

Dighton Unified School District 482

CASE STUDY



Challenge

Challenged by roof leaks, windows with broken hardware, an inefficient steam boiler, aging ventilators and air handling units that were past their expected life, Dighton Unified School District (USD) 482 was experiencing equipment failures and the frequent need for emergency repairs. In alignment with its commitment to providing top quality facilities that are comfortable, inviting, safe and accessible, the district sought to upgrade its HVAC and pneumatic controls systems, as well as address staff requests to add cooling in locker rooms and the gym/cafeteria.

Solution

Conforming with Kansas State Statute KSA 75-37, 125, Trane completed an Investment Grade Audit for Dighton USD to determine the feasibility of using a performance contract to implement energy and operating cost saving measures. Trane conducted physical surveys of lighting, mechanical systems, domestic water use and the building envelope. The district provided utility bills and historical maintenance expenditures, and building operations data was collected from staff interviews and site observations. Using Performance Guarantee Contracting allowed the district to leverage future energy savings to proactively address facility needs, with a proven mechanism that ensures a guaranteed price, a positive environmental impact, local job creation, and improved learning conditions. Proposed upgrades were designed to reduce the district's annual energy use and address deferred maintenance issues. Trane worked with Dighton USD through a two-year bond campaign, using the energy savings data to encourage acceptance of the bond issue that would pay for the project over a twenty-year period.

Reducing electrical consumption, improving lighting

To brighten dim classrooms, the T12 fluorescent lamps in the elementary school were replaced with 25 watt T8 lamps and ballasts. The 400 watt metal halide lamps in the high school gym were upgraded with high efficiency fixtures to increase output and decrease energy use. Electrical improvements included the replacement of utility transformers, the upgrading of electrical service, the replacement of switchgear with circuit breaker based distribution boards, and the installation of transient voltage surge suppression to protect computers and other equipment from electrical surges.

Dighton Unified School District 482 Dighton, Kansas

PROJECT HIGHLIGHTS

Performance contracting upgrades result in projected savings in operations, maintenance and utility expenses of \$190,000 a year; enhance classroom learning environment.

Dighton USD 482 includes an elementary school and a Jr/Sr High School. The district has an enrollment of approximately 250 students and employs more than fifty teachers, support staff and administrators.

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Increasing efficiency and comfort

The existing steam boiler, piping, corridor heater, classroom unit ventilators, and air handling units were replaced with Trane® ProSpace™ variable refrigerant flow (VRF) system cassettes. The highly efficient ProSpace VRF systems allow simultaneous heating or cooling of any zone, so one room can be in heating mode and the next in cooling mode. With ProSpace, refrigerant is moved throughout the interior of the building using small-diameter pipes before passing through coils in each room being served. Fans move air past the heated or cooled coils, transferring either warmed or cooled air into the room. The variable-speed design precisely matches compressor speed to demand level, maximizing comfort and minimizing energy use. District schools benefit from the efficiency, individual control, and quiet operation offered by the ProSpace system. The heating-only rooftop units serving the gym were replaced with two new units, one with cooling. The energy efficient units use a variable speed fan that slows down on part-load days to reduce energy use. A roof-mounted Trane® Horizon™ dedicated outside air system (DOAS) works with the VRF system to condition fresh air, control humidity and filter out contaminants; provides ventilation to all occupied spaces; and helps to reduce system load.

Monitoring and controlling system operations

Trane® Tracer™ controls replaced pneumatic controls on the facility's original equipment and were factory mounted on the new equipment. Dighton Unified School District uses a Trane® Tracer™ SC building automation system (BAS), installed in each of its buildings, to access its HVAC systems from any web-connected device, such as a smartphone or tablet. Tracer™ ES, a systems integration solution, provides the district with an enterprise-wide view to monitor and control equipment and systems in all of its buildings. Using the controls system, facility managers perform daily operations, such as creating schedules, controlling temperatures, alarm management, troubleshooting, and data analysis.

Results

Performance contracting upgrades, designed to reduce Dighton Unified School District's annual energy use and address deferred maintenance issues, included the replacement of aging equipment with a more efficient Trane ProSpace VRF system, a Horizon dedicated outside air system and new rooftop units; as well as the addition of an integrated controls system. The project's overall savings in operations, maintenance and utility expenses are projected to be approximately \$190,000 annually. Quieter, more comfortable classrooms have also improved the learning environment for students and staff.



About Dighton Unified School District 482

A Trane Horizon dedicated outdoor air unit works with ProSpace VRF systems to increase efficiency and keep students comfortable.



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