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Sustainability Becomes Part Of School Construction's Core Curriculum

by Jim Parsons

2007 will go down as the year of sustainable building for the Tri-State region's schools. All three states made milestone commitments to promote sustainable, energy-efficient design and construction in most public education projects.

The New Jersey Schools Development Authority issued its 21st Century Schools Design Manual, a set of 24 design criteria that will apply to all new projects it funds. The New York State Energy Research and Development Authority collaborated with the State Education Department to create the New York Collaborative for High Performance Schools, a set of voluntary guidelines designed to improve academic achievement and reduce operating costs.

In Connecticut, the state's Department of Public Works is developing criteria to meet a state legislative mandate requiring major public school construction and renovation projects to achieve LEED silver or equivalent rating beginning in 2009.

Not surprisingly, rising energy costs are the primary driver behind each state's choice of green as the defining color for the modern version of the little red schoolhouse.

"Most of the schools we're replacing were built in the 1950s, 60s and 70s when energy wasn't a cost factor," says Paul Tonko, NYSERDA president and CEO. "Because these buildings are also a huge source of greenhouse emissions, it behooves us to take a different approach."

There are other considerations to address as well, such as enhancing the quality of the learning environment, accommodating education-specific operations and facility durability.

Although the U.S. Green Building Council issued a school-oriented LEED system in 2007, administrators such as Daniel R. Millen Jr., director of architecture and engineering for SDA's Project Management Division, say that most New Jersey districts will prefer the education-focused elements of the homegrown design standard.

"Our program represents the culmination of best practices from around the country, bringing a sustainable design element to the types of facilities we're building" he says of the Design Manual, which was developed in collaboration with the New Jersey Institute of Technology and will be continually evaluated to keep up with educational and technology trends.

Millen adds that the 21st Century Schools rating system is easier to implement than LEED. "If you can answer the questions under each of the design criteria, you should have a high-performance school building," he says.

Similarly, existing programs in California, Massachusetts and other states formed the basis of New York's guidelines, which also place a strong emphasis on life-cycle costing

SED facilities planning coordinator Carl Thurnau says that while such concerns are not new for school districts, "it's difficult for them to incorporate both construction and maintenance within voter-authorized budgets. The standards help them make what can be difficult decisions up-front to save money over the long-term. The state also saves money because we don't have to go back and fund work for things that wore out too soon."

Early endorsements

Thurnau credits these and other factors for the swift adoption of NY-CHPS by several New York school districts. Within days of the guidelines' late September debut, the East Hampton Union Free School District submitted the first NY-CHPS compliant project to SED: a renovation and 90,000-sq-ft expansion to East Hampton High School.

Todd Harvey, senior partner for Beatty, Harvey & Associates, New York, says that like many other sustainable design projects, the biggest hurdle was helping the district get past the perceptions of substantially higher first costs and the paperwork burdens of getting certified.

"Once the district understood the process and had the opportunity to be a pilot project for NY-CHPS, everything came together," Harvey says. "They saw the project as a good way to set a good example for students, the community and other school districts."

Scheduled to begin construction this spring, the \$58 million East Hampton project will cut the school's projected energy use by nearly half compared with a comparable design using conventional systems and materials. The two-story, steel-framed addition with masonry and glass curtain wall exterior will include recycled materials, sophisticated mechanical systems and filters, occupancy sensors to conserve electricity and triple-glazed windows in the cafeteria for daylighting and controlling heat gain.



Although the project's attributes are comparable to those that aim for LEED silver, such as the recently completed 140,000-sq-ft Hampton Bays Middle School, also designed by BH&A, Harvey says he expects NY-CHPS to grow in popularity.

"An important advantage of NY-CHPS is that it also covers how schools are managed," he adds. "Unlike LEED, projects receive points for things like outlet design and eliminating excess or inefficient appliances from classrooms."

The first project under New Jersey's 21st Century Schools program, a 46,186-sq-ft early childhood center to accommodate 324 pre-kindergarten students in Jersey City, is in the early stages of schematic design with construction many months away, Millen says.

"We have several other projects in various design stages, all of which are following LEED to some degree," he adds.

New Jersey also recently received its first LEED gold certification for a school. Summerfield Elementary School, a three-story, 105,000-sq-ft, design-build project, was completed in 2006 and features a farm-themed design that includes a garden, other outdoor activities and an open-air amphitheatre at the rear of a cafetorium that is also available for community use.

Patock Construction Co. of Shrewsbury, N.J., teamed with EI Associates of Cedar

Knolls, N.J., to complete Summerfield Elementary School in 22 months.

"We received a lot of value from using design-build," Millen says. "While various types of delivery methods will be utilized for the 21st Century Schools program, I expect it will prove helpful in achieving its goals as well."

Although Connecticut's sustainable school criteria will also draw heavily on the CHPS concept, "our legislation has a stronger mandate on meeting energy-efficiency requirements," says Bruce Bockstael, the DPW's team administrator for sustainable energy standards. "A project like this deserves our attention because of the cost of fuel. Even making changes at one school can make a difference."

Bockstael points to voluntary local programs such as one in New Haven, which contracted with Gilbane Building Co. to assess the energy efficiency of the city's school designs.

"When we started the inventory of school buildings five years ago, energy use compared with other Northeast school buildings was off the charts—approximately 260 KBTU per sq ft a year," says Tom Rog r, Gilbane program director. "We developed performance specifications, processes and sophisticated energy modeling support that designers, contractors and commissioning staff use to ensure that they deliver the highest-performing building the city can afford."

The project team has charted energy performance across the system as new schools have been constructed and existing facilities upgraded. "School energy use is now less than 80 KBTU per sq ft—a 70% reduction over a four-year period," Rog r says. "That includes many buildings that have not yet been upgraded."

Lessons to be learned

While the three states' initiatives represent milestones in school construction, many issues remain unresolved. Cash-strapped school districts may still perceive gaps between needs and affordability, even with the long-term energy savings.

Currently, no state plans supplemental funding for sustainable school construction. "I'm hopeful the dialogue for educational funding will continue in the upcoming legislative session," NYSERDA's Tonko says. "We need to find ways to help districts achieve NY-CHIP certification, particularly those that don't have a lot of resources."

Helping school districts understand and implement sustainability criteria will also be essential. All three states plan in-house training and look to the design and construction community for help as well.

? "Coordinated design is wave of the future," SED's Thurnau says. "If everyone is at the table, we can do an educationally sound, energy-efficient, right-sized school based on local needs."

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