



Gainesville, Florida

SIMPSON HALL UNIVERSITY OF FLORIDA

CHALLENGE

Selecting an efficient and customizable cooling and heating system

SOLUTION

Variable Refrigerant Flow (VRF) technology from Mitsubishi Electric

RESULT

An energy-efficient residence hall on campus, inspiring the construction of additional residence halls with VRF systems



For University of Florida alumni and residents, Gainesville, Florida, is affectionately referred to as “The Swamp,” but when it comes to the world of HVAC, such epithets are loaded with thoughts of high temperatures and muggy humidity. These were exactly the challenges faced when the university looked into renovating two residence halls: North Hall and Simpson Hall. Both buildings were products of the 1950s and only had the HVAC renovated once in the mid-70s – a project that equipped both buildings with chilled water systems for cooling and hot-water for heating. When the department of housing and residence education recently completed a second renovation to the 34,847-square-foot Simpson Hall, it selected Variable Refrigerant Flow (VRF) from Mitsubishi Electric.

At the time, Chad Doering, mechanical engineer and project manager for the Engineering team at Moses & Associates, Inc., Gainesville, was called in to specify the new HVAC systems. “We wanted to be able to dehumidify

and maintain indoor pressure, which was not something we were able to do well with the previous system.” Doering confirmed the benefits of VRF heat recovery systems by completing a lifecycle cost analysis for both North Hall – which included 96 tons of chilled water systems across 99 zones – and Simpson Hall – which included 130 tons of VRF over 143 zones.

Responding to humidity, Doering’s team needed to find a solution for pressurizing the building. He said, “We had been working with 100 percent dedicated outside air systems (DOAS) on the rooftop, but now we could use Mitsubishi Electric as a floor-by-floor solution. Each floor has its own outdoor unit.”

VRF also meant a cost-effective installation, averaging roughly \$30 per square foot and helping students to personalize their comfort. Doering said, **“This install covers 143 zones and if we wanted to give each student personalized control, we would have needed a branch controller for each**

zone – that’s 143 branch boxes. With Mitsubishi Electric, we only needed 15 boxes – and five of those were for the outdoor units.”

Additional cost savings have been achieved by selecting the heat recovery option: “The Mitsubishi Electric R2 model with heat recovery helps redirect heat for essentially free heating in certain modes of operation. It helps us to dehumidify and maintain the indoor pressure. At times, it’s so efficient that the outdoor fan is almost off completely.” Overall, energy costs for Simpson Hall were only \$1.93 per square foot, which is less than most other housing facilities on campus.

In the time since installation, Doering has moved even closer to the project, assuming the role of the school’s Assistant Director of Housing Energy Management. The University of Florida now has over 600 tons of Mitsubishi Electric products on campus. Some of that equipment is at Cypress Hall – a new residence hall with 223 zones, conditioned by 134 tons of Mitsubishi Electric VRF.

Despite being one of the largest residence hall construction projects on campus, the HVAC installation at Cypress Hall cost just \$26 per square

foot – besting Simpson Hall’s installation costs by an average of \$4.

The success of Simpson Hall – as a blueprint for retrofit projects – and Cypress Hall – as new construction – has presented VRF as the most practical solution for any of the university’s HVAC needs. Thinking back to that initial experience that set into motion the University of Florida’s continued use of VRF, Doering said, “Simpson Hall went from being one of our worst maintenance- and energy-performing buildings to one of our best. We were constantly trying to put bandages on our system before and we would always get service calls to the hall or complaints about it being too hot or too cold. All of those calls and complaints have gone away since the installation.”



“Being in Gainesville [Florida], we have to worry about high humidity and high temperature, so we want to be able to dehumidify and maintain indoor pressure, which was not something we were able to do well with our last system.”

— Chad Doering, assistant director of housing energy management, University of Florida

ENERGY SAVINGS WITH VRF OVER CONVENTIONAL OPTIONS

	Total Size	Annual Energy Cost	Cost
North Hall (chilled water)	21,066 ft ²	\$54,400	\$2.70/ft ²
Simpson Hall (Mitsubishi Electric VRF)	34,847 ft ²	\$67,283	\$1.93/ft ²
Average Total Savings Per Square Foot			\$0.77

PROJECT TEAM

Engineer:

Moses and Associates, Gainesville, Florida

EQUIPMENT

- ▶ (10) PURY R2-Series Outdoor Units
- ▶ (1) PCFY Ceiling-suspended Indoor Unit
- ▶ (5) PEFY CFM Dedicated Outside Air System Indoor Units
- ▶ (125) PKFY Wall-mounted Indoor Units
- ▶ (16) PLFY 4-Way Ceiling-recessed Cassette Indoor Units