Designation: C 1532 – 02

Standard Guide for Selection, Removal, and Shipment of Masonry Assemblage Specimens from Existing Construction[1]

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1. Scope

1.1 This guide covers the process of selection, removal, and shipment of masonry assemblage specimens from existing construction that are intended for testing. These specimens are a portion of existing masonry, typically consisting of masonry units, mortar, grout, reinforcing steel, collar joint, and masonry accessories, that has been removed from an existing masonry assembly. The specimens may be taken from single- or multiple-wythe construction, or portions thereof. This guide also covers procedures for reporting as part of this process.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

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 requirements prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

C 43 Terminology of Structural Clay Products[2]

C 1180 Terminology of Mortar and Grout for Unit Masonry[2]

C 1209 Terminology of Concrete Masonry Units and Related Units[2]

C 1232 Terminology of Masonry[2]

C 1420 Guide for Selection, Removal, and Shipment of Manufactured Masonry Units Placed in Usage[2]

E 122 Practice for Calculating Sample Size to Estimate, with a Specific Tolerable Error, the Average for Characteristics of a Lot or Process[3]

3. Terminology

3.1 *Definitions*:

3.1.1 For definitions of other terms used in this guide, refer to Terminologies C 43, C 1180, C 1209, and C 1232.

4. Significance and Use

4.1 Assemblages of masonry are sometimes removed as part of an assessment of the condition of masonry construction. Such specimens are commonly prepared for shipment to a laboratory where the specimens are assessed with visual techniques, petrographic techniques, or standard test methods. The process of selecting, removing, and shipping the specimens can have an effect on test results. This guide provides procedures for selecting, removing, and shipping masonry assemblage specimens removed from existing construction.

4.2 The selection and removal processes described in this guide are primarily intended for walls. Selection and removal of masonry assemblages from locations other than walls requires user judgment in order to obtain appropriate specimens.

4.3 This guide also covers reporting of the selection, removal, and shipping processes. This information allows interested parties to assess the impact of these processes on test results.

4.4 This guide does not address the use of test results conducted on removed assemblage specimens. This guide does not determine whether the removed masonry materials met original specification requirements.

4.5 If only individual units are to be removed from an existing construction, refer to Guide C 1420 as a guide.

5. Selection and Removal

5.1 *Selection of Test Samples*:

5.1.1 *Visual Assessment*—Prior to selecting assemblages for removal, perform a visual survey of the exposed surface to assess the in-place, undisturbed condition of the masonry wall and other related construction.

5.1.1.1 Record observations from the visual survey with photographs or drawings, or both, that represent the appearance of the masonry. Include sample locations identified in 5.2.

5.1.1.2 Conduct the visual assessment either over the whole construction or on a representative sample of the whole. Examine locations with different exposures, such as walls exposed to rain and walls protected from rain.

5.1.2 *Sampling*—Select specimens representative of the entire masonry construction or a portion thereof. Consider aspects such as the orientation of the units of the proposed assemblage specimens (for example, stretcher, header, or

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[2] *Annual Book of ASTM Standards*, Vol 04.05.

[3] *Annual Book of ASTM Standards*, Vol 14.02.

soldier), location in the structure (for example, parapet, corbel, or quoin), where different masonry units are blended to produce a range of color or architectural effect within the wall, and required specimen size to accommodate further testing. Sample by one or more of the following techniques:

5.1.2.1 *Random Sampling*—Within the whole construction, or in a selected part of the whole, select assemblage specimen sample locations based on a random sampling process. Designate a numbering system associated with specimen locations and randomly select numbers, or use a similar random sampling method.

NOTE 1—When assemblages are to be removed for testing in accordance with test methods that include requirements for selection and sampling of samples, those requirements should be replaced with 5.1 of this guide.

NOTE 2—Practice E 122 provides information on how to calculate the number and locations of samples necessary in order to estimate with a prescribed precision, a measure of quality representing all the sampling area.

5.1.2.2 *Location-Specific Sampling*—Select assemblage sample locations specific to a particular installed location, such as construction at a shelf angle or parapet wall construction.

5.1.2.3 *Condition-Specific Sampling*—Select assemblage sample locations specific to a physical condition of the masonry, such as units or mortar visually assessed to be deteriorated or units or mortar visually assessed to be undamaged.

NOTE 3—Sampling is useful for identification of differences in masonry construction in different locations or exposures, that is, the difference between the masonry on different building elevations, or the difference between masonry exposed to environmental or atmospheric conditions and those not exposed. Under these circumstances, sampling should be representative of each usage condition. For example, select masonry visually considered to be in the best physical condition, in the worst physical condition, and the most representative of the overall physical condition.

5.2 *Identification*—Identify each specimen on the wall with a permanent marker and photograph before removal. Do not mark on more than 10 % of any face of the specimen. Reference the marked specimen to the specific location where the specimen was obtained as recorded in 5.1.1.1.

5.3 *Pre-removal Documentation*—Prior to removing assemblage specimens, thoroughly document the visual condition of the masonry within the proposed sampling location. Prepare a sketch of or photograph each sample location. This documentation will be used for judging the specimen's pre-removal condition and for comparative purposes to determine if it is damaged during removal or shipping. Trace over any cracks within the masonry with a felt-tipped marker and document the cracks' maximum width(s) to assist in judging if the extent and size of existing cracks have increased during specimen removal or shipping.

5.4 *Specimen Removal*:

5.4.1 *Specimen Size*—Each specimen shall be sufficient size to allow the proposed testing as specified in the test procedure(s).

5.4.2 *Specimen Removal*—Remove existing masonry construction (units and mortar) at the perimeter of the specimen as necessary to allow removal of accessories (such as ties, joint reinforcement across wythes, etc.), within the specimen perimeter, without causing damage to the specimen. Remove adjacent masonry or adjoining construction by saw-cutting or by chiseling, as necessary, to obtain properly sized assemblages. Do not use electric or hydraulic impact equipment that damages the specimen. Remove the specimen from the construction and set on stable horizontal surface (such as the ground, scaffolding, etc.), taking care to avoid damage during removal and transport to the stable surface.

NOTE 4—While removing the assemblages, do not detrimentally affect the structural or serviceability performance of the remaining masonry and other related construction. Provide adequate shoring and weather protection.

NOTE 5—Assemblages with a nominal thickness of 4 in. (102 mm) are normally removed with a power-driven rotary saw with a diamond-tipped blade having a diameter of 12 to 14 in. (305 to 356 mm).

5.4.3 *Specimen Condition after Removal*—Move specimen to site of preparation for shipping and document the specimen's condition as described in 5.3. The purpose of documenting the specimen's condition after removal is to judge if the specimen has been damaged during the removal process.

5.4.4 *Specimen Confinement Prior to Transport*—Prior to packing for shipment, confine the specimen. Place ¾-in. (19-mm) thick plywood pieces or other rigid material cut to the specimen's thickness and width on the top and bottom of the sample and confine the specimen without damage during packaging and shipment.

NOTE 6—The use of a banding machine and steel banding straps or nylon or cotton woven shipping straps with a self-contained ratchet have been found sufficient for specimen confinement. If other confinement methods are used, they should be selected based on their ability to maintain confining pressure throughout shipment of the specimen.

5.4.5 *Condition of Exposed Masonry*—Document the condition of the exposed construction in the resultant hole prior to patching, if any. Note the type, dimensions, and construction of the underlying masonry (such as the air space, insulation, ties, etc.). Use sketches and photographs to assist with documenting the conditions.

5.5 *Shipment*:

5.5.1 Protect each assemblage specimen on all sides with suitable material, such as 1-in. (25-mm) thick packaging foam or bubble wrap.

5.5.2 Completely encase one or more specimens and packaging material in crates consisting of ¾-in. (19-mm) thick plywood, or as suitable to protect the specimens during shipment. Completely fill all space within the crate to prevent movement of the specimens within the crate. Clearly mark the crates, "Handle With Care."

5.5.3 Document the condition of the specimens after receipt at their final destination as described in 5.3.

6. Report

6.1 Report the following information about the selection, identification, removal, and shipment of the specimens.

6.1.1 Results of the visual assessment (see 5.1.1). Include survey sheets or photographs, or both, indicating the location where the specimens were removed.

6.1.2 Sampling technique (see 5.1.2).

6.1.3 Condition of each specimen, prior to removal, after

removal, and after shipping (See 5.3, 5.4.3, and 5.5.3) Include sketches and photographs of the specimens generated during these steps.

6.1.4 Method of specimen removal (see 5.4.2).

6.1.5 Condition of the underlying masonry (See 5.4.5).

6.1.6 Method of shipment (see 5.5).

6.1.7 Specimen identification (see 5.2). This shall be used for cross-reference in the report as well as for cross-reference with subsequent test reports.

7. Keywords

7.1 assemblages; masonry; masonry assemblage specimen removed from usage; removal; sampling; selection process; shipment