post & beam

building green to save green at the lake

by Ann Wayne

The contemporary green building movement, also known as sustainable or high performance building, arose out of the need and desire for more energy efficient and environmentally friendly building practices. The oil price increases of the 1970s spurred significant research and activity to improve energy efficiency and find renewable energy sources. The environmental movement of the 1960s and 1970s also led to early experiments with contemporary green building.

Green building is the practice of increasing the efficiency with which buildings consume energy, water, and materials, while reducing the building's impact on human health and the environment.

Sam and Barbara Glabermen of Mooresville, NC are believers in global warming and the need for green building and conservation. "Building a special house seemed to be the important thing to do. I had never really done anything special in my life," Sam told Southern Home Magazine.

After visiting Barbara's son in Charlotte, Barbara and Sam began to think of moving to North Carolina and early retirement. After selling Christmas

decorations for many years, an early retirement was an attractive idea to Sam. Barbara also had ideas of retirement and was ready to give up selling real estate in the Manhattan area. After years of battling New Jersey's winters, moving South was appealing.

The Glabermens made the big move. They purchased a four-acre parcel on the shores of Lake Norman. Before buying house plans, Sam spent eight months researching plans and products that were energy efficient and Earth friendly. Sam conferred with an Energy Star consultant before making any final decisions. Energy Star is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy helping consumers save money and protect the environment through energy efficient products and practices.

In 2007, Sam and Barbara met with Tom West from Lindal Cedar Homes. Sam and Barbara had a pretty good idea of what they wanted and with Tom's help they were able to come up with a list of qualified subcontractors and a beautiful 3,800 square foot, post and beam, cedar retreat with a lodge-style, open floor plan. Lindal Cedar Homes is the world's largest manufacturer of custom post and beam cedar homes. Founded in 1945, there are more than 50,000 Lindal Cedar Homes. They are well known for their superior post and beam designs, quality building materials and detailed craftsmanship.

The architecture and position of the house itself was designed to be energy efficient. Overhangs to protect the south facing windows from excessive heat in the summer and in the winter those same windows will heat the house due to the change of angle of the sun from summer to winter.

With so many choices to make, the couple agreed Sam would take charge of the yard and all the mechanical systems and Barbara would choose products for the inside and be in charge of the interior design and decorating.

It took the Glabermens eight months to finish their home. When asked if they would build again, Barbara said "It was rough! It was hard on us.

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We didn't know anyone local and it was sometimes hard finding vendors."

When asked about the budget, Sam stated, with a chuckle, "We didn't have an initial budget, but we did go over by about twenty percent from what we expected. Green elements do cost more but in the long term they pay off for the homeowner and the environment." The Glabermen's electric bill averages about $120.00 a month, not bad for a pool, four acres and a 3,800 square foot house.

In spite of the fact that it was sometimes difficult to find contractors who are familiar with green, energy efficient, products and installation methods Sam said he would build again. Sam also offered advice for anyone contemplating building a home. He said, "Know what you want. Know what's important." Sam and Barbara report, the most important energy efficient options with the best payback and comfort are good insulation such as spray-in foam to seal air infiltration and double pane argon filled windows. Energy conservation begins with the building envelope. However, there are many other elements that also contribute to the Glabermen's efficient home. A blower test was performed by Energy Star to check the air tightness of the house. The Glabermen's house was rated second best in the region, according to the test results. Statistics show that Americans, along with Energy Star, saved enough energy in one year alone to avoid greenhouse gas emissions equivalent to that from 27 million cars – while saving $16 billion on their utility bills.

Foundation Walls

Stone and styrofoam were laid on the ground before the concrete foundation was poured. Styrofoam, with twelve inch plastic brackets, surrounds the concrete, foundation walls, wrapping the house like an envelope. The house is well isolated from the ground and this house is twice insulated because of this technique.

Metal Roof

Metal roofs are favored for their speed and ease of installation. This type of roof is surprisingly lightweight and is great at reflecting heat from the sun helping to keep the house cool. Metal roofs are made primarily from aluminum and steel—but other materials, such as copper and alloys are also used.

Titanium Underlayment

Titanium paper was used under the metal roofing system instead of the traditional tar paper. Titanium paper is a 100% polymeric based material, which is fully recyclable – unlike roofing felt underlayments that are made from asphalt products. Sam shared a story about the titanium paper being installed on the roof and sitting there for a month and a half before the actual metal roof was installed. He said that traditional tar paper would not have held up. Titanium paper also has a 25-50 year warranty, depending on the product brand. This product is 100% inert to moisture absorption, unlike felt paper, thus protecting the metal roof from water breach or mold.

Hot Water Panel

Solar Hot Water Panels convert sunlight to hot water for domestic use. On sunny days the temperature in the storage tank will quickly rise to 180 degrees. Tremendously efficient, the average cost for hot water is just $7 a month, about 70% less than tradition hot water systems, because of their energy efficient water tank, Duke Energy offers Sam and Barbara Glabermen's electricity at half price and has the privilege of turning off the power during peak times. They monitor this with a radio controlled tower.

Geothermal Heating & Cooling

Very similar to a typical air conditioner or heat pump, but

the air is pulled from tubes in the ground. A typical air conditioner tries to cool the house using the outside temp of say 90 degrees, while the geothermal unit is cooling the house using 56 degree ground temp. Because there is less fluctuation in ground temperatures the same can be had in the winter.

When properly installed, a closed-loop system is economical, efficient, and reliable. In 2008, the IRS offered a $2,000 credit for residents who installed an Energy Star geothermal heat pump. It is IRS Form 5695 – Residential Energy Efficient Property Credit. The Glabermen's average heat bill is usually $110 - $120 monthly. Compare this to an average 3,880 square foot home that has an electric bill of at least $300 monthly - for a savings of around 70%.

Energy Recovery Unit

They also have an energy recovery unit. This system takes outside air, which could be cold, and runs it through baffles to warm the air before coming inside.

Argon Filled Windows

Large energy efficient windows open the view for the lake setting. These windows were actually manufactured by Lindal, the cedar log home builder. The argon filled windows make homes more energy-efficient by reducing the overall transfer of heat between the inside and outside of the house.

Insulation

All interior walls are standard drywall; however, they are six inches thick and insulated with a layer of closed cell foam. The density of this foam provides better insulation than most types. The walls also have a layer of gauzing material and are filled with a fluffy fiberglass. Sam stated that the walls really seal up the house.

Low VOC Paints

Low VOC (Volatile Organic Compounds) paints were used. These paints are safer for the air we breathe. Paints and finishes release low level toxic emissions into the air for years after application.

Fireplace Insert

A high efficiency insert, which draws cold *(con't on p 34)*

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