



Applied Hippie: Earthen materials were once the domain of freethinking, unruly counterculture types. Now, a group of engineers (and hippies too) have developed an earthen material building block that meets code requirements.

## EARTH TO BUILDERS: "USE ME"

Earthen block moves from hippie to helpful with updated design

» NEIL ZAWICKI

It's likely true that the first guy to mix up some mud and straw and form it into a building material so many thousands of years ago was a popular member of his community. He was an innovator.

Such materials have of course moved away from innovation and into the venues of earthy types who want to live off the grid. Cob construction, as it is known, is used to make earth ships—funky, round dwellings with wine bottle windows. While these are interesting structures, they do little to inspire widespread construction. And anyway, concrete is stronger and stands up to the elements better. Of course, concrete is understood as a less-than-Green material. And it's used in great quantities: Concrete is the second most consumed substance on earth. Water is the first. Producing and

using concrete generates 79 million metric tons of carbon emissions each year. And it's relatively cheap. So, the people who advocate cob construction are hard-pressed to get their products into the mainstream, which is a shame because as a raw material, earthen blocks are quite Green. Earth Uprising Adobe Block, for example, makes a product that is different from the standard sun-dried adobe blocks in that the moist earthen material is machine-pressed into a dense block. There is one drawback: The block needs to be stabilized with concrete, otherwise it will eventually erode. Bummer. What is required to make a viable earthen building block that behaves like concrete but does not pollute like it, is a partnership between the hippies and the technophiles, taking the best of both methods to make a truly earth-happy product. This product would also have to be standardized for use in the modern building industry.

Actually, there is now just such a product, and it costs the same as concrete block. Integrity Block in Los Altos, Calif., has created a standardized building block made of earthen materials that carries the same strength as concrete. Company CEO Trevor

Stout says the real benefit is the price.

"The industry as a whole is used to paying a premium for Green building, historically," he says. "The fact that we can come in and be competitive I think is just tremendous."

Stout says the impetus for the product came from his interest in finding a way to be a better steward to the environment.

"I started doing a lot of research and looking at the benefits. And I was pretty amazed," he says. "First of all, almost 50 percent of the world's population actually lives in structures that are made out of earth."

Stout says it became a puzzle for him to discover just how to make this material viable.

"The longevity is there, the heating and cooling properties are excellent," he says, "so, I was trying to understand, you know, why isn't this technology more pervasive? What came out of that is that there was no commercially available product that you can buy off the shelf that allows any way to build a structure."

The biggest hurdle, Stout says, was that there's very limited building code written for earthen block. He and a team of industry experts, as well as people who would be happy to be called "hippies," set out to solve the puzzle.

"It's been a two-year process with a lot of research and development, some in the backyard, some in the lab," he says. "What we set out to do is to take this technology that has great properties and is low in energy use and make this fall under an existing building code, and what that meant was, ultimately could we make it as strong as concrete."

The company managed to woo major players in earthen construction, as well as structural engineers.

"We wanted to prove that we could take this technology and engineer it in a way to make it as strong as possible,"

Stout says.

The proprietary process the team came up with worked, says Stout.

"Without giving away too much proprietary information, it was a process of engineering a soil composite using pre-consumer quarry by-product," he says. "We also have a proprietary machine process."

The company managed to make an earthen block product that passed the ASTM C-90 building code for concrete. To be fair, there is a very small amount of cement in the block, but it's a reduction of 36 percent over concrete. The company hopes to completely eliminate cement over time.

Once the structural integrity was accomplished, Stout says they came upon another facet worth marketing.

### HIGH STYLE

"It started out as a sustainable replacement for concrete block, but as we started manufacturing it, we were getting these really rich earth tones and different types of colors," he says. "And the immediate feedback we got from the masons and the building industry was, 'Wow, this has a superior finish to concrete block, this looks really nice. It's more in line with an architectural block.'"

The Integrity Block Line could mark a new trend in what can be called "simplistic high-tech," taking age-old methods and bringing them up to date.

"Where we see the industry going over time, and I think the way it should be, is that you should be able to engineer a product in a way that makes that a cost parity [with traditional products]," Stout says. "It's about finding better ways to use things and to use less energy. And actually when you use less energy, you're reducing the cost inherently, and it's just a great trend over all."

As for the hippie factor, Stout says that's a good thing too. ☺