

Country Club Towers Apartments: Balcony, Plaza Retaining Walls, and Garage Improvements

Arlington, Virginia

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The Country Club Towers Apartments project in Arlington, VA, was complex, involving the repair and improvement of the balconies, plazas, garage, retaining walls, and grounds. The building, designed by Cohen, Haft, AIA, & Associates, was constructed in 1964.

The property consists of an eight-story apartment building with two levels of underground parking, two plazas at the north and south side of the building, asphalt pavement, an on-grade pool and patio, and two retaining walls. The building has terraces around the first floor both on the plazas and on grade, and balconies at the second through eighth floors.

Existing Conditions

The garage is located below the building and the north and south plazas. Of the two levels in the garage, the lowest is a concrete slab on grade, and the upper level is an elevated, conventionally-reinforced concrete slab with drop panels at the columns. At the perimeter of the garage, there is a concrete basement wall that is below grade on three sides and exposed at the south end of the garage.

In general, there were moderated levels of concrete deterioration throughout the elevated deck, the columns, and the walls. The soffit under the main building lobby, however, was severely deteriorated. A planter located in the lobby leaked water into the slab for many years causing extensive, and in some areas severe, corrosion of the reinforcing steel leading to spalling of the concrete.

The balconies are cantilevered, conventionally-reinforced concrete. The coating on the balconies was well beyond its service life and was allowing water to infiltrate the concrete slab. This caused corrosion to the reinforcing steel and a moderate level of concrete deterioration was found. The aluminum railings were in fair condition.

The two plazas are on an elevated, conventionally-reinforced concrete deck over the parking garage. The concrete decks have a waterproofing membrane covered by asphalt pavement, concrete sidewalks, and planters and terraces surrounded by brick walls. The plazas had several problems, including leaks into the garage below, cracked and spalled brick at the terrace and planter walls, and the appearance was very outdated. The leaks through the slab caused a moderate to severe level of corrosion of reinforcing steel and concrete spalling at the structural deck.



The north plaza area

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There is also a brick masonry retaining wall at the north side of the driveway and a stone masonry gravity retaining wall at the pool deck. The brick retaining wall at the driveway had extensive cracking in the brick and mortar joints. It also had the same outdated appearance as the brick walls at the plazas and at the south end of the garage. The stone masonry retaining wall adjacent to the pool deck was bowed outward at midheight with a horizontal crack running the length of the wall. Many of the stones had fallen out of the wall or were loose and about to fall. There was a steady flow of water through the wall as well. The area at the pool deck had been closed off for fear the wall could collapse at any time.



South plaza deck concrete repairs



Steel reinforcement for the new driveway retaining wall



Installing synthetic stone at the pool retaining wall

The loading dock at the west side of the building is also a concrete slab supported by concrete masonry units (CMUs) on three sides. There is a steel railing with embedded posts at the top of the loading dock that has a gate that can be opened for deliveries. There was deteriorated concrete at the loading dock slab.

Design

The engineering consultants performed a survey of the garage and plazas and compiled a comprehensive report of findings and construction cost estimates. The owner provided renderings and some previously prepared drawings showing the appearance of the plazas they wanted after the repairs were completed. Included in the specifications were:

- Concrete repairs at the plaza decks, balconies, and garage;
- Waterproofing the plaza decks;
- New concrete walls and sidewalks at the plaza deck;
- New masonry terraces;
- New asphalt pavement;
- New masonry signs;
- New traffic bearing membrane to the garage slab;
- New retaining wall at the pool deck; and
- New coating and new railings at the balconies.

Construction

The repair project began in December of 2005 and was substantially complete in March of 2007, for a total cost of \$4.2 million. Most of the project went as expected, but several conditions that were not anticipated caused alteration of some aspects of the original repair design. Because of these conditions, coordination between the owner, contractor, and designer was important to the success of the project.

The repair work began in the garage. The garage repairs were designed to restore the garage to the original design load bearing capacity and to protect the concrete from future deterioration. The deteriorated concrete in the garage was repaired per ICRI guidelines.

The concrete soffit under the lobby was a challenge to repair. The lobby had recently been completely renovated with marble floors, wood wall coverings, and other new finishes. Several avenues were explored to perform the repairs without affecting the finishes. It was finally decided that the only way to do a proper repair was to remove the new marble floor, protect the other finishes as thoroughly as possible, and perform full-depth repairs. All of the deteriorated concrete was removed with jackhammers, the heavily corroded reinforcement was replaced, and new concrete was placed. New marble tiles were installed after the repair was completed.

Like the garage, the balcony repairs were to restore the original design loading capacity and to protect the concrete from future deterioration. Being at the exterior of the building, the balconies also had to be designed for aesthetics. A traffic bearing membrane was chosen for the balcony coating. At the soffit, a breathable coating was applied. New surface-mounted aluminum railings were to be installed after the membrane was applied.

For the plazas, the first step was to remove everything down to the structural concrete deck. Concrete repairs were performed per ICRI guidelines, and then new hot rubberized waterproofing was installed over the entire surface. After the waterproofing was complete, new asphalt pavement, terraces, sidewalks, a perimeter wall at the south plaza, and curbs were installed.

The terraces were designed with reinforced masonry walls faced with real stone. The CMU was placed with vertical reinforcing bars embedded in the structural slab and horizontal joint reinforcement every other course. Wood decking installed at an angle was called for in the renderings. A concrete footer was designed and installed to support the masonry walls for the terraces on grade. French drains were installed to prevent ponding under the wood decks.

The stone masonry gravity retaining wall at the pool deck could not be removed for the repairs due to the proximity of a house and garage at the top of the wall. The retaining wall was stabilized by installing a new reinforced concrete retaining wall, including drainage system, in front of the existing wall. After the new retaining wall was poured and cured, synthetic stone was installed at the face and stone coping at the top to match the stone masonry at the terrace walls as closely as possible.

The brick retaining wall was not included in the original scope of work but it was determined that it needed replacement during the course of the project. A new reinforced concrete retaining wall was placed with synthetic stone at the face and stone coping at the top to match the pool retaining wall and the south wall of the garage.

For the loading dock, the original design was to repair a small amount of deteriorated concrete and apply a traffic bearing coating. This had to be altered when the CMU was removed to check the underside of the concrete. Moisture trapped under the slab by the CMU had caused extensive and severe corrosion to the underside of the loading dock. The entire slab was removed and a newly designed concrete slab was installed with the traffic bearing coating and new steel railings.

On the grounds, stone masonry signs to match the terraces, a brick paver walkway, and new pole lights were installed on grade at the north side of the building. Asphalt pavement was removed and replaced and a French drain installed at the north parking area.

This was a complex project with many different elements being repaired at the same time. There were many unknown conditions that had to be dealt with and repairs redesigned at nearly every stage of the project. The owner, contractor, and design engineer worked together to make this project a success. The result of the project is structurally sound, waterproof, durable, and aesthetically pleasing plazas, garage, balconies, and retaining walls.



Construction of the terraces



New stone masonry terrace with custom aluminum railing, stone coping, and new lights

Country Club Towers Apartments

Owner

Washington Real Estate Investment Trust
Rockville, Maryland

Project Engineer/Designer

Tadger-Cohen-Edelson Associates, Inc.
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Repair Contractor

Concrete Protection & Restoration, Inc.
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