

Case Study - Historic Restoration



230 Park Avenue, The Helmsley Building,
New York City (2019-21)

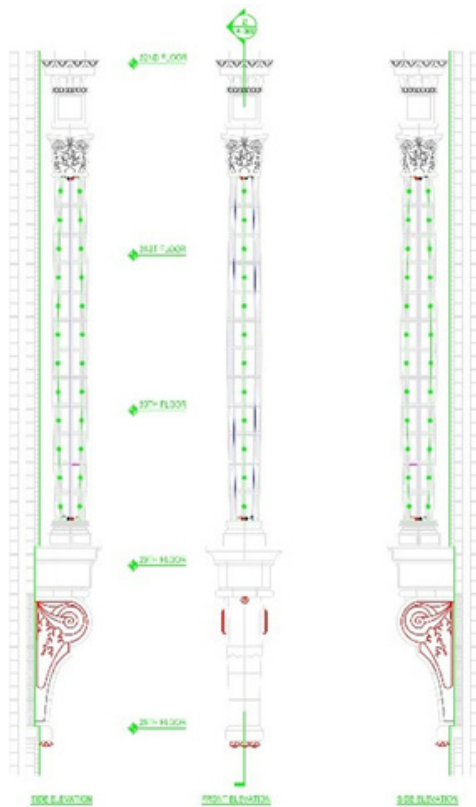
Background

The Helmsley Building was built in 1929 by Warren & Wetmore in the Beaux-Arts style. The building is a 35-story skyscraper situated at 230 Park Avenue between East 45th and 46th Streets in Midtown Manhattan, just north of Grand Central

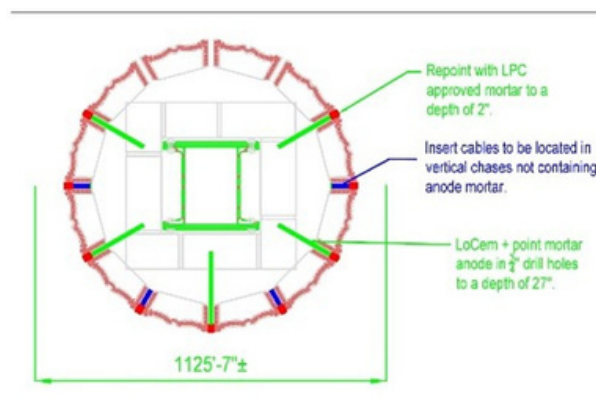
Terminal in New York City. Over the years it has gained iconic status and is one of the most recognized skyscrapers in the city. The building is constructed of a transitional structural steel frame clad in a terra-cotta façade (typical of the era 1890-1950), including 32 three-story Corinthian columns. The façade also has 74 six-foot-tall terra-cotta bison heads that make up the cornice of the low-rise structure.

Many elements of the building were facing embedded steel corrosion, including the structural steel lattice columns within the colossal terra-cotta enclosures. The expansion of the steel caused by the corrosion was severely damaging the masonry cladding and cracking the bison heads.

Restoring and Protecting Heritage Buildings via ICCP



The solution for controlling and preventing the steel corrosion getting worse was the installation of a low carbon impressed current cathodic protection (ICCP) system. The target locations for ICCP were the steel sections with the colonnades at 29th to 32nd floors whereas the bison heads were deconstructed, steel cleaned-up and masonry reconstructed. The colonnades were subject to either full height or partial height repairs to the terracotta and installation of ICCP to protect the steel in the future.



LoCem® +point® anode mortar was applied within the bed joints and drilled in to provide 360° protection of the steel surfaces (above). +point® operates as an ICCP anode and is installed using a conventional repointing gun and finishing tools operating behind the heritage mortar finish to pass protection current to the structural steel frame.

As well as its sustainability credentials (+point® provides up to 80% less CO₂e due to being produced from waste by-products and produced with little heat), this material also minimizes disruption to the structure with simple and conventional installation methods easily performed by competent contractors.

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Long Term Control and Monitoring

The ICCP system offers long-term performance and control for whole life preservation of our clients' assets. An AchillesICP power, control and monitoring network management system is installed. This provides minimised additional wiring and capacity for expansion in the future if more areas of the property need protection.

The data collected are presented through an online server facility (AiMS), which provides ISO standard performance assessment, remote control of protection and service life tracking from embedded corrosion rate monitoring. Corrosion performance data are available securely online to the owner and their representatives, allowing them to make predictive maintenance decisions.



THE NEW YORK
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Winner at the Lucy G Moses Preservation Awards, April 2022 –
Presented by the New York Landmarks Conservancy

Benefits of the C-Probe Approach



Installation LoCem® +point® ICCP anode system is sustainable and aligned with Environmental Social Governance (ESG)



Alkali Activated Cementitious Material (AACM) technology means low carbon protection and enhanced resilience for whole life of the protected elements of the property



The historic fabric of the structure was protected through non-invasive repairs, helping to retain embodied carbon.



Great flexibility for the client with remote control and operation via AchillesICP



Valuable structural health data will be provided for the long-term through AiMS, meaning higher cost savings and protection of asset value



Future expansion based on assessed need