



# Braun's Bicycle Store Kitchener, Ontario

Braun's Bicycle Store, a family-owned business in southern Ontario, expanded in 1985 to larger retail and service facilities to accommodate a growing business. The building used to be heated with an old oil-fired furnace; there was no air conditioning and hot water was provided by electric resistance heating. The store owners were faced with a choice between gas or oil-fired combustion equipment with electrical air conditioning and a GeoExchangeK (geothermal) heating and cooling system. Since the GeoExchange alternative already offered high reliability and low life-cycle costs relative to the more conventional system, the Brauns selected the retrofit that provided heating and air conditioning, as well as domestic hot water.

Braun's Bicycle Store occupies a large 7200-square-foot showroom with a mezzanine floor. Offices and storerooms occupy 4100 square feet on the main floor. Two GeoExchange heat pumps now provide space conditioning for the main building while electrical resistance heating is used for the basement workshop during working hours.

The GeoExchange system uses a vertical closed-loop system. Each of the two 1,430-foot loops is installed in five vertical 7.8-inch diameter wells 135 feet deep under the parking lot. The two WaterFurnace GeoExchange systems, with a seasonal performance factor of 3.0, have a combined cooling capacity of ten tons. One unit is fitted with a desuperheater to supply hot water. A standard air duct system is used to distribute the warm air.

After the installation of the GeoExchange system, heating costs dropped from \$85 a day in the winter of 1985 to about \$10.90 a day for the following winter. Annual savings are \$7,960 --- the system paid for itself in less than three years.

The economic benefits, however, were not the only advantages of the Braun store GeoExchange retrofit. Air distribution and humidity control have improved, fire risks are reduced, and useful space previously occupied by the oil furnace and fuel storage facilities has been recovered.

## **System Features**

Number of GeoExchange systems: 2

GeoExchange manufacturer: WaterFurnace

GeoExchange seasonal performance factor: 3.0

Ground system: 2 vertical closed loops, 135 feet deep

Heat transfer fluid: glycol/water

### Comparative Economics

Costs	Conventional System	GeoExchange System
<b>Capital Cost</b> Heat pumps & equipment, collectors & installation, with ducting improvements  Resistance heating for basement  Combustion furnace with installation and electric air conditioning	<b>\$19,750</b>      \$19,750	<b>\$40,810</b>  \$35,650  \$5,160
<b>Annual Energy Cost</b>	<b>\$10,950</b>	<b>\$2,989</b>

#### Project Participants

**Owner:** Braun's Bicycle Store, Kitchener, Ontario (519) 579-2453

**Project Manager:** Al Dunn, Dunnco Mechanical Ltd., Waterloo, Ontario  
(519) 746-6000

**Equipment Supplier:** Earth Systems Ltd., Leamington, Ontario