The Fundamentals of LEED for

High Performance Medical Buildings

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By David G. Campbell, AIA, LEED AP, and William E. Wiebe, SIOR, CCIM, CRE

No one looks forward to a hospital stay. Apart from the health problem that lands you in a medical facility, it's not comforting to know that the longer you stay the more risk you run of catching an airborne disease. And the typical accommodations—sterile, brightly lit, and often noisy and crowded—are hardly conducive to a restful stay and rapid recovery.

Now think of a hospital with large rooms, each with a window, an abundance of natural light, ventilation drawn from an outside garden, and an absence of harmful emissions from building materials, furnishings, and cleaning products. That sounds a lot more healthful—and restful. When you're well enough to be up and about, you can relax in that landscaped garden. When you're ready to leave, your bill is likely to be lower because the facility's energy costs are significantly lower than average. On top of everything else, those who are aware of the importance of lessening their environmental impact will feel better knowing that the building was constructed with a small environmental footprint, so that your lapse of health is less likely to indirectly create unhealthful conditions for someone else.

Sounds great, doesn't it? Then why have hospitals and other medical facilities been slow to adopt "Green" building standards and methods? Primary reasons appear to be a lack of knowledge about the process of "going Green," and misconceptions about the complexity and cost. But this is changing with growing awareness of what Green really means and recognition of the many benefits of Green/LEED design, construction, and practices, including:

- Quicker permitting time
- Reduced operating costs
- Higher patient usage
- Shorter hospital stays
- Positive press/media
- Better work productivity
- Less absenteeism

A commitment to environmental sustainability translates into a source of significant competitive advantage and differentiation. Being Green is not only beneficial to health, the environment, and to the community, it can also have a positive impact on the bottom line. Organizations that have chosen to engage in environmentally responsible practices have typically done so either because they feel it is the right thing to do or it is a way to conserve energy and lower their costs.

As consumers become more conscious of the benefits of responsible energy use in the ingredients and/or components of the products they purchase and the services they use, they are impacting the way that

Baylor Heart Hospital. Photographer: Charles Davis Smith | Architect: RTKL Associates Inc. | Healthcare Design

organizations look at what they need to do to meet consumer demand.

In this article, we provide basic information about the true benefits (and costs) of a sustainable approach to building or renovating a medical facility. First, we'll review what LEED is and how it works; then we'll focus on what it means to your clients in real-world terms of costs and benefits.

LEED Is Changing All Phases of Building

The United States Green Building Council (USGBC) is a national nonprofit organization based in Washington, DC. The purpose of the organization is to integrate building industry sectors, lead market transformation, and educate owners and practitioners on the practice of building "Green" and sustainable buildings. Founded in 1996, USGBC began with 61 members, by 2008 its membership had topped 14,000 and it continues to grow.

LEED was developed to transform the built environment by providing the building industry with consistent, credible standards for what constitutes a Green (sustainable, environmentally friendly) building. LEED gives building owners and operators the tools they need to have an immediate and measurable impact on their building's performance. The USGBC also created LEED to prevent "greenwashing," which refers to false or exaggerated claims.

In this article, we describe LEED building efforts not only as "Green," but also as "high performance," because through the LEED process, we are creating buildings that operate more efficiently and thus reduce operating costs.

How to Earn LEED Credits

Buildings are rated against 69 LEED credits. The more credits achieved and the more Green or high performance the building is, the higher the award level the building will receive. In theory, the more credits achieved, the more sustainable the building is, and it should cost less to operate. The levels/awards that can be achieved per building are as follows:

Consensus-Based Standards USGBC has four levels of LEED:	
Platinum	52—69 credits
Gold	39—51 credits
Silver	33—38 credits
Certified	26—32 credits

The credits are organized in five main categories that focus on the different aspects of the built environment. Each category correlates to design disciplines that take the lead in achieving credits within the category:

- Sustainable Sites (Civil Engineering, Electrical Engineering)
- Water Efficiency (Civil Engineering, Mechanical Engineering)

Providence Health System and Services in Newberg, Oregon—the only LEED Gold healthcare facility in the United States. Certification was awarded in August 2006.

- Energy & Atmosphere (Mechanical Engineering, Electrical Engineering)
- Materials & Resources (Architecture, Structural Engineering)
- Indoor Environmental Quality (Architecture, Mechanical Engineering)

There is also an opportunity to achieve additional credits in the Innovation and Design Process category, basically by doing something that the USBGC has not thought of yet. In addition, there is now a Green Guide for Healthcare™ (GGHC) modeled on LEED (downloadable at http://www.gghc.org).

Why Go Green?

Reasons that clients in a variety of industries decide to go Green vary but now include:

- Enhance and protect ecosystems and biodiversity
- Improve air and water quality
- Reduce solid waste
- Conserve natural resources
- Reduce operating costs
- Enhance asset value and profits
- Improve employee productivity and satisfaction
- Optimize life-cycle economic performance
- Improve air, thermal, and acoustic environments
- Enhance occupant comfort and health
- Minimize strain on local infrastructure
- Contribute to overall quality of life

In a 2005 survey of building owners by McGraw-Hill Construction, the top two reasons owners indicated for their decision to design their facilities to higher environmental standards revolved around costs and image.

While the typical focus is on the economic rewards, there are also marketing and media benefits. This is particularly true for healthcare facilities that depend on donor funds to meet construction costs or any medical facility that relies on positive community perception to attract patients. A study by Turner Construction Company of New York City questioned nearly 100 senior healthcare administrators in Green healthcare facilities, who reported in addition to reduced energy use and lower operating costs there were public relations benefits as well.

While many building owners are finding that a greener work environment means increased work productivity and less absenteeism—thereby directly affecting the bottom line—a healthful environment has even more impact in a healthcare facility. Improving air quality through reduction of air-borne toxins and better ventilation, maximizing natural light, and using outdoor gardens as extensions of a healthful and comfortable indoor ambience can have striking results. The Turner Construction study cited above found that 47 percent of healthcare administrators reported patient recovery time was reduced in their Green facilities and shorter hospital stays translate into lower costs for the hospital.

Municipal Governments Can Encourage Green Projects

Some municipalities are offering special benefits to LEED projects. For example, Chicago has a new Green Permit Program that enables developers to obtain a permit in 30 days; the city also waives the consultant review fees for those projects planning on pursuing LEED certification. While to date this is the only city to offer it, the Chicago Permitting Department has received calls from other cities such as Seattle and Toronto inquiring about the program.

Each city has different permits and initiatives to address high-performance building efforts. These initiatives affect site selection and building planning opportunities. Tax credits and funding programs may be available for those who choose to build a high-performance building. Medical as well as other types of buildings can install photovoltaic systems to supply energy needed for a building. Use of photovoltaic systems not only supplies the building but excess energy can be sold to utilities that are required to buy back excess energy generated on private land. Although more upfront money is required, the benefit is reduced operating costs down the road.

One prominent Green medical facility, Dell Children's Medical Center of Central Texas, built a cogeneration plant that generates all their electricity using a clean-burning natural gas-powered turbine generator. The by-product is steam, which is also used by the hospital and by neighboring buildings in absorption chillers to provide chilled water. Austin Energy picked up the $6 million tab because that was less expensive than expanding its generation capacity to supply the new hospital's projected energy demand.

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Dell Children's Medical Center of Central Texas—the world's first LEED Platinum hospital. Photography: Marc Swender, Courtesy of Seton Family of Hospitals

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What Is the Real Cost to Be Green?

As more companies strive to meet LEED practices, several factors are working to modify costs:

- The construction industry is gaining more knowledge about and experience with Green materials and methods.
- Manufacturers are responding to demand by producing environmentally-friendly products.
- Clients are implementing their programs early enough to see immediate benefits.
- LEED consultants/designers are increasing their experience in planning ahead to obtain benefits at lower cost.

Some elements do vary from project to project and can influence the cost of building to LEED specifications. These elements include:

- Building location and size
- Level of LEED achieved
- LEED points sought
- Education and planning
- End users participation in the planning process

The information above counters some of the popular misconceptions about sustainable building, such as loss of square footage, higher costs during both design and construction, and extended design and construction timelines.

Theoretically, LEED should not cost any more than a conventional building if construction costs are weighed against operating costs. There are many credits that do not cost a dime and some that even save money on a project, however many do cost more and need to be chosen carefully with input from all stakeholders. It helps to classify credits in the following categories: no cost, added cost/reduced operational cost, added cost, reduced cost, just the right thing to do.

In general terms, Certified and Silver projects cost between one-half to six percent more than conventional projects, Gold projects cost eight to10 percent more, and Platinum projects are much higher. Platinum projects are few and far between, involving everything from generating energy to cleaning wastewater and capturing rainwater.

Although it may seem a laborious effort to achieve LEED certification, with advance planning it does not have to be. To be most successful, an organization has to consider and plan for LEED from day one—at the site selection stage. That is where you, the broker, come in. You are now aware of the benefits of Green and are able to advise your client to consider all options including the feasibility of Green building in relationship to your client's budget and goals, when thinking about creating a high-performance building. When it comes to LEED credits, planning early allows you to identify more of the low-hanging fruit. If your client and their design team approach Green options logically and carefully—and if you as the healthcare real estate professional are able to assist in the site or even city selection—there are opportunities to reduce the cost between standard building and high-performance building construction to the point where the difference in the cost could be below zero. It is possible to realize building operation savings on day one.

Healthcare executives are starting to heed the call. In the 2007 Turner Construction study, 10 percent of healthcare administrators said they would be involved with Green building and operating projects in 2007. By 2008, that number had almost doubled (19 percent). And in Massachusetts, the *Boston Globe* reported that health authorities are enthusiastic about making Green construction standards mandatory in healthcare environments.

Be prepared. Your role in site selection—looking for tax credits and sites near public transportation can align your client's project with easily achieved credits. A LEED-qualified and experienced design team can take your client the rest of the way—from energy savings to healthful, soothing environments to the ultimate goal: comfortable patients who recover more quickly.