

## Straw: Homes

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The rubble of collapsed steel-and-concrete buildings can also be milled and recycled to provide a stone foundation for the straw-bale houses. The house under construction by Mueller includes a foundation of processed rubble. The bags holding the ground rubble are recycled grain sacks or bags stitched from discarded blue tarps, which are plentiful in these days in Haiti's refugee camps.

Mueller says Haiti has long had a high percentage of homelessness, but may as many as 1½ million homeless people since the earthquake.

When Haitians first saw the straw-bale walls going up, "they would come in and just sort of laugh," says Mueller. But after builders put the plaster on it, "they would come in and say: 'This is MY house.' There was a 180-degree turn."

As principal designer and owner of GreenSpace Collaborative since 1996, Mueller said he has built dozens of straw-bale homes from start to finish, and has also assisted, or built components for, at least 75 more.

His own home in Charlemont is a straw-bale home, warm on both floors, even though it's heated by a single wood stove and uses only a cord of wood each winter.

In 2005, Mueller co-founded Natural Builders Northeast. He is also treasurer of the Sheltering Pines Institute, based in Williamsburg, which is raising money for the Ti Kay Pay building project. Sheltering Pine is a nonprofit organization dedicated to building sustainable human ecosystems.

Although the group is trying to raise \$30,000 to develop the right kind of house for Haitians, "The cost to build a Ti Kay Pay will be about \$5,000 U.S. dollars once we go into production," Mueller said.

Mueller says the straw houses are remarkably earthquake-resistant, and the insulated straw walls and ceiling will keep the interior naturally cooler during the hottest days than other types of structures.

Soon after last January's earthquake, Mueller said he was contacted by Builders Without Borders architect Martin Hammer of Berkeley, Calif., and they went to Haiti last March, to determine

existing conditions there and the availability of local materials and the feasibility of building a straw-building prototype.

"We weren't even sure there was rice (growing) in Haiti," he said.

Despite difficulty feeding its poor, Haiti has fallow rice fields, says Mueller. And the reason is because there is little incentive to farm it. Because Haiti does not have a mechanized means of processing rice, imported rice from the U.S. can be purchased for less than the local produce. If the demand for straw-bale homes grows, the added value of the straw could create more incentive for local rice-growing, he said.

Mueller said traditional rural homes, or Ti Kay, are about 9 feet by 15 feet — the size of a single room in an American house. Such a home generally houses a family of five. Mueller said the straw-bale house under construction is a little larger — roughly 13 feet by 16 feet.

He said the kitchens are separate from the houses, which has two internal spaces, one for a communal area and the rest is a sleeping area.

He said the traditional "wattle and daub" houses in which the poor live are made of woven tree saplings, sealed with earth. He said they handled the earthquake much better than steel and concrete buildings, but they are also stigmatized as poverty housing.

The right-angles on the corners of the straw-bale house and the lime-washed plastered walls seem elegant to the Haitians who might someday live in them. "Because of the plaster, we can get sharp edges," he said. "Even the poor people can afford to build a rich man's house, in this way."

To make the straw bricks, the building team designed and fabricated a compression mold, with a steel box and a farm jack, such as is used here to jack-up farm tractors. The bales are molded into bricks 1-foot-square by 2 feet long.

They also purchased a manual a rubble-crusher to prepare the foundation, crushing the rubble to certain specified dimensions.

Besides the building team, local laborers were hired to do much of the work. Moisture sensors were put in with the



Left, Haitian workers build a straw-bale house. Below, Andy Mueller, a Charlemont resident who is the lead builder in the "Ti Kay Pay" project, is hoping to teach Haitians how to build the inexpensive, energy-efficient shelters that could help reduce some of the homelessness, food-scarcity and even the building rubble left after last year's earthquake.

Submitted photos

straw bales, to collect long-term data on how well the walls perform.

The house will have a large porch, in keeping with local Haitian architecture, and a pitched roof with a wide overhang, to protect the walls from rain.

With the prototype home, the rainwater will be collected for both potable and non-potable water use. It will also have an outdoor composting toilet.

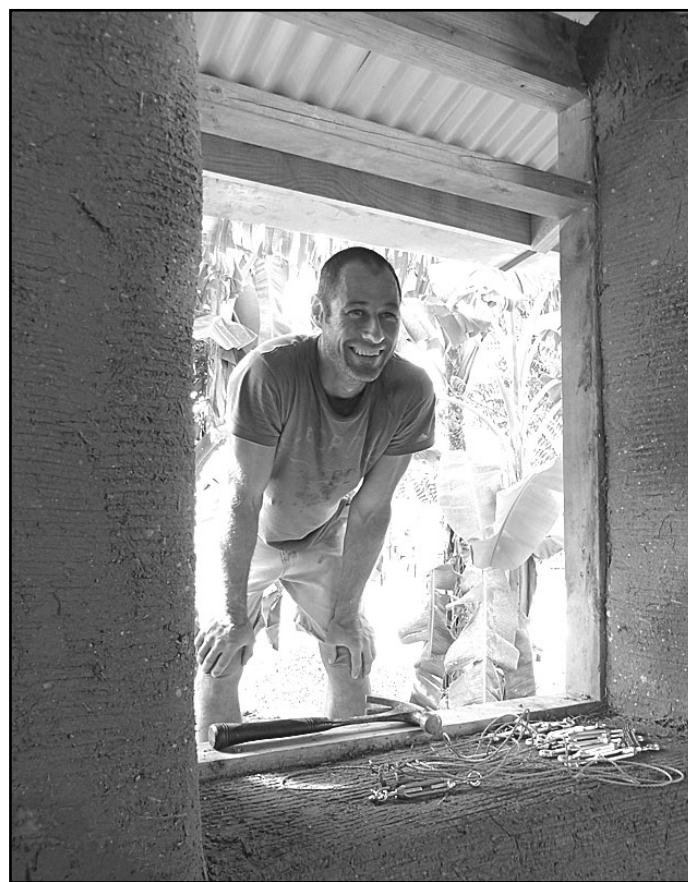
The ceiling is made of bamboo, packed with insulation made of rice hulls and clay.

Mueller said he plans to finish this first project, which will be a "model home" and will become the headquarters for Sheltering Pine Institute in Haiti. He'll also help select another project. Some of the ideas include a school building, an orphanage, a school office or a community art center.

"We will provide technical assistance within our budget," he said. "But whatever organization wants it, will have to fund the labor for workers and for the materials," he said.

"We're trying to raise money to finish this project and for our costs, to assist with the next project." He said the US builders and architects are only being paid for their travel flights and living expenses.

When asked if the poor have land to build on, Mueller said others are looking into a "micro-financing model," in which people could borrow money for land or housing



### State/Region Briefs



#### Students to serve during Catholic Schools Week

WATERTOWN — Catholic school students will serve as lecturers and altar servers during live daily Mass at CatholicTV studios in honor of Catholic Schools Week.

Starting today, CatholicTV will host students from six Catholic schools to mark the 38th Catholic Schools Week, a joint project of the National Catholic Educational Association and the United States Conference of Catholic Bishops.

Based in Watertown, CatholicTV is available in 5.7 million homes nationwide.

#### Bottle-law changes sought in Vermont

BURLINGTON, Vt. — Vermont lawmakers will consider bills to bolster, but also repeal, Vermont's pioneering bottle law during the new legislative session.

The Burlington Free Press says two bills were introduced to expand the law. If passed, they would require the bottle law to also include wine and all carbonated and noncarbonated drink containers, and to force beverage companies to use the money from unclaimed deposits to support environmental programs.

Another bill would enact a solid waste program under which producers would have to set up and pay for a program to collect, recycle and dispose of certain types of packaging. The bill would also repeal the beverage container redemption system.

#### Special counsel named in probe

BOSTON — State Treasurer Steven Grossman says he has appointed a special counsel experienced in securities law enforcement to handle a federal investigation into Goldman Sachs Group's dealings with his predecessor, Timothy P. Cahill and Cahill's former aides.

Grossman told The Associated Press Sunday he has hired Ian D. Roffman, a former senior trial counsel for the Securities and Exchange Commission and now a partner at a Boston law firm.

Grossman would not provide details about the SEC investigation.

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