

Sustainability, the Green Movement, and the Concrete Industry

By Brian Gallagher



Green construction, sustainability, environmental responsibility. One cannot read a construction industry trade journal without finding a mention of sustainability or going green. Despite memories of eco-friendliness fads from the past, this vibrantly green movement—now approximately 10 years in the making—shows strong signs of staying power. Green structures offer many benefits to the environment, the economy, and the community. New technologies reduce the environmental effects of natural resource consumption, improve the bottom line over the life of the building, improve employee productivity and tenant popularity by enhancing the occupants' comfort and health, and minimize the strain on local infrastructures, as well as ultimately improve the community's quality of life. Largely due to an overwhelming acceptance of green and sustainable practices in the design and construction industries, many in the concrete industry are taking notice and action.

New standards, initiatives, and funding resources are consistently introduced, ensuring that sustainability will be a viable part of the future. The United States Green Building Council (USGBC), the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), and the Illuminating Engineering Society of North

America (IESNA) are currently working together to formulate a new ANSI-accredited green building standard titled "Standard 189P Design of High-Performance Green Buildings Except Low-Rise Residential Buildings." This standard is planned to replace ANSI 90.1, which is a current code-enforced energy efficiency guideline. It is expected that ANSI Standard 189P will also be enforced through building codes nationwide.

When these sustainable principles hit the building code realm, green building will become a mainstream practice that will transform the overall construction industry—and the concrete repair industry—with great momentum. As the interest in building green increases, many firms in the concrete repair industry are looking for solutions as to how their services will become involved in this ever-greening world.

Going Green

The USGBC defines a green building as one that is "designed, constructed, and operated to boost environmental, economic, health, and productivity performance over that of conventional buildings." Further, a building's resource depleting impact on the environment is significantly reduced or eliminated in the following areas: sustainable site planning,

Defining Green

A green, or sustainable, building is a structure that's designed, constructed, renovated, operated, or reused in an ecologically friendly and resource-efficient manner. Typically, green buildings are designed to meet certain objectives, including the efficient use of materials, energy, water, and other resources; protection of occupant safety and health; improvement of productivity of employees; and a reduction in the impact on the environment.

water preservation and water efficiency, energy efficiency and renewable energy, conservation of materials and resources, and indoor air quality.

To quantify the level of sustainability and to ensure a building is indeed green, the USGBC developed a third-party verification rating system called Leadership in Energy and Environmental Design (LEED). The USGBC defines LEED as "a voluntary, consensus-based national standard to support and validate successful green building design, construction, and operations." LEED provides specific programs for each of the following: New (commercial) Construction and Major Renovations projects, guidelines for multiple buildings and on-campus building projects, Existing Buildings: Operations & Maintenance, Commercial Interiors projects, Core & Shell development projects, Homes, Neighborhood Development, Schools, and Retail. Furthermore, new categories are frequently being introduced, such as LEED for Healthcare. Buildings are ranked as Certified, Silver, Gold, or Platinum based on their performance level in essentially three areas: natural resource conservation; healthy environments, both interior and exterior; and reduced building maintenance costs.

Fortunately for the concrete repair industry, repair work can garner points in a wide assortment of LEED platforms to help achieve the Certified level at a minimum for the building and/or site. Owners and developers can achieve green rating points just by preserving and restoring a structure compared with building a new building.

The natural properties of concrete, used as a main part of a building's structure, have the ability to cause a mass cooling effect. During the evening hours, the concrete will cool down several degrees and will then emit coolness throughout the day until the outdoor temperature reaches the "critical point" at which time the concrete then begins to store heat. In most environments, concrete will keep its coolness until the evening hours. The mass cooling effect is applicable to the energy efficiency category in any LEED program previously listed.

The use of recycled materials in concrete, such as recycled aggregate and different admixtures that

come from post-consumer waste, can contribute to LEED points. Construction waste management is a program that establishes the enactment of recycling on a building site both during and after the project is built. Recycling falls under the Materials category in the LEED program. If the concrete repair project uses coatings, then choosing coating systems low in Volatile Organic Compounds (VOCs) can contribute to an increase the indoor air quality, which is also a measure recommended by the LEED program.

According to the Portland Cement Association (PCA), concrete, compared to other building materials, has low embodied energy characteristics. Concrete can also contain recycled materials, and concrete can be recycled. In most cases, concrete is produced locally, or even on site, which results in reduced transportation costs. For certain applications, pervious concrete systems for walkways, driveways, and parking lots retain storm water and surface pollutants and prevent them from flooding the nearby retention areas or overloading storm water systems. Structures built with concrete tend to last two to three times longer than buildings constructed with other common building materials. In some cases, concrete restoration and repair projects reduce the need to build new buildings. There is also research being conducted regarding the positive solar reflectance properties of concrete. Under the leadership of the Strategic Development Council (SDC) of the American Concrete Institute, several leading organizations in the concrete industry are working toward developing a vision and road map to reduce the concrete industry's footprint, improve education, and advocate sustainable concrete.

The Green Light

Now that you're ready to go green, how do you get started? Begin by talking with your clients, engineers, architects, manufacturers, and contractors that have both an interest and some history with green projects so that you can learn from their experience and expertise. Become more educated about sustainability, the USGBC, LEED, and other general environmental knowledge. Survey your clients for what services they might be looking for

that have yet to be offered. Most suppliers to the concrete repair market have, or are developing, products that meet green criteria. Be sure to do research on all new green products available in the marketplace. The green movement has built such momentum that even big-box retailers such as Lowe's and Home Depot stock a selection of green construction materials and products.

Green Resources

The Environmental Council of Concrete Organizations
www.ecco.org

United States Green Building Council
www.usgbc.org

SDC "Concrete's Role in Sustainable Development"
www.concretesdc.org/Sustainability/Sustainability_home.htm

GreenSpec
www.buildinggreen.com/index.cfm

PCA: Building Green With Concrete
www.cement.org/buildings/green_leed.asp

iGreen Build
www.igreenbuild.com

Sustainable Building Toolkit
www.ciwmb.ca.gov/GreenBuilding/ToolKit.htm

Be sure to review how others in the industry are tackling green and learn from their best practices. Promote your green efforts, purchase reading materials and send employees to LEED workshops to elevate green awareness among the entire staff.

In addition to design and construction practices, look for other opportunities to be a green leader such as reducing waste, recycling paper waste, using recycled products, and committing to energy efficiency. Let your employees and prospects know that your changed world view is a long-lasting theme in your company's approach.

Sustainability has moved beyond the fad stage to an established sector of the U.S. construction industry. A growing number of grants and other funding programs are available for green construction and restoration projects. At the end of 2006, more than 5000 projects had registered to try to obtain LEED certification. More than 20 states and 50 major cities already have policies in place that dictate sustainability for their own building projects. Now is the time to start focusing on your green approach to maintaining existing buildings, repairing the old, and investing wisely in future construction projects.



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