



CASE STUDY



The Washington Library

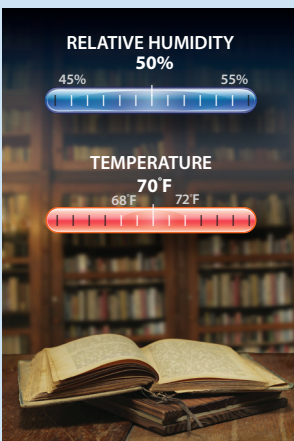
PRICELESS PAPERS SAFEGUARDED WITH OPTIMAL EFFICIENCY AT GEORGE WASHINGTON'S MOUNT VERNON

Project Objectives

The Fred W. Smith National Library for the Study of George Washington, located at George Washington's Mount Vernon, was built in 2010-2013 to extend education about Washington's life, achievements and character to the whole world. The library safeguards Washington's books, manuscripts and related papers, and provides educational outreach and scholarly residency programs. During the design process, the Mount Vernon Ladies' Association, a private non-profit organization that owns and operates the historic property, anticipated that the Washington Library would require a state-of-the-art heating, ventilation and air conditioning (HVAC) system in order to protect the thousands of eighteenth and nineteenth century books and papers in the collection. The Association also sought the most efficient solution that would meet the diverse needs of different areas of the new library.

"The [Carrier AquaSnap® 30MPW] reheat chiller in the library complex was a new concept for us, but we have been amazed by its great performance and efficiency."

– Joe Sliger, Vice President, Operations & Maintenance, George Washington's Mount Vernon



Thousands of eighteenth and nineteenth century books and papers at the Washington Library are protected by a precisely controlled yet highly efficient climate system, including a Carrier AquaSnap® 30MPW Reheat Chiller and Aero® 39MN air handlers.

Project Solution

With its specialized installation experience and technical expertise with heating, ventilation and air conditioning (HVAC) projects in historic buildings, Carrier was selected by the Mount Vernon Ladies' Association to assist in the development of the HVAC system for the new library. The Washington Library system includes a Carrier AquaSnap® 30MPW heat recovery chiller and three Carrier Aero® 39MN air handlers. The AquaSnap chiller operates in conjunction with a dry cooler to capture and re-purpose heat from the refrigerant coils in order to provide economical heating during those times of year when cold weather demands heating in some areas of the building, yet occupancy produces sufficient humidity to require simultaneous cooling. The AquaSnap chiller also provides emergency backup cooling for the priceless artifacts in the Rare Books Room; and can provide efficient cooling as needed during low-load conditions, such as overnight hours. Meanwhile, two of the air handlers deliver cooling to common areas of the library, such as the classrooms and lecture hall, while the third unit is equipped with special carbon filters to protect artifacts in the special collections area by removing potentially harmful substances from the air.



Synopsis

The Fred W. Smith National Library for the Study of George Washington, located at George Washington's Mount Vernon, was built in 2010-2013 to extend education about Washington's life, achievements and character to the whole world. The 45,000 ft² (4,180.6 m²) library safeguards Washington's books, manuscripts and related papers, and provides educational outreach and scholarly residency programs. The facility contains spaces—such as the Reading Room, Rare Books Vault, Rubenstein Leadership Hall and DeVos House Scholars' Residence, as well as classrooms and supporting offices—all with differing indoor air quality needs. During the design process, the Mount Vernon Ladies' Association, a private non-profit organization that owns and operates the historic property, anticipated that the Washington Library would require a state of the art heating, ventilation and air conditioning (HVAC) system in order to protect the approximately 1,500 eighteenth century books and thousands of nineteenth century documents in the collection. Naturally, the Association also sought the most efficient solution that would meet the various needs of the different areas in the new library.

Carrier has specialized installation experience with heating, ventilation and air conditioning (HVAC) projects in historic buildings. Due to this, coupled with their technical expertise, the Mount Vernon Ladies' Association selected Carrier to assist in the development of the HVAC system for the new library. The Washington Library HVAC system features a 45-ton Carrier AquaSnap® 30MPW heat recovery chiller and three Carrier Aero® 39MN air handlers.

The AquaSnap 30MPW water-cooled package chiller has a compact design that makes it highly adaptable in both retrofit and new construction projects. The 30MPW is a high-efficiency scroll chiller with a built-in energy management module to minimize energy consumption. The AquaSnap 30MPW chiller at the Washington Library serves multiple functions. First, it operates in conjunction with a dry cooler to capture and re-purpose heat from the refrigerant

coils in order to provide economical heating during those times of year when cold weather demands heating in some areas of the building, yet occupancy produces sufficient humidity to require simultaneous cooling. In addition, the 30MPW chiller offers emergency back-up cooling for the priceless artifacts in the Rare Books Room, and can also provide efficient cooling during low-load conditions, such as overnight hours.

Vincent Gusmano, Senior Sales Engineer at Carrier, said, "The AquaSnap 30MPW chiller enhances energy efficiency and lowers utility costs by redirecting heat from the dry cooler to the facility's heating loop. When it's winter outside, yet indoor occupancy conditions demand air conditioning for humidity control, the AquaSnap chiller captures the waste heat from the cooling system to deliver economical occupant comfort."

The 39MN air handlers were an indoor-installation—a necessity for historic properties where maintaining original exterior appearance is essential. They are ideally suited to special installations because they can be customized with several filtration options and ultraviolet B and C germicidal lamps according to specific facility requirements. One of the 39MN air handlers at the Washington Library integrated carbon filters to remove any gases that might damage the rare books, while standard filtration units cool common areas of the library, such as the classrooms and lecture hall. The 39MN air handlers were also well suited to this project because of their reliability, quiet operation and ease of maintenance.

Joe Sliger, Vice President, Operations & Maintenance at George Washington's Mount Vernon, said, "We are very pleased with our Carrier equipment. The reheat chiller in the library complex was a new concept for us, but we have been amazed by its great performance and efficiency."

Project Summary

LOCATION: Mount Vernon, VA

PROJECT TYPE: New Construction

BUILDING SIZE: 45,000 ft² (4,180.6 m²)

BUILT: 2013

BUILDING USAGE: Archive and education

OBJECTIVES: Protect priceless books and papers; provide high efficiency space conditioning to disparate library areas

EQUIPMENT: AquaSnap® 30MPW chiller, Aero® 39MN air handlers (3)

MAJOR DECISION DRIVERS: Carrier selected because of expertise with historic projects, plus state-of-the-art capabilities of equipment

UNIQUE FEATURES: One air handler equipped with carbon filters to protect rare books from degradation; chiller reclaims heat from dry cooler to building heating loop for economical heating during simultaneous heating/cooling season

INSTALLATION DATE: 2013

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