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Case Study – Lincoln Home

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



Carrier Provides Preservation, Comfort at Historic Lincoln Home

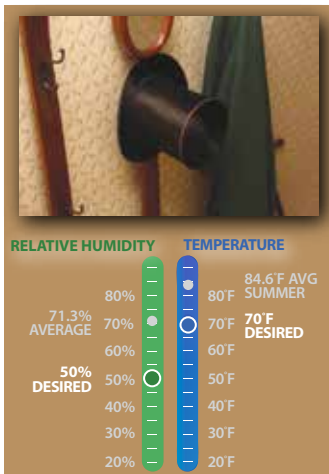
OBJECTIVES:

The Lincoln Home National Historic Site in Springfield, Illinois, preserves the house where Abraham Lincoln and his family lived for 17 years prior to his election to the presidency of the United States. The Lincoln Home provides an educational experience for more than 200,000 visitors a year, in addition to preserving numerous historical furnishings and artifacts associated with Lincoln. The Carrier heating, ventilation and air conditioning (HVAC) system at the facility had been in service for 25 years, longer than its expected lifetime, so the facilities staff sought to replace it.

SOLUTION:

The National Park Service, which manages the Lincoln Home site, called on Henson Robinson, a Springfield-based Carrier contractor with expertise in historical sites, to modernize the system. Without disrupting visitors, the contractors removed the old equipment and replaced it with a Carrier AquaSnap® 30RA chiller and an Aero® 39M air handler. The air handler was installed in the basement of the historic home, while the chiller was placed in an outbuilding that also serves as a warehouse for artifacts not currently needed for display. The buried coolant loop that connected the original chiller and air handler was also updated, necessitating the services of an archeologist to oversee the digging in the yard.

Carrier Chiller and Air Handler Retrofit Provide Precise Humidity and Temperature in Historic Home



A Carrier AquaSnap® 30RA chiller and Aero® 39M air handler deliver preservation conditions and occupant comfort to the Lincoln Home National Historical Site, which receives 200,000+ visitors a year. The Springfield, IL, location averages summer temperatures of 84.6° F, with 71.3 percent relative humidity.



Case Study – Lincoln Home



“The project was important because it allowed us to accomplish one of our primary goals, which is the long-term protection of the Lincoln Home for future generations.”

--Dale Phillips, Superintendent,
Lincoln Home National
Historical Site

SYNOPSIS:

The Lincoln Home National Historic Site in Springfield, Illinois, has a mission to preserve, protect and interpret the house where Abraham Lincoln and his family lived for 17 years prior to his election to the presidency of the United States. The Lincoln Home, which emphasizes the relevance of Lincoln’s life to people living today, provides an educational experience for more than 200,000 visitors a year, in addition to preserving numerous historical furnishings and artifacts associated with Lincoln. Historical accuracy and period-appropriate appearance are important goals for the facility, which replicates the home’s appearance in 1860, when the Lincolns moved to Washington, D.C.

Since Willis Carrier did not invent modern air conditioning until 1902, several decades after Lincoln’s lifetime, the original Carrier heating, ventilation and air conditioning (HVAC) system at the home was cleverly concealed in order to provide appropriate conditions while hiding any traces of the modern air delivery system, which is located in the security railings. This existing HVAC system had been in service for 25 years, longer than its expected lifetime, so the facilities staff sought to replace it.

Dale Phillips, Superintendent at the site, said, “The project was important to the Lincoln Home National Historical Site because it allowed us to accomplish one of our primary goals, which is the long-term protection of the Lincoln Home and its contents for future generations.” The National Park Service, which manages the Lincoln Home site, called on Henson Robinson, a Springfield-based Carrier contractor, to upgrade the system.

The Lincoln Home remained open to the public while renovations took place. Working in the basement and yard, Henson Robinson disassembled and removed the old HVAC equipment and replaced it with a Carrier AquaSnap® 30RA air-cooled chiller and an Aero® 39M air handler. The air handler was installed in the basement of the historic home, while the chiller was placed in a modern but period-designed outbuilding that also serves as a warehouse for artifacts not currently needed for display. The buried coolant loop that connected the original chiller and air handler was also updated, necessitating the services of an archeologist to oversee the digging in the yard, in case the contractors found any historical objects.

The Aero 39MN air handler includes an electric heater, so the unit is able to provide both heating and cooling to the Lincoln Home. In an interesting adaptation, fresh air enters the system via dampers in an old chimney. Two dehumidifiers and a steam-powered humidifier serve to keep the relative humidity at the target 50 percent ideal for both human health and artifact preservation. In the hot and humid summer months typical of Springfield, the AquaSnap 30RA chiller provides additional cooling capacity by sending chilled water to the air handler via the loop buried under the yard.

Mark Patrick, Project Manager for Henson Robinson, said, “It was an interesting challenge to perform this installation with a minimum of disruption to the visitors and staff. The components of the air handler had to be delivered through a standard three foot wide door, and we could not so much as drill a hole without permission from the staff. However, the project was very successful, and we believe our founder, Henson Robinson — who himself was a neighbor of Lincoln’s and provided cutlery for the Union Army during the Civil War — would have been proud.”

Project Summary

Location: Springfield, IL

Project Type: Retrofit

Building Size: 12-room, two-story home

Built: 1839

Building Usage: Historical preservation, education

Objectives: Replace original heating, ventilation and air conditioning (HVAC) system to maintain artifact preservation and visitor

comfort; do not disrupt visitors; maintain period appropriate appearance of home.

Equipment: Carrier AquaSnap® 30RA chiller; Aero® 39M air handler

Total Cooling Tons: 10

Major Decision Drivers: Original Carrier HVAC system had outlived expected lifetime, and had been reliable. Carrier has expertise in historic and preservation-oriented installations.

Unique Features: Renovations conducted while Lincoln Home was open to visitors; work did not disrupt visitor experience. Chiller located remotely due to confines of original home basement.

Installation Date: 2014