

Fifth Parking Garage

Des Moines, Iowa



STORIES BUILT



Rising up to replace an outdated precast parking garage in Des Moines, Iowa, the Fifth Parking Garage houses street-level retail space and 11 levels of public parking. Two additional levels are reserved for amenity decks for a planned 42-story tower to be constructed next door in the rapidly growing city.

Ceco provided horizontal and column forming services for the beam-and-slab post-tensioned concrete garage, which contains 282,000 square feet of elevated structure utilizing 27 x 60-foot elevated bays. Because the garage has a unique double-helix design that expedites parking, Ceco provided schedule guidance during the budgeting phase to help keep the complex build on track with longtime client and general contractor The Weitz Co.

Double-helix designs are tricky because each rotation skips floors.

For example, while one helix travels along Levels 1, 3, 5 and 7, the other runs through 2, 4, 6 and 8. Each helix has its own leading edge of work and is built upon the other helix, yet all levels tie into the same columns and walls.

The crossover is a spot where a vehicle can transition from one helix to another. The design is good for parking because it takes less time for drivers to travel up 11 levels and back down again. It's also a safe option, because traffic typically travels up one helix and down another—drivers don't have to face oncoming vehicles.

The design is a two-bay-wide double helix with crossovers at every other floor and two speed ramps located at the ends of each bay. This means very few areas of the 120 x 223-foot garage are flat, which presented work continuity and elevation grading challenges for the Ceco team during construction.

Careful coordination was required to ensure all trades and concrete operations were in sync so that team members were ready to build upon the concrete that seemed to be poured below them as the double helix unfolded.

Consequently, the team broke each level into three pours (north helix, south helix, center), with pours taking place in round-robin fashion as one helix level chased the other. When 80 percent of the first pour was complete on the north helix side of the floor, the second pour began on the south side. When 50 percent of the second pour was complete, the third pour began at the center.

Another design feature was floor-to-ceiling heights of up to 23 feet at the first level to accommodate retail space. The Ceco team used tall Titan shoring to support the loads on the lower level. For the parking levels, the team used Ceco's 60-foot steel beamforms and 25-foot-long deck panels to mechanize and expedite the deck formwork operations. For details, see the Ceco Structural BIM video at tinyurl.com/FifthGarage.

The garage is more than the precursor to a skyscraper planned in downtown Des Moines. It also will serve the city's entertainment district.

FAST STATS

Project Owners: City of Des Moines & Mandelbaum Properties

Contractor: The Weitz Company

Designer/Architect: SCB Architects - Chicago

Structural Engineer: WSP USA Buildings Inc.

Ceco Scope: Slab and column forming services

Ceco Project Manager: Jared Korf

Ceco Superintendent: Randy Wilson

Ceco Engineer: Matt Hackman

To Be Completed: October 2020