1. Basis of the product report:
   - 2012 IRC: Sections R104.11 Alternative materials, and R502.1.5, R602.1.2, and R802.1.4 Structural glued laminated timber
   - ASTM D3737-12 and D3737-08 recognized by the 2018 and 2015 IBC and IRC, and 2012 IBC and IRC, respectively
   - APA Report T2017P-36 and other qualification data

2. Product description:
   Rosboro glulam products are used as beams, headers, rafters, purlins, and columns, and are manufactured with the conventional layup combinations with the exception that the tension and compression laminations of 24F-V8M4/DF, 30F-E2M3/SP, and 30F-E/DF2 are substituted by laminated veneer lumber (LVL) in accordance with ANSI A190.1. The LVL laminations are supplied by manufacturers recognized by APA and identified in Rosboro’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 thicknesses up to 2 inches from wood veneers. All veneer grain is parallel to the length of the billets. The veneers are bonded with exterior-type adhesives, which comply with ASTM D2559 and ANSI 405.

3. Design properties:
   Allowable design properties for Rosboro glulam beams and columns are listed in Tables 1 and 2. The allowable spans for Rosboro glulam beams shall be in accordance with the recommendations provided by the manufacturer (www.rosboro.com/resource-library) and APA Glued Laminated Beam Design Tables, Form S475 (www.apawood.org/resource-library), as applicable. The allowable loads for Rosboro glulam columns shall be in accordance with the recommendations provided by the manufacturer (see link above), and APA Data File: Design of Structural Glued Laminated Timber Columns, Form Y240 (see link above), as applicable.

4. Product installation:
   Rosboro glulam beams and columns 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 Note: Field Notching and Drilling of Glued Laminated Timber Beams, Form S560 (see link above).
5. Fire-rated assemblies:
Fire-rated assemblies shall be constructed in accordance with the recommendations provided by the manufacturer and APA Design/Construction Guide: *Fire-Rated Systems*, Form W305 (see link above). For one- or two-hour rated glulam beams, the Rosboro glulam products shall be constructed in accordance with ANSI A190.1 and designed in accordance with the recommendations provided by the manufacturer and APA Technical Note: *Calculating Fire Resistance of Glulam Beams and Columns*, Form Y245 (see link above) or Chapter 16 of the 2018 National Design Specification for Wood Construction (NDS).

6. Limitations:
a) Rosboro glulam beams and columns listed in this report shall be designed in accordance with the code using the design properties specified in this report.
b) Rosboro 24F-V8M4/DF glulam beams shall have a minimum depth of 9-1/2 inches, 30F-E2M3/SP glulam beams shall have a minimum depth of 7-1/4 inches and a maximum depth of 48 inches, and 30F-E/DF2 glulam beams shall have a minimum depth of 7-1/4 inches and a maximum depth of 26 inches.
c) Rosboro glulam beams and columns listed in this report are produced at Rosboro, Springfield, OR and Veneta, OR facilities under a quality assurance program audited by APA.
d) This report is subject to re-examination in one year.

7. Identification:
Rosboro glulam beams and columns listed in this report are identified by a label bearing the manufacturer’s name (Rosboro) and/or trademark, the APA assigned plant number (1001 for Springfield or 1078 for Veneta), the product standard (ANSI A190.1), the APA logo, the combination symbol, the report number PR-L251, and a means of identifying the date of manufacture.
### Table 1. Allowable Design Values for Rosboro Glulam Beams for Normal Duration of Load *(1,2)*

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Species Outer/ Cover*(3) (Bal or Unbal)*(3)</th>
<th>Extreme Fiber in Bending*</th>
<th>Compression Perpendicular to Grain</th>
<th>Shear Perpendicular to Grain</th>
<th>Modulus of Elasticity*(7)</th>
<th>Extreme Fiber in Bending*</th>
<th>Comp. Perpendicular to Grain</th>
<th>Shear Parallel to Grain*</th>
<th>Modulus of Elasticity*(7)</th>
<th>Axially Loaded</th>
<th>Fasteners</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Bottom of Beam Stressed in Tension (Positive Bending)</td>
<td>Top of Beam Stressed in Tension (Negative Bending)</td>
<td>Ten. Face</td>
<td>Comp. Face</td>
<td>True</td>
<td>Apparent</td>
<td>Beam Stability</td>
<td>True</td>
<td>Apparent</td>
<td>Beam Stability</td>
</tr>
<tr>
<td>Rosboro 20F-V7/DF</td>
<td>DF/DF (B)</td>
<td>2,000</td>
<td>2,000</td>
<td>650</td>
<td>650</td>
<td>265</td>
<td>1.7</td>
<td>1.6</td>
<td>0.85</td>
<td>1,450</td>
<td>560</td>
</tr>
<tr>
<td>Rosboro 20F-V12</td>
<td>AC/AC (U)</td>
<td>2,000</td>
<td>1,400</td>
<td>560</td>
<td>560</td>
<td>265</td>
<td>1.6</td>
<td>1.5</td>
<td>0.79</td>
<td>1,250</td>
<td>470</td>
</tr>
<tr>
<td>Rosboro 20F-V13</td>
<td>AC/AC (B)</td>
<td>2,000</td>
<td>2,000</td>
<td>560</td>
<td>560</td>
<td>265</td>
<td>1.6</td>
<td>1.5</td>
<td>0.79</td>
<td>1,250</td>
<td>470</td>
</tr>
<tr>
<td>Rosboro 24F-V4/DF*(5)</td>
<td>DF/DF (B)</td>
<td>2,400</td>
<td>1,850</td>
<td>650</td>
<td>650</td>
<td>265</td>
<td>1.9</td>
<td>1.8</td>
<td>0.95</td>
<td>1,450</td>
<td>560</td>
</tr>
<tr>
<td>Rosboro 24F-V8/DF*(5)</td>
<td>DF/DF (B)</td>
<td>2,400</td>
<td>2,400</td>
<td>650</td>
<td>650</td>
<td>265</td>
<td>1.9</td>
<td>1.8</td>
<td>0.95</td>
<td>1,550</td>
<td>560</td>
</tr>
<tr>
<td>Rosboro 24F-V8/VD<em>C</em>(5)</td>
<td>LVL/DF (B)</td>
<td>2,400</td>
<td>2,400</td>
<td>510*(11)</td>
<td>510*(11)</td>
<td>265</td>
<td>1.9</td>
<td>1.8</td>
<td>0.95</td>
<td>1,550</td>
<td>560</td>
</tr>
<tr>
<td>Rosboro 30F-V8/M3<em>SP</em>(5)</td>
<td>LVL/SP (B)</td>
<td>3,000</td>
<td>3,000</td>
<td>650</td>
<td>650</td>
<td>300</td>
<td>2.2</td>
<td>2.1</td>
<td>1.11</td>
<td>1,750</td>
<td>650</td>
</tr>
<tr>
<td>Rosboro 30F-E2/M3<em>SP</em>(5)</td>
<td>LVL/DF (B)</td>
<td>3,000</td>
<td>3,000</td>
<td>650</td>
<td>650</td>
<td>265*(11)</td>
<td>2.2</td>
<td>2.1</td>
<td>1.11</td>
<td>1,550</td>
<td>560</td>
</tr>
</tbody>
</table>

**Notes:**

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. AC = Alaska cedar, 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*<sub>c</sub> 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*<sub>c</sub> shall be multiplied by a volume factor, *C*<sub>v</sub> = (5.125 b<sup>1/2</sup>)<sup>1/2</sup> (12/d)<sup>1/2</sup> (21/L)<sup>1/2</sup>, 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 (NDS 3.4.3.3), the *F*<sub>c</sub> and *F*<sub>c</sub> values shall be multiplied by a factor of 0.72. The tabulated *F*<sub>c</sub> values are for members 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* and for beam stability calculation (NDS 3.3.3.8), *E*<sub>app</sub> values shall be used unless the shear deflection is determined in addition to bending deflection based on the tabulated *E*<sub>app</sub>. The axial modulus of elasticity, *E*<sub>axial</sub> and *E*<sub>axial</sub> shall be equal to the tabulated *E*<sub>axial</sub> and *E*<sub>axial</sub> values.
8. The values of *F*<sub>y</sub> are based on members 12 inches in depth. For depths less than 12 inches, *F*<sub>y</sub> shall be permitted to be increased by multiplying by the flat use factor, (12/d)<sup>1/2</sup>, 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 for 24F-V4/DF and 24F-V6/DF are limited to 4 or more laminations. The beam depths for 24F-V8/DF and 24F-V8/DF are limited to 9-1/2 inches minimum. The beam depths for 30F-E2M3/SP are limited to 7-1/4 to 48 inches. The beam depths for 30F-E2M3/SP are limited to 7-1/4 to 26 inches. 24F-V8M4/DF, 30F-E2M3/SP, and 30F-E2M3/SP are limited to dry-use only due to the use of LVL tension laminations.
10. The value of *F*<sub>c</sub> shall be permitted to be increased to the published values of the outermost LVL in the planked orientation.
11. The allowable shear stress shall be reduced to 255 psi, 215 psi, and 210 psi, respectively, for 9-1/4-inch, 7-1/2-inch, and 7-1/4-inch deep beams.

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Table 2. Allowable Design Values for Rosboro Glulam Columns for Normal Duration of Load (1)

<table>
<thead>
<tr>
<th>Combination Symbol</th>
<th>Species(2)</th>
<th>Grade</th>
<th>All Loading</th>
<th>Axially Loaded</th>
<th>Bending about Y-Y Axis</th>
<th>Bending about X-X Axis</th>
<th>Fasteners</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Modulus of Elasticity(3)</td>
<td>Compression Perpendicular to Grain</td>
<td>Compression Parallel to Grain</td>
<td>Loaded Parallel to Wide Faces of Laminations</td>
<td>Loaded Perpendicular to Wide Faces of Laminations</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$E_{mod}$ (10^6 psi)</td>
<td>$0.95 E_{mod}$ (10^6 psi)</td>
<td>$E_{mod} v_{-} v_{y}$ (10^6 psi)</td>
<td>$F_{ax, min}$ (psi)</td>
<td>$F_{ax}$ (psi)</td>
</tr>
<tr>
<td>1</td>
<td>DF</td>
<td>L3</td>
<td>1.6</td>
<td>1.5</td>
<td>0.79</td>
<td>560</td>
<td>950</td>
</tr>
<tr>
<td>2</td>
<td>DF</td>
<td>L2</td>
<td>1.7</td>
<td>1.6</td>
<td>0.85</td>
<td>560</td>
<td>1,250</td>
</tr>
<tr>
<td>3</td>
<td>DF</td>
<td>L2D</td>
<td>2.0</td>
<td>1.9</td>
<td>1.00</td>
<td>650</td>
<td>1,450</td>
</tr>
<tr>
<td>5</td>
<td>DF</td>
<td>L1</td>
<td>2.1</td>
<td>2.0</td>
<td>1.06</td>
<td>650</td>
<td>1,650</td>
</tr>
<tr>
<td>69</td>
<td>AC</td>
<td>L3</td>
<td>1.3</td>
<td>1.2</td>
<td>0.63</td>
<td>470</td>
<td>725</td>
</tr>
<tr>
<td>70</td>
<td>AC</td>
<td>L2</td>
<td>1.4</td>
<td>1.3</td>
<td>0.69</td>
<td>470</td>
<td>975</td>
</tr>
</tbody>
</table>

(1) The tabulated allowable design values are for normal duration of loading. For other durations of loading, see 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 factors shown at the bottom of the table.

(2) AC = Alaska cedar and DF = Douglas fir-Larch.

(3) The tabulated $E$ values include axial modulus of elasticity ($E_{mod}$), 0.95 $E_{mod}$, and $E$ for column stability calculation ($E_{mod} v_{-} v_{y}$, NDS 3.7.1). For calculating column deflections due to lateral loads, the tabulated 0.95 $E_{mod}$ value shall be used unless the shear deflection is determined in addition to bending deflection based on the tabulated $E_{mod}$.

(4) The values of $F_{ax}$ are based on members 12 inches in depth. For depths less than 12 inches, $F_{ax}$ shall be permitted to be increased by multiplying by the flat use factor, (12/d)^0.6, where $d$ is the beam depth in inches. When $d$ is less than 3 inches, use the size adjustment factor for 3 inches.

(5) For non-prismatic members, notched members, members subject to impact or cyclic loading, or shear design of bending members at connections (NDS 3.4.3.3), the tabulated $F_{ax}$ and $F_{vy}$ values shall be multiplied by 0.72.

(6) The tabulated $F_{ax}$ values are for members of 4 or more lams. The tabulated $F_{ax}$ values shall be multiplied by a factor of 0.95 for 3 lams and 0.84 for 2 lams. For members with 5, 7, or 9 lams manufactured from multiple-piece lams with unbonded edge joints, the tabulated $F_{ax}$ values shall be multiplied by a factor of 0.4. For all other members manufactured from multiple-piece lams with unbonded edge joints, the tabulated $F_{ax}$ values shall be multiplied by a factor of 0.5. This adjustment shall be cumulative with the adjustment specified in Footnote 5.

(7) The tabulated $F_{vy}$ values 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, $F_{vy}$ shall be multiplied by a volume factor, $C_v = (5.125 b)^{1/6} (12 d)^{1/6} (21 L)^{1/6}$, 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).

(8) The tabulated $F_{vy}$ values are for members without special tension lams up to 15 inches in depth. If the member depth is greater than 15 inches without special tension lams, the tabulated $F_{vy}$ values must be multiplied by a factor of 0.88. If special tension lams are used, the tabulated $F_{vy}$ values are permitted to be increased by a factor of 1.18 regardless of the member depth provided that the increased $F_{vy}$ value does not exceed 2,400 psi. This factor shall be cumulative with the volume factor, $C_v$, specified in Footnote 7.
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