

# PCI CERTIFICATION



Photo courtesy of USC/Gus Ruelas.



**OVER 50 YEARS OF EXCELLENCE**



—Based on the Body of Knowledge for the Precast/Prestressed Concrete Industry



# QUALIFIES THE ENTIRE SUPPLY CHAIN

## PLANTS

For more than 50 years, the Precast/Prestressed Concrete Institute's (PCI's) Plant Certification Program has ensured that each plant has developed and documented an in-depth, in-house quality system based on time-tested industry standards. Each plant undergoes two thorough, unannounced audits each year in accordance with the PCI certification requirements. The PCI program is supported by a management system established in accordance with internationally recognized ISO standards and accreditation requirements of the International Accreditation Service. The accreditation body is a signatory to the Multilateral Recognition Arrangement under International Accreditation Forum (IAF). The in-plant audits are conducted by competent, third-party engineers who evaluate the plant according to requirements specifically developed for the types of products being manufactured.

## ERECTORS

The PCI Erector Certification Program evaluates erection procedures and field quality control for precast concrete. Introduced in 1999, this program extends PCI's quality performance standards through the construction process. The erection company's management and each erection crew are audited according to nationally published criteria, providing customers with increased assurance that the product quality created by stringent factory conditions continues into the field during installation.

## PERSONNEL

PCI trains and certifies plant quality personnel who manufacture precast concrete products, field personnel who erect precast concrete systems, and erector auditors. The Plant Quality Personnel Certification Program, created in 1985, provides instruction and evaluation for three levels of certified quality-control personnel, plus Glass-Fiber-Reinforced Concrete (GFRC) Technicians/Inspectors. The Certified Field Auditor (CFA) and Certified Company Auditor (CCA) Programs train and certify personnel of the precast concrete erector and the erector auditor.

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**From start to finish, PCI certifies the process of manufacturing and erecting precast and prestressed concrete components. This certification of plants, erectors, and personnel provides greater assurance to owners, architects, engineers, and contractors that precast concrete components will be manufactured and installed according to stringent industry standards.**

**PCI CERTIFICATION HELPS ENSURE QUALITY AND COMPETENCY.**

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# HELPS ENSURE QUALITY

Knowledgeable specifiers choose PCI-Certified companies because they know the PCI Certification process confirms the ability to manufacture and install quality components according to national industry standards published by PCI.

**PCI CERTIFICATION PROVIDES A HIGH DEGREE OF ASSURANCE.**



## HIGH STANDARDS

PCI sets very high standards for quality precast concrete production and erection that require a deliberate, concerted effort to implement. Once attained and practiced consistently, PCI's quality standards contribute to improved customer satisfaction—not only by ensuring that the manufacturing and installation processes are high quality, but by helping make the construction process faster and smoother for all parties involved.

## IAS ACCREDITATION

PCI's Plant Certification Program is accredited as a *Management System Certification Body* by the International Accreditation Service ([www.iasonline.org](http://www.iasonline.org)), a leading accreditation body in the United States. Obtained in early 2016, the accreditation promotes and provides confidence to industry, consumers, and regulators that PCI's Plant Certification Program conforms to ISO/IEC 17021-1 and IAS AC477. The ISO/IEC 17021-1 standard to which the PCI Plant Certification Program is accredited contains principles and requirements for the competence, consistency, and impartiality of bodies providing audit and certification of management systems. This means the plant's management system must comply with the PCI Plant Certification Program (Policy 20 & ISO 9001:2015, including IAF Codes 16 & 28 for Concrete and Construction) requirements to be recognized as a Certified Plant. In short, PCI undergoes third-party verification that its Plant Certification Program is as well managed as it is objective.

## OBJECTIVITY

The intent of PCI's Quality Assurance and Certification Programs is to improve and maintain the quality of precast concrete products industrywide and ensure the satisfaction of owners and regulators specifying its use. Consequently, producers of precast concrete are not required to join PCI in order to participate in the PCI certification programs; there is no membership requirement and PCI's IAS Accreditation ensures objectivity and impartiality. Owners, architects, engineers, and contractors all benefit when precast concrete components, products, and erection services are provided by PCI-Certified companies.





# OFFERS SEVERAL KEY ADVANTAGES

## PREQUALIFIED BIDDERS

Specifying products from a PCI-Certified plant ensures that bidders have an ongoing quality system in place and a history of quality assurance. PCI-Certified plants are required to develop and maintain a detailed Quality System Manual compiled according to industry standards and evaluated by PCI. Avoid surprises during the construction process by requiring certification in project specifications.

## PRODUCTION EXPERIENCE

It is easy to identify plants that are certified to produce various types of precast concrete components by referring to PCI's product-specific certification categories. Best of all, the experienced precast concrete plant can often provide suggestions for challenges that may be encountered.

## LOWER COST

Doing the job right the first time saves material and labor costs while preventing schedule delays. PCI-Certified plants are capable of producing uniform, consistent products that eliminate many potential problems.

## FASTER ERECTION

Using quality products leads to more efficient and safer field operations, which in turn helps prevent schedule delays. Quality-control systems ensure that components are properly identified and delivered in the appropriate number and order and then fit together quickly using predetermined erection and stability plans, often resulting in reduced on-site labor and scheduling costs.

## NO ADDED COST

There is no cost to the owner or specifier for using a PCI-Certified plant. In fact, the efficiencies and processes inherent in a PCI-Certified plant often cut waste and reduce costs associated with repairs, rejected products, and delays.



## PROVEN EXPERIENCE



PCI-Certified plants bring to each job a host of skills and efficiencies that can aid the construction process, especially if the precast concrete plant is brought in as a collaborative design partner early in the schematic design process. The precast concrete producer can provide input and guidance on structural component layout, architectural effects, efficient sizes and shapes, value-engineering options, state-of-the-art connection systems, and other aspects that produce aesthetically pleasing, functional, and cost-effective precast concrete designs.

## PRODUCT CATEGORIES

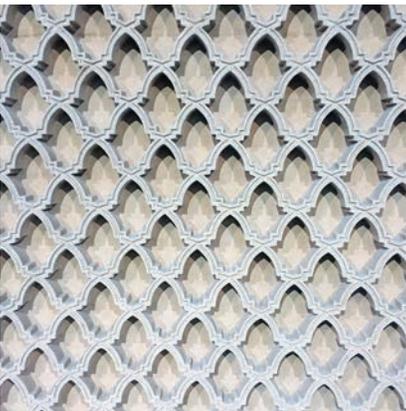
Precast concrete plants may be certified in as many as four general groups or products: Group A—Architectural Products; Group B—Bridge Products; Group C—Commercial (Structural) Products; and Group G—Glass-Fiber-Reinforced Concrete (GFRC) Products. Architectural and GFRC producers manufacture specially finished precast concrete components and cladding for buildings and other structures. Bridge producers in Group B manufacture concrete girders, decks, piers, and other products used in bridges. Commercial producers in Group C provide a wide range of primary and secondary structural products for commercial buildings.



Precast concrete producers who have demonstrated expertise with the applications of special architectural finishes and shape complexity that add to a product's aesthetic appeal are certified in one of five architectural precast concrete categories - AA, AB, AC, AD or AT.

## PUBLISHED STANDARDS

Three of the product groups are divided into categories that identify more-specific product types, conveying the special expertise and capability of individual plants. The categories reflect similarities in the ways the products are manufactured and their structural reinforcement. Product groups are audited according to the standards and provisions of one of three PCI quality-control manuals.



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**PCI-Certified plants are required to develop and maintain a detailed Quality System Manual that is compiled according to industry standards and evaluated by PCI.**

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# PCI PLANT CERTIFICATION PROGRAM

Categories are listed in ascending order. That means a precast concrete plant certified to produce components in a latter category is also certified for products in the preceding categories. For example, a plant certified in category C3 is also certified for products in categories C1 and C2, but not for C4.

## ARCHITECTURAL PRODUCTS

Certification requirements for architectural precast concrete products are contained in the *PCI Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products* (MNL-117) and *PCI Architectural Certification Program Supplemental Requirements*.

Architectural precast concrete products, through their finish, shape, color, or texture, contribute to a structure's architectural expression. These products may be custom designed or feature standard shapes. They may be manufactured with conventional mild-steel reinforcement, or they may be pretensioned or posttensioned. These products typically have more stringent requirements for dimensional tolerances than products in other product groups.

### AT – MISCELLANEOUS ARCHITECTURAL TRIM UNITS

Includes mullions, bollards, urns, railings, sills, copings, benches, planters, pavers, and other types of miscellaneous shapes.

### AD – ARCHITECTURAL PRECAST CONCRETE PRODUCTS

Includes structural products with an architectural finish such as plant applied finishes, formliners, brick veneers or extruded profiles. (Certification in this category does not include the products in AT.)

### AC – ARCHITECTURAL PRECAST CONCRETE PRODUCTS

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

### AB – ARCHITECTURAL PRECAST CONCRETE PRODUCTS

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

### AA – ARCHITECTURAL PRECAST CONCRETE PRODUCTS

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

## GFRC PRODUCTS

Certification requirements for GFRC products are contained in the *PCI Manual for Quality Control for Plants and Production of Glass-Fiber-Reinforced Concrete Products* (MNL-130).

### G – GLASS-FIBER-REINFORCED CONCRETE PRODUCTS

These architectural products are made by spraying a cement/sand slurry reinforced with glass fiber into molds. The products are custom designed and contribute to a structure's architectural expression through their finish, shape, color, or texture. The range of products is similar to the non-load-bearing units in categories AC, AB, and AA.



The PCI Plant Certification Program is accredited by the International Accreditation Service (IAS), which provides objective evidence that an organization operates at the highest level of ethical, legal, and technical standards. This accreditation demonstrates compliance to ISO/IEC 17021-1 and IAS AC477.

CATEGORY

AT

CATEGORY

AD

CATEGORY

AC

CATEGORY

AB

CATEGORY

AA

CATEGORY

G

# PCI PLANT CERTIFICATION PROGRAM

CATEGORY

**B1**

CATEGORY

**B2**

CATEGORY

**B3**

CATEGORY

**B4**

CATEGORY

**C1**

CATEGORY

**C2**

CATEGORY

**C3**

CATEGORY

**C4**

## BRIDGE PRODUCTS

Certification requirements for bridge products are contained in the *PCI Manual for Quality Control for Plants and Production of Structural Precast Concrete Products* (MNL-116).

Bridge components consist of precast concrete or precast, prestressed concrete products and are usually produced with gray cement and local aggregates.

NOTE: Some precast bridge products are not automatically covered in routine plant audits. These include highway median barriers, box culverts, and three-sided structures. These products are audited at the request of the precast concrete plant or if PCI Certification is required by the project specifications.

### B1 – PRECAST BRIDGE PRODUCTS (NO PRESTRESSED REINFORCEMENT)

Mild-steel-reinforced precast concrete elements, including some types of bridge beams or slabs, as well as products such as piling, sheet piling, pile caps, retaining-wall elements, parapet walls, and sound barriers.

### B2 – PRESTRESSED MISCELLANEOUS BRIDGE PRODUCTS (NON-SUPERSTRUCTURE)

Any precast, prestressed concrete elements except for superstructure beams. This includes piling, sheet piling, retaining-wall elements, stay-in-place bridge deck panels, full-depth deck panels, and all products covered in B1.

### B3 – PRESTRESSED STRAIGHT-STRAND BRIDGE BEAMS (SUPERSTRUCTURE)

All precast, prestressed concrete superstructure elements using straight, pretensioning, or posttensioning strands such as box beams, I-girders, bulb-tee beams, stemmed members, solid slabs, segmental box beams, and all products covered in B1 and B2.

### B4 – PRESTRESSED DEFLECTED-STRAND BRIDGE BEAMS (SUPERSTRUCTURE)

Precast concrete bridge members that are reinforced with deflected pretensioning or posttensioning strand. Included are box beams, I-girders, bulb-tee beams, stemmed members, solid slabs, and all products in B1, B2, and B3.

## COMMERCIAL PRODUCTS

Certification requirements for commercial products are contained in the *PCI Manual for Quality Control for Plants and Production of Structural Precast Concrete Products* (MNL-116).

This group includes structural and nonstructural precast or precast, prestressed concrete elements for buildings and other structures. Products in Categories C1 through C4 have no special architectural finish and may be suitable for painting if specified.

### C1 – PRECAST CONCRETE PRODUCTS (NO PRESTRESSED REINFORCEMENT)

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

### C2 – PRESTRESSED HOLLOW-CORE AND REPETITIVELY PRODUCED PRODUCTS

Precast concrete products that are prestressed with straight, pretensioning, or posttensioning strands. Included are hollow-core slabs for floor, roof, and wall construction that may be wet cast, machine cast, extruded, or slip formed. Other products include railroad ties, flat slabs, wall panels, utility poles, and all products in C1.

### C3 – PRESTRESSED STRAIGHT-STRAND STRUCTURAL MEMBERS

Precast concrete structural members that are prestressed with straight, pretensioning, or posttensioning strands. Included are stemmed members for roofs, floors, and walls, as well as beams, columns, spandrels, joists, seating members, and all products in C1 and C2.

### C4 – PRESTRESSED DEFLECTED-STRAND STRUCTURAL MEMBERS

Precast concrete structural members made with deflected pretensioning or posttensioning strands for roofs and floors, beams, joists, and all products in C1, C2, and C3.

# PCI PLANT CERTIFICATION GUIDE SPECIFICATIONS

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These guide specifications will help you select qualified precast concrete plants to bid on your project. PCI suggests that the process start by listing the various precast concrete products required for the project, then determining the appropriate product group and category for each product based on the product's use, the method of reinforcement, and special surface finishes. In the specifications, list each precast concrete product and each required group and category included in the project's scope. Refer to the "Notes to Specifiers" for additional guidance.

[WWW.PCI.ORG/CERTIFICATION](http://WWW.PCI.ORG/CERTIFICATION)  
for more information

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## PRECAST CONCRETE PLANT QUALIFICATIONS

The precast concrete plant shall be certified under the PCI Plant Certification Program. The precast concrete plant shall be certified at the time of bidding. Certification shall be in the following product group(s) and category(ies):

### GROUP A – ARCHITECTURAL PRECAST CONCRETE PRODUCTS

- AT – Architectural Trim Units
- AD – Architectural Precast Concrete Products
- AC – Architectural Precast Concrete Products
- AB – Architectural Precast Concrete Products
- AA – Architectural Precast Concrete Products

### GROUP B – BRIDGE PRODUCTS

- B1 – Precast Concrete Bridge Products (No Prestressed Reinforcement)
- B2 – Prestressed Miscellaneous Bridge Products (Non-superstructure)
- B3 – Prestressed Straight-Strand Bridge Beams (Superstructure)
- B4 – Prestressed Deflected-Strand Bridge Beams (Superstructure)

### GROUP C – COMMERCIAL (STRUCTURAL) PRODUCTS

- C1 – Precast Concrete Products (No Prestressed Reinforcement)
- C2 – Prestressed Hollow-Core and Repetitive Products
- C3 – Prestressed Straight-Strand Structural Members
- C4 – Prestressed Deflected-Strand Structural Members

### GROUP G – GLASS-FIBER-REINFORCED CONCRETE PRODUCTS (GFRC)

Notes to Specifiers:

Categories in Product Groups A, B, and C are listed in ascending order. For example, a plant certified to produce products in Category C4 is automatically certified to produce products in the preceding Categories C1, C2, and C3. However, a plant certified to produce products in Category C2 is certified for Category C1 but is not certified for Categories C3 or C4.

A product group and category should be determined and shown in the specifications for each type of precast concrete product used in a project. This will allow more than one precast concrete plant to submit bids on individual products. For example, a precast concrete plant with expertise in producing prestressed piling (with certification in C2) could submit a bid for only piles on a project that also included prestressed double tees. Similarly, a producer with certification in C4 could submit a bid for the tees that either included or excluded the piling.

Important: Specify the most appropriate product group and category for the project. Do not select a category with more complex products than necessary. Selecting an inappropriate group or category could unnecessarily restrict the number of available bidders.

# PCI CERTIFIED PERSONNEL

## PLANT QUALITY PERSONNEL CERTIFICATION

Conducting an effective quality-control program requires knowledgeable and motivated testing and inspection personnel. These employees must understand the key ingredients that produce overall quality, the specifics of how each product is manufactured, and how to conduct precise tests and inspections. PCI has been training quality-control personnel since 1974 and published its first technician training manual in 1985. Four distinct levels of Plant Quality Personnel Certification can each be achieved by passing a PCI examination:

### LEVEL I

This basic level requires six months of precast concrete industry experience (or other educational, technical, or professional criteria). Level I certification focuses on the fundamental requirements of the many quality-control issues typically encountered in a precast concrete plant. Requirements also include current certification by the American Concrete Institute in the Concrete Field Testing Technician Program, Grade 1.

### LEVEL II

Level II certification provides greater detail in maintaining and improving quality levels, such as tensioning and strand-elongation corrections, effects of accelerated curing, material-control tests, welding basics, and a variety of plant topics. Requirements include PCI Level I and one year of precast concrete industry experience (or other educational, technical, or professional criteria).

### LEVEL III

The highest level of certification provides significant instruction in concrete materials and technology. Certification requires two years of precast concrete industry experience, attendance at a four-day PCI school, and PCI Level II certification.

## GFRC TECHNICIAN/INSPECTOR

PCI-Certified Plants certified in the Group/Category G are required to have a least one individual certified as a PCI-Certified GFRC Technician/Inspector. This certification requires six months of experience in a GFRC plant (or other educational, technical, or professional criteria).

## FIELD QUALITY PERSONNEL CERTIFICATION

### CERTIFIED FIELD AUDITOR (CFA)

This program, instituted in 1999, provides certification for personnel trained to conduct field audits of industry erection procedures and evaluate compliance with PCI standards. CFA certification requires a minimum of two years of precast concrete erection experience, attendance at a PCI QC school, and successful completion of a PCI examination. Certification helps ensure that the high quality achieved in the plant is maintained throughout installation.

### CERTIFIED COMPANY AUDITOR (CCA)

PCI-Certified company auditors perform the company audits that lead to PCI-Certified Erector status. CCA certification requires two years of acceptable experience in the supervision of the erection of precast concrete, attendance at a PCI QC school, successful completion of a PCI examination, and current CFA certification.

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PCI has two comprehensive certification programs for employees of companies involved in precast concrete manufacture or erection. The Plant Quality Personnel Certification Program ensures that precast plant workers have extensive technical knowledge and training that aid in producing consistent, high-quality products. The Field Quality Personnel Certification Program brings the quality program into the field by training personnel on industry erection standards and best practices for conducting field audits or erection processes.

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# PCI CERTIFIED PERSONNEL GUIDE SPECIFICATIONS

## PERSONNEL CERTIFICATION BENEFITS

Owners, architects, engineers, and contractors all benefit by working with precast concrete plants and erectors that employ PCI-Certified quality-control personnel. These professionals can effectively and efficiently develop and implement a quality-control program, and in many other ways help improve the quality component of the precast concrete plant. Their input can help companies cut costs even as they produce better and more efficient precast concrete components and building systems.

Demand for qualified personnel continues to grow. Plant Quality Personnel Certification is required by more than one-third of state departments of transportation. These agencies require PCI Certification not only for plant personnel but also for their own materials inspectors and quality-assurance personnel.

Achieving Plant Quality Personnel Certification status is a demanding task, but those who rise to the challenge improve their proficiency and provide better service to the precast concrete industry. PCI Certification is a reliable means for ensuring that the precast concrete plant working on your project meets the highest possible industry standards.

## PERSONNEL QUALIFICATION GUIDE SPECIFICATION

The project specifications should require trained and certified quality-control personnel in the manufacturing plant. PCI recommends that the precast concrete plant employ personnel according to the following Personnel Qualifications specifications:

The precast concrete plant shall employ a minimum of one person, regularly present in the plant, who is certified by PCI for Plant Quality Personnel, Level I (for non-prestressed products) or Level II (for prestressed products).

Note: All PCI-Certified plants are required to employ at least one PCI-Certified individual.



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**PCI-CERTIFIED PLANT PERSONNEL are required by the PCI Plant Certification Program.**

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# PCI ERECTOR CERTIFICATION PROGRAM



## CATEGORY S1

(Simple Structural Systems)

This includes horizontal decking members (such as hollow-core slabs on masonry walls), and single-lift wall panels attached to a structure.



## CATEGORY S2

(Complex Structural Systems)

This includes everything contained in S1 as well as total-precast concrete construction, multiproduct structures (those that combine vertical and horizontal members), and single- or multistory load-bearing members, including those with architectural finishes.



## CATEGORY A

(Architectural Systems)

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

## PROGRAM BENEFITS

PCI's Erector Certification Program extends the institute's demanding quality standards to the process of erecting the finished precast concrete product components in the field. This program provides increased assurance that the high-quality precast concrete components produced by a PCI-Certified Plant are erected to the exacting standards expected by owners, developers, architects, contractors, and the precast concrete industry as a whole.

The erection process is vital to the overall performance of the finished precast concrete products in the structure. Handling pieces properly and installing them correctly require well-trained erection personnel who understand every aspect of lifting, maneuvering, and connecting each precast concrete piece regardless of its shape or size. An erector may qualify in one of two structural classifications and/or an architectural classification (categories S1, S2, and A, defined at left).

The PCI Erector Certification Program is designed to provide assurance that individual erection crews have the skills, procedures, and supervision necessary to conduct erection operations in accordance with essential safety and quality criteria published by PCI. Each Primary erection crew is audited twice each year by a PCI-Certified Field Auditor, with at least one of the two audits conducted by an independent auditor.

The PCI Erector Certification Program is also designed to provide assurance that the erecting organization has the managerial and administrative capability to achieve and sustain performance consistent with requirements established by PCI, the producer, and the owner/specifier. It represents the highest commitment to safety and quality an erector can achieve under the PCI Quality Assurance System. In addition to the required field audits of each Primary erection crew, the organization's quality documents, safety and erection procedures, personnel-qualification records, project files, and equipment-management records are audited annually by an independent third-party PCI-Certified Company Auditor to ensure that the required managerial and administrative criteria are being met on all applicable projects.

## GUIDE SPECIFICATION FOR PCI-CERTIFIED ERECTORS:

"Erector Certification: The erecting organization, including all crews erecting precast concrete, shall be certified in category[ies] [A, S1, and/or S2] under the Precast/Prestressed Concrete Institute (PCI) Erector Certification Program."





# SPECIFY PCI CERTIFICATION

## THERE IS NO EQUIVALENT

The Precast/Prestressed Concrete Institute (PCI) certification is the industry's most proven, comprehensive, trusted, and specified certification program. The PCI Plant Certification Program is accredited by the International Accreditation Service (IAS), which provides objective evidence that an organization operates at the highest level of ethical, legal, and technical standards. This accreditation demonstrates compliance to ISO/IEC 17021-1. PCI certification offers a complete regimen covering personnel, plant, and field operations. This assures owners, specifiers, and designers that precast concrete products are manufactured and installed by companies who subscribe to nationally accepted standards and are audited to ensure compliance.

To learn more about PCI Certification, please visit [pci.org/certification](http://pci.org/certification).



Precast/Prestressed Concrete Institute

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