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Schaumburg School District 54

Siemens improves an Illinois district's facilities by implementing a multi-phase, comprehensive building infrastructure solution.

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School District 54 in Schaumburg, IL, educates more than 14,000 students each year. Unlike many districts that have a substantial amount of deferred maintenance, School District 54 has stayed on top of facilities management. A tough challenge for a district of its size with over 30 buildings, most of which were built in the 60s and 70s.

A vigilant approach with its staff, Siemens, and other business partners has prevented building systems and equipment from failing unexpectedly. The school district is committed to continuing on a proactive path of building maintenance and does not want to fall behind on upkeep, equipment upgrades and system replacement.

Keeping buildings in good condition, streamlining building operations and saving energy not only provides big benefits to the district, but it also makes interior spaces more conducive to learning. Classrooms are better lit and mechanical systems are properly conditioned for optimum comfort. By improving facilities, the district is also increasing teachable moments.

Contributing to its success over the years has been the implementation of a series of performance contracts dating back to 2000 and a tremendous partnership between both entities. Using a strategic, multi-phase approach allowed District 54 to proactively retrofit equipment and systems that were at or approaching useful life expectancy.

The Motivation Behind Performance Contracting

The Illinois School Code (article 19b, *School Energy Conservation and Saving Measures*) enabled the district to enter into a performance contract wherein the savings are guaranteed to the extent necessary to pay the costs of the energy conservation measures. While this financial model was attractive to the district, performance contracting offered many other benefits as well.

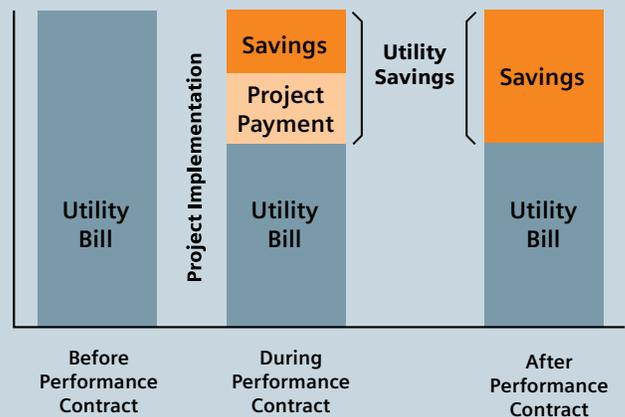
To begin with, it would enable administrators and building maintenance teams to get a level of consistency that traditional bid-spec would have been difficult to achieve. The district is very conscious about making sure its school buildings are similar in nature and can be operated with a high level of continuity. This allows its maintenance staff a very streamlined approach to maintaining the hundreds of pieces of equipment as well as a more simplified and consistent method of training from one school to the next. As stewards of the community and taxpayers, the district was very conscious of greatest overall value and recognized the importance of life cycle costs versus lowest bid. Working with one energy service company (ESCO) meant that the district would have a single point of contact for its building improvements. "You're eliminating all the finger-pointing," says Ken Detina, Siemens Sr. Account Executive. "If something goes wrong, they call one company, one team – Siemens," he adds.

Performance Contracting Defined

Performance contracting is a means of financing a multi-faceted capital improvement project. An Energy Services Company (ESCO) identifies Facility Improvement Measures (FIMs) that will reduce water, sewage, electricity, steam, natural gas consumption and guarantees the predicted savings. The ESCO provides single-source accountability, acting as project manager, executing the work and/or hiring local contractors.

The contractee gets a loan to pay for the improvements. The cost of the project is divided by the guaranteed annual savings to determine the length of the contract. Project payment is based on the guaranteed annual savings. Once the project is implemented, the savings resulting from increased efficiencies are used to make loan payments to the capital leasing company. If the actual savings are in excess of the guaranteed savings, the contractee keeps the amount above the guarantee. If they are lower, the ESCO must pay the contractee the difference. Beyond the term of the contract, the contractee receives the entire energy savings.

How Performance Contracting Works



Lastly, a performance contract is a means to bundle many projects in the master plan and complete them all in a shorter timeframe, and therefore, reap the benefits sooner without prolonging the risk of unexpected system failures and potential price increases. “We don’t want to replace things before their useful life has expired. But we also don’t want to wait too long to where things are failing on us, and then we have disruptions at the buildings,” says Ric King, Assistant Superintendent of Business Services.

Due Diligence

When it came to the district’s procurement process, school administrators followed the school code and its requirements to the letter. “We go above and beyond what we probably need to, just to make sure that we are doing things right,” says King.

School District 54 issued a request for proposal and, when multiple proposals came in, the district looked to a third-party for objectivity and assistance in evaluating all proposals.

“We had an independent energy consultant help us with the project evaluations based on several criteria,” explains Darlene Russo, Purchasing Coordinator, Schaumburg School District 54. That included:

- Experience and qualifications
- Proposal presentation
- Technical approach
- Financial consideration and economic impact
- Ability to implement the project
- Ability to provide maintenance, training and ongoing support

The first time the district considered Performance Contracting, they had no pre-existing relationship with Siemens. They received multiple proposals then narrowed the field down to three, one which was Siemens. The shortlisted companies were invited for interviews, and the Buffalo Grove, Illinois-based company was selected based on its overall approach to successfully meeting the criteria above. Part of the evaluation was the district’s ability to look beyond this particular phase of work and seek out a business partner who they could rely on for future work and consultative advice.

School District 54 has an extensive staff of maintenance personnel that was very in tune with what they wanted to accomplish over a ten-year period. This helped the team at Siemens co-author a short- and long-term business plan with District 54 that would accomplish its immediate goals and help establish this high level of consistency they wanted to achieve.

Siemens engineered, designed, implemented and guaranteed the savings of all work and validated that the projects were financially advantageous. “We already knew the savings were going to be there,” says King.

The Contract

The performance contract for the first phase of work was valued at \$1.5 million and signed in 2001. The subsequent five phases brought the total contract value to \$28.3 million and met the school district’s objective of proactively maintaining all of its buildings, with improvements being implemented over a span of 13 years. While many districts use bonds or other, similar financing to fund major infrastructure improvements, Schaumburg School District 54 had the available money, and wanted to use the energy and operational savings from the performance contract to support its Operations & Maintenance Fund, allowing them to consistently reinvest in facilities.

In addition to the traditional energy projects typically seen in performance contracts, the district also chose to use Siemens for its needed life safety projects. The fire and safety-related improvements included in the contract’s most recent phase, consisted of replacing outdated zone fire systems with addressable systems and implementing additional security-related projects.

During the course of the six phases the district issued three RFPs, and on each occasion Siemens was awarded the work. “They have never handed us any business,” notes Detina. “We earn every ounce of work we contract for, given our history and performance in the district. Our team of engineers and PM’s understand the district’s buildings very well and know how best to design and execute the scope of work. The working relationship between the two companies grew based on mutual respect, trust, timely execution and full price transparency.

As subcontractors’ bids came in, Siemens and the district opened sealed envelopes together so they could be assured the process was competitive. Siemens and the district also created a rubric to evaluate and make decisions that put together the best project and greatest overall value. Price was certainly a strong component but not the only one that was considered.

The equipment was always bid out as well. “We’d bid out for the equipment and then Siemens and the independent contractor helped us evaluate and choose it,” says Russo. Decisions considered more than price; compatibility with existing systems and equipment was another important factor.

Project Phases

While the work performed by Siemens throughout the six phases of the performance contract is vast, all phases contain projects that address equipment replacement – replacing, repairing, or upgrading equipment near the end of its useful life.

Phase I: Program Service Center

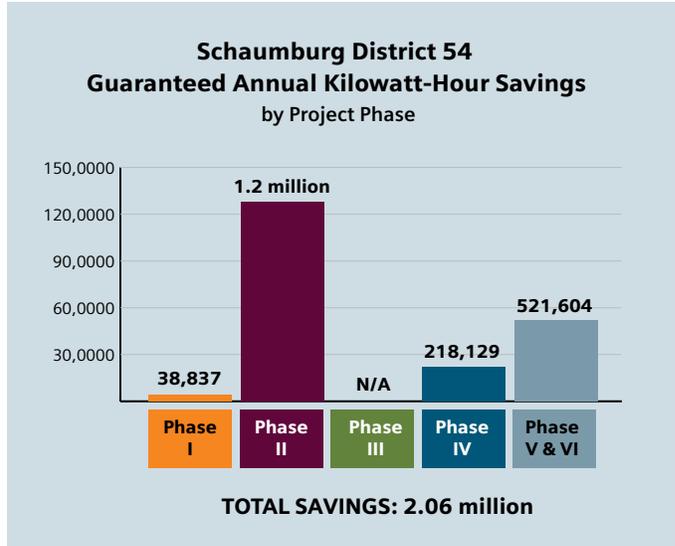
Siemens performed a lighting upgrade and various HVAC improvements (boiler replacement, unit ventilator replacement, VAV replacement, and A/C added to a portion of the building that didn’t have it before) at the Rauch Center, a facility used as a training and Science center. Siemens’ solution for addressing the 25,100 square-foot facility’s needs was technically creative, and saved half of the cost originally projected by the district.

Phase II: Lighting Retrofit Program

The district-wide lighting retrofit program, impacting approximately 1.7 million square feet, included upgrades to more efficient T-8 fixtures. Gymnasiums with 250 and 400 watt high pressure sodium fixtures have been replaced with new 250 watt pulse start metal halide fixtures. Incandescent lamps were replaced with compact fluorescent screw-in lamps resulting in a 70-percent reduction in power consumption. The comprehensive retrofit program is projected to save the district \$53,266 annually.

Phase III: Computer Room Power Upgrade

The Phase III improvements greatly enhanced the functionality and reliability of the district’s computer room. A new 150 kW natural gas generator was installed along with two, 5-ton computer room air-conditioning systems and a new emergency power system. The four-month project was finished in September 2006.



Phase IV: Extension of Lighting Upgrade and Power Improvements

In the fourth phase of the contract, additional lighting retrofits took place. Work was scheduled during evenings and weekends to avoid disrupting students and teachers. Power feeds were also installed in 27 schools and 75 classrooms, while six schools received new single-circuit power feeds to new classroom projectors.

Phase V and VI: District-wide Boiler, Chiller, Fire and Security Replacements

The most complex of all the phases to commenced in 2010. Here, inefficient boilers were replaced with high-efficiency central plant gas boilers (either 1,000 MBH or 500 MBH) or domestic hot water boilers. Office air-handling condensing unit upgrades occurred in eight school buildings, cooling tower upgrades were made in nine buildings, and eight schools’ standard efficiency motors were replaced with new high efficiency motors and belts.

The need for a fire alarm system upgrade in the district’s buildings was dire. “We had different systems throughout the district,” says Mike Mostacci. “Now we’re able to have one fire alarm panel that’s proprietary to each building. False alarms are way down.”

Ten schools received extensive fire alarm system improvements, including:

- Strobe devices in public areas
- The replacement of old zoned fire alarm panels with new analog addressable fire detection systems
- Addressable smoke and/or heat detection and visual devices in classrooms

These improvements were implemented in accordance with the local fire department and State of Illinois requirements, as well as in compliance with ADA guidelines.

Along with the fire alarm system upgrade, the security alarm system received similar attention. The same 10 schools receiving the fire alarm system upgrade also received a security alarm system upgrade. Improvements included:

- New multi-technology motion detectors to replace existing motion detectors
- Burglar alarm panels replaced with new Digital Alarm Communicator Transmitters
- Surface-mounted door contacts swapped out for new single-pole single-throw versions

Installation was performed in accordance with the National Electrical Code (NEC) and applicable local electrical codes, and per manufacturer’s specification. Siemens will also provided each school two hours of comprehensive user training on the system.

Benefits of the Projects

The comprehensive building solutions designed and implemented by Siemens over the years have provided numerous advantages to the school district. Chief among these are the resultant energy savings and the functionality of the installed systems. Every year, Siemens provides a Measurement and Verification (M&V) report to the district for each project with data that shows the energy savings achieved. “And, it’s been exceeding our expectations,” says King. “Avoided expenses and operational savings for all six phases is projected to be more than \$1.6 million annually.”

Although energy conservation is the most obvious way in which money is being saved, it’s not the only reason the performance contract has been a fiscally responsible endeavor for School District 54. The timing of the projects has allowed the district to use the economy. Locking in prices over a course of 4 years allowed all price risk to shift to Siemens as apposed to the district. As a result, there were no change orders and no price increases regardless of price volatility.

Capacity Charge: Saving Every Dollar

Following their performance contracting successes, Siemens and District 54 teamed up on a new energy savings program, Capacity Charge. It’s a simple energy management program with big upside and little risk, since there are no upfront costs.

Through Capacity Charge, Siemens works with District 54 to implement temporary energy reductions in utility usage during predicted peak hours. Siemens offers a dedicated program administrator that alerts District 54 when their local utility is likely to experience peak electricity usage, usually with a 24-hour notice. If District 54 chooses, they curtail their energy usage during these periods, which last 1-2 hours, typically between 3pm and 6pm. Through the program, Siemens provides District 54 about 30 alerts.

Siemens saw this as an ideal opportunity for District 54, which can afford to pull back on energy usage in the summer, especially in late afternoons, with minimal impact on its indoor environment.

Through the first summer, the program has been a tremendous success and is projected to save the district more than \$1,000,000 over the next four years. And, since the program is implemented through a shared services agreement with Siemens, there are no upfront costs for District 54.

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| <p>30 forecasts</p> <p>Provided by Siemens, given District 54 opportunity to reduce electricity during peak hours.</p> | <p>\$0 upfront cost</p> <p>The program does not require any upfront capital outlays to benefit.</p> | <p>\$1,000,000+</p> <p>Projected energy savings for District 54 over a 4-year period.</p> |
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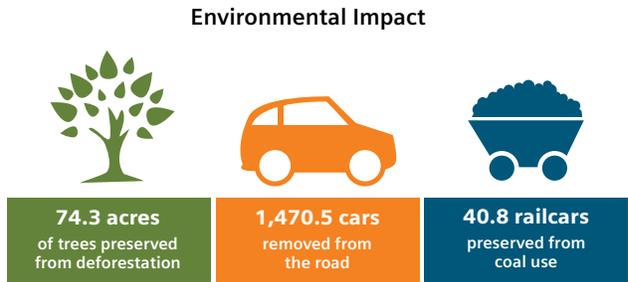
For example, the work for phases V and VI was executed in 2009, 2010, 2011 and 2012, but prices for equipment and contractor services were locked in at the onset. "We knew what equipment we were going to need over that 4-year period, and by having this contract in place, we were able to lock in at the current prices for that five-year period," says King of the phase V and VI work.

Streamlining facilities management also has a financial benefit. Improvements to fire alarm panels (made in phases V and VI) cut down on the number of false alarms the district was experiencing. Not only is this beneficial to schools where disruptions have been a nuisance, but the buildings are easier to operate and the fees associated with emergency responder services have decreased substantially. "It is \$100 each time that [emergency responders] have to come out. They charge us after so many," explains King.

There are other positive and far-reaching implications beyond dollars and cents. New lighting has had a dramatic impact, providing a better indoor environment for students and staff. Occupancy sensors were installed in many of the large spaces, including gyms and auditoriums, allowing the district to use only the energy that is required while occupants are present. HVAC improvements at the schools have resulted in greater comfort levels, far fewer hot/cold calls, and a more productive overall learning environment.

The environment stands to benefit as well. When all the phases are complete, the district will save approximately 2.06 million kilowatt-hours of energy annually reducing carbon dioxide (CO₂) emissions by 16.6 million pounds each year and Nitrogen oxide (NOx) and sulfur dioxide (SO₂). Combined, these reductions are the yearly equivalent to:

- Preserving 74.3 acres of trees from deforestation
- Removing 1,470.5 cars from the road
- preserving 40.8 railcars of coal from use



A true partnership has resulted from the performance contract. "They've been right here a hundred percent of the time, backing us a hundred percent," says Director of Buildings and Grounds, Mike Mostacci. Siemens and School District 54 have learned from each other and trust has been built. "It's been a great working relationship," adds King.

Siemens is a proud member of the U.S. Green Building Council, ENERGY STAR, AASHE and a sponsor of the American College & University Presidents Climate Commitment.



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