



By integrating daylight sensing with precise control, Lutron's EcoSystem™ lighting control solution improves the learning environment.



Sidwell's Middle School exterior now includes a number of advanced, eco-friendly design changes.

Prestigious private pre-K through 12 school in nation's capital sets new environmental standard for educational facilities as the first LEED® Platinum facility with a wide variety of sustainable features, including a revolutionary new lighting system.

**When Sidwell Friends School in Washington, D.C. recently upgraded its Middle School building, the administration decided that, in order to live up to the school's Quaker ideal of environmental stewardship, the building would have to be transformed into a LEED® Platinum certified facility. Sidwell was able to attain that rating with a host of sustainable design features, including the EcoSystem™ lighting control solution from Lutron.**

Steve Sawyer has been maintaining the grounds and facilities for Sidwell Friends School since graduating from college in 1981. From its inception in 1883, this private, independent school, serving pre-K through 12 on two campuses in Washington, D.C. and Bethesda, MD, has taught a multitude of students from the Beltway, including children of U.S. presidents. As the facility manager, Sawyer must accommodate a variety of individual security needs for these high-profile families while, at the same time, providing a comfortable learning environment for teachers and students alike.

On top of these duties, Sawyer recently was given an additional mandate: he was told the Middle School building (grades 5 – 8) must set an example for environmental consciousness, exceeding the eco-friendly standard of every other secondary



Depending on their proximity to the windows, EcoSystem dims rows of lights to different levels to take advantage of natural light while providing an even illumination in the room.



A light shelf and EcoSystem work in tandem to achieve energy efficiency in corridors and elsewhere in the building.

school in the country. Sidwell is a Quaker institution, and environmental stewardship ranks as a high priority. The Middle School, built in 1950, was in dire need of an upgrade, so the administration established the most demanding of goals for its then-eco-backward building: when finished, the \$21 million construction project would receive the LEED Platinum certification, the highest possible rating.

LEED is an acronym for Leadership in Energy and Environmental Design, a rating system established in 1993 by the United States Green Building Council (USGBC), which sets industry standards for high-performance green buildings. USGBC awards credits for green building attributes including state-of-the-art strategies for sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. There are four levels of certification: Certified, Silver, Gold, and Platinum, with Platinum being the highest rating.

Sidwell Friends School is the first secondary school to receive the LEED Platinum designation and the first structure of any type to achieve it in the District of Columbia. The certification process involved numerous school constituents, including faculty, trustees and alumni, as well as outside consultants. Ground was broken in June 2005 and the project was completed in September 2006.

“It’s been a lot of work for us,” Sawyer said, “but the results have been gratifying for everyone. Virtually every design feature took environmental responsibility into account and that, in turn, sends the right message to the kids who attend here.”

Michael Saxenian, Sidwell’s Assistant Head of School and Chief Financial Officer, guided the project along. “It was a values-based decision for us,” Saxenian said. “Sidwell Friends stresses environmental stewardship to our students, and we decided that if we’re going to ‘walk our talk’ then we needed to orient the project in the manner we did. We believe we’re in a critical moment in our planet’s history, so we figured we should have the most advanced design and systems available.”

The project was a combination of renovation (37,000 sq. ft.) and an addition (39,000 sq. ft.). It incorporated a variety of sustainable design features, including the following:

- Lutron’s **EcoSystem™** lighting control solution, installed throughout the building, provides energy-efficient fluorescent lighting, integrating daylight sensors, occupancy sensors, and dimming ballasts.
- A light shelf incorporated into the façade transmits daylight deep into the building while shading the corridors from direct sun.
- Exterior walls of the addition and third floor of the existing building are sheathed with western red cedar cladding, sunscreens and high-performance windows.
- Five percent of the overall building’s electrical load is to be generated by photovoltaic panels.



EcoSystem is able to provide optimum lighting levels suitable for any environment, including the school's music room.



The precise lighting control levels enable students to use computers without on-screen glare.

"We're trying to push energy efficiency as much as we can," Saxenian said, adding that Lutron's EcoSystem lighting control solution was essential in helping Sidwell reach that objective.

On average, lighting accounts for about 55 percent of an educational facility's electricity use, according to the U.S. Energy Information Administration. Lutron maintains that typically the EcoSystem lighting system can cut a building's lighting energy use up to 60 percent, but Saxenian said that, "overall, with our more efficient lighting system, better use of daylight, and the resulting reduction in air conditioning load, the school expects to reduce total energy use associated with lighting by 92 percent. Because of that, EcoSystem is a core component of Sidwell Friends School's strategy of using life-cycle payback to finance more efficient energy systems."

Sawyer agrees. "Energy was number one for us," he said, "because lighting accounts for such a big part of any building's electrical and heat-gain loading. Installing a lighting system that can reduce our energy usage was central to the school's plan of attack." He said the fact that the lighting system can "pretty much run itself" means far fewer distractions for him and his staff.

The architect for this project was KieranTimberlake Associates LLP of Philadelphia, widely acknowledged for its innovative design services. "Lutron's EcoSystem fits into the design goals we set for this project," said Stephen Kieran, of KieranTimberlake. "Sidwell Friends School wanted a building that set a new standard for environmental responsibility

and, in order to give them that, we needed the most advanced lighting system available that can integrate daylight sensing and other technologies."

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**Stephen Kieran, FAIA**

KieranTimberlake Associates LLP

The EcoSystem lighting control solution senses changes in lighting needs based on the amount of natural light entering the building throughout the day, and it reacts dynamically to those changes by modifying the learning environment in ways proven to improve productivity and reduce energy costs. The connection between a building and the productivity of its occupants has been gaining acceptance through numerous studies dating back to the 1920's. Generally, the studies have shown that when the work environment, including the lighting, is improved, the quality and/or quantity of the work output is improved accordingly. The Sidwell Friends School project is the testing ground for the latest research on the subject. A team of academics from Yale University is examining how the Sidwell Middle School's biophilic design elements affect health, emotional well-being, intellectual performance, motivation and social interaction.



**Client:**

Sidwell Friends School  
Washington, D.C. and Bethesda, MD

**Equipment Provider:**

Lutron Electronics Co., Inc.  
Coopersburg, PA

**Architect:**

KieranTimberlake Associates LLP  
Philadelphia, PA

**MEP Engineer:**

Bruce E. Brooks & Associates  
Philadelphia, PA

**Lighting Design:**

Sean O'Connor Associates Lighting Consultants, LLC  
Beverly Hills, CA

Benya Lighting Design  
West Linn, OR

Sidwell officials say the installation of Lutron's EcoSystem lighting control solution was part of a larger strategy to achieve student productivity gains from improved exterior lighting, attained through several different strategies, including the use of the EcoSystem lighting control system (with its daylight sensing capabilities).

Sawyer said EcoSystem's personal control flexibility – what he calls its “user-adjustability” – has been a popular feature in the school. “Teachers have a full range of choices when it comes to overall lighting levels and the use of uplighting or downlighting,” Sawyer said. “If the teachers are using a smart-board or a projector, the students have no problem seeing the information. If the students are at a computer, the lighting level is easily adjusted so there's no glare. It really helps create a classroom environment that's most conducive to learning.”

Rave reviews from teachers confirm this. “As one of the eighth-grade environmental science teachers, I am grateful to be working in a building that incorporates so many wonderful environmental features,” said Dave Wood. “I work so much more efficiently with all this natural light pouring into my windows. I am also comforted by the knowledge that if I or my students leave the classroom lights on, they will turn off automatically, preventing our carelessness from wasting energy. I appreciate that!”

Saxenian said the decision to go green was borne, not only by the school's Quaker ideals, but for three other reasons, too: Sidwell wanted to create a healthy environment for the 340-plus Middle School students and roughly 50 employees; the school wanted to create a living laboratory for learning, both within the community itself and more broadly in the world; and the school wanted to help lead others to look into the possibilities for green building.

The building's “report card” bears impressive numbers: lighting energy consumption has been cut by 92 percent, and overall energy use has been reduced by 55 percent. For someone like Sawyer, who manages a total of ten buildings, the go-green decision's success speaks for itself. “This was an unconventional project that required unconventional thinking,” he said. His smile would tell you that, so far, it has achieved unconventional results.



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Lutron Electronics Co., Inc.  
7200 Suter Road  
Coopersburg, PA 18036-1299

World Headquarters 1.610.282.3800  
Technical Support Center 1.800.523.9466  
Customer Service 1.888.LUTRON1

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