

# Canadian Structure Will Tap Geothermal Energy with Piles



▲ **Hot Stuff.** Loops of polyethylene pipe containing glycol in piles and foundations will capture geothermal heating and cooling in first North American project.

After a successful 20-year run in Europe, Austrian geothermal heating technology is making its debut in North America. The low-cost thermal-active foundations can provide up to 600 tons of heating or cooling capacity and can be used in piles, diaphragm walls and foundation slabs.

Developed by Nagele Energie-und Haustechnik, GmbH, Feldkirch, Enercret uses looped piping installed in slabs, walls and piles to circulate a glycol mixture for conversion to heating or cooling.

Already in use in over 400 European buildings, the system can reduce utility costs by 80%, say Nagele officials.

Those were important considerations for foundation contractor Birmingham Construction Ltd., Hamilton, Ontario, as it installed 57 14-in.-dia steel pipe piles 100 ft deep for the new \$6-million Canada Marine Discovery Center. Birmingham and Earth Energy Utility Corp., Burlington, Ontario, are acquiring the North American rights from Nagele.

"Energy used to be pretty cheap in

North America," says Peter J. Smith, Birmingham vice president. "That isn't so any more and we have a cost-effective way to heat and cool any size building." He notes the system has been used on a number of large commercial structures, including a 20-story bank building in

Hanover, Germany, and a terminal at London's Heathrow Airport. Enercret also has been used to keep bridge decks ice-free by placing loops in abutment piles.

Enercret already has saved about \$100,000 in project construction costs. "In our original design, we were going to drill separate piles outside the building and run the loops in," says Joseph W. Chalklin, project manager for Zeidler Partnership Architects, Toronto. But Enercret "is perfect for the site because it has poor soils and a high water table."

Each concrete-filled pile contains two 1-in.-dia loops wrapped together with duct tape. "Each loop is on a separate circuit that can be shut off if it leaks," says Chalklin. The piping connects to one of two manifolds connected to the HVAC system for the 18,000-sq-ft, one-floor structure.

"The system does not require any special concrete and the high-density polyethylene tubing is off-the-shelf, so costs are reasonable," says Smith. "The mechanical room contains water-to-air heat pumps connected to conventional ducting, so costs are roughly comparable to

conventional boilers and air-conditioning units." He says the payback on the loops can be realized in as little as four to five years at current energy prices. To check for leaks during installation each loop is charged with 85-psi air until final testing and acceptance. Birmingham took six weeks to install the piles, 40,000 linear ft of piping and equipment on its \$350,000 contract. The general contractor, James Kemp Construction Ltd., Hamilton, built the slab and walls. ■

By William J. Angelo