



ACCEPTANCE CRITERIA FOR RACKING SHEAR EVALUATION OF PROPRIETARY SHEATHING MATERIALS USED AS BRACED WALL PANELS

AC269

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PREFACE

Evaluation reports issued by ICC Evaluation Service, Inc. (ICC-ES), are based upon performance features of the International family of codes and other widely adopted code families, including the Uniform Codes, the BOCA National Codes, and the SBCCI Standard Codes. Section 104.11 of the *International Building Code*® reads as follows:

The provisions of this code are not intended to prevent the installation of any materials or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

Similar provisions are contained in the Uniform Codes, the National Codes, and the Standard Codes.

This acceptance criteria has been issued to provide all interested parties with guidelines for demonstrating compliance with performance features of the applicable code(s) referenced in the acceptance criteria. The criteria was developed and adopted following public hearings conducted by the ICC-ES Evaluation Committee, and is effective on the date shown above. All reports issued or reissued on or after the effective date must comply with this criteria, while reports issued prior to this date may be in compliance with this criteria or with the previous edition. If the criteria is an updated version from the previous edition, a solid vertical line (|) in the margin within the criteria indicates a technical change, addition, or deletion from the previous edition. A deletion indicator (→) is provided in the margin where a paragraph has been deleted if the deletion involved a technical change. This criteria may be further revised as the need dictates.

ICC-ES may consider alternate criteria, provided the report applicant submits valid data demonstrating that the alternate criteria are at least equivalent to the criteria set forth in this document, and otherwise demonstrate compliance with the performance features of the codes. Notwithstanding that a product, material, or type or method of construction meets the requirements of the criteria set forth in this document, or that it can be demonstrated that valid alternate criteria are equivalent to the criteria in this document and otherwise demonstrate compliance with the performance features of the codes, ICC-ES retains the right to refuse to issue or renew an evaluation report, if the product, material, or type or method of construction is such that either unusual care with its installation or use must be exercised for satisfactory performance, or if malfunctioning is apt to cause unreasonable property damage or personal injury or sickness relative to the benefits to be achieved by the use of the product, material, or type or method of construction.

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1.0 INTRODUCTION

1.1 Purpose: The purpose of this criteria is to establish requirements for racking shear evaluation of proprietary sheathing materials used as braced wall panels that are to be recognized in an ICC Evaluation Service, Inc. (ICC-ES), evaluation report under the 2006 *International Building Code*[®] (IBC), the 2006 *International Residential Code*[®] (IRC), and the 1997 *Uniform Building Code*[™] (UBC). Bases of recognition are IBC Section 104.1.1, IRC Section R104.11, and UBC Section 104.2.8. Applicable code sections are IBC Sections 2211.2 (Type I shear walls), 2303.1.4 (Wood structural panels), 2304.6 (Wall sheathing), 2306.4 (Shear walls), 2305 (General Design Requirements for Lateral-Force-Resisting Systems), 2308.3.2 (Braced wall panel connections), 2308.9.3 (Bracing), and 2505 (Shear Wall Construction); IRC Sections R602.10 (Wall bracing), R602.11.1 (Wall anchorage), R603.7 (Structural sheathing), and R604 (Wood Structural Panels); and UBC Sections 2219 (General), 2303 (standards of quality), 2310 (exterior wall coverings), 2315 (wood shear walls and diaphragms), 2319.2 (wood structural panel diaphragms), 2315 (Wood shear walls and diaphragms), 2320.11.3 (Bracing), and 2513 (Shear resisting construction with wood frame), and Table 23-II-B-1 (Nailing Schedule), as applicable.

The reason for the development of this criteria is to allow evaluation of proprietary sheathing materials for racking resistance, since the proprietary sheathing materials are not listed for use as shear wall sheathing under Section 2306.4 of the IBC, or Section R602.10.3 of the IRC, or Sections 2315.3.3 and 2319.2 of the UBC. This criteria may also be used to evaluate code-complying sheathing materials that require racking shear testing to determine design values for installations not described in the code.

1.2 Scope: Racking shear evaluation of proprietary sheathing materials used on wood or steel framed walls as braced wall panels on buildings of Type V construction. The braced wall panels shall be qualified by racking load tests of braced walls panels sheathed on one side only as described in Section 4.0. Qualification by this method limits panel use to sizes and materials used in the tests. The evaluation of the proprietary sheathing material for properties other than racking shear shall be covered in the ICC-ES acceptance criteria for the proprietary product or the code when evaluating a code-complying sheathing material.

1.3 Codes and Referenced Standards: Where standards are referenced in this criteria, the standards shall be applied consistently with the code upon which compliance is based.

1.3.1 2006 *International Building Code*[®] (IBC), International Code Council.

1.3.2 2006 *International Residential Code*[®] (IRC), International Code Council.

1.3.3 1997 *Uniform Building Code*[™] (UBC).

1.3.4 ASTM E 72-02, Standard Test Method of Conducting Strength Tests of Panels for Building Construction, ASTM International.

1.3.5 ASTM E 564-00e1, Standard Practice for Static Load Test for Shear Resistance of Framed Walls for Buildings, ASTM International.

1.3.6 *Standard Method of Cyclic (Reversed) Test for Shear Resistance of Framed Walls for Buildings*, by the Structural Engineers Association of Southern California (SEAOSC), dated August 1, 1996 (revised January 20, 1997).

1.3.7 AISI PM—2001, Standard for Cold-formed Steel Framing-Prescriptive Method for One- and Two-Family Dwellings, American Iron and Steel Institute.

1.3.8 AISI NASPEC 2001, Standard for Cold-Formed Steel Framing-General Provisions, American Iron and Steel Institute.

1.3.9 ASCE 16-95, Standard for Load and Resistance Factor Design (LRFD) for Engineered Wood Construction, American Society of Civil Engineers.

1.3.10 ANSI/AF&PA NDS-2001, National Design Specification (NDS) for Wood Construction with 2001 Supplement, American Forest & Paper Association.

1.3.11 ICC-ES Acceptance Criteria for Water-resistant Barriers (AC38).

1.3.12 ICC-ES Acceptance Criteria for Nails and Spikes (AC116).

1.3.13 ICC-ES Acceptance Criteria for Prefabricated Wood Shear Panels (AC130).

1.3.14 ICC-ES Acceptance Criteria for Wood-based Studs (AC202).

1.4 Definitions:

1.4.1 Aspect Ratio: The aspect ratio of a proprietary sheathing material is the specimen's height divided by the length of the specimen covered by the sheathing material. Also refer to Section R202 of the IRC.

1.4.2 Braced Wall Line: A single or series of braced wall panels in a single story level designed and constructed to resist in-plane shear loads for the story in which the braced wall line is installed and for any stories or roof above.

1.4.3 Braced Wall Panel: A section of wall designed to resist in-plane shear loads through interaction of framing members, sheathing material, and anchors.

1.4.4 Proprietary Sheathing Material: A wall sheathing material evaluated under another ICC-ES acceptance criteria.

1.4.5 Continuously Sheathed Braced Wall: A braced wall with the proprietary sheathing material applied at all sheathable areas of all exterior walls, and interior braced wall lines, where required, including areas above and below openings.

2.0 BASIC INFORMATION

2.1 General: The following information shall be submitted:

2.1.1 Product Description: Complete information concerning material specifications, thickness, size and the manufacturing process.

2.1.2 Installation Instructions: Installation details and limitations, fastener materials, and installation manual.

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2.1.3 Packaging and Identification: A description of the method of packaging and field identification of the panel. Identification provisions must include the evaluation report number and the name or logo of the inspection agency. The identification shall be visible after the sheathing material is installed.

2.1.4 Field Preparation: A description of the methods of field-cutting, application and finishing.

2.2 Testing Laboratories: Testing laboratories shall comply with Section 2.0 of the ICC-ES Acceptance Criteria for Test Reports (AC85) and Section 4.2 of the ICC-ES Rules of Procedure for Evaluation Reports.

2.3 Test Reports: Test reports shall comply with AC85.

2.4 Product Sampling: Products shall be sampled in accordance with Section 3.1 of AC85.

3.0 BRACED WALL PANEL DESCRIPTION

The description of the braced wall panels tested in accordance with Section 4.0 shall include the following:

3.1 Dimensions: Thickness, height and length of each panel type tested shall be listed in the test report.

3.2 Sheathing Material: A description of the proprietary sheathing material shall be included in the test report. The sheathing material shall comply with a current ICC-ES evaluation report. The material shall be clearly identified to determine compliance. Sheathing material used on weather-exposed surfaces defined in IBC Section 202 or UBC Section 201 shall be protected by a water-resistive barrier unless the sheathing material is a water-resistive barrier complying with the requirements of AC38. Sheathing material shall not be used to splice boundary framing members.

3.3 Panel Framing: The panel framing consisting of either wood or steel shall be described in the test report. The description of wood framing shall include dimensions, species, grade and specific gravity. The description of steel framing shall include dimensions including base-metal thickness, physical properties, and detailed description of holes and notches. Framing members of wood shall have at least a nominal 2-inch (50.8 mm) width. Framing members of cold-formed steel shall be a minimum of $1\frac{5}{8}$ inches by $3\frac{1}{2}$ inches (41.28 mm by 88.90 mm), with a $\frac{3}{8}$ -inch (9.53 mm) return lip. The cold-form steel shall have a minimum thickness of 0.033 inch (0.84 mm). Grading standards and specifications described in the applicable code shall apply to the all-sawn-lumber framing members and cold-formed steel framing members. Proprietary wood-based framing members, such as structural composite lumber complying with the ICC-ES Acceptance Criteria for Wood-based Studs (AC202), shall be recognized in a current ICC-ES evaluation report.

3.4 Connections: The panel connection details shall be described in the test report. Fasteners shall be properly specified, including fastener type, size, length and location. Braced wall panels shall be constructed with fasteners having approved values. Where no fastener values are recognized by the applicable code, data described in the ICC-ES Acceptance Criteria for Nails and Spikes (AC116) or a current ICC-ES acceptance criteria for the fasteners is required. When used, independent hold-down devices shall be currently recognized in an ICC-ES evaluation report or

shall comply with current ICC-ES acceptance procedures. Results of the hold-down tests shall be used in the analysis of the braced wall panel. Fastener spacing shall not exceed 12 inches (304.8 mm) along intermediate framing members and 6 inches (152.4 mm) along edge framing members. Fasteners shall be placed not less than $\frac{3}{8}$ inch (9.53 mm) in from the edge of the framing member. Connections and anchorages shall be detailed or adequately described for the attachment of the braced wall panel to the other building elements.

4.0 BRACED WALL PANEL LOAD TEST METHODS

4.1 Braced Wall Panels Subjected to Racking for Wind and/or Seismic Design Categories A, B and C for Wood Construction and A and B for Steel Construction under the IBC and IRC and Seismic Zones 0, 1 and 2 under the UBC for Both Steel and Wood Construction:

4.1.1 Purpose: Braced wall panels shall be tested for racking shear in accordance with ASTM E 72, Section 14 (Racking Load—Evaluation of Sheathing Material on a Standard Wood Frame) and/or Section 15 (Racking Load—Evaluation of Sheathing Material (Wet) on a Standard Wood Frame).

4.1.2 Braced Wall Panels Framing: The ASTM E 72 test procedure may be used for wood framing or cold-formed steel framing. When wood framing is used, Douglas fir or southern pine lumber with a moisture content of 15 percent or less shall be used. The tests shall be conducted with the ASTM E 72 specified hold-down rods in place.

4.1.3 Loading Beam: The loading beam shall not be in contact with the proprietary sheathing and shall not interfere with the movement of the proprietary sheathing during the test procedure.

4.1.4 Loading Procedure: Loading procedure from ASTM E 72 shall be followed, except that the specimen shall be allowed to recover for 5 minutes after the load is removed following the first and second loading stages.

4.1.5 Compressive Deformation: An additional sensor shall be installed at the right lower corner of the specimen (Figure 7 of ASTM E 72) to measure bottom plate compressive deformation and the displacement of the wall stud relative to the base of the test fixture.

4.1.6 Horizontal Displacement: Horizontal displacement, used to establish the allowable shear, shall be calculated by removing the uplift, compressive, and base slip deformations from the total wall deflection measured at the top of the specimen.

4.1.7 Wet Conditioning: Braced wall panels shall be tested in accordance with ASTM E 72, Section 15, unless the construction is limited to locations where the braced wall panel will not be subjected to wetting during construction. Braced wall panels, where the sheathing material is the weather-resistive barrier, shall be tested in accordance with ASTM E 72, Section 15. The specimen may be allowed to air dry in accordance with the test standard, prior to testing, if the sheathing material is to be covered by an approved weather-resistant exterior wall covering. Braced wall panels not subjected to wetting during construction may be tested under ASTM E 72, Section 14.

4.1.8 Determination of Aspect Ratio of the Test Assembly: The aspect ratio for the proprietary sheathing

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material shall be determined by calculating the aspect ratio of the sheathed portion of the wall test assembly.

4.2 Continuously Sheathed Braced Wall Subjected to Racking for Wind and/or Seismic Design Categories A, B, and C for Wood Construction under the IRC:

4.2.1 Purpose: The testing described in this section shall be used to document use of a continuously sheathed braced wall for proprietary sheathing materials applied to wood stud walls in accordance with the IRC, as noted in Section 6.1.6.1 of this criteria.

4.2.2 Test Method: Continuously sheathed braced wall shall be tested for racking shear in accordance with the test procedure of ASTM E 564 to evaluate the conformance of the proprietary sheathing materials with Section R602.10.5 of the IRC. All of the configurations shown in Table 2 shall be tested.

Conditions of Acceptance: The measured test results for stiffness and ultimate strength shall be equal to or greater than the predicted values for the proprietary sheathing material using the reduction factors noted in Table 2. The predicted values for stiffness and ultimate strength are determined using Footnotes 1 and 2 of Table 2.

4.2.3 Loading Procedure: A displacement-controlled ramp function shall be permitted in lieu of the loading procedure of ASTM E 564 when an electronic data acquisition system is used. The maximum load shall be achieved in no less than five minutes and no more than twenty minutes.

4.2.4 Braced Wall Line Framing: The ASTM E 564 requirements may be used for wood framing. Overturning restraints shall be provided at the braced wall line ends using corner returns framed in accordance with Figure R602.10.5 of the IRC, or prefabricated metal hold-down devices, as specified in Table 2.

4.2.5 Specimen Configuration and Sample Size: An 8-foot-by-8-foot (2.4 m by 2.4 m) specimen shall be tested with prefabricated hold-downs to establish the unit racking stiffness and unit shear (configuration 1 in Table 2). Two 8-foot-high-by-12-foot-wide (2.4 m by 3.6 m) specimens shall be tested with a 2-foot (0.6 m) and a 4-foot (1.2 m) corner (configurations 2 and 3 in Table 2, respectively). A minimum of six braced wall line configurations with openings shall be tested in accordance with configurations 4 to 9 in Table 2. Each configuration with openings shall be a minimum of 12 feet (3.60 m) long and shall have a minimum of one opening. Each opening shall be a minimum of 4 feet wide. Braced wall panels shall have the minimum length permitted by IRC Table R602.10.5 based on the adjacent openings. Each opening height included in IRC Table R602.10.5 (i.e., 100%, 85%, and 65% of wall height) shall be incorporated in at least one specimen configuration. Different wall heights need not be evaluated. Configuration 1 (Table 2) shall have a minimum sample size in accordance with ASTM E 564. Configurations 2 to 9 (Table 2) shall be permitted to have a minimum sample size of one wall specimen for each configuration.

4.2.6 Boundary Conditions: Pretension force on anchor bolts and hold-down devices shall not exceed 1,200 pounds (5 400 N). The loading beam shall have a bending stiffness capacity, EI , of no more than 330,000 kip-in² (e.g.

29,000 ksi × 11.3 in⁴). Additional gravity load shall not be applied to the specimens or testing fixtures.

4.2.7 Amount of Bracing—Percent of Full-Height Braced Wall Required, Table R602.10.1 of the IRC: Testing of one additional wall configuration 8 from Table 2 is required to verify the increase in percentage of full-height wall bracing required for Methods 2,4,5,6,7 or 8 as noted in Table R602.10.1 of the IRC. The test wall shall be modified to include additional percentage of proprietary sheathing (alternate to either Methods 2,4,5,6,7 or 8) as required in Table R602.10.1 of the IRC and shall be tested as noted in Sections 4.2.2 to 4.2.6.

Conditions of Acceptance: The actual test results (design load according to Section 4.5.3 of this criteria, and deformation at design load) shall be compared to the predicted results based on equivalency to Method 3 wall configuration 8 as determined using Section 2305.3.8.2 of the IBC. The actual versus predicted shall be equal to or greater than the predicted value for the Method 3 configuration 8 wall assembly to qualify for prescriptive design in accordance with the IRC.

Exception: Testing of Configuration 8 wall with additional percentage of proprietary sheathing shall not be required if the Configuration 8 value for design load and deformation at design load meets the conditions of acceptance.

4.3 Braced Wall Panels Subjected to Racking for Wind and/or Seismic Design Categories C, D0, D1, D2, E and F for Steel Construction and D0, D1, D2, E and F for Wood Construction under the IBC and IRC and Seismic Zones 3 and 4 under the UBC:

4.3.1 Purpose: Testing in accordance with Section 4.1 shall be conducted prior to testing in accordance with this section. Braced wall panels shall be tested for cyclic shear in accordance with the *Standard Method of Cyclic (Reversed) Test for Shear Resistance of Framed Walls for Buildings*, by the Structural Engineers Association of Southern California (SEAOSC), dated August 1, 1996 (revised January 20, 1997), with the following modifications to the SEAOSC document as noted in Section 5.1 of ICC-ES Acceptance Criteria for Prefabricated Wood Shear Panels (AC130).

4.3.2 Determination of Aspect Ratio of the Test Assembly: The aspect ratio for the proprietary sheathing material shall be determined by calculating the aspect ratio of the sheathed portion of the wall test assembly.

4.4 Braced Wall Panel Structural Testing Other than Racking: Structural tests other than the racking test are beyond the scope of this acceptance criteria.

4.5 General:

4.5.1 Test and Report: The testing and reporting shall comply with Section 2 of this criteria.

4.5.2 Test Setup: The conditions and descriptions noted in Section 5.2.2 of AC130 apply to this criteria.

4.5.3 Design Loads:

4.5.3.1 Allowable Stress Design for Testing Under Section 4.1 of This Acceptance Criteria: The allowable

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shear (pounds per foot or N/m) for the test samples shall be the lesser of the allowable loads based on a drift limit or ultimate load limit, determined as follows:

4.5.3.1.1 Ultimate Load: For wood framed braced wall panels, the allowable shear (pounds per foot or N/m) is the average ultimate load divided by a safety factor of 3 divided by the length of the braced wall panel. For cold-formed steel framed braced wall panels under allowable stress design (ASD), the allowable shear (pounds per foot) is the average ultimate load divided by a safety factor (Ω) of 2.5 divided by the length of the braced wall panel. For cold-formed steel framed braced wall panels under load and resistance factor design (LRFD), the allowable shear (pounds per foot) is the average ultimate load multiplied by a resistance factor (ϕ) of 0.55 divided by the length of the braced wall panel.

4.5.3.1.2 Drift Limit: The allowable shear (pounds per foot) is the applied average load in pounds (N) that causes a horizontal displacement of 0.2 inch (5.1 mm) divided by the length of the braced wall panel. The minimum applied average load at this displacement limit shall be 1,200 pounds (5 400 N).

4.5.3.2 Allowable Stress Design for Testing Under Section 4.3 of this Acceptance Criteria: The allowable shear (pounds per foot) for the test sample shall be the lesser of the allowable loads based on a drift limit or ultimate load limit, determined as noted in Section 5.2.4.1 of AC130; except for use of a safety factor of 3.0 for wood studs and 2.5 for steel studs. Drift limits shall be determined using a maximum deflection amplification factor, C_{dr} of 2.

5.0 QUALITY CONTROL

Quality control requirements shall be as noted in the ICC-ES acceptance criteria for the proprietary sheathing material.

6.0 EVALUATION REPORT RECOGNITION

6.1 Installation: The following is information that shall be included in the ICC-ES evaluation report on the braced wall panel:

6.1.1 Cutting of Braced Wall Panels: Cutting the braced wall panels for wall openings is not permitted.

6.1.2 Holes and Notches in Framing Members:

6.1.2.1 Wood Framing Members: Holes and notches may be installed in the framing at predetermined locations only. Testing shall include the appropriate size and location of hole(s) and notch(es) as intended for the end use. Holes are not permitted to be greater in diameter than 40 percent of the framing member width, and notches are not permitted to be greater than 25 percent of the framing member width. The ICC-ES evaluation report shall state the limitations for hole and notch sizes and locations ascertained by testing.

6.1.2.2 Steel Framing Members: Holes and notches may be installed in the framing members at predetermined locations only. Holes and notches shall be limited based on the tested assemblies and shall not be greater than allowed by AISI NASPEC 2001 General provisions and AISI PM—2001 Section A4.4.

6.1.3 Penetrations in Sheathing Material: Penetrations in the sheathing material will be permitted only

at predetermined locations. Testing shall include the appropriate size and location of hole(s) and notch(es) as intended for end use. The ICC-ES evaluation report shall state the limitations for hole and notch sizes and locations ascertained by testing.

6.1.4 Sheathing Material Joints: The joints in sheathing materials shall occur over framing members or shall be blocked and attached to the framing member or blocking. Sheathing materials tested with horizontal joints unblocked may be listed for this method of installation in the evaluation report.

6.1.5 Braced Wall Panel Aspect Ratios: The maximum aspect ratio for the proprietary sheathing material used as braced wall panel shall be determined by testing under Section 4.0, aspect ratio is defined in Section 1.4.1 of this criteria. The aspect ratio shall be reported in the ICC-ES evaluation report and shall not exceed 2:1.

6.1.6 Alternate to IRC Methods: Braced wall panels that develop allowable shear resistance equal to or greater than that listed in Table 1 of this criteria shall be considered an alternate to the braced wall panel for the specific method(s) recognized under the IRC.

6.1.6.1 Alternate to IRC Section R602.10.5, Continuous Structural Panel Sheathing for Seismic Design Categories A, B and C: The proprietary sheathing material evaluated under this section shall be qualified as an alternate bracing method in accordance with Section 6.1.6. The continuously sheathed braced wall lines evaluated in accordance with Section 4.2 shall develop racking stiffness and ultimate load capacity equal to or greater than the predicted value for the proprietary sheathing. The evaluated proprietary sheathing material shall be considered an alternate to Method 3, braced wall panel construction, described in Section R602.10.3 of the IRC for wall bracing applications permitted by Section R602.10.5 of the IRC. Braced wall panel aspect ratios for the evaluated proprietary sheathing shall not exceed those tested under Section 4.2. Continuously sheathed braced wall constructed with the proprietary sheathing material shall satisfy the wall bracing amounts from Table R602.10.1 of the IRC for the appropriate bracing method as qualified under Section 4.1 and Table 1. Modifications to the braced wall amounts using the multipliers in accordance with Section R 602.10.5 of the IRC shall be permitted.

6.1.7 When braced walls tested and evaluated under this criteria are used under the IBC and the UBC, design load on the building shall be determined in accordance with Chapter 16 of the IBC and the UBC and the shear loads shall be resisted by the braced walls using the allowable load determined by this criteria.

6.1.8 When commercial holddowns are required to achieve specified shear loads that are to be reported in the proposed evaluation report, they must be evaluated as noted in Section 3.4 of this criteria. The assemblies described in the proposed evaluation report must include a reference to the commercial holddown and the appropriate ICC-ES report on the holddown.

6.1.9 The wall assemblies tested and evaluated in accordance with this criteria shall be detailed in the evaluation report based on the tested assembly and shall be

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in accordance with the applicable code when using prescriptive design procedures.

6.2 Conditions of Use: The following are Conditions of Use for braced wall panels installed under the IBC, IRC, and UBC as applicable:

6.2.1 A quality assurance plan complying with Section 1705 of the IBC shall be provided for structures assigned to Seismic Design Category C, D, E or F. Special inspections in Seismic Design Categories C, D, E, or F shall be provided for nailing, bolting, anchoring and other fastening of components within the seismic-force-resisting system, including connections of the braced wall panels and braced wall lines to drag struts and hold-downs, in accordance with IBC Section 1707.1.

6.2.2 The use of braced wall panels and braced wall lines in Exposures A and B where the basic wind speed is 120 mph or greater and in Exposures C and D where the basic wind speed is 110 mph or greater shall be under a quality assurance plan in accordance with IBC Section 1706.1, except for buildings designed and constructed in accordance with IBC Section 2308 or the IRC.

6.2.3 For proprietary sheathing materials covered under AC295 and wood-based sheathing materials tested to this criteria, earthquake load resistance shall be determined using the following maximum values: $R = 2$, $\Omega_o = 2.5$, $C_d = 2$ under the IBC with a maximum height of 65 feet (19.8 m) for seismic design categories D, E, and F; and $R = 4.5$, $\Omega = 2.8$ under the UBC with a maximum height of 65 feet (19.8 m) for seismic zones 3 and 4. ■

TABLE 1—BRACED WALL PANEL CONSTRUCTION SHEAR RESISTANCE FOR THE INTERNATIONAL RESIDENTIAL CODE®

METHOD	MATERIAL	MINIMUM PANEL LENGTH (feet and inches)	ALLOWABLE SHEAR RESISTANCE (plf)	
			Framing Spacing (inches)	
			16	24
1	Nominal 1-by-4 continuous diagonal let-in brace	4'-7" for 8 ft. wall height 5'-9" for 10 ft. wall height	Note 2	Note 2
2	⁵ / ₈ -inch wood boards applied diagonally	4'-0"	Note 2	Note 2
3	Wood structural panel ³	4'-0"	200 ^{1,3}	230 ^{1,3}
4	¹ / ₂ -inch or ²⁵ / ₃₂ -inch structural fiberboard sheathing	4'-0"	125 ¹	Note 2
5	¹ / ₂ -inch gypsum wallboard	8'-0"	Note 2	125 ¹
6	Particleboard wall sheathing	4'-0"	120 ¹	Note 2
7	Portland cement plaster	4'-0"	180 ¹	Note 2
8	Hardboard panel siding	Entire wall	Note 2	Note 2

For **SI**: 1 inch = 25.4 mm, 1 foot = 0.3 m, 1 plf = 14.59 N/m.

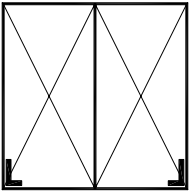
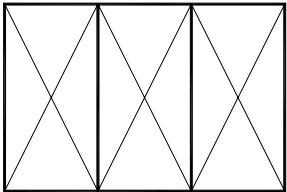
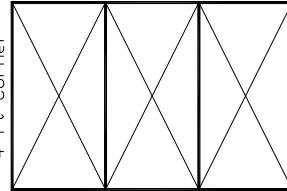
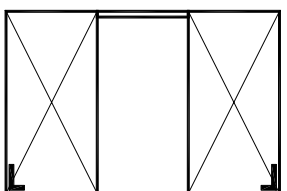
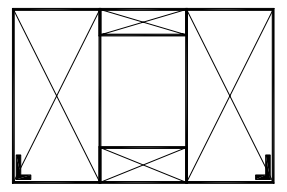
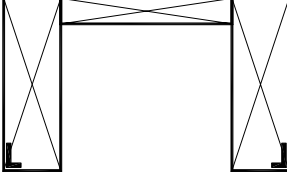
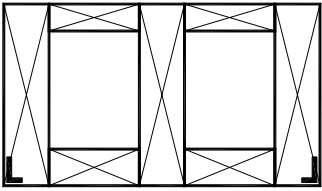
¹Allowable shear resistance values are based on the IBC one-sided sheathed ASTM E 72 tests in the dry condition.

²Allowable shear resistance values not provided in the IBC shall be determined by testing in accordance with this acceptance criteria. In no case shall the allowable shear resistance for this comparison be less than 150 plf (2 189 N/m).

³Allowable load for the 16-inch framing is based on ⁵/₁₆-inch-thick wood structural panels, and the 24-inch framing is based on the ³/₈-inch-thick wood structural panels.

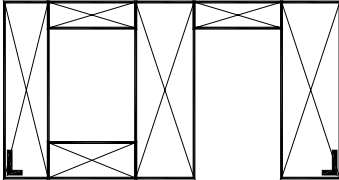
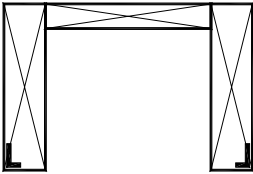
ACCEPTANCE CRITERIA FOR RACKING SHEAR EVALUATION OF PROPRIETARY SHEATHING MATERIALS
USED AS BRACED WALL PANELS

TABLE 2—TEST MATRIX FOR CONTINUOUSLY BRACED SHEAR WALLS
FOR THE INTERNATIONAL RESIDENTIAL CODE®

Config.	Sketch ^{3,4,5}	Size H x W , feet	Max Opening Height, %	Reduction Factor ^{1,2}	Type of Openings	Segment Aspect Ratio ⁶
1 ³		8x8	0%	1.0	None	1:1
2 ⁴	2-ft Corner 	8x12	0%	0.80	None	1:1.5
3 ⁴	4-ft Corner 	8x12	0%	0.90	None	1:1.5
4 ⁵		8x12	100%	0.40	Full height	2:1
5 ⁵		8x12	65%	0.51	Window	2:1
6 ⁵		8x13.3	85%	0.21	Door	3:1
7 ⁵		8x14	65%	0.28	2-Windows	4:1

ACCEPTANCE CRITERIA FOR RACKING SHEAR EVALUATION OF PROPRIETARY SHEATHING MATERIALS USED AS BRACED WALL PANELS

TABLE 2—TEST MATRIX FOR CONTINUOUSLY BRACED SHEAR WALLS FOR THE INTERNATIONAL RESIDENTIAL CODE® (Continued)

Config.	Sketch ^{3,4,5}	Size H x W , feet	Max Opening Height, %	Reduction Factor ^{1,2}	Type of Openings	Segment Aspect Ratio ⁶
8 ⁵		8x15.3	65%, 85%	0.29	Window and Door	4:1, 3:1
9 ⁵		8x12	85%	0.16	Garage Door	4:1

For SI: 1 foot = 0.3 m.

Footnotes:

1. The predicted racking stiffness for use with Section 6.1.6.1 shall be determined as the product of the reduction factor, the unit racking stiffness (from Configuration 1 specimen), and the wall length.
2. The predicted ultimate load capacity for use with Section 6.1.6.1 shall be determined as the product of the reduction factor, the unit shear (from Configuration 1 specimen), and the wall length.
3. Configuration 1 shall be tested with prefabricated metal holddown devices at each end of the wall.
4. Configurations 2 and 3 shall be tested with 2 foot (0.6 m) and 4 foot (1.20 m) respectively corner returns at each end of the wall and shall be detailed in accordance with Figure R602.10.5 of the IRC.
5. Configurations 4 through 9 shall be tested with prefabricated metal holddown devices at each end of the wall.
6. Segment Aspect Ratio is the aspect ratio for an individual full height panel, using an 8 foot high segment and the width of panel . Aspect Ratio is defined in Section R202 of the IRC.