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Bill Blanski

Design principal, HGA, Minneapolis, Minn.

Bill Blanski is a nationally recognized architect and design principal at HGA who focuses on designing environments that inspire people to be creative, innovative, and professionally productive.

For more than 20 years, he has designed award-winning projects for arts, education, health-care, corporate, and government clients. He approaches each project from the client's perspective to design solutions that accomplish their goals effectively and creatively.

Blanski was awarded the prestigious Ralph Rapson Traveling Fellowship in 1999. He received his bachelor of architecture degree from the University of Minnesota.



Beth Broome

Managing editor, *Architectural Record* magazine, Brooklyn, N.Y.

Beth Broome is managing editor of *Architectural Record* magazine, the 125-year-old, award-winning publication from McGraw-Hill that features a mix of current work, design trends, news, building science, and business strategies. In her role, Broome oversees the day-to-day operations, planning, and production of the print magazine and website. She also edits and writes on a range of projects, events, and issues, and participates in juries and forums at academic institutions and for professional organizations.

A native of Boston, Mass., Broome lives in Brooklyn, N.Y., and is a former managing editor of *The New York Observer*. She received her degree from Tufts University in 1991



Matt Graf

Executive vice president, International Concrete Products, Germantown, Wis.

Matt Graf, executive vice president of International Concrete Products, encountered his first piece of precast concrete in 1977 while working during summers before college, and he never looked back. Over the past 35 years, he has held numerous jobs in the architectural precast concrete industry, including building forms, tying reinforcing steel, placing and patching concrete, dispatching, overseeing field finishing, and ultimately managing projects. His firsthand experience in these roles has given him a thorough understanding of the product and the knowledge to overcome many of the challenges project teams regularly face in this industry. He is a firm believer that the customer is always right and that we need to be fair and honest to deliver the highest quality and best products available to our customers.

Graf received his bachelor's degree in structural engineering from the University of Wisconsin-Milwaukee.



Marty Huie

Senior projects architect, Jacobs Engineering Group, Dallas, Tex.

As a senior projects architect and code and life-safety firm-wide resource for Jacobs Engineering Group, Marty Huie frequently challenges established concepts and synthesizes complicated and often conflicting requirements from clients and the construction trade industry. With the ability to truly listen and then respond with outside-the-box thinking, he has the bold ambition to alter the industry. He works closely with his clients to navigate the regulatory requirements for health-care facilities, communicate their impact on the design of these facilities, and generate innovative design solutions.

He educates clients and the design community through in-person and association presentations nationally, as well as writing for recognized industry publications. Huie has served as a National Fire Protection Association (NFPA) Healthcare Subcommittee member since 2004, and has actively debated code issues on the floor at the NFPA national committee meeting. He received his bachelor of architecture degree from Louisiana Tech University.

Capitol Federal Hall, University of Kansas

Lawrence, Kans.



Building on the momentum of its national ranking and increasing enrollment, the University of Kansas School of Business in Lawrence, Kans., wanted to build a brand-new facility that would represent its commitment to a campus-wide culture of entrepreneurship. The architects of the 166,500 ft², four-story building wanted the design to reflect the entrepreneurial and collaborative spirit of the School of Business while making broader connections to the campus through geometry and sectional properties. They also wanted a structure that could be constructed quickly with minimal disruption to the busy college campus. To achieve these goals, they chose a combination of glass, steel, and precast concrete to create a soaring, modern structure that suggests strength, durability, and connectivity through its design.

"This entrepreneurial spirit inspired the design to promote multiple manifestations of "connectivity" through building shape, programmatic relationships, and spatial weaving." Dirk McClure, Enterprise Precast Concrete Inc.

PLAYS WELL WITH OTHERS

The building consists of two wings linked by an expansive four-story glass atrium, which serves as a connector between the building's major program elements and a variety of informal spaces. "The visual flexibility and modular nature of precast made it a natural choice for the majority of the exterior façade," says Dirk McClure, regional director of sales and business development for Enterprise Precast Concrete Inc. in Omaha, Neb.

A key design decision made early on was to use a series of insulated panels in place of more traditional architectural cladding, to take advantage of the high-performance characteristics of precast concrete, McClure says. The primary design is broken up as a 4-4-4 panel; however, portions of the surface wythe protrude as much as 10 in. at the apex of a "V" pattern in the design.



OWNER:
The University of Kansas,
Lawrence, Kans.

**PCI-CERTIFIED PRECAST CONCRETE
PRODUCER & PRECAST CONCRETE
SPECIALTY ENGINEER:**
Enterprise Precast Concrete Inc.,
Omaha, Neb.

ARCHITECT:
Gensler & Associates Inc.,
Chicago, Ill.

ARCHITECT OF RECORD:
GastingerWalker&,
Kansas City, Mo.

ENGINEER OF RECORD:
Bob D. Campbell and Company,
Kansas City, Mo.

GENERAL CONTRACTOR:
JE Dunn Construction,
Kansas City, Mo.

PROJECT COST:
\$70.5 million

PROJECT SIZE:
166,500 ft²



Photos: Enterprise Precast Concrete Inc. and Jacia Phillips Photography.

The predominantly cream-colored precast concrete panels are accented by a series of copper panels to break up the look of the façade. The slight inset of the panels further creates a shadow effect that varies as the sun moves. “Combined with the glass and steel, this is truly an example of precast playing well with other materials,” McClure says.

From a structural standpoint, insulated spandrels span column-to-column and hang off steel haunches. “Through careful planning and coordination, a lot of weight was able to be braced back to the structure as it was suspended off the steel,” McClure says. Short insulated panels spanned long spans, transferring the loads back to the columns.

Going with an exposed precast concrete design added durability and reduced maintenance requirements, while also giving all the energy efficiency benefits of an insulated precast concrete panel.

Along with delivering a beautiful and durable design that will serve the campus for decades, the project came in ahead of schedule and under budget. This was due in part to the extensive use of building information modeling during preconstruction for coordination of overhead services, McClure reports. “It resulted in zero ceiling height changes and reduced the overhead mechanical, electrical, and plumbing rough-in work from 40 days to 25 days per floor per wing.”

Key Project Attributes

- Unique tapered panel design features portions of the surface wythe protruding as much as 10 in. at the apex.
- A sharp slope at the end of the cladding creates a striking cantilever.
- Insulated spandrels span column to column, hanging off steel haunches.

Project and Precast Concrete Scope

- Create a glass, steel, and precast concrete design for a four-story university building.
- The project features 49,165 ft² of precast concrete, varying from 18 in. to 12 ft.
- Precast concrete installation was completed in just four months.

University of Chicago Campus North Residential Commons Chicago, Ill.



Photo: International Concrete Products.

The Gothic architecture of the University of Chicago, Ill., founded in 1890, was chosen specifically to convey a sense of history, seriousness, and intellectual fortitude. Over the years, the university has remained committed to the Gothic and neo-Gothic design aesthetic, creating a community defined by its pointed arches, vaulted ceilings, and light, airy interiors.

When Studio Gang Architects was hired to design a three-building, multistory addition to house 800 students on campus, they knew it had to stay true to the style. “The biggest challenge was how to respond to the University of Chicago’s architectural context in a contemporary way,” says Emily Licht, a design team member in Studio Gang’s Chicago office.

They needed a material that could mimic the look of carved stone but could also be delivered on a tight timeline and within a limited budget. These demands led them to precast concrete. “The precast concrete panels allowed the design to emulate the collegiate Gothic tradition, updating this traditional architecture through form, rhythm, verticality, and scale,” Licht says. “They were also an affordable option that were able to be produced not too far away, in Wisconsin, expediting the delivery schedule.”

The goal of the new project was to create a gateway connecting the campus and community with plazas, gardens, walkways, courtyards, and retail space. The housing would include shared entryways, lounges, reading rooms, classrooms, and dining commons, as well as outdoor spaces meant to encourage interactions between students.

“The precast concrete panels serve as the primary visual element of the entire project,” Licht says. The façade of the new structures features brilliant white precast concrete panels that have an added sparkle, which plays off the coloration of the surrounding limestone architecture. Each panel has an acid-etch finish with subtle arcs that come to a point and twist up and down each of the three buildings in varying directions. “The arcs pay tribute to the university’s history of architecture,” she says.

“The precast concrete panels allowed the design to respond to the collegiate Gothic architectural context of the university, reinterpreting the tracery and depth of the carved limestone buildings without the cost or labor that stone would have required.” Emily Licht, Studio Gang

OWNER:
University of Chicago, Chicago, Ill.

**PCI-CERTIFIED PRECAST
CONCRETE PRODUCER:**
International Concrete Products Inc.,
Germantown, Wis.

PRECAST CONCRETE ENGINEER:
Midwest Structure Engineering,
West Allis, Wis.

ARCHITECT:
Studio Gang, Chicago, Ill.

ENGINEER OF RECORD:
Magnusson Klemencic Associates,
Chicago, Ill.

GENERAL CONTRACTOR:
Mortenson Construction, Itasca, Ill.

PCI-CERTIFIED ERECTOR:
Creative Erectors LLC,
Rockford, Ill.

PROJECT COST:
\$148 million

PROJECT SIZE:
400,000 ft²



Photo: Tommy Harris Photography.



Photo: Tommy Harris Photography.

The depths on the panels provide the sun shading and the thermal mass necessary for a radiant slab heating and cooling system. To achieve thermal performance, spray foam insulation was applied to the backs of the precast concrete panels, which helped eliminate the need for a rain screen system. The design of the precast concrete panels and window system also allows maximum natural light and fresh air into the building, Licht says. “The precast concrete panels provide the durability necessary for a building designed to be a long-lasting home for hundreds of students each year.”

MOCK-UP USED AS TRAINING TOOL

To ensure the precast concrete elements would exactly meet the specifications of the architect, a two-story mock-up was produced prior to construction. “The mock-up not only provided the architect with a visual of how the building would look, but it provided a training session for all trades to practice how the building was going to come together,” says Therese Hurley, business development manager for International Concrete Products.

The precast concrete producer then created 156 custom molds to produce more than 1000 panels. Because of the unique shapes and the fact that they had to be stored and shipped facedown, special cradles were produced to keep the sharp points and arcs safe during transport. “The cradles were so unique that they were later incorporated as benches in the garden on campus,” Hurley says.

The final design met all of the owner’s and architect’s goals, and fits seamlessly with surrounding structures. “The panels helped the building fit comfortably within the Gothic tradition of the campus, complementing the university’s past without competing with it,” Licht says. “It serves as a beacon and portal that anchors the northeast edge of the campus, creating a new front door for the university.”

Key Project Attributes

- Precast concrete easily mimics the Gothic architecture of the university campus.
- Precast concrete panels offer solar shading and provide thermal mass for a two-way radiant heating slab system.
- The weatherproof features of precast concrete eliminated the need for a rain screen.

Project and Precast Concrete Scope

- 156 custom molds were used to produce 1033 panels, 61 of which were unique in shape.
- The project used 148,448 ft² of precast concrete.
- Precast concrete erection was completed in nine months.

OWNER:
Hospitality 3, New York, N.Y.

**PCI-CERTIFIED PRECAST CONCRETE
PRODUCER & PRECAST CONCRETE
SPECIALTY ENGINEER:**
Universal Concrete Products,
Stowe, Pa.

ARCHITECT:
DIGSAU, Philadelphia, Pa.

ENGINEER OF RECORD:
DeSimone Consulting Engineers,
New Haven, Conn.

GENERAL CONTRACTOR:
P. Agnes, Philadelphia, Pa.

PCI-CERTIFIED ERECTOR:
Jemco Erectors,
Shamong, N.J.

PROJECT COST:
\$50 million

PROJECT SIZE:
149,000 ft²



The Study at University City Philadelphia, Pa.

The Study at University City is a 10-story luxury hotel at the intersection of two world-class universities in the heart of Philadelphia, Pa. “The owner of the project envisioned a high-quality, robust structure that reflected the traditions of the buildings in Philadelphia,” says Jeff Goldstein, principal at DIGSAU, the Philadelphia-based architecture firm.

The challenge: erecting this sophisticated piece of architecture on a tight jobsite, in a busy urban environment, and on a short schedule.

Initially, brick emerged as the most appropriate material to convey the owner’s design aesthetic.

However, a fully brick structure would have been time- and cost-intensive to construct, which conflicted with the timeline. “The team was motivated to enclose the structure as quickly as possible to allow for interior finish work to begin,” Goldstein says.

“The precast concrete panels are a nod to both the tradition and culture of bricklaying, while reflecting more modern building methods such as panelization and mass production.”

Jeff Goldstein, DIGSAU

Instead, the designers went with precast concrete, designing panels faced with thin brick to provide the look and feel of brick in a more time- and cost-effective package. “Choosing precast satisfied the design and performance requirements of the project, and minimized expensive field labor working on the tight urban site,” he says. The precast concrete panels are also a lighter envelope solution than traditional brick masonry, which was important for managing the vertical and lateral loads imposed on a cast-in-place concrete structural frame.

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BRICK, ONLY BETTER

The final design features a façade composed of solid precast concrete panels containing ironspot thin brick in a three-dimensional garden-wall bond pattern, which is a popular architectural theme in many of Philadelphia’s historic buildings. The precast concrete producers used bricks of multiple thicknesses, which required custom formliners to produce a highly textured and stealthily repetitive design. “The ability to generate a unique, three-dimensional brick bond allowed the precast wall assembly to take on a crafted, hand-made quality that greatly contributes to the building’s presence and character,” Goldstein says.

The panels were stacked in an offset pattern at corners, and custom brick shapes were used to wrap the exposed jambs and soffits of the panels. Metal trim was incorporated along select vertical joints to obscure the stacked arrangement of the panels. High-density mineral wool insulation with foil facing was incorporated into the panels to provide a continuous thermal barrier behind the panels and across joints.

“We really got excited about the opportunity to work within the tried-and-true methods of fabricating precast panels,” Goldstein says. The use of cast thin-brick precast concrete panels balanced the contextual references and provided a cost-effective façade solution. “It gave us a way to create something that reflected the hands of the skilled craftspeople who contributed to their creation.”



Photos: DIGSAU.

Key Project Attributes

- Thin-brick veneer delivered the look and feel of brick for a lower cost and with speedier erection.
- High-density mineral wool insulation with foil facing ensured a continuous thermal barrier.
- The use of custom formworks maximized the interchangeability and appearance of the complex and dynamic façade.

Project and Precast Concrete Scope

- Create a façade of solid precast concrete panels with thin-brick veneer for a 10-story 145,000 ft² hotel.
- Six custom oversized forms were used to form over 500 panels.
- The precast concrete exterior wall panels are supported by a cast-in-place concrete frame.

Universal Alloy Light Press Plant

Ball Ground, Ga.



Photos: Metromont Corp.

In the last half century, many manufacturing buildings have been constructed using precast concrete. However, despite the incredible versatility in color, texture, and detail that can be achieved with precast concrete designs, these buildings tend to be simple, utilitarian boxes with little design flair. “Most designers are not given the support to take advantage of the unique properties of precast concrete to add enhanced architectural details,” says George Spence, business development manager for Metromont Corp. in Hiram, Ga.

That was not the case with the new 110,348-ft² Universal Alloy light press plant in Ball Ground, Ga. This plant is an example of how an innovative designer can create a beautiful, detailed design using precast concrete in a way that adds virtually no additional costs to the project, Spence says. “Yet it yields an eye-catching façade that is truly handsome.”

“The durable, high-strength concrete used in casting these wall panels provides the owner with a maintenance-free wall system that was delivered at a very economical cost per square foot.” George Spence, Metromont Corp.

BIG AND BEAUTIFUL

The design for the plant, which will manufacture high-strength extrusions for the aircraft industry, included 106,000 ft² of manufacturing space, along with a 90-ft-high bay for vertical heat treat equipment, and three 75-ft-deep pits for loading and quenching the aluminum extrusions.

- OWNER:**
Universal Alloy Corp.,
Atlanta Ga.
- PCI-CERTIFIED PRECAST
CONCRETE PRODUCER:**
Metromont Corp.,
Hiram, Ga.
- PCI-CERTIFIED ERECTOR:**
Precision Stone,
Hiram, Ga.
- ARCHITECT:**
Querkraft Architects,
Vienna, Austria
- ENGINEER OF RECORD:**
Haines, Gipson & Associates,
Lawrenceville, Ga.
- GENERAL CONTRACTOR:**
Choate Construction Company,
Atlanta, Ga.
- ADDITIONAL TEAM MEMBERS:**
Wakefield Beasley & Associates,
Alpharetta, Ga.
- PROJECT COST:**
\$16 million
- PROJECT SIZE:**
110,348 ft²





The owner and design team chose load-bearing precast concrete panels to avoid weather delays during construction, and to take advantage of the superior structural advantages. They went with 12-ft-wide, full-height panels to reduce the piece count and erection duration, which improved the overall job schedule and reduced the number of trades on site. “The decision to use insulated wall panels immediately provided a complete wall assembly that was load-bearing, finished on both sides, and waterproof with an air and moisture barrier,” Spence says.

The panels included C-Grid carbon-fiber mesh, which is equivalent to welded-wire fabric but without the thermal bridging, which meant they could be insulated to meet the energy code and still be designed as a composite structural element. The panels also span structurally from the foundation to the roof structure, which eliminated the need for additional wind braces, further benefitting the cost and schedule.

Spence is quick to point out that the benefits of precast concrete on this project expand beyond performance and durability. It is also beautiful to look at, thanks to a façade that appears to be three-dimensional (3-D), an effect achieved through the innovative use of color, texture, and design. “Painted vertical accent stripes on the panels in combination with saw-tooth tops create a 3-D illusion that the panels project in and out like an accordion, adding architectural pizzazz to this rectangular manufacturing plant,” Spence says. “I’ve been in the precast concrete business for 45 years, and this is one of the most fascinating projects I’ve been involved in building.”

Key Project Attributes

- Sandwich panels with carbon-fiber grid provide the strength to withstand wind loads and carry roof loads.
- Novel use of striping creates a 3-D accordion effect on the façade.
- Piece count and erection duration were reduced with 12-ft-wide, full-height panels.

Project and Precast Concrete Scope

- Project included 65,886 ft² of carbon-cast high-performance insulated wall panels.
- The tallest panel is 46 ft 10 in. and the heaviest panel weighs 51,502 lb.
- Both wythes of the insulated panels are prestressed to give them beam strength and load-bearing capacity.

4260 Cortex St. Louis, Mo.



The Cortex Innovation Community is home to a vibrant 200-acre innovation hub and technology district in the historic Central West End of St. Louis, Mo. When the owners decided to build an additional mixed-use structure that could act as a gateway to the hub, they turned to CannonDesign in St. Louis to create a building that would measure up to the nationally ranked universities and medical centers in the surrounding neighborhood, while achieving pedestrian scale to invigorate a walkable community. “CannonDesign had a very specific idea of what they were looking to achieve aesthetically very early on in this process,” says Dirk McClure, regional director of business development for Enterprise Precast in Overland, Kans.

However, they faced challenges in how to construct the building in the busy urban environment. The project site was flanked on three sides by heavily trafficked streets, says Craig Norman, vice president at CannonDesign. The construction schedule was also aggressive, set to meet tenant move-in date commitments, which put added emphasis on enclosing the building quickly. “Precast was selected as an enclosure material as it could be fabricated remotely under quality conditions and installed quickly to expedite construction, while minimizing impact to surrounding site and roadways,” Norman says.

“Precast was selected because it affords the flexibility of utilizing varied patterns, textures, and colors within a singular building material.”
James Gordon, CannonDesign

SHADOW AND LIGHT

The architect’s design consists of two stacked box forms, with the upper projecting out beyond the lower. The first floor uses charcoal-colored precast concrete with a horizontally striated formliner, while



OWNER:
Cortex, St. Louis, Mo.

**PCI-CERTIFIED PRECAST
CONCRETE PRODUCER:**
Enterprise Precast Concrete,
Omaha, Neb.

**PRECAST CONCRETE
SPECIALTY ENGINEER:**
Enterprise Properties Engineering,
Omaha, Neb.

PCI-CERTIFIED ERECTOR:
Florida Builders Group,
Miami, Fla.

ARCHITECT & ENGINEER OF RECORD:
CannonDesign, St. Louis, Mo.

GENERAL CONTRACTOR:
Tarlton, St. Louis, Mo.

PROJECT COST:
\$14 million

PROJECT SIZE:
60,000 ft²

the upper volume is clad in white acid-etched precast concrete panels that contrast with the dark precast concrete and glass base. The upper floor features window openings that are varied in size and staggered. "This reinforces the idea of motion and resembles large-scale cast stonework between openings," says Andrew Gilles, former senior associate with CannonDesign, now at Mackey Mitchell Architects.

One notable aspect of this project was that the linear formliner pattern, which ran vertically, was turned 90 degrees so that the fine, textured lines ran horizontally, McClure says. "This occurs at eye level on the first floor, so great care was taken in making the pattern line up perfectly from panel to panel."

The use of curtainwall glazing on the north and south elevations and the first level volume frames impressive views, but more importantly acts as billboards to showcase the creative activities taking place within and enliven a once-vacant streetscape.

Along with providing a visually appealing structure, the precast concrete design also offers a low-maintenance, cost-efficient solution. "Panels are integrally colored to avoid long-term repainting costs, and double sealant joints and polyurethane foam insulation create a highly energy-efficient envelope," Gordon says. Fly ash was also cast into the concrete mixture to help meet sustainability goals.

The precast concrete façade complements buildings of similar scale and material located within the district, which was a key goal of the owner, adds James Gordon, senior vice president at CannonDesign. "As the architect, what I love most about this project is seeing how it brought the district to life and created a real sense of community."



Key Project Attributes

- Designers rotated a traditionally vertical formliner to achieve a horizontal striated look.
- L-shaped panels at the upper levels cut erection time and number of precast concrete pieces.
- Double sealant and an internally applied polyurethane foam insulation create a highly energy-efficient envelope.

Project and Precast Concrete Scope

- Design a façade for a three-story, 60,000-ft² mixed-use structure.
- The project included 2700 ft² of precast concrete, totaling 155 pieces.
- The average size per piece was 80 ft². The heaviest piece was about 9500 lb.



Photos: CannonDesign and Architectural Imageworks LLC.

Honor Credit Union Operations Office

Berrien Springs, Mich.



In September 2014, Honor Credit Union in Berrien Springs, Mich., broke ground on a new three-story, 37,000-ft² operations center. The new building would provide centralized support, offices, and technological services for the entire credit union network—and the owners wanted it up and running in just 12 months.

“The biggest challenges began with the construction schedule, timing, and winter,” says Jeff Klymson, founding principal at Collective Office in Chicago, Ill., the architect on the project. Berrien Springs is on the east coast of Lake Michigan, which is known for its long, snowy winters, so the team had to work fast to get the building enclosed before the cold set in.

Their solution: make the entire cladding using only two precast concrete panels, and get them into production as early as possible. “That way, only the interior trades were working in the coldest months of the year,” Klymson says.

“The harsh winter wind and snow in this region of southwest Michigan requires an exterior that is very durable. This precast solution is performing well and will continue to do so for years to come.” Jeff Klymson, Collective Office



OWNER:
Honor Credit Union,
Berrien Springs, Mich.

**PCI-CERTIFIED PRECAST
CONCRETE PRODUCER:**
Kerkstra Precast,
Grandville, Mich.

PCI-CERTIFIED ERECTOR:
G2 Inc., Cedar Springs, Mich.

ARCHITECT:
Collective Office, Chicago, Ill.

STRUCTURAL ENGINEER OF RECORD:
Louis Shell Structures Inc.,
LaGrange, Ill.

GENERAL CONTRACTOR:
E.C. Moore of Berrien County Inc.,
Berrien Springs, Mich.

PROJECT COST:
\$10 million

PROJECT SIZE:
40,000 ft²



Photos: Collective Office/Jeff Klymson. Mike Schwart Photography.

ONE PANEL DOES MOST OF THE WORK

The final exterior design, which Klymson refers to as “quietly modern and timeless,” alternates between full-floor solid and glass using nine unique panels for the entire building; however, 80% of the panels were identical in size. To break up the design, the architect alternated the direction of the rectangular panel from floor to floor. They also integrated tall, narrow glass modules between the panels to provide more light in the building and in the individual offices at less square footage than smaller strip windows. “It created great efficiency for cost and manufacturing,” he says.

To link the new structure to the rest of the Union’s retail branches, the designers had 13,000 modular Black Manganese Ironspot bricks and 900 corner pieces cast into the face of the panels. “The brick holds a rich unique color with an incredible sheen, and it is the standard for all Honor Credit Union branches,” Klymson says. Precast concrete was also used on the interior flooring, where approximately 44,000 ft² of 8-in. slab and 118 brick-clad precast concrete panels were installed.

Along with providing a cost-effective, interesting design, the precast concrete panels offer a low-maintenance solution, which is critical for a corporate office maintenance program. “This is an owner-occupied building, and therefore was meant to be an economical project in every way possible,” Klymson says.

The client loves the modern, elegant design and the highly efficient nature of the building. “The objective was to create an open, welcoming, but industrial feel to the project,” he says. “Using precast concrete delivered on this goal.”

Key Project Attributes

- One panel design was used for 80% of the façade, providing time and cost savings and manufacturing benefits.
- Black Manganese Ironspot bricks were cast into the façade to mimic the Union’s retail design aesthetic.
- The precast concrete solution allowed for rapid enclosure of the structure, which was key in the harsh Michigan winter.

Project and Precast Concrete Scope

- 118 precast concrete wall panels with brick facing totaling 12,000 ft².
- 470 hollow-core floor slabs totaling 44,000 ft².
- Precast concrete erection was completed in less than four months.



Photos: George Spence.

OWNER:

City of Alpharetta,
Alpharetta, Ga.

**PCI-CERTIFIED PRECAST CONCRETE
PRODUCER & PRECAST
CONCRETE SPECIALTY ENGINEER:**
Metromont Corp., Hiram, Ga.

ARCHITECT:

Smallwood, Reynold, Stewart,
Stewart & Associates, Inc
Atlanta, Ga.

ENGINEER OF RECORD:

Uzun & Case Engineers, LLC,
Atlanta, Ga.

GENERAL CONTRACTOR:

Choate Construction Company,
Atlanta, Ga.

PROJECT COST:

\$5.44 million

PROJECT SIZE:

140,500 ft²



Alpharetta City Center Parking Deck

Alpharetta, Ga.

Alpharetta, Ga., is a fast-growing southern city, with restaurants, shops, and office spaces that are attracting a growing population of citizens and tourists. This growth has been great for the local economy, but it was creating increasing traffic concerns. So in 2012, city leaders decided they needed a new downtown parking structure to accommodate the flow.

“The high-strength structural concrete used in this project will give the owner a parking deck with a long, durable, low-maintenance life that will be appreciated for years to come.” George Spence, Metromont Corp.

says George Spence, business development manager for Metromont Corp. in Hiram, Ga. But it had to be done on a fixed budget.

The architectural team chose precast concrete to address these dual needs. Precast concrete ensured the structure would be aesthetically compatible with the traditional Georgian architecture of the adjacent City Hall building, while still accommodating the schedule, budget, and structural needs of the deck, he says. “The ease of casting intricate and repetitive shapes in precast concrete panels allowed an economical way to incorporate the high level of detail required to effectively coordinate with the surrounding municipal buildings.”

HIGH-END DESIGN ELEMENTS

To further accommodate the budget, the designers wanted to minimize the number of precast concrete pieces used on the project, without compromising the design aesthetic.

To achieve these goals, they worked with the precast concrete producer to develop a panelization system featuring a joint pattern that would eliminate individual spandrel panels supported on columns, which reduced the number of façade pieces by 30%.

To add visual appeal and structural support, they created a tall “tree” column design with branches extending to each side. The branches feature architectural details and are able to receive double-tee loads on the back side. “The resulting layout fulfilled the architectural intent, the structural requirements, and kept the project in budget,” Spence says.

For the façade, the precast concrete producer cast thin-brick insets with buff-colored exposed and sandblasted concrete to mimic the cast stone pieces on City Hall. The entry and exit points and elevator towers have a reveal pattern that simulates cut limestone block construction, suggesting a grand entrance for approaching cars and pedestrians. The structure is capped with a precast concrete cornice, accented with bands of bullnose projections at each floor level. A series of cast-in medallions was also included, some inserted directly into the brick façade and others framed in shadow boxes in the limestone-colored precast concrete spandrel.

Achieving these monumental details in a structural parking deck was no small feat, but it was worth the time spent on planning and collaboration to get it right. “Although this is a parking deck, the façade has the architectural complexities of high-end institutional building,” Spence says. “In my opinion, the Alpharetta City Center Parking Deck has the best architectural design of any parking deck anywhere.”

The new 40,500-ft² five-level parking deck is a supporting component of the master-planned Civic and Government Center and accommodates 455 cars, dramatically easing the demand for parking in the area. But this structure had to be more than a temporary warehouse for cars. “The City of Alpharetta wanted a showcase parking deck with an architectural design to match the new City Hall in its new city complex,”



Key Project Attributes

- Panelized system cut the number of precast concrete pieces by 30%.
- A façade joint pattern was developed to eliminate individual spandrel panels supported on columns.
- Thin-brick insets mimic the adjacent City Hall’s cast-stone pieces.

Project and Precast Concrete Scope

- The project included 99 pieces of precast concrete, including 27 architectural detailed panels and 61 flat panels.
- 11,000 ft² of thin-brick veneer was cast in the panels.
- The heaviest panel was 22,862 lb, with the average panel weighing 18,000 lb.

Church of Jesus Christ of Latter-Day Saints Temple

Gilbert, Ariz.



Photos: Gate Precast Company.

When the team at Architekton was selected to design the new Church of Latter-day Saints in Gilbert, Ariz., they wanted to create a structure that would stand out, with a soaring façade, detailed patterns, and arched window openings to support crafted art glass. They knew the intricate design would be challenging to achieve, particularly on a fast-track schedule and limited budget, which is why they chose precast concrete.

“You can do anything with precast,” says Dane Astle, senior associate architect with Architekton. “We had very minor limitations in the level of detail we could achieve, which allowed us to create a very ornate building.”

THREE-DIMENSIONAL DESIGN MAKES FOR A PERFECT FIT

The design of the church features nearly 1000 precast concrete panels made with 73 forms. The sizes range from a single square foot to 262 ft², with the heaviest piece weighing more than 25,000 lb. The Architekton team, which was led by principal Greg Lambright, used three-dimensional (3-D) modeling to design the intricate patterns into each panel. “The ability to view the drawings in 3-D was beneficial on this complex project,” Lambright says. The precast concrete producer used the 3-D drawings to cast full-scale master molds and custom formliners.

“Special attention was also paid to the mix design and finishes,” Lambright says. The owner wanted the temple to look and feel like natural stone, which they achieved by choosing a light buff color with a medium sandblast and including a white aggregate in the mixture that sparkles when the sun hits it.

“Precast is an interesting material. It is long-lasting and has a similar look and feel to stone, yet you can form it into any design, pattern, thickness, or panel size.”
Greg Lambright, Architekton

OWNER:
 Church of Latter-day Saints,
 Gilbert, Ariz.

**PCI-CERTIFIED PRECAST
 CONCRETE PRODUCER:**
 Gate Precast, Hillsboro, Tex.

**PRECAST CONCRETE
 SPECIALTY ENGINEER:**
 Precast Technical Services Group,
 North Kansas City, Mo.

PCI-CERTIFIED ERECTOR:
 IMS Masonry, Lindon, Utah

ARCHITECT:
 Architekton, Tempe, Ariz.

ENGINEER OF RECORD:
 Paragon Structural,
 Phoenix, Ariz.

GENERAL CONTRACTOR:
 Okland Construction,
 Tempe, Ariz.

PROJECT COST:
 \$3.36 million (for precast concrete)

PROJECT SIZE:
 85,326 ft²





The designers met weekly with the contractor and the precast concrete producer's engineering department to ensure the panels could be replicated in the forms, and to determine the best size and shape of each panel. "We spent an incredible amount of time with Gate discussing how to break the panels into management pieces, and how they would be attached once they were at the site," Astle says. This was critical, as the project site was more than 1000 miles away from the plant, so everything had to be done right the first time.

The long distance also added shipping challenges, as the precast concrete producer had to ensure the ornate precast concrete panels were protected during the long haul. "It was very complicated, and we were always nervous until they actually arrived on site," Astle says. Thanks to precise calculations on weight distribution, all of the panels arrived safely with only minor damage to a few, despite the very long journey.

The project was completed in January 2014, and the owners love the way it looks like intricately carved stone, Astle says. "We gave them the look and feel that they wanted without having to go through the difficulty and expense of using stone."

Astle notes that not enough architects are aware of the versatility and cost-effectiveness of precast concrete. "You can achieve so many aesthetics with precast that are similar to other materials, but at a much lower cost," he says. "Architects should spend more time understanding how this material can be used."

Key Project Attributes

- Precast concrete façade features limestone-like finish with intricate artistic patterns of indigenous plants.
- Use of building information modeling ensured pieces were perfectly aligned for erection.
- Panels had to be trucked 1073 miles to the jobsite via 175 separate loads.

Project and Precast Concrete Scope

- Project includes 988 panels ranging in size from 1 to 262 ft².
- Precast concrete mixture includes white aggregate to add sparkle and stone-like quality to the façade.
- Precast concrete producers used 3-D models to cast full-scale master molds and 73 custom forms.

Kroger Field Renovation/Expansion Lexington, Ky.



Photo: Phebus Photography.

When the University of Kentucky set out to renovate its iconic Commonwealth Stadium (now Kroger Field), the owners knew they wanted to reinvent every corner of the space to make it feel more authentically Kentucky. It was a big challenge for a project that had to be completed while the stadium was open for football season, according to Greg Hosfield, architect and project manager for Ross Tarrant Architects in Lexington, Ky. That was one of the many reasons the team chose precast concrete for the exterior.

“The use of precast helped in allowing the exterior façade to be constructed quickly with minimal disruption to the game day experience,” he says. It also provided a completely new aesthetic to the façade of the stadium, while keeping the budget and schedule in line.

MASSIVE PANELS BRING COST SAVINGS

The façade was cast in 87 massive 8-in.-thick architectural precast concrete panels. “The large size allowed us to reduce the number of pieces and bearing points, which lowered the overall cost of the project,” says Kevin Locke, senior principal with Ross Tarrant Architects. To make the pieces feel smaller and more detailed, the larger panels were divided into smaller sections with reveals and two finishes: a heavy and light sandblast in a random pattern to emphasize the smaller panel design. “With the two finishes, one mix was able to be utilized, which gave two distinct looks while saving cost,” he says.

To ensure the variations in the finish were consistent, the design team worked closely with Gate Precast to alter the finish of small sections of each panel to help blend the entire façade together. “This required a great deal of design collaboration, as well as ongoing coordination and adjustments during manufacturing and construction to achieve the intended final product,” Hosfield says. “The process was challenging and required an innovative approach, but it yielded great results.”

“The university and Wildcat Football fans have commented on the stadium’s sophisticated, clean look. The impact of the curved precast façade on the exterior of the stadium is very striking.” Greg Hosfield, Ross Tarrant Architects

OWNER:
University of Kentucky,
Lexington, Ky.

**PCI-CERTIFIED PRECAST CONCRETE
PRODUCER & PRECAST
CONCRETE SPECIALTY ENGINEER:**
Gate Precast Company,
Winchester, Ky.

ARCHITECT:
Ross Tarrant Architects,
Lexington, Ky.

SPORTS DESIGNER:
HNTB Architecture Inc.,
Kansas City, Mo.

ENGINEER OF RECORD:
Brown and Kubican,
Lexington, Ky.

GENERAL CONTRACTOR:
Skanska/Congleton-Hacker,
Lexington, Ky.

PROJECT COST:
\$114.5 million

PROJECT SIZE:
191,545 ft² (addition);
292,664 ft² (renovation)



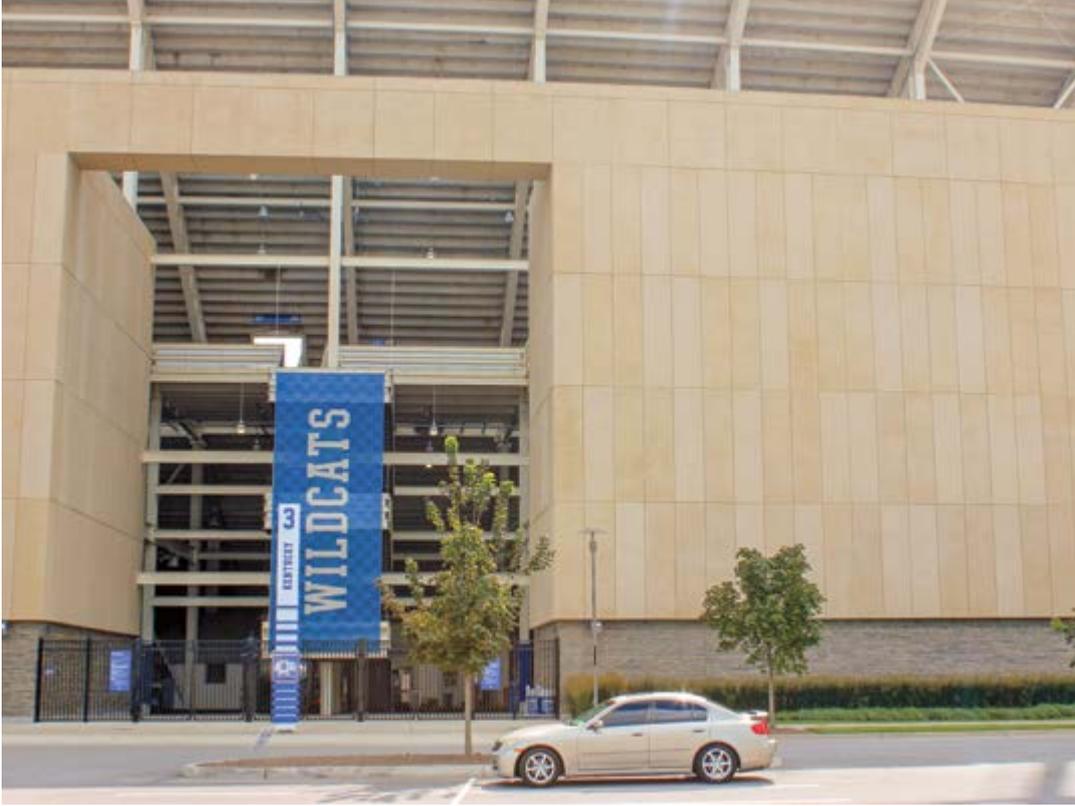


Photo: Gate Precast Company.

The massive weight of the panels and assembly crane also caused concerns regarding their impact on the drainage system. To mitigate that risk, the project team built a dedicated path and crane pad with timbers to prevent any damage. The project remained on schedule, and caused minimal disruption, even as the 2015 football season began before construction was complete.

The result is an attractive, durable, high-performance design that more than met the expectations of the university and Wildcat Football fans. “The goals for this project included transforming the appearance of the existing stadium and enhancing the fan and athlete experience,” Locke says. “The use of precast concrete was instrumental in achieving these goals.”

Key Project Attributes

- Curved precast concrete façade provides a new aesthetic to an old stadium.
- Envelope performance, recycled content, and regional production contribute to LEED silver certification.
- A dedicated crane pad made from timbers was built to protect the field and drainage system during construction.

Project and Precast Concrete Scope

- Design a comprehensive renovation and addition to a university football stadium.
- The project required a 191,545 ft² addition and 292,664 ft² of renovations.
- Precast concrete elements include 287 architectural precast concrete panels and 210 structural pieces.

Photo: Gate Precast Company.



Corning Museum of Glass Contemporary Art + Design Wing

Corning, N.Y.



Photos: Guy Nordenson and Associates and Richard Barnes.

The Corning Museum of Glass Contemporary Art in Corning, N.Y., is a not-for-profit museum dedicated to one thing: showcasing the beauty, versatility, and artistry of glass.

When the museum decided to expand the space in 2015, adding a 100,000 ft² addition, including 26,000 ft² of gallery space, they relied on another versatile material: precast concrete.

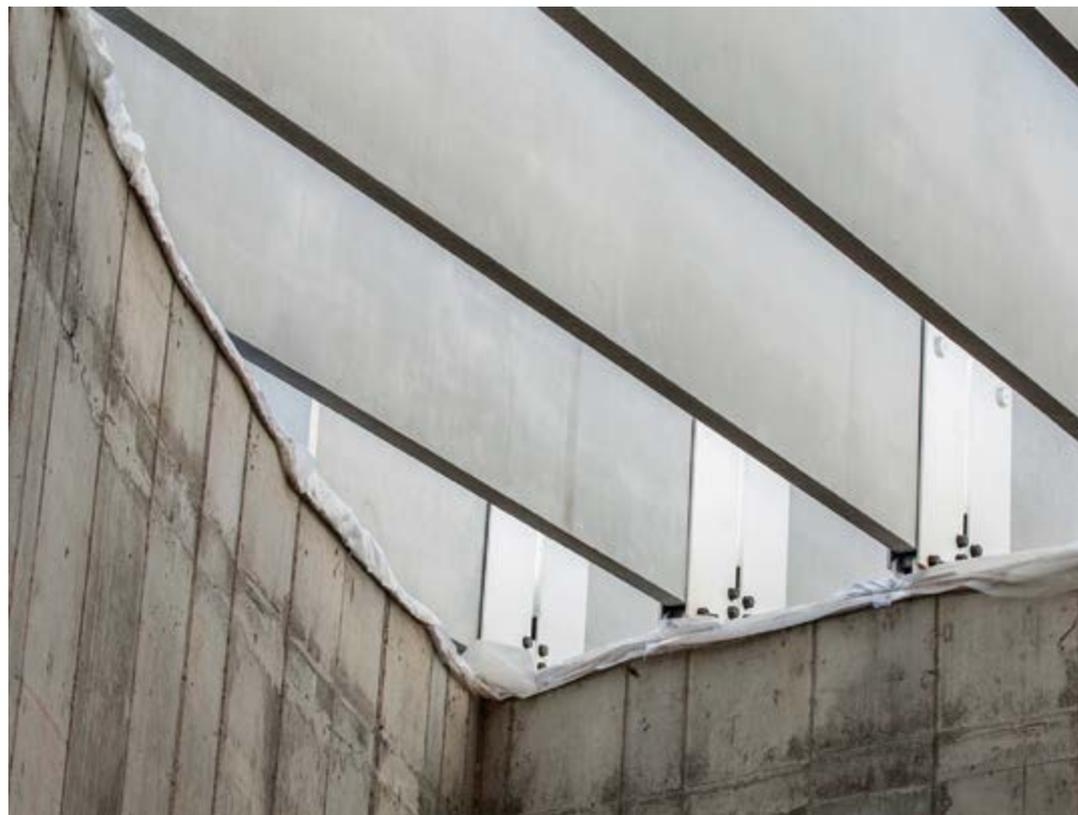
“The new design wing showcases the high-quality finish and tight fabrication tolerances that can be achieved with precast concrete,” says Lucile Walgenwitz, associate at Guy Nordenson and Associates in New York, N.Y.

STRONG AND THIN

One of the museum’s most prominent design features is the high-performance precast concrete long-span roof joists to support a series of gabled skylights, which filter light into the galleries below. To extend that aesthetic, the architects designed a series of 200 thin, closely spaced precast concrete roof joists, ranging from 6 to 55 ft, that span north to south between perimeter steel and interior concrete wall elements to support additional skylights. A system of thin steel purlins runs east-west over the top of the precast concrete roof joists to provide lateral bracing to the joists.

“The innovation in this project lies in the slender geometry of the precast concrete roof joists,” says Erich Oswald, associate partner at Guy Nordenson and Associates. The extremely thin profile of the precast concrete joists, coupled

“We love the smooth yet rich texture of the precast concrete roof joists, and how they contrast with the white-washed serpentine walls below. And of course, we are in awe at their extreme thinness.” Erich Oswald, Guy Nordenson and Associates



OWNER:

Corning Museum of Glass,
Corning, N.Y.

PCI-CERTIFIED PRECAST CONCRETE PRODUCER:

BPDL – Bétons Préfabriqués du Lac,
QC, Canada

PRECAST CONCRETE SPECIALTY ENGINEER:

Guy Nordenson and Associates,
New York, N.Y.

ARCHITECT:

Thomas Phifer and Partners,
New York, N.Y.

ENGINEER OF RECORD:

Guy Nordenson and Associates,
New York, N.Y.

GENERAL CONTRACTOR:

Gilbane-Welliver Joint Venture,
Albany, N.Y.

PROJECT COST:

\$64 million

PROJECT SIZE:

100,000 ft²



Photo: Guy Nordenson and Associates.

with the long spans and roof loading requirements, demanded detailed analysis of expected cracked sections and lateral torsional buckling modes. “Complex structural calculations had to be performed to confirm lateral stability, taking into account many different loading configurations and geometrical variations across the roof,” he says.

The absence of architectural finishes also meant that the whole roof structure was exposed to view. So in addition to meeting the load demands and negotiating the complex geometry, the connections had to complement the overall architectural design intent. “Using precast concrete allowed us to embed connection material such as sleeves and anchors within the joists and minimize the need for additive components that may have detracted from the architecture,” he says.

Walgenwitz notes that prefabricating the pieces off-site allowed the team to achieve the high compressive strength without any problems. “Tight tolerances and high strength were both key, given the slender geometry of the roof joists.”

Despite the complexity of the design, the erection process went quickly without any major problems, which Oswald attributes to close coordination between the design team, general contractor, fabricators, and erectors. “This allowed the schedule to progress without interruption... and helped the project to be completed on time.”

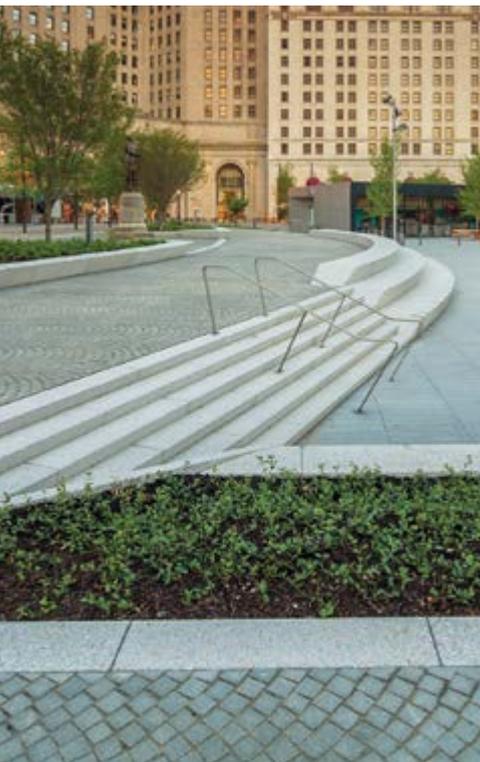
Key Project Attributes

- Extremely long and thin joists, up to 55 ft in span, support an array of gabled skylights.
- Exposed structural members require a high-quality stainless-steel finish.
- Connections use solid stainless-steel pins placed through stainless-steel pipe sleeves cast into the ends of the precast concrete joists.

Project and Precast Concrete Scope

- Project includes 206 roof joists ranging in length from 6 to 55 ft.
- Precast concrete pieces meet 10 ksi (70 MPa) compression strength.
- Joists are pinned at both ends and braced at 9 ft 6 in. by roof purlins.

Cleveland Public Square Cleveland, Ohio



Photos: Tectura Design.

For years, the heart of downtown Cleveland, Ohio, was home to a neglected 10-acre civic space that was bisected by two of the city's busiest streets, limiting its community value. But a 15-month, \$50-million renovation has transformed the space into a park-like destination that now provides a centerpiece to the city's ongoing redevelopment efforts.

The redevelopment project involved reorganizing streets, rerouting traffic, and creating a lush green center for the city's growing population. However, delivering the designer's vision in just 15 months in a city known for its harsh winters and heavy traffic was no easy task, says Veronica Rivera, associate architect at James Corner Field Operations in San Francisco, Calif.

The need for speed, durability, and versatility in the design made it a perfect fit for precast concrete. "The utilization of precast concrete allowed us to continue installation throughout the year with the precision and quality desired," Rivera says. "It would not have been possible to achieve with any other construction methodology."

"With a highly nuanced and customized design, precast concrete was utilized to unify the design while making each space a unique experience."

Veronica Rivera, James Corner Field Operations

800 CUSTOM MOLDS

The project included 1300 individual precast concrete elements, including low linear walls to frame the perimeter gardens, and continuous, sinuous walls reaching up to 8 ft in height to frame the "Key Bank Promenade" at the center of the square. The precast concrete walls were also used to create artificial topography, which "framed critical design features while articulating an otherwise flat site," Rivera says.

- OWNER:**
Group Plan Commission,
Cleveland, Ohio
- PCI-CERTIFIED PRECAST
CONCRETE PRODUCER:**
Tectura Designs,
a Wassau Tile Inc. brand,
Rothschild, Wis.
- PRECAST CONCRETE
SPECIALTY ENGINEER:**
J3 Engineering, Mequon, Wis.
- ARCHITECT:**
James Corner Field Operations,
New York, N.Y.,
and San Francisco, Calif.
- ENGINEER OF RECORD:**
Osborn Engineering,
Cleveland, Ohio
- GENERAL CONTRACTOR:**
Donley's Inc.,
Cleveland, Ohio
- PROJECT COST:**
\$50 million
- PROJECT SIZE:**
10 acres





To ensure that all of the various pieces would fit together seamlessly, the precast concrete producer created 800 custom molds, including one to support a 9-ft-tall, 20,000-lb precast concrete piece. The design also included special aggregates, pigments, and admixtures, incorporating 1200 pieces of concrete weighing in at over two million pounds, Rivera reports. “The utilization of precast concrete allowed us as the designers to have absolute control over the finish and concrete design mix.”

The finished park, which opened in time for the July 2016 Republican Convention, now provides a beautiful setting for the people of Cleveland that surpassed the expectations of the planning commission and showcases the many benefits of choosing precast concrete for this type of project, she says. “Precast was used both for its flexibility in design and customization, as well as for its long-term durability and low maintenance in what is now the central civic space for the city of Cleveland.”

Key Project Attributes

- 800 custom molds were created to achieve the custom design of this city square.
- Speed of erection achieved by using precast concrete was key for meeting the 15-month deadline.
- Styrofoam molds were compacted and recycled for reuse.

Project and Precast Concrete Scope

- Manufacture and erect more than 1200 pieces of precast concrete in a busy Cleveland public center.
- Precast concrete elements included 2 million lb of precast concrete in 800 custom shapes.
- Shipping and erection was completed in just 12 months.

