



Designation: C1800/C1800M – 16

# Standard Test Method for Determining Density of Roller-Compacted Concrete Specimens Using the Gyratory Compactor<sup>1</sup>

This standard is issued under the fixed designation C1800/C1800M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This test method covers the compaction of cylindrical specimens of roller-compacted concrete (RCC) using the gyratory compactor to determine density.

1.2 *Units*—The values stated in SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. (Warning—Fresh hydraulic cementitious mixtures are caustic and may cause chemical burns to skin and tissue upon prolonged exposure.)*<sup>2</sup>

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>3</sup>

- C125 Terminology Relating to Concrete and Concrete Aggregates
- C127 Test Method for Relative Density (Specific Gravity) and Absorption of Coarse Aggregate
- C128 Test Method for Relative Density (Specific Gravity) and Absorption of Fine Aggregate
- C188 Test Method for Density of Hydraulic Cement
- C192/C192M Practice for Making and Curing Concrete Test Specimens in the Laboratory
- C1077 Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for

## Testing Agency Evaluation

- C1170/C1170M Test Method for Determining Consistency and Density of Roller-Compacted Concrete Using a Vibrating Table
- C1435/C1435M Practice for Molding Roller-Compacted Concrete in Cylinder Molds Using a Vibrating Hammer
- D6925 Test Method for Preparation and Determination of the Relative Density of Asphalt Mix Specimens by Means of the Superpave Gyratory Compactor

## 3. Terminology

3.1 *Definitions*—For definitions of terms used in this Test Method, refer to Terminology C125.

## 4. Significance and Use

4.1 This Test Method is used to prepare specimens containing a nominal maximum aggregate size of up to 37.5 mm [1-1/2 in.] and a Vebe consistency time, in accordance with Test Method C1170/C1170M, of greater than 30 s for determining the density of compacted RCC mixtures. This method is not intended to specify a standard compactive effort in RCC mixture design, but rather to provide a standardized method for comparing various aggregate combinations.

4.2 This test method may be used for making specimens and determining densities of laboratory-produced RCC mixtures.

NOTE 1—The agency and personnel performing this test method should meet the criteria of Practice C1077 or equivalent.

NOTE 2—The use of gyratory-compacted RCC specimens for strength determinations is not recommended due to specimen geometry and low L/D ratios. Research has shown a lack of correlation between compressive strengths of gyratory-compacted RCC specimens and specimens prepared in accordance with Practice C1435/C1435M.

## 5. Apparatus

5.1 *Gyratory Compactor*—An electromechanical, electro-hydraulic, or electro-pneumatic compactor meeting the requirements of Test Method D6925.

5.2 *Specimen Molds*—Specimen molds having an inside diameter of approximately 150 mm [6 in.], meeting the requirements of Test Method D6925.

5.3 *Mold Plates and Ram Heads*—Mold plates and ram heads shall conform to Test Method D6925.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.45 on Roller-Compacted Concrete.

Current edition approved July 1, 2016. Published July 2016. DOI: 10.1520/C1800-16.

<sup>2</sup> Section on Safety Precautions, Manual of Aggregate and Concrete Testing, Annual Book of ASTM Standards, Vol. 04.02. (see C09.95 Coordination Document)

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For Annual Book of ASTM Standards volume information, refer to the standard's Document Summary page on the ASTM website.