

**PROJECT:**

Retrofit, Bronx Neighborhood  
Government Buildings

**LOCATION:**

Bronx, NYC

**THE TEAM:****MANUFACTURER REP:**

Wales Darby

**HVAC CONTRACTOR:**

DCAS in-house engineers

**HVAC DISTRIBUTOR:**

Johnstone Supply

**CHALLENGE:**

100 year old building with  
disjointed heating and cooling  
systems - comfort levels were low  
and energy expenses were high.

**SOLUTION:**

A variety of Airstage VRF and  
Halcyon mini-splits were used to  
replace a steam heating system.

**RESULT:**

50% energy savings. DCAS  
will continue making energy  
improvements with VRF systems  
city-wide.

## NEW YORK'S DCAS RETROFITS BUILDINGS CITY-WIDE

New York City's DCAS (Department of Citywide Administrative Services) has a relatively simple mission: to provide value-added and effective shared services to support the operations of New York City government.

But doing so is anything but simple.

DCAS' work encompasses everything from cyber security and real estate leasing to sales of NYC souvenirs; even the installation and service of large HVAC systems. Talk about a diverse mission! Fortunately, DCAS' 5,000+ employees possess very specialized skillsets.

"DCAS has been given an initiative to reduce energy consumption in their buildings across the city," said Chris Crean, at manufacturer's rep firm Wales Darby. "The organization operates more than 50 facilities, including courthouses, jails, offices and all sorts of public facilities."

In lock-step with New York's march toward electrification, NYSERDA (New York State Energy & Research Development Authority) has set an ambitious goal to reduce the 2025 energy-use forecast by 185 trillion BTUs. DCAS has begun a systematic program of installing high efficiency heat pump systems in facilities that will yield the greatest savings.

### IN-HOUSE MANPOWER

To date, DCAS has installed roughly 300 tons of VRF system capacity in buildings all across New York City's five boroughs. They're just getting started.

"We have our own HVAC stationary engineers on staff, and the crew is growing as we speak," said DCAS Energy Manager Daniel Donovan. "DCAS started installing mini-split heat-pump systems in single-room applications a few years ago. Our confidence in and familiarity with the systems has grown. We're now retrofitting buildings with VRF technology. Sometimes that includes whole-building HVAC, and other times it's only a portion of the facility."

Growth is due in part to relationships with Johnstone Supply, Wales Darby and Fujitsu General America, all of which have provided ample training and support. DCAS now even has their own VRF training facility. The goal is to create more stationary engineers and expand their ability to install and service VRF systems across the city.



## CASE STUDY

"As DCAS continues to prove to the mayor's office that they're reducing energy consumption, more funding is earmarked for upcoming projects," explained Crean. "There're numerous citywide efforts in place to curb energy spending, many of which compete for funding. By making incremental investments and weighing the returns of each project, the mayor's office and the Department of Energy get a real-world assessment of which avenues yield the highest returns."

Last year, three DCAS stationary engineers – Charlie Laidlaw, Anthony Peralta and Rocco Rinaldi – were awarded the DCAS Energy Champions Certificate that recognizes the high quality for their VRF installation work at the Bronx Neighborhood Government Building retrofit.



"The technology has proven itself," said Donovan. Being selective in regard to the buildings retrofitted, and taking training very seriously has been a big part of that successes we've had."

"DCAS manages many facilities in New York," Donovan continued. "When we consider and analyze buildings to provide the greatest benefit, we first look at the size of the building. If it's too big, it's a capital project, and beyond our ability to handle in-house. Then we look at the buildings with the worst energy performance, why they're underperforming, what time of year they're consuming too much energy, what fuel source is currently being used, and why it's consuming more energy than it should."

After that, DCAS experts turn their attention to project feasibility. Not every building is conducive to a retrofit – or at least a whole-building retrofit. For example, some sites aren't ideal to mount condensers. Some buildings present opportunities to improve only small areas. For example, DCAS has installed VRF systems in 12 elevator machine rooms across the city, most of which were previously cooled by



Ceiling cassettes were used throughout the Bronx Neighborhood Government building. This is in the Carriage House.

packaged or split systems.

### REAL WORLD SAVINGS

A substantial retrofit conducted by DCAS took place at the Bronx Neighborhood Government Building. The 100-year-old, three-story brick building houses the Bronx district attorney's office, a medical clinic and various other city agencies.

Previously served by an oil-fired steam heating system, a single rooftop unit and various, disjointed AC systems, comfort levels were low and energy expenses were high. The building was ideally suited for a VRF retrofit.

"Any time DCAS identifies a new application, I work through system designs with Dan Donovan, Charles Laidlaw, and VRF specialists at Johnstone Supply," said Crean. "We look at building needs and carefully consider all loads present within the space. I'll then speak with Fujitsu engineers to make sure we've considered everything and that we're supplying the best solutions. The Neighborhood

Building had a few unique design considerations.”

One of the biggest challenges faced there by DCAS was getting outdoor equipment onto the building’s roof. Rather than blocking the street with a crane, workers removed a skylight to hoist outdoor units through the opening.

The largest room in the building, an expansive conference space was previously served by a rooftop unit containing a DX coil and semi-hermetic compressor for cooling, and a gas-fired furnace. This did a poor job of responding to the fluctuating human load.

“The conference room is now one of nine VRF zones in the building,” said Laidlaw. “We installed three, three-ton ceiling cassettes. We’ve witnessed much better temperature modulation in response to quickly changing loads.”

Other zones in the building are served by a variety of indoor units. Two eight-ton, high-static air handlers are used, one on the first floor and one on the second. Two five-ton vertical air handlers condition various offices. Wall-mount units are used in a storage area and a custodian’s office.

“Standby heat loss from the old steam boiler used to keep the basement hot,” said Laidlaw. “So we installed a three-ton ducted unit to keep the space above freezing.”

In total, eight condensing units and 11 indoor units were used for 46 tons of capacity. Once eight of

the 11 VRF systems were running, work on the project was paused. From July through October of 2019, energy use data was collected.

**ELECTRIC AND OIL BILLS WERE COMPARED TO THE SAME MONTHS OF THE PREVIOUS YEAR, SHOWING A 34 PERCENT SAVINGS.**

“Because three units serving the first floor weren’t operational during the initial comparison period, we fully expect that the savings will be higher once collection of data includes the entire building – around 50 percent,” said Donovan. “All the units are now installed, we’re just waiting to connect power to the last few Airstage units.”

## GROWING WITH THE DEMAND

With resounding successes like the Bronx Neighborhood Building, there’s increasing demand (and funding) for DCAS to continue making energy improvements with VRF systems city-wide. The key limiting factor has been availability of manpower to install and service VRF systems. That’s

changing.

“We’ve partnered with Johnstone Supply and Fujitsu General America to train stationary engineers in order to expand our capability,” said Donovan. “They attend a variety of classroom training sessions, including Fujitsu factory training. This has increased the number of factory-certified staff, meaning that our installations qualify for extended warranties.”

DCAS has created a VRF training center located within the organization’s much larger Henry Chang Learning Center in Manhattan. Here, DCAS provides training specific to all of their operations.

“Our new VRF training center is now operational and expanding,” said Donovan. “Wales Darby helped us get a Fujitsu Airstage system for the training facility, which allows us to provide hands-on instruction. Trainees learn every aspect of VRF installation and service.”



A variety of Airstage VRF and Halcyon mini-splits were used by DCAS to replace a steam heating system

# CASE STUDY

The goal is to train four VRF stationary engineers per borough, or 20 total, in addition to two controls specialists.

"We're aggressively tackling retrofits with our existing crew," explained Donovan. "Until we have more trained staff, it's difficult to look too far ahead. Even so, we've identified a few large projects for 2020 and beyond."

Already on the horizon is the Long Island City Courthouse, in Queens, which will require 52 tons. Keeping the big stone building in operation may mean that the retrofit process could take as long as three years to complete. Also in Queens, DCAS is purchasing Airstage VRF equipment to retrofit eight server rooms.

"We've learned through DOE that the mayor's office is excited about what we're doing," said Donovan. "We have people in training already, so the future holds great potential."

## FUJITSU EQUIPMENT:

### MAIN BUILDING:

- (1) AOUA288RLBVG1 V-II Heat-Pump ODU
- (1) ARUH36TLAV High static pressure duct IDU
- (2) ARUH48TLAV High static pressure duct IDU
- (2) ARUV48TLAV Vertical Air Handler IDU
- (1) ARUH96TLAV High static pressure duct
- (1) UTY-DTGYZ1 Touch panel controller(Internet access)
- (5) UTY-RNRUZ2 Wired RC(Touch)
- (3) AOU60RLAVM J-II Heat Pump
- (2) ARUV60TLAV Vertical Air Handler
- (1) ARUH60TLAV High static pressure duct

### CARRIAGE HOUSE:

- (1) AOUA120RLBV1 V-II Heat-Pump ODU
- (2) ASUB24TLAV Wall Mount IDU
- (3) AUUB36TLAV Ceiling Cassette IDU
- (1) UTY-RNRUZ1 Wired Control



DCAS' Anthony Peralta checks an Airstage VRF system.



All facets of VRF installation are taught to DCAS employees at the Henry Chang Learning Center.

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