

## BLUEPRINT

### FAUBOURG DU MOULIN

*A Neighborhood Designed with the Environment in Mind*

#### PROJECT INFORMATION

**Building Type:**

Multi-Family, Apartments and Condominiums

**Floors:** First Building = 8 floors  
Future Buildings = 8 to 15 floors

**Manufacturer's Representative:**  
ITC Technologies

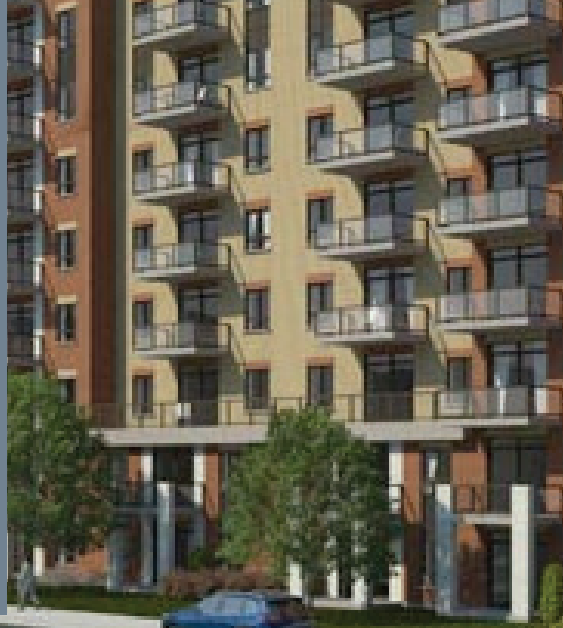
**Building Owner/Developer:**  
Groupe Dallaire

**Consulting Engineer:**  
Poly Energie/Gencor

**Developers:**  
Claude Routhier, Poly Energie  
Pierre Trudel,  
Groupe Dallaire/ Dalcon

Robin Labbe, ITC Technologies

**General Contractor:**  
Dalcon Construction



[www.faubourgdumoulin.ca](http://www.faubourgdumoulin.ca)

#### Challenges:

The two primary challenges for this project included the design of a distinct condenser loop hydronic system, and its integration with the building's heating and cooling system. The initial HVAC installation was designed and developed to service a building containing 154 apartments, as well as planned future expansion of an additional 2,000 apartments.

#### The Hydronic System

The first challenge was to design and develop a cost-effective condenser loop hydronic alternative to a previously proposed geothermal system. The new system required maintaining Energy Efficiency Ratios equivalent to a geothermal ground source loop, without the added cost of drilling the geothermal loop. The selected hydronic system had to control the condenser loop water temperature that served the heating and cooling system in the primary building, as well as 8 to 10 future buildings planned for the Faubourg du Moulin development.

Due to roof-top installation with limited space, the hydronic system had to be small, lightweight, and operate quietly.

#### The Building System

The second challenge involved the building's primary heating and cooling system. Similarly, this side of the system required an energy efficient heating and cooling solution that did not necessitate a large installation space, and would heat and cool the 154 apartment units with independent thermostat controls. Basement installation of the system's condenser units also required quiet operation to ensure resident comfort.

#### Solutions:

A customized, air-cooled hydronic unit designed by Daikin and ITC Technologies was installed to control the water temperature of the condenser water loop. An economical solution, this small and light weight unit required less installation space, and operated quieter compared to an alternative chiller solution. It also provided the high efficiencies desired.

A Daikin VRV-W Series water cooled heat recovery system feeds Branch Selector Boxes and Vertical Air Handlers in each of the 154 apartments offering a cost effective, low maintenance, extremely quiet, and efficient solution. The VRV-W Series system connects to the hydronic water loop system providing year-round high efficiency heating and cooling. The small footprint of the VRV-W Series units and the special hydronic water loop design, along with the quiet operation compared to traditional chiller options, resulted in a big win for this unique project.

Daikin's Intelligent Touch Manager (ITM) was selected as the centralized HVAC control system communicating with 154 Daikin Navigation Remote Controllers in each apartment. The ITM and accompanying adaptor provided connectivity to a BACnet® interface that networks into the building management system (BMS). Integration of the Daikin ITM to the BMS provided the flexibility desired by the customer to optimize energy consumption and operational cost.

Faubourg du Moulin, by the Dallaire Groupe, is a new multi-family neighborhood located just north of Highway Capital near the city center of Quebec City, Canada. This modern development will eventually contain over 2,000 condos, townhouses, and rental units. The beautifully landscaped property features a large park, pond with water fountains, and walking trails. Conveniently located near Promenades Beauport entertainment district, residents are just steps away from restaurants, a movie theater, and up-scale shopping.

Faubourg du Moulin Phase 1 is an eight floor, 154 unit apartment building. This building also housed the crucial condenser loop hydronic system. Designed for expansion, this system will eventually provide the condenser water for the entire residential development.

The Developer, Claude Routhier of Poly Energie, initially designed Faubourg du Moulin to include a geothermal system to achieve the efficiency goals desired by the developer and general contractor, Dalcon Construction. Daikin collaborated with ITC Technologies to develop a unique air source alternative to the geothermal system. This project considered both geothermal and chiller system solutions. Although a complete geothermal system is an efficient solution, the high cost of drilling boreholes for a geothermal field proved cost prohibitive when compared to Daikin's custom-designed condenser water loop system. A



unique 960-ton condenser water loop system was installed on the roof of the Phase 1 apartment building that is less expensive than the geothermal option. With expansion in mind, between 8 and 10 additional residential buildings planned for construction at Faubourg du Moulin will connect to this same condenser water loop system.

The condenser water loop system was connected to VRV-W Series units with the entire system connected to the BMS, and centrally controlled with a Daikin ITM. With sound levels as low as 50 dB(A) and only 39-3/8" H x 30-3/4" W and 330 lbs., the choice to locate the VRV-W Series units in the basement was an easy decision. The lightweight and compact modular design allowed for stacking of units, and required less space than a comparable chiller system. Long, vertical refrigerant line runs were routed from the VRV-W Series units in the basement to the vertical air handlers in each of the individual apartments. The VRV-W Series is well suited to handle long refrigerant lines up to 980 feet (390 feet max. linear liquid piping length), 164 feet height difference. Unlike traditional HVAC systems that can only be in either heating or cooling mode, the VRV-W Series heat recovery system allows for simultaneous heating and cooling for each apartment. Vertical air handling units were located in a closet in each apartment and ducted to individual rooms which allowed for easy installation and future maintenance. Each apartment was zoned independently to provide individual comfort control with a Daikin Navigation Remote Controller.

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### DAIKIN EQUIPMENT

- VRV W-III Heat Recovery
  - 37 RWEYQ72/84PTJU
- Custom Designed 960 Ton Daikin Hydronic System
- Vertical Air Handling Unit
  - 132 FXTQ12PAVJU
  - 20 FXTQ18PAVJU
- Horizontal Air Handler Unit
  - 8 FXMQ07PVJU
  - 1 FXMQ09PVJU
- Branch Selector Box
  - 152 BSVQ36PVJU
- Controls
  - 2 Intelligent Touch Manager DCM601A71
  - 2 BACnet® Interface DMS502B71
  - 7 ITM Plus Adapter DCM601A72
  - 154 Navigation Remote Controller BRC1E72

## FIND OUT MORE ABOUT DAIKIN VRV.

Contact your local dealer or manufacturer's representative.

### Additional information

Before purchasing this appliance, read important information about its estimated annual energy consumption, yearly operating cost, or energy efficiency rating that is available from your retailer.

Actual savings and costs will vary. Cost and savings statements are applicable solely to the installation indicated. For additional information please contact the installing contractor, distributor or factory representatives.



Our continuing commitment to quality products may mean a change in specifications without notice.

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