

IN DEPTH: COMMERCIAL REAL ESTATE

From the December 10, 2004 print edition

Green Building

Sustainable materials integral to environmentally friendly projects

Linda Stone

Building and construction activities worldwide consume 3 billion tons of raw materials each year, or 40 percent of total global use. "Green building" aims to reduce this level of consumption through guidelines for selection and use of materials. These guidelines have been set by the U.S. Green Building Council (USGBC), hence the term "green building."

Elements used in green building projects must meet specific criteria. Builders should look for materials that: contain recycled, post-consumer content; come from natural or renewable sources; are manufactured with resource-efficient processes; are locally produced; are salvaged or refurbished; can be reused or recycled; have non-toxic finishes; and have long-term durability.

Using sustainable materials conserves dwindling resources and reduces environmental impacts associated with extraction, transportation, fabrication, installation and disposal. Such materials can be utilized in virtually every phase of construction in a new building, as outlined below.

The roof can be framed using Forest Stewardship Council (FSC)-certified wood with Optimum Value Engineering (OVE), which provides the necessary support using fewer materials. Alternatively, Structurally Insulated Panels (SIPs) can be utilized, which do not require any framing and incorporate insulation. Cool or reflective roofs should be considered as they lower building cooling costs.

Exterior walls are similar to the roof in that they can be built with FSC wood, OVE, or alternative materials. Some of the alternatives are SIPs, earthen construction, Insulated Concrete Forms (ICFs), and Autoclaved Aerated Concrete (AAC) blocks. Exterior surfaces might be locally sourced brick or stone, metal, fiber-cement siding or stucco.

Interior wall options include SIPs, clay tile, stone, or wood frame with various veneers such as gypsum board or cork.

Paints and coatings come in low and no-VOC (volatile organic compounds) versions, which are better for indoor air quality. Other options include mineral dyes, low and no-VOC stains and milk-based paint.

Insulation can be integrated with the structure in the form of SIPs or ICFs, or can include natural materials, such as cotton, wool, cork, cellulose or soy-based foam.

Natural flooring options are beautiful and plentiful and include salvaged wood, stained concrete, recycled rubber, bamboo, wool, cork, fibers (such as sisal) or recycled-content tile.

Financial benefits

Incorporating green materials into construction projects can pay a variety of dividends to building owners and building occupants. These elements contribute to reduced maintenance and replacement costs during the life of a building, energy conservation, improved occupant health and productivity, and lower costs associated with changing space configurations because of greater design flexibility.

Energy consumption in a building constructed using USGBC standards can be 20 to 50 percent lower than a conventional building, and water consumption can be as much as 30 percent lower. A report in 2003 by the USGBC found that several federal agencies have dramatically reduced their operating expenses through the incorporation of energy-efficient building techniques. The report showed that the government's building-related energy costs have declined 23 percent per square foot since 1985, which has saved taxpayers \$1.4 billion dollars during this time period.

Locally, both the San Antonio Water System (SAWS) and City Public Service (CPS) offer rebates for customers who implement efficiency measures. For more information on these valuable rebates, please visit www.saws.org/conservation/programs and www.citypublicservice.com; or for a compendium of all green building rebates and incentives, see www.mp4e.info/index-rebates.htm.

Another benefit to employers from having a green-built structure is improved indoor air quality, which can lead to reduced owner liability and improved employee productivity. A 2002 Lawrence Berkeley National Laboratory study reported that feasible and commonly recommended improvements to indoor environments could reduce health care costs and work losses resulting from communicable respiratory diseases by 9 to 20 percent; from allergies and asthma by 18 to 25 percent; and from other nonspecific health effects by 20 to 50 percent. The researchers estimated that employing the use of green building approaches could decrease employee absenteeism and health care costs enough to generate an estimated savings of \$17 to \$48 billion across the country each year.

Green building certification is available for both residential and commercial structures. The U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program certifies commercial buildings. More information about this program and a link to the local chapter of the USGBC is available at www.usgbc.org/leed/leed_main.asp.

Build San Antonio Green is the region's residential certification program co-administered by the Metropolitan Partnership for Energy and the Greater San Antonio Builders Association. Visit www.buildsagreen.org for details.

In addition to the two Web sites listed above, there are many excellent sources to use in finding and learning about green building materials. Austin's free online Sustainable Building Sourcebook www.ci.austin.tx.us/greenbuilder/srcbk_9.htm is a good place to start. Another authoritative publication is Environmental Building News, with a Web site at www.buildinggreen.com. There is a fee to obtain information from this organization, but it is well worth it.

Linda Stone is director of the Metropolitan Partnership for Energy, a nonprofit collaborative of local governmental entities aimed at increasing the San Antonio area's

energy efficiency and sustainability by providing the region with energy leadership, education and expertise. E-mail Stone at lstone@mp4e.info. Architect and LEED Certified Professional Stephen Colley (stephencolley@stic.net) also contributed to this article. Build San Antonio Green is a residential green building program developed by the Metropolitan Partnership for Energy and co-administered with the Greater San Antonio Builders Association.