

PCI Architectural Precast Concrete Certification Category Selection Guidelines



designer'snotebook

PCI Architectural Precast Concrete Certification Guidelines

This document provides a basis for specifying the most appropriate PCI architectural certification categories for the production and field erection of various types of architectural precast concrete components. These five certification categories do not apply to structural components without architectural features.

The new certification program strives to align the potential of precast concrete, which is expanding as new technologies and techniques emerge, with project requirements and plant capabilities. The strength of the program is that it was developed in a collaborative fashion by precast concrete producers to meet market demands driven by the architectural, construction, and engineering industries' need for consistent outcomes. For these reasons, architectural precast concrete certification will be a significant differentiator for PCI members.

Michael Zensen
CannonDesign Quality and Construction Administration Leader

Consensus on Quality

Designer creativity and advanced production techniques are expanding the expressive potential of architectural precast concrete façades. In response, and through collaboration between the design community and the precast concrete industry, PCI's Architectural Certification Program has expanded with new categories that are more specific to the various building market segments that use the benefits of precast concrete solutions. These new categories ensure a high-quality product within each specified category, while aligning the designer's expectations for the complexity of the project with the capabilities of the individual architectural precast concrete producers.

Performance and Accountability

There are three basic principles that coalesce into a quality assurance program that will produce predictable outcomes:

- Specifying distinct capabilities
- Performance-based certification
- Continuity of performance through audits and post-occupancy evaluations

Giving designers the ability to specify distinct capabilities enables them to clearly define the expected outcome. There should be no confusion about what will be acceptable and what will not be acceptable regarding finished product quality.

A precast concrete producer's initial certification in one of the new categories is reliant on the producer's ability to produce a set of mock-up panels that demonstrate a specific level of complexity and tolerances. Proper selection of the categories assures the construction manager/general contractor, owner, and designer that the precast concrete plant has the capability to execute the project requirements.

Biannual plant audits ensure that the plant is maintaining PCI quality program standards. During audits, the precast concrete plant is required to demonstrate architectural capabilities through ongoing reviews of recent production panels or new mock-ups.

Creating Four Different Categories

The revised certification program creates four new certification categories in lieu of the previous single A1 category. It also eliminates the previous CA and BA categories that were used for structural and bridge elements with architectural features. These changes will ensure that the producer's capabilities correspond to the needs of the project.

An Alpha-Alpha system is used to avoid confusion between the old certification categories and the new categories. The new categories are AA, AB, AC, and AD. Category AT, which is the certification category for architectural trim, carries over from the original certification program.

The Certification Categories Described

New Categories

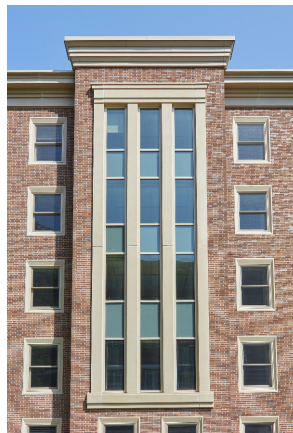
Effective October 1, 2021, the previous PCI certification categories A1, BA, and CA will be replaced by four new architectural certification categories: AA, AB, AC, and AD.

Category AA



Nordstrom NYC Flagship Store, New York, NY. Photo: Gate Precast Company.

Category AB



University of Minnesota Pioneer Hall, Minneapolis, MN. Photo: InsideOut Studios, Rick Peters/Wells Concrete.

Category AC



80 on the Commons, Columbus, OH. Photo: Finline Photography.

Category AD

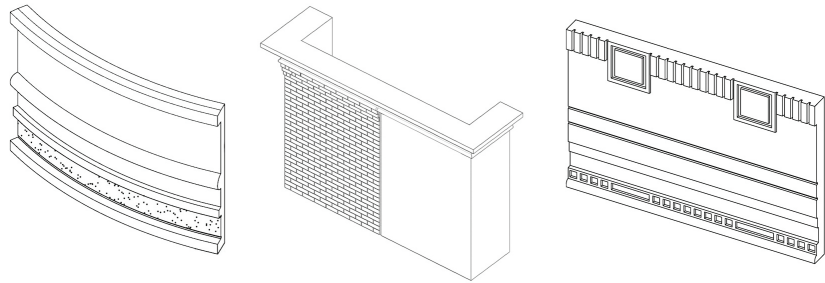


McQueary Family Health Science Hall, Missouri State University, Springfield, MO. Photo: Prestressed Castings Co.

Cover photo: 80 on the Commons, Columbus, OH. Photo: Finline Photography.

Category AA: This category covers the certification of plants producing architectural products with multiple concrete mixtures and textures, a variety of three-dimensional projections, radiused mold surfaces, or sequential returns. Some of the required production tolerances for this category are more stringent than the previous requirements for PCI-certified architectural precast concrete production under PCI MNL 135, *Tolerance Manual for Precast and Prestressed Concrete Construction*, and the quality requirements of PCI MNL 117, *Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products*. Plants in this category must demonstrate the capability to provide (by internal or affiliated party means) building information modeling (BIM) at level of development (LOD) 350. The use of a PCI-certified erector (Category A) is required. Category AA includes all profiles, colors, textures, and veneer materials included in Category AB, plus:

- Unique projects that include complex geometry and surface profiles
- Projects that require tight tolerances for material interfaces that exceed the requirements of Category AB



Mock-up panels to be produced for Category AA certification.

Four examples of Category AA certification projects are shown below.



One South First, Brooklyn, NY.
Photo: Gate Precast Company.



Church of Jesus Christ of Latter-Day Saints Temple, Tucson, AZ. Photo: Gate Precast Company.



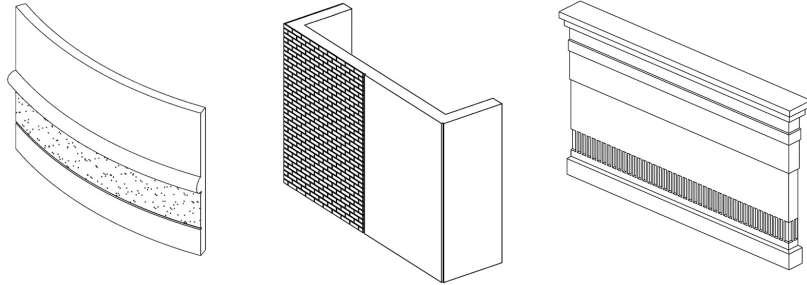
Alpharetta City Center Parking Garage, Alpharetta, GA. Photo: George Spence.



1200 Intrepid Building, Philadelphia, PA.
Photo: Bjarke Ingels Group.

Category AB: This category covers the certification of plants producing architectural products with multiple concrete mixtures and textures, a variety of three-dimensional projections, radiused mold surfaces, or sequential returns. Production tolerances for this category are required to meet the requirements of PCI MNL 135 and the quality requirements of PCI MNL 117. Plants in this category must be capable of BIM capacity for LOD 350. The use of a PCI-certified erector (Category A) is required. Category AB includes all profiles, colors, textures, and veneer materials included in Category AC, plus:

- Projects that have three-dimensional surface profiles such as bullnoses, cornices, radii, and integral returns
- Projects that have multiple concrete mixtures and/or surface finishes
- Projects that have stone, ceramic, tile, or terracotta veneers



Mock-up panels to be produced for Category AB certification.

Four examples of Category AB certification projects are shown below.



Marshfield Clinic Health System Hospital and Cancer Center, Eau Claire, WI. Photo: Gage Brothers.



Millwright Building, Minneapolis, MN. Photo: Gage Brothers.



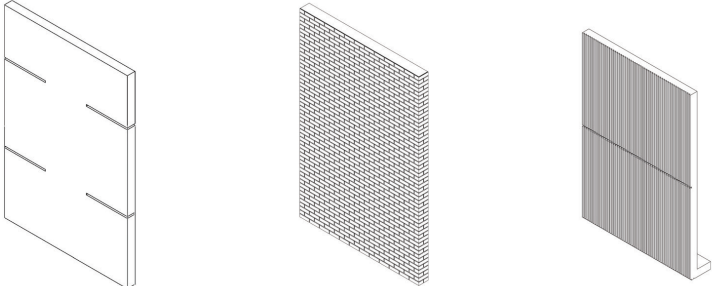
Pinnacle National Development Center, Kansas City, KS. Photo: Jacia Phillips Photography/Enterprise Precast Concrete.



Health Partners Bloomington Parking Structure, Bloomington, MN. Photo: McGough Construction Co., Inc., Wells Concrete.

Category AC: This category covers the certification of plants producing products with single concrete mixtures and plant-applied finishes, including thin brick and formliners. Production tolerances for this category are required to meet the requirements of PCI MNL 135 and the quality requirements of PCI MNL 117. The use of a PCI-certified erector (Category A) is required. Category AC includes all profiles, colors, textures, and brick veneer materials included in Categories AD and AT, plus:

- Flat precast components that incorporate a single concrete mixture and finish
- Projects that require the architectural finish to be applied to the panel edge or return



Mock-up panels to be produced for Category AC certification.

Four examples of Category AC certification projects are shown below.



Smithfield Middle School Gymnasium Addition and Storm Shelter, Haltom City, TX. Photo: Eric Childs, Key Construction



Fire Department of New York Firehouse Rescue #2, Brooklyn, NY. Photo: High Concrete Group.



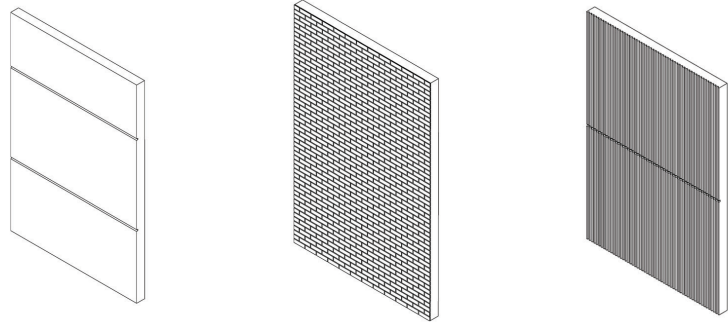
Terrace 459 at Parkside of Old Town Chicago, IL. Photo: David Shalilol, and Landon Bone Baker Architects.



DC West Elementary School, Valley, NE. Photo: Enterprise Precast Concrete and Jacia Phillips | Arch Photo KC.

Category AD: This category covers the certification of plants producing structural products with an architectural finish such as wall panels and beams with plant-applied finishes, including structural products with brick veneers and formliners or extruded profiles. The product type tolerances of PCI MNL 135 and the quality requirements of PCI MNL 116, *Manual for Quality Control for Plants and Production of Structural Precast Concrete Products*, apply. The use of a PCI-certified erector is preferred, but not required. Projects that may use Category AD include:

- Insulated wall panel elements with extruded or formed surface profiles used for large storage, retail, or manufacturing buildings
- Structural elements with an architectural finish such as columns, load-bearing panels, bridge beams, bridge abutments, and wall panels on storm shelters requiring less stringent tolerances because of their large size and structural complexity.



Mock-up panels to be produced for Category AD certification.

A Category AD certification project is shown below.

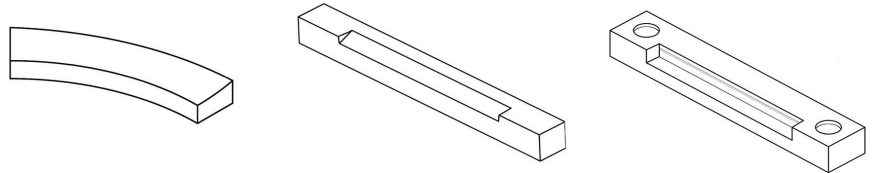


DC Blox Data Center, Birmingham, AL. Photo: DC Blox.

Existing Category AT

The previously existing Category AT for architectural trim units will remain, but the qualification standards for certification will be enhanced through the requirement of casting mock-ups to demonstrate production capabilities. This category covers the certification of plants producing architectural trim products such as copings and lintels with plant-applied finishes. The product type tolerance requirements of PCI MNL 135 and the quality requirements of PCI MNL 117 apply. Projects that may use Category AT include:

- Masonry projects that incorporate architectural precast concrete sills, lintels, copings, jambs, and medallions
- Hardscape applications, signage, and outdoor public spaces



Mock-up panels to be produced for Category AT certification.

Three examples of Category AT certification project are shown below.



Cleveland Public Square, Cleveland, OH.
Photo: Tectura Designs, Wausau Tile.



Block 16 Office Building and Parking Garage,
Milwaukee, WI. Photo: Stonecast Products, Inc.



Public School 154, Brooklyn NY. Photo: David Kucera, Inc.

Differentiating between Categories

All certification categories require high levels of aesthetic quality. The differentiating factors recognize that precast concrete producers possess different manufacturing capabilities based on the types of products they produce and the markets they serve. The new categories align the project's level of complexity, dimensional tolerances, and aesthetic requirements with the precast concrete plant's capabilities. The matrix in Table 1 provides a direct comparison of the five categories.

For a more detailed understanding of the different certification categories, download our PCI Architectural Certification Program Supplemental Requirements www.pci.org/archcert

Table 1 PCI Architectural Certification Category Requirements.

Required Architectural Precast Concrete Production Capabilities		Certification Category				
		AA	AB	AC	AD	AT
Color and finish of face mixture	White cement	X	X	X		X
	White and gray cement	X	X	X		X
	Gray cement	X	X	X	X	X
	Multiple colors in finished face	X	X			
	Single color in the finished face	X	X	X	X	X
	Multiple textures in the finished face	X	X			
	Single texture in the finished face	X	X	X	X	X
Panel geometry	Flat panels	X	X	X	X	X
	Panels with sequential returns	X	X			
	Panels with single cast returns	X	X	X		
	Three-dimensional (3-D) form surface (buildups, liners, projections on face)	X	X			X
	3-D form surface (reveals and liners only)	X	X	X	X	X
	3-D panels including radius (concave, convex)	X	X			X
Embedded material and veneer	Tile, stone, terra cotta	X	X			
	Thin brick	X	X	X	X	
Production capability	Batch plant mixing	X	X	X		
	Batch plant or truck mixing				X	
	Fixed or temporary covered production required	X	X			
Technology	3-D BIM submittals per project specifications	X	X			
Production tolerances	MNL 135 AA (modified MNL 117)	X				
	MNL 135 (current MNL 117)		X	X		X
	MNL 135 (current MNL 116)				X	
Erection tolerances	MNL 135 AA (modified MNL 117)	X				
	MNL 135 (current MNL 117)		X	X		X
	MNL 135 (current MNL 116)				X	
PCI-certified erector	Required	X	X	X		
Plant audits	Two unannounced audits per year	X	X	X	X	X
Key feature evaluations	Must be demonstrated every two years	X	X	X	X	X

Note: BIM = building information modeling.

Most recent version of referenced documents shall be used

Where can I find assistance in selecting the most appropriate certification category?

There are multiple ways to receive assistance in selecting the most appropriate architectural certification category, including:

- The Architecture Certification Program section of the PCI website
- PCI regional affiliates
- PCI-certified producers

Two examples of Category AA certification projects are shown below.



Statue of Liberty Museum, New York, NY.
Photo: High Concrete Group.



The Patricia and Phillip Frost Museum of Science, Miami, FL. Photo: Miami In Focus