Standard Specification for

Ready-Mixed Concrete

AASHTO Designation: M 157-13 (2017)

Technical Section: 3b, Fresh Concrete

Release: Group 1 (April 2017)

AASHTO

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1. SCOPE

1.1. This specification covers ready-mixed concrete manufactured and delivered to a purchaser in a freshly mixed and unhardened state as hereinafter specified. Requirements for quality of concrete shall be either as hereinafter specified or as specified by the purchaser. In any case where the requirements of the purchaser differ from those in this specification, the purchaser's specification shall govern. This specification does not cover the placement, consolidation, curing, or protection of the concrete after delivery to the purchaser.

1.2. The values stated in SI units are the preferred standard. The values given in parentheses are for information only.

1.3. As used throughout this specification the *manufacturer* shall be the contractor, subcontractor, supplier, or producer who furnishes the ready-mixed concrete. The *purchaser* shall be the specifying agency and designated representatives thereof. The *engineer* shall be interpreted to mean the designated representative of the specifying agency.

2. REFERENCED DOCUMENTS

2.1. *AASHTO Standards*:

- M 6, Fine Aggregate for Hydraulic Cement Concrete
- M 80, Coarse Aggregate for Hydraulic Cement Concrete
- M 85, Portland Cement
- M 154M/M 154, Air-Entraining Admixtures for Concrete
- M 194M/M 194, Chemical Admixtures for Concrete
- M 195, Lightweight Aggregates for Structural Concrete
- M 240M/M 240, Blended Hydraulic Cement
- M 295, Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
- M 302, Slag Cement for Use in Concrete and Mortars
- M 307, Silica Fume Used in Cementitious Mixtures
- R 60, Sampling Freshly Mixed Concrete
- T 22, Compressive Strength of Cylindrical Concrete Specimens
- T 23, Making and Curing Concrete Test Specimens in the Field
- T 105, Chemical Analysis of Hydraulic Cement
- T 106 M/T 106, Compressive Strength of Hydraulic Cement Mortar (Using 50-mm or 2-in. Cube Specimens)
- T 119M/T 119, Slump of Hydraulic Cement Concrete

- T 121M/T 121, Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
- T 131, Time of Setting of Hydraulic Cement by Vicat Needle
- T 152, Air Content of Freshly Mixed Concrete by the Pressure Method
- T 196M/T 196, Air Content of Freshly Mixed Concrete by the Volumetric Method
- T 290, Determining Water-Soluble Sulfate Ion Content in Soil

2.2. *ASTM Standards*:

- C567/C567M, Standard Test Method for Determining Density of Structural Lightweight Concrete
- C1157/C1157M, Standard Performance Specification for Hydraulic Cement
- C1602/C1602M, Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
- C1603, Standard Test Method for Measurement of Solids in Water
- D512, Standard Test Methods for Chloride Ion in Water
- E329, Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

2.3. *American Concrete Institute Standards*:

- 211.1, Standard Practice for Selecting Proportions for Normal and Heavyweight and Mass Concrete
- 211.2, Standard Practice for Selecting Proportions for Structural Lightweight Concrete
- 305R, Hot Weather Concreting
- 306R, Cold Weather Concreting

2.4. *U.S. Government Printing Office*:

- "Test for Variability of Constituents in Concrete." Designation 26, *Bureau of Reclamation Concrete Manual*, 7th Edition

3. TERMINOLOGY

3.1. For the purpose of this specification, ready-mixed concrete is hydraulic cement concrete manufactured for delivery to a purchaser in a plastic state and delivered as hereinafter specified.

3.2. The volume of freshly mixed and unhardened concrete in a given batch shall be determined from the total mass of the batch divided by the actual mass per cubic foot of the concrete. The total mass of the batch shall be calculated either as the sum of the masses of all materials, including water, entering the batch or as the net mass of the concrete in the batch as delivered. The mass per cubic foot shall be determined in accordance with T 121M/T 121 from the average of at least three measurements, each on a different sample using a 14-L ($^1/_2$-ft^3) container. Each sample shall be taken from the midpoint of each of three different truck loads by the procedure outlined in R 60.

Note 1—It should be understood that the volume of hardened concrete may be, or appear to be, less than expected due to waste and spillage, overexcavation, spreading forms, some loss of entrained air, or settlement of wet mixtures.

4. MATERIALS

4.1. Storage and facilities satisfactory to the engineer shall be provided at the batching plant to permit proper sampling, testing, and control of materials prior to and during use. The following specifications shall apply: