Designation: C1686 – 09 (Reapproved 2017)

Standard Practice for Installation and Testing of Reinforced Autoclaved Aerated Concrete (AAC) Units[1]

This standard is issued under the fixed designation C1686; 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 practice covers the installation and testing of solid, reinforced units made from autoclaved aerated concrete (AAC), a cementitious product addressed by Specification C1693. The units are large-sized, factory-reinforced, solid rectangular prisms, laid using thin-bed mortar.

1.2 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.

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1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C1693 Specification for Autoclaved Aerated Concrete (AAC)

3. Classification

3.1 Reinforced AAC units installed in accordance with this practice shall be classified according to their strength class.

4. Materials and Manufacture

4.1 Reinforced AAC units installed in accordance with this practice shall be composed entirely of AAC material conforming to Specification C1693. The units themselves shall conform to Specification C1693.

5. Significance and Use

5.1 This practice is intended to regulate the installation of reinforced AAC units and to provide test methods for determining their transverse load-displacement characteristics and load-carrying capacities.

6. Shipping and Handling of Reinforced AAC Reinforced Element

6.1 Reinforced AAC elements shall be protected from damage during shipping by placement on pallets or other supports, banding of the elements, placement of material between the elements, or any other method deemed appropriate by the AAC manufacturer. Reinforced AAC elements should be handled using lifting devices or clamps recommended by the AAC manufacturer.

7. Repair of Reinforced Elements

7.1 Damage from handling or shipping of reinforced AAC elements shall be repaired using special AAC repair mortars. If the damage is severe, the AAC manufacturer shall be consulted as to the structural integrity of the element. Damage that results in exposure of the reinforced element shall be repaired only after the exposed steel is coated with a corrosion-resistant coating as recommended by the AAC manufacturer.

8. Field Cutting of Reinforced Elements

8.1 Do not field-cut reinforced elements unless approved by the project engineer and performed in accordance with the AAC manufacturer's recommendations.

9. Rejection

9.1 If, upon delivery, an individual element fails to conform to this practice, the manufacturer shall be permitted to repair the element to satisfy the specification, or to replace the element.

10. Expense of Tests

10.1 Except as specified in Section 9, and unless otherwise agreed, the expense of inspection and testing shall be the responsibility of the purchaser.

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[1] This practice is under the jurisdiction of ASTM Committee C27 on Precast Concrete Products and is the direct responsibility of Subcommittee C27.60 on Precast Autoclaved Aerated Concrete.

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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.

11. Installation of Reinforced AAC Units

11.1 Installed units covered by this practice shall be protected against direct exposure to moisture using a coating material accepted by the AAC unit manufacturer.

NOTE 1—The rest of this section is blank until installation requirements are developed.

12. Determination of Transverse Load-Displacement Characteristics of Reinforced AAC Elements

12.1 *Scope*—The scope of this practice is to determine the deflection and the load bearing capacity (ultimate load) of these elements.

12.2 *Apparatus:*

12.2.1 The testing machine shall allow a service load to be imposed with an accuracy of 5 % and an ultimate load with an accuracy of 2 %.

12.2.2 The testing machine shall support the reinforced element on two simple supports made of steel. One support shall be fixed in the plane of the element, and the other shall be free to move in that plane. The supports shall support the entire width of the element. The bearing length shall be adjustable, so that the minimum bearing length shall be equivalent to the least bearing length supplied by the manufacturer or a minimum of 1.6 in. (40 mm).

12.2.3 The deflection gauge shall allow the deflection to be determined with a precision of 0.02 in. (0.5 mm).

12.3 *Test Specimens*—The test specimens shall consist of complete reinforced AAC elements as supplied by the AAC manufacturer. The elements to be tested shall have attained the same temperature as the testing environment. The moisture content of the specimens shall be between 10 and 40 % by mass as determined by Specification C1693. If the dry density of the AAC material is known to an accuracy of 5 %, then the moisture content shall be permitted to be determined by calculation based on the mass and volume of the element and the mass of the reinforcement. The mass of the specimens shall be determined before testing to an accuracy of 10 lb (4.5 kg). Report the moisture content of the AAC at time of test.

12.4 *Procedure:*

12.4.1 Apply equal loads to the two quarter points as shown in Fig. 1. Apply the loads through steel shapes placed on soft fiberboard with a thickness of 0.4 to 0.50 in. (10 to 12 mm). The steel profiles shall have sufficient bearing area to produce an even bearing pressure not exceeding 50 % of the specified compressive strength of the AAC material. The bearing area shall cover the entire width of the element, and its extension along the length of the element shall not be less than 4 in. (100 mm).

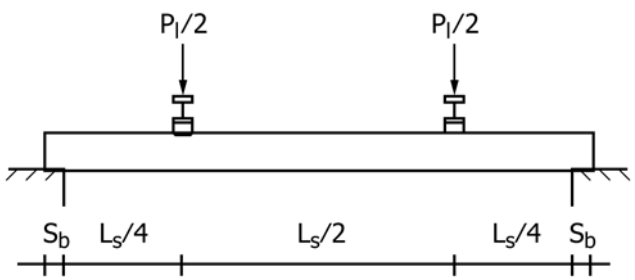
12.4.2 Measure out-of-plane deflection at midspan, either on both sides of the element or in the center. Take the first deflection reading when the element is resting on the supports without any imposed load. Then place the loading apparatus in position and apply load, at a rate sufficient to reach the service load after 2 min. Maintain the service load for 5 min while inspecting the element for cracking. If cracks are found, measure their width at a level corresponding to the bottom of the reinforcement. After that 5-min period, measure and record the deflection of the element under service load. Then load the element to failure within a period not less than 2 min. Record the failure load and failure mode. Before removing the element from the testing apparatus, record the number and size of all of the reinforcing wires and their AAC cover.

13. Precision and Bias

13.1 The precision and bias of the test procedures are being determined and will be provided when sufficient data are available to indicate acceptable tolerances in repeatability and reproducibility.

14. Keywords

14.1 AAC; autoclaved aerated concrete; installation; load-displacement characteristics; reinforced autoclaved aerated concrete



NOTE 1—Position of Applied Loads:
L_s = clear span,
S_b = bearing length of support, and
P_l = imposed test load.

FIG. 1 Transverse Loading (Flexural) Test