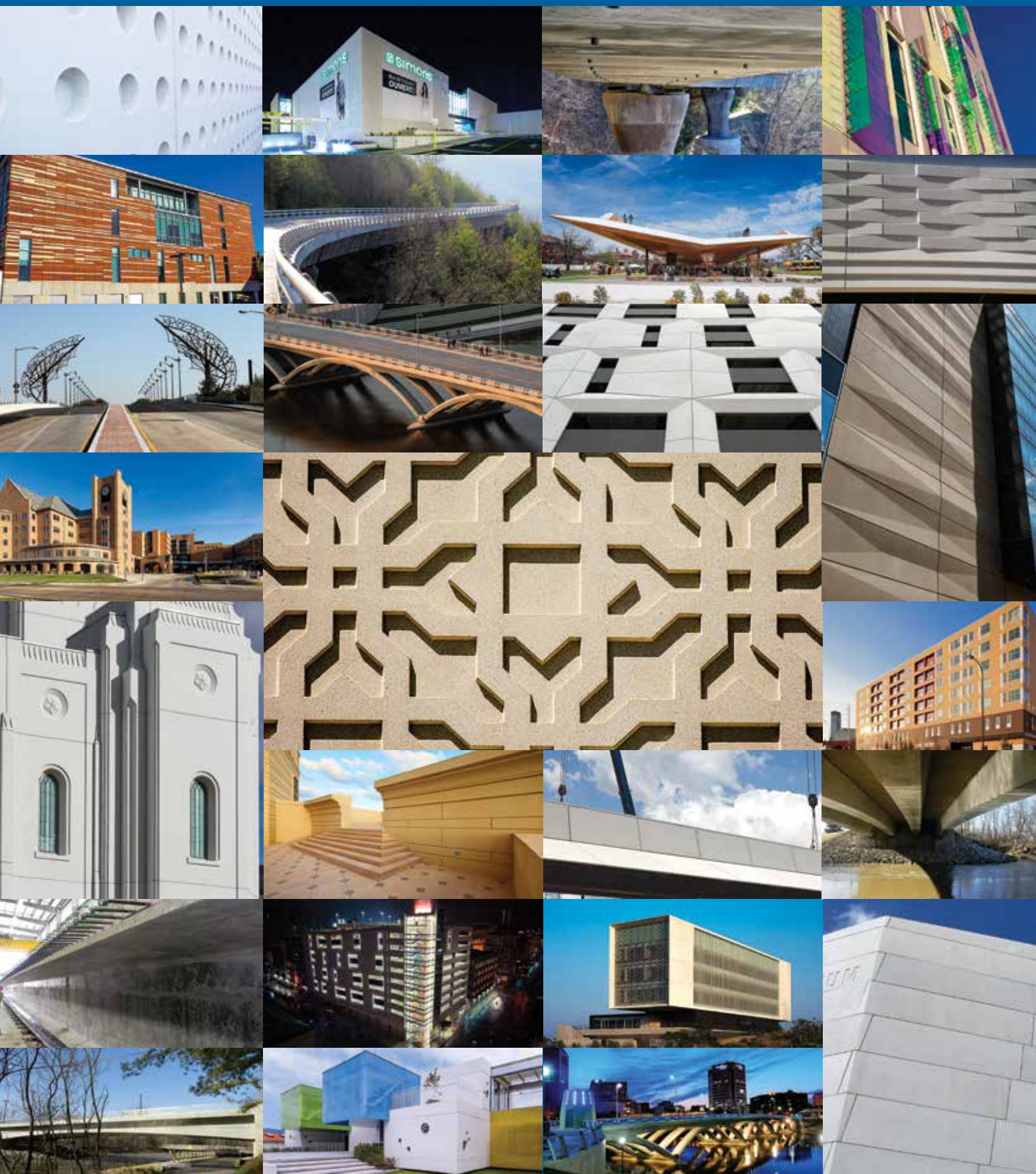
2014 PCI DESIGN AWARDS

Precast/Prestressed
Concrete Institute



High-Performance Precast Concrete

By Sarah Fister Gale

This year's PCI Design Award winners reflect the versatility, efficiency, and resiliency of precast concrete. In almost every case, the decision to use precast concrete helped cut costs—some by more than a million dollars—while enabling project teams to meet tight schedules.

Cost and time savings aren't the only benefits that precast concrete provided. The architects, engineers, precasters, and contractors involved in these projects also point to the beauty and strength that high-performance precast concrete brought to their projects.

"It was a tough competition," says Don Powell Jr., principal-in-charge at BOKA Powell architecture firm and one of the building awards judges. "We saw many innovative applications of this technology that resulted in low-cost, high-quality finishes and exceptional quality control."

Several award winners are pursuing LEED certification and—thanks to their use of precast concrete—have received added points for reduced construction waste, locally sourced materials, and exceeding thermal requirements for their structures.

Other winners note how precast concrete allowed them to deliver intricate designs and novel solutions, from the elegant peach blossom motif etched into the facade of the LDS temple in Brigham City, Utah, to the unique clamshell windows on the Sanford Cardiovascular Hospital in Sioux Falls, S.Dak., that extend 4 ft (1.2 m) beyond the structure and are cast entirely with precast concrete.

Powell was also especially impressed by the use of terra-cotta tiles cast into precast concrete panels on the facade of the Henry W. Bloch School of Management at the University of Missouri–Kansas City. "Typically, using terra-cotta as a rain screen is cost prohibitive," he says, but the project team came up with a unique design that cost less than a traditional rain screen and delivered a beautiful and durable solution. "It's a great example of how the industry can solve problems when they work together."

Ten judges from across the industry assessed dozens of projects and ultimately gave awards for 6 bridges and 16 buildings located in the United States, Canada, Mexico, and the United Arab Emirates. Award categories covered an array of building types, including Best Parking Structure, Best Multifamily Housing, and Best Religious Structure, along with a variety of bridge types and lengths. Special awards were also given for the Best Sustainable Design, the Best All–Precast Concrete Solution, and the Harry H. Edwards Award for Industry Advancement.

The following pages showcase the projects selected by the transportation, buildings, and special awards juries.

Each of this year's award winners proved that precast concrete brings beauty, strength, and efficiency to all types of structures.

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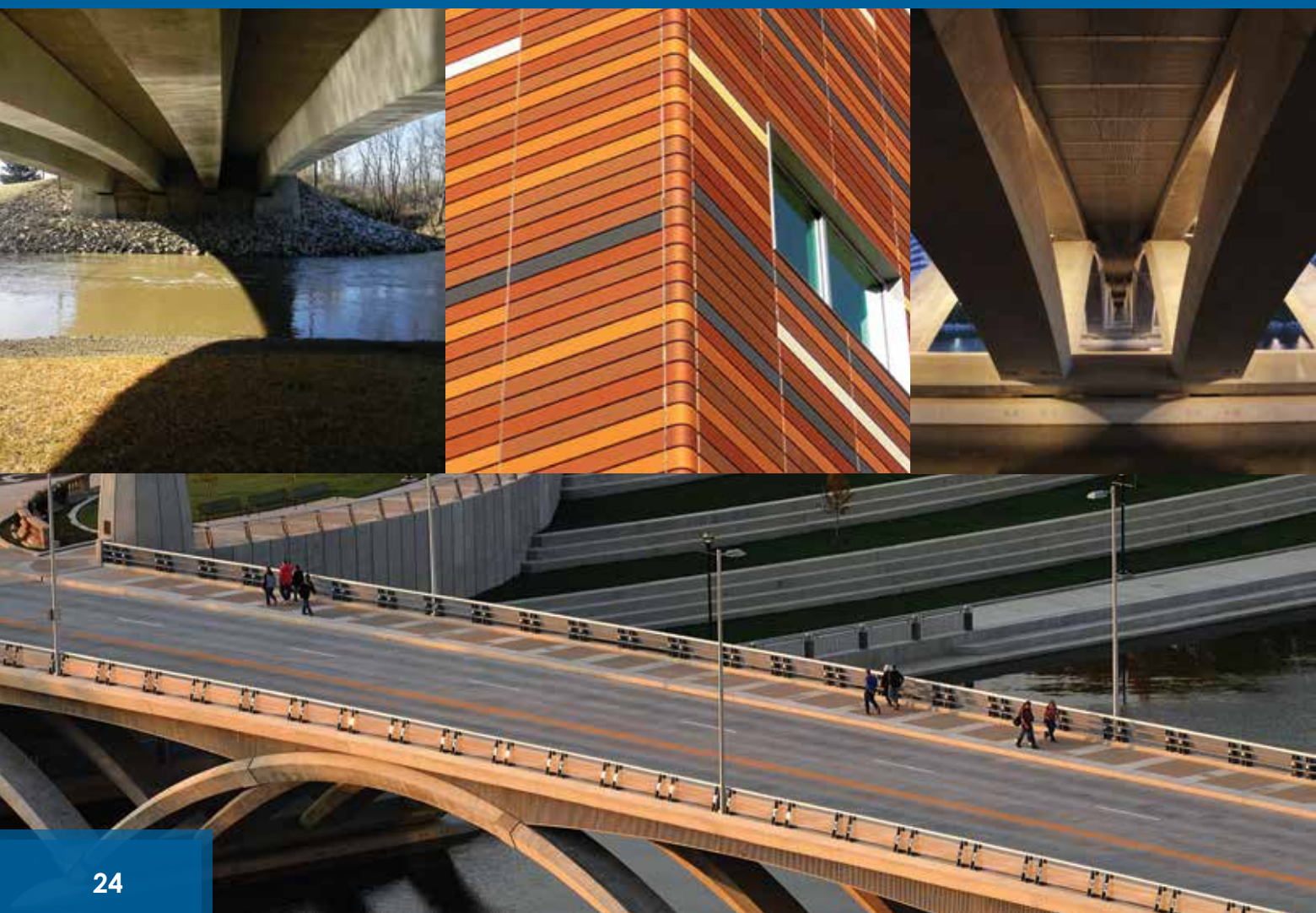


David Cook, AIA, principal architect at CTLGroup in Skokie, Ill., has more than 30 years of experience in commercial and residential construction, project design, structural evaluation, and project management. With his design background, he brings a strong focus on sustainability to structural and building envelope repair and rehabilitation.

Before joining CTLGroup, Cook served as the superintendent of facilities management for the City of Evanston, Ill., where he managed capital facility improvements and operations for 40 civic buildings and facilities. During his tenure Cook oversaw construction of the first LEED gold certified fire station in Illinois.

Previously, Cook worked as a senior architect and project manager for an engineering consulting firm, where he investigated construction defects and developed plans for the repair and rehabilitation of deteriorated and historical structures.

Cook received a bachelor's degree in architecture from the University of Illinois at Chicago in 1988 and a master of project management from Northwestern University in 2011.

Joe Bunkers is the vice president of preconstruction at Gage Brothers Concrete Products in Sioux Falls, S.Dak., and works closely with customers throughout the preconstruction process. He has experience in drafting, quality control, precast concrete sales, project management, and customer service.

Bunkers has achieved Quality Control Personnel Certification Level III from PCI. A graduate of Leadership PCI, Bunkers is an active member of the Leadership PCI Committee and PCI's Architectural Services Committee. He also volunteers as a Girl Scout troop leader for his daughter's troop.

Andrew E. N. Osborn, SE, PE, joined Wiss, Janney, Elstner Associates (WJE) in New York, N.Y., in 1978 and has participated in more than 2000 projects. He has conducted a wide range of investigations, repair designs, and load tests of buildings, bridges, water retaining structures, parking structures, tunnels, stadiums, and a lighthouse. He has also investigated numerous structural failures.

Osborn received a bachelor of science in civil engineering from Cornell University in 1975 and a master of science in structural engineering from the University of Illinois–Urbana-Champaign in 1976. Osborn is a registered professional engineer in eight states.

Osborn has been active in PCI since 1981, when he first joined the Connection Details Committee. He has served as chair of the Connection Details Committee, Strand Bond Task Group, Prestressing Steel Committee, and the Technical Activities Council. He has also served as a long-term member of the Research and Development Council.

“This was a great application of a high-performance precast envelope with a cost-effective, time-efficient production process.”
Greg Sheldon

Harry H. Edwards Industry Advancement Award
and Best Higher Education Building

University of Missouri Henry W. Bloch Executive Hall of Entrepreneurship and Innovation

Kansas City, Mo.

Owner	University of Missouri–Kansas City, Kansas City, Mo.
Architect	BNIM Architects/Moore Ruble Yudell Architects & Planners, Kansas City, Mo.
Precaster	Enterprise Precast Concrete Inc., Omaha, Neb.
Engineer of Record	Structural Engineering Associates, Kansas City, Mo.
Contractor	J. E. Dunn Construction, Kansas City, Mo.
Project Cost	$21.8 million
Project Size	68,000 ft² (6320 m²)
Photo	*Jacia Phillips Photography*

Designers of the Henry W. Bloch School of Management at University of Missouri–Kansas City wanted to create a contemporary structure that blends in with the university's historic masonry.

The dappled terra-cotta facade they chose is a modern take on a traditional color palette, but the use of insulated wall panels behind the terra-cotta tiles makes the facade truly innovative.

"The building is the first of its kind in the United States," says Dirk McClure, regional director of business development at Enterprise Precast Concrete. In the past, terra-cotta had been clad into smaller, noninsulated panels, but not on such large (12 ft wide [3.7 m]) fully insulated panels, Through collaboration among all of the project teams, they were able to combine the cost and time efficiencies and thermal attributes of precast concrete insulated panels with the beauty and elegance of terra-cotta tiles.

The solution gave the team a way to balance aesthetics with high performance, budget, and schedule, says Greg Sheldon, associate principal at BNIM Architects.

The cladding was originally envisioned as a conventional rain screen system with a steel frame and an air barrier. But a cost analysis by the general contractor concluded that a traditional rain screen would cost considerably more than terra-cotta–clad insulated precast concrete sandwich panels. "The precast system delivered a similar appearance while yielding notable cost savings," Sheldon says.

It also supported BNIM's philosophy of creating designs that deliver the greatest cost and energy efficiencies over the life of the structure. A CarbonCast C-grid system was employed to connect the concrete wythes with minimal thermal transfer, and with precast concrete panels, the insulation was continuous from edge to edge and top to bottom. These features met strict ASHRAE requirements and helped the building achieve LEED gold certification, Sheldon says.

To ensure the terra-cotta panel design would work, Enterprise's team did extensive research on everything from the amount of precast concrete bowing that could be tolerated without cracking the terra-cotta tiles to determining the optimum thickness of the tile to confirming adequate resistance to freezing and thawing.

Once the design was confirmed, precast concrete mockup panels were fabricated at the precast concrete plant with a five-color, random-blend terra-cotta tile pattern. The panels were completed in three months, and the entire building envelope was erected in just 12 weeks.

Harry H. Edwards Industry Advancement Award

Dodridge Street Bridge

Franklin County, Ohio

Owner	Franklin County Engineer's Office, Columbus, Ohio	**Precast Concrete Specialty Engineer**	GPD Group, Columbus, Ohio
Engineer of Record	E. L. Robinson Engineering, Columbus, Ohio	**Contractor**	J. D. Williamson Construction Co. Inc., Tallmadge, Ohio
Project Engineer	Janssen and Spaans Engineering Inc., Indianapolis, Ind.	**Project Cost**	$7,520,000
		Bridge Length	256 ft (78 m)
Precaster	Prestress Services Industries LLC, Lexington, Ky.	*Photos*	*E. L. Robinson Engineering of Ohio Co.*
Bridge Architect	Bridgescape LLC, Columbia, Md.		

"These engineers pushed spliced precast, posttensioned concrete U girders to a new length using a tie-down span."

Special Awards Jury

The new Dodridge Street Bridge over the Olentangy River serves as a gateway into the Olde North neighborhood in Columbus, Ohio. The new structure handles more than 14,000 vehicles per day while also serving as a pedestrian path for local residents. "It is a unique bridge that local residents are proud to use as a landmark reference," says Rick Engel, vice president and lead structural engineer at E. L. Robinson Engineering, the engineer of record for this project.

Because the bridge is so important to the community, residents were given a chance to choose between a steel design and a precast concrete design for the new structure. They overwhelmingly chose the precast concrete option, Engel says. "They wanted the bridge to have a little pizzazz, and the precast concrete design had a special look."

Engineers of the new bridge, which replaced a deficient 206 ft (63 m) long two-span structure, employed an innovative, aesthetically enhanced design consisting of a three-span posttensioned concrete girder superstructure that is anchored on each end in hidden tub girders.

The architectural geometry of this bridge required the smallest structural section where peak design demand occurred, posing a significant design challenge," Engel says.

The two hidden end spans balance the effects of having a slender main-span structure. Tie-down anchors were used to provide stability for the bridge, which is otherwise unbalanced in its three-span configuration. The tub girders were posttensioned in stages as dead load was applied to allow the girders to function as continuous beams, despite the appearance of a single-span gentle arch.

Achieving this delicate balance wasn't easy, Engel says. "The construction of this bridge required a careful sequencing of the posttensioning and tie-down forces to ensure the tub girders were stable throughout all stages of construction and at no time overstressed."

The design team also learned early in the planning phase of the project that there was a high volume of special needs individuals who use the bridge daily to access a nearby bus stop. To ensure their safety, the engineers incorporated a wider separated sidewalk and shoulders. Wider travel lanes, and improved roadway geometrics and street lighting, also increase safety for pedestrians and vehicular traffic and provide an opportunity for future bike lanes.

The project achieved further savings and environmental goals by recycling existing abutment blocks to support the new bike path retaining wall on the Olentangy River Greenway, which will allow users to navigate the trail while appreciating the aesthetic bridge features.

Both community members and the bridge owner are pleased with the result, Engel says. "This aesthetically pleasing structure will provide local residents with a beautiful gateway that can be enjoyed for decades."

"High-performance precast provided the aesthetic and thermal performance all in one system."

Thomas M. Gormley

Sustainable Design Award

University of Kentucky Albert B. Chandler Hospital Pavilion

Lexington, Ky.

Owner	University of Kentucky, Lexington, Ky.
Architect	GBBN Architects, Cincinnati, Ohio
National Healthcare Architect	AECOM-Ellerbe Becket, Minneapolis, Minn.
Precaster and Precast Concrete Specialty Engineer	Gate Precast Co., Winchester, Ky.
Engineer of Record	Affiliated Engineers, Madison, Wis.
Contractor	Turner Construction, Cincinnati, Ohio
Project Cost	$352 million
Project Size	1,200,000 ft² (111,000 m²)
Photos	*Pease Photography, Courtesy of GBBN Architects and AECOM*

As the new centerpiece of the Albert B. Chandler Hospital at the University of Kentucky in Lexington, Pavilion A celebrates the art and science of medicine.

The new 1.2 million ft² (111,000 m²) facility serves as the front door to the hospital campus, unifying the complex and creating a new focal point as visitors arrive, says Thomas Gormley, principal at GBBN Architects.

One of the biggest challenges for the design team was finding a way to build an attractive, durable structure that could be enclosed quickly so work could begin on the interiors and the schedule could be maintained. "The exterior skin of the hospital was a large part of the construction's critical path," he says.

The team sought the most thermally efficient exterior skin compatible with an accelerated schedule, says Mark Pedron, vice president of operations at Gate Precast. They chose precast concrete after seeing how insulated precast concrete panels could meet the exterior-design objectives, offering continuous insulation and a blend of five types of textures and colors to mimic the hand-set brick and stone on adjoining buildings.

The team visited several precast concrete installations to evaluate options and verify that the system could achieve the project's exterior-design objectives. "The architect wanted a building that had continuous insulation with no cold spots... [and no] bearings or connectors to interfere with the consistency of the insulation layer," Pedron says. "Additionally, the exterior precast concrete cladding offered a quality of construction that could be better controlled and still take a significant amount of time off the project schedule."

The precast concrete panels consist of a 3 in. (75 mm) exterior wythe of concrete with another $^{5}/_{8}$ in. (16 mm) layer of thin brick, a 2 in. (50 mm) center of polyisocyanurate insulation with ship-lapped edges, a vapor barrier, and an interior 4 in. (100 mm) structural wythe. The resulting panels are 6 ft 8 in. (2.03 m) tall and 36 ft (11 m) long.

Erection was conducted in two shifts. "We were able to set precast components during the second shift, which allowed the other trades to use the cranes during the day," Pedron says. The erection crew was able to enclose the structure much sooner than by other construction methods and mxaterials.

"If they had tried to use hand-laid brick, it would've taken forever to get it completed, and the site—at the front of the hospital—would have been disrupted for a long time with materials and scaffolding," says Bill Sparks, chief engineer at Gate. He estimates the precast concrete panels allowed the building to be enclosed two to three times faster than would have been possible with hand-laid brick, without the site congestion.

Best Bridge with All-Precast Concrete Solution and Main Span from 76 to 149 ft

Rich Street Bridge

Columbus, Ohio

Owner	Ohio Department of Transportation District 6, Delaware, Ohio
Client	City of Columbus, Department of Public Service, Columbus, Ohio
Engineer of Record and Precast Concrete Specialty Engineer	Burgess and Niple Inc., Columbus, Ohio
Structural Engineer	Leonhardt, Andrä und Partner Beratende Ingenieure VBI AG, Stuttgart, Germany
Bridge Architect	Bridgescape LLC, Columbia, Md.
Precaster	Prestress Services Industries, Melbourne, Ky.
Contractor	Kokosing Construction Co. Inc., Columbus, Ohio
Overall Project Cost	$30,533,000
Bridge Construction Cost	$12,453,000
Bridge Length	562 ft (171 m)
Photos	*Randall Lee Schieer Photography, Columbus, Ohio*

The new Rich Street Bridge in Columbus, Ohio, had to do more than just offer cars and pedestrians a way across the river. The bridge was going to be a centerpiece for the city's thriving downtown riverfront and a venue for festivals and community events.

"The owner wanted an iconic design that fit the style of the city," says John Shanks, project manager with Burgess and Niple, the engineer of record for the project.

The new structure would replace a historic but structurally deficient concrete spandrel–filled arch bridge, but it would be built on a new alignment slightly farther downstream.

Originally, the engineers envisioned a cast-in-place concrete ribbon arch bridge; however, midway through the design process, the engineer and architect were challenged to reduce the overall cost of the project and shorten the construction time frame. "We determined that a precast concrete bridge was the only solution that would meet those project goals," Shanks says. "It allowed for greater speed and efficiency of construction, it was a lower-cost option, and it had greater expected durability than cast-in-place concrete."

The new design is a 562 ft (171 m) modern rib arch bridge with semi-lightweight precast, posttensioned concrete arch ribs. Using lightweight precast concrete arch ribs instead of the cast-in-place arch plates reduced construction time and allowed for a minimal number of field segments, which were precast locally and transported via truck to the site.

The radii of the ribs and all other relevant dimensions are standardized from span to span. Along with the biaxial symmetry of the structure, this standardization allowed all of the precast structural members to be cast with just one set of three custom adjustable forms, saving both time and money. All posttensioning strand-end anchorages were arranged to be concealed and terminate above flood level for added durability. The change to precast concrete ultimately shortened construction by seven months and reduced estimated project costs by $10 million.

"The use of precast concrete also provided distinct advantages when incorporating bridge aesthetics," Shanks says. The modern arch structure used precast concrete beam, arch rib, and arch apex segments stitched together with a combination of prestressing and field posttensioning. This created a fully continuous frame, eliminating intermediate expansion joints and spandrel columns, to allow for a slender open design that provides clear views of the water and city skyline. To create additional drama, architectural lighting was installed both above and below the bridge deck to light up the structure at night, creating a dazzling display that reflects off the river.

"The new bridge has such widespread appeal that it regularly appears as the backdrop for local newscasts, newspapers, and tourism materials," Shanks says. "The use of semi-lightweight precast concrete, field-spliced posttensioning, and a minimal number of efficiently tailored segments helps advance the boundaries of what can be achieved with precast concrete, melding aesthetic, durable, and economical bridge design."

"These graceful high-performance precast arches created a local icon for decades to come."

Joey Hartmann, Transportation Awards Jury

"Precast concrete provided the most efficient way to achieve the goals for the project."

Todd Rhoades

All–Precast Concrete Solution

Higher Ground

Minneapolis, Minn.

Owners	Catholic Charities of St. Paul and Minneapolis, Minn. Community Housing Development Corp., Minneapolis, Minn.
Architect	Cermak Rhoades Architects, St. Paul, Minn.
Precaster	Hanson Structural Precast, Maple Grove, Minn.
Precast Concrete Specialty Engineer	Ericksen Roed and Associates, St. Paul, Minn.
Engineer of Record	Mattson Macdonald Young, Minneapolis, Minn.
Contractor	Frerichs Construction, St. Paul, Minn.
Project Cost	$14.3 million
Project Size	74,811 ft^2 (6950 m^2)
Photos	*Brandon Stengel - Farm Kid Studios*

Higher Ground in Minneapolis, Minn., is a unique transitional housing center. It provides overnight shelter for the homeless as well as permanent housing for individuals ready to move beyond the shelter system. The design eases the transition from homelessness to long-term housing, allowing clients to literally ascend as they regain independence.

The project team faced many challenges, says Lisa Germann, associate architect with Cermak Rhoades Architects. The building had to fit a triangular, sloping site, and it had to be finished in just 12 months, while still meeting the owner's desire for an attractive building with light-filled rooms and open spaces.

"The use of precast concrete for the new facility's structure, envelope, and finishes contributed in many ways to the success of the new building and the ability to serve its residents," Germann says. "It allowed us to introduce a variety of colors and textures to the building exterior, with a timeless modern design at a cost that worked within the nonprofit developers' tight budget."

The combined precast concrete structure and envelope also allowed the team to cut six weeks from the schedule.

Durability and maintenance were also key factors. "Not only was the nonprofit developer concerned about how long the building materials would last but also how the material selections and envelope would affect their operating cost," she says, but the use of precast concrete allayed their concerns.

The precast concrete sandwich walls provide a tight, well-insulated skin, exceeding ASHRAE 90.1-2004 requirements by 23%. Precast concrete stairs were left exposed, and the polished concrete topping was used as the finished floor in many areas, contributing to the building's modern aesthetic as well as enhancing durability and facilitating maintenance. The precast concrete structure and envelope also met the fire-resistance requirements.

The building's facade features thin brick and warmly colored precast concrete panels to create a welcoming yet contemporary residential feel within the nearly all–precast concrete envelope. "Other structural and envelope systems could have accomplished these spans, but the use of precast for both the structure and envelope made for a more seamless, energy-efficient and cost-effective solution," Germann says.

The precast concrete panels also allowed for large windows to draw light in and create a connection between the residents and the rest of the community.

"When precast was first suggested for this building, we all had preconceptions about how this selection may affect the project," Germann says. "But together, we pushed precast beyond conventional practices, evolving into a highly expressive, durable, and efficient building."

2014 PCI DESIGN AWARDS
Building Awards Jury

Best Government or Public Building
U.S. Freedom Pavillion/The Boeing Center at the National World War II Museum in New Orleans, La.

Best Government or Public Building
Salas Regionales del Golfo in Xalapa, Veracruz, Mexico

Best Healthcare/Medical Building
Sanford Heart Hospital in Sioux Falls, S. Dak.

Best Higher Education Building
University of Houston Health and Biomedical Sciences Building in Houston, Tex.

Best K-12 School
Kinder Monte Sinaí in Mexico City, Mexico

Best Multifamily Housing
2550 N. Lakeview Drive in Chicago, Ill.

Best Office Building
Polsinelli Headquarters and Hotel Sorella in Kansas City, Mo.

Best Parking Structure
The Z in Detroit, Mich.

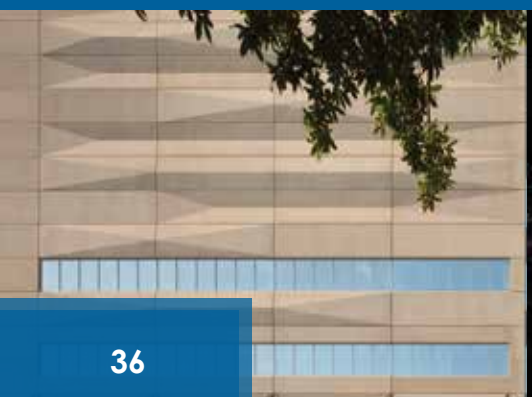
Best Religious Structure
LDS Temple in Brigham City, Utah

Best Religious Structure
The First Baptist Church of Dallas in Dallas, Tex.

Best Retail Building
La Maison Simons in Montreal, QC, Canada

Best Custom Solution
The Ohio State University Chiller Plant in Columbus, Ohio

Best Custom Solution
G8Way Pavilion in Washington, D.C.



Donald R. Powell Jr., AIA, NCARB, RID, is principal-in-charge at BOKA Powell LLC, an architecture firm in Dallas, Tex., which he launched three decades ago.

After planning and designing more than 35 million ft² (3.3 million m²) of architecture and interiors, he says that the best design solutions come from a thorough understanding of the problem and allowing that clarity to drive the process.

Powell received a bachelor of architecture degree and a bachelor of science in environmental design from Ball State University in 1976. He continues his professional education through executive graduate courses at the Harvard Graduate School of Design.

He is affiliated with the American Institute of Architects, the Texas Society of Architects, the National Council of Architectural Registration Boards, and the Urban Land Institute Office Development Council. He received the Ball State University Award of Outstanding Achievement in 2008.

Bruce Sekanick, AIA, OAA, is principal architect for Warren, Ohio–based Phillips|Sekanick Architects Inc., which provides planning and design services for commercial and government projects. Sekanick coordinates strategic efforts for the firm and is responsible for Creative Studio projects.

Sekanick has been a member of the American Institute of Architects (AIA) for more than 25 years. He is a member of the AIA national board of directors and serves as vice chair of the National ArchiPAC Committee. He has served as president of AIA Ohio and AIA Eastern Ohio and is a member of the Ontario Association of Architects.

He earned a bachelor of science degree in architecture and a bachelor of architecture from Kent State University in 1984, as well as a certificate in urban studies and planning. He completed an executive certificate in leadership and management through the University of Notre Dame in 2012.

N. Jean-Pierre Pelletier, FIRAC, is a Montreal architect and first vice president of the Royal Architectural Institute of Canada (RAIC) in Ottawa, ON. He founded the architectural practice Pelletier, N. Jean-Pierre, Architects in 1983 and in 1989 founded PNJP Consultants Inc., in Montreal and Ottawa, dedicated to the management of construction projects. In 1997 these two enterprises were certified ISO 9001.

From 2005 to 2011 he was director of research and development for the CANAM Group, with manufacturing facilities in Canada and the United States. Since 2011, Pelletier has acted in the capacity of consultant in building science and devotes time to teaching.

A member of the Order of Architects of Québec since 1981, Pelletier joined its board in 1996. He became a fellow of RAIC in 2004, and since 2011 he has been a member of the RAIC board. Pelletier graduated from the University of Montreal's School of Architecture in 1978.

Timothy Taylor, AIA, a principal at Gensler, is Gensler's foremost resource on architectural and technical specifications. As the technical director for Gensler's southeast region, Taylor provides oversight for specifications contract documents and works in tandem with the design teams to write architectural specifications. He is an integral part of Gensler's firmwide quality assurance/quality control program, helping to develop and maintain its master specification program.

Taylor has worked on a variety of projects over his career, including U.S. embassies for the Department of State, several U.S. museums, high-rise commercial and mixed-use office buildings, airports, and mixed-use projects up to 4 million ft² (370,000 m²) in size and totaling $3 billion.

He earned a bachelor of science in architecture and a master of architecture degree from The Catholic University of America. Taylor is a registered architect and a member of several industry organizations, including PCI, the American Institute of Architects, AAMA, DHI, and ASTM International.

"At 30,000 gross square feet and 100 feet tall, the pavilion makes a dramatic architectural statement."
Bartholomew Voorsanger

Best Government or Public Building

U.S. Freedom Pavilion/The Boeing Center at the National World War II Museum

New Orleans, La.

Owner	The National WWII Museum, New Orleans, La.	**Contractor**	Woodward Design + Build, New Orleans, La.
Architect	Voorsanger Mathes LLC, New York, N.Y.	**Project Cost**	$21 million
Precaster	Gate Precast Co., Monroeville, Ala.	**Project Size**	36,000 ft² (3350 m²)
Engineer of Record	Weidlinger Associates Inc., New York, N.Y.	*Photo*	*Martin Stigsgaard*

The U.S. Freedom Pavilion/Boeing Center at the National World War II Museum in New Orleans is a destination for visitors from around the world. The breathtaking precast concrete, glass, and steel museum, which features slanted walls of windows showcasing a collection of iconic aircraft, was designed to convey the strength and fortitude of American soldiers who fought in World War II.

"Precast was an excellent architectural material to showcase the strength of the mission of the museum and the purpose for this building," says Martin Stigsgaard, lead designer at Voorsanger Mathes LLC in New York.

The Freedom Pavilion is part of a 240,000 ft² (22,000 m²) expansion of the museum campus in New Orleans and is the tallest building on the site. "The precast concrete panels are what mostly signify the power within the material palette, but it also gave the opportunity to weave interlocking angular geometries in a very precise manner," says Bartholomew Voorsanger, principal in charge of design at Voorsanger Mathes.

Ensuring that the design has the presence to anchor the campus was particularly important because the site is bypassed by a highway off-ramp. "The challenging context of the siting is dramatically resolved by the 98 ft [30 m] high slanting walls," Stigsgaard says.

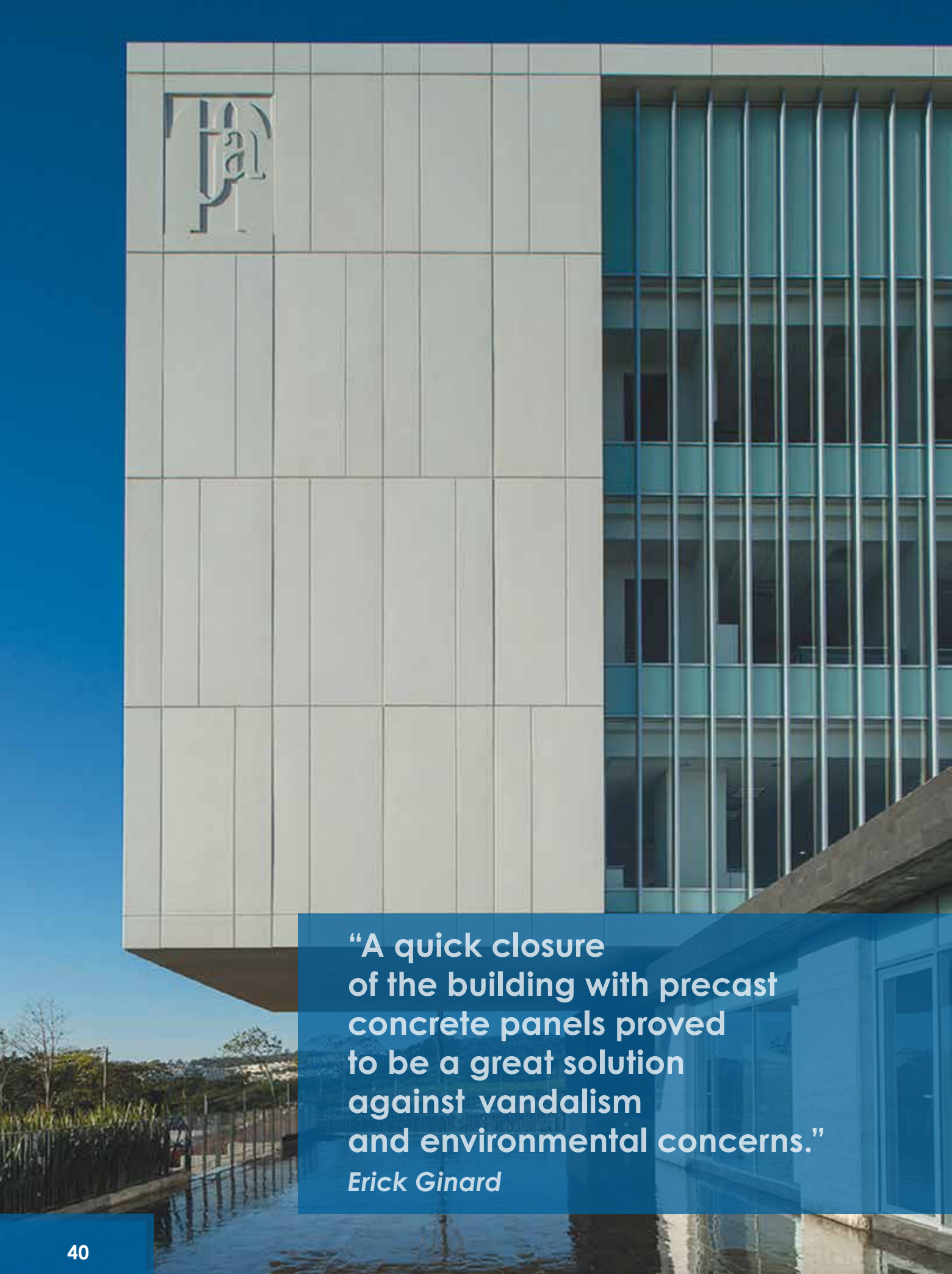
The sloping facades consist of a series of horizontal precast concrete panels that are 8 ft (2.4 m) high with a 19,000 ft² (1800 m²) footprint. Trapezoids and parallelograms are the two repetitive shapes of the individual precast concrete panels on the building elevations. The use of massive interlocking precast concrete elements allowed the team to create a large-scale surface for the exterior, weaving interlocking angular geometries.

Precast concrete also provided the building with the durability to withstand hurricanes and allowed for rapid construction, Stigsgaard says.

One of the biggest challenges on the project was designing long-span trusses that would be strong enough to sustain the weight of the largest and heaviest airplanes while also having heavy tanks and other equipment displayed on the floor below. The B-17 Flying Fortress is currently the largest display aircraft hung from a structure anywhere in the country, and it is just one of six planes hanging from trusses inside the pavilion. The others include a B-25J Mitchell bomber, a TBM Avenger, a P-51, a Corsair F4U, and a SBD Dauntless.

Adding complexity to the design was the utter lack of 90-degree angles in the precast concrete panels, says Mark Ledkins, vice president of operations for Gate Precast Co., the precaster for the project. "The horizontal joints align, but they are tapered, and all of the vertical joints are offset," he says.

Precast concrete also provided versatility in meeting the project's aesthetic requirements and allowed for increased open space inside the building, eliminating the need for columns and obstructions, Ledkins says.



“A quick closure of the building with precast concrete panels proved to be a great solution against vandalism and environmental concerns.”

Erick Ginard

Best Government or Public Building

Salas Regionales del Golfo in Xalapa

Veracruz, Mexico

Owner and Architect	Tribunal Federal de Justicia, Mexico City, Mexico
Precaster and Precast Concrete Specialty Engineer	Pretecsa, Atizapán de Zaragoza, Mexico
Engineer of Record and Contractor	Proyecta y Edifica, S.A. de C.V., Mexico City, Mexico
Project Cost	$6,246,300
Project Size	32,000 ft² (3000 m²)
Photo	*© Luis Gordoa*

Perched on top of a hill in a rural community, the Salas Regionales del Golfo in Xalapa, Mexico, serves as a beautiful and modern symbol of justice.

"This project demonstrates the high-performance attributes of precast concrete," says Erick Ginard, communication manager for Pretecsa, the precaster and specialty engineer on the project.

The building, which is the legal system headquarters for the state government, is a rectangular prism atop a cast-in-place concrete pedestal surrounded by gardens and reflecting pools. The facade features 373 architectural precast concrete panels with white and beige marble aggregates and a light acid-etched finish.

"Precast technology and its precision were the key to defining the unique look needed," Ginard says. "The austere design blends a harmonic web of straight and exact colored precast pieces with large mullions and modern windows that open up to the privileged surrounding view."

The ground-floor structure features spaces for public and social functions, with two open patios to bring in light and natural ventilation. The enormous rectangular prism sits above that floor, jutting out in a perpendicular line, housing penal rooms and courtrooms.

Lights are positioned to follow continuous lines between the mullions to create columns of light framed with precast concrete, illuminating the building and surrounding area each night.

Creating the sober image expressed in the design presented challenges related to manufacture and precise execution, Ginard says. Architectural precast facade was an ideal way to meet both requirements.

The precast concrete panels were rapidly manufactured and installed with minimum waste, which helped maintain a clean working environment. It also limited the number of skilled tradespeople required on the site, which was a major risk factor on the project because finding such talent in the remote community would have been difficult.

The use of precast concrete also minimized the effect of weather on construction, which coincided with the beginning of Mexico's rainy season.

"Installation was executed with a high degree of accuracy within the schedule," enabling completion of the work despite heavy rains and thunderstorms, Ginard says.

The precast concrete panels were erected in less than 60 days, allowing the team to enclose the space at a very early stage of the project, providing protection to the construction workers who dealt with the interior finishes and preventing vandalism and damage from the rains.

"Utilizing precast panels saved three to four months from the project's schedule in lieu of using conventional brick veneer."

Tom Kelley

Best Healthcare/Medical Building

Sanford Heart Hospital

Sioux Falls, S.Dak.

Owner	Sanford Health, Sioux Falls, S.Dak.	**Contractor**	Henry Carlson Co., Sioux Falls, S.Dak.
Architect and Engineer of Record	AECOM, Minneapolis, Minn.	**Project Cost**	$75 million
Precaster	Gage Brothers, Sioux Falls, S.Dak.	**Project Size**	213,000 ft² (19,800 m²)
Precast Concrete Specialty Engineer	e.construct, Omaha, Neb.	*Photo*	*Gage Brothers*

The Sanford Heart Hospital in Sioux Falls, S.Dak., looks more like a castle than a medical building. The 213,000 ft² (19,800 m²) hospital features a soaring clock tower, breezy open entryways, a detailed thin brick facade, and rich coloring that reflects the institution's signature collegiate gothic style. The Gothic look was achieved quickly and cost effectively through the use of a high-performance precast concrete facade, says Tom Kelley, president of Gage Brothers.

Precast concrete wasn't part of the original design. Initially, the owners envisioned a conventional full-brick job with steel stud backup, but it just wasn't practical. The time and cost to scaffold and brick the massive structure were untenable and would have caused unacceptable disruption, Kelley says. "It was a very tight site on a large host campus, so site disturbance and lack of room for a masonry crew did not make sense."

Instead, Gage suggested thin-brick-clad precast concrete panels. Precast concrete not only solved the site problem but cut months from the site work, saving more than $1 million, Kelley says.

Precast concrete also provided a higher-performance material for better humidity management for the hospital. "With all the precast banding throughout the brick field, the moisture control would have been a major challenge with a conventional system," Kelley says. "Integrally casting all the banding within the precast panel system solved this problem."

One of the most unique features of the building design is the elaborate clock tower that anchors one corner of the hospital. The designers were initially concerned about the need for a backup steel system to support the multisided design of the columns, which is common in a conventional cavity wall system. But the self-supporting spanning nature of precast concrete eliminated that problem, Kelley says. "By utilizing precast, the project was able to save tons of steel that would have been required with a conventional brick and stud system."

Gage added further material savings with a unique clamshell design for the upper-level windows that extend 4 ft (1.2 m) beyond the structure. Instead of building three framing sections to hold the roof, sides, and floor of the windows, Gage cast them entirely in precast concrete, eliminating the need for framing altogether. "That was a fun and unique solution for this project," Kelley says.

They also created an all–precast concrete solution for the four-sided columns of the porte-cochère where patients are dropped off. "The porte-cochère thin brick panel system provided a durable solution with both inside and outside faces being precast," he says.

The owners are very happy with the way the design turned out, and they look forward to the reduced maintenance costs of the precast concrete facade.

"A conventional brick system would need tuck-pointing every 20 years," Kelley says, "but you never have to tuck-point thin-brick-clad precast panels."

“I love the way the precast design allows the building to be painted by sunlight as the day progresses.”

Mark Boone

Best Higher Education Building

University of Houston Health and Biomedical Sciences Building

Houston, Tex.

Owner	University of Houston, Houston, Tex.	**Engineer of Record**	Cardno Haynes Whaley, Houston, Tex.
Architect	Bailey Architects, Houston, Tex.	**Contractor**	Tellepsen Builders, Houston, Tex.
Project Designer	Shepley Bulfinch, Boston, Mass.	**Project Cost**	$54.6 million
Precaster and Precast Concrete Specialty Engineer	Coreslab Structures (Texas) Inc., Cedar Park, Tex.	**Project Size**	172,260 ft² (16,000 m²)
		Photo	*Nic Lehoux*

The University of Houston Health and Biomedical Sciences Building was originally envisioned as a two-story building for the College of Optometry. Over time the vision for the building grew, and the physical plan expanded by four stories to include research laboratories, classrooms, and surgical suites.

That added complexity to the design, says Luke Voiland, an architect with Shepley Bulfinch. They had to consider the light sensitivity of delicate research studies; the need to support heavy laboratory equipment on upper floors; and multiple types of room styles, heights, and floor designs in one structure. They also had to meet the budget, schedule, and quality requirements that come with every project. "Precast concrete quickly became the material of choice," Voiland says.

Both the mechanical systems and the research programs needed windowless spaces. Typically, that would be accomplished by placing those rooms below ground, but because of the site's topography and high water table, they had to be placed on the upper floors to be protected from potential flooding.

That meant the upper half of the building required a large, prominent, windowless facade. "Because the precast concrete panels could be made so large, we were able to cover a lot of that space very economically," Voiland says.

To lessen the bulk of windowless spaces, Voiland's team created a beveled facade that reflects light and shadow as the sun plays across the building's surface. The design uses simple rectangular concrete panels that are triangularly faceted, creating 6 in. (150 mm) deep peaks and valleys in the facade's surface.

"The carefully detailed system of triangularly beveled concrete panels creates a distinctive visual display," says Nick Faerber, project manager for Coreslab Structures. "The bevels add a whole different dimension of light to the monochrome surface and give it the illusion of many shades of color."

Voiland's team worked closely with Coreslab to model the design and determine how deep the relief needed to be. They were surprised to discover that a mere 6 in. (150 mm) delivered the contrasts and changing light that the design called for.

They also made sure that the panels would line up evenly to create a tight envelope. The panels spanned column to column, allowing the floor slabs to move independently from the exterior and the windows to be anchored in the precast concrete. The panels were then sprayed with foam insulation to create a continuous vapor barrier that spans the joints, reducing air infiltration and leakage.

This design choice reduced air loss, a major concern for laboratory buildings, which have stringent ventilation requirements, Voiland says. "Precast concrete allowed for a much tighter building envelope."

"We loved the architect's interpretation of toddler activities in a spectacular building design."

Alex Fastag

Best K–12 School

Kinder Monte Sinaí

Mexico City, Mexico

Owner	Colegio Hebreo Monte Sinaí, Mexico City, Mexico	**Contractor**	Grupo Danhos, Mexico City, Mexico
Architect	LBR&A, Mexico City, Mexico	**Project Cost**	$2,326,000
Precaster and Precast Concrete Specialty Engineer	Pretecsa, Atizapán de Zaragoza, Mexico	**Project Size**	12,500 ft² (1160 m²)
		Photo	*Alfonso Merchand*
Engineer of Record	VAMISA, Mexico City, Mexico		

Designers of the Kinder Monte Sinaí school in Mexico City wanted a whimsical structure with playful features and bright colors that would complement the preschool classes inside, but space was a constraint.

The new preschool was an expansion of an existing elementary, middle, and high school, and construction would take place on the existing parking lot.

"The area where the preschool was being built was secluded from the rest of the buildings, but there was limited area for storage at the job site," says Alex Fastag of Pretecsa, the precaster for the project.

The design features a playground, main courtyard, library, and 18 classrooms that rise 36 ft (11 m) above the parking lot. Twelve of the classrooms are covered in whitewashed precast concrete panels with round windows at different heights. "That couldn't be achieved with traditional building systems," Fastag says. The panels help maintain cooler indoor temperatures on the south-facing structure.

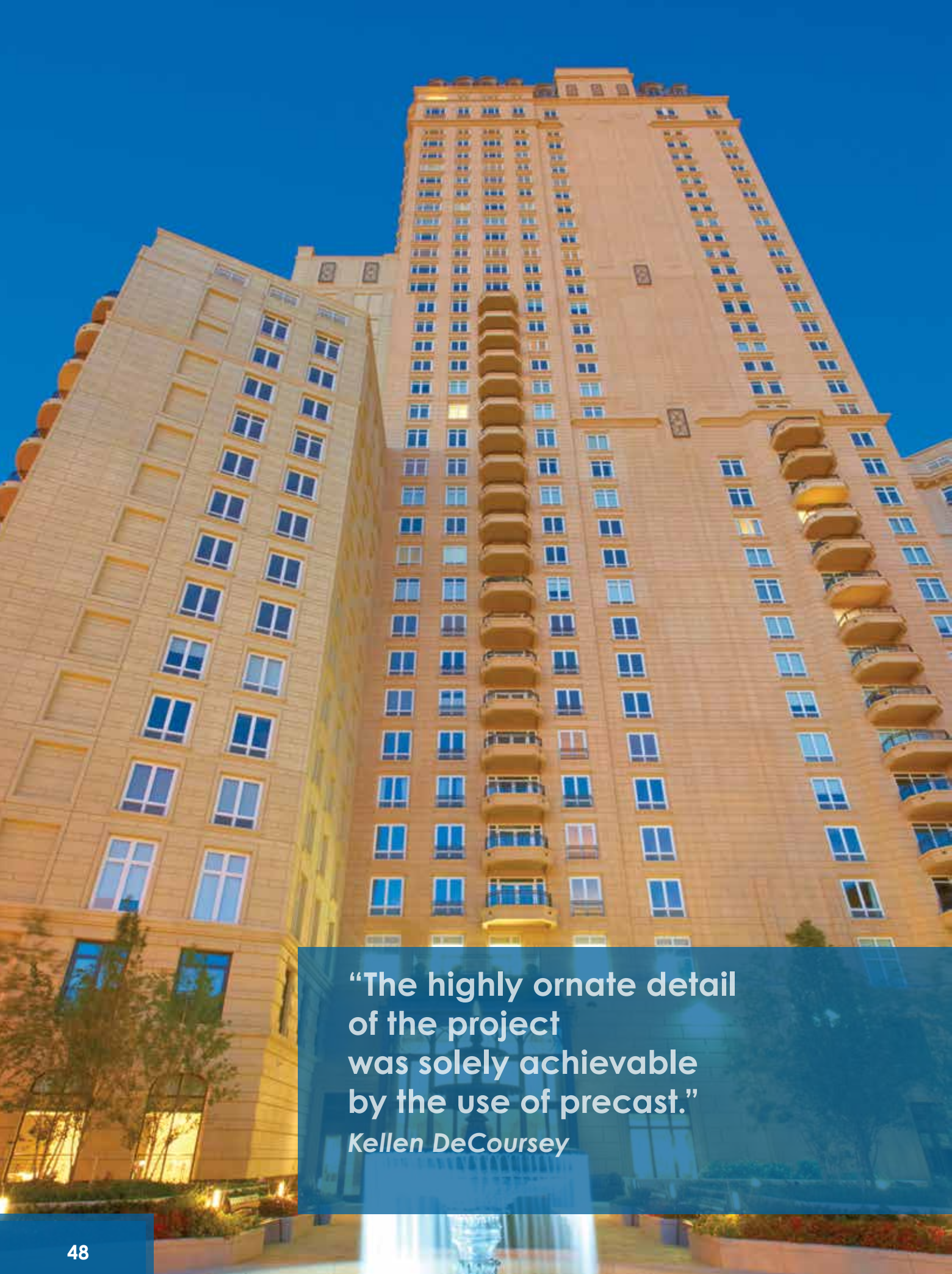
The precaster had to take special care to achieve and maintain the smooth surface required by the designer. "This required extreme caution in forming, panel movement, transportation, and installation, with specially designed carts to roll the panels into the building without damage," Fastag says.

The other six classrooms are made of colored laminated glass.

"The classrooms are placed perpendicular along the main axis, alluding to the concept of stacked toy blocks," says Benjamin Romano, an architect with LBR&A.

The lightness of the glass-reinforced precast concrete panels aided in achieving the stacked cubes appeal, reducing the facade weight by about one-third compared with competing materials. This allowed for more open spaces with fewer supporting columns.

The use of precast concrete also reduced the disruptive effect of construction on the other schools, which were in session throughout the project. "Construction hours and material deliveries had to be carefully balanced against school hours to interfere as little as possible with daily class activities," Fastag says. Using glass-fiber-reinforced precast concrete panels helped the team overcome these challenges. Through precise logistics and coordination with the general contractor, the team was able to deliver and install the panels in the required sequence, taking them almost directly from the truck to their final position. "The workers and material movements required at the job site were minimal, and construction of the new building did not affect the rest of the students taking classes next door."



“The highly ornate detail of the project was solely achievable by the use of precast.”

Kellen DeCoursey

Best Multifamily Housing

2550 N. Lakeview Drive

Chicago, Ill.

Owner	Lake Tower Development LLC, Chicago, Ill.
Developer	Ricker-Murphy Development, Chicago, Ill.
Architect	Lucien Lagrange Architects, Chicago, Ill.
Precaster	High Concrete Group, Denver, Pa.
Engineer of Record	CS Associates Inc., Oak Lawn, Ill.
Contractor	Walsh Construction, Chicago, Ill.
Project Cost	$13,122,416
Project Size	200,418 ft² (18,619 m²)
Photo	*High Concrete Group LLC*

The 39-story residential complex at 2250 Lakeview Drive offers residents a breathtaking view of Chicago's lakefront and skyline. The unique residential structure has been dubbed the Vertical Gold Coast by local Realtors because it offers some of the most exclusive properties in the Chicago area.

The architectural precast concrete facade, which features more than 2000 separate elements, lends an air of luxury and decadence to the building, says Kellen DeCoursey, assistant project manager for Walsh Construction, the contractor. "I love that this project's design steered away from the more common glass and metal–paneled high-rises that you see throughout Chicago and much of the nation," DeCoursey says. "The classic design and old-world feel of this building make it a . . . jewel for Chicago and the neighborhood of Lincoln Park for years to come."

The use of architectural precast concrete was key. The architectural precast concrete panels, column covers, and other elements cover more than 200,000 ft² (18,600 m²) of the building, providing a beautiful look and feel with an exterior that will stand up to harsh weather conditions for years to come.

Overall, the design creates the illusion of three separate towers. The designers took advantage of the flexible color and design options that precast concrete offers to incorporate different design schemes across the building, giving each tower a unique color and custom detailing. The precast concrete elements also incorporate intricate reveals, detailed balcony railings, and carefully designed exterior finishes.

DeCoursey says, "Working with the architect and High Concrete, we were able to achieve detailed cornices and reveal patterns and to interface seamlessly between other facade materials, including the windows, steel trellis, and mansard roofing."

Precast concrete also helped the contractor manage the tight confines of the project site, which is located in a crowded and high-traffic area of Chicago. "We were able to minimize the impact to the overall size of the site and lay-down area by dedicating specific trucking paths and pick points for precast panels," DeCoursey says. Loads were delivered daily and picked up immediately so the trucks wouldn't have to linger on site.

"This is the most complex architectural precast project I have been involved with or have seen around the city," DeCoursey adds. "Working through challenging and complex shapes, drafting, and forming, the precaster was able to provide the owners and the residents of Chicago with a project that everyone can enjoy."

“The precast concrete facade panels provided an economical solution to a challenging project.”

David Rezec

Best Office Building

Polsinelli Headquarters and Hotel Sorella

Kansas City, Mo.

Owner	Van Trust Real Estate LLC, Kansas City, Mo.
Architect (Office Building)	360 Architecture, Kansas City, Mo.
Architects (Hotel)	Gould Evans Architects, Kansas City, Mo., and DRAW Architecture and Urban Design, Kansas City, Mo.
Precaster and Precast Concrete Specialty Engineer	Enterprise Precast Concrete Inc., Omaha, Neb.
Engineers of Record (Office)	Opus A& E, Kansas City, Mo.
Engineers of Record (Hotel)	Bob D. Campbell & Associates, Kansas City, Mo.
Contractor	J. E. Dunn, Kansas City, Mo.
Project Cost (Office)	$42 million
Project Cost (Hotel)	$24.5 million
Project Size (Office)	286,461 ft^2 (26,613 m^2)
Project Size (Hotel)	114,000 ft^2 (10,600 m^2)
Photo	*Jacia Phillips Photography*

The Polsinelli Headquarters and Hotel Sorella in Kansas City, Mo., almost weren't built. The project originated in 2006 as a hotel with a connecting link to the headquarters of an advertising agency, but midway into the project the contractor and developer parted ways and abandoned the site. Three years later the project was revived by a new owner with a new vision and a new anchor tenant for the office building. However, meeting the demands of the new owner and tenant would require substantial rework.

The previously proposed office building featured an office configuration that was uniquely developed for an advertising agency. However, the Polsinelli law firm wanted a more traditional design, so the original building was torn down and 360 Architecture designed a new 10-story structure that would sit atop the already finished parking structure.

The new building features a white, acid-etched precast concrete facade that matches the hotel. The designers used a formliner with an intricate infill pattern to mimic the Spanish heritage of the Country Club Plaza district, where the building is located.

"The plaza is very ornate with a lot of terra-cotta tile and masonry," says Sandy Price, project designer for 360 Architecture. He wanted the facade of the office building to reflect that historic context, but with a modern, durable material that would be quick and cost-effective to assemble. The precast concrete panels are also much lighter than masonry, he says. That was important because the building was supported by the foundation of the parking structure beneath it, and weight was a primary concern.

The hotel was more than half finished when the second phase began, but the designers decided that they wanted a more modern look for the facades. Some of the previously installed precast concrete elements were removed and recycled, while new elements were brought in to complete the hotel, says Dirk McClure, regional director of business development for Enterprise Precast Concrete. "Through special care and detailing, the precast match was incredible," especially considering that most of the phase 1 elements had been in place for several years.

Along with meeting the aesthetic requirements, the precast concrete systems on both structures delivered strength and durability while still offering a lightweight and energy-efficient solution. "The new tenants plan to be in the building a long time, so they were looking for the long-term life-cycle cost savings of precast," McClure says.

“It is the culmination of a team that wanted to create a parking experience atypical to the usual parking options in a major city.”

Scott Bonney

Best Parking Structure
The Z
Detroit, Mich.

Owner	Bedrock Real Estate Services, Detroit, Mich.
Architect	Neumann/Smith Architecture, Southfield, Mich.
Precaster	Kerkstra Precast Inc., Grandville, Mich.
Precast Concrete Specialty Engineer	IES Associates Consulting Engineers, Windsor, ON, Canada
Engineer of Record	Rich and Associates Inc., Southfield, Mich.
Contractor	Colasanti/Sachse JV, Detroit, Mich.
Project Size	535,000 ft² (49,700 m²)
Photo	*Neumann/Smith Architecture*

Beginning as two empty lots on a crowded city block, The Z is a transformative mixed-use building in Detroit's historic Broadway district.

The design team needed to create a building in an area of the city that desperately needed more parking. They came up with a 10-level, precast concrete structure that would hold 1282 cars above 33,000 ft² (3100 m²) of grade-level retail and restaurant space.

Precast concrete allowed the team to meet budget and schedule and accommodate the tight job site and the busy urban setting, all while delivering a facade that complements the local architecture.

The exterior features exposed aggregate and white concrete with a bold geometric picture frame design intended to reduce the apparent scale of the 10-story structure. The precast concrete facade uses repetitive formwork to create the faceted picture frame panels, and the deck spans an alley with crossovers above level three to allow users to enter and exit onto two major arteries into and out of the city.

"The unique two-story precast cladding screens views of parked cars and reduces the visual mass of the deck," says Scott Bonney, design director at Neumann/Smith Architecture. "The white precast blends with neighboring white terra-cotta-clad towers, and angular precast frames respond to the neighboring modernity of the YMCA."

The panels were produced by Kerkstra Precast during the winter to reduce the erection crew's exposure to the severe Michigan climate. Once construction began, the panels were delivered in a timely manner, keeping up with the aggressive schedule.

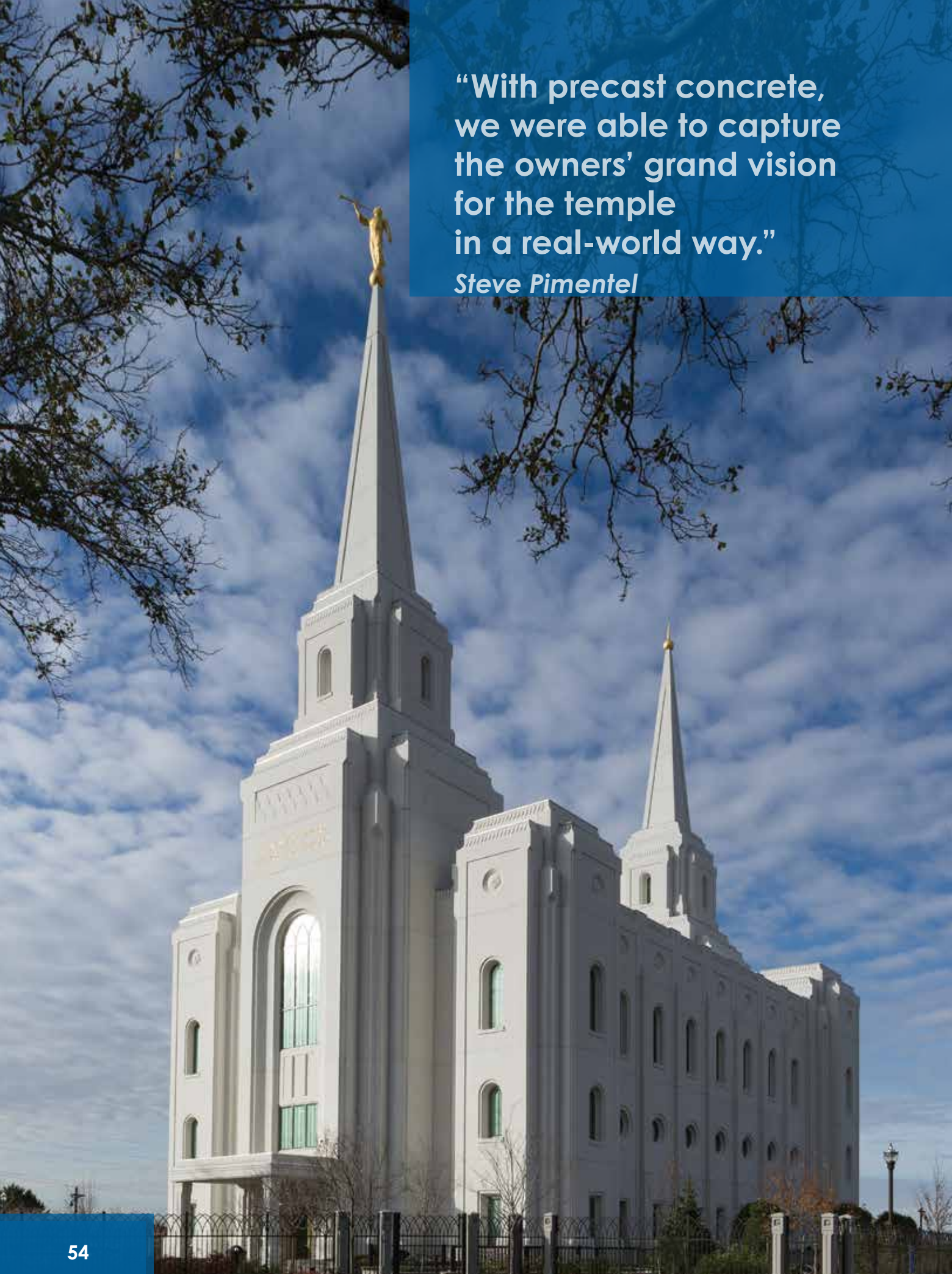
"Using precast, we were able to carefully sequence the construction operation and minimize the number of trades needed on the site," says Kathy Buck, project architect with Neumann/Smith Architecture.

With the money saved by using precast concrete, Bedrock collaborated with the Library Street Collective gallery, located in one of the adjacent buildings, to bring in 27 world-renowned street muralists to beautify the inside of the parking garage. The artists were asked to create a museum within the precast concrete walls, adding vibrant murals that represent what the city means to each artist on each floor.

"The interesting design elements of the exterior frames became the picture frames for the art inside," Bonney says. "The project has already become an iconic destination for art tours and out-of-towners."

The designers also incorporated brightly lit, 10-story glass stairwells at each corner of the building to create a sense of safety for the community. Each landing has bright white LED lights, and the outer corners of the stair towers are lined with vertical RGB LED lights with 16.2 million possible color combinations programmed to celebrate holidays and local events.

"They have become lanterns for the neighborhood," Bonney says. "They light the city and make the streets safer and friendlier for pedestrians passing by."



“With precast concrete, we were able to capture the owners’ grand vision for the temple in a real-world way.”

Steve Pimentel

Best Religious Structure

LDS Temple

Brigham City, Utah

Owner	The Church of Jesus Christ of Latter-Day Saints, Salt Lake City, Utah
Architect	FFKR Architects, Salt Lake City, Utah
Precaster and Precast Concrete Specialty Engineer	Clark Pacific, West Sacramento, Calif.
Engineer of Record	ARW Engineers, Ogden, Utah
Contractor	Big D Construction Corp., Salt Lake City, Utah
Project Size	35,600 ft² (3300 m²)
Photo	*JSturr Photographer*

The new LDS temple in Brigham City, Utah, was first imagined as having an all-stone facade.

"With the intricately designed details they wanted, stone would have been prohibitively expensive, with an incredible amount of material waste," says Steve Pimentel, senior project manager with Clark Pacific, the precaster for the project. "It also would have been extremely difficult, if not impossible, to achieve given the aggressive project schedule."

Instead, they chose precast concrete, which gave them the beauty, durability, and design they were looking for but on a much more reasonable budget. "Precast provided an environmentally and economically friendly way to achieve the design intent that would have been all but impossible using other materials," Pimentel says.

Choosing an architectural precast concrete facade also saved time. Hoisting of the precast concrete panels for the main temple building was completed in just one and a half months, ultimately enabling the team to deliver the completed building within two years of the first project meeting attended by Clark Pacific.

"By using precast for the exterior cladding instead of other materials, the project team was able to take advantage of the high-quality and durable finish of the architectural precast concrete," he says. It also enabled the team to use the architectural versatility of concrete to create a complex facade of dramatic depth and bold character.

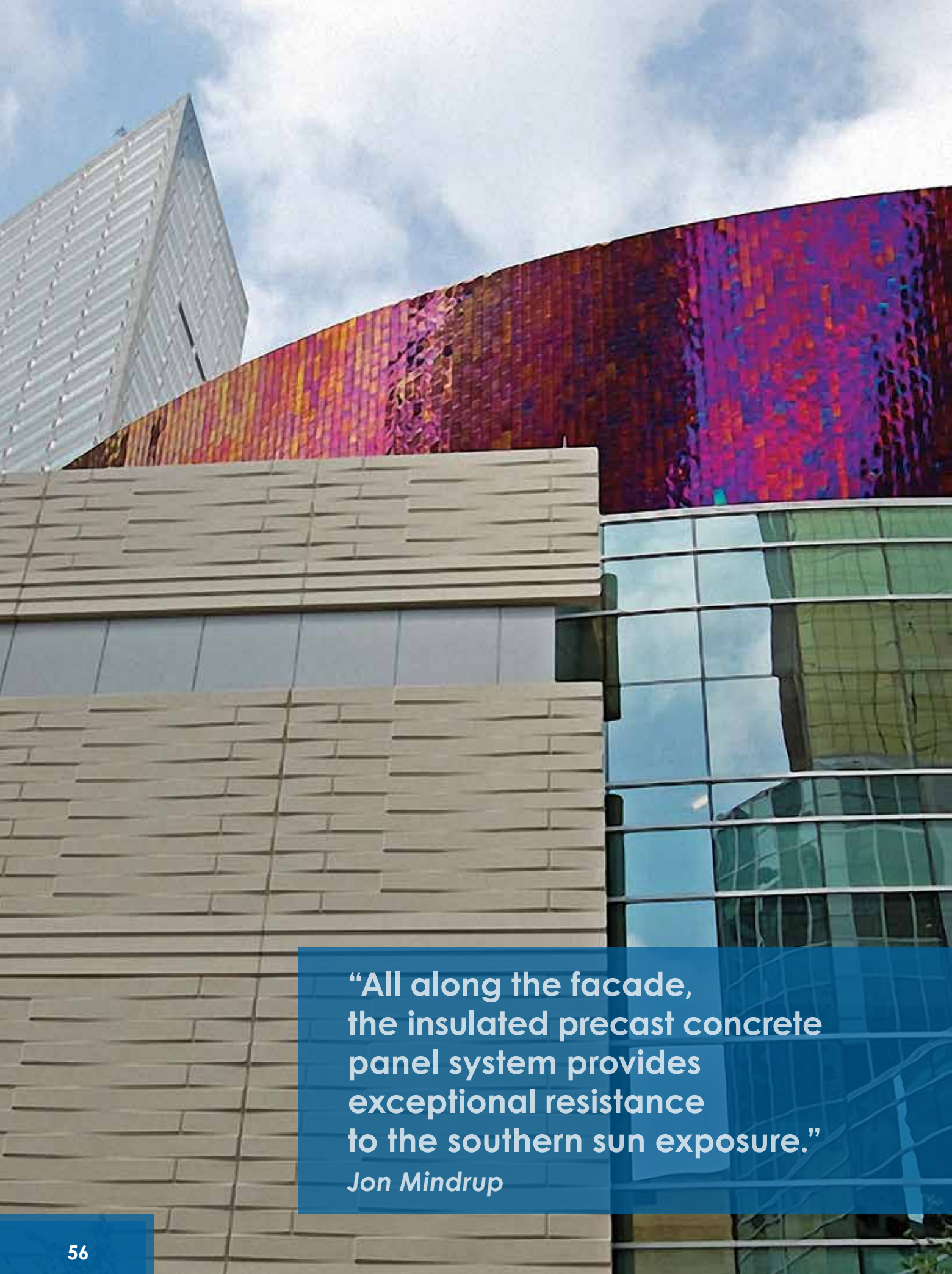
The temple's spire reaches more than 160 ft (49 m) into the sky, making the structure visible throughout the surrounding valley. The building is clad in white dolomite aggregate-based precast concrete panels. The design features arched recessed windows, a peach blossom motif that reflects a similar design etched in the windows, compound steps at the corners of the building, and recessed cornices. Seven large wall panels at the base of the spires also include a multilayered flower petal detailing element with wedding cake–like setbacks.

"When I first saw the designs for this project, my jaw dropped at the architectural features," Pimentel says. "It was a whole new level of ornate detail than anything we had done before."

They worked closely with the designer, the architect, and the engineer throughout the project. "We had great rapport with everyone on the project, which is why it came together so well," he says.

The temple will act as a landmark for the community. The precast concrete cladding, along with field-applied spray-on foam insulation at the backs of the panels, created an efficient thermal barrier system at the building's exterior that will support a 250-year service life.

"The durability of precast was a frequent topic of conversation on this project," Pimentel says. "They wanted something beautiful, of the highest-quality finish, that would stand the test of time, and that is what we gave them."



“All along the facade, the insulated precast concrete panel system provides exceptional resistance to the southern sun exposure.”

Jon Mindrup

Best Religious Structure

The First Baptist Church of Dallas

Dallas, Tex.

Owner	First Baptist Church of Dallas, Dallas, Tex.
Architect	The Beck Group, Dallas, Tex.
Precaster	Gate Precast Co., Hillsboro, Tex.
Precast Concrete Specialty Engineer	e.Construct USA LLC, Omaha, Neb.
Engineer of Record	Brockette Davis Drake, Dallas, Tex.
Contractor	Manhattan Construction, Dallas, Tex.
Project Cost	$130 million
Project Size	275,000 ft² (25,500 m²)
Photo	*Jon Mindrup*

For their centrally located urban house of worship, the members of the First Baptist Church of Dallas wanted the building to reflect the modern and aesthetically pleasing sensibility of the community. The church campus occupies a prime area on the north side of downtown Dallas between Thanksgiving Plaza and the Arts District. All portions of the facade face downtown streets and had to blend with the local architecture.

That wasn't easy, says Jon Mindrup, associate principal of Beck Group LLC, the architect for the project. The existing campus was a collection of aging, mismatched buildings, and the design team was tasked with creating a cohesive master plan of new structures, all of the same design concept and in concert with the church's vision for a welcoming public campus. The church needed a glass curtain wall on the portions of the building that faced north and served public spaces, but they also needed an attractive, energy-efficient, durable solid wall for the south half of the building that would complement the curtainwall.

The biggest challenge in pulling it all together was finding a highly thermally resistive material for the harshest sun exposure areas that would also be attractive and durable, Mindrup says. "Insulated precast concrete panels were the best choice for those facades."

The structure design starts at a fountain and extends radially through the curtain wall. The precast concrete facade was designed to reinforce the horizontality of the building while allowing the design to flow seamlessly from panel to panel. A basket-weave pattern was created on the precast concrete panels using a custom formliner to add depth and detail to the facade, pulling all elements of the campus together. Street-level panels are recessed slightly to visually break up the large building mass and maximize public circulation space.

"Precast concrete was a unique solution for this project in that it was able to be panelized in such a way that the upper floors could extend out closer to the street than the first floor," Mindrup says. This allowed his team to provide wide, accommodating public sidewalks at street level while maximizing building square footage above, all with a material that could stand up to the harsh city environment.

The insulated precast concrete panel system also improved the building's energy efficiency. "By utilizing an inner core of rigid insulation between concrete panels, we created a durable energy shield. That was a big contributor to our LEED silver certification."

In the busy downtown corridor, precast concrete facilitated construction and sequencing because no laydown space was required. "Panels came off of the truck and were placed on the facade immediately," he says. "The result is a very efficient thermal protective skin that provides a beautiful facade to the private spaces of the structure."

"Lemay Michaud had a very specific vision for Simons's store in the Galeries d'Anjou."

Guy Tremblay

Best Retail Building

La Maison Simons

Montreal, QC, Canada

Owner	La Maison Simons Inc., Quebec, QC, Canada	**Engineer of Record**	KD & Associés Inc., Montreal, QC, Canada
Architect	Lemay Michaud Architecture Design, Quebec, Canada	**Contractor**	Constructions Albert Jean Ltée, Montreal, QC, Canada
Precaster	BPDL Béton Préfabriqué Du Lac, Alma, QC, Canada	**Project Size**	27,000 ft² (2500 m²)
		Photo	*© Marc Cramer*

La Maison Simons is a mainstay of the Quebec apparel marketplace. The retailer has eight stores in Quebec and one in Edmonton, AB, but it was looking to create an iconic building for its new location at the Galeries d'Anjou Mall in Montreal's east end. The architect, Lemay Michaud, came up with a design that literally lights up the mall and acts as a beacon to draw in patrons. The design employs a precast concrete facade covered in recesses threaded with fiber-optic lights that twinkle day and night.

"We wanted to create a minimalist building with a unique texture," says Philippe Blais, architect with Lemay Michaud. "We achieved just that with the sleek white concrete surfaces and the impact of the fiber-optics. Everybody is talking about the glittering facade."

The look was achieved using precast concrete panels featuring up to 2350 recesses where the fiber-optics are displayed. "The plasticity of the concrete allowed us to achieve the dotted texture with the variable depths and diameters we wanted while keeping this as a simple white volume," Blais says. "It also helped us for the integration of the fiber-optic lighting in the panels."

In total, 138 white double-wythe insulated panels were used, covering 27,000 ft² (2500 m²) of the facade. The dotted texture is in various sizes and depths, and each little change in the recess depths or alignment required a new mold, explains Guy Tremblay, technical director with BPDL, the precaster for the project. "The challenge was to keep the project both economical and interesting for the client in the pursuit of his original design."

To meet those goals, BPDL created multiple molds with recesses in various shapes and patterns, all of which needed to be sloped to accommodate incoming rain and other elements. Fiber-optics were woven into the panels, and crews glued colored disks to the recesses from the outside to complete the building's eye-catching effect.

The decision to use precast concrete for the facade also saved time and cost and improved durability. "We wanted to cut down the budget and the schedule for the exterior wall construction, which is why we chose precast insulated panels," Blais says.

Installation of all 138 panels, which totaled 27,000 ft² (2500 m²), took only four weeks, and the insulated precast concrete panels eliminated the need for typical exterior walls with insulation, air-vapor barriers, and other additional layers. "That is normally done on-site prior to the exterior cladding installation, which is more expansive and takes more time than work done at a plant," he says. "By using precast cladding, the only work that was done on-site was the precast panel installation."

“The Ohio State University wanted a building that would be iconic for their new medical center and would remain in place for a number of years.”

Eric Martin

Best Custom Solution

The Ohio State University Chiller Plant

Columbus, Ohio

Owner	Ohio State University, Columbus, Ohio
Design Architect	Ross Barney Architects, Chicago, Ill.
Architect of Record	Champlin Architecture, Cincinnati, Ohio
Precaster	High Concrete Group, Denver, Pa.
Engineer of Record	Shelley Metz, Baumann Hawk, Columbus, Ohio
Contractor	Whiting-Turner Contracting Co., Mayfield Heights, Ohio
Project Cost	$77.3 million
Project Size	53,938 ft² (5011 m²)
Photos	*Feinknopf Photography*

The trend in chiller plant design is to use eye-catching enclosures, often glass boxes, that allow mechanical systems to be seen from outside. However, this can interfere with cooling. The designers of The Ohio State University chiller plant came up with an alternative.

The new 10-story plant uses precast concrete panels with a series of openings that allow a view inside while maintaining a consistent interior temperature. Precast concrete also enabled the designers to stay within the tight budget.

"The sloped surfaces and various openings could only be designed by using precast concrete without adding significant cost and time to the project," says Eric Martin, principal at Ross Barney Architects.

The designers developed 11 different panel types, which allowed them to reuse the forms to create more than 200 panels. By changing the orientation of the panels, they were able to create a dynamic facade while obviating the need for additional formliners.

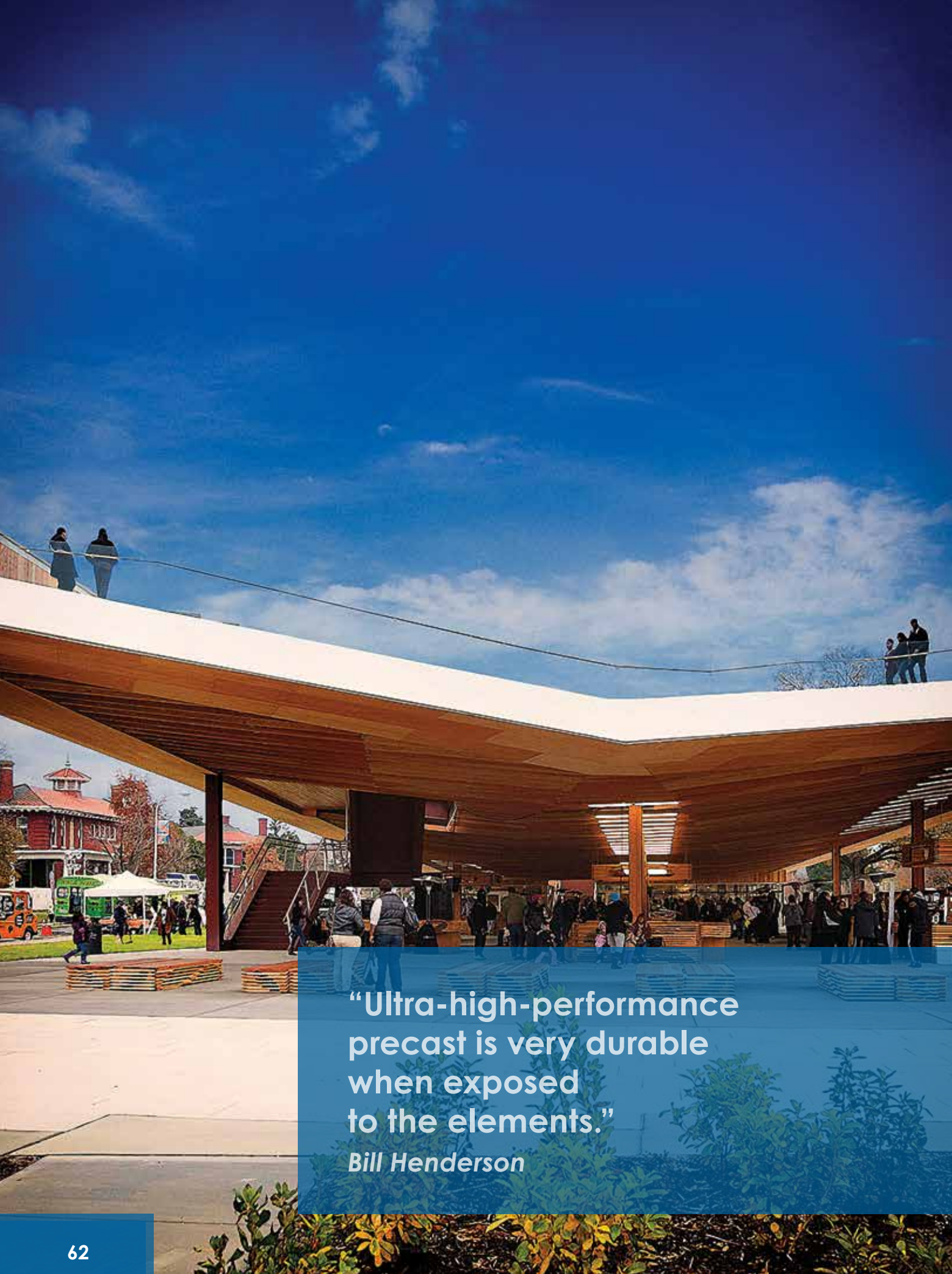
The precast concrete panels are embedded with diachronic glass fins that cast rays of colored light across the surface. The facade changes with time of day, season, and location of the observer.

"The design team decided to polish the exposed surface of the concrete, not only to reduce the potential of stains and dirt from collecting on the surface, but to enhance the colors from the glass fins that protrude from the building facade," Martin says.

High Concrete worked with the building team to create detailed three-dimensional models of the structure to identify and resolve conflicts between the structural steel and precast concrete cladding. They also produced mockups of the panels to ensure that the polished concrete met expectations.

The design team chose the largest panels possible to accelerate installation. The main panels are 9 × 30 ft (3 × 9 m) with 35 ft (11 m) tall top panels that enclose the cooling towers. More than 100 connection attachments were attached to the structural steel frame during fabrication, saving time during erection, Martin says. "The speed at which precast concrete panels can be installed was another reason why the material was chosen."

The insulated precast concrete panel design provides a durable, low-maintenance finish that the function of the building demands for both exterior and interior finishes, says Ben Richards, principal at Champlin Architecture. "The panels lend themselves to the sustainable component of the project, which assisted in achieving LEED silver certification for use of regional materials and recycled content."



“Ultra-high-performance precast is very durable when exposed to the elements.”

Bill Henderson

Best Custom Solution

G8Way Pavilion

Washington, D.C.

Owner	Office of the Deputy Mayor for Planning and Economic Development, Washington, D.C.
Architect	Davis Brody Bond, Washington, D.C.
Precaster and Precast Concrete Specialty Engineer	Gate Precast Co., Ashland City, Tenn.
Engineer of Record	Robert Silman Associates, Washington, D.C.
Contractor	KADCON Corp., Washington, D.C.
Project Cost	$8.3 million
Project Size	23,000 ft² (2100 m²)
Photos	*Eric Taylor, Davis Brody Bond*

The G8Way Pavilion in Washington, D.C., is a place to gather for community events. Thanks to precast concrete, the visually stunning structure is a place to gain protection from the elements or a bird's-eye view of the neighborhood.

"The pavilion creates an instantly iconic, visible, and welcoming view into the site," says Bill Henderson, vice president of operations for Gate Precast Co.

The pavilion's sloping canopy and rooftop terrace comprise precast ultra-high-performance concrete (UHPC) panels that are just 1.75 in. (45 mm) thick. Hollow structural sections attached to the backs of the panels create a pleasing, structurally sound system.

"Because the UHPC premix is made up of fine aggregates, it was possible to cast the panels with strict angular geometries," Henderson says. By matching the panel dimensions to the primary steel structural grid of 15 ft (4.6 m) on center, the architect minimized the number of secondary members, significantly reducing costs.

The different geometrical panel shapes and requirements for panel placement made erection difficult.

To avoid errors in the field, all of the teams involved with the project used three-dimensional drafting software to model the structure and compared models regularly throughout design. "That allowed the design team to identify and solve potential problems on the computer before they became problems in the field," Henderson says. As a result, they were able to cast and install the panels without any significant field modifications or delays.

The collaborative process also allowed for the primary steel frame to be concurrently installed with the UHPC panels and without clashes to further support the aggressive schedule.

The erection crew had to develop a special method to adjust the UHPC panels to their intended designed geometrical attitude while keeping the panels suspended before they could be placed on the structure. This was accomplished by employing nylon straps of varying lengths and combinations of chain-falls and come-alongs to set the panels in place.

The erection crew used 30-ton and 50-ton rough terrain cranes to aid in the overall handling and accurate positioning of the panels. Because these cranes are easily moved, the erector was able to meet an aggressive schedule.

"This was one of the speediest fast-track projects on which we have ever worked," Henderson says. Over the course of just 19 days, 181 UHPC panels were produced, and erection was completed in one month.

"The project really does look great in the field, and it would be difficult not to take pride in that accomplishment," he says.