



**ENERGY EFFICIENCY CASE STUDY  
DAHLSTROM MIDDLE SCHOOL  
HAYS CISD**



**ELECTRIC CONSUMPTION REDUCED 32%**

Dahlstrom Middle School is a 136,000 square foot facility located near Buda. The school has both water source and conventional air-to-air heat pump systems. The water source heat pump loop, which serves one of the classroom wings, consists of a fluid cooler, boiler, water pumps, and individual heat pumps in each classroom.

The existing air conditioning/heating systems in many parts of the school were approaching 20 years old. The school was experiencing maintenance problems with the water source heat pump system. Also, recent additions to the school left a combination of new and old equipment. Therefore, the District decided to replace the aging equipment as a part of their bond program.

Work accomplished consisted of:

- Replacing the existing fluid cooler on the water source heat pump loop
- Variable frequency drives were added to the hot water pumps to increase energy savings during low load conditions
- Installing an energy management system to control the heating and cooling systems in the building. A sequence of operation was specified to maximize the operating efficiency of the systems.

Because packaged outside air units were already in place and in use, the sizes of the classroom heat pumps could be reduced. Typically, units in classrooms were replaced with 2-ton systems.

Construction was completed in the summer of 2004. Significant results were noted immediately as electric consumption dropped considerably from the 2003-04 to the 2004-05 school year. Electric use was down more than 500,000 kwh, or **32%**, resulting in savings in excess of \$26,000. Electric costs fell from \$0.91 to \$0.71 per square foot and efficiency, as measured by kwh per square foot, dropped from 12.7 to 8.6. Both measures reflect extremely good systems design and operation.

The replacement of old, inefficient equipment that was experiencing problems with new, higher efficiency equipment controlled by an energy management system has saved on energy costs as well as maintenance expenses. The combination of equipment replacement and efficient building operation has yielded big savings for Hays CISD.

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