

Kenilworth Bungalow



Classic design meets new technology in ultra-efficient LEED Platinum home

Featuring a traditional turn of the century design, the Kenilworth Bungalow demonstrates that aesthetics need not be sacrificed when building a green home. The stylish bungalow uses structural insulated panels and other energy-saving technologies to achieve a HERS Index of 49, making it 51 percent more efficient than an average code-built home. With such impressive energy savings, this 3,394 sq. ft. LEED Platinum home had no trouble claiming the Overall Competition Runner-Up and winner of the Single Family Home over 3,000 sq. ft. category in the 2010 SIPA Building Excellence Awards.

PROJECT AT A GLANCE

LOCATION: **Minneapolis, MN**

SQUARE FOOTAGE: **3,394**

ARCHITECT: **Domain Architecture & Design**

DISTRIBUTOR: **Panelworks Plus**

BUILDER: **Reuter Walton Construction**

SIP MANUFACTURER: **Extreme Panel Technologies**

Energy Savings

With a building site situated in Minneapolis' historic Kenwood neighborhood, the homeowners wanted a home that matched the Arts and Crafts style of neighboring residences. They enlisted Domain Architecture & Design to create a design that stayed true to the Craftsman style while reaching the highest level of the LEED for Homes green building rating system.

In Minnesota, where winter temperatures routinely dip below 0°F, reducing heating loads was one of the primary goals for the project team. Reaching a high level of energy efficiency was crucial not only to meet the requirements of LEED for Homes, but also to make the homeowners' investment in sustainable construction pay off with long-term utility savings.

Architect Joe Johnson of Domain Architecture & Design attacked the energy efficiency challenge by designing a building envelope that minimized air leakage and thermal bridging. Up to 40 percent of heat loss in a home is caused by air leakage through the building envelope.

A permeable driveway helped designers retain 100 percent of storm water onsite. Photo by Isabel Subtil.



“When you have a house with multiple dormers at multiple angles, it is critical to make sure sealing is done properly to get the airtightness that a LEED Platinum house demands,” said Johnson.

Johnson accomplished this by specifying structural insulated panels (SIPs) from local supplier Panelworks Plus for the walls and roof of the home. Prefabricated SIPs come in sections as large as 8-ft. by 24-ft., limiting the amount of locations that need to be sealed against air leakage. And with a solid core of rigid foam insulation and minimal wood framing, SIPs virtually eliminate thermal bridging.

“You can do quite a bit with spray polyurethane foam these days, but SIPs are a no brainer—you only have to worry about the seals,” said Johnson. “We did thermal imaging on this house, and you could see exactly where the wood was in the walls. It was an eye opener to the strength of SIPs and what they can do.”

Johnson paired the high performance SIP building envelope with an efficient HVAC system with a heat recovery ventilator. The duct design was centralized to minimize duct runs and each room uses a pneumatic damper to balance airflow.

An energy rating revealed how effective the home’s simple approach to energy saving can be: it received a HERS Index of 49—an impressive 51 percent more efficient than a home built to the 2006 International Energy Conservation Code. This will save the homeowners more than \$1,363 in utility costs annually, 84 percent of which is money that would have been spent on heating and cooling.

Domain Architecture & Design is tracking the home’s utility costs on their website to determine the long-term payback of energy-efficient construction.

“One of the goals of the project is to track energy savings so everyone can see how we think and how we discern things,” said Johnson. “When the long-term picture is shown, the case for this type of construction becomes extremely clear and it literally sells itself.”

Arts and Crafts details were maintained throughout the home, including the detached garage. Photo by Isabel Subtil.



Reaching LEED Platinum

Reaching the Platinum level of the LEED rating system takes a lot more than just energy efficiency. Environmental sustainability is a criterion for all stages of the design process, beginning with the site layout and drainage system. The home sits within 100 feet of a lake system, making storm water management a priority. Johnson and the design team were able to retain 100 percent of storm water onsite through the installation of four rain gardens and a permeable driveway that allows water to be naturally absorbed into the soil.

From sustainable site design the project team looked at material efficiency to minimize the amount of natural resources needed to construct the home. Concrete with fly-ash, a recycled product from coal power plants, was used for the foundation. Building with SIPs minimized the amount of onsite construction waste and earned points under the LEED rating system as material-efficient framing. The construction crew was also able to divert 67 percent of onsite construction waste from landfills.

“Everything is important with a LEED Platinum project,” said Johnson. “We even have an irrigation system with a rain sensor that will skip an irrigation cycle if it rains.”

Despite an amazing array of high tech systems, the finishes and detailing stay very close to a traditional Arts and Crafts design, with a floor plan adapted to modern living.

“This is an extremely technologically advanced home, but it looks like a period style house and blends very well with the historic neighborhood,” said Johnson.



All cabinetry and moldings were made with FSC Certified wood. Photos by Brandon Stengel.



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