Freedman Award winner cornerstone of art district

The Crow Museum of Asian Art is the inaugural building of the Edith and Peter O'Donnell Jr. Athenaeum, a 12-acre arts and performance complex on the campus of the University of Texas at Dallas. The project is slated to include two museums and a performing arts center surrounding a public art plaza.

The 68,000 ft² (6300 m²) structure, which is the Crow Museum's second location, was a design-assist project bringing together design architect Morphosis, based in Los Angeles, Calif.; general contractor The Beck Group, of Dallas, Tex.; and PCI producer member GATE Precast, based in Hillsboro, Tex.

Coordination among all parties was required early on to make sure connections were placed in the panels in a way that would interfere as little as possible with the work of other trades on the jobsite. Approximately half of the museum's 158 uniquely shaped panels are cantilevered off secondary steel; the rest are hung in the traditional bottom-bearing, top-connected orientation. The building's lobby and atrium feature sweeping expanses of curved, canted panels, each of which required its own engineering and analysis.

The panels measure roughly 10 × 30 ft (3 × 9 m) and are 6½ in. (165 mm) thick, on average, with a rigid foil-faced insulation backing and a separate metal-stud furring wall inside the assembly. Some of the panels were shaped using intricate flat-panel formliners, while others—21 unique panels, both concave and convex—required custom computer-numerical-control foam shapes, which were designed with three-dimensional modeling software. GATE Precast proved to be the only company that could make the custom foam shapes quickly enough to meet the project schedule. Their carpenters constructed wood forms around the foam shapes before the liner patterns were applied to the foam.

The project team considered precast concrete to be a logical fit because of its flexibility and ability to accommodate adventurous new enclosure design possibilities. The museum's deceptively complex, undulating facade has a lively, creative energy reminiscent of brushstrokes and paint spatters. This effect was the result of an iterative process through which they optimized the repetition and overlapping of just a handful of formliners to create maximal variation. The facade's shimmer, refined through several trials of concrete, aggregate, and finish combinations, was ultimately created by moderately sandblasting the bright white concrete to expose some of the white aggregate.
—Rory Cleveland

GATE Precast Co. of Hillsboro, Tex., won the 2024 Sidney Freedman Craftsmanship Award for the Crow Museum of Asian Art at the University of Texas at Dallas. Mauricio Rojas, Courtesy of UT Dallas.

New DC bridge's arch base has custom connection solution

The Frederick Douglass Memorial Bridge used 480 precast concrete deck panels fabricated by Jersey Precast. Courtesy of South Capitol Bridge Builders.

The new Frederick Douglass Memorial Bridge in Washington, D.C., combines improved functionality with eye-catching architecture and fresh opportunities to honor its namesake, the distinguished American statesman and abolitionist.

The core of the project—replacement of the original bridge, which was built in 1950—was completed in June 2022. The 1444 ft (440.1 m) long bridge, which includes two 452 ft (138 m) side spans and a 540 ft (165 m) center span, raises the number of traffic lanes to six and brings improvements for people crossing on foot or bicycle. It also features four pedestrian overlooks, each bearing a plaque commemorating Douglass's legacy. A unique above-deck structural steel arch design, which can be illuminated in different colors, cuts a distinctive, softly undulating figure over the Anacostia River.

Fabricating 480 huge precast concrete deck panels with tight tolerances is no small task. The project had an extra layer of complexity in that, to faciliate alignment in the field, the panels had reinforcing bars protruding from all four sides, two sides with epoxy reinforcement and two with galvanized reinforcement. Jaimin Patel, a senior manager at Jersey Precast, says they were able to head off potential challenges to meeting the construction schedule by working throughout the year in a temperature-controlled indoor environment and transporting the panels via truck to the jobsite.

Designing the bridge's arch base connection presented a challenge because every part of the anchorage is contained within the arch section. This differs from conventional steel-to-concrete connections, which use a base plate outside of the arch section. Design solutions were required to manage factors such as stiffener/anchor rod layout, edge spalling effects, base-plate details and fabrication, and coordination with V-pier post-tensioning detailing. In addition, building the massive V-pier substructure required the construction of temporary piles to support a significant amount of falsework, which also supported the custom formwork that created the bridge's tapering hexagonal shape.

Jersey Precast, based in Hamilton Township, N.J., provided custom precast concrete deck panels for the design-build project, which is the largest in the District Department of Transportation's history. Patel says that to achieve an expected service life of 100 years, the company designed a durable concrete mixture that replaced part of the cement with fly ash, slag, and silica fume. In addition to improving durability, the use of these admixtures helped reduce the project's carbon footprint.
—Rory Cleveland

The new Frederick Douglass Memorial Bridge in Washington, D.C., replaces the original swing bridge. Courtesy of Duane Lempke Photography.