



UW offers more 'green' for less

PHOTO COURTESY SUE THERING

By Andrea Ward
THE DAILY CARDINAL

Popular images of "green-built" homes often come in two distinct shapes: do-it-yourself rustic cottages made of straw bales, or million-dollar "eco-mansions" with state-of-the-art technologies that only the wealthy can afford. Middle-income families have traditionally had fewer options when it comes to living "green."

That may be about to change. Faculty and students in the UW-Madison landscape architecture department have teamed up with professional advisors and Wisconsin's American Indian tribes to bring "affordable" and "green" a little closer together.

"Green and affordable have always been contradictory because you're talking about high quality materials and high quality craftsmanship," said Sue Thering, UW-Madison assistant professor of landscape architecture and coordinator of the project.

For years, architects have struggled with the concept of making energy-efficient buildings more affordable. As an architecture student in the wake of the energy crisis of the 1970s, Thering saw the contradiction in building affordable housing that was poorly constructed and therefore energy inefficient. Thering observes this problem continuing today.

"Many people thought the energy crisis went away," Thering said. "Well, it didn't. When you have families paying five to six hundred a month for heating in the wintertime, they're going into debt. But, they also may have their heat shut off and develop health issues because of that. It's a huge cost to society as well as the individual."

Historically, UW-Madison Landscape Architecture faculty and students have collaborated with Wisconsin's tribes in landscape design and master planning that aim to preserve the natural and cultural resources of the reservations. When some community leaders asked about green practices at the housing level, Thering was more than willing to organize a partnership between UW-Madison and the Tribes and Design Coalition, a Madison-based non-profit community development firm specializing in green construction.

"The tribes are very savvy and knowledgeable about healthy housing," Thering said. "They understand that their housing affects their families in health and economic ways, and it affects the community at large."

Duane Emery, the director of planning for the St. Croix Ojibwa said he jumped at the chance for his community to be part of UW-Madison's efforts to build greener homes.

"As Native Americans, we are trying to go back to basic Earth principles," Emery said. "We need to take

care of mother Earth by using the sun and using the elements."

With a three-year grant from the Baldwin Wisconsin Idea Foundation, UW's "Green Team" has developed a program to train local builders from reservation communities in green-building techniques, and implement those techniques by collaborating on "demonstration" houses. The goal of the program is to become locally sustainable as the builders from the tribes pass on the new skills through building green houses in their communities.

This year, the Green Team's idea began to take shape. In May, builders from several Ojibwa communities traveled to Santa Fe, N.M., for a week of green building training, and ground was broken this fall for the first demonstration house, which is being built near Hertel, Wis., on the St. Croix reservation in northwestern Wisconsin.

Currently, the demonstration house, nestled into the woods in a rural neighborhood, stands only partially completed. In the spring, when the house is finished, a St. Croix elder named Betty will move in. At first glance, Betty's new house looks pretty much like any other half-built house—a concrete foundation with wooden studs placed 24 inches apart. What makes it green? More than you might think.

Energy efficiency

Walk to the back of the house and you'll see that builders have begun to pack the spaces between the studs with what look like giant bricks of straw. This straw mixture, known as northern light straw clay, is one of the signature elements of a green built house.

Instead of conventional insulation made of fiberglass or cellulose, the walls of Betty's house will be packed tightly with straw coated lightly with a watery clay slip, which is made on-site in a giant cement tumblers. Straw has very high insulation properties, and the clay coating both binds the straw together and prevents the straw from getting wet, eliminating the possibility of water damage and rot.

You'll also notice that unlike other houses on the block, Betty's house appears slightly off-kilter. This is an intentional feature of the design called passive solar.

"The windows and floor plan respond to where the sun rises and sets, and where the sun is at different times of the day and different times of the year," Thering explained.

Passive solar takes full advantage of lighting and heat that enters the house when windows are placed just right, cutting down on demand for electricity and heating.

Local, sustainable materials

Of the three essential structural materials going into Betty's house (wood, straw and clay), each can be traced to sources within 20 miles of the building site. By using local materials, the community saves money and energy otherwise lost on transporting products over long distances. Also, by purchasing materials locally, the builders are not only able to support the local economy, but also the close proximity allows consumers to make sure the resources are being harvested sustainably.

"The [green-building] project is building tribal sovereignty," said Steve Kozak, director of the Lac Courte Oreilles Ojibwa Community College Sustainable Living Institute. "The tribal communities immediately grasped the empowering features of building houses with local supplies without going through outside organizations."

Non-toxic materials

Betty's house will contain none of the plywood or particle board used in conventional housing construction. These products are made with adhesives, which release formaldehyde gases into the air to be breathed in by inhabitants throughout the life of the house.

"When we talk about "green," we're not just talking about the health of the planet," Thering said. "We're also talking about human health. Breathing formaldehyde is just not a good thing."

Natural toxins like mold and mildew often accumulate when poorly-constructed housing allows moisture to collect inside walls and enclosed spaces, with detrimental health effects. This won't happen in Betty's house.

In place of the traditional drywall or plaster, builders will coat the light straw-clay walls with a natural clay plaster (made from the same locally-excavated clay), forming a wall that allows natural evaporation. The clay plaster also regulates humidity in the house, absorbing moisture during times of high humidity and exhaling it again when air moisture falls, eliminating the need to run energy-hogging dehumidifiers.

Community involvement

Beyond the human health and ecological benefits of building green, Thering also focuses on some of the more intangible benefits communities can gain by working together on green-built homes.

The builders who participated in the training in Santa Fe will train other builders, expanding the knowledge base among reservation communities and eliminating the need to pay outside experts. But it's also about education, not just job training.

"Housebuilding engages natural

sciences in a way that you just can't do in the classroom," Thering said.

Busloads of students from the Head Start all the way up to the tribal college have visited the build-site of Betty's house. Students, parents and teachers have all gotten their hands dirty working with the straw clay. This exposure, Thering believes, is how green building will catch on in communities on and off the reservation.

On the St. Croix reservation, the jury is still out on green building. "Some people think it's the coolest thing since sliced bread, and others wonder if it's really going to be worth it in the long run," Thering said.

Skeptics wonder whether green can truly be affordable. While Thering acknowledges that higher-quality "green" materials are still three to five percent more expensive than conventional building materials, there isn't much they can do about that for now.

But she firmly believes that building green gives homeowners more for their money, and the small extra expense at the outset can be recouped quickly in the form of greatly reduced energy and maintenance costs. "We're talking about long-term affordability," Thering said. "These houses will be solid and energy-efficient for more than a hundred years."

While it may take time for builders to perfect the energy-efficient homes and determine ways to drive down building labor costs, Emery and Kozak believe affordable energy-efficient homes are within reach.

"We have the technology," Emery said. "We just need to push our principles ahead."

Whether or not they're sold on green building, the St. Croix community is paying attention, and to Thering, that's what really matters.

"Once people see that you can use locally harvested things—wood, clay, locally-grown straw—you're supporting farmers, contractors, the local economy and you're building energy-efficiently, what's not to love?"

While the finishing touches on Betty's house won't take place until spring, the green-building teams already have plans for three more demonstration houses to be built next summer. In the meantime, Thering has been fielding calls from universities across the upper Midwest who are eager to implement the project in their own states.

"Through the vision and the leadership that folks at UW-Madison have shared with the Native Americans, a sustainable housing vision is taking place," Kozak said. "It seems like we're meeting a need that has gone unmet for a long time," Thering said.

—Jennifer Evans contributed to this report.



Science in brief

INTERNATIONAL

Rumors have lasting effects

Sticks and stones may break my bones, but words will never hurt me, right?

Wrong, says a recent German study. To test the power of rumors, researchers anonymously paired strangers together to play a computerized cooperation game. After several rounds, the pairs were then switched and asked to assess how good or bad they perceived their partner's performance; information available for future partners to see.

Researchers at the Max Planck Institute for Evolutionary Biology discovered that, when new partners were assigned, participants placed more weight upon rumors about an individual than the player's cooperative record.

Will the HPV test one day replace the Pap test?

When testing for cervical cancer, Canadian researchers say HPV tests appear more accurate than traditional Pap tests.

The study, reported today in the New England Journal of Medicine, is the first of its kind to examine the ability of HPV tests to detect cervical cancer in more than 10,000 Canadian women.

While the evidence shows HPV tests to be more sensitive in detecting early signs of cervical cancer than Pap tests, more studies will be needed to assess whether similar results will be found in the United States.

NATIONAL

Scary faces jump out

With Halloween just around the corner, researchers at Vanderbilt University have discovered that people identify faces frozen with fear faster than faces reflective of other emotions.

By temporarily reducing study participants' ability to see, researchers tested how speedy participants could make out human faces. Without any conscious awareness of the type of face they were seeing, patients selected the fearful face more often than the happy and expressionless face.

LOCAL

Environmental advocate from NY to speak at UW-Madison

Check out this public lecture next Wednesday, Oct. 24 at 7:30 p.m. in room 180 Science Hall.

LOOKING AHEAD

It's not easy being green

UW-Madison researchers find high levels of nutrients used on local farms are causing major health problems for Wisconsin frogs. Find out more in The Daily Cardinal science section next Thursday.