CONTENTS for Committee Ballot 2021-C1 Item 1

1) *All revisions are tracked in the "underline (insertion) and strike-out (deletion)" style based on PRR 410-2016.*
2) *Rationales for the revisions are based on Committee Straw Polls 2021-S1 through 2021-S3 and pertinent resolutions. Please contact the Secretariat for a copy of those straw polls and resolutions as needed.*
3) *The revisions highlighted in yellow are changes made beyond previous Straw Polls, as reviewed and discussed at the Committee Meeting 2 on 2/26/21.*
4) *Please cast your vote and provide comments on the ballot form attached to the ballot by the deadline of the ballot.*

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1. Scope

1.1 An engineered wood rim board is a rectangular-shaped product manufactured from either wood structural use panels sawn into rim board dimensions, re-sawn structural glued laminated timber, or structural composite lumber manufactured specifically to meet the performance requirements of rim boards in wood frame construction.

1.2 An engineered wood rim board shall have been qualified as meeting one or more of the referenced product standards listed in Section 2. Proprietary wood rim board products are outside the scope of this standard and shall be permitted to be qualified in accordance with ASTM D7672.

1.3 Unless otherwise specified, the term "engineered wood rim boards" referenced in this standard represents the rim board products defined in Sections 1.1 through 1.2 and qualified under this standard.

1.4 This standard provides dimensions and tolerances, performance requirements, test methods, quality assurance, and trademarking for engineered wood rim boards. When used in bending applications, engineered wood rim boards qualified in accordance with this standard shall be designed in accordance with the design properties specified as follows:

   a. Plywood Design Specification or CSA O86 for plywood qualified in accordance with PS 1, CSA O121, or CSA O151

   b. ANSI 117 or CSA O86 for glulam, or

   c. Manufacturer's design literature for structural composite lumber qualified in accordance with ASTM D5456.

For rim boards manufactured from mat-formed and composite panels, and plywood qualified in accordance with PS 2 or CSA O325 used in bending applications, such as rim board over an opening that is directly below the rim board, the edgewise bending properties shall be qualified in accordance with this standard, the design span shall be limited to 4 feet (1.2 m) or less, and the design load shall not exceed the value tabulated in Annex B. The span limitation shall not apply to plywood qualified in accordance with PS1, CSA O121, or CSA O151, glulam, or structural composite lumber rim boards.

1.5 Engineered wood rim boards shall be used in dry service conditions where the mean equilibrium moisture content of solid-sawn lumber is less than 16%.

1.6 Products carrying an engineered wood rim board trademark are to be used in accordance with the installation requirements prescribed in the code or code report, and the recommendations published by the rim board manufacturer, or its qualified agency or trade association.

1.7 The annexes contained in this standard are mandatory, and notes and appendices are non-mandatory. This standard incorporates the U.S. customary units as well as the International System of Units (SI). The values given in the U.S. customary units are the standard and the SI values given in parentheses are for information only.

2. Referenced Documents

This standard incorporates dated references. These normative references are cited at the appropriate places in the text. Subsequent amendments or revisions to these references apply to this standard only when incorporated into this standard by amendments or revisions.

2.1 ASTM Standards:

D9-~~12~~ 20 Standard Terminology Relating to Wood and Wood-Based Products

D198-15 Standard Test Methods of Static Tests of Lumber in Structural Sizes

D1037-12(2020) Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials

D2395-~~14e1~~ 17 Standard Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Base Materials

D2915-~~10~~ 17 Standard Practice for Sampling and Data-Analysis for Structural Wood and Wood-Based Products

D3501-05a (~~2011~~2018) Standard Test Methods for Wood-Based Structural Panels in Compression

D3737-~~12~~ 18e1 Standard Practice for Establishing ~~Stresses~~ Allowable Properties for Structural Glued Laminated Timber (Glulam)

D4761-~~13~~ 19 Standard Test Methods for Mechanical Properties of Lumber and Wood-Based Structural Material

D5456-~~14b~~ 19e1 Standard Specification for Evaluation of Structural Composite Lumber Products

D7033-14 Standard Practice for Establishing Design Capacities for Oriented Strand Board (OSB) Wood-Based Structural-Use Panels

D7672-~~14~~ 19 Standard Specification for Evaluating Structural Capacities of Rim Board Products and Assemblies

F1667-~~15~~ 20 Standard Specification for Driven Fasteners: Nails, Spikes, and Staples

2.2 Other Standards:

ANSI/AWC NDS-~~2015~~ 2018 National Design Specification for Wood Construction

ANSI/AWC SDPWS-~~2015~~ 2021 Special Design Provisions for Wind and Seismic

ANSI 117-~~2015~~ 2020 Standard Specification for Structural Glued Laminated Timber of Softwood Species

ANSI A190.1-~~2012~~ 2017 Standard for Wood Products - Structural Glued Laminated Timber

ANSI/ASME Standard B18.2.1-2012 Square and Hex Bolts and Screws (Inch Series)

APA D510-~~2012~~ 2020 Panel Design Specification

APA Y510-1997 Plywood Design Specification

CSA B111-1974 (R2003) Wire Nails, Spikes and Staples

CSA O86-~~14~~ 19 Engineering Design in Wood

CSA O121-~~08~~ 17 (R2013) Canadian Douglas Fir Plywood

CSA O122-~~06~~ 16 Structural Glued-Laminated Timber

CSA O151-~~09 (R2014)~~17 Canadian Softwood Plywood

CAN/CSA O325-07 (R2012)16 Construction Sheathing

ISO/IEC 17011-2017 Conformity Assessment—General Requirements for Accreditation Bodies Accrediting Conformity Assessment Bodies

ISO/IEC 17020-2012 Conformity Assessment—Requirements for Operation of Various Types of Bodies Performing Inspection

ISO/IEC 17025-2017 General Requirements for the Competence of Testing and Calibration Laboratories

ISO/IEC 17065-2012 Conformity Assessment—Requirements for Bodies Certifying Products, Processes, and Services

US Product Standard PS 1-09 19 Structural Plywood

US Product Standard PS 2-10 18 Performance Standard for Wood-Based Structural-Use Panels

3. Terminology

3.1 Definitions:

See the referenced documents for definitions of terms used in this standard.

3.2 Description of Terms Specific to This Standard:

ASD Reference Design Value—a design value used in the U.S. based on normal duration of load, dry service conditions, and sustained temperatures up to 100ºF (38ºC) for Allowable Stress Design (ASD)

Approved Agency (Canada)—an established and recognized agency regularly engaged in conducting certification services, when such agency has been approved by regulatory bodies (see Qualified Certification Agency)

Approved Agency (U.S.)—an established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved by regulatory bodies (see Qualified Inspection Agency and Qualified Testing Agency)

3.2.1 *Composite Panel—Any any* panel containing a combination of veneer and other wood-based materials meeting the requirements of PS 2 or CSA O325.

3.2.2 *Edgewise Bending Properties—The the* mechanical properties of rim boards, including design edgewise bending stress ($F_{be, ASD}$ or $f_{be, LSD}$ $f_{be, LSD}$), modulus of elasticity (E_e), shear stress ($F_{ve, ASD}$ or $f_{ve, LSD}$), and compressive stress perpendicular to grain ($F_{c\perp e, ASD}$ or $f_{c\perp e, LSD}$) when subjected to loading on the edge of the rim boards.

3.2.3 *Horizontal (Shear) Load Transfer Capacity—The the* mechanical capacity of rim boards to transfer applied lateral loads, such as wind or seismic, through shear load transfer provided by the connections between rim board and floor sheathing, and rim board and sill plate.

LSD Design Value—design value used in Canada based on standard-term duration of load, dry service conditions, and temperatures up to 122ºF (50ºC) except for occasional exposures to 150ºF (65ºC) for Limit States Design (LSD)

3.2.4 *Mat-Formed Panel—Any any* wood-based panel which does not contain veneer, consistent with the definition of wood structural-use panels.

3.2.5 *Mill Specification—Aa* manufacturing specification based on product evaluation to be used for quality assurance purposes by the manufacturer and the qualified agency.

Qualified Certification Agency (Canada)—an agency meeting the following requirements:
    a. *has trained personnel to perform product certification in compliance with all applicable requirements specified in this standard,*
    b. *has procedures to be followed by its personnel in performance of the certification,*
    c. *has no financial interest in, or is not financially dependent upon, any single company manufacturing the product being certified,*
    d. *is not owned, operated, or controlled by any such company, and*
    e. *is accredited by a recognized accreditation body under ISO/IEC 17065*

Qualified Inspection Agency (U.S.)—an agency meeting the following requirements:
    a. has trained personnel to verify that the grading, measuring, species, construction, bonding, workmanship, and other characteristics of the products as determined by inspection in compliance with all applicable requirements specified in this standard,
    b. has procedures to be followed by its personnel in performance of the inspection,
    c. has no financial interest in, or is not financially dependent upon, any single company manufacturing the product being inspected,
    d. is not owned, operated, or controlled by any such company, and
    e. is accredited by a recognized accreditation body under ISO/IEC 17020

Qualified Testing Agency—an agency meeting the following requirements:
    a. has access to the facilities and trained technical personnel to conduct testing on the characteristics of the products by sampling and testing in compliance with all applicable requirements specified in this standard,
    b. has procedures to be followed by its personnel in performance of the testing,
    c. has no financial interest in, or is not financially dependent upon, any single company manufacturing the product being tested,
    d. is not owned, operated, or controlled by any such company, and
    e. is accredited by a recognized accreditation body under ISO/IEC 17025

Recognized Accreditation Body—an organization complying with ISO/IEC 17011 and recognized by the regulatory body having jurisdiction as qualified to evaluate and accredit certification agencies, inspection agencies and/or testing agencies

3.2.6 *Rim Board*—A a continuously supported, full-depth structural element developed for use within a wood floor or roof assembly and performing a similar role as a starter or end joist when installed in a load bearing wall or non-load bearing wall perpendicular or parallel to the joist framing to transfer horizontal (shear) and vertical (compression) loads, provide attachment for diaphragm sheathing, siding and/or exterior deck ledgers, and provide lateral support to floor or roof joists or rafters.

3.2.7 *Structural Composite Lumber (SCL)*—An an engineered wood product that is intended for structural use and bonded with an exterior adhesives, and meets the definition and requirements of ASTM D5456.

3.2.8 *Structural Glued-Laminated Timber (glulam)*—An an engineered, stress rated product of a timber laminating plant comprising that is comprised of assemblies of specially selected and prepared wood laminations securely bonded together with adhesives, and meets the definition and requirements of ANSI A190.1 or CSA O122.

3.2.9 *Structural-Use Panel* – A panel product composed primarily of wood which, in its commodity end use, is essentially dependent upon certain mechanical and/or physical properties for successful end-use performance and meets the definition and requirements of PS 1, PS 2, CSA O325, CSA O121 or CSA O151.

3.2.10 *Vertical (Compression) Load Capacity*—The the mechanical capacity of rim boards to transfer applied gravity loads, such as wall loads, through compressive load transfer to the sill plate of the supporting wall.

Wood Structural Panel—a panel product composed primarily of wood that, in its commodity end use, is essentially dependent upon certain mechanical and/or physical properties for successful end-use performance and meets the definition and requirements of PS 1, PS 2, CSA O325, CSA O121, or CSA O151

4. Dimensions and Dimensional Tolerances

4.1 The nominal thickness for engineered wood rim boards shall not be less than 1-1/4 inch (31.8 mm) for Rim Board Grade A, 1-1/8 inches (28.6 mm) for Rim Board Grade B, or 1 inch (25.4 mm) for Grade C. ~~Engineered wood~~ Wood structural panel rim boards shall be identified by the Performance Category shown in Section 4.3. Structural composite lumber and structural glued-laminated timber rim boards shall be identified by the nominal thickness, which shall be permitted to exceed the nominal thickness associated with the performance category for wood structural panel rim boards as needed to meet the required design properties for the rim board grade.

Note 1: Where increased thickness of rim board reduces available joist bearing length below minimum requirement for joists, the joists should be supported by joist hangers with suitable bearing length and capacity.

4.2 The depth for engineered wood rim boards shall not exceed 24 inches (610 mm). Depth requirements for glulam rim boards shall follow Sections 4.2.1 and 4.2.2 with an additional product marking specified in Section 7.3.2(g).

4.2.1 For glulam rim boards of 14 inches (356 mm) or less in depth, the as-manufactured depth shall be 3/16 inch (4.8 mm) deeper than the targeted depth.

4.2.2 For glulam rim boards greater than 14 inches (356 mm) in depth, the as-manufactured depth shall be based on a consultation with the designer for the end-use moisture conditions and the effect of the rim board depth change on the rim board design, as prescribed in the design specification provided by the designer.

To ensure compatibility with I-joists, the depth of rim boards manufactured from glulam shall be based on the as-manufactured and end-use moisture contents. The depth change for glulam rim boards due to moisture content change shall be estimated as follows:

$$\Delta d = 0.002 \times \Delta M \times d$$

where

Δd = Glulam rim board depth change due to moisture content change (positive Δd means shrinkage) in inch (mm)
ΔM = $M_i - M_f$
M_i = As manufactured moisture content in percentage
M_f = End-use moisture content in percentage
d = Glulam rim board depth in inches (mm)

Note 2: For example, when the as-manufactured moisture content is 14% and the end-use moisture content is expected to be 8% for a 16-inch (406 mm) deep glulam rim board, Δd = 0.002 x (14 − 8) x 16 = 0.192 inch (4.9 mm). The positive depth change (Δd) indicates shrinkage.

4.3 Dimensional tolerances – Dimension tolerances permitted at the time of manufacture for engineered wood rim boards shall be ~~as follows:~~ in accordance with this section.

~~Depth – Plus 1/8 inch (3.2 mm) or minus 0 inch (measured to 1/32 inch or 0.79 mm) for structural-use panel or structural composite lumber rim boards. Structural glued-laminated timber rim board shall be manufactured at a moisture content and depth to ensure that it meets these same tolerances over a range of application moisture contents from 5 to 16%.~~

4.3.1 Depth tolerances shall be plus 1/8 inch (3.2 mm) or minus 0 inch (measured to 1/32 inch or 0.79 mm).

~~Note 1: To ensure compatibility with I-joists, the depth of rim boards manufactured from glulam should be based on a moisture content of approximately 12%.~~

4.3.2 Thickness ~~– T~~tolerances for wood structural panel rim boards shall be in accordance with Table 1. Structural composite lumber and structural glued-laminated timber rim boards shall have a thickness tolerance of plus or minus 5% of the nominal thickness.

TABLE 1
THICKNESS TOLERANCES | FOR WOOD STRUCTURAL PANEL RIM BOARDS[a]

Performance Category	1	1-1/8	1-1/4
Minimum Thickness[a]	0.950 inch (24.13 mm)	1.069 inches (27.15 mm)	1.188 inches (30.16 mm)
Maximum Thickness	1.050 inches (26.67 mm)	1.181 inches (30.00 mm)	1.313 inches (33.34 mm)

(a) The label thickness

[a] Thickness tolerances for structural composite lumber and structural glued laminated timber rim boards are provided in Section 4.3.2.

5. Required Performance Criteria

Engineered wood rim boards shall meet the performance requirements established in this section.

5.1 Sampling

5.1.1 Test samples shall be representative of typical production and shall be sampled at the manufacturing facility by a qualified agency.

5.1.2 For engineered wood rim boards manufactured from wood structural-use panels, a minimum of 20 full-size (typical 4 feet by 8 feet or 1219 mm by 2438 mm) panels shall be sampled for all evaluation tests. For engineered wood rim boards manufactured from other materials, a total of at least 200 lineal feet (61,000 mm) taken from a minimum of 2 different billets of representative production shall be sampled.

5.1.3 The sample size required for horizontal load transfer capacity, uniform vertical load capacity, lag screw tests, and concentrated vertical load capacity shall be sufficient for estimating the population mean within 5% precision with 75% confidence, or 10 assemblies, whichever is larger. In general, a sample size larger than 10 assemblies is needed when the coefficient of variation is greater than 13%. In addition, for engineered wood rim boards manufactured from structural composite lumber or structural glued laminated timber, the sample sizes for cross-grain compressive strength and stiffness shall be sufficient to estimate a 5% parametric tolerance limit with 75% confidence with a standard error of no greater than 5% when evaluated in accordance with Section 4.4.3.2 of ASTM D2915.

5.1.4 For rim boards manufactured from mat-formed and composite panels, and plywood qualified in accordance with PS 2 or CSA O325, the rim board materials required for determining edgewise bending properties shall be sampled from representative production in accordance with Section 6.7.

5.2 Structural Performance Criteria

5.2.1 Structural performance for engineered wood rim boards shall be evaluated for the horizontal load transfer capacity, uniform vertical load capacity, 1/2-inch (12.7-mm) diameter lag screw lateral resistance, concentrated vertical load capacity, and edgewise bending properties. In addition, for engineered wood rim boards manufactured from structural composite lumber or structural glued laminated timber, the cross-grain compressive strength and stiffness shall be determined by testing in accordance with ASTM D7672, and calculations in accordance with Section 6.3.4 shall demonstrate that the uniform vertical load design capacity meets or exceeds the required uniform vertical load design capacity for the rim board grade.

5.2.2 Structural performance shall be evaluated for each engineered wood rim board thickness, depth, grade, and species combination unless otherwise noted in the test method.

5.2.3 Engineered wood rim boards shall meet the minimum structural performance given in Table 2 based on the test methods described in Section 6.

Table 2. Required Mean Test Values [a] at As-Received Moisture Conditions for Engineered Wood Rim Boards

Rim Board Grade	Performance Category or Nominal Thickness [b]	H [c] (lbf/ft)	V [d] (lbf/ft)								Z [e] (lbf)	P [f] (lbf)
			Depth [d] (d) Limitation (in.)									
		d ≤ 24	9-1/2	11-7/8	14	16	18	20	22	24	d ≤ 24	d ≤ 24
A	1-1/4 or higher	675	16,200	16,200	16,200	15,450	13,950	12,450	10,950	9,600	2,190	10,500
B1	1-1/4 or higher	560	16,200	16,200	16,200	15,450	13,950	12,450	10,950	9.600	2,190	10,500
B2	1-1/8 or higher	560	14,550	14,550	14,550	14,550	13,950	12,450	10,950	9,600	2,190	10,500
C1	1-1/8 or higher	505	14,550	14,550	14,550	14,550 13,200	13,950	12,450	10,950	9,600 9,000	2,190	10,500
C2	1 or higher	505	12,900	12,900	11,700	9,900	8,250	6,900	5,850	4.950	1,875	10,500

For SI: 1 in. = 25.4 mm, 1 lbf/ft = 0.0146 N/mm, 1 lbf = 4.448 N

[a] The tabulated values are the required mean test values. The allowable stress design (for the U.S.) and limit states design (for Canada) values are provided in Annex A.
[b] Performance categories as shown in Section 4.3 for wood structural panel rim boards or nominal thickness for structural composite lumber and structural glued-laminated timber rim boards in accordance with Section 4.1.
[c] Mean test value for the horizontal (shear) load transfer capacity.
[d] Mean test value for the uniform vertical (compression) load capacity when qualified in accordance with Section 6.3 using specimens at as-received moisture conditions. The value shall be multiplied by 2.5/3.0 or 0.83 when qualified using specimens at standard moisture conditions.
[e] Mean test value for the lateral resistance of a 1/2-inch (12.7-mm) diameter lag screw when qualified in accordance with Section 6.4 using specimens at as-received moisture conditions. The value shall be multiplied by 0.8 when qualified using specimens at standard moisture conditions.
[f] Mean test value for the concentrated vertical load capacity when qualified in accordance with Section 6.5 using specimens at as-received moisture conditions. The value shall be multiplied by 2.5/3.0 or 0.83 when qualified using specimens at standard moisture conditions.

5.2.4 Engineered wood rim boards shall meet the minimum edgewise bending properties specified in Table 3 based on the test methods described in Section 6.7.

TABLE 3
REQUIRED EDGEWISE BENDING PROPERTIES FOR ENGINEERED WOOD RIM BOARDS [a]

Grade	$F_{be,0.05}$[b] (psi)	$E_{e,0.5}$[c] (psi)	$F_{ve,0.05}$[d] (psi)	$F_{c\perp e,0.5}$[e] (psi)
All	1,260	550,000	440	835

For SI: 1 psi = 6.8948 kPa

(a) The tabulated values are characteristic test values. The design values are provided in Annex A. Higher characteristic values shall be required when higher design values are approved by a qualified agency specified in Section 7.3.2 in accordance with this standard.

(b) Characteristic (5th percentile with 75% confidence) edgewise bending strength.

(c) Characteristic (mean) edgewise bending modulus of elasticity.

(d) Characteristic (5th percentile with 75% confidence) edgewise shear strength.

(e) Characteristic (mean) edgewise compressive strength perpendicular to grain at 0.04-inch (1 mm) deformation.

5.3 Edge Nailing Durability Criteria

5.3.1 Samples used for evaluating the edge nailing durability of engineered wood rim boards shall be prepared from those panels required in Section 5.1.2.

5.3.2 Tests shall be conducted in accordance with the procedures provided in Section 6.6.

5.3.3 The mean edge nailing durability shall be at least 75% of the mean horizontal load transfer capacity determined from Section 6.2.

5.4 Physical Properties Criteria

5.4.1 Requirements specified in this section do not apply to plywood panels, laminated veneer lumber, or glulam materials.

5.4.2 Samples used for establishing the physical properties of engineered wood rim boards shall be prepared from those panels required in Section 5.1.2.

5.4.3 Thickness swell – The rim board thickness swell shall be evaluated based on the 24-hour water soak method of ASTM D1037 using 5 specimens (6 inches by 6 inches or 152.4 mm by 152.4 mm) from each of 5 panels (25 specimens in total) tested for structural performance (Section 5.2). The mean thickness swell for the whole sample population shall not exceed 10% and no individual value shall exceed 12%.

5.4.4 Density – The rim board density shall be determined in accordance with ASTM D2395 using the same panels tested for structural performance (Section 5.2). One specimen with a dimension of 6 inches (152.4 mm) by 6 inches (152.4 mm) shall be prepared from each panel (20 specimens in total) for the density determination based on oven-dry weight and as-tested volume. Data obtained from this evaluation shall be used to establish the control values for ~~the~~ quality assurance use (see Section 8.~~3~~4.1.4).

5.4.5 Internal bond – The rim board internal bond shall be determined based on ASTM D1037 using 5 specimens (2 inches by 2 inches or 50.8 mm by 50.8 mm) from each panel (100 specimens in total) tested for structural performance (Section 5.2) except that the rim boards manufactured from SCL (excluding LVL) shall be evaluated based on ASTM D5456. Data obtained from this evaluation shall be used to establish the control values for ~~the~~ quality assurance use (see Section 8.~~3~~4.1.5).

6. Test Methods

6.1 General

6.1.1 Test methods provided in this section shall be used to establish the structural capacities of engineered wood rim boards.

6.2 Test Method RB-1, Horizontal (Shear) Load Transfer Capacity

6.2.1 Specimen preparation

6.2.1.1 Horizontal (shear) load transfer capacity of engineered wood rim boards shall be determined using the assembly consisting of rim board, sheathing, I-joists, and sill plate shown in Figure 1 for use in the U.S. and Figure 1A for use in Canada.

6.2.1.2 Dimensions for each component of the assembly shall meet the requirements shown in Table 4 for use in the U.S and Canada. The sill plate shall be 2x4 spruce-pine-fir (SPF) with a specific gravity of no greater than 0.45 (i.e., 0.42 + 0.03) and comply with grading standards referenced in the applicable building code. The specific gravity of the SPF shall be reported.

FIGURE 1

TEST ASSEMBLY FOR DETERMINING THE HORIZONTAL LOAD TRANSFER CAPACITY FOR USE IN THE U.S.
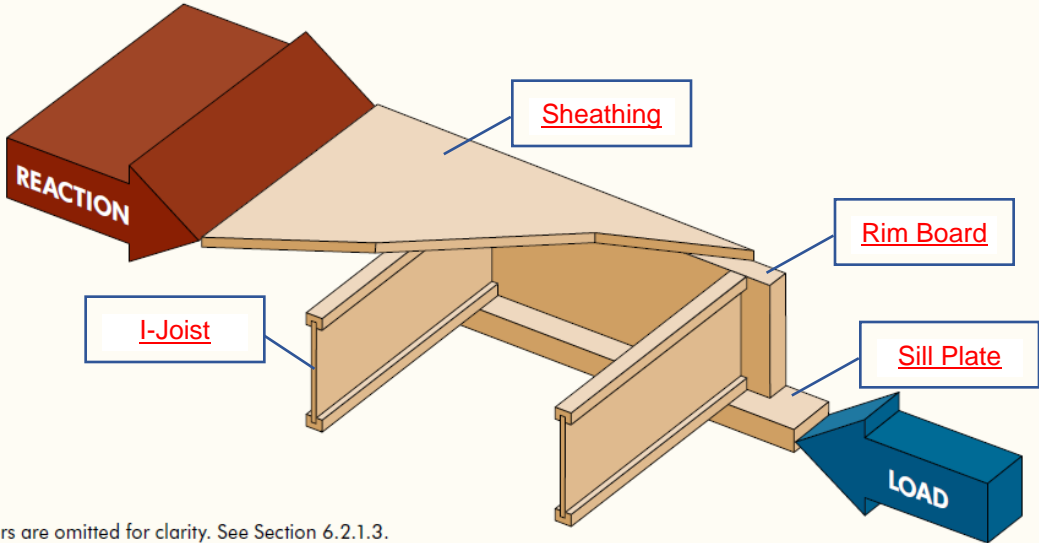
REACTION

Sheathing

Rim Board

I-Joist

Sill Plate

LOAD

Fasteners are omitted for clarity. See Section 6.2.1.3.

FIGURE 1A

TEST ASSEMBLY FOR DETERMINING THE HORIZONTAL LOAD TRANSFER CAPACITY FOR USE IN CANADA

REACTION

Bottom Plate

Sheathing

Rim Board

I-Joist

Sill Plate

LOAD

Fasteners are omitted for clarity. See Section 6.2.1.3.
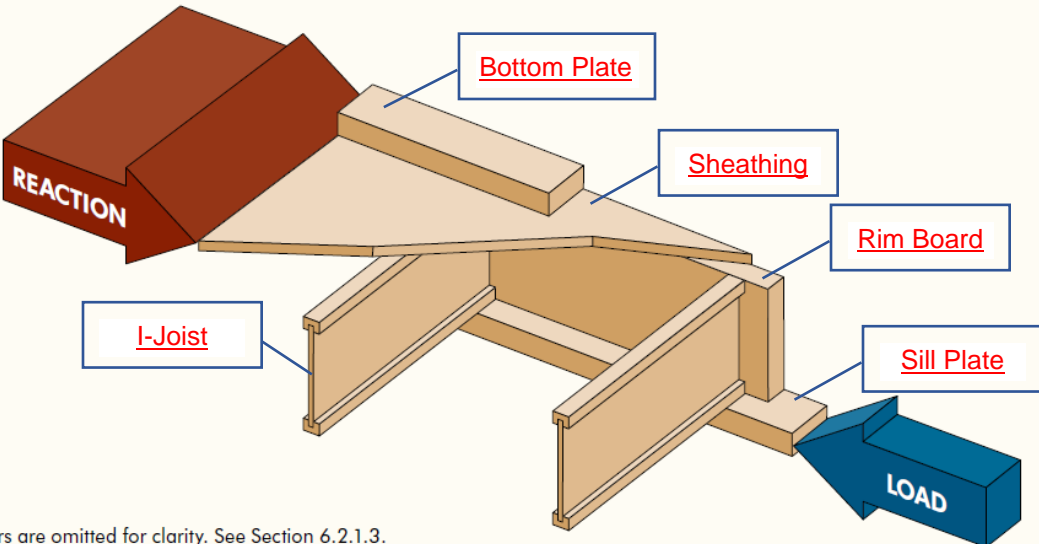
TABLE 4
MATERIAL DIMENSIONS

Material	Thickness (in.)	Depth or Width (in.)	Length (in.)
Rim Board	1 minimum	24 maximum	36
I-Joist	1-3/4 maximum	24 maximum	12
Sheathing (OSB)	23/32 maximum	12	39 minimum
Sill Plate[a] (SPF)	Nominal 2	Nominal 4	39 minimum

For SI: 1 in. = 25.4 mm
(a) Including the bottom plate for the Canadian assemblies.

6.2.1.3 Nailing schedules for the assembly shall follow the requirements provided in Table 5 for use in the U.S. and Table 5A for use in Canada. The first and last nails between sheathing and rim board (edge nails) shall be 3 inches (76.2 mm) from each rim board end. Nails between sheathing and I-joist shall be 3 inches (76.2 mm) from each I-joist end. The first and last toe nails between rim board and sill plate shall be 3 inches (76.2 mm) from each rim board end. Nails used for the assembly shall be in conformance with to ASTM F1667 for the U.S., and CSA B111 and ASTM F1667 for Canada.

Table 5. Nailing schedule for use in the U.S. [a]

Nailing			
Sheathing to Rim Board or Joist	Rim Board to Sill Plates (Toe Nail)	Joist to Sill Plate (Slanted)	Rim Board to Joist
6 – 8d common (0.131 in. x 2-1/2 in.) @ 6 in. o.c.	6 – 8d box (0.113 in. x 2-1/2 in.) @ 6 in. o.c.	2 – 8d box (0.113 in. x 2-1/2 in.)	2 – 8d box (0.113 in. x 2-1/2 in.)

For SI: 1 in. = 25.4 mm
[a]   Rim board products qualified with the nailing schedule in this standard are recognized in Section 2303.1.13 of the 2021, 2018 and 2015 International Building Code® (IBC), and Sections R502.1.7 and R602.1.7 of the 2021, 2018 and 2015 International Residential Code® (IRC).

TABLE 5A
NAILING SCHEDULE FOR USE IN CANADA

Nailing				
Sheathing to Rim Board or Joist	Bottom Plate through Sheathing to Rim Board[a]	Rim Board to Sill Plates (Toe Nail)	Joist to Sill Plate (Slanted)	Rim Board to Joist
6 - 6d common (0.113 in. x 2 in.) @ 6 in. o.c.	3 - 12d common (0.148 in. x 3-1/4 in.) @ 15.7 in. o.c. or 6 - 12d common (0.148 in. x 3-1/4 in.) @ 6 in. o.c.[b]	6 - 12d common (0.148 in. x 3-1/4 in.) @ 6 in. o.c.	2 - 8d common (0.131 in. x 2-1/2 in.)	2 - 8d common (0.131 in. x 2-1/2 in.)

For SI: 1 in. = 25.4 mm
(a) 1/2 of the assemblies shall be prepared with a 3-1/4-in. (82-mm) nail installed between the 2-in. (51-mm) nails and the other 1/2 of the assemblies shall be prepared with a 3-1/4-in. (82-mm) nail installed within 0.4 in. (10 mm) of a 2-in. (51-mm) nail.
(b) For braced walls in high wind and seismic areas.

6.2.1.4 Joist spacing for the assembly shall be 24 inches (610 mm) on center.

6.2.1.5 The assembly shall be fabricated at least 12 hours prior to mechanical testing.

6.2.2 Test procedures

6.2.2.1 Horizontal loads shall be applied through the sill plate while the sheathing reacts through full-width bearing, or vice versa. Vertical tie-rods or other similar devices shall be used to provide vertical restraints to avoid overturning the assembly. These restraints, however, shall not interfere with the lateral displacement of the assembly in the direction parallel to the loading.

6.2.2.2 Assembly displacements shall be measured based on the relative lateral displacements between the sill plate and sheathing along the entire length of the rim board. Vertical displacements caused by overturning forces, if any, shall be isolated from the measurements of lateral displacements.

6.2.2.3 The loading rate shall not exceed 450 lbf (2.0 kN) per minute.

6.2.2.4 The assembly shall be tested to the ultimate load or 0.4-inch (10.2 mm) lateral displacement, whichever occurs first. No preload shall be applied. Load and displacement readings shall be taken at approximately equal load increments.

Note 23: *Testing beyond the 0.4-inch (10.2-mm) lateral displacement may provide additional information for some rim board materials.*

6.2.3 The maximum lateral load transfer capacity (test value) for each assembly is equal to the maximum load determined from Section 6.2.2.4 divided by the rim board length.

6.2.4 The lateral load transfer capacity determined from Section 6.2.3 is applicable to a shallower rim board of the same thickness and species combination.

6.3 Test Method RB-2, Uniform Vertical (Compression) Load Capacity

6.3.1 Specimen preparation

6.3.1.1 Specimens used for this test method shall be at least 12 inches (305 mm) in length and tested as a stand-alone column. Specimens shall be tested after reaching an equilibrium moisture content at standard conditions of 65 ± 5% RH and 68 ± 11°F (20 ± 6°C). The moisture equilibrium is considered achieved when consecutive weight readings taken at least 24 hours apart agree within 0.2%. Alternatively, specimens shall be permitted to be tested as received without moisture conditioning provided that the higher load factor in 6.3.3 is used.

6.3.2 Test procedures

6.3.2.1 Vertical loads shall be applied uniformly over the entire length and thickness of the stand-alone rim board. No lateral supports shall be used for testing. The loading direction shall be consistent with the intended application of the rim board.

6.3.2.2 Vertical load deformations shall be measured based on the ~~displacements~~ deformations over the entire depth (crosshead movement).

6.3.2.3 The average time to failure shall be approximately two minutes.

6.3.2.4 A preload of no more than 10% of the estimated ultimate load is permitted to be applied and the deformation reading zeroed. After that, the load and deformation readings shall be taken at approximately equal load increments until the ultimate load is reached.

6.3.2.5 The ultimate load and the load at 0.06-inch (1.5-mm) vertical deformation shall be recorded.

6.3.3 The maximum uniform vertical load capacity (test value) for each specimen is equal to the ultimate load determined from Section 6.3.2 divided by the rim board length, or 2.5 times the load at 0.06-inch (1.5-mm) vertical ~~displacement~~ deformation divided by the rim board length, whichever is less. When the specimen is tested as-received

without moisture conditioning, the maximum uniform vertical load capacity (test value) for the specimen is equal to the ultimate load determined from Section 6.3.2 divided by the rim board length, or 3 times the load at 0.06-inch (1.5-mm) vertical ~~displacement~~ deformation divided by the rim board length, whichever is less.
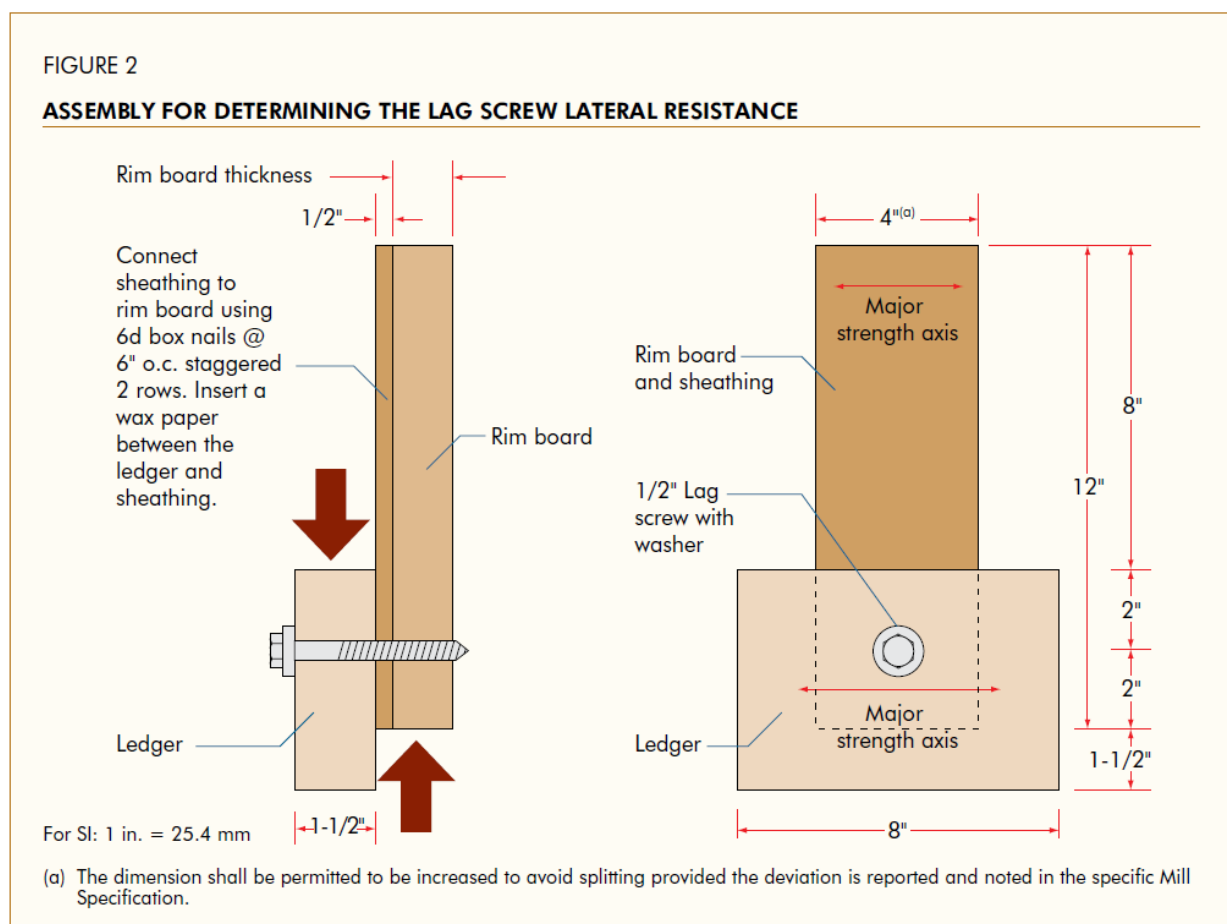
6.3.4 The buckling capacity for rim boards made with SCL and glulam shall be calculated in accordance with the National Design Specification for Wood Construction (NDS) using the appropriate ~~axial~~ compressive ~~stress~~ strength and bending modulus of elasticity in the perpendicular to the rim board length direction, as tested in accordance with ASTM D7672 ~~D3501 and D198, respectively~~. The buckling length coefficient, K_e, shall not be less than 0.90. The maximum uniform vertical load capacity for the rim board shall be equal to the calculated buckling capacity corresponding to a 10-year load duration or the maximum uniform vertical load capacity determined from 6.3.3, whichever is less. The uniform vertical load capacity cannot exceed the compression perpendicular-to-grain capacity of the sheathing and plate materials.

Note 3̶4: *The calculated buckling load capacity for wood structural ~~use~~ panels is equal to or greater than the allowable value shown in Table A1 based on the properties published in the Panel Design Specification and the allowable compressive stress perpendicular to the grain of 360 psi for floor sheathing.*

6.3.5 The uniform vertical load capacity determined from Section 6.3.4 is applicable to a shallower rim board of the same thickness and species combination.

6.4 Test Method RB-3, Lag Screw Lateral Resistance

6.4.1 Specimen preparation

FIGURE 2

ASSEMBLY FOR DETERMINING THE LAG SCREW LATERAL RESISTANCE

For SI: 1 in. = 25.4 mm

(a) The dimension shall be permitted to be increased to avoid splitting provided the deviation is reported and noted in the specific Mill Specification.

6.4.1.1 Specimens used for determining the lag screw lateral load resistance of engineered wood rim boards shall be prepared in accordance with Figure 2. Dimensions for each component of the assembly shall meet the requirements shown in Figure 2. A piece of wax paper shall be inserted between the ledger and sheathing to minimize friction.

Note 45*: This test method is not intended for lag screw installation with multiple washer spacers between the head of the lag screw and the ledger.*

6.4.1.2 A 1/2-inch (12.7-mm) diameter lag screw with washer shall be used for testing. The lag screw used for the assembly shall be in conformance with to ANSI/ASME B18.2.1.

6.4.1.3 The ledger shall be 2x6 spruce-pine-fir (SPF) with a specific gravity of no greater than 0.45 (i.e., 0.42 + 0.03) and comply with grading standards referenced in the applicable building code. The specific gravity of the SPF shall be reported.

6.4.1.4 A clearance hole and lead hole shall be bored in accordance with the guidelines provided in the 2005 NDS. The diameter for the lead hole shall be 5/16 inch (7.9 mm).

6.4.1.5 The assembly shall be fabricated at as-received conditions and conditioned at standard conditions of 65 ± 5% RH and 68 ± 11°F (20 ± 6°C) until reaching moisture equilibrium before mechanical testing. The moisture equilibrium is considered achieved when consecutive weight readings taken at least 24 hours apart agree within 0.2%. Alternatively, specimens shall be permitted to be tested as-received without moisture conditioning provided that the required mean test values in Table 2 are used.

6.4.2 Test procedures

6.4.2.1 Loads shall be applied through the ledger while the rim board and sheathing react through full-width bearing, or vice versa.

6.4.2.2 Assembly displacements shall be measured based on the movement of the machine cross head.

6.4.2.3 The loading rate shall not exceed 0.1 inch (0.25 mm) per minute.

6.4.2.4 The assembly shall be tested up to the ultimate load or 1.5-inch (38-mm) displacement, whichever occurs first. No preload shall be applied. Load and displacement readings shall be taken at approximately equal load increments.

6.4.3 The maximum lag screw lateral resistance (test value) for each assembly is equal to the maximum load determined from Section 6.4.2.4.

6.4.4 The lag screw lateral resistance determined from Section 6.4.3 is applicable to all rim boards of the same thickness and species combination.

6.5 Test Method RB-4, Concentrated Vertical Load Capacity

6.5.1 Specimen preparation

6.5.1.1 Specimens used for this test method shall be at least 16 inches (406 mm) in length and tested as a stand-alone column. Specimens shall be tested after reaching an equilibrium moisture content at standard conditions of 65 ± 5% RH and 68 ± 11°F (20 ± 6°C). The moisture equilibrium is considered achieved when consecutive weight readings taken at least 24 hours apart agree within 0.2%. Alternatively, specimens are permitted to be tested as-received without moisture conditioning provided that the higher load factor in 6.5.3 is used.

6.5.2 Test procedures

6.5.2.1 Test procedures shall follow Section 6.3.2 except that the concentrated vertical load shall be applied through a 4-1/2-inch (114-mm) long steel bar with a minimum thickness of 1/2 inch (12.7 mm) and a width of not less than the rim board thickness. The steel bar shall be centered on the 16-inch (406-mm) specimen length.

6.5.3 The maximum concentrated vertical load capacity (test value) for each specimen is equal to the ultimate load determined from Section 6.5.2, or 2.5 times the load at 0.06-inch (1.5-mm) vertical deformation, whichever is less. When the specimen is tested as-received without moisture conditioning, the maximum concentrated vertical load capacity (test value) for the specimen is equal to the ultimate load determined from Section 6.5.2 or 3 times the load at 0.06-inch (1.5-mm) vertical ~~displacement~~deformation, whichever is less.

6.5.4 The concentrated vertical load capacity determined from Section 6.5.3 is applicable to a shallower rim board of the same thickness and species combination.

6.6 Test Method RB-5, Edge Nailing Durability

6.6.1 Specimen preparation

6.6.1.1 Specimens used for this test method shall be prepared in accordance with Section 6.2.1. A minimum of 3 assemblies shall be tested for each rim board species, depth, and thickness combination.

6.6.1.2 The 24-hour water soak method of ASTM D1037 shall be applied to each rim board specimen before the test assembly is fabricated. The test assembly shall be fabricated while the rim board specimen is still wet.

6.6.1.3 The assembly shall be redried to a moisture content that is within 2 percent ~~comparable to the~~ moisture content of the assemblies tested in Section 6.2 before mechanical testing.

6.6.2 Test procedures

6.6.2.1 Test procedures shall follow Section 6.2.2.

6.6.3 The maximum edge nailing durability (test value) for each assembly is equal to the maximum load determined from Section 6.6.2 divided by the rim board length.

6.6.4 The edge nailing durability determined from Section 6.6.3 is applicable to a shallower rim board of the same thickness and species combination.

6.7 Test Method RB-6, Edgewise Bending Properties

6.7.1 Edgewise bending strength and modulus of elasticity

6.7.1.1 For plywood qualified in accordance with PS 1, CSA O121, or CSA O151, edgewise bending strength and modulus of elasticity shall be evaluated in accordance with Plywood Design Specification or CSA O86.

6.7.1.2 For glulam qualified in accordance with ANSI A190.1 or CSA O177, edgewise bending strength and modulus of elasticity shall be evaluated in accordance with ANSI 117 or CSA O86.

6.7.1.3 For structural composite lumber qualified in accordance with ASTM D5456, edgewise bending strength and modulus of elasticity shall be evaluated in accordance with manufacturer's design literature.

6.7.1.4 For mat-formed and composite panels, and plywood qualified in accordance with PS 2 or CSA O325, edgewise bending strength and modulus of elasticity shall be evaluated in accordance with Section 6, Bending Edgewise, of ASTM D4761 except that the specimens shall be tested at as-received conditions with a dimension of 2 inches in depth by 36 inches in length and the load shall be applied at mid-span (center-point loading) using an on-center test span of 33 inches.

6.7.1.4.1 The characteristic (5th percentile with 75% confidence) edgewise bending strength for specimens tested in accordance with this section shall be divided by an adjustment factor of 1.64 (see Note 56) when compared to the requirements specified in Table 3.

6.7.1.4.2 The mean edgewise modulus of elasticity for specimens tested in accordance with this section shall be divided by an adjustment factor of 1.05 (see Note 67) when compared to the requirements specified in Table 3.

Note 56: *The adjustment factor of 1.64 for edgewise bending strength is composed of a combination of the following factors:*

1) A factor of 1.45, which accounts for an assumed volume effect between the qualification size of 2 inches by 33 inches and the maximum permissible span of 4 feet (1.2 m) with a depth of 24 inches (610 mm) based on a 2-parameter Weibull by assuming a coefficient of variation of 15%.

2) A factor of 1.08, which relates the center-point loading configuration to the uniform load used in design.

3) A factor of 1.05, which accounts for the moisture effect on edgewise bending strength between the qualification (as-received) moisture content and the moisture content at standard moisture conditions at of 65% RH and 68°F (20°C) conditions.

Note 67: *The adjustment factor of 1.05 for edgewise modulus of elasticity accounts for the moisture effect on edgewise modulus of elasticity between the qualification (as-received) and standard moisture at 65% RH and 68°F (20°C) conditions.*

6.7.2 Edgewise shear strength

6.7.2.1 For plywood qualified in accordance with PS 1, CSA O121, or CSA O151, edgewise shear strength shall be evaluated in accordance with Plywood Design Specification or CSA O86.

6.7.2.2 For glulam qualified in accordance with ANSI A190.1 or CSA O177, edgewise shear strength shall be evaluated in accordance with ANSI 117 or CSA O86.

6.7.2.3 For structural composite lumber qualified in accordance with ASTM D5456, edgewise shear strength shall be evaluated in accordance with manufacturer's design literature.

6.7.2.4 For mat-formed and composite panels, edgewise shear strength shall be evaluated in accordance with the Panel Design Specification or tested in accordance with Section 6.5.5 of ASTM D5456.

6.7.2.5 For plywood qualified in accordance with PS 2 or CSA O325, edgewise shear strength shall be tested in accordance with Section 6.5.5 of ASTM D5456.

6.7.3 Edgewise compressive strength perpendicular to grain

6.7.3.1 For plywood qualified in accordance with PS 1, CSA O121, or CSA O151, edgewise compressive strength perpendicular to grain shall be evaluated in accordance with Plywood Design Specification or CSA O86.

6.7.3.2 For glulam qualified in accordance with ANSI A190.1 or CSA O177, edgewise compressive strength perpendicular to grain shall be evaluated in accordance with ANSI 117 or CSA O86.

6.7.3.3 For structural composite lumber qualified in accordance with ASTM D5456, edgewise compressive strength perpendicular to grain shall be evaluated in accordance with manufacturer's design literature.

6.7.3.4 For mat-formed and composite panels, and plywood qualified in accordance with PS 2 or CSA O325, edgewise compressive strength perpendicular to grain shall be evaluated in accordance with the Panel Design Specification or tested in accordance with Section 6.5.4 of ASTM D5456.

7. Product Evaluation

7.1 Qualification Tests

Required qualification tests and criteria are detailed in Section 5 of this standard. Retesting shall be conducted using a new independent sample set after process improvement is implemented as needed.

7.2 Mill Specification

Upon conformance ~~with~~ to the requirements specified in this standard, a manufacturing specification unique to the product and mill shall be written based on product evaluation. This specification shall be used for quality assurance purposes by the manufacturer and the qualified agency. Product evaluation will be accomplished on the same lot supplied by the manufacturer for qualification testing. Reference values shall be established during product evaluation or from applicable performance requirements in this standard, as specified in Section 8.

7.3 Trademarking and Certification

7.3.1 Certification

All engineered wood rim boards represented as being in conformance ~~with~~ to this standard shall bear the stamp of a qualified agency which (1) either inspects the manufacture or (2) has tested a random sampling of the finished products in the shipment being certified for conformance ~~with~~ to this standard.

~~7.3.2 Qualified Agency~~

~~A qualified agency is defined to be one that:~~

~~a. has the facilities and trained technical personnel to verify that the grading, measuring, and other characteristics of the products as determined by inspection, sampling and testing conform to all of the applicable requirements specified herein;~~

~~b. has developed procedures to be followed by agency personnel in performance of the inspection and testing;~~

~~c. has no financial interest in, or is not financially dependent upon, any single company manufacturing the product being inspected or tested; and d. is not owned, operated or controlled by any such company.~~

7.3.~~3~~ 2 Product Marking

All engineered wood rim board products represented as conforming to this standard shall be identified with marks giving the following information:

a. Rim Board Grade qualified in accordance with this standard~~.~~

b. The Performance Category for wood structural panel rim boards or the nominal thickness for structural composite lumber and structural glued-laminated timber rim boards

c. The labeled rim board thickness

d. The mill name or identification number

e. The qualified agency name or logo

f. The symbol of "*ANSI~~/APA~~ PRR 410*" signifying conformance ~~with~~ to this standard~~.~~

g. A label of "Do not resize the depth" for glulam rim boards

h. Any manufacturer's designations which shall be separated from the grade-marks or trademarks of the qualified agency by not less than 6 inches (152 mm).

7.3.*4* 3 *Voiding Marks*

Engineered wood rim boards originally marked as conforming to this standard but subsequently rejected as not conforming thereto shall have any reference to the standard obliterated or voided by the manufacturer. No reference shall be made to this standard in the certification or trademarking of engineered wood rim board not conforming to this standard.

Note *7*8: *This can be performed by blocking out the stamp with permanent black ink or light sanding.*

8. Quality Assurance

8.1 Objective

This section is intended for use with an engineered wood rim board product that has qualified for trademarking under this standard. The purpose of this section is to assure product quality through the application of quality assurance procedures and by detecting changes in properties which may adversely affect rim board performance. In all cases, the criteria to which the engineered wood rim board is tested will be provided in the Mill Specification.

8.2 Referenced Standards

8.2.1 Engineered wood rim boards can be made from a variety of wood-based products, each with unique test requirements. Quality assurance requirements exist in different forms for many of these products, as listed in Section 2.

8.2.2 Engineered wood rim board quality assurance requirements shall be permitted to be considered satisfied when the requirements for the referenced standards in Section 2 and any additional requirements listed in Sections 8.3 and 8.4 are met.

8.2.3 Referenced standards shall be specified by product type to define appropriate procedures and/or guidelines for quality assurance. If a product trademarked under this standard is trademarked under another standard, samples shall be taken for both standards.

8.3 Process Control

On-going evaluation of the process properties listed in Section 8.4 shall be performed to confirm that the rim board quality remains in satisfactory compliance to the product specification requirements. Sampling methods and quality assurance testing shall be documented in an in-plant manufacturing standard and approved by the *approved agency*. All processes and test records relevant to the production shall be retained based on the manufacturer's record retention policy and are subject to audit by the *approved agency*. Production shall be held pending results of the quality assurance testing on representative samples.

8.3 4 Mechanical and Physical Property Quality Assurance

8.3*4*.1 *Mat-formed and composite panels*

*8.3*4*.1.1* Mechanical properties – Dry bending strength and stiffness in both the along and across directions, and redry (cycled in accordance with Section 7.16, *Single Cycle Test*, of PS 2) bending strength in the along direction (Section 7.6, *Small Static Bending Test*, of PS 2), of the product qualified under structural performance (Section 5.2 of this standard) shall be established in accordance with PS 2 or CSA O325. In addition, the edgewise bending strength and modulus of elasticity shall be tested in accordance with Section 6.7.1 and shall meet the values specified in Table 3.

*8.3*4*.1.2* Glue bond durability shall be established based on tests conducted in accordance with Section 6.2.4.1 of PS 2 or CSA O325.

*8.3*4*.1.3* Thickness swell shall be tested for quality assurance. The mean thickness swell for the quality assurance sample shall not exceed 10% and no individual value shall exceed 12%.

*8.3*4*.1.4* Density control value shall be established from qualification, as specified in Section 5.4.4. The minimum control value shall be established as follows:

Minimum density = Mean density – 2.1 x standard deviation

For quality control purposes, the density based on weight and volume at typical environmental conditions of the manufacturing facility shall be established.

8.3̶4̶.1.5 Internal bond control value shall be established based on ASTM D1037 from qualification, as specified in Section 5.4.5. The minimum control value shall be established as follows:

Minimum internal bond = Mean internal bond – 2.1 x standard deviation

8.3̶4̶.2 Plywood panels

8.3̶4̶.2.1 Specification for species, thickness, and grade shall be established in accordance with PS 1, PS 2, CSA O121, or CSA O151.

8.3̶4̶.2.2 Glue bond durability tests shall be conducted in accordance with Section 6.1.3 of PS 1, Sections 6.2.4.1, 6.3, and 6.3.4.3 of PS 2, or equivalent sections in CSA O121 or CSA O151.

8.3̶4̶.3 Glulam

8.3̶4̶.3.1 Specification for mechanical properties shall be established based on ANSI/̶A̶I̶T̶C̶ A190.1 and the principles set forth in ASTM D3737.

8.3̶4̶.3.2 Glue bond durability tests shall be conducted in accordance with Section 5.6.2 of ANSI/̶A̶I̶T̶C̶ A190.1.

8.3̶4̶.4 Structural composite lumber

8.3̶4̶.4.1 Control values for mechanical properties shall be established based on the principles set forth in ASTM D5456.

8.3̶4̶.4.2 Glue bond durability tests shall be conducted in accordance with Section 10.4 of ASTM D5456.

Annex A
Design Properties for ANSI/APA PRR 410 Engineered Wood Rim Boards

Table A1. ~~Allowable~~ ASD Reference Design Values [a] for Engineered Wood Rim Boards

Rim Board Grade	Performance Category or Nominal Thickness[b]	H[c] (lbf/ft)	V[d] (lbf/ft)								Z[e] (lbf)	P[f] (lbf)
			Depth[d] Limitation (in.)									
		d ≤ 24	9-1/2	11-7/8	14	16	18	20	22	24	d ≤ 24	d ≤ 24
A	1-1/4 or higher	240	5,400	5,400	5,400	5,150	4,650	4,150	3,650	3,200	350	3,500
B1	1-1/4 or higher	200	5,400	5,400	5,400	5,150	4,650	4,150	3,650	3,200	350	3,500
B2	1-1/8 or higher	200	4,850	4,850	4,850	4,850	4,650	4,150	3,650	3,200	350	3,500
C1	1-1/8 or higher	180	4,850	4,850	4,850	~~4,400~~ 4,850	4,650	4,150	3,650	~~3,000~~ 3,200	350	3,500
C2	1 or higher	180	4,300	4,300	3,900	3,300	2,750	2,300	1,950	1,650	300	3,500

For SI: 1 in. = 25.4 mm, 1 lbf/ft = 0.0146 N/mm, 1 lbf = 4.448 N

[a] The allowable values are the mean test values specified in Table 2 of this standard multiplied by the adjustment factor provided below:
    Horizontal load transfer capacity (H): 1/2.8
    Uniform vertical load capacity (V) and concentrated vertical load capacity (P): 1/2.5 for standard moisture conditions or 1/3 for as-received moisture conditions
    Lag screw lateral resistance (Z): 1/5 for standard moisture conditions or 1/6.25 for as-received moisture conditions

These design values are applicable only to rim board applications in compliance with the connection requirements tested in this standard. All design values are applicable to the normal load duration (10 years) for wood products, except for the horizontal load transfer capacity (H), which is based on the short-term load duration (10 minutes). Design values shall be adjusted for other load durations in accordance with the applicable building code except that the uniform vertical (compression) load capacity (V) and concentrated vertical load capacity (P) are not permitted to be increased for any load durations shorter than the normal load duration (10 years). Toe-nailed connections are not limited by the 150 lbf/ft lateral load capacity noted for Seismic Design Categories D, E and F in Section ~~4.1.7~~ 4.1.10 of the SDPWS.

[b] Performance categories ~~listed in this standard~~ for wood structural panel rim boards or nominal thickness for structural composite lumber and structural glued-laminated timber rim boards in accordance with Section 4.1.

[c] H = The horizontal (shear) load transfer capacity based on the attachment schedule specified in this standard. This capacity represents the total of the lateral loads transferred through the rim board by both the floor sheathing and wall plate above the floor sheathing. H is based on qualification tests and is not subject to the limitations specified in Section ~~4.1.7~~ 4.1.10 of the SDPWS. H is permitted to be increased by a factor of 1.4 when subjected to wind loads.

[d] V = The uniform vertical (compression) load capacity, which shall be simultaneously satisfied along with the concentrated vertical load capacity.

[e] Z = The lateral resistance of a 1/2-inch (12.7-mm) diameter lag screw in compliance with the connection requirements tested in this standard.

[f] P = The concentrated vertical load capacity based on a 4-1/2-inch (114-mm) bearing length.

Table A1A. ~~Limit States Design Values~~ LSD Factored Resistances [a] for Engineered Wood Rim Boards

Rim Board Grade	Performance Category or Nominal Thickness [b]	H_r [c] (lbf/ft)	V_r [d] (lbf/ft)								Z_r [e] (lbf)	P_r [f] (lbf)
		d ≤ 24	Depth [d] (d) Limitation (in.)								d ≤ 24	d ≤ 24
			9-1/2	11-7/8	14	16	18	20	22	24		
A	1-1/4 or higher	~~313~~ 292	7,830	7,830	7,830	~~8,590~~ 7,468	6,743	6,018	5,293	~~5,338~~ 4,640	584	~~5,838~~ 5,075
B1	1-1/4 or higher	~~261~~ 243	7,830	7,830	7,830	~~8,590~~ 7,468	6,743	6,018	5,293	~~5,338~~ 4,640	584	~~5,838~~ 5,075
B2	1-1/8 or higher	~~261~~ 243	7,033	7,033	7,033	~~8,090~~ 7,033	6,743	6,018	5,293	~~5,338~~ 4,640	584	~~5,838~~ 5,075
C1	1-1/8 or higher	~~235~~ 219	7,033	7,033	7,033	~~7,339~~ 7,033	6,743	6,018	5,293	~~5,004~~ 4,640	584	~~5,838~~ 5,075
C2	1 or higher	~~235~~ 219	6,235	6,235	5,655	~~5,504~~ 4,785	3,988	3,335	2,828	~~2,752~~ 2,393	500	~~5,838~~ 5,075

For SI: 1 in. = 25.4 mm, 1 lbf/ft = 0.0146 N/mm, 1 lbf = 4.448 N

[a] These design values are applicable to standard-term load duration and permitted to be adjusted for other load durations in accordance with the applicable building code except that the uniform vertical (compression) load capacity (V_r) and concentrated vertical load capacity (P_r) are not permitted to be increased for any load durations shorter than the standard-term load duration. Factors for ASD to LSD conversion are shown in Appendix B.

[b] Performance categories ~~listed in this standard~~ for wood structural panel rim boards or nominal thickness for structural composite lumber and structural glued-laminated timber rim boards in accordance with Section 4.1.

[c] H_r = Factored horizontal (shear) load transfer resistance (ϕH) based on the attachment schedule specified in this standard. This capacity represents the total of the lateral loads transferred through the rim board by both the floor sheathing and wall plate above the floor sheathing.

[d] V_r = Factored uniform vertical (compression) load resistance (ϕV).

[e] Z_r = Factored lateral resistance (ϕZ) of a 1/2-inch (12.7-mm) diameter lag screw in compliance with the connection requirements tested in this standard.

[f] P_r = Factored concentrated vertical load resistance (ϕP) based on a 4-1/2-inch (114-mm) bearing length.

Table A2. ~~Allowable~~ ASD Reference Edgewise Bending Properties [a] for Engineered Wood Rim Boards [b]

Grade	$F_{be, ASD}$ [c] (psi)	E_e [d] (psi)	$F_{ve, ASD}$ [e] (psi)	$F_{c\perp e, ASD}$ [f] (psi)
All	600	550,000	140	500

For SI: 1 psi = 6.8948 kPa

[a] The design values are intended for use in Allowable Stress Design (ASD) in the U.S. Higher design values shall be permitted in accordance with this standard when approved by ~~a qualified agency defined in Section 7.3.2~~ an approved agency defined in Section 3.2.

[b] The allowable design values are derived by dividing the characteristic test values specified in Table 3 of this standard by an adjustment factor specified below. The F_{be} and F_{ve} values are applicable to the normal load duration (10 years) for wood products and permitted to be adjusted for other load durations in accordance with the applicable building code.

[c] ASD edgewise bending stress, $F_{be, ASD} = f_{be,0.05} / 2.1$

[d] Edgewise bending modulus of elasticity, $E_e = E_{e,0.5} / 1.0$

[e] ASD edgewise shear stress, $F_{ve, ASD} = f_{ve,0.05} / 3.15$

[f] ASD edgewise compressive stress perpendicular to grain, $F_{c\perp e, ASD} = f_{c\perp e,0.5} / 1.67$

Table A2A. LSD Specified Edgewise Bending Properties [a] for Engineered Wood Rim Boards [b]

Grade	$f_{be, LSD}$ [c]	E_e [d]	$f_{ve, LSD}$ [e]	$f_{c\perp e, LSD}$ [f]
All	7.6 MPa or 1,110 psi	3,793 MPa or 550,000 psi	1.8 MPa or 260 psi	6.3 MPa or 910 psi

[a] The design values are intended for use in Limit States Design (LSD) in Canada. Higher design values shall be permitted in accordance with this standard when approved by ~~a qualified agency defined in Section 7.3.2~~ an approved agency defined in Section 3.2.

[b] The LSD design values are derived by multiplying the ASD values published in Table A2 by a conversion factor provided below. The specified strength values are applicable to standard-term load duration for wood products and permitted to be adjusted for other load durations in accordance with the applicable building code.

[c] LSD specified edgewise bending strength, $f_{be, LSD} = 1.848 F_{be, ASD}$. For factored resistance, use a resistance factor (ϕ) for $f_{be, LSD}$ of 0.9.

[d] Edgewise bending modulus of elasticity, E_e.

[e] LSD specified edgewise shear stress, $f_{ve, LSD} = 1.859 F_{ve, ASD}$. For factored resistance, use a resistance factor (ϕ) for $f_{ve, LSD}$ of 0.9.

[f] LSD specified edgewise compressive stress perpendicular to grain, $f_{c\perp e, LSD} = 1.820 F_{c\perp e, ASD}$. For factored resistance, use a resistance factor (ϕ) for $f_{c\perp e, LSD}$ of 0.8.

Annex B
PRR 410 Rim Boards Used to Span an Opening for Rim Boards Manufactured from Mat-Formed and Composite Panels, and Plywood Qualified in Accordance with PS 2 or CSA O325

TABLE B1

Change to "PS 2" (add a space)

ALLOWABLE LOADS FOR RIM BOARDS MANUFACTURED FROM MAT-FORMED AND COMPOSITE PANELS, AND PLYWOOD QUALIFIED IN ACCORDANCE WITH PS2 OR CSA O325 WHEN USED TO SPAN AN OPENING (LOAD DURATION FACTOR C_D = 1.0)

Load Condition	Size	Span (L)					Size	Span (L)				
		L ≤ 24"	24" < L ≤ 30"	30" < L ≤ 36"	36" < L ≤ 42"	42" < L ≤ 48"		L ≤ 24"	24" < L ≤ 30"	30" < L ≤ 36"	36" < L ≤ 42"	42" < L ≤ 48"
Total Load (lbf/ft)	1" x 9-1/2"	780	640	540	420	350	1-1/8" x 9-1/2"	880	720	610	470	390
Min. End Bearing (in.)		3.0	3.0	3.0	3.0	1.5		3.0	3.0	3.0	3.0	1.5
Total Load (lbf/ft)	2 plies 1" x 9-1/2"	1,570	1,280	1,080	850	700	2 plies 1-1/8" x 9-1/2"	1,760	1,440	1,220	950	780
Min. End Bearing (in.)		3.0	3.0	3.0	3.0	1.5		3.0	3.0	3.0	3.0	1.5
Total Load (lbf/ft)	1" x 11-7/8"	980	800	670	580	510	1-1/8" x 11-7/8"	1,100	900	760	660	580
Min. End Bearing (in.)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Total Load (lbf/ft)	2 plies 1" x 11-7/8"	1,960	1,600	1,350	1,170	1,030	2 plies 1-1/8" x 11-7/8"	2,200	1,800	1,520	1,320	1,160
Min. End Bearing (in.)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Total Load (lbf/ft)	2 plies 1" x 14"	2,310	1,890	1,590	1,380	1,220	2 plies 1-1/8" x 14"	2,600	2,120	1,790	1,550	1,370
Min. End Bearing (in.)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Total Load (lbf/ft)	2 plies 1" x 16"	2,640	2,160	1,820	1,580	1,390	2 plies 1-1/8" x 16"	2,970	2,430	2,050	1,780	1,570
Min. End Bearing (in.)		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0
Total Load (lbf/ft)	2 plies 1" x 18"	2,810	2,320	1,980	1,720	1,520	2 plies 1-1/8" x 18"	3,170	2,610	2,220	1,930	1,710
Min. End Bearing (in.)		4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Total Load (lbf/ft)	2 plies 1" x 20"	3,130	2,580	2,200	1,910	1,690	2 plies 1-1/8" x 20"	3,520	2,900	2,470	2,150	1,900
Min. End Bearing (in.)		4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Total Load (lbf/ft)	2 plies 1" x 22"	3,300	2,840	2,420	2,100	1,860	2 plies 1-1/8" x 22"	3,870	3,190	2,720	2,360	2,090
Min. End Bearing (in.)		4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Total Load (lbf/ft)	2 plies 1" x 24"	3,300	3,100	2,640	2,290	2,030	2 plies 1-1/8" x 24"	4,220	3,480	2,970	2,580	2,280
Min. End Bearing (in.)		4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5	4.5	4.5

For SI: 1 lbf/ft = 0.0146 N/m, 1 inch = 25.4 mm

(a) This table is for preliminary design use only. Final design shall include a complete analysis.

(b) For dry service conditions where the average equilibrium moisture content of solid-sawn lumber is less than 16%.

(c) The table is developed based on design properties tabulated in Table A2A with a maximum depth-to-width ratio of 12 and an assumed uniform load. The shear load includes the load within a distance from supports equal to the Rim Board depth.

(d) Simply supported beam subjected to uniform loads only. Span is distance measured between inside faces of opening. Connect the 2-ply Rim Boards with a minimum of 3 rows of 8d box nails (0.113 inch x 2-1/2 inches) at 6 inches on center for 11-7/8 inches or less in depth, 4 rows of 8d box nails at 6 inches on center for 16 inches and 18 inches in depth, 5 rows of 8d box nails at 6 inches on center for 20 inches and 22 inches in depth, and 6 rows of 8d box nails at 6 inches on center for 24 inches in depth. Clinch the nails whenever possible.

(e) Tabulated values represent total loads permitted in addition to the dead weight of the Rim Board (assumed 45 pcf).

(f) Joints in Rim Board shall not be located within opening.

(g) For openings greater than 4 feet in length, use glulam, SCL, or other engineered wood products.

Change to "PS 2" (add a space)

TABLE B1A
MAXIMUM LIMIT STATES FACTORED LOADS FOR PRR 410 RIM BOARDS MANUFACTURED FROM MAT-FORMED AND COMPOSITE PANELS, AND PLYWOOD QUALIFIED IN ACCORDANCE WITH ~~PS2~~ OR CSA O325 WHEN USED TO SPAN AN OPENING (STANDARD-TERM LOAD DURATION K_D = 1.0)

Load Condition	Size	Span (L)					Size	Span (L)				
		L ≤ 610 mm	610 mm < L ≤ 762 mm	762 mm < L ≤ 914 mm	914 mm < L ≤ 1067 mm	1067 mm < L ≤ 1220 mm		L ≤ 610 mm	610 mm < L ≤ 762 mm	762 mm < L ≤ 914 mm	914 mm < L ≤ 1067 mm	1067 mm < L ≤ 1220 mm
Total Load (kN/m)	25 x 241 mm	19.0	15.6	13.2	10.4	8.1	29 x 241 mm	21.4	17.5	14.8	11.7	9.1
Min. End Bearing (mm)		76	76	76	76	76		76	76	76	76	76
Total Load (kN/m)	2 plies 25 x 241 mm	38.0	31.1	26.3	20.7	16.1	2 plies 29 x 241 mm	42.8	35.0	29.6	23.3	18.1
Min. End Bearing (mm)		76	76	76	76	76		76	76	76	76	76
Total Load (kN/m)	25 x 302 mm	23.8	19.4	16.4	14.2	12.6	29 x 302 mm	26.8	21.9	18.5	16.0	14.1
Min. End Bearing (mm)		76	76	76	76	76		76	76	76	76	76
Total Load (kN/m)	2 plies 25 x 302 mm	47.6	38.9	32.9	28.5	25.1	2 plies 29 x 302 mm	53.5	43.8	37.0	32.1	28.3
Min. End Bearing (mm)		76	76	76	76	76		76	76	76	76	76
Total Load (kN/m)	2 plies 25 x 356 mm	53.1	43.8	37.3	32.5	28.8	2 plies 29 x 356 mm	59.7	49.3	42.0	36.6	32.4
Min. End Bearing (mm)		114	114	114	114	114		114	114	114	114	114
Total Load (kN/m)	2 plies 25 x 406 mm	60.7	50.1	42.7	37.1	32.9	2 plies 29 x 406 mm	68.3	56.4	48.0	41.8	37.0
Min. End Bearing (mm)		114	114	114	114	114		114	114	114	114	114
Total Load (kN/m)	2 plies 25 x 457 mm	68.3	56.4	48.0	41.8	37.0	2 plies 29 x 457 mm	76.8	63.4	54.0	47.0	41.6
Min. End Bearing (mm)		114	114	114	114	114		114	114	114	114	114
Total Load (kN/m)	2 plies 25 x 508 mm	75.9	62.6	53.3	46.4	41.1	2 plies 29 x 508 mm	85.4	70.5	60.0	52.2	46.2
Min. End Bearing (mm)		114	114	114	114	114		114	114	114	114	114
Total Load (kN/m)	2 plies 25 x 559 mm	80.4	68.9	58.7	51.1	45.2	2 plies 29 x 559 mm	93.9	77.5	66.0	57.5	50.9
Min. End Bearing (mm)		114	114	114	114	114		114	114	114	114	114
Total Load (kN/m)	2 plies 25 x 610 mm	80.4	72.0	61.7	54.0	47.9	2 plies 29 x 610 mm	97.3	81.0	69.4	60.7	53.9
Min. End Bearing (mm)		114	152	152	152	152		152	152	152	152	152

For English Units: 1 kN/m = 68.5 lbf/ft, 1 mm = 0.0394 in.

(a) This table is for preliminary design use only. Final design shall include a complete analysis.

(b) For dry service conditions where the average equilibrium moisture content of solid-sawn lumber over a year is 15 percent or less, and does not exceed 19 percent.

(c) The table is developed based on design properties tabulated in Table A2A with a maximum depth-to-width ratio of 12 and an assumed uniform load. The shear load includes the load within a distance from supports equal to the Rim Board depth.

(d) Simply supported beam subjected to uniform loads only. Span is distance measured between inside faces of opening. Connect the 2-ply Rim Boards with a minimum of 3 rows of 8d box nails (0.113 inch x 2-1/2 inches) at 152 mm (6 inches) on center for 302 mm (11-7/8 inches) or less in depth, 4 rows of 8d box nails at 152 mm (6 inches) on center for 406 mm (16 inches) and 457 mm (18 inches) in depth, 5 rows of 8d box nails at 152 mm (6 inches) on center for 508 mm (20 inches) and 559 mm (22 inches) in depth, and 6 rows of 8d box nails at 152 mm (6 inches) on center for 610 mm (24 inches) in depth. Clinch the nails whenever possible.

(e) Tabulated values represent total loads permitted in addition to the dead weight of the rim board (assumed 0.72 g/cm³ or 45 pcf).

(f) Joints in rim board shall not be located within opening.

(g) For openings greater than 1.2 m (4 feet) in length, use glulam, SCL, or other engineered wood products.

Appendix A

History of Standard (Non-Mandatory)

In May 2009, the APA Standards Committee on Standard for Performance-Rated Engineered Wood Rim Boards was formed to develop a national standard under the consensus processes accredited by the American National Standards Institute (ANSI). This national consensus standard, designated as ANSI/APA PRR 410-2010, was developed based on the *Performance Standard for APA EWS Rim Boards*, APA PRR-401®, which had been in use by the engineered woods industry in North America since 1994.

In 2011, the Standard Committee revised the standard as ANSI/APA PRR 410-2011 for consistency with ASTM D7672, which applies to proprietary wood rim board products.

In 2016, the ANSI/APA PRR 410-2011 standard was reviewed, and revised, and published as ANSI/APA PRR 410-2016 to incorporate edgewise bending properties.

In 2021, the ANSI/APA PRR 410-2016 standard was reviewed, revised, and published as ANSI/APA PRR 410-2021 to add the uniform vertical load capacities for rim board depths between 9-1/2 inches (241 mm) and 24 inches (610 mm), clarify the dimension and dimensional tolerances of structural glued laminated timber rim boards, and update the conversion factors for the Limit States Design factored resistances.

The names of the ANSI/APA PRR 410 Committee members when this standard is published are as follows. The current list of the committee membership is available from the committee secretariat upon request.

[Secretariat Note]: The Committee Roster will be updated before the revised standard is published.

Inquiries or suggestions for improvement of this standard should be directed to:

Secretariat, ANSI/APA PRR 410

APA – The Engineered Wood Association

7011 South 19th Street, Tacoma, WA 98466

www.apawood.org

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Appendix B

ASD-to-LSD Conversion Factors (Non-Mandatory)

B1. Horizontal Load Capacities (H)

Note: *The conversion factor for rim board horizontal load capacities follows the same procedures used to convert the shearwall values published in Clause 9 of CSA O86.*

$$\text{LSD:} \quad \phi\, K_{D,LSD}\, H_{LSD,standard\text{-}term} \geq \alpha_Q Q \qquad \text{[B1-1]}$$

$$\text{ASD:} \quad H_{ASD,short\text{-}term} \geq Q \qquad \text{[B1-2]}$$

where

ϕ	= resistance factor = ~~0.7~~ 0.8 for nailed shearwalls and rim boards
$K_{D,LSD}$	= LSD load duration factor = 1.15 for LSD short-term loading
α_Q	= LSD load factor = ~~1.5~~ 1.4 for wind
Q	= applied load
$H_{LSD,standard\text{-}term}$	= LSD specified horizontal load capacity for LSD standard-term load duration
$H_{ASD,short\text{-}term}$	= ASD allowable horizontal load capacity for ASD short-term (10-minute) load duration

From Equations B1-1 and B1-2,

$$\phi\, H_{LSD,standard\text{-}term} = \frac{\alpha_Q}{K_{D,LSD}} H_{ASD,short-term}$$

$$= \frac{1.4}{1.15} H_{ASD,short-term} \qquad \cancel{= \frac{1.5}{1.15} H_{ASD,short-term}}$$

$$= 1.217 \;\cancel{1.304}\; H_{ASD,short\text{-}term} \qquad \text{[B1-3]}$$

As a result, the conversion factor for the factored horizontal load capacities, ϕH_{LSD}, from the ASD horizontal load capacities in the short-term (10-minute) load duration, $H_{ASD,short\text{-}term}$, is 1.217. ~~1.304.~~ Note that the converted ϕH_{LSD} is based on LSD standard-term but not short-term load duration.

B2. Uniform Vertical Load Capacities (V)

$$\text{LSD:} \quad \phi\, K_{D,LSD}\, V_{LSD} \geq \alpha_D Q_D + \alpha_L Q_L \qquad \text{[B2-1]}$$

$$\text{ASD:} \quad K_{D,ASD}\, V_{ASD} \geq Q_D + Q_L \qquad \text{[B2-2]}$$

where

ϕ	= resistance factor = 0.95 for compression member
$K_{D,LSD}$	= LSD load duration factor = 1.0 for LSD standard-term loading
V_{LSD}	= LSD specified uniform vertical load capacity for standard-term load duration
α_D	= LSD dead load factor = 1.25
Q_D	= applied dead load
α_L	= LSD live load factor = 1.5
Q_L	= applied live load
$K_{D,ASD}$	= ASD load duration factor = ~~1.15 under roof snow load~~ 1.0 (uniform vertical load is not permitted for load duration increase in the allowable stress design)
V_{ASD}	= ASD allowable uniform vertical load capacity for ASD normal load duration

Assuming $Q_L/Q_D = \gamma$, from Equations B2-1 and B2-2,

$$\phi V_{LSD} = \frac{\alpha_D + \gamma\alpha_L}{K_{D,LSD}(1+\gamma)} K_{D,ASD} V_{ASD} \qquad \text{[B2-3]}$$

When calibrated to $Q_L/Q_D = \gamma = 4.0$ in accordance with the practice adopted by CSA O86,

$$\phi V_{LSD} = \frac{1.25 + 4\times1.5}{1.0\times(1+4)} \times 1.15 \times V_{ASD} \frac{1.25 + 4 \times 1.5}{1.0 \times (1 + 4)} \times 1.0 \times V_{ASD}$$

$$= \cancel{1.668}\ 1.45\ V_{ASD} \qquad \text{[B2-4]}$$

For uniform vertical load capacities, a relative humidity effect factor of 0.85 that is applied to sheathing panels to account for the difference in the relative humidity of 80% (the basis for CSA O86) and 65% (the standard relative humidity for ASD) for wood structural-~~use~~ panels given in CSA O86 is not required for ~~rimboards~~ rim boards due to the location of the ~~rimboard~~ rim boards within the wall assembly. Therefore, the conversion factor for the factored uniform vertical load capacities, ϕV_{LSD}, is ~~1.668~~ 1.45.

B3. Concentrated Vertical Load Capacities (*P*)

The conversion factor for the factored concentrated vertical load capacities, ϕP_{LSD}, is the same as the factored uniform vertical load capacities: ~~1.668~~ 1.45.

B4. Lag Screw Capacities (*Z*)

The derivation of lag screw conversion factor follows the same procedures as the factored uniform vertical load capacities, as shown in Equation B2-4 with the exception that $K_{D.ASD} = 1.15$ under roof snow load. Therefore, the LSD factored lag screw capacities, ϕZ_{LSD}, are equal to 1.668 times the ASD lag screw capacities.