

# On Historic Preservation

Spring 2012

## Saving a Landmark

By Robert J. Nacheman, P.E. (RNacheman@ThorntonTomasetti.com)



The colossal order of columns (a multi-story order of columns) is a signature feature of the building.

**C**ornelius Vanderbilt's grand headquarters for the New York Central Railroad was in trouble: The 1929 NYC landmark building at 230 Park Ave. had vertical cracks at its corners. Previous repair design by others had been estimated at \$15 million. Thornton Tomasetti was hired to evaluate the conditions of the 34-story building's façade walls and recommend appropriate and cost-effective repairs.

To correlate the degree of cracking visible at the surface with the amount of subsurface corrosion, we conducted invasive probes at the building corners and terra cotta enclosed decorative façade columns and brackets. Pulse echo scans were also performed on the terra cotta brackets to identify internal cracking.



Grout being pumped into the terra cotta anchor assembly to engage and stabilize terra cotta units.

A finite element stress analysis model of the terra cotta brackets was developed to better understand the cause of the cracking, and guide the necessary corrective action.



Pulse echo scanning of terra cotta.

We specified stainless steel anchors set in pressure-grouted fabric socks in the cracked terra cotta brackets, and stainless steel staples at the building's corner cracks.

A cathodic protection system was installed at the most severely corroded laced steel columns inside the terra cotta enclosures to minimize and monitor corrosion. The repair was accomplished at half the expected cost, with sensitivity to historic preservation requirements. Our approach showed that technology can be effectively applied to historic building assemblies with significant savings in repair cost.