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Case Study – Monroeville Mall

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



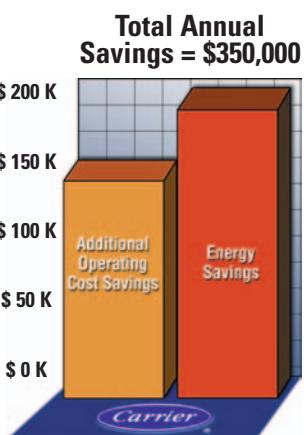
Mall Shops For Savings & Wins Big With Carrier

Project Objectives

The Monroeville Mall was heating and cooling 1.2 million sq. ft. of retail space with aging equipment that operated at less than optimal efficiency. What's more, the chillers used ozone-depleting R-11 refrigerant, which is scheduled for phase-out. Mall management wanted to upgrade the building's infrastructure to improve energy efficiency, but the project had to be cost-effective, with significant operating cost savings and a quick payback. In addition, the work had to be carried out without disruption to the mall's tenant stores or inconvenience to shoppers.

Solution

Carrier implemented a comprehensive upgrade resulting in energy savings of nearly \$200,000 per year and additional annual operating cost reductions estimated at more than \$150,000. The existing R-11 chillers were replaced with energy-efficient Carrier centrifugal units using chlorine-free R-134a. Three high-efficiency gas-fired hot water boilers were installed, requiring a conversion from electricity to gas. The pumping system was redesigned, with new pumps and variable frequency drives (VFDs) for energy savings. A lighting retrofit further reduced electrical consumption and contributed to the significant overall savings. The project was completed with uninterrupted chiller plant operation and no disruption of services to tenants.



Carrier's infrastructure upgrade dramatically cut costs, with \$193,000 in energy savings and more than \$150,000 in other operating cost reductions — for total savings of about \$350,000 annually.



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Case Study – Monroeville Mall continued

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"If anything, Carrier's estimates of our savings from this project were conservative. They delivered everything they promised and we had noticeable cost reductions as soon as we switched over to the new equipment. The installation went smoothly, everything is working well and the Carrier team is still on hand whenever we need anything."

Rick Little,
General Manager,
Turnberry Associates

Project Synopsis

The two-story Monroeville Mall in Monroeville, PA houses 1.2 million sq. ft. of retail space. In addition to providing conditioned air to the mall, the building's HVAC plant provides chilled water to the adjacent Pittsburgh Expo Mart conference center, and hot water to Expo Mart and the Radisson Hotel. With older HVAC equipment and R-11 refrigerant scheduled for phase-out, the 23-year-old building had potential for significant improvements. Mall management was looking for an infrastructure upgrade proposal that would provide substantial operating cost savings and a quick payback. It was also essential that any work be carried out with no inconvenience to tenants and shoppers.

Carrier experts performed a comprehensive building evaluation, focusing on opportunities to improve efficiencies and reduce electrical consumption. Their proposal included replacing the existing chillers with energy-efficient Carrier 19XR centrifugal chillers using non-ozone depleting R-134a refrigerant, and converting to gas-fired hot water boilers. The pumping system was redesigned and replaced with primary and secondary loops, and included the addition of VFDs to conserve energy. Also included was a retrofit of the mall's public-space lighting fixtures. The project would yield savings of more than \$350,000 per year: energy savings of nearly \$200,000 and over \$150,000 in maintenance and repair savings and utility rate reductions.

Working closely with mall personnel throughout the planning and installation, Carrier staged the project so that conditioned air was delivered to the mall at all times. "We installed and commissioned one chiller at a time, while the other two continued to run," said Steve Svoboda, Carrier Account Executive. "When the secondary pumps and piping were installed, we switched over quickly during the low load winter months."

"It was critical that the work not disrupt normal mall operations," said James Fallucco, Carrier Project Manager. "As far as the tenants and the public were concerned, Carrier was invisible."

In addition to the new equipment, Carrier installed its Chillervisor chiller controller, a data collection module, and ComfortVIEW™ control software. The upcoming second phase of the project will add a complete direct digital controls (DDC) system to fine-tune the delivery of conditioned air to precisely match changing building conditions. This will further reduce energy use and operating costs, improving profitability, while enhancing comfort for mall shoppers.

Project Summary

Location: Monroeville, PA

Building Age: 23 years

Project Type: Retrofit

Building Type/Size: Brick & block/Two-story, 1.2 million sq. ft.

Building Usage: Shopping mall

Total Cooling (tons)/Type of Refrigerant: 3,300/R-134a

HVAC Equipment: Three 1,100-ton model 19XR chillers; Chillervisor; ComfortVIEW

Objectives: Upgrade infrastructure for increased efficiency and cost savings; use non-ozone depleting refrigerant

Major Decision Drivers: Carrier expertise; comprehensive, solid proposal showing significant cost savings

Design Considerations: Non-ozone depleting refrigerant; complete work with no disruption of services

Unique Features: Work completed with no interruption of conditioned air delivery to the mall and adjacent conference center and hotel

Project Cost Range:
\$1 million to \$5 million

Installation Date:
December, 2000

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