

Silvis Middle School



A long-awaited middle school offers sustainable environment for student learning

After years of petitioning the state legislature, in 2011 the Silvis School District was finally awarded funding for a new middle school. But rising construction costs and a new state mandate for green building certification meant the district had to make the most of their construction budget. Working with Bloomington, Illinois-based BLDD Architects, the district got their new, green school, and kept it under budget with structural insulated panel construction.

PROJECT AT A GLANCE

LOCATION: **East Moline, IL**

SQUARE FOOTAGE: **52,600**

ARCHITECT: **BLDD Architects**

BUILDER: **Estes Construction**

BUDGET: **\$13.5 million**

SIP MANUFACTURER: **Energy Panel Structures**

Building Green on a Budget

Like any public project, managing the construction budget was a chief concern for BLDD Architects. Construction costs had risen significantly in the years since the initial funding request was submitted, and the State of Illinois now required all publicly-funded projects over 10,000 sq. ft. to achieve a Leadership in Energy and Environmental Design (LEED) Silver certification or a 2 Globe rating under the Green Building Initiative's Green Globes rating system. BLDD was tasked with not only designing the 52,600 sq. ft. school to meet a high degree of sustainability, but to do so as cost effectively as possible.

Although the Green Globes rating system considers all aspects of sustainable construction, such as water conservation and resource-efficient materials, energy efficiency is its major focus—accounting for more points than any other evaluation category.

Large windows and daylighting sensors allow students to enjoy the productivity benefits of natural lighting.



“Because of a state mandate, we were looking at LEED or Green Globes certification,” said John Maynerich, Project Architect with BLDD. “Either one was going to require us to use a high R-value insulation material that fit into the budget.”

The quest for an enclosure system with high thermal performance led Maynerich to structural insulated panels (SIPs) from Energy Panel Structures. SIPs are a panelized building system comprised of rigid insulating foam sandwiched between two layers of structural sheathing, providing insulation and a structural shell for the building’s steel frame in a single product. And because SIPs do not have studs, the insulation is continuous, without any thermal bridges, voids, or opportunities for air leakage.

BLDD had used SIPs previously on the LEED Platinum Center of Sustainability and Innovation at Richland Community College in Decatur, Illinois. They knew that SIPs could deliver the necessary performance at a reasonable cost.

“We looked at metal studs and it came back more than we wanted to spend, more than SIPs,” said Maynerich. “SIPs gave us more than adequate R-value to meet the insulation requirements in the walls and roof.”

An energy-efficient building envelope was only one part of BLDD’s holistic approach to sustainability. Heating and cooling for the school is provided by an advanced geothermal heat pump system that circulates water through piping buried in the ground to harness the constant temperature of the soil. The building’s design places emphasis on natural daylight for classrooms, which studies have shown enhances student performance. Light sensitive controls dim electric lighting when adequate natural light is present.

BLDD also specified many sustainable materials such as recycled steel, recycled aluminum and locally-sourced materials wherever possible.

Working with large-format SIPs helped crews enclose the building in record time.



Structural Considerations

SIPs are often used as a structurally self-sufficient building system or in concert with traditional wood construction, but the Silvis Middle School applied SIPs as a curtain wall over a structural steel frame. In this type of application, the structural capabilities of SIPs can span long distance between steel supports, helping close in the building quickly. Working with large, 8 by 24-foot prefabricated panels translated to significant labor savings for construction crews when compared with site-built construction methods.

“The SIPs were installed within three to four weeks time,” said Maynerich. “For such a large building, if we had gone with more traditional construction that would have affected the schedule greatly.”

Labor savings, material savings, and a cost-effective energy reduction strategy helped BLDD meet the sustainable design goals while keeping the project under budget. Preliminary calculations show that BLDD’s energy-efficient design will save the district approximately 30 percent on their total electric bill, making the project eligible for rebates from the local utility company and saving money throughout the life of the building.



SIPs and other energy-efficient features are estimated to save the school district 30 percent in utility costs.



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