



Students Thrive and Schools Save Thanks to Optimized Environmental Systems

Challenge

Hoke County is a small, mostly rural county in south-central North Carolina. One of the biggest things about Hoke County is that part of it is within the Fort Bragg military reservation. Fort Bragg is the largest military installation in the country, with more than 53,000 troops and 14,000 civilians working at the post, and a total population of roughly 260,000 when military families, contractors, and retirees are included.

Hoke County's population has been steadily growing in recent decades, due in large part to increased numbers of military families taking up residence in the county. Increased families translate to increased student enrollment in the Hoke County Schools system. The school system works diligently to provide ever-improving service to its students and families. Thus, in 2014, the administration realized that some aspects of their aging infrastructure needed to be

*Providing a
net gain of
\$2.6 million*



upgraded to ensure the continued success of their endeavors.

The environmental conditions within their schools was of immediate concern, particularly during hot weather. Students had recently had to endure a hot spell with no air conditioning because some of the chillers were unable to keep up with the demand for cool air. The teachers and administrators knew that an uncomfortable physical environment in the classroom can be an impediment to student focus, learning, and achievement, and environmental fluctuations were occurring all too frequently.

The school system leadership wanted to make the needed improvements but, as with many other districts across the country, funding was the biggest hurdle. Their solution came in the form of Performance Contracting, a funding approach in which the cost of improvements are paid for by guaranteed energy savings over a set performance period. Hoke County Schools realized that Performance Contracting was the best way for them to complete the work and ensure they stayed true to their guiding principles of efficiency, simplicity, sustainability, and reliability.

Solution

The school system solicited proposals from qualified firms and awarded the project to Brady. The project is a guaranteed energy savings project—one of Brady's areas of proven expertise. The guaranteed energy savings for the first 15 years of operation is \$8,120,932, which exceeds the project cost of \$6,214,333, and even enables the school to offset any interest charges they occur for

project financing.

The work kicked off in early 2015 and began with an energy audit at each of the 13 target buildings. Brady used the results of the energy audit to design the best system and select the most appropriate components for each of the buildings. Brady worked with the school administration and facilities manager to fine-tune the proposed upgrades to perfectly fit their needs and expectations.

The upgrades and energy-saving measures were installed in 2015–2016 and included:

- Installation of high-efficiency lighting
- Replacement and installation of pipe insulation
- Weatherization of building entries, windows, and other internal-external interfaces
- Installation of upgraded HVAC components and control systems
- Installation of standalone programmable thermostats
- Replacement of chillers
- Boiler tune-ups and replacement of boiler burners
- Fuel switching for improved efficiency and control
- Upgrading of plug load management systems
- Upgrading of water and wastewater systems and controls
- Replacement of electric water coolers with more energy-efficient coolers
- Installation of open-platform, web-based controls for building management systems

These changes are now providing state-of-the-art HVAC and mechanical systems,



building control systems, and energy savings to 952,680 square feet of building space in the Hoke County Schools system.

Results

The project's first operational year was from 2016 to 2017 and was a great success in multiple ways. The improved consistency of the indoor environment at the schools now provides students and teachers with a comfortable atmosphere in which learning excels. In addition to precise and reliable temperature control, noise levels from the HVAC equipment are greatly reduced, adding to the better classroom environment.

Students and teachers are enjoying the improved classroom lighting, which is another important component of an optimized learning environment. The upgraded lighting systems have also helped Hoke County meet one of their sustainability goals—to be one of the first counties in the nation to use all LED lighting in their public facilities!

From an administrative standpoint, the Year 1 energy savings was guaranteed to be \$544,236. At the conclusion of Year 1, the actual energy savings was verified to be \$550,974. Add to that the \$36,947 of savings in O&M time and costs, and total Year 1 savings was \$587,921—a full 8% higher than anticipated. Year 1 savings for specific resources included:

- Electricity: 4, 476,614 kWh
- Water: 1,048,844 kGallons
- Natural gas: 74,332 therms

Based on these actual Year 1 savings, the projected total savings for the 15-year

contract period is more than \$8.8 million. This will easily cover the project installation cost of \$6.2 million, providing Hoke County Schools with a net gain of \$2.6 million! Brady—helping students thrive and schools succeed!

