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An ACI Standard

Specification for Hot Weather Concreting

Reported by ACI Committee 305

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This reference specification provides requirements for hot weather concreting that the architect/engineer can apply to any construction project involving hot weather concreting by citing it in the project specification. Checklists are provided to assist the architect/engineer in supplementing the provisions of this reference specification as needed by designating or specifying customized project requirements.

This specification includes hot weather requirements for production preparations, delivery, placement, finishing, bleed-water evaporation, curing, and concrete protection. Provisions governing a preplacement conference, concrete mixture proportions, maximum allowable concrete temperature, rate of surface evaporation measurements, evaporation control measures, and acceptance of a concrete mixture from past field experience or preconstruction testing are also included.

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

Keywords: bleeding; curing; evaporation; finishing; mixture proportioning; plastic shrinkage cracking; protection period; trial batch.

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(mandatory portion follows)

ACI 305.1M-14 supersedes ACI 305.1-06 and was adopted June 16, 2014 and published January 2015.

APPENDIX B—EXAMPLE OF NRMCA NOMOGRAPH FOR ESTIMATING SURFACE EVAPORATION RATE ON THE BASIS OF MENZEL FORMULA, p. 6

Mandatory portion follows

SECTION 1—GENERAL

1.1—Scope

1.1.1 This specification covers requirements for hot weather concrete construction.

1.1.2 This specification supplements the contract documents and provides requirements for the Contractor.

1.1.3 This specification governs for construction within its scope, but the contract documents govern if there is a conflict.

1.1.4 This specification governs if there is a conflict with its reference standards.

1.1.5 The Contractor is permitted to submit written alternatives to a provision in the specification.

1.1.6 Do not use this specification in conjunction with ACI 301M, 350.5M, 522.1M, or ACI 530.1 unless contract document states that this specification governs for work covered by 1.1.1.

1.1.7 Ignore provisions of the specification that are not applicable to the work.

1.1.8 Values to this specification are stated in SI units. A companion specification in inch-pound units is also available.

1.1.9 The Notes to Specifier are not part of this specification.

1.2—Definitions

ACI provides a comprehensive list of definitions through an online resource, "ACI Concrete Terminology," http://concrete.org/Tools/ConcreteTerminology.aspx. Definitions here compliment that resource.

hot weather—one or a combination of the following conditions that tends to impair the quality of freshly mixed or hardened concrete by accelerating the rate of moisture loss and rate of cement hydration, or otherwise causing detrimental results: high ambient temperature, high concrete temperature, low relative humidity, and high wind speed.

1.3—Reference Standards

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

1.3.1 *American Concrete Institute*

ACI 301M-10—Specifications for Structural Concrete

ACI 308.1M-11—Specification for Curing Concrete

ACI 350.5M-12—Specification for Environmental Concrete Structures

ACI 522.1M-08—Specification for Pervious Concrete Pavement

ACI 530.1-11—Building Code Requirements and Specification for Masonry Structures

1.3.2 *ASTM International*

ASTM C31/C31M-12—Standard Practice for Making and Curing Concrete Test Specimens in the Field

ASTM C39/C39M-14—Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

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

ASTM C94/C94M-14—Standard Specification for Ready-Mixed Concrete

ASTM C138/C138M-13—Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete

ASTM C143/C143M-12—Standard Test Method for Slump of Hydraulic-Cement Concrete

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

ASTM C173/C173M-14—Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

ASTM C192/C192M-13—Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory

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

ASTM C293/C293M-10—Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Center-Point Loading)

ASTM C1064/C1064M-12—Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete

1.4—Submittals

1.4.1 Submittal of concrete proportions

1.4.1.1 Concrete mixture proportions shall be submitted to the architect/engineer for review.

1.4.1.2 Submittal shall include the constituent materials and proportions of the proposed concrete mixture, in addition to test results obtained from past field experience or preconstruction testing. Test results shall meet all the applicable requirements in the project specification.

1.4.2 Before the preplacement conference, submit procedures for production, placement, finishing, curing, and protection of concrete during hot weather conditions to the architect/engineer for review and comment. Submittals shall indicate which methods will be used for pre- and post-cooling of the concrete, and the order in which they will be initiated when multiple methods are proposed.

1.4.3 *Preplacement conference*

1.4.3.1 At least 15 days prior to beginning concrete construction, hold a preplacement conference to review hot weather concreting procedures and the anticipated effect on the proposed mixture proportions.

1.4.3.2 Send a preplacement conference agenda, including hot weather concreting procedures, to representatives of concerned parties not less than 10 days before the scheduled date of the preplacement conference.

1.4.3.3 Preplacement conference attendance shall include, but is not limited to, representatives of the contractor, concrete subcontractor, testing agency, pumping contractor, engineer of record, and ready-mixed concrete producer.