

SOUTH CAROLINA DOT HEADQUARTERS COLUMBIA, SOUTH CAROLINA

KEY PARAMETERS

- Type of Facility – Existing Building
- Function – Government / Office Bldgs
- Area – 6-Story 242,795 sq. ft.
- Project Completed – 2019

Challenges: Energy savings and occupant comfort. The building's forty-two-year-old remote central steam and chilled water plant were causing comfort issues and energy costs to increase. "We wanted to come off the central plant, address issues on our own, and decrease our energy cost," said Roger Sears, PE, SCDOT Headquarters.

Because the building was at full occupancy, it would be necessary to avoid disrupting normal business operations.

Solution: A comprehensive Guaranteed Energy Savings Performance Contracting solution allowed SCDOT to pay for improvements with energy savings generated by the project and eliminate the need for an upfront capital outlay. The solution included equipment and controls technology upgrades, water conservation measures, and implementation of energy conservation measures that included interior and exterior lighting, and air filtration.

A water-cooled chiller plant was constructed adjacent to the ground level parking deck and a new high-efficiency condensing boiler plant was



built in the building's machine room. The system provided on-demand redundancy with two identical natural gas boilers. "They only heat when needed and are much more energy efficient," said Sears.

For the air-handling system, the team added new hot water coils and VFDs; established four variable air volume (VAV) perimeter zones per floor; and implemented direct digital controls (DDC) on the primary and perimeter air-handling units and 330 VAV boxes. A fifteen-fan array with VFDs replaced outdated vane axial fans. Dynamic V8 Air Cleaning Systems were selected based on energy efficiency and redundancy and were installed in the HVAC system to replace inefficient, high-energy use bag filters.

Results: The upgrades improved comfort and air distribution and enabled SCDOT to disable connections to expensive centralized utilities. The building is realizing a 19 percent reduction in kWh and an 85 percent reduction in therms. Guaranteed Energy Savings for the project is more than \$250,000, with an operational cost savings guarantee of more than \$80,000.

TEAM

- Owner – South Carolina Department of Transportation
- Architects – Watson Tate Savory Inc.
- Engineers – MECA, Inc.
- Performance Contracting – Trane Technologies

MECHANICAL SYSTEMS

- Trane CenTraVac® centrifugal chiller
- Trane Tracer® SC platform with Tracer Ensemble™ Cloud
- Trane VariTrane™ VAV units

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