



Case Studies Comanche Elementary School Uses City Drinking Water to Heat and Cool

When school superintendent Terry Davidson began searching for the most economical, energy efficient and environmentally-friendly way to heat and cool the city's new elementary school, he never dreamed it could be done using drinking water from the local utility company. But after meeting with Jim Hardin, inventor of the patented water+® system, Davidson, along with city and utility officials, grew more excited about the possibilities. Today, The water+ system is saving Comanche Elementary School more than 40% a year.

Comanche Elementary School is the first facility to use this system and take advantage of its energy- and cost-saving benefits. "It's a way to get heating and air conditioning at low cost," remarked Davidson, Superintendent of Schools for Comanche school district.

Water+ uses energy-efficient and environmentally friendly ground source (or geothermal) heating and cooling equipment, in conjunction with the city water that is supplied to every home and building, to provide a low-cost source of heating and cooling.

The water+ system can work on any home, commercial building, church or school. At Comanche Elementary, it uses the water supplied to the building from the city water main and operates just like your dishwasher, icemaker, water heater or any other water-consuming appliance. The only difference is that it doesn't contaminate the water in any way, but merely adds or extracts heat.

An abundant source of clean, renewable and free energy lies beneath every home and building. Water+ transports this thermal energy stored in the ground via a water utility main to or from ground source heating and cooling units in the school, located a little over a mile from the city water plant.

Traditionally, ground source units use conventional earth loops to transport energy which results in additional front-end installation costs. With the water+ system, no earth loops are needed. Instead, the utility's water main acts as the heat source and heat sink for the 32 100-ton units in the school. "The system saves a lot of money on first costs, so you are ahead of the curve immediately," remarked Davidson.

Using this source, the ground source units, which are up to four times more efficient than ordinary heating and cooling systems, provide total heating and cooling throughout the school at a fraction of the cost of ordinary HVAC systems. According to Davidson, Comanche is saving more than 40% on operating costs versus the cost of package units on the roof.

After passing through the units, the water is returned to the water+ line and transported to the processing plant where it is tested and returned to the final stage of treatment before being pumped back out into the main. Water passing through the system is in no way altered except for a slight temperature change as it passes through the unit. As the water returns to the treatment plant, the earth surrounding the line makes up the difference in temperature, thus the water becomes a 100% renewable source of energy.

The new Comanche elementary school started operations on the first day of school in 1999 and the system has been running great ever since. In fact, Superintendent Davidson is so pleased with its operation that he has obtained QZAB (Qualified Zone Academy Bonds) at no interest for 10 years to install the water+ system in 6 existing school buildings! The savings on energy will pay for the cost of the retrofit on the existing buildings.

In addition to cost-savings, Davidson is also impressed by other benefits of the system which include its maintenance-free operation and reliability. "There are no outdoor units to worry about, you have nothing on the roof or the ground that can be run into, vandalized or damaged by hail. You also eliminate the need for flat roofs that can leak."

Not only does the water+ system allow the school to easily upgrade the buildings and make students more comfortable, but it also keeps Comanche's energy dollars within the city. Instead of sending thousands of dollars each month to the gas pipeline company, they are paying their own water utility. They are also proud to be doing good things for the environment.

According to the EPA, ground source or geoexchange systems are the most environmentally friendly way to heat and cool our buildings. Water Plant Manager, Terry Williams is also very pleased with the arrangement. "The water+ system brings an entirely new stream of income to the utility," Williams commented. "The answer to our energy problems flows by every building every day, we just need to tap into it!"