

Students of new LEED-rated high school learning green is a sustainable ideal

Students get a new green building course and LEED silver school in which to learn it.

If you have lingering doubts that the green building movement is here to stay, this story may cause them to dwindle, if not disappear altogether.

From the light-reflecting roof overhead to the metered faucets and waterless urinals in indoor restrooms and heat-dissipating gravel parking lot outside, Whitmore Lake High School displays efficiency, conservation and sustainability everywhere you look (and in places you can't see).

These are a few of the features that have earned the school a lot of notice: from building professionals, the construction press, and from the U.S. Green Building Council, which awarded the school a LEED Silver certification. Even students of the school, located near Ann Arbor, Mich., like their new digs.

When the final bell has rung at the end of the school day some of them, rather than bolting out the doors, like to hang around with friends in the sunlit main hallway. "It's environmentally friendly and it's so cool," one senior said.

The main hallway's glass ceiling lets in enough sunlight to completely illuminate the space during the school day. It can be supplemented with electrical light in overcast conditions and after sunset. Windows with solar shades and translucent glass prevent glare and excessive heat. Occupancy and photovoltaic sensors automatically control classroom light. In carpets, floor tiles, wall coverings and

other materials many examples of recycled products and paints and adhesives that emit low levels of toxins may be found.

Building material sources closest to the project site were used, wherever possible, to minimize shipping distances and energy consumption. And when the construction was complete, more than 80% of construction waste was recycled.

Out of sight

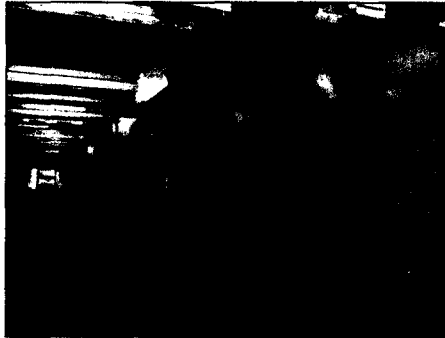
A key contributor to the school's Silver LEED rating is its closed-loop geothermal heating/cooling system. Much of it is unseen, buried underground during construction. The mechanical contractor, Boone & Darr, in Ann Arbor, installed the geothermal system's piping. An



The nearby retention pond serves several purposes, including a heat sink in summer for the underground geothermal system.

elaborate network of manifolds and high-density polyethylene pipe is joined to form the nearly 600-foot by 500-foot mat buried next to the school and an adjacent

manmade retention pond. With ample acreage surrounding the school, the less



Heat pumps take the place of conventional chillers and cooling towers inside the school's mechanical room.

costly horizontal style loop design was chosen.

Project manager Anna Marie Weller (LEED-AP) said about three miles of HDP pipe were used on the underground mat. The mains are 6-inch diameter with smaller pipe used on the branches. There are a couple of runs from the retention

pond to the school's mechanical room where the heat exchange takes place.

The geothermal system uses the ground's constant temperature as a heat source in winter and a heat sink in summer. The heat transferred to the building's water

loop in the winter, for example, gets distributed by a series of heat pumps. In summer the process reverses itself. The water loop transfers unwanted building heat back

to the outdoor glycol-based geothermal loop so it can be returned to the earth.

The four-acre retention pond has varied uses. Besides a component of the geothermal system, it also catches storm water runoff that can supply the school's fire sprinklers or furnish water to help keep the school grounds and sports fields green.

The heat pumps drive the 150,000-square-foot school's

indoor heating-cooling system. By eliminating boilers, cooling towers and other components of conventional central systems, the geothermal heat pump system is a more efficient, less costly performer. The geothermal system is also practical for buildings like the high school, which have similarly sized annual heating and cooling loads and varied climate control needs.

Jeff Darr said the Whitmore Lake High School job was the largest geothermal system that Boone & Darr has built yet. The contractor assigned a second project manager to handle all the LEED requirements connected with the job. The Whitmore Lake High School project was challenging while exciting, Weller, who is LEED accredited, admitted. "The whole LEED process is still very new," she said. And so was installation of the

geothermal system. It wasn't the state's first school to use geothermal heating and cooling, but it was the first school to receive a Silver certification in Michigan. Weller, a graduate of Eastern Michigan University's Construction Management Program, entered the project while it was underway joining fellow Boone & Darr PM Nick Newman.

Watching construction of their new school, which opened in 2007, was a learning experience for educators and students at Whitmore Lake. Weller explained that teachers documented a lot of the green building process, so they could teach their students about how the school was built and why. Today the school provides a lot more than merely a place to teach students about sustainable buildings. In every direction of the classroom the instructor can point to examples that illustrate what it's about.

Green building technology has even found a place in the high school's regular curriculum. "We wanted to move alternative energy education beyond the science classroom to make it available to all students, because it is such a critical topic today and to the future of our nation," said principal Tom DeKeyser in announcing a new "Green Tech" course recently established at the high school.

"We're going to show the kids that we really care about this community we live in," he said.