



PREQUALIFY YOUR PRECASTER



Specify an Architectural Precast Association Certified Plant

ARCHITECTURAL PRECAST

Architectural precast concrete has grown in popularity as a building product due to its economy, flexibility, durability, and universal availability. Architectural precast has evolved into a highly specialized industry which requires an equally specialized system of quality control procedures.

The successful use of architectural precast concrete is dependent not only on the designers' understanding of the product, but on the ability of manufacturers to produce products which meet the desired intent of the project. To this end, in 1994 the Architectural Precast Association developed a Plant Certification Program which provides designers assurance of a manufacturer's ability to produce quality precast concrete products. By concentrating on architectural precast concrete as its primary inspection priority, APA can offer a level of quality assurance which only specialization can provide.

STRINGENT REQUIREMENTS FOR APA INSPECTORS

Only highly qualified inspectors are chosen. To provide specifiers the quality assurance needed, the APA uses inspectors who have the knowledge to properly evaluate precasting procedures. The APA uses a rotating team of inspectors that includes registered Professional Engineers with in-depth knowledge of precast concrete and industry professionals with a minimum of ten years' experience in the precast concrete industry.

UNANNOUNCED INSPECTIONS PROVIDE ACCURATE RESULTS

Every APA inspection is conducted randomly and is unannounced. A plant must be prepared for an inspection at all times so all data is reflective of the daily status of a plant. Each biannual inspection spans an entire casting cycle and covers over one hundred thirty check points. Each area is graded

as pass/fail. Either the item inspected meets the high APA standard or it does not.

A plant that falls below the standards set by the APA Plant Certification Program faces suspension of its certification for varying lengths of time based upon the type of infraction. A suspended plant must be able to prove it has remedied any deficiencies prior to having its certification reinstated.

APPROVED QUALITY CONTROL MANUALS ARE MANDATORY

All APA certified plants are required to maintain an updated QC Manual. This manual delineates the procedures producers will follow to ensure compliance with the certification program. Prior to attaining certification each plant's QC manual is reviewed by experts for sufficiency and the manual must be maintained and updated, as appropriate to be recertified.





THE CERTIFICATION PROCESS

Quality control begins with the dedication of each company to produce a fabricated product which conforms to the requirements specified in the contract documents as well as relevant industry standards. The manual must be in compliance with appropriate codes; the recommended standards and practices of the industry; and the requirements established in the APA's Plant Certification Program.

CERTIFIED QUALITY CONTROL PERSONNEL

The APA requires that plants employ certified quality control professionals. Level II Master Quality Control Managers are supported by Level I Quality Control Technicians. The APA is the only



organization that requires a Certified Batch Plant Operator as well. This team of QC professionals is responsible for implementing the total quality control experience which ensures that finished products conform to the design dictated by the architect and engineer, as well as relevant standards. All aspects of quality control are checked, re-checked, and inspected.

TESTING

Material Testing

Testing is the primary method of determining conformance to design and specification requirements. Testing procedures are assigned to the produced product, material to be incorporated into the product, and to the machinery or equipment used in the manufacturing process.



The specified properties of all materials used are determined by appropriate testing according to relevant ASTM Standards.

Strict testing compliance is assured for elements integral to quality production. Key elements include:

- Cement
- Aggregates
- Water
- Reinforcing
- Reinforcing Admixtures
- Hardware
- Pigments
- Inserts
- Embeds
- Mix Designs

Concrete Testing

Product testing ensures uniformity and conformity to established criteria. Mix specimens are made and tested for:

- Compressive Strength
- Slump
- Spread
- Air Content
- Freeze Thaw (as required)
- Linear Shrinkage (as required)

Other tests as required by specification are performed according to established methods and standards.

ALL QUALITY CONTROL PROCEDURES ARE CAREFULLY REVIEWED

The scope of quality control reviews which are performed in architectural precast concrete plants include but are not limited to:

- Aggregates
- Reinforcing
- Cement
- Embeds
- Hardware

Concrete

Concrete is checked for mix consistency throughout a project. The consistency of temperature, slump and curing conditions are important to the final product.

Weighing, dispensing, sequencing and mixing of materials are certified to be accurate and consistent to maintain acceptable finishes.

Preparation of Forms

Forms are meticulously inspected to assure compliance to specified tolerances.

Changes involving block-outs, reveals, cast-in items, position and amount of reinforcing are re-checked following initial positioning and prior to concrete placement.

THE CERTIFICATION PROCESS, continued

Samples

Precast samples are key to ensuring that the proposed architectural treatment will be consistent in color and finish throughout the project. Related to specific projects, they are used to show the type of material, the quality of the concrete, and the type of finish. Sample acceptability and proper storage is noted.

Shop Details

Items inspected include:

- How finished products compare to shop drawing details
- Surface Finishes
- Dimensions
- Location of Embeds
- Conformance to Shape
- Detailing

STORAGE AREAS

Observations of storage areas for finished products are conducted to ensure proper blocking methods are used for prevention of chipping, warpage, cracking, or contamination. A final review of the product is made during loading to detect defects caused by handling. If needed, proper repair procedures are witnessed.

RECORD KEEPING

Inspectors check files to verify that quality control procedure take place daily. Typical files which are checked include but are not limited to:

- Samples
- Finishes
- Mix Designs

- Drawings
- Mill Test Reports
- Special Items
- ASTM Certificates of Compliance
- Calibration Reports

PLANT FACILITIES

Quality production of architectural precast concrete requires plant facilities which are clean, safe, and reflect current concrete technology.

Material Storage

Proper cement and aggregate storage is inspected and verified. Contamination is minimized for enduring strength and a lasting finish.

Batch Plant & Batching Operations

Concrete batching operations are inspected to ensure consistency and specified tolerance adherence. Scales are certified annually. It is determined that all mixing equipment is of a capacity and type to produce thoroughly mixed concrete of a uniform consistency. Admixture dispensing is also checked.

Casting Area Inspections Include:

- Placing Concrete
- Consolidation
- Curing
- Stripping
- Finishing
- Storage
- Shipping
- Safety
- Reinforcement
- Subassemblies



ARCHITECTURAL CAST STONE

The APA Plant Certification Program addresses the differences between wet and dry cast production procedures for architectural cast stone. Dry cast products are formed from a 0-slump concrete mix that requires the use of pneumatic rammers to compact the concrete into molds. Wet cast products use a measurable slump concrete mix that is poured into molds and properly consolidated. Both methods produce high quality architectural precast building units that simulate natural cut stone and are typically treated as handset masonry units during installation.

Architectural cast stone units are generally used for ornamental design purposes where the architect requires a finer detail in the precast concrete treatment. The APA certification process therefore expands its criteria for finish, durability, and quality control to meet the special requirements of this product.



GLASS FIBER REINFORCED CONCRETE (GFRC)

Special aesthetic needs are satisfied with GFRC. Its lightweight, durable character makes it ideal for precast applications that do not require the strength of architectural panels or cast stone. Special fiberglass reinforced high slump concrete is sprayed on to forms then hand compacted to achieve the proper thickness and consolidation. These special casting procedures require unique quality control considerations that wet or dry cast operations do not employ. The APA Plant Certification Program assures that additional GFRC quality control procedures are followed by your manufacturer.



ULTRA HIGH PERFORMANCE CONCRETE (UHPC)

UHPC is a high strength, durable material that delivers low permeability and unmatched versatility in regard to piece size and required thickness. UHPC is typically batched with cement, fine aggregate, admixtures, water and fiber reinforcement (steel or synthetic) and meticulously poured into carefully prepared molds. These products offer unprecedented design options, deliver high compressive & flexural strength and require minimal maintenance for the long term. Typical applications of this product include panels, treads, beams, furniture, specialized decorative shapes, etc.



SPECIFY THE APA PLANT CERTIFICATION PROGRAM

The APA Plant Certification Program has been tried and tested for over 25 years by architects, engineers, and federal and state agencies throughout the U.S. and Canada. After a comparison of certification programs has been dutifully accomplished, the APA Plant Certification Program has been deemed equivalent, or superior to, other plant certification programs. Since the program's inception it has been welcomed

as the standard of quality architectural precast concrete production. The APA is proud that the American Institute of Architects' Master Spec®, Speclink®, and 4-Specs® contain APA Plant Certification and that the program is included in the Unified Facility Guide Specification used by the United States Armed Forces and NASA. Specify the APA Plant Certification Program in your next project!

