

Standard Practice for Static Load Test for Shear Resistance of Framed Walls for Buildings¹

This standard is issued under the fixed designation E 564; 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.

ε¹ NOTE—An editorial change was made in 6.3.3.2 in March 2001.

1. Scope

1.1 This practice describes methods for evaluating the shear capacity of a typical section of a framed wall, supported on a rigid foundation and having load applied in the plane of the wall along the edge opposite the rigid support and in a direction parallel to it. The objective is to provide a determination of the shear stiffness and strength of any structural light-frame wall configuration to be used as a shear-wall on a rigid support.

1.2 *Limitations*—This practice is not intended to be used as a basis for classifying sheathing shear capacity or as an evaluation of combined flexure and shear resulting from the wall being loaded on a flexible foundation.

1.2.1 The effect of sheathing variations is assessed by holding all other variables constant. Permitted variations in framing configuration and boundary conditions, however, require accurate documentation of the test setup to validate across-study comparisons of sheathing contribution to wall shear capacity.

NOTE 1—A wall tested on a flexible foundation is evaluated by comparing shear stiffness and strength results to those of an identical wall tested on a rigid foundation, following this practice. However, no methods are given for the measurement of wall bending displacements or assessment of stress distribution resulting from foundation flexure. Any extrapolation of wall racking behavior from the foundation conditions specified by this practice to flexible conditions shall be done with the support of a comparative test on a representative foundation.

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.*

2. Referenced Documents

2.1 ASTM Standards:

E 4 Practices for Force Verification of Testing Machines²

E 72 Test Methods of Conducting Strength Tests of Panels for Building Construction³

E 122 Practice for Choice of Sample Size to Estimate a Measure of Quality for a Lot or Process⁴

E 575 Practice for Reporting Data from Structural Tests of Building Constructions, Elements, Connections, and Assemblies³

3. Terminology

3.1 Definitions:

3.1.1 *racking*—when applied to shear walls, refers to the tendency for a wall frame to distort from rectangular to rhomboid under the action of an in-plane force applied parallel to the wall length.

3.1.2 *shear wall*—structural subassembly that acts as a cantilever/diaphragm to transfer horizontal building loads to the foundation in the form of horizontal shear and an overturning moment.

3.1.3 *uplift*—the vertical displacement measured at the loaded end stud with respect to the test apparatus.

3.2 Symbols:

3.2.1 *a*—height of cantilevered shear wall, in metres (feet).

3.2.2 *b*—length of cantilevered shear wall, in metres (feet).

3.2.3 *C*—initial length of the diagonal $\sqrt{a^2 + b^2}$, in metres (feet).

3.2.4 δ —diagonal elongation, in millimetres (inches).

3.2.5 Δ —total horizontal displacement of the top of the wall measured with respect to the test apparatus, in millimetres (inches). This value includes effects due to panel rotation, translation, and shear.

3.2.6 *G'*—global shear stiffness of the assembly, includes rotation and translational displacements as well as diaphragm shear displacement.

3.2.7 *G'_{int}*—internal shear stiffness of the assembly, includes only the shear displacement of the wall in calculation.

3.2.8 *P*—concentrated load applied at the top edge of the wall at the selected reference displacement, in newtons (pound-force).

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² Annual Book of ASTM Standards, Vol 03.01.

³ Annual Book of ASTM Standards, Vol 04.11.

⁴ Annual Book of ASTM Standards, Vol 14.02.

