

Green becoming mainstream

New materials offering more opportunities to build environmentally friendly structures

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Open a gallon of Enviro-Safe paint, and the first whiff is not a sharp, chemical odor, but a pleasant scent akin to bread dough.

Without the harmful volatile organic compounds (VOCs), Enviro-Safe paint is among an increasing number of green-building products that include recycled construction materials, concrete-and-recycled Styrofoam insulation, responsibly harvested wood and vegetative roofs.

Green building has entered the mainstream, largely due to heightened environmental awareness and the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED), the national benchmark for certified building design and construction.

Modern materials make green-built buildings appear similar to conventional ones, but their inner workings -- energy efficient lighting and insulation or cork floor tiles -- leave a lighter footprint on the earth.

"Green building isn't just about straw bale houses or underground hippie huts anymore," says Stephen Colley, certified architect and coordinator of the green building program at the Metropolitan Partnership for Energy. "Although those are certainly still out there."

Cost and savings

Green building materials and construction can be more expensive than their traditional counterparts. For a conventional commercial building that costs \$150 per square foot, its green counterpart would run an additional \$4 per square foot. However, a California study of 33 commercial buildings in 10 states found that green building results in significant savings: an average of \$64 per square foot over approximately 20 years.

A building's greatest energy use, and an opportunity for savings, is in heating and air-conditioning. Cool roofs are one way to keep buildings temperate while decreasing energy consumption. The roofs are made from highly reflective materials that can reflect up to 85 percent of the sunlight or are covered with vegetation, which buffers the building from the elements and eliminates stormwater runoff from the home. A green roof surface can be 35 to 80 degrees cooler than conventional roofs. The challenge with vegetative roofs, also known as green roofs, is finding plants appropriate for the climate, and ensuring the root systems don't burrow into the roof lining. But even in chilly Chicago and cloudy San Francisco, roofs are covered with alpine grass and other native grasses and wildflowers. In Texas, the Ladybird Johnson Wildflower Center is studying types of plants that would withstand the Central Texas heat.

Inside, spray urethane, while not completely VOC-free, still provides excellent insulation and reduces energy costs. Workers spray it between the studs as the house is being built. A new formula, Biobase, includes soybeans as an ingredient and is more environmentally friendly.

And Gridwall, locally manufactured by **Amazon Forms LLC**, combines recycled Styrofoam with concrete to make wall forms. The technology is an improvement on European products in use for 40 years. Although Styrofoam alone is weak and soft, mixing it with concrete gives the forms structural integrity, says Amazon founder Claudette Sumrall. Finished, "it looks like a concrete block, but you can pick it up." Adding stucco to Gridwall, "is like icing a cake," she says.

The energy-saving wall forms can extend to eight stories high, are termite-proof and don't burn or rot; an Austin EMS station built with Gridwall recently received a rare gold certification, the second-highest rating, from LEED.

Gridwall has other environmental benefits, Amazon recycled 1.2 million cubic feet of Styrofoam, much of it from manufacturers that didn't want to pay tipping fees to deposit it in landfills.

Another wall product is Aerated Autoclave Block, a mix of cement, lime, silica sand, recycled fly ash, water and aluminum powder or paste. San Antonio resident April Chase used the block, which originated in Europe in the mid-20th century, to build her 4,900-square-foot home.

The blocks themselves are the forms into which concrete is poured. Rebars help anchor the forms to the foundation. Chase is applying stucco to the exterior.

Yet, she says there can be drawbacks to the blocks. Chase, who, with a contractor, stacked the blocks for her home, cautions that it was difficult to learn and adjust to the eccentricities of the materials. "There's no wiggle room to plumb them," she says.

New trends

Colley says the next green construction trend is upgrading existing buildings using environmentally conscious techniques. The MPE is receiving a good response to its residential green building program, "Build San Antonio Green," and is working on expanding green building information available to those in the San Antonio region.

One of the most ambitious green rehab projects occurred at Cevallos and South Flores streets, where the architectural firm, O'Neill, Conrad and Oppelt moved into its offices at a former manufacturing building.

The whole aesthetic and style is based on recycled materials, says Mickey Conrad, a principal with the firm. "A lot of architects have been applying green building principles for years," Conrad adds. "It's very important that the whole industry embrace the green building movement. It makes sense to re-use resources and be good stewards of the earth. It keeps things out of the landfill."

For example, during renovations, builders used recycled concrete pallets and fashioned rusted structural steel into decorative gate fences and trellises.

The drawback, Conrad says, is the bureaucracy a builder must navigate to obtain LEED certification. "It can be carried too far and make it not so inviting to do," he says. The firm has registered its project with the U.S. Green Building Council (USGBC) in an effort to obtain a basic LEED certification.

Obtaining LEED certification is a lengthy process, and USGBC recommends hiring a LEED-accredited professional to navigate the system. First, a building plan must meet eligibility requirements, depending on the structure type; schools, health care centers, homes and commercial buildings have different protocols. Unique buildings require contractors to consult a special LEED rating system checklist to calculate a potential point total to qualify.

After the building plan has been deemed eligible, the plan is registered, and extensive paperwork can be involved, including letters, narratives, drawings and photos, site plans and floor plans -- all to be used as proof that the building meets LEED requirements.

Buildings can be awarded a LEED platinum, gold, silver or certified rating, depending on the "greenness" of the building. This can take weeks, even months, but certification can be fast-tracked -- for a price. Expedited fees can cost as much as \$10,000.

Increased sensitivity

In addition to green construction materials, a building's interior can also tread lightly on the environment. Enviro-Safe's paint is geared to people with chemical sensitivities or those seeking an environmentally friendly alternative to petroleum-based paint.

After distributing the paints for two decades, Chem-Safe, which is based in Uvalde and Houston, bought the company from San Antonio's John Sabitino, who for several years painstakingly perfected the paint formulas using pigments, clays and minerals.

"Back in the day, petroleum seemed like a godsend," says CEO Jim Lee. "It was synthetic, cheap and easy to make."

However, the low cost also came with a price. Volatile organic compounds, known as VOCs, are common in household products. They can irritate the eyes, nose and throat, cause liver and kidney damage; others are suspected to cause cancer.

To avoid VOCs, Sabitino originally offered only pastel colors, but after finding a Dutch company that makes non-VOC colorants, Chem-Safe now offers all shades for \$30 a gallon. "There is no color I know of that we can't make," says Lee.

Dixie Plywood sells products certified by the Forest Stewardship Council, an independent group that ensures wood is responsibly harvested. The wood is distributed by Columbia Forest Products. In addition, the adhesive lining on the plywood is free of formaldehyde, which in high

doses can trigger asthma attacks, and in lower concentrations, nausea and difficulty breathing. It is also a suspected cancer-causing chemical. Green plywood is the same price as traditional stock. "You get an added value," says Dixie's general manager Danny Bachman, "but there is no upcharge."

And when it's time to sweep up after a day of hanging drywall, there's still an opportunity to clean green. San Antonio's AmEx International sells broom and mop handles made from wood certified by the Forest Stewardship Council.

Resources

Metropolitan Partnership for Energy: Its Build SA Green residential program will soon unveil its commercial version for city-owned buildings. Also plan to market to private market.

Buildsagreen.org lists green architects and builders and companies that sell environmentally friendly construction products or services.

Texasgreenroofs.org: Discusses the vegetative roof study at the Ladybird Wildflower Center

Greenbuilder.com: Compiles wide variety of green building resources, including professional services and building products.

USGBC.ORG: Site of the U.S. Green Building Council, which administers the LEED program.