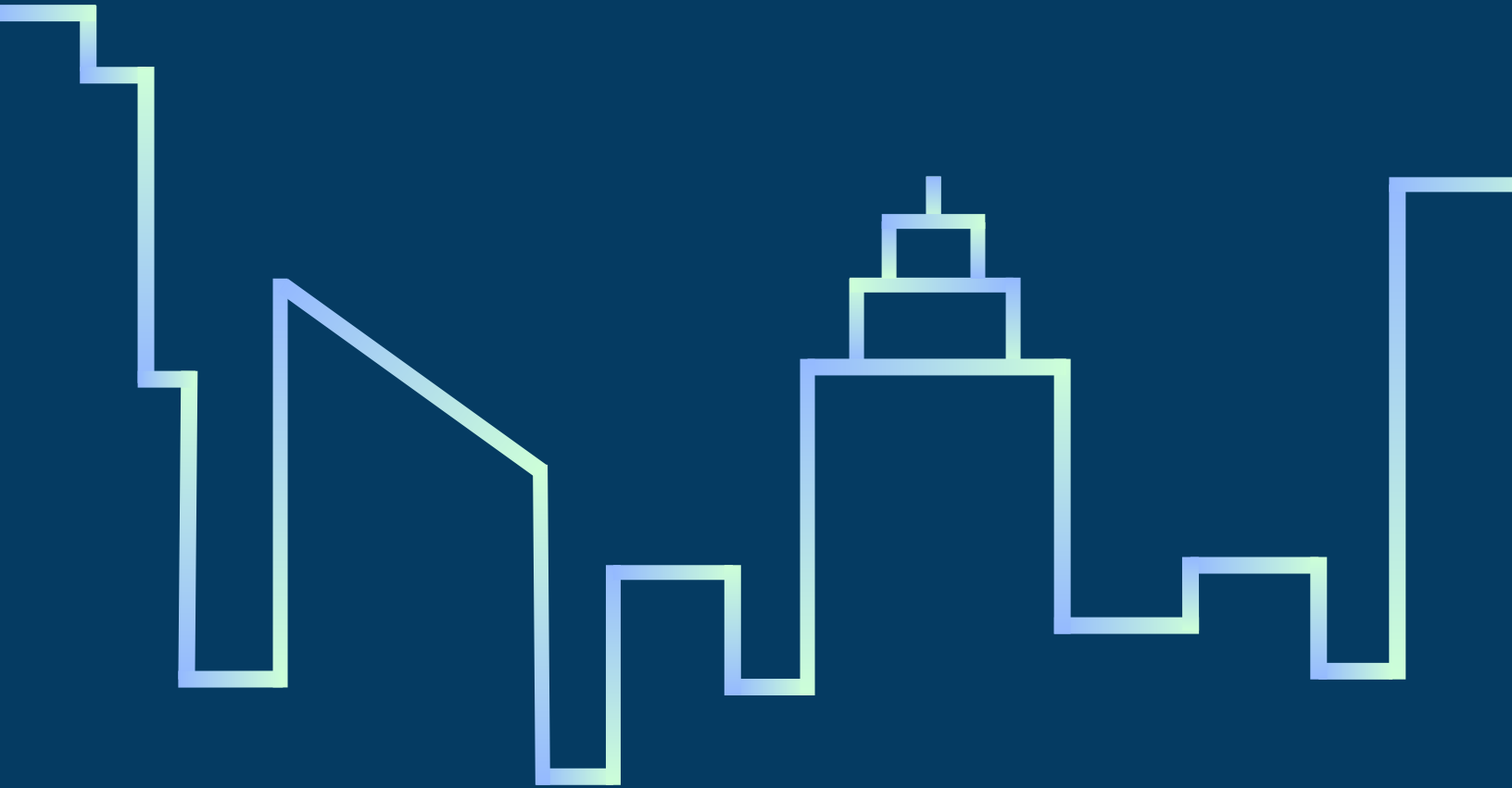




CASE STUDY

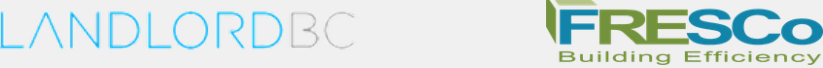
A Hybrid Pathway To Low Carbon Ventilation

Make-Up Air Retrofit in Vancouver at 939 Beatty Ave, Vancouver

RARA Case Study

Market Rental

939 Beatty Ave, Vancouver



Retrofit Overview

A low-efficiency, gas-heated make-up air (MUA) system in a Yaletown market rental building in downtown Vancouver was upgraded to a hybrid dual-fuel heat pump MUA system. A MUA system supplies fresh, tempered outdoor air to maintain hallway pressurization for indoor air quality and to mitigate smoke and odour migration between suites. In the upgraded system, the heat pump serves as the primary heating source, with gas auxiliary heat used only during the coldest conditions, reducing the system size and cost.

Why This Retrofit at This Building?

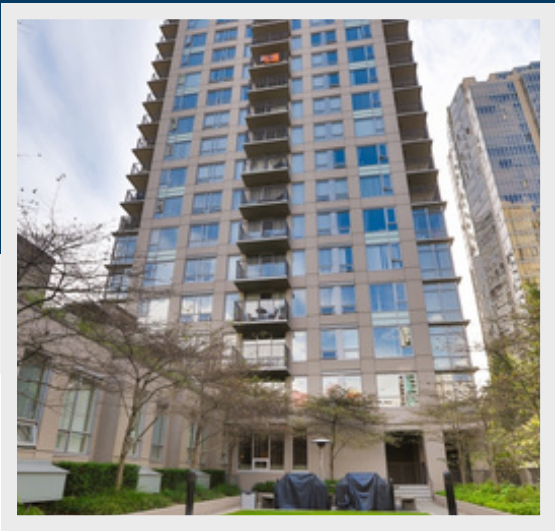
- Aligns with QuadReal's long-term decarbonization and Environmental Sustainability Goals (ESG) objectives for this flagship property.
- The existing MUA was at end of life and needed replacement.
- Multiple incentives supported a strong retrofit business case.
- Sufficient electrical capacity to support a dual-fuel MUA system.
- Cooling was a core objective for comfort and thermal resilience.

Installation Highlights

- Engineers:** FRESCo (mechanical), AES (electrical), RJC (structural)
- Contractor:** Kern Building Solutions Group
- Project Completion Date:** June 2026
- Equipment Selection:** AAON RNA 031 series cold climate air source heat pump with gas auxiliary heating

Equipment Specifications:

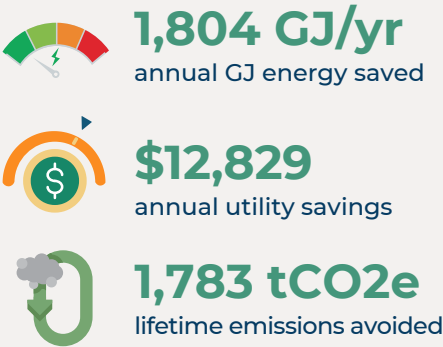
Airflow	Modulating up to 12,500 CFM
Refrigerant	R-454B Low-Global Warming Potential (GWP)
Heating Capacity	Modulating heat pump 279 MBH; Gas backup 972 MBH
Gas Heating Turndown Ratio	5:1
Cooling Capacity	Modulating to 420 MBH
Coefficient of Performance	3.8 at -3°C/27°F
Heat Pump Minimum Operation Temperature	-5°C/23°F
Sound Level	Max 99 dBA



Building Details

Year Built:	2004
Building Size (sq. ft):	180,833
Number of Units:	184
Number of Storeys:	20
Location:	Downtown, Vancouver, BC

The Expected Savings



Project Challenges

The project team addressed key challenges through coordination and technical problem-solving, including:

Equipment supply delays: extended project timelines.

Crane logistics and scheduling: added significant complexity and cost in a dense urban, high-rise context.

Access and servicing constraints: Rooftop and ductwork conditions required a prefabricated aluminum access deck and railing for safe servicing.

RARA Case Study

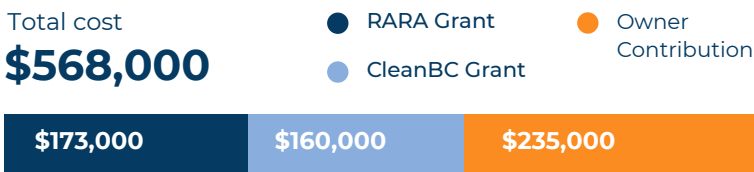
Market Rental

MUA System Cost

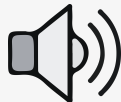
Total Project Cost: **\$568,000**

- Demolition: \$29,000
- Equipment: \$255,000
- Roofing: \$52,000
- Crane: \$27,000
- Structural Upgrades: \$16,000
- Electrical: \$77,000
- HVAC: \$50,000
- Service Platform: \$29,000
- Project Management: \$33,000

Funding Breakdown



Noise Mitigation



MUA equipment produces operational noise such as humming, airflow, and vibration. If not properly isolated, this noise can travel through building structures and become a source of occupant or neighbour complaints, or conflict with municipal noise bylaws.

As part of this retrofit, measures were implemented to limit noise transfer and maintain a quiet environment, including:

- Placement of the system on the rooftop, increasing separation from occupied areas.
- Use of the existing screen wall assembly, providing an acoustic barrier.
- Internal and external vibration isolation, including installation on a custom vibration-isolation plenum curb designed to absorb and dissipate vibration.
- Flexible duct connections to prevent system vibration from transferring into the building's ductwork.

These measures work together to reduce sound transmission and support quiet and reliable operation.

“For many buildings, full electrification is not always immediately practical. A hybrid MUA system can be a strong interim option because it delivers meaningful emissions reductions, adds cooling, and works within real-world site and electrical constraints.”

Paul Ristow, Chief Engineer, FRESCo

R-454B Refrigerant

R-454B is a newer refrigerant (fluid used in heat pumps and air conditioners) that has 78% lower global warming potential (GWP) than R-410A and meets current and emerging federal and provincial refrigerant regulations. It performs nearly as well as older refrigerants, has lower climate impact, does not harm the ozone layer, and can be used in new equipment with only small design changes, making it a practical option for HVAC systems.



Rental Apartment Retrofit Accelerator Program (RARA)

RARA™ is a free, one-stop concierge retrofit program that helps rental housing providers plan and implement energy efficiency and decarbonization retrofits, offering technical support, education, and central intake for accessing incentives and grants.

The program is led by **LandlordBC**, whose leadership and advocacy in the rental housing sector play a central role in shaping owner-focused, sector-informed retrofit approaches and accelerating market uptake.

RARA is delivered in partnership with **FRESCo**, the prime consultant, which leads participant recruitment, feasibility assessments, and engineering. FRESCo also handles system design, tendering, installation, commissioning, and performance verification.

RARA is funded by the City of Vancouver, City of Victoria, District of Saanich, the Province of BC, BC Hydro, and Natural Resources Canada through the Zero Emissions Innovation Centre (ZEIC) as part of the BC Retrofit Accelerator (BCRA).