GeoExchange and School Buildings

GeoExchange systems provide cost-efficient, comfort, safety, reliability, and quality learning environment while freeing-up tight budgets for quality educational programs. Operating costs are substantially lower.

Kentucky Utilities commissioned studies by three engineering firms who modeled the life cycle costs of alternatives including GeoExchange. Even assuming that the GeoExchange system would cost more to install, the enormous operating and maintenance savings yielded 12 to 19 percent life cycle savings over 20 years. The study also compares energy costs for 24 schools with various HVAC designs. The three lowest operating cost schools have GeoExchange. Similarly, a Lincoln Electric System study of new GeoExchange schools in Nebraska showed savings — even though the GeoExchange schools were designed to meet higher ventilation standards than earlier comparison buildings.

Maintenance savings are remarkable.

At one Canadian school, maintenance costs are less than $0.03 per square foot per year. Routine maintenance is primarily replacement of air filters, and can be done by custodial staff. No in-school technicians are needed in GeoExchange schools. Likewise, the Austin (Texas) Independent School District has converted many of its facilities to GeoExchange. One of the advantages they find is that maintaining spare parts is easier than with alternative systems. The heat pumps are modular and interchangeable, and Austin no longer needs to stock parts for multiple boiler and chillers.

Classroom comfort and user satisfaction.

Because GeoExchange systems use many relatively small heat pumps, each teacher has control for his or her classroom. This leads to greater comfort and satisfaction. Larger GeoExchange units are installed in spaces such as auditoriums, allowing cost-effective heating and cooling for after-school events.

Design flexibility / reduction in rooftop repairs.

GeoExchange eliminates the need for outdoor or rooftop equipment. Schools are no longer limited to flat roofs, allowing for better architectural design. And with no roof penetrations for piping or servicemen on the roof, the need for roof repairs is reduced.

Safety.

Some combustion-based systems present an explosion hazard if the storage or delivery of their fuel is not carefully controlled. Since these systems require a flame to operate, failures can result in loss of property or life to fire. Incorrectly installed systems, chimneys that become blocked, or downdrafting can cause carbon monoxide to remain inside of buildings.
GeoExchange systems have no combustion, and thus produce no indoor pollutants like carbon monoxide. And since the earth connection is buried, there is no dangerous outdoor equipment that children might be tempted to play on.

Integration with educational values.

As the most energy efficient systems available, GeoExchange systems prevent pollution. In addition to creating a quality learning environment, GeoExchange communicates the important higher due to the additional cost of the required earth connection. However, experienced architects and engineers often find that other factors offset that additional cost, specifically:

GeoExchange systems need much smaller message of stewardship of the Earth to students.

Installation Costs are Competitive

GeoExchange installation costs are sometimes mechanical spaces. Leaving out boiler rooms can decrease the size of the building (and its cost) by 3 to 5 percent.

Because large ductwork is not used to distribute energy throughout the building, floor-to-roof (or floor-to-floor) heights can be reduced. For instance, in Toronto, construction cost savings were more than one million dollars for a 180,000 square foot school.

It's important to include these construction savings in any economic analysis. Involvement by one of the many experienced designers who understand schools and GeoExchange systems helps assure success.

The Educated Choice

Over 300 principals are proud, 45,000 teachers are smiling, and 1,250,000 students are learning in a more comfortable environment thanks to GeoExchange heating and cooling systems.

GeoExchange systems offer many ways for schools to save money, improve safety, and enhance the learning environment while demonstrating stewardship of our natural resources. No wonder school districts around the country are building or converting all of their facilities to GeoExchange after they experience its comfort and cost savings.

(Text provided by the Geothermal Heat Pump Consortium)

If you have further questions on this GeoTech Bulletin please contact us toll-free

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