



SHOWCASE PROJECT: LOS ANGELES UNIFIED SCHOOL DISTRICT (LAUSD): SANTEE EDUCATION COMPLEX

SOLUTION OVERVIEW

Santee Education Complex opened in July 2005 as the first new 4-year high school for the Los Angeles Unified School District (LAUSD) in over 35 years. The 338,000-square-foot educational complex serves over 1,940 students and 145 staff. In 2011 the facility was selected to undergo a comprehensive audit after it was identified as the second highest energy consuming facility in the district with an energy use intensity (EUI) of 163. As a result of recommissioning building systems and installing energy conservation measures, the facility achieved an energy savings of 29% and cost avoidance of \$226,000.

Santee Education Complex is a high school facility located in the Central Los Angeles area. The complex includes classrooms, a library, a gymnasium, offices, and an auditorium building. The campus also has an extensive central open area with athletic fields and a competition-size pool.

LAUSD is the second-largest school district in the United States, with over 1,200 K-12 schools and centers within 720 square miles, serving approximately 640,000 students.

SECTOR TYPE

Education

LOCATION

Los Angeles, California

PROJECT SIZE

338,000 Square Feet

FINANCIAL OVERVIEW

\$2.56 million

SOLUTIONS

In 2011, LAUSD selected Santee to undergo an extensive energy audit to address the high energy consumption at the facility. Between 2012 and 2014, energy managers discovered that the school was manually running many of the building mechanical systems, including the air conditioning system and pool heating system, and 25% of the facility was not fully operational. In light of the district's portfolio-wide goal to achieve a 20% energy reduction by 2024, targeted savings measures were implemented from 2014-2018 through the Proposition 39 Program. [Proposition 39](#) is a state

program providing funding to local educational agencies for improving energy efficiency and creating clean energy jobs. The efficiency measures include interior and exterior lighting upgrades, occupancy sensor installation, replacement of the energy management system, retro-commissioning of building set points and operating schedule for the domestic hot water pump, conversion of domestic water heaters to tankless water heaters, efficiency upgrades to the hydronic boilers, and variable frequency drive (VFD) installation on the chiller and boiler water pumps. In 2019, LAUSD anticipates an EUI of 115 kBtu/sq. ft., which equals a 29% source EUI reduction.

The following are the energy reduction solutions that will contribute to the school’s targeted EUI reductions:

Savings Measure	Cost	Notes
Lighting upgrades and occupancy sensor installation	\$1,074,500	Replace 32w T8 lamp systems with 15W LED lamps and rapid-start electronic ballasts. Install occupancy sensors where applicable.
Exterior lighting upgrades	\$138,000	Replace existing exterior light fixtures with new fluorescent and LED technologies and upgrade exterior lighting control panels.
Energy management system upgrade	\$462,600	Upgrade existing front-end energy management system and HVAC control modules throughout.
Hot water boiler upgrade	\$445,600	Install new efficient condensing hydronic hot water boilers.
Chiller VFD installation	\$129,700	Install VFDs for the chiller water pumps at Building C.
Boiler VFD installation	\$107,350	Install VFDs for the condensing hydronic hot water boiler pumps at Building C.
Domestic hot water heater upgrade	\$200,700	Install new efficient tankless domestic hot water heaters.
Domestic hot water pump set points and schedule	\$4,100	Retro-commission set points and operating schedule for domestic hot water pump.

OTHER BENEFITS

Santee Education Complex is a High Performance-designed facility, incorporating sustainable and energy-efficient design and construction standards (site, water, energy, materials, indoor environmental quality, and operations), apart from the Proposition 39 initiatives and other energy

efficient programs that are currently in place. The additional benefits resulting from these measures are:

Productivity Improvements

The integration of high-performance features into Santee Education Complex, such as lighting upgrades and thermal comfort improvement, make this an ideal place for learning and interaction among students, teachers, and campus staff. Given that 25% of the Santee facility was not fully operational at the start of the project, the district anticipates positive effects on the health and quality of the learning environment due to improved comfort and indoor air quality, which is expected to lead to decreased absenteeism and increased productivity.

Maintenance Savings

The long-term benefits also include cost savings from reduced maintenance as a result of the upgrades to the lighting, HVAC, domestic hot water pumps, and energy management systems.

Annual Energy Use

(Source EUI)

Baseline(2014)



Actual(2019)



Energy Savings

29%

Annual Energy Cost

Baseline(2014)



Actual(2019)



Cost Savings

\$226,000



Santee Education Complex