



The Paradigm Building is a 24-storey, 350-suite condominium located at Brant and Fairview Street East in Burlington, Ontario. With three high-rise towers (West, Central and East) the building shares amenities including an indoor pool, a gym, party room and a lobby on the lower levels with the upper floors separated into individual towers.

Working with G.S. Sheet Metal, O'Dell was responsible for providing make-up air (MUA) for each tower's corridors, a dehumidification system with heat recovery for the indoor pool, fresh air for the amenity spaces and general ventilation for individual suites.

The Challenge

Similar to most modern condominium plans, the design focus provided as much useable space for the condos and amenities as possible.

Unfortunately, this usually means restricted ceiling space and smaller mechanical rooms. In this case, each restriction was system specific and included the following constraints:

- The MUA unit for corridor ventilation was located in the mechanical room, along with many other mechanical systems (boilers, chiller, DWHT). Each was given a specific footprint and the MUA had to fit in a 14-foot wide by 12-foot long space while providing up to 27,000 cubic foot per minute (CFM).
- The dehumidifier was located in the corner of a block wall with the return air running along the front wall and the supply air running perpendicularly. The ceiling where the dehumidifier was to be installed was only 9 feet high and because of the large room volume and the amount of glass in the pool area, the dehumidifier required 6,000 CFM of ventilation air.



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- A remote heat-recovery ventilator (1,000 CFM) was designed for the dehumidifier's outside air and exhaust air. Due to height restrictions in the corridor, it had to fit within a 20-inch ceiling space and required corrosion-resistant material properties to handle harsh chemicals in the pool air.

The O'Dell Solution

Working with various manufacturers, O'Dell was able to provide a solution for each application.

The MUA unit selected was a Krueger hydronic indoor air handler. The numerous customizable options allowed for this component to be shipped in three, split, pre-assembled sections to fit through the block wall opening and be assembled on site. The unit was supplied with a variable frequency drive to modulate the supply air from 20,000 CFM to 27,000 CFM based on occupancy and time of day. A face and bypass section was included for better part-load temperature control. The unit width (restricted at 14 feet for 27,000 CFM) was not an issue. However, the length—which included an intake section, HW coil, face/bypass dampers, CW coil and a supply fan—would not be able to fit within the 12-foot allowance if it were to be a straight-through horizontal air-handling unit. Instead, a vertical fan section was chosen and placed on top of the cooling coil section, with the fan inlet downstream from the coil and a top discharge supply configuration for airflow.

The dehumidifier had a similar challenge because the unit was placed in a small mechanical closet room. A typical horizontal or vertical arrangement was not available as the block walls would not allow for a straight-through supply- air discharge and the low ceiling height would restrict a top discharge for airflow. A vertical-style Dectron Dry-O-Tron was chosen, with a plenum fan on a variable frequency drive. By selecting this fan and including a top-mounted plenum box, we took advantage of its characteristics and chose an applicable supply-air discharge direction. The unit has a horizontal intake for the return air at the front of the dehumidifier and discharges the supply air at a right angle (following the path of the block wall).

Finally, for the pool dehumidification heat recovery ventilator (HRV), a building performance equipment (BPE) system was selected. The BPE unit is a core only system that utilizes remote fans for the supply and exhaust air. The face of the HRV was 17.5 inches wide by 32.5 inches tall but could be installed on its side so the 17.5-inch face could fit within the 20-inch high ceiling space. Meanwhile, the BPE's core is made entirely of polypropylene to handle corrosive air from the pool area.



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