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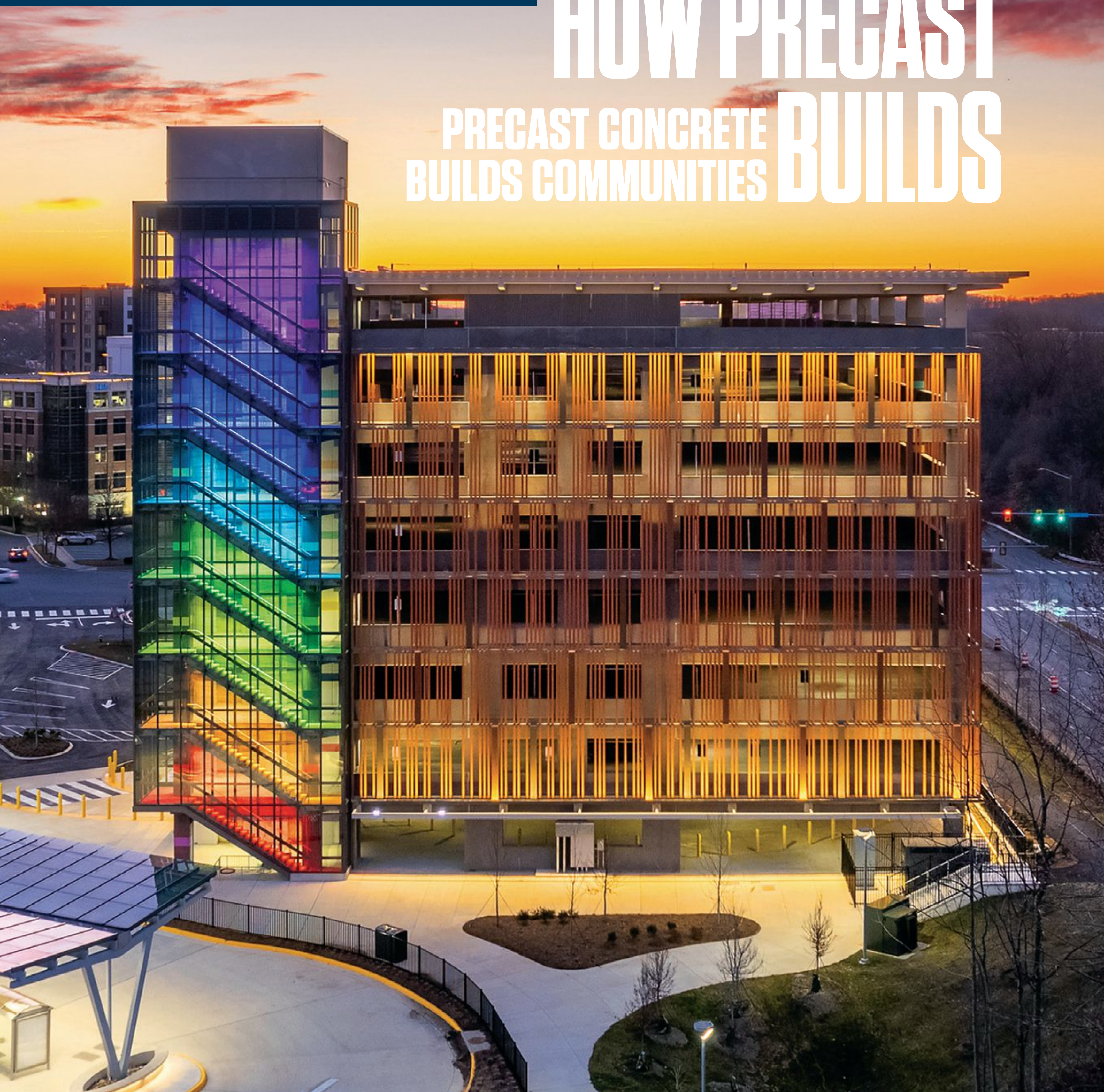
SUMMER 2025

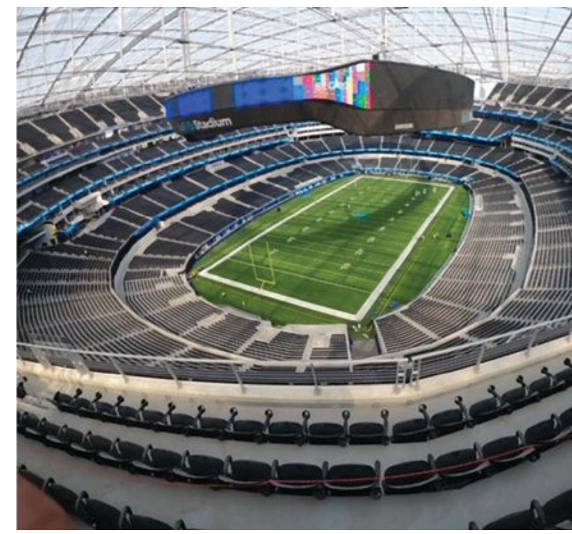


HOW PRECAST BUILDS

PRECAST CONCRETE BUILDS COMMUNITIES

LAPD Police Administration Building - Los Angeles, California

Beacon Hall - Valparaiso, Indiana



SoFi Stadium - Inglewood, California

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POSTMASTER: Send address changes to *Ascent*, 8770 W. Bryn Mawr Ave., Suite 1150, Chicago, IL 60631

Periodical postage paid at Chicago, IL and additional mailing offices.

Ascent (Vol. 35, No. 3, ISSN 10796983) is published quarterly by the Precast/Prestressed Concrete Institute, 8770 W. Bryn Mawr Ave., Suite 1150, Chicago, IL 60631

Email marketing@pci.org for questions and comments.

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On the cover: *Monument Drive Commuter Parking Garage and Transit Center,*
Photo: *Kate Wichlinski Photography Inc.*

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PhotoS: *Brian J. Rotert, Cipher Imaging.*

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RYAN PENLERICK
PROGRAM DIRECTOR, PROFESSOR OF PRACTICE, TEXAS STATE UNIVERSITY CONCRETE INDUSTRY MANAGEMENT

SHAPING PRECAST CONCRETE'S FUTURE THROUGH EDUCATION

The future of the precast concrete industry lies not only in technical innovation but in preparing a new generation of professionals who understand the business behind the product. The PCI Foundation's long-standing commitment to education continues to strengthen the industry's foundation, with one of its most compelling recent success stories emerging from the Concrete Industry Management (CIM) program at Texas State University.

In Fall 2024, Texas State launched a new junior-level course titled Precast/Prestressed Management, a first-of-its-kind class that focuses not on design theory, but on the business and operational realities of the precast concrete industry. Now required for all CIM majors, the course fills a gap in construction and concrete education by shifting the lens from purely structural engineering to the strategic, logistical, and management challenges unique to the precast, prestressed concrete sector.

While engineering students across the country study prestressed concrete design, and while PCI continues to be a leader in developing technical design resources, there are remarkably few educational opportunities focused on plant management, operational efficiency, and commercial strategy in the industry. That's where this course breaks new ground by offering students a holistic view of precast concrete from the perspective of the producer.

Curriculum Designed for Industry Readiness

With support from a generous curriculum development grant from the PCI Foundation, the course was thoughtfully developed by Texas State University faculty in collaboration with local industry leaders and PCI partners. The PCI Foundation's investment made it possible to build a robust and engaging curriculum that responds directly to the industry's evolving workforce needs.

The Precast/Prestressed Management course covers a wide array of management-oriented topics that are critical to day-to-day operations. These include:

- Plant operations and layout optimization
- Estimating, pricing strategy, and bid development
- Lifting, rigging, and hoisting safety practices
- Production scheduling and labor management
- Supply chain and inbound/outbound logistics
- Inventory management and material tracking
- Quality control procedures and product verification
- Sales and client relations in the precast concrete sector

By introducing these topics in an academic setting, students develop a comprehensive understanding of how precast concrete businesses operate, from raw material procurement to final product delivery. This prepares them to step confidently into roles in estimating, project management, operations, and beyond.

Learning by Doing: A Hands-On Experience

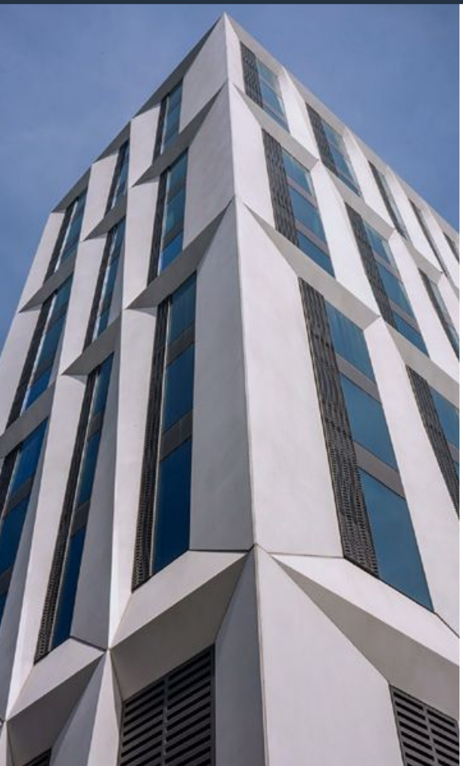
Perhaps the most distinctive aspect of the course is its hands-on lab and field component. Students visit local precast and prestressed concrete plants to see production in real time, speak directly with plant managers, and observe how decisions made in the office impact work on the floor and vice versa.

Back on campus, the learning continues through lab-based casting of a precast concrete component. Students work in teams to design mixture proportions, interpret drawings and specifications, build and prepare formwork, pour and finish their element, and conduct quality checks. The course culminates in a capstone-style project in which each team completes a mock pricing exercise and develops a professional sales proposal for their component, bridging the gap between technical production and business development.

This full-circle learning experience mirrors real-world challenges and exposes students to the interdisciplinary nature of the precast concrete industry. It brings together concrete technology, construction management, logistics, and entrepreneurship in a way that few courses currently do.

As the precast concrete industry navigates new challenges ranging from workforce shortages to supply chain disruptions and sustainability mandates, educational efforts like this one will be essential. By investing in hands-on, business-focused, and operations-driven instruction, Texas State University's CIM program and its partners in the industry are setting the stage for a stronger, more resilient future.

Ryan Penlerick, PhD, CPC, is a professor of practice and program director for the Concrete Industry Management program at Texas State University. Email ryan.penlerick@txstate.edu.



Photos: ICP2017.

PRECAST CONCRETE

DESIGN RESOURCES

PCI develops, maintains, and disseminates the Body of Knowledge for designing, fabricating, and constructing precast concrete structures and systems. It is from this Body of Knowledge that building codes, design guides, education, and certification programs are derived. Please visit pci.org/design for all of these design resources and more.

Architectural Precast Concrete Color and Texture Selection Guide, 2nd Edition (CTG-10)

The *Architectural Precast Concrete Color and Texture Selection Guide* has been updated with 12 new color and texture pages, plus identification pages with mixture designs. This edition includes nine new color pages with two new colors per page, two pages of new formliners, and one page of new clay brick-faced precast concrete. The numbers in the guide have not been changed, so that there is no confusion between the old and the new versions.

Architectural Precast Concrete, 3rd Edition (MNL 122)

This fully revised edition includes new sections on sustainability, condensation control, and blast resistance. You'll get extensive updates in the areas of color, texture, finishes, weather, tolerances, connections, and windows, along with detailed specifications to meet today's construction needs. Includes full-color photographs and a bonus DVD.

PCI Architectural Precast Concrete Certification Guidelines

Featuring clear descriptions of PCI's new certification categories for architectural concrete, this *Designer's Notebook* provides guidance for specifying the most appropriate PCI architectural certification categories for the production and field erection of various types of architectural precast concrete components.

Designer's Notebooks – Free

The PCI *Designer's Notebooks* provide detailed, in-depth information on precast concrete relevant to specific design topics such as acoustics, mold, and sustainability.

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PCI Continuing Education

PCI is a registered continuing education provider with the American Institute of Architects (AIA), and the National Council of Examiners of Engineers and Surveyors (NCEES). PCI also has registered programs with the International Code Council (ICC). PCI's educational offerings include a variety of programs to fit your schedule and preferred learning environment, such as webinars, seminars, lunch-and-learns, and online education. To learn more, visit **pci.org/Education**.

Learning Opportunities

> WEBINARS

PCI webinars are presented live each month by industry experts on a variety of topics from design and construction to sustainability and more. All webinars are FREE. Webinars provide an inexpensive way to stay up to date on new materials, products, concepts, and more while earning continuing education credits. Visit **pci.org/PCI/Education/Webinars** for the full schedule of upcoming webinars and registration information.

> 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 presentation recording and reference materials. Visit **oasis.pci.org**.

> SEMINARS AND WORKSHOPS

PCI and its regional affiliates offer seminars and workshops all over the United States on a variety of topics. Visit **pci.org/PCI/Education/Seminars_and_Workshops** for up-to-date seminar listings, additional information, and registration.

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> LUNCH-AND-LEARNS

PCI's lunch-and-learn/box-lunch programs are a convenient way for architects, engineers, and design professionals to receive continuing education credit without leaving the office. Industry experts visit your location; provide lunch; and present on topics such as sustainability, institutional construction, parking structures, aesthetics, blast resistance, the basics of precast concrete, and many more. Visit **pci.org/LearnAtLunch** for a list of lunch-and-learn offerings and to submit a program request.

ADVERTORIAL

DESIGN ASSIST

A MORE EFFECTIVE START TO EVERY PREFAB PROJECT

The foundation for a successful project begins long before construction. Early collaboration with prefabricated building solution providers can significantly improve the design process and overall project performance. When technical insight and aesthetic goals are aligned early, the result is a more efficient, streamlined path from concept to completion.

EARLY ENGAGEMENT MATTERS.

Wells' specialty design services translate the design vision into efficient, buildable solutions. This collaboration supports a wide range of project goals, from achieving a striking architectural façade to navigating complex structural requirements. Engaging the specialty design team at the right time helps identify opportunities, avoid rework, and improve constructability without sacrificing the original vision.

Early coordination determines the potential for using prefabrication, provides reliable cost and constructability feedback, and reduces the likelihood of scope gaps or late-stage changes and change orders. It can also eliminate redundant drafting efforts, helping to ensure that all partners are working from the same playbook.

Every project is different, and the level of design assistance needed varies. Some teams may benefit from high-level input during early planning, while others may require detailed, ongoing collaboration throughout design development. What matters is that the goal is the same: to help deliver a successful project by supporting your vision with the right expertise. Ultimately, a design-assist model is built on partnership. You remain in control of the design; your prefabrication partner simply brings value-added resources and technical expertise to help bring it to life—efficiently, effectively, and without compromise. ●

Intermountain Health Lutheran Medical Office Building, Wheat Ridge, CO. Wells provided design-assist services to convert the building envelope to a unitized façade system.

LET'S LAY THE GROUNDWORK FOR PROJECT SUCCESS—*TOGETHER*.
Learn more about Wells' specialty design services at wellsconcrete.com/DesignAssist/

PRECAST PROTECTS LIFE

PRECAST PLANT SEES PRECAST'S BENEFITS

There was nothing particularly special about October 2, 2024, in Hawley, Minn., a quiet town of 2200 people just 20 miles east of Fargo, N.D. It was a typically busy day at Taracon Precast 11 miles northeast of town when, just after 5:00 p.m., a spark got into a fuel depot, followed quickly by fire and an explosion. The blaze was extinguished after about four hours; five damaged precast concrete wall panels and double tees were quickly replaced a few days after the event. Precast concrete components prevented much more serious damage. "If the plant was a steel or wood structure, most of the building would have been destroyed," said Alan Cartwright, vice president of production. Except for some soot, the walls and roof a few feet away were completely undamaged.

"Total cost of the damage and cleanup was $7 million," said Cartwright. "It would have been significantly higher if the structure was not precast concrete. If the structure was steel or wood, we would have lost the entire building as well as everything inside, which would have been damaged beyond repair. The loss would have easily been four times what it was."

Various areas of the plant were out of commission for two to seven days, as electrical power had to be reconnected and debris cleared away. Nobody was injured. "Employees did a great job of notifying others and utilizing radios to inform each other while following the company's fire safety protocol," Cartwright said.

Precast concrete producers regularly extol the benefits of precast concrete, but Taracon Precast found out up close and personal exactly how beneficial precast concrete is when the unexpected happens on an ordinary day. ●

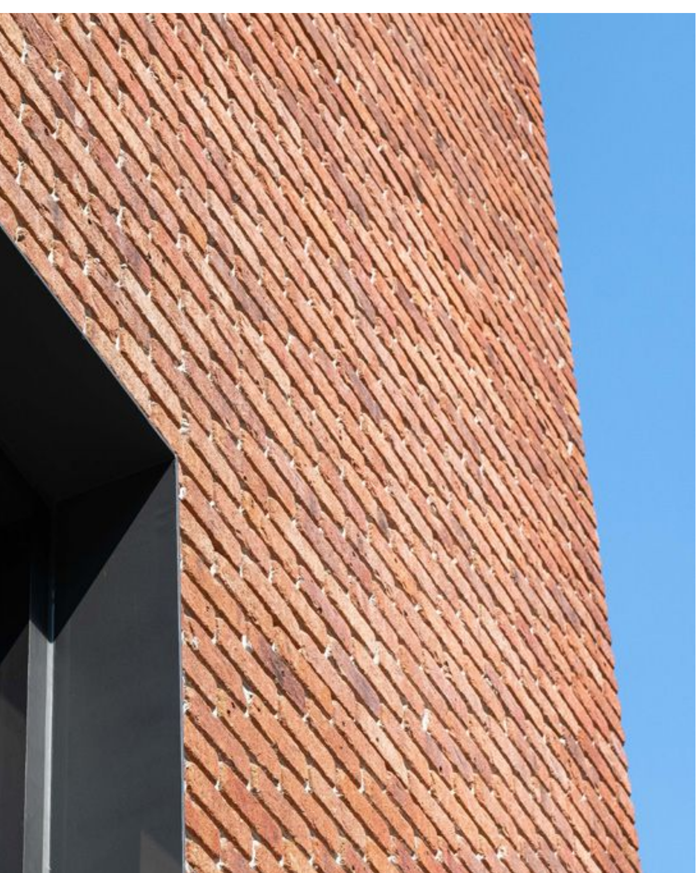
Many volunteer fire departments helped extinguish the fire at Taracon Precast.
Photo: *Taracon Precast.*

*Ascent has a Precast Protects Life story in every issue. If you have an example of how a precast concrete project was constructed to resist a storm, earthquake, blast, or fire, or has withstood such an event, email details to **marketing@pci.org.***

Precast Concrete Enclosure Systems: THE IDEAL BUILDING SOLUTION

Precast concrete offers quality that can be used in creating high-performance building enclosures

BY JIM SCHNEIDER



A wall panel with a thin-brick face.
***Photo:** Clark Pacific.*

The built environment plays a crucial role in shaping our world, impacting not only the physical landscape but also the health, safety, and well-being of its occupants. Americans spend 90% of their lives indoors, according to the U.S. Environmental Protection Agency. It is the responsibility of those in the architecture, engineering, and construction community to design, build, and maintain buildings that best support the health of occupants and the surrounding environment.

The demand for buildings that are strong, sustainable, and safe has never been greater. The building enclosure, which serves as the primary interface between the interior and exterior environments, is an important point of emphasis in this effort. Precast concrete offers quality that can be used in creating high-performance building enclosures.

Precast Concrete Enclosure Systems: Types and Applications

Precast concrete enclosure systems offer a solution for the design of high-performance building envelopes. Wall panels are produced off-site in a manufacturing facility under controlled conditions that provide a great deal of control over materials, mixture proportions, and quality. There are three basic types of precast concrete enclosure systems: solid wall panels, insulated sandwich wall panels, and thin-shell cladding, each with unique characteristics and applications.

Single-wythe panels are solid precast concrete panels that serve as both the structural and architectural components of the building enclosure. They are typically 3 to 8 in. thick. Single-wythe precast concrete panels are often used with an interior furring system to allow installation of additional insulation and utilities, though there is the potential to have an exposed concrete finish on the interior. Single-wythe panels are used in a variety of applications, including commercial structures, industrial buildings, and warehouses.

Double-wythe insulated panels, also known as insulated sandwich wall panels, consist of two concrete wythes of precast concrete, prestressed concrete separated by a layer of insulation. The thicknesses of the concrete wythes and the insulation layer vary depending on the design of the wall panel and its performance requirements. The wythes are typically connected by a series of ties or mesh made from a nonconductive material, such as carbon fiber or fiber composite, to eliminate thermal bridging (Fig. 1).

Using metal pins or ties of any kind, as can be the case in some traditional brick cavities, creates thermal bridges through the assembly. Any metal will create cold spots or short circuits that impact the thermal efficiency of the assembly, per the American Society of Heating, Refrigerating and Air-Conditioning Engineers' Standard 90.1, *Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings*. As the thermal imaging in Fig. 2 shows, a precast concrete sandwich wall panel provides continuous insulation free of thermal bridges, which prevents thermal energy from passing through the wall.

Precast concrete insulated sandwich wall panels are generally classified as composite or noncomposite based on design methodology and connection devices used between the two concrete wythes. In composite panels, the concrete wythes work together as one wall to carry the load. Alternatively, in noncomposite panels, the concrete wythes work independently, often with the interior wythe being thicker to carry the load, while the exterior wythe has an architectural finish (Fig. 3).

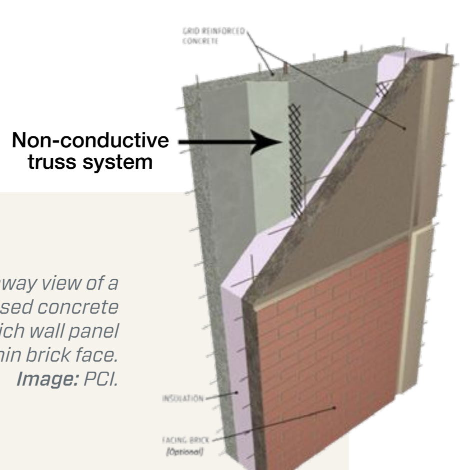


Figure 1: A cutaway view of a precast, prestressed concrete insulated sandwich wall panel with a thin brick face. ***Image:*** *PCI.*

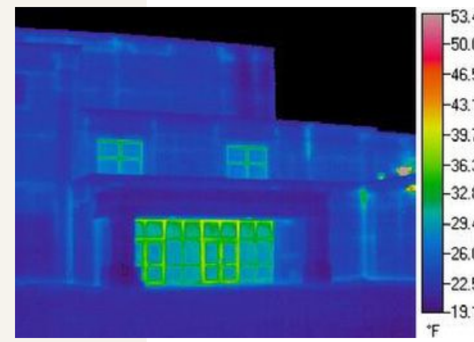


Figure 2: Thermal imaging of a high school using precast concrete sandwich wall panels. Green indicates where thermal energy is coming through the envelope, which in this case is just at the doors and windows. The precast concrete panels provide a secure thermal envelope. ***Image:*** *PCI.*

Composite panels of a given total thickness of concrete wythes will have nearly the same stiffness and strength as solid concrete panels of the same thickness. Noncomposite panels will have about the same stiffness and strength as the sum of the stiffness and strength values for the individual concrete wythes.

For similar panel geometries, partially composite walls have stiffness values greater than those of noncomposite panels and less than those of composite panels. They also have strengths that are greater than those of noncomposite panels and less than or equal to those of composite panels.

Thin-Shell Precast Concrete

Where precast concrete serves in a primarily architectural capacity, lighter-weight thin-shell panels are used in cavity wall systems. This type of application uses approximately 1½ to 3-in.-thick precast concrete panels as the exterior cladding, hung on a separate interior wall structure that is often made from cast-in-place concrete or steel.

This type of assembly typically consists of an exterior thin-shell precast concrete panel separated from the interior wall by an air cavity, creating a multilayer system. This cavity serves as a drainage plane and can house insulation, though insulation can alternatively be installed on the interior wall itself. The air space allows water that penetrates the exterior to drain away through weep holes while also providing ventilation. For this system to function effectively, proper moisture management is essential and includes features like appropriate flashing, weep holes, and moisture barriers to prevent water damage and promote drying.

While there are height limitations due to weight for the other types of precast concrete wall systems (typically 10 to 12 stories), thin-shell precast concrete can be used on taller buildings because it works in tandem with another material framing assembly. For this reason, thin-shell applications often include high-rise buildings, commercial structures, institution facilities, and healthcare establishments.

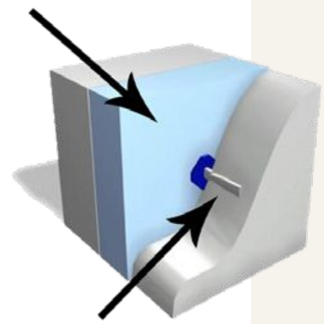


Figure 3: A cutaway section of a precast concrete sandwich wall panel, highlighting the non-conductive pins used to prevent thermal bridging. ***Image:*** *PCI.*

Energy Efficiency, Indoor Environmental Quality

Thermal mass is the ability of a material to absorb, store, and release heat. Precast concrete, with its high density and specific heat capacity, exhibits excellent thermal mass properties. This plays a significant role in the performance of precast concrete enclosure systems.

The thermal mass effect contributes to building performance in several ways:

- Temperature stabilization: Thermal mass absorbs heat during warm periods and releases it during cooler periods, helping to stabilize indoor temperatures.
- Peak-load shifting: By delaying heat transfer, thermal mass can shift peak cooling loads to off-peak hours, reducing energy costs and strain on heating, ventilating, and air-conditioning (HVAC) systems.
- Passive solar design: Thermal mass can be used to capture and store solar heat, reducing heating requirements.
- Reduction of temperature swings: The heat-absorbing capacity of thermal mass helps dampen temperature fluctuations, improving occupant comfort.

The impact of thermal mass on building performance can be quantified through the concept of effective *R*-value. Unlike the material *R*-value of insulation materials, the effective *R*-value of a precast concrete wall system accounts for the dynamic thermal performance provided by thermal mass.

Determining effective *R*-value involves complex thermal modeling that considers factors such as climate zone, building orientation, wall composition, occupancy patterns, and HVAC operation schedules. Studies have shown that the effective *R*-value of a precast concrete wall system can be significantly higher than its nominal *R*-value, particularly in climates that experience substantial daily temperature swings.

For example, a thermal mass calculation was conducted on a project in Fresno, Calif., that employed precast concrete insulated sandwich wall panels. The wall system had a material *R*-value of 11.33. However, when thermal mass was incorporated in the calculation, the wall system performed at an *R*-value of 26.10. This significant increase in *R*-value allowed that project team to downsize the building's HVAC equipment by 37% in tonnage.

To maximize the benefits of thermal mass in precast concrete enclosure systems, designers can:

- optimize the thickness and composition of concrete layers to balance thermal mass and insulation requirements;
- carefully consider the position of insulation within the panel to allow the concrete to interact with the interior environment;
- use appropriate finishes and colors to enhance solar heat absorption or reflection based on climate needs;
- design HVAC systems to work in conjunction with the thermal mass effect, such as nighttime precooling strategies.

The benefits provided by the thermal mass of a precast concrete envelope system will vary according to the conditions, but as it is an inherent quality of the material, it is worthwhile for project teams to assess and run the calculation for potential thermal mass performance.

Sustainability Considerations

As greenhouse gas emissions become a larger part of the conversation, questions arise about concrete, which accounts for 8% to 10% of annual global carbon dioxide (CO^2) emissions. This is partly because it is the most used human-made material on Earth, but also due to its material ingredients.

Most of concrete's CO^2 impact comes from using portland cement—the binder in the concrete. For many years, the industry has argued that concrete's impact is all up front, and once manufactured, it is essentially inert from an emissions standpoint. So, when the initial impact is spread out over a long life cycle, that reduces the impact from cradle to grave.

Still, there is recognition that CO^2 reduction must happen now, so currently available measures to decrease concrete's impact should be considered. For one, using supplementary cementitious materials such as fly ash to partially replace the cement can lower the impact. There are also offset technologies that inject industrial waste CO^2 into concrete to entomb it there.

Newer types of cement, such as portland limestone cement, which offers some CO^2 emission reductions, are becoming more common. Developing technologies, such as limestone calcinated clay cement, promise to deliver even greater reductions in the future. Innovations abound, and a great deal of investment is going into finding suitable and scalable replacements for cement in concrete. ●

This article is based on a presentation the author gave at the IIBEC (International Institute of Building Enclosure Consultants) International Convention and Trade Show in March 2025.

Jim Schneider is executive director of the PCI Mountain States chapter. Email jschneider@pcims.org.

ONLINE EXCLUSIVE

EXPANDED CONTENT FOR: "PRECAST CONCRETE ENCLOSURE SYSTEMS: THE IDEAL BUILDING SOLUTION"

DEFINING HIGH-PERFORMANCE BUILDING ENCLOSURES

The increasing intensity of severe storm events and other natural disasters, as well as alarming data from the International Panel on Climate Change's sixth climate report, "AR6 Synthesis Report: Climate Change 2023," has more building owners and architects seeking buildings that exceed basic code requirements and achieve higher levels of durability and performance.

THIS HAS INSPIRED A TREND TOWARD HIGH-PERFORMANCE BUILDINGS.

ONLINE EXCLUSIVE

EXPANDED CONTENT FOR: "PRECAST CONCRETE ENCLOSURE SYSTEMS: THE IDEAL BUILDING SOLUTION"

The U.S. General Services Administration (GSA) defines a high-performance building as one that meets requirements spelled out in the document titled "Guiding Principles for Sustainable Federal Buildings," which was last updated in December 2020. These principles are a set of goals that federal agencies use to ensure energy efficiency and sustainable design. In GSA's framework, high-performance buildings are designed to accomplish the following:

- Reduce emissions
- Minimize inefficiencies
- Ensure health and safety
- Save energy and water
- Cost less to operate
- Produce less waste
- Generate higher tenant satisfaction

A high-performance building enclosure can be defined as an integrated system of building components that effectively manages the flow of heat, air, and moisture between the interior and exterior environments. These enclosures are designed to optimize energy efficiency, durability, and indoor environmental quality while meeting or exceeding relevant building codes and standards. Key characteristics of high-performance building enclosures may include the following:

- Superior thermal performance
- Effective air barrier systems
- Moisture control strategies
- Durable and low-maintenance materials
- Integration with other building systems

Ensuring Healthy and Comfortable Interiors

Effective management of heat, air, and moisture is important for creating healthy buildings that support the comfort and well-being of occupants.

HEAT MANAGEMENT

When using precast concrete enclosure systems, proper heat management considerations include the following:

- Insulation strategies: Use continuous insulation and minimize or eliminate thermal bridging, optimize insulation thickness based on climate and building use, and factor in dynamic thermal performance resulting from thermal mass.
- Thermal breaks: Use nonconductive connectors between concrete wythes and use careful detailing at panel joints and penetrations.
- Solar heat gain control: Integrate shading devices and use reflective coatings or finishes where appropriate.

AIR MANAGEMENT

Controlling air movement through the enclosure system is also essential for energy efficiency and good indoor air quality for a building. Key considerations include the following:

- Air barrier systems: Have a continuous air barrier throughout the enclosure with proper sealing at panel joints and penetrations, as well as integration with window and door systems.
- Ventilation: Design for appropriate fresh air intake and consider natural ventilation strategies where feasible.
- Pressure management: Proper building pressurization prevents unwanted air infiltration. In tall buildings, be conscious of stack effect.

Moisture Management

Finally, effective moisture control is also part of the equation for a high-performance envelope, for preventing mold growth and ensuring building durability.

- Water resistance: Use water-resistant concrete, be sure to properly detail panel joints and connections, and integrate flashing and drainage systems.
- Vapor control: Understand and design for vapor drive based on climate. Place vapor retarders or use vapor-permeable materials where needed.
- Condensation prevention: Analyze dew point locations within the wall assembly and prevent cold spots by using thermal breaks and minimizing thermal bridging.
- Drainage and drying: Incorporate drainage planes in cavity wall systems and design for drying potential in case of moisture intrusion.

A successful heat, air, and moisture management strategy requires an integrated approach that considers the interactions between each of these elements. Precast concrete enclosure systems offer the advantage of factory-controlled production, allowing precise integration of insulation, air barriers, and moisture control measures.

Material Choices and Long-Term Impact

The selection of materials for building enclosures has consequences that extend well beyond the construction phase. Given the economic, material, and environmental costs of construction, it is increasingly important to design and build structures that will operate at a high level for many decades. Precast concrete offers several advantages to a high-performance envelope design through long-term performance, safety, and sustainability.

Precast, prestressed concrete is a durable material that is capable of delivering a 100-year service life with minimal maintenance. This longevity contributes to reduced life-cycle costs, a decreased need for replacement materials, and a lower environmental impact over time.

Because concrete is noncombustible, it provides inherent fire-resistance properties that can help provide enhanced safety for occupants and the community. Precast concrete enclosures can contribute to a balanced fire-mitigation design by limiting the spread of fire, reducing the risk of toxic emissions during a fire, and maintaining structural integrity during a fire event.

Fire is among the oldest foes of human construction, and structure fires today are as destructive as ever. And given the complexity of modern buildings, fires are becoming more expensive as well. Using noncombustible materials such as concrete can help minimize those risks.

Another ancient enemy of buildings is weather, and precast concrete enclosures offer excellent resistance against high winds (such as those found in tornadoes and hurricanes), wind-borne debris, and flooding. The durability and resilience of the material itself contribute to occupant safety and reduce the need for repairs or replacement after extreme events. Meeting the requirements of the Federal Emergency Management Agency's, Safe Rooms for Tornadoes and Hurricanes (FEMA P-361), precast concrete envelope systems are commonly used on storm shelter and safe room applications due to their inherent weight and strength.

Precast, prestressed concrete is a durable material that is capable of delivering a 100-year service life with minimal maintenance.

Occupant health and safety is another important consideration when thinking about the long-term performance of a building. Good envelope design, regardless of the material or system, is vital to supporting a healthy indoor environment. In this area, precast concrete can positively impact indoor environmental quality by providing resistance to mold growth, low or no volatile organic compound emissions, and good acoustic qualities, with sound transmission class ratings in the 50s and above.

Conclusion

Precast concrete enclosure systems offer a compelling solution for creating buildings that are strong, sustainable, and safe. By leveraging the inherent properties of concrete and high-performance design, these systems can significantly contribute to energy efficiency, occupant comfort, and overall building performance.

The thermal mass effect, when properly used, enhances both energy efficiency and indoor environmental quality. Effective management of heat, air, and moisture is crucial for creating healthy interiors, and precast concrete systems provide excellent control over these factors.

The long-term impact of choosing precast concrete extends far beyond initial construction, offering durability, safety, and sustainability benefits throughout the building's life cycle. As the industry continues to innovate, future design concepts promise even greater performance and integration with smart building technologies.

Precast concrete enclosure systems align with the growing demand for structures that not only stand the test of time but also prioritize the well-being of occupants and the environment. As we face the challenges of a changing climate and increasing urbanization, these systems will play a crucial role in shaping the resilient, efficient, and healthy buildings of tomorrow. ●

CASE STUDIES

Precast Builds Communities

Empowering public spaces with lasting strength

BUILDINGS OFTEN RECEIVE THE MOST ATTENTION WHEN THEY ARE THE BIGGEST, grandest, or most expensive. But look around any city, perhaps the one in which you live, and you will find many buildings where you and your family go to school, church, a concert, sporting event, museum, or medical center. You might pass them by every day without giving them a second look. Precast concrete is the ideal construction material for any of these buildings,as the case studies on the following pages demonstrate. Read on to learn how precast builds communities.

BY MONICA SCHULTES, DEBORAH R. HUSO AND MASON NICHOLS

Monument Drive Commuter Parking Garage and Transit Center: Lighting the stair tower elevates the high-profile project that is visible from several commuter routes as well as the adjacent government center. The single stair runs appear to support floating landings at each level of the parking structure.
Photo: *Kate Wichlinski Photography Inc.*

MONUMENT DRIVE COMMUTER PARKING GARAGE AND TRANSIT CENTER

FAIRFAX, VA. /// *BY MONICA SCHULTES*

*The eight-level multimodal facility accommodates 820 vehicles and encourages the use of public transportation. **Photo:** Kate Wichlinski Photography Inc.*

Monument Drive Parking Garage and Transit Center is a new commuter parking structure located in Fairfax County, Va., just west of Washington, D.C. Designed by HGA and Walker Consultants and constructed by Howard Shockey & Sons with precast concrete manufactured by Metromont, the eight-level, 262,000-ft^2 facility has room for 820 vehicles. In addition to free parking for commuters, the facility supports buses, rideshare, bicycles, and a green roof.

The owner, Fairfax County, wanted to be creative for this high-profile, multimodal parking structure. Visible on all four sides, the prominent site serves as the gateway to the Fairfax County government center and is strategically located for commuters to the District of Columbia.

Total–Precast Concrete Structure

Fairfax County often selects precast concrete for their parking facilities for its "familiarity, inherent durability, cost effectiveness, and speed of construction," says Damian Larkin, project manager at Walker Consultants. The parking structure layout is a single helix that is repetitive and user-friendly with flat parking. For a parking layout and circulation system that relies on 90-degree parking with two-way traffic, "precast concrete makes all the sense in the world," adds Jim Polhamus, principal at HGA.

The exterior is a departure from a utilitarian transit center. Precast concrete spandrels are dark gray in color with an acid-etched finish. The precast concrete panels can be seen up close but fade behind a dramatic aluminum screen encompassing the total–precast concrete structure.

"We designed the façade system drawing on earthy colors like brick without actually using masonry," says Polhamus. The aluminum tubes form a gradient reminiscent of a tree. With the appearance of individual pickets or sticks, the aluminum panel system spans floor to floor. The pattern comprises three tube widths and three shades of terra-cotta. "It seems like a random pattern, but the intent is a dense forest of different tube widths and accent colors to avoid a monochromatic appearance.

The custom aluminum system is coated with a textured reddish-brown finish and was preassembled to reduce labor and installation costs. Metromont cast embed plates in the precast concrete spandrels to support a steel frame. The steel framing that is attached to the precast concrete spandrels used custom clips to support an aluminum assembly. As the structural and functional designers of the parking structure, Walker Consultants detailed façade supports to allow independent movement of the precast concrete and screening systems.

The aluminum system is attached to the galvanized frame in the field with about 18-in. clearance from the face of the precast concrete panels. The connections had to handle the different tolerances and movements of the precast concrete, steel, and aluminum. It was also vital to maintain the openness for air circulation to avoid the need for mechanical ventilation.

PROJECT SPOTLIGHT
MONUMENT DRIVE COMMUTER PARKING GARAGE AND TRANSIT CENTER

Location: Fairfax, Va.

Owner: Fairfax County, Fairfax, Va.

Architect: HGA Architects & Engineers, Alexandria, Va.

Contractor: Howard Shockey & Sons, Winchester, Va.

Engineer: Walker Consultants, Berwyn, Pa.

PCI-Certified Precast Concrete Producer: Metromont, Winchester, Va.

Precast Concrete Specialty Engineer: Blue Ridge Design, Winchester, Va.

Precast Concrete Components: 258,122 ft^2 (792 pieces) of structural and architectural precast concrete components (field-topped and factory-topped double tees, spandrels, wall panels, beams); 47,275 ft^2 of acid-etched finish, 364 ft^2 formliner; 30,401 ft^2 of medium acid-etched finish

Precast concrete spandrels were offset by decorative aluminum picket cladding system in shades of terra-cotta. ***Photo:*** *Kate Wichlinski Photography Inc.*

The first level of the structure supports "slugging" with lay-by lanes for vehicle queues. Slugging is a form of casual carpooling in the Washington, D.C., metro region that matches single-occupancy vehicles with potential rideshare partners. To take advantage of faster commute times in express lanes on Route 66, drivers pick up passengers heading to a specific destination such as the Pentagon or downtown to meet the requirements for high-occupancy vehicles (HOV-3). Slugs typically catch rides at local commuter facilities like the Monument Drive Parking Garage.

Physical Separation

Entrances and configurations affect how a parking structure is used. The tight site, street access, and the need to accommodate bus movements all had an impact on the layout and orientation of the structure. Wayfinding, stall striping, and ramp locations were tailored to fit the usage around the site. "The ramp on the north side of the garage separates the flow of buses from vehicles, bicycles, and pedestrians. The buses access the site separately from the north side from Random Hill Road and all the other activities are from Government Center Parkway," Larkin adds.

"Public safety is of paramount importance to Fairfax County as well as the users of this facility," says Polhamus. A continuous fence was installed to physically separate the circulation of buses and pedestrians. Access for passenger vehicles is opposite the bus entrance, and they function independently. The same applies to bicyclists who use a multiuse path.

Designed by HGA, architectural lighting adds nighttime drama across the structure's exterior. Continuous lighting graziers control the changing colors to accentuate the unique architectural pattern across the parking structure. Another striking feature is the single-run stair tower. The stair towers provide openness and passive security and assist with way finding. The framing is hung from the outside instead of being centrally located. This gives the appearance of a central tree column whose branches support each landing. The single-run stairs rise from each landing, which appear to float into the seven levels of parking. The single-run landings are accented with synchronized LED strips.

Without a laydown area, logistics were challenging. Local highways also had restrictions for heavy haulers and oversize loads. Trailers had to be parked and shuttled to be offloaded. The tight triangular-shaped site added another layer of complexity for installation, recalls David Sommer, vice president of project management and field operations at Metromont. "Access was limited, and crane movement was tight, but we were able to use Monument Drive to stage and drop off trailers. We had to work around the bus canopy construction and get creative with supplying the crane with precast concrete pieces," he says.

Supporting Commuters and Communities

The new multimodal facility with free parking encourages using mass transit. There are plans in the distant future to build a nearby METRO station, which would add a light rail component to the commuter options at this feeder location.

Monument Drive Commuter Garage improves accessibility, reduces traffic congestion, fosters economic development, and supports a more sustainable environment. The new transit center is more than where bus routes meet. It serves as a regional mobility hub, with park and ride, pedestrian connections, bike, slug, and bus opportunities. This project is a testament to the collaborative effort of the team to blend functional requirements of commuting with an aesthetic solution.

VALLEY SOUTHWOODS HIGH SCHOOL CAREER AND TECHNICAL EDUCATION ADDITION

WEST DES MOINES, IOWA /// *BY MONICA SCHULTES*

Career and technical education (CTE) projects can improve the educational backdrop of a community. What used to be called vocational schools, CTE programs provide students with valuable skill sets, preparing them for future employment. At Valley Southwoods Freshman High School in Des Moines, Iowa, 720 ninth-grade students are now better prepared for success in high school and to contribute to the work force.

West Des Moines Community Schools (WDMCS) completed the $28-million expansion project at the high school in summer 2024. The school district is proud to showcase the addition to the school and the community. Designed by Shive-Hattery, an experienced firm in education design, the building creates a space that supports the goals of the school as well as embodies the values of serving the community.

"This cutting-edge facility provides our students with the skills and experiences they need to succeed in internships, apprenticeships, and their future careers," says WDMCS superintendent Matt Adams. "We are proud to support the next generation of our community's workforce. It has been exciting to watch our students thrive in this space as they build bright futures."

Education By Design

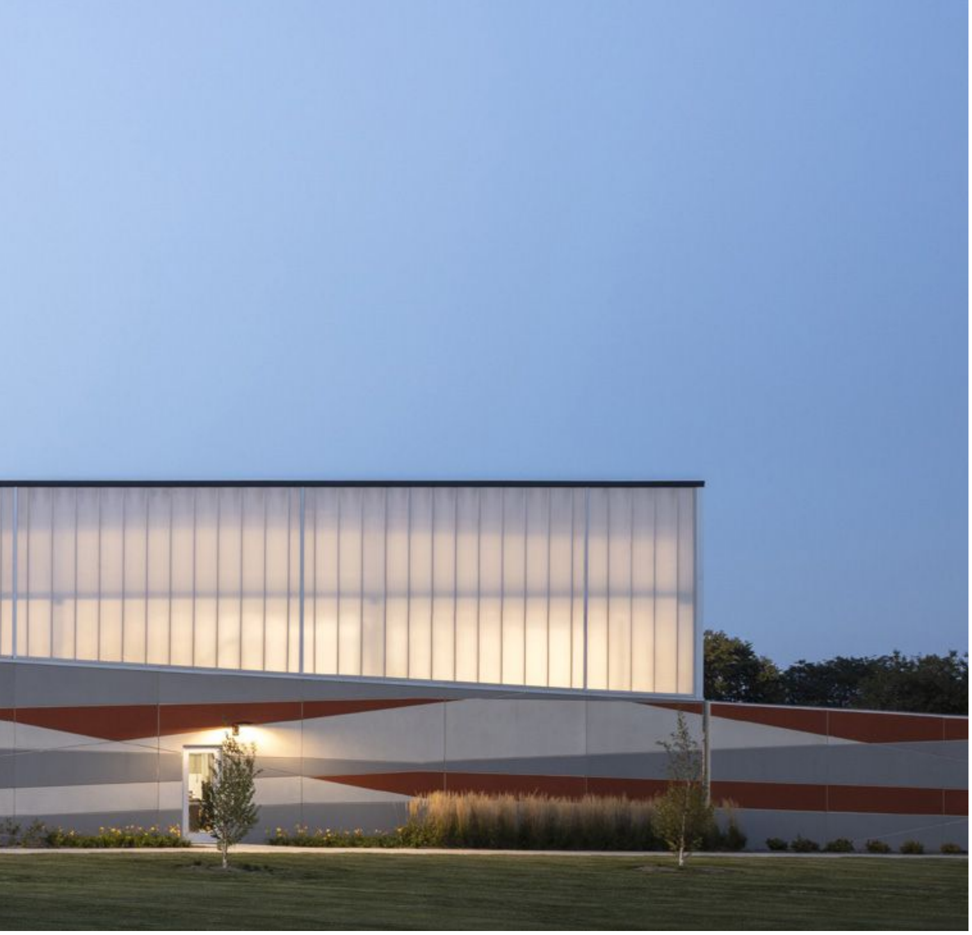
The 29,000-ft^2, two-story building addition integrates an open-design concept with an innovative layout. The design team used precast concrete and structural steel to house programs for culinary arts, manufacturing, engineering technology, construction, robotics, welding, and wood working.

Design flexibility is crucial in CTE construction to adapt to the ever-changing needs of students, programs, and technologies. The laboratory spaces need to accommodate new equipment, furniture, and software without renovation. The Valley Southwoods addition was designed for all possible programming needs. "We wanted to give the school district full flexibility as to how they could use this space," describes Michael Kleene, architect at Shive-Hattery.

Kleene said the addition "flips the script" on what career and technical education means for students. The addition is featured prominently on the site. "Instead of a shop located in the back of the school, it is right in front of the building to make this a model environment for students."

Catching the Sunlight

The existing building was built in the 1990s and did not present the welcoming exterior that the school district desired. Kleene recalls, "We wanted to diverge from that palette and incorporate different finishes and textures." The result is a subtle nod to the original brick and block building, by way of orange and gray Nawkaw stains on smooth precast concrete panels. At designat-



The precast concrete panels decrease in size as they run along the front of the building. ***Photo:*** *AJ Brown Imaging.*

ed locations there are also acid-etched precast concrete panels with a charcoal color and texture that catch the sunlight.

The new construction is meant to stand out from the existing structure in both function and design. To set off the addition, both shadow and relief were incorporated into the charcoal-gray prefabricated wall panels. The precast concrete panels decrease in size as they run along the front of the building.

The insulated panels vary in thickness. The largest is a total of 14 in., which includes an 8-in. panel front wythe, 3 in. of extruded insulation, and 3 in. of concrete on the back wythe. "The charcoal-gray panels had to be augmented to accommodate the deep relief of the custom formliner," describes Andrew Scholten, sales representative at Wells. The precast concrete panels provide shadow and crisp relief with sufficient concrete cover in contrast to adjacent pieces that were recessed 1 in. The panels have an average *R*-value of 16, exceeding the American Society of Heating, Refrigerating, and Air Conditioning Engineers' requirements for mass walls.

Coordinating the variety of programs in a CTE project is challenging. Current and future programs must be considered to allow adequate space for agriculture, robotics, and wood working. Kleene describes the process as "thinking outside of the box for this high-volume space."

In addition to the standard laboratory space, there is also a conference room for students to practice their soft skills with the option for mock interviews or pitching their inventions to local

ONLINE EXCLUSIVE

EXPANDED CONTENT FOR: VALLEY SOUTHWOODS HIGH SCHOOL CAREER AND TECHNICAL EDUCATION ADDITION

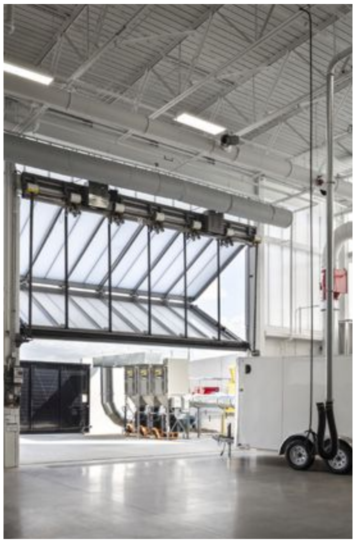
SHELTERING FOR STORMS

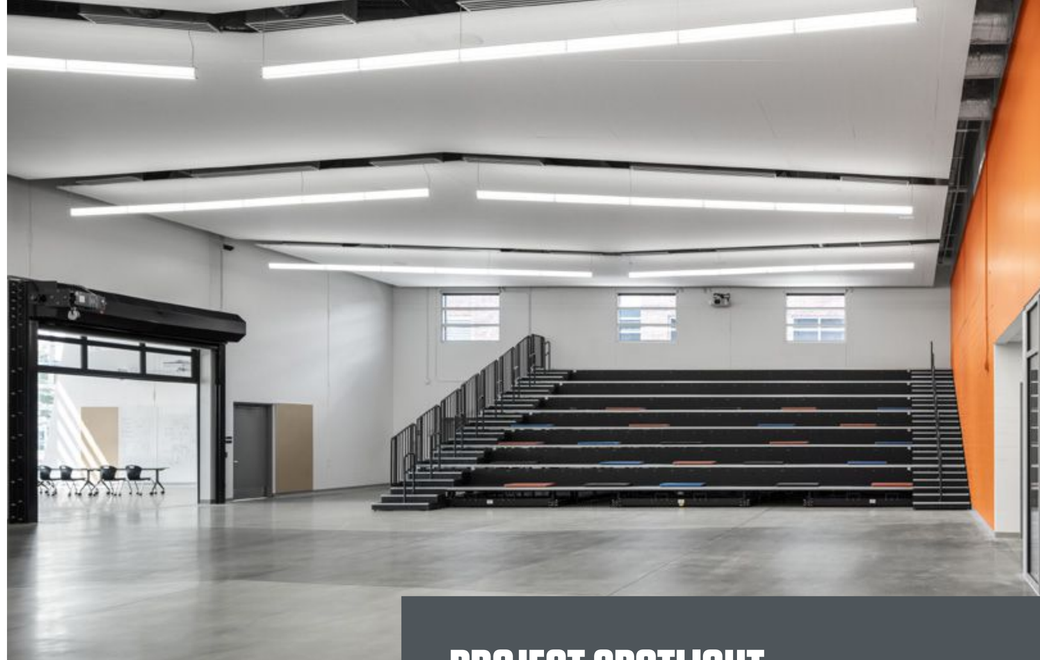
With a total of 125 tornadoes across Iowa in 2024, safe rooms and storm shelters are becoming more mainstream in public schools. Storm shelters in schools are designed and constructed according to the ICC/NSSA Standard for the Design and Construction of Storm Shelters (ICC 500). To meet this standard, buildings must withstand a wind speed of 250 mph and the impact of wind-blown debris.

"Precast concrete lends itself to storm shelters, especially in Iowa," says Seth Falcon, project engineer at Wells. At Valley Southwoods, the precast concrete wall panels and double-tee roof in the assembly space serve that dual purpose. The roof comprises 80-ft-long double tees that were treated with a 2-in. concrete topping to help support the mechanicals as well as meet the uplift requirements.

Building resilience into the Valley Southwoods High School is essential, as it serves as both a learning environment and community refuge during severe weather events. By investing in durable, cost-effective solutions, such as prefabricated concrete components and impact-resistant windows, the school district safeguards occupants and property and reduces repair and replacement costs.

Textured charcoal-gray precast concrete panels differentiate the addition from the existing structure in both function and design. Built to withstand severe weather, the expansion serves the community as a storm shelter, if necessary.





Left: Overhead garage doors bring light in and allow for the movement of large equipment and flexibility of laboratory spaces.

Right: Hands-on learning is an important part of training and requires a highly flexible layout. ***Photos:*** *AJ Brown Imaging.*

businesses. A computer laboratory, metal shop, and videography studio round out the space. A new central air–cooled chiller and high-efficiency condensing boilers heat and cool the laboratory spaces. Ventilation, exhaust hoods, and dust collection were provided for key pieces of equipment to help improve the indoor air quality of the laboratories. A separate entrance to the CTE addition was added for security purposes and to allow use by the community in addition to the students.

The custom revealed panels extend southward beyond the building to create a screen wall that protects students as well as neighbors from noise. The perimeter wall surrounds the rear of the building, where students emulate work in a construction zone. Adjacent to the existing food service portion of the existing building, the culinary arts laboratory was expanded to feature a teaching kitchen and six practice kitchens. Here, precast concrete panels flank store front glazing that looks out on an outdoor terrace where students can congregate. The same charcoal wall panels were used to provide continuity with the building addition. The main entrance to the school was also renovated, which helped modernize and brighten the façade.

An Economical Solution

Community involvement requires shared spaces with adaptable layouts. Overhead garage doors in the space allow easy movement of large equipment and future expansion of hands-on learning activities. To bring ample light into the space, glass occupies a large surface area. A gradual decreasing of panel size along the façade allows ample natural light to permeate the structure. The interior of the precast concrete panels and demising walls are finished with gypsum board to provide flexibility in the future without major renovation.

PROJECT SPOTLIGHT
VALLEY SOUTHWOODS HIGH SCHOOL CAREER AND TECHNICAL EDUCATION ADDITION

Location: West Des Moines, Iowa

Owner: West Des Moines Community Schools, West Des Moines, Iowa

Architect: Shive-Hattery Architecture Engineering, West Des Moines, Iowa

Contractor: Core Construction, Des Moines, Iowa

Engineer: Shive-Hattery Architecture Engineering, West Des Moines, Iowa

PCI-Certified Precast Concrete Producer: Wells, Wells, Minn.

PCI-Certified Erector of Specialty Engineer: US Erectors, Pleasant Hill, Iowa

Precast Concrete Components: 80 architectural insulated walls, 18 architectural solid walls, 19 structural solid walls, 15 double tees

Vocational training plays a critical role in fostering community development. Preparing students for life and career is not something WDMCS takes lightly. This facility provides students with hands-on opportunities to explore different career pathways and connect with businesses in the community. Students from Valley High School also use the addition, which means nearly 3000 students have access to the space.

To meet the distinctive requirements of CTE programs, the design team wanted an economical building solution that offered consistent quality and efficiency while providing a modern and attractive structure. Prefabrication took advantage of flexible bay sizes, year-round manufacturing in a controlled environment, and faster installation that minimized disruptions to school operations.

STUDIO MUSEUM IN HARLEM

NEW YORK, N.Y. /// *BY MONICA SCHULTES*

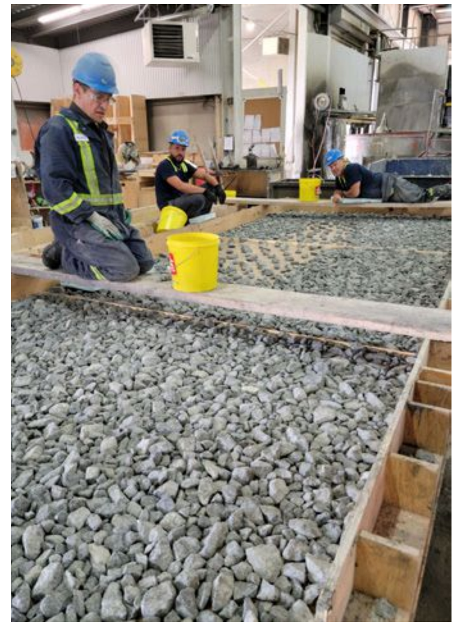
Top: The stacked spaces make the most of fitting the museum program into the small site and pays homage to Harlem architecture, particularly the iconic stoop. ***Rendering:*** *Adjaye Associates.*

Bottom: The museum design features an elegant and dynamic black-hued precast concrete façade. ***Photo:*** *Cooper Robertson.*

One of the best things about New York City is access to more than 170 museums. These cultural landmarks focus on education and community engagement and display the city's diverse history. One such iconic structure is the new Studio Museum of Harlem, which showcases the work of artists of African descent.

Located on 125th Street on the site of the Studio Museum's original home, the new building will double the space for exhibitions and house public events and educational programs. Scheduled to open in the fall of 2025, the museum will include studios for artists in residence as well as a cafe, lobby, and rooftop terrace.

Situated in the heart of Harlem, its dark, bold exterior is constructed with precast concrete, offering a stark contrast to the traditional architecture of the surrounding neighborhood. Comprising a series of stacked shapes over six stories, the different elevations shift in size and placement. The west façade of the building forms a single vertical wall, while the other three faces feature terraces and overhangs.



Left: The museum provides room for studios for artists in as well as a cafe, lobby, and rooftop terrace. It is slated to open in the fall of 2025. ***Photo:*** *Cooper Robertson.*

Right: Craftsmen at the precast concrete plant painstakingly installed individual aggregates at the bottom of the form to achieve the bold, charcoal-colored finish. ***Photo:*** *Bétons Préfabriqués du Lac.*

The stacked volumes provide 82,000 ft^2 of exhibition space and public areas. There is also a four-story monumental stair within the museum, which allows visitors to view artwork along the 85-ft-tall vertical gallery.

Local Architecture

Taking its cues from the brownstones of Harlem, the Studio Museum projects a dynamic façade with its textured precast concrete and windows of various sizes. "The design was inspired by the masonry architecture of Harlem and draws on its frames, apertures, and doorways. The use of precast concrete evokes the forms and textures of the architectural landscape of the neighborhood," says Jonathan Pietro, senior associate at Cooper Robertson.

The polished finish on the precast concrete panels accentuates the charcoal-black aggregate. The finish emulates polished granite, and the black hues evoke urban sophistication. The result transforms the building itself into art, blending creativity with functionality. The precast concrete producer, Bétons Préfabriqués du Lac (BPDL), placed the stones individually in the precast concrete form to achieve the desired effect.

The precast concrete creates a sculptural façade that is inviting and reflects the activity inside, describes Pietro. The design intent was a polished finish that exposed the large aggregate and the precast concrete producer went through several iterations perfecting that result.

The striking polished precast concrete panels are 7 in. thick; the remaining solid precast concrete panels are 5 in. thick and have a sandblasted finish. Precast concrete was also used strategically in the interior of the building. In the main lobby there is a tall precast concrete demising wall approximately 26 ft in height that is a feature of the lobby. The exposed precast concrete vestibule in the main entry draws visitors into the interior and complements the stair tower clad in ¾-in.-thick terrazzo stone with its smaller aggregate in similar tones and finishes.

Museums engender pride in local communities. Just as the exhibits and art within the building tell a story, the building and spaces that make up the museum do the same. The Studio Museum demonstrates a connection to the community as it invites Harlem residents and visitors into a multiuse space that will be open to the public during museum hours and used for informal gatherings.

"The stacked composition of varying scales and apertures really open up the façade at street level and draw people in," says Pietro. A set of glass doors that can be opened in different configurations are located below street level to welcome visitors down a set of steps or a "reverse stoop," evocative of the New York City brownstone. This key architectural feature draws the visitor down into the lecture hall area, which serves as a gathering space with terraced seating.

Circulation is important in museum planning and flexibility is key because spaces are subject to change on a regular basis to display art installations. A dramatic solution to this concept is seen in the museum's monumental stair tower. Clad in polished terrazzo, the four-story space spans the height of the building and at its apex is a clerestory window. "The vertical gallery is fitting for large-scale art display and the pyramid shape at the apex was inspired by local neighborhood cathedrals," says Pietro.

Unique Panels

The Studio Museum relies on a steel frame for its lateral resistance system. The staggered boxes posed challenges for controlling seismic and wind loads. Every piece of precast concrete was custom, adding a layer of complexity as well as tight tolerances. This proved challenging to the building's structural engineer of record, Simpson Gumpertz & Heger (SGH).

SGH has been involved in this unique project since 2015, recalls Kevin Poulin, principal at SGH. "It is not a typical precast building," he emphasizes. The uniqueness and customization are unusual for precast concrete construction, which is often valued for its repetition and economies of scale. SGH consulting engineer Alexander Stephani agrees. "There were some panels that repeated, but there were over 200 different connection types and 230 unique panels. At that magnitude, every panel had to be designed and reviewed, so efficiency was not the primary goal."

One of the most critical aspects in engineering precast concrete is the design of connections, which are necessary to transfer loads and restrain movement. The unique precast concrete components, including three-dimensional shapes with multiple sided finishes, required more than 200 unique connection types.

At the upper level of the building, one such precast concrete component spans 50 ft in length and weighs approximately 25 tons. "There is a large magnitude of forces hanging off the side of the building. We were dealing with significant loads, particularly very heavy seismic loads on this project," says Stephani.

In addition to the unique shapes, custom connections, and tight tolerances, minimal joint spacing was required to align with the curtain wall system. "Despite some large spans, we worked hard to maintain the goal of three-quarter-inch joint spacing with very few exceptions," recalls Stephani. "For example, in the gallery space the beam loading is over 100 pounds per square inch over 50 feet. In order to achieve that, the live load deflection is limited to less than one quarter." Everything is studiously planned and aligned in this project, so any changes to the joint spacing would have a significant impact.

Critical Collaboration

The museum was constructed just inches from the adjacent building, but tight sites are common in New York City. It was a meticulous process that involved collaboration at every stage. SGH worked with BPDL and the erector, Midwest Steel, to make it more efficient for the site requirements, including the crane reaches. Some panel sizes were modified to improve efficiency on the jobsite.

"Collaboration was critical for this project," adds Pietro The precast concrete producer participated in an extensive shop drawing process and countless meetings with Cooper Robertson, SGH, BPDL, Sciame Construction, and other team members. "The complexity demanded that level of cooperation and coordination," he says. One of the more complex facets of the project was installing the precast concrete.

Art Installation

Precast concrete producer BPDL shipped panels to a storage yard in New Jersey where they were shuttled to the site as needed. Then the challenge of installing the large custom three-dimensional panels began. "The complexities of this job were staggering; this was the most difficult project that we have ever tackled," says William Silengo, precast concrete superintendent with Midwest Steel.

PROJECT SPOTLIGHT
STUDIO MUSEUM IN HARLEM

Location: New York, N.Y.

Owner: The Studio Museum in Harlem, New York, N.Y.

Design Architect: Adjaye Associates, New York, N.Y.

Executive Architect: Cooper Robertson, New York, N.Y.

Contractor: Sciame Construction, New York, N.Y.

Engineer: Simpson Gumpertz & Heger, New York, N.Y.

PCI-Certified Precast Concrete Producer:
Bétons Préfabriqués du Lac (BPDL), Alma, QC, Canada

PCI-Certified Erector: Midwest Steel, Detroit, Mich.

Precast Concrete Components: 40,353 ft^2 of architectural precast concrete, of which 13,120 ft^2 was polished

Because of the interior soffit panels, custom rigging was designed for this project to transfer these thirty-ton panels from the crane. "The rigging plan required openings in the floor to allow us to drop our rigging down from the floor above," says Silengo. "Each panel was detached from the crane and transferred from one set of chain falls to the next until it was in place, sometimes 40 feet into the building."

During one stage of the installation, a weekend road closure of 124th Street allowed two cranes to work in tandem. "A temporary monorail system was required because the crane was so tight to the building there was no room to set it up with enough luffing jib," Silengo says. A luffing jib is often used for vertical lifting in confined urban sites. Due to the limited reach and otherwise inaccessible interior, the precast concrete panels were fed to a monorail as Midwest Steel worked around the clock to finish by Monday morning.

Every aspect of this project was painstakingly complex. Despite the myriad challenges and complexities, the project is completed and awaits the grand opening of this iconic structure.

The facility is representative of the strength and vitality of the community it serves. "The façade design was driven in part by the museum's desire to serve the public with an experience of art from the street and draw the community into the space," says Pietro. The façade with its form, weight, and texture of the precast concrete creates a strong architectural presence that supports the museum's goals.

See a time-lapse construction video at studiomuseum.org/the-building.

Top: Many of the precast concrete panels feature embedded thin brick that was cast into the panels at the plant.

Left: With its riverfront location and proximity to existing hospital structures, the Delores Barr Weaver Pavilion had to accommodate a number of site challenges. ***Photos:*** *GATE Precast.*

DELORES BARR WEAVER HEART AND VASCULAR PAVILION AT ST. VINCENT'S HOSPITAL

JACKSONVILLE, FLA. /// *BY DEBORAH R. HUSO*

When St. Vincent's Health required a flexible and scalable structure for its new heart center at Ascension St. Vincent's Riverside hospital in Jacksonville, Fla., total-precast concrete offered an affordable solution for establishing a space that could be expanded for future growth if needed.

The original hospital on the banks of the St. Johns River was built in 1914, and, according to Kristen Herman, construction project manager for Ascension Health, the hospital needed more space for heart patients and also wanted a space devoted exclusively to cardiovascular specialties. The hospital was in dire need of additional ICU rooms as well as a consolidated space for heart patients because the existing ICU space was insufficient for the number of cardiac patients St. Vincent's was taking in.

However, given the hospital's location next to the river and potential flood areas as well as the age of the original building, Herman acknowledges that "everything we do at Riverside is at tremendous cost." St. Vincent's Health needed to erect a new structure more affordably and quickly to minimize disruption to the adjacent existing hospital building. Total-precast concrete fit the bill.

Site Challenges and Budget Constraints Inform Design

Completed in 2020, the Delores Barr Weaver Heart and Vascular Pavilion is a four-story, total-precast concrete structure featuring embedded Summitville thin brick.

The lower level provides parking while the two middle levels provide space for patient care, including 30 medical and surgical rooms as well as 30 intensive care rooms. The fourth level, currently the structure's roof, accommodates mechanical systems, though it was designed to become office space in the future when the heart center needs more space. With its flexible design options, precast concrete provided for a future fourth-floor addition or even further vertical expansion.

Herman says the hospital system chose total-precast concrete to address budget concerns. "Plus, it's a very confined site, so pouring or doing a tilt-up would be problematic." Additionally, on-site pouring would have extended the construction timeline due to wait times for curing. "And we were working right up against an existing, functioning hospital [building]."

That meant noise was also a potential problem for patients and staff at the hospital. "Schedule is definitely an issue when it comes to on-site operations and impact," Herman remarks. A total-precast concrete solution meant St. Vincent's Health could get the new pavilion erected quickly with minimal disruption to the existing hospital site.

PROJECT SPOTLIGHT

DELORES BARR WEAVER HEART AND VASCULAR PAVILION AT ST. VINCENT'S HOSPITAL

Location: Jacksonville, Fla.

Size: 58,000 ft^2

Cost: $55.2 million

Owner: Ascension Health, St. Louis, Mo.

Architect: Gresham Smith, Jacksonville, Tenn.

Contractor: Haskell, Jacksonville, Fla.

Structural Engineers: McVeigh & Magnum Engineering (now IMEG), Jacksonville, Fla.

PCI-Certified Precast Concrete Producer: GATE Precast, Jacksonville, Fla.

Precast Concrete Components: 547 total–precast concrete components, including 5078 ft^2 of hollow-core and 3665 yd^3 of load-bearing walls. There were 10 different precast concrete components in total, including double tees, hollow-core slabs and solid slabs for roofs, columns, spandrels, beams, inverted T-beams, 12-in. walls including 12-in. shear walls, 32-in. column walls, and stairs. The largest precast concrete component was 14 ft wide and weighed just over 71,000 lb.

Designed and Built with Vertical Expansion in Mind

Jacksonville-based contractor Haskell chose prefabricated concrete for the new pavilion to accommodate an aggressive construction schedule on an extremely tight jobsite. Furthermore, with two existing hospital buildings adjacent to the building site, the hospital needed to remain accessible and operational throughout construction.

Another challenge was the building's large cutouts on the ground-level exterior walls. Randy Phillips, director of structural systems for Jacksonville-based GATE Precast, says there weren't a lot of options for shear walls in the building's interior, so exterior walls had to provide for lateral shear to accommodate the site's Category IV risk profile and Exposure D for wind. Phillips says GATE also had to design pilasters into the inside of the exterior wall panels to handle the floor loads due to the large openings in the shear walls on the ground floor.

With load-bearing walls and columns as well as flat slabs, double tees, and hollow-core flooring components that were all manufactured at GATE Precast's facility in Jacksonville, the construction team was able to ensure quality control and minimize potential issues that could arise from on-site concrete pouring.

The flexibility of precast concrete construction also allows for potential future vertical expansion of the pavilion. Herman notes that while mechanical systems currently occupy the fourth floor of the building, that floor is essentially enclosed with precast concrete panels and window openings. "It provides a buffer space to build vertically and not impact patients below," she says.

Phillips says Jacksonville-based architectural firm Gresham Smith had to design the fourth floor to potentially accommodate patient live loads should the hospital expand vertically and add more patient rooms. The building was, in fact, designed to potentially accommodate four additional floors. "So we had to provide for reaction loads for foundation design as if the hospital was eight stories," Phillips explains.

That created a challenge for how to connect all those future walls. Phillips says the shear walls used NMB splice sleeves that were cast into the panels for future connections, while all of the remaining walls and columns had grout tubes cast into them to allow new precast concrete wall panels to be stacked and attached on top of existing exterior walls.

GATE also manufactured precast concrete for a connector wing that attached to the existing hospital. "However, we couldn't design for a rigid connection between the new precast concrete and the existing hospital wall, so we had to design it with a slide bearing connection that allowed for an expansion joint between existing and new construction," Phillips says.

Precast Concrete Solution Complements Existing Architecture

The construction team took only 10 weeks to set 547 prefabricated concrete components and enclose the 58,000-ft^2 facility. GATE Precast achieved some efficiencies from repetition with six to eight different panel types with window layouts that could be repeated around the building. Also, many of the precast concrete panels feature embedded thin brick that was cast into the panels at the plant.

"The pavilion complements existing architecture," Herman says. "The older [hospital] structure is brick masonry." Meanwhile the new pavilion offers a combination of architectural precast concrete and brick façade. "It looks like it belongs there, while also being more modern," Herman adds.

Parking is on the first level with hospital services starting on the second floor. The design and construction teams were mindful of past flooding events and wanted to ensure patient care would not be impacted in the event of future flood events. Herman says the new pavilion is about 12 ft off the ground, meeting the requirements for a 500-year flood event.

Total–precast concrete construction streamlined the building process, reduced the number of trades required on-site, and minimized disruptions on a jobsite with limited laydown areas for products and installation.

A QUICK **UPGRADE** IN PATIENT **CARE**

When Ascension St. Vincent's Riverside hospital needed to expand and consolidate services for cardiac patients, total–precast concrete provided an all-in-one solution on a tight timeline and options for future growth. Key benefits of precast concrete construction of the Delores Barr Weaver Pavilion included:

- fast construction timeline;
- limited noise, traffic, and construction disruption to adjacent hospital;
- flexible design with easy scalability for future growth;
- off-site panel manufacture to limit laydown on-site;
- reduced need for trades on-site.

PEACE LUTHERAN CHURCH FAMILY ACTIVITY CENTER ADDITION

SIOUX FALLS, S.DAK. /// *BY DEBORAH R. HUSO*

The largest Lutheran church in Sioux Falls, S.Dak., Peace Lutheran Church, has provided a space for worship and community since the 1960s. But because of its growing congregation, the church needed a better gathering space to accommodate the inflow and outflow of members between two Sunday services as well as an activity space to house a gym, family activities, and musical rehearsal space and classrooms.

"We've helped out Peace Lutheran Church several times," says Chase Kramer, director of design for Sioux Falls-based TSP Inc., the project's architect and engineer. "The church wanted a master plan due to growth." TSP won the master planning project in 2020, and out of that plan, the family activity center addition, completed in 2024, became the top priority.

"The family activity center was where we really looked at different [construction] options—stick-built, steel, and precast concrete," Kramer says. One of the church's building committee members, Joe Bunkers, president of Sioux Falls precast concrete producer Gage Brothers, planted the idea of a precast concrete structure. In the end, the committee decided to use precast concrete for the gym portion of the family activity center addition and steel frame for the future music center.

For the gym, precast concrete provides both structure and façade, consisting of precast concrete wall panels and double tees. The key reason the team chose precast concrete was for its constructability and to accommodate an accelerated building schedule. "We know precast concrete works well for gym spaces," says Kramer. "It makes for efficient construction and quick delivery. You get it to the site, and it goes up really fast."

"Precast concrete is almost always the structure of choice in this area," adds Bunkers. "It offers really good insulation, goes up quickly, and is extremely durable inside and outside."

Precast concrete insulated structural panels with architectural finish make up the activity center's walls. "They're doing the brunt work of bearing double tees," says Kramer. "There are no beams supporting the system." Precast concrete hollow-core slabs supported by a steel structure make up the space between the existing church structure and the new two-story family activity center.

The precast concrete wall panels run all the way from the foundation to the roof. The largest wall panels are 40 ft tall with a width of 12 ft, weighing in at over 50,000 lb.

The canopy roof of the activity center consists of metal panels supported by precast concrete double tees that are exposed on the inside and run through the wall panels to create the architectural feature of an overhang. The orange and dark gray sandblasted finish matches the existing church with its brick facing and a heavy band of dark gray exterior insulation and finish system above.

PROJECT SPOTLIGHT
PEACE LUTHERAN CHURCH FAMILY ACTIVITY CENTER ADDITION

Location: Sioux Falls, S.Dak.
Size: 13,300 ft^2
Cost: $8.4 million
Owner: Peace Lutheran Church, Sioux Falls, S.Dak.
Architect and Structural Engineer: TSP Inc., Sioux Falls, S.Dak.
Contractor: McGough Construction, Sioux Falls, S.Dak.
PCI-Certified Precast Concrete Producer: Gage Brothers, Sioux Falls, S.Dak.
PCI-Certified Precast Concrete Erector: Gil Haugan Construction, Sioux Falls, S.Dak.
Precast Concrete Components: 89 pieces totaling 21,568 ft^2, including 11 double tees, 41 hollow-core slabs, and 37 insulated wall panels

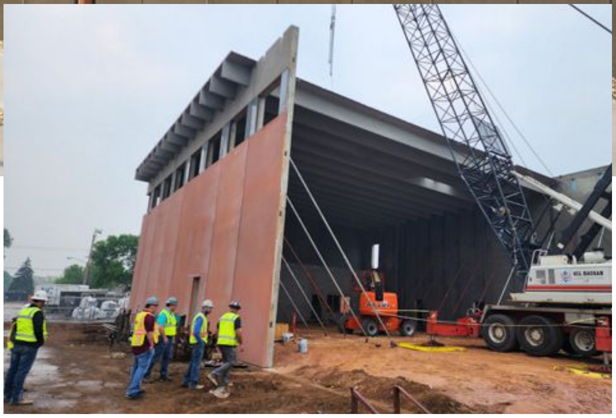
The design team had originally wanted the orange color of the structure to be thin brick to match the church. This proved too costly, however, so they settled on an etched orange finish for the precast concrete instead, along with polished bands of gray between the windows to give the structure an aluminum framing appearance. The orange precast concrete also provides the architectural feature of a recessed cross at the new church entrance.

Clever Design Solutions

Precast concrete construction did create a few complexities, however. The master plan TSP had designed called for ribbon windows at the top of the gym structure. "Architects love continuous windows," says Bunkers. "It's a neat aesthetic, but it's hard to pull off on a load bearing wall."

So, to maintain the look of ribbon windows, TSP alternated windows with precast concrete with a dark and shiny finish that would blend with the windows to create the illusion of glass coming together at the corners of the building.

The design and building teams also had to coordinate to allow for future additions on the north side of the activity center, including a new entry that would connect to a future fellowship



hall and classroom space. "We had to plan for blockouts in the walls to allow for new openings for future walkways," explains Kramer. "We even accommodated for future roof drains."

Gage Brothers fabricated all the precast concrete components for the project in about two weeks, and erection took another two weeks.

"Cost is always a factor for a community job, and there's always an end date when you want to open, but committees are slow," Bunkers says. "Precast concrete construction gave us the ability to pick up speed and make up time in the schedule." Churches typically don't have a lot of extra money for maintenance, which also makes precast concrete an ideal building material. "And it makes a really good shelter for tornadoes, offering a safe space no matter what Mother Nature brings." ●

Top: An etched orange finish for the precast concrete along with polished bands of gray between the windows give the family activity center an aluminum framing appearance. The orange precast concrete also provides the architectural feature of a recessed cross at the new church entrance.

Bottom: The precast concrete wall panels go all the way from the foundation to the roof. The largest wall panels are 40 ft tall with a width of 12 ft, weighing in at over 50,000 lb. ***Photos****: Brian J. Rotert, Cipher Imaging.*

ONLINE EXCLUSIVE

EXPANDED CONTENT FOR: "PRECAST CONCRETE BUILDS COMMUNITY"

RAVEN PRECISION AGRICULTURE CENTER

BROOKINGS, S.DAK. /// *BY MASON NICHOLS*

Precast concrete is known worldwide as a versatile material capable of bringing nearly any project to life. From hospitals to air traffic control towers, high-rise buildings, and beyond, it's resilient, durable, and sustainable in every application. But despite all its advantages, the true power in precast concrete lies in its ability to bring people together.

Such is the case at South Dakota State University (SDSU) in Brookings, S.Dak., where university officials sought to combine two of the school's largest agriculture majors into a consolidated program. Previously, students studying agricultural and biosystems engineering and agronomy, horticulture, and plant science were separated by several blocks on campus.

University officials launched SDSU's Precision Agriculture program—the first in the United States—to bring these students together not only in their studies, but in their physical location as well. The resulting structure, the 130,000-ft2 Raven Precision Agriculture Center, is a hub for research and hands-on learning that better connects the campus thanks in large part to precast concrete.

Planting the Seeds

Early conversations surrounding the cutting-edge facility kicked off in 2015. Precast concrete was incorporated into the design due to the need for high head clearance on the building's south side, According to Colin Gaalswyk, senior mechanical engineer at SDSU, the plan was for high- and mid-bay spaces to house large agricultural equipment such as combines and tractors. These spaces also needed to be tall enough to support bridge cranes.

Shawn Crowley, director of higher education for EAPC Architects Engineers, agrees with Gaalswyk, adding that the project team sought to make the walls on the south end of the Raven Precision Agriculture Center double as both a structure and durable surface. "Precast concrete offered a solid base for the south end of the building," he says. "We could use load-bearing precast concrete and have long-span roof structures without the need for extra steel or building a separate wall."

EAPC and contractor McCownGordon partnered with Gage Brothers of Sioux Falls, S.Dak., to manufacture the precast con-

*Precast concrete walls made the south side of the Raven Precision Agriculture Center possible, enabling the construction of the high- and mid-bay spaces needed to house large agricultural equipment. **Photo**: Jordan Powers Photography.*

crete for the project. Gage Brothers produced 42 interior structural load-bearing gray wall panels totaling more than 1300 ft for the facility. For the exterior, Gage Brothers manufactured 36 3-in. XPS load-bearing structural insulated precast concrete wall panels featuring a thin-brick finish. These panels represented 1221 ft with a maximum panel weight of nearly 52,000 lb.

Rooted in Collaboration

From the beginning of the project, substantial collaboration was necessary. The work leveraged a high level of building information modeling (BIM) coordination, including weekly meetings between the precast concrete producer and the contractor. "Our precast process performs best when BIM coordination starts early," says Ann Hill, business development manager for Gage Brothers. "With a well-organized model shared from the lead design team, our team was able to align grids, levels, and base points, setting the stage for accurate modeling across all trades."

Teamwork was also critical to ensuring the facility's aesthetics matched SDSU's needs. The campus relies heavily on masonry in the design of its buildings, a common motif for higher education.

"With our campus design standards, we predominantly use brick on all our facilities," Gaalswyk says. "As such, that was a major requirement for this building, especially since the facility sits on a prominent corner of campus."

The building's high visibility meant that it needed to not only blend with nearby structures but also present itself as a modern, forward-thinking facility capable of projecting the same innovation and interconnectedness as the country's first Precision Agriculture program.

Most of the building was designed to be constructed with concrete masonry units and face brick. However, for the south end of

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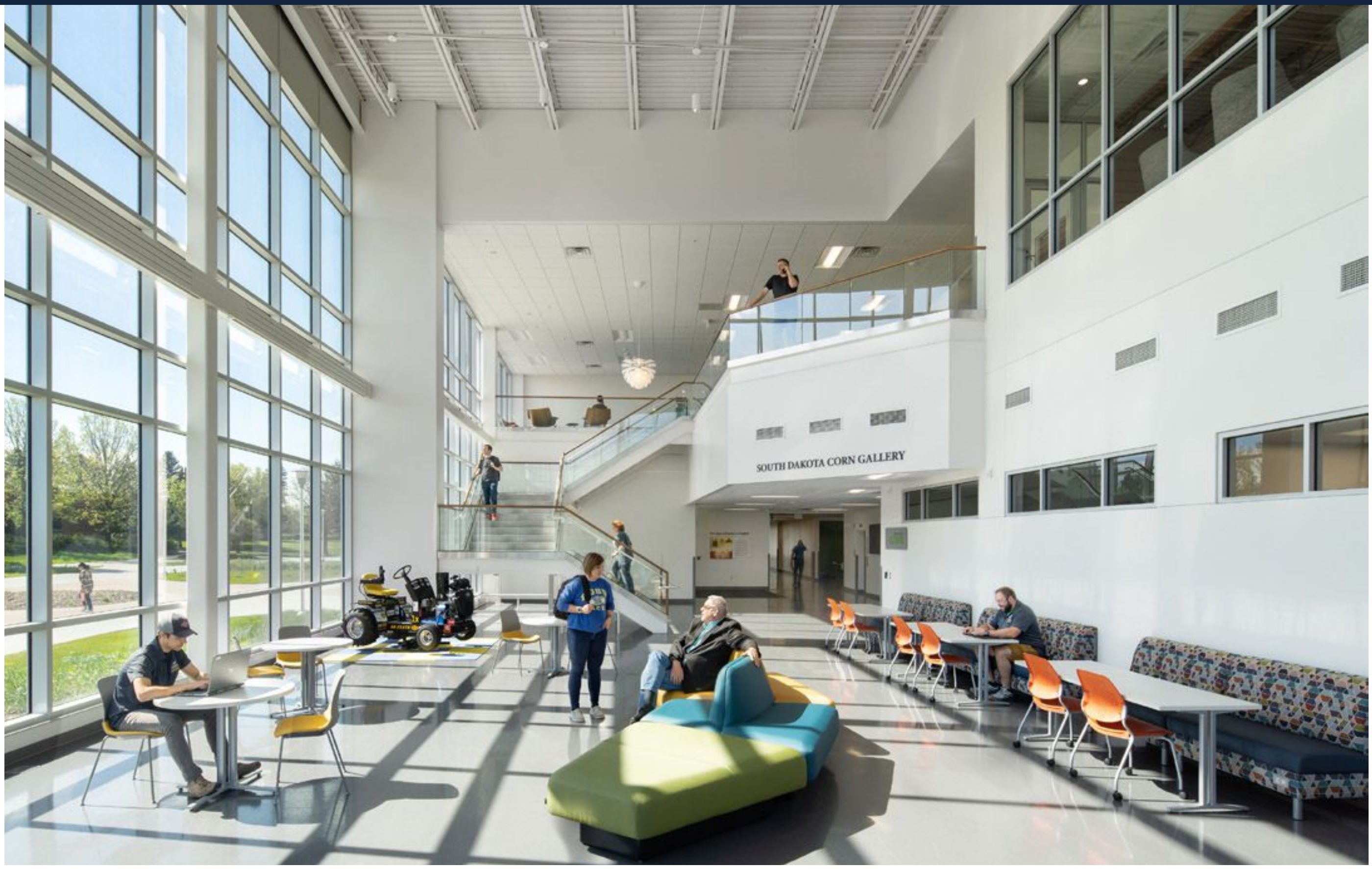


*Students of South Dakota State University's Precision Agriculture program benefit from ample collaborative spaces inside of the Raven Precision Agriculture Center. **Photo**: Jordan Powers Photography.*

the structure, which would contain the high- and mid-bay spaces, precast concrete was the material of choice.

This decision necessitated a thin-brick application for the precast concrete panels. The thin brick had to match the structure's face brick to ensure a consistent appearance along with a seamless transition where the two types of brick met.

According to Crowley, when the project team initially compared face-brick and thin-brick samples on-site, there was a distinct difference between the two. To solve this, he traveled with a McCownGordon project manager to Endicott Clay Products' plant in Nebraska to modify the thin-brick blend. Once an appropriate selection was made, the two brick types were a better match, resulting in a cohesive aesthetic across the facility's façade.

Powered by Precast Concrete

Using precast concrete brought myriad benefits to the project. The face brick and thin brick blended well through the collaborative efforts of the team, but the building also achieved a modern look via the use of other materials, including glass and metal panels.

"The main advantage for precast concrete is reducing the construction schedule for the contractor and getting the building completed sooner," Gaalswyk said. "If we had that many lineal feet to erect with large masonry block, it would have probably been another two to three months for the masonry contractor to finish."

"With CMU [concrete masonry units], you're putting up each block individually," Crowley added. "You're grouting it, you're adding rebar—a bunch of different steps that just makes things take longer. With precast, everything is done off-site, then you simply bring it in and stand it up."

Numerous environmentally friendly features were also made possible thanks to precast concrete. The Raven Precision Agriculture Center earned a LEED silver certification with features such as a 50-kW photovoltaic array, white reflective roofing, and an exhaust heat recovery system that all work cohesively with the precast concrete enclosure.

Beyond these benefits, the building further enhances the SDSU community bringing faculty and students together, including those outside of the newly formed Precision Agriculture program. Several other departments use the spaces in the building, including the many collaboration spaces housed within—a reflection of how the Raven Precision Agriculture Center was designed and ultimately constructed.

The Raven Precision Agriculture Center expertly blends face brick and thin brick in a facility that's as resilient and sustainable as it is aesthetically pleasing.
Photo: *Brian Rotert, Cipher Imaging.*

"By taking advantage of the inherent speed of construction, reduced maintenance, and long lifespan precast concrete provides, SDSU can further their mission by adding new spaces and programming while spending less on maintenance and replacement," says Joe Bunkers, Gage Brothers president. "In the case of the Raven Precision Agriculture Center, SDSU will teach the next generation of farmers how to better manage farming operations to literally help feed the world."

Copious Community Impact

The Raven Precision Agriculture Center stands as a symbol of SDSU's dedication to transforming the way the agriculture field will operate in the future. Those who are learning inside the space will become the field's leaders of tomorrow, ultimately transforming local communities through their work. On the strength, durability, and sustainability of precast concrete, the facility stands as a testament to what's possible at the intersection of collaboration and innovation.

PROJECT SPOTLIGHT
RAVEN PRECISION AGRICULTURE CENTER

Location: Brookings, S.Dak.

Owner: South Dakota State University, Brookings, S.Dak.

Architect: Clark & Enersen, Lincoln, Neb.;
EAPC Architects Engineers, Sioux Falls, S.Dak.

Contractor: McCownGordon Construction, Kansas City, Mo.

Engineer: Clark Engineering (Civil Engineering – Aberdeen, S.Dak.; Structural Engineering – Sioux Falls, S.Dak.)

PCI-Certified Precast Concrete Producer:
Gage Brothers, Sioux Falls, S.Dak.

Precast Concrete Components: 36 load-bearing structural insulated wall panels (thin-brick finish), 42 interior structural load-bearing wall panels

ONLINE EXCLUSIVE

EXPANDED CONTENT FOR: "PRECAST CONCRETE BUILDS COMMUNITY"

*To complement the historic feel of downtown Plainfield with its mostly brick architecture, the performing arts center features brick facing on the precast concrete wall panels. **Photos**: Coreslab Structures (INDIANAPOLIS) Inc.*

PLAINFIELD PERFORMING ARTS CENTER

PLAINFIELD, IND. /// *BY DEBORAH R. HUSO*

In 2018, the town of Plainfield, Ind., was well into planning for a downtown redevelopment and was looking for a new home for their town hall and civic center. "They did not have a designated performing arts center, just a movie-style theater downtown that had fallen into disrepair," says Zachary Hilleson, senior associate at the Indianapolis office of RATIO Design.

The town decided to combine needs into a single new structure that would accommodate daytime, evening, and weekend use. "It's really a bifurcated building, meaning half government center and half arts center," Hilleson says. "So we had to align project needs with the government as well as the arts side."

The new government center was the first priority and was completed in 2022. To build the adjoining arts center, with its 600-seat theater, the client wanted a streamlined construction process. Precast concrete quickly rose to the top of the list as the ideal construction material.

The design team at RATIO considered brick, glass, metal panels, and limestone for the exterior. "But when we began to look at what would surround the auditorium, we knew we needed a structure that could vault 50 to 80 feet above finished street level," Hilleson adds. "We knew precast concrete would meet structural, fire rating, and acoustical performance requirements."

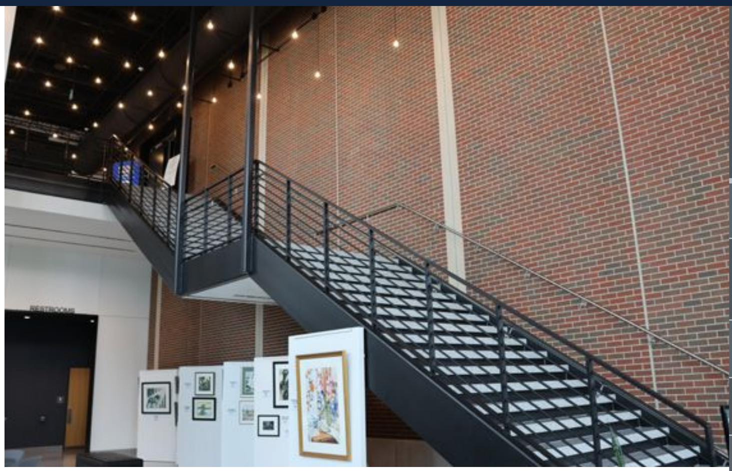
Reducing Disruption

Precast concrete serves as both structure and façade for the Plainfield Performing Arts Center. While the government center features steel-frame wall construction with a metal stud frame infill and insulated brick veneer, the performing arts center is mainly constructed of precast concrete components to address the structural needs of the auditorium, fly tower above the stage, and the equipment dock.

"Precast concrete was the core shell of the performing arts center," says Corey Greika, vice president and general manager of Coreslab Structures (INDIANAPOLIS) Inc. "The precast concrete wall panels performed a variety of duties. Structurally, they are load bearing for floor and roof framing. They are the shear walls for the building. And they create the big proscenium opening for the stage."

Precast concrete also enabled a faster construction timeline because the town hall portion of the building was completed first and was occupied by employees while the performing arts center was under construction. "During the second half of the project, you had people working and living around a construction site," says Hilleson. "Precast concrete was an advantage there. Building components off-site [allowed] the mass of the building to go up very quickly."

There was no place for laydown when erecting the performing arts center because of the already-constructed government building. The construction team therefore had to work out dif-



Interior inlaid brick into precast concrete complements the look of the surrounding area.

PROJECT SPOTLIGHT
PLAINFIELD PERFORMING ARTS CENTER

- Location: Plainfield, Ind.
- Size: 40,000 ft2 for the performing arts center; 100,000 ft2 including the government center
- Cost: $44 million
- Owner: Town of Plainfield, Ind.
- Architect: RATIO Design, Indianapolis, Ind.
- Contractor: The Hagerman Group, Fishers, Ind.
- Structural Engineers: Fink Roberts & Petrie Inc., Indianapolis, Ind.
- PCI-Certified Precast Concrete Producer: Coreslab Structures, (INDIANAPOLIS) Inc.
- Precast Concrete Engineer: Unity Design, Buffalo Grove, Ill.
- Precast Concrete Components: 145 components, including 98 13-in.-thick insulated load-bearing panels with thin brick, 7 8-in.-thick solid walls with thin brick, 38 5-in.-thick pieces at the parapet, and 2 20-in. square columns

ferent locations for the crane, which was actually located inside the building footprint to erect the fly loft for the theater. "All the precast concrete was erected straight off the truck," says Greika.

Another advantage of precast concrete was having panels that served as structure, insulation, and architectural façade. The precast concrete panel walls are 13 in. thick, including 3 in. of insulation. The precast concrete walls also provide necessary acoustic separation, given that the performing arts center is adjacent to a national highway and close to an airport.

"We also knew we needed a firewall separating the two sides of the building," says Hilleson. "One edge of the auditorium box is also a firewall." Precast concrete readily met those separation of occupancy requirements.

To complement the historic feel of downtown Plainfield with its mostly brick architecture, the team knew they had to create a brick façade for the combined government building and arts center. The same brick used for stud framing, Belden Commodore Full Range Velour, serves as brick facing on the precast concrete wall panels. "You can't tell the difference between the two," says Hilleson. Concrete was poured over the brick in the molds at the factory.

Support for Tall Walls and Wide Openings

RATIO and Coreslab coordinated on the size of the wall panels based on what was possible to transport. "We initially wanted solid precast panels all the way to the top of the arts center at 80 feet," Hilleson says. "But you can't transport an 80-foot piece of precast concrete." So the team had to determine a dividing line for the wall panels and address connecting precast concrete to precast concrete. "We needed to make sure it wouldn't interrupt aesthetics," he adds.

The tallest panels are 50 ft high and just under 10 ft wide. The team used two panels, one stacked on top of the other, to achieve the 80-ft height required for the auditorium flyover. The remainder of the auditorium is one panel high with a 5-in. decorative precast concrete component at the top.

The individual panels are separated by a vertical precast concrete pinstripe that approximates the look of the actual limestone around the base of the building. Those vertical pinstripes hold a centered joint, but there is also another joint halfway between the pinstripes.

Because the precast concrete panels provided a self-supporting wall, Coreslab cast steel embeds directly into the walls to attach them to the structure of the roof. The roof load thus transfers directly to the foundation, eliminating the need for a separate steel structure inside the precast concrete.

Precast concrete also helped address the structural challenge of all the openings in the theater box. "You need an opening in the frame around the stage," Hilleson says. "You also have a huge opening at the dock where you bring scenes in." Therefore, the design team had to consider how to make the precast concrete components remain structural without taking too much structural capacity out of the panels and allow for transfer of gravity loads to the walls.

The project included 145 precast concrete components with a total erection duration of four weeks spread out over three mobilizations. "Precast concrete gave us the ability to integrate so much—structure, insulation, electrical, and architectural," Greika says.

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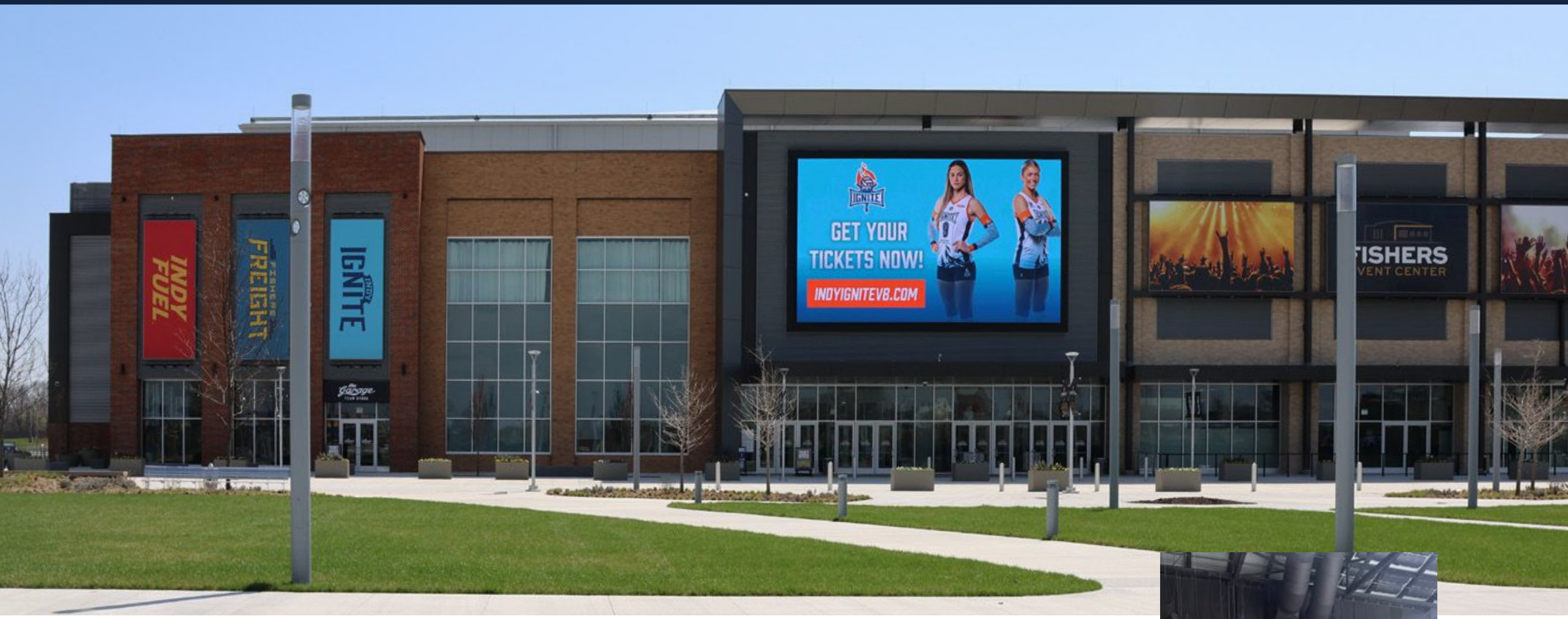
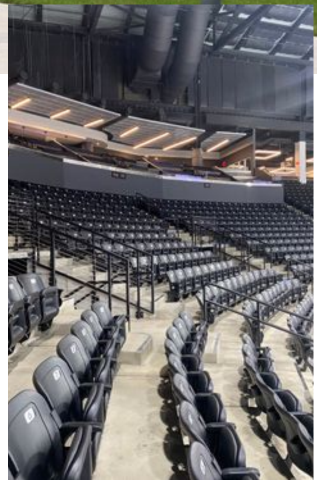




Top: The seating bowl features Coreslab's structural gray concrete with form finish bottoms and trowel top finishes to ensure both durability and a sleek aesthetic.

Right: Coreslab Structures supplied concrete for the seating bowl for the Fishers Event Center, which opened in November 2024. ***Photos:*** *Coreslab Structures (INDIANAPOLIS) Inc.*

FISHERS EVENT CENTER

FISHERS, IND. /// *BY DEBORAH R. HUSO*

A northern suburb of Indianapolis, the city of Fishers, Ind., has been working over the past decade to become a destination in its own right. The city recently redeveloped their downtown main street, added new parking structures, many mixed-use developments, a new police station, and a municipal arts center.

"We've been very involved in their redevelopment over the last 10 years," says Corey Greika, vice president and general manager of Coreslab Structures (INDIANAPOLIS) Inc. "They've used precast concrete in a variety of ways—and basically employed every type of precast concrete available."

Recently the city found another opportunity to enhance its downtown when the Indy Fuel, a professional hockey team located at the state fairgrounds in Indianapolis, was seeking a new home. The Indy Fuel agreed to move into the new event center if the city of Fishers would build it. So in 2023, construction began.

Precast Concrete for the Win

The city called upon Coreslab yet again, this time to build a state-of-the-art seating bowl for the new Fishers Event Center, one that would accommodate not just the fans of hockey games but also other athletic tournaments as well as concerts. "Precast concrete was a better option than steel as far as acoustics, structural resilience, and fire ratings go," says Greika.

The city needed the seating bowl, which is designed to seat 7500 people, to be flexible and also wanted it to mimic the sight lines used at the downtown Indianapolis home of the Pacers. Coreslab's Indianapolis plant was involved in that project in 1995.

"Precast concrete was fast," Greika explains. "The city of Fishers was able to award the seating bowl on a design-build contract." Coreslab worked with the structural steel contractor to meet an accelerated building schedule that would have the entire event venue substantially built by the end of 2024.

With the aggressive construction schedule, precast concrete had to be erected at night, while workers erected steel during the day. The erection team used a hidden pin connection to attach the precast concrete components to the steel frame. Coreslab cast a sleeve in the precast concrete that fit over the steel studs and then grouted that pocket. "It's a fast, clean connection," Greika explains.

It took only six weeks to erect all the precast concrete, with in-factory fabrication taking about four months. Coreslab had only seven to eight months to design and manufacture the precast concrete components and began fabricating in September. Precast concrete erection started in December 2023 and was completed in March.

The seating bowl consists of precast concrete double risers and a few single risers, precast concrete stair units, and some precast concrete wall panels at stairs and overbuilds for camera wells on top of precast concrete seating systems.

A Sleek Finish for Sports Architecture

The seating bowl consists of precast concrete single and double risers, precast concrete stair units, and precast concrete wall panels at stairs and overbuilds for camera wells on top of precast concrete seating systems.

Coreslab used three different forms to fabricate the seating units. The typical span of the riser units was 30 ft. The seating bowl features Coreslab's structural gray concrete with form finish bottoms and trowel top finishes to ensure both durability and a sleek aesthetic.

"Precast concrete is durable, easy to clean, fire resistant, and offers good sound attenuation," Greika says. "It's a highly used product for this type of application."

The Fishers Event Center had its grand opening in November 2024 and has become a game changer for the development of Fishers' entertainment scene. Home to the Indy Fuel as well as professional volleyball team the Indy Ignite, the event center also hosts a variety of concerts and events. The arena's precast concrete seating bowl showcases the strength, efficiency, and precision of precast concrete in modern sports architecture that has to meet standards of design versatility to accommodate both high-impact sports as well as large-scale concerts.

"We have more projects coming in Fishers," says Greika. "The city has become much bigger, and they've done a lot of it with precast concrete." ●

PROJECT SPOTLIGHT
FISHERS EVENT CENTER

Location: Fishers, Ind.

Size: 200,000 ft2

Cost: $170 million total, of which the precast concrete cost $3.8 million

Owner: City of Fishers, Ind.

Architect: SCI Architects, New York, N.Y.

Contractor: AECOM Hunt, Indianapolis, Ind.

Structural Engineer: Fink, Roberts, Petrie Inc., Indianapolis, Ind.

PCI-Certified Precast Concrete Producer: Coreslab Structures (INDIANAPOLIS) Inc.

Precast Concrete Components: 429 pieces equaling 45,868 ft^2 and including 15 stair units, 97 single risers, 247 double risers, 2 flat slabs, and 68 wall panels

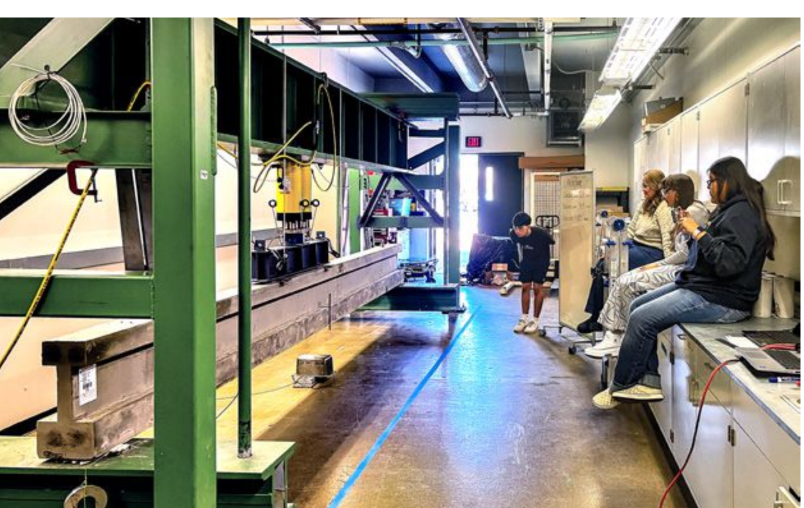
ADVERTORIAL

HOW ENCON UNITED COMPANY BUILDS COMMUNITY

Bridging Industry and Academia

BY MELODY MADUELL

Thanks to the Innovative Building Technology (IBT) Precast grant from the PCI Foundation, EnCon United Company and Northern Arizona University (NAU) have established a transformative partnership that reaches beyond traditional recruitment to create spaces that spark passion, give purpose, and address critical challenges in construction.



This year's NAU team for PCI's Big Beam contest watch as they stress test their beam that was poured in Tpac's yard.

Strategic Community Building

Building a community is more than providing safe, healthy spaces, "those spaces start in people's minds," said Marc Davis, Vice President/General Manager of Encon's Southwest Division, Tpac. "By building relationships with the people inside the schools we build, we are able to reach deeper into the recruitment pipeline and stir up more interest," he explained. With labor shortages driven by demographic shifts, Davis acknowledged, "We can't replicate the manpower we used to have."

At a PCI event, Davis and fellow Arizona resident Ben Dymond, Ph.D., Associate Professor of Structural Engineering at NAU, met alongside Jason Lien, P.E., FPCI, Colorado-based VP of EnCon United, and CU Denver Architecture Professor Matthew Shea. "We talk about tackling industry problems from both ends," said Shea, with Lien elaborating on "big struggles like labor shortage, gender bias, mental health, and greenhouse gas emissions." The group believes longer vertical and horizontal integration could resolve these challenges by bringing more talent to the table.

Interfacing at Academic Intersections

The demand for construction managers far exceeds supply, with only 6,000 annual graduates nationwide against 20,000 openings. Sponsored by 55 companies, NAU's Construction Management (CM) program is a de facto, "neutral-ish ground for super-competitive companies to work together," explained Professor John Tingerthal, Ed.D.

Shelley Hartnett, EnCon's Sr. VP of Business Development, recently visited to support Shea's architecture students in their final project—a precast/prestressed concrete hospitality build in downtown Denver. Hartnett judged alongside industry players, agreeing with Tingerthal that "it's a neutral place for us all to focus efforts on preparing students."

Recently, Tpac expanded their NAU relationship thanks to the PCI Foundation grant. Davis noted, "the extra time spent at school helps solve personnel issues," referring to a student who brandished a resume during a yard tour, "and improves industry quality itself."

Empathy-Driven Education

Timothy Womack, Assistant Professor of Practice in CM at NAU, knows from experience that "projects go smoother when architects understand builders' constraints and builders understand architects' workflows." NAU's Construction Management program focuses on building empathy, which Lien supported, "better understanding reduces miscommunication and backtracking, and faster projects save time and money."

This approach began when the department identified a need for synergy. NAU previously had separate labs for electrical, soils, plumbing studies, etc., "but that didn't prepare them for the real world where they combine into one product," recalled Tingerthal. In 2012, they revamped the lab area adopting vertical and horizontal integrations as NAU's Construction for Practice (C4P) Lab. Dymond reported students now "see how materials work together and grasp why they can't just move plumbing over an inch."

The lab's capstone project requires sophomores, juniors, and seniors collaborate as builders, architects, and project managers. "By graduation, they've gained empathy for all roles they'll manage," Womack explained. This achieves a 98% job placement rate. Dane Lind, Tpac Project Manager Assistant, observed during a student tour that "they understood enough to be curious about our processes." If students are able to get more from a precast yard tour, then they're more likely to keep precast in mind.

Precast Concrete Innovation and Sustainability

The PCI Foundation funds a precast/prestressed concrete course for Spring 2026. "The course will cover how precast works, specification, hands-on manufacturing, and innovative building technologies like carbon capture," detailed Tingerthal.

Fellow mechanical engineering Assistant Professor and researcher Jennifer Wade, Ph. D, informs the incorporated innovation topics, "Precast is sustainable—durable, reliable, with thermal inertia and great albedo," Wade stated. "Its largest CO_2 source is portland cement, used in the last 150-200 years, while concrete has existed for thousands." Wade studies differences between portland cement and trapped carbon alternatives. "The gap between lab discoveries and manufacturing adoption remains wide," she admitted, hoping the grant's professional involvement will bridge her research with industry. The entire construction industry stands to benefit as more pieces of the looming greenhouse gas problem are solved.

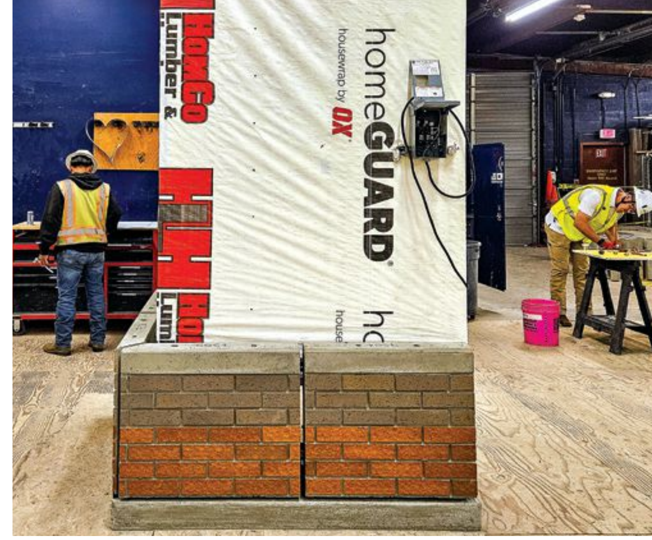
How Precast Concrete Benefits Learning

True to their method of integration, NAU has three programs participating in the IBT Precast grant: Construction Management, Civil Engineering, Mechanical Engineering and weekly seminars. Weekly seminars attract non-CM majors, including a psychology student recruited by Hensel Phelps. Womack noted, "with mental health being another industry crisis, incorporating people like her makes meaningful impact."

Though the grant-funded course hasn't started enrollment, precast is now "integral to our lab," said Womack, "because the importance of pre-planning, sticking with a plan, coordinating, and communicating are all enhanced by the precast."

The grant came to fruition mid-semester, so mid-semester, professors created a design change from brick to precast. "We throw in mistakes like wrong materials or measurements," added Dymond, "so this material change order was typical."

Once the grant came through, Womack leveraged increased Tpac access, having Lind zoom into classrooms as a supplier. EnCon United engineers made shop drawings, which students then reincorporated into their designs. Students chose architectural finishes, giving them intimate knowledge of precast's incredible adaptability.



Four of the eight miniaturized precast/prestressed concrete panels are installed on a team's final projects in the CM lab.

Although not all the teams were able to complete the installation of the wall panels this year, Womack was still impressed. "I was not expecting the precision we achieved," he said, crediting EnCon United's donations of time, materials, and hydraulic installation rigs, plus Lind's personal involvement. "The result was an elevated learning experience for all, and we're excited to continue this," Womack stated.

Solving Labor Shortage Via Gender Diversity

Dymond and Womack noted that as the academic trend swings back in favor of the trades, it has brought more women with it. "This is a great industry, with a lot of opportunities in a lot of different areas, so we have room for everyone," said Womack. This year's PCI Big Beam contest team, mentored by Dymond and described as "much more enthusiastic," comprises of mostly young women.

One of those students, Isabella Velasco, visited EnCon headquarters recently. She switched to engineering thanks to the lab piquing her curiosity, "I wondered why it was always busy," Velasco recalled. After losing passion for dental hygiene, "once I found math was involved, I switched to engineering." Graduating this year from Civil Engineering, she appreciates the head-start from the grant, "you're working and building connections during school."

Conclusion

The EnCon United-NAU partnership demonstrates how academia and industry can collaboratively address workforce and sustainability challenges. By fostering empathy, technical rigor, and innovation, the initiative prepares students while providing companies with adaptable talent, setting precedent for cross-sector collaboration in solving global challenges. ●

Learn more about Encon United at enconunited.com.

THANK YOU TO ALL THE VENDORS WHO CONTRIBUTED TO THE CM LAB FINAL PROJECT:

- ALP Supply, Tony Cuttone
- EnCon United Company
- Hilti, Fredrick Auer
- Innovative Brick Systems, Sherry Cooney
- JVI, Heidi Zieman & Chris Walk-Faust
- MetroBrick, Michael Mizer

And a special thanks to Paul Kramer & Dane Lind for their personal donations!

UNIVERSITY PROFILE

LADIES IN CONCRETE WORKSHOP LEAVES LASTING IMPACT

Welding is a popular part of the workshop at Middle Tennessee State University. ***All photos:*** *Nikole Clow/PCI.*

BY NIKOLE CLOW

Driven by a vision to blend creativity, passion, and skill with the need to attract more young women to the concrete industry, Natalie Martin, director of business development and membership at PCI, crafted the Ladies in Concrete Workshop. With the Concrete Industry Management (CIM) Patrons Board — coordinator Sally Victory, director Jon Huddelston, industry and academic specialist Nicole Green, and lab manager Cannon Lamb — the concept came to fruition. In 2024, the Ladies in Concrete Workshop welcomed more than 200 participants. Following the resounding success of that event, the Ladies in Concrete Workshop returned in 2025 with more areas of fieldwork and the hope of inspiring more young women.

In May, over 300 young women from schools in central Tennessee gathered at Middle Tennessee State University's (MTSU's) School of Concrete and Construction Management in Murfreesboro. Organized by the CIM program at MTSU, the Ladies in Concrete Workshop promotes the concrete industry and educates women on the many fields and opportunities available. Young women in middle school to high school participated in sessions including hand and power tools, delivery systems, heavy equipment, mixture proportions, masonry, precast concrete and finishing, three-dimensional printing, and even welding.

Natalie Martin, director of business development and membership at PCI, instructs students with the precast concrete doghouse in the foreground.

Operational Experience

In the welding workshop, students received hands-on experience by welding two halves of a heart together. Each participant suited up in their personal protective equipment, stepped behind a welding screen, and partnered with one of three professional welders for one-on-one instruction. Welding is always a favorite of the students and volunteers, mainly for that firsthand engagement.

"A lot of girls don't understand what all goes into concrete and what kind of jobs you have with it," said Claire Mullins, a recent MTSU graduate and second-year Ladies in Concrete Workshop volunteer. "Letting them get hands-on experience and learning what we actually get to do is my favorite part."

During the precast concrete and finishing workshop, students engaged with Martin and learned how to read plans, understand formwork and lightweight fiber mixtures, and build a concrete doghouse. They gained insight into why precast concrete is one of the most versatile and durable building materials today. Students also received real-world experience for mapping out and using tools to create different finishes on concrete with Arie Milam, who works in business development at Wayne Brothers.

Bringing Precast Concrete to Life

FINFROCK's engineering and quality control department provided drawings and mixture proportions for a precast concrete doghouse, giving the students an opportunity to learn how precast concrete is shaped and brought to life. "This is truly a dream come true to bring industry leaders from different concrete divisions in to run all these workshops and to see these young ladies getting their hands dirty even with fancy nails," said Martin, an alumna of the CIM program at MTSU. "These women were fearless and incredibly supportive of one another. Our workshops were a success! One young lady was so confident in what she learned that she put together a detailed list of items to make her dad a concrete grilling tool board for Father's Day. How cool is that!"

MTSU CIM student Nikki Bennett expressed her gratitude for the Ladies in Concrete Workshop event, which she also attended last year. "Many programs don't give you opportunities, but when I came here and saw what they do, I realized that they have a lot of opportunities for jobs, internships, even volunteering," she said. "I wanted to be a part of it and part of [this] community. This is going to shape my whole career." Volunteering for this year's event gave Bennett the opportunity to experience this event from a different perspective and see how much the program has grown.

The Ladies in Concrete Workshop started out as a dream but has become a testament to the success of programs that champion women in the concrete industry. Based on feedback from those who have attended, this program leaves a lasting impression and a positive impact. Hannah Neal, a second-year CIM student, expressed how enlightening this program is. "[The girls] were all crazy excited. To see a light go off in their head when they're like, 'Wow, I can do this, I can be part of this.' That was really cool."

The Ladies in Concrete Workshop will return to MTSU in spring 2026. ●

Nikole Clow is marketing manager at PCI. Email nclow@pci.org.

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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 thefollowing product group(s) and category(ies): [Select appropriate groups and categories (AA, AB, AC, AD, or AT), (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 Structural Precast Concrete Products*
- MNL–117 *Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products*
- 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. The A categories are in descending order (AB is certified for AB, AC and AD whereas AD is only certified for AD). Yet, B4 is certified in all B categories and B1 is only certified in B1. So, B1 is the 'basic level' and AD is the 'basic level.' Going for AA to AD would be descending levels of complexity and B1 to B4 would be ascending levels of capability.

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 AD – ARCHITECTURAL PRECAST PRODUCTS

Includes structural products with an architectural finish such as plant applied finishes, formliners, brick veneers or extruded profiles.

CATEGORY AC – ARCHITECTURAL PRECAST PRODUCTS

Includes primarily cladding or non-load bearing products with architectural finishes such as plant applied finishes, formliners, brick veneers or extruded profiles, as well as products in Categories AT and AD.

CATEGORY AB – ARCHITECTURAL PRECAST PRODUCTS

Includes primarily cladding or non-load bearing products with multiple concrete mixes and textures, a variety of three-dimensional projections, radius mold surfaces, or sequential returns, as well as products in Categories AT, AD, and AC.

CATEGORY AA – ARCHITECTURAL PRECAST PRODUCTS

Includes primarily cladding or non-load bearing products with multiple concrete mixes and textures, a variety of three-dimensional projections, radius mold surfaces, sequential returns, and most stringent product and installation tolerances, as well as products in Categories AT, AD, AC and AB.

> GROUP B – BRIDGES

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 precast concrete producer or if required by the project specifications.

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 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 hollowcore 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 G – GLASS-FIBER-REINFORCED CONCRETE (GFRC)

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

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Con-Fab California, LLC B4,C4
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Oldcastle Infrastructure, Inc. C2
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Oldcastle Infrastructure, Inc. C1
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Basin Precast, Inc. C3
Sidney, (406) 433-7237

Missoula Concrete Construction AC,B3,C3
Missoula, (406) 549-9682

Rinker Materials B4,C3
Billings, (406) 656-1601

> NEBRASKA

American Concrete Products Co. B1,C1
Valley, (402) 991-2635

Concrete Industries, Inc. AC,B4,C4
Lincoln, (402) 441-4407

Coreslab Structures (OMAHA) Inc. AA,B4,C4
LaPlatte, (402) 291-0733

Enterprise Precast Concrete, Inc. AA,C2
Omaha, (402) 895-3848

> NEW HAMPSHIRE

Newstress Inc. B3,C3
Epsom, (603) 736-9000

> NEW JERSEY

Boccella Precast LLC C2
Berlin, (856) 767-3861

Jersey Precast AD,B4,C4
Hamilton Township, (609) 689-3700

Northeast Precast AC,B3,C3
Vineland, (866) 699-2557

Precast Systems, Inc. B4,C4
Allentown, (609) 208-1987

SJC B2,C2
Pedricktown, (609) 208-1987

> NEVADA

The Boring Company – NV Precast Plant C1
Las Vegas, (951) 525-0528

Western Pacific Precast, LLC B4,C3
Sloan, (702) 623-4484

> NEW MEXICO

Castillo Prestress B4,C4
Belen, (505) 864-0238

Coreslab Structures (ALBUQUERQUE) Inc. AC,B4,C4
Albuquerque, (505) 247-3725

> NEW YORK

David Kucera Inc. AT
Gardiner, (845) 255-1044

Fabcon – Selkirk, NY AD,B3,C3
Selkirk, (800) 727-4444

Tenflex Corporation G
Gardiner, (845) 255-1044

The Fort Miller Co., Inc. AC,B3,C3
Greenwich, (518) 695-5000

The L.C. Whitford Materials Co., Inc. B4,C3
Wellsville, (585) 593-2741

> NORTH CAROLINA

Coastal Precast Systems III, LLC, Wilmington Plant B4,C2
Wilmington, (910) 444-4682

Lindsay Precast - Franklinton B1,C3
Franklinton, (919) 494-7600

Prestress of the Carolinas B4,C4
Charlotte, (704) 587-4273

Smith-Midland Corporation B2,C2
Reidsville, (336) 349-2905

Utility Precast B3
Concord, (704) 721-0106

> NORTH DAKOTA

Rinker Materials B4
Menoken, (701) 639-7765

> OHIO

DBS Prestress of Ohio C2
Huber Heights, (937) 878-8232

Encore Precast, LLC B3
Dayton, (513) 726-5678

Fabcon - Grove City, OH AC,C3
Grove City, (800) 727-4444

High Concrete Group Springboro AA,C3
Springboro, (937) 748-2412

Lindsay Precast - Canal Fulton C3
Canal Fulton, (330) 854-4511

Mack Industries Inc. C3
Valley City, (330) 460-7005

Mack Industries Inc. B3,C3
Vienna, (330) 638-7680

Prestress Services Industries, LLC – Mt. Vernon Plant B4,C3
Mount Vernon, (740) 393-1121

Rocla Concrete Tie, Inc. C2
Sciotoville, (740) 776-3238

Sidley Precast Group AC,C3
Thompson, (440) 298-3232

> OKLAHOMA

Coreslab Structures (OKLA) Inc. (Plant 1) AC,C4
Oklahoma City, (405) 632-4944

Coreslab Structures (OKLA) Inc. (Plant 2) B3,C3
Oklahoma City, (405) 672-2325

Coreslab Structures (TULSA) Inc. B3,C3
Tulsa, (918) 438-0230

NAPCO Precast AC,C3
Broken Arrow, (918) 995-2227

> OREGON

Knife River Prestress AC,B4,C4
Harrisburg, (541) 918-5100

> PENNSYLVANIA

Architectural Precast Innovations, Inc. AB,C3
Middleburg, (570) 837-1774

Brayman Precast, LLC B1,C1
Saxonburg, (724) 352-5600

Concrete Construction Systems, LLC B3,C3
Bethel, (717) 933-4107

Conewago MFG LLC / Conewago Precast Bldg Systems AC,C3
Hanover, (717) 632-8240

Dutchland, LLC B1,C3
Gap, (717) 442-1463

Fabcon - Mahanoy City, PA AC,C3
Mahanoy City, (800) 727-4444

High Concrete Group Denver AA,C3
Denver, (717) 336-9300

Nitterhouse Concrete Products, Inc. AB,C3
Chambersburg, (717) 267-4505

Northeast Prestressed Products, LLC B4,C3
Pottsville, (570) 385-2352

PENNSTRESS, A Division Of MacInnis Group, LLC AC,B4,C4
Roaring Spring, (814) 695-2016

Say-Core Inc C2
Portage, (814) 736-8018

Sidley Precast Group C3
Youngwood, (724) 755-0205

FOR THE OFFICIAL AND MOST CURRENT PLANT AND ERECTOR DIRECTORIES, VISIT ***PCI.ORG/PCI/DIRECTORIES/PCICERTIFIEDPLANTS***

Slaw Precast AC,B3,C3
Lehighton, (610) 852-2020
Universal Concrete Products Corp. AA,C3
Stowe, (610) 323-0700

> SOUTH CAROLINA

Faddis Concrete Products B3,C3
Richburg, (540) 419-6363
Florence Concrete Products, Inc. AC,B4,C3
Sumter, (803) 775-4372
Lindsay Precast - Rock Hill B1,C3
Rock Hill, (919) 494-7600
Metromont - Greenville AC,C3
Greenville, (864) 605-5000
Metromont - Spartanburg C3
Spartanburg, (864) 605-5063
Smith-Midland Corporation B2,C2
Hopkins, (803) 708-2222
Tindall Corporation – South Carolina Division AB,C3
Spartanburg, (864) 576-3230

> SOUTH DAKOTA

Collins Precast LLC AB,C3
Iroquois, (605) 625-3123
Gage Bros. Concrete Products, Inc. AA,B4,C4
Sioux Falls, (605) 336-1180
Pete Lien & Sons, Inc. B1,C3
Rapid City, (605) 342-7224
Rinker Materials B4
Rapid City, (605) 343-1450
SteinBauer LLC AC,C3
Faulkton, (605) 324-3302

> TENNESSEE

Gate Precast, TN AA,C3
Ashland City, (615) 792-4871
Mid South Prestress, LLC C3
Pleasant View, (615) 746-6606
Ross Prestress B4,C3
Bristol, (865) 524-1485
Ross Prestress B4,C4
Knoxville, (865) 524-1485
Thomson Prestress B4,C4
Jackson, (731) 668-7305

> TEXAS

American Concrete Products of Texas, LLC B3,C3
Dallas, (214) 631-7006
Coreslab Structures (TEXAS) Inc. AA,C4
Cedar Park, (512) 250-0755
CXT Incorporated - Precast Buildings B1,C1
Hillsboro, (254) 296-6114
East Texas Precast AC,C4
Hempstead, (281) 463-0654
Enterprise Precast Concrete of Texas, LLC AA,C3
Corsicana, (903) 875-1077
Gate Precast, TX AA,C3
Hillsboro, (254) 582-7200
Gate Precast, TX C2
Pearland, (281) 485-3273
GFRC 360, LLC dba GFRC Cladding G
Garland, (972) 494-9000
Heldenfels Enterprises, Inc. (San Marcos Plant) B4,C4
San Marcos, (512) 396-2376
Legacy Precast, LLC AC,C4
Brookshire, (281) 375-2050
Lowe Precast, Inc. C3
Waco, (254) 776-9690
Manco Structures, Ltd. AC,C4
Schertz, (210) 690-1705
NAPCO Precast AC,C4
San Antonio, (210) 424-4377
Redondo Manufacturing AA,C3
Converse, (210) 661-8474
Texas Concrete Partners, LP - Elm Mott B4,C4
Elm Mott, (254) 822-1351
Texas Concrete Partners, LP - Victoria B4,C4
Victoria, (361) 573-9145
The Boring Company – TX Precast Plant C1
Bastrop, (509) 481-3881
Tindall Corporation – Texas Division AC,C3
San Antonio, (210) 248-2345
Valley Prestress Products, Inc. B4
Eagle Lake, (979) 234-7899
Valley Prestress Products, Inc. B2
Houston, (713) 455-6098

> UTAH

Contech Engineered Solutions AC,B4,C4
Salt Lake City, (801) 966-1060
Olympus Precast Plant AC,B3,C3
Bluffdale, (801) 571-5041

> VERMONT

Dailey Precast, LLC AC,C3
Shaftsbury, (802) 442-4418
Joseph P. Carrara & Sons, Inc. B4,C3
Middlebury, (802) 388-6361

> VIRGINIA

Atlantic Metrocast, Inc. B4,C4
Portsmouth, (757) 397-2317
Coastal Precast Systems III, LLC, Cape Charles Plant B4,C3
Cape Charles, (757) 545-5215
Coastal Precast Systems III, LLC, Chesapeake Plant B4,C3
Chesapeake, (757) 545-5215
Faddis Concrete Products B2,C2
King George, (540) 775-4546
HRCP Precast Plant B4
Chesapeake, (305) 796-8749
Metromont - Richmond AC,C3
Richmond, (864) 605-5013
Rockingham Precast, Inc. B4
Harrisonburg, (540) 433-8282
Shockey Precast - A Metromont Company AB,C3
Winchester, (540) 401-0101
Smith-Midland Corporation AA,B2,C2
Midland, (540) 439-3266
Tindall Corporation – Virginia Division AB,C3
Petersburg, (804) 861-8447

> WASHINGTON

Bethlehem Construction, Inc. B1,C3
Cashmere, (509) 782-1001
Concrete Technology Corporation B4,C4
Tacoma, (253) 383-3545
Jensen Infrastructure - Camas B1
Camas, (360) 834-3459
Jensen Infrastructure - Puyallup B1,C1
Puyallup, (253) 847-9782
Knife River Prestress AC,B4,C4
Newman Lake, (509) 536-3300
National Precast B3,C3
Vancouver, (360) 573-5775
voestalpine Railway Systems Nortrak Concrete Tie Plant B2,C2
Spokane Valley, (509) 921-8721

> WEST VIRGINIA

Carr Concrete B3,C3
Williamstown, (304) 850-6303

> WISCONSIN

County Prestress & Precast, LLC - Burlington, WI AC,B4,C3
Burlington, (262) 767-8700
County Prestress & Precast, LLC - Janesville, WI B4,B4-IL
Janesville, (608) 373-0950
County Prestress & Precast, LLC - Roberts, WI B4,C3
Roberts, (800) 426-1126
Huffcutt Concrete LLC AC,C1
Chippewa Falls, (715) 723-7446
International Concrete Products AA,C2
Germantown, (262) 242-7840
MidCon Products, Inc. AC,C1
Hortonville, (920) 779-4032
Stonecast Products - Germantown AA,C3
Germantown, (262) 253-6600
Wells - Valders, WI AA,B4,C3
Valders, (920) 775-4121

> WEST VIRGINIA

CXT Inc. B3,C3
Williamstown, (304) 850-6303

> WYOMING

voestalpine Railway Systems Nortrak Concrete Tie Plant C2
Cheyenne, (307) 633-8246

> MEXICO

DURA ART STONE – TECATE PLANT AB,C1,G
Tecate, (310) 467-4082
Willis De Mexico - Tecate Plant AA,C1,G
Tecate, 52 (665) 655-2222

> CANADA

BRITISH COLUMBIA

APS Architectural Precast Systems Ltd. AD,B3,C3
Langley, (604) 888-1968

NEW BRUNSWICK

Strescon Limited - Saint John Plant AB,B4,C4
Saint John, (506) 633-8877

NOVA SCOTIA

Strescon Limited - Bedford Plant B4,C4
Bedford, (902) 494-7400

ONTARIO

Global Precast, Inc. AC
Maple, (905) 832-4307

QUEBEC

BPDL AC,B1,C1
Saint-Jean-sur-Richelieu, (418) 668-6161
BPDL AC,C3
Ste-Marie-de-Beauce, (418) 668-6161
BPDL - Bombardier Plant AC,C2,G
Alma, (418) 668-6161
BPDL - Papeterie Plant AC,B1,C3
Alma, (418) 668-6161
Saramac/9229-0188 Quebec Inc. AC
Terrebonne, (450) 473-6831

> GUAM

Rocky Mountain Precast C4
Yigo, (671) 653-4701

PCI-CERTIFIED ERECTORS DIRECTORY

AS OF JUNE 2025

FOR THE OFFICIAL AND MOST CURRENT PLANT AND ERECTOR DIRECTORIES, VISIT
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When it comes to quality, why take chances?

When you need precast or precast, prestressed concrete products, choose a PCI-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-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-Certified Erector is the first step toward getting the job done right the first time, thus keeping labor costs down.
- PCI-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 certified by the Precast/Prestressed Concrete Institute (PCI) prior to the beginning of any work at the jobsite. The precast concrete erector shall be 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.

> ALABAMA

Brooks Construction, LLC A,S2
Valley Grande, (334) 349-5138

> ARIZONA

Coreslab Structures (ARIZ) Inc. A,S2
Phoenix, (602) 237-3875

EnCon Arizona, LLC dba Tpac A,S2
Phoenix, (602) 262-1360

Steel Girder, LLC dba Stinger Bridge & Iron S2
Coolidge, (520) 723-5383

> CALIFORNIA

Coreslab Structures (L.A.) Inc. S2
Perris, (951) 943-9119

> COLORADO

EnCon Field Services, LLC A,S2
Denver, (303) 287-4312

Gibbons Erectors Inc. A,S2
Englewood, (303) 841-0457

Wells A,S2
Brighton, (303) 480-1111

> CONNECTICUT

Blakeslee Prestress, Inc. A,S2
Branford, (203) 481-5306

Connecticut Mason Contractors Inc. A,S1
Middletown, (860) 296-9984

> FLORIDA

Concrete Erectors, Inc. A,S2
Longwood, (407) 862-7100

Coreslab Structures (MIAMI) Inc. A,S2
Medley, (305) 823-8950

Hodges Erectors Inc A
Miami, (305) 234-3467

Pre-Con Construction, Inc. A,S2
Lakeland, (863) 688-4504

Specialty Concrete Services, Inc. A,S2
Umatilla, (352) 669-8888

Toronto, LLC (subsidiary of Finfrock Industries, Inc.) S2
Apopka, (407) 293-4000

> GEORGIA

Bass Precast Erecting, Inc. S2
Clermont, (706) 809-7583

Ishi Precast Erectors LLC A,S2
Winder, (470) 967-4091

Jack Stevens Welding, LLP S2
Dahlonega, (770) 534-3809

Precision Stone Setting Company, Inc. A,S2
Hiram, (770) 439-1068

RGR Erectors, Inc A,S2
Cleveland, (706) 809-2718

SE Precast Erectors Inc A
Roswell, (770) 722-9212

Spring Precast LLC A,S1
Cobb, (229) 591-7009

> IDAHO

Boise Crane S2
Boise, (208) 362-3602

Inland Crane, Inc. A,S2
Boise, (208) 345-9508

Precision Precast Erectors, LLC A,S2
Post Falls, (208) 981-0060

> ILLINOIS

Area Erectors, Inc. A,S2
Rockford, (815) 562-4000

Hauter Brothers, Inc S2
Willowbrook, (708) 949-8091

Mid-States Concrete Industries, LLC S2
South Beloit, (800) 236-1072

MVP Erectors A,S2
Saint Charles, (815) 991-5404

WAUBONSEE Development A,S2
Aurora, (630) 896-4679

> INDIANA

Chicago Steel Construction, LLC A,S2
Merrillville, (219) 947-3939

F.A. Wilhelm Construction Co., Inc. A,S2
Indianapolis, (317) 359-5411

> IOWA

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

Henkel Construction Company A,S2
Mason City, (641) 423-5674

Industrial Steel Erectors S1
Davenport, (563) 388-6789

Northwest Steel Erection, Inc. A,S2
Des Moines, (515) 986-0380

Peak Construction Group Inc. S2
North Liberty, (319) 383-3474

Tri-City Iron Works S1
Davenport, (563) 441-8350

US Erectors, Inc. S2
Pleasant Hill, (515) 243-8450

Woodruff Construction S2
Ames, (515) 955-2170

> KANSAS

Carl Harris Co., Inc. A,S2
Wichita, (316) 267-8700

Crossland Construction S2
Columbus, (620) 429-1414

Doherty Steel Inc. A,S2
Paola, (913) 557-9200

Griffith Steel Erection, Inc. A,S2
Wichita, (316) 941-4455

> LOUISIANNA

C&A Erectors, LLC A,S2
West Monroe, (318) 537-3937

> MARYLAND

DLM Contractors, LLC A,S2
Upper Marlboro, (301) 877-0000

E & B Erectors, Inc. A,S2
Westminster, (410) 360-7800

EDI Precast, LLC A,S2
Upper Marlboro, (301) 877-2024

L.R. Willson and Sons, Inc. A,S2
Gambrills, (410) 987-5414

Modern Precast Erectors A
Ijamsville, (240) 626-4983

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> MASSACHUSETTS

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

> MICHIGAN

Assemblers Precast & Steel Services, Inc. A,S2
Whitmore Lake, (734) 878-5380

G2 Inc. A,S2
Cedar Springs, (616) 696-9581

Ideal Contracting LLC A,S2
Detroit, (313) 843-8000

Midwest Steel, Inc. A,S2
Detroit, (313) 873-2220

Pioneer Construction A,S2
Grand Rapids, (616) 247-6966

> MINNESOTA

Amerect, Inc. A
Newport, (651) 459-9909

Danny's Construction Company, LLC S2
Shakopee, (952) 445-4143

Fabcon Precast, LLC A,S2
Eden Prairie, (952) 890-4444

Molin Concrete Products Company A,S2
Lino Lakes, (651) 786-7722

Sowles Co. A,S2
Shakopee, (952) 698-9700

Wells A,S2
Maple Grove, (507) 380-9793

Wysan Precast Services LLC A,S2
Hawley, (218) 486-5100

Zachman Precast, Inc. S2
St. Michael, (763) 497-2529

> MISSOURI

Alberici Constructors A,S2
Overland, (314) 733-2000

Arch City Ironworks S1
Saint Louis, (314) 892-3030

Ben Hur Construction Company A,S2
Saint Louis, (314) 298-8007

Building Erection Services Company A,S2
Kansas City, (913) 764-5560

Concrete Strategies, LLC A,S2
Saint Louis, (314) 595-6300

JE Dunn Construction Company A,S2
Kansas City, (816) 474-8600

Prestressed Casting Co A,S2
Springfield, (417) 869-7350

> NEBRASKA

Davis Erection A Division of Topping Out, Inc. A,S2
Gretna, (800) 279-1201

Patriot Steel Erection A,S2
Gretna, (402) 616-2315

> NEVADA

WPP Construction, LLC S2
Sloan, (702) 329-1136

> NEW HAMPSHIRE

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

Newstress Inc. S2
Epsom, (603) 736-9000

> NEW JERSEY

JEMCO Erectors, Inc. A,S2
Shamong, (609) 268-0332

Reliant Steel Construction A,S2
Blackwood, (856) 725-5715

Stonebridge Inc. A,S2
South Plainfield, (908) 753-1100

TCN & Co., LLC A,S2
Barrington, (856) 983-2580

> NEW MEXICO

Structural Services, Inc. A,S2
Albuquerque, (505) 345-0838

> NEW YORK

A.J. McNulty & Co., Inc. A,S2
Maspeth, (718) 784-1655

Barone Steel S1
Brooklyn, (718) 832-4705

J.C. Steel Erectors Corporation A,S2
Islip, (631) 624-4088

Koehler Masonry Corp. A,S2
Farmingdale, (631) 694-4720

Tutor Perini Corporation S2
New Rochelle, (914) 739-1908

U.S. Crane & Rigging, LLC A
Bronx, (718) 418-2020

> NORTH CAROLINA

Carolina Stone Setting Company, Inc. A,S2
Cary, (919) 467-4692

> NORTH DAKOTA

Comstock Construction, Inc. S2
Wahpeton, (701) 642-3207

Magnum Contracting, Inc. S2
Fargo, (701) 235-5285

Northwest Contracting Inc. A,S2
Bismarck, (701) 255-7727

PKG Contracting, Inc. S2
Fargo, (701) 232-3878

> OHIO

Precast Services, Inc. A,S2
Twinsburg, (330) 425-2880

Sidley Precast Group A,S2
Thompson, (440) 298-3232

> OKLAHOMA

Coreslab Structures (OKLA) Inc. A,S2
Oklahoma City, (405) 632-4944

> PENNSYLVANIA

Century Steel Erectors A,S2
Kittanning, (724) 545-3443

Conewago Precast Building Systems A,S2
Hanover, (717) 632-7722

High Structural Erectors, LLC A,S2
Lancaster, (717) 207-4314

Independence Erectors A,S2
Chester, (310) 388-1863

Kinsley Steel Inc A,S1
York, (717) 741-3841

Nitterhouse Concrete Products, Inc. S2
Chambersburg, (717) 267-4505

> SOUTH CAROLINA

Davis Erecting & Finishing, Inc. A,S2
Greenville, (864) 220-0490

Florence Concrete Products, Inc. S2
Florence, (843) 662-2549

Keith's Welding Service Inc. A,S2
Travelers Rest, (864) 895-8191

Tindall Corporation - South Carolina Division A,S2
Spartanburg, (864) 576-3230

> SOUTH DAKOTA

Bluarc Steel and Precast Inc. S2
Sioux Falls, (605) 331-5267

Fiegen Construction Company A,S2
Sioux Falls, (605) 335-6000

Gil Haugan Construction A,S2
Sioux Falls, (605) 336-6082

Henry Carlson Construction, LLC A,S2
Sioux Falls, (605) 336-2410

Journey Construction A,S2
Sioux Falls, (605) 221-0156

Peska Construction, Inc. S2
Sioux Falls, (605) 334-0173

Puetz Design+Build A,S2
Mitchell, (605) 996-2276

> TENNESSEE

JWR Erectors, LLC A,S2
Hillsboro, (404) 456-2589

KLS Contractors, Inc. A
Portland, (615) 336-2844

> TEXAS

Alpha Omega Erection S2
San Antonio, (210) 767-3491

Coreslab Structures (TEXAS) Inc. A,S2
Cedar Park, (512) 250-0755

Empire Steel S1
Humble, (281) 548-7377

Heritage Precast Erectors, LLC A,S2
Brookshire, (281) 306-2442

JMES Erectors, LLC A,S2
San Antonio, (830) 446-0020

Nationwide Erectors LLC A,S2
Grapevine, (817) 567-8015

Precast Erectors, LLC A,S2
Hurst, (817) 684-9080

S 'N' S Erectors, Inc. A,S2
Burleson, (817) 823-5882

> UTAH

HHI Corporation S2
Ogden, (385) 333-4400

> VERMONT

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

> VIRGINIA

Shockey Bros., LLC., a Metromont Company A,S2
Winchester, (540) 667-7700

> WISCONSIN

J.P. Cullen & Sons, Inc. A,S2
Janesville, (608) 754-6601

Miron Construction Company, Inc. A,S2
Neenah, (920) 969-7000

Wells A,S2
Valders, (414) 290-9000

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