APA PRODUCT REPORT®

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QB Structural Glued Laminated Timber and QB RIM — PR-L305
QB Corporation — Revised February 10, 2025

Products: QB 30F-E3 2.1E 650$F_{c\perp}$ Glulam and QB RIM
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1. Basis of the product report:
   - 2024 International Building Code (IBC): Sections 104.2.3 Alternative materials and 2303.1.3 Structural glued-laminated timber
   - 2021, 2018, and 2015 IBC: Sections 104.11 Alternative materials and 2303.1.3 Structural glued laminated timber
   - 2024 International Residential Code (IRC): Sections R104.2.2 Alternative materials, and R502.1.3, R602.1.3, and R802.1.2 Structural glued-laminated timbers
   - 2021, 2018, and 2015 IRC: Sections R104.11 Alternative materials, and R502.1.3, R602.1.3, and R802.1.2 Structural glued laminated timber
   - ANSI 117-2020 and ANSI 117-2015 recognized in the 2024 and 2021 IBC and IRC, and 2018 IBC and IRC, respectively
   - ANSI A190.1-2022, ANSI A190.1-2017, and ANSI A190.1-2012 recognized in the 2024 IBC and IRC, 2021 and 2018 IBC and IRC, and 2015 IBC and IRC, respectively
   - 2021 ANSI/AWC Special Design Provisions for Wind and Seismic (SDPWS)
   - ASTM D3737-18e1 and D3737-12 recognized in the 2024 and 2021 IBC and IRC, and 2018 and 2015 IBC and IRC, respectively
   - ASTM D7672-19, D7672-14e1, D7672-14, and D7672-12 recognized in the 2024 IBC and IRC, 2021 IBC and IRC, 2018 IBC and IRC, and 2015 IBC and IRC, respectively
   - APA Reports T2011P-72 and T2019P-31, and other qualification data

2. Product description:
   QB 30F-E3 2.1E 650$F_{c\perp}$ glulam beams are used as beams, headers, rafters, or purlins, and are manufactured with a proprietary balanced layup combination documented in the in-plant manufacturing standard. QB 30F-E3 glulam beams use conventional laminating lumber grades of Douglas fir-Larch in the tension and compression zones, and Southern pine in the core with the exception that the outermost tension and outermost compression laminations are made of laminated veneer lumber (LVL), as permitted by ANSI A190.1. The LVL laminations are supplied by manufacturers recognized by APA and identified in QB's in-plant manufacturing standard approved by APA. The LVL complies with the control values listed in the manufacturing standard and is manufactured in full length and width laminations, and in net thicknesses of 1-1/2 inches from wood veneers. All veneer grain is parallel to the length of the billets. The LVL is bonded with another LVL or lumber laminations using exterior-type adhesives in compliance with ANSI 405. QB 30F-E3 glulam beams have a minimum depth of 7-1/4 inches and a maximum depth of 48 inches.

   QB RIM is a glulam rim board manufactured in accordance ANSI A190.1 (www.apawood.org/resource-library) using Combination 1 (L3/DF) and then resawn to a specific thickness without re-grading. The depth of QB RIM shall be 20 inches or less.

3. Design properties:
   Table 1 lists the allowable design properties for QB 30F-E3 glulam beams. The allowable spans for QB 30F-E3 glulam beams shall be in accordance with the recommendations provided by the manufacturer (www.qbcorp.com), and APA Data File: *Glued Laminated Beam Design Tables*, Form S475 (see link above), as applicable. Table 2 lists the allowable

properties for QB RIM in rim board applications. The allowable bending stress, tensile stress, and compressive stress parallel to grain for Combination 1 glulam may not be applicable to QB RIM.

4. Product installation:
QB 30F-E3 glulam beams shall be installed in accordance with the recommendations provided by the manufacturer and APA Construction Guide: *Glulam Connection Details*, Form T300 (see link above). Permissible field notching and drilling shall be in accordance with the recommendations provided by the manufacturer, and APA Technical Notes: *Field Notching and Drilling of Glued Laminated Timber Beams*, Form S560, and *Effect of Large Diameter Horizontal Holes on the Bending and Shear Properties of Structural Glued Laminated Timber*, Form V700 (see link above).

   QB RIM shall be installed in accordance with the recommendations provided by the manufacturer. Permissible field notching and drilling shall be in accordance with the recommendations provided by the manufacturer.

5. Fire-rated assemblies:
Design of fire-resistant exposed wood members in accordance with Chapter 16 of the National Design Specification for Wood Construction (NDS), or Section 722.1 of the 2024, 2021, 2018, and 2015 IBC shall be applicable to QB 30F-E3 glulam beams. Fire-rated assemblies shall be constructed in accordance with the recommendations provided by the manufacturer, and APA Design and Construction Guide: *Fire-Rated Systems*, Form W305 (see link above).

   The provisions of 2024, 2021, 2018, and 2015 IBC Section 722 Calculated fire resistance shall be applicable to QB RIM. Fire-rated rim board assemblies shall be constructed in accordance with the recommendations provided by APA Data File: *APA Rim Board in Fire-Rated Assemblies*, Form D350 (see link above) or the manufacturer.

6. Limitations:
   a) QB 30F-E3 glulam beams shall be designed in accordance with the code using the design properties specified in this report. QB RIM shall be designed in accordance with the applicable code using the design properties specified in this report.
   b) QB 30F-E3 glulam beams shall have a minimum depth of 7-1/4 inches and a maximum depth of 48 inches.
   c) QB RIM shall be limited to 1-1/2 to 5-1/2 inches in thickness and a maximum of 20 inches in depth.
   d) QB RIM shall be limited to applications where the rim board is continuously supported for the full length and thickness of the product.
   e) QB RIM is limited to dry service conditions where the average equilibrium moisture content of solid-sawn lumber is less than 16%.
   f) QB RIM shall not be resized for depth or thickness (width). Field modifications (i.e., cuts, notches, planing…, etc.) to the rim board depth or thickness (width) shall not be permitted unless specifically approved by QB, as applicable.
   g) QB RIM with a minimum thickness of 3-1/2 inches shall be permitted to be labeled with ANSI/APA PRR 410-2021 Grade B1 when the rim board meets the depth requirements of Sections 4.2.1 and 4.2.2 and is labeled in accordance with Section 7.3.2(g) of the standard. QB RIM with a minimum thickness of less than 3-1/2 inches shall not be permitted to be labeled with ANSI/APA PRR 410-2021.
   h) QB 30F-E3 glulam beams and QB RIM are produced at QB's Salmon, Idaho facilities under a quality assurance program audited by APA.
   i) This report is subject to re-examination in one year.

7. Identification:
   QB 30F-E3 glulam beams and QB RIM described in this report are identified by a label bearing the manufacturer's name (QB) and/or trademark, the APA assigned plant number (1102), the product standard (ANSI A190.1), the APA logo, the combination symbol, the report number PR-L305, and a means of identifying the date of manufacture.

Table 1. Allowable Design Values for QB 30F-E3 Glulam Beams for Normal Duration of Load[1,2]

Symbol	Species Outer/ Core[3] (Bal or Unbal[4])	**Bending About X-X Axis** (Loaded Perpendicular to Wide Faces of Laminations)								**Bending About Y-Y Axis** (Loaded Parallel to Wide Faces of Laminations)						**Axially Loaded**		**Fasteners**	
		Extreme Fiber in Bending[5]		Compression Perpendicular to Grain		Shear Parallel to Grain[6]	Modulus of Elasticity[7]			Extreme Fiber in Bending[8]	Comp. Perpen-dicular to Grain	Shear Parallel to Grain[6]	Modulus of Elasticity[7]			Tension Parallel to Grain	Comp. Parallel to Grain	Specific Gravity for Dowel-Type Fastener Design	
		Bottom of Beam Stressed in Tension (Positive Bending)	Top of Beam Stressed in Tension (Negative Bending)	Ten. Face	Comp. Face		True	App-arent	Beam Stabi-lity				True	App-arent	Beam Stabi-lity			Top or Bottom Face	Side Face
		F_{bx}^+ (psi)	F_{bx}^- (psi)	$F_{c\perp x}$ (psi)		F_{vx} (psi)	$E_{x\ true}$ (10^6 psi)	$E_{x\ app}$ (10^6 psi)	$E_{x\ min}$ (10^6 psi)	F_{by} (psi)	$F_{c\perp y}$ (psi)	F_{vy} (psi)	$E_{y\ true}$ (10^6 psi)	$E_{y\ app}$ (10^6 psi)	$E_{y\ min}$ (10^6 psi)	F_t (psi)	F_c (psi)	SG	
QB 30F-E3 2.1E 650$F_{c\perp}$[9]	LVL/DF/ SP (B)	3,000	3,000	650[10]	650[10]	300	2.2	2.1	1.11	1,700	650	230	2.1	2.0	1.06	1,350	1,750	0.50	0.50
Wet-use factor		0.8		0.53		0.875	0.833			0.8	0.53	0.875	0.833			0.8	0.73	see NDS	

(1) The combinations in this table are intended primarily for members stressed in bending due to loads applied perpendicular to the wide faces of the laminations. Allowable design values are tabulated, however, for loading both perpendicular and parallel to the wide faces of the laminations.
(2) The tabulated allowable design values are for normal duration of loading. For other durations of loading, see the applicable building code. The tabulated allowable design values are for dry conditions of use. For wet conditions of use, multiply the tabulated values by the wet-use factors shown at the bottom of the table.
(3) DF = Douglas fir-Larch, SP = Southern pine, and LVL = Laminated veneer lumber in accordance with the manufacturing standard.
(4) The unbalanced (U) layup is intended primarily for simple-span applications and the balanced (B) layup is intended primarily for continuous or cantilevered applications.
(5) The values of F_{bx} are based on members 5-1/8 inches in width by 12 inches in depth by 21 feet in length. For members with a larger volume, F_{bx} shall be multiplied by a volume factor, $C_v = (5.125/b)^{1/10}\ (12/d)^{1/10}\ (21/L)^{1/10}$, where b is the beam width (in.), d is the beam depth (in.), and L is the beam length between the points of zero moment (ft).
(6) For non-prismatic members, members subject to impact or cyclic loading, or shear design of bending members at connections (2024 NDS 3.4.4.1 or 2018 and 2015 NDS 3.4.3.3), the F_{vx} and F_{vy} values shall be multiplied by a factor of 0.72. The tabulated F_{vy} values are for timbers with laminations made from a single piece of lumber across the width or multiple pieces that have been edge bonded. For timber manufactured from multiple piece laminations (across width) that are not edge bonded, value shall be multiplied by 0.4 for members with 5, 7, or 9 laminations or by 0.5 for all other members.
(7) The tabulated E values include true E (also known as "shear-free E"), apparent E, and E for beam stability calculation (NDS 3.3.3.8). For calculating beam deflections, the tabulated E_{app} values shall be used unless the shear deflection is determined in addition to bending deflection based on the tabulated E_{true}. The axial modulus of elasticity, E_{axial} and $E_{axial\ min}$, shall be equal to the tabulated $E_{y\ true}$ and $E_{y\ min}$ values.
(8) The values of F_{by} are based on members 12 inches in depth. For depths less than 12 inches, F_{by} shall be permitted to be increased by multiplying by the flat use factor, $(12/d)^{1/9}$, where d is the beam depth in inches. When d is less than 3 inches, use the size adjustment factor for 3 inches.
(9) The beam depths are limited to 7-1/4 to 48 inches.
(10) The value of $F_{c\perp}$ shall be permitted to be increased to the published value of the outermost LVL in the plank orientation if provided by the manufacturer.

Table 2. Allowable Design Properties for QB RIM[1,2]

Product	Thickness, t (in.)	Horizontal Load Transfer Capacity (lbf/ft)[3,4]	Vertical Load[5]						Lateral Resistance for 1/2-inch-dia. Lag Screws (lbf)[7]
			Uniform (lbf/ft)			Concentrated (lbf)[6]			
		Nails Spaced at 6 inches o.c.	Depths ≤ 11-7/8 in.	11-7/8 in. < Depth ≤ 14 in.	14 in. < Depth ≤ 20 in.	Depths ≤ 11-7/8 in.	11-7/8 in. < Depth ≤ 14 in.	14 in. < Depth ≤ 20 in.	
QB RIM	1-1/2 ≤ t < 3-1/2	220	2,700	2,600	NA	2,800	2,800	NA	425
	3-1/2 ≤ t ≤ 5-1/2	220	7,400	7,100	7,100	7,200	7,200	7,200	475

For SI: 1 inch = 25.4 mm, 1 lbf = 0.454 kg, 1 psi = 6.9 kPa.

(1) The rim board depth shall not exceed 20 inches. Only permitted in applications where the rim board is continuously supported for the full length and thickness of the product.
(2) All design values are applicable to the normal load duration (10 years) for wood products, except for the horizontal load transfer capacity, 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 load capacity and concentrated vertical load capacity are not permitted to be increased for any load durations shorter than the normal load duration (10 years). The horizontal load transfer capacity is permitted to be increased by a factor of 1.4 when subjected to wind loads. 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 4.1.10 of the 2021 SDPWS, and Section 4.1.7 of the 2015 and 2008 SDPWS.
(3) QB RIM shall be permitted to be substituted for solid-sawn framing in horizontal wood diaphragms as shown in Table 4.2A of the SDPWS, provided the maximum shear values for the diaphragms are limited to the allowable lateral capacity noted in this table.
(4) 8d common (0.131 x 2-1/2 inches) nails shall be used to connect the floor sheathing to QB RIM and to connect QB RIM to the sill plate (toenail). Two 8d box (0.113 x 2-1/2 inches) or common (0.131 x 2-1/2 inches) nails are required to connect each floor joist to the sill plate, and two 8d box (0.113 x 2-1/2 inches) or common (0.131 x 2-1/2 inches) nails are required to connect the 1-1/2-inch-thick QB RIM to the end of each floor joist. Slant nails shall be installed to connect the floor joist to the QB RIM that has a thickness greater than 1-1/2 inches.
(5) Compression perpendicular-to-grain capacities of the sill plate and floor sheathing must be checked and must not be exceeded.
(6) The concentrated vertical load capacity is based on a 4-1/2-inch bearing length.
(7) Capacity of lag screw connections between rim board and deck ledgers per lag screw of 1/2 inch in diameter when installed into the face of QB RIM, 2x spruce-pine-fir side member, and 1/2-inch-thick sheathing with a full penetration of the QB RIM of the lag screw. Minimum end distance of 4 inches is required

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