



Commercial Case Study

Energy-Saving Geothermal System from ClimateMaster Helps Christina Seix Academy Achieve LEED® Certification While Conserving Funds for Educating Underprivileged Youth

The Christina Seix Academy in New Jersey took its commitment to the community to great heights when it chose to build its eight-building, 64-acre campus, from the ground up, with sustainable materials and practices designed to meet the U.S. Green Building Council's (USGBC) LEED® certification standards. The Academy – which serves underprivileged youth in the Trenton-Ewing area living with a single adult caregiver – was funded by Christina Seix, a successful businesswoman, who also grew up poor and was raised by a single mother.

“We were very interested in putting sustainable building practices in place in order to help the school run incredibly efficiently,” said Dr. Rob Connor, Christina Seix Academy head of school.

Working with Spiegle Architectural Group, the Academy

designed a unique campus which boasts numerous cutting-edge technologies that promote efficiencies and conservation, ultimately providing benefits for the school, its students and the environment alike now and into the future. Challenged with designing a campus to meet the consumption and functional needs of current pre-kindergarten and preschooler students and faculty, the firm was also required to account for future needs as the Academy added more grade levels and students, and incorporated on-campus student housing.

With all buildings designed to meet or exceed ASHRAE energy efficiency standards while achieving LEED certification requirements, the campus includes renewable energy elements such as active and passive solar building orientations and a photovoltaic solar panel array.

“The decision to pursue LEED certification is an





elaborate process that requires all involved to weigh the costs and benefits of putting these practices into place and commit to them long-term,” said Brian Eaves, project engineer with Spiezle Architectural Group. “Christina Seix Academy was very committed from the start, so we designed every building detail with comprehensive solutions that will help them save and conserve now and into the future.”

In addition, the Academy supported specification of a state-of-the-art mechanical system employing renewable geothermal technology. The system, featuring water-source and geothermal heat pumps from ClimateMaster, includes 68 Tranquility® 20 Single-Stage (TSH) Series horizontal and vertical units, 5 Tranquility Rooftop (TRE) Series units, and 2 vertical Tranquility 20 Single-Stage (TSV) Series units.

The system was designed by Haddon Heights, N.J.-based mechanical engineering and design consulting

firm Pennoni Associates Inc. After careful review of the environmental considerations on the project, the firm initially recommended a closed-loop geothermal system to provide conditioning in all of the buildings.



Tranquility® 20 Single-Stage Unit

“We looked at a number of HVAC systems and what we determined was that a closed-loop, vertical bore geothermal system would be most efficient,” said Bob Mellohusky, MEP division manager and project engineer at Pennoni Associates. “That would be the backbone of the HVAC for the commercial buildings, in addition to accounting for the future needs of the residential facilities.”

During the value engineer stage of the project, however, Mellohusky made the determination to change the design of the system based on the client’s needs.

“We discovered that we needed to make adjustments to the borehole field design,” explained Mellohusky. “Originally, there was a centralized system for commercial and residential buildings. After review, we decided to use the same principle and the same





Tranquility® 20 Single-Stage Unit

equipment, but go with a decentralized system to help with performance and reduce overall costs for the owner."

The final design included five individual geothermal borehole fields with a 196-ton total capacity, and a total of 106 boreholes drilled to 350 feet.

Ground broke on construction of the Academy in May of 2011, and initial installation of the mechanical system followed in the winter of 2011. Mechanical contractor West Jersey Air Conditioning & Heating Co. oversaw the installation of the system and all of its components, and felt it was a smooth process.

"For that volume of work, our interactions with ClimateMaster and their local representative Sass, Moore and Associates were very clean," said West Jersey Air Conditioning & Heating owner Keith Conroy. "We purchased a number of energy recovery units and makeup air units – a good amount of equipment and controls – and even with changes to the drawings, I was pleased that everyone had what they needed."

Completed in September 2012, the Academy has already observed the energy and cost-saving benefits of its geothermal heating and cooling system from ClimateMaster.

"The economic benefit was a huge motivating factor for us because it meant that we could direct more resources to our students, and in turn, serve more kids," said Connor. "We are pleased that this decision is already deriving the savings we expected."

The Academy is presently seeking to obtain LEED certification from the USGBC for seven of its buildings on the campus. Specifically, it is pursuing LEED Gold certification for a 28,000- square- foot academic building, 13,900- square-foot field house/ gymnasium and 10,440- square- foot community resource welcome center, plus an additional 7,180- square feet of commercial space, with the intent of securing certification by February 2014. The buildings dedicated to housing, including the 10,660- square- foot faculty residences, the 2,860- square- foot head master residence and the 10,970- square- foot student dormitories will be pursuing LEED for Homes classification, also expected to be secured by February 2014.



Tranquility Rooftop Series Units

While the school is reaping the economic and environmental benefits of its decision to build green, it also purported to advance the social impacts of its sustainable practices.

"The mission of the Christina Seix Academy is to teach underprivileged children to pay it forward like Christina Seix herself has done," said Connor. "That means the students should understand these sustainable practices on a fundamental level. The hope is that they will go back to their communities to help them build and develop in efficient ways. It's a natural fit to educate them on the importance of these issues – it also empowers them in amazing ways."



Christina Seix Academy
Trenton, NJ

Architect:
Spiezle Architectural Group

Mechanical Engineer:
Pennoni Associates Inc.

Mechanical Contractor:
West Jersey Air Conditioning & Heating Co.

Manufacturer's Representative:
Sass, Moore & Associates

ClimateMaster Equipment:
68 Tranquility® 20 Single-Stage (TSH) Series horizontal and vertical units; 5 Tranquility Rooftop (TRE) Series units; 2 vertical Tranquility 20 Single-Stage (TSV) Series units

Project Website:
www.christinaseixacademy.org



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