

5. LEED-EB and Green Globes CIEB: Rating Sustainable Reconstruction

By Pamela Dittmer McKuen, Contributing Editor

When green building rating programs were launched about a decade ago, their primary objective was to reduce environmental impacts from new construction. Over time, as the U.S. Green Building Council's LEED system and the Green Building Initiative's Green Globes program evolved and expanded, the focus started shifting to existing buildings, either for ongoing sustainable operations and maintenance—office fitouts, hotel room renovations, lighting upgrades, etc.—or for more wholesale repurposing—more elaborate reconstruction, adaptive reuse, renovation plus addition, etc. In recent years, certifications for existing buildings have rapidly outpaced those for newly built ones, according to both the USGBC and the GBI.

The tide turned in 2009. That's when the certifications for the USGBC's LEED for Existing Buildings: Operations + Maintenance program surpassed those for new construction. By the end of 2011, the cumulative footprint of LEED-EB:O+M exceeded LEED-NC by 15 million sf.

The GBI has witnessed a similar pattern in its Green Globes program. As of March 2011, the organization had granted 333 certifications for projects on its Continual Improvement of Existing Buildings (CIEB) track and 105 projects for New Construction.

UNRAVELING THE MULTIPLE FACTORS BEHIND THE EXISTING BUILDING TREND

Interest in sustainability for existing buildings has been propelled by a number of factors, primarily the economic downturn, which derailed billions of dollars' worth of new construction projects. While owners of existing buildings certainly felt the pain of the economic collapse, many of their properties reached a point where substantial maintenance, renovation, or reconstruction was called for. Given a decade's worth of publicity about sustainability practices, products, and programs, a significant portion of owners apparently opted for going green with their reconstruction projects.

Government mandates were another important motivator. At the state level, where most coffers are seriously strained, lawmakers more and more are requiring sustainability measures for both new and renovated public buildings. These green mandates are often in lieu of tax incentives or prerequisites for receiving grants. More than half the states specifically name LEED, Green

Globes, or both in their legislation.¹

Federal agencies must meet the Guiding Principles of Executive Order 13514—Federal Leadership in Environmental, Energy and Economic Principles (5 October 2009).² EO 13514 requires each federal agency to have 15% of its existing leased or owned space greater than 5,000 sf in compliance by 2015.

RAISING THE BAR ON PERFORMANCE

Repeat business is also spurring growth. Satisfied early adopters are recertifying and signing up additional properties. Fall-off rates are low. Both the USGBC and GBI report an influx of portfolio—or *volume*—projects, notably retail chain stores, bank branches, and property management firms' leased office space. The GBI currently is working with seven colleges and universities, including the entire Drexel University campus in Philadelphia.

Seasoned clients are likely to push for higher ratings in subsequent go-rounds, say, from Silver to Gold or from two Green Globes to three Green Globes. They often become more creative as well. Standout initiatives from LEED-EB:O+M clients take a holistic approach by integrating their buildings into the larger community, such as by hosting onsite farmers' markets or inviting neighborhood groups to use the facilities for community activities.

LEED-EB:O+M – FINDING A GROOVE WITH OWNERS

LEED for Existing Buildings—LEED-EB, as it was known at first—came out in 2002; it became LEED-EB:O+M in 2008. The number of buildings to earn LEED-EB:O+M certification, as of 15 March 2011, was 1,628. Of those, most attained Silver or Gold ratings.

Registrations for LEED-EB:O+M more than doubled after a major 2008 revision that removed design and construction requirements, over which owners and operators of existing buildings said they had little or no control, and replaced them with energy-savings and performance measures. In 2009 the point scale for LEED-EB:O+M was “harmonized” at 100 points along with the other LEED rating programs.³

Once again the program is undergoing revision, with LEED 2012 planned for release at Greenbuild (San Francisco) in mid-November. The USGBC's Lauren Riggs, LEED AP, manager of LEED Performance, detailed some of the proposed changes to LEED-EB:O+M:

¹ See <http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1852>.

² *The Guiding Principles of EO 13514: employ integrated design principles, optimize energy performance, protect and conserve water, enhance indoor environmental quality, and reduce environmental impact of materials.* At: <http://edocket.access.gpo.gov/2009/pdf/E9-24518.pdf>.

³ *Sustainable Sites*, 26; *Water Efficiency*, 14; *Energy & Atmosphere*, 35; *Materials & Resources*, 10; *IEQ*, 15.

⁴ *They are: Arkansas, Connecticut, Delaware, Florida, Hawaii, Illinois, Kentucky, Massachusetts, Minnesota, Nevada, New Jersey, New Mexico, New York, North Carolina, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Virginia, and Wisconsin.*

- Additional compliance paths for schools, retail, hospitality, and data center projects.
- A whole-building water meter requirement in addition to the previously required whole-building energy meter.
- New occupant engagement and site improvement options in the Pilot Credit Library.
- New alternative compliance path for buildings that demonstrate improved energy efficiency of 20% over 12 months.
- Streamlined data reporting for recertification.

LEED-EB:O+M clients are an even blend of public and private enterprises. Commercial office buildings make up the largest base (in square footage), followed by retail chains, big boxes, and property management companies. Clients include such brand-name entities as Kohl's, Target, the U.S. General Services Administration, and Vornado Realty Trust.

One notable project: the National Geographic Headquarters in Washington, D.C. The 746,000-sf complex, mostly office and exhibit space, was built in three stages over the course of a century, starting in the 1880s. It earned a LEED-EB Silver rating in 2003, and has twice been recertified Gold. Among its performance achievements: an overhaul of the mechanical system decreased energy use by 20%, and water use from plumbing fixtures has been reduced by 36% over what LEED requires.

The project is significant because it shows that a building with both older and newer components can attain a high level of sustainability, says Michael Army, president of Leonardo Academy, Madison, Wis., and LEED consultant to National Geographic. Army chaired the LEED-EB development committee and has been a major contributor to the program since its inception.

GREEN GLOBES – MAKING A SPLASH WITH THE VETERANS ADMINISTRATION

The Portland, Ore.-based GBI began awarding its Green Globes for New Construction certification in 2004; Green Globes for Continual Improvement of Existing Buildings followed two years later. It is possible to earn one to four Green Globes, correlating roughly to LEED's four-tier scale. Most

projects achieve two or three Green Globes.

GBI's client roster is a mix of office buildings, colleges and universities, corporate headquarters, manufacturing plants, warehouses, medical facilities, and parking garages. Chicago's Civic Opera House is a Green Globes CIEB client. The mix is divided 50/50 between private and public projects, but on a building-count basis, the 200 facilities from the U.S. Department of Veterans Affairs skew the ratio closer to 30/70. About one-third of GBI clients are repeat users, says GBI vice president Sharene Rekow. Twenty-four states recognize Green Globes for certifying state-owned buildings.⁴

Starting in 2009 the VA submitted 21 buildings, mostly healthcare facilities, for Green Globes certification, then added 180 more. All were certified. When the federal Guiding Principles were announced, the VA hired the GBI to develop a compliance tool. As an extension of that experience, the GBI in 2011 rolled out its most recent module, CIEB for healthcare facilities.

Other recent projects of note are the 57-story IDS Center in Minneapolis and the sprawling Medtronic World Headquarters in Fridley, Minn. Three more Medtronic projects are in the works.

Also on the list are unusual or specialty projects, such as water treatment facilities and parking garages that might not be appropriate for LEED. Green Globes, for example, recognizes Sustainable Forestry Initiative-branded lumber; LEED does not. Green Globes' cost is lower, too—less than one-third of the cost of LEED. Some buildings, like the William J. Clinton Presidential Center in Little Rock, Ark., and the Hands On Children's Museum in Olympia, Wash., have earned dual certifications.

ONWARD AND UPWARD WITH CERTIFICATION PROGRAMS

While certifications for existing buildings are expected to keep climbing upward, they are still only beginning to make a dent in the vast inventory of more than 60 billion sf of existing commercial buildings in the U.S. Both the USGBC and the GBI are looking to cultivate international clientele, although translating and standardizing local business codes, products, and materials to foreign

Global Survey Confirms Owner Interest in Energy Efficiency

The 5th JCI/IFMA/ULI Annual Global Energy Efficiency Survey of nearly 4,000 building owners worldwide revealed the following:

- Energy management is important to 70% of managers.
- Average energy-reduction target of owners: 12%.
- 80% of owners said (June 2011) they foresaw a >10% energy price bump within a year (they were right).
- 39% of building owners plan to pursue green certifications for existing buildings in the next year.
- Energy cost savings, government incentives, and enhanced public image were the biggest motivators for energy-efficiency investments.
- The green building movement reaches new heights, with nearly four in 10 respondents achieving certifications, twice as many as the previous year.
- North America building owners expect lighting and smart building technology to play major role in the future.
- Seven in 10—up from six in 10—indicate that energy management is important to them, with respondents in India (89%) and China (85%) expressing the most interest, followed by U.S./Canada (66%) and Europe (61%).
- Three out of four have set energy or carbon reduction goals.
- Nearly four in 10 have achieved at least one green building certification, twice as many as the prior year. An additional 32 percent (32%) have incorporated green building elements.
- Building owners planning to pursue green building certifications for existing buildings (39%) slightly outpaced those with plans to certify new construction (35%).
- Lighting and HVAC controls improvements continued to be the most popular energy-efficiency improvements made during the previous year (2010).
- Building owners have greater access to energy data, but few are taking advantage of it. More than eight in 10 measure and record data at least weekly or monthly, but fewer than two in 10 review and analyze that data at least weekly. Those who have implemented smart grid/smart building technology such as advanced energy metering and management systems are nearly three times more likely to review and analyze their data frequently.
- Organizations that set a reduction goal, analyze energy data frequently, add internal or external resources, and use external financing were found to implement four times as many improvement measures as those who employed no such measures.

Source: "Fifth Annual Global Energy Efficiency Survey," Johnson Controls' Institute for Building Efficiency, the International Facility Management Association, and the Urban Land Institute, 17 June 2011. Summary at: <http://www.uli.org/News/PressReleases/Archives/2011/2011PressReleases/2011JohnsonControlsEnergyEfficiencySurvey.aspx>

shores can be difficult.

Michael Army, the “godfather” of LEED-EB, predicts building operators will exert increasingly greater pressure on their supply chains to be more sustainable. Vocal elements of the public, too, will be pressuring the companies they do business with to do the same, or they’ll take their business elsewhere. +

ADDITIONAL RESOURCES ON CERTIFICATION FOR EXISTING BUILDINGS

“A Comparison of Two Environmental Rating Systems Using Dual Certified Buildings,” Harvey Bryan, PhD, FAIA, and Jiri Skopek, AADip., RIBA, MCIP, OPPI, OAA, at: <http://www.thegbi.org/green-resource-library/pdf/Final-SB-2008-LEED-GG-paper.pdf>;

Operation & Maintenance Reports, Energy Star, at: http://www.energystar.gov/index.cfm?c=business.bus_om_reports;

Energy Efficiency Calculator, at: <http://www.sba.gov/content/energy-saving-calculators-energy-star>;

“Current Trends in Green Real Estate—Summer 2011 Update,” at: <http://www.costar.com/webimages/webinars/CoStar-Webinar-CurrentTrendsInGreen20110621.pdf>

Security Factors in High-performance Reconstruction Projects

By Martin Denholm, AIA, LEED AP BD+C, BSCP



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A landscaped vehicle barrier using water and other natural elements demonstrates the compatibility of aesthetics and security in a high-profile reconstruction project.

Building Teams intent upon achieving high-performance outcomes in the reconstruction of old and historically significant buildings need to address not only the sustainability requirements of these projects but also, in many cases, their significant security concerns. This is especially true in reconstructed government buildings, high-profile commercial office

buildings, and special venues, such as national museums. However, the use of softscape elements can meet all the requirements for the most demanding vehicle weight and speed parameters, thus meeting two distinctly different purposes with a single design feature that is more aesthetically pleasing.

The design of CBR protection for reconstructed buildings has ramifications for building energy use and interior environments that can limit the ability to implement sustainable features and systems.

The major impact of CBR protection is the method by which contaminants from outside the building are prevented from entering the interior air supply. The obvious response is to seal off or positively pressurize the building to prevent the infiltration of airborne contaminants. This mitigation rules out the opportunity to employ natural ventilation through operable windows or outside air-fed vertical convection through atria. Unfortunately, sensors for detecting contaminants, and in particular biological agents, are not yet capable of detecting and activating closure of windows and intakes fast enough to prevent those agents from entering the interior building air stream.

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The two biggest challenges in this effort are requirements for blast protection and protection from chemical, biological, or radiation (CBR) threats. Significant blast protection criteria lean toward brute mass and distance to withstand extreme pressure levels and flying debris. CBR protection leans toward sealed structures and separate systems and controls for different areas of the building.

The key is to identify those design solutions where security and sustainability requirements can strengthen each other or utilize the same design elements to accomplish both goals. Though some aspects of these trends limit the design’s ability to attain either the security or sustainable goals desired, there are a number of strategies that allow security and sustainability to cooperate and reinforce each other.

Making blast protection aesthetically pleasing. Where reconstruction or major renovation requires mitigation of blast forces, a building can be reinforced with little or no effect upon its sustainability profile. For instance, a reconstructed building can use a double-wall design to shield the building from extremes of hot and cold temperatures, while at the same time providing blast protection, serving as a crush zone or sacrificial skin. Similarly, when a building can accommodate extra site area for standoff distance, there may be an opportunity to employ sustainable features such as bioswales, water retention ponds, and landscaping as part of a vehicle barrier system.

The typical response to providing such barriers often results in a mixture of hardscape elements that are rather brutish and obvious, such as walls and bollards.

Outside air intake systems for sealed buildings face a similar problem, but can be equipped with filtering media to prevent contamination. The negative impact on sustainability with such systems is that greater fan power and energy are required to pull air through high-efficiency filters.

Inside the building, Building Teams can achieve CBR protection by sequestering areas such as lobbies, mailrooms, and loading docks from the general building air systems. This is accomplished by employing separate HVAC systems for these areas and creating negative pressure zones for areas most likely to be contaminated. These systems and physical containment areas do not directly conflict with sustainable goals and offer the ability to limit the infiltration of outside air into the general building environment. In a building where outside air is already heavily filtered and conditioned, this separation may provide some small energy savings by easily maintaining the interior environment’s temperature and humidity levels.

Finding methods and design elements where security and sustainability can reinforce each other and limit conflicts is critical to attaining totally integrated high-performance design for select reconstructed buildings.

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The Construction Specifications Institute (CSI) is proud to advance our mission and the knowledge of our members and industry through participation in this reconstruction white paper.

CSI's mission is to advance building information management and education of project teams to improve facility performance. Reconstruction presents an incredible opportunity for improved performance in our existing facilities.

No matter the motivation, the drive to consume less material, less energy, less water, and produce less waste from our facilities is the order of the day. The greatest potential for making an impact in this area can be found in our existing facilities which represent 99% of the building stock at any time.

CSI members work every day in a collaborative manner to understand, document and communicate the answers to challenging technical questions on today's reconstruction projects. CSI's unique community of 12,000 professionals from across the project team, identify and share solutions that take advantage of the most recent advances in design, materials and construction. This multi-disciplinary approach is talked about by many, but truly practiced every day by CSI members.

CSI members interact regularly at more than 100 chapters across the country, in specialized CSI Practice Groups, and in online communities to share established best practices, explore innovative new ideas with colleagues, and build their professional networks. Much of this information exchange will be visible at the upcoming CONSTRUCT and the CSI Annual Convention, September 11-14, 2012 in Phoenix, AZ.

Please enjoy this information contained in this white paper. I highly encourage you to expand your knowledge in this area by participating in other CSI activities. Visit www.csinet.org for our latest information.

A handwritten signature in black ink, appearing to read 'Walt Marlowe', is written in a cursive style.

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