An ACI Standard

Specification for Hot Weather Concreting

Reported by ACI Committee 305

ACI 305.1-14

American Concrete Institute
Always advancing
Specification for Hot Weather Concreting

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G. Terry Harris Sr., Chair

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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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General notes, p. 4
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APPENDIX A—EXAMPLE OF UNO EQUATION
USED TO DETERMINE SURFACE EVAPORATION
RATE OF FRESH CONCRETE, p. 6

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 301, 350.5, 522.1, 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 inch-pound units. A companion specification in SI units is also available.
1.1.9 The Notes to Specifier are not part of this specification.

1.2—Definitions
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 301-10—Specifications for Structural Concrete
ACI 308.1-11—Specification for Curing Concrete
ACI 350.5-12—Specification for Environmental Concrete Structures
ACI 522.1-08—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 postcooling 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