Protecting The Phillips Collection

Thermal Upgrade Enhances Historical D.C. Building

By Steven Gillis

A comprehensive upgrade to The Phillips Collection's historical house gallery in Washington, D.C., has provided the museum with a state-of-the-art digitized temperature and humidity control system designed to enhance visitor comfort and protect the art collection for future generations. The project was completed in June 2018, well in advance of The Phillips Collection's centennial in 2021. Although galleries within the house were closed, the museum remained open during the renovation, providing access to collections as well as to a full complement of programs.

A Distinctive Setting

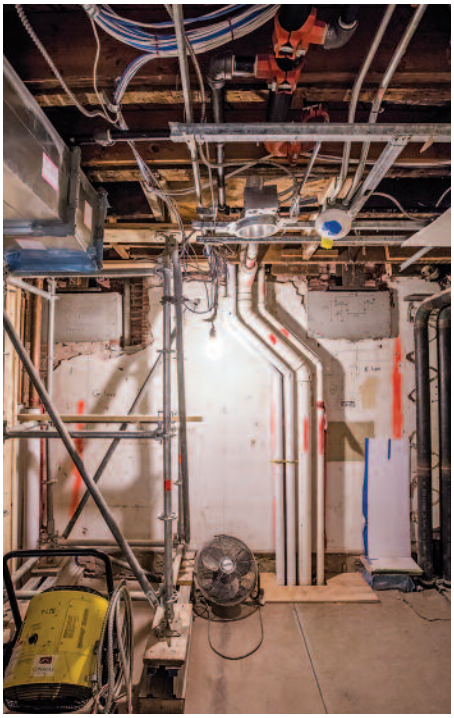
The Phillips Collection, known as "America's First Museum of Modern Art," is located in the Dupont Circle neighborhood of northwest Washington, D.C. The museum houses paintings by Pierre-Auguste Renoir, including the iconic *Luncheon of the Boating Party*, as well as works by Mark Rothko, Paul Cézanne, Pierre Bonnard, Claude Monet, Edgar Degas, Paul Klee, Georgia O'Keeffe, Vincent van Gogh, Richard Diebenkorn, and many other notable Impressionists and contemporary artists.

The Phillips Collection maintains three connected buildings—the Sant Building, the Goh Annex, and the circa-1897 Georgian Revival home of museum founder Duncan Phillips—in addition to a former carriage house now converted into the University of Maryland Center for Art and Knowledge at The Phillips Collection. The renovation project primarily focused on the original, four-story house, which has served as the museum's home since it opened in 1921. Here, dated building systems were replaced with energy-efficient new systems that will improve temperature and humidity control, create zone-based flexibility, and minimize long-term maintenance.

Upgrading Temperature and Humidity Control

Highlights of the renovation included equipping the gallery and related support spaces with modern, energy-efficient HVAC systems, including a 100% outside air-handling system with an exhaust-air energy-recovery wheel. The system serves multiple variable-volume air-handling units that provide conditioned air to new direct digital-controlled, zone-level, air-terminal units. The major HVAC systems and related air-terminal units are located in a new architectural penthouse that removed the original roof structure and associated roof-mounted HVAC systems.

A new, architecturally screened, high-efficiency chiller fitted with sound-attenuating components was also provided. The chiller is sized for the full load of the Phillips house and will serve as a back-up to the chiller plant on the roof of the Goh Annex. A pair of new, high-efficiency, condensing hot-water boilers with heating water pumps are also located in the new penthouse.



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New HVAC systems being installed.

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Upgrade in process at the Phillips house.

The new air-terminal units with hot-water reheat coils provide individual zone control, and were connected to existing duct distribution systems to the fullest practical extent, while new supply grilles and return grilles were added to improve air distribution. The air-handling units serving the gallery spaces are fitted with modulating humidifiers served by a new treated-water system.

A new building automation system has also been provided to serve the Phillips house systems, and has been integrated into the existing system in the Goh Annex and Sant building. Additional upgrades included modifications to the existing fire suppression, fire alarm, electrical power, lighting, and plumbing systems to suit the renovation requirements.

A Team Effort

The mechanical, electrical, and plumbing engineering firm of Mueller Associates supported Bowie Gridley Architects on the project, coordinating closely to ensure that the historical character of the building was not compromised. Existing drawings lacked detail and challenged the design and construction team to route the new systems to suit the existing and variable structural features of the original building. The team's use of Revit® software for the 3-D building model facilitated the design development and coordination of the disciplines as the project progressed.

Bowie Gridley Architects' design of a mansard-style, copper-shingle-clad rooftop penthouse received neighborhood support and the approval of the D.C. Historic Preservation Review Board. The new penthouse encloses the majority of the new mechanical equipment and zone reheat coils and humidifiers, which is a vast improvement over the original system with rooftop air-handling units, exposed ducts above the roof that hindered personnel access, and zone-level reheat coils and humidifiers above the ceilings of the historical building. Improved staff administrative support space was created on the top floor below the new penthouse.

The team also included Consigli Construction, a construction management firm that has renovated many American museums along the East Coast; Simpson Gumpertz & Heger Inc. for structural engineering; and JM Zell Partners as the owner's representative. Understanding the historical character of this project, the team worked very closely to reconcile hidden and unforeseen conditions that were discovered as the solid finishes of this historic structure were unveiled.

"Doing this important work in advance of the museum's centennial lays the groundwork to improve the visitor experience and ensure the preservation of the collection for future generations of art lovers and enthusiasts," said Thomas D. Rutherfoord, Jr., trustee and chair of the buildings and grounds committee for The Phillips Collection.

Steve Gillis, PE is a vice-president with Mueller Associates. He served as project manager for the mechanical, electrical, and plumbing services for the renovation.

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Roof-mounted HVAC systems being installed.