

## Case Study: Sisters High Performance School

### 'Old West' town proud of new sustainable school

For a small Oregon town that's right out of the Old West with 1880 storefronts and a real rodeo, Sisters seems an unlikely place to find a state-of-the-art sustainable school building. But, the charming town of 1,000 located just east of the Cascade Mountains in Central Oregon has just that in its newly constructed high school.

The attractive 152,400 square-foot building was designed to be highly energy efficient - 25 percent more efficient than Oregon code requirements. This feature alone will produce considerable savings over its long-term operation. Other innovative features include reduced water usage, lower maintenance costs, and flexible use so students and the community can use the building for many years to come.



*Sisters new high school was built for the future and for the community.*



*The Sisters High School library has eight-foot windows that allow sufficient natural light so electric lights are seldom needed.*

"It is surprising to see a small community have such a building," said Sisters School District Facilities and Project Construction Manager Bob Martin. "But, this community supports its schools, and they are thrilled with the results."

#### **Community passes bond issue**

Martin, a former Portland-area builder, joined the district in 2000 shortly after residents passed a \$20.5 million bond. The bond was to build a new high school and renovate the old high school to house the middle school.



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The architect for the project, Scott Steele of Steele Associates of Bend, and the mechanical and electrical engineers with Interface Engineering of Salem wanted the district to know about the latest in building design - sustainable buildings that are energy and water efficient, use earth-friendly products, and are built for long-term use. Steele Associates, a member of the US Green Building Council, sponsored the first LEED® (Leadership in Energy and Environmental Design) training workshop in Central Oregon and have been active in encouraging sustainable building design in new projects in the area.

The Sisters School District staff and School Board needed no convincing that they wanted a building that reduced energy usage. And, they haven't been disappointed with the results.

### **Less energy usage**

The energy-efficient heating, ventilation, and air conditioning (HVAC) system, heat recovery ventilation system, and energy-efficient lights are already paying off. The new 152,400 square-foot building opened in September 2003 with 500 students. In its first year of use, the new high school used about the same amount of electricity as the smaller (93,600 square feet) middle school that houses just 320 students.

"On winter weekends when the HVAC system is on minimum settings, you can still be comfortable in the building," Martin said. "The 12-inch concrete block walls really retain the heat."

The district constructed a well, irrigation pond and sophisticated pumping system that is used to irrigate both the new school and adjacent middle school grounds. Before the construction, expensive city water was used for irrigation. In addition to using well water, the 60 acres of new school grounds are planted with drought-resistant, local variety plants and grass that require less water and requires less frequent mowing.

"The grass isn't extremely popular because it isn't lush and green," Martin said. "But, it is low maintenance and requires much less water so it provides quite a savings."

All plumbing fixtures are low-flow and have sensors to turn on and off. Martin is seeing the low-water usage reflected in the first year usage. The new high school uses only a bit more water than the middle school that houses 200 fewer students.

The school grounds include a bioswale feature where rain run-off from the parking lots, building and athletic fields gathers and is "filtered" by plant material before it is absorbed by the ground. This feature dramatically reduces the amount of run-off water and removes pollutants from the water.

"It works great and gets rid of a lot of water," Martin said. "We had plenty of snow last winter and it handled the melt off very well."

Other aspects distinguish the new high school from the norm. It was built for the future and for the community. The school was built to accommodate 700 students and currently has a population of 500 students 9th through 12th grade. The auditorium was specifically built to seat 742 people so community events can be



*The bioswale at Sisters High School goes unnoticed at the side of the athletic field, but serves an important purpose in filtering rain and snow run-off.*

held. A popular event is the Starry Night concert series held in November, December and February-March each year. Kenny Loggins, Amy Grant and other well-known popular entertainers come to town and put on several benefit concerts for the Sisters School Foundation. In 2004, the concert series raised \$100,000. The new auditorium allows community residents to make the most of the event.

Community residents are also invited once a month to the Outlaw Café for lunch. Students in the culinary arts classes, prepare and serve the meal. “It’s quite popular with 20 to 40 people attending every month,” Martin said. “It’s a great way to get members of the community, especially retired folks, into the school building. They enjoy it a lot and so do the kids.”

The school was designed to use natural lighting where possible. The library has eight-foot windows with 12-foot ceilings to bring in extra light. The interior science labs have no windows, but do have skylights. Skylights are also used in the interior “plazas.” Overhangs on the south side of the building are used to shade windows and reflective glass on the west side of the school reduce heat gain.

The classrooms use T-5, the latest fluorescent lamp technology. These small-diameter tube lights are bright and energy efficient. Each classroom has just two rows of lights that are on occupancy sensors so they turn off automatically if no one is in the room.

The entry to the school opens into a large multi-purpose commons area that is used for the cafeteria. The high ceilings are covered with “clouds” that house the lights and duct system. Between classrooms, there are four “plazas” where students can gather to do homework, work on a project, or use a computer.

All interior walls are low-maintenance concrete blocks. The rough-textured blocks discourage graffiti and student roughhousing according to Martin. The masonry was manufactured in nearby Redmond. Buying as many building products locally helped the local economy and reduced transportation emissions. The floors are concrete and covered with vinyl tiles for easy maintenance. The tiles were installed using an adhesive that contained no volatile organic compounds (VOCs) that can cause health concerns.

This state-of-the-art school is finding it fits in quite well in this “Old West” town. And, it will be there for many years to come.



*The hallway walls at Sisters High School are rough textured concrete blocks that discourage students from rough-housing and require less maintenance than a smooth surface.*

## **Sisters High School**

Architect:	Scott Steele, Steele Associates Architects
School Project Manager:	Bob Martin
Mechanical and Electrical Engineers:	Interface Engineering
Civil Engineering:	Hickman William & Associates
Education Consultants:	Lombard Conrad Architects
Structural Engineers:	Froelich Consulting Engineers CSA Acoustic Engineers

# High Performance Schools Program

The Oregon Department of Energy through its High Performance School Program provided Sisters School District with a \$15,000 grant to explore a design that would qualify for a U.S. Green Building Council's LEED® (Leadership in Energy and Environmental Design) Green Building Rating System. The Sisters School Board decided not to pursue the LEED certification, but incorporated many of the energy and resource-efficiency measures in their new high school.

The Department of Energy has expanded its High Performance School Program to offer school districts technical assistance, best practices research, design guidelines and financing. School district staff are often not familiar with design approaches that include eco-charrettes, energy modeling, commissioning or LEED standards.

The Oregon Department of Energy's High Performance School Program can help with both technical assistance and the expense of building a high performance school. The Department of Energy has a team of energy analysts who specialize in school energy efficiency. The Department also has special grants of up to \$50,000 per school currently available for new schools that commit to designing a high performance school. In addition, the Business Energy Tax Credit Pass-through Option can cover some of the additional costs.

All High Performance School Program participants use Oregon Department of Energy technical services including:

- Facilitation of information sharing and decision making among the school district construction managers, architects, engineers, and the community
- Technical expertise
- Review of all schematic design and construction documents
- Verification of energy modeling
- Knowledge of financial resources

Department of Energy staff can assist you and discuss your school district's situation. It is most important, however, that you call Greg Churchill at the Department of Energy at 1-800-221-8035 or (503) 373-7563 in Salem as soon as possible. The High Performance School Program offers technical assistance and financing that must begin prior to the design phase to ensure a high performance school. The program is available for a limited time, first come-first served.



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