Restoring Aesthetic Appeal

By Alan Jolley

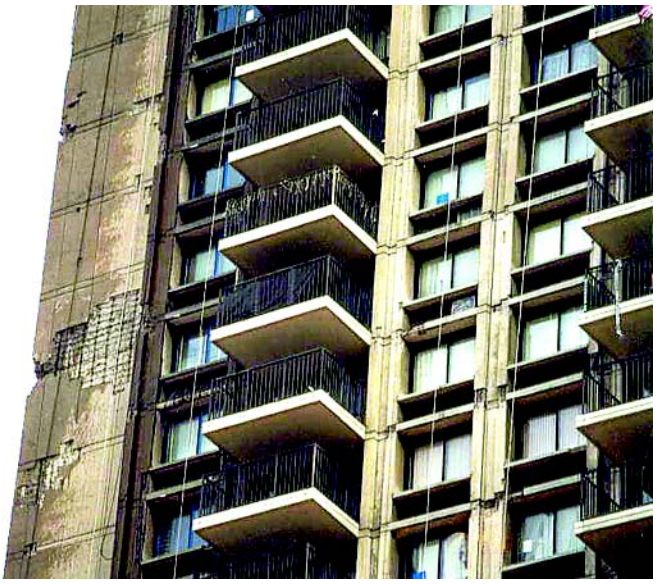
100 West 92nd St. is a 29-story residential condominium tower located on the Upper West Side of Manhattan in New York City. The tower, which is over 30 years old, houses a portion of the Trinity School in the lower levels, which also occupies several adjacent buildings on the block. The 5th through the 29th floors include residential apartments, many of which are occupied by faculty and staff of the school.

Damaged Façade

While the building itself is in excellent structural condition, the façade had suffered from years of harsh New York winters and deterioration caused by atmospheric contaminants. The structure's concrete façade had been repaired on several occasions throughout the years, resulting in a patched-looking exterior that did not present the image the owners wanted to convey. A number of the patches had been completed haphazardly in the past, while other areas exhibited signs of rust staining caused by corroding reinforcing steel not bedded at the proper depth when the concrete was initially formed.

The surface of the concrete, in many areas, exhibited classic signs of spalling and surface cracking. In one particular location, a large portion along the southeast elevation had fallen away to the street, presenting a potential hazardous situation to pedestrian and street traffic surrounding the location.

The owners contracted with a concrete repair contractor to complete an overall restoration of the building to return the façade to its original condition and provide a monolithic appearance. Challenges of this assignment ranged from on-site water restrictions, excessive heat, assembly and maintenance of proper scaffolding, and all the demands inherent to maintaining a working project in a tenant-occupied building. And, of course, there was the additional challenge always present when working in a crowded urban setting.



The restoration contract provided for the job to be performed in two phases to accommodate the schedules of both the residential and business tenants. The first phase consisted of repairs to the south and west elevations that had to be completed prior to the start of a summer program for the Trinity School. The second phase included the north and east street elevations, which were to be completed prior to the start of the fall school term.

The overall goal was to identify spalled areas and restore the exterior façade to its original condition. This was accomplished by first hammer testing all exterior reinforced concrete surfaces of the building. Through thorough testing, it was determined that approximately 4000 ft^2 of the façade would need repair.

Repair Procedure

For the repairs, the unsound concrete in the affected areas was removed and the area was prepared for accepting the patching material. The repair area was then chipped to a depth of approximately 2 in. and properly squared off. Following ICRI Guidelines, the contractor allowed for at least a 3/4-in. surface area surrounding the reinforcing steel. This step was taken to ensure proper adhesion for the subsequent mechanical keying in of repair mortars to the clean edges of the repair area.

After general demolition within the repair area, much of the exposed reinforcing steel was properly cleaned by chipping, scraping, or wire brushing until all oxidized steel had been removed. In a number of cases, the reinforcing steel had to be completely removed and subsequently replaced to ensure proper reinforcement for the ensuing patching material placement. The reinforcing was then treated with a bonding and anti-corrosion agent to avoid future corrosion.

The decision was made to use polymer-modified repair mortars to take advantage of their inherent freeze-thaw resistance, excellent adhesion properties, and flexural strength. Overhead mortar was used to repair all vertical patches, while a trowel-grade mortar was chosen for horizontal

repair areas. In addition to horizontal and vertical concrete patching, many areas, including concrete ledges, sills, and corners had to be formed and poured using a full-depth repair mortar.

After completion of the façade repairs, the entire surface area of the building was pressure washed at 3000 psi. The surface was then coated with a cementitious polymer-modified skim coat to smooth out surface irregularities and create a monolithic look. A 1/16-in. layer of cementitious waterproof coating was subsequently applied to the now smooth surface of the structure to ensure that the façade would be protected from future moisture intrusion.

The final step in the repair process involved coating the entire surface area with a flexible silicone coating. This material was applied in both prime and finish coats to a total dried film thickness of 17 mils. The coating was custom tinted to match the former exterior, helping to return it to its original splendor.

Although the scope of work increased substantially beyond the estimated 4000 ft^2 of horizontal and vertical concrete patching that was provided in the engineer's specifications, both phases were completed well ahead of schedule.

Communication is Key

A large part of the success and timely completion of the project was due to the contractor and the project supervisor. The supervisor ran a very efficient operation, monitoring the daily demolition and repair work in progress as specified by the project engineers. She also supervised and organized the laborers and, most importantly, kept the project on time and under budget. She maintained excellent communication, keeping in touch daily with the unit tenants, building maintenance staff, and the engineering field staff. Once again, emphasis on good communication helped ensure a successful project for a pleased owner.

Alan Jolley *is a product manager with ICRI Supporting Member, Sto Corp., focusing on coatings and concrete façade and exterior repair business units. Jolley has more than 10 years in the building and construction industry in the capacity of both contractor and distributor. Assisting Jolley in the development of this article were Dan Canova of Sto Corp., who acted as the local liaison, and Marvin Rosenthal of Brend Construction.*

100 West 92nd Street

Contractor
Brend Construction
Brooklyn, New York
Field Supervisor: Noemi Rosario

Product Manufacturer
Sto Corp.
Atlanta, Georgia

Engineer
Joseph K. Blum Co. LLP
New York, New York
Project Engineer: Thomas M. Capobianco