

Replacing 39 Obsolete HVAC Units for Increased Energy Efficiency & Control



Industry analysts estimate that half of the commercial rooftop HVAC equipment in the U.S. is outdated, exceeding the 15- to 20-year lifespan recommended by ASHRAE. Replacing such systems offers benefits like enhanced energy efficiency, reduced utility costs, improved reliability, superior indoor air quality, and modern features like smart controls. Additionally, these upgrades qualify for utility provider incentives.

This case study profiles a forward-thinking K-8 school system in Illinois that undertook a comprehensive upgrade of its HVAC systems to enhance energy efficiency, lower costs, and improve comfort levels at its 100,000-square-foot facility.

Project Objectives



The school system aimed to replace 39 rooftop HVAC units, most over 20 years old, with the following objectives:

- Enhance energy efficiency to cut utility costs.
- Qualify for energy rebates and incentives.
- Provide temperature controls for individual classrooms.
- Replace non-compliant R-22 refrigerant with A2L.
- Complete installation over the summer for the Fall school opening.

Solution Overview



The school engaged a leading design/build performance contractor, with PremiStar as its mechanical contractor. Zach Glover, PremiStar’s VP of Construction, collaborated with the school facilities manager and performance contractor on each stage of the project, from assessment and system design to equipment selection, permitting, scheduling, installation, testing, and commissioning.

To accomplish its objectives, the facilities operations team approved the following upgrades to HVAC infrastructure:

- **Rooftop HVAC Units:** Installation of 39 ultra-high efficiency rooftop units using A2L refrigerant, ranging from 3 to 20 tons.
- **Ductwork:** Replacement of existing ductwork to boost energy efficiency and indoor air quality.

Solution Overview

Continued



- **VAV:** Installation of 47 variable air volume (VAV) units for the regulation of individual classroom temperatures.
- **Piping:** Replacement of gas piping to enhance safety, efficiency, regulatory compliance, and cost savings.
- **Air Filtration:** Deployment of MERV 13 air filtration units to capture airborne particles, improving air quality and protecting HVAC components.
- **Controls:** Installation of building automation controls to maximize efficiency and reduce operating costs.

Installation Process



Following the planning and design phase, the PremiStar team began coordination of the complex logistics involved in the installation process. On June 25th, four semi-trucks transported the HVAC units to the school parking lot. A team of 24 technicians, using a heavy-lift construction helicopter, successfully installed 39 new units and removed the old units in 90 minutes, efficiently managing both installation and removal to minimize project costs. Over the following two weeks, the team replaced ductwork, connected electrical and gas services, and performed start-up and commissioning.

Customer Benefits



Installation of the new, ultra-high-efficiency rooftop HVAC units and associated system upgrades resulted in the following benefits:

- **Schedule:** The project was completed in two months and was operational before the start of the Fall semester.
- **Energy Savings:** The school anticipates 30% annual savings in heating and cooling costs.
- **Comfort:** Improved control over classroom temperatures and air quality, and enhanced comfort for staff and students.
- **Project Cost & ROI:** Utility rebates reduced the total project cost by 35%, resulting in an estimated 5-year payback period.

Key Takeaways

This project highlights the significant advantages of updating HVAC systems, demonstrating how strategic planning and collaboration with leading partners can yield substantial energy efficiency and financial savings while improving building comfort, indoor air quality, and compliance with environmental regulations.

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