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Family uses green vision to restore fire-damaged home

Little more than a year ago, Skip Stiles and Margie Mulholland roused their children from bed and fled a fire that would destroy their home.

Despite heavy losses, the two gave thanks that their family was alive and unhurt. They vowed to rebuild. They promised to make their home safer, better.

Telltale smudges of smoke on the front porch of 1121 Graydon Ave. remind what happened early Nov. 5, 2007. Not much else.

Stiles and Mulholland have turned their home from charred black to eco-friendly green.

A cool-white, fiber-cement siding reflects light and acts as a fire barrier in ways their wooden shingles never could.

Inside, insulation pads the walls where none hung before. Heating and cooling the 1916 home used to cost a "few hundred" each month, Stiles said. When the family moves back in January, a geo-thermal heat pump will slice the cost to less than \$30 a month, he said.

The couple is picking out counters. One is made with recycled Budweiser brown- and Heineken green-colored glass embedded in a durable resin. It will sit on cabinets constructed from fast-growing plants and emit little or no formaldehyde, a known carcinogen.

All around, an energy-recovery ventilation system will control humidity and preheat or cool incoming air the family breathes. It does so by harnessing building energy.

"Both of us are pretty committed to this stuff," said Stiles, who serves on the state's Commission on Climate Change and advises Gov. Tim Kaine on how to cut Virginia's emissions.

"This is my dream house now," said Mulholland, an associate professor in Old Dominion University. "I just think it's so important."

The home also serves as a learning lab. Neighbors, Norfolk Environmental Commission members and U.S. Green Building Council faithful from Hampton Roads have trooped through.

Inspectors and trades workers are getting an education, too. Norfolk Plumbing owner Jeff Hux and staff learned how to plumb the home so it could eventually use "gray water" from sinks and showers to flush toilets or water the yard.

"We researched ways how to cut their usage," Hux said.

Sales people pitch what Stiles and Mulholland don't want. Three tried to sell them high-efficiency heat pumps, not the geo-thermal system they wanted.

"It's not plug-and-play," Stiles said of renovating green.

The couple's home is only the second existing residence in Virginia to be renovated to meet green-building standards by EarthCraft House, an independent third-party rating firm.

"This is Cadillac, top of the line," said Bob Congdon, a technical inspector for EarthCraft, of the couple's home.

Here are some of its features:

Atrium

To brighten the interior of the home, the couple added a pair of remote-operated skylights in a rear stairwell to complement one at the front of the house. When open, the skylights will create an updraft, allowing warm air to rise and escape.

Contractor Nick Shawyer called it an atrium ventilation system and a likely energy saver.

"I'm hoping when other people are running their air conditioning, (they've) got the windows open," he said.

Cabinetry and flooring

Odd as it may seem, Stiles and Mulholland are covering their floors and cabinets with a type of grass. They call it bamboo. And though it grows in China, and requires considerable energy to bring it stateside, it gets high marks in green building.

Bamboo is a rapidly renewable resource because it grows to maturity in 5-1/2 to 6 years of age, well within the 10 years needed to receive a U.S. Green Building Council blessing.

The bamboo to be used in the couple's home also will help preserve indoor air quality there. Some has no urea-formaldehyde added to the adhesives, according to its importer, Teragren of Bainbridge Island, Wash.

Insulation

Insulation is the unsung hero of green living.

Stiles and Mulholland encapsulated their home with it to stop outdoor air from blowing in and conditioned air from seeping out.

They used tiny bubbles of foam, shredded newspaper and rigid foam boards that outperform a similar thicknesses of batts of fiberglass insulation, a less costly product, said Steve Tetreault, owner of The Drying Co. in Williamsburg.

Tetreault sprayed one-half inch of dense, impermeable foam on the interior of the couple's gutted walls. He then applied 3 inches of cellulose, a mix of recycled newspapers and new wood fiber. Together they achieved an R-value of about R-15, he said. (R-value represents resistance to heat loss.) A similar thickness of fiberglass batts provide a value of R-13, Shawyer said.

Tetreault also insulated wide band boards between floors with foam to prevent air leaks. He attached rigid foam boards with a value of R-10 to the exterior basement walls to stop humidity. Under the attic rafters, he sprayed a half inch of foam and 10 inches of cellulose for a value that exceeds R-30, Shawyer said.

Geo-thermal heat pump

If Stiles and Mulholland want to make heads swivel at holiday parties, they need utter one sum, \$28.

That's how much they'll spend per month, on average, to heat and cool their 3,700-square-foot home, said Ed Battelle with Virginia Service Co. in Virginia Beach.

Stiles and Mulholland have their geo-thermal heat pump to thank. When running, it will harness ground temperature to control indoor air temperatures. It works by piping water in and out of five wells, each 200 feet deep, in the couple's backyard, Battelle said.

In the winter, the Earth's stable temperatures warm the water in the pipe, which transfers heat to the home. In the summer, the home's heat is absorbed by the water and piped into the wells, where the heat dissipates.

The system also will pre-heat the home's hot water, lessening the load of a planned solar hot water system, Stiles said.

A tax savings of at least \$2,000 is possible for the geo-thermal system, Battelle said. That would reduce the difference in cost for a geo-thermal heat pump and a new air-to-air heat pump in the home to about \$8,000, he said.

Disposal

Shawyer has tried to cut waste by using materials more effeciently.

For instance, his crews used two studs instead of three when framing corners. The California-corner technique eliminates dead space that is hard to insulate.

Shawyer also separates his trash. Crews dump brick, block, glass, metals, porcelain, tile and untreated wood in a bin bound for Waterway Recycling in Chesapeake.

There, woods are ground into mulch. Brick and block are recycled. Drywall and insulation go to a landfill.

So far, Shawyer's crews have recycled 8-1/2 tons of material and trashed 7-3/4 tons.

"Who knew there was this big recycling place?" Shawyer said.

One of his roofing crew did and passed the word.

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