over the ground so two floor slabs can be easily lifted. Form the perimeter to control dimensions. See Floor Slabs Drawing, page 18. Form the openings for waste chutes and vent pipes.

Caution: Do not use saltwater or salty beach sand for your concrete. It will make weak concrete. Dust-free beach sand that is far from the beach may be fine. Taste it.

Remember, mixing cement by hand is hard work, so rotate the mixing folks so as not to exhaust your team. Sand and gravel must be sifted before being brought to the mixing site. Have enough buckets to carry the cement to the folks making the slab and to those laying up the blocks.

Rinse the buckets and tools frequently during construction and at the end of each day to prevent concrete building up on the surfaces. For this, you can use saltwater if fresh water had to be carried for the concrete and mortar mix. Always mix the dry components before adding the water. Although it's easier to mix watery concrete, it will be weak when cured, so do not add too much water. Use the exact formula on the bag of cement or use a "Slump Test" if no recipe is on the cement bag.

Mortar

Use one part cement to three parts sand. Mix with clean water to a smooth, workable texture.

Concrete Block

Standard, cored locally made block is assumed, with dimensions of 8 in. x 8 in. x 16 in. Mortar joints completely, and strike slightly concave with a jointing tool. Fill cores completely with mortar where reinforcing rods occur. Provide top surface of all walls with a mortar wash suitable to receive next level of construction.

Waterproofing the Wastewater Garden

Coat the interior of the wastewater garden with marine resin, Dow-Corning "Block-Bond" or equal.

Metal Components

All metal components are to be cleaned by immersion in a strong detergent solution, flushed thoroughly with water, dried, and then completely coated with marine resin.

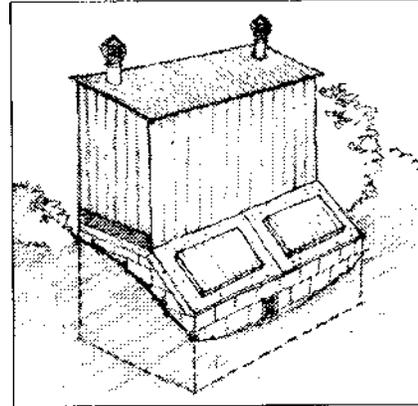
- Threaded rod with nuts and washers. (See Materials List, page 16.)
- 1/2 in. #4 concrete reinforcing bars.
- 6/6#4 or #6 concrete reinforcing wire mesh (wwm).

Coat all exposed metals with marine resin before assembly, and after assembly, as appropriate.

Corrugated metal siding and roofing: Can be galvanized steel or aluminum, as available. All cuts to be smoothed. Prime and paint. Use nails and/or screws compatible with the corrugated metal used.



A Twin-Bin with Net Composting Toilet structure for public use in Fiji



The composting toilet system can be dug into the ground. However, this should be done only where flood waters and groundwater are unlikely to flood the composter. Also, in warm climates, this makes the composter cooler than out-door temperatures, which slows the processing and creates an inviting place for insects and rodents.

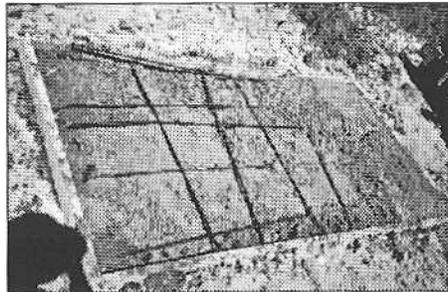
How to Build the Twin-Bin Net Composting Toilet System

Note: This procedure does not include the superstructure or stairs.

Make sure that all raw materials, necessary tools, and miscellaneous materials like gloves and buckets are on site and not in some store in town!

If you are working with a group of people, here are some tasks to do while the base slab and composters bins are being built by others:

- Get sand and gravel ready.
- Get plants for optional wastewater garden.
- Mix cement.
- Make S-hooks and coat them with fiberglass resin to prevent corrosion. These are hard to retrofit if they rust off. See Step 5: Make the S-Hooks, page 8.



Packing the base slab with cement and laying rebar reinforcement.



- Make the removal doors. See
- Step 7: Making the Doors, page 9

Make the concrete toilet lid and the wooden toilet lid/seat (with hinges or a handle). Note: Either make or purchase manufactured toilet seats and lids for use with the composting toilet. Beware, however, that they might get stolen from remote public facilities.

- Saw a round wooden toilet lid, if you make your own, and paint it. Paint “Close when not in use” in the local language on the wooden toilet lid.
- Saw off bottoms of 5-gallon buckets and make sure they are smooth inside.
- Attach fly screen to the air intakes and tops of vent/exhaust pipes.
- Paint tops of vent/exhaust pipes black.
- Attach pipe Ts or other rainhat on top of vent/exhaust pipes.

- Cut wood and gather materials for the superstructure.

While the superstructure is being built, make stairs (if required) out of concrete, stone, or wood, perforate pipes for wastewater garden (if using one).

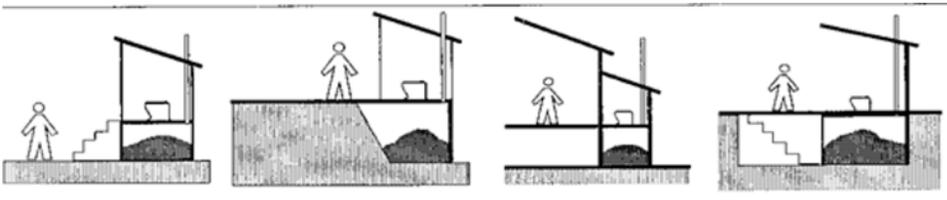
Note: An easy way to create a superstructure is to wrap a woven mat around a frame and use a palm-leaf roof.

Step 1: Select a Site

Consider:

- The ease of accessing the removal doors.
- Maximum sun exposure for the composter (base of the unit) and the vent/exhaust chimneys.
- The wind direction so that people do not smell odors.
- Cultural issues. For example, many cultures consider having a toilet inside the house to be barbaric; women may appreciate a toilet that is distant so they can have privacy; school toilets should not be too far away from the school; entrance to the toilet should be somewhat private; some cultures separate men's and women's facilities.

An ideal site for this system is a two-level site with a small drop-off/elevation which allows the superstructure to be entered from one level and the composter to be emptied from the back. The advantage is that no stairs will be needed.



Siting options. Note the advantage of choosing a site with two levels.

Step 2: Prepare the Site

1. Clear vegetation and rocks.
2. Excavate/level the site to make a level base. (Dig into the hill/elevation if you have a two-level site.)

Step 3: Check the Size of the Base

Place the first level of blocks around the perimeter (leaving 3/8 in. for mortar space), so you can double-check the size of the unit and the base slab needed. **Note:** The size of concrete block can vary from place to place, so the measurements in these plans might not apply to your installation. Adjust your forms accordingly. See Base Slab Drawing, page 17.

Step 4: Make the Base Slab

Note: Make the toilet-room floor slabs as early in the process as you can, as these need at least eight days to cure. These will hold weight, so you want them to be as cured as possible when you are ready to place them.

1. Make the forms for the base slab for the composter and optional wastewater garden by simply placing a frame on the ground.
2. Put down reinforcing wire mesh or rebar.

3. Fill with rocky cement.

Step 5: Make the S-Hooks

To make S-hooks, use a hammer or bending jig to make two set of six to nine S-hooks. You need one set for each composting chamber. Clean them with detergent, and rinse and dry. Coat them with resin coating to prevent rusting. See Hook Detail Drawing, page 26.

Step 6: Make the Floor Slab

To make the floor slabs, see Floor Slabs Drawing, page 18.

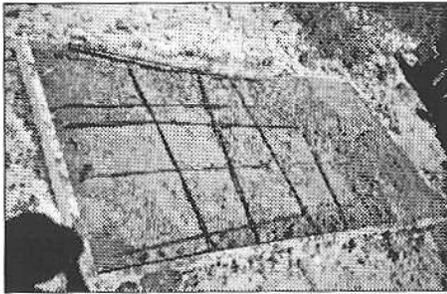
1. Make the wooden forms for the toilet-room floor.
2. Measure out and mark the locations of the toilet riser openings and the vent pipe. Line the form with plastic (to prevent the concrete sticking to the form).
3. For the toilet openings and risers, insert upside-down 5-gallon buckets with their bottoms cut off evenly. Or if you are using another type of riser to be added later, simply insert a segment of pipe to create the opening.
4. For the vent/exhaust pipe, place sawed off segments of pipe.
5. Reinforce the floor with wire mesh (chicken wire is not strong enough), placing it around the toilet openings. Fill with cement.

Optional: For super-stability, bend down pieces of rebar through the form. These can be inserted into the block at the corners of the composter bins, about 2 in. from each edge. These will insert into the corner blocks of the composter walls.

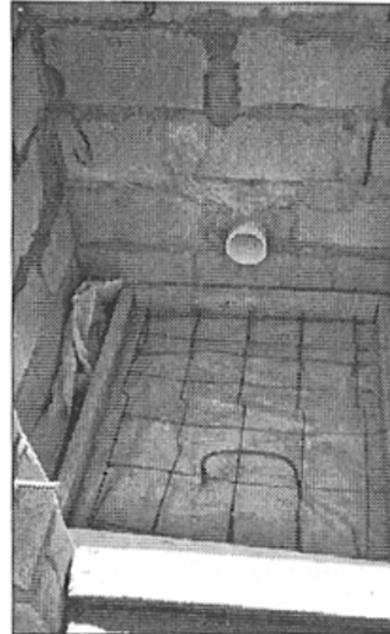
If you are using pour-flush toilet molds that also serve as floor slabs, pour them now.

Important: The toilet floor is a good place to write special instructions, such as NO TRASH, NO SMOKING, and REPLACE LID AFTER USE. You can also write “Ecological Toilet” or “Composting Toilet” so that users understand and respect the system. Ideally, you can inscribe the general maintenance instructions for the system.

- To secure the optional superstructure, add rebar or threaded studs for attaching the frame of the superstructure.



Packing the base slab with cement and laying rebar reinforcement.



The floor of the compostor serves as a level place in which to set the door.

Step 7: Making the Doors

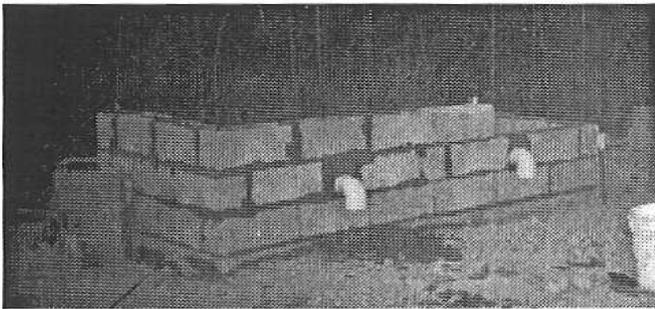
Make forms for the doors. Reinforce with wire mesh. Add rebar handles. (This could also be done by another work team as the walls of the compostor are being built.)

Note: The doors can be made of wood coated with waterproofing.

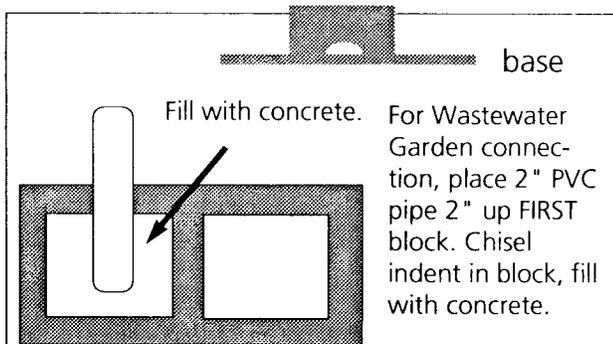
Step 8: Construct the Composter

To construct the compostor bins, see Wall Drawings, pages 20, 21, 22, 23, and 24.

- Construct the concrete block walls, placing 3/8 in. of concrete between blocks.
- Place the lengths of rebar in every other hole in the concrete blocks.
For a super-strong unit, pack the openings of the concrete blocks with concrete. (The more rebar and concrete, the stronger the unit.)
- Place the air-intake pipes at the second layer of blocks,. These face downward to avoid collecting rain. Pack around them with cement.
- Place the S-hooks at the second to last layer of blocks. To secure them in place, chip out a small indentation (about 1/2 in.) in the concrete block for each one, place the hooks, and then mortar them.



Remember to set the air intakes.



Step 9: Finish the Base Slab

1. Skim coat with mortar the outside of the composteer and wastewater garden. Use a concrete mix without the aggregate.
2. Mold a sill at the bottom of the removal openings to help support the doors.
3. When the concrete is dry, apply resin/waterproofing coatings to the inside of the composteer.

Step 10: Add the Floor Slabs

1. Place 2 in. of mortar on top of the concrete block walls.
2. Set in place the toilet room floor slabs. This can require at least four strong people. Make a ramp with two planks from the ground to the top of the unit to help support some weight and lower the chance of breakage.
3. Seal the cracks between the slabs and the base.

Stand back and admire your handiwork! (This is always a very satisfying moment, especially if you've mixed your cement by hand in hot weather.)

Step 11: Make the Toilet Stool Risers

See Floor Slab Elevation Drawing, page 19.

1. To make the toilet stool risers, choose one of the following two methods:
 - **Method 1:** Build concrete around the buckets, adding small rocks at the base for stability. The layer of concrete around the bucket should be 3 in. to 4 in. thick; flare the base of the

concrete. You should let an initial layer of concrete dry overnight before adding the finishing layer, so the weight of the cement does not continually sag.

- **Method 2:** Find a container that is wider than the bucket used for the toilet riser form. Cut off the bottom and place that over the toilet riser bucket. You now have a form into which you can pour cement and rocks. Note: Line the inside of the outer container with mold release, such as motor oil. (Or, you could leave the plastic container in place.)

2. Make screw holes on the back rim of the toilet riser for fastening the lid onto it.
3. Make your toilet lid. Cut off the top 6 in. of a drywall or 5-gallon bucket. Place this on a flat surface and pack cement into it.

Nice Feature: Nail a wooden block onto the wall in back of the seat that encourages the toilet lid to close.

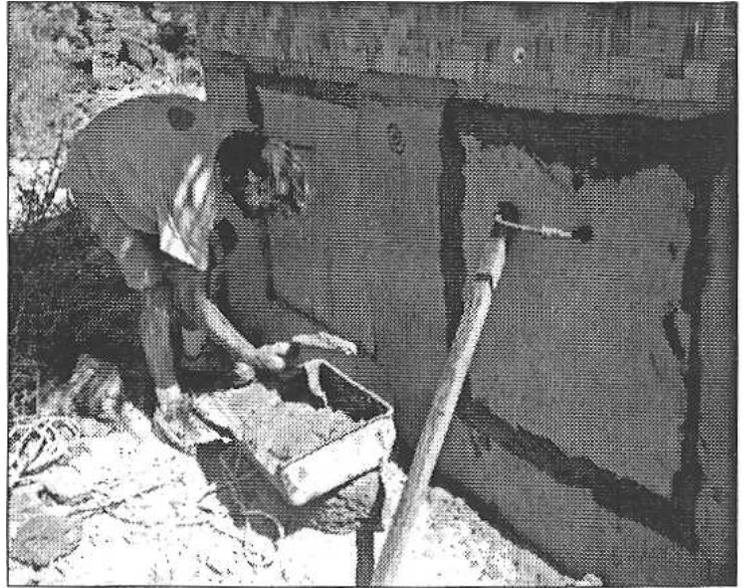
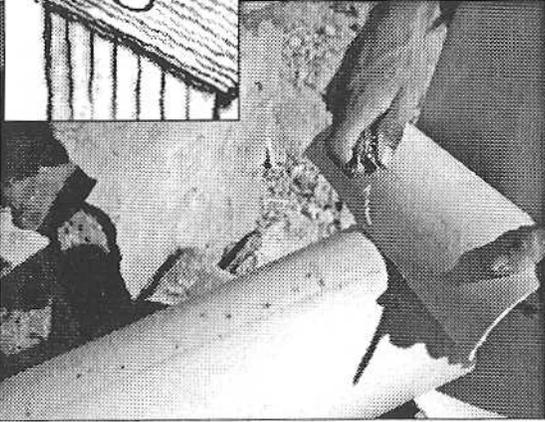
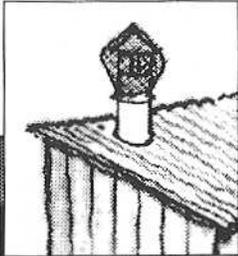
Step 12: Finish the Aeration Components

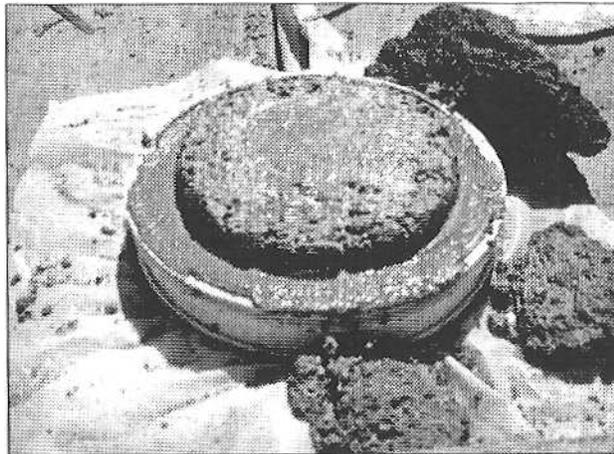
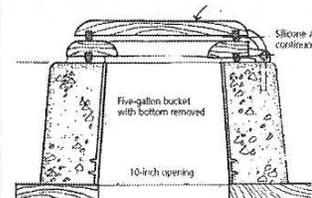
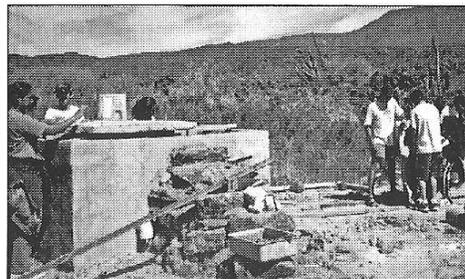
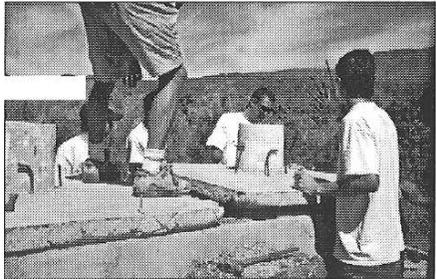
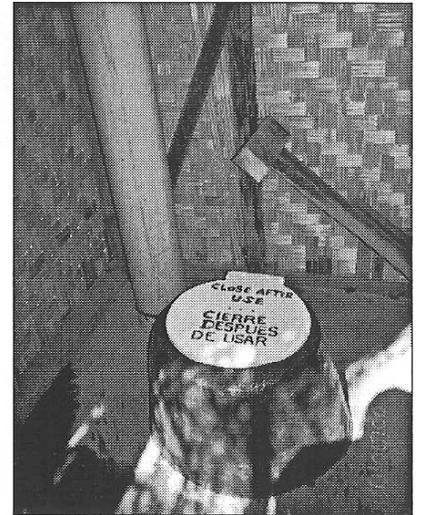
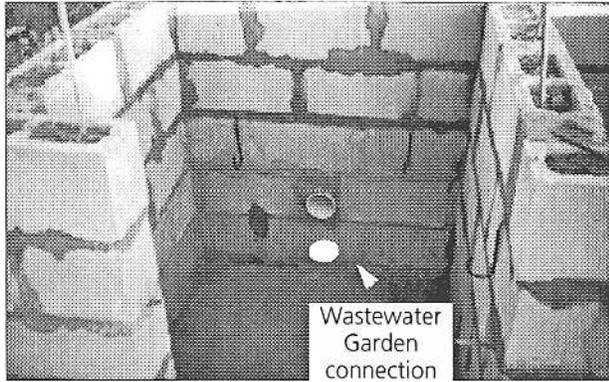
See Floor Slab Elevation Drawing, page 19.

1. Install the vent/exhaust pipes.
2. Attach pipe Ts to the tops of the exhaust chimney pipes. Paint black the tops that extend above the roofline of the superstructure, so they will absorb solar heat. This will promote upward movement of air.
3. Blouse fly screen around the ends of the air-intake pipes. (Blouse it loosely; do not pull it tight. If loose, rain will clean off debris.)
4. When the inside of the composter is dry, install the net:
 - a. Take your net, weave the polypropylene rope through the edges, and drape the net inside, hanging it from the rope binding.
 - b. Adjust the net so that it pouches in the middle and sags to within no more than 6 in. of the bottom of the composter. **Note:** The net and rope will sag with time, so give it some room to sag. A good way to test this is to add some broad rocks—about 10 lb or so—to the middle of the net to test how low it will sag. It is worth taking the time to get this right!
 - c. When finished, place on the net some biodegradable fiber mat, such as palm leaves. The idea of the net is to aerate the material, not keep it entirely suspended. This initial carbon barrier allows excrement to accumulate in the net a bit before the matting decomposes. This ensures that the excrement builds up in the net and does not create a mountain just underneath the net.
5. Add a bit of mortar to the sides of the removal door openings, then put the doors in place and skim coat around them. While they are drying, prop a board or stick against them to keep them in place.
6. Construct stairs (if necessary) out of stone, blocks, or wood.

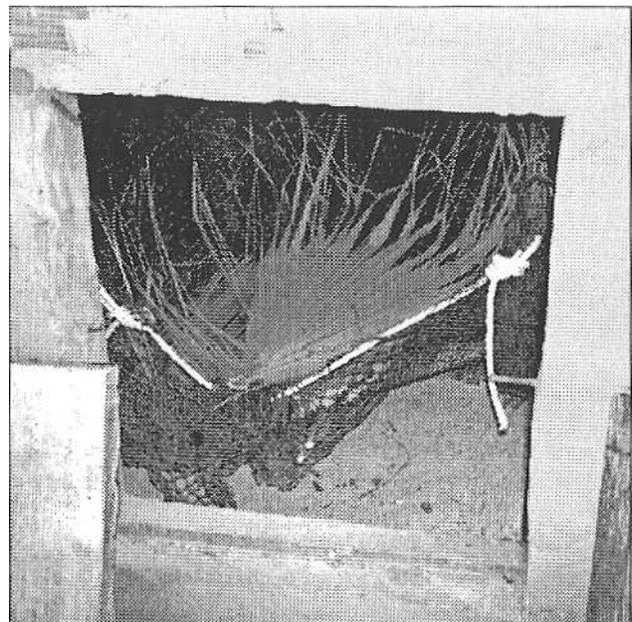
Optional: Paint the composter (the base) a dark color, such as dark green. Or, just paint the side that faces south. You could also paint the toilet risers (for decor and to smooth them a bit).

If you do not have access to pipe tees, make a rain-hat by slicing a piece of pipe and fitting it over the top, as shown. Left: Always blouse the insect net over the top, so that it will not clog with debris.





The sawed-off top of the bucket makes a good mold for the lid for the inactive toilet riser. Insert a bent rebar handle on the top. (This is dug into the ground.)

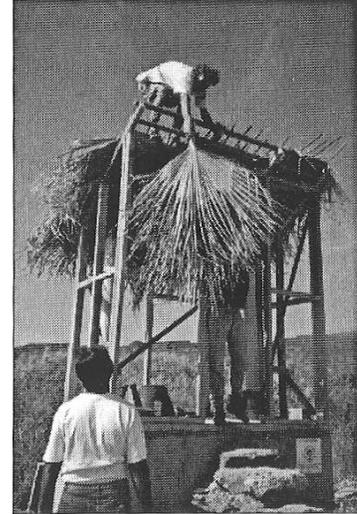


The net should sag and hold weight about four inches off the floor. Test it by placing a 10-pound stone in it.

Step 13: Create the Superstructure

1. Construct the framework for walls and roof.
2. Construct the doors. Create an inside latching mechanism.
3. Apply walls (wood, corrugated metal, woven mat, etc.)
4. Apply a roof (palm fronds, corrugated metal, etc.). **Note:** Leave openings for the vent/exhaust pipes. It is helpful to clamp the exhaust/vent chimneys to the roof framing for extra stability.

If there is a wastewater garden, have the roof extend over it so that rain is kept out.

**Step 14: Construct the Wastewater Garden Leachate/Urine Bed**

Note: The composter must drain down to the wastewater garden.

The wastewater garden should be about 18 in. deep. It can be dug into the ground or be sited above ground. See Wastewater Garden General Diagram, page 25.

As a liner, 20 mm polyethylene plastic sheeting can be used instead of concrete. In good soils (rare in coastal and other wet areas), the wastewater garden does not need to be lined. It can be open to the ground.

Sift gravel. Particles should be anywhere from ¼ in. to 1 in. (Perlite, broken safety glass, broken pottery, shredded tires, and crushed shell also work. Use recycled material wherever possible.)

Coat interior with fiberglass resin or other waterproofing agent. When dry, fill with the gravel.

Place piping per following diagram. Perforated pipe holes must face down on the gravel!

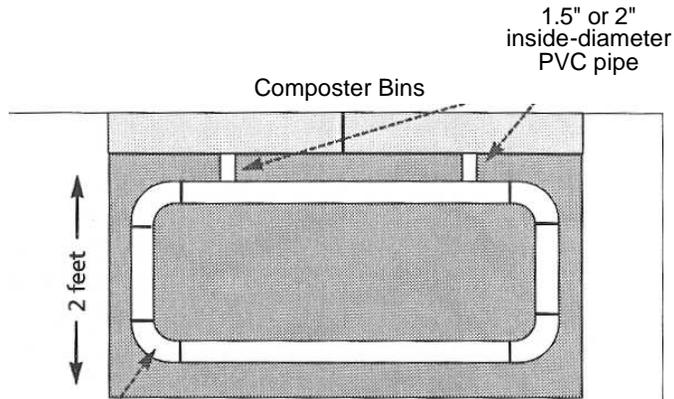
Plant the thirsty plants. Best are phreatophytes and halophytes, such as bamboo. Water them a bit until the composter is in full use.

In rainy climates, add a roof overhang from the superstructure to prevent the garden from getting flooded.

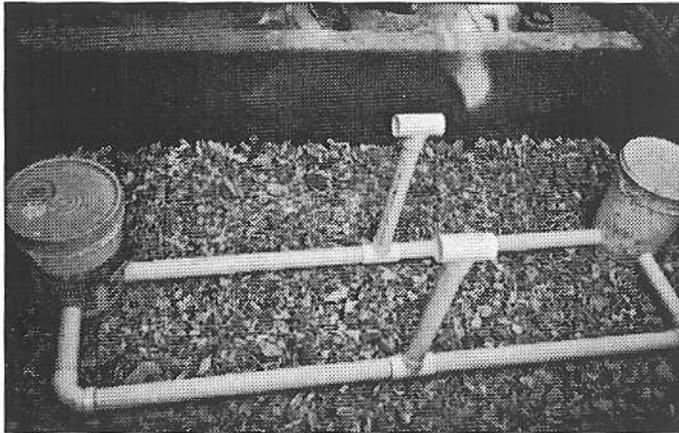
You might have to water the wastewater garden periodically. Monitor it. If sink water from one sink is to be added to the wastewater garden, double the size of the garden. The following photo shows the layout of a wastewater garden that handles sink water. For precise performance rates of wastewater gardens, see *Installing and Planting Your Wastewater Garden*.²

² Del Porto, David, and Carol Steinfeld. *Installing and Planting Your Wastewater Garden*. 2004

**Wastewater Garden (Leachate Bed) Simplified
Design for a 10-person/day System**



As wide as the composter base 18" deep
4" ID PVC (leachfield pipe--available perforated) Holes: 1/2" to 5/8"--Holes face down



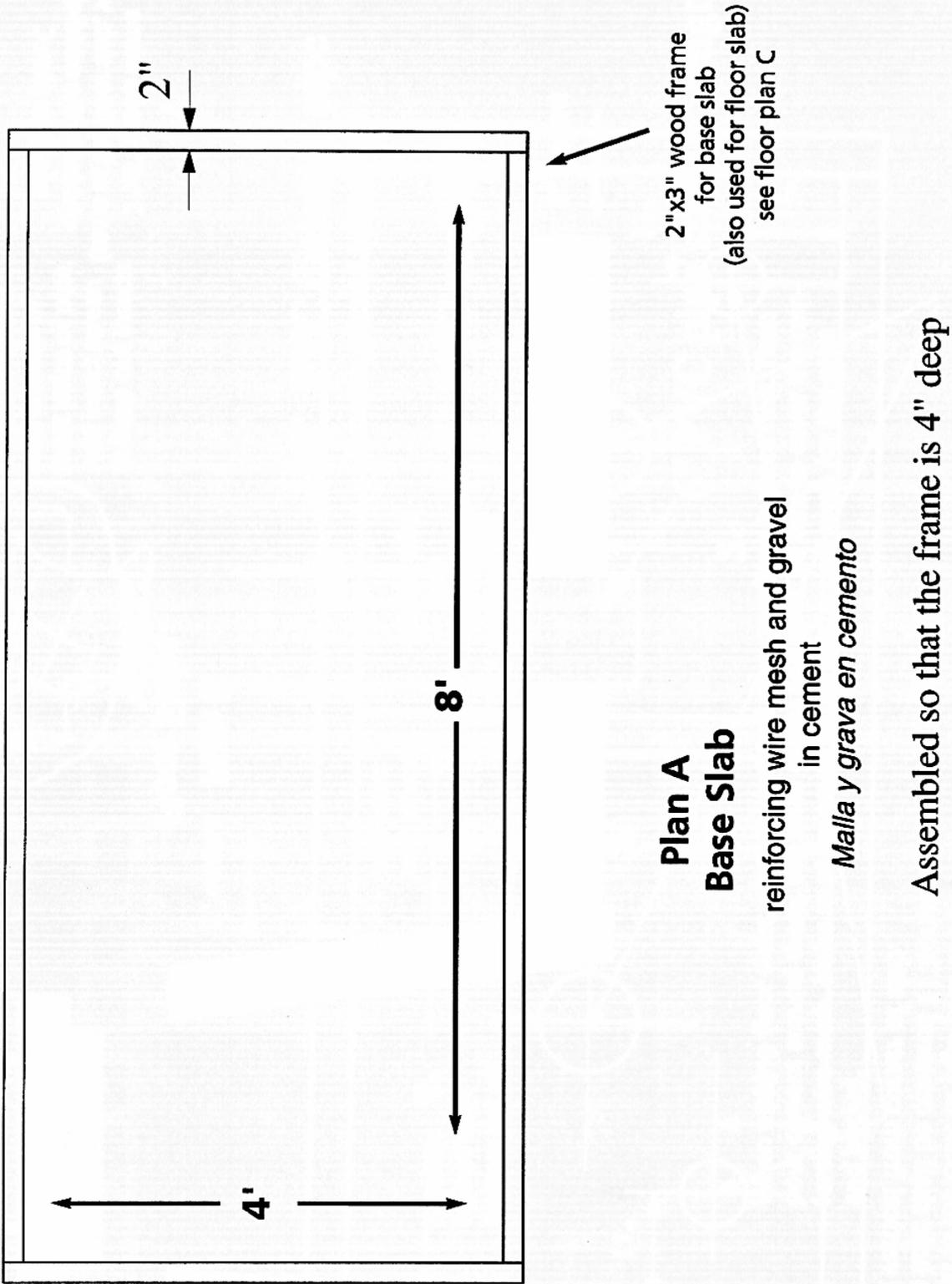
This photo shows a small wastewater garden that also handles sink water. The drywall buckets hold nylon filters, which can be replaced and cleaned. The pipe risers add aeration to boost performance.

Materials List

This materials list is for the Twin-Bin with Net composter only, not the privacy structure, stairs, or the wastewater garden, if used.

Material	Amount
Cement	15 to 20 80 lb sacks
Sharp sand	8 to 12 cu yd (as available)
Coarse aggregate	As available
Concrete blocks (8 in. x 8 in. x 16 in.)	100 (plus 10 to 15 for mistakes/breakage)
Bricks (2.25 in. x 3.75 in x 8 in.)	154 (plus 15 extra)
2 x 4s for forms	Quantity and Length: Two 9 ft 4 in., two 4 ft 4 in. Two 4 ft 8 in., two 9 ft 6 in., one 4 ft
#2 reinforcing rods (rebar)	140 ft
#2 rebar for S hooks	40 to 50 ft
Reinforcing wire mesh	60 sq ft
8 penny nails – 4 in.	5 lb
2 in. galvanized wood screws	50
6 in. PVC pipe	20 ft (or two 10 ft lengths)
6 in. Ts for rainhats	2
50 lb or 5 gal plastic bucket	2
Waterproof coating	10 gal
Two-part marine resin (polyester fiberglass)	Two 500 ml containers
Silicone caulking	Enough for 50 ft bead
Trisodium phosphate (detergent)	1 lb box
Commercially available wooden toilet seat	1
Fly screen (nylon, copper, or aluminum)	7 sq ft
Stretched-mesh twisted polyethylene, 1 in. squares, trawl, or trammel fish net	Two 7 ft x 7 ft squares
5/8 in. polypropene or nylon rope	50 ft
Waterproof mastic for permanent sealing of composting chambers	10 gal
1 in. wooden pole for attaching the net to hooks	1
Dark paint to match surroundings and to absorb solar rays	
Light paint to match surroundings and to reflect solar rays	

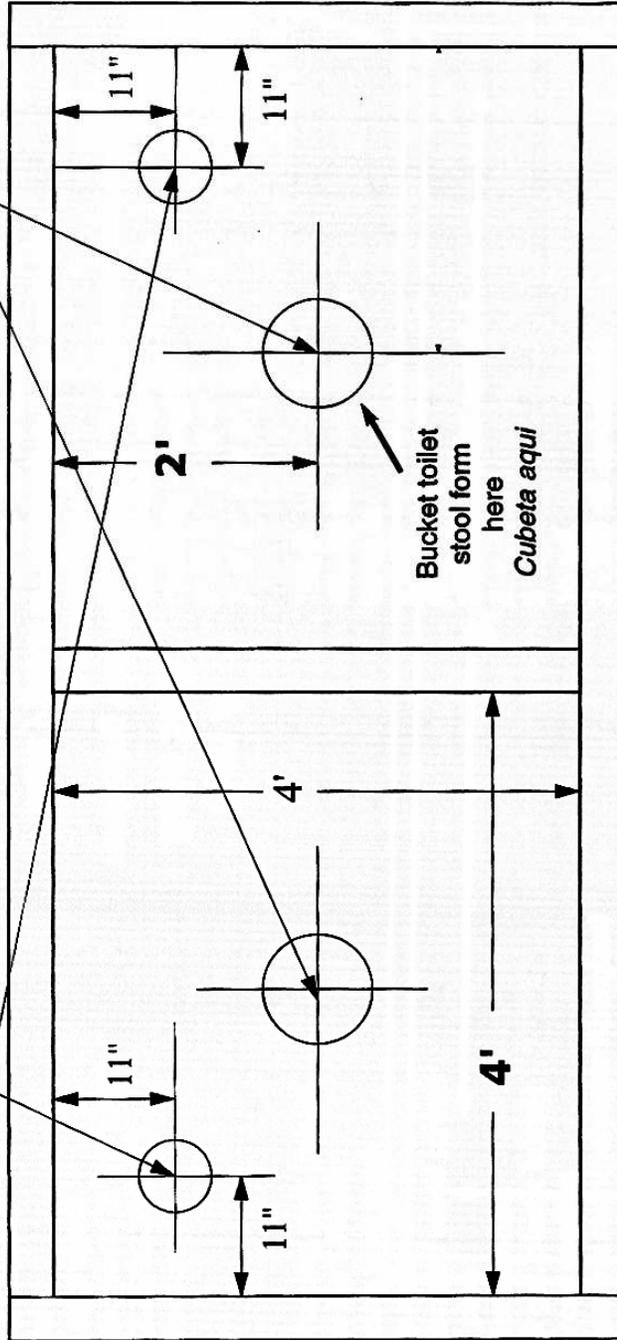
Base Slab Drawing



Floor Slabs Drawing

Exhaust pipe holes in slab shall have a diameter equal to the O.D. of pipe plus 1/4". The hole shall be centered 11" horizontal and vertical from corner of slab.

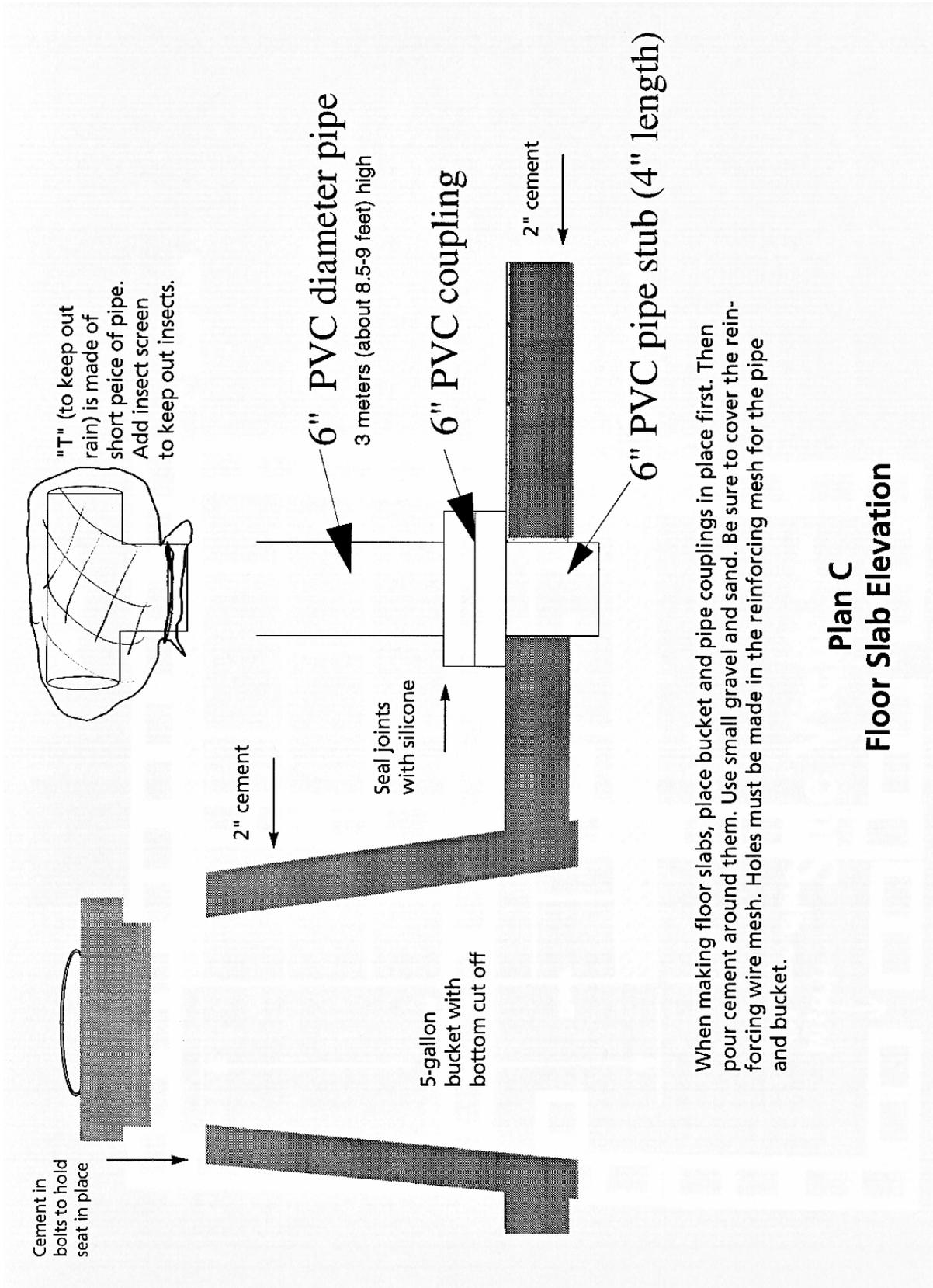
In center of slab



**Plan B
Floor Slabs**

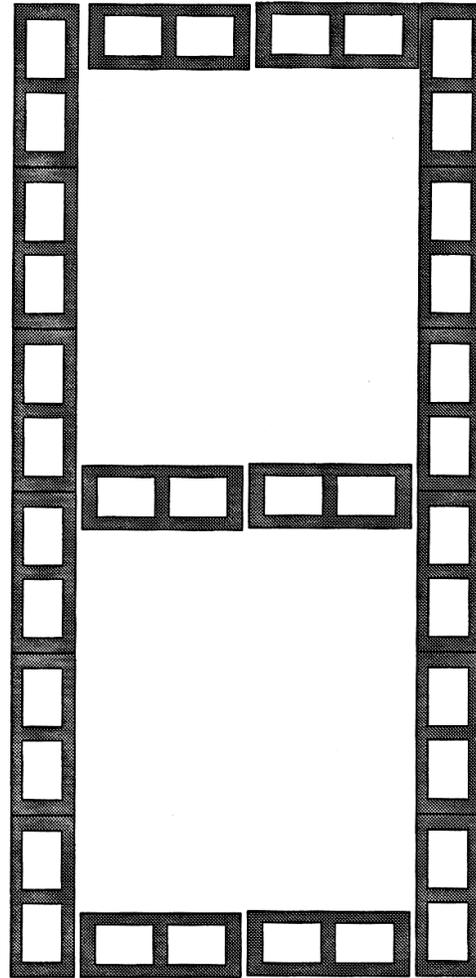
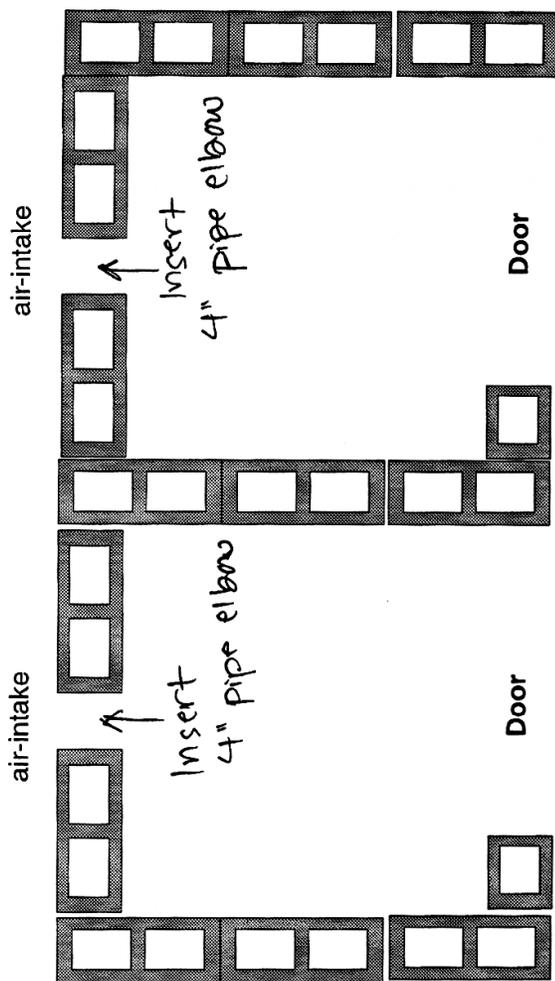
2"x3" wood frame
(same as for floor slab, with
divider in the middle)
see floor plan C

Floor Slab Elevation Drawing



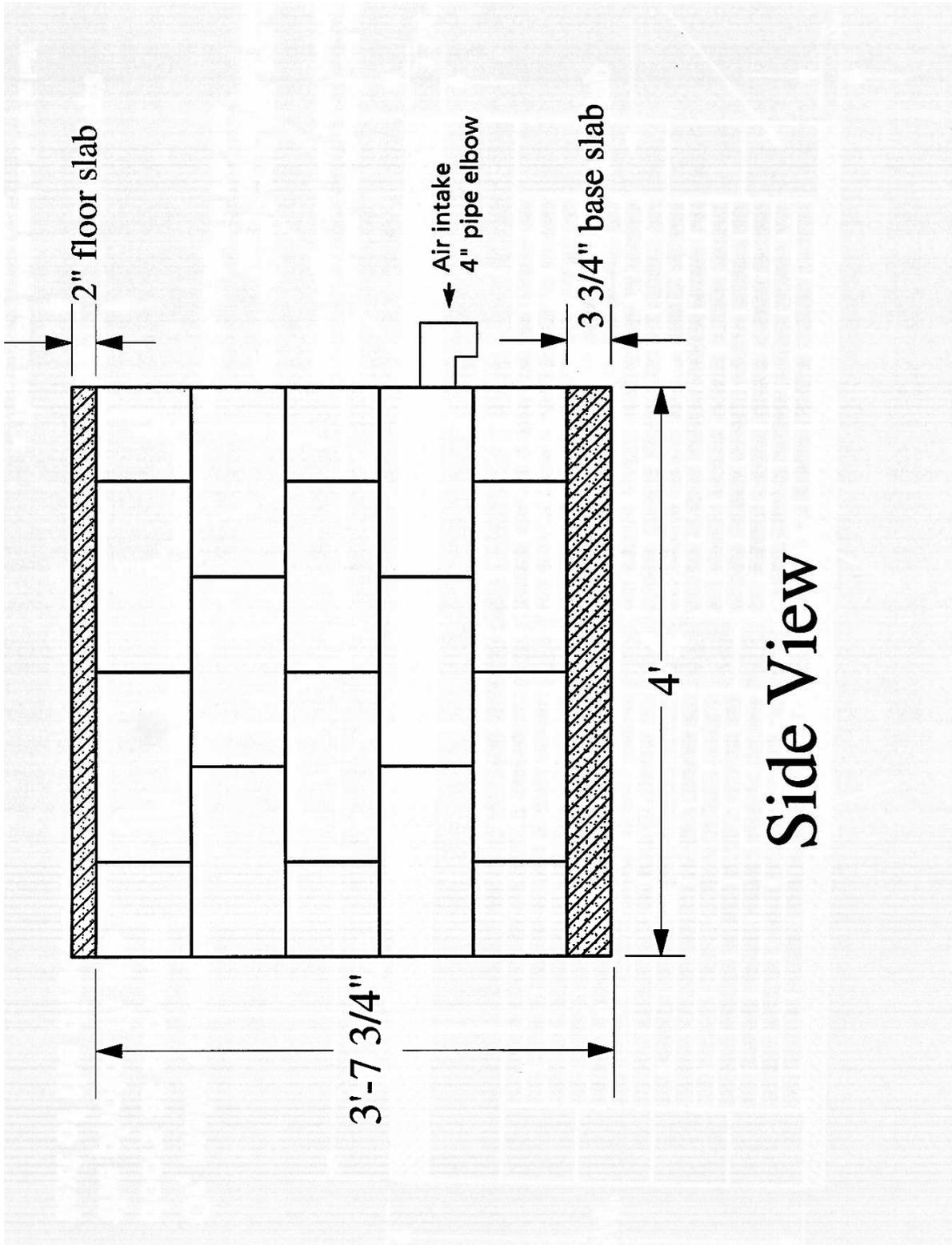
Plan C
Floor Slab Elevation

Walls Drawing (Top View)

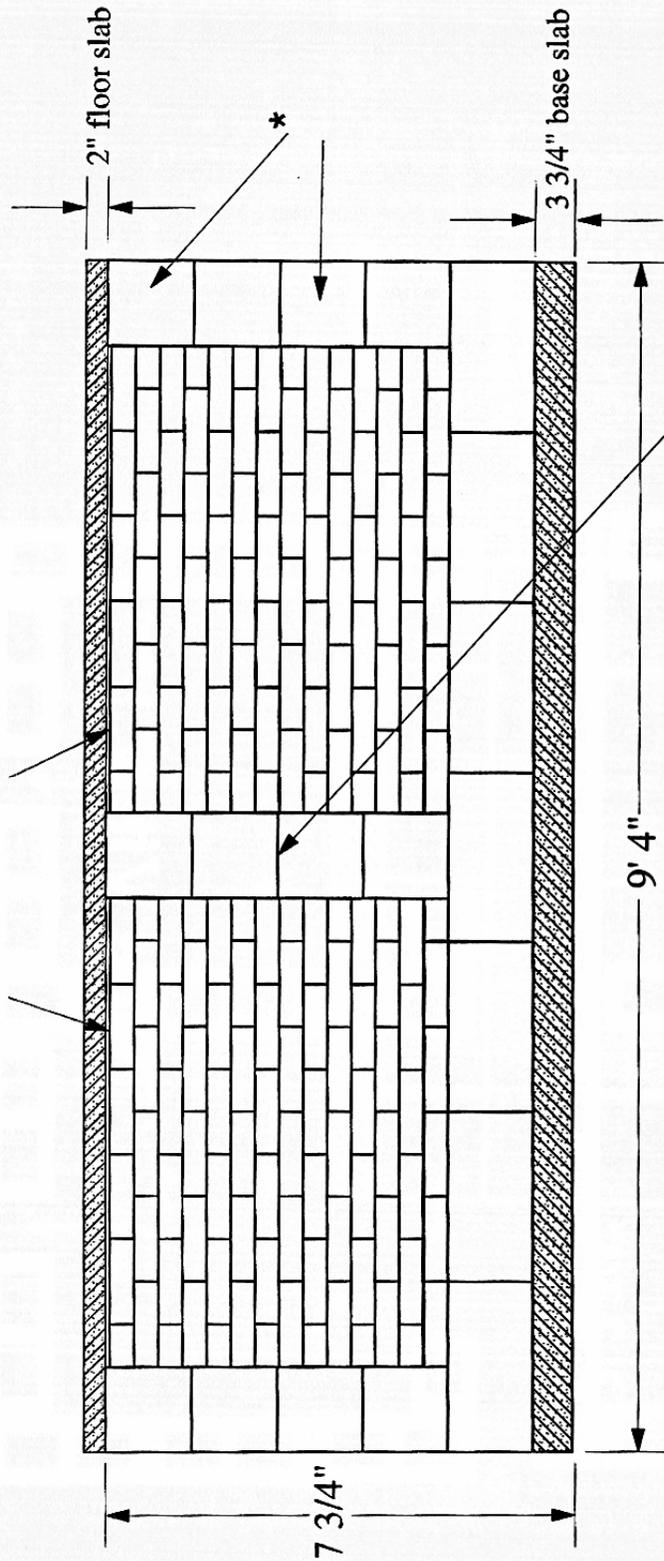


Top View

Walls Drawing (Side View)



Walls Drawing (Rear Elevation)



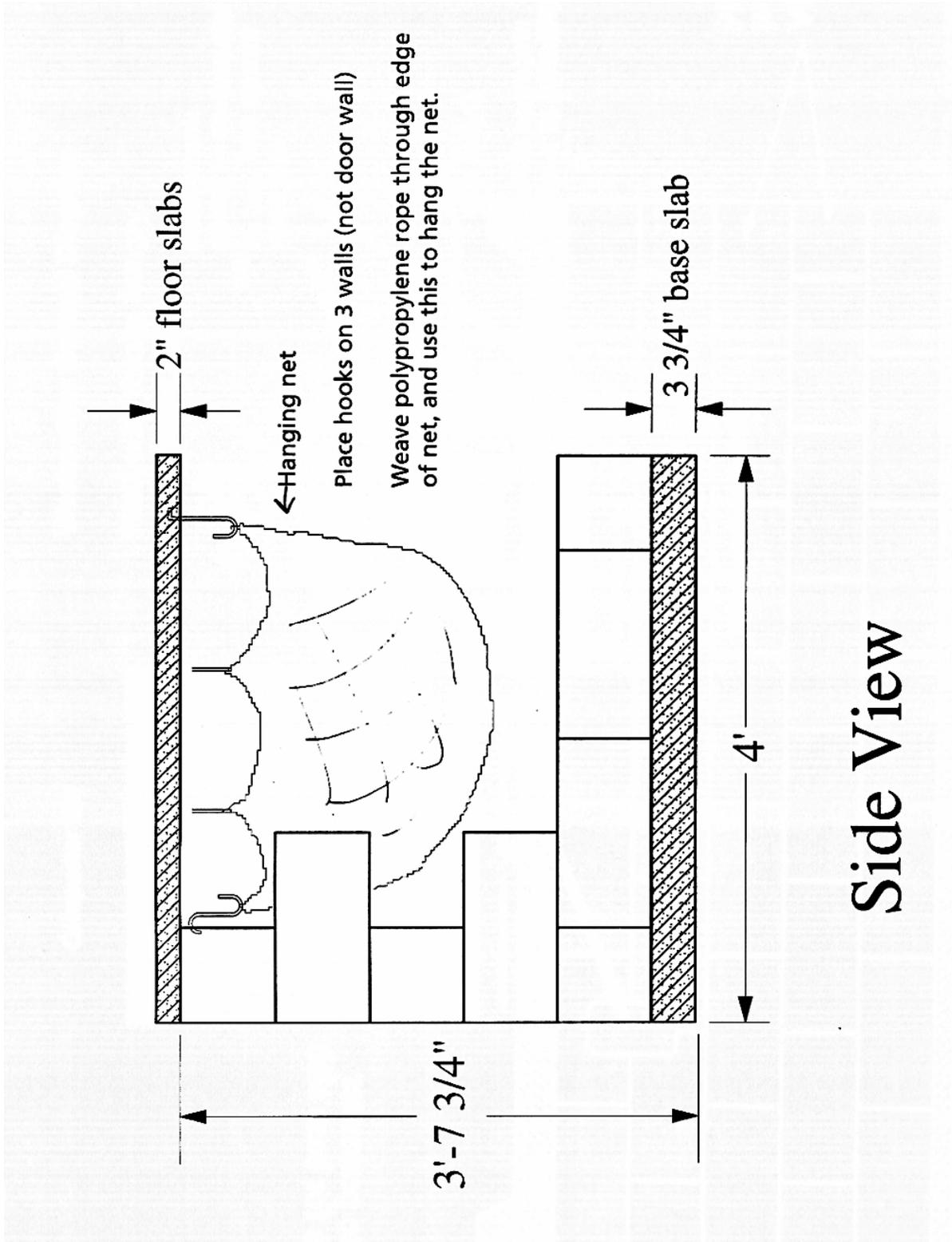
Use 4 concrete block halves to fill in this face

* These concrete blocks need to be cut in half to allow for a square hole.

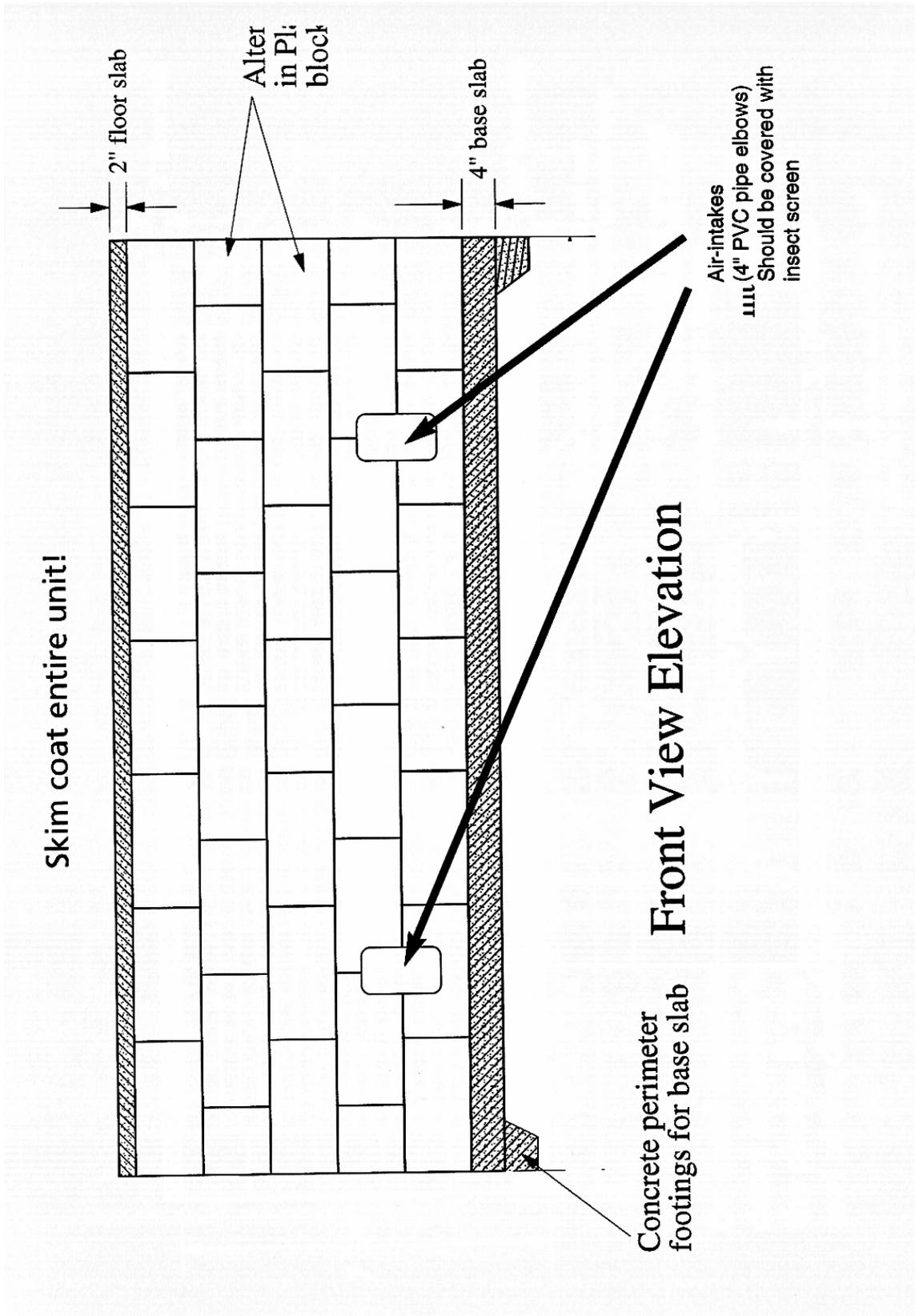
Or, make concrete doors as shown in the photos in the text of the directions.

Rear Elevation

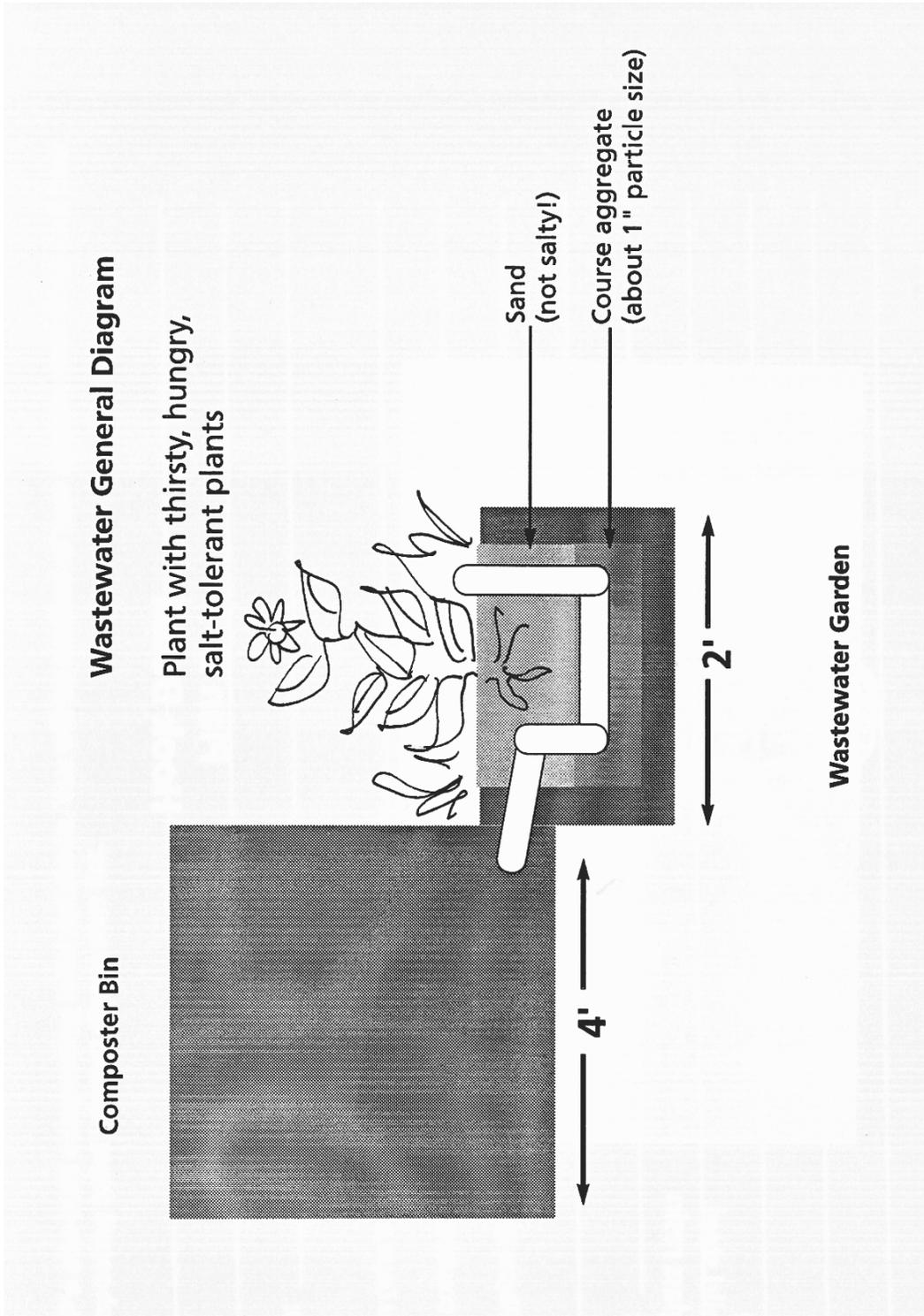
Walls Drawing (Cutaway Showing Hooks and Net)



Walls Drawing (Front Elevation)

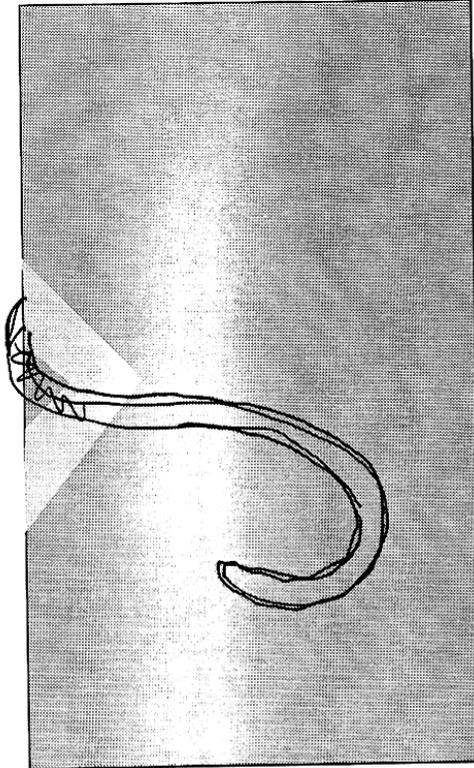


Wastewater Garden General Diagram



Hook Detail Drawing

Chisel notch in block
3/4" deep for S hook



- S hook**
- 6" long
 - Made of 1/4" mild steel
 - Coat with fiberglass resin

Plan D
Hook Detail

Operating and Maintaining the Twin-Bin with Net Composting Toilet System

Little work is required to maintain the twin-bin with net system. However, you should check it periodically.

Some regular maintenance tasks:

- Check the overall condition of the composter. Make sure that the pipes (the large ones and the small ones in front) are unobstructed by dirt, etc.
- Make sure the composter is not being filled with trash. If it is, try to remove larger pieces with a stick.
- Check the level of contents in the active side of the composter. If it is high, knock it down and level it with a stick or board. If it is full, it is time to use the other side of the composter. Take out the concrete plug from the toilet stool on the inactive composter bin and place it in the stool on the filled composter bin. Remove the toilet seat, and put it on the newly opened toilet stool.
- When both sides are full, open the removal opening of the older side. This will require a chisel, as the opening has been bricked shut with a skim coat of mortar. Above the concrete door is a wooden board. This can be removed first to make moving the door/bricks easier. Shovel out the contents of this side. It should look and smell like earth. This material can be buried 6 ft deep around trees and bushes or used on flower gardens. Although it should be disease free, it is safest to use it only on non edible plants.
- Check the condition of the net. If there are holes or it is worn, replace the net. Make sure it is still hanging from the hooks.
- Leave a shovelful of the material in the composter bin to make sure that the necessary bacteria are present in the system.
- Replace the door and the board above the opening. Apply a thin layer of cement over the seams so that the system is airtight.

If you have any questions about the operation and maintenance of the system, contact:

Carol Steinfeld
 Ecowaters Projects
 P.O. Box 1330
 Concord, MA 01742
 Tel.: 1-978-760-0034
 Email: info@ecowaters.org



Every few days, add a handful of carbonaceous material, such as shredded dried leaves or paper

