

# Co-op City's Parking Deck Rehabilitation

**C**o-op City is a large cooperative apartment complex located in the northeast section of the Bronx, New York, near I-95. The complex, built in the early 1960s, consists of multiple high-rise buildings containing thousands of cooperative apartments. Along with these high-rise buildings, eight large parking garages were built. They are seven and eight stories in height and approximately 340,000 ft<sup>2</sup> (31,590 m<sup>2</sup>) each. They were constructed using the waffle form method with placed reinforced concrete parapet walls.

Over the years, as with many older parking garages, they began to deteriorate. Virtually no maintenance was performed. Through the 1970s and 1980s, the deterioration continued but the parking garages were still in use. In the 1990s, serious damage occurred to both the parking deck and the parapet wall. Shoring had to be used to support some of the floors and walls. Through the 1990s, more and more areas of the deck had to be closed due to the threat of collapse. Soon there was not enough parking available for the residents.

Eight years ago, the management company hired a contractor to shore the decks and perform emergency work as needed. But the decks were deteriorating quickly, and the funds needed to continue the repairs were not available.

The management company contacted a noted engineering company in New York City to perform an assessment of the parking decks. They documented many areas of severe deterioration (refer to photos). They identified the causes and sources of water infiltration and the degree of structural

deterioration and recommended remedial repairs. They also performed a complete inspection and evaluation of the fire standpipe system and electrical systems in the structures. The engineering firm confirmed that most of the ramps had to be replaced, the parapets patched, and the waffle deck in the parking areas had to be repaired.

The management company had no choice but to secure funds for the rebuilding of the decks. The funds were raised through loans, from both the State Housing Authority and the Co-op. The project went out to bid. The nominated contractor won the bid at \$101 million. The rehabilitation of the decks began in August 2005. A time deadline was set for all repairs to be completed.

## Repair Project Begins

The repair project included many aspects:

- Floor slab reconstruction (both partial and full depth with new epoxy-coated reinforcement);
- Repair of the waffle slab ribs;
- Installation of new floor drains and drainage piping;
- Installation of a new traffic-bearing waterproofing membrane;
- Façade restoration including the application of an elastomeric coating;
- New lighting with electrical upgrades; and
- New standpipe systems.

Different crews were assembled to perform specific tasks: demolition and concrete finishing crews for full-depth demolition and replacement, demolition crews for restoration, and masons for



*Existing conditions before repair*



*Demolition of a top slab*



*A finished interior with new striping and wheel stops*



*Façade work and parapet patching*



*A finished garage exterior*

hand-patching and spraying repair mortars. The plan was to work on three or four garages at a time with a large contingency of labor. As the various crews gained experience, efficiency rose.

At first, the contractor repaired the parapet walls by hand-patching. The material supplier came to the job site and demonstrated low-pressure spraying to apply repair mortar. The contractor realized that this method would improve the finished product by achieving a better bond and a denser patch. It would also make the repair process quicker. This is just one example of the teamwork between contractor, designer, owner, and manufacturer, leading to the success of this project.

The scope of this job was enormous. Besides the thousands of yards of concrete, there were approximately 50,000 50 lb (22.7 kg) bags of repair mortar used on this project. A combination of shotcrete and hand-patch mortar was used. After all the repairs were made, the outsides of the buildings were coated with a breathable acrylic coating. Approximately \$658,000 was spent in mortar and coatings alone.

This was a challenging and interesting project that required a great deal of planning and cooperation

among the contractor, designer, owner, and manufacturer. Because of the attention to detail and quality planning, the project was completed ahead of schedule.

## Co-op City Parking Deck

### Owner

RiverBay Corp.  
Bronx, NY

### Project Engineer/Designer

DESMAN Associates  
New York, NY

### Repair Contractor

Technical Construction Services, Inc.  
Teterboro, NJ

### Materials Suppliers/Manufacturers

The Euclid Chemical Co./Tamms  
Cleveland, OH

Stillwell Supply Corp.  
Long Island City, NY