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Trash Concrete

by **Thinkenstein** on January 24, 2011

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Intro: Trash Concrete

I wanted to extend a hillside patio area. Hauling in dirt fill by hand was more work than I wanted to do, and it would probably settle over time. Cement was better.

The gravel in regular concrete is heavy and costs money. I decided to replace it with free plastic bottles and pieces of Styrofoam trash. Sand and cement were the only purchased materials.

Although the air cavities from the bottles don't have the compression strength of solid cement, the spaces between them create interior columns, walls and arches which are load bearing. The top layer was more solid, with pieces of foam and cement to help spread out the weight. The patio only needs to support foot traffic, and it does that just fine.

Image Notes
1. Space is left between the bottles. That area of cement acts as walls, columns, and arches; which are all for vertical load bearing.

Image Notes
1. The project area was done in sections over several days.

step 1: Collecting the Trash

I don't drink soda pop, or use vast quantities of Chlorox. Going against the normal flow of things, I went to our city's recycling department and was given bottles that they had collected. I also put the word out locally and helped clean up our barrio of locally generated bottles.

Image Notes
1. A layer of fishnet went down first.

step 2: Basic Structure

I laid some fishnet down first, with enough skirt left over to fold up over the layer of trash concrete. That way, the mass would have a skin holding it all together if it ever does decide to fragment.

Bottles went down first, with richer amounts of Styrofoam toward the top. I already knew that Styrofoam cement makes a pretty non-compressive layer for walking on. That layer helps spread one's weight out over the foam-like bottle and cement layer below.   Foot pressure is not concentrated on a small area.

It supports my weight well now, and I am expecting no problems.

Image Notes
1. Sacks of bottles and foam scraps.

step 3: Mixing the Cement

For those who have never mixed cement, all you need is a flat area to mix on, a water source, and a shovel. A square nosed shovel is preferred to a pointed shovel. One part of cement is mixed with three parts of sand.

Mix the sand and cement dry first. Make a hole in the middle of the pile and add water. It is better to add less water at first and creep up on the proper consistency little-by-little. Mix with the shovel, trying to not let water escape the ring of dry material. If you get it too soupy, the bottles will float in it and the cement doesn't behave well as mortar between the bottles.   If you make a ball of mortar, it may sag some, but it should not run.

Use rubber gloves to protect your hands. Cement is caustic to skin. Use a trowel for smoothing the cement.

step 4: The Finished Project

The patio was extended two, or three feet. It was a small patio to begin with. This extension makes it much more comfortable.

Image Notes
1. The project area was done in sections over several days.

Image Notes
1. This thinner layer of fishnet reinforced cement extending out at the bottom will help keep erosion from undercutting the edge of the fill area.

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