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LAKE HOUSE IS GOLD, ACCORDING TO GREEN FANS

Tim Knauss

Elet Callahan's new house on Skaneateles Lake is shaded on the west side by towering maple trees, several of which are within a few feet of the house. They should be in full leaf by the time Callahan moves in next month.

The trees are one reason Callahan's house is considered the greenest in New York state. Many builders would have knocked them down to make way for the house. Callahan's builder, **Kevin Stack**, dug around their roots with a hand shovel and carefully bent the roots out of the way while the house's foundation was poured.

When the time came to run a water line from the house into the lake, **Stack** used a GPS-assisted drilling machine to bore under the trees and to avoid digging up the shoreline.

Why all the trouble?

Stack said the trees are part of the "natural capital" of Callahan's property, not to be wasted. Besides beauty, they provide summer cooling, water drainage and erosion control. They convert carbon dioxide to oxygen.

"We look to nature for examples of how we should be doing things," **Stack** said.

The decision to save the trees was one of many choices that earned Callahan's house a top rating for environmental design.

The U.S. Green Building Council recently certified the house at the "gold" level under its Leadership in Energy and Environmental Design program. It's the only house in New York to be rated that high.

Three other houses in the country have been rated gold, the third-highest of four LEED levels; four houses have reached the highest level, platinum.

The Callahan house is no Spartan bunker. It's a 3,000-square-foot cottage-style house designed by architect Andy Ramsgard, who incorporated elements of Arts & Crafts style.

The house has three bedrooms and four bathrooms, with a layout that is cozy and convenient. The gathering room is richly trimmed with oak, the kitchen with cherry.

Inch by square inch, **Stack** chose materials and construction methods designed to save energy and resources.

The porch material is a composite made from recycled plastic and wood refuse. The concrete in the foundation is 30 percent fly ash, a waste material from coal-burning power plants. The bathroom cabinets are made from wheat board, a particle board composed of wheat straw. The tiles in the showers are recycled glass.

"There's no waste in nature," **Stack** says.

For energy efficiency, the heating system features a high-tech boiler and in-floor radiant heating. The system is at least 94 percent efficient, **Stack** said.

Waste heat from both the boiler and a gas fireplace in the gathering area are recovered and used to heat fresh air brought into the house by a heat recovery ventilator.

Based on its score on the Home Energy Rating System of the Energy Star program, the Callahan house should use 60 percent less energy than a conventional new home, **Stack** said.

But **Stack** said he won't be content until he knows for sure.

With help from the Syracuse Center of Excellence in Environmental and Energy Systems, **Stack** has had data loggers installed throughout the house to record when the heating, cooling or air handling system turns on or off. CDH Energy Corp., of Cazenovia, supplied the data loggers and will analyze the data, which will be collected for another two years, **Stack** said.

Along with the Callahans' utility bills, the data will demonstrate how much energy the house uses and how well the heating, air conditioning and air handling components perform.

"It's time to quit talking about it and start proving it," **Stack** said. "No one's going back and seeing if (green buildings) are actually performing the way the energy models say they should."

Callahan, 50, is a professor of environmental law and policy at Syracuse University's Whitman School of Management. She and her husband, orthodontist Dr. John Callahan, 52, decided to build a year-round house on the lake two years ago. They have a quarter-acre lot on East Lake Road, in Spafford.

Because of her academic interest in sustainable development, Elet Callahan sought a "green builder." That led her to **Stack**, a custom builder who is widely considered Central New York's leader in the field, she said.

Stack is president and owner of Northeast Natural Homes Inc. and a charter member of the Center of Excellence.

Coincidentally, **Stack** had been chosen to collaborate with the U.S. Green Building Council, the National Association of Home Builders and the New York Energy Research and Development Authority to build a green home that could be a demonstration project for other builders.

The Callahans agreed to let their home be the demonstration.

"We were excited to be a part of the project," Callahan said.

Stack held several workshops for builders at the house during and after construction. Information gleaned from the house will be shared with other builders and with students in local construction management programs, he said.

Does it cost more to build green?

Ten years ago, the answer would have been a definitive yes, **Stack** said. But the prices of recycled and energy-saving materials are dropping as they become more common, and they often compete well against traditional materials, he said.

Some materials may cost extra. Soy-based foam insulation, for example, costs more than cellulose or fiberglass, but it seals and insulates much better and will save money over the long run, **Stack** said. The soy insulation also allows the use of smaller rafters, which saves on wood.

Callahan declined to say how much her house cost.

According to town assessment records, the house's full-market value is estimated at \$540,000, not counting the value of the lot.

Rick Fedrizzi, president and CEO of the U.S. Green Building Council, said LEED-certified homes may cost a little more to build, but the payback comes quickly.

"The return on investment in these things happens very quickly - in most cases under a year, sometimes two or three years," he said.

Although some consumers may build green for philosophical reasons, Fedrizzi said he believes most choose green as a way to improve the air quality and the overall comfort of their new homes.

"This really focuses on the ability to make the human the most important element in this place," he said.

Stack is one of 375 builders involved in the LEED for Homes program. Most, like **Stack**, are

custom builders, but the program also has attracted considerable interest from affordable home builders, said Emily Mitchell, assistant program manager.

So far, 200 homes have been LEED certified, most at the silver level. About 6,000 more homes are in the pipeline to become certified, Mitchell said.

Stack said he expects green building technology to spread quickly through the housing industry, because it offers higher quality homes and lower utility bills for a slightly higher up-front cost. As the technology evolves, it's important that builders learn from each other, he said.

"We just set the bar," **Stack** said of the Callahan house. "I can't wait for someone to step up and say, "Mine's greener.""

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Here are some of the details that went into the greenest house in New York:

Cork floors: The wood can be harvested every six to nine years, without killing the tree. Acts like a hardwood, with more cushion. Just don't walk in the house with stiletto heels.

Soy-based foam insulation: It's renewable, and seals and insulates better than cellulose or fiberglass.

Low VOC paint: Latex paint specially designed to have low or no emissions of noxious volatile organic compounds.

Insulated concrete foundation: Made of concrete sandwiched between two layers of foam insulation, it has an R-value of at least 22, twice that of a conventional foundation. The concrete contains 30 percent fly ash, a waste product.

In-floor radiant heat: Hot water circulates through tubes, heating the floor and other objects; more efficient and comfortable than heating the air.

High-efficiency boiler: Varies BTU output based on outdoor air temperature, and recovers its own waste heat.

Recycled glass tiles .

Heat recovery ventilator: Brings fresh air into the super-tight house, but warms it first using exhaust air.

Dual-flush toilets: They use less water to flush liquids than solids, saving 6,000 gallons per year for a family of four.

Sustainable hardwoods: Oak and cherry harvested under sustainable forestry rules of the Forestry Stewardship Council.

High-efficiency windows and doors: Help prevent heat loss.

Pre-cut, engineered lumber: Compared with dimensional lumber (traditional boards), engineered wood (used for floor joists, studs and roof trusses) allows the mill to use 50 percent more of each tree. Cutting the wood to size at the mill prevents wood waste at the construction site.

Wheat board cabinets: Particle board made from wheat straw, without formaldehyde.

Composite porch: Made from a long-lasting blend of recycled plastic and wood waste.