



Oakwood & Millennium Trail Long Term Care Facilities

CASE STUDY



Long term care facilities for the elderly provide unique heating, ventilation and air conditioning (HVAC) design challenges particularly when it comes to conditioning outdoor air ventilation loads. High levels of outdoor air ventilation designed to maintain proper indoor air quality for residents and staff adds to HVAC equipment size while year round 24/7 operation translates into significant annual HVAC operating costs. System designers are challenged with minimizing these costs while still maintaining a healthy, comfortable indoor environment.

Tackling Outdoor Air Loads with Energy Recovery Ventilation (ERV)

Oakwood Long Term Care in Oakland, Ontario faced this challenge in 2002 when they contracted with Millennium Engineering of Burlington, Ontario to design an energy efficient HVAC system for their new facility in Oakville, Ontario.

Millennium consulting engineer Pal Ahuja, together with Domanick Mattina of Mattina Mechanical in Niagara Falls agreed that with outdoor air ventilation representing such a large portion of the total heating and cooling load, an energy efficient outdoor air was needed to meet Oakville's design objectives.

Value of New Energy Recovery Wheels at Oakland & Millennium Trail

Project Date:	2002
Outdoor Air CFM:	22,500
Peak Cooling Reduction:	32 Tons
Peak Load Reduction:	1.65 Million BTU/Hr.
*Estimated Annual Operating Savings (24/7):	\$37,000
Simple Payback:	Instant
Annual CO2 Reduction:	255 Tons

*Based on the following assumptions: 84% Heating Efficiency @ \$0.80 therm & \$0.08 kWh / 0.8 kW/Ton Cooling Efficiency @ \$0.08 per kWh & \$8.00 per kW Demand Charge.

After reviewing several options, the design team decided Energy Recovery Ventilation (ERV) with Airxchange energy recovery wheels provided the best solution to the outdoor air energy challenge.

Airxchange energy recovery wheels capture and re-use up to 80% of the energy in building exhaust air to precondition outdoor air thereby reducing HVAC equipment size and operating costs. Selecting ERV's up front in the design process, allowed the team to reduce the overall size and cost of the HVAC system. Ahuja relied on AHRI certified performance provided with the Airxchange wheels to properly downsize the heating and cooling system to the new design loads.

A total of (10) gas-electric high efficiency packaged rooftop units were specified. Seven units were set up for recirculation only and the remaining three units were mated with three ERV units on the roof to provide 100% of the facilities outdoor air ventilation needs. The high efficiency HVAC/ERV combination provided 100% outdoor air for control of indoor air pollutants at a significantly lower first cost and operating cost than conventional 100% outdoor air systems.



Energy Recovery Ventilator connected to Packaged Rooftop Unit

Avoided HVAC Costs Pay for Energy Recovery Ventilators

Ahuja and Mattina reduced the packaged rooftop design from 82 tons to 50 tons of cooling and 2,389 mbtu/hr to 735 mbtu/hr of heating load respectively. The 32 tons of unitary rooftop equipment savings nearly offset the entire installed cost of the ERV's and an estimated annual energy savings of \$37,000 provided attractive returns from day one. In addition, the Oakwood facility was aided by the Canadian Building Incentive Program, a financial incentives package that rewards efficient building design with upfront cash offsets to facilitate efficient design measures.

Long Term Performance and Reliability with Airchange Wheels

Pal Ahuja and Domanick Mattina were very pleased with the results of the HVAC design and installation. The ease of maintenance of the ERV's and their quiet, energy saving operation exceeded expectations. As a result, a second long term care facility, Millennium Trail Manor, Niagara Falls, NY has repeated the use of high efficiency packaged rooftop units with Airchange energy recovery wheels.



Airchange wheels reduce outdoor air loads by 70% at the Millennium Trail Manor long care nursing home.

The local HVAC equipment Sales Manager Doug Roberts provided equipment for both projects and has been very pleased with the support he received from Airchange and its OEM partner who assisted with their selections of energy recovery units using Airchange performance software.

Design with Confidence

The Air conditioning Heating and Refrigeration Institute (AHRI) has established a voluntary third party performance certification program for energy recovery ventilation components to verify performance claims of participating manufacturers such as Airchange.

"It was important that we chose energy recovery wheels that had AHRI certified performance so that the engineer and owner had confidence that this innovative combination of high efficiency rooftops operating at 100% OA would be able to condition, heat and dehumidify the OA supply at all times of the year. We have had a couple of very hot summers and one miserably long and cold winter of operation and indoor comfort was never an issue. Maintenance has been limited to changing the OA and EA filters every 3 months. The wheels are still very clean and do not require washing." -Doug Roberts - Sales Manager, HVAC Equipment Supplier

Both the 2 year old Oakwood facility and Millennium Trail facility in Niagara Falls are designed to provide many years of worry free operation along with good IAQ to help facilitate the care of its' elderly residents who will make these buildings their home. The success of these installations has served as a blueprint for future long-term care facility designs by Millennium Engineering

About Airchange

Airchange has 35 years of extensive experience in the energy recovery industry. Our mission is to design and manufacture high quality products that perform reliably and effectively for the life of the HVAC system, reduce energy consumption, and improve indoor air quality. The addition of high-tech materials and innovative designs to a technology based on fundamental scientific principles has earned us the trust of our valued OEM customers. We will continue to innovate and support our customers to meet evolving market demands for energy recovery ventilation technology. Visit airchange.com for more info.