

Rotating Compost Bin Builder Notes

August 2020

K.W.Melvin & C.G.Melvin

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Introduction

This document contains design diagrams, notes, snapshots, and descriptions of a Rotating Compost Bin built during July and August 2020. The project used many materials that were available on-hand, and some materials that were purchased.

You are responsible for your own safety when using power tools. The author expects you to be familiar with the use of the various power tools mentioned in this document, and to use them responsibly. There are no power tool safety instructions in this document.

Furthermore, the author is not responsible for any injuries or damage to personal property that you may incur when following these build notes.

Safety First!

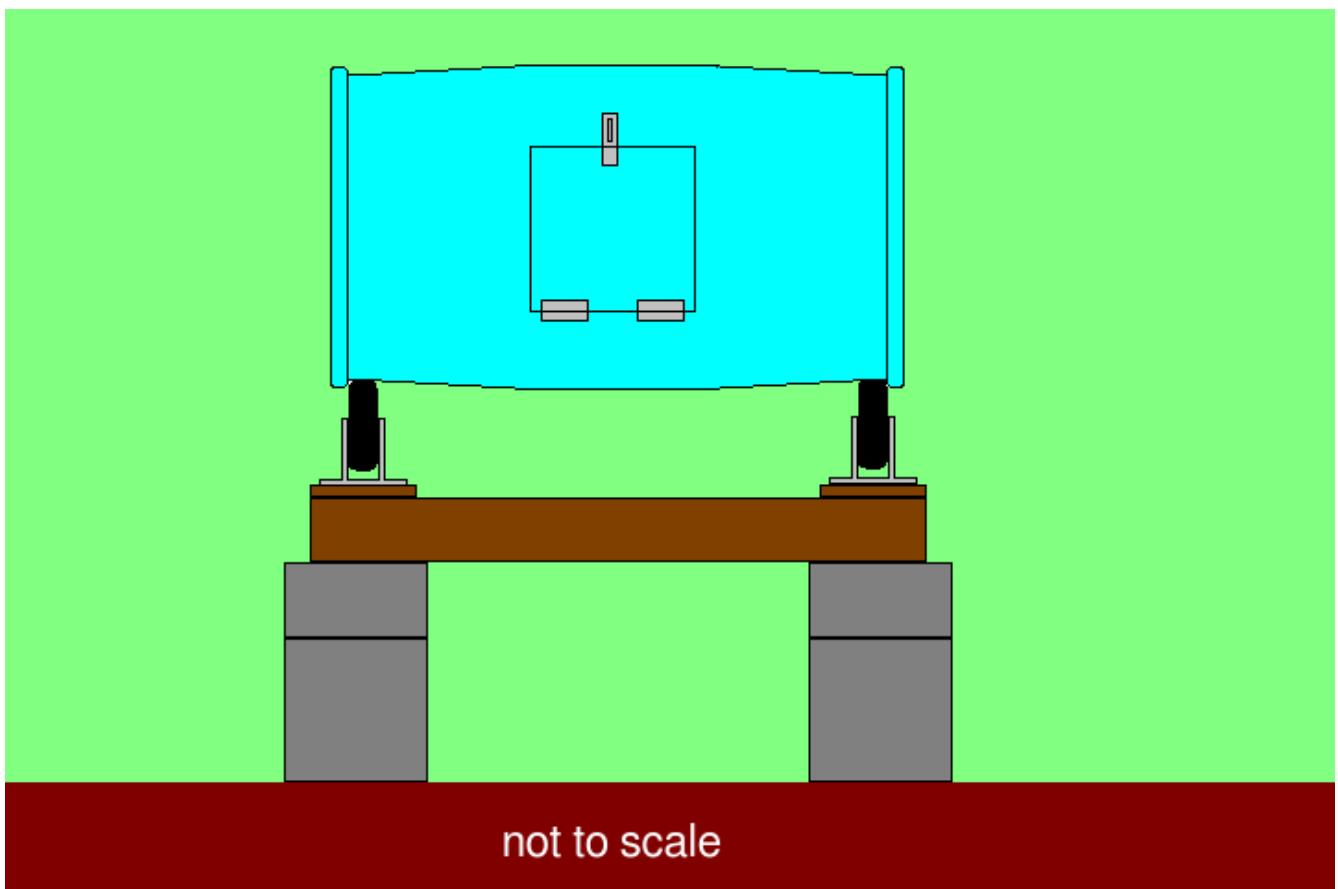
Please read the entire document before you begin this project.

Design Notes and Diagrams

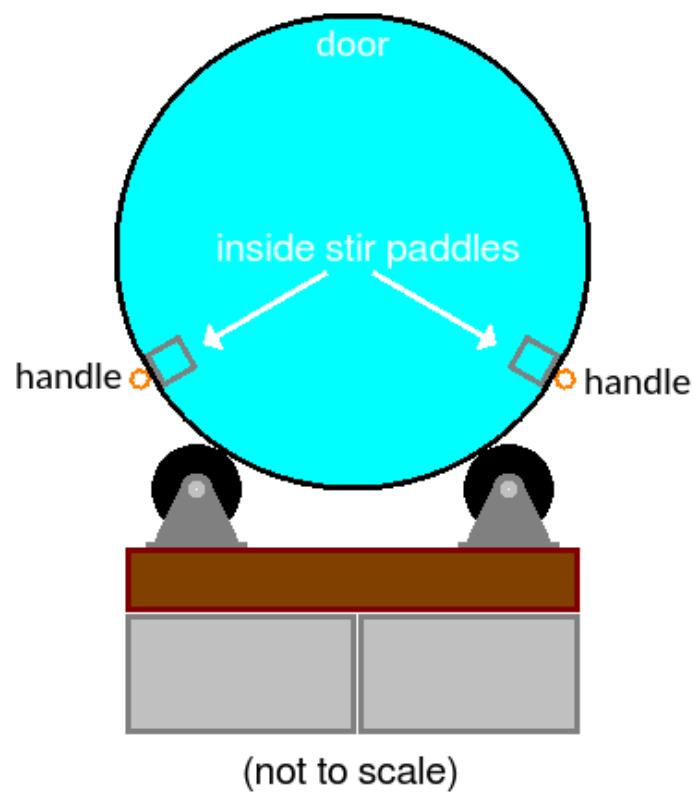
Two Food Grade High-density polyethylene 55 gallon barrels were used for the compost bins. These first were purchased and used as rain barrels in 2006. They are approximately 23 inches in diameter and 36 inches high with two bung holes in one end, and a hole for a spigot near the bottom. The wall thickness of these barrels is about 1/8 inch thick. The basic idea was to cut a door in each barrel, then attach hinges and a hasp. The barrels would be supported on casters fixed to a 2x4 frame.

Here are some of the preliminary design diagrams.

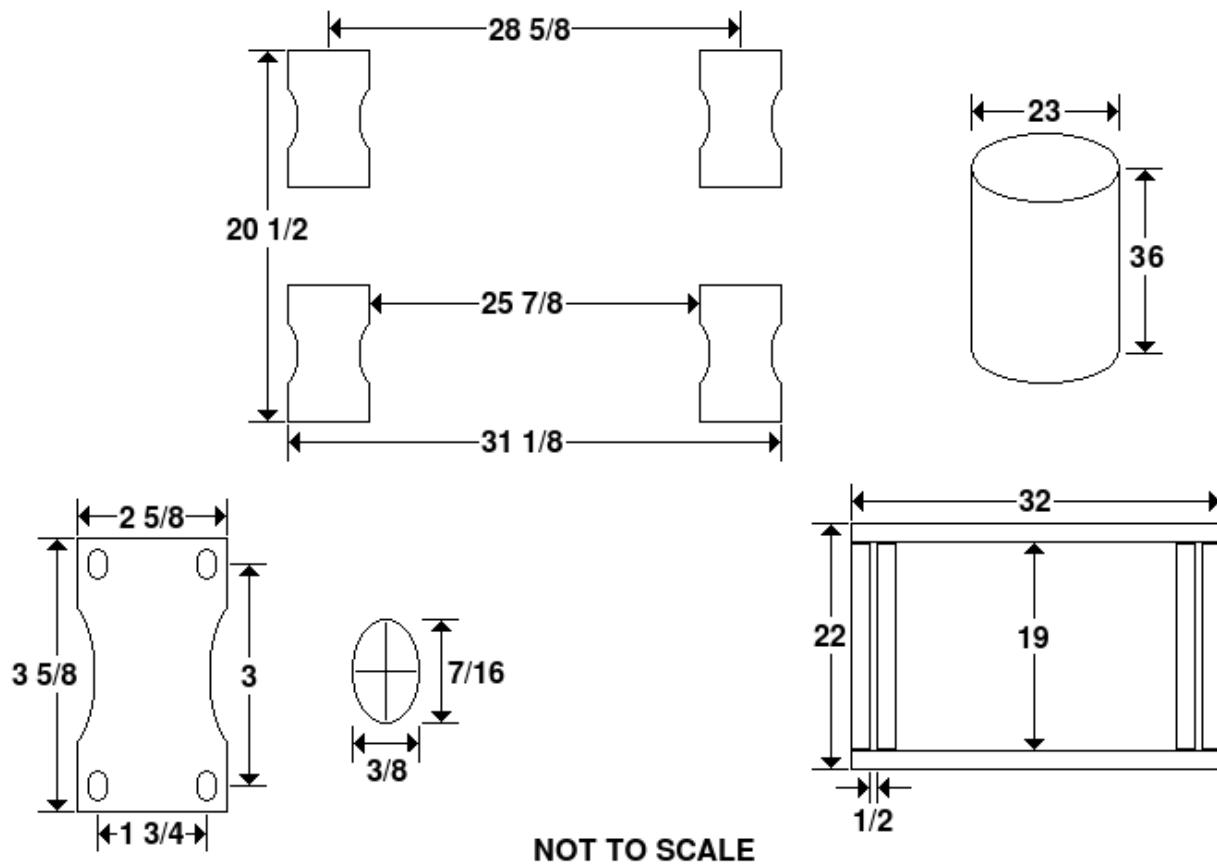
Front View:



Side View:



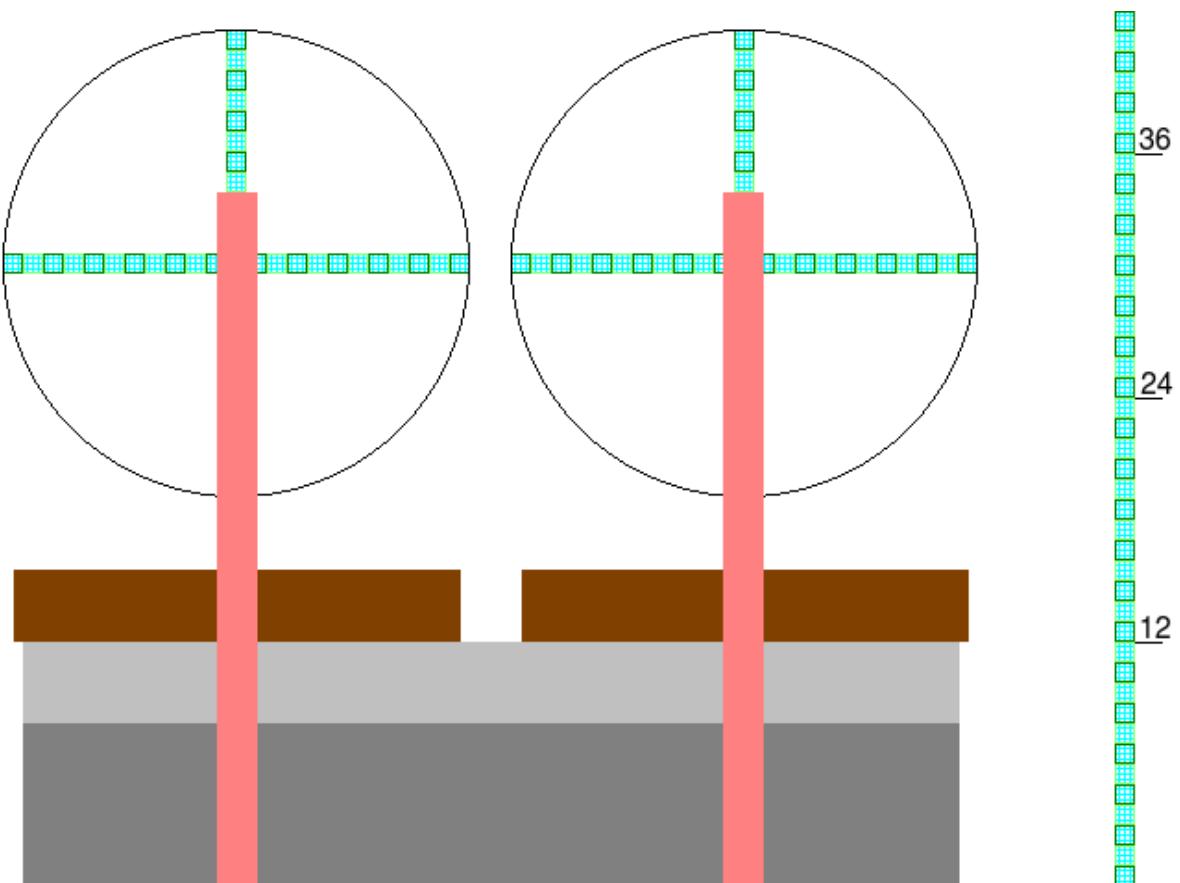
Frame and caster dimensions:



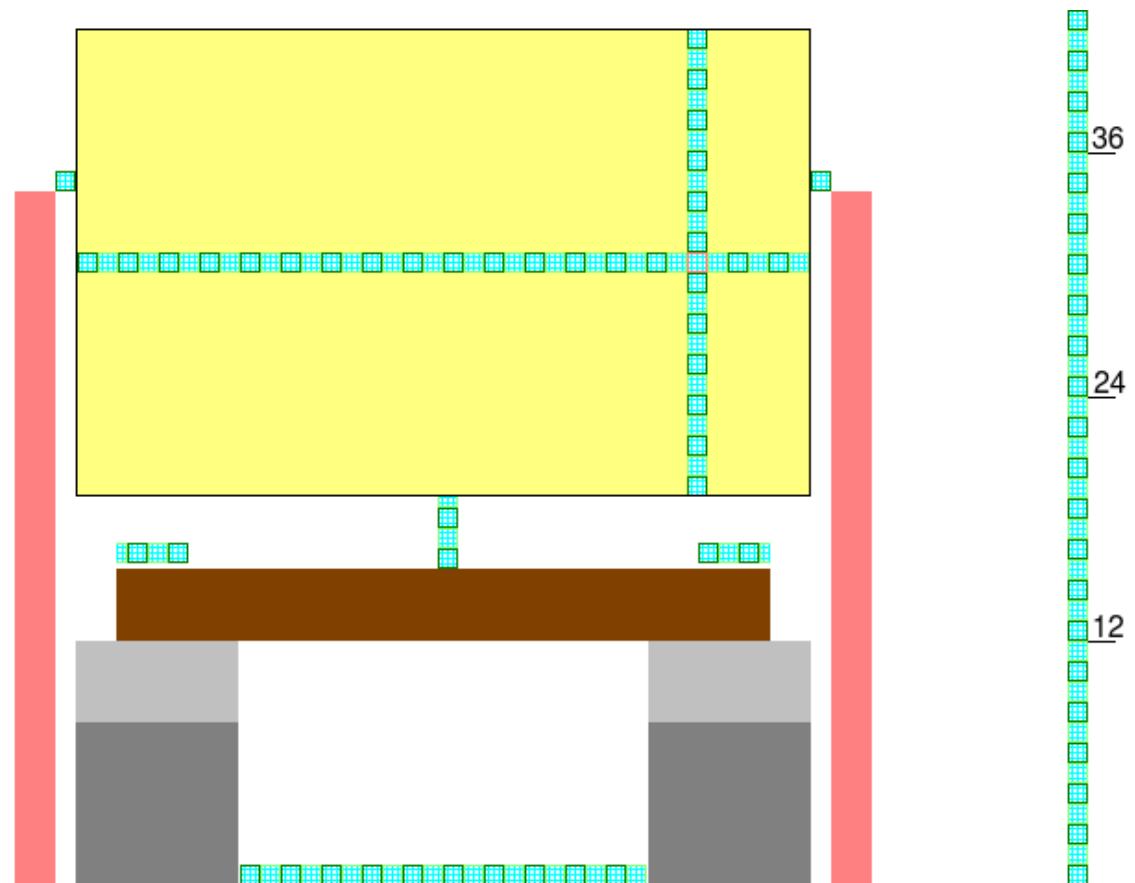
Four 5 inch diameter casters with ball bearings were purchased for each barrel. The casters rested on pieces of $\frac{3}{4}$ inch thick plywood, $3 \frac{1}{2}$ inches wide by 22 inches long. The plywood was nailed to a 2x4 frame that was 22 inches wide by 32 inches long.

Layout of two compost bins:

The compost bins are placed on a cinder block foundation and fence posts were placed at each end to prevent the bins from rotating off the casters laterally.



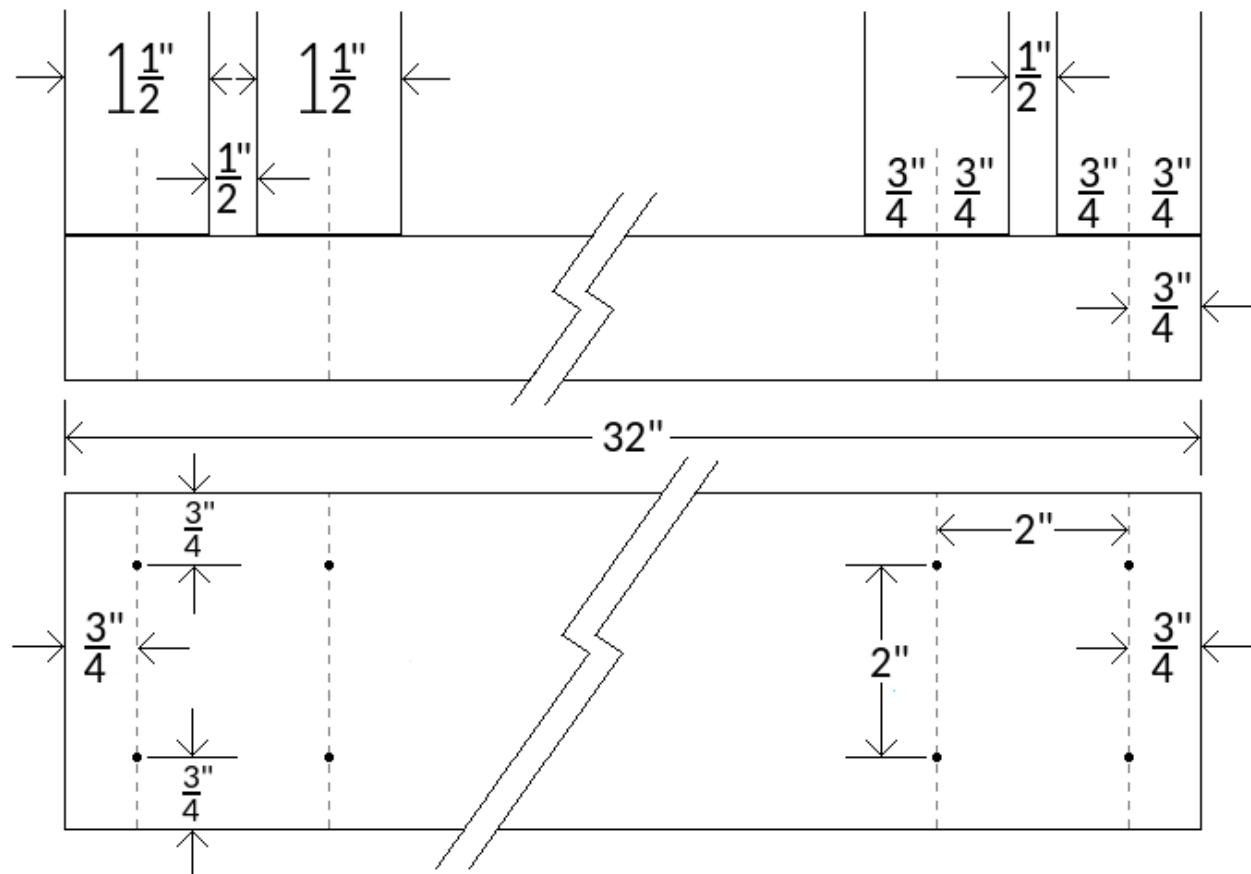
Front View of Compost Bins with Fence Posts:



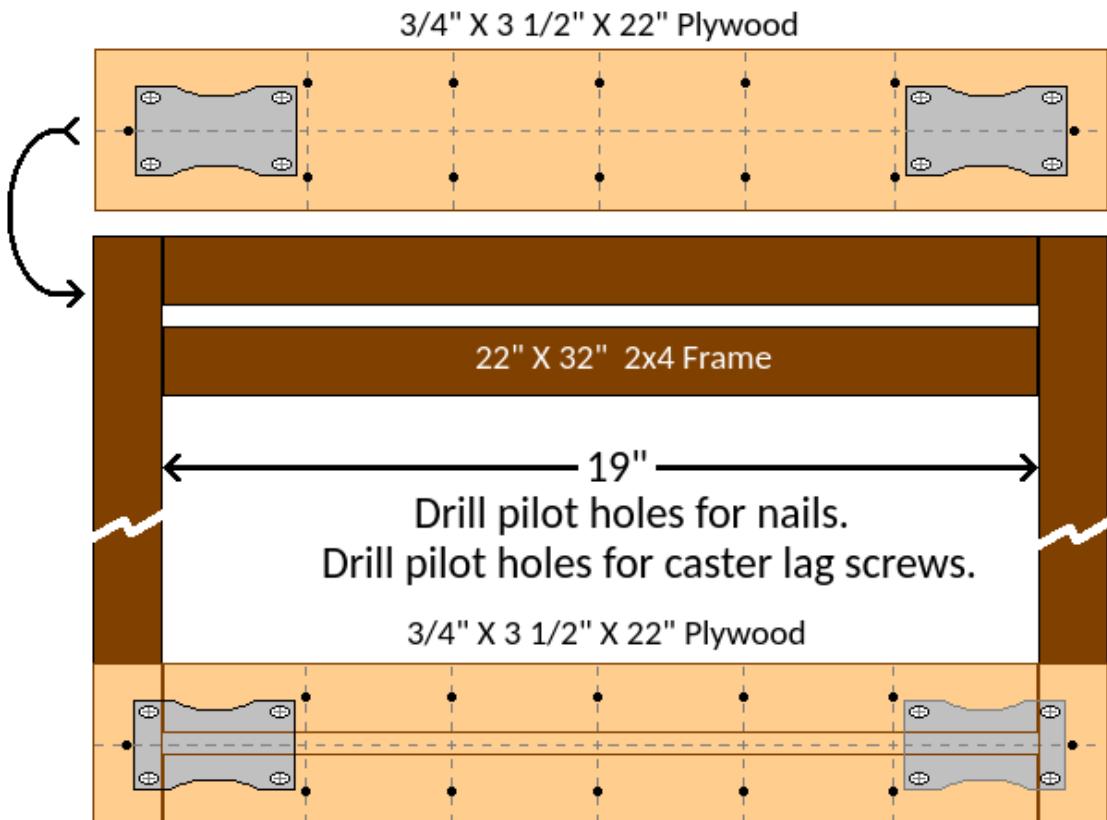
The cinder blocks are spaced far enough apart to be able to insert a masonry tray between them.

2x4 Frame Notes:

Each of the 2x4 frames were made with two pieces 32 inches long, and four pieces 19 inches long. Pilot holes were drilled in the 32 inch long pieces for 12d coated nails. Two nails were used in each end of the 19 inch long 2x4s. A $\frac{1}{2}$ inch space was left between the 19 inch long pieces.



The Plywood and Casters:



The pilot holes for the 12d nails were made with a drill bit that was slightly smaller than the diameter of the nail. The casters were centered on the plywood with one end of each caster about $\frac{3}{4}$ inch from the end of the plywood.

Frame with Casters:

This is a bottom view of the 2x4 frame:



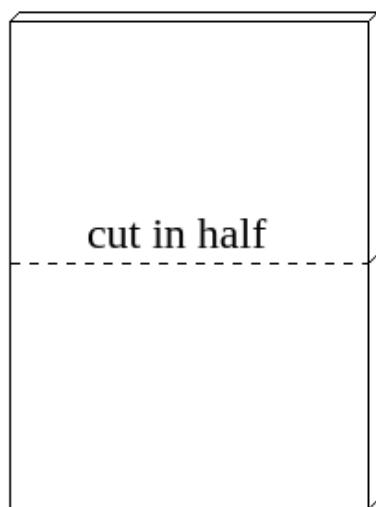
Frame with Casters:

This is a top view of the 2x4 frame with plywood and casters attached. 5/16 X 1 inch Lag Screws were used to attach the casters to the plywood and frame.

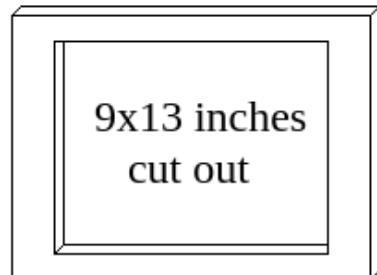
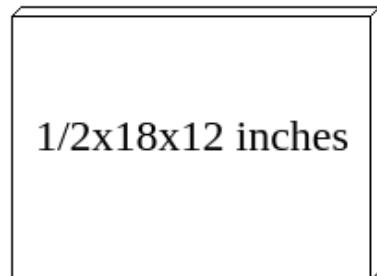


Door Frame:

The door frame was made from an 18 inch by 24 inch by $\frac{1}{2}$ inch thick Nylon Cutting Board. The cutting board was cut in half using a power saw. This left two pieces of 18 inch by 12 inch cutting board. Each piece had a 9x13 inch piece cut out it. Then the cutting board frame had $\frac{1}{4}$ inch deep kerfs cut in the back.



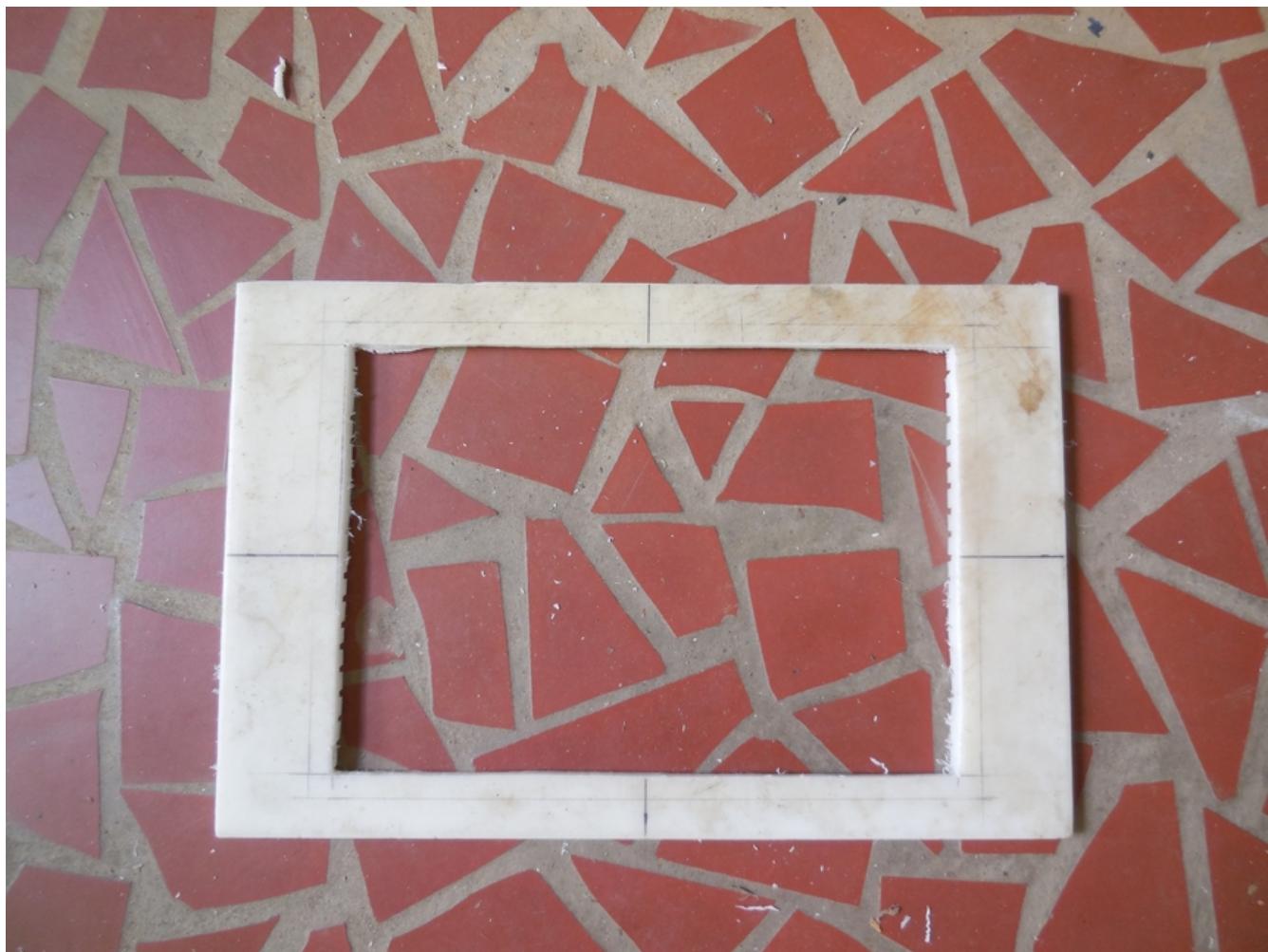
1/2x18x24 inch
nylon cutting board



not to scale

Nylon Cutting Board:

A 9x13 inch piece was cut out of the cutting board.



Nylon Cutting Board:

$\frac{1}{4}$ inch deep kerfs cut $\frac{1}{2}$ inch apart to help with curving the nylon cutting board to the curve of the door cut out of the barrel.



Bolting the Nylon Cutting Board Frame to the Barrel Door Opening:

5/16x1 inch stainless steel machine screws were used to fasten the door frame to the barrel, with flat washers and lock nuts. The cutting board was immersed in very hot water for a few minutes to enable it to be bent into a curve. Clamps held the door frame in position while holes were drilled and the bolts were fastened.



Hinges and Latch:

Hot glue was used with the wood screws that came with the hinges and latch to fix them in place.



The hinges are stainless steel 3 1/2 by 2 1/8. The latch is 1 1/4 by 5 inches long.

Handles, Paddles, and Ventilation Holes:

The outside handles for turning were made from $\frac{1}{2}$ inch copper pipe, 7 inches long, with the ends flattened and drilled. The inside stirring paddles were made from 1x1x12 inch aluminum tubing.



1 $\frac{1}{2}$ inch long bolts with lock nuts were used to fasten the handles and paddles through the barrel walls. They were placed in an equilateral triangle.

Handles and Ventilation Holes:

A template was used to mark the ventilation holes which were placed in the middle between the handles, and the handles and the door.



Inside Stirring Paddles:

The inside stirring paddles are made from 1x1x12 inch aluminum tubing. They are fastened through the barrel walls and handles with 1 ½ inch long bolts and lock nuts.



Painting:

Two coats of Kilz primer were painted on the 2x4 frames, followed by two coats of Krylon GLOSS ENAMEL RED Acrylic Latex.



Painting:

Two finish coats of GLOSS ENAMEL RED Exterior paint were applied over two coats of Kilz primer.



Cinder Block Foundation:

Six 8x8x16 inch cinder blocks were leveled at the compost bin site. Three blocks on each side. They are spaced 36 inches apart.



Six more were added on top of these six to make the foundation two blocks high.

Aluminum Flashing:

Ten pieces of 10 inch wide aluminum flashing was cut 12 inches long from a roll of flashing. These pieces were bent on a sheet metal brake to fit the cinder blocks.



Installation:

The painted 2x4 frames and casters were set on top of the cinder block foundation, and the barrels were placed on top of the casters.



Fence Posts and PVC Pipe:

Fence posts covered with 4 inch diameter PVC pipe were installed at each end of the barrels to keep the barrels from rolling off the casters as they were rotated.



Composed Mulch and Kitchen Scraps Added:

A 5 gallon bucket of composted wood chips was added to each barrel. Then kitchen scraps were added to the active barrel and the barrel was rotated to mix the ingredients.



Bill of Materials:

item	qty vendor	Item cost now	item cost new	subtotal now	subtotal new
55 gallon drums	2 aaron's		50.00		100.00
cinder block	12 home depot	1.65		19.80	
12d nails	1 home depot	4.23		4.23	
kilz primer 1qt	1 home depot		10.68		10.68
red gloss paint	1 lowes	11.00		11.00	
hinges	1 amazon				
castors	2 amazon	36.35		72.70	
latches	2 amazon	6.99		13.98	
hinges	1 amazon	19.99		19.99	
bolts	2 home depot	9.97		19.94	
washers	1 home depot	11.70		11.70	
lock nuts	1 home depot	6.57		6.57	
lag screws	1 home depot	13.96		13.96	
2x4x8 lumber	4 home depot		3.65		14.60
paint brush	1 home depot		4.22		4.22
T fence posts	4 Clemmon's Mill		6.00		24.00
PVC tube	1 home depot		7.90		7.90
Hot Glue	1 home depot		4.49		4.49
Scrap Cu tube					
Scrap square Al tube					
Canopy Bolts					
Subtotal				193.87	165.89
Final Total for two bins		359.76			
Final Total for each bin		179.88			

Notes:

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