



JLL completes retrofit of all 6,514 windows at Empire State Building

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Jones Lang LaSalle (JLL) has completed retrofitting all 6,514 windows at the Empire State Building as part of its work as program manager of the property's \$550 million upgrade initiative. Retrofitting all the windows was one of eight components of the building's energy and sustainability retrofit program that was launched this past year to reduce total energy usage at the landmark.

Retrofitting the more than 6,500 thermopane windows at the Empire State Building entailed adding new components to the glass and sashes to create triple-glazed insulated panels that reduce summer heat load and winter heat loss. The groundbreaking process reused 96% of the existing glass and frames, and retrofitting the windows alone is expected to directly reduce building energy costs by more than \$400,000 annually.

The JLL team overseeing the assignment was led by Raymond Quartararo, international director, with the company's New York office. The company's work on the energy and sustainability retrofit program was led by Dana Robbins Schneider, VP and northeast market lead for Energy and Sustainability Services, also with the firm's New York office.

"The decision to retrofit the windows at the Empire State Building rather than replace them was truly innovative, as this approach had never before been attempted," said Schneider. "We were able to re-use in excess of 96% of the existing materials in the windows while more than doubling their overall performance. In addition, the expense of retrofitting the windows at the Empire State Building was nearly 70% less than it would have cost to replace them outright. We hope this project will encourage and motivate other building owners to consider retrofitting their windows to improve overall building performance."

The Empire State Building's energy retrofit project was announced in April 2009 by Anthony Malkin, owner of the Empire State Building Co., along with the Clinton Climate Initiative, Johnson Controls, JLL and the Rocky Mountain Institute. The initiative partners also offered the Empire State Building as a template to retrofit existing, older structures throughout the country with energy efficient infrastructure, equipment and operation strategies.

When the retrofit program is complete, the landmark building is expected to reduce total energy usage by more than 38 percent, energy costs by \$4.4 million annually, and carbon emissions by 105,000 metric tons over the next 15 years. The project overall is estimated to create more than 140 direct and indirect jobs.

JLL was selected as program manager by the Empire State Building in 2006 to oversee its overall capital improvement program, which includes the energy and sustainability retrofit program. The effort was designed to facilitate traffic flow, enhance security, improve visitor queuing areas and restore the splendor of the building's historic Art Deco finishes. The work also included renovation of the 86th and 102nd floor observatories.

Other elements of the energy retrofit include:

Radiator Insulation Retrofit - Added insulation behind radiators to reduce heat loss and more efficiently heat the building perimeter.

Tenant Lighting, Daylighting and Plug Upgrades - Introduction of improved lighting designs, daylighting controls, and plug load occupancy sensors in common areas and tenant spaces to reduce electricity costs and cooling loads.

Air Handler Replacements - Replacement of air handling units with variable frequency drive fans to allow increased energy efficiency in operation while improving comfort for individual tenants.

Chiller Plant Retrofit - Reuse of existing chiller shells while removing and replacing "guts" to improve chiller efficiency and controllability, including the introduction of variable frequency drives.

Whole-Building Control System Upgrade - Upgrade of existing building control system to optimize HVAC operation as well as provide more detailed sub-metering information.

Ventilation Control Upgrade - Introduction of demand control ventilation in occupied spaces to improve air quality and reduce energy required to condition outside air.

Tenant Energy Management Systems - Introduction of individualized, web-based power usage systems for each tenant to allow more efficient management of power usage.

As part of the energy retrofit Jones Lang LaSalle oversaw a highly collaborative team that conducted an innovative process for analyzing and retrofitting existing structures for environmental sustainability. The program is the first comprehensive approach utilizing an existing building to model steps for the reduction of energy consumption, and to share details of the team's findings to create a replicable model for similar projects around the world.

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The retrofit for greater energy efficiency carried an incremental cost of approximately \$20 million over the previously planned building renovations, taking into account savings from redirected expenditures and additional alternative spending in tenant installations. Although current funding is sufficient to cover the cost of the initiative, alternatives are being explored to gain lower-cost financing based on annual energy savings in excess of \$4 million when implementation is complete.

The window retrofit project, along with other details of the sustainability initiative, are showcased in the Empire State Building's recently unveiled \$2.0 million, multi-media sustainability exhibit in its world famous Observatories' second floor visitors center. The exhibit is open seven days a week from 8 a.m. to 2 a.m. For more information on the Empire State Building's sustainability initiative and the window retrofit, visit www.esbsustainability.com.

About the Empire State Building

Soaring 1,454 feet above Midtown Manhattan, the Empire State Building is the "World's Most Famous Office Building." With new investments in infrastructure, public areas and amenities, the Empire State Building has attracted first-rate tenants in a diverse array of industries from around the world. The skyscraper's robust broadcasting technology supports all major television and FM radio stations in the New York metropolitan market. The Empire State Building was named America's favorite building in a poll conducted by the American Institute of Architects. The Empire State Building Observatory is one of the world's most beloved attractions and is the region's #1 tourist destination. For more information on the Empire State Building, please visit www.esbnyc.com.

About Johnson Controls

Johnson Controls is a global diversified technology and industrial leader serving customers in over 150 countries. Our 130,000 employees create quality products, services and solutions to optimize

energy and operational efficiencies of buildings; lead-acid automotive batteries and advanced batteries for hybrid and electric vehicles; and interior systems for automobiles. Our commitment to sustainability dates back to our roots in 1885, with the invention of the first electric room thermostat. Through our growth strategies and by increasing market share we are committed to delivering value to shareholders and making our customers successful.

About the Clinton Climate Initiative

The William J. Clinton Foundation launched the Clinton Climate Initiative (CCI) to create and advance solutions to the core issues driving climate change. Working with governments and businesses around the world to tailor local solutions that are economically and environmentally sustainable, CCI focuses on three strategic program areas: increasing energy efficiency in cities, catalyzing the large-scale supply of clean energy, and working to measure and value the carbon absorbed by forests. In each of these programs, CCI uses a holistic approach to address the major sources of greenhouse gas emissions and the people, policies, and practices that impact them. CCI serves as the action arm of the C40, an association of large cities around the world that have pledged to accelerate their efforts

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to reduce greenhouse gas emissions, and of which New York is a member. To learn more about the work of the Clinton Climate Initiative and the William J. Clinton Foundation, please visit www.clintonfoundation.org.

About Rocky Mountain Institute

Rocky Mountain Institute (RMI), a 501(c)(3) nonprofit organization, was established in 1982 by resource analysts L. Hunter Lovins and Amory B. Lovins. What began as a small group of colleagues focusing on energy policy has since grown into a broad-based institution with approximately eighty full-time staff, an annual budget of nearly \$12 million (over half of it earned through programmatic enterprise), and a global reach.

About Jones Lang LaSalle

Jones Lang LaSalle (NYSE:JLL) is a financial and professional services firm specializing in real estate. The firm offers integrated services delivered by expert teams worldwide to clients seeking increased value by owning, occupying or investing in real estate. With 2009 global revenue of \$2.5 billion, Jones Lang LaSalle serves clients in 60 countries from 750 locations worldwide, including 180 corporate offices. The firm is an industry leader in property and corporate facility management services, with a portfolio of approximately 1.6 billion square feet worldwide. In the New York tri-state area, Jones Lang LaSalle provides leasing and management services for more than 94 million square feet of commercial real estate on behalf of owners and occupiers in the region. For further information, please visit our website, www.joneslanglasalle.com.

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