

Colorado Center Tower III

DENVER, COLORADO

Attention to detail helps office tower's precast concrete double tees stand out beautifully and efficiently

By Monica Schultes





Careful attention was given to the structural design as well, with exposed precast concrete double tees providing an extra layer of depth and texture to the façade. Photo: Sam Adams/Tryba Architects.

Colorado Center is a premier, 13-acre office/retail/entertainment/residential complex. It is located between downtown Denver, Colo., and the Denver Tech Center, and adjacent to Interstate 25. The transit-oriented development is adjacent to FasTracks light-rail and bus lines, providing convenient access to downtown as well as the Tech Center. In addition to providing access to CarShare locations, a new pedestrian/bike overpass connects the site to the neighborhood across the interstate, and is complemented by shower facilities and a bike storage and repair facility.

Master-planned by Tryba Architects in 2007 prior to the recession, the development now features three office towers (including the new Tower III) totaling 500,000 ft², residential apartments, and 767 structured parking spaces.

The design vision for the mixed-use development also included the creation of an open-air shopping strip with pedestrian walkways connecting the various structures. This 24-hour “Main Street” is comprised of high-quality restaurant and retail uses. It now includes a 120,000-ft² entertainment center with a United Artists movie/IMAX theater and a Dave & Buster’s. There has been a huge investment in the site development concept and design.

CLASS AA OFFICE

Colorado Center offers unparalleled views of the Rocky Mountains and the Denver skyline. Tower III completes the office component of the transit-oriented development with live/work/play/shop options. Beyond ground-level retail and restaurant space, the first seven floors are parking, the next eight are Class A office space, and the 16th level offers a rooftop terrace and enclosed event venue.

The total–precast concrete structure includes precast concrete columns, double tees, inverted tees, beams, spandrels, and window walls. Nearly 300,000 ft² in all, the building, while predominantly precast concrete, includes a significant amount of glass curtain wall. The floor-to-ceiling glass heights provide abundant natural light.

The 15-story structure includes 8000 ft² of ground level retail with high floor-to-floor clearance, restaurant and café, seven levels of structured parking, and 203,000 ft² of offices on eight floors. Raising the office space allows tenants the opportunity to enjoy the panoramic views as well as direct access to the building from the parking levels. Future development at the site calls for a companion residential tower.

CUSTOM BLEND

Scott Maclay, account manager with Rocky Mountain Prestress in Denver, recalls they collaborated with Tryba Architects to achieve the desired color, texture, and finish. “In this case, the color was selected to match the existing office campus.” The result was a buff color with acid wash that were also used for the parking structure below.

“We wanted to be able to respect the context of the established building, while elevating the campus with a modern design,” says Emmett Harrison, senior associate with Tryba Architects. “When you can reinforce the relationship of the new development to what is already there, the connection allows the new design to enhance the presence of the existing buildings as well. In this case, precast was the primary element to establish that relationship.”

SHADOW PLAY

In addition to efforts to match the color, a corrugated formliner was introduced to provide visual depth and texture to the façade. “One of the unique things about Colorado is that we have excellent

sunlight. We are always looking for opportunities to use those crisp shadows that play across a façade throughout the day. You can use something simple like a formliner to achieve various tones within the same mix of concrete,” says Harrison.

The owners also wanted a slightly more industrial look than is typical for an office building, with exposed structure and systems in lieu of the standard dropped ceiling.

The double tee became a unifying design element as a result. “The double tees bring a strong linear rhythm to the structure, which we were able to use to provide a layer of visual unity that helped to tie the garage below to the office above,” Harrison explains. “The texture and spacing of the double tees informed the design of the other elements on the building—from the curtainwall mullions

to the light fixtures—to achieve a unified composition that extends the full height of the building when viewed from outside.”

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PRECAST PILASTERS

In the office levels, L beams support the double tees. Adjacent to these are built-up precast concrete wall column sections where



A custom formliner was developed to capture the crisp shadows that play across a façade throughout the day in the Denver area. Photo: Rocky Mountain Prestress.

The roof terrace offers unparalleled views of the Rocky Mountains and was designed to accommodate everything from corporate training to wedding receptions to afternoon yoga. Photo: Sam Adams/Tryba Architects.



exterior window wall panels are cast with large pilasters on the back to reduce the number of pieces. The pilasters helped carry the gravity load to the foundations.

"To minimize piece count and production cost, [on the north elevation] we used integral pilasters, which caused the panels to be very heavy," says Maclay. In addition, mullions for the glazing system were all designed to align with the double tees.

With space for 400 cars, the parking structure features field-topped precast concrete double tees and offers direct access to the offices above. Vehicles circulate via a circular ramp system.

UNDER EXPOSED

Precast concrete was even incorporated into the building architecture by leaving the underside of the double tees exposed in the offices. The ultimate goal is to achieve an open workspace that cultivates collaboration. However, the challenge is how to organize the systems usually hidden from view in Class A space.

"More and more often, tenants are asking to tear out the ceilings so they have more space," says Maclay. "So the double tees were exposed in this building, too." There was a lot of coordination with the design team to manage all the mechanical, electrical, and plumbing (MEP) blockouts so that

the structure could be exposed. Rocky Mountain Prestress used self-consolidating concrete to achieve a smooth finish on the underside of the double tees with very few bug holes. Maclay adds, "You still see the MEP systems, but they are well organized."

Another design challenge was the roof terrace. "We integrated the roof top terrace after the project was 50 percent constructed," says Charlie McLean, associate with Martin/Martin Consulting Engineers in Lakewood, Colo. "However, we knew there was the possibility

of a future roof terrace and designed for the additional load. But, we were able to get the design in before the precast was made and the columns and foundation had the capacity for the extra loads." Roof loading did drive an increased depth of precast concrete double-tee stems when needed. The steel frame on the terrace is a separate structure with

exposed steel trellises, which required coordination with the architect and contractor. The roof also features tree planters, a trellis, and a fire pit, with an enclosed structure that's home to an event space with a fireplace and catering kitchen.

SPEEDY INSTALLATION

Six months were cut off the schedule by using precast concrete. That was accomplished by using two cranes erecting

'We integrated the roof top terrace after the project was 50 percent constructed,'

simultaneously to speed the installation.

While it might seem like a perfect location for construction right off the interstate, three 100%-occupied buildings surround the site. The contractor controlled traffic around the site, and since there was no storage or laydown area, the just-in-time delivery method was effective in getting the panels offloaded each morning.

Another factor that sped up installation was that the punched window wall panels were preglazed in the precaster's plant prior to shipping. "The preglazed panels saved an incredible amount of time, so scaffolding was not required to glaze the building," says Maclay. Because it is a total-precast concrete building, the perimeter wall panels with punched windows were welded to the structure and the glazing had to be protected from weld slag during the installation. So, a protection system was developed using aluminum frames and lightweight fire blankets that were installed over the windows at the jobsite prior to setting. (For more information about preglazing, see the Perspective article in this issue.)

BEAUTIFUL AND SUSTAINABLE

Seeking LEED gold certification, the building has numerous sustainability features. It includes a thermoplastic polyolefin three-ply, built-up roofing membrane with a vapor barrier applied directly to the topping slab. Insulated glazing units feature foil-faced wool taped to the interior face of mullions to act as a vapor barrier. Curtainwall glazing consists of high-tech SolarBan glass.

Precast concrete components were all locally produced and off-site precast concrete production helped divert waste from the landfill. In addition, structural concrete mixtures contained up to 12.2% fly ash. Spray foam insulation was applied to the interior of the noninsulated precast concrete spandrels and wall panels. Finally, the use of a precast concrete structure and skin makes for a durable building that is anticipated to last longer than the traditional building, lowering the building's overall life-cycle costs.

Additional sustainability features include the use of low-flow plumbing fixtures, LED

The precast concrete for Tower III was carefully developed with Rocky Mountain Prestress to match the existing campus (background), while modern materials such as curtainwall and a metal screen lend fresh consideration to a familiar material.
Photo: Sam Adams/Tryba Architects.





The lightness of the glass curtainwall contrasts with the monolithic precast concrete, underscoring the lobby's invitation as the "living room" for the campus. Photo: Sam Adams/Tryba Architects.



The roof terrace provides an ideal location for special events, meetings, or just a quick lunch, all with unparalleled views of the Rocky Mountains. Photo: Sam Adams/Tryba Architects.

COLORADO CENTER TOWER III

LOCATION

Denver, Colo.

PROJECT TYPE

Mixed-use office and parking with at-grade retail

SIZE

300,000 ft²

COST

\$60 million

DESIGNER

Tryba Architects, Denver, Colo.

OWNER

Lincoln Property Company, Denver, Colo.

STRUCTURAL ENGINEER

Martin/Martin Consulting Engineers, Lakewood, Colo.

CONTRACTOR

JE Dunn Construction, Denver, Colo.

PCI-CERTIFIED PRECASTER

Rocky Mountain Prestress, Denver, Colo.

PRECAST COMPONENTS

155 spandrels, 170 window walls, 928 double tees, 168 columns, 223 inverted tees, 29 L beams, and 97 R beams. The spandrels are buff-colored, in acid-etched and formliner finish.

lighting, materials with low volatile organic compound emissions on the interior, and direct evaporative cooling. The project is engaged in the commissioning process. The design team partnered with the local utility company (Xcel Energy) to evaluate the energy efficiency of early design decisions, which helped to inform everything from lighting densities to the depth of the exterior sunshades.

Colorado Center Tower III is very visible and will stand alone because of the design quality. Maclay adds, "The three key issues the owner, architect, and contractor considered were achieved with precast:

1. the precast panels were able to match the surrounding buildings;
2. the precast was installed six months faster than the steel;
3. it was less expensive."

The first helped build beautifully; the second and last demonstrate the efficiency of selecting precast concrete for the total structure.