Façade Restoration on Historic Hyatt Hotel

By Richard Reese and Chris Clausen

The Hyatt Regency Hotel, located at 265 Peachtree Street, Atlanta, GA, is a building complex that occupies a city block and is comprised of both low- and high-rise structures. The original portion of the hotel, now called the Atrium Tower, was designed by famous Atlanta architect John Portman, and was the first atrium hotel in the world. The Atrium Tower was built in 1960, with additional low- and high-rise additions added through the 1990s.

The major portion of the low-rise base of the hotel consists of a mildly reinforced, cast-in-place concrete structure that measures 280 x 380 ft (85 x 116 m) in plan and contains the lobby and all of the general public and support areas. This portion of the complex extends four levels below grade and contains approximately 350,000 ft^2 (32,516 m^2) of floor space.

Three high-rise towers that contain 1260 guest rooms extend upward from the low-rise base of the hotel. The 22-story Atrium Tower, which forms the central core of the hotel, is a mildly reinforced, cast-in-place concrete structure that measures 200 x 180 feet (61 x 55 m) in plan and contains 560,000 ft^2 (52,025 m^2) of floor space. The interior of the tower is defined by a large open atrium that extends to the roof clerestory and skylights. The adjacent International Tower is also a mildly reinforced, cast-in-place concrete structure. It is 24 stories tall, measures 80 x 100 ft (24 x 30 m) in plan, and contains 192,000 ft^2 (17,835 m^2) of floor space. The third guest tower is the 22-story Ivy Tower. This final tower is a steel framed structure with a metal and glass curtain wall and a stucco clad base.

A portion of the main elevator core in the Atrium Tower extends 40 ft (12 m) above the tower roof to form a mildly reinforced, cast-in-place concrete support pedestal and cantilevered frame for the circular Polaris Restaurant. A steel frame extends the concrete cantilever and supports the remainder of the restaurant floor area. The restaurant incorporates a revolving floor and a blue acrylic sky dome. The restaurant façade elements consist of exposed aggregate on the concrete pedestal, standard stucco soffits and fascias, and a gridded ring of precast concrete outrigger beams that cantilever out from the façade at the restaurant floor slab level.

Primary Façade Features

The façades of the Atrium Tower, International Tower, and the low-rise base of the hotel are very similar, with both cast-in-place and precast elements exposed on the façade. The cast-in-place portion of the façades contains a significant amount of exposed aggregate finish, in addition to form finished areas. The majority of the façade area of both towers consists of guest room balconies edged with smooth finished precast concrete elements, including railings, fin walls, scuppers, and shade slabs. The precast railings are open picket style, with the vertical pickets and horizontal rails being only approximately 3-1/2 x 4 in. (9 x 10 cm) in cross section. The precast scuppers contained triangular fin wall edges that were only 2 in. (5 cm) wide. These narrow concrete sections created a lot of spalling and cracking problems because a small offset in the placement of the original reinforcing steel during casting easily resulted in a lack of concrete cover.

The guest room balconies on all four sides of the Atrium Tower and on two sides of the International Tower are usable, in that the exterior room wall is set approximately 4 ft (1.2 m) back from the slab edge. On two sides of the International Tower, however, the exterior room wall is set only approximately 1 ft (0.3 m) back from the slab edge, forming narrow, unusable false balconies. The narrowness of these false balconies made it extremely difficult for the Hyatt to maintain concrete and deck coatings, and was a challenge for this repair project as well.

Condition Assessment

The concrete portions of the building façade were showing staining from normal city air exposure and Hyatt had noticed cracks and small concrete spalls at various locations. The façade was assessed by visual observation from the ground, roof, and balconies. A close-up inspection was made via swing stage at several locations and the original design drawings were reviewed. Loose spalls were removed to reveal the underlying conditions and phenolphthalein was used to evaluate carbonation depth. The following problem conditions were noted:

- Spalls and cracks were being caused by the corrosion of near-surface reinforcing steel and weld plates at numerous locations. Many loose spalls were removed during the course of the assessment;
- Spalls and cracks were occurring on all of the concrete elements of the façade as well as the top and undersides of the balcony decks;
- Some balcony decks had never been coated, particularly the narrow false balconies on

two faces of the International Tower, which promoted corrosion of the embedded steel elements in the concrete;

- The embedded steel corrosion had been worsened by the carbonation of the near-surface concrete at some locations;
- Spalls were typical at the underside of the balcony slabs at balcony drainage locations at the spaces between railings due to the lack of an underside drip, which kept these areas wetter than most;
- The application of the protective coating that had been applied to the concrete elements 8 to 10 years earlier was very spotty, with the upper floors having only approximately 60% coverage at numerous locations;
- The exposed aggregate surfaces involved brown and orange river pebbles in a standard gray concrete matrix. Since original construction, the overall appearance of these areas of the building varied significantly from location to location due to the uneven distribution of the aggregate; and
- Corrosion and initial installation defects were adversely affecting the stucco soffits and fascias on the building.

Façade Repairs

The general repair scope involved cleaning all façade surfaces and applying an acrylic coating, repair of all spalls, application of a urethane deck coating to all balconies, replacement of sealant as required, and repair/replacement of deteriorated stucco.

More than 3500 spalls were removed by chipping hammer to sound concrete. Saw cuts were used to square patch edges to a depth of 1/2 in. (1.3 cm). Near-surface reinforcing steel was removed at numerous locations, following consultation with the repair engineer. All vertical and overhead spalls were mechanically anchored by either heavy-gauge hanger wire staples set in epoxy or by removing concrete from behind existing reinforcing steel. The patch anchorage method originally specified and mocked up—5/16 in. (0.8 cm) stainless threaded rod bent into 90-degree hooks and set in epoxy—was abandoned because the 90-degree bend was significantly weakening the patch anchors at the point of the bend.

Patches were completed by application of a rust inhibitive coating to all surfaces, followed by the application of a pre-proportioned, polymer modified repair mortar suitable for unformed vertical and overhead work. New aggregate matching the existing was added to patches in the exposed aggregate areas. Patches varied in size from a few square inches to extremely large, with one location in a cast-in-place fin wall on the 18th floor that grew to 18 ft (5.5 m) high by 3 ft (0.9 m) wide by 2 1/2 in. (6.3 cm) deep before sound concrete was reached. Also, approximately 1070 precast concrete scuppers were partially filled with patching mortar to reduce the area of the 2 in. (5 cm) wide fins that were exposed on both sides. All patches were then cured using taped-down polyethylene sheets or wet burlap.

Balcony railing being prepped for repair

After all the patches cured, the entire façade was pressure washed and two coats of a protective acrylic concrete coating were applied to all formed and smooth concrete surfaces. Approximately 8000 gal. (30,283 L) of coating was applied to roughly 350,000 ft^2 (32,516 m^2) of exposed concrete surface.

Chipped-out repair area

Patch prior to repair

Repair mortar being applied

Before repair

After repair and coating

By adapting tools and using selected two-man teams for all tasks, the contractor was able to patch and coat the narrow, false balconies on the International Tower by working entirely from the exterior, without removing the guest room sliding glass doors or access to the guest rooms. Sealant-formed drips were added to the underside edge of the balcony slabs at the balcony drainage spaces between the railings to keep the undersides of the balcony slabs dry. Also, approximately 1200 gal. (4542 L) of urethane-based pedestrian deck coating was applied to all balcony floors.

A portion of the exposed aggregate concrete was painted with a solid acrylic coating at locations less visible to the public. The more visible exposed aggregate areas, totaling 60,000 ft^2 (5574 m^2), were coated with a semi-opaque stain to give the gray concrete matrix a more overall uniform appearance without losing the variable color and texture created by the existing exposed aggregate. In areas where aggregate was missing or poorly distributed, several colors of opaque stains were dappled onto the surface to blend these areas in. Some stucco areas were also removed and replaced, but the majority was repaired in place by adding additional hanger supports, routing and sealing cracks, and applying an elastomeric coating to fascias and an acrylic coating to soffits.

The main site protection challenges occurred at the main drive through entry to the hotel. The overhead protection at the main entry covered an area of 50 x 50 ft (15 x 15 m) on both sides of the entry porte-cochere canopy. It was built up using steel and aluminum I-beams and tied-down plywood, and had to allow traffic access for guest drop-off throughout the repair.

The main access challenge occurred at the Polaris Restaurant, as the restaurant floor line is 40 ft (12 m) above the Atrium Tower roof, with numerous cantilevers. Access was achieved using stick scaffolding with cantilevered kickouts, supported both on the Atrium Tower roof as well as on the ring of precast concrete outrigger beams at the restaurant floor line.

Special Features

The repair project was very successful, based on the open working relationship that developed between the owner, design professional, and the contractor. Because the initial assessment of the building façade was sufficiently thorough by the design professional, no significant unforeseen conditions were discovered.

All bidders had been prequalified and the selected contractor worked well with both the design professional and the owner in regard to

Balconies being repaired

Hotel after repairs are complete

Hyatt Regency Hotel

Owner
Hyatt Regency Atlanta
Atlanta, GA

Project Engineer
Wiss Janney Elstner Associates, Inc.
Norcross, GA

Repair Contractor
Engineered Restorations, Inc.
Lawrenceville, GA

Material Suppliers
Sika Corporation
Lyndhurst, NJ

BASF Building Systems
Shakopee, MN

establishing typical repair methods and working with the noise restrictions inherent in an occupied building. Mock-ups of all major repair tasks were completed, which promoted confidence in the competence of the contractor and resulted in little or no problems arising during the course of the follow-up repair inspections.

The owner's building engineering staff was experienced, communicated well with the contractor, and accommodated the contractor's site use and noise needs to the extent possible.

One of the lessons learned during the course of the project was the discovery of problems in bending stainless steel threaded rods and the follow-up suitability of heavy-gauge stucco hanger wire for patch anchorage. The wire is inexpensive and corrosion resistant. It is very malleable and easy to work with in the field, which promotes easy adjustments to maintain desired patch cover over the anchors and patch thickness behind the anchors. The design professional's future concrete repair specifications are being modified to incorporate this technique.

Another lesson learned was in regard to the success of working with semi-opaque stains on an exposed aggregate surface. The overall process turned out to be more complicated than had been initially anticipated, but the desired result was achieved.

The project was a success because of the quality and success of the repair work, the willingness of all parties involved to work with each other toward a common goal, the significant size of the repair effort on one of Atlanta's prominent buildings, the improvement in the overall appearance of the hotel, and the expected increase in the useful life of the concrete façade.

Richard Reese *was Wiss Janney Elstner Associates, Inc.'s Lead Consultant on the Hyatt restoration project.*

Chris Clausen *was Engineered Restorations, Inc.'s, Project Manager on the Hyatt restoration project. Engineered Restorations, Inc., provides specialty architectural and structural contract services throughout the Southeast for repair, maintenance, waterproofing, and preservation of all types of structures, such as offices buildings, hotels, hospitals, parking garages, dams, and bridges.*