

Rehabilitation & Installation of an Impressed Current Cathodic Protection System at 390 Madison Parking Garage

NEW YORK, NEW YORK

SUBMITTED BY PULLMAN SST, INC.

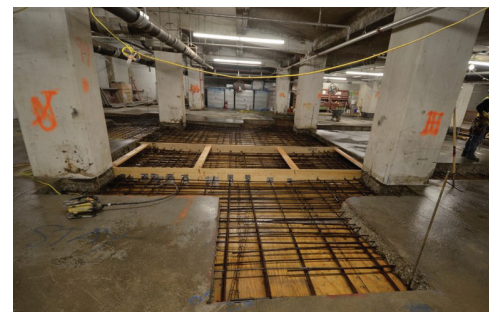
The 390 Madison Avenue parking garage, located in New York City's Midtown area, is the first garage building to receive an Impressed Current Cathodic Protection (ICCP) system in New York City. Recurrent moisture ingress and salt contamination damaged the cast-in-place concrete slabs, putting the garage out of use for more than nine years. In 2014 an intensive concrete and corrosion survey was performed. Findings indicated the steel and concrete were actively corroding. A "Return On Investment" study performed by the concrete/ICCP consultant illustrated the only method of achieving a 20+ year service life with minimal intervention was ICCP.

After the work was delayed an additional three years, a survey was performed to capture the increases in defective areas, repair quantities, and slab debonding. Core sampling uncovered varying slab thicknesses up to 14 inches. Overhead and vertical patching was executed at depths of failure up to 2 inches. Concrete requiring 2–8 inch removal was formed and poured. Select locations required full depth slab replacement. Upon completing the

concrete repairs, the cathodic protection system was installed to protect the remaining reinforcement from active corrosion. Two sub-cellar levels, split into 12 zones, received more than 11,000 probe anodes placed into the topside of the slabs and beams. Hardware installed for the ICCP system includes negative connections, reference electrodes,



electric cables, junction boxes, anode material, anode connections, and power supply. Each anode zone is powered by an independent DC power supply that runs to the Main Control Unit (MCU). The MCU allows the cathodic specialists to remotely monitor the system to pinpoint areas of potential active corrosion. To further protect the slabs and beams from moisture ingress and corrosive salts, a heavy-duty traffic deck coating system was installed on the three garage levels, an area measuring approximately 45,000 sf. Substantial completion was achieved in Spring 2019.



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