EXISTING BUILDING COMMISSIONING
CASE STUDY

Stonebridge Elementary School
Stillwater, Minnesota

PROJECT BACKGROUND
Despite the installation of new equipment in 2002, Stonebridge Elementary used excessive amounts of energy throughout the year and there were comfort complaints by the school staff. As a result, Stillwater Area School district asked CEE to recommission the building.

INVESTIGATION
A comprehensive recommissioning investigation of Horizon Middle School was conducted in 2008. Building systems were analyzed using a combination of field observation, diagnostic testing, and building automation system trending. Further testing was performed on the indoor pressure differentials as these gave indication of operational issues and had been investigated previously without resolution. Several significant energy conservation opportunities were identified to reduce energy costs with an attractive payback.

IMPROVEMENTS
One area of focus was on simultaneous heating and cooling. Heating and cooling were occuring in the air handlers at the same time, leading to ineffective humidity control and unncessary energy use by the boilers and chiller.

Another area of focus was the PRVs. The dampers on the PRVs did not function properly, causing excessive air exchange between the indoors and outdoors. In addition, the PRVs exhausted more air than necessary due to high flow ratings and long run times. Other oportunties included improving the efficiency of the hot water system, changing the controls of the roof top units during unoccupied hours, and developing a morning warm-up and cool-down routine.

Implementing all of the recommended improvements would cost $17,600. With an estimated recommissioning conservation rebate of $2,600, Stonebridge Elementary School would save $13,650 annually, leading to a payback of 1.1 years.

PROBLEMS
- High energy use
- Staff comfort complaints

SOLUTIONS
- Eliminate simultaneous heating and cooling
- Reduce air exhausted by power roof ventilators
- Improve efficiency of hot water system
- Implement lighting controller
- Control use of heating loop pump
- Optimize control of air handling units during unoccupied hours
- Develop morning warm-up and cool-down routine

ANNUAL SAVINGS
- Electricity: 49,900 kWh; $1,550 (8.9% of total)
- Peak demand: 25.9 kW; $880 (6.6% of total)
- Natural gas: 11,260 therms; $11,220 (27.3% of total)
- Carbon footprint reduction: 94.4 tons of CO2

FOR MORE INFORMATION CONTACT:

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