GREEN BUILDING ASSOCIATION
OF CENTRAL PENNSYLVANIA
An Affiliate of USGBC
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It's Easy Teaching "Green" With School Renovations

With the recent plans to construct or renovate many local school buildings, there is a unique opportunity to build innovation and learning right into the process.

As our current resource use exceeds the capacity of the planet to sustain us, environmental educators recognize the need to create an ecologically literate generation by empowering students with the technologies, skills and proactive attitudes that promote stewardship.

Creating the next "green generation" will require engaging in a twofold process: greening the curriculum, and greening the physical surroundings that encompass the learning community. Integrating the two can result in a real win-win situation.

In order to integrate sustainable systems into the curriculum, the Pennsylvania Department of Education has developed a new set of academic standards in Environment and Ecology. Teachers in Pennsylvania are now increasing the concepts in ecology that they introduce in our youngest people, including even integrated pest management in the third grade.

At the same time, the State Education and Environmental Roundtable, a group of top education administrators from 12 participating state departments of education, is promoting a new model for integrating "hands-on" activities into the "K-12" curriculum. This research group has documented improved performance of student participants in the new curriculum, called the Environment as an Integrated Context for Learning, in all academic subject areas, as well as in the students' ability to engage in systems thinking and cooperation.

Retrofitting school buildings creates an opportunity to use the building and surrounding school grounds as a "learning hands-on laboratory" and to create a more sustainable facility. For example, adding renewable energy technologies to school buildings can offer long-term, non-polluting energy production, and serve as a resource to study the technologies the next generation of students will need to understand. Solar, fuel cell, bio-diesel, geothermal and wind energy production can be integrated into new buildings in accessible ways, while students measure and predict temperature, wind speed, energy production and so on.

Clearview Elementary School—Hanover, PA

Renovation can include "green design" architecture and engineering features that utilize lower impact construction materials and maximize passive solar heating and daylighting. Light meters can be used to study solar orientation. Heat and/or water recaptured from a waste stream can be monitored by a classroom. A "green roof", planted with perennial plants such as sedum, can provide insulation, increase biodiversity and reduce stormwater runoff while serving as a biology lab.

In addition to improving science scores, these high performance buildings can help save the district money. As schools struggle to finance new classroom space, rethinking the schoolyard as an outdoor classroom also makes sense.

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The Green Building Association of Central Pennsylvania is a coalition of building professionals and citizens who are interested in improving the sustainability of the systems in our region. The mission of the GBACPA is to promote environmentally responsible design, planning, construction and operation of the built environment through education, outreach and networking. For information write: info@gbacpa.org or call: 717.497.5768 or visit our web site at www.gbacpa.org.

The Top 10 Green Schools in the U.S.: 2006

Adapted from an article in The Green Guide,
by P.W. Randle and Sara Smiley Smith

The Green Guide developed its 2006 list of the top green schools in the U.S. by mailing invitations to more than 2500 K-12 schools, garnering detailed responses from 67 schools. The survey covered 10 categories, awarding up to 10 points in each category, for a maximum of 100 points. Survey categories were:

1. **Green Building and Construction** – School administrators were asked if their new building or renovation projects had received LEED® certification. Seventeen schools were determined to have been built – and three remodeled – in accordance with the LEED rating system.
2. **Electricity Supply** – Almost 40 percent of U.S. emissions of carbon dioxide comes from electric utilities. Schools were asked about the use of renewable energy to reduce CO2 generation, specifically whether the school had on-site or off-site solar, wind, hydroelectric or other sources of energy. On-site solar proved the most popular, eight schools using it in some form.
3. **Food** – Schools were asked if they offered organic food and relied on local growers, as well as whether they reused dishes and tableware. Twelve schools served organic food, while eighteen had committed to using local food sources. Schools were also asked if they allowed vending machines, and what they contained, if they were allowed. Seventeen schools in the survey did not allow vending machines on campus, and only seven schools that allowed vending machines allowed candy to be sold from them.
4. **Recycling** – Schools indicated if they had a recycling program and what materials were recycled. Almost all schools surveyed had some sort of recycling program.
5. **Procurement Policies** – Schools were asked if they had environmental procurement policies, and which factors were taken into account. Factors included recycled content, life cycle analysis, energy use, water use, toxicity, and length of usable life. Twenty-three schools had environmental procurement policies, with recycled conent and energy use the most frequently cited factors.
6. **Transportation** – Recognizing that many of the new regional schools lie some distance from city centers, adding considerable commute times, schoos were asked about transportation alternatives for faculty, staff, and students, including carpooling, bicycling, and public transport.
7. **Environmental Curriculum** – Connecting students' intellectual and emotional lives with their environs is one of the most significant outcomes a green education can have. Schools were asked if they had an environmental curriculum, and what the curriculum covered. Almost two-thirds of the survey respondents reported having such a curriculum.
8. **Environmental Contaminants** – This was the most detailed portion of the survey, with questions concentrating on threats to indoor air quality. Schools were asked about the elimination of pesticides and whether the least toxic practices, known as integrated pest management, were used indoors and outdoors. Twenty-two schools responded positively. Use of green cleaners, to reduce exposure of faculty, staff, and students to chlorine, ammonia, and other caustic chemicals was reported by nineteen schools. Schools were also asked to describe management policies for lead, asbestos, mold, and arsenic (such as in treated wood).
9. **School Green Spaces** – Flowers and vegetable gardens, trails and woodland areas offer students unique learning opportunities, ranging from wildlife observation to planting and harvesting their own organic produce in "edible schoolyard" programs. Twenty-five responding schools reported using native plants for green areas, only four had edible schoolyard programs.
10. **Environmental Quality** – Once respondents had finished the survey, they were asked to rate their schools' overall commitments to environmental quality.

The survey results

One school ranked in the Top 10 and another in the second 10 hold particular interest for GBACPA members. The Willow School, a private school in Gladstone, NJ was ranked in second place. Several members of GBACPA worked on the design team for the existing school building, a LEED-Gold building, and the school is developing a Platinum building to house its art program. Drawing from wind power off-campus an solar power on-campus, the Willow School conserved energy by turning off its HVAC system when the temperature outside is between 60 and 80 degrees F. A light goes on in classrooms and other space, to prompt students and staff to open windows. Willow School also maintains a green focus in everyday life on campus through serving local foods and adhering to environmentally friendly procurement policies and a detailed recycling program.

The second school of interest to GBACPA members is the Northside Elementary School in Mechanicsburg, PA, filling the number 14 spot in the survey. Local foods are served, and the school runs an organic gardening program that involves the students. Integrated pest management is used both inside and outside the school.

ANSI/ASA S12.60: New Standard for Classrooms

Because of a 2002 voluntary standard for acoustics, classrooms of the future could be quieter – and designers could have to learn new ways of designing classrooms nationwide. The standard, developed by the American National Standards Institute (ANSI) and the Acoustical Society of America (ASA), is similar to standards that are already in use by the World Health Organization and other countries.

Welcomed by many since compelling evidence has linked learning levels to background noise, the standard is also causing confusion and controversy in the school design community where architects and engineers are trying to pinpoint noise culprits and rethink classroom design to meet the stringent criteria.

What is Standard S12.60?

S12.60 is a national standard that details acoustical performance criteria, setting maximum limits for several categories of learning spaces. Some of the criteria outlined in the standards include (for the typical California classroom of 960 square feet with a 10-foot ceiling):

- Noise levels – 35dBA (A-weighted decibels)
- Reverberation – 0.6 seconds
- Noise isolation – Sound transmission class (STC) 50-60 materials for wall, floor-ceiling, and roof-ceiling assemblies (depending on the kind of space) adjacent to classrooms.

Is the Standard too stringent?

Over the past few decades, a variety of studies have shown that learning is improved in quieter classrooms. These studies have also shown that classroom noise causes a particular learning barrier for children with hearing impairments or learning disabilities, or students who speak English as a second language.

Since as many as one-third of students in a typical classroom fall into these categories of extra sensitivity to poor acoustics, meeting the acoustic standard can make a significant difference in learning levels.

But at what cost? Particularly in schools that are already built and would require retrofits to meet the standard, administrators and designers wonder what will have to be eliminated from the budget to fund acoustic retrofits. Many existing classrooms today reach 50 to 60 dBA and higher, so costs for retrofit could be high.

For new construction, for a classroom built at $190 per square foot, some sources estimate a cost of $5.70 per square foot increase in cost.

Do I have to comply with the Standard?

S12.60 was approved in 2002 as a voluntary standard, meaning that it is a national recommendation for classroom design and not required. States, school districts, and other code organizations can adopt the standard to make them mandatory. The standard was submitted to the International Code Council for inclusion in the 2003 International Building Code, though it was rejected because of questions about cost burden to schools and other concerns. In California, the standard has not been accepted by the Department of Education, the Division of the State Architect, or any other policy making agency.

Where can I get more information?

Acoustics Resource Page, National Clearinghouse for Educational Facilities at www.edfacilities.org/rl/acoustics.cfm

Classroom Acoustics (Volumes I and II), the Acoustical Society of America at http://asa.aip.org/classroom/booklet.html

ANSI/ASA S12.60 can be ordered from the ASA website, http://asa.aip.org.

Do Green Architecture! KD3 Design Studio, Inc., a small energetic Central PA sustainable-oriented architecture firm, seeks Architect, CAD Tech Captain, and Interior Designer looking for unlimited opportunity for professional growth. Comfortable office where design is valued and your energy will be appreciated and rewarded. Candidates must be experienced and able to develop a set of drawings and understand building construction and detailing. Computer/AutoCAD skills a must. *Email resume to DRH@KD3designstudio.com*

Notice of job opening!

The Stone House Group, an organization member of GBACPA, is seeking a project manager with experience in the health care sector. LEED experience and an MEP background would be helpful. The position is in central Pennsylvania, with occasional minor travel.
For more information contact Tim Bard at 717 239-1102

As the World's leading supplier of environmental comfort systems, Trane continues to demonstrate its commitment to the high performance, high efficiency and sustainable building movement through innovative products, controls, and systems. Through years of environmental stewardship, Trane has received various awards from government and environmental organizations. Many LEED buildings operate with Trane equipment, controls, and services. Trane's St. Paul facility is currently registered under LEED for Existing Building.

Trane has been and continues to be a leader in Green Marketing. We were the first company to become CFC-Free in 1993 (an action for which we received the EPA Ozone Protection Award). We are the only HVAC company to have received the coveted U.S. EPA Climate Protection Award, awarded to Trane for the development of the EarthWise™ CenTraVac™. The EarthWise CenTraVac is the only water chiller that is certified by Green Seal for its environmental responsibility. For nearly a decade, we have championed "highest efficiency/lowest emissions" and of doing things that are both BusinessWise and EarthWise. This is precisely the right direction for the future. This duality of doing what's right both for business and the environment is exactly the tact of the U.S. EPA's ENERGY STAR® programs, and we feel that these programs are the best method for customers to show their concern for the environment while being fiscally responsible.

Trane is a corporate member of the U.S. Green Buildings Council. As a member of USGBC, Trane employees are involved in various LEED committees. In addition to a strong corporate commitment, local Trane sales offices are also aligned with local USGBC chapters to better serve building owners. Many Trane account executives "walk the talk" as they become LEED Accredited Professionals (LEED AP).

By participating in various green building conferences worldwide, Trane demonstrates its capabilities to owners, architects, consulting engineers, contractors, and many others in the green building movement.

For more information on Trane, go to www.trane.com, or contact your local Trane sales office at (717)561-5400.

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GBACPA Bronze Member

Founded in Lancaster 117 years ago, Wholsen is today one of Central Pennsylvania's leading construction firms, providing a broad range of cost-efficient general contracting, construction management, design/build and facilities services to senior living, healthcare, education and commercial clients in the Mid-Atlantic States. With specialists in almost every type and size of building construction, the scope and experience of the entire Wohlsen employs artisans, craftsmen and master carpenters in addition to project managers, field superintendents and support staff. All associates receive thorough training in their craft as well as in safety, quality, and customer service. Our company is a proponent of partnering with the owners, architects and builders involved in each project. A high rate of repeat business and referrals affirm Wohlsen's commitment to maintain long term client satisfaction.

Wohlsen has been involved with several recent projects which incorporate elements of "green" design and construction.

Doing work for **The Department of General Services (DGS)** at the Capitol Building in Harrisburg has made Wohlsen Construction personnel sensitive to several conservation opportunities. DGS specifications require insulation with post consumer recovered paper; foamed in place insulation must consist of 5% recovered material; and, we must provide add alternates for disposal of existing carpet in a recyclable manner. We also salvage building materials (Habitat's store can resell them), and recycle demo material (ceiling tile can be recycled at Armstrong World Industries' Marietta ceiling plant).

Wohlsen recently completed construction of a new **Administrative Center for York County** following the standards for LEED Certification. It is the Owner's intention to submit for certification upon project completion. In addition to providing overall support for the process, Wohlsen specifically contributed to the process by recycling materials, monitoring indoor air quality and managing the volatility of contents to preserve the atmosphere.

Boyer Hall Academic Center - Messiah College

Wohlsen constructed the new **Boyer Hall Academic Center at Messiah College** which includes 22 general use classrooms, a 140 seat auditorium and film studio, language lab, resource rooms, administrative offices and interview/counseling rooms for the behavioral sciences department. The building was designed and constructed according to LEED certification requirements, but the Owner elected not to pursue actual certification.

Welcome Our New Organization Members

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Green schools have been linked to increased student performance and significant reductions in energy costs. For example, properly implemented daylighting has been shown to improve reading performance by 26 percent and math performance by 20 percent while reducing the need for electric lighting.

A recent study, National Review of Green Schools: Costs, Benefits, and Implications for Massachusetts, concluded that while green schools cost about two percent more they provide fincncial benefits that are significantly greater than this cost. The study can be found at http://www.cap-e.com.

In the summer of 2005 Pennsylvania entered the forefront of rapidly growing green school movement when Governor Rendell signed Act 46, which provides augmented reimbursement for schools which achieve the equivalent of LEED® Silver or higher status.

The sum of $470 multiplied by the elementary rated pupil capacity and $620 multiplied by the secondary and vocational rated pupil capacities is added to the approved building construction cost.

For a new elementary school with a rated pupil capacity of 700, the added reimbursement could total over $300,000. The extra funding would easily pay for any added cost of producing a LEED-rated school. To qualify for these funds schools must seek LEED or equivalent certification for new or significant renovation projects and must receive LEED Silver or equivalent certification within one year of project completion.

In addition, the Pennsylvania High-Performance Green Schools Planning Grant Program is available to assist in producing green schools. Grants may be used for simulation and modeling costs, including daylighting studies and energy modeling; green coaches and additiona design and consulting fees beyond those conventionally covered, and costs of documentation required for LEED certification. These grants vary in size depending on the project, but are expected to average $20,000.

The grants are funded by the State Public School Building Authority and jointly administered by the Governor's Green Government Council and the Pennsylvania Department of Education. Additional information on green schools is available at http://www.gggc.state.pa.us.

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The Clearview Elementary School in Hanover, PA was recently designed to consume one-third less energy than a conventional structure. The school also used approximately 40 percent locally manufactured building material, with a high (75 percent) recycled content. The cost is comparable to other renovation projects.

According to a recent study conducted by the California Board for Energy Efficiency, test scores were 15 percent to 30 percent higher in classrooms with daylighting, making green design an improvement worth the investment.

Lighting also affects your mood. Research published by Helen Clark at London University's Institute of Education confirms that "light, space, furnishings and equipment can make people feel valued – or not – affecting behavior and attitudes, which significantly enhance or impede the learning process."

Facilitating ecological literacy and stewardship requires spending time in activities that connect us to the natural world. Yet today, children are leading more sedentary lives indoors, plugged into something other than sunshine. Obesity has reached crisis proportions as our children exercise less and eat higher quantities of unhealthy food.

It will be up to this generation to provide the support and tools needed for the next generation to live in more ecologically responsible ways. Let's start with creating more sustainable schools where children can learn about cutting-edge technologies through hands-on activities while saving the planet at the same time.

Article by Laura Silver: Director of Outreach for the Penn State Center for Sustainability

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The Benefits of Membership

All GBACPA members receive our quarterly newsletter, special e-mailings, invitations to networking and educational events, and access to the Members Only section of the web site. Organizational and "metal" memberships can enter a firm description on the GBACPA web site and publish case studies. Small orgs (<20 employees) get two memberships, large orgs (>20 employees) get four memberships. Metal members receive discounts to events, free web link, advance event sponsorship opportunities and more. Make checks payable to "GBACPA, Inc.".

Membership levels are as follows:

Associates - $50
Small Organizations - $250
Large Organizations - $500

Bronze - $1,000
Silver - $2,000

Gold - $3,500
Platinum - $5,000

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