

## **CONCRETE DESIGNS INC. - SPECIFICATIONS**

### **SECTION 03410 – STRUCTURAL PRECAST CONCRETE - PLANT CAST**

#### **PART 1 - GENERAL**

##### **SUMMARY**

This section refers to structural precast concrete units. Plans should differentiate between architectural and structural precast concrete if both are used on the same project.

Structural precast concrete includes the following:

Precast concrete units as defined in the architectural plans. Potentially includes wall caps, columns, balustrade, quoins, pavers, finials, moldings, sills, lintels or any other decorative element designed to be cast out of concrete.

These are structural, self supporting units as defined by the project.

The Structural Architectural Precast Manufacturer shall have a minimum of five (5) years experience in fabricating architectural precast concrete.

##### **SUBMITTALS**

Product data and instructions for manufactured materials and products.

Shop drawings prepared by the manufacturer showing complete information concerning the precast concrete units. This would include the unit shapes (elevations and sections), joint, connection and lifting details, and location of imbeds and anchoring items. Unless otherwise noted, anchors will be embedded in a standard configuration.

Design Calculations will be submitted upon request for structural design calculations. Required loads must be specified by the project engineer.

Test reports will be submitted upon request including reports on compressive strength.

Samples - Submit samples of color options and texture options for selection process.

Individual Details-If required, individual details may be submitted at the request of the architect. This process will impact cost and construction schedules.

## **QUALITY ASSURANCE**

Fabricator Qualifications: CDI has over 50 years of successful experience in fabrication of architectural precast concrete units. Fabricator has sufficient production capacity to produce, transport and deliver required units without causing delay in the project.

Design modifications will be made only as necessary to meet field conditions and to ensure proper fitting of the work and only as acceptable to the Architect or Project Manager. Maintain general design concept shown without increasing or decreasing sizes of members or altering profiles and alignment shown without architect's approval. Modifications may need to be considered in view of budget constraints.

## **DELIVERY, STORAGE AND HANDLING**

Deliver precast concrete units to project site in such quantities and at such times to assure continuity of installation. Schedules and priorities will be based on the information provided by the customer. Products to be packaged to protect the finish during transport. Precast may be a long lead time item and should be ordered accordingly.

## **PART 2 - PRODUCTS**

### **CONCRETE MATERIALS**

Portland Cement: Type 1 Portland Cement Gray or Lehigh White based on color requirements. Cement should conform to ASTM C150.

Use only one brand, type and source of supply of cement throughout the project, unless otherwise acceptable to Architect.

Fly Ash: Fly Ash shall conform to ASTM C618.

Coarse/Fine Aggregate - Sand and Gravel: Hard, durable, selected and graded; free of material that causes staining or reacting with cement. Aggregate shall conform to ASTM C33.

Pigments: Non-fading, resistant to lime and other alkalies. Pigment shall conform to ASTM C260.

Water: Potable, free from foreign materials in amounts harmful to concrete and embedded steel.

Air-Entraining Admixture: Utilize standard mix designs incorporating admixtures which facilitate the workability, curing and strength of the mix. Admixtures shall conform to ASTM C260 and C494.

Compressive Strength: 5000 psi minimum at 28 days.

## **REINFORCING MATERIALS**

Rebar used in some product designs as required by engineering or to insure safe handling. Rebar shall conform to ASTM A615.

Corrugated Wall Ties - Included in moldings as the mechanical fastener. 22 gauge mill galvanized steel - 7/8" x 7".

Threaded Inserts - Plastic inserts are included in very large castings such as large moldings, columns and stackable column components. These are for mechanical ties and not for lifting purposes. In addition, inserts may be defined for lifting in accordance with manufacturers published literature.

Reinforcing Steel – Additional rebar, wire mesh or steel plates shall conform to ASTM A615, ASTM A496, or ASTM A36. All items shall be used in accordance with manufacturers published literature.

Adhesives - Latex - modified mortar or equivalent used on a stable substrate in conjunction with the mechanical fastener may be suggested. White cement can be used to adjust the greenish color created by using the latex mortar.

Premium grade construction adhesives which come in tubes should be used for bonding columns and on flat surfaces where latex mortar cannot be used.

## **FABRICATION**

Design: Structural calculations and associated drawings shall conform to the latest revision of the following industry standards unless other standards are specified by the customer:  
International Building Code  
Local and State Design Standards

The Design Criteria used for the material will be determined by the exact application and use of the product and shall be submitted for approval prior to fabrication. Loads and specific requirements should be submitted to the manufacturer to be incorporated in this design.

General: Fabricate precast concrete units complying with manufacturing and testing procedures, quality control recommendations, and following dimensional tolerances, unless otherwise indicated. Concrete testing, mill certificates, and aggregate testing will be monitored by the Quality Control Inspector to assure the product is manufactured in compliance with specifications and drawings.

Molds: Accurately construct molds mortar-tight and of sufficient strength to withstand pressures due to concrete placing operations and temperature changes. Maintain mold work to provide completed precast concrete units of shapes, lines and dimensions indicated, within specified fabrication tolerances.

Dimensional Tolerances of Finished Units: Ornamental architectural precast concrete, being tapered by design, is measured for length, width and thickness at the surface from which the mold is loaded maintaining plus or minus 1/16 of an inch tolerance. Overall height and width measured at face adjacent to mold at time of casting:

Surface Finish and Color: Fabricate precast units and provide exposed surface finished as follows:

Texture:

Modern – Smooth, relatively void free texture.

Traditional – Randomly spaced air voids, producing a travertine-like finish.

Etched – Lightly etched texture, producing a limestone-like finish.

Sandblast – Heavily etched texture, exposing more aggregate.

Antique - Highly irregular, rusticated finish.

Color: Select from CDI color chart to minimize variations in color or define specific requirements.

Other color and/or textures available as required by the project. Time should be allowed for special sample requests.

**PART 3 - RECOMMENDED EXECUTION OF THE INSTALLATION** - The successful installation requires experienced, knowledgeable installers in order to achieve a quality installation. Local building codes should be followed. Considerations for installation include:

Install precast concrete members plumb, level and in alignment. Provide temporary supports and bracing as required to maintain position, stability and alignment as members are being permanently connected.

Maintain horizontal and vertical joint alignment and uniform joint width as erection progresses.

Accessories: Install clips, hangers and other accessories required for erection of precast units to supporting members and backup materials.

Anchor units in final position by bolting, welding, grouting, or as otherwise indicated. Remove temporary shims, wedges and spacers as soon as possible after anchoring and grouting are completed.

Cleaning: Clean exposed facings to remove dirt and stains on units after erection and completion of joint treatments. Protect other work from damage due to cleaning operations. Do not use cleaning materials or processes that could change the character of exposed concrete finishes.

**PART 4 WARRANTY** – The Precast Concrete Manufacturer shall guarantee the precast concrete products against defects in material and workmanship, for a period of five (5) years, from the date of purchase. This guarantee covers castings used in the proper manner and installed and maintained by qualified personnel.

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