

ASCENT[®]

DESIGNING WITH PRECAST

HOW PRECAST BUILDS

SMART AND STYLISH ARCHITECTURAL PRECAST CONCRETE





THE CROW MUSEUM OF ASIAN ART

DALLAS, TEXAS /// BY SUSAN BADY

The Crow Museum of Asian Art is the first building to be constructed at the University of Texas at Dallas as part of the planned Edith and Peter O'Donnell Jr. Athenaeum. The Athenaeum is a 12-acre cultural district that will include two museums, a performing arts center, a large parking structure, and a public art plaza that connects all the spaces.

Describing the design concept for the museum, architect Aleksander Tamm-Seitz, associate principal and project manager at Morphosis, says, "Our office is very formal in nature, so all our buildings have very formal qualities to them. We love designing in the full three-dimensionality available, not just orthogonal XYZ components, and using complex formal geometry to what we think is the betterment of projects."

Morphosis zeroed in on precast concrete for the museum project "because it can be quite malleable, which works for the types of geometries and complex forms that we design," says Tamm-

Seitz. "For our buildings, precast is very appropriate for enclosures and provides a lot of opportunities that other materials don't."

Based on the positive results at the Crow Museum and other Morphosis projects over the last 15 years, Tamm-Seitz says, "I see us using precast in the future because now that it's part of our repertoire, we can push [the envelope] a little bit further."

Three-Dimensional Quality Sculpting

The Crow Museum was a design-assist project with Morphosis, general contractor The Beck Group, and GATE Precast—a collaboration that began early in the process.

"Coordination between the GATE team led by senior project manager Ryan Reinhard, the architect, the general contractor, and the structural engineer revolved around panel geometry and jointing," says GATE's vice president of operations, Mike Ryan. "Great attention to detail was given in placement of the connections to the steel to confirm constructibility and minimize the effect on other trades."



PROJECT SPOTLIGHT CROW MUSEUM OF ASIAN ART

Location: Dallas, Tex.

Size: 68,000 ft²

Owner: University of Texas at Dallas

Design Architect/Architect of Record:
Morphosis, Los Angeles, Calif.

Local Consulting Architect: GFF Design, Dallas, Tex.

Structural Engineer: Datum Engineers, Dallas, Tex.

Contractor: The Beck Group, Dallas, Tex.

PCI-Certified Precast Concrete Producer: GATE Precast,
Hillsboro, Tex.

Precast Concrete Components: 158 panels, each with an average thickness of 6½ in., including curved, canted, and popout “eyebrow” panels. The longest panel is 32 × 10 ft.

This rendering illustrates the massing of the Crow Museum. The building is considerably larger on the second floor than on the first, creating cantilevers and overhangs that offer protection from the elements. Illustration: @Morphosis.

There was a significant amount of variation in the panels, ranging from complex flat-panel formliners to unique panel shapes. There were 21 unique concave and convex panels. “The most challenging aspect of the panel geometry was the warped panels, which required the use of Rhino modeling software to generate custom CNC [computer numerical control] foam shapes,” Ryan says.

The team could only find one company capable of producing the custom foam shapes within the required time frame. Carpenters at GATE Precast built wood forms around the foam shapes, which took weeks to complete. The liner patterns were then applied to the foam.

For other trades, curtainwall support also proved to be challenging and was coordinated through the models. “The Beck Group did a great job of coordinating all the trades,” he says. “And C&A Erectors of West Monroe, La., did an amazing job installing the panels.”

Up to the first floor, the building is cast-in-place concrete. The rest of the structure is precast concrete panels, and it is impossible to tell from the outside that it’s a conventional precast concrete system, says Tamm-Seitz. The panels have an average thickness of 6½ in. and are backed with rigid foil-faced insulation, with a separate metal-stud furring wall inside the assembly. Each panel is roughly 10 × 30 ft.

“Precast allowed 3-D quality sculpting that helped with the overall massing and three-dimensional moves that we were making,” Tamm-Seitz says. The pattern complements the 3-D shapes of the building and creates a dynamic reading of the façade.

The project team worked through several iterations of the concrete, the aggregates, and the finish, eventually settling on a medium sandblast. “We used 100 percent white cement with white aggregate in it,” he says. “The sandblasting exposed some of the white aggregate, making it shimmer.”

One Formliner, Many Casts

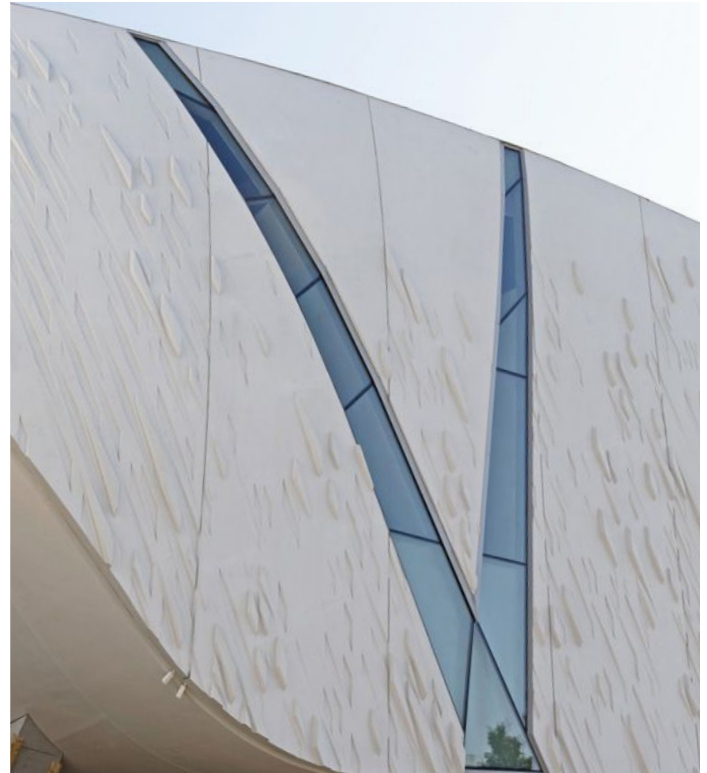
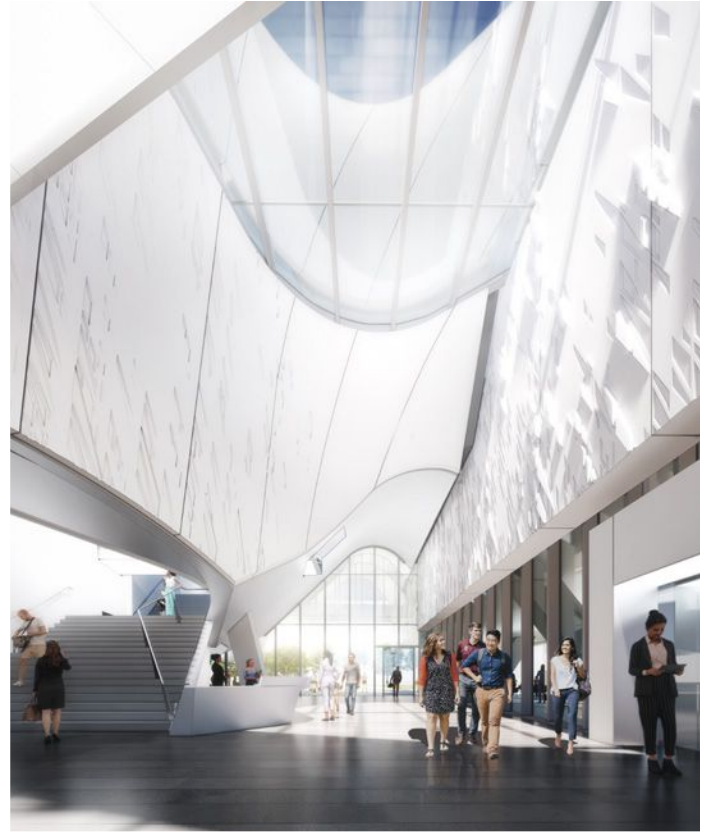
While it looks complicated, the pattern is made from just a few formliners that were repeated and overlapped. “It’s not like it’s one form per panel; we’re actually getting many casts on the same formliner because we’re using rubber formliners to make those negatives,” says Tamm-Seitz.

To optimize the pattern and textures on the panels, Morphosis and GATE went through “10 or 20 iterations,” he says. “The façade looks very complex but it’s actually quite systematized.”

Only about half the panels are hung in the traditional configuration—bottom bearing and top connected—while the rest are cantilevered off secondary steel. Curved radius panels in the lobby and atrium are canted and angled. “One-off engineering and analysis were required for every single one of those panels,” Tamm-Seitz says.

Crow Family's Asian Art Collection Donated to UT Dallas

Real estate giant Trammell Crow and his wife Margaret amassed an extensive collection of Asian art during their travels. Starting in the mid-1960s, the Crows brought home pieces from Cambodia, China, Japan, India, Indonesia, Korea, Myanmar, Nepal, Pakistan, Thailand, Tibet, and Vietnam, spanning from historical to contemporary. In 1998, the Crow family opened the Trammell and Margaret Crow Collection of Asian Art as a permanent museum in Dallas. Trammell Crow died in 2009 and the family donated the entire collection to the University of Texas at Dallas in 2019, where it is on display at the new Crow Museum of Asian Art.



Top right: The lobby has a small footprint but makes an impression with its double-height ceiling and grand staircase, which draw the eye to the upper floor. Illustration: @Morphosis.

Bottom photos: The pattern and texture of the panels creates a dynamic façade that changes depending on the time of day, the time of year, and the weather. Photos: Kristin Blackmar.