

# WHAT IT MEANS TO BE GREEN

By Joe Cooper, EarthCraft House certification coordinator

**T**here are as many ways to build an environmentally friendly home as there are floor plans to choose from. Whether it is employing passive solar design, choosing to use engineered lumber and recycled building materials, tightening the building envelope and ducts, or recycling wood and drywall waste, every measure a builder takes can significantly reduce the impact of a new home on our environment. Certifying a home as an EarthCraft House is a sure way for a builder to provide homeowners with a home that was built green, and will stay green for years to come.

At the heart of any green building program is energy efficiency. To be environmentally friendly, a home must be efficient in its construction and in its maintenance. The Earth Craft House certification process takes numerous factors into consideration, all of which add up to a home that:

- Conserves resources and energy,
- Saves on operating, repair, and health costs, and
- Improves air and water quality.

Many energy features offer benefits such as increased comfort, reduced noise and improved fire safety, in addition to obvious advantages in terms of energy consumption. Energy efficient homes also experience fewer moisture problems, reducing the risk of mold development. In addition, better control of moisture and temperature means less movement of materials, which reduces unpleasant floor squeaks and drywall cracks.

Getting the most efficiency for the least cost requires careful attention throughout the design and construction process. Most energy efficient homes have dozens of little

improvements that individually add little to construction cost, yet together yield big savings.

While some energy features add to construction costs, others can actually reduce costs. For example, advanced framing techniques can reduce lumber costs over 15 percent and prevent mold growth in outside walls and ceilings.

A poorly insulated, leaky building envelope and unsealed ductwork add up to the largest energy penalty in a home. As much as 40 percent of all heating and cooling costs can literally be going out the door. Increasing insulation and sealing air leaks will reduce heating and cooling needs, allowing the use of smaller HVAC equipment and ductwork. The savings on the mechanical systems can pay for the increased cost of insulation and air sealing. And a tight building envelope and duct system can significantly reduce the introduction of unconditioned, contaminated air into the home.

Choosing high-efficiency windows is another decision that

can have a significant effect on energy consumption, while not necessarily adding significantly to construction costs. Double-paned windows with wood or vinyl frames and low-e coatings are more costly than typical windows, but they can often reduce heating and cooling loads enough to allow for smaller, less expensive and more effective HVAC equipment. This is especially true when window orientation is considered as well. Window orientation greatly affects energy use—as much as 25 percent for some designs. Major glass areas should face south for maximum winter heating. Avoid unshaded glass on east and west sides to reduce summer overheating. Use solar shade screens, roof overhangs, trees and other landscaping to provide shade.

Another important aspect of an environ-

## Easy methods of improving energy efficiency throughout the house:

- Seal all penetrations in the building envelope
- Locate ducts inside conditioned space; if not possible, ensure ducts are tightly sealed with mastic and insulated
- Install adequate insulation with no gaps or compressed areas
- Specify efficient windows; consider orientation
- Size heating and cooling equipment; choose efficient models
- Provide controlled ventilation
- Install efficient water heating
- Specify efficient lighting for fixtures used more than four hours daily
- Choose efficient appliances

mentally friendly home is its reduced water usage and efficient water heating. A family of four can spend more for hot water than for heating or cooling the home. Simple conservation measures, such as low-flow showerheads and toilets, tank insulation jackets, and convection traps in hot water lines cost little but contribute greatly to energy savings.

### A green home is a healthy home

All homes should provide a healthy indoor environment. Poor energy features can contribute to serious health concerns, especially for children, the elderly and those suffering from illness. Energy efficient homes can reduce health risks from mold, dust mites, radon, combustion by-products, and other contaminants. They also offer fewer entry points for dust and pollen, insects, rodents and other pests.

Being environmentally friendly involves much more than taking your cans, bottles and newspapers out to the curb once a week. There are simple decisions we can all make everyday that can have a tremendous positive impact on the environment. While we do not usually think of homes as being pollution generators, the energy they require contributes to the problems our environment faces. From the lumber mill that makes the building products to the coal-fired power plant that generates the electricity to operate it during its lifetime, a home can significantly contribute to global warming, acid rain, smog and other serious environmental problems.

Participating in the EarthCraft House program is a great way for builders to show they are committed to building high-quality, efficient, healthy homes and to protecting the environment. Builders benefit from the increased value of the home and reduced callbacks and comfort issues. Home-owners have assurance that they are buying a well-built, energy-efficient, comfortable home that will remain high-performance for years to come. ▲

For more information on EarthCraft House visit [earthcrafthouse.com](http://earthcrafthouse.com) or call the HBA at (770) 938-9900.



Glen Cartledge (left) and Carl Seville inspect insulation at a recent SawHorse project.

# REMODELING GOES GREEN

By Geoff Kohl

Rethinking the remodeling industry has raised the question that, while remodeling a house, is it possible to really correct the building envelope, even make it comply with EarthCraft House standards? Some local remodelers and Southface staff members are hoping to answer that question with an affirmative. In an effort to create EarthCraft guidelines for remodeling project, local remodelers have partnered with Southface to beta-test remodeling projects.

One such project was the home of Glen Cartledge, an architect with SawHorse Inc. Glen, whose home previously was a one-floor-plus-basement ranch in Buckhead was your standard ranch. Built decades earlier, it lacked many of the modern amenities and amount of space typical in newer homes. As a result Cartledge, with the assistance of Carl Seville, president of SawHorse and a member of the HBA executive committee, decided to revamp the home. By severely gutting and reconstructing the home—including the addition of a second story with a master suite and unfinished (but conditioned) space that could accommodate two bedrooms—Cartledge had the option of effectively air-sealing and insulating the walls. He went with an icynene insulation, a foam insulation that is sprayed in and which then expands to fill up the cavity. Not only does it provide a fantastic level of insulation, but it is able to serve as an air-block. As Seville admitted, the icynene is more expensive, but the initial cost “eliminates a lot of other work,” including air sealing. The home uses a number of recessed lighting cans, but Seville noted that by applying the insulation under the roof rather than on top of the ceiling, insulating the cans wasn’t necessary.

cont. on page 13

# 22 TOP GREEN BUILDING TIPS FOR TODAY

By Geoff Kohl

**W**e consulted with green building aficionado and EarthCraft House quality manager Rob Johnson about the latest things going on in terms of environmentally friendly construction. The result is this list of 22 things builders can do to stand out in creating a high quality home that not only aids in preservation of the outside environment, but also better conditions the inside, living environment. Many of these tips can be quite technical if fully explained, so we recommend that you consult EarthCraft House specifications found at [www.earthcraft-house.com](http://www.earthcraft-house.com) and do research on your own to learn which of these trends can be cost-effective for your homes.



## **1 Protect your site's trees.**

Really protect the trees. Johnson explained that some progressive builders are not only not cutting the trees from their property, but that they're actually going as far as to protecting the drip line of a tree, the area contained within the farthest-reaching branches and underneath which is the root structure. A silt fence guards the drip line, leaving the area completely undisturbed. This, he says, is "sensibly protecting trees, not just at the base, but at the roots."



## **2 Hang on to open space.**

While permitting can sometimes be a challenge,

builders can increase site density, thereby increasing the amount of undisturbed land that would be ready for trails, parks, wetlands, etc.



**3 Vent the radon gas.** It's a simple \$50 change early on in the construction project, but it can save \$5,000—the average cost of mitigating a radon problem with a homeowner. The solution is simple: a 3-inch PVC pipe that extends below the slab and vents the radon gas in a sealed pipe above the house. Best of all, the pipe fits between 2x4 studs in a typical wall.



**4 Stop moisture transfer from the slab to the framing.** By building in a capillary break using a roll of foam (like SillSeal) between the foundation and framing, moisture isn't allowed to wick into the wood.



**5 Advance your framing.** Advanced framing techniques supported by the EarthCraft House program not only cut back on the lumber needed (money saved), but in instances of use like the "California corner," can actually allow the house to have insulation where standard framing wouldn't allow.



**6 Use engineered lumber products.** By providing plans to a lumberyard/plant, builders can have trusses and floor joists ready made, eliminating labor in the field and decreasing the construction site waste.



**7 Get conditioned.** Johnson recommends moving the house's "mechanicals" into conditioned spaces.

The reasoning is easy to follow: an air conditioning unit and duct work in a 150-degree attic means the unit has to work harder to create the correct room temperature. By creating a combustion closet, air conditioners and heaters are working at a temperature much closer to the desired result.



## **8 Isolate the combustion air.**

By creating a well-designed combustion closet for gas water heaters and furnaces, fresh air is used for combustion and the resulting air is vented out. It keeps combustion gases from escaping into the home's breathable air.



## **9 Freshen the place up.**

Today's air-sealed, well-insulated homes have a need for fresh air, and builders are starting to design a fresh air intake into the return air plenum of the HVAC mechanical systems.



**10 Grind things out.** "Some of our builders are doing on-site grinding," says Johnson. Today's grinders can chip up waste lumber

and even separate metal from the resulting mulch—which can then be used instead of or in combination with silt fences as a more effective erosion control technique than straw-bales.



**Find the right plants for the job.** Xeriscaping, he says, is the wave of the future. It means using native species that are accustomed

to the amount of rainfall Georgia receives, as well as drought-tolerant species—thereby saving your homeowner a whopping water bill, and keeping Lake Lanier full enough to fish in.



**Harvest the rainwater.**

While this isn't something that many, if any, builders are doing, a simple connection from rain gutters to a food-grade barrel (through a filter) means free water from the sky can be used for landscape watering, much like a cistern system. By elevating the barrel, gravity creates water pressure that doesn't even require an electric pump.



**Light up smartly.** Compact fluorescent bulbs require much less energy to operate and last seemingly forever. Panasonic's Globe

light bulbs, for example, have a lifespan of 10,000 hours and their 15-watt bulb produces as much light as a standard 60-watt incandescent.



**Get moving.** By coupling smart light bulbs with motion sensors, timers and electronic eyes that can sense whether exterior

lights need to be on or off, you're shaving money off your buyer's electric bill.



**Cool things down.** Fact: a 72-degree room with 40 percent humidity will feel warmer than a 72-degree room with 20 percent

humidity. Help the air conditioning system feel cooler by power-venting the kitchen range hood or down draft to the outside.



**Fan out in the bathroom.** Get that moisture from a hot-shower out quickly. Not only will the space feel more comfortable

(see #15), but it prevents moisture from invading interior spaces (a key cause of mold growth). Using high-efficiency bathroom fans (which are quieter) in combination

cont. on page 26

Insulating the roof also allowed the ductwork located in the attic to be kept in a conditioned space.

Because a focus was to make the home as insulated as possible, they went with low-E, argon-filled windows from Marvin. Upgraded and new plumbing allowed Cartledge to have a system for hot water on-demand. He installed a manual control that preps hot water for release from faucets, eliminating the waste of running the hot water tap until the desired temperature is available. For the mechanicals, Cartledge used a high-efficiency furnace, and all ductwork was leak-proofed with mastic. A thick, pleated air filter removes 90 percent of the particles from the air intake. Compact fluorescent bulbs are used throughout the house, upgrading the lighting even in parts of the house that weren't fully remodeled or rebuilt.

The end cost of upgrading the house was to the tune of \$325,000, a cost well-above most remodeling projects. But it proved that remodeling and the EarthCraft House program can work together. As an additional testament to that fact—as Seville, Cartledge and I were finishing our tour, we took a glance at the thermostat upstairs. Cartledge has the thermostat timed for a 78-degree operation during the day while he and his wife are away. While it was mid-afternoon with an outside temperature in the mid-80s, the reading on the thermometer still read 75 degrees; holding steady from the nighttime settings almost seven hours later. ▲

Editor's note: Seville's company SawHorse Inc. will be revamping another Buckhead home to EarthCraft specs in the coming months as part of a project from Professional Remodeler magazine. To learn more about how your remodeling company can become EarthCraft-involved, contact the HBA at (770) 938-9900.

cont. from page 13, 22 Tips

with timers and motions sensors, says Johnson, are one way to ensure the fans are on for the right amount of time and use less energy.



**17 Go low with low-E windows.** The “E” stands for emissivity, or the ability for heat to radiate through a surface. Low-E windows, therefore help stabilize a home’s internal temperature, not allowing sunlight to severely overheat a room.



**18 Upgrade your insulation.** Blown-in cellulose insulation not only is middle of the road in price, but it improves air sealing. In open studding, where you don’t have two barriers of drywall, an easy to install mesh layer can create the barrier to hold the insulation in place. Pat yourself on the back for considering this stuff—it’s made from recycled newsprint. The boric acid in the cellulose mix not only makes the insulation bug proof, but it’s fire-resistant too. Johnson says that “100 percent of homes with blown-in cellulose insulation have passed the Earth-Craft House tests.”



**19 Power vent the garage.** The gases from automobile combustion have no place in your buyer’s lungs. By creating a garage exhaust fan, especially one timed to the light that turns on when an automatic garage door is opened or closed, you’re moving those gases away from the conditioned living spaces.



**20 No leaky ducts.** The average ductwork leaks between 10 and 15 percent. By mastic sealing duct seams and air handlers you can reduce leakage to 5 percent or less.



**21 Solarize.** Shy of installing solar panels to provide energy to a home (a decent idea in itself), you can still use solar power in your house, especially by using solar tubes instead of skylights. The idea is a tubular skylight approximately the same diameter as a basketball that transmits light from the roof into almost any space. The tubes (from manufacturers like SolaTube International) have a reflective lining, allowing light to travel over a long dis-

tance and then bend out into the room courtesy of a light diffuser at the end. Because it’s a one-square-foot area that isn’t insulated, as opposed to a possible 15 to 20 square feet of uninsulated space as with a typical skylight, you’re keeping the R-value of the ceiling relatively uniform. The cost to put one of these in is surprising low, estimated at around \$250.



**22 Take advantage of the Earth’s thermals.** While it’s an expensive process, typically only done at the request of the homeowner, by laying pipes in the ground below the house, you can take advantage of the surprisingly static ground temperature. Geothermal systems (there are many different theories on how to best use this resource) can in some cases have water piped through the ground, after which air can blow across the water piping, thereby transferring the ground temperature to the air. The reason it works is that, in the winter and the summer (when homes use the most energy), the temperature of the ground is much closer to preferred temperatures of your home than outside air temperatures are. ■