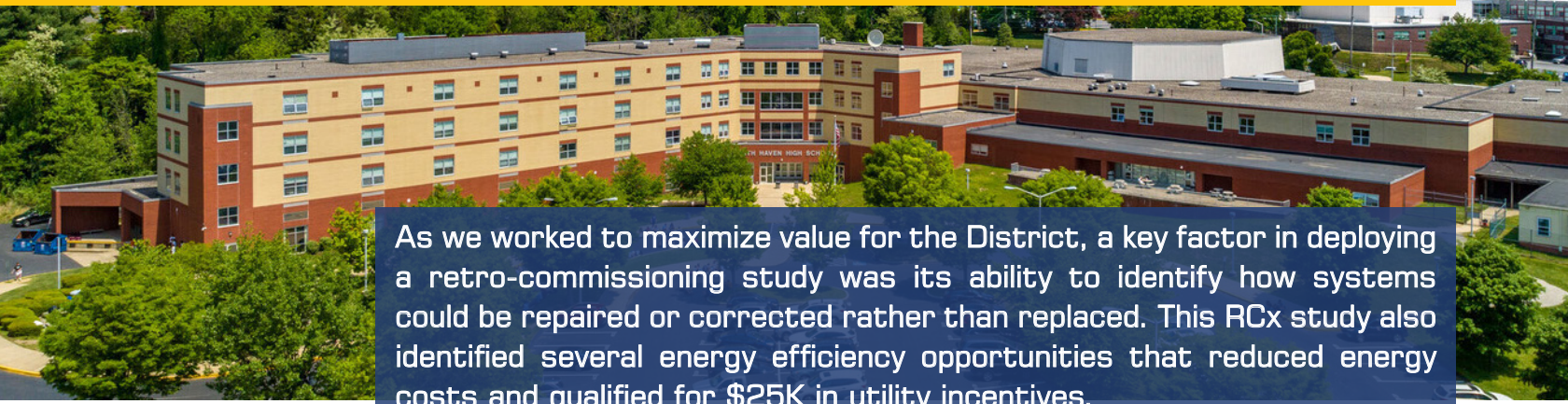


Optimization Services

Project: Wallingford-Swarthmore School District



As we worked to maximize value for the District, a key factor in deploying a retro-commissioning study was its ability to identify how systems could be repaired or corrected rather than replaced. This RCx study also identified several energy efficiency opportunities that reduced energy costs and qualified for \$25K in utility incentives.

Background

Located in Southeastern Pennsylvania, Wallingford Swarthmore School District serves 3,700 students from grades K-12. With four school buildings plus an administration building, the District was continuously striving to balance facility priorities – including energy, maintenance, operations and comfort.

To this end, the District partnered with CM3 to conduct retro-commissioning (RCx) on three of its buildings. The RCx study would provide greater insight into each building's functionality, illuminating systems issues and helping to determine a path forward.

Why RCx is Needed

For a variety of reasons, facility maintenance budgets tend to be chronically underfunded. This deferred maintenance combined with staff turnover and facility usage changes can often lead to a lack of system knowledge and weaknesses in system oversight. Systems then fail to function at their peak performance, which increases energy consumption and negatively impacts occupant comfort. The Retro-commissioning Study creates a building baseline which systematically identifies and quantifies opportunities for corrections thereby illuminating pathways for repair and refurbishment.

Project Phases

RCx Study 1

Rutledge Elementary School
Strathaven Middle School
Strathaven High School

RCx Study 2

Nether-Providence ES
Wallingford Elementary School

Utility Rebate: \$25,000

Results

CM3's initial RCx study uncovered several systems issues which were contributing to both higher energy costs and occupant discomfort. The report was well received by the School Board and the community, because it detailed opportunities for upgrades and repairs, as opposed to complete equipment replacements.

The RCx study also helped the District identify energy savings that would qualify for \$25K in incentives from local utility company, PECO.

Upon completion of RCx Study 1, the District then opted to pursue a Phase 2 project with CM3. This would involve completing an RCx Study on the remaining two schools while also prioritizing repairs for the Middle School.



As we strove to maximize value for the District, one critical factor in the decision to deploy a retro-commissioning study was its ability to identify how the District's systems could be repaired or corrected, versus having to replace equipment.

The RCx study also identified several energy efficiency opportunities which reduced energy costs, as well as qualified for \$25K in utility incentives.

Brad Pappal
CM3 Director of Optimization Services



Key Findings

That resulted in energy savings and helped the District qualify for utility incentives:

- Replacement of isolation valves for heat pumps
- Leaky chilled water valve repair
- Automatic fan settings
- Fan coil cleanings



Examples of Findings

Equipment	Location	Category	Action	Findings	Recommendation
Air Handling Unit	ERU-3	Energy	PM	Heat wheel not moving, no energy can be exchanged. VFD shows an on command at 40hz speed. possible motor or belt failure.	No access found for heat wheel belt, due to age of device this is likely the failure point. Recommend further diagnosis and correction.
Air Handling Unit	AHU-1	Energy	Repair	OA and RA damper actuators are modulating when commanded. In addition the left damper linkage has been removed	Recommend replacing 2 actuators and correcting linkage.
Air Handling Unit	ERU-2	Energy	Repair	Heating valve is not fully closing. Incoming air is 70 and leaving is 80 with valve at 0%.	Recommend correcting voltage. Possible actuator replacement.
Air Handling Unit	PAU-1	Energy	Repair/ Upgrade	Unit has the capability to economize but seems to lack programming for economizing.	Recommend adding economizing program or correcting the program that is present as the unit appears to not be economizing currently.
Cabinet Unit Heaters	CUH-1 Stair #2	Mechanical	Repair	Open high voltage wire splices found inside cabinet.	Provide and install an electrical junction box to house spliced wiring.
Exhaust Fans	KEF-1	IAQ	Upgrade	KEF doesn't exist, it was part of an add alternate during 2002 renovations. Existing hood exhaust for two burner range and steam cooker does not work. the device is off at the disconnect.	Recommend review of the add alternate bid from the 2002 project and implement design recommendations. Kitchen currently has one working exhaust fan for the dishwasher and a heating only fan coil.
Exhaust Fans	TF-1	IAQ	Upgrade	TF-1 doesn't exist, it was part of an add alternate during the 2002 renovations. The fan would have handled the bulk of kitchen exhaust	Recommend review of the add alternate bid from the 2002 project and implement design recommendations.
Fan Coil Units	FCU-13 Conference Room	Automation	Repair	Chilled water valve will not close when sent to 0%.	Recommend evaluating and possibly changing valve.
Fan Coil Units	FCU-26 Classroom 204	Automation	Repair	Room temperature displayed on the BAS is incorrect.	Calibrate or replace room temperature sensor.

Why RCx is More Cost Effective than Building Assessments

Unlike Building Assessments conducted by Engineering Firms which typically focus on estimated equipment lifecycles, the Retro-Commissioning Study delivers an in depth, functional look at the actual equipment. It identifies the real-time status of the equipment, not expected lifecycles, and specifies what can be done to correct, enhance and extend the useful life of that equipment.

