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Concordia University, Nebraska

Case Study

A Siemens-guaranteed Performance Contract finances facility improvements at Concordia – and far exceeds the projected initial savings!

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Long-lasting operational and energy savings. Guaranteed.

Concordia University, Nebraska's main campus is located in Seward, about 25 miles west of Lincoln. The university is a private institution founded in 1894 by the Lutheran Church — Missouri Synod. The 120-acre campus is home to more than 2,300 undergraduate students from more than 40 states and several countries.

For 13 consecutive years, Concordia has been ranked a top-50 school in the "Best Regional Universities – Midwest" category of *U.S. News & World Report's* Best Colleges rankings. In addition, the school is the only institution in the state to receive the Christian College of Distinction award and is recognized by *MONEY Magazine* as the 23rd most affordable private college in the country.

Client Objectives

Universities around the country are grappling with budget constraints, aging infrastructures, and finding funding for deferred maintenance projects. These institutions also understand the value of a healthy built environment for attracting, retaining, and teaching students. They are eager to find creative solutions that will help reduce energy and operating costs and leave capital budgets intact.

At Concordia, outdated and energy-consuming lighting systems, failing chillers, noisy and inefficient boilers, and old HVAC units were at the top of an increasingly menacing list of infrastructure upgrade needs.

In 2012, Rick Ihde was promoted to Concordia's Director of Buildings and Grounds and immediately began to tackle the university's deferred maintenance backlog. He assessed the life expectancy of mechanical equipment and systems, studied utility consumption and costs, and researched new technologies for energy-saving opportunities. A long-standing relationship between Concordia's Buildings and Grounds team and Siemens Building Technologies afforded Rick the opportunity to discuss areas for improvement with his Siemens Account Manager.

At Rick's request, Siemens Project Engineer John Hay performed a complimentary preliminary analysis that included benchmarking utility consumption data in comparison to similar universities, proposing budget ranges for the necessary fixes, and developing a prioritized project list. Some of the areas of need identified were:

- Structural items
- Safety concerns (ie. better lighting campus-wide)
- Additional deferred maintenance items



The Siemens Energy Savings Performance Contract will deliver \$2.419M in energy savings over a 15-year term.

- No-cost and low-cost items that the University could self implement (ie. cleaning coils and changing motors, fan shafts, and bearings)
- Long-range capital projects for the University to incorporate into 5, 7, and 10-year planning processes

Rick, John, and their respective teams discussed the benefits of a Siemens-guaranteed Performance Contract. This type of agreement weighs the cost of each upgrade or repair according to the expected savings generated from reduced utility costs and maintenance expenses.

With a performance contract, an energy services company (ESCO) identifies the energy saving facility improvement measures (FIMs) that will increase energy efficiency and



Siemens and the University's technicians worked together to integrate and install the best new technology and equipment.

reduce operational expenses. When those savings are translated from energy units (kWh, etc.) into dollars, they meet or exceed the cost of the project; in effect, the project pays for itself over time. Because the ESCO guarantees the results for the length of the contract (typically 10 to 25 years) the focus is on life-cycle costs, not just first costs.

Concordia's Executive Vice President Chief Financial Officer/ Chief Operating Officer David Kumm was initially skeptical of performance contracts. For him, "the proof was in the payback." Dave's reservations disappeared early in the process, however, when savings from water and electrical upgrades were quickly realized and reinvested into other projects.

Siemens Solutions

In September 2013, shortly after approval of the performance contract by the Board of Regents, Rick and the Siemens team initiated an investment-grade audit (IGA) with an independent engineering firm. Over 100 line items were uncovered and rated by their risk potential. Concordia used the audit to develop a short- and long-term road map of facility improvements.

As the lead contractor, Siemens began to coordinate and manage the facility improvements and equipment upgrades. Bi-weekly status meetings between John and Rick ensured lines of communication remained open for all stakeholders. This included the administration, professors, staff, student leadership, and all of the various sub-contractors. "Any project on a university campus poses challenges; there's a small window to get things done. By staying proactive with our communications, everyone remained aware of our schedule for upgrades. This helped ease the disruption," explained Rick.

Communication was critical in order to minimize disruptions and inconveniences when lighting was being retrofitted and upgraded in hallways, dorms, and classrooms. Old fluorescent systems were swapped out for environmentally friendly CFLs and exterior light fixtures were converted to LED. Siemens worked closely with the university and the Nebraska Public Power District to ensure the project met rebate qualifications. A significant rebate from the power company helped further stretch the facility improvement budget.

A new, state-of-the-art variable refrigerant flow HVAC system was installed in the Ruth A dormitory. "This was an exciting aspect of the project for us," said Rick. "Because of the strong partnership with Siemens, technicians from both teams worked together to identify not only the best new technology, but also a system the internal crew would feel comfortable maintaining."

The indoor environment at the student center, Janzow Hall, was made more energy efficient with a new chiller, cooling tower, compressor system, and building automation system (BAS) upgrade. This hub of campus life is now a comfortable gathering place.

A failing chiller was also replaced at Link Library, home to over 230,000 volumes and a museum. Scheduled during the summertime, work on this project was completed quickly and with minimal downtime to protect the invaluable assets inside from humidity. A loud, outdated condensing unit on the side of the building was removed and replaced with a new (and much quieter!) rooftop unit. Now an environment that is much more conducive to studying can be appreciated by staff and students alike.

CONTRACT HIGHLIGHTS

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| Contract Amount | \$1.689 million |
| Guaranteed Energy Savings Over 15 Years (Energy and Operational Expenses) | \$2.419 million |
| Guaranteed Energy/Water Unit Savings for Year 1 <ul style="list-style-type: none"> • Electric Energy • Water | 1.465 million kWh 2.987 million gallons |
| Guaranteed Energy Savings During Implementation Phase | \$15,475 |
| ACTUAL ENERGY SAVINGS ACHIEVED DURING IMPLEMENTATION PHASE | \$106,645 |
| REBATE FROM NEBRASKA PUBLIC POWER DISTRICT | \$38,746.30 |
| SAVINGS ABOVE GUARANTEE DURING IMPLEMENTATION | \$90,170 |

To better appreciate the performing talent at the Music Center, centrifugal fans were replaced with more discreet and efficient radial models.

The Siemens APOGEE® Building Automation System was installed and expanded to communicate with older digital direct controls. The system was also integrated with a legacy energy management system, enabling the implementation of sophisticated scheduling sequences and setback controls. Tighter control of HVAC and lighting systems has significantly reduced the amount of energy consumed.

With one front-end Siemens Insight® Workstation now in place, data collected from all of the various building systems is compiled, analyzed, and acted upon from one single point of control. The facilities maintenance team can monitor conditions across campus and make adjustments from the workstation to save time and boost productivity.

To conserve water, all bathroom fixtures were updated to lower gpm showerheads, flush valves, and aerators. These improvements are slated to reduce the amount of water the campus consumes by almost 3,000,000 gallons per year, in addition to producing significant cost savings.

Client Results

Installation was completed in February 2015. To date, energy savings have far surpassed the guarantee, with all of the excess savings going directly to Concordia.

With the facility improvements now complete, both Rick and Dave have noticed a significant increase in productivity. “We don’t have a big internal team, yet our technicians cover a lot of square footage. The new chillers and plumbing valves require very little maintenance. And the upgraded fixtures and LED technology means a technician is no longer changing bulbs five days a week,” stated Rick. “The team is now able to focus on allocated maintenance projects rather than putting out fires,” added Dave.

“The performance contract allowed us to move forward and address a lot of deferred maintenance items... things that aren’t glamorous but are certainly necessary for a 100-year-old institution to repair,” said Dave.

As the selected ESCO on this project, the Siemens team worked with Rick to formulate, design, and implement a customized solution for the university that would help them achieve their business and sustainability goals: reducing operating and energy expenses, addressing the backlog of deferred maintenance items, increasing productivity, creating a more comfortable indoor environment, and improving their campus infrastructure. The partnership, shared vision, and guarantee made it possible to install state-of-the-art, energy-efficient equipment and systems that will generate long-lasting savings and support Concordia’s long-standing tradition of excellence.

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