

CASE STUDY

Small Ohio School District Scores Big On Energy Savings

When the Bettsville Bobcats held their homecoming pep rally and dance in the school gym this winter, the high school's 60 students could have generated enough energy to steam up the windows. Fortunately, all that heat and moisture was put to good use. Revolving slowly in each of six new rooftop units, energy recovery wheels recover as much as 80 percent of the sensible (heat) and latent (moisture) energy from the exhaust air stream and transfer it to the supply air stream. Recovering heat and moisture from the exhaust air and using it to pre-treat the cold, dry outside air helps this school district, one of Ohio's smallest, save big on its ventilation and energy costs.

Located in a rural community in northwest Ohio, Bettsville's entire K-12 student body is 335 students. To comply with the state's stringent energy management requirements – which mandate energy recovery systems – school officials needed a new HVAC system specifically designed to efficiently condition ventilation air, a major portion of any energy bill. The all-in-one McQuay RoofPak™ applied rooftop systems that heat, cool and ventilate the



building give the Bobcats the fighting chance they needed.

State Grants Variance; Design Is A Winner

Bettsville's one-roof school was built in the 1950s, expanded in the 1970s and outgrown by 2000. Major expansion and renovation were necessary to save the school. "Fortunately, the state actively

supports districts with the least ability to raise money," said Randy Pawlowski, Bettsville schools superintendent. "In our case, the 85/15 split with the state meant we could put out a \$600,000 bond levy to raise our portion."

The project included renovating the existing 55,000-square-foot building for the elementary and middle school wings, and adding a 17,000-square-foot high school wing. The HVAC portion of the \$5 million budget was \$1 million-and that had to cover the required energy wheel design as well as a 100 percent economizer cycle to cool the building when outside air allows.

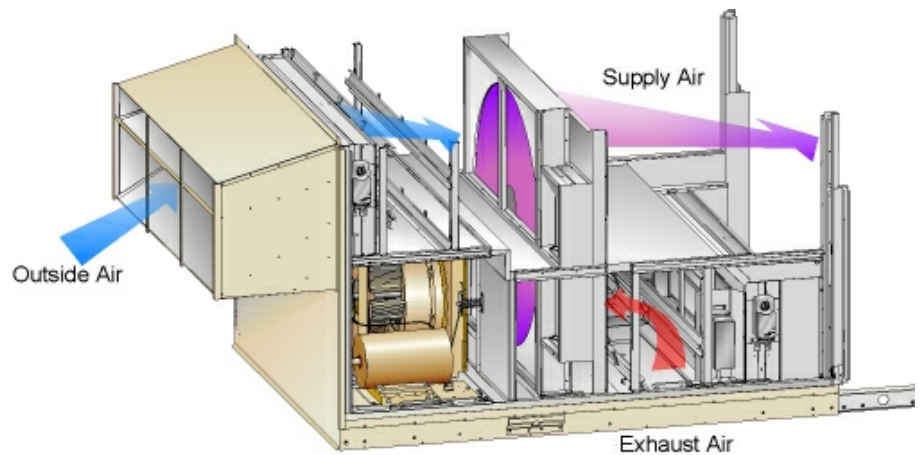


Based on Ohio guidelines, schools have four HVAC system choices to meet these requirements: 1) a central plant variable air volume system with hot water reheat terminals; 2) a central plant variable air volume system with fan-powered reheat terminals; 3) a central plant dual-duct constant air volume system with dual-duct constant volume terminals; 4) a water source heat pump system.

Rooftop systems are not one of the choices. “However, there was nowhere to put a mechanical room to house indoor air handling units and the required energy recovery wheels,” said Bud Bernsdorff, consulting engineer and owner, H.T. Bernsdorff Engineering, Toledo. “Our only solution was to install rooftop air handling units with energy wheels – and the state gave us a variance to do that.”

Factory-installed Wheel Reduces First Costs

Installed over the gym, cafeteria and classrooms, McQuay Roofpak units are assembled at the factory, then tested and shipped as a one-piece package. “This eliminates field design, on-site assembly and coordination, all of which lower first costs,” said Scott Warner, mechanical contractor, Warner Mechanical, Fremont OH. “Energy recovery



systems lower first costs even more because they reduce capacity requirements for mechanical refrigeration, heating and humidifying. This allows the system to be downsized, helps to offset the initial cost of the energy recovery wheel, and reduces the unit's electrical requirements for even more cost savings.”

To reduce system first costs, McQuay RoofPak units are custom-built from a factory platform to meet any building's size and space requirements. The complete package is customized for the specific project, and includes an energy efficient direct expansion cooling system couples with a wide range of filter, fan, coil and heating options to match building requirements.

The new air conditioning system replaced old shutoff, system-powered variable air volume (VAV) boxes. “System-power uses air in the duct stream to drive the controller rather than pneumatic or electric power,” said Bernsdorff. “These were removed and replaced with fan-powered VAV boxes, which allowed contractors to use original ductwork wherever possible in the existing building.”

Rebuilding Bettsville schools with an energy-efficient HVAC system has been a winner for students and staff. As for the homecoming dance-we'd like to say it was a victory dance, too. However, the basketball team is rebuilding this year after losing four starters from last year's squad. As Bettsville's experience shows, rebuilding can be a winning strategy.

