

# SPOTLIGHT

WaterFurnace International,  
Inc.

Case Study 8

## Geothermal comfort goes low-rise in Kitsilano, British Columbia

### Key Features

**Square Footage:** 26,600 office, 39,800 retail,  
3,000 common area

**Type of System:** Closed loop, vertical bore

**Number of Units:** 70

**Total Capacity (HVAC Tons):** 210



*In 1991, Vancouver became the first Canadian city to incorporate energy-efficiency measures into a bylaw. The standards apply to all new buildings and additions, except for one- and two-family dwellings. Bylaw 6871 was Vancouver's attempt to reduce the environmental impact and operational costs of buildings in the Lower Mainland.*

*According to energy and environmental consultant Murray Ward, geothermal energy is seen as a means to reduce the conventional energy needs for space heating and domestic hot water of existing and future Canadian communities by over 70%... and the associated greenhouse gas and acid rain causing emissions.*

### A better way

Developer Harold Kalke wants to change peoples' lives by showing them there are different ways to do things. When Kalke began laying the groundwork for a new residen-

tial/commercial complex on the block-long stretch once occupied by a landmark car dealership in Kitsilano, British Columbia, he had three objectives in mind.

First, the project must positively impact the quality of the occupants' lives. Second, by extension, the project must show the neighborhood that development can be integrated into, as well as enhance, the existing community. Finally, the project must show the development industry that there is "a better way."

### Condos with a conscience

Kalke enlisted Hotson Bakker Architects to design the new town centre of Kitsilano's commercial district. The resulting structure is a four- to five-story building comprised of 69,400 square feet of commercial space plus 78 condominium residences. A conscious effort was made to preserve the historic ambience of the site and allow the building to blend seamlessly into the surrounding community. But the project's ingredients focused on renewal.

Office/Retail, Commercial Application



  
"Ask for Heating and Cooling Equipment  
with the ENERGY STAR® logo, the  
Symbol for Energy Efficiency."

Earth friendly, efficient features include thermally-broken window frames and "rain-screen" exterior walls – an intricate system that provides superlative heat insulation, blocks out noise and prevents leaks. The carpeting is made from recycled materials. Most suites can be heated with their gas fireplace alone and all residential water is processed through a central filtration system. But the developers made their most dramatic departure from the norm when choosing a heating and cooling system for the commercial division.

### **The giant battery**

Cost efficiency is one reason why Kalke chose to make the Kitsilano project the first Western Canadian complex to use a geothermal comfort system. The geothermal system provides heating and cooling for 26,600 square feet of office space and 39,800 square feet of retail space as well as provides all of the hot water in the condos by tapping into the energy beneath the earth's surface. Kalke also praises geothermal for its energy efficiency. "As a society in general, we should start to take stock of the energy we are using," said Kalke.

Intertech Construction Ltd. was hired as the general contractor. "We wanted to use the earth's heat to preheat the cold water supply and alternatively to cool the water returning from the building," states Project Engineer Bruce Tidball. Dandelion Geothermal Ltd., another Kalke company, brought in Bertram Drilling from Alberta to drill the bore holes in the closed vertical loop installation. Drilling was completed in less than three weeks with no disruption to the other construction activities. Forty-two holes reach a depth of 300 feet and extract geothermal energy for tenants on the commercial level. The remaining four bore holes provide energy for the two

penthouses.

With the pipe in place, the holes were pressure-grouted from the bottom up with bentonitic clay, a material which expands with underground moisture to provide a tight seal between the pipe and the earth. Variable-speed drive pumps circulate heat transfer fluid through the piping system.

### **The system of choice**

Dandelion Geothermal Ltd. supplied the actual geothermal units. According to company president Marvin Breyfogle, WaterFurnace was the system of choice. Two 10-ton WXW units, one for the commercial division and the other for residential, were installed to provide hot water to the project. The retail and office space is conditioned by 68 Premier AT units.

The geothermal technology also integrates the cooling system of a tenant's cooler, reducing additional equipment and lowering costs. "By utilizing the geothermal system, we were able to devote less space for mechanical equipment, therefore reducing construction costs in these areas," proclaims Breyfogle. A small room in the project's lower parking level houses the technology.

"Incorporation of geothermal technology enabled us to reduce energy consumption, allowing us to completely eliminate the use of gas in the commercial component of the project," adds Breyfogle. "We don't even have a commercial gas meter."

### **An excellent forecast**

In an attempt to make the development a quiet, full-service neighborhood, the commercial division houses an exclusive population which includes a bookstore, a deluxe natural food store, and a garden supply store. Yet the final prices are competitive with other new units in

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the area. Since its tenants took up residence, the entire complex has proven to be cost effective. "The project has been a complete success with a payback estimated to be a period of less than three years," exclaims Tidball. The low maintenance will also benefit the project with reduced costs in the future.

### **Part of the solution**

The Kitsilano project, known simply by its address "2211 West Fourth," has been recognized as a direct demonstration of conservation and civic responsibility. Kalke was awarded zVanCity's Ethics in Action Award for his efforts.

Kalke has a positive, environmentally friendly outlook on life, and the name of his company—the Salt Lick Projects—reflects his approach. The theory behind Salt Lick Projects is that in nature, all trails lead naturally to the salt lick. His earth energy offshoot, Dandelion Geothermal Ltd., speaks volumes for the future of the industry: "...a dandelion is pervasive," explains Kalke. "It's all over the world. It's a pretty optimistic plant, wouldn't you say?"