



COLORADO SPRINGS CITY ADMINISTRATION PARKING GARAGE



- Project Type:** Parking Structure
- Location:** Colorado Springs, Colo.
- Owner:** City of Colorado Springs
- Architect:** YOW Architects PC, Colorado Springs, Colo.
- Engineer:** RMG Inc., Colorado Springs, Colo.
- Engineer:** Walker Parking Consultants, Greenwood Village, Colo.
- Contractor:** Art C. Klein Construction Inc., Colorado Springs, Colo.
- Precaster:** Stresscon Corp., Colorado Springs, Colo.

OVERVIEW

The new city parking facility is a 567-space addition to a 1,009-space existing downtown parking structure. The older, garage-style building contained six floors plus basement, including several floors added vertically in an earlier addition. Each level is 49,039 sq. ft. The new addition, adjoining the old structure on one side, consists of seven floors plus basement, each 25,432 square feet.

The challenge was to connect the two facilities, but use different exterior materials and design on the addition to better match its downtown location. While the interior layout flows seamlessly between the two buildings, the exterior appears to be two separate structures.

Goal was to create the look of a traditional office building so that the new structure would fit cohesively within its commercial neighborhood. The design incorporates storefront elements on the first level with integral thin-set brick precast panels and a grid of vertical steel members on the upper façade. The steel grid imitates the curtain-wall construction on commercial buildings in the neighborhood. It was created without the use of glass, which was prohibited by code requirements since the garage is listed as a non-mechanically ventilated, open structure.

Not only does the design enhance the urban environment, it provides the owner with potential future leasable retail space on the ground level. Streetscape improvements were also included to enhance the pedestrian experience.

"The design," says Tom Martin, AIA, project architect, YOW Architects PC, "is sort of an eclectic collection of elements from other buildings in the neighborhood. The steel in the openings emulates curtain-wall construction on nearby commercial buildings. It was all powder coated for durability. There is an area of the first floor that can be converted to retail space. So we included storefronts and used flat slab floors on the second level in that area to provide more ceiling height for future retail.

"The other thing we did," adds Martin, "was to tie into the existing parking floors so that we didn't have to add our own vertical circulation. No ramps were required on the first six levels, which greatly enhanced the efficiency of the addition."

The new structure is primarily precast concrete construction, with a cast-in-place concrete foundation, structural steel, steel joists and decking, and structural cold-formed metal framing. In all, 596 precast components were utilized, including 298 26-in., pre-topped double tees, 28 12 x 30-ft. horizontal lite walls, and 193 architectural elements, as well as precast elevator towers, stairwells, and stairs. The latter consisted of brick veneer and acid etch walls, spandrels and columns.

14 WEEKS

Total erection time of the precast concrete components

0 EMISSIONS

Amount of VOCs emitted by the unpainted precast concrete panels

95 PERCENT

Amount of precast reinforcement made from recycled steel



Build on a tight site, the structure runs to the property line on three sides.

Photo: Stresscon Corp.



Structure included pretopped double tees, litewalls and thin brick panels.

Photo: Stresscon Corp.



First level has storefronts for possible future conversion to retail space.

Photo: YOW Architects, PC

One major challenge was the tight building site. The garage addition adjoins the existing facility on one side and runs to the property line on the other three sides. "We built the structure from within and then backed out the crane," says Tom Clemans, project manager, Art C. Klein Construction Inc.

"It took a lot of coordination and team effort between us and Stresscon," Clemans adds. "The city allowed us to shut one lane of traffic on each street and we had to vertically shore the foundation excavation. When we pulled off the spandrel panels on the side of the existing structure [where the addition was going] the structure lost its shear support, so we had to go in with a complicated steel cross bracing system to re-establish the shear component. Also, the new building is one floor taller than the existing structure, so we had to add a ramp from the existing parking structure to the top floor of the new building. That presented an issue because the reach was so great the crane couldn't swing the heavier pretopped tees far enough laterally. So untopped tees went over the existing building in a fly over type of erection and we topped those tees later."

Total precast erection time was just 14 weeks.

PRECAST CONCRETE'S CONTRIBUTION TO SUSTAINABLE CONSTRUCTION PRACTICES

Precast concrete construction contributed to the sustainability of the project in a number of ways. Use of thin brick reduced the amount of raw materials required. The speed of precast construction reduced site disturbance and building costs. Over the building life cycle, precast concrete will also lower maintenance demands and operating costs.

Sustainable Sites:

Precast concrete members, including brick-inlaid/acid-etched panels, were cast off site at a manufacturing plant.

Long-span, prestressed concrete members, such as the precast double tees and beams at each level, allowed for more open space, thereby eliminating redundant supporting members and significantly reducing the amount of on-site concrete poured for foundations.

Light color concrete in this total precast structure enhanced reflectivity, limited the absorption of sunlight, and helped mitigate the urban heat island effect.

Energy & Atmosphere:

Thin brick inlays require significantly less energy to produce compared to traditional, full-size brick. The use of acid etching and brick inlay promotes longer life cycles and lower maintenance costs. Due to the aesthetic nature of architectural precast, there is no need to apply paint to the exterior of the structure, due to the aesthetic nature of architectural precast, so that no harmful VOCs are emitted.

Materials & Resources:


A large portion of the precast products were cast on reusable steel forms, minimizing the amount of natural resources used for forming.

Steel used for reinforcement was made from 95% recycled material.

Delivery distance from plant to site for the precast components was less than 20 miles.

Innovation & Design Process

The use of thin-brick cast into precast concrete panels reduced the amount of raw materials required, as well as transportation and on-site labor costs.

The use of pretopped double tees in most areas of the project reduced the need for site work and facilitated the construction process. 



Precast/Prestressed
Concrete Institute

200 West Adams Street
Suite 2100 Chicago, IL 60606
Phone: 312-786-0300
Fax: 312-621-1114
www.pci.org