Precast concrete panels bring aesthetic appeal to Chicago surgery center

The overarching goals for the University of Illinois (UI) Health Specialty Care Building (SCB), a new outpatient surgery center in the heart of Chicago's Medical District, were to create a pivotal, transformative new addition to the campus and also to bookend a new entrance gateway into the district.

The new six-level, 200,000 ft² (19,000 m²) facility includes two levels of same-day surgery suites, three levels of specialty clinics, and a ground floor with check-in, pharmacy, and imaging services.

The new building site completes the corner of the medical center's campus, where outpatient and inpatient services come together.

The building's architects opted for precast concrete panels as an alternative to brick pilasters during schematic design, which allowed for quicker installation and a more custom solution.

To meet the project's budget, the design team worked closely with the developer and contractor team to find local, available, and cost-effective solutions for the envelope.

A precast concrete panel manufacturer, International Concrete Products (ICP), from Germantown, Wis., was brought in very early in the process to work with the design team to find solutions for the facility.

The depth of precast concrete panel and texture were tested for shade, shadow, and scale during the design process, with the design team landing on a custom serrated and sawtooth texture that changes its appearance throughout the day and throughout the seasons.

Substantial mock-ups for color and constructibility were used to ensure that the design was achievable and would match the vision of the design team.

The use of vertical panels references the verticality of the neo-Gothic architecture of the existing campus, and the modern use of precast concrete echoes the existing hospital's presence.

"The design called for the same slope on the different-width panels, which would have meant several different forms," says Jim Miller, senior project manager with ICP. "Through coordination with the architect and ICP, a design was developed to minimize the number of forms."

Production also posed some challenges. "With the sawtooth design, concrete molds were used," says Rob Bisswurm, ICP plant manager. The molds were blocked up on one side so the panels were cast on a slight angle, creating a draft on the vertical edge. This was done to reduce chipping during the stripping process. "We also used air ports, so we could introduce air during the stripping process to help with the release," he says.

In terms of installation and erection, adjustable bearing seats were used to help speed installation. Panels were set close to final elevation, and the detail crew made adjustments to the final elevation. "This also helped with maintaining plumbness with the tall slender pieces," Miller says.

—William Atkinson

The University of Illinois Health Specialty Care Building, a new outpatient surgery center in the heart of Chicago's Medical District, is a six-level, 200,000 ft² (19,000 m²) facility that includes two levels of same-day surgery suites, three levels of specialty clinics, and a ground floor with check-in, pharmacy, and imaging services. Courtesy of AJ Brown Imaging.

University tower combines aesthetics with efficiency

The new Ryan Tower at the University of North Texas in Dallas is a 180 ft (55 m) tall landmark amid a university campus and sits adjacent to the new student center, marking the intersection of the north-south promenade, Vista Court, Campus Square, and the new amphitheater.

The tower includes a water feature, donor wall, masonry seat walls, and lighted pedestrian plaza. The lighted tower also marks the center of the university so that it can be seen from miles away by the surrounding community.

The original construction concept was to use a traditional structural steel frame with handset masonry. However, this would have created problems in two areas: site impact and scheduling. Because the structure is centrally located on a college campus, minimal site impact was a high priority. In addition, a 180 ft fully handset masonry tower would require extensive scaffolding and time that would have had a significant impact on the construction schedule.

As a result, the general contractor contacted Enterprise Precast Concrete of Corsicana, Tex., to investigate an alternate system that could provide the same level of design aesthetic while meeting a more aggressive schedule and minimizing site impact. Enterprise explained that a fully self-supported precast concrete system could do just that, meet the schedule and minimize site impact.

Enterprise was then engaged in the design-build process in July 2021. Following the engineering process, the precast-concrete was produced in November and then erected in just 15 days in December.

An architectural precast concrete panel is being lifted into place for Ryan Tower. The panels at the top of the tower feature lighted window openings and can serve as a local wayfinding landmark. Courtesy of Jacia Phillips, Arch Photo KC & Enterprise Precast Concrete.

The new Ryan Tower at the University of North Texas in Dallas is a 180 ft (55 m) tall landmark amid a university campus. The engineered connections at each level were achieved using NMB splice sleeves along with typical precast concrete welded connections. Courtesy of Jacia Phillips, Arch Photo KC & Enterprise Precast Concrete.

The project is composed of a self-supported 180 ft tall precast concrete tower system using 70 pieces of load-bearing, moment-resisting architectural precast concrete walls and floor slabs. The architectural precast concrete wall panels are composed of a campus thin brick design, thin brick formliner, and built forms to create the tower facade. The base podium of the tower was constructed using cast-in-place concrete with handset masonry. No other structural members were used above the podium.

The architectural precast concrete panels at the top of the tower feature window openings that are lighted and can serve as a local wayfinding landmark. The tower is topped by a monumental dome that is also supported by the precast concrete system.

"The original design was steel frame structure and handset masonry. After conversations with ownership, we were able to introduce the concept of a total precast system," says Hunter Heinrich, business development manager for Enterprise.

The project employed three-dimensional (3-D) finite element analysis to engineer and analyze the precast concrete system under the area's wind and seismic conditions. This analysis, along with building information modeling (BIM), ensures the structural integrity of the tower and maximizes the efficiency of the precast concrete system. The precast concrete shop tickets were extracted from the BIM model using plans, sections, and 3-D views. Finally, the engineered connections at each level were achieved using NMB splice sleeves along with typical precast concrete welded connections.

"Necessary testing is needed to certify that the selected brick can be successfully cast into the precast panels," Heinrich says. "In order to meet the aggressive project schedule we had to accelerate the testing." Transportation and installation of the precast concrete pieces posed no challenges at all.

—William Atkinson