

**UNIFORM BUILDING CODE STANDARD 21-6
IN-PLACE MASONRY SHEAR TESTS**

See Appendix Chapter 1, Sections A1 06.3.3 and A1 07.2, *Uniform Code for Building Conservation*
Note: See Appendix Chapter A1, Section A104, California Existing Building Code.

SECTION 21.601 — SCOPE

This standard applies when the *Uniform Code for Building Conservation (California Existing Building Code)* requires in-place testing of the quality of masonry mortar.

SECTION 21.602 — PREPARATION OF SAMPLE

The bed joints of the outer wythe of the masonry shall be tested in shear by laterally displacing a single brick relative to the adjacent bricks in the same wythe. The head joint opposite the loaded end of the test brick shall be carefully excavated and cleared. The brick adjacent to the loaded end of the test brick shall be carefully removed by sawing or drilling and excavating to provide space for a hydraulic ram and steel loading blocks.

SECTION 21.603 — APPLICATION OF LOAD AND DETERMINATION OF RESULTS

Steel blocks, the size of the end of the brick, shall be used on each end of the ram to distribute the load to the brick. The blocks shall not contact the mortar joints. The load shall be applied horizontally, in the plane of the wythe, until either a crack can be seen or slip occurs. The strength of the mortar shall be calculated by dividing the load at the first cracking or movement of the test brick by the nominal gross area of the sum of the two bed joints.

**UNIFORM BUILDING CODE STANDARD 21-7
TESTS OF ANCHORS IN UNREINFORCED MASONRY WALLS**

See Appendix Chapter 1, Section A1 07.3 and A1 07.4, *Uniform Code for Building Conservation*
Note: See Appendix Chapter A1, Section A105, A107.3, A107.4 and Table A1-E, California Existing Building Code.

SECTION 21.701 — SCOPE

Shear and tension anchors in existing masonry construction shall be tested in accordance with this standard when required by the *Uniform Code for Building Conservation (California Existing Building Code)*.

SECTION 21.702 — DIRECT TENSION TESTING OF EXISTING ANCHORS AND NEW BOLTS

The test apparatus shall be supported by the masonry wall. The distance between the anchor and the test apparatus support shall not be less than one half the wall thickness for existing anchors and 75 percent of the embedment for new embedded bolts. Existing wall anchors shall be given a preload of 300 pounds (1335 N) prior to establishing a datum for recording elongation. The tension test load reported shall be recorded at $\frac{1}{8}$ inch (3.2 mm) relative movement of the existing anchor and the adjacent masonry surface. New embedded tension bolts shall be subject to a direct tension load of not less than 2.5 times the design load but not less than 1,500 pounds (6672 N) for five minutes (10 percent deviation).

SECTION 21.703 — TORQUE TESTING OF NEW BOLTS

Bolts embedded in unreinforced masonry walls shall be tested using a torque-calibrated wrench to the following minimum torques:
 $\frac{1}{2}$ -inch-diameter (13 mm) bolts—40 foot pounds (54.2 N · m) $\frac{5}{8}$ -inch-diameter (16 mm) bolts—50 foot pounds (67.8 N · m) $\frac{3}{4}$ -inch-diameter (19 mm) bolts—60 foot pounds (81.3 N · m)

SECTION 21.704 — PREQUALIFICATION TEST FOR BOLTS AND OTHER TYPES OF ANCHORS

This section is applicable when it is desired to use tension or shear values for anchors greater than those permitted by Table A-1-E of the *Uniform Code for Building Conservation (California Existing Building Code)*. The direct-tension test procedure set forth in Section 2 1.702 for existing anchors may be used to determine the allowable tension values for new embedded or through bolts, except that no preload is required. Bolts shall be installed in the same manner and using the same materials as will be used in the actual construction. A minimum of five tests for each bolt size and type shall be performed for each class of masonry in which they are proposed to be used. The allowable tension values for such anchors shall be the lesser of the average ultimate load divided by a factor of safety of 5.0 or the average load of which $\frac{1}{8}$ inch (3.2 mm) elongation occurs for each size and type of bolt and class of masonry.

Shear bolts may be similarly prequalified. The test procedure shall comply with ASTM E 488-90 or another approved procedure.

The allowable values determined in this manner may exceed those set forth in Table A-1-E of the *Uniform Code for Building Conservation (California Existing Building Code)*.

SECTION 21.705 — REPORTS

Results of all tests shall be reported. The report shall include the test results as related to anchor size and type, orientation of loading, details of the anchor installation and embedment, wall thickness, and joist orientation.