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Case Study – City of Charlotte

EDUCATION / HEALTH CARE / LODGING / MANUFACTURING / OFFICE BUILDING / RETAIL / SPECIAL



3V™ Packaged Control System

Project Objectives

The City of Charlotte Landscape Management Facility wanted to achieve the full benefits of recent renovations to its HVAC system. Despite recently installed equipment, the facility still wasn't able to obtain proper comfort for its tenants. The equipment wasn't operating at peak efficiency due to a problem with its controls. Additionally, the City wanted to add the ability to remotely monitor the building's HVAC system using the Internet. They turned to the experts — Carrier — who helped them get the most out of their system while adding the features they desired.

Precise Comfort with Carrier Controls

WITHOUT Carrier Controls
up to 5° variance



WITHOUT Carrier Controls
up to 5° variance

Solution

To deliver precise comfort and increase energy efficiency, Carrier's new 3V™ Packaged Control System with ComfortVIEW™ software was selected. Airflow was improved by installing 3V Universal Controllers on non-Carrier air handling units (AHUs) and 3V's VVT® Zone and Bypass controllers on the existing system dampers. To manage the boiler and water pump operation for the hot water heating coils supplying the AHUs, a Carrier controller was utilized. In the return duct system, CO₂ sensors were used to monitor the building's occupancy levels. Through Carrier internet-based technology and ComfortVIEW software, the City can now monitor and manage the building's HVAC system via their internal network and the web.

Before Carrier installed its 3V Packaged Control System, actual temperatures fluctuated up to five degrees of desired comfort level. Now, Carrier controls keep setpoints within three-tenths of one degree.



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Case Study – City of Charlotte *continued*

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"We're very pleased with the solution Carrier brought to the City's Landscape Management Facility. I like the system and it works very well."

Carlton Winter,
HVAC Controls
Technician,
City of Charlotte



Project Synopsis

Of the many attractive features that make Charlotte one of the nation's most livable cities, its climate and natural cityscapes rank among the highest. The responsibility of designing and maintaining the City's flora and fauna falls on the engineers, horticulturists and support staff who work in the City of Charlotte Landscape Management Facility. The 25-year-old structure serves both as office space and field equipment storage. In 2003 the building underwent extensive renovation, which included its HVAC system.

Shortly after the construction finished, the City of Charlotte's HVAC Controls Technician, Carlton Winter, began receiving complaints regarding uncomfortable temperature fluctuations from nearly all the employees working inside. "They were either too hot or too cold throughout any given workday," Winter explained. "And after a thorough on-site inspection, I knew that we had a bigger problem."

Along with comfort issues, the constant volume air handling equipment wasn't operating efficiently, causing undue wear on system elements as well as unnecessarily driving up the facility's energy usage and hence, operating costs. The latter issue was of particular concern as the City of Charlotte has a very aggressive program of facilitating efficient energy use by collecting and analyzing energy and operation data from all its municipal buildings on a regular basis.

It was then that Jeff Swiderski, Carrier Carolina's Commercial Controls Manager, stepped in. "I knew that while the building had non-Carrier equipment, our controls could solve their problems," Swiderski explained. To correct the problem, Carrier's new 3V Universal Controllers were installed on the facility's two AHUs which served both its core and perimeter zones. Carrier's VVT zone and bypass controllers were used on the existing zone and bypass dampers within the duct system. A new Carrier controller now manages the boiler and hot water pump operation for the hot water heating coils for both AHUs. CO₂ sensors were installed in the return duct system for monitoring the building's occupancy. To retrieve the system's operational information and generate managerial reports, Carrier's Data Collection module was utilized.

"Now, instead of the desired setpoint fluctuating as much as five degrees like it used to, our controls keep it within three-tenths of a degree," Swiderski said. "The employees are much more comfortable and the equipment is running more efficiently, from both an energy as well as a wear-and-tear perspective."

To complete the system, Carrier's internet-based technology and ComfortVIEW software allow the City to monitor and manage the building's HVAC system via their internal network or by using the World Wide Web. Including the City of Charlotte Landscape Management Facility, there are 55 municipal buildings utilizing Carrier equipment and controls.

Project Summary

Location: Charlotte, NC

Project Type: Controls replacement

Building Age: Approximately 25 years / Renovation in 2003

Building Type/Size: Approximately 18,000 sq. ft.

Building Usage: Office and field equipment storage

Objectives: Improve comfort, increase energy efficiency and provide remote access

Major Design Drivers: Must improve existing non-Carrier equipment's performance

Design Considerations: Must connect to existing non-Carrier constant volume system & AHUs, access via City's Intranet/Ethernet

Total Cooling (tons): 45

HVAC Equipment: (Existing non-Carrier) one 30-ton AHU, one 15-ton AHU, two boilers, two hot water pumps, 15 zone dampers

Unique Features: Carrier 3V Packaged Control System, ComfortVIEW software, Data Collection module and full web access.

Installation Date: August, 2004

Supplier: Carrier Carolina

For more information, contact your nearest Carrier Representative, call 1.800.CARRIER or visit our web site at www.commercial.carrier.com