



## HVAC and controls upgrade creates optimal learning environment, reduces energy costs more than 30 percent; team shares mission to give back.

### Challenge

Wanting to give back to the community by providing a better education for the area's underprivileged students, education professional Richard Clark moved forward with plans for a new high school. Using donations, he leased a 1912 red brick school building, approximately five minutes from downtown Cleveland, that hadn't had an upgrade in many years. Clark sought an energy efficient, sustainable building that would offer a comfortable, safe environment for learning. With the historic building needing many upgrades and no financing available, Clark knew he would have to rely solely on donations to fund the improvements. "The neighborhood had seen better days," said Clark, founder, Saint Martin de Porres High School. "The building had no elevator or air conditioning, and used an 8 ft scroll cage fan for circulation."

### Solution

Clark met a Trane business development manager, who had grown up in the area and was troubled by the deterioration of his old neighborhood. The two discussed strategies for the new school, the immediate need for air-conditioning, long-term goals, and how Trane could help. After determining the feasibility of installing contemporary air-conditioning in a 1912 building, the school moved forward to raise money for the project. "People asked why it was important to have air conditioning," said Clark. "I asked, 'How do you learn when it is 95 degrees in the room?' Trane pointed out the importance of not only cooling, but also conditioning the air for the health of building occupants. They said our attendance would go up and our academic performance would improve. Everything they said would happen, happened."

### Expanding to accommodate growing student needs

As the student population began to grow, the 1912 building was not large enough to accommodate the school's needs. Working with the building's architect, engineering firm and general contractor, the Trane team developed a design for a second building that would create an optimal learning environment, while adhering to budget considerations. The group visited Trane's facility in LaCrosse, WI, to get an up-close view of Trane chillers, rooftop units and controls, and to meet the design engineers, product experts and factory personnel behind the equipment.

### Selecting equipment for high-performance and efficiency

Trane worked closely with engineering consultant, Karpinski Engineers, to select equipment and controls for the second building. The team considered three HVAC options: a ground source heat pump system, a water source heat pump system, and a hybrid system, which included a Trane IntelliPak rooftop, VAV unit with reheat coils and terminal boxes. A cost analysis deemed the high-performance hybrid to be the best solution based on efficiency, reduced energy costs and adherence to budget parameters. The school was familiar with the system, which would allow them to handle most of the required maintenance themselves. "It was a very complex project with the open architectural design and a lot of windows," said Ray Hoon, senior associate, Karpinski Engineers. "There were sound and placement concerns, and performance and energy efficiency were most important. We were also targeting LEED® Gold."



### SAINT MARTIN de PORRES CLEVELAND, OHIO

#### Project Highlights

##### Challenge

- Historic building with open design
- Comfortable learning environment
- Energy efficiency

##### Solution

- Trane® IntelliPak® rooftop, VAV unit
- Tracer® SC BAS
- Trane® Air-Fi® Wireless Communication

##### Results

- Aligned partnership
- Improved learning environment
- Enhanced comfort
- Energy costs reduced more than 30 percent

## Optimizing building operations and energy savings

With cloud ceilings and an open structure, ductwork, boxes and controls had to be located where they would not be seen, and could be easily accessed for service. A new controls system with wireless communications technology was installed in the school that would enable optimal building operations and energy savings, while also accommodating future expansion.

CO<sub>2</sub> sensors were installed to automatically adjust temperature based on room occupancy levels. Lighting controls with sunlight and occupancy sensors dim fixtures when less light is needed, and completely turn lights off if no one is in the room. In addition, Saint Martin de Porres High School facility managers use a Trane® Tracer® SC building automation system (BAS) to perform daily tasks, control temperatures, implement scheduling, manage alarms and troubleshoot issues, as well monitor systems to improve efficiency and energy savings. The web-based system enables convenient, remote access using a laptop, tablet or phone to keep the building comfortable for after-hours meetings, put systems on unoccupied mode during holiday breaks, adjust temperatures or check alarms.

With self-healing mesh technology and redundant signal paths, Trane® Air-Fi® provides worry-free communication between the BAS, unit controllers and sensors. The wireless technology eliminates the need for unsightly wires and conduits in the open structure of the school, preserving building aesthetics.

“In the old days, you turned the system on in the morning and off in the evening,” said Clark. “Now, you can control every room. You can schedule classrooms for the next nine months, or have the HVAC turn on at night for an event. It is phenomenal how it works.”

## Results

Sharing a mission to invest in education to improve the community and student opportunities for success, Saint Martin de Porres High School, Karpinski Engineers and Trane upgraded HVAC and controls in the school’s original facility, and second building addition. A phase two expansion, currently in planning, will allow all of the students to be housed under one roof.

“Now comfort is one thing our students don’t have to be concerned about,” said Marcus Prewitt, dean of students and life and management, Saint Martin de Porres High School. “They have an opportunity to learn, focus, grow, enhance their ability, and broaden their horizons. This school is Cleveland’s best kept secret.”

“The right amount of outside air and the right lighting is an important part of the design process. It all has an impact on students’ ability to learn and stay focused,” said Hoon. “I am also very proud of the energy efficiency of the building. Saving the school more than 30 percent in energy costs allows the dollars to be used for other things, like buying books or computers.”

“What does HVAC really do for the school? You have to come here to see that,” said Clark. “The community holds council meetings in the building, the district police use it, and at the end of the day, we have a hard time getting students to leave. From a student’s point of view, the whole set up says, ‘I am important. I am worth it’. Self-confidence is so important to learning and HVAC is part of it.”

“You can have great equipment, but you have to have the people,” added Clark. “In the end, it’s the people of Trane that made this project a success.”



## ABOUT SAINT MARTIN de PORRES HIGH SCHOOL

Saint Martin de Porres is a Catholic coeducational high school located in the St. Clair-Superior neighborhood of Cleveland, Ohio. Nearly 400 students, exclusively from families of limited economic means, attend the school which provides a comprehensive college preparatory curriculum and career readiness program, combined with a unique work study system. A pillar of the community, the school often hosts community events, and is considered a place of comfort and safety by parents.

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