

## Honorable Mention: Peter Basso Associates, Inc.

### Whitmore Lake (MI) High School

Opened in Aug. 2006, the new Whitmore Lake High School in Whitmore Lake, MI, showcases the school district's strong commitment to sustainability — as well as the design firm's innovation and construction team's successful delivery of the project.

"District personnel and school board members had an intimate involvement with the design team, which provided a reassuring presence and kept the team's actions in line with their guiding vision," says Robert N. Roop, CPD, Vice President, Peter Basso Associates, Inc.

As part of the district's commitment to sustainable design, LEED certification was determined early on as a project requirement. Through a cooperative effort of all design and construction team members, the US Green Building Council announced in Aug. 2007 that the project attained LEED Silver status, surpassing the basic requirements of a certified building.

"An internal peer review process was utilized throughout the design process to minimize construction coordination issues, and a third-party commissioning process oversaw the installation and functional testing phases," notes Roop. In addition, a thorough value engineering process — involving all design team members, owner's representatives and trade contractors — helped bring the project in within the established construction budget.

The project cost just over \$30.5 million. Construction began in July 2004 and was completed in Aug. 2006. The architects for the project were Mitchell and Mouat, partnered with TMP Associates.

"At Peter Basso Associates, we work hard to find innovative yet practical solutions for our clients," says Roop. "It is an honor to be recognized for that effort with this Excellence in Design award, and a testament to the teamwork that made it possible."

Whitmore Lake High School attained Silver LEED status in Aug. 2007. (Photos by Peter Basso Associates, Inc.)



#### System Design

The building's heating and cooling needs are served completely by a geothermal water source heat pump system consisting of nearly 47 miles of piping, approximately one third of which is located in a pond. Roop says that each space in the building is provided with a measured quantity of out-



This view of the mechanical room shows the geothermal water source heat pump piping system.

side air, which is pretreated by dedicated energy recovery units to minimize the impact of the outside air load on the space-tempering equipment.

Every classroom has independent temperature control through a water source heat pump, which operates in conjunction with space temperature and CO<sub>2</sub> sensors to maintain a properly ventilated space within the design temperature range. According to Roop, calculations have shown an estimated annual energy savings of more than \$80,000 per year in operating costs when compared to conventional systems for this building.

District maintenance personnel also had input to the locations of mechanical system components. "For ease of maintainability nearly all equipment is located in indoor spaces. Care was taken in placing these mechanical spaces relative to the proximity of those spaces they serve in an effort to reduce delivery cost by reducing required fan energy and ductwork. Additionally, all ceiling spaces are return air plenums, which eliminated the need to insulate the ductwork, further reducing first cost."

Because the facility was constructed in a former farm field in a rural area, there was a need for on-site storm water retention and a water supply for the fire protection system. Roop says these two needs were combined and met through the creation of a pond, which let designers use the water as a portion of the heat sink/source for the geothermal field. In addition, an area was created along the pond shore for an outdoor education area for student use and observation.

Along with the district's commitment to a sustainable facility, they also wanted a state-of-the-art building to serve not only their educational needs but also the needs of a growing community. "A 600-seat auditorium was provided for the school and community, and a separately funded natatorium, provided by a community-approved recreation millage, also has been a great addition to the learning environment and the community," Roop concluded.