



## DELAWARE RIDGE ELEMENTARY CASE STUDY

### BPU sparks community growth with all-electric school that conserves energy and expenses.

In spring 2005, Bonner Springs School District 204 taxpayers passed a \$18.7 million bond issue to pay for school renovations and the construction of a new elementary school in Bonner Springs, Kan. Kansas City Board of Public Utilities (BPU) worked closely with school district representatives to help deliver the best energy solution possible. As a result of teamwork and preplanning, the new Delaware Ridge Elementary School has helped promote further economic development in the southwest portion of Wyandotte County and Kansas City, Kan. Simultaneously, it's achieved impressive results in energy conservation and operational savings for the school district.

### SITUATION

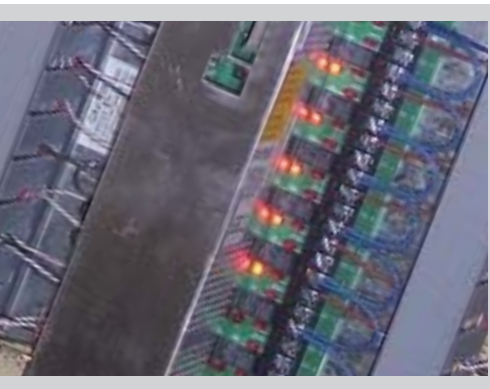
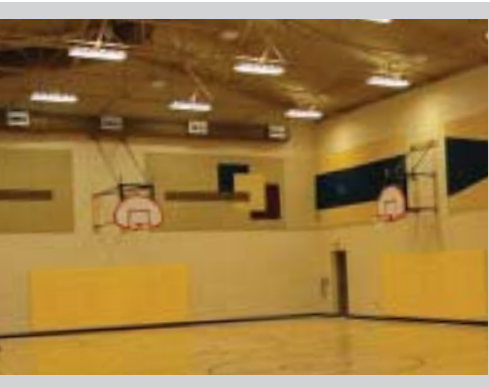
Bonner Springs' population and rooftops are growing. Thanks in part to its proximity to the Legends shopping center, Kansas Speedway and several other major attractions, many people have fallen in love with its unique mix of small-town charm and big-city entertainment.

Zarda's Development Group is helping the community grow. The local land development company recently built a subdivision featuring 1,100 new single- and multi-family homes. When the school bond issue passed, Zarda's Development Group donated 30+ acres of land in the development to the school district and recommended that the new school be all-electric. "We've had a very positive response from making the homes in the subdivision all-electric," notes Tim Zarda. "So it seemed like a good fit to make the school energy efficient as well."

With funding approved and a perfect location secured, the Bonner Springs school board quickly proceeded to the planning phase. BPU gave the board a demonstration of the long-term environmental and economic benefits of building an energy-efficient, all-electric ground-sourced heat pump school. The plans were approved and work started on the area's first new school to be built in 25 years.

### ACTION

Construction on the new school began in summer 2006. The plan called for state-of-the-art electrical systems to maximize efficiency. Although this requires a slightly bigger investment up-front, the school will more than make up for it over time with much lower monthly charges. A total of 58 ground-sourced heat pumps were



Delaware Ridge Elementary  
1601 North 130th  
Kansas City, KS 66109

installed at the site, forming the backbone of Delaware Ridge's HVAC system. With 66 water wells drawing water from a depth of 400 feet and a circulation capacity of 730 gallons per minute, the heat pumps can cool the air in the summer and warm it in the winter with exceptional efficiency. The heat pumps and chiller help maintain the school's specified humidity level within the conditioned space, reducing wear on the building's materials.

T8 lighting was implemented throughout the school. These high-efficiency bulbs use 50 percent less electricity than conventional T12 bulbs and last up to 20 times longer. Yet, they give off the same amount of light for a fraction of the energy cost. High-output T5 lighting was installed in the gym, and outside lights were placed on an automatic timer for increased efficiency.

A newly installed Electronic Management System (EMS) enables the school to track exact energy usage, avoid peak electrical charges and realize savings on operation and maintenance costs. Now, maintenance personnel can monitor and adjust zone-specific temperatures, manage electrical loads, control lighting and much more – all from a centralized computer display. They can even use the EMS to troubleshoot service calls by making electronic adjustments or by quickly determining exactly what requires maintenance on site.

Construction and installation of all these money-saving systems were completed on time for fall 2007 classes. The finished school provides a comfortable learning environment for up to 550 students and 50 staff.

## RESULTS

Thanks to preplanning, creative thinking and excellent teamwork, Bonner Springs has a beautiful new elementary school built with energy-efficient equipment that will more than pay for itself.

BPU and the school district anticipate this all-electric approach will provide an annual savings of 50 percent over conventional utility methods. Maintenance is much lower with a centralized energy management system. And BPU will present the school with a check for \$63,300 in ground-sourced heat pump incentives and rebates. BPU also absorbed \$16,175 in electric utility construction costs for a 1,600-amp, 480/277-volt secondary drop to power the school.

"This is truly a win-win situation," notes George Powell, Director of Economic Development & Retail Services with BPU. "The community gets the school it needs. The city and developers spur more growth. The building design conserves energy. And taxpayers save a lot of money in operational costs."

In 2008, Delaware Ridge Elementary School will be submitted for an Energy Efficiency award at the annual Build Green Conference hosted by BPU. The community has the opportunity to plan and build a middle school within the next few years on the remaining land donated by Zarda's Development Group. And a new mixed-use commercial development will soon break ground nearby.

"BPU has gone above and beyond in responding to our needs," says Bonner Springs Superintendent Dr. Robert VanMaren. "The conservation efforts, economic efficiencies and opportunities created by our partnership will continue to have a positive impact on our community for years to come."

