

*With the LEED™ rating system in place
it is easier to make sure your new library
saves money as it treads lightly
on natural resources*



The New Green Standard

By Bill Brown

LIBRARIES ARE ON the cutting edge of green design. Long the lonely mission of environmentally responsible architects, green architecture grew out of a desire to lessen the negative environmental impacts of conventional buildings, which use nearly half the energy consumed in this country. Many other benefits have been discovered along the way. For many librarians, the meaning of green architecture has shifted from saving our environment for future generations to saving money now. That economic drive provides an optimistic base for what has sometimes seemed like a hopeless cause.

Historically, this comprehensive, collaborative design process—variously labeled as green, environmentally sustainable, or high-performance design—has suffered from a lack of standards. In 2000, the U.S. Green Building Council (USGBC) formulated the Leadership in Energy and Environmental Design (LEED™) rating system to certify green buildings, and it is rapidly gaining acceptance among library designers and library professionals.

Well-designed green buildings cost less to operate and maintain than conventionally constructed buildings. They use less energy and natural resources. They are better integrated into their sites and communities. They are more comfortable, enjoy more daylight, and are more attractive to customers and employees. They are also less likely to contribute to health problems and more likely to enhance productivity and learning.

These spaces often require a slightly greater investment in design and construction costs, though there are exceptions. The green Oaklyn Library (pictured above) came in below the cost for conventional construction. In any case, these buildings pay off through a lifetime of return on that initial investment.

Up on the Roof

The living meadow roof (above) on the new Oaklyn Library, IN, will pay for itself with energy savings over time; it will clean the air and water as it grows. See the front of the library on p. 64

LEED™ing the way

LEED™ scores projects in six categories including Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, and Innovation & Design. Of 69 possible points, projects must get 26

to be certified, 33 to be certified silver, 39 to be certified gold, and 52 to be certified platinum. Certification is given after the building is complete to assure that predicted performance has been achieved. Seventy projects have been certified since the rating system's inception, and over 900 registered projects currently await certification. Over 400 of the approximately 900 projects registered with LEED™ are federal, state, and local public projects. Local projects make up the largest share. Approximately 16 percent, or 145, of LEED™ registered projects incorporate libraries.

While a handful of high-profile green projects were completed prior to the establishment of the USGBC ten years ago and many continue to be completed without using the rating system, LEED™ is gaining momentum as the standard for green design. State governments in California, Maryland, Massachusetts, New Jersey, New York, Oregon, and Pennsylvania use LEED™ for their projects, as do the local governments of Austin, TX; Arlington, VA; Boulder, CO; Cook County, IL; Portland, OR; Seattle; and, in California, Los Angeles, San Diego, San Jose, and San Mateo. In some of these locales,

PHOTO BY JERRY BUTTS

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LEED™ has been incorporated into local building codes.

Requests for proposals (RFPs) for public projects now routinely require candidates to list their LEED™ experience and expertise. This rapid entry of LEED™ into the mainstream has created a rush among architecture and engineering firms to gain competence and experience in green design, one of USGBC's goals. The council's inaugural national Greenbuild convention in Austin last year sold out early at twice the expected attendance and created standing-room-only crowds on the exposition floor and in the seminar rooms.

Early collaboration

The idea that all design decisions are interrelated is especially true with green design. This requires early collaboration among design disciplines (and possibly with community entities), which goes against standard practice in many

architecture firms. This is a key difference between conventional design, where some green features may be tacked on at the end of a linear design process, and truly green design, where design integration begins at the earliest stages of the project.

The selection of a lighter ceiling color, for example, can improve the performance of lighting, both natural and artificial. Thus, the library will need fewer fixtures or smaller window apertures. This reduces the heating and cooling load, which then calls for smaller mechanical equipment and ducts. These compounding impacts drive down the initially hefty price of the project. Basically, design integration makes green projects cost-effective.

Location, location, urban location

Site selection, important for any project, is critical for green design. LEED™ encourages urban redevelopment be-

Public Input Yields Greener Library

By Louise Levy Schaper

WHEN FAYETTEVILLE Public Library's (FPL) \$23.3 million Blair Library opens in fall 2004 it will be the first building project in Arkansas to be registered with the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED™) program. The commitment to build a green library came from an intense public process of open meetings and deep community dialog about what a library is and can be and what its design and construction should be. Ultimately, the process spurred a greener library than anyone imagined.

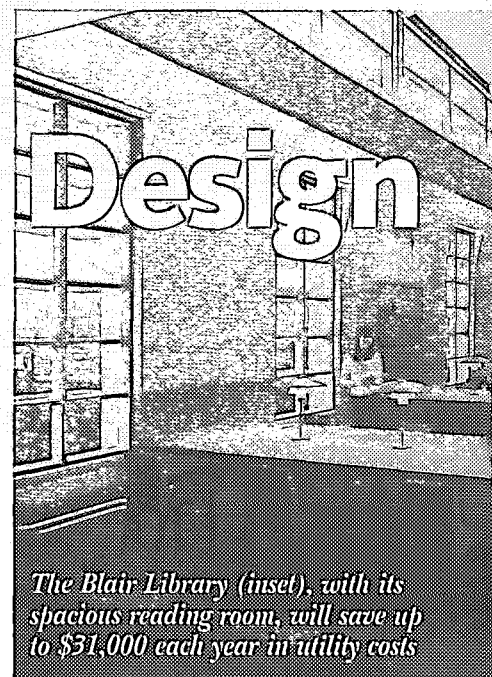
When I became the FPL director in late 1997, I recognized that years of piecemeal space planning needed to come to an end. The trustees readily agreed, and a few months later our city council approved funds to hire a library planning and design team.

Over the next two and a half years, we completed a 20-year master plan with consultant Anders Dahlgren. We also held nearly 40 public input meetings with an estimated 2000 participants, completed a feasibility study for funding, received approval from 75% of the voters for a temporary sales tax to raise 80% of the funds to build a new main library, and embarked on a capital

campaign to raise \$12 million to complete the building and establish an endowment. The recognition we received from local and statewide media—especially for our commitment to public process—was energizing.

Discovering LEED™

Until the final design phase, there was limited discussion about building an environmentally friendly building. Most of the dialog was about why a new library was needed, where to locate the new library, and the future of the public library in general. As the emphasis shifted to design, the dialog turned aesthetic. However, throughout, participants expressed ideas directed to a greater regard for the environment. For example, the question of location led to discourse



The Blair Library (inset), with its spacious reading room, will save up to \$31,000 each year in utility costs

about tree preservation and reuse, quality of urban life, and walkable cities.

Throughout the public input process, Jeff Scherer, FAIA, principal architect, Meyer, Scherer & Rockcastle, Ltd., asked the underlying questions that tapped into deeper issues and fears. Scherer and his project manager, Sean Wagner, AIA, heard citizens ask more specifically for "green" building technologies. Scherer and Wagner surprised me when they proposed registering the project with the LEED™ certification program, something of which I was only dimly aware. LEED™ is, in essence, an audit process for buildings. I realized that if the building were LEED™ certified, our citizens would know that their library would be as green as we advertised. I didn't know that registering for

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cause of the infrastructure already in place. Alternative transportation is usually possible. The site will be less disturbed. Stormwater management exists. And an urban site contributes to the big picture: there will be lower impact on the urban heat island effect and a limited increase in light pollution. In turn, LEED™ discourages the use of greenfield sites, or undeveloped land.

Site selection also influences building design. Opportunities to orient the building for optimum solar exposure, for instance, can enhance the power of daylighting and significantly improve energy efficiency. That is why it is important to select your design team before you select a site.

Energy is LEED™'s middle name

A core goal of green design is to produce buildings that use significantly less energy. Such buildings create less pollution. They also deplete fewer nonrenewable resources and

cause less damage from the extraction and transportation of those resources.

Using existing industry standards as benchmarks, LEED™ awards points for energy efficiency savings. Up to ten points are awarded for besting the standards by 60 percent in a new building and 50 percent in an existing one. Other energy-related points come when buildings employ renewable energy like solar or wind power, undergo additional building commissioning (independent testing), eliminate ozone-depleting refrigerants, or measure and verify monitoring and use of green power (power produced by utility companies from renewable resources).

The design for energy efficiency requires coordination with other disciplines to optimize the building envelope (walls, glazing, roofing), lighting, and controls. Good plans often result in dramatically downsized mechanical systems that can save enough initial and operating costs to pay for the extra expense of the design and materials.



benefits and the mechanics of LEED™ won unanimous approval from our city council. It didn't hurt that the citizens had recently elected a mayor who had received the local Sierra Club chapter endorsement during his campaign.

Once we got started, we evaluated which of the four levels of certification (basic, silver, gold, platinum) we'd shoot for. Achieving "basic" certification was within our immediate reach because we had already made many good decisions. Because our project budget would not support gold or platinum levels, the design team began to look at how to achieve a silver certification within our established budget.

Community choice and pride

FPL's Blair Library will be green owing to dozens of subtle technologies and choices. The downtown site is close to alternative transportation and within walking distance to many users. Carpooling parking spaces and bike racks are available, as are showers for employees who bike, walk, or run to work. For water

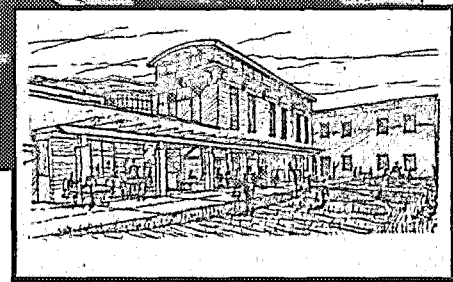
conservation, we've introduced waterless urinals, a cistern to capture and reuse rainwater for irrigation, and native and drought tolerant landscaping. For building materials, we chose rapidly renewable and sustainably harvested material and low "VOC" (volatile organic compounds) materials, adhesives, and finishes. We will exceed national energy standards for building envelope, lighting, and mechanical system design. To top it off, we used a white reflective roof and a "green" landscaped roof adjacent to an outdoor reading terrace.

Because Blair Library will earn its "green" status not from a single splashy

"front page" technology, we've developed some cogent images to illustrate how the many smaller decisions will make the difference to the library's bottom line, its environment, and the regional environment:

- The construction waste we recycled or reused throughout the project would fill the University of Arkansas football stadium to the sixth row.
- The library's cozy fireplace and landscape retaining walls will be built with rock from the site. The meeting room podium and table will be made from a walnut tree harvested from the site.
- We will save almost one million gallons of water every year through conservation strategies.
- We will save approximately 25¢–35¢ per square foot, or \$22,000–\$31,000, annually in utility costs over normal commercial construction in our area.
- We will open without noxious odors endemic to most new buildings.
- The south-facing views will allow natural daylight to trigger a powering down of artificial lighting.

We'll have to wait until we've been in the new building to know the exact costs and savings, but we know we're going in the right direction for our community. Public input drove home the need for our participation in the LEED™ program, which resulted in a greener design—a compelling argument for libraries to use construction projects as community learning experiences. The citizen input process facilitated by a design team with extraordinary listening skills, coupled with a well-publicized construction project, has helped our community of 60,000 and our state know what it means to go green. ■



LEED™ would open up a world of possible green building technologies.

Many benefits

The idea of being the first LEED™ building in the state was compelling. Our library board and even our fiscally conservative finance manager, who knew that energy efficiency meant lower operating costs, supported the idea. I had to convince our city administrators and elected officials that spending \$26,000 for LEED™ registration and additional professional fees was worth it. A concise written and verbal statement of need that stressed the economic

Which is greener, metal studs made from recycled steel or wood studs harvested from certified forests? LEED™ does not specifically answer questions like this, but it does encourage designers to study the options. LEED™ documentation requires research into material origins and life cycle, and the system awards points for use of materials with reused and recycled content. To support local economies and decrease transportation impacts, LEED™ values materials manufactured locally or within a 500-mile radius. Rapidly renewable materials, like cork flooring, are encouraged, as are wood products from well-managed forests.

The system requires that green projects include areas dedicated to recycling. LEED™ also encourages the reuse of buildings, which means historic renovation projects can score as well as new construction. Additionally, construction waste management is encouraged, which can be simple or not, depending on the level of cooperation from the contractor and the quality of the local recycling industry.

Let Mother Nature work

Andrew Carnegie asked that libraries designed under his grants include "a representation of the rays of a rising sun, and above 'LET THERE BE LIGHT.'" Turn of the century libraries, like those built 2000 years earlier, made the most of natural daylight and natural ventilation, two hallmarks of current green design. The relatively recent invention of artificial lighting and mechanical heating and cooling systems reduced the need to design for daylighting and natural ventilation. Then came architecture marked by windowless buildings dependent on artificial means for supporting life. Operable windows became an endangered species in libraries for fear of ultraviolet light, glare, and heat gain or loss.

Now it is common knowledge that poor indoor environments can be life-threatening. However, few building owners consider the benefits of good indoor environments, which have a documented positive impact on health, productivity, human performance, learning, mood, comfort, and employee retention. Personnel require a much greater investment than building costs. Small improvements in human performance more than offset most of the cost of improved indoor environments. LEED™ calls for a minimum for indoor air quality and control of environmental tobacco smoke. A building wins points for CO₂ monitoring, increased ventilation effectiveness, indoor air quality management plans, use of low-emitting materials, indoor chemical and pollutant source control, controllable heating and cooling systems, thermal comfort, and available daylight and views.

Enlightened designers have learned that the benefits of daylight and natural ventilation can be enjoyed without energy penalties. In fact, properly designed daylighting improves human performance and health, saves energy, and reduces the cost of library construction. Aided by new glazing technology, intelligent lighting controls, and sophisticated daylighting and energy analysis software, green designers can fine-tune building envelopes to take advantage of high-quality sunlight while controlling heat loss or gain.

What are the hurdles?

LEED™ certification can be complicated, and critics have found it cumbersome and sometimes inconsistent. It also adds immediate expenses to a project. Registration and certification fees typically total less than \$3000 for libraries under 75,000 square feet but max out at \$9000 for libraries over 300,000 square feet. Prerequisites for LEED™ certification include basic building commissioning, which is not yet standard practice in many regions. In addition, design fees typically rise owing to the need to spend more time on design and construction phase meetings, research, and documentation: Usually the burden of educating the funding agencies, the public, contractors, and other stakeholders falls to the design team, which often includes one or more special consultants. Bid prices may reflect costs to fulfill additional requirements associated with LEED™, such as certifying recycled content of materials used.

The good news is that standard construction documents now incorporate LEED™ requirements, and new computerized reporting templates in LEED™ 2.1 have streamlined documentation. Manufacturers, seeing that LEED™ compliance sells, have caught up with reporting requirements and now make information that was once difficult to find part of their standard literature.

When planning a project, consider hiring an experienced green design firm or at least make sure the design team includes a knowledgeable green design consultant. Then incorporate any additional certification costs into the initial project budgets.

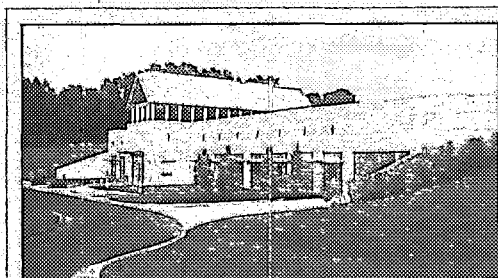
The USGBC has a listing of LEED™-accredited professionals (www.usgbc.org). Also, the American Institute of Architects offers an excellent tutorial on writing green RFPs, which includes guidelines and examples of actual RFPs (www.aia.org/pia/cote/rfp) and feedback from users of those RFPs.

A greener future

Approximately five percent of new commercial and institutional construction is some shade of green. As demand continues to grow, competition will heat up among designers, contractors, and manufacturers. This should drive down costs for green design. The prices of innovative new green materials and systems should follow suit as demand and production volume increases. Perhaps conventional design will become obsolete as the benefits and savings of green design become obvious to even the most entrenched critics.

Such an outcome will be a good introduction to the real technological shift to come. If we reach a point where all new and existing buildings are LEED™-certified, we will still be wasting our finite resources. Truly green architecture will exist when we are designing buildings that restore fresh water and air and produce more energy than they consume. That is a challenge that enlightened librarians can help us meet, one building at a time. ■

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Nestled into the Hillside

Oaklyn Library's face gathers eastern light efficiently, and its LightBridge, which rises above the meadow roof (also pictured on p. 61), draws light throughout the day. The building was designed before LEED™ was finalized, but planners may seek silver-level LEED™ certification retroactively, a daunting task, given the required documentation, that is possible with a willing contractor

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