

An ACI Standard

Specification for Shotcrete

Reported by ACI Committee 506

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Specification for Shotcrete

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This specification contains the construction requirements for the application of shotcrete. Both wet- and dry-mixture shotcrete are addressed, as well as fiber-reinforced shotcrete. The minimum standard for materials, properties, testing, and application are covered.

The materials, processes, quality control measures, and inspections described in this specification should be tested, monitored, or performed as applicable only by individuals holding the appropriate ACI certifications or equivalent.

Keywords: dry-mixture shotcrete; fiber-reinforced shotcrete; nozzleman; qualification; quality control; quality assurance; shooting; wet-mixture shotcrete.

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Reference to this document shall not be made in contract documents. If items found in this document are desired by the Architect/Engineer to be a part of the contract documents, they shall be restated in mandatory language for incorporation by the Architect/Engineer.

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PART 1—GENERAL**1.1—Scope**

1.1.1 Work specified—This Reference Specification covers the requirements for shotcrete as specified by the Architect/Engineer. Included are the requirements for materials; proportioning; and application of structural and nonstructural shotcrete, including structural and nonstructural fiber-reinforced shotcrete.

1.1.2 Units—Values in this specification are stated in inch-pound units. A companion specification in SI units is also available.

1.2—Definitions

accepted—determined to be satisfactory by Owner or Architect/Engineer.

Architect/Engineer—the architect, engineer, architectural firm, engineering firm, or architectural and engineering firm issuing Contract Documents or administering the Work under Contract Documents, or both.

Contract Documents—set of documents supplied by Owner to Contractor as the basis for construction; these documents contain contract forms, contract conditions, specifications, drawings, addenda, and contract changes.

Contractor—the person, firm, or corporation with whom the Owner enters into an agreement for construction of the Work.

fiber-reinforced shotcrete (FRS)—shotcrete containing discontinuous discrete fibers.

gun finish—undisturbed final layer of shotcrete as applied from a nozzle without further finishing.

overspray—waste shotcrete material deposited away from intended receiving surface.

Owner—the corporation, association, partnership, individual, public body, or authority with whom the Contractor enters into an agreement and for whom the Work is provided.

permitted—accepted by or acceptable to Architect/Engineer; usually pertains to a request by Contractor, or when specified in Contract Documents.

predampening—in the dry-mixture process, adding water to the aggregate before mixing to bring its moisture content to a specified amount, usually 3 to 6 percent.

quality assurance—actions taken by Owner or Owner's representative to assure Work done and materials provided are in accordance with Contract Documents.

quality control—actions taken by the Contractor to assure that Work meets requirements of Contract Documents.

Reference Specification—a standardized mandatory-language document prescribing materials, dimensions,

and workmanship, incorporated by reference in Contract Documents.

Reference Standards—standardized mandatory-language documents of a technical society, organization, or association, including building codes of local or state authorities, which are referenced by the Contract Documents.

required—stipulated in this specification or the Contract Documents.

rod finish—a sharp-edged cutting screed to be used to trim shotcrete forms or ground wires.

shotcrete—concrete or mortar conveyed through a hose and pneumatically projected at high velocity onto a surface to achieve compaction.

structural shotcrete—plain or reinforced shotcrete in a member that is part of a structural system required to transfer gravity and/or lateral loads along a path to the ground.

submit—provide to Architect/Engineer for review.

submittal—documents or materials provided to Architect/Engineer for review and/or acceptance.

Work—the entire construction or separately identifiable parts thereof required to be furnished under Contract Documents.

1.3—Referenced standards

Standards of ASTM International cited in this Specification are listed by name and designation, including year.

ASTM International

A185/A185M-07—Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete

A615/A615M-12—Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

A706/A706M-09b—Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement

C33/C33M-13—Standard Specification for Concrete Aggregates

C78/C78M-10^{e1}—Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third Point Loading)

C42/C42M-13—Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete

C94/C94M-13a—Standard Specification for Ready-Mixed Concrete

C127-12—Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate

C128-12—Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Fine Aggregate

C150/C150M-12—Standard Specification for Portland Cement

C171-07—Standard Specification for Sheet Materials for Curing Concrete

C231/C231M-10—Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

C309-11—Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete