



Designation: **C1372—14 C1372 – 14a**

Standard Specification for Dry-Cast Segmental Retaining Wall Units¹

This standard is issued under the fixed designation C1372; 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 (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 This specification covers dry-cast segmental retaining wall units of concrete, machine-made from hydraulic cement, water, and suitable mineral aggregates with or without the inclusion of other materials. The units are intended for use in the construction of mortarless segmental retaining walls.

NOTE 1—When particular features are desired, such as density classification, higher compressive strength, surface texture, finish, color, or other special features, such properties should be specified separately by the purchaser. Suppliers should be consulted as to availability of units having the desired features.

1.2 The text of this standard references notes and footnotes which that provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

2. Referenced Documents

2.1 *ASTM Standards*:²

C33 Specification for Concrete Aggregates

C140 Test Methods for Sampling and Testing Concrete Masonry Units and Related Units

C150 Specification for Portland Cement

C331 Specification for Lightweight Aggregates for Concrete Masonry Units

C595 Specification for Blended Hydraulic Cements

C618 Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

C989 Specification for Slag Cement for Use in Concrete and Mortars

C1157 Performance Specification for Hydraulic Cement

C1232 Terminology of Masonry

C1262 Test Method for Evaluating the Freeze-Thaw Durability of Dry-Cast Segmental Retaining Wall Units and Related Concrete Units

3. Terminology

3.1 Terminology defined in Terminology C1232 shall apply for this specification.

3.2 *Definitions*:

3.2.1 *Dry-cast, adj*—manufacturing concrete products using low frequency, high amplitude vibration to consolidate concrete of stiff or extremely dry consistency in a form.

3.2.2 *segmental retaining wall unit, n*—unit manufactured of concrete for the construction of dry-stacked earth retaining walls.

3.2.3 *segmental retaining wall unit, dry-cast, n*—a segmental retaining wall unit manufactured of concrete using a dry-cast process.

4. Materials

4.1 *Cementitious Materials*—Materials shall conform to the following applicable specifications:

4.1.1 *Portland Cements*—Specification C150.

¹ This specification is under the jurisdiction of ASTM Committee C15 on Manufactured Masonry Units and is the direct responsibility of C15.03 on Concrete Masonry Units and Related Units

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² 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.

*A Summary of Changes section appears at the end of this standard

4.1.2 *Modified Portland Cement*—Portland cement conforming to Specification **C150**, modified as follows:

4.1.2.1 *Limestone*—Limestone, with a minimum 85 % Calcium Carbonate (CaCO₃) content, shall be permitted to be added to the cement, provided these requirements of Specification **C150** as modified are met:

- (1) Limitation on Insoluble Residue—1.5 %.
- (2) Limitation on Air Content of Mortar—Volume percent, 22 % max.
- (3) Limitation on Loss of Ignition—7 %.

4.1.3 *Blended Hydraulic Cements*—Specification **C595**.

4.1.4 *Hydraulic Cement*—Specification **C1157**.

4.1.5 *Pozzolans*—Specification **C618**.

4.1.6 *Blast Furnace Slag Cement*—Specification **C989**.

4.2 *Aggregates*—Aggregates shall conform to the following specifications, except that grading requirements shall not necessarily apply:

4.2.1 *Normal Weight Aggregates*—Specification **C33**.

4.2.2 *Lightweight Aggregates*—Specification **C331**.

4.3 *Other Constituents*—Air-entraining agents, coloring pigments, integral water repellents, finely ground silica, and other constituents shall be previously established as suitable for use in segmental retaining wall units and shall conform to applicable ASTM standards or shall be shown by test or experience to be not detrimental to the durability of the segmental retaining wall units or any material customarily used in segmental retaining wall construction.

5. Physical Requirements

5.1 At the time of delivery to the work site, the units shall conform to the physical requirements of **Table 1** when tested in accordance with **8.2**. All units shall be sound and free of cracks or other defects that interfere with the proper placement of the units or significantly impair the strength or permanence of the construction. Minor cracks incidental to the usual method of manufacture or minor chipping resulting from customary methods of handling in shipment and delivery are not grounds for rejection.

5.1.1 When higher compressive strengths than those listed in **Table 1** are specified, the tested average net area compressive strength of three units shall equal or exceed the specified compressive strength, and the following single unit strength requirements shall apply.

5.1.1.1 When the specified compressive strength is less than 5000 psi, no single unit net area compressive strength test result shall be less than the specified compressive strength minus 500 psi.

5.1.1.2 When the specified compressive strength is 5000 psi or greater, no single unit net area compressive strength test result shall be less than 90 % of the specified compressive strength.

5.2 *Freeze-Thaw Durability*—In areas where repeated freezing and thawing under saturated conditions occur, freeze-thaw durability shall be demonstrated by test or by proven field performance that the segmental retaining wall units have adequate durability for the intended use. When testing is required by the specifier to demonstrate freeze-thaw durability, the units shall be tested in accordance with **8.3**.

5.2.1 Specimens shall comply with either of the following: (1) the weight loss of each of five test specimens at the conclusion of 100 cycles shall not exceed 1 % of its initial weight; or (2) the weight loss of each of four of the five test specimens at the conclusion of 150 cycles shall not exceed 1.5 % of its initial weight.

6. Permissible Variations in Dimensions

6.1 Overall dimensions for width, height, and length shall differ by not more than $\pm \frac{1}{8}$ in. (3.2 mm) from the specified standard dimensions.

NOTE 2—The term “width” refers to the horizontal dimension of the unit measured perpendicular to the face of the wall from the exposed surface of the unit to the back of the unit. The term “height” refers to the vertical dimension of the unit as placed in the wall. The term “length” refers to the horizontal dimension of the unit measured parallel to the running length of the wall.

6.1.1 Dimensional tolerance requirements for width shall be waived for architectural surfaces.

TABLE 1 Strength, Absorption, and Density Classification Requirements^A

| Density Classification | Oven-Dry Density of Concrete | Maximum Water Absorption | | Minimum Net Area Compressive Strength | |
|------------------------|---|---|---|---------------------------------------|---------------------------|
| | lb/ft ³ (kg/m ³) | lb/ft ³ (kg/m ³) | lb/ft ³ (kg/m ³) | lb/in. ² (MPa) | lb/in. ² (MPa) |
| | Average of Three Units | Average of Three Units | Individual Units | Average of Three Units | Individual Units |
| Lightweight | Less than 105 (1680) | 18 (288) | 20 (320) | 3000 (20.7) | 2500 (17.2) |
| Medium Weight | 105 to less than 125 (1680 to 2000) | 15 (240) | 17 (272) | 3000 (20.7) | 2500 (17.2) |
| Normal Weight | 125 (2000) or more | 13 (208) | 15 (240) | 3000 (20.7) | 2500 (17.2) |

^A Consult manufacturers for available densities.