FALL 2009

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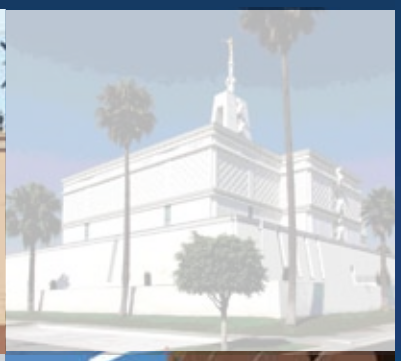
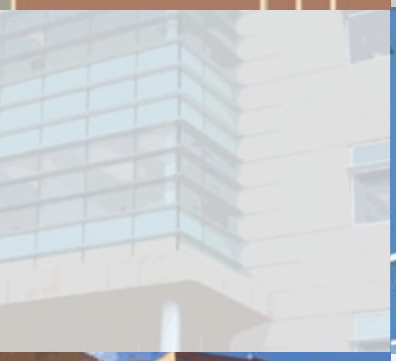
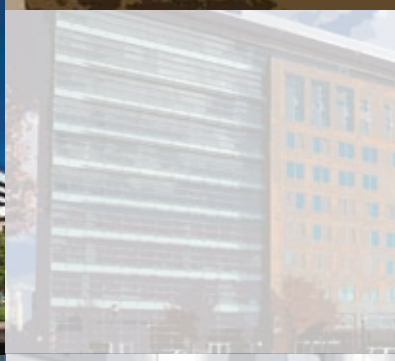
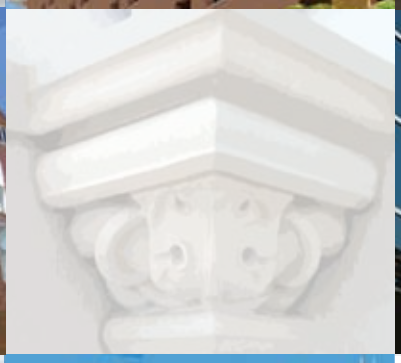
DESIGNING WITH PRECAST

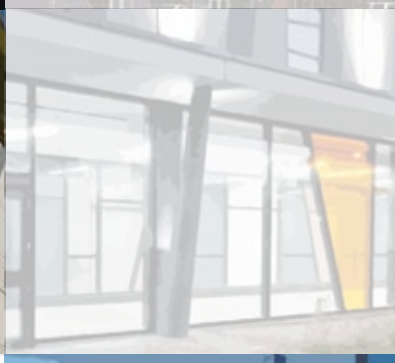
2009 Design Award Winners

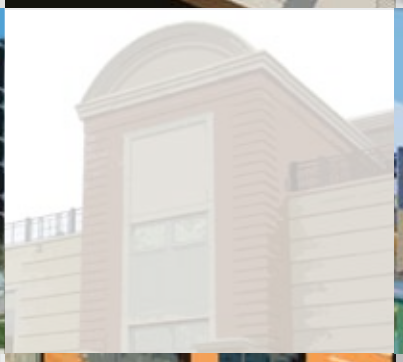









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— p. 8

Feature

Winning Designs

47th Annual PCI Design Awards

Departments

4 Insight
Design Awards Highlight Industry Trends

39 Designer's Notebook
Successful Planning with Architectural Samples

51 PCI-Certified Plants Directory
State-by-state directory of PCI-certified plants, including a guide to product groups and categories for reference in upcoming projects

55 PCI-Qualified & PCI-Certified Erectors Directory
State-by-state directory of PCI-qualified & PCI-certified erectors, including a guide to erector classification and a guide specification for reference in projects

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Lucas Oil Stadium – Indianapolis, IN

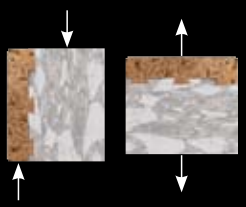
Endicott Thin Brick: Medium Ironspot #77
Velour 1/2" x 3-5/8" x 11-5/8"

Architect: HKS, Inc. Dallas, TX

General Contractor: Hunt Construction Group
Indianapolis, IN

Precast Contractor: Gate Precast Co.
Ashland City, TN

Endicott's unique "keyback" design mechanically locks Thin Brick into the concrete for maximum durability and permanence.



The "keyback" design also provides advantages of increased shear values and pull-out strengths.

SETTING A HIGHER STANDARD

Endicott Tile is proud to be the manufacturer of Thin Brick for this landmark facility – Lucas Oil Stadium in Indianapolis. The brick clad/precast arch and column work on this project has raised the bar on precast design to a new level.

Available in a full array of colors, six textures and four sizes, Endicott's Thin Brick, along with custom-made form-liners, continues to make precast concrete panels a popular design and construction concept – no longer are concrete panels limited to broomed, acid etched, sandblasted or exposed aggregate finishes.

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Design Awards Highlight Industry Trends

Brian Miller, P.E., LEED AP
Executive editor
bmiller@pci.org

It is hard to believe that fall is almost upon us. Of course, fall brings us the crop of talent and innovation recognized by the PCI Design Awards competition. More than 47 years ago, PCI launched its Annual Design Awards program. The PCI Design Awards program recognizes design excellence and construction quality using precast concrete, and since its inception more than 1000 projects have been honored with these prestigious awards.

Entries are accepted in two primary categories: buildings and transportation structures. Three special award categories include All-Precast Solution, Sustainable Design, and the Harry H. Edwards Industry Advancement Award. This year the juries selected twelve building projects and seven transportation projects to receive PCI Design Awards. They also selected eight honorable mentions.

A summary of the winning building projects is included in this of issue of *Ascent*. This coverage is one of the exciting features that make this issue of *Ascent* the most read each year. For more information and pictures on the winning projects, visit www.pci.org and click on the "2009 Design Awards Winners" icon on the homepage.

One of the great benefits of the PCI Design Awards program is that it brings out the latest design trends in the industry. Look for future articles that further expand on these trends at the PCI Design Awards website and in industry publications.

The 48th Annual PCI Design Awards call for entries will open in January 2010. We look forward to your entry!

Ascent is a publication of the
Precast/Prestressed Concrete Institute

ASCENT **On the cover: Announcing the 2009 PCI Design Awards winners (see page 8)**

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- **POSTMASTER:** Send address changes to *Ascent*, 209 W. Jackson Blvd., Suite 500, Chicago, IL 60606-6938. Periodical postage paid at Chicago, IL and additional mailing offices.
- *Ascent* (Vol. 19, No. 2, ISSN 10796983) is published quarterly by the Precast/Prestressed Concrete Institute, 209 W. Jackson Blvd., Suite 500, Chicago, IL 60606.

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Winning Designs

The 2009 PCI Design Award Winners once again prove that precast concrete can meet the structural, aesthetic, sustainability, scheduling, and budgetary goals of project owners.

The 47th annual Design Awards Competition sponsored by PCI drew projects from across the industry, showcasing the ways that precast concrete has become an indispensable option in the quest to build exceptional structures across North America. The award winners comprise an array of complex projects, including two buildings on the historic Boston College and University of California, Berkeley, campuses and a Leadership in Energy and Environmental Design–certified affordable housing complex that demonstrates the cost-effective sustainable attributes that precast concrete delivers.

The designers on each project used precast concrete in innovative ways, often meeting difficult schedule, design, and aesthetic challenges specifically by incorporating precast concrete solutions into the plans.

Twelve projects won awards in a variety of categories, including Best Retail/Mixed-Use Building, Best Office Building, Best Parking Structure, and Best Multi-Family Building. The judges also conferred awards for the Best Custom Solution and the Sustainable Design Award.

Eight additional projects were granted Honorable Mentions.

The following pages showcase the buildings projects selected by the Buildings and Special Awards juries. The honors will be presented to representatives of each project during PCI's 55th Annual Convention and Exhibition and National Bridge Conference September 12–15, 2009, in San Antonio, Tex., at the Marriott Rivercenter and Henry B. Gonzalez Convention Center.

Courtesy of Paul Grigonis.

Buildings jury (from left)

Drew Ranieri, AIA
Associate Principal
Solomon Cordwell Buenz & Associate
Chicago, Ill.

Josephine Minutillo
Senior Editor
McGraw-Hill Co. Inc.
New York, N.Y.

Walter Hainsfurther, FAIA
President
Kurtz Associates Architects
Des Plaines, Ill.

Randy Dhar, OAA/PP, FRAIC, Hon. FAIA
President Elect
Royal Architectural Institute of Canada
Toronto, ON, Canada

Ted Herr, AIA, CSI, CDT
Director of Technical Services
Eckenhoff Sauders Architects
Chicago, Ill.

Courtesy of Paul Grigonis.

Special awards jury (from left)

Roger Becker, P.E., S.E.
Precast Division Vice President
The Spancrete Group, Inc.
Waukesha, Wisc.

Doug Widener, LEED AP
Chicago Chapter Executive Director
U.S. Green Building Council (USGBC)
Chicago, Ill.

David P. Nasser, P.E.
Texas Office Vice President
The Consulting Engineers Group, Inc.
San Antonio, Tex.

47th Annual PCI Design Awards

Special Awards

Sustainable Design Award

Melrose Commons Site 5 Affordable Housing Building
Bronx, N.Y. 10

All-Precast Solution Award

The Aviation Rescue Swimmer School and Physical Fitness Center
Pensacola Naval Air Station, Pensacola, Fla. 12

Stillwater Public Library
Stillwater, Minn. 14

Buildings

Best Multi-family

The Irene and George Woodruff Family Residence Center
Atlanta, Ga. 16

Best Office Building

Edward Jones North Campus Building B2
Maryland Heights, Mo. 18

Best Public/Institutional Building

Two Waters Salt River Pima-Maricopa Indian Community Tribal Government Complex
Phoenix, Ariz. 20

Best Parking Structure

Blue Cross Blue Shield of Michigan Parking Structure and Campus Improvements
Detroit, Mich. 22

Best Retail/Mixed-Use Building

South of Market Office and Retail Complex
Reston, Va. 24

Best School

Restoration of Boston College's Gasson Hall Tower
Chestnut Hill, Mass. 26

Sutardja Dai Hall Technology Building
Berkeley, Calif. 28

Best Stadium

Citizens Business Bank Arena
Ontario, Calif. 30

Best Custom Solution

The Annenberg Community Beach House
Santa Monica, Calif. 32

Honorable Mention

Best Custom Solution

Colonnade at York University Performing Arts and Academic Building
Toronto, ON, Canada 34

Best Office Building

U.S. Bank Tower at 621 Capitol Mall
Sacramento, Calif. 34

Harry H. Edwards Industry Advancement Award

Principal Child Development Center/Principal Parking Structure
Des Moines, Iowa 35

Sustainable Design Award

Mexico City Church of Jesus Christ of Latter-Day Saints
Mexico City, Mexico 35

Best School

Henry Madden Library at Fresno State University
Fresno, Calif. 36

Best Stadium

Lucas Oil Stadium
Indianapolis, Ind. 36

Best Public/Institutional Building

North Central College Wentz Concert Hall and Fine Arts Center
Naperville, Ill. 37

Harm A. Weber Academic Center at Judson University
Elgin, Ill. 37

Owner
Blue Sea Development Co. LLC, New York, N.Y.

Architect
Equus Design Group, Belmont, Mass.

Architect of Record
Danois Architects, New York

Engineer of Record
William Atlas Associates, New York

Contractor
Blue Sea Construction, New York

Precaster
Oldcastle Precast Building Systems, Edgewood, Md.

Additional Team Members
Equus Design Group, Belmont, Mass.

Sustainable Design Award
Melrose Commons Site 5 Affordable Housing Building
Bronx, N.Y.

The precast concrete allowed for large window openings to bring in more daylight than would typically be found on masonry-constructed affordable housing projects.

The Melrose Commons 5 affordable housing complex project is proof that affordability and environmentally friendly design can go together. Located in the heart of the Bronx in New York, this five-story, 71,640 ft^2 (6655 m^2) building is awaiting the U.S. Green Building Council's (USGBC's) Leadership in Energy and Environmental Design platinum certification, the highest rating from the USGBC.

These accomplishments were achieved through the use of a total-precast-concrete solution.

"Originally designed as a masonry building, the owner had the project redesigned using precast concrete to take advantage of precast's speed of erection, minimal air infiltration, durability, less material waste, and inherent green building properties," says architect Michael Smith of Equus Design Group in Belmont, Mass.

The building superstructure is built entirely of precast concrete components, utilizing load-bearing exterior wall panels and an interior load-bearing corridor wall. The floors and roof are 8-in.-thick (200 mm) hollow-core, and the stairwells, stairs, landings, roof penthouses, and elevator shaft are all made of precast concrete. The voids in the hollow-core units are used to horizontally exhaust each housing unit, saving valuable floor by not requiring a vertical chase through the floors to the roof.

The use of precast concrete wall panels reduced the number of exterior joints, reducing air and moisture infiltration and creating a more energy-efficient envelope. The precast concrete also allowed for large window openings to bring in more daylight than would typically be found on masonry-constructed affordable-housing projects.

The precaster installed all of the window and door headers and sills at the plant, saving time and the need for an on-site scissor lift on the project.

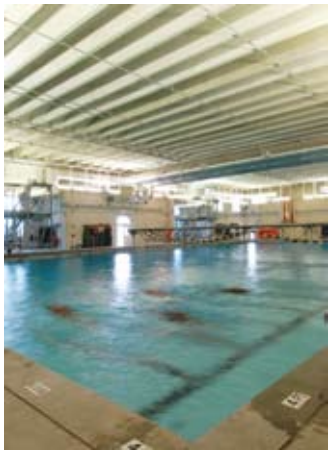
"Using a total precast building system and embedded thin-brick veneer enabled the project to be quickly erected with limited disturbance or impact to adjacent properties and neighbors," Smith says.

JUDGES' COMMENTS

From an overall sustainability standpoint the judges liked this project because it was a nice mixture of affordable housing and affordable green. A lot of the unique aspects of the project that related to precast were the fact that the precast contributed so much across so many areas of sustainability, from local selection, local manufacturing, energy efficiency, everything from reduced construction waste and dealing with tight construction time lines and windows. It had three precast aspects that were well suited. One was its cost-effectiveness, the second is its attractiveness, lastly it met sustainability criteria really well, and the platinum LEED certification was probably a clincher.

Photos courtesy of Oldcastle Precast Building System.

All-Precast Solution Award, Co-winner
The Aviation Rescue Swimmer School and Physical Fitness Center
Pensacola Naval Air Station, Pensacola, Fla.



APS

Owner U.S. Navy, Pensacola, Fla.

Architect C. H. Guernsey & Co., Oklahoma City, Okla.

Engineer of Record C. H. Guernsey & Co., Oklahoma City

Contractor Dick Corp., Pittsburgh, Pa.

Precaster Gate Precast Co., Monroeville, Ala., and Gate Concrete Products Co., Jacksonville, Fla.

Precast Specialty Engineer PTAC Consulting Engineers, Pensacola

Additional Team Members Zahl-Ford, Inc., Oklahoma City

"The precast [concrete] building system can withstand both external weather elements and [take antiterrorism/force protection] measures." — David Oman, director of architecture

Photos courtesy of J.D. Merrryweather, Merryweather Photography, jdmerryweather@gmail.com.

The Aviation Rescue Swimmer School and Physical Fitness Center at the Pensacola Naval Air Station in Florida used a total-precast-concrete solution to design a facility that meets the physical fitness and training needs of the community in a structure rigorous enough to withstand hurricane-strength winds.

The nearly 35,000 ft^2 (3300 m^2) Rescue Swimmer School within the center was built to train rescue swimmers to perform search–and-rescue missions in the water. At the heart of the facility is a state-of-the-art 82 ft × 168 ft (25 m × 51 m) wave pool with two 9H1 helicopter simulator towers, two open parachutes, and a hydraulic bridge to support training operations. Attached to the towers are two large spray heads that mimic rotor wash.

Architects chose a total-precast-concrete-brick paver solution for these two buildings because it met the architectural aesthetic desires, antiterrorism/force protection (AT/FP) requirements, and structural durability needs for extreme weather conditions of Florida while maintaining an environmentally responsible design.

The structures were built to withstand hurricane forces through the use of 103-ft-long (31 m) double-tees that span the entire roof structure of the pool portion of the building.

A solid, precast concrete, insulated wall system with a built-in vapor barrier was used on both facilities to separate indoor and outdoor temperatures, reducing condensation that can lead to mold and mildew. Electrical boxes and conduits were plant cast into the walls, and load-bearing wall panels replaced perimeter steel beams and columns so that there was no need for redundant exterior wall framing.

"The precast building system can withstand both external weather elements and AT/FP measures while maintaining a structure that is aesthetically pleasing, environmentally responsible, and functional for the Navy's mission," says David Oman, director of architecture for C. H. Guernsey & Co. in Oklahoma City, Okla.

APS

JUDGES' COMMENTS

The 100-foot clear span utilizing the double tees and the insulated wall panels were both ideal precast solutions for this project. A pool environment requires durability, uncracked concrete. It requires a good thermal envelopes. This was provided in this project with double-tees for a roof, very durable, insulated wall panels for the moisture resistance, the humidity that you experience in a pool building. All of the precast elements in this building were perfectly applicable to the occupancy requirements.

Owner Stillwater Public Library, Stillwater, Minn.

Architect Miller Dunwiddie Architecture, Minneapolis, Minn.

Engineer of Record MBJ Consulting Structural Engineers, Minneapolis

Contractor Adolfson & Peterson, Minneapolis

Precaster Molin Concrete Products Co., Lino Lakes, Minn., and American Artstone, New Ulm, Minn.

Precaster Specialty Engineer Molin Concrete Products Co., Lino Lakes

APS

Designers were able to mimic the carved limestone detailing of the original structure using special forms for the precast concrete.

All-Precast Solution Award, Co-winner
Stillwater Public Library
Stillwater, Minn.

APS

Photos courtesy of Adolfson & Peterson.

The renovation of the Stillwater Public Library, in Stillwater, Minn., an original 1902 Andrew Carnegie design, used a total-precast-concrete solution to create open, inviting spaces and more parking while adhering to the building's turn-of-the-century design and $10 million budget.

Designers used hollow-core units; precast, prestressed concrete beams and columns; and custom precast concrete architectural components to provide a better overall experience within the 56,000 ft^2 (5200 m^2) space. Meetings early on in the design process allowed the design teams and precasters to coordinate their efforts and to save time and money by simultaneously producing shop drawings and general plans.

Originally designed as a cast-in-place concrete structure, precast structural concrete gave the designers a plant-cast product that could be installed during the cold Minnesota winter. A combination of precast concrete hollow-core units, beams, and columns were used to construct the parking structure as well as large open conference rooms and an open-air terrace overlooking the river valley below.

Budgetary issues early in the project slowed the progress of the building, but once funds had been raised, the owners wanted the project to push ahead as quickly as possible. This created a tight schedule that was greatly aided by the shorter lead times that precast concrete offered.

Designers were able to mimic the carved limestone detailing of the original structure using special forms for the precast concrete, thus achieving the original architectural look and feel with a more cost-effective and durable material. Topping off the entry is the signature elliptical coved archway, which is typical of all Carnegie Libraries. On the plaza deck are window surrounds and more columns, matching the expression of the original elements on that elevation of the existing structure.

"The end result was a seamless integration of the new and the old," the architect says.

JUDGES' COMMENTS

The use of precast concrete on this project caught the judges' eye because they were able to replicate the existing historical structure and do it in a timely and economical fashion. In addition to this project using all-precast elements to create the building, the structure, the facade, architectural precast was used to replicate older-style construction materials, particularly limestone. That type of construction is just not economically feasible anymore, and architectural precast just does a terrific job in replicating the unique characteristics of that older-style construction to make a wonderful-appearing project.

Owner Shepard Spinal Center, Atlanta, Ga.

Architect Howell, Rusk Dodson Architects, Atlanta

Engineer of Record Rosser International, Atlanta

Contractor Choate Construction, Atlanta

Precaster Metromont USA, Dalton, Ga.

Precaster Specialty Engineer Metromont Corp., Atlanta

Project Cost $14.1 million

Photos courtesy of R. Moon.

Erection of the 526 precast concrete components took a mere 45 days.

Best Multi-family
The Irene and George Woodruff Family Residence Center
Atlanta, Ga.

The Irene and George Woodruff Family Residence Center in Atlanta, Ga., is an on-campus residence facility of the Shepherd Spinal Center, a not-for-profit hospital dedicated to the care of catastrophic spinal-cord injuries. The objective of the 87,000 ft^2 (8100 m^2) facility is to keep families involved in patients' rehabilitation and to provide emotional support during therapy and training.

Accessibility to meet the needs of users who face innumerable physical challenges had to be the top priority for designers. Because it is a not-for-profit hospital, the $14.1 million construction budget had to be stretched as far as possible.

The project team agreed that a total precast concrete solution would be the best way to achieve these goals, both because it would deliver schedule advantages and offer the best opportunity to control the cost of construction.

Design began in May 2006, and construction was completed in May of 2008, with erection of the 526 precast concrete components taking a mere 45 days. The precast concrete components included double-tees; beams, and inverted-tee beams; interior, insulated wall panels; and exterior wall panels with brick veneer that mimics the designs of other campus buildings.

To address usability issues, kitchens and bathrooms in the 84 residential units feature state-of-the art, barrier-free designs, and the floor levels of the center are aligned with the parking structure levels for easy access. Small but open gathering spaces are also included on each floor to facilitate patient and family interaction.

"This approach has proven successful in meeting this client's unique needs," says architect Ron Moon of Howell, Rusk Dodson Architects in Atlanta. "It will be considered a prototype for future campus projects, [and] it should be viewed by architects as a tool that can help provide an attractive building for clients with restrictive budgets."

MF

JUDGES' COMMENTS

The judges appreciated that the project was totally precast, including the structural frame as well as the skin, and what we liked about it in particular was the way that the architect and the fabricator blended together the different materials, different colors, to give it a lot of visual interest. One of the things that really distinguished the building was the fact that it really needs to be repetitive in order to work with precast, but it had a really lyrical rhythm that set up the nature of single-family living within a multifamily building.

Owner Edward Jones, Des Peres, Mo.

Architect Arcturis, St. Louis, Mo.

Engineer of Record Alper Audi Inc., St. Louis

Contractor McCarthy, St. Louis

Precaster High Concrete Group LLC, Denver, Pa.

OF

The design team found a way to replicate the look of limestone using precast concrete.

Best Office Building
Edward Jones North Campus Building B2
Maryland Heights, Mo.

Photos courtesy of Arcturis, www.arcturis.com.

Limestone and precast concrete elements merge in this six-story suburban corporate headquarters building to create a sleek, sophisticated look within a limited budget.

The architect, Arcturis of St. Louis, Mo., originally suggested limestone to achieve a classic urbane style and had planned to apply 50,000 ft² (4600 m²) of it to the exterior of the building. The extensive use of limestone, however, would have exceeded the budget, so the design team found a way to replicate the look of limestone using precast concrete.

The team had to meet the skin design weight of 50 lb/ft² (243 kg/m²) or less with precast concrete or choose a different enclosure material. They chose 8-in.-thick (200 mm) CarbonCast carbon-fiber-reinforced-polymer (CFRP) precast concrete panels, consisting of a 2-in.-thick (50 mm) face backed with 6 in. (150 mm) of expanded polystyrene (EPS) foam insulation. The CFRP precast concrete delivered the same sleek look and weight as limestone.

In the final design, use of limestone is limited to the first floor, while the rest of the building features precast concrete architectural panels formed in a 30 in. × 60 in. (760 mm × 1520 mm) stack-bond appearance using identical-width reveals and panel joints. Finished with a light sandblast, the buff-colored panels create the illusion of monolithic limestone blocks.

The CFRP precast concrete panels also provide thermal efficiency through the EPS insulation, which is expected to deliver energy savings.

"Without the lightweight architectural precast, we would have looked at a metal panel cladding system," says Steve Hoover, project architect of Arcturis. "But after we chose limestone, we knew metal would not give us the aesthetic we wanted. With precast, we knew we were going to get a product that would closely replicate the original design intent."

JUDGES' COMMENTS

There was obviously effective reuse of minimal different panel sizes, and you had a very, very well integrated design. We liked the way the precast concrete was integrated with the curtain wall in the project, and the overall proportioning was excellent. The precast had just enough rustication to give the panels interest and not overwhelm it.

Owner
Salt River Pima-Maricopa Indian Community, Scottsdale, Ariz.

Architect
SmithGroup, Phoenix, Ariz.

Engineer of Record
PK Associates, Scottsdale

Contractor
Chuska Sahara Haselden, Centennial, Colo.

Precaster
Coreslab Structures (Ariz.) Inc., Phoenix

Additional Team Members
David Sloan Architects, Albuquerque, N.M.

Project Cost
$70 million

Best Public/Institutional Building

Two Waters Salt River Pima-Maricopa Indian Community Tribal Government Complex

Phoenix, Ariz.

Precast concrete panels could easily meet the quality, cost, and schedule needs of the $70 million project.

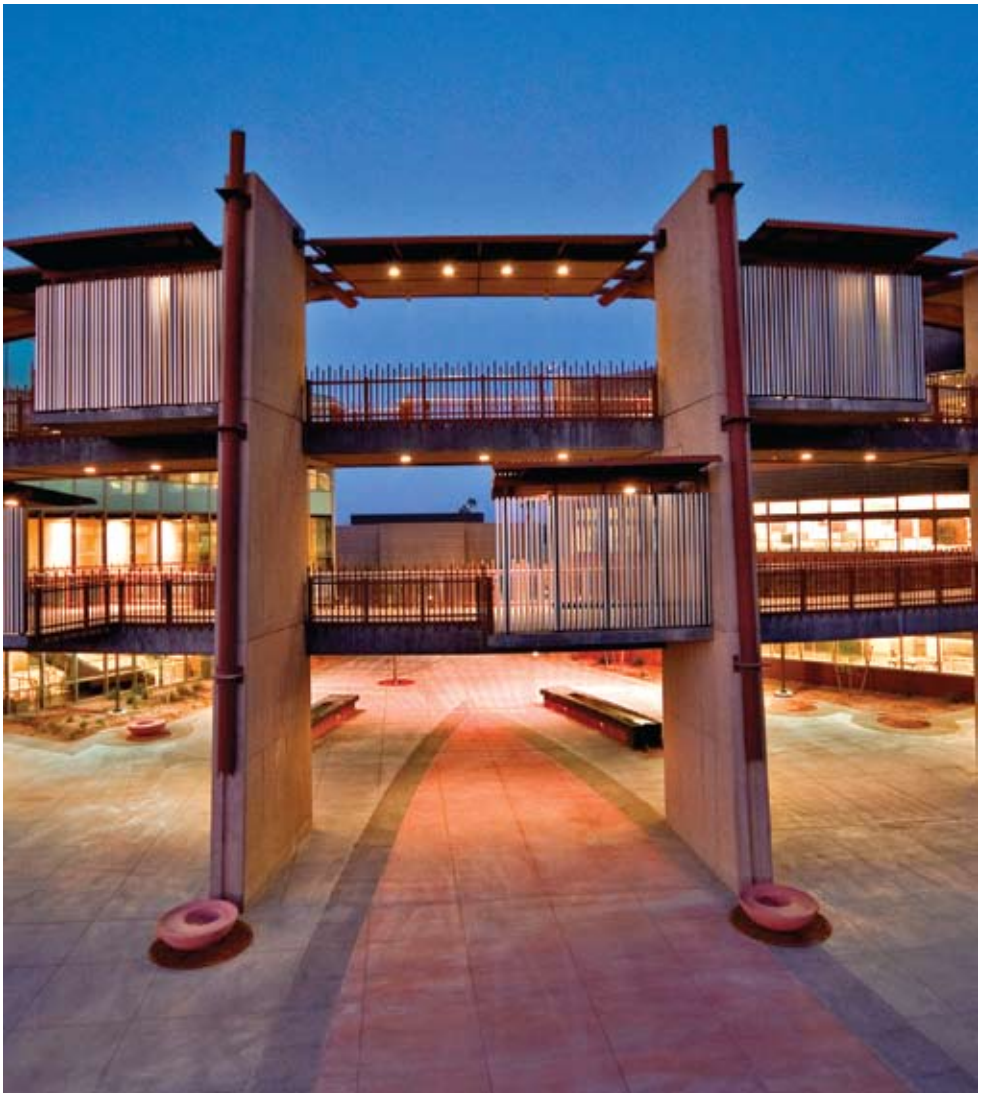


Photo courtesy of Mark Duran.

PI

The architects of the Salt River Pima Maricopa Indian Community Tribal Government Complex in Phoenix, Ariz., wanted to design a centralized location for tribal community members that reflected the cultural belief system and environmental stewardship of the tribal population.

The project included the design of two three-story buildings connected by an open-air, three-story bridge and viewing area totaling 180,000 ft² (17,000 m²). The center would house government offices, cultural displays, and a 220-seat tribal council chamber.

To achieve a traditional look and feel in the structure, the architect had planned to use a battered cast-in-place (CIP) concrete wall and column design that would convey a regional character and sense of handmade construction. However, having a three-story battered wall of cast-in-place concrete posed challenges of quality, cost, and schedule.

Precast concrete panels could easily meet the quality, cost, and schedule needs of the $70 million project. However, architects were initially concerned that the end product would look too pristine, ruining the weathered effect of the design.

They solved this aesthetic problem by using a varied reveal pattern, integral color, and a sandblast finish to match the natural feel of a CIP-exposed structure. The precast concrete panels were also set at an angle to create the battered look of structural CIP concrete. The addition of richly colored masonry and zinc panels compliments the subdued earthen color of the concrete.

The 26 prestressed, precast concrete panels, which totaled 15,210 ft² (1413 m²), took only five days to erect in April 2009 and cost less than $800,000.

"In working closely with the precaster and through mock-ups, the design team was able to accomplish an organic handmade look that worked with the design intent and integrated well with the cast-in-place concrete," says Mark Roddy, design principal of SmithGroup in Phoenix.

JUDGES' COMMENTS

The use of precast concrete in a community-based facility has been handled extremely well, and this is a community where the respect for the land, the respect for culture and tradition, and the building also respects the climatic conditions of that area. The whole project came out to be a successful one because of the use of the precast concrete in various forms, shapes, color, and texture.

Photo courtesy of Mark Duran.

Photo courtesy of SmithGroup.

Photo courtesy of SmithGroup.

Photo courtesy of Mark Duran.

Owner Blue Cross Blue Shield of Michigan, Detroit, Mich.

Architect Neumann/Smith Architecture, Southfield, Mich.

Engineer of Record Desai/Nasr Consulting Engineers, West Bloomfield, Mich.

Contractor Turner Construction Co., Detroit

Precaster National Precast Inc., Roseville

Precaster Specialty Engineer I.E.S., Tecumseh, ON, Canada

Additional Team Members Rich & Associates Inc., Southfield

Photo courtesy of Scott R. Bonney, AIA, design director at Neumann/Smith Architecture.

Photo courtesy of Scott R. Bonney, AIA, design director at Neumann/Smith Architecture.

Photo courtesy of Scott R. Bonney, AIA, design director at Neumann/Smith Architecture.

The total precast concrete solution supports a vegetated roof and walking path, which helped the project achieve LEED certification.

Best Parking Structure
Blue Cross Blue Shield of Michigan Parking Structure and Campus Improvements
Detroit, Mich.

Photo courtesy of Justin Maconochie of Maconochie Photography.

Beauty, environmental sustainability, and functionality were the goals of this urban parking structure and plaza, which anchors the Blue Cross Blue Shield of Michigan corporate campus in Detroit, Mich. Sitting on the footprint of the original 125-spot parking lot, the new parking structure houses 1808 vehicles. The ground floor of the parking structure also has meeting rooms, a fitness center, and maintenance offices.

"The owner was looking for a design that would capture the attention of others, be user friendly, and at the same time be environmentally conscious," says project designer Scott R. Bonney of Neumann/Smith Architecture in Soutfield, Mich.

The design team was able to meet those goals within the budget and schedule by using a total precast concrete design solution.

Design elements made possible by the flexibility and functionality of precast concrete gave the structure visual appeal and contrast. For example, the ends of the precast concrete double-tee stems and flanges in the roof are cantilevered to create a dramatic soaring effect. Decorative aluminum endplates conceal exposed steel reinforcing at the double-tee ends, and a vertical metal fascia disguises the sloped edges of the double-tees to create an elegant and inexpensive cornice feature to the structure.

The exterior wall panel system, which doubles as both structural system and finished architecture, hides the sloping floors of the parking structure from exterior view, and the plaza features a gentle sloping spiral walk flanked by curved precast concrete walls and bench seating.

The total precast concrete solution also enabled designers to utilize a skewed floor plan to capture every inch of the space available and support a vegetated roof and walking path, which helped the project achieve Leadership in Energy and Environmental Design (LEED) certification.

"The design of this LEED-certified parking structure showcases the fresh and uninhibited concept for using standard-industry materials in an application that is not standard for the industry and to emphasize their intrinsic beauty," says project manager Kathleen M. Buck.

Owner Boston Properties, Washington, D.C.

Architect SmithGroup Inc., Washington

Engineer of Record Tadjer Cohen Edelson, Silver Spring, Md.

Contractor HITT Contracting Inc., Fairfax, Va.

Precaster High Concrete Group LLC, Denver, Pa.

Precast Shop Drawings Computerized Engineering Inc., Ashland, Va.

RM

"Precast gave us great design flexibility."
— Andy Rollman, architect

Best Retail/Mixed-Use Building
South of Market Office and Retail Complex
Reston, Va.

RM

Photos courtesy of Nathan Cox Photography.

Aesthetics were the primary reason developers chose a precast concrete solution for this 650,000 ft² (60,400 m²) office and retail complex in the heart of Reston Town Center, a planned mixed-use community in Reston, Va., 15 mi (24 km) from Washington, D.C. A composition of three varied-scale sister buildings host major-brand retailers and high-profile tenants who expect the architecture of the community to reflect that of an elegant East Coast town that developed over time.

The speculative development project from Boston Properties includes two ten-story buildings and one six-story building, all with ground-floor retail and offices above. The three buildings sit on top of a common, two-level, below-grade parking structure and appear as three buildings on a full block with a plaza one-third of the way along.

"With relating to the urban context of major importance, aesthetics were a primary consideration for the precast cladding design," says Andy Rollman, architect for SmithGroup Inc. in Washington, D.C.

To contrast two gleaming precast concrete towers across the street, the design team chose an amber thin brick, which was embedded in the face of the precast concrete architectural panels and runs edge to edge in a running-bond pattern finished with rake joints. The windows are deeply inset with L-shaped thin bricks completing the recesses.

Aluminum channels, inserted through certain floors on the horizontal and vertical, break the facade of punch windows fitted with low-E (low emissivity) glass and provide a modern, engineered look. Vertical glass units at the top correspond to the precast concrete towers.

The $140 million project took just under two years to complete, with erection of the precast concrete elements completed in five months.

"Precast gave us great design flexibility," Rollman says. "We could introduce metal and brick where we wanted without having to worry about a complicated backup structure of metal studs or [concrete masonry units]."

JUDGES' COMMENTS

This project, which is a mixed-use development with retail on the first floor and offices above, was notable to the jury because of the way that the glass and the precast units meshed together. They're kind of in one plane and they give a very unified look, yet they are used in sympathy with each other to create a really pleasant visual image.

Best School, Co-Winner

Restoration of Boston College's Gasson Hall Tower

Chestnut Hill, Mass.

Owner
Boston College,
Chestnut Hill, Mass.

Architect
McGinley Kalsow & Associates Inc.,
Somerville, Mass.

Engineer of Record
LeMessurier Consultants,
Cambridge, Mass.

Contractor
Phoenix Bay State Construction
Company Inc.,
Boston, Mass.

Precaster
Bétons Préfabriqués du Lac,
Alma, QC, Canada

Precast/Caststone Consultant
Building & Monument Conservation,
Arlington, Mass.

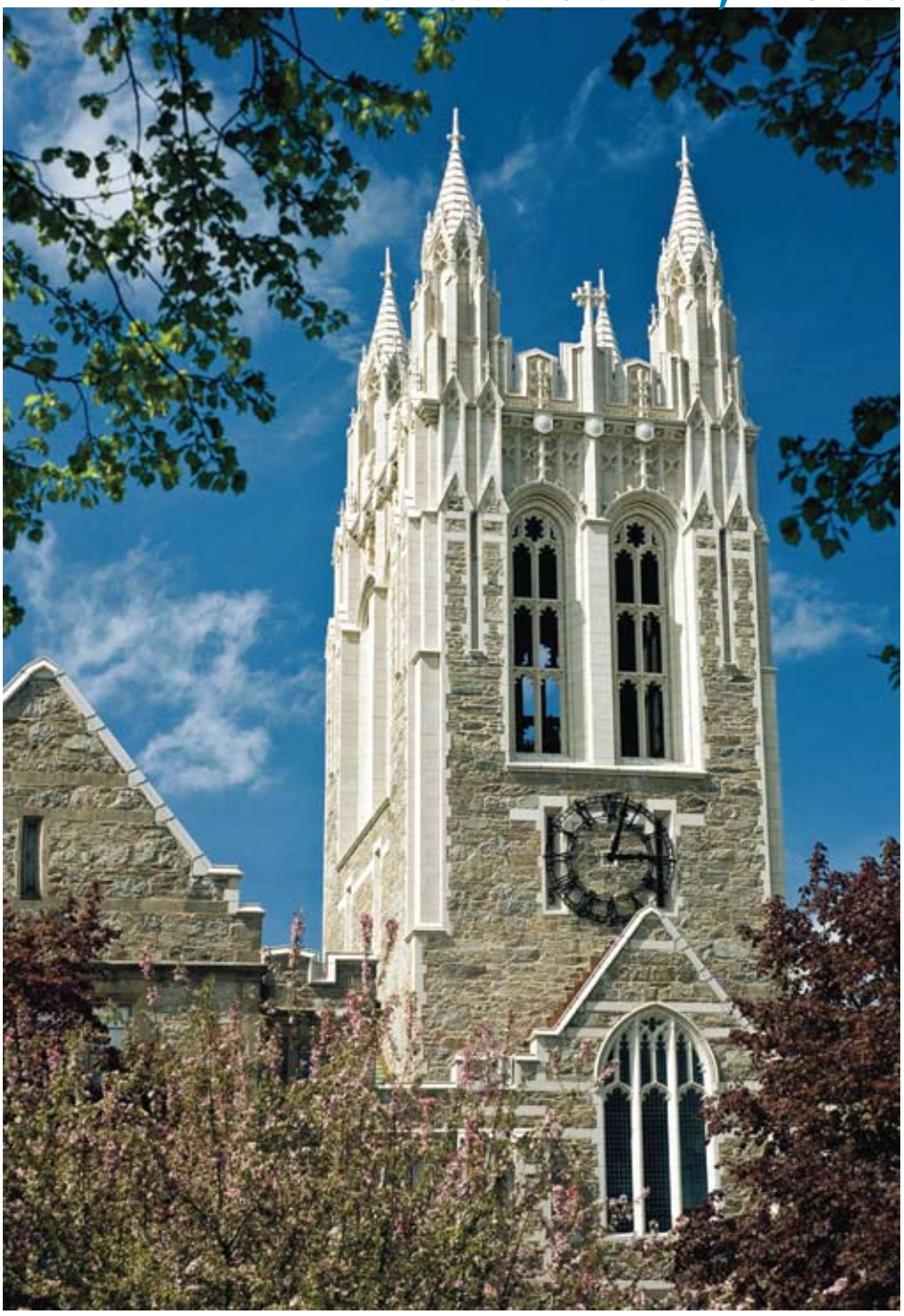


Photo courtesy of Lee Pellegrini.

Repairing and restoring Gasson Hall Tower on Boston College's historic Chestnut Hill, Mass., campus was no small feat. The 96-year-old hall was the first building constructed on the campus, and its 175-ft-tall (53 m) tower has become a landmark in the community. After nearly 100 years of exposure, the original cast stone was weathered and starting to fail.

Architects relied on the versatility of precast concrete to faithfully replicate the details of the tower, replacing the original cast stone with new matching cast stone. The walls were constructed of local puddingstone, while all of the original trim and ornamental details were fabricated from cast stone tinted to resemble limestone.

To compensate for the loss of detail due to weathering, each unit was refinished by hand to simulate natural stone tooling prior to making a mold from that unit. To improve durability and long-term performance, a new anchoring system was engineered and some small units were combined to create larger units with false joints.

Because the worksite was restricted and the geometry of the tower complex, each unit was numbered to identify its location in the wall and each stone was delivered to the jobsite in the sequence that it would be set.

Mold and pattern making took 11 months, and production of the nearly 3300 units took about a year, with the more than 450 unique shapes. The units were installed as they were cured, and installation took 14 months.

"For many years precast concrete has expanded its technical capabilities, increased its structural capacities, and improved durability and performance characteristics," says the architect, Wendall Kalsow of McGinley Kalsow & Associates in Somerville, Mass. "This project advances the aesthetic frontier of precast and cast stone and demonstrates its potential role in significant historic preservation projects."

JUDGES' COMMENTS

This project was cited because of its really unusual nature. It's a precast concrete solution to replace what was a cast stone product, and it really provided an example of how an architect can use precast concrete to really re-create an authentic gothic structure. The thoroughness of the detail and the cleverness of the connections and the effective form reuse were considered remarkable.

Photo courtesy of Wendall Kalsow.

Architects relied on the versatility of precast concrete to faithfully replicate the details of the tower.

Photo courtesy of Chris Ripman.

Photo courtesy of Ed Film.

SC

Owner
University of California Berkeley—Capital Projects, Berkeley, Calif., and College of Engineering, University of California, Berkeley

Architect
SmithGroup, San Francisco, Calif.

Engineer of Record
Forell/Elsesser, San Francisco

Contractor
Hathaway Dinwiddie Construction, San Francisco

Precaster
Willis Construction Co., San Juan Bautista, Calif.

Best School, Co-Winner
Sutardja Dai Hall Technology Building
Berkeley, Calif.

Concrete slurry was sprayed into the mold to pick up the fine texture of the wood grain, allowing the precaster to fabricate 92 panels with a consistent design at a moderate cost.

SC

Sutardja Dai Hall, a seven-story technology center on the University of California's Berkeley campus, reflects the arts and crafts architecture of the surrounding buildings in a durable modern design.

Defying the conception that precast concrete–panel finishes are limited to a sandy, flat surface, the design team achieved this combination of form and aesthetics through the use of a precast concrete cladding system that mimics the rich texture of spruce across the 140,000 ft^2 (13,000 m^2) building.

The team selected glass-fiber-reinforced-concrete (GFRC) panels, which easily adapt to shapes and textures, allowing for greater design possibilities. The GFRC skin is substantially thinner than traditional precast concrete panels, making it lighter and easier to handle during construction. However, imitating the texture of spruce on the GFRC turned out to be a challenge.

The precaster couldn't sample from the wood directly because the concrete stuck to the wood surface, damaging the texture when it was stripped and cleaned for reuse. Instead, the precaster created rubber, reusable liners from the wood.

Concrete slurry colored to match the spruce, was sprayed into the mold to pick up the fine texture of the wood grain, allowing the precaster to fabricate 92 panels with a consistent design at a moderate cost.

The rich brown color of the panels was maintained through the use of a heavy-duty concrete detergent that, when scrubbed on with a nylon brush, achieved a similar tone on each panel without damaging the wood detail.

"The board form texture on the facade complements the wood exterior of its historic neighbors and creates a unique rustic feel," says project manager Johnny Wong of SmithGroup in San Francisco, Calif. "This solution helps create a warm humane character for a high-tech research building."

JUDGES' COMMENTS

This school stood out in the jurors' opinion because of the nature of the arts and crafts design and how it was set into context. And what really made it interesting was the creative use of precast and the texture and colors that were used to communicate that design as part of the overall solution. It was a panel finish I don't think anybody in the group had seen before and was extremely innovative, really called attention to the project, remarkable use of texture.

Photographs © Tim Griffith.

SC

Owner The City of Ontario, Ontario, Calif.

Architect Rossetti, El Segundo, Calif.

Engineer of Record Englekirk & Sabol Consulting, Los Angeles, Calif.

Contractor Turner Construction, Anaheim, Calif.

Architectural Precaster Clark Pacific, Fontana, Calif.

Structural Precaster Mid-State Precast, Corcoran, Calif.

Best Stadium **Citizens Business Bank**

Photographs © Brett Drury, www.architectural-photography.com.

"This precast solution offered architectural design advantages over a typical post-and-beam design by allowing greater flexibility in how the interior spaces are configured." —Timothy Lambert, architect

Arena Ontario, Calif.

The Citizens Business Bank Arena in Ontario, Calif., is far more than a hockey arena. The 220,000 ft² (20,400 m²) facility accommodates sports teams, trade shows, concerts, and community events throughout the year. The vast and open floor plan offers seating for 10,000, and a soaring design that catches the light throughout the day.

All of these functional and aesthetic features were achieved through the use of an innovative, cost-effective system of precast concrete stadia, raker beams, and columns.

"This precast solution offered architectural design advantages over a typical post-and-beam design by allowing greater flexibility in how the interior spaces are configured," says the architect. "It was particularly helpful in gaining space in tight concourses, improved sightlines from fewer columns, and generally provided more usable square footage without expanding the building's footprint."

Along with creating open space, the precast concrete structural system was used to conceal the enormous mechanical system within a large cantilever, creating a column-free space in the end zone to accommodate a full-sized stage.

On the exterior, designers used precast concrete panels to create an elevation with a strong horizontal focus, using sharp lines to define the building.

The design suggests an airplane wing taking flight from the flat landscape, which was accomplished with a series of raised and recessed reveals in the elevations, producing a dynamic sense of movement. As the light shifts throughout the day, they create a continuous adjustment in the appearance of the arena, reducing the sensation of a static object.

"The use of exterior, precast architectural panels gave much more flexibility in expressing this idea," says Timothy Lambert, principal in charge.

ST

JUDGES' COMMENTS

The building wasn't ashamed about using precast. It really understood that you need to cast this material, that you can form it, that you can shape it, you can use shade and shadow. One of the nicest things about it is that it understood light, whether it was daytime or nighttime, it really has a nice scale. So walking by this building, a windowless building, has a really nice quality regardless of the time of day, and it really settles itself into a neighborhood well.

Owner City of Santa Monica, Santa Monica, Calif.

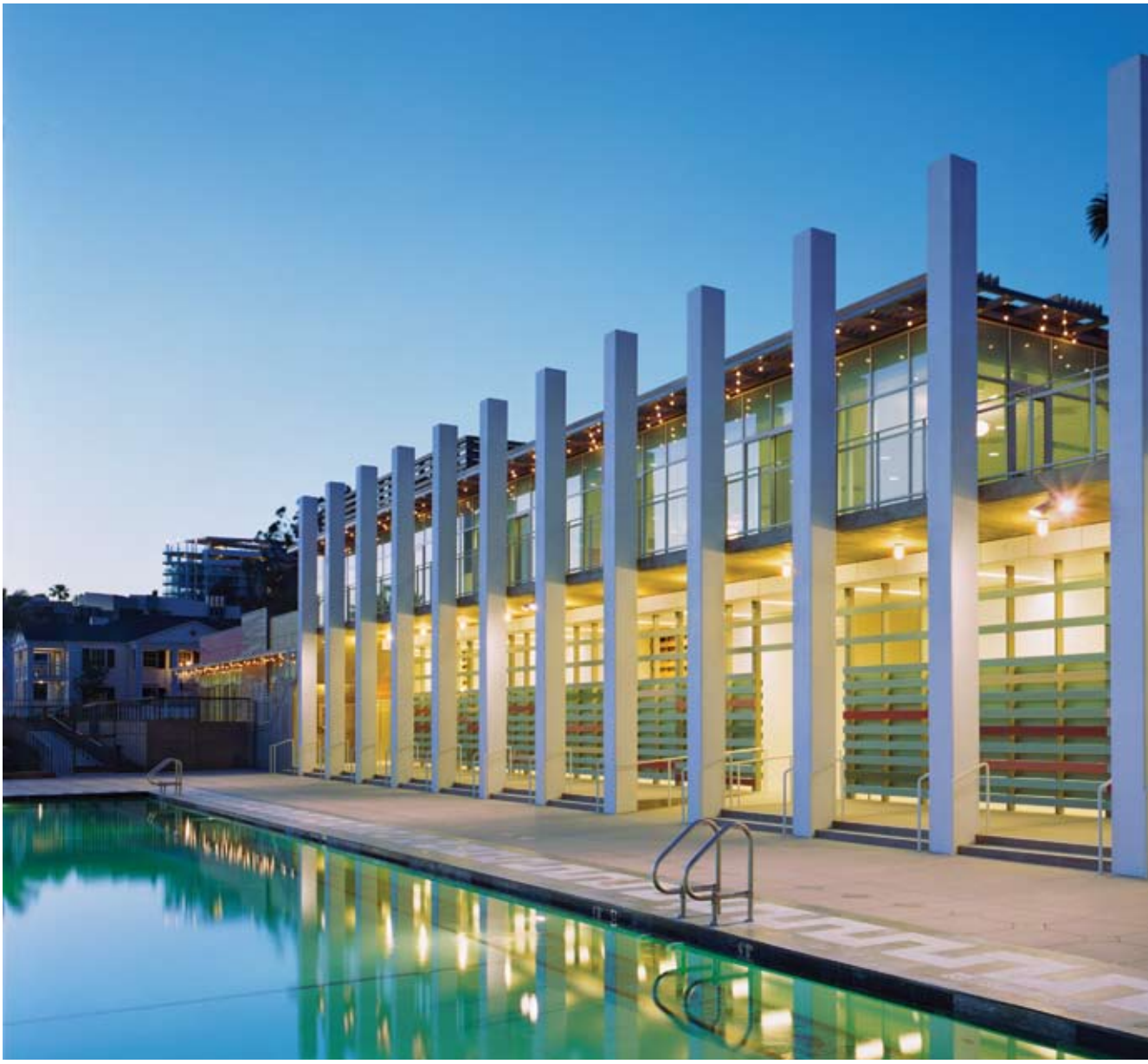
Architect Frederick Fisher & Partners, Los Angeles, Calif.

Engineer of Record KPFF Consulting Engineers, Los Angeles

Contractor Pankow, Pasadena, Calif.

Precaster Mid-State Precast, Corcoran, Calif.

Precast Specialty Engineer Mid-State Precast, Corcoran



"This could only be achieved with the use of architectural precast concrete."
—Fred Fisher, architect

Best Custom Solution
The Annenberg Community Beach House
Santa Monica, Calif.

Photos courtesy of Grant Mudford.

The adaptive reuse project to restore the Annenberg Community Beach House on the Marion Davies Estate in Santa Monica, Calif., demanded meticulous attention to historic guidelines. The Annenberg Foundation provided a grant of $27 million to rehabilitate the beachfront estate, which was originally constructed in the 1920s by William Randolph Hearst and designed by Julia Morgan. The city's landmark commission had to review all final designs to ensure that the historicism of the site was preserved.

At the heart of the project was the installation of sixteen 29-ft-high (8.8 m) monumental pure white pillars that frame the pool house and evoke the iconic columns of the original mansion.

"This could only be achieved with the use of architectural precast concrete," says architect Fred Fisher of Frederick Fisher and Partners in Los Angeles, Calif.

The pillars were cast off-site using a highly refined, brilliant white concrete and form system to symbolically replicate the columns of a different era. The precaster worked closely with the design team to develop samples of the concrete color and final texture as well as lift/brace points.

Once on-site, the purity of the white concrete pillars required constant protection from the ongoing surrounding construction activity. The project team went to great lengths to protect them, including wrapping them in white corrugated plastic during construction.

"As evolution of the property over the decades has left few remnants of historic significance, the soaring white pillars play an integral role in connecting new features with old site elements," Fisher says. "The 16 precast pure-white concrete pillars represent the project's marquee element."

JUDGES' COMMENTS

This project was recognized for being a custom solution, and what really distinguished it was its simplicity and its strength. You have some really outstanding elements with these vertical columns out of precast that are plain white, really stark white, that really add to the power of the setting that is created by the project. We have the white precast columns that are set in front of the rest of the beach house and really frames it and makes a very dramatic entry.

Best Custom Solution, Honorable Mention

Colonnade at York University Performing Arts and Academic Building

Toronto, ON, Canada

The addition of colonnaded walkways allowed York University to complete its network of enclosed walkways providing a safe method for moving between the various venues on campus without regard to weather. The V-shaped, precast concrete columns are unique not only for their shape, but also for their use of a dark-grey precast-concrete admixture, varying surface roughness, and LED-lighting integration.

Photo courtesy of Zeidler Partnership Architects.

Owner York University, Toronto, ON, Canada

Architect Zeidler Partnership Architects, Toronto

Engineer of Record Halsell Associates Ltd., Toronto

Contractor Bird Construction, Toronto

Precaster Tri-Krete Ltd., Toronto

Precast Specialty Engineer Hasell Associates Ltd. in association with Tri-Krete Ltd., Toronto

HM

Best Office Building, Honorable Mention

U.S. Bank Tower at 621 Capitol Mall

Sacramento, Calif.

This 25-story Sacramento, Calif., office tower is unique in its embrace of a transparent design theme while remaining sensitive to the surrounding historic brick and stone structures. By finding and maintaining ideal mixture proportions and sandblasting techniques, the designer and precaster were also able to achieve a remarkably inconspicuous balance between normal weight precast concrete and glass-fiber-reinforced concrete on the building's exterior.

Photo courtesy of HOK, photographer: John Swain.

Owner David S. Taylor Interests Inc., Sacramento, Calif.

Architect HOK, San Francisco, Calif.

Engineer of Record HOK, San Francisco

Contractor Hensel Phelps Construction Co., San Jose, Calif.

Precaster Willis Construction Co. Inc., San Juan Bautista, Calif.

Harry H. Edwards Industry Advancement Award, Honorable Mention
Principal Child Development Center/Principal Parking Structure
Des Moines, Iowa

Photo courtesy of Dennis Befeler.

This innovative precast structure provides two great benefits: an early-child-care development center and a secure parking facility for all downtown employees. Because of precast concrete's inherent design flexibility, large structural revisions were possible while the structure was deep in the construction phase. This cost-effective structure achieved a LEED gold rating, proving that low cost and sustainability need not be opposing goals.

Owner Principal Financial Group, Des Moines, Iowa

Architect SVPA Architects, West Des Moines, Iowa

Engineer of Record Charles Saul Engineering, Des Moines

Contractor The Weitz Co., Des Moines

Precaster IPC Inc., Des Moines

Precast Specialty Engineer The Consulting Engineers Group Inc., San Antonio, Tex.

HM

Sustainable Design Award, Honorable Mention
Mexico City Church of Jesus Christ of Latter-Day Saints
Mexico City, Mexico

This 1979 Mexico City Church of Jesus Christ of Latter-Day Saints temple's tilting structure and harsh environmental conditions were the motivation for the complete replacement of all exterior panels and the recycling of the old panels. An extreme logistical challenge, the old panel removal and new panel replacement process had to be performed simultaneously on two opposing walls in an attempt to retain structural balance. Utilizing new lightweight precast concrete panels, the new exterior brings the building back to its original splendor.

Owner Church of Jesus Christ of Latter-day Saints, Salt Lake City, Utah

Architect Valentiner Crane Brunjes Onyon, Salt Lake City

Engineer of Record Reaveley Engineers + Associates, Salt Lake City

Contractor Jacobsen Construction, Salt Lake City

Precaster Pretecsa, S.A. de C.V., Atizapan de Zaragoza, Mexico

Precast Specialty Engineer Pretecsa, S.A. de C.V., Atizapan de Zaragoza

Photo courtesy of PRETECSA Archive.

Best School, Honorable Mention
Henry Madden Library at Fresno State University
Fresno, Calif.

Photo © Art Gray Photography.

This California State University library in Fresno sought to embrace the design language of aboriginal central valley people though its synthesis of glass, metal, and precast concrete. The patchwork nature of the exterior precast concrete panels creates visual intrigue and conceals the breaks between the panels, evoking the notion that the entire wall is a single unique tapestry.

Owner California State University, Fresno State University, Fresno, Calif.

Architect AC Martin Partners, Los Angeles, Calif.

Engineer of Record AC Martin Partners, Los Angeles

Contractor Swinerton Builders, Oakland, Calif.

Precaster Clark Pacific–West Sacramento, West Sacramento, Calif.

Additional Team Members RMJM, Princeton, N.J.

HM

Best Stadium, Honorable Mention
Lucas Oil Stadium Indianapolis, Ind.
Indianapolis, Ind.

This retractable-roof, multipurpose stadium calmly complements the surrounding downtown Indianapolis, Ind., manufacturing buildings through its use of color-matched, preinsulated, brick-inlay architectural precast concrete panels. In addition, the stadium made extensive use of a new type of specially designed gravity connection to support the arched precast concrete soffits over the main entrances.

Owner Indiana Stadium and Convention Building Authority, Indianapolis, Ind.

Architect HKS Inc., Dallas, Tex.

Engineer of Record Walter P Moore & Associates, Houston, Tex.

Contractor Hunt Construction Group, Indianapolis

Precaster Gate Precast Co., Ashland City, Tenn., and High Concrete Group LLC, Fishers, Ind.

Best Public/Institutional Building, Honorable Mention
North Central College
Wentz Concert Hall and Fine Arts Center
Naperville, Ill.

Photo courtesy of North Central College, Naperville, Ill.

Beyond the function of structure and an attractive design, the North Central College Wentz Concert Hall and Fine Arts Center in Naperville, Ill., utilized precast concrete as a significant form of acoustical dampening. This imaginative new use of precast concrete together with its distinctive design has propelled the hall to be hailed as a great success by community members and critics alike.

Owner North Central College, Naperville, Ill.

Architect Loebl Schlossman & Hackl, Chicago, Ill.

Engineer of Record Campbell & Associates, Naperville

Contractor Gilbane Co., Chicago

Precaster Dukane Precast, Naperville

Precast Specialty Engineer Dukane Precast, Naperville

Additional Team Members Dukane Precast, Naperville

Best Public/Institutional Building, Honorable Mention
Harm A. Weber Academic Center at Judson University
Elgin, Ill.

HM

By utilizing the unique benefits inherent in precast concrete—high thermal mass, minimal site disturbance, and freedom in prefabrication design—this ground breaking facility was able to become the first building of its type to utilize natural ventilation in the Midwest's extreme humidity and temperature differentiation. This, coupled with a comprehensive system integration design methodology, aided the building in receiving a Leadership in Energy and Environmental Design gold rating.

Owner Judson University, Elgin, Ill.

Architect Burnidge Cassell Associates, Elgin

Engineer of Record KJWW Engineering Consultants, Naperville, Ill.

Contractor Shales McNutt, Elgin

Precaster Mid-States Concrete Industries, South Beloit, Ill.

Precast Specialty Engineer Losch Engineering Corp.., Palatine, Ill.

Additional Team Members Short & Associates, London, U.K.

Photo © 2007 Bruce Starrenburg/www.bstarrenburg.com.

photo courtesy of PCI and Mid-States Concrete Industries

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PCI's certification program is more than just inspections and documentation. It is based on comprehensive expertise. For over 50 years, PCI has set the standards and developed the knowledge for the design and construction of precast concrete structures. This feat is set on the foundation of millions of dollars of research, dozens of technical guides and manuals, a network of over 80 committees, PCI's professional and experienced staff, and support of over 2000 PCI members.

To learn more about PCI certification and PCI, visit **www.pci.org/certification** or contact Dean Frank, P.E., Director of Quality Programs, at (312) 583-6770 or dfrank@pci.org

PCI Precast/Prestressed Concrete Institute
209 West Jackson Boulevard | Suite 500 | Chicago, IL 60606
Phone: 312-786-0300 | Fax: 312-786-0353 | www.pci.org

Successful Planning with Architectural Samples

PCI's Architectural Precast Concrete Committee offers tips and suggestions on achieving the proper color, form, and texture on any project

designer's**notebook**

Successful Planning with Architectural Samples

PCI's Architectural Precast Concrete Committee offers tips and suggestions on achieving the proper color, form, and texture on any project

The proper selection of color, form, and texture for a building's architectural precast concrete exterior is critical to creating a successful aesthetic appearance. Different colors and textures can be achieved by varying and combining aggregate, matrix color, finishing processes, and depth of exposure. A combination of two or more types of finish or textures can be created within the same panel, providing a wide variety and flexibility in selecting the final appearance (Fig. 1). Knowing how to use samples and what sizes or mockups are required can ensure the project's success.

Early on, develop a schedule for creating samples and determining uniformity of colors and texture requirements. Although material and production factors may cause differences in color or texture, uniformity variations on the facade will be minimized if the sample development procedures that are detailed in this article are followed. The precaster can provide significant input in selecting the textures and finishes to achieve the desired aesthetic effect and ensure that design concepts translate into reality.

Figure 1 Appearance variations are acheived with different finishes on the same concrete mixture. (Courtesy *Architectural Precast Concrete*)

The building's appearance results from the architect's use of light, shadow, color, form, and texture. Color and, consequently, color tone represent relative values. They are affected by light, shadow, density, time, and nearby colors. Thus, color selection should be made in lighting that replicates the light and shadows of the site's natural daylight.

Some color and texture differences between nominally identical precast concrete units are inevitable, but variations between and within panels should be kept within an agreed-upon range. Therefore, at the sample development stage it is important to reconcile the expectations of the owner and architect with the practical limits of uniformity.

The sample development process includes the following:

- creating prebid design reference samples to establish the general color and texture for the project
- producing approval samples after the contract award to evaluate the same mixture under typical production conditions
- producing range sample panels that are about 15 ft^2 to 20 ft^2 to show the anticipated range of color and texture
- viewing initial production panels or mockups to see the final outcome of the process based on bulk ordering of currently quarried materials and full concrete batches

Development of Samples

Achieving the desired textures and colors through feasible production techniques is a process that requires the precaster to produce samples that satisfy the architect's design concepts. This can be accomplished by producing a few samples, or it may require a series of samples and considerable investigation of corresponding production and finishing techniques.

At this stage of the procedure, the development of samples may involve considerable expense in research and investigation on the part of the precaster. Most precasters will assist the architect in developing a design reference sample as early as possible. The architect can aid in sample development by visiting precasting plants that have sample selections on hand to assist in setting limits for the desired finish. Alternatively, for the initial selection of color, texture, and finish, the Color & Texture Guide at www.pci.org/publications/ctg/index.cfm can serve as a visual reference (Fig. 2).

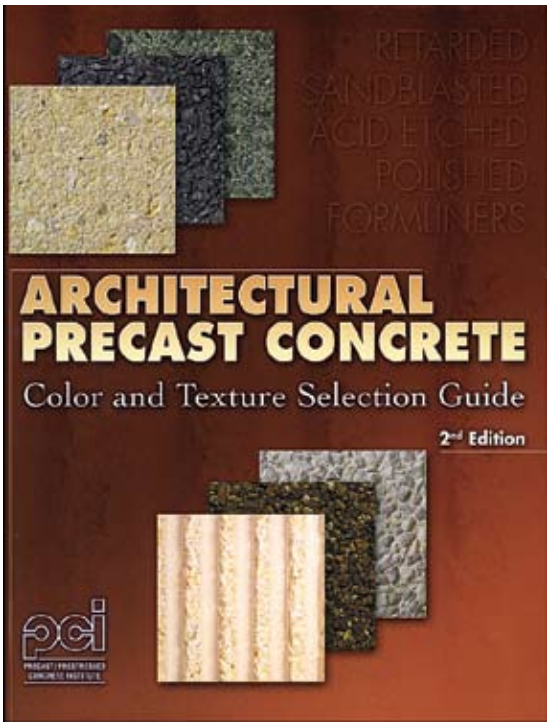

Figure 2

Because different precasters utilize different material sources and manufacturing techniques, the photographic samples in the guide and the final product will not be an exact match. Samples must be made to ensure that the desired colors and textures are matched satisfactorily. Samples for architectural precast concrete are custom produced to translate the architect's specific design concept into a standard for realistic and economic production requirements.

Because the architect is responsible for the final decision, design judgment should be supplemented with an assessment of the operating procedures and technical personnel from all plants likely to bid on the project. Watching plant operations and talking with plant personnel also help the architect obtain an understanding of production considerations.

Prebid Samples

Once a project's sample for each color and texture has been finalized, the designer should make the samples available to all interested precast concrete bidders to view and photograph. In some cases, multiple samples are made so that each precast concrete bidder can have a sample. Listing the mixture proportions for the selected samples in the specification is encouraged so that all bidders have identical information.

It is recommended that all precasters approved for a particular project develop samples for approval as a prerequisite for bidding. If the precast concrete units have an exposed interior finish, such as a trowel finish, samples of the finish, color, and texture should also be shown for the back surface.

Samples should be at least 12 in. square with a 2 in. thickness to provide information on mixture proportions (color tone) and finishes (texture) for the architect's initial aesthetic evaluation (Fig. 3). Larger samples are recommended, but they may be difficult to handle.

Product appearance is influenced by factors such as form, complexity of the casting, and physical mass, as well as the natural characteristics of the concrete ingredients. In short, a single 12 in. × 12 in. sample may not accurately represent a production casting. Larger samples—the next step in the process—are necessary to give a true picture of the possible finish

Figure 3 Samples show color, finish, and texture at the precasing plant. (Courtesy Paul Grigonis)

variations over a large area, to demonstrate normal surface blemishes, to incorporate rustication details, or to show the effects of the natural day-to-day variations of aggregates and cement.

The design reference samples are for initial verification of design intent relative to color and texture and should be regarded only as a standard for performance within the variations of workmanship and materials to be expected.

Individual plant preferences, differences in sources of supply, and different techniques developed by various plants serving the same area mean that not all precasters will be able to obtain an exact match of the selected samples. Many architects select and approve samples prior to bid closing. Then the approved precasters' names and corresponding sample code numbers are published in an addendum or the approval list is given in writing to the general contractor.

This practice may result in slight variations in color, aggregate, or texture but not necessarily in the quality supplied by different bidders. The individual precaster, within specification limits, selects the materials and employs the placing and finishing techniques best suited to its plant operations. By making approval of prebid samples a prerequisite for bidding, the architect and client are protected by requiring equivalent optimum quality from all precasters. Then those involved know the result to be achieved in color and texture of the finish. The following requirements should be adhered to by any architect making prebid sample approval part of the specifications:

- Sufficient time, usually about two weeks, must be allowed for the bidder to submit samples or information for approval. Time also must be provided to allow the approvals to be conveyed to the precaster in writing so that the precaster can estimate and submit an accurate bid.
- If the mixture proportions for the selected samples are not available, any prebid submittal should be treated in confidence by the architect and general contractor/construction manager and the individual precaster's solutions and/or techniques should be protected both before and after bidding.

If the characteristics of submitted prebid samples deviate from the project specifications, the precaster must make this clear when submitting the samples and other required information for approval. For proper evaluation and approval of the samples, the precaster should state the reasons for any deviations. These reasons might include the precaster's concern over controlling variation in either color or texture within specified limits.

The architect should request data to evaluate the deviations. If the deviations and samples are approved, the architect should change the original project specifications and contract drawings to match the new samples.

Production Approval Samples

After award of the contract but before producing any units, the precaster prepares and submits for approval a representative sample or samples of the required color and texture.

For nonplanar, curved, or other complex shapes, a flat-cast sample may not represent the anticipated appearance of the final product. Sample shapes should be selected to offer a reasonable comparison to the precast concrete units they represent. Also, the sizes of the samples should reflect the relationship among materials (for example, the maximum size of the aggregate to be used), finishes, shapes, and casting techniques. These techniques include mold or formliner types, the thickness of the concrete section, the orientation of exposed surfaces during casting, and consolidation procedures. If the precast concrete units have an exposed interior finish, such as a finish ready for painting, samples of the back-surface workmanship, color, and texture should be shown as well.

Also, architects should specify that the matrix's color or tone match that of the coarse aggregate so that minor segregation of the aggregate won't be noticeable. Panels containing aggregates and matrices of contrasting colors will appear less uniform. As the size of the coarse aggregate decreases, less matrix is seen and the panel's color will appear more uniform. Once the small samples are within an acceptable range,

Figure 4 Panels assist in finish selection. (Courtesy *Architectural Precast Concrete*)

larger samples should be made to confirm that the mixture proportions, vibration, and finishing techniques necessary to make production-sized pieces could duplicate the aesthetic qualities of the small sample pieces.

Figures 4 shows that a 12 in. square sample with a 2 in. thickness may bear little relationship to the appearance and physical characteristics of a production panel. Differences in mass, density, and curing rate between the sample and the production panel may make direct comparison difficult. This is particularly true for insulated sandwich panels.

Full-scale and quarter- or half-scale samples (usually 4 ft × 4 ft can be used to evaluate the production methods and the finished products. The panels should incorporate details of architectural features, finishes, textures, and transitions from one color or texture to another. For example, if return elements are to be cast with a major panel section, the samples should have returns cast with them to represent the way that the finish will be accomplished on such sections. The production of uniform, blemish-free samples that demonstrate the abilities of a single master craftsperson will be misleading and could cause endless difficulties when the production personnel using actual manufacturing facilities have to match the sample.

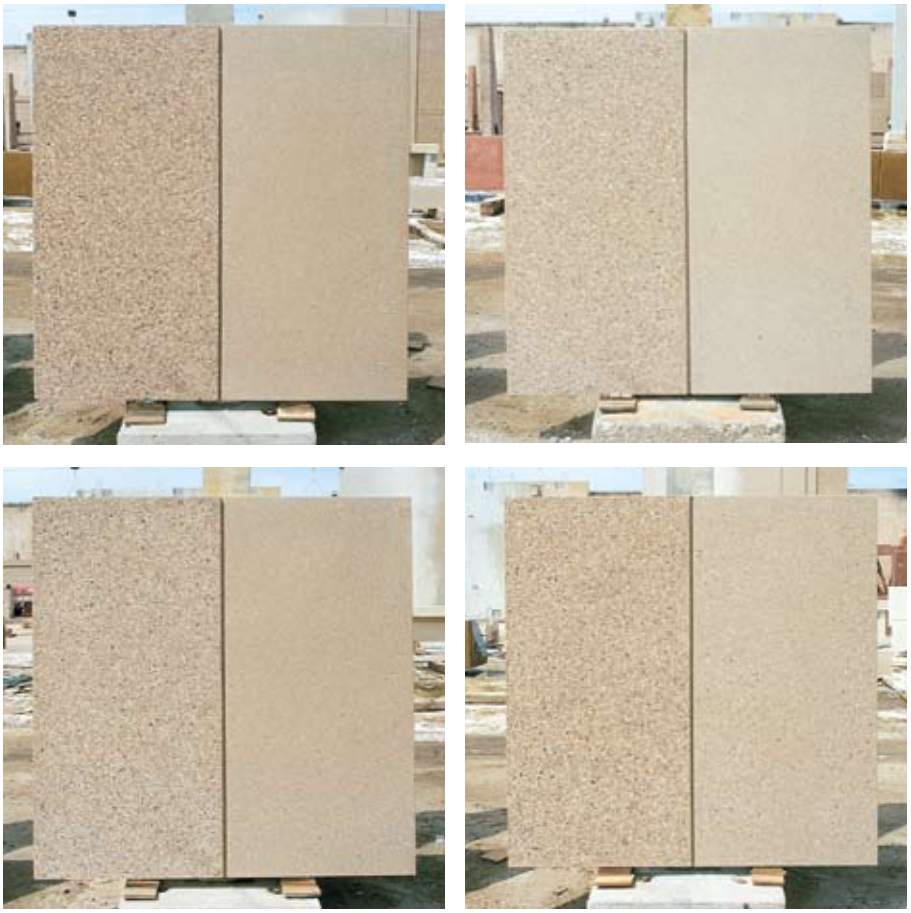

Figure 5 These range samples show retarded finishes on the left and acid-etched finishes on the right.
(Courtesy *Architectural Precast Concrete*)

Range Samples

Range samples should be produced based on the plant's past experience with a mixture or finish and for large projects with multiple approving entities with little apparent precast concrete experience. At least three range samples of one size (full scale but not necessarily full sized) should be produced to demonstrate actual planned production conditions. These should establish the anticipated maximum and minimum ranges of acceptance as well as the optimum target for

color and texture variations; uniformity of returns; frequency, size, and uniformity of air-void distribution; surface blemishes; and overall appearance. The approved range samples or mockup panels should be stored outdoors and positioned to allow comparison of finished production units with the acceptable range samples. They should be stored adjacent to each other to ensure similar lighting (sun and shade) for daily comparisons of finish and exposure with production units. There is no reason to expect the finished product to vary significantly from the range samples.

Figure 5 shows the acceptable range of concrete samples made with 3/8 in. aggregate with retarded (left side) and acid-etched (right side) finishes. Only two of the retarded finishes were within the acceptable range on the three approved acid-etched samples. Therefore, one additional sample was made to obtain an acceptable range for the retarded finishes. Figure 6 shows the production panel made after the samples were accepted.

The acceptability of repair techniques for chips, spalls, or other surface blemishes can also be established on the production approval, range samples, or mockup units. The face of each sample should contain at least two areas of approved size and shape that have been chipped out and then patched and repaired. The color, texture, and appearance of

Figure 6 This production panel was made after the samples were accepted. (Courtesy *Architectural Precast Concrete*)

patched areas should match those of the adjacent surface. Repairs should be at least one month old before acceptability is judged. Perfecting a repair procedure can save both time and money in the final outcome of the project.

Mockups for Production Approval

If the project's size warrants, the architect and owner should authorize the expenditure for mockups, either of a partial or full-scale portion of a panel or an entire typical unit. The mockups usually encompass most of the different shapes and finishes on typical panels (Fig. 7). Investing in such mockups removes uncertainties held by both the architect and owner about the overall appearance of the completed building and verifies conformity to established design guidelines. Larger samples require considerable time to produce, and they should not be specified unless sufficient lead time exists.

In some cases, after the design reference samples are selected, a precaster may be engaged to fabricate a mockup with all ancillary materials. Then all precasters would use this as a basis for their bids. This approach eliminates production-schedule delays. Also, it may be desirable to separate the mockup costs from the base bid so that the cost can be evaluated separately.

Aesthetic mockups can offer the opportunity to evaluate the fit and finish of all of the exterior materials as well as the following specific precast concrete factors:

- details on the exposed face and uniformity of returns
- erection and bracing techniques
- connection details
- colors and finishes of adjacent materials (for example, window frames, glass, and sealants)
- dimensional accuracy of the precast concrete work and the constructability of the specified tolerances
- acceptability of the precast concrete unit's inside surface finish (where exposed)
- suitability of the selected sealers, if specified
- weathering patterns or rain runoff on a typical section of the precast concrete facade

Mockups should be produced using standard production equipment and techniques. Important variables that should be controlled as close to actual casting conditions include the retarder coverage rate and method of application, if used; mixture proportions and slump; admixtures; the temperature of fresh and cured concrete; vibration; piece thickness; the age at which finishing operations are performed; and the method of cleaning. This is especially important with light etches that are particularly affected by changing conditions. Special details, such as reveal patterns and intersections, corner joinery, drip sections, patterns, colors, and textures should be demonstrated in the mockup units for approval. Changes in aggregate orientation, color tone, and texture can easily be noted on full-scale mockup panels.

Figure 7 Mockups usually show the different shapes and finishes on typical panels.
(Courtesy *Architectural Precast Concrete*)

The mockups allow the precaster and designer to explore a series of options for particularly challenging details prior to full-scale production. The mockup sample can demonstrate the more-detailed conditions that may be encountered in the project, such as recesses, reveals, outside/inside corners, multiple finishes, textures, and veneers. Mockup panels should contain any expected cast-in inserts, reinforcement, and plates. Designers can inspect window interfaces, joints and sealants, connections, and other critical elements to ensure that they are visually acceptable and will properly interface between trades.

When the mockups are manufactured and erected, all interested parties should be present and ready to discuss the approval for panel production. If surface texture or other changes are desired, all information should be recorded. Depending on the changes, production should not begin until the changes have been made and the mockups are approved.

During range-sample or mockup review, the precaster will ask the architect or representative to inspect and approve (sign and date) the range-sample panels or mockup. These then supersede the previously approved 12 in. × 12 in. samples.

Visit the Precaster

Where mockups are not used, it is recommended that the architect or owner visit the precast concrete plant and approve (sign and date) the initial production units. This approval should precede a release for production to avoid potential controversies later. However, delays in visiting plants will upset normal operations and the job schedule. The contract documents should state clearly how long the production units or the mockup structure will be kept in the plant or at the jobsite for comparison purposes.

The contract documents also should permit the approved full-scale mockup units to be used in the job installation in the late stages of construction. The units should remain identifiable, even on the structure, until final project acceptance. The panels should be erected adjacent to each other to allow continued comparison if necessary.

Designers can exert more control over the final appearance using precast concrete thanks to finish and range samples as well as mockup panels. By visiting the precaster to monitor progress, the architect and owner can help ensure no surprises arise at the site.

Assessment of Samples and Finished Product

When assessing 12-in.-square samples, most people will try to visualize how the entire unit, or even the entire facade, will look. This unrealistic view may lead to disappointments when production begins and remedies become expensive or impossible. If 12-in.-square samples are used to select the aggregate color, the architect must remember that the general appearance of large areas of a building wall tend to be lighter than the samples.

Also, panels will appear darker when damp than when dry.

Determining acceptable uniformity of color, finish, and texture is by visual examination and is generally subjective. However, suitable criteria for product acceptability require that the finished concrete surfaces should have no readily visible imperfections other than minimal color and texture variations from the approved samples. Also, the surface should not show evidence of repairs when viewed in typical daylight illumination with the unaided eye at a 20 ft or greater viewing distance. Appearance of the surface should not be evaluated when light is illuminating the surface from an extreme angle because this tends to accentuate minor surface irregularities due to shadowing.

Mockups are assessed most effectively when mounted in their final orientation. Samples viewed from a distance of a few feet will reveal details that will not be noticed on a building when viewed from 50 ft to 100 ft. Details should be appraised from a distance typical for the distance of the installed panel. Overlooking this may lead to demands for shapes, textures, and drafts that are not only expensive but may not even be identifiable in the finished building. Approved 12 in. × 12 in. samples should also be compared to the mockup to ensure that the original intent has not been lost.

Both designers and owners should realize that the selection of a 12 in. × 12 in. architectural precast concrete sample represents only the first step in the development of the actual production of that element. It should not be considered a final decision. When you are completing the approval process of larger samples, mockups or approval of the first production panels is extremely important and develops communication among all parties regarding acceptance criteria and ensures that design concepts translate into reality.

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Statement of Ownership, Management, and Circulation (Requester Publications Only)

1. Publication Title	2. Publication Number	3. Filing Date
Ascent	0 1 4 - 5 6 8	August 20, 2009
4. Issue Frequency	5. Number of Issues Published Annually	6. Annual Subscription Price (if any)
Bi-annual	Two	Free to qualified

7. Complete Mailing Address of Known Office of Publication (Not printer) (Street, city, county, state, and ZIP+4®)
Precast/Prestressed Concrete Institute
209 W. Jackson Blvd., Suite 500
Chicago, IL 60606-6907
Contact Person: Brian Miller
Telephone (Include area code): 312-786-0300

8. Complete Mailing Address of Headquarters or General Business Office of Publisher (Not printer)
PCI (same as above)

9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor (Do not leave blank)
Publisher (Name and complete mailing address)
PCI (same as above)

Editor (Name and complete mailing address)
Brian Miller
(same as above)

Managing Editor (Name and complete mailing address)
Michelle Busgess
(same as above)

10. Owner (Do not leave blank. If the publication is owned by a corporation, give the name and address of the corporation immediately followed by the names and addresses of all stockholders owning or holding 1 percent or more of the total amount of stock. If not owned by a corporation, give the names and addresses of the individual owners. If owned by a partnership or other unincorporated firm, give its name and address as well as those of each individual owner. If the publication is published by a nonprofit organization, give its name and address.)

Full Name	Complete Mailing Address
Precast/Prestressed Concrete Institute	209 W. Jackson Blvd., Suite 500 Chicago, IL 60606

11. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages, or Other Securities. If none, check box → ☒ None

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12. Tax Status (For completion by nonprofit organizations authorized to mail at nonprofit rates) (Check one)
The purpose, function, and nonprofit status of this organization and the exempt status for federal income tax purposes:
☒ Has Not Changed During Preceding 12 Months
☐ Has Changed During Preceding 12 Months (Publisher must submit explanation of change with this statement)

PS Form **3526-R**, September 2007 (Page 1 of 3 (Instructions Page 3)) PSN: 7530-09-000-8855 **PRIVACY NOTICE:** See our privacy policy on www.usps.com

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13. Publication Title	14. Issue Date for Circulation Data Below
Ascent	Winter 2009

15. Extent and Nature of Circulation			Average No. Copies Each Issue During Preceding 12 Months	No. Copies of Single Issue Published Nearest to Filing Date
a. Total Number of Copies (Net press run)			53,971	50,870
b. Legitimate Paid and/or Requested Distribution (By Mail and Outside the Mail)	(1)	Outside County Paid/Requested Mail Subscriptions stated on PS Form 3541. (Include direct written request from recipient, telemarketing and Internet request from recipient, paid subscriptions including nominal rate subscriptions, employer requests, advertiser's proof copies, and exchange copies.)	49,683	45,400
	(2)	In-County Paid/Requested Mail Subscriptions stated on PS Form 3541. (Include direct written request from recipient, telemarketing and Internet requests from recipient, paid subscriptions including nominal rate subscriptions, employer requests, advertiser's proof copies, and exchange copies.)	0	0
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	(4)	Requested Copies Distributed by Other Mail Classes Through the USPS (e.g. First-Class Mail®)	0	0
c. Total Paid and/or Requested Circulation (Sum of 15b (1), (2), (3), and (4)) ▶			49,683	45,400
d. Nonrequested Distribution (By Mail and Outside the Mail)	(1)	Outside County Nonrequested Copies Stated on PS Form 3541 (include Sample copies, Requests Over 3 years old, Requests induced by a Premium, Bulk Sales and Requests including Association Requests, Names obtained from Business Directories, Lists, and other sources)	0	0
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e. Total Nonrequested Distribution (Sum of 15d (1), (2), (3) and (4))			0	0
f. Total Distribution (Sum of 15c and e) ▶			49,683	45,400
g. Copies not Distributed (See Instructions to Publishers #4, (page #3)) ▶			4288	5,470
h. Total (Sum of 15f and g)			53,971	50,870
i. Percent Paid and/or Requested Circulation (15c divided by f times 100) ▶			100%	100%

16. Publication of Statement of Ownership for a Requester Publication is required and will be printed in the Fall 2009 issue of this publication.

17. Signature and Title of Editor, Publisher, Business Manager, or Owner — Manager — Date: Aug. 19, 2009

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PCI-Certified Plants

(as of August 2009)

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

Whatever your needs, working with a PCI plant that is certified in the product groups it produces will benefit you and your project.

- You'll find easier identification of plants prepared to fulfill special needs.
- You'll deal with established producers—many certified for more than 30 years.
- Using quality products, construction crews can get the job done right the first time, keeping labor costs down.
- Quality products help construction proceed smoothly, expediting project completion.

Guide Specification

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

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

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

Product Groups and Categories

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

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

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

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

GROUPS

GROUP A – *Architectural Products*

Category AT – Architectural Trim Units

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

Category A1 – Architectural Cladding and Load-Bearing Units

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

GROUP B – *Bridges*

Category B1 – Precast Concrete Bridge Products

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

Category B2 – Prestressed Miscellaneous Bridge Products

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

Category B3 – Prestressed Straight-Strand Bridge Members

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

Category B4 – Prestressed Deflected-Strand Bridge Members

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

GROUP BA – *Bridge Products with an Architectural Finish*

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

GROUP C – *Commercial (Structural)*

Category C1 – Precast Concrete Products

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

Category C2 – Prestressed Hollow-Core and Repetitive Products

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

Category C3 – Prestressed Straight-Strand Structural Members

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

Category C4 – Prestressed Deflected-Strand Structural Members

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

GROUP CA – *Commercial Products with an Architectural Finish*

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

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

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

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

ALABAMA

Gate Precast Company, Monroeville (251) 575-2803 — **A1, C1A**
Hanson Pipe and Precast Southeast, Birmingham (205) 663-4681 — **B4, C4**
Rotondo Weirich - Aliceville, Aliceville (215) 256-7940 — **C1**
Standard Concrete Products, Theodore (251) 443-1113 — **B4, C2**

ARIZONA

Coreslab Structures (ARIZ) Inc., Phoenix (602) 237-3875 — **A1, C4A**
TPAC, Phoenix (602) 262-1360 — **A1, B4, C4A**

ARKANSAS

Coreslab Structures (ARK) Inc., Conway (501) 329-3763 — **C4A**

CALIFORNIA

Bethlehem Construction, Inc., Shafter (661) 391-9704 — **C3A**
Clark Pacific, Fontana (909) 823-1433 — **A1, C3, G**
Clark Pacific, West Sacramento (916) 371-0305 — **A1, C3**
Clark Pacific, Woodland (916) 371-0305 — **B3, C3**
Con-Fab California Corporation, Lathrop (209) 249-4700 — **B4, C4**
Coreslab Structures (L.A.) Inc., Perris (951) 943-9119 — **A1, B4, C4A**
Fintech Precast, Inc., Redding (530) 241-8397 — **C2A**
Hanson Structural Precast, Irwindale (626) 962-8751 — **C4**
Hanson Structural Precast, San Diego (619) 423-9030 — **C4**
Mid-State Precast, L.P., Corcoran (559) 992-8180 — **A1, C3A**
Pomeroy Corporation, Perris (951) 657-6093 — **B4, C2**
Walters & Wolf Precast, Fremont (510) 226-5162 — **A1, G**
Willis Construction Co., Inc., San Juan Bautista (831) 623-2900 — **A1, C1, G**
Willis De Mexico S.A. de C.V., Tecate — **A1, C1, G**

COLORADO

EnCon Colorado, Denver (303) 287-4312 — **B4, C2**
Flatiron Constructors, Inc., Longmont (303) 485-4050 — **B1**
Plum Creek Structures, Littleton (303) 471-1569 — **B4, C3**
Rocky Mountain Prestress, Inc., Denver (303) 480-1111 — **B4, C4**
Rocky Mountain Prestress, Inc., Denver (303) 480-1111 — **A1, C3A**
Rocla Concrete Tie, Inc., Denver (303) 296-3505 — **C2**
Stresscon Corporation, Colorado Springs (719) 390-5041 — **A1, B4, C4A**
Stresscon Corporation, Dacono (303) 659-6661 — **C4**

CONNECTICUT

Blakeslee Prestress Inc., Branford (203) 481-5306 — **A1, B4, C4A**
Coreslab Structures (CONN) Inc., Thomaston (860) 283-8281 — **A1**
Oldcastle Precast, Inc./dba Rotondo Precast, Avon (860) 673-3291 **B1, C1A**

DELAWARE

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

FLORIDA

CDS Manufacturing Inc., Midway (850) 875-4651 — **B3, C4**
Cement Industries, Inc., Fort Myers (239) 332-1440 — **B3, C3**
Coreslab Structures (MIAMI) Inc., Medley (305) 823-8950 — **A1, C4A**
Coreslab Structures (ORLANDO) Inc., Orlando (407) 855-3191 — **C2**
Coreslab Structures (TAMPA) Inc., Tampa (813) 626-1141 — **B3, C3A**
Dura-Stress, Inc., Leesburg (800) 342-9239 — **A1, B4A, C3A**
Finfrock Industries, Inc., Orlando (407) 293-4000 — **C4**
Florida Precast Industries, Inc., Sebring (863) 655-1515 — **C2**
Florida Rock and Sand Prestress Precast Co., Inc.,
Florida City (305) 247-9611 — **B3, C3**
Gate Concrete Products Company, Jacksonville (904) 757-0860 — **B4, C4**
Gate Precast Company, Kissimmee (407) 847-5285 — **A1**
South Eastern Prestressed Concrete, Inc.,
West Palm Beach (561) 793-1177 — **B3, C3**
Stabil Concrete Products, LLC, St. Petersburg (727) 321-6000 — **A1**
Standard Concrete Products, Inc., Tampa (813) 831-9520 — **B4, C3**

GEORGIA

Atlanta Structural Concrete Co., Buchanan (770) 646-1888 — **C4A**
ConArt Precast, LLC, Cobb (229) 853-5000 — **A1, AT, C3**
Coreslab Structures (ATLANTA) Inc., Jonesboro (770) 471-1150 — **C3A**
MC Precast, Inc., Newnan (678) 423-4364 — **B1, C2**
Metromont Corporation, Hiram (770) 943-8688 — **A1, C4A**
Standard Concrete Products, Inc., Atlanta (404) 792-1600 — **B4**
Standard Concrete Products, Inc., Savannah (912) 233-8263 — **B4, C4**
Tindall Corporation, Conley (800) 849-6383 — **C2A**
Tindall Corporation, Conley (800) 849-6383 — **C4A**

HAWAII

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

IDAHO

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

ILLINOIS

ATMI Dynacore, Lockport (815) 838-9492 — **C2**
ATMI Precast, Aurora (630) 896-4679 — **A1, C3A**
County Materials Corporation, Champaign (217) 352-4181 — **B3**
Dukane Precast, Inc., Aurora (630) 355-8118 — **A1, C3**
Egyptian Concrete Company, Salem (618) 548-1190 — **A1, B4, C4**
High Concrete Group LLC, Paxton (217) 379-9790 — **A1, C3A**
Illini Precast, LLC, Marseilles (708) 562-7700 — **C3**
Lombard Architectural Precast Products Co., Alsip (708) 389-1060 — **A1**
Mid-States Concrete Industries, South Beloit (608) 364-1072 — **C3**
Prestress Engineering Corporation, Blackstone (815) 586-4239 — **B4, C4**
Spancrete of Illinois, Inc., Crystal Lake (815) 459-5580 — **C2**
St. Louis Prestress, Inc., Glen Carbon (618) 656-8934 — **B3, C3**

INDIANA

ATMI Indy, LLC, Greenfield (317) 891-6280 — **C2**
Coreslab Structures (INDIANAPOLIS) Inc.,
Indianapolis (317) 353-2118 — **A1, C4A**
Hoosier Precast LLC, Salem (812) 883-4665 — **B3, C1A**
Precast Specialties, Inc., Monroeville (260) 623-6131 — **A1**
Prestress Services Industries LLC, Decatur (260) 724-7117 — **B4, C4A**
StresCore, Inc., South Bend (574) 233-1117 — **C2**

IOWA

Andrews Prestressed Concrete, Inc., Clear Lake (641) 357-5217 — **B4, C4**
IPC, Inc., Des Moines (515) 243-5118 — **C4**
IPC, Inc., Iowa Falls (515) 243-5118 — **A1, B4, C4A**
IPC, Inc., West Burlington (515) 243-5118 — **A1, B4, C3A**
MPC Enterprises, Inc., Mount Pleasant (319) 986-2226 — **A1, C3A**

KANSAS

Coreslab Structures (KANSAS) Inc., Kansas City (913) 287-5725 — **B4, C4**
IPC, Inc., Pleasanton (913) 352-8800 — **C3**
Prestressed Concrete, Inc., Newton (316) 283-2277 — **A1, B4, C4**
Stress-Cast, Inc., Assaria (785) 667-3905 — **C3A**
Waffle-Crete International, Inc., Hays (785) 625-3486 — **C3A**

KENTUCKY

de AM - RON Building Systems LLC, Owensboro (270) 684-6226 — **C3**
Gate Precast Company, Winchester (859) 744-9481 — **A1**
Prestress Services Industries LLC, Henderson (270) 826-6244 — **B4, C3**
Prestress Services Industries LLC, Lexington (859) 299-0461 — **A1, B4, C4A**
Prestress Services Industries LLC, Melbourne (859) 441-0068 — **B4, C3**

LOUISIANA

Boykin Brothers, Inc./Louisiana Concrete Products
Baton Rouge (225) 753-8722 — **A1, B4, C3A**
F-S Prestress, LLC, Princeton (318) 949-2444 — B4, C3
Fibrebond Corporation, Minden (318) 377-1030 — **A1, C1**

MAINE

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

MARYLAND

Atlantic Metrocast, Inc., LaPlata (301) 870-3289 — **B3, C1**
Larry E. Knight, Inc., Glyndon (410) 833-7800 — **C2**
Oldcastle Precast Building Systems Div.,
Edgewood (410) 612-1213 — **A1, C3A**

MASSACHUSETTS

Oldcastle Precast, Inc./dba Rotondo Precast,
Rehoboth (508) 336-7600 — **B4, C3**
Unistress Corporation, Pittsfield (413) 499-1441 — **A1, B4, C4A**
Vynorius Prestress, Inc., Salisbury (978) 462-7765 — **B2, C2**

MICHIGAN

Dura-Crete Products, Warren (586) 759-4286 — **B2, C2**
Gerace Construction Company, Inc., Midland (989) 496-2440 — **A1, B3, C3**
Grand River Infrastructure, Inc., Grand Rapids (616) 534-9645 — **B4, C1**

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

International Precast Solution, LLC, River Rouge (313) 297-7700 **A1, B3, C3**
Kerkstra Precast Inc., Grandville (800) 434-5830 **B1, C3A**
National Precast Structural, Inc., Shelby (586) 247-1201 **C3**
National Precast, Inc., Roseville (586) 294-6430 **A1, C3A**
Nucon Schokbeton / Stress-Con Industries, Inc.,
Kalamazoo (269) 381-1550 **A1, B4, C3A**
Stress Con Industries, Inc., Saginaw (989) 239-2447 **B4, C3**
Stress-Con Industries, Inc., Detroit (313) 873-4711 **B2, C3**

MINNESOTA

Cretex Concrete Products North, Inc., Elk River (763) 545-7473 **B4, C2**
Hanson Structural Precast Midwest, Inc.,
Maple Grove (763) 425-5555 **A1, C4A**
Molin Concrete Products Co., Lino Lakes (651) 786-7722 **C3A**
Wells Concrete Products Co., Wells (507) 553-3138 **A1, C4A**

MISSISSIPPI

F-S Prestress, LLC, Hattiesburg (601) 268-2006 **B4, C4**
Gulf Coast Pre-Stress, Inc., Pass Christian (228) 452-9486 **B4, C4**
J.J. Ferguson Prestress-Precast Company, Inc.,
Greenwood (662) 453-5451 **B4**
Jackson Precast, Inc., Jackson (601) 321-8787 **A1, C2A**
Prestress Services Industries of MS, LLC, Ridgeland (601) 856-4135 **B4, C1**
Tindall Corporation, Moss Point (228) 435-0160 **A1, C4A**

MISSOURI

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

MONTANA

Missoula Concrete Construction, Missoula (406) 549-9682 **A1, B3, C3**
Montana Prestressed Concrete, Billings (605) 718-4111 **B4, C3**

NORTH CAROLINA

Gate Precast Company, Oxford (919) 603-1633 **A1, C2**
Metromont Corporation, Charlotte (704) 372-1080 **A1, C3**
Oldcastle Precast, Inc / dba NC Products, Raleigh (919) 772-6301 **C1**
Prestress of the Carolinas, LLC, Charlotte (704) 587-4273 **B4, C4**
S & G Prestress Company, Leland (910) 397-6255 **B4**
S & G Prestress Company, Wilmington (910) 763-7702 **B4, C3**
Utility Precast, Inc., Charlotte (704) 596-6283 **B3A**

NORTH DAKOTA

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

NEBRASKA

Concrete Industries, Inc., Lincoln (402) 434-1800 **B4, C4A**
Coreslab Structures (OMAHA) Inc., LaPlatte (402) 291-0733 **A1, B4, C4A**
CXT, Inc., Grand Island (308) 382-5400 **C2**
Enterprise Precast Concrete, Inc., Omaha (402) 895-3848 **A1**
GFRC, Inc., Lincoln (402) 466-3200 **G**
Stonco, Inc., Omaha (402) 556-5544 **A1**

NEW HAMPSHIRE

Architectural Cladding Systems, Inc., Hollis (603) 889-6310 **G**
Newstress Inc., Epsom (603) 736-9348 **B3, C3**

NEW JERSEY

High Concrete Group LLC, Buena (856) 697-3600 **C3**
Jersey Precast Corp., Hamilton Township (609) 689-3700 **B4, C4**
Precast Systems, Inc., Allentown (609) 208-1987 **B4, C4**
Universal Concrete Products of NJ, Inc., Folsom (609) 704-9400 **A1, C1**

NEW MEXICO

Castillo Prestress, Belen (505) 864-0238 **B1, C3**
Coreslab Structures (ALBUQUERQUE) Inc.,
Albuquerque (505) 247-3725 **A1, B4, C4**
Ferreri Concrete Structures, Inc., Albuquerque (505) 344-8823 **A1, C4A**

NEW YORK

David Kucera Inc., Gardiner (845) 255-1044 **A1, G**
Lakelands Concrete Products, Inc., Lima (585) 624-1990 **A1, B3A, C3A**
Oldcastle Precast Building Systems Div.,
South Bethlehem (518) 767-2116 **B3, C3A**
The Fort Miller Co., Inc., Greenwich (518) 695-500 **B1, C1**
The L.C. Whitford Materials Co., Inc., Wellsville (585) 593-2741 **B3, C3**

OHIOI

DBS Prestress of Ohio, Huber Heights (937) 878-8232 **C2**
High Concrete Group LLC, Springboro (937) 748-2412 **A1, C3A**
KSA, Sciotoville (740) 776-3238 **C2**
Mack Industries, Inc., Valley City (330) 483-3111 **C2**
Prestress Services Industries LLC, Grove City (614) 871-2900 **B4**
Sidley Precast, Thompson (440) 298-3232 **A1, C4A**
United Precast, Inc., Mt. Vernon (800) 366-8740 **B4, C3**
United Precast, Inc., Mt. Vernon (740) 393-1121 **B3, C1**

OKLAHOMA

Coreslab Structures (OKLA) Inc. (Plant No.1),
Oklahoma City (405) 632-4944 **A1, C4A**
Coreslab Structures (OKLA) Inc. (Plant No.2),
Oklahoma City (405) 672-2325 **B4, C1**
Coreslab Structures (TULSA) Inc., Tulsa (918) 438-0230 **B4, C4**
Tulsa Dynaspan, Inc., Broken Arrow (918) 258-1549 **C3**

OREGON

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

PENNSYLVANIA

Architectural Precast LLC, Middleburg (570) 837-1774 **A1, C2A**
Castcon Stone, Inc., Saxonburg (724) 352-2200 **C1A**
Concrete Safety Systems, LLC, Bethel (717) 933-4107 **B1, C1**
Conewago Precast Building Systems, Hanover (717) 632-7722 **A1, C2A**
Dutchland, Inc., Gap (717) 442-8282 **C3**
Hanson Pipe & Precast, Pottstown (610) 970-2216 **B1A, C1A**
High Concrete Group LLC, Denver (717) 336-9300 **A1, C3A**
High Concrete Group LLC, Williamsport (570) 329-4228 **C3**
J & R Slaw, Inc., Lehighton (610) 852-2020 **A1, B3, C3**
Newcrete Products, Roaring Spring (814) 224-2121 **B4, C4**
Nitterhouse Concrete Products, Inc., Chambersburg (717) 267-4505 **A1, C4A**
Northeast Prestressed Products, LLC, Cressona (570) 385-2352 **B4, C3**
Pittsburgh Flexicore Company, Inc., Monongahela (724) 258-4450 **C2**
Say-Core, Inc., Portage (814) 736-8018 **C2**
Sidley Precast, Youngwood (724) 755-0205 **C3**
Technopref Industries Inc., Royersford Plant,
Royersford (450) 569-8043 **B1, C1**
Top Roc Newcrete Products Company, Erie (814) 838-2011 **B4**
Universal Concrete Products Corporation, Stowe (610) 323-0700 **A1, C3A**

SOUTH CAROLINA

Coreslab Structures (COLUMBIA) Inc., Hopkins (803) 783-5460 **A1**
Florence Concrete Products, Inc., Sumter (803) 775-4372 **B4, C3A**
Metromont Corporation, Greenville (864) 295-0295 **A1, C4A**
Tekna Corporation, Charleston (843) 853-9118 **B4, C2**
Tindall Corporation, Fairforest (864) 576-3230 **A1, C4A**

SOUTH DAKOTA

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

TENNESSEE

Construction Products, Inc. of Tennessee, Jackson (731) 668-7305 **B4, C4**
Gate Precast Company, Ashland City (615) 792-4871 **A1**
Metromont Corporation, LaVergne (615) 793-3393 **A1, C4A**
Mid South Prestress, LLC, Pleasant View (615) 746-6606 **C3**
Prestress Services Industries of TN, LLC, Memphis (901) 775-9880 **B4, C3**
Ross Prestressed Concrete, Inc., Bristol (423) 323-1777 **B4, C3**
Ross Prestressed Concrete, Inc., Knoxville (865) 524-1485 **B4, C4**
Rotondo Weirich - Trousdalz, TN, Hurtsville (215) 631-4264 **C1**
Sequatchie Concrete Service, Inc., Knoxville (423) 867-4510 **C2**
Southeast Precast Corporation, Knoxville (865) 524-3615 **A1**

TEXAS

Coreslab Structures (TEXAS) Inc., Cedar Park (512) 250-0755 **A1, C4A**
CXT, Inc., Hillsboro (254) 580-9100 **B1, C1**
Enterprise Concrete Products, LLC, Dallas (214) 631-7006 **B3, C3**
Gate Concrete Products Company, Pearland (281) 485-3273 **C2**
Gate Precast Company, Hillsboro (254) 582-7200 **A1**
GFRC Cladding Systems, LLC, Garland (972) 494-9000 **G**
Heldenfels Enterprises, Inc., Corpus Christi (361) 883-9334 **B4, C4**

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

Heldenfels Enterprises, Inc., San Marcos (512) 396-2376 ____ **B4, C4**
Lowe Precast, Inc., Waco (254) 776-9690 ____ **A1, C3A**
Manco Structures, Ltd., Schertz (210) 690-1705 ____ **B4, C4A**
North American Precast Company, San Antonio (210) 509-9100 ____ **A1, C4A**
Rocla Concrete Tie, Inc., Amarillo (806) 383-7071 ____ **C2**
Tindall Corporation, San Antonio (210) 248-2345 ____ **C2**

UTAH

EnCon Utah, LLC, Tooele (435) 843-4230 ____ **A1, B4, C3A**
Hanson Structural Precast Eagle, Salt Lake City (801) 966-1060 **A1, B4, C4A, G**
Owell Precast LLC, Bluffdale (801) 571-5041 ____ **C3**

VERMONT

Dailey Precast, Shaftsbury (802) 442-4418 ____ **A1, B3A, C3A**
J. P. Carrara & Sons, Inc., Middlebury (802) 388-6363 ____ **A1, B4A, C3A**

VIRGINIA

Atlantic Metrocast, Inc., Portsmouth (757) 397-2317 ____ **B4, C3**
Bayshore Concrete Products Corporation,
Cape Charles (757) 331-2300 ____ **B4, C4**
Bayshore Concrete Products/Chesapeake, Inc.,
Chesapeake (757) 549-1630 ____ **B4, C3**
Coastal Precast Systems, LLC, Chesapeake (757) 545-5215 ____ **B4, C3**
Metromont Corporation, Richmond (804) 222-8111 ____ **C3A**
Rockingham Precast, Inc., Harrisonburg (540) 433-8282 ____ **B4, C3**
Rotondo Weirich Enterprises, Inc., Salem (215) 631-4264 ____ **C1**
Smith-Midland Corporation, Midland (540) 439-3266 ____ **A1, B1, C3**
The Shockey Precast Group, Fredericksburg (540) 898-1221 ____ **A1, C3A**
The Shockey Precast Group, Winchester (540) 667-7700 ____ **A1, C4A**
Tindall Corporation, Petersburg (804) 861-8447 ____ **C4A**

WASHINGTON

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

WEST VIRGINIA

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

WISCONSIN

Advance Cast Stone Co., Inc., Random Lake (920) 994-4381 ____ **A1**
Architectural Precast, Inc., Browntown (608) 966-4370 ____ **C3A**
County Materials Corporation, Eau Claire (800) 729-7701 ____ **B4**
County Materials Corporation, Roberts (800) 426-1126 ____ **B4, C3**
International Concrete Products, Inc., Germantown (262) 242-7840 **A1, C1**
J.W. Peters, Inc., Burlington (800) 877-9040 ____ **B3, C3A**
MidCon Products, Inc., Hortonville (920) 779-4032 ____ **A1, AT, C1**
Precast Concrete Specialties, Inc., Omro (920) 685-2727 ____ **A1**
Spancrete Industries, Inc., Waukesha (414) 290-9000 ____ **A1, B2A, C3A**
Spancrete, Inc., Green Bay (920) 494-0274 ____ **B4, C4**
Spancrete, Inc., Valders (920) 775-4121 ____ **A1, C3A**

CANADA

ALBERTA

Con-FORCE STRUCTURES, Calgary (403) 248-3171 ____ **A1, B4, C4**
P. Kruger Concrete Products, Ltd., Edmonton (780) 438-2072 ____ **A1, C1**

BRITISH COLUMBIA

Con-FORCE STRUCTURES, Richmond (604) 278-9766 ____ **A1, B4, C3**

MANITOBA

Con-FORCE STRUCTURES, Winnipeg (204) 338-9311 ____ **B4, C3A**
Lafarge Canada Inc., Winnipeg (204) 958-6381 ____ **C2**

NEW BRUNSWICK

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

NOCA SCOTIA

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

ONTARIO

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

QUEBEC

Betons Prefabriques du Lac Inc., Alma (418) 668-6161 ____ **A1, C3, G**
Betons Prefabriques du Lac, Inc., Alma (418) 668-6161 ____ **A1, C1**
Betons Prefabriques Trans. Canada Inc.,
St. Eugene De Grantham (819) 396-2624 ____ **A1, B4, C3A**
Prefab De Beauce, Sainte-Marie (418) 387-7152 ____ **A1, C3**
Saramac Inc., Lachenaie (450) 966-1000 ____ **A1**
Schokbeton Quebec, Inc., St. Eustache (450) 473-6831 ____ **A1, B4A, C3**

MEXICO

PRETECSA, S.A. DE C.V., Atizapan De Zaragoza (000) 000-0000 ____ **A1, G**

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

PCI-Qualified & PCI-Certified Erectors

(as of August 2009)

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

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

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

Guide Specification

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

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

Erector Classifications

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

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

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

GROUPS

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

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

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

Certified erectors are listed in blue.

ARKANSAS

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

ARIZONA

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

CALIFORNIA

Coreslab Structures (L.A.), Inc., Perris (951) 943-9119 — **S2, A**
Walters & Wolf Precast, Fremont (510) 226-9800 — **A**

COLORADO

Colorado Fabricators & Constructors, Inc., Centennial (303) 471-9902 — **S2**
Gibbons Erectors, Inc., Parker (303) 841-0457 — **S2**
Mehring Welding & Erection, Penrose (719) 372-6607 — **S2**
Rocky Mountain Prestress, Denver (303) 480-1111 — **S2**
S. F. Erectors Inc., Elizabeth (303) 646-6411 — **S2**

CONNECTICUT

Blakeslee Prestress, Inc., Branford (203) 481-5306 — **S2**
Jacobs Engineering & Construction, LLC, New Haven (203) 389-4300 — **S2, A**

FLORIDA

All Florida Erectors and Welding, Inc., Apopka (407) 880-3717 — **S2, A**
Concrete Erectors, Inc., Altamonte Springs (407) 862-7100 — **S2**
Finfrock Industries, Inc., Orlando (407) 293-4000 — **S2**
Florida Precast Industries, Sebring (863) 655-1515 — **S2, A**
Gate Precast Erection Co., Jacksonville (904) 757-0860 — **S2, A**
James Toffoli Construction Company, Inc., Fort Myers (239) 479-5100 — **S2**
Pre-Con Construction of Tampa Inc., Tampa (813) 626-2545 — **S2, A**
Randy J. Mellor Construction, Inc., Nokomis (941) 321-1826 — **S1**
Solar Erectors U. S. Inc., Medley (305) 825-2514 — **S2, A**
Southeast Tilt-Wall Erectors, Inc., Geneva (407) 349-3545 — **S1**
Specialty Concrete Services, Inc., Altoona (352) 669-8888 — **S2, A**
Summit Erectors, Inc., Jacksonville (904) 783-6002 — **S2, A**

GEORGIA

ConArt Precast, LLC, Cobb (229) 853-5000 — **S2, A**
Precision Stone Setting Co., Inc., Hiram (770) 439-1068 — **S2, A**
Rutledge & Son's, Woodstock (770) 592-0380 — **S2**

IOWA

Cedar Valley Steel, Inc., Cedar Rapids (319) 373-0291 — **S2**
Topping Out Inc. / dba Northwest Steel Erection, Grimes (515) 202-8307 — **S2**

ILLINOIS

Creative Erectors, LLC, Rockford (815) 229-8303 — **S1**
Mid-States Concrete Industries, South Beloit (800) 236-1072 — **S2**
Spancrete of Illinois, Inc., Crystal Lake (815) 459-5580 — **S2**

INDIANA

National Steel Erectors, Inc., Indianapolis (317) 481-0388 — **A**
Sofco Erectors, Inc., Indianapolis (317) 352-9680 — **S2, A**
Stres Core Inc., South Bend (574) 233-1117 — **S1**

KANSAS

Carl Harris Co., Inc., Wichita (316) 267-8700 — **S2**
Topping Out Inc. / dba Davis Erection Kansas City, Kansas City (913) 208-2857 — **S2**

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MASSACHUSETTS

Concrete Structures, Inc., Marshfield (781) 837-1931 — **S1, A**
Prime Steel Erecting, Inc., North Billerica (978) 671-0111 — **S2**

MARYLAND

E & B Erectors, Inc., Pasadena (410) 360-7800 — **S2, A**
E.E. Marr Erectors, Inc., Baltimore (410) 837-1641 — **S2, A**
EDI, Inc., Upper Marlboro (301) 568-4585 — **S1, A**
L.R. Willson & Sons, Inc., Gambrills (410) 987-5414 — **S2, A**
Mid Atlantic Precast Erectors, Inc., Baltimore (410) 837-1641 — **A**
Oldcastle Building Systems Div. / Project Services,
Baltimore (518) 767-2116 — **S2, A**

MAINE

American Aerial Services, Inc., Falmouth (207) 797-8987 — **S2**
Cianbro Corporation, Pittsfield (207) 679-2435 — **S2**
Reed & Reed, Inc., Woolwich (207) 443-9747 — **S2, A**

MICHIGAN

Alpha Omega Development, Saginaw (989) 399-9436 — **S2**
American Erectors Inc., Waterford (248) 674-0060 — **S2, A**
Assemblers Precast & Steel Services, Inc., Saline (734) 429-1358 — **S2, A**
Devon Contracting, Inc., Detroit (313) 965-3455 — **S2**
G2 Inc., Cedar Springs (616) 696-9581 — **S2, A**
Kerkstra Precast Inc., Grandville (616) 224-6176 — **S2**
Moyle Construction, Houghton (906) 482-3000 — **S1**
Pioneer Construction Inc., Grand Rapids (616) 247-6966 — **S2**

MINNESOTA

Amerect, Inc., Newport (651) 459-9909 — **A**
Molin Concrete Products Company, Lino Lakes (651) 786-7722 — **S2**
Wells Concrete Products Co., Wells (507) 553-3138 — **S2, A**

MISSISSIPPI

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

MISSOURI

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

NEBRASKA

Concrete Industries, Inc., Lincoln (402) 434-1800 — **S2**
Topping Out Inc. / dba Davis Erection Lincoln, Lincoln (402) 610-1866 — **S2**
Topping Out Inc. / dba Davis Erection Omaha, Omaha (402) 306-2012 — **S2**

NEW HAMPSHIRE

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

NEW JERSEY

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

NEW MEXICO

Ferreri Concrete Structures, Inc., Albuquerque (505) 344-8823 — **S2**

NEW YORK

All Systems Precast, Inc., Farmingdale (631) 694-4720 — **S2**
Arben Group LLC, Pleasantville (914) 741-5459 — **S1**
Oldcastle Building Systems Div. / Project Services
South Bethlehem (518) 767-2116 — **S2, A**
Oldcastle Building Systems Div. / Project Services
Manchester (518) 767-2116 — **S2, A**

NORTH CAROLINA

Buckner Steel Erection Inc., Graham (336) 376-8888 — **S2**
Carolina Precast Erectors, Inc., Taylorsville (828) 635-1721 — **S2**
Rabon Erectors, Inc., Archdale (336) 434-3308 — **S2, A**
T & M Concrete, Inc., Waxhaw (704) 843-3292 — **S2**
Tri State Erectors, Inc., Henderson (252) 572-4373 — **S1, A**

NORTH DAKOTA

Concrete, Inc., Grand Forks (701) 772-6687 — **S2**
Northwest Contracting Inc., Bismarck (701) 255-7727 — **S2**

OHIO

Ben Hur Constructionn Company, Fairfield (513) 874-9228 — **A**
Capital City Group, Inc., Columbus (614) 278-2120 — **S2, A**
Precast Services, Inc., Twinsburg (330) 425-2880 — **S2, A**
Sidley Precast Group, Thompson (440) 298-3232 — **S2**
Sofco Erectors, Inc., Cincinnati (513) 771-1600 — **S2, A**

OKLAHOMA

Allied Steel Construction Co., LLC, Oklahoma City (405) 232-7531 — **S2, A**
Coreslab Structures (OKLA), Inc., Oklahoma City (405) 632-4944 — **S2, A**

PENNSYLVANIA

Century Steel Erectors, Kittanning (724) 545-3444 — **S1, A**
Conewago Enterprises, Inc., Hanover (717) 632-7722 — **S2**
High Concrete Group, Denver (717) 336-9300 — **S2, A**
Maccabee Industrial, Inc., Belle Vernon (724) 930-7557 — **A**
Nitterhouse Concrete Products, Inc., Chambersburg (717) 267-4505 — **S2**
Patterson Construction Company, Inc., Monongahela (724) 258-4450 — **S1**
Say-Core, Inc., Portage (814) 736-8018 — **S1**
Structural Services, Inc., Bethlehem (610) 282-5810 — **S1**

SOUTH CAROLINA

Davis Erecting & Finishing, Inc., Greenville (864) 220-0490 — **S2, A**
Florence Concrete Products Inc., Florence (843) 662-2549 — **S2**
Tindall Corporation, Fairforest (864) 576-3230 — **S2**

TENNESSEE

Hoosier Prestress, Inc., Brentwood (615) 661-5198 — **S2**
Sector Steel LLC, Cleveland (423) 472-4552 — **S1**

TEXAS

Gate Concrete Products Company, Pearland (281) 485-3273 — **S1**
Precast Erectors, Inc., Hurst (817) 684-9080 — **S2, A**

UTAH

OutWest C & E Inc., Bluffdale (801) 446-5673 — **S2, A**

VERMONT

CCS Constructors LLC, Morrisville (802) 888-7701 — **S2**

VIRGINIA

The Shockey Precast Group, Winchester (540) 665-3253 — **S2, A**
W. O. Grubb Steel Erection, Inc., Richmond (804) 271-9471 — **A**

WISCONSIN

Modern Crane Service, Inc., Onalaska (608) 781-2252 — **S1**
Spancrete Industries, Inc., Waukesha (414) 290-9000 — **S2, A**
Spancrete, Inc., Valders (920) 775-4121 — **S2, A**
The Boldt Company, Appleton (920) 225-6127 — **S2, A**

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