

**Precast Systems, LLC
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**GUIDE SPECIFICATION
FOR
PRECAST PRODCUTS**

PART 1- GENERAL

A. REFERENCES

ACI INTERNATIONAL (ACI)

ACI 211.1	Standard practice for selecting proportions for normal, heavyweight, and mass concrete
ACI 304R	Guide for measuring, mixing, transporting and placing concrete
ACI 305R	Hot Weather Concreting
ACI 306R	Cold Weather Concreting
ACI 309R	Consolidation of concrete
ACI 318	Building code requirements for structural concrete
ACI 350	Code requirements for environmental engineering concrete structures and commentary

ASTM INTERNATIONAL (ASTM)

ASTM A 82	Specification for steel wire, plain, for concrete reinforcement
ASTM A 184	Specification for fabricated deformed steel mats for concrete reinforcement
ASTM A 496	Specification for steel wire, deformed, for concrete reinforcement
ASTM A 497	Specification for steel welded wire reinforcement, deformed, for concrete
ASTM C 14	Standard specification for concrete sewer, storm drain
ASTM C 31	Standard practice for making and curing concrete test specimens in the field
ASTM C 33	Specification for concrete aggregates

ASTM C 39	Test method for compressive strength of cylindrical concrete specimens
ASTM C 70	Standard test method for surface moisture in fine aggregate
ASTM C 125	Standard terminology relating to concrete and concrete aggregates
ASTM C 136	Test method for sieve analysis of fine and coarse aggregates
ASTM C 138	Test method for density (unit weight), yield, and air content (Gravimetric) of concrete
ASTM C 143	Test method for slump of hydraulic cement concrete
ASTM C 150	Specification for Portland Cement
ASTM C 172	Standard practice for sampling freshly mixed concrete
ASTM C 192	Practice for making and curing concrete test specimens in the laboratory
ASTM C 231	Test method for air content of freshly mixed concrete by pressure method
ASTM C260	Specification for air-entraining admixtures for concrete
ASTM C 494	Standard specification for chemical admixtures for concrete
ASTM C 566	Test method for total evaporable moisture content of aggregate by drying
ASTM C 617	Standard practice for capping cylindrical concrete specimens
ASTM C 618	Specification for coal fly ash and raw or calcined natural pozzolan for use as a mineral admixture in concrete
ASTM C 825	Specification for concrete barriers
ASTM C 913	Specification for precast concrete water and wastewater structures
ASTM C 1064	Standard test method for temperature of freshly mixed Portland Cement concrete
ASTM C 1116	Standard specification for fiber-reinforced concrete and shotcrete
ASTM C 1602	Standard specification for mixing water used in the production of hydraulic cement concrete

AMERICAN WELDING SOCIETY (AWS)

AWS D 1.1	Structural welding code- Steel
AWS D 1.4	Structural welding code- Reinforcing steel

NATIONAL PRECAST CONCRETE ASSOCIATION (NPCA)

NPCA QC Manual	Quality control manual for Precast Concrete Plants
NPCA Selected ASTM Standards	ASTM Standards for Precast Concrete

B. QUALITY ASSURANCE

1. Qualifications of Precast Systems, LLC.
 - a. Precast Systems, LLC has been regularly and continuously engaged in the manufacture of precast concrete units similar to that indicated in the project specifications or drawings for at least 5 years.
 - b. Precast Systems, LLC is a member of the National Precast Concrete Association and is NPCA certified.
2. Testing
 - a. All testing shall be performed by Precast Systems, LLC quality control inspectors and in accordance with all provisions in the latest edition of the National Precast Concrete Association Quality Control Manual For Precast and Prestressed Concrete Plants.

C. SUBMITTALS

1. Shop Drawings submitted upon request
 - a. The content may include:
 - i. Unit shapes (elevations and sections) and dimensions
 - ii. Finishes
 - iii. Joint and connection details
 - iv. Lifting and erection inserts
 - v. Location, dimensional tolerances and details of anchorage devices that are embedded in or attached to structure or other construction
 - vi. Other items cast into the precast unit
2. Test Reports
 - a. Submit, upon request, reports on materials, compressive strength tests on concrete and water absorption test on storm water and sanitary sewer precast units
3. Design Modifications
 - a. Submit design modifications necessary to meet performance requirements and field coordination.

PART II- PRODUCTS

A. MATERIALS

1. Portland Cement per ASTM C150, Type I gray cement
2. Flyash per ASTM C618
3. Air Entraining Agent per ASTM C260
4. Aggregates per ASTM C33

5. Water
 - a. Free from foreign materials in amounts harmful to concrete. Potable water is ordinarily acceptable per ASTM C1602.
6. Reinforcing Steel
 - a. Reinforcing bars are new billet, deformed steel, grade 60, per ASTM A615
 - b. Reinforcing bars are new billet, deformed steel, grade 60, per ASTM A706 when used in welded hardware assemblies.
 - c. Structural welded wire reinforcement
 - i. Plain steel welded wire reinforcement per ASTM A185
 - ii. Deformed steel welded wire reinforcement per ASTM A497
7. Cast-in Anchors
 - a. Materials
 - i. Carbon steel shapes and plates per ASTM A36
 - ii. Carbon steel structural tubing per ASTM A500
 - iii. Carbon steel standard pipe per ASTM A53, Grade B

B. MIXES

1. Water-cement ratio: 0.40 maximum
2. Air Entrainment: Minimum 4% not more than 7% when concrete is placed.
3. Salt: Calcium Chloride and other ionic compounds that are electrolytic are not permitted in concrete mix.
4. Super Plasticizer: Can be used at Precast Systems, LLC's option per ASTM C494.

C. MANUFACTURING

1. Minimum compressive strength of precast concrete after 28 days shall be a 5,000 psi.
2. Compression test for precast concrete per ASTM C39.
 - a. Number of tests: Make compression test for each day's production of each type of concrete.
 - b. Specimens
 - i. Provide test specimens for compression test at 18 hours and 28 days.
 - ii. Obtain concrete for specimens from the actual production batch they will represent.
 - iii. 4" x 8" molded concrete cylinder meeting applicable requirements of ASTM C31
3. Curing
 - a. Form cure precast units until a sufficient stripping strength has developed

PART III- PRODUCT DELIVERY, HANDLING AND STORAGE

1. Delivery and Handling
 - a. Deliver all precast concrete units to project site in such quantities and at such times as to assure the continuation of the progress of the project.
 - b. Handle and transport units in a position consistent with their shape and design in order to avoid stresses which would cause cracking or damage