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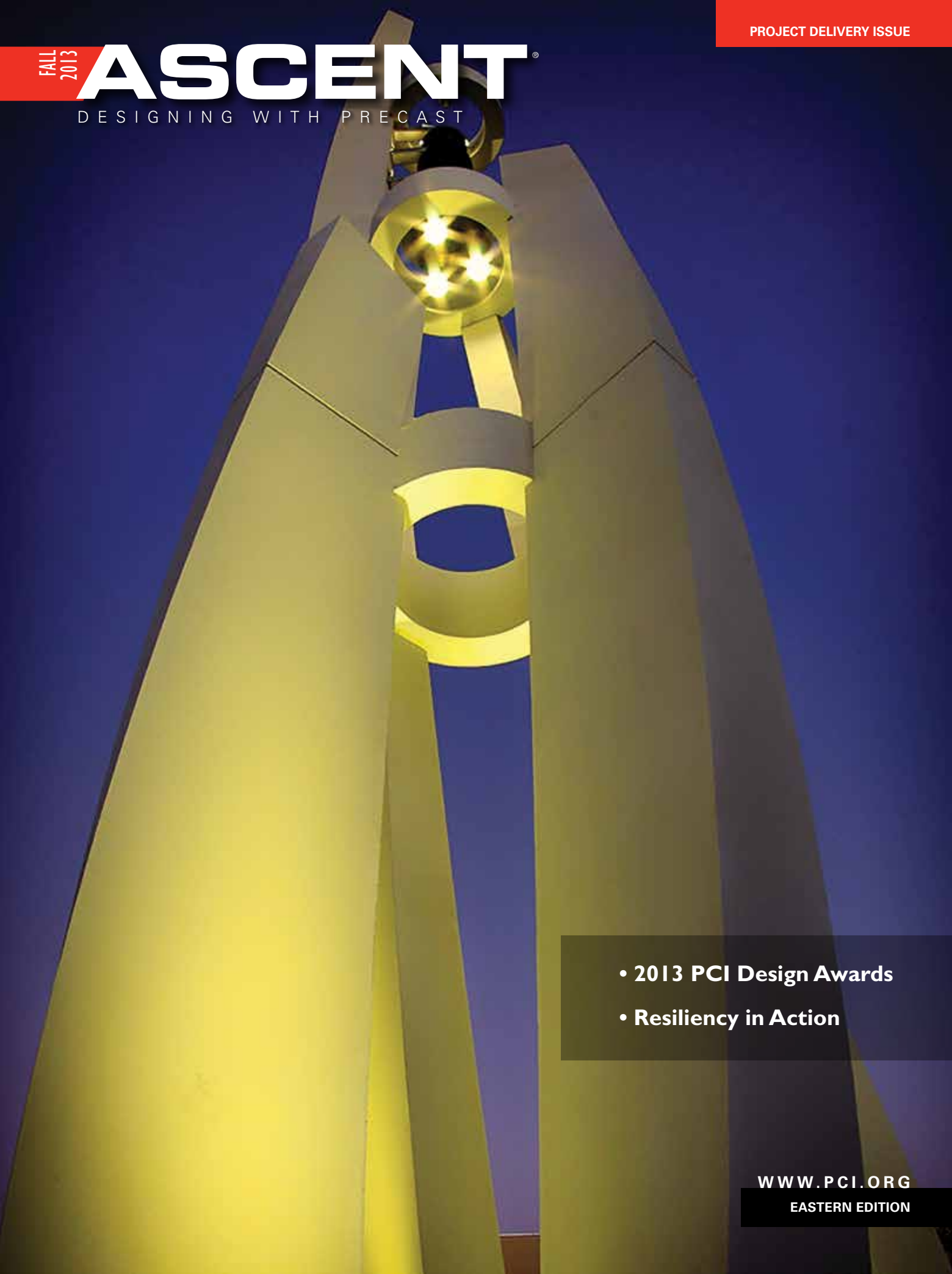

- 2013 PCI Design Awards
- Resiliency in Action

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High-Performance Precast Concrete

Highlights of the 51st annual PCI Design Award-winning projects.

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Optimization is Key in High-Performance Projects

For more than 50 years, the Precast/Prestressed Concrete Institute has honored innovation and creative design techniques in its Design Awards competition. The program has expanded since its first awards in 1963 to encompass more categories and more types of designs. This correlates with the expanded use of precast concrete systems.

Most designers use precast concrete in bridges, parking structures, warehousing, and other "big-box" type applications. In fact, the majority of structures in these markets are built with precast. However, as our Design Awards presentation shows, the inherent high-performance attributes of precast make it an optimum choice for almost any project type. This is especially true with the ever-growing, high-performance requirements that codes and owners demand today.

In 2013, the Buildings Jury selected 14 projects to receive a PCI Design Award. These buildings represent many market segments, including K-12, higher education, justice and correctional, government and public, mixed use, healthcare, and multifamily along with several others including parking and warehousing. (Bridge and transportation awards, which are presented in *Aspire*,™ magazine, can be viewed at www.pcidesignawards.org.)

These outstanding projects encompass many of the high-performance attributes inherent with precast concrete systems. The word "inherent" is very important. Often, one attribute drives a decision to use precast, such as speed of construction. But once selected, several other attributes are gained whether a designer planned for them or not.

For example, all precast concrete by its nature has thermal mass. Yet design teams do not always evaluate the HVAC design to determine if the systems can be downsized because of this. Often projects can save significant first costs, as well as improve operating efficiency (reducing energy consumption and life-cycle costs), by evaluating the thermal-mass effect.

Another example is aesthetic versatility. Precast can incorporate or emulate most traditional finishes, yet there are still projects that field install a brick veneer over a precast concrete envelope.

By underestimating the value of these attributes, designers may leave a lot of value on the table. After all, a big part of high-performance design involves optimizing all relevant attributes for a project. Precasters can be very helpful in assisting designers with optimizing their projects and should be involved in the early stages of a project's design.

Do you consider all of the applicable attributes that precast concrete can offer in each project? Do you reach out to precasters with design challenges and work as teams to assist with the early phase of design? Check out how this year's Design Award winners maximized the benefits in their innovative projects.

You can learn more about high-performance precast by visiting www.pci.org, as well as find many design resources to help you achieve success and meet owners' growing needs. We hope the projects in this issue will inspire you to greatness and to earning your own PCI Design Award.

ASCENT

On the cover: Robert & Beverly Koski Bell Tower & Academic Plaza (see page 52).

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- **POSTMASTER:** Send address changes to *Ascent*, 200 W. Adams St., Suite 2100, Chicago, IL 60606.
  Periodical postage paid at Chicago, IL and additional mailing offices.
- *Ascent* (Vol. 23, No. 4, ISSN 10796983) is published quarterly by the Precast/Prestressed Concrete Institute, 200 W. Adams St., Suite 2100, Chicago, IL 60606.

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UNC Uses Cooling Tubes in Precast Concrete Home

CHARLOTTE, NORTH CAROLINA

Photo: Clarke Snell.

Students at the University of North Carolina at Charlotte incorporated heating/cooling tubes and geopolymer concrete into the precast concrete panels it used to clad its competition home in the U.S. Department of Energy's Solar Decathlon. The material was designed to emphasize the students' focus on "several new renewable technologies."

"It's innovative and novel," says project manager UNC Charlotte Assistant Professor of Architecture Mona Azarbayjani. The school is competing for the second time in the competition, after collaborating with DOE in the first Solar Decathlon in 2002. The DOE event invites 20 universities to design, build, and operate solar-powered homes that are "cost-effective, energy-efficient, and attractive." The winning team, DOE says, blends "affordability, consumer appeal, and design excellence with optimal energy production and maximum efficiency."

The home, called "Urban Eden," was designed to serve as urban infill in a market with a similar climate to Charlotte. Precast concrete panels were used to clad the building both as an energy-saving technique and to provide an effective sound barrier to city noises, the student group says. Although not part of the project's criteria, the panels also will provide an inherent resistance to fire and to mold growth due to their inorganic composition, as well as other benefits for homeowners.

The insulated precast concrete panels contain an array of small-diameter plastic "capillary" tubes that enhance the concrete's capability for storing and radiating heat. In the summer, the concrete absorbs ambient heat from the interior space, which is transferred through the tubes to copper-fin heat exchangers above the roof at night.

"The combination of the large surface areas of the interior wythe of concrete and the embedded tubes creates a very efficient transfer medium for heat," the group says. The pipes cool down, and the water recirculates through the walls, cooling the concrete via passive cooling.

The group also is using geopolymers to produce concrete binders that contain no Portland cement, reducing the concrete's carbon footprint. The geopolymers consist of a fly-ash mixture that decreases carbon emissions by as much as 90%. Although the concrete has to be heated to be cured, the panels were produced in typical precast forms by Metromont Corp.

Finfrock Completes $60-Million UCF Student Housing

ORLANDO, FLORIDA

Finfrock Industries recently completed a $60-million precast concrete facility that is raising the bar on student housing standards near the University of Central Florida (UCF) campus. The 600-student dormitory offers two- and four-bedroom units. Each unit has its own kitchen and laundry area, and each bedroom has a private bathroom, extra storage, and large closet.

Constructed entirely of precast concrete, the building also has an access-controlled parking structure with a direct entrance to each residential floor. Designed, manufactured, and constructed by Finfrock, the project was completed in less than 12 months. Although privately funded, the building is being managed by the UCF housing office.

The University of Florida's new dormitory features upscale designs for 600 students in a total-precast concrete structure.

SDSU Architectural Selected for PCI Studio

BROOKINGS, SOUTH DAKOTA

– *Brian Rex*

South Dakota State University (SDSU), in partnership with the SDSU Foundation, has been awarded a competitive grant from the Precast/Prestressed Concrete Institute (PCI) Foundation to create a precast/prestressed concrete studio for the university's Departments of Architecture and Construction Management.

The grant enables the shared study of precast building technologies in both departments. The Architecture, Math, and Engineering building now under construction on the SDSU campus will connect students in these programs with a shared workshop. Central to the new studio is the active engagement with regional PCI industry partners, specifically Gage Brothers in Sioux Falls, S. Dak. The grant will deepen the relationship between Gage Brothers and SDSU through plant tours, guest lectures, and other collaborations.

"The PCI Trustees were impressed with a number of things about the SDSU proposal," says Thomas J. D'Arcy, PCI Foundation chairman. "The first was that it was a partnership between a school of architecture and a school of construction management. We have been working to develop programs on the construction management side and were pleased to see it come about here.

"The second part of the proposal that we liked was the 'hands-on' approach to learning that SDSU takes. The trustees applauded the effort that the school takes to provide students with a unique learning experience that may include getting their hands dirty."

The program, "Building Concrete Community," began this fall, with each incoming class of students partnering with a South Dakota town to study during their years at SDSU. During this time, students will interact with rural communities and ultimately design and construct a small civic project, such as a park structure, band shell, or other community-identified need.

"We also liked the thoughtfulness and care that Professor Brian Rex took in creating the program," D'Arcy says. "It is important for us that the faculty embraces an integrated approach to the study of design and construction. That will mean allowing the local industry to be on hand to provide insight and guidance, and the industry as a whole will learn from the work at SDSU as it is shared at industry meetings."

In support of the Studio and growing programs, Gage Brothers also pledged $200,000 of gift-in-kind support over the next four years, including tours, plant visits, teaching, and scholarship support.

"Our support made perfect sense to us as a company," said Tom Kelley, president of Gage Brothers. "We are proud to have been involved in numerous building projects at SDSU. This studio will allow additional interaction with our team and the students on an ongoing basis, as well as help educate the future architects and construction managers on the benefits of utilizing precast concrete."

The PCI Foundation provides grants for educational and research initiatives focused on state-of-the-art innovative approaches to the integrated use of precast concrete design, fabrication, and construction. It is an independent 501©(3) and has provided support for programs at accredited schools of architecture, engineering, and construction management in the United States. The PCI Foundation began sponsoring learning studios at schools of engineering and architecture in 2007.

High Concrete Names Seroky New President

DENVER, PENNSYLVANIA

– *John J. Seroky*

High Concrete Group LLC has named John J. Seroky to serve as the company's president.

Prior to joining the company, Seroky served as a general manager of Otis Elevator's U.S. Southern Region, based in Atlanta, Ga. Seroky holds an MBA from the Hough Graduate School of Business at the University of Florida with a focus on finance, economics, and marketing.

Manual-Review Team Seeks Engineer Participantst

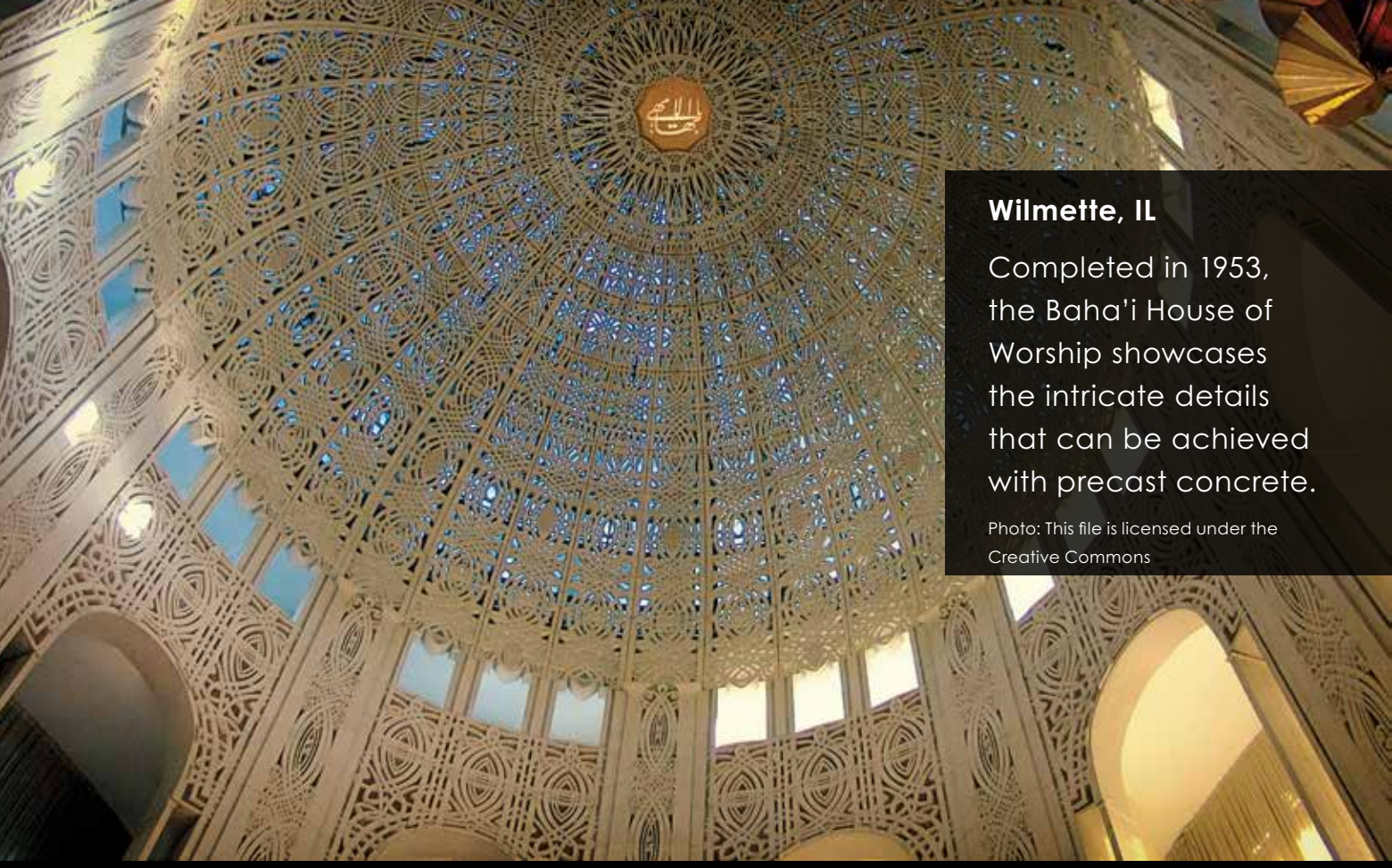
CHICAGO, ILLINOIS

PCI's Industry Handbook Committee is looking for candidates to serve on the Blue Ribbon Review Team for the eighth edition of the *PCI Design Handbook: Precast and Prestressed Concrete* to be published in the first quarter of 2015.

Engineers with experience in the design of precast/prestressed concrete structures who are interested in assisting the committee are encouraged to send their qualifications to Helmuth Wilden at hwilden@roadrunner.com no later than December 31.

The procedure consists of reviewing material created by the committee in advance of a two- or three-day meeting in the Chicago area in March or April 2014 to provide input to the committee.

Submit your headline news for consideration in a future issue of *Ascent* to Brian Miller at bmiller@pci.org.

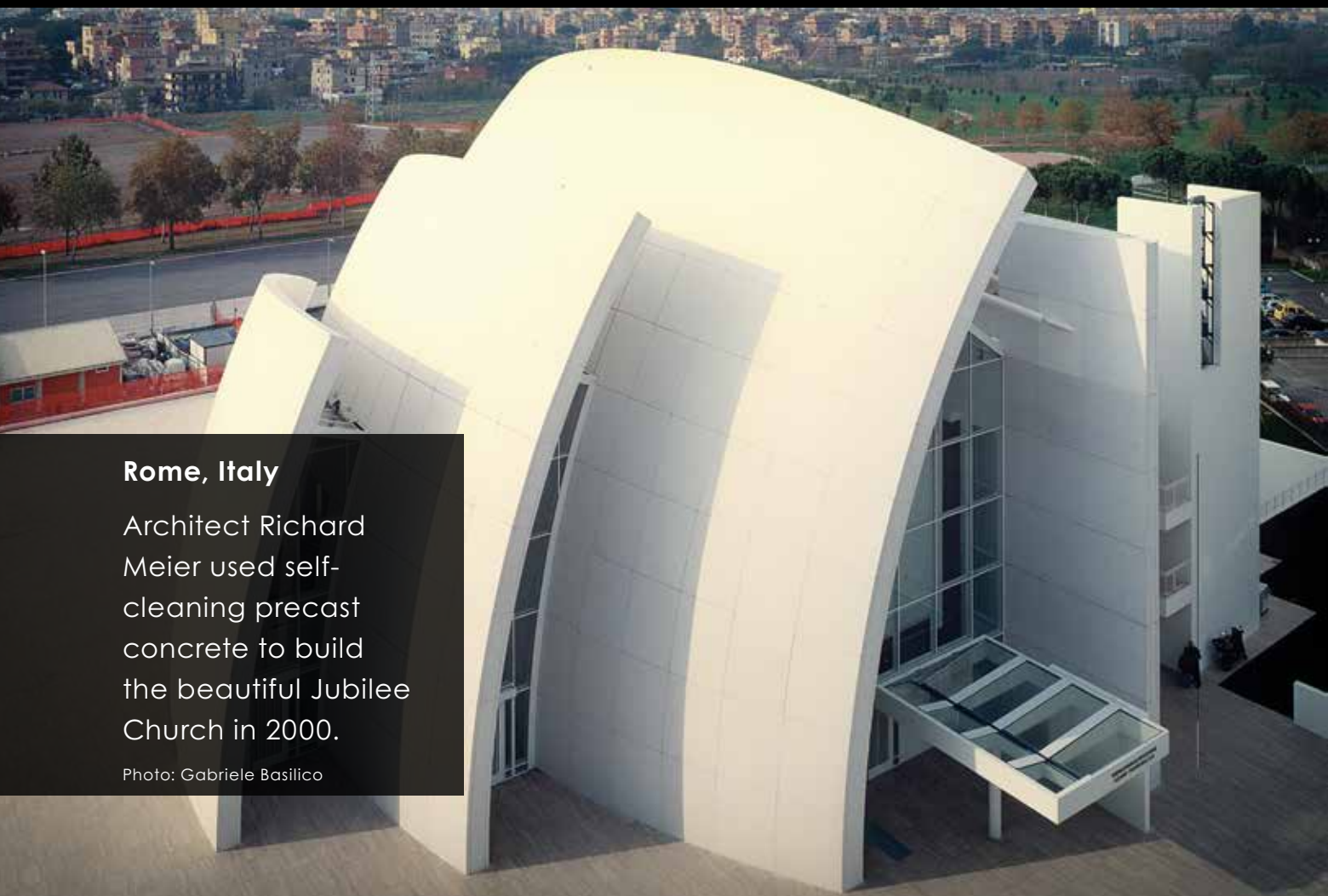


Wilmette, IL

Completed in 1953, the Baha'i House of Worship showcases the intricate details that can be achieved with precast concrete.

Photo: This file is licensed under the Creative Commons

WHAT DO THESE BUILDINGS HAVE IN COMMON?



Rome, Italy

Architect Richard Meier used self-cleaning precast concrete to build the beautiful Jubilee Church in 2000.

Photo: Gabriele Basilico

They all use the aesthetic versatility of precast concrete to achieve their **beauty**

San Francisco, CA

Built in 1972, the iconic, 48-story, TransAmerica building is clad in beautiful precast concrete which is resilient enough to handle one of the highest seismic zones in the U.S.

Photo: Wayne Thom

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Resiliency in Action

Projects around the country show precast concrete's ability for ensuring structures withstand the worst nature can create

— Craig A. Shutt

A number of factors allowed the precast concrete panels on the Imax Theater addition to the Warren Theater in Moore, Okla., to survive intact when tornadoes hit the area in May. Patrons survived without injury, and the theater was turned into an emergency center. Photos: Coreslab Structures (OKLA), Inc.

More attention is being paid to structural resiliency today as natural disasters—including tornadoes, earthquakes, hurricanes and wildfire—seem to increase in frequency and intensity. As owners and designers look for ways to boost protection in a cost-effective way, they are discovering the benefits of the inherent resiliency offered by high-performance precast concrete structural and envelope systems.

Designers are gaining awareness of the benefits of designing resiliency into projects, but it's important to understand what that encompasses. In part, resiliency can be defined as durability, or the long-term performance in a given exposure environment. For instance, a concrete structure exposed to cyclic freeze-thaw conditions must be designed with dense, low-permeable, air-entrained concrete to provide excellent resistance in those circumstances.

But resiliency goes beyond durability to include less frequent, often more extreme, events. Designing for high seismic control and such weather conditions as high winds, hail, heavy rains, and other localized events can be critical.

Resiliency also encompasses sustainability, which means to create without negatively affecting the environment or wasting limited resources. Certainly, not needing to rebuild a structure after an extreme event provides high sustainability by saving materials and energy, not to mention saving lives.

Recent examples show some of the ways that high-performance precast concrete designs can provide the kinds of long-term resiliency that pays off throughout the building's service life.

Oklahoma Theater

The Warren Theatre's IMAX addition stood in the path of an EF-5 tornado that tore through Moore, Okla., on May 20, 2013. The destruction around the theater from the tornado, whose winds reached as high as 200 mph, was near total. But the theater itself withstood the barrage and offered a safe haven for about 50 patrons, then served as an emergency rescue center afterward.

The addition was constructed with precast concrete load-bearing and nonload-bearing wall panels, but it was designed to standard ASCE wind loading for the area (i.e., 90 mph) and not to the higher FEMA 361 requirements, according to Sean Morris, chief engineer at Coreslab Structures (OKLA) Inc., which supplied the precast concrete components.

The structure features wall panels as tall as 57' 4", some of which had clear spans exceeding 54 feet. The size was required to provide the sight lines and height required for the large IMAX movies, Morris explains. The majority of the structure was constructed with load-bearing wall panels to support the steel-framed roof, while a handful of the wall panels were nonload-bearing panels.

Four key factors helped the theater withstand the battering it took, which included being impacted by windborne debris of all shapes and sizes.

1. **Building style.** The theater needed a large, open space with no windows to project its large-size movies in darkness. "The building lent itself to being resilient," says Morris. The lack of doors and windows created large expanses of solid panels. "The debris-impact resistance of the solid panels prevented an increase in the internal wind pressures that could have created the effect of blowing up the structure like a balloon," he says.
2. **Seismic requirements.** Ironically, a key ingredient in its resiliency was that designers had to incorporate design elements to withstand a fairly high seismic event. "Building codes seem to have placed more emphasis on designing structures for higher seismic forces than for higher wind pressures in the Oklahoma City area, while it appears that the opposite should be the case." In fact, more tornadoes hit the area after the big one on May 20th. "It's ironic that the connections we created to withstand a seismic event have instead turned out to be more useful for enduring an extreme wind event."
3. **Tall walls.** One of the major design changes to make the panels more resilient was the way they were connected to each other, he explains. This was done both to meet seismic needs but especially due to the tall clear spans that were needed. Most of the wall panels were cast with pilasters on each side, which created C-shaped cross-sections. The panels were 6 inches thick, with the 12- by 16-inch rectangular pilasters flanking them for nearly their entire height.

   This approach reduced shipping weights on the panels, which were already high due to their size, while ensuring the panels would be secure for their over 54-foot clear span. "Clear spans of that much are a tall order," he says. "The pilaster system gave us a nice lateral load-resisting system that helped resist the tornado's high winds, too."
4. **Prestressing.** In addition to creating the secure connection system, the precaster prestressed the panels to provide added strength. The goal was to prevent any bowing or cracking over the length of the clear span, but it also provided durability that hadn't been planned. "The prestressing is a huge reason the panels performed so well," he says. "It made them virtually impact resistant."

That was apparent from the debris field seen after the storm. Some of the theater's signage was completely destroyed, while other pieces had been thrown to the other side of the interstate. A number of smashed-in cars were strewn about, some so demolished it was difficult to identify make or model.

"There's no doubt the panels were impacted by debris, but it appeared, upon visual inspection, that none of the panels had even cracked. The pilaster system and the prestressing in particular gave the panels the extra out-of-plane bending resistance they required."

Approximately 50 patrons were inside the theater when the tornado hit, according to local reports. They rode it out safely after employees herded them into the hallways and had them sit tightly against the walls. Once it passed, IMAX manager Ales Ansari calmed those in the vicinity then helped evacuate elderly patients and mothers with newborns from the hospital across the street, which was heavily damaged. An emergency rescue center was set up in the theater, coordinated by a graduate nursing student who had been in the theater, according to the Norman Transcript.

Three days later, the theater reopened for business, hoping to return some normality to lives that will take a long time to truly return to normal. The town is grateful to the theater, says Deidre Ebrey, Moore's director of economic development. She told the local Channel Nine News that the theater and its employees "were a major component in saving lives for those who sought refuge there. It was a meeting place. It is much more than a business."

Fujita Tornado Damage Scale

EF0-Light: Chimneys are damaged, tree branches are broken, shallow-rooted trees are toppled.

EF1-Moderate: Roof surfaces are peeled off, windows are broken, some tree trunks are snapped, unanchored mobile homes are overturned, attached garages may be destroyed.

EF2-Considerable: Roof structures are damaged, mobile homes are destroyed, debris becomes airborne (missiles are generated), large trees are snapped or uprooted.

EF3-Severe: Roofs and some walls are torn from structures, some small buildings are destroyed, non-reinforced masonry buildings are destroyed, most trees in forest are uprooted.

EF4-Devastating: Well-constructed houses are destroyed, some structures are lifted from foundations and blown some distance, cars are blown some distance, large debris becomes airborne.

EF5-Incredible: Strong frame houses are lifted from foundations, reinforced concrete structures are damaged, automobile-sized missiles become airborne, trees are completely debarked.

Rockaway Beach Boardwalk

Another precast concrete structure survived the most devastating wind event in years—Hurricane Sandy, which hit the Rockaway Beach Boardwalk in Queens, N.Y., in 2012. Older timber sections of the boardwalk were completely destroyed, flinging windborne debris into the air to become projectiles. But one 10,000-linear-foot section remained virtually intact because

Precast concrete panels, formed to resemble five textured planks, were used in rows of five to produce an upgraded 10,000-linear-foot boardwalk in Queens, N.Y. The panels withstood Hurricane Sandy, the only portion of the boardwalk to remain intact. Photos: Steve Kenepp, U.S. Concrete Precast Group.

it had been replaced several years earlier with precast concrete planks.

The project had been commissioned in 2010 as a design-build project by the City of New York Parks and Recreation Department. "It was unusual for them to let a project as design-build, but they wanted repairs to the boardwalk to be completed quickly and as cost effectively as possible," explains Jeff Sa, director of construction for Padilla Construction, which headed the design-build team. U.S. Concrete Precast Group supplied the precast concrete components.

The design they created reused the existing timber substructural piers, timber and concrete pile caps, and concrete bents. But they replaced the timber boardwalk superstructure. "It was heavily deteriorated, and we decided to avoid heavy maintenance in the future by using precast concrete rather than wood," Sa says.

The project was designed in-house with the aid of the precaster, who was selected based on past experience with the company's attention to quality, he adds. "Our key challenge was to design a system to attach the new planks to the existing pile caps and ensure they would resist uplift." Their goal was to meet AASHTO H20 truck-load standards, which is somewhat robust but not extraordinarily high. "We knew of some past flooding problems, so we wanted them to be able to withstand a storm," he explains. "But we hadn't anticipated Hurricane Sandy's winds," which reached 115 mph.

The boardwalk features 8- by 20-foot precast concrete planks with four alternating textures created with formliners within each panel to mimic the variety found on a traditional wooden boardwalk. Five panels were needed to span the 40-foot-wide boardwalk.

Miniature Double-Tee Design

The panels were designed as miniature double tees, with two stems projecting from the underside. The stems were slid over the pile caps, fasteners were drilled into the cap, and the plank was bolted to it. "It was a fairly simplistic system, but it worked very well," Sa says. "The pieces were installed very quickly with this design."

The 10,000 feet of boardwalk was completed in three phases, which played to precast concrete's strength, he notes. "The precaster began fabricating pieces early in the process, so we could connect the first set of planks while we finalized the design of the second phase and surveyed the third phase." Not all of the pile caps were at the same height, requiring drawings to be shared with the precaster to ensure planks would fit properly to provide a smooth and level surface.

The resulting boardwalk was the only part of the structure to survive. It remained intact after the hurricane passed. "Cracks developed in a few of the panels, but they were easily repaired," Sa says. None of the panels had to be replaced. Not only did that allow the boardwalk to survive, but it prevented any part of it from adding to the problems caused by windborne debris.

"I think this approach to these projects will begin to be done more often as officials realize the benefits, not only in resisting storms but in not becoming part of the problem," Sa says. Designers must be careful in designing the pieces and work with a precaster known for high quality, he warns. "It's possible to overdo the camber or get aesthetics that aren't successful," he notes. "The quality of the precaster is critical."

For more information on these or other projects, visit www.pci.org/ascent.

Above-Ground Shelters Gain Popularity

With devastating weather events gaining a higher profile, many municipalities and developers are reviewing their building codes, existing emergency plans, and available structures to ensure they are providing as much protection as possible. In some cases, they are turning to FEMA-approved, precast concrete, above-ground shelters to serve as safe havens.

These safe rooms have long been a topic for schools in the Midwest, where protecting children during tornadoes and high winds has become a key concern. FEMA has grant programs available that can help schools design new additions, such as gymnasiums, to serve the additional role of storm protection. (For more on these projects, see the Summer 2011 issue of *Ascent*.)

Precasters have designed a number of these facilities for school districts in Kansas, Arkansas, and Missouri following recent tornadoes, says Sean Morris, Coreslab Structures (OKLA) chief engineer. "Many of them have a dual use, such as for gyms or music rooms," he says. "Oklahoma, our home state, has been slower to see the benefits, but we're trying to change that."

The facilities, designed to withstand winds up to 250 mph, feature precast concrete structural systems including double tees, beams, columns, and structural walls with architectural finishes. An alternative design provides load-bearing precast concrete walls that support the roofing members. Typically, the precast concrete walls are prestressed and 12 inches thick for walls as tall as 30 feet, providing strong protection.

FEMA funding can offset the added cost for the project, Morris notes. In some cases, the added funding makes the robust structure cheaper than the original design's budget.

Administrators in Newcastle, Okla., for instance, constructed a community center with a robust precast concrete structure to serve as a storm shelter and received enough FEMA funding after the fact that it could reallocate funds to construct a new police station with a similar design. (It didn't request FEMA funding for the second structure, as FEMA requires funded shelters to be open to the public during a storm, which would not be feasible for the first-responders' center.)

A number of building types offer great potential for these shelters, Morris notes. Nursing homes, where residents have little mobility, benefit greatly, as above-ground storm shelters require no elevators that could become inoperable if electricity failed. Apartments, warehouses, and data centers also offer strong options.

At least one university has asked for designs for an underground precast concrete shelter, he notes, and Coreslab Structures (OKLA) Inc. has been involved in plans for a new water treatment plant designed to remain operable after sustaining an encounter with an EF-5 tornado.

More Information

To learn more about requirements for FEMA safe rooms, visit: http://www.fema.gov/plan/prevent/saferoom/index.shtm and http://www.fema.gov/plan/prevent/saferoom/fema361.shtm. To learn about grant programs, visit: http://www.fema.gov/safe-room-funding.

The Oakdale High School in Oakdale, Okla., was designed with a total-precast concrete system, including double tees spanning 68 feet and 12-inch insulated precast concrete sandwich wall panels, which included 2 inches of insulation. Using 12-foot-wide wall panels and 8-foot-wide double tees allowed every third double tee to cross the wall joint and lock the panels together, reducing connections to resist loads across the joints. The building meets FEMA standards for safety.

At Pomona College, the students aren't the only ones earning high marks!

In October 2011, Southern California's Pomona College proudly announced the achievements and national recognition earned by two recent additions to campus - the new Sontag and Pomona dormitories.

Opened in the Summer of 2011, the dorms had been designed to meet the highest standards of sustainable and environmentally conscious construction using features such as rooftop solar panels, low-flow water fixtures, energy efficient lighting, and a solar-heated hot water system predicted to provide 80 percent of the buildings' needs.

Another key component was concrete sandwich walls insulated with Thermomass System NC. Built by Clark Pacific, the high performance precast panels created a durable and resilient exterior wall with continuous insulation, no thermal bridges and an R-value nearly twice that of California's stringent energy code.

In all, the energy saving components and sustainable construction techniques resulted in a LEED Platinum certification for both of the new dormitories - a first for California, and only the second large-scale residence project in the nation to earn such a distinction.

By adhering to a philosophy of high standards, environmental conservation, and attention to detail, Pomona College is setting an example that reaches well beyond its classrooms.

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2013 DESIGN AWARDS

High-Performance Precast Concrete

by Sarah Fister Gale

Today's architects and engineers are under constant pressure to deliver beautiful, durable structures within constrained budgets and schedules. The winners of the 2013 PCI Design Awards Competition demonstrate the ways that precast concrete helps them meet those goals.

This year's winners showcase the high-performance attributes that precast, prestressed concrete can bring to a project. Award recipients include bridges that feature precast concrete spans extending for more than 100 ft (30 m); homes that can withstand earthquakes, hurricanes, and sea air; and buildings that replicate historic architectural designs with cost-effective solutions that will last for decades.

Precast concrete enabled all of the winners to accelerate construction, often while working in extremely tight site conditions with minimal effects on traffic, the community, and the local environment.

The awards covered an array of building types, including Best Parking Structure, Best Mixed-Use Building, 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 Solution, and the Harry H. Edwards Award for Industry Achievement.

Why the industry loves precast concrete

The 11 judges were drawn to the versatility, strength, and economy that precast concrete brought to the winning projects.

Judge Maher Tadros noted that precast concrete helped several bridge designers overcome many of the financial, environmental, and structural obstacles they faced. "Precast was not the only choice, but it was the best choice … because of all the advantages it offers," he says.

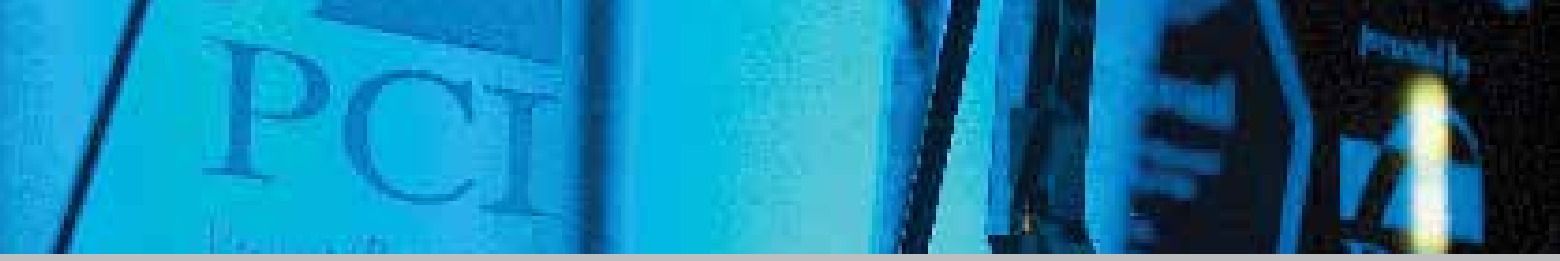
Judge Loren Risch pointed to the value that precast concrete brought to the many projects involving historic structures. "You can salvage a bridge that is cherished and loved by a community, and that bridge will be there for a long time to come because of precast concrete," he says.

Each of this year's award winners proved that precast concrete brings beauty, strength, and efficiency to all types of structures and will continue to be a go-to material for engineers and architects seeking high performance.

"Precast is clearly an extremely efficient system," says judge Beth Broome. "It's structural; it's architectural; it has immense potential."

The following pages showcase the projects selected by the bridges, buildings, and special awards juries. The honors will be presented to representatives of each project during the 2013 PCI Convention and National Bridge Conference September 21–24 in Grapevine, Tex.

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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Special Awards

Building Awards

Special Awards Jury

Dan Kolb

Dan Kolb is vice president of sales, nontransportation, for Prestress Engineering Co. LLC (PEC), a manufacturer of precast/prestressed concrete products in Prairie Grove, Ill. Before joining PEC, he was responsible for sales and marketing for J. W. Peters and Sons.

Kolb has served on the PCI Board of Directors as the zone director for producer members in Illinois and Wisconsin for the past five years. He has been chair and vice chair of numerous PCI subcommittees and previously was a member of PCI's Marketing Council.

Kolb was also a charter member of the Safe Home Illinois Coalition, an organization developed by the American Red Cross Chicago chapter to educate government officials, building industry professionals, and the public about building products and techniques to mitigate tornado and wind storm damage.

Kolb holds a bachelor's degree in psychology and sociology from Northeastern Illinois University in Chicago.

Craig T. Barrett

Craig T. Barrett, PE, is vice president of engineering at LEAP Associates International, a precast/prestressed concrete consulting firm in Tampa, Fla. In this role, he is responsible for developing engineering standards and supervision of project engineers and project managers.

Barrett has more than 25 years of experience in specialty design of precast/prestressed concrete structures, including parking structures, airport facilities, commercial/industrial buildings, professional sports facilities, marine structures, multifamily housing, and food processing facilities.

He is an active member of PCI. He served on the PCI Handbook Committee, where he participated in writing the sixth edition of the *PCI Design Handbook: Precast and Prestressed Concrete*. He also served on the PCI Board of Directors for a two-year term and serves on PCI's Technical Activities Committee, which is responsible for oversight of all PCI technical activities.

Barrett has a bachelor of science degree in civil engineering from Michigan Technological University in Houghton, Mich.

Rachel Michelin

Rachel Michelin, RA, LEED AP BD+C, joined Thornton Tomasetti in 2005 and is a senior project architect. She implements sustainable design principles in the repair and renovation of existing buildings and specializes in concrete, masonry, stone, curtain walls, roofing, and waterproofing repair and design.

Michelin is the green building leader for Thornton Tomasetti's Chicago, Ill., office, and is responsible for questions related to LEED and for the maintenance of staff members' LEED credentials. She has presented on numerous sustainable design topics, such as thermal break improvements, and at the Greener by Design Conference and Expo in October 2012.

Michelin holds a master of architecture with an emphasis in structures and a bachelor of science in architectural studies from the University of Illinois at Urbana-Champaign.

Harry H. Edwards Industry Advancement Award and Best Bridge with Spans between 76 and 150 ft (23.2 and 46 m)

Hodder Avenue Underpass

Thunder Bay, ON, Canada

Photo:	Ministry of Transportation of Ontario
Owner:	Ministry of Transportation of Ontario, Northwestern Region, Thunder Bay, ON, Canada
Engineer of Record:	Hatch Mott MacDonald, Mississauga, ON, Canada
Precaster and UHPC Supplier:	Lafarge Canada Inc., Winnipeg, MB, Canada
Contractor:	Teranorth Construction & Engineering Ltd., Sudbury, ON, Canada
Total Cost:	$9 million
Bridge Length:	279 ft (85 m)

"Because of the high durability properties of ultra-high-performance and high-performance concrete, this structure will stand the test of time."
Biljana Rajlic

The Hodder Avenue underpass in Thunder Bay is proof that the extensive use of ultra-high-performance concrete (UHPC) in a modular construction project delivers versatility, durability, and design excellence.

This underpass is the first structure in North America to incorporate precast UHPC pier cap and pier column shells along with precast high-performance concrete box girders, parapet walls, and approach slabs. All field connections were field cast using UHPC, resulting in smaller, simpler joints with superior durability.

The bridge spans six highway lanes and is founded on hard till and bedrock. Because the structure would be exposed to the harsh northern Ontario climate, it was necessary to choose a construction material that could stand up to extreme weather conditions, says Biljana Rajlic, vice president and engineer for Hatch Mott MacDonald in Mississauga, ON, Canada.

A precast concrete design gave Rajlic that durability and so much more. "The use of precast concrete, along with UHPC joints, provided multiple benefits," she says. The precast, prestressed concrete solution increased structural capacity and met the design requirements while the UHPC allowed for smaller joints with improved durability, strength, and continuity. "Even after years of exposure to harsh climate and abuse from salt spray, it will still look great for decades to come."

The use of UHPC also enabled the design team to create a clean, open frame with sleek, elegant lines to meet the owner's aesthetic goals. This look was achieved through the use of a pier cap beam incorporated into the superstructure that spans continuously over the three pier column shells. Each shell has an octagonal shape, which transitions from a smaller constant dimension at the bottom to a flared, larger dimension toward the top. The pier cap cantilevers at the ends with an inverted T shape to provide ledges upon which the box girders sit.

"The pier cap was designed using prestressed UHPC with a compressive strength of up to 29,000 psi (200 MPa), which allowed for just three pier columns and a more open appearance, says Paul Kochan, sales and marketing manager at LaFarge's precast concrete division in Winnipeg, MB, Canada. "This creates the appearance that the pier cap is integral with the box girders while seeming to provide a frame that goes directly into the superstructure."

Due to restricted plant height clearance, the UHPC pier column shells were cast on a 15-degree angle using steel formwork, which allowed the material to be placed slowly from the top of the column through an inlet funnel. To erect the UHPC shell pier columns, the original forms were shipped to the site and wrapped around the elements before concrete infill placement.

"The result is an open and slender structural form that complements the surrounding landscape rather than obstructs it," Rajlic says.

Because the use of precast concrete eliminated the need for forming and curing onsite, the project was completed in 80% of the time that would be required for a cast-in-place bridge, Kochan says. Each girder took just 15 minutes to erect, with 16 girders per span.

This project demonstrates that the use of precast ultra-high-performance and high-performance concrete bridge elements with field-cast UHPC connections gives designers an opportunity to advance bridge performance, shorten construction time, and extend the durability of these spans. The result, Rajlic says, "is a resilient, attractive structure that is built to last and an excellent model for similar precast bridge projects worldwide."

"As the owner of the bridge, we are extremely proud of the finished structure. The use of UHPC enabled us to achieve our intended objective of an open, aesthetically pleasing, and welcoming bridge, which was also economical and durable. It will now form the baseline design for a number of other planned overpasses on this section of the Trans-Canada Highway," says Ray Krisciunas of the Ministry of Transportation of Ontario.

Every two years, the U.S. Department of Energy hosts a Solar Decathlon, where collegiate teams design, build, and operate solar-powered houses that are cost-effective, energy-efficient, and attractive. In 2011, a team of architecture and engineering students from the New Jersey Institute of Technology (NJIT) and Rutgers University entered the contest with a radical goal: to build the first precast concrete house in the history of the competition.

The team chose a precast concrete home and partnered with Northeast Precast for many reasons, says NJIT associate professor Richard Garber, AIA, who led the team. Precast concrete is low maintenance and durable; it can resist weather, chemicals, and moisture; it can contain natural materials and recycled byproducts to reduce its carbon footprint; and it has low to negligible levels of volatile organic compounds, making it a healthier alternative to standard construction.

However, the use of precast concrete also presented several challenges, which is why we turned to Northeast Precast, Garber says. "We enjoyed many unique firsts on this project that had to do with the use of precast in a high-performance and sustainable housing solution."

To meet the criteria of the decathlon, the house had to be solar powered and no more than 1000 ft^2 (93 m^2). It would also be judged on 10 objective and subjective criteria, including engineering, affordability, comfort, market appeal, and energy balance.

For the roof, wall, and floor assemblies, the team came up with a design using 27 reinforced concrete panels composed of one layer of expanded polystyrene foam sandwiched between two layers of concrete. The house's concrete panels are all-in-one modular units, which eliminated the need for additional trades on the building site.

"We pushed the flexibility of concrete in this novel formal and performative solution by utilizing the varied casting processes of our industry partner, Northeast Precast, and developing each component and connection to deal with unique conditions," Garber says.

To meet aesthetic and energy goals, the precast concrete roof was designed in a bowl shape and calibrated for optimal sun angle and rain collection while hiding the photovoltaics and solar collectors, which some consider unattractive. The roof cantilevers over the north facade almost 10 ft (3 m), which helps to create an appealing sense that the heavy precast concrete roof is floating above the clerestory windows directly below.

One of the biggest hurdles for the team was the need to build the house first in New Jersey to demonstrate the concept. That process took five days, which included 48 hours for the precast concrete to set. Then they had to disassemble it, ship it to Washington, D.C., and reassemble it on the National Mall, which took another 40 hours.

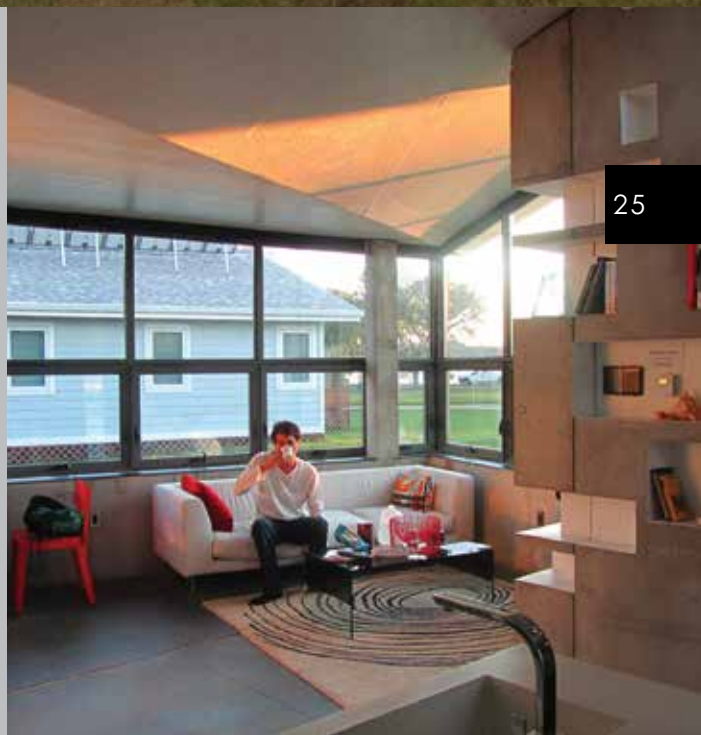
This constraint played a significant role in the development of the structural systems, says John Ruga, president of Northeast Precast in Millville, N.J. The house is divided into three main components that had to be placed and bolted together. "With pieces as heavy as 45,000 lb (20 tonnes) and as wide as 17 ft (5.2 m), it created some very interesting challenges for erecting and shipping. Each location was different and required very precise coordination."

Although the house didn't win the decathlon, it delivered valuable lessons to both the students and the architecture community about the many benefits that precast concrete brings to the sustainability conversation. "One of the most unique things about this project is that it showed the flexibility of precast," Garber says. "It was a great example of what can happen when a very creative design team and producer agree to collaborate to make a project happen with great engineers."

"eNJoy House challenges traditional concepts and techniques for building high-performance, energy-efficient homes."
Richard Garber

Sustainable Design Award
eNJoy House
Washington, D.C.

Photos:	Solar Team NJ
Owner and Architect:	New Jersey Institute of Technology College of Architecture and Design, Newark, N.J.
Precaster:	Northeast Precast, Millville, N.J.
Engineer of Record:	ARUP, New York, N.Y.
Contractor:	Skanska USA Building Inc., Parsipanny, N.J.
Project Cost:	$450,000
Project Size:	1000 ft^2 (93 m^2)



Photos:	Martinot Photos
Owner:	LOM Inc., Hollywood, Fla.
Architect and Engineer of Record:	Finfrock Design Inc., Apopka, Fla.
Precaster:	Finfrock Industries Inc., Apopka, Fla.
Contractor:	Finfrock Construction, Apopka, Fla.
Project Size:	175,300 ft^2 (16,300 m^2)

"Finfrock had the opportunity to solve some pretty unique challenges using precast concrete on a project that created a lot of local, and now national, interest."

Jorge Arboleda

All–Precast Concrete Solution
Surf Style
Clearwater, Fla.

Festive summer colors and big, bright windows offer an inviting facade to the Surf Style complex, a 175,300 ft^2 (16,300 m^2) beachside retail center and parking structure in the heart of Clearwater, Fla. The six-level building includes more than 42,000 ft^2 (3,900 m^2) of retail and restaurant space on the ground and mezzanine levels, with parking for 344 vehicles on five levels above.

Along with a fun and friendly shopping experience, the designers of this facility had to create a structure that could withstand corrosive sea air, meet strict flood zone requirements dictated by the Federal Emergency Management Agency (FEMA), and deliver construction on an accelerated schedule within a tight footprint in the midst of a busy beachfront community during tourist season.

An all–precast concrete solution helped the team overcome all of these challenges, says Daniel J. Finfrock of Finfrock Design in Apopka, Fla. "We were able to take each challenge of the project, apply some innovative thinking, and use precast to solve that particular problem," he says.

The owner of the project was keen to minimize disruption to business as much as possible. "By producing structural concrete products off-site, fast-track construction could begin immediately upon demolition of the existing structure," says architect Jorge Arboleda of Finfrock Design.

Offsite construction of precast concrete components also reduced the need for extra space onsite, which was vital because the construction zone abutted one of the most active parts of Clearwater Beach. Cornices, reveals, and recesses were cast within the precast concrete panels, eliminating the need for extra trades on-site or added attachment hardware.

"By choosing a precast concrete solution, no on-site lay-down area was required," Arboleda says. It also dramatically reduced the dust, noise, and other effects of construction.

To meet the area's FEMA flood zone designation, the designers added a wave wall in front of the building with a 3 ft (1 m) tall concrete cap extending above grade that is supported by vinyl sheet pile extending 20 ft (6 m) below grade. The building was also designed under strict FEMA coastal construction guidelines to withstand the force of 6 ft (1.8 m) of standing water without incurring major damage.

The project team was further challenged when, midway through construction, the owner decided to incorporate a FlowRider surf attraction into the retail surf shop. This addition required an extension to the original project schedule to accommodate the dramatic new feature.

"Since Finfrock handled the design, manufacturing, and construction of the project, structural changes were handled quickly and efficiently, adding only six additional weeks to complete the project," Finfrock says. "Even with the drastic change of scope, final delivery of the building was three weeks ahead of our contractually obligated schedule."

Building Awards Jury

Scott Powell

Scott Powell, AIA, LEED AP BD+C, is the vice president and secretary for Craig-GauldenDavis Architects in Greenville, S.C.

He is a past board member of the American Institute of Architects (AIA) South Carolina Chapter and past president of the Greenville Section of the AIA. He is also a board member of the Council of Educational Facility Planners International (CEFPI) and a member of the South Carolina School Board Association.

Powell has received design awards from AIA, CEFPI, and PCI for his work on the Carolina High School and other notable projects. He is a speaker and writer and has been published in *Ascent* and *South Carolina Architecture*.

He received a bachelor of science degree in design from Clemson University in 1987.

Christopher Morrison

Christopher Morrison, AIA, LEED AP, joined Cunningham Quill Architects as an associate in 2000 and became a principal in 2005. He has more than 15 years' experience in architecture, historic preservation, sustainability, adaptive reuse, and planning.

Morrison's projects have received numerous design awards, including the Catalyst Award and the Award of Excellence from the AIA Washington Chapter; the D.C. Mayor's Award for Excellence in Historic Preservation; and a Merit Award from the General Service Administration's Design Excellence Program.

Morrison recently completed service on the national board of directors of the AIA and as the board liaison to the American Institute of Architecture Students and the AIA Council of Emerging Professionals.

Paul Frank

Paul Frank, NSAA, FRAIC, Hon. AIA, is senior partner in JDA MacKenzie Architects in Halifax, NS, Canada. He became a registered architect in 1985.

For the past 30 years he has been designing and building healthcare facilities in Canada, the United States, Mexico, and Trinidad.

Frank is a past president of the Design and Construction Institute of Nova Scotia, past president of the Nova

Best Parking Structure (900+ Cars): Hartford Hospital Hudson Street Employee Parking Garage

Best Warehouse/Storage/Distribution Center Facility: Dollar General Distribution Center Employee Hub

Best Mixed-Use Building: Eurocenter

Best K–12 School: New Sandy High School

Best Higher Education Building: WPI Sport and Recreation Center

Best Justice and Correctional Structure: James F. Battin United States Courthouse

Best Government or Public Building: Centro de Gobierno Plaza Cívica

Best Religious Structure: First United Methodist Church

Scotia Association of Architects, and a fellow and current president of the Royal Architectural Institute of Canada. He is also an honorary member of AIA and past chair of the Program Advisory Committee for the Architectural and Engineering Technician Program at Nova Scotia Community College.

Frank obtained a bachelor of arts degree from St. Mary's University in Halifax and a bachelor of architecture degree from the Technical University of Nova Scotia in 1983.

Beth Broome

Beth Broome is managing editor of *Architectural Record*, the 122-year-old award-winning publication from McGraw-Hill that features a mixture 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 magazine.

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. Broome was previously managing editor of *The New York Observer.*

She received a degree in sociology from Tufts University in 1991.

Eui-Sung Yi

Eui-Sung Yi is a principal at Morphosis Architects in Los Angeles, Calif., and director of the NOW Institute at UCLA. Yi has played a significant role in several pivotal projects at Morphosis, including the San Francisco Federal Building and the Azalea Springs Winery in Napa Valley, Calif. He was also part of the joint project team to design and build the Korean Embassy in Japan.

Comanaging the Korean branch of Morphosis from 1994 to 1997, Yi oversaw construction of the firm's first high-rise, the Sun Tower in Seoul, South Korea.

Yi's academic career includes positions as adjunct associate professor at the University of Southern California School of Architecture and director of the master of architecture programs. He serves as an executive board member for Docomomo International and will head the organization's 2014 International Conference in Seoul.

He received a bachelor of architecture degree from Cornell University and a master of architecture degree from Harvard University

Best High-Tech or Laboratory Facility: Millennium Science Complex, Pennsylvania State University

Best Multifamily Housing: ETS Student Housing Phase IV

Best Single-Family House: Casa Vallarta

Best Custom Solution: Robert and Beverly Koski Bell Tower and Academic Plaza

Best Parking Structure (900+ Cars)

Hartford Hospital Hudson Street Employee Parking Garage

Hartford, Conn.

"This design put yet another twist on what precast can do for the architect and his aesthetic requirements by providing consistency combined with natural materials to achieve a new but authentic look."

Anthony Caputo

Photos:	HalkinMason Photography, Philadelphia, Pa.
Owner:	Hartford Hospital, Hartford, Conn.
Architect:	Perkins+Will, New York, NY
Precaster:	Unistress Corp., Pittsfield, Mass.
Precast Concrete Specialty Engineer:	Simpson Gumpertz & Heger, Waltham, Mass.
Engineer:	Desman Associates, Rocky Hill, Conn.
Contractor:	Downes Construction Co., New Britain, Conn.
Project Cost:	$28.4 million
Project Size:	448,335 ft^2 (41,652 m^2)

The architects who designed the nine-story employee parking structure at Hartford Hospital in Connecticut wanted to build a structure that would be more than just storage for cars. "While traditional garages have a flat concrete panel, the design team was interested in introducing a sense of scale and texture into the system," says Anthony Caputo, senior project designer with Perkins+Will in New York. They also wanted to incorporate shingling concepts usually found in slate roof and wood cladding to create dynamic texture and shadowing.

Precast concrete allowed them to achieve these design goals in an economical and versatile package.

The designers used white modular precast concrete as its primary cladding system, taking advantage of the panels' ability to span long distances, which was crucial for the lengthy facades.

Ribbed charcoal precast concrete panels are positioned between expanses of white precast concrete to further mitigate the broad scale of the facade. "The white precast both evokes and evolves the existing hospital's white brick material by introducing exposed aggregates that create a textural surface and react to daylight by subtly shifting in shadow, shade, and texture," Caputo says.

A three-dimensional fold was added to further enhance the play of shadows on the facade and to create channels for rainwater that will mitigate the unsightly streaking that typically occurs on flat panel systems.

"The building's unique facade raised the sense of accomplishment in our manufacturing department," says Mark DiPietro at Unistress Corp., a precast concrete producer in Pittsfield, Mass. "Though most of the product is structural 6000 psi (40 MPa), it's also architectural, and because precast requires very little maintenance it can be washed or sand blasted years later and returned to its original state."

Pull up to the Dollar General Distribution Center in Bessemer, Ala., and you'll be struck by the unusual facade.

While most warehouses are big gray boxes, Dollar General wanted a unique structure that would help employees feel valued and connected to the Dollar General brand, says Bill Baxley of Leo Daly architects in Minneapolis, Minn., but it had to be accomplished within a tight budget.

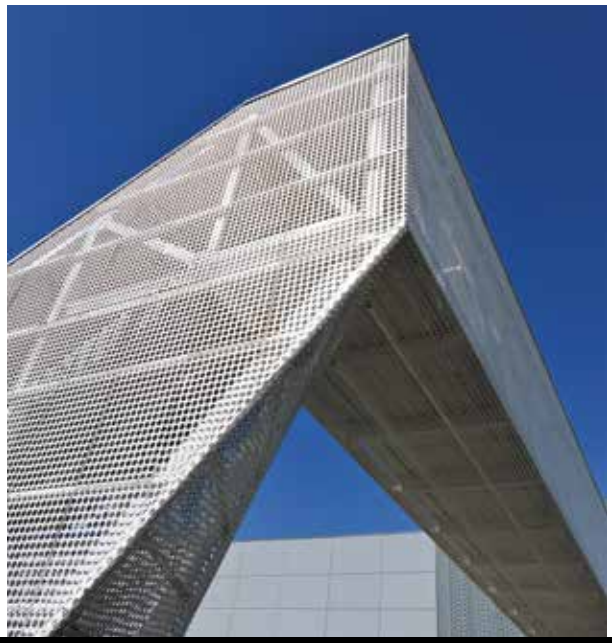
Baxley's solution was to create a facade that represents what the employees do. "We looked beyond basic white to find a way to brand the facility," he says. "Precast concrete helped us do that."

Metromont Corp. in Hiram, Ga., created a reusable custom formliner replicating an enlarged tire tread pattern that could be embedded into each of the facade's precast concrete panels. "The formliner allowed endless design possibilities not possible with other construction methodologies," Baxley says. The treads run up the entire facade of the employee hub, creating differentiation and ownership for this portion of the building while also reinforcing a symbolic authority of the architecture.

Linking the pattern in each panel was a challenge, but through precise design and construction, the pattern is seamless. "Every edge is crisp and the quality is exceptional," Baxley says. "Once you see it, you want to go up and run your fingers over it."

Because the formliners were reusable, adding the tread pattern to the precast concrete panels did not significantly affect the cost, yet it transformed what could have been a basic, formulaic structure into something special. And that was just one of the many reasons Baxley chose precast concrete for this project.

"Precast concrete panels are high performance, cost effective, and allow fast erection times," he says. "The fact that we could create that stunning tire tread pattern was icing on the cake."



Photos:	Bill Baxley
Owner:	Dollar General, Goodlettsville, Tenn.
Architect:	Leo A Daly, Minneapolis, Minn.
Precaster:	Metromont Corp., Hiram, Ga.
Precast Concrete Specialty Engineer:	Architectural Polymers, Palmerton, Pa.
Engineer of Record:	Leo A Daly, Minneapolis, Minn.
Contractor:	Clayco Construction, St. Louis, Mo.

Best Warehouse/Storage/Distribution Center Facility

Dollar General Distribution Center Employee Hub

Bessemer, Ala.

"This facility is all about trucking, and we used precast concrete panels to tie that into the identity of the structure."
Bill Baxley

Best Mixed-Use Building

Eurocenter

Santa Fe, Mexico

The Eurocenter II in Santa Fe, Mexico, is the central element of one of Mexico's largest mixed-use urban development projects, and designers wanted to be sure it stood out. They used precast concrete to create a stunning visual effect that also delivers energy efficiency and cost savings to the project.

The design features 1300 architectural precast concrete mullions with white marble aggregates combined with hundreds of glass shades to create a precast concrete and glass web across the front and back of the building. The chisel-hammered precast concrete elements were arranged randomly to add visual appeal.

Separation of the precast concrete panels from the glass and aluminum enclosures required architectural finishes on all four surfaces of each concrete element so that the inside view of the precast concrete became part of the scenery, says Alejandro Fastag, CEO of Pretecsa, the precast concrete producer for the project. "This requirement had to be solved with a very clean hidden anchoring system so that only perfectly white chiseled concrete was shown from every angle."

Along with offering aesthetic appeal, the precast concrete design helped the owner achieve schedule, durability, and sustainability goals.

"The vertical mullions solved the required energy efficiency and short schedule requirements with a spectacular, attractive facade," Fastag says. "By manufacturing the elements outside the jobsite, it allowed for precise alignment and reduced jobsite complications for these visually freestanding elements."

The exposed granite aggregate and highly textured skin will also require minimum maintenance in a finish that will last for decades, Fastag says. "The project is a tribute to precast concrete and a clear example of the efficient use of precast panels designed with an innovative and artistic vision."

"The precise architectural precast concrete elements provide an interesting shadowing effect as the sun changes against the impeccable white chiseled finish."
Alejandro Fastag

Photos:	Pretecsa
Owner:	Collective Ownership, Santa Fe, México
Architect:	TEN Arquitectos, Condesa, México
Precaster and Precast Concrete Specialty Engineer:	Pretecsa, Estado de México
Contractor and Engineer of Record:	Geométrica Developers, Bosques de las Lomas, México
Project Cost:	$20,902,140
Project Size:	85,304 ft^2 (7925 m^2)

"The use of precast insulated wall panels reduced the number of trades involved in creating the structure and building skin and allowed off-site fabrication, which resulted in a well-crafted wall."

Jerry Waters

Best K–12 School
New Sandy High School
Sandy, Ore.

Thanks to a population surge in Sandy, Ore., between 2000 and 2010, the local high school had become overcrowded.

To accommodate the growth and give students a more inviting place to learn, the city announced plans in 2010 to build a state-of-the-art 310,000 ft^2 (28,200 m^2) high school facility that could house 1600 students with support space for an additional 200, along with a gym and a performing arts center.

Precast concrete insulated wall panels were chosen early on as a cost-effective, maintenance-free exterior wall system, says Jerry Waters, AIA, LEED AP, architect for Dull Olsen Weekes Architects in Portland. "Precast concrete lends itself to custom color, surface textures, and finishing that, when combined, result in a rich and varied facade treatment," Waters says, "and the durability of concrete will provide the building with the longevity necessary when building with taxpayer dollars."

One of the bigger challenges was to create a building envelope that met the city design standards, as well as the school district's requirements for durability and economy. Waters worked with precast concrete producer Knife River to create a custom precast concrete solution that features a stone liner modeled after the "Sandy style" of architecture at the base and a shiplap wood grain liner on the upper part.

The use of high-performance structural precast concrete reduced the amount of structural steel framing needed and the length of time needed for on-site erection, while lowering the overall cost of the structure. That durability helped the project achieve LEED gold certification.

"The ability to create full wall-height panels that met the aesthetic requirements of the city while simultaneously providing the thermal and moisture needs of the envelope and the load-bearing structure proved to be very economical," he says.

Photos:	Josh Partee
Owner:	Oregon Trail School District, Sandy, Ore.
Architect:	AIA, Dull Olson Weekes-IBI Group Architects Inc., Portland, Ore.
Precaster:	Knife River, Harrisburg, Ore.
Precast Concrete Specialty Engineer:	The Consulting Engineers Group, San Antonio, Tex.
Engineer:	KPFF Consulting Engineers, Portland, Ore.
Contractor:	Hoffman Construction, Portland, Ore.
Project Cost:	$75 million
Project Size:	310,000 ft^2 (28,200 m^2)

Walk into the Worcester Polytechnic Institute (WPI) Sports and Recreation center in Worcester, Mass., and you'll find swimmers doing laps in a competition-sized pool under soaring precast concrete arches. Head one floor up, and you'll find more students playing basketball on a court supported by those same precast concrete bents.

"Precast concrete is incredibly versatile in that it can be formed to develop a wide range of shapes and customized to the particular design situation," says Lynne Deninger, principal for Cannon Design in Boston, Mass. "The precast helped our team not only meet the dimensional requirements of the frames over the pool but also the aesthetic expression for the building."

The design team knew that the structure needed to be durable enough to withstand the potentially corrosive pool environment, be able to accommodate the 110 ft (34 m) spans across the pool, and satisfy vibration requirements for supporting the gymnasium. They initially considered steel trusses but determined it wasn't the most resilient choice.

"Eventually we chose precast concrete thanks to its durability, mass, and shape flexibility," Deninger says.

The bents were designed as five separate elements spaced at 14 ft 9 in. (4.5 m) on center spanning 110 ft (34 m) across the pool. The smaller pieces met requirements for shipping, weight, and size, and splice locations were chosen to minimize demand on the connection and avoid heavily reinforced areas.

"The use of precast concrete proved a differentiator with this project as it allowed for us to support very diverse sports and activities in the same building," says Colleen McKenna, associate principal with Cannon Design. "That kind of flexibility and fusion is necessary in today's recreation environments and helps WPI best meet the needs of its students."

Precast concrete double tees were placed between the bents to support the four-court gymnasium above.

Photos:	Anton Grossi, Esto Photographics; Jesse Shauffer, Cannon Design	Precast Concrete Specialty Engineer:	Simpson Gumpertz & Heger Inc., Waltham, Mass.
Owner:	Worcester Polytechnic Institute, Worcester, Mass.	Contractor:	Gilbane Building Co., Boston, Mass.
Architect and Engineer of Record:	Cannon Design, Boston, Mass.	Project Cost:	$48 million
Precaster:	Unistress Corp., Pittsfield, Mass.	Project Size:	140,000 ft^2 (13,000 m^2)

"Everyone involved with this project is proud of the innovative use of precast. We really think we've broken new ground."
Lynne Deninger

Best Higher Education Building

WPI Sport and Recreation Center

Worcester, Mass.

Photos:	Sean Airhart, NBBJ
Owner:	GSA Rocky Mountain Region, Denver, Colo.
Architect:	NBBJ, Seattle, Wash.
Precaster and Precast Concrete Specialty Engineer:	Gage Brothers Concrete Products Inc., Sioux Falls, S.Dak.
Engineer of Record:	Magnusson Klemencic Associates, Seattle, Wash.
Contractor:	Mortenson, Bellevue, Wash.
Additional Project Team Member:	Weidlinger Associates Inc., New York, N.Y.
Total Cost:	$59 million
Project Size:	147,000 ft^2 (13,700 m^2)

With both design and construction completed in a record 27 months, the James F. Battin U.S. Courthouse in Billings, Mont., represents the fastest delivery of a federal courthouse in modern history, and precast concrete helped make it happen.

From the beginning, precast concrete was envisioned as an important design component of the project, says Jeanne Iannucci, AIA and LEED AP architect for NBBJ in Seattle, Wash. "The courthouse had to be designed and built in record time while meeting high-performance, high-durability goals at a reasonable cost to the taxpayer," she says. "Precast cladding, with its off-site production simultaneous with the on-site erection of the steel supporting frame, helped us meet this record-breaking schedule."

The courthouse features rugged precast concrete panels designed to reflect the buttes of Montana. The designer used 12 formliner patterns arranged in various combinations to create eight unique larger panels. To emphasize the lightness of the upper floors, the precast concrete panels are hung from steel framing cantilevered past the lower-level footprint of the building.

"The formliners created varying angled planes, which are playful in how they look in different angles of sunlight," says Tom Kelley, president of Gage Brothers.

The use of precast concrete also enabled the designers to meet blast-resistance goals, says Collin Moriarty, engineering manager for Gage. To prevent objectionable deflection of the upper-level panels, they needed to be stiff sections, causing them to attract large blast forces. "Precast provided that high-performance attribute," he says. "Energy dissipation is one of the advantages you get from precast."

Sustainability is another benefit, says Iannucci. "The durability of precast translates into longevity for our 100-plus-year building and presents an ideal face for the climatic barriers and super insulation essential to our American Recovery and Reinvestment Act energy conservation goals."

Best Justice and Correctional Structure

James F. Battin United States Courthouse

Billings, Mont.

"Expressing the dignity of the courts along with the rugged Montana geology was one of the coolest things about our specially formed precast facades."

Jeanne Iannucci

"The precise detailing of precast concrete panels gives this project a sense of perfection, even with its large dimensions."
Alejandro Fastag

Best Government or Public Building

Centro de Gobierno Plaza Cívica

Monterrey, Mexico

Photos:	Pretecsa
Architect:	Constructora Andrade Gutiérrez SA de CV, Bosques de las Lomas, Distrito Federal, Mexico
Precaster and Precast Concrete Specialty Engineer:	Pretecsa, Atizapán de Zaragoza, Mexico
Engineer of Record:	Consorcio en Innovación y Construcción SA de CV, Monterrey, Mexico
Owner:	Gobierno del Estado de Nuevo León, Monterrey, Mexico
Contractor:	Consorcio en Innovación y Construcción SA de CV, Monterrey, Mexico
Project Cost:	$100,205,528
Project Size:	656,560 ft² (61,000 m²)

The new Centro de Gobierno Plaza Cívica in Monterrey, Mexico, is a soaring modern landmark in a burgeoning metropolis. The 591 ft (180 m) tall high-rise is the tallest structure in the city, with 42 stories housing 22 government agencies.

It's a centerpiece in the community. However, designers didn't want the massiveness of the structure to overwhelm the downtown, says Alejandro Fastag, CEO of Pretecsa, the precast concrete producer for the project. To lessen its bulk, the project team visually slimmed it down by combining vertical straight lines with a curved design.

"Despite its volume, the complicated geometry of the curved panels resulted in an artistic look, highlighting harmonic surfaces with precise lines in a visually homogeneous construction," Fastag says.

The tower required 2117 straight and curved precast concrete panels, ranging in sizes from 93 to 190 ft² (8.6 to 18 m²). The panels were cast in regular concrete and glass-fiber-reinforced concrete (GFRC) and feature white marble aggregates with a light acid-etch finish. The lower annex building includes another 815 precast concrete elements of different geometries.

A flexible form-casting system reduced the number of forms needed to make the panels. "The cutting-edge forms required a few turns of nuts and bolts ... but there was no need to rebuild new forms," Fastag says. "Precast concrete technology and its precision were the key to defining the unique shapes needed."

The use of precast concrete also accelerated installation and allowed for quick enclosure of the structure, which permitted inside work to be completed sooner and acted as a buffer against vandalism and environmental concerns.

"Construction involved challenging architecture and precise execution," he says. "The architectural precast facade proved to be the ideal solution to meet both requirements."

When designing the addition for the First United Methodist Church in Orlando, Fla., the architect chose a precast concrete design to mimic the color, style, and texture of the existing structure with a modern, cost-effective, and sustainable solution.

"This was an urban project in downtown Orlando, and the owner of the church wanted a building that would last 100 years," says Tim Black, architect with CDH Partners in Marietta, Ga.

A precast concrete design was also less expensive than other design options, while still providing the long life and ease of maintenance that the owners were looking for, he says. "That was the main driver for using precast concrete."

To be sure the project went off without a hitch, they initially built a three-dimensional model of the church, which they shared with the precast concrete producer, engineers, and contractor to identify any challenges that could occur during construction.

"The 3-D modeling gave us a tremendous advantage," says David Baker, plant manager for Gate Precast in Kissimmee, Fla. "We were able to identify issues from an engineering and a production standpoint that helped us avoid delays and speed construction."

Choosing precast concrete also allowed the erection team to address the tight footprint and active neighborhood during construction, and because the precast concrete plant was so close to the jobsite, just 20 mi. (32 km) away, they were able to ship the elements on an as-needed basis during nonpeak traffic hours. This further minimized disruption and eliminated the need for storage or extra trailers on-site, Baker says. "We were able to off-load pieces on an hourly basis, which meant the jobsite never filled up."

Best Religious Structure

First United Methodist Church

Orlando, Fla.

Photos:	Jacque Brund; Timothy J. Black, CDH Partners
Owner:	First United Methodist Church, Orlando, Fla.
Architect:	CDH Partners Inc., Marietta, Ga.
Precaster:	Gate Precast Co., Kissimmee, Fla.
Precast Concrete Specialty Engineer:	InfraStructure LLC, Omaha, Neb.
Engineer of Record:	LC Engineering of Architecture, Orlando, Fla.
Contractor:	Jack Jennings & Sons, Orlando, Fla.
Project Cost:	$20,697,000
Project Size:	121,500 ft^2 (11,300 m^2)

"Precast concrete brought durability, reduction in maintenance costs, and the ability to match the existing building material to this project. It demonstrates what a high-performance material precast concrete is."
David Baker

Best High-Tech or Laboratory Facility

Millennium Science Complex, Pennsylvania State University

University Park, Pa.

Photos:	High Concrete Group LLC
Owner:	Pennsylvania State University, University Park Campus, University Park, Pa.
Architect:	Rafael Viñoly Architects PC, New York, N.Y.
Precaster:	High Concrete Group, Denver, Pa.
Engineer of Record:	Thornton Tomasetti Inc., Newark, N.J.
Contractor:	Whiting-Turner Contracting Co., Baltimore, Md.
Total Cost:	$190 million
Project Size:	292,000 ft^2 (27,100 m^2)

The new science complex at Pennsylvania State University uses precast concrete to create a soaring, angular structure that draws attention both for its compelling design and its high-performance attributes.

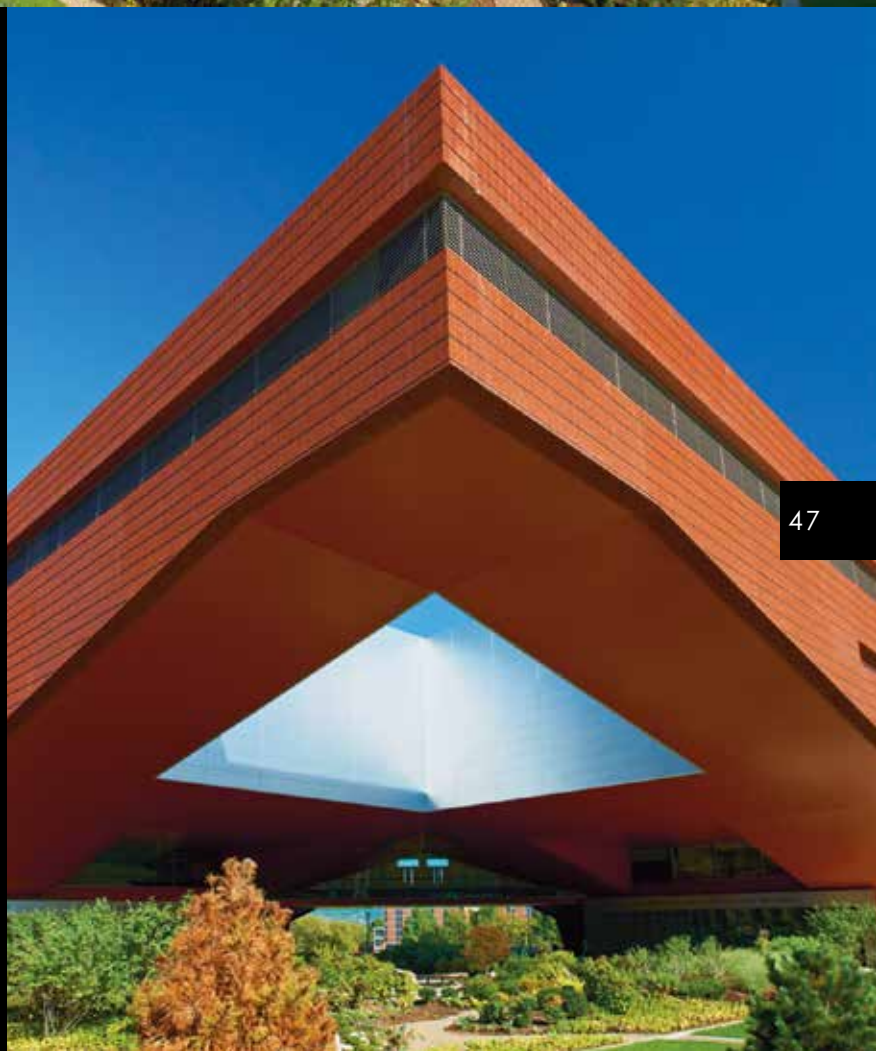
The 292,000 ft^2 (27,100 m^2) structure is one of the few research facilities in the country designed to integrate the physical and life sciences. In choosing precast concrete rather than traditional brick masonry, the designers were able to meet a tight budget and schedule with a sustainable material that mimics the brick architectural design used throughout the Penn State campus. The facade features embedded kiln-fired brick in precast concrete panels installed with thermal insulation already mounted to the rear of the panel.

"Precast concrete allowed us to recess brick courses and to control the dimensional tolerance for the stack-bond layout of the brick facade in a way that would not have been possible had the brick wall been traditionally constructed," says David Rolland, AIA, JIA, project director for Rafael Viñoly Architects in New York.

Precast concrete also enabled the team to construct the massive 150 ft (46 m) cantilever in a way that would deflect level when all of the dead-load weight was applied. "This could only have been achieved through the use of precast panels, which allowed for readjustment and releveling as the structure deflected into its final position," Rolland says.

Along with creating a compelling visual design, the precast concrete cantilever allows dampening of the building structure for lower-level laboratory spaces, including quiet labs, where sensitive equipment must be protected from vibration, noise, temperature, and humidity. "Everybody loves the extraordinary precast concrete cantilever," Rolland says, "but only a few truly appreciate that all of this was contemplated, designed, and engineered to improve the performance of the most vibration-sensitive, acoustic-sensitive, and thermally sensitive equipment in this research complex."

"The use of precast concrete allowed for a level of quality control and review that was essential to the overall success of the structure's facade."
David Rolland



"The appearance and performance of architectural precast concrete is a well-proven system with high standards of durability. When you add the cost savings during construction, it makes this particular panel a great choice."

Serge Jacques

Best Multifamily Housing

ETS Student Housing Phase IV

Montréal, QC, Canada

Schedule is always a top concern on construction projects, but it was particularly important for the team designing and constructing the ETS Student Housing for an engineering university in Montréal, QC, Canada. "The completion date in August 2012 had to be respected as the building was fully rented to students for the beginning of their school year," says Serge Jacques, principal architect for Régis Côté et Associés.

To meet the deadline, as well as cost and durability goals, the firm chose a precast concrete panel system. The composite precast concrete panels are 2 in. (50 mm) thick architectural concrete on a galvanized steel stud frame, which translates into thinner, lighter panels.

The lighter panels cut concrete costs while shortening installation time and reducing the need for additional on-site work trades, Jacques says. In spite of the large building footprint, the tower crane was able to lift any panel around the building perimeter and the lighter loads on the structure translated into overall savings. "It gave us a great advantage during erection."

To save additional time, guarantee quality, and enable cold-weather construction, the precast concrete producer, BPDL Béton Préfabriqué, suggested installing the windows and insulation in the heated plant so the panels would arrive ready to install at the jobsite. The facade features vertical windows around dining areas and horizontal windows that offer panoramic views in study areas and in some of the bedrooms. Three different tints, in gray, white, and black, mimic the color scheme of the existing buildings on the downtown campus.

"The design is sophisticated, but the concrete gives it a somewhat rugged look," Jacques says. "The precast gives the building some weight, and one can tell the building is resistant just by looking at it."

Photos:	Serge Jacques
Owner:	ÉTS École de Technologie Supérieure, Montréal, QC, Canada
Architect:	Régis Côté et Associés, Montréal, QC, Canada
Precaster:	BPDL Béton Préfabriqué, Alma, QC, Canada
Engineer of Record:	Pasquin St-Jean & Associés, Montréal, QC, Canada
Contractor:	Decarel, Westmount, QC, Canada
Project Cost:	$31.5 million
Project Size:	81,000 ft² (7500 m²)

Photos:	Ezequiel Farca
Owner and Architect:	Ezequiel Farca, Polanco, Mexico
Precaster and Precast Concrete Specialty Engineer:	Pretecsa, Atizapán de Zaragoza, Mexico
Contractor and Engineer of Record:	Grupo SYASA, Bosques de las Lomas, Mexico
Project Size:	10,925 ft^2 (1015 m^2)

Best Single-Family House

Casa Vallarta

Puerto Vallarta, Mexico

The Baja California coast is dotted with pretty little wood-framed beach houses that weather quickly in the salty air. Architect Ezequiel Farca wanted to mimic their delicate look when he designed the Casa Vallarta beach home in Puerto Vallarta, Mexico, but he wanted his structure to stand up to the harsh beach climate.

"One of the biggest challenges was to find a material that would resist environmental conditions and help us add a differentiating design element that would mimic aged gray wood," Farca says. "Precast concrete gave us the opportunity to find the exact compromise between the design and the maintenance requirements."

The result is a contemporary three-story home covered with durable architectural precast concrete elements that imitate natural wood and other nature-influenced finishes to achieve a refined look that melds gently into the exotic beachfront surroundings.

The project included more than 850 small precast concrete elements that were manufactured and installed over a two-month period in 2012. The pieces were placed in varying combinations on both the external facade and internal walls to create a variety of textures that alternate with other materials. Subtle variations in color were obtained by using diverse natural pigments in the concrete mixture and manually tinting each precast concrete element with acid-based stains in a range of tones.

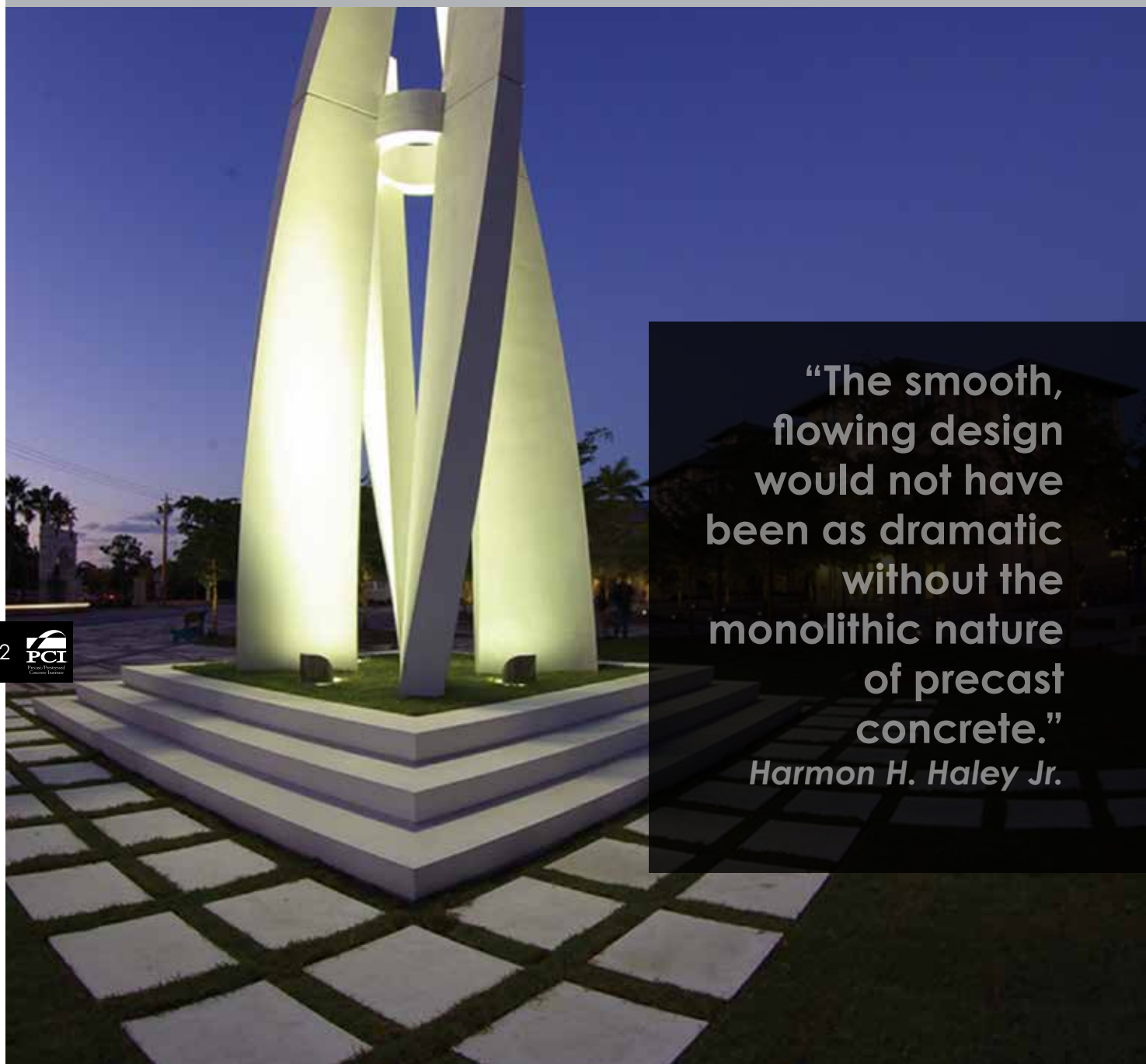
Because the elements were fabricated locally by Pretecsa, construction had minimal impact on the delicate beachfront ecology and allowed the project to be finished ahead of schedule.

"Precast's flexibility in terms of design was a strong advantage in this specific project," says Alejandro Fastag, CEO of Pretecsa. "It allowed us to create an open space in the very humid environment of Vallarta and add warmth to the whole project without compromising on the easy maintenance."

“Using precast concrete for design purposes in a smaller-scale project had been a very interesting process. It shows that precast concrete elements can deliver a whole design concept.”

Ezequiel Farca

Photos:	Renker Eich Parks Architects
Owner:	New College of Florida, Sarasota, Fla.
Architect:	Renker Eich Parks Architects, Saint Petersburg, Fla.
Precaster:	Stabil Precast, Saint Petersburg, Fla.
Precast Concrete Specialty Engineer:	American Constructioneers LLC, Tampa, Fla.
Structural Engineer:	Miller Structural Engineering Inc., Tampa, Fla.
Electrical Engineering/Lighting Design:	Engineering Matrix Inc., Clearwater, Fla.
Bell Consultant:	Christoph Paccard Bell Foundry
Contractor:	Willis A. Smith Construction Inc., Sarasota, Fla.
Project Cost:	$390,000



"The smooth, flowing design would not have been as dramatic without the monolithic nature of precast concrete."
Harmon H. Haley Jr.

Best Custom Solution

Robert and Beverly Koski Bell Tower and Academic Plaza

Sarasota, Fla.

When philanthropist Beverly Koski agreed to fund the bell tower at New College of Florida, she wanted something original that would reflect the educational opportunities taking place in its shadow.

After much back and forth, the architects chose precast concrete to create an innovative design that reimagined what a bell tower could look like.

"The precast design allowed a structure with a forceful spiraling monolithic ascending flow," says Harmon H. Haley Jr., AIA, LEED AP BD+C, and architect at Renker Eich Parks Architects in Saint Petersburg, Fla.

The entire tower is a cool white to represent the light of knowledge. The base features a series of steps reflecting how knowledge builds upon itself. At the top of the steps emerge four columns twisting from the cardinal points of a compass, holding the bell at its center. These reflect the germination of a seed growing toward the sun.

The design accommodated Koski's unique vision, but it wasn't easy to create, Haley says. "The shape, the finish, and cost were some of the greatest challenges to overcome."

Del Hight of STABIL Precast in Saint Petersburg helped him meet those challenges. "Making forms to accommodate the various converging angles while tying in the numerous sleeve connections with electrical feeds for lighting and bell controls was challenging," he says, "but it was all a perfect fit in the field."

Precast concrete also enabled the team to create the spiraling design while cutting the cost of the project dramatically. "Ironically, the first design, which would have been a traditional bell tower, cost twice as much as this final design made from architectural precast concrete," Haley says.

Its durability, however, is what makes this high-performance precast concrete design stand out. "Using white cement and aggregates along with totally enclosed connections ensured a resilient maintenance-free monument for the school."

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Opening Keynote
Monday, November 4

Boxing Legend, Sugar Ray Leonard
Closing Keynote
Wednesday, November 6

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- Oldcastle
- Precast/Prestressed Concrete Institute
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Early in the design of a project, Gate Precast contributes as a design-assist partner offering design and detailing innovations including the creation of a BIM model, development of the specialized mixes and finishes, and scheduling enhancements.

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Gate Precast was hired to facilitate the implementation of precast wall systems on The Perot Museum of Nature and Science in Dallas, Tex., and FIU Science Classroom Complex BT-876 in Miami, Fla.—two iconic structures.

FIU Science Classroom Complex features precast sunshading elements. Photo: Miami in Focus.

FIU Science Classroom Complex BT-876, Miami, Fla.

This 136,000-square-foot lab/classroom complex on Florida International University's campus features varying precast concrete window openings with pre-glazed wall panel systems, a cost- and time-efficient method of enclosure.

Architect:
Perkins + Will

Contractor:
DPR Construction

Owner:
Florida International University

Awards:
2013 Sid Freedman Craftsmanship Award

Revit rendering.

Actual photo of precast window openings that tilt in multiple directions.

Innovative engineering:

Due to tilting and sloping of window boxes, careful attention to panel joint details was critical.

Prior to delivery, each precast panel was pre-glazed, caulked, inspected, and applied with waterproof coating on the back face.

Topping out enclosure with last window panel. Photo: DPR Construction.

Perot Museum of Nature and Science, Dallas, Tex.

The new 180,000-square-foot Perot Museum was designed to resemble a sedimentary geological formation. The precast concrete façade satisfies the intent to reflect the geology and stratification of the earth's surface, through the creation of undulating forms, which are rigorously systematic but seemingly random.

Knowing that the colors of natural strata vary, the architect selected a lightweight gray concrete mixture that would derive natural mottling in each panel. Gate Precast worked in a design-assist role to define the cast-as-grey precast concrete cladding which features both convex and concave horizontal striations.

The museum opened to the public on Dec 1, 2012, a month ahead of schedule and has won much recognition for its dynamic complex design.

Architect:
Morphosis Architects and
Good Fulton & Farrell Architects

Contractor:
Balfour Beatty

Owner:
Museum of Nature and Science

Awards:
2012 Sid Freedman Craftsmanship Award, 2012 PCI Design Awards - Best Government and Public Building, *ENR* Best 2012 Projects Winner

Precast panels were digitally modeled in the design assist process which allowed greater integration/coordination with other building materials. All photos: Gate Precast.

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Upcoming Webinars:

- **Artist's Palette: The Aesthetic Versatility of Precast Concrete**
  October 22 and 24
- **The New Sound of IEQ: Indoor Comfort and Acoustic Design**
  November 19 and 21

PCI eLearning Center

The PCI eLearning Center is the first education management system dedicated to the precast concrete structures industry. This free 24-hour online resource provides an opportunity for architects and engineers to earn continuing education credits on demand. Each course includes a webinar presentation recording, reference materials, and a quiz. Visit this new resource at www.pci.org/elearning.

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  Level I/II
  October 23–25, Chicago, Ill.
  November 4–6, 2013, Calgary, Alberta, Canada
  December 9–11, Nashville, Tenn.

  Level I–III
  November 4–9, 2013, Calgary, Alberta, Canada
  December 9–14, Nashville, Tenn.

  Level III
  October 22–25, Chicago, Ill.
  November 6–9, Calgary, Alberta, Canada
  December 11–14, Nashville, Tenn.

- **CFA/IES**
  December 9–11, Nashville, Tenn.
- **CCA**
  May 22, 2014, Nashville, Tenn.

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PCI-Certified Plants

(as of October, 2013)

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- Quality products help construction proceed smoothly, expediting project completion.

Guide Specification

To be sure that you are getting the full benefit of the PCI Plant Certification Program, use the following guide specification for your next project:

"***Manufacturer Qualification***: The precast concrete manufacturing plant shall be certified by the Precast/Prestressed Concrete Institute Plant Certification Program. Manufacturer shall be certified at time of bidding.

Certification shall be in the following product group(s) and category(ies): [Select appropriate groups and categories (AT or A1), (B1,2,3, or 4), (C1,2,3, or 4), (G)]."

Product Groups and Categories

The PCI Plant Certification Program is focused around four groups of products, designated A, B, C, and G. Products in Group A are audited to the standards in MNL–117. Products in Groups B and C are audited to the standards in MNL–116. Products in Group G are audited according to the standards in MNL–130. The standards referenced above are found in the following manuals:

- MNL–116 *Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products*
- MNL–117 *Manual for Quality Control for Plants and Production of Architectural Precast Concrete*
- MNL–130 *Manual for Quality Control for Plants and Production of Glass-Fiber-Reinforced Concrete Products*

Within Groups A, B, and C are categories that identify product types and the product capability of the individual plant. The categories reflect similarities in the ways in which the products are produced. In addition, categories in Groups A, B, and C are listed in ascending order. In other words, a plant certified to produce products in Category C4 is automatically certified for products in the preceding Categories C1, C2, and C3. A plant certified to produce products in Category B2 is automatically qualified for Category B1 but not Categories B3 or B4.

Please note for Group B, Category B1: Some precast concrete products such as highway median barriers, box culverts, and three-sided arches are not automatically included in routine plant audits. They may be included at the request of the precaster or if required by the project specifications.

GROUPS

GROUP A – *Architectural Products*

Category AT – Architectural Trim Units

Wet-cast, nonprestressed products with a high standard of finish quality and of relatively small size that can be installed with equipment of limited capacity such as sills, lintels, coping, cornices, quoins, medallions, bollards, benches, planters, and pavers.

Category A1 – Architectural Cladding and Load-Bearing Units

Precast or precast, prestressed concrete building elements such as exterior cladding, load-bearing and non-load-bearing wall panels, spandrels, beams, mullions, columns, column covers, and miscellaneous shapes. This category includes Category AT.

GROUP B – *Bridges*

Category B1 – Precast Concrete Bridge Products

Mild-steel-reinforced precast concrete elements that include some types of bridge beams or slabs, sheet piling, pile caps, retaining-wall elements, parapet walls, sound barriers, and box culverts.

Category B2 – Prestressed Miscellaneous Bridge Products

Any precast, prestressed element excluding super-structure beams. Includes piling, sheet piling, retaining-wall elements, stay-in-place bridge deck panels, and products in Category B1.

Category B3 – Prestressed Straight-Strand Bridge Members

Includes all superstructure elements such as box beams, I-beams, bulb-tees, stemmed members, solid slabs, full-depth bridge deck slabs, and products in Categories B1 and B2.

Category B4 – Prestressed Deflected-Strand Bridge Members

Includes all products covered in Categories B1, B2, and B3.

GROUP BA – *Bridge Products with an Architectural Finish*

These products are the same as those in the categories within Group B, but they are produced with an architectural finish. They will have a form, machine, or special finish. Certification for Group BA production supersedes Group B in the same category. For instance, a plant certified to produce products in Category B2A is also certified to produce products in Categories B1, B1A, and B2 (while it is not certified to produce any products in B3A or B4A).

GROUP C – *Commercial (Structural)*

Category C1 – Precast Concrete Products

Mild-steel-reinforced precast concrete elements including sheet piling, pile caps, piling, retaining-wall elements, floor and roof slabs, joists, stairs, seating members, columns, beams, walls, spandrels, etc.

Category C2 – Prestressed Hollow-Core and Repetitive Products

Standard shapes made in a repetitive process prestressed with straight strands. Included are hollow-core slabs, railroad ties, flat slabs, poles, wall panels, and products in Category C1.

Category C3 – Prestressed Straight-Strand Structural Members

Includes stemmed members, beams, columns, joists, seating members, and products in Categories C1 and C2.

Category C4 – Prestressed Deflected-Strand Structural Members

Includes stemmed members, beams, joists, and products in Categories C1, C2, and C3.

GROUP CA – *Commercial Products with an Architectural Finish*

These products are the same as those in the categories within Group C, but they are produced with an architectural finish. They will have a form, machine, or special finish. Certification for Group CA production supersedes Group C in the same category. For instance, a plant certified to produce products in Category C2A is also certified to produce products in C1, C1A, and C2 (while it is not certified to produce any products in Groups C3 or C4A).

Group G – *Glass-Fiber-Reinforced Concrete (GFRC)*

These products are reinforced with glass fibers that are randomly dispersed throughout the product and are made by spraying a cement/sand slurry onto molds. This produces thin-walled, lightweight cladding panels.

Visit www.pci.org for the most up-to-date listing of PCI-Certified plants.

ALABAMA

Gate Precast Company, Monroeville (251) 575-2803 ..... **A1, C4A**
Hanson Pipe and Precast Southeast, Pelham (205) 663-4681 ..... **B4, C4**

ARKANSAS

Coreslab Structures (ARK) Inc., Conway (501) 329-3763 ..... **C4A**
Rotondo Weirich, Hot Springs (215) 256-7940 ..... **C1**

ARIZONA

Coreslab Structures (ARIZ) Inc., Phoenix (602) 237-3875 ..... **A1, B4, C4A**
CXT Concrete Ties, Tucson (520) 644-5703 ..... **C2**
Royden Construction Company, Phoenix (602) 484-0028 ..... **B4**
TPAC, Phoenix (602) 262-1360 ..... **A1, B4, C4A**

CALIFORNIAA

Bethlehem Construction, Inc., Shafter (661) 391-9704 ..... **C3A**
Clark Pacific, Fontana (909) 823-1433 ..... **A1, C3A, G**
Clark Pacific, Irwindale (626) 962-8751 ..... **C4**
Clark Pacific, West Sacramento (916) 371-0305 ..... **A1, C3A**
Clark Pacific, Woodland (916) 371-0305 ..... **B3, C3A**
Con-Fab California Corporation, Lathrop (209) 249-4700 ..... **B4, C4**
Con-Fab California Corporation, Shafter (661) 630-7162 ..... **B4, C4**
Coreslab Structures (L.A.) Inc., Perris (951) 943-9119 ..... **A1, B4, C4A**
CTU Precast, Olivehurst (530) 749-6501 ..... **A1, C3A**
KIE-CON, Inc., Antioch (925) 754-9494 ..... **B4, C3**
Mid-State Precast, L.P., Corcoran (559) 992-8180 ..... **A1, C3A**
Oldcastle Precast Inc. (*), Stockton (209) 466-4212 ..... **C2**
Oldcastle Precast, Inc., Perris (951) 657-6093 ..... **B4, C2A**
StructureCast, Bakersfield (661) 833-4490 ..... **A1, B3, C3A**
Universal Precast Concrete, Inc., Redding (530) 243-6477 ..... **A1**
Walters & Wolf Precast, Fremont (510) 226-5162 ..... **A1, G**
Willis Construction Co., Inc., San Juan Bautista (831) 623-2900 ..... **A1, C1, G**

COLORADO

EnCon Colorado, Denver (303) 287-4312 ..... **B4, C2**
Plum Creek Structures, Littleton (303) 471-1569 ..... **B4, C3A**
Rocky Mountain Prestress LLC, Denver (303) 480-1111 ..... **A1, C3A**
Rocky Mountain Prestress LLC, Denver (303) 480-1111 ..... **B4, C4**
Rocla Concrete Tie, Inc., Pueblo (303) 296-3505 ..... **C2**
Stresscon Corporation, Colorado Springs (719) 390-5041 ..... **A1, B4A, C4A**

CONNECTICUT

Blakeslee Prestress Inc., Branford (203) 481-5306 ..... **A1, B4, C4A**
Coreslab Structures (CONN) Inc., Thomaston (860) 283-8281 ..... **A1, B1, C1**
Oldcastle Precast, Inc./dba Rotondo Precast, Avon (860) 673-3291 **B2, C1A**
United Concrete Products Inc., Yalesville (203) 269-3119 ..... **B3, C2**

DELAWARE

Concrete Building Systems of Delaware, Inc., Delmar (302) 846-3645 **B3, C4**
Rocla Concrete Tie, Inc., Bear (302) 836-5304 ..... **C2**

FLORIDA

Cement Industries, Inc., Fort Myers (239) 332-1440 ..... **B3, C3**
Colonial Construction, Concrete, Precast, LLC, Placida (941) 698-4180 ..... **C2**
Coreslab Structures (MIAMI) Inc., Medley (305) 823-8950 ..... **A1, C4A**
Coreslab Structures (ORLANDO) Inc., Orlando (407) 855-3191 ..... **C2**
Coreslab Structures (TAMPA) Inc., Tampa (813) 626-1141 ..... **A1, B3, C3A**
Dura-Stress, Inc., Leesburg (800) 342-9239 ..... **A1, B4A, C4A**
Finfrock Industries, Inc., Orlando (407) 293-4000 ..... **A1, C3**
Florida Precast Industries, Inc., Sebring (863) 655-1515 ..... **C2**
Gate Precast Company, Jacksonville (904) 757-0860 ..... **A1, B4, C3A**
Gate Precast Company, Kissimmee (407) 847-5285 ..... **A1, C3**
Metromont Corporation, Bartow (863) 440-5400 ..... **A1, C3A**
Pre-Cast Specialties Inc. (*), Pompano Beach (800) 749-4041 ..... **C4**
Royal Concrete Concepts, LLC, Okeechobee (561) 689-5395 ..... **C1**
Stabil Concrete Products, LLC, St. Petersburg (727) 321-6000 ..... **A1**
Standard Concrete Products, Inc., Tampa (813) 831-9520 ..... **B4, C3**
Structural Prestressed Industries, Medley (305) 556-6699 ..... **C4**

GEORGIA

Atlanta Structural Concrete Co., Buchanan (770) 646-1888 ..... **C4A**
Colonial Construction, Concrete, Precast, LLC, Elberton (941) 698-4180 ..... **C2**
Coreslab Structures (ATLANTA) Inc., Jonesboro (770) 471-1150 ..... **C2**
Metromont Corporation, Hiram (770) 943-8688 ..... **A1, C4A**
Standard Concrete Products, Inc., Atlanta (404) 792-1600 ..... **B4**
Standard Concrete Products, Inc., Savannah (912) 233-8263 ..... **B4, C4**
Tindall Corporation, Conley (800) 849-6383 ..... **C4A**
Tindall Corporation, Conley (800) 849-6383 ..... **C2A**

HAWAII

GPRM Prestress, LLC, Kapolei (808) 682-6000 ..... **A1, B3, C4**

IDAHO

Hanson Structural Precast Eagle, Caldwell (208) 454-8116 ..... **A1, B4, C4**
Teton Prestress Concrete, LLC., Idaho Falls (208) 523-6410 ..... **B4, C3**

ILLINOIS

ATMI Precast, Aurora (630) 896-4679 ..... **A1, C3A**
AVAN Precast Concrete Products, Lynwood (708) 757-6200 ..... **A1, C3**
County Materials Corporation, Champaign (217) 352-4181 ..... **B3, B3-IL**
County Materials Corporation, Salem (618) 548-1190 ..... **A1, B4, B4-IL, C4**
Dukane Precast, Inc., Aurora (630) 355-8118 ..... **A1, B3, B3-IL, C3**
Illini Concrete Company of Illinois, LLC, Tremont (309) 925-5290 .. **B3, B3-IL**
Illini Precast, LLC, Marseilles (708) 562-7700 ..... **B4, B4-IL, C3**
Lombard Architectural Precast Products Co., Alsip (708) 389-1060 ..... **A1**
Mid-States Concrete Industries, South Beloit (608) 364-1072 .... **A1, B3, B3-IL, C3A**
Prestress Engineering Corporation,
Blackstone (815) 586-4239 ..... **B4, B4-IL, C4**
St. Louis Prestress, Inc., Glen Carbon (618) 656-8934 ..... **B3, B3-IL, C3**
Utility Concrete Products, LLC, Morris (815) 416-1000 ..... **B1A, C1A**

INDIANA

ATMI Indy, LLC, Greenfield (317) 891-6280 ..... **A1, C2A**
Coreslab Structures (INDIANAPOLIS) Inc.,
Indianapolis (317) 353-2118 ..... **A1, C4A**
Hoosier Precast LLC, Salem (812) 883-4665 ..... **B3, C1A**
Precast, LLC dba Precast Specialties, Monroeville (260) 623-6131 ..... **A1, B1**
StresCore, Inc., South Bend (574) 233-1117 ..... **C2**

IOWA

Advanced Precast Co., Farley (563) 744-3909 ..... **A1, C1A**
Cretex Concrete Products Midwest, Inc.,
Iowa Falls (515) 243-5118 ..... **A1, B4, B4-IL, C4A**
MPC Enterprises, Inc., Mount Pleasant (319) 986-2226 ..... **A1, C3A**
PDM Precast, Inc., Des Moines (515) 243-5118 ..... **B3, C4**

KANSAS

Coreslab Structures (KANSAS) Inc., Kansas City (913) 287-5725 ..... **B4, C4**
Prestressed Concrete, Inc., Newton (316) 283-2277 ..... **A1, B4, C4**
Stress-Cast, Inc., Assaria (785) 667-3905 ..... **C3A**

KENTUCKY

Bristol Group, Inc., Lexington (859) 233-9050 ..... **A1, B3A, C3A**
de AM - RON Building Systems LLC, Owensboro (270) 684-6226 ..... **B3, C3A**
Gate Precast Company, Winchester (859) 744-9481 ..... **A1, C2A**
Prestress Services Industries LLC, Lexington (859) 299-0461 ..... **A1, B4, C4A**
Prestress Services Industries LLC, Lexington (260) 724-7117 **B4, B4-IL, C4A**
Prestress Services Industries LLC, Melbourne (859) 441-0068 ..... **B4, C3**

LOUISIANA

Atlantic Metrocast, Inc., New Orleans (504) 941-3152 ..... **C2**
Boykin Brothers, Inc./Louisiana Concrete Products,
Baton Rouge (225) 753-8722 ..... **A1, B4, C3A**
F-S Prestress, LLC, Princeton (318) 949-2444 ..... **B4, C3**
Fibrebond Corporation, Minden (318) 377-1030 ..... **A1, C1A**

MARYLAND

Larry E. Knight, Inc., Glyndon (410) 833-7800 ..... **C2**
Oldcastle Precast Building Systems Div., Edgewood (410) 612-1213 **A1, C3A**

MAINE

Oldcastle Precast, Auburn (207) 784-9144 ..... **B2, C1**

MASSACHUSETTS

Oldcastle Precast, Inc./dba Rotondo Precast, Rehoboth (508) 336-7600. **B4, C3**
Precast Specialities Corp., Abington (718) 878-7220 ..... **A1**
Unistress Corporation, Pittsfield (413) 499-1441 ..... **A1, B4, C4A**
Vynorius Prestress, Inc., Salisbury (978) 462-7765 ..... **B3, C2**

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MICHIGAN

International Precast Solution, LLC, River Rouge (313) 843-0073 ..... **A1, B3, C3**
Kerkstra Precast Inc., Grandville (800) 434-5830 ..... **A1, B3, C3A**
M.E.G.A. Precast, Inc., Roseville (586) 294-6430 ..... **A1, C3A**
M.E.G.A. Precast, Inc., Shelby Township (586) 294-6430 ..... **C3**
Nucon Schokbeton / Stress-Con Industries, Inc.,
Kalamazoo (269) 381-1550 ..... **A1, B4, C3A**
Peninsula Prestress Company, Grand Rapids (616) 437-9618 ..... **B4, C1**
Stress-Con Industries, Inc., Saginaw (989) 239-2447 ..... **B4, C3**

MINNESOTA

Crest Precast, Inc., La Crescent (507) 895-8083 ..... **B3A, C1A**
Cretex Concrete Products Midwest, Inc.,
Maple Grove (Elk River) (763) 545-7473 ..... **B4, C2**
Fabcon Precast, LLC, Savage (800) 727-4444 ..... **A1, B1, C3A**
Hanson Structural Precast Midwest, Inc., Maple Grove (763) 425-5555 ..... **A1, C4A**
Molin Concrete Products Co., Lino Lakes (651) 786-7722 ..... **C3A**
Wells Concrete, Albany (320) 845-2299 ..... **A1, C3A**
Wells Concrete, Wells (507) 553-3138 ..... **A1, C4A**

MISSISSIPPI

F-S Prestress, LLC, Hattiesburg (601) 268-2006 ..... **B4, C4**
Gulf Coast Pre-Stress, Inc., Pass Christian (228) 452-9486 ..... **B4, C4**
J.J. Ferguson Prestress-Precast Company, Inc., Greenwood (662) 453-5451 ..... **B4**
Jackson Precast, Inc., Jackson (601) 321-8787 ..... **A1, C2A**
Tindall Corporation, Moss Point (228) 435-0160 ..... **A1, C4A**

MISSOURI

Coreslab Structures (MISSOURI) Inc., Marshall (660) 886-3306 ..... **A1, B4, C4A**
County Materials Corporation, Bonne Terre (573) 358-2773 ..... **B4**
Mid America Precast, Inc., Fulton (573) 642-6400 ..... **A1, B1, C1**
Prestressed Casting Co., Ozark (417) 581-7009 ..... **C4**
Prestressed Casting Co., Springfield (417) 869-1263 ..... **A1, C3A**

MONTANA

Missoula Concrete Construction, Missoula (406) 549-9682 ..... **A1, B3, C3A**
Montana Prestressed Concrete, Billings (605) 718-4111 ..... **B4, C3**
Montana Prestressed Concrete - MT City Plant,
Montana City (406) 442-6503 ..... **B4**

NEBRASKA

American Concrete Products Co., Omaha (402) 331-5775 ..... **B1**
Concrete Industries, Inc., Lincoln (402) 434-1800 ..... **B4, C4A**
Coreslab Structures (OMAHA) Inc., LaPlatte (402) 291-0733 ..... **A1, B4, C4A**
Enterprise Precast Concrete, Inc., Omaha (402) 895-3848 ..... **A1, C2A**
Stonco, Inc., Omaha (402) 556-5544 ..... **A1**

NEW HAMPSHIRE

Newstress Inc., Epsom (603) 736-9348 ..... **B3, C3**

NEW JERSEY

Boccella Precast LLC, Berlin (856) 767-3861 ..... **C2**
Jersey Precast, Hamilton Township (609) 689-3700 ..... **B4, C4**
Northeast Precast*, Millville (856) 765-9088 ..... **A1, B2, C3A**
Precast Systems, Inc., Allentown (609) 208-1987 ..... **B4, C4**

NEW MEXICO

Castillo Prestress, Belen (505) 864-0238 ..... **B4, C4**
Coreslab Structures (ALBUQUERQUE) Inc.,
Albuquerque (505) 247-3725 ..... **A1, B4, C4A**
Ferreri Concrete Structures, Inc., Albuquerque (505) 344-8823 ..... **A1, C4A**

NEW YORK

David Kucera Inc., Gardiner (845) 255-1044 ..... **A1, G**
Lakelands Concrete Products, Inc., Lima (585) 624-1990 ..... **A1, B3A, C3A**
Oldcastle Precast Building Systems Div., Selkirk (518) 767-2116 ..... **B3, C3A**
The Fort Miller Co., Inc., Greenwich (518) 695-5000 ..... **B3, C1**
The L.C. Whitford Materials Co., Inc., Wellsville (585) 593-2741 ..... **B4, C3**

NORTH CAROLINA

Gate Precast Company, Oxford (919) 603-1633 ..... **A1, C2**
International Precast Inc., Siler City (919) 742-3132 ..... **A1, C3A**
Metromont Corporation, Charlotte (704) 372-1080 ..... **A1, C3A**
Prestress of the Carolinas, Charlotte (704) 587-4273 ..... **B4, C4**
Utility Precast, Inc., Concord (704) 721-0106 ..... **B3A**

NORTH DAKOTA

Wells Concrete, Grand Forks (701) 772-6687 ..... **C4A**

OHIO

DBS Prestress of Ohio, Huber Heights (937) 878-8232 ..... **C3**
Fabcon Precast, LLC, Grove City (614) 875-8601 ..... **A1, C3A**
High Concrete Group LLC, Springboro (937) 748-2412 ..... **A1, C3A**
KSA, Sciotoville (740) 776-3238 ..... **C2**
Mack Industries, Inc., Valley City (330) 483-3111 ..... **C3**
Prestress Services Industries of Ohio, LLC, Mt. Vernon (740) 393-1121 ..... **B3, C1**
Prestress Services Industries of Ohio, LLC, Mt. Vernon (800) 366-8740 ..... **B4, C3**
Sidley Precast, Thompson (440) 298-3232 ..... **A1, C4A**

OKLAHOMA

Coreslab Structures (OKLA) Inc. (Plant No.1),
Oklahoma City (405) 632-4944 ..... **A1, C4A**
Coreslab Structures (OKLA) Inc. (Plant No.2),
Oklahoma City (405) 672-2325 ..... **B4, C1**
Coreslab Structures (TULSA) Inc., Tulsa (918) 438-0230 ..... **B4, C4**

OREGON

Knife River Corporation, Harrisburg (541) 995-6327 ..... **A1, B4, C4**
R.B. Johnson Co., McMinnville (503) 472-2430 ..... **B4, C3**

PENNSYLVANIA

Brayman Precast, LLC, Saxonburg (724) 352-5600 ..... **C1**
Concrete Safety Systems, LLC, Bethel (717) 933-4107 ..... **B1A, C1A**
Conewago Precast Building Systems, Hanover (717) 632-7722 ..... **A1, C2A**
Dutchland, Inc., Gap (717) 442-8282 ..... **C3**
Fabcon Precast, LLC, Mahanoy City (570) 773-2480 ..... **A1, B1A, C3A**
High Concrete Group LLC, Denver (717) 336-9300 ..... **A1, B3, C3A**
J & R Slaw, Inc., Lehighton (610) 852-2020 ..... **A1, B4, C3**
Newcrete Products, Roaring Spring (814) 224-2121 ..... **A1, B4, C4**
Nitterhouse Concrete Products, Inc., Chambersburg (717) 267-4505 ..... **A1, C4A**
Northeast Prestressed Products, LLC, Cressona (570) 385-2352 ..... **B4, C3**
Say-Core, Inc., Portage (814) 736-8018 ..... **C2**
Sidley Precast, Youngwood (724) 755-0205 ..... **C3**
Universal Concrete Products Corporation, Stowe (610) 323-0700 ..... **A1, C3A,**
US Concrete Precast Group Mid-Atlantic, Middleburg (570) 837-1774 ..... **A1, C3A**

SOUTH CAROLINA

Florence Concrete Products, Inc., Sumter (803) 775-4372 ..... **B4, C3A**
Metromont Corporation, Greenville (864) 295-0295 ..... **A1, C4A**
Tekna Corporation, Charleston (843) 853-9118 ..... **B4, C3**
Tindall Corporation, Fairforest (864) 576-3230 ..... **A1, C4A**

SOUTH DAKOTA

Gage Brothers Concrete Products Inc., Sioux Falls (605) 336-1180 ..... **A1, B4, C4A**

TENNESSEE

Construction Products, Inc. of Tennessee, Jackson (731) 668-7305 ..... **B4, C4**
Gate Precast Company, Ashland City (615) 792-4871 ..... **A1, C3A**
Mid South Prestress, LLC, Pleasant View (615) 746-6606 ..... **C3**
Prestress Services Industries of TN, LLC, Memphis (901) 775-9880 ..... **B4, C3**
Ross Prestressed Concrete, Inc., Bristol (423) 323-1777 ..... **B4, C3**
Ross Prestressed Concrete, Inc., Knoxville (865) 524-1485 ..... **B4, C4**
Sequatchie Concrete Service, Inc., Chattanooga (423) 867-4510 ..... **C2**

TEXAS

Coreslab Structures (TEXAS) Inc., Cedar Park (512) 250-0755 ..... **A1, C4A**
CXT, Inc., Hillsboro (254) 580-9100 ..... **B1, C1A**
Eagle Precast Corporation, Decatur (940) 626-8020 ..... **A1, C3**
East Texas Precast Co., LTD., Hempstead (936) 857-5077 ..... **C4A**
Enterprise Concrete Products, LLC, Dallas (214) 631-7006 ..... **B3, C3**
Enterprise Precast Concrete of Texas, LLC, Corsicana (903) 875-1077 ..... **A1, C1**
Gate Precast Company, Hillsboro (254) 582-7200 ..... **A1**
Gate Precast Company, Pearland (281) 485-3273 ..... **C2**
GFRC Cladding Systems, LLC, Garland (972) 494-9000 ..... **G**
Heldenfels Enterprises, Inc., Corpus Christi (361) 883-9334 ..... **B4, C4**
Heldenfels Enterprises, Inc., San Marcos (512) 396-2376 ..... **B4, C4**
Lowe Precast, Inc., Waco (254) 776-9690 ..... **A1, C3A**
Manco Structures, Ltd., Schertz (210) 690-1705 ..... **C4A**
NAPCO PRECAST, LLC, San Antonio (210) 509-9100 ..... **A1, C3A**
Rocla Concrete Tie, Inc., Amarillo (806) 383-7071 ..... **C2**
Tindall Corporation, San Antonio (210) 248-2345 ..... **A1, C3A**

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UTAH

Hanson Structural Precast Eagle, Salt Lake City (801) 966-1060 ..... **A1, B4, C4A,G**
Harper Contracting, Salt Lake City (801) 326-1016 ..... **B2, C1**
Owell Precast LLC, Bluffdale (801) 571-5041 ..... **A1, B3A, C3A**

VERMONT

Dailey Precast, Shaftsbury (802) 442-4418 ..... **A1, B4A, C3A**
J. P. Carrara & Sons, Inc., Middlebury (802) 388-6363 ..... **A1, B4A, C3A**
S.D. Ireland Companies, South Burlington (802) 658-0201 ..... **A1**

VIRGINIA

Atlantic Metrocast, Inc., Portsmouth (757) 397-2317 ..... **B4, C4**
Bayshore Concrete Products Corporation, Cape Charles (757) 331-2300 ..... **B4, C4**
Bayshore Concrete Products/Chesapeake, Inc., Chesapeake (757) 549-1630 ..... **B4, C3**
Coastal Precast Systems, LLC, Chesapeake (757) 545-5215 ..... **A1, B4, C3**
Metromont Corporation, Richmond (804) 222-8111 ..... **A1, C3A**
Rockingham Precast, Inc., Harrisonburg (540) 433--8282 ..... **B4**
The Shockey Precast Group, Winchester (540) 667-7700 ..... **A1, C4A**
Tindall Corporation, Petersburg (804) 861-8447 ..... **A1, C4A**

WASHINGTON

Bellingham Marine Industries, Inc., Ferndale (360) 676-2800 ..... **B3, C2**
Bethlehem Construction, Inc., Cashmere (509) 782-1001 ..... **B1, C3A**
Central Pre-Mix Prestress Co., Spokane (509) 533-0267 ..... **A1, B4, C4**
Concrete Technology Corporation, Tacoma (253) 383-3545 ..... **B4, C4**
CXT, Inc., Spokane (509) 921-7878 ..... **C2**
CXT, Inc., Spokane (509) 921-8716 ..... **B1**
EnCon Northwest, LLC, Camas (360) 834-3459 ..... **B1**
EnCon Washington, LLC, Puyallup (253) 846-2774 ..... **B1, C2**
Wilbert Precast, Inc., Yakima (509) 248-1984 ..... **B3, C3**

WEST VIRGINIA

Carr Concrete Corporation, Waverly (304) 464-4441 ..... **B4, C3**
Eastern Vault Company, Inc., Princeton (304) 425-8955 ..... **B3, C3**

WISCONSIN

County Materials Corporation, Eau Claire (800) 729-7701 ..... **B4**
County Materials Corporation, Janesville (608) 373-0950 ..... **B4**
County Materials Corporation, Roberts (800) 426-1126 ..... **B4, C3**
International Concrete Products, Inc., Germantown (262) 242-7840 ..... **A1, C1**
KW Precast, LLC, Burlington (262) 767-8700 ..... **B4, B4-IL, C4**
MidCon Products, Inc., Hortonville (920) 779-4032 ..... **A1, C1**
Spancrete, Inc., Valders (920) 775-4121 ..... **B4, C3**
Stonecast Products, Inc., Germantown (262) 253-6600 ..... **A1, C1**
Wausau Tile Inc., Rothschild (715) 359-3121 ..... **AT**

WYOMING

voestalpine Nortrak, Inc., Cheyenne (509) 220-6837 ..... **C2**

MEXICO

PRETECSA, S.A. DE C.V., Atizapan De Zaragoza 52-555-0770071 ..... **A1, G**
Willis De Mexico S.A. de C.V., Tecate 52-665-6552222 ..... **A1, C1, G**

CANADA

ALBERTA

Armtec Limited Partnership, Richmond (604) 278-9766 ..... **A1, B4, C3**

NEW BRUNSWICK

Strescon Limited, Saint John (506) 633-8877 ..... **A1, B4, C4A**

NOVA SCOTIA

Strescon Limited, Beford (902) 494-7400 ..... **A1, B4, C4**

ONTARIO

Artex Systems Inc., Concord (905) 669-1425 ..... **A1**
Global Precast INC, Maple (905) 832-4307 ..... **A1**
Prestressed Systems, Inc., Windsor (519) 737-1216 ..... **B4, C4**

QUEBEC

Betons Prefabriques du Lac Inc., Alma (418) 668-6161 ..... **A1, C3A, G**
Betons Prefabriques du Lac, Inc., Alma (418) 668-6161 ..... **A1, C2**
Betons Prefabriques Trans. Canada Inc., St. Eugene De Grantham (819) 396-2624 ..... **A1, B4, C3A**
Prefab De Beauce, Sainte-Marie De Beauce (418) 387-7152 ..... **A1, C3**

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PCI-Qualified & PCI-Certified Erectors

(as of October, 2013)

When it comes to quality, why take chances? When you need precast or precast, prestressed concrete products, choose a PCI-Qualified/Certified Erector. You'll get confirmed capability with a quality assurance program you can count on.

Whatever your needs, working with an erector who is PCI Qualified/Certified in the structure categories listed will benefit you and your project.

- You'll find easier identification of erectors prepared to fulfill special needs.
- You'll deal with established erectors.
- Using a PCI-Qualified/Certified Erector is the first step toward getting the job done right the first time, thus keeping labor costs down.
- PCI-Qualified/Certified Erectors help construction proceed smoothly, expediting project completion.

Guide Specification

To be sure that you are getting an erector from the PCI Field Certification Program, use the following guide specification for your next project:

"Erector Qualification: The precast concrete erector shall be fully qualified or certified by the Precast/Prestressed Concrete Institute (PCI) prior to the beginning of any work at the jobsite. The precast concrete erector shall be qualified or certified in Structure Category(ies): [Select appropriate groups and categories S1 or S2 and/or A1]."

Erector Classifications

The PCI Field Certification Program is focused around three erector classifications. The standards referenced are found in the following manuals:

MNL–127 *Erector's Manual - Standards and Guidelines for the Erection of Precast Concrete Products*

MNL–132 *Erection Safety Manual for Precast and Prestressed Concrete*

GROUPS

Category S1 - Simple Structural Systems
This category includes horizontal decking members (e.g., hollow-core slabs on masonry walls), bridge beams placed on cast-in-place abutments or piers, and single-lift wall panels.

Category S2 - Complex Structural Systems
This category includes everything outlined in Category S1 as well as total-precast, multi-product structures (vertical and horizontal members combined) and single- or multistory load-bearing members (including those with architectural finishes).

Category A - Architectural Systems
This category includes non-load-bearing cladding and GFRC products, which may be attached to a supporting structure.

Certified erectors are listed in blue.

ARKANSAS

Coreslab Structures (ARK) Inc., Conway (501) 329-3763 ..... **S2**

ARIZONA

Coreslab Structures (ARIZ), Inc., Phoenix (602) 237-3875 ..... **S2, A**
TPAC, Phoenix (602) 262-1360 ..... **S2, A**

CALIFORNIA

Walters & Wolf Precast, Fremont (510) 226-9800 ..... **A**

COLORADO

Encon Field Services, LLC, Denver (303) 287-4312 ..... **S2, A**
Gibbons Erectors, Inc., Englewood (303) 841-0457 ..... **S2, A**

CONNECTICUT

Blakeslee Prestress, Inc., Branford (203) 481-5306 ..... **S2**
Jacob Erecting & Construction LLC, Durham (860) 788-2676 ..... **S2, A**
The Middlesex Corporation, West Hartford (860) 206-4404 ..... **S2**
The Smedley Company, Branford (203) 315-6066 ..... **A**

FLORIDA

All Florida Erectors and Welding, Inc., Apopka (407) 466-8556 ..... **S2**
Concrete Erectors, Inc., Altamonte Springs (407) 862-7100 ..... **S2, A**
Finfrock Industries, Inc., Orlando (407) 293-4000 ..... **S2, A**
Florida Builders Group, Inc., Miami (305) 278-0098 ..... **S2**
Gate Precast Erection Co., Kissimmee (407) 847-5285 ..... **A**
James Toffoli Construction Company, Inc., Fort Myers (239) 479-5100 . **S2, A**
Pre-Con Construction of Tampa Inc., Tampa (813) 626-2545 ..... **S2, A**
Prestressed Contractors Inc., Palm Beach Gardens (561) 741-4369 ..... **S1**
Specialty Concrete Services, Inc., Altoona (352) 669-8888 ..... **S2, A**
Structural Prestressed Industries, Inc., Medley (305) 556-6699 ..... **S2**
Summit Erectors, Inc., Jacksonville (904) 783-6002 ..... **S2, A**

GEORGIA

Big Red Erectors Inc., Covington (770) 385-2928 ..... **S2, A**
Rutledge & Son's, Woodstock (770) 592-0380 ..... **S2**

IOWA

Cedar Valley Steel, Inc., Cedar Rapids (319) 373-0291 ..... **S2, A**

IDAHO

Precision Precast Erectors, LLC, Worley (208) 660-5223 ..... **S2, A**

ILLINOIS

Area Erectors, Inc., Rockford (815) 562-4000 ..... **S2, A**
Mid-States Concrete Industries, South Beloit (800) 236-1072 ..... **S2**
Trinity Roofing Service Inc., Blue Island (708) 385-7830 ..... **S1**

KANSAS

Carl Harris Co., Inc., Wichita (316) 267-8700 ..... **S2, A**
Crossland Construction Company, Inc., Columbus (620) 429-1414 ..... **S2, A**
Ferco, Inc., Salina (785) 825-6380 ..... **S2**

MASSACHUSETTS

Prime Steel Erecting, Inc., North Billerica (978) 671-0111 ..... **S2, A**

MARYLAND

DLM Contractors, LLC, Upper Marlboro (301) 877-0000 ..... **S2, A**
E & B Erectors, Inc., Pasadena (410) 360-7800 ..... **S2, A**
E.E. Marr Erectors, Inc., Baltimore (410) 837-1641 ..... **S2, A**
L.R. Willson & Sons, Inc., Gambrills (410) 987-5414 ..... **S2, A**
Oldcastle Building Systems Div. / Project Services, Baltimore (518) 767-2116 ..... **S2, A**

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MAINE

Cianbro Corporation, Pittsfield (207) 679-2435 ..... **S2**

MICHIGAN

Assemblers Precast & Steel Services, Inc., Saline (734) 429-1358 ..... **S2, A**
Devon Contracting, Inc., Detroit (313) 221-1550 ..... **S2, A**
G2 Inc., Cedar Springs (616) 696-9581 ..... **S2, A**
Midwest Steel, Inc., Detroit (313) 873-2220 ..... **S2**
Pioneer Construction Inc., Grand Rapids (616) 247-6966 ..... **S2, A**

MINNESOTA

Amerect, Inc., Newport (651) 459-9909 ..... **A**
Landwehr Construction Inc., St. Cloud (320) 252-1494 ..... **S2**
Molin Concrete Products Company, Lino Lakes (651) 786-7722 ..... **S2, A**
Wells Concrete, Wells (507) 553-3138 ..... **S2, A**

MISSOURI

Acme Erectors, Inc., St. Louis (314) 647-1923 ..... **S2, A**
JE Dunn Construction Company, Kansas City (816) 474-8600 ..... **S2, A**
Prestressed Casting Co., Springfield (417) 869-7350 ..... **S2, A**

MISSISSIPPI

Bracken Construction Company, Inc., Jackson (601) 922-8413 ..... **S2, A**

NORTH CAROLINNA

Carolina Precast Erectors, Inc., Taylorsville (828) 635-1721 ..... **S2, A**

NORTH DAKOTA

Comstock Construction, Wahpeton (701) 642-3207 ..... **S2**
PKG Contracting, Inc., Fargo (701) 232-3878 ..... **S2**
Wells Concrete, Grand Forks (701) 772-6687 ..... **S2**

NEBRASKA

Structural Enterprises Incorporated, Lincoln (402) 423-3469 ..... **S2**

NEW HAMPSHIRE

American Steel & Precast Erectors, Inc., Greenfield (603) 547-6311 ..... **S2, A**

NEW JERSEY

CRV Precast Construction LLC, Eastampton (800) 352-1523 ..... **S2, A**
J. L. Erectors, Inc., Blackwood (856) 232-9400 ..... **S2, A**
JEMCO-Erectors, Inc., Shamong (609) 268-0332 ..... **S2, A**
Jonasz Precast, Inc., Westville (856) 456-7788 ..... **S2, A**

NEW MEXICO

Ferreri Concrete Structures, Inc., Albuquerque (505) 344-8823 ..... **S2**
Structural Services, Inc., Albuquerque (505) 345-0838 ..... **S2, A**

NEW YORK

Koehler Masonry, Farmingdale (631) 694-4720 ..... **S2**
Oldcastle Building Systems Div. / Project Services,
Selkirk (518) 767-2116 ..... **S2, A**
The L.C. Whitford Co., Inc., Wellsville (585) 593-2741 ..... **S2**
Yonkers Contracting Company, Inc., Yonkers (914) 636-2301 ..... **S1**

OHIO

Precast Services, Inc., Twinsburg (330) 425-2880 ..... **S2, A**
Sidley Precast Group, Thompson (440) 298-3232 ..... **S2**
Sofco Erectors, Inc., Cincinnati (513) 771-1600 ..... **S2, A**

OKLAHOMA

Allied Steel Construction Co., LLC, Oklahoma City (405) 232-7531 ..... **S2, A**
Bennett Steel, Inc., Sapulpa (918) 260-0773 ..... **S1**
Coreslab Structures (OKLA), Inc., Oklahoma City (405) 632-4944 ..... **S2, A**

PENNSYLVANIA

Century Steel Erectors, Kittanning (724) 545-3444 ..... **S2, A**
Conewago Enterprises, Inc., Hanover (717) 632-7722 ..... **S2**
High Structural Erectors, LLC, Lancaster (717) 390-4203 ..... **S2, A**
Kinsley Construction Inc., York (717) 757-8761 ..... **S1**
Maccabee Industrial, Inc., Belle Vernon (724) 930-7557 ..... **S2, A**
Nitterhouse Concrete Products, Inc., Chambersburg (717) 267-4505 ..... **S2, A**

SOUTH CAROLINA

Davis Erecting & Finishing, Inc., Greenville (864) 220-0490 ..... **S2, A**
Tindall Corporation, Fairforest (864) 576-3230 ..... **S2**

SOUTH DAKOTA

Fiegen Construction Co., Sioux Falls (605) 335-6000 ..... **S2, A**

TENNESSEE

Mid South Prestress, LLC, Pleasant View (615) 746-6606 ..... **S2**
River City Erectors, LLC, Rossville (901) 861-6174 ..... **A**

TEXAS

Derr and Isbell Construction, LLC, Euless (817) 571-4044 ..... **S2, A**
Empire Steel Erectors LP, Humble (281) 548-7377 ..... **A**
Precast Erectors, Inc., Hurst (817) 684-9080 ..... **S2, A**

UTAH

IMS Masonry, Lindon (801) 796-8420 ..... **A**
OutWest C & E Inc., Bluffdale (801) 446-5673 ..... **S2, A**

VIRGINIA

The Shockey Precast Group, Winchester (540) 665-3253 ..... **S2, A**

VERMONT

CCS Constructors Inc., Morrisville (802) 888-7701 ..... **S2**

WISCONSIN

Miron Construction Co. Inc., Neenah (920) 969-7000 ..... **S2, A**
Spancrete, Valders (920) 775-4121 ..... **S2, A**
The Boldt Company, Appleton (920) 225-6127 ..... **S2, A**

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For more information visit www.pci.org and click on the WOC icon or contact Megan Lanning at mlanning@pci.org..

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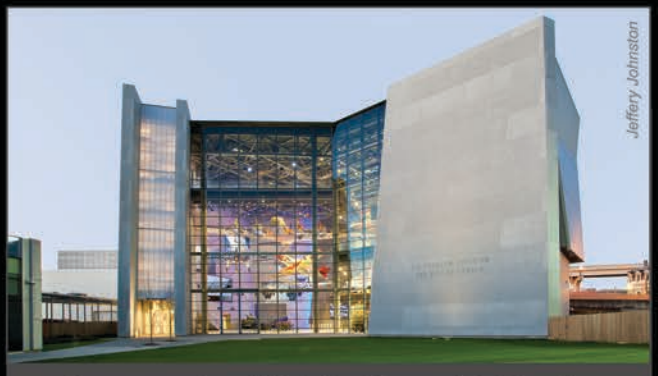

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