Greening a School District One Building at a Time

When I explained to my third grader that I was writing an article for school administrators about why building green schools is a good idea, she said, "That will be easy, just tell them that it is healthy for the kids." After so many years of being told to eat their greens, today's kids simply assume that grown-ups will do and pay just about anything to make and keep their children healthy.

"Green' school" buildings mean just that: healthier schools for the staff, the children, and the environment. It should be an easy sell, but too often the only thing that really matters in construction is the numbers. To tell you the truth, cost is one of the least of my concerns, and here's why.

As an architect trained in Germany, I was brought up on environmental design. I did not understand that my training was unique until I moved to the United States 10 years ago. Not that Germans are any more responsible environmental architects than Americans, but 80 million Germans live in a country the size of Montana, so you can't help but be frugal with resources. For example, "Paper or plastic?" is not asked at the checkout in a German supermarket. You must ask for a bag if you did not bring your own, and each one costs a quarter, if only to make you remember the next time.

Everyone in Europe lives close to a power plant and has some kind of waste management facility in the neighborhood. Add to the mix a postwar generation that remembers "how it was to have nothing" and a whole other country on the other side of the iron curtain, and you have a very conservation-oriented nation by default, not really by choice.

My perception of the architectural profession changed after my first assignment in the United States. I was to design a build-out of 70,000 square feet of commercial office space in Washington, D.C. The previous tenant had just moved out, and I was ready to measure and draw the floor plan with the partitions when the senior architect informed me that everything was going to the landfill; we would start from scratch, with an empty shell.

At this time, it seemed like one of the most outrageous things that I had ever heard. So much waste – and I was part of it. After about 10 more of these kinds of projects, I had almost gotten used to the waste – almost.

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Then in 2000, the Leadership in Energy and Environmental Design (LEED) rating system came out. Now, there was something to reduce this craziness of legally wasted energy and resources in construction: a rating system that look sat a building holistically – at the site, the pollution, the resources, and the health effects of the chemicals that go into construction – and awards up to 69 points in six categories. After completion, the

building is third-party certified by the U.S. Green Building Council (USGBC), rated like an Olympic medalist; Bronze, Silver, Gold, or Platinum. (Bronze certification was discontinued, apparently because of American discomfort with fourth place. But the genius idea of competing buildings remained.)

While those involved in the building construction rate town the finish line with their eye on those coveted 69 points, the true winner in these "games" is the building owner. Even if he or she must pay a green premium in capital money, the upgrades will generate savings in operation and maintenance, often for a payback within the first five years.

The Journey toward Green

Short of becoming a bickering bag lady and pitching a tent in front of the white House to protest, I decided instead to reorient myself in my professional outlook.

Infused with love for my own children, I knew the best area for me to focus on was on education facilities. One-fifth of America's citizens spend most of their days in schools, so more than any other building type, it is the schools that need a green redesign. The school building itself should be a 3-D textbook for environmental stewardship and sustainability and make all community members proud.

Many studies show that comfortable temperatures, better air quality, good indirect daylight, and even views to the outside significantly improve student performance and increase attendance of students and staff. But how many more studies do we really need? It's not difficult to see with your own eyes the relationship between facilities and achievement.

My daughter attends a public elementary school in Washington, D.D., where, on a frigid winter day, the classroom is 85 degrees Fahrenheit with the windows wide open. She cannot concentrate and suffers from frequent headaches. Her teacher has been absent much of the year. Who needs another research study when our common sense tells us that this cannot be good? Her learning suffers, her health is compromised, and energy is waster.

In 2003, I had the opportunity to start a green program for Maryland's Montgomery County Public Schools (MCPS) as the LEED expert in their Department of Facilities Manager.

A school system with more than 200 facilities, MCPS already had a resource conservation program for students called SERT (School Eco Response Team). Adding energy conservation and environmental design as in-house programs made financial sense and when combined with the existing SERT program, it emphasized for students the importance of conservation.

Research shows that student and staff involvement in energy conservation not only is an opportunity for hands-on learning, but also makes economic sense. Just turning off lights and computers can save about 15%. When combined with more energy-efficient design and lighting, the savings can easily become 50%. Studies and business models from the USGBC that showed great potential for utility savings, as well as productivity gains, were convincing enough for the leaders of our department to try a pilot for a LEED school.

I organized a green building charrette – a two-day design workshop with facilities management staff and experts from the green design community. The charrette was very successful and not only provided an opportunity for everyone to learn about high-performance design and the LEED system, but also reassured those who still eyed green design as tree hugging that this was a valid and necessary strategy. There was something in the system for everyone, and we all learned quickly that by doing this right, we could improve the quality of our buildings and, as a result, education.

The following year, my interest and scope graduated from mere energy conservation to green building and high-performance design, with a stronger focus on integrating all aspects of sustainability. In 2006, a green building bill for Montgomery County made LEED a requirement for all new school construction. As a result, the MCPS Green Building Program is now its own entity within the Division of Construction.

Reviewing all school construction projects is a big part of the job, and it's the main reason I like to call green design "preventive design." The key is to design the building to prevent waste by improving the envelope and making it easier to operate and maintain.

But greening an entire school system is not easy. The school facilities and construction staff that I work with are busy with myriad tasks, such as design reviews, problem solving, contract and consultant management, procurement, community meetings, complaints, emergencies, repairs, and more. Adding green and high-performance design to the standard scope brings the system to overload very quickly. I soon learned that they key is to focus on the issues at hand work from there.

For example, roof membranes can be prevented from leaking by adding a protective vegetative layer, a green roof. A green roof also reduces storm-water runoff and erosion. Grassy slopes, too steep to mow, become no-mow zones with native vegetation. Flooded bathrooms get no-flush urinals that do not need valves and that save water.

Green in Maryland

For MCPS, it turned out that using the LEED rating system for its high-performance pilot schools was the right choice. What LEED does best is raise the standard about mere code compliance, from mediocre to excellent. LEED not only promotes more efficiency but also has a whole section dedicated to indoor environmental quality. I like to call it the "health section." Here, LEED provides benchmarks for the amount of harmful chemicals in building materials, the quality of air filtration, and the amount and quality of daylight.

The benchmarks are beyond what is considered legal, raising the bar from standard to high-performance buildings.

In August 2006, Great Seneca Creek Elementary School in Germantown and its twin Little Bennett in Clarksburg opened their doors to the students and staff of Montgomery County, Maryland. Both are green school pilots for our school system, designed to high-performance green design standards that were initiated at our LEED charrette in 2003.

One of the schools has been submitted for a LEED certification by the USGBC and we are anxiously awaiting our plaque. It is the first public school in the state of Maryland to be certified green.

"I am amazed at how this LEED school turned out. My family has lived in this country for many generations, and this school building makes me very proud of our tax dollars," Assistant Principal Donna Sagona said in her first month at Green Seneca Creek Elementary School. Can you put a number on that?

A Look to the Future

LEED delivers a certified green building and high-performing school. In a school system, certification is important. We hire certified consultants who guarantee code compliance. We have certified teachers who give grades, which are also important certificates of performance. Our students graduate with a diploma, not just in good faith.

To require the same independent third-party certificate for the performance of our school buildings seems like the natural next step. For us as the building owner, the LEED rating system is a means of quality control and improves accountability in the design and construction process. Remember how the sentence "This is a graded exercise and there will be a test" got our attention in school? It is the same concept and just as effective.

LEED is constantly revised and updated by USGBC members and national experts. After a pilot phase for LEED 1.0, we are now at LEED version 2.2. It has become much more refined, adapted from an initial focus on commercial office space to other building types, like residential and retail.

For the past three years, I had the pleasure of working with a very dedicated team of 11 national green school construction experts who volunteered their time as the elected core committee for LEED for Schools. This new rating system for K-12 schools will address issues unique to school construction by adding acoustics, community use, and mold prevention. As all LEED systems raise the bar on building quality, LEED for schools will be another important step toward better and greener schools.

To hit the ground running, the USGBC decided to forgo a pilot phase for LEED for Schools, but will allow schools to alternatively certify to the standard LEED-NC for new construction for some time. To learn more about LEED for Schools, visit http://www.usgbc.org.

Cost versus Benefits

As for the costs, the savings in utilities in a high-performance green school are significant and will eventually pay for any extra capital investments needed. This is the most convincing argument for responsible facility managers that also want to be smart fiduciaries, especially in times of ever-rising energy costs. Any new building in a school system is a liability to the taxpayer that should require low maintenance costs form the design team. But just as important to me, as a professional and as a parent, are the health benefits for students and staff in a greener school.

When our first LEED school opened to the students in August 2006, it felt great knowing that we did all we possibly could to keep harmful chemical and dust out of this building. I call it "the green under the hood" and brag about it shamelessly to parents whenever I get a chance, because it is something they cannot actually see to appreciate.

So, how much more does it cost to build a greener-school? It depends on how green you want it. Some technology upgrades come at no extra cost. Other very green features are more expensive but might generate a great return on investment and a much better learning environment.

But here is when it does not really matter that much: One of the students a Great Seneca Creek Elementary School was interviewed by the press on his first day of school. When asked what he liked best about his new school, he talked enthusiastically about the green features and pleasant daylight in his classroom. I could not help but shed a tear of joy. Now what is that worth to us as a society?

Resources

Montgomery County Public Schools' Green Building Web site.
http://www.Schools2Green.org
National Research Council, Committee to Assess the Health and Productivity Benefits of Green Schools, 2006.
Green schools – Attributes for health and learning.
http://www.nap.edu/catalog/11756.html

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