

Astm C1577 17 Standard Specification For Precast

Astm C1577 17 Standard Specification For Precast ASTM C1577 17 Standard Specification for Precast Concrete Products 1 Scope This standard covers the requirements for the production testing and evaluation of precast concrete products intended for use in construction It establishes minimum performance standards and inspection procedures for various aspects of precast concrete production including concrete mix design reinforcement fabrication and quality control This standard is applicable to both structural and nonstructural precast concrete products 2 Referenced Documents This standard references the following documents ASTM C33 Standard Specification for Concrete Aggregates ASTM C150 Standard Specification for Portland Cement ASTM C39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens ASTM C42 Standard Specification for Concrete Made by Volumetric Batching ASTM C127 Standard Test Method for Staining Characteristics of Mortar ASTM C143 Standard Test Method for Slump of Portland Cement Concrete ASTM C157 Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method ASTM C172 Standard Method of Sampling Fresh Concrete ASTM C192 Standard Specification for Concrete Made by Hand Mixing ASTM C230 Standard Specification for Lightweight Aggregates for Concrete ASTM C330 Standard Specification for Lightweight Aggregates for Structural Concrete ASTM C471 Standard Test Method for Density of Concrete ASTM C494 Standard Specification for Chemical Admixtures for Concrete ASTM C617 Standard Specification for Fly Ash for Use as a Mineral Admixture in Concrete ASTM C618 Standard Specification for Coal Fly Ash and Other Pozzolans for Use in Concrete ASTM C94 Standard Specification for Ready Mixed Concrete ASTM C1012 Standard Test Method for Tensile Strength of Mortar ASTM C109 Standard Test Method for Compressive Strength of Hydraulic Cement Mortars 2 ASTM C1077 Standard Test Method for Determination of Air Content of Freshly Mixed Concrete by the Volumetric Method ASTM C1442 Standard Specification for Precast Concrete Products ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials ACI 318 Building Code Requirements for

Structural Concrete ACI 345 Specification for Nonstructural Concrete Products 3 Definitions Precast Concrete Product A concrete product cast in a form cured and then transported to its final location Structural Precast Concrete Product A precast concrete product that carries structural loads Nonstructural Precast Concrete Product A precast concrete product that does not carry structural loads Batching The process of measuring and combining the ingredients of concrete Mixing The process of combining and blending the ingredients of concrete Curing The process of maintaining the moisture and temperature of concrete after casting to promote hydration and hardening Reinforcement Steel bars wires or mesh embedded in concrete to increase its tensile strength and ductility Formwork The temporary structure that supports and shapes the fresh concrete until it hardens Fabrication The process of manufacturing and assembling precast concrete products Quality Control The process of monitoring and verifying the quality of precast concrete products throughout the production process 4 Material Requirements 41 Concrete Materials Portland Cement Shall conform to ASTM C150 Aggregates Shall conform to ASTM C33 ASTM C230 or ASTM C330 as applicable Water Shall be clean and free from impurities that could adversely affect the concrete Chemical Admixtures Shall conform to ASTM C494 Fly Ash Shall conform to ASTM C617 or ASTM C618 42 Reinforcement Steel Reinforcement Shall conform to applicable ASTM specifications Welded Wire Fabric Shall conform to applicable ASTM specifications 3 EpoxyCoated Reinforcement Shall conform to applicable ASTM specifications 5 Production Requirements 51 Batching and Mixing Concrete shall be batched and mixed in accordance with ASTM C42 or ASTM C192 The concrete mix design shall be based on the intended use and performance requirements of the precast concrete product The concrete mix shall be designed to achieve the required strength workability and durability 52 Fabrication Precast concrete products shall be fabricated using proper formwork reinforcement and casting procedures The formwork shall be strong and rigid enough to support the weight of the fresh concrete and any applied loads The reinforcement shall be properly placed and secured in the formwork to ensure adequate bond and structural integrity The concrete shall be placed in the formwork in a manner that minimizes segregation and air entrainment 53 Curing Precast concrete products shall be cured in accordance with the specified requirements to ensure proper hydration and hardening Curing methods may include moist curing steam curing or other approved methods The curing process shall be carefully controlled to prevent cracking shrinkage and other defects 6 Testing and Inspection 61 Concrete Testing Concrete shall be tested in accordance with the applicable ASTM specifications to

verify compliance with the specified requirements Tests shall be conducted on representative samples of concrete from each batch or production run Tests shall include but are not limited to compressive strength air content slump density and setting time 62 Reinforcement Inspection 4 Reinforcement shall be inspected to verify compliance with the specified requirements Inspection shall include but is not limited to material type size spacing and placement 63 Fabrication Inspection Precast concrete products shall be inspected to verify compliance with the specified requirements Inspection shall include but is not limited to formwork reinforcement casting curing and finish 7 Quality Control The manufacturer shall establish and maintain a quality control program to ensure that precast concrete products meet the specified requirements The quality control program shall include written procedures for all aspects of production testing and inspection Records of all tests and inspections shall be maintained for a specified period of time 8 Acceptance Criteria Precast concrete products shall be accepted for use only if they meet the specified requirements Acceptance criteria may include but are not limited to compressive strength air content slump density reinforcement placement dimensions finish and appearance 9 Marking and Identification Precast concrete products shall be marked and identified in accordance with the specified requirements Marking shall include but is not limited to the manufacturers name date of manufacture and product designation 10 Delivery and Handling Precast concrete products shall be handled and transported in a manner that minimizes damage Proper lifting and supporting devices shall be used to prevent damage during handling and transportation 11 Installation Precast concrete products shall be installed in accordance with the specified requirements Installation shall include but is not limited to proper anchoring grouting and sealing 5 12 Safety All activities related to the production testing inspection and installation of precast concrete products shall be conducted in a safe manner Workers shall be trained in safe work practices and provided with appropriate personal protective equipment 13 Keywords Precast concrete standard specification concrete products structural nonstructural production testing inspection quality control acceptance criteria marking identification delivery handling installation safety 14 Conclusion ASTM C157717 provides comprehensive guidelines for the production testing and evaluation of precast concrete products This standard ensures the quality safety and performance of these products contributing to the overall success of construction projects By adhering to the requirements outlined in this standard manufacturers and users of precast concrete products can enhance project efficiency minimize risks and deliver reliable and durable structures

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