

HVAC CASE STUDY

Lewis & Clark Student Center Blazes New Trail to HVAC Efficiency



Portland college furthers their sustainability commitment with a highly efficient HVAC system.

When it came time to renovate the Stephanie Fowler Student Center, the administrators at Lewis & Clark College in Portland, Ore., placed sustainability front and center. Designed to be the “heart of the campus” according to Lewis & Clark president Robin Holmes-Sullivan, the renovation designs included the most efficient HVAC system available to provide optimal thermal comfort for the newly constructed third floor of the building, a 6,370 sq. ft. multipurpose area that includes a conference room, two meeting rooms, and a technology classroom.

With all options on the table, Lewis & Clark College determined that the very high efficiency dedicated outdoor air system (very high efficiency DOAS) would provide their students, faculty, and staff with enhanced comfort and healthy air, while reducing energy use by more than half, when compared to a standard, code-minimum HVAC approach.



“Indoor air quality is a top priority for Lewis & Clark. We take every step we can to improve the air quality through capital project improvement work. By providing clean, healthy air, we know we’re creating an environment that will help prevent illness and improve student wellness.”

— David Ernevad, Associate Vice President for Facilities, Lewis & Clark College

Project Overview



Building Type
Multi-use student center



Year Built
1956
(newly constructed 3rd floor)



Project Floor Area
6,370 sq. ft.



Energy Utility/Program
Portland General Electric / Energy Trust of Oregon



Reduction in HVAC EUI
58%*



Project Partners
Alliant Systems, LLC / Johnson Barrow Oregon

*Compared to a modeled code-minimum HVAC system.

High-performance HVAC offers sustained efficiency and comfort.

To achieve the highest standards of energy efficiency and building IAQ, Lewis & Clark College utilized high-performance HVAC equipment and design principles, including:

- **A DOAS approach** that decouples (i.e., separates) heating and cooling from the ventilation equipment.
- **High-performance electric heat pump** that meets ENERGY STAR® performance standards.
- **High-efficiency heat recovery ventilator (HRV)** that recovers more than 82% of the sensible heat from the stale indoor exhaust air, while delivering 100% fresh, filtered outdoor air at neutral temperatures to the building.
- **Right-sized heating and cooling equipment.**

Better HVAC creates an enhanced learning environment.

Despite being open 24 hours a day, 7 days a week, all year long, the Stephanie Fowler Student Center's very high efficiency DOAS approach has demonstrated remarkable indoor temperature consistency, maintaining a uniform 70 F setpoint across the past 10 months of monitoring. Regardless of the changing temperatures and weather conditions outside, students on the third floor of the student center know they can expect comfortable classrooms and common areas any time of year.

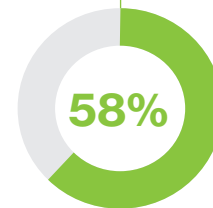
"Building users don't realize that the air is closely monitored to make sure air changes and temperature regulation holds closely within the parameter setpoints," said David Ernevad, Associate Vice President for Facilities at Lewis & Clark College. "The new system and its continuous air-quality monitoring has functioned flawlessly. It was easy to get the controls and indoor air experience right from the start, and it has functioned extremely well since installation, requiring very little effort from maintenance staff."

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HVAC Project Summary

Modeled Pre-Existing HVAC system:	Packaged Heat Pump Rooftop Unit (RTU)
New HVAC system:	Ducted VRF system 1 Ventacity VS3000RTh HRV



reduction in total HVAC energy use*

*Compared to a modeled code-minimum HVAC system.



Combining natural daylighting with the very high efficiency DOAS has provided a very fresh, healthy, and open feeling. And it's a real win-win to achieve this comfortable tempered space while also saving energy."

—David Ernevad, Associate Vice President for Facilities, Lewis & Clark College

Results

In addition to reducing overall building energy use, the new HVAC system offers a variety of benefits to building occupants and operators, including:

- **Better IAQ** due to filtered 100% outside air coming into the space, with less recirculation between rooms than a standard HVAC approach.
- **Increased occupant comfort** through improved temperature stability and the ability to create zones with unique temperature controls.
- **Increased occupant productivity.**
- **Reduced energy bills.**