

Case Study

HVAC System Gets New Life at Trinity College's Jacobs Life Science Building

The Assessment

Forty years after its installation in 1967, the Heating, Ventilation and Air Conditioning (HVAC) system serving the 73,000 sq. ft. Jacobs Life Science Building at Trinity College was aging and operating poorly. Facilities managers sought to replace the pneumatic control system with modern Direct Digital Control (DDC).

As a science building, there are secure areas where researchers keep mice, rats, snakes etc. The sensitive environmental needs of the animals including light and sound levels are paramount.

The Resolution

TNE presented Trinity's Facility Managers with a menu of options and associated costs.

The decision was made to:

- replace the original terminal boxes with new pressure independent variable air volume boxes;
- replace the pneumatic control system with DDC and connect it to the campus wide, American Auto-Matrix brand Building Automation System (BAS);
- refurbish the custom built air handlers with new dampers and valves are controlled by the new DDC system;
- repair, replace or refurbish other systems and components as needed to bring the building up to standard.



Cramped work area above ceiling—new VAV, control valve and actuator

Typical work area where there could be no collateral damage to equipment / fixtures



Highlights

Criteria

- Absolutely no contamination of labs or offices during work
- Control of lab environment to support research projects
- Eliminate the pneumatic control system
- Eliminate splined ceilings where possible
- Meticulous planning of ceiling demo, asbestos abatement, equipment installation and ceiling replacement
- 7 Air Handlers
- 104 VAV's
- 2 Fan Coil Units
- 9 Exhaust Fans
- 2 Heat Exchangers

Results

- Minimum occupant impact
- Control of environment maintained
- Professional installation
- Maximum reliability
- Seamless integration of automation controls
- Satisfied occupants and facilities personnel

SERVICES PROVIDED

- ✓ Engineering
- ✓ Installation
- ✓ Service
- ✓ Automation
- ✓ Project Management

Project Challenges & Resolutions

All projects have their unique challenges, and this project was no different. At TNE we take pride in our ability to affect a speedy resolution.

Challenge Number 1 – Work Above the Ceiling

The majority of the work was performed above various types of ceilings with minimal clearances.

Resolution Number 1

TNE performed all of the mechanical, electrical, and control work on its own and also coordinated the ceiling demolition and installation as well as asbestos abatement on behalf of the college.

Challenge Number 2 – Pump Undersized

During the commissioning of the new system, TNE discovered that the existing hot water heating pump serving the re heat coils had been changed from the original pump and had not been capable of supplying enough water to the reheat coils.

Resolution Number 2

TNE then selected and installed the correct pump and the coils are now operating as designed.

Challenge Number 3 – Custom Air Handlers—Not an inch to spare

The mechanical penthouses are part of the architecture; the air handlers are entombed in the upper part of the towers along the front of the building with access from the roof.

Resolution Number 3

TNE rose to the challenge and refurbished these units with new dampers and valves all controlled by the new DDC system.



Rooftop
Mechanical Access



Tech working in cramped space



Typical installation of new damper and actuators with tight access

The Client Trinity College, Hartford, CT

Science Department Mission

Our science students are offered a wealth of curricular opportunities across disciplines, from biology and neuroscience to environmental science and engineering, so that they gain both a broader understanding of scientific activity and the chance to engage in research early in their careers.

Feedback from Trinity College

Jim Egan, Trinity's Assistant Plant Engineer, once said prior to this project that the HVAC system in the Jacobs Life Science Building was in serious need of improvement. TNE's efforts eliminated this situation.

Plant Engineer Ezra Brown relayed that this was a difficult project to execute and not disrupt the occupants or their studies. I had more feedback from the staff regarding the theory behind the project rather than complaints about TNE's work and impact.