

Silverwood Park Visitor Center



Three Rivers Park District Visitor Center Represents Philosophy of Environmental Stewardship

Presiding over 27,000 acres of parks in the Minneapolis, Minnesota metro area, the Three Rivers Park District is a leader in environmental conservation and protection. In addition to park administration, the agency also provides forestry, wildlife and water resources management for the district. So when it came time to build a new visitor center for the Silverwood Park outside of Minneapolis, the agency wanted a building that would embody their philosophy of sustainability and environmental stewardship.

Minneapolis-based firm Miller Dunwiddie Architecture was assigned the task of designing a building that would match traditional park structure aesthetics while eliminating storm water runoff, reducing energy use, and minimizing disturbance to the building site. Miller Dunwiddie was able to accomplish these goals and keep construction costs down by using a revolutionary building product: structural insulated panels.

PROJECT AT A GLANCE

LOCATION: **Minneapolis, MN**

ARCHITECT: **Miller Dunwiddie Architecture**

BUILDER: **Stahl Construction**

BUDGET: **\$5.3 million**

SIP MANUFACTURER: **Extreme Panel Technologies**

Reducing Environmental Impact

The design of the 19,000 sq. ft. visitor's center began with proper solar orientation for maximum daylighting. Sun shading was also a key component to limit the solar heat gain through the copious windows that provide stunning views of Silver Lake for the park's many visitors.

A large portion of building energy use is claimed by space heating and cooling, especially in the cold Minnesota climate. Miller Dunwiddie Project Manager Joel Stromgren knew that a well insulated building envelope would be crucial in reducing energy use. He specified structural insulated panels (SIPs) for the roof of the building. SIPs are a panelized building system composed of an insulating foam core laminated between two pieces of wood sheathing, typically oriented strand board.

"The client was very interested in energy efficiency and SIPs were part of a total energy-efficient design strategy," said Stromgren. "A geothermal system that heats and cools the building was coupled with a SIP envelope that is almost super insulated and very airtight."

After choosing SIPs for the roof, Stromgren saw them as a possible solution for the walls as well, where large viewing windows and the framing around them was compromising the insulating ability of the building envelope.

Prefabricated SIPs arrived on the jobsite ready to install, saving time and reducing labor costs.



“We were running into problems on the areas with the large windows,” said Stromgren. “With conventional framing, the walls would be almost entirely lumber with no insulation. By going with SIPs, we got better wind loading and also increased insulation.”

By using SIPs to reduce the heating and cooling loads for the building, Stromgren was able to take full advantage of an advanced 15-ton geothermal heat pump. Sixty wells were drilled into the ground and filled with pipes that circulate water that will harness the natural constant temperature of the earth.

To comply with Three Rivers Park District’s zero storm water runoff policy, a rain cistern was installed to harvest rainwater that is then used for irrigation. Careful construction practices were used to avoid disturbing the trees near the building site. The few white oaks that had to be removed for construction were milled and used for interior trim in the visitor’s center.

Labor Savings

Three Rivers Park District opted for a more traditional, lodge-style park structure with plenty of heavy timber framing, decorative rockwork and large windows for lake viewing. The one-story structure is punctuated by several octagonal bay windows and shed dormers for better daylighting. Although these features were integral in the aesthetic and passive solar strategy, they posed a constructability issue. Octagonal roof structures are very time-intensive to frame. This was added to an already complex roof with several roof planes, hips and dormers.



What made SIPs especially attractive to Stromgren for this project was that the SIPs would be fabricated offsite, reducing the framing labor cost. SIP manufacturer Extreme Panel Technologies, based in nearby Cottonwood, Minnesota, used CAD-integrated software and an automated cutting machine to fabricate the panels with exact tolerances. When the panels arrived on the jobsite, the once complicated octagon was reduced to a simple installation.

“Given the complexity of the roof, the SIPs definitely helped reduce construction time,” said Stromgren. “To hand frame the roof would have taken a very long time and involved a lot more labor and cost.”

Architecture firm Miller Dunwiddie used SIPs over the traditional timber frame to avoid thermal bridging along structural members in the numerous dormers and large windows.

A Natural Environment

When it opened to the public in August of 2009, the Silverwood Park Visitor's Center was established as a gateway to the natural beauty of the park. Visitors can create art through artist-led, naturalist educational programs, or peruse the professional nature-themed art gallery.

Surrounded by the hiking trails through the dense oak forest, the visitor center serves as an example of how the built environment can successfully interact with the natural environment through energy-efficient, sustainable design.



The building's octagonal bay windows and large roof spans are easily closed in using precision cut, prefabricated SIPs.



