

Weinberg Investments Prospers from High Performance HVAC System

→ BACKGROUND

Weinberg Investments faced a challenge with an aging heating and cooling system for their 80-unit high-rise apartment complex, built in the 1930's. In addition to being energy-inefficient, the heating and cooling system could not meet space-conditioning requirements for the facility's senior residents.

The building had a "two-pipe" heating and cooling system to minimize first cost when it was installed in the early 1980s. The entire building was either in cooling mode or in heating mode at one time, with one switchover in fall and one in spring. This created temperature control problems and persistent complaints from the residents.

Lew Weinberg, proprietor of Weinberg Investments, retained Michaels Engineering to explore converting the building's heating and cooling system to a geothermal heat pump system.

The existing heating and cooling plant consisted of gas-fired steam boilers and an air-cooled chiller. The boilers made hot water, which was circulated to fan-coil units in the apartments and makeup air units serving the corridors. When the system was in cooling mode, the chiller provided chilled water through the same distribution system.

→ MEASURES

Michaels completed a feasibility study to examine the cost and savings benefits of converting the system to geothermal heating and cooling. Converting the building's inefficient T12 and incandescent lighting systems to efficient T8 fluorescent and compact fluorescent technologies was also analyzed as part of the study.

The study results provided Mr. Weinberg with the information and confidence he needed to pursue implementation. Following the study, Michaels' design team provided design services to implement the project. Key design concepts included:

An open-loop geothermal design was used for this downtown location because sufficient area was not available for a closed-loop well field.

"Tower" heat pumps replaced existing fan-coil units in the existing cabinets to avoid carpentry and architectural work, minimizing implementation cost.

Water-to-water heat pumps were used for heating and cooling makeup air units serving the corridors. This was a key design element as it allowed the steam boilers to be retired and negated the need for a smaller inefficient cooling source for the makeup air.

→ ATTRACTIVE RESULTS

After the new geothermal system was in operation for about two years, the actual results were impressive. Utility bills showed a reduction in energy costs that matched the predicted results almost exactly.

In addition to energy savings, the building has a new heating and cooling system that will provide years of reliable operation. The temperature control / comfort problems have been eliminated and each resident can efficiently achieve heating or cooling as they desire all hours of the year.

