



Standard Test Methods for In Situ Measurement of Masonry Mortar Joint Shear Strength Index¹

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1. Scope*

1.1 These test methods cover procedures for the determination of the average in situ mortar joint shear strength index in existing unreinforced solid-unit and ungrouted hollow-unit masonry built with clay or concrete units. Three methods are provided:

1.1.1 *Method A (with Flatjacks Controlling Normal Compressive Stress)*—For determining mortar joint shear strength index when the state of normal compressive stress at the test site is controlled during the test using the flatjack method described in Test Method C1197. Horizontal displacement of the test unit is monitored throughout the test. The test setup for Method A is shown in Fig. 1.

1.1.2 *Method B (without Flatjacks Controlling Normal Compressive Stress)*—For determining mortar joint shear strength index when using an estimate of the normal compressive stress at the location of the test site. Horizontal displacement of the test unit is not monitored during this procedure. The test set up for Method B is shown in Fig. 2.

1.1.3 *Method C (with Flatjack Applying Horizontal Load)*—For determining mortar joint shear strength index using an estimate of the normal compressive stress at the location of the test site, as shown in Fig. 3. Horizontal displacement of the test unit is generally not measured during this procedure.

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.

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.*

¹ These test methods are under the jurisdiction of ASTM Committee C15 on Manufactured Masonry Units and are the direct responsibility of Subcommittee C15.04 on Research.

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2. Referenced Documents

2.1 ASTM Standards:²

C1180 Terminology of Mortar and Grout for Unit Masonry
C1196 Test Method for In Situ Compressive Stress Within Solid Unit Masonry Estimated Using Flatjack Measurements

C1197 Test Method for In Situ Measurement of Masonry Deformability Properties Using the Flatjack Method

C1232 Terminology of Masonry

E4 Practices for Force Verification of Testing Machines

2.2 Other Document:

International Existing Building Code (Appendix A, Chapter A1, Seismic Strengthening Provisions for Unreinforced Masonry Bearing Wall Buildings), 2014³

ASCE/SEI 41 Seismic Evaluation and Retrofit of Existing Buildings, ASCE Standard ASCE/SEI 41 (Chapter 11, Masonry)⁴

3. Terminology

3.1 Terminology defined in Terminologies C1180 and C1232 shall apply for these test methods.

4. Summary of Test Method

4.1 The in-place shear test is used to provide an index of the in situ, horizontal shear resistance of mortar joints in unreinforced masonry. For Method A, a single masonry unit is removed from opposite ends of the chosen test unit as shown in Fig. 1. For Method B, a single masonry unit and a head joint are removed from opposite ends of the chosen test unit, as shown in Fig. 2. For Method C, head joints on both ends of the tested unit are removed as shown in Fig. 3. Ensure that the bed joints are not disturbed in the unit to be tested. The test unit is then displaced horizontally relative to the surrounding masonry using a hydraulic jack or specialized flatjacks. The horizontal

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.

³ Available from International Code Council, 4051 Flossmoor Road, Country Club Hills, IL 60478.

⁴ Available from American Society of Civil Engineers (ASCE), 1801 Alexander Bell Dr., Reston, VA 20191, <http://www.asce.org>.

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