
Standard Specification for Reclaimed Concrete Aggregate (RCA) for Use as Coarse Aggregate in Hydraulic Cement Concrete

AASHTO Designation: MP 16-13 (2015)¹



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Reclaimed Concrete Aggregate (RCA) for Use as Coarse Aggregate in Hydraulic Cement Concrete

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1. SCOPE

- 1.1. This specification covers coarse aggregate derived from reclaimed concrete for use in hydraulic cement concrete. The specification is not intended for use when lightweight, high-density, or other specialty concrete applications are required. When aggregate materials are properly processed and manufactured to the requirements of this specification, combined and mixed in accordance with the appropriate requirements, and placed, consolidated, and cured properly, a concrete structure of acceptable strength and durability can be produced. Introducing reclaimed concrete aggregate (RCA) into concrete, however, requires the use of quality control and quality assurance procedures to ensure that deleterious materials that might be present in the reclaimed concrete aggregate will not adversely impact the quality of the concrete product.
- 1.2. Best practice applications for using reclaimed concrete aggregate in concrete shall consist of concrete pavements, cement-treated base courses, sidewalks, median barriers, curbs, and other nonstructural applications.
- Note 1**—Caution should be exercised if reclaimed concrete aggregate is considered for use in structural applications. The presence of deleterious materials and the variability in the source concrete may produce inconstant volumetric properties and affect the properties of the concrete produced. Two properties of concern include dimensional stability and creep.
- 1.3. Because reclaimed concrete aggregate is a recycled material, various state and local jurisdiction laws and regulations may be applicable. The user of this specification is cautioned to contact state and local environmental and other local regulators to determine what requirements are appropriate.

2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*
- M 43, Sizes of Aggregate for Road and Bridge Construction
 - M 80, Coarse Aggregate for Hydraulic Cement Concrete
 - T 2, Sampling of Aggregates
 - T 11, Materials Finer Than 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing
 - T 19M/T 19, Bulk Density ("Unit Weight") and Voids in Aggregate
 - T 27, Sieve Analysis of Fine and Coarse Aggregates
 - T 85, Specific Gravity and Absorption of Coarse Aggregate
 - T 96, Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

- T 103, Soundness of Aggregates by Freezing and Thawing
- T 104, Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
- T 112, Clay Lumps and Friable Particles in Aggregate
- T 113, Lightweight Pieces in Aggregate
- T 161, Resistance of Concrete to Rapid Freezing and Thawing
- T 260, Sampling and Testing for Chloride Ion in Concrete and Concrete Raw Materials
- T 303, Accelerated Detection of Potentially Deleterious Expansion of Mortar Bars Due to Alkali-Silica Reaction
- T 327, Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus

2.2. *ASTM Standards:*

- C125, Standard Terminology Relating to Concrete and Concrete Aggregates
- C227, Standard Test Method for Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method)
- C289, Standard Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method)
- C295/C295M, Standard Guide for Petrographic Examination of Aggregates for Concrete
- C342, Standard Test Method for Potential Volume Change of Cement-Aggregate Combinations (Withdrawn 2001)
- C586, Standard Test Method for Potential Alkali Reactivity of Carbonate Rocks as Concrete Aggregates (Rock-Cylinder Method)
- C856, Standard Practice for Petrographic Examination of Hardened Concrete
- C1293, Standard Test Method for Determination of Length Change of Concrete Due to Alkali-Silica Reaction
- D6928, Standard Test Method for Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus

3. TERMINOLOGY

- 3.1. The definitions of concrete and concrete aggregate terms used in this specification are provided in ASTM C125. The term “reclaimed concrete aggregate,” as used in this specification, shall mean coarse aggregate material derived from the crushing, processing, and classification of hydraulic cement concrete construction debris recovered from roadways, sidewalks, buildings, bridges, and other sources.

4. ORDERING INFORMATION

- 4.1. *The purchaser or specifier shall include the following information in the purchase order or contract documents:*
- 4.1.1. Reference to this specification and year of issue,
 - 4.1.2. Grading to be furnished (AASHTO Size No.) (Section 6.1),
 - 4.1.3. Soundness testing requirement (Section 7.2),
 - 4.1.4. Class designation of aggregate (Table 1),