APA PRODUCT REPORT®

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GP LAM® Laminated Veneer Lumber
Georgia-Pacific Wood Products LLC

PR-L257

Revised August 28, 2008

Products: GP Lam® 1.8-SP, 1.9-ES, 2.0-ES and 2.1-ES LVL
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1. Basis of the product report:
   - 2006 International Building Code: Section 104.11 Alternative Materials
   - 2006 International Residential Code: Section R104.11 Alternative Materials
   - 2007 and 2004 Florida Building Code, Building: Section 104.11 Alternative Materials
   - ASTM D 5456-03 recognized by the 2006 International Building Code
   - ASTM D 5456-05 recognized by the 2007 Florida Building Code and the 2006 Supplement to the 2004 Florida Building Code
   - APA Reports T2002P-44, T2002P-45, T2002P-66, T2003M-13, T2003P-46, T2004M-41, T2004M-56, T2004M-80, T2005M-23, T2005M-97 and other qualification data

2. Product description:
   GP Lam LVL is made with veneer sheets of various species and grades in accordance with the in-plant manufacturing standard approved by APA. GP Lam LVL are available in thicknesses from 3/4 inch to 5-1/4 inches, widths of 1-1/2 inches to 48 inches and lengths up to 80 feet.

3. Design properties:
   Table 1 lists the design properties and Table 2 lists the equivalent specific gravities for connection design for GP Lam LVL. The allowable spans for GP Lam LVL shall be in accordance with the recommendations provided by the manufacturer (www.gp.com/build/product.aspx?pid=1392).

4. Product installation:
   GP Lam LVL shall be installed in accordance with the recommendations provided by the manufacturer. Permissible details and allowable hole sizes shall be in accordance with the recommendations provided by the manufacturer.

5. Fire-rated assemblies:
   The provisions of IBC Section 721.6.3, design of fire-resistant exposed wood members, shall be applicable to GP Lam LVL. Fire-rated assemblies shall be constructed in accordance with the recommendations provided by APA Design/Construction Guide: *Fire-Rated Systems*, Form W305 (www.apawood.org/publications) and the manufacturer.

6. Limitations:
   a) GP Lam LVL shall be designed in accordance with the code using the design properties specified in this report.
   b) GP Lam LVL are limited to dry service conditions where the average moisture content is less than 16 percent.
   c) GP Lam LVL is produced at the Georgia-Pacific Wood Products LLC, Roxboro, North Carolina facilities under a quality assurance program audited by APA.
   d) This report is subject to reexamination in 1 year.

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7. Identification:
The GP Lam LVL described in this report is identified by a label bearing the manufacturer's name (Georgia-Pacific Wood Products LLC) and/or trademark, the APA assigned plant number (1028), the LVL grade, the APA-EWS logo, the report number PR-L257, and a means of identifying the date of manufacture.

Table 1. Design Properties (Allowable Stress Design) for GP Lam LVL [a,b,c]

Property		Design Stress (psi)			
		1.8-SP	1.9-ES	2.0-ES	2.1-ES
Bending (F_b)[d,e]	Joist	2,600	2,750	2,900	3,150
Tension parallel to grain (F_t)[f]		1,825	1,825	1,825	1,825
Longitudinal shear (F_v)	Joist	400	295	295	295
Compression parallel ($F_{c\|\|}$)		2,400	2,500	2,600	2,750
Compression perpendicular ($F_{c\perp}$)	Joist	900	845	845	845
Modulus of Elasticity, E[g]		1.8×10^6	1.9×10^6	2.0×10^6	2.1×10^6

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 lbf = 0.454 kg, 1 psi = 6.9 kPa.

(a) The tabulated values are design values for normal duration of load. All values, except for E and $F_{c\perp}$, are permitted to be adjusted for other load durations as permitted by the code. The design stresses are limited to conditions in which the maximum moisture content is less than 16 percent.

(b) Joist = load parallel to glueline.

(c) SP = southern pine; ES = eastern species (any combination of southern pine and/or yellow poplar)

(d) Tabulated flexural stress (F_b) may be increased by 4 percent when the member qualifies as a repetitive member as defined in the NDS.

(e) The tabulated values are based on a reference depth of 12 inches. For other depths, when loaded edgewise, the allowable bending stress (F_b) shall be modified by $(^{12}/_{d})^{1/9}$, as shown in the following table. For depths less than 3-1/2 inches, the factor for the 3-1/2-inch depth shall be used. For beams constructed of 2- or 3-plies of LVL, a 5% increase in F_b is permitted if the beam was assembled at the Georgia-Pacific Wood Products LLC Engineered Lumber Plant. This increase in F_b does not apply to field-assembled multiple-ply beams.

Depth (in.)	3-1/2	5-1/2	7-1/4	9-1/4	11-1/4	12	16	18	20	24
Multiply by	1.15	1.09	1.06	1.03	1.01	1.0	0.97	0.96	0.94	0.93

(f) The tabulated values are based on a reference length of 4 feet. For other lengths, the allowable tensile stress shall be modified by $(4/\ell)^{1/10}$, where ℓ = length in feet. For lengths less than 4 feet, use the allowable tension stresses in Table 1 unadjusted.

(g) For uniformly loaded simple-span beams, deflection is calculated as follows:

$$\delta = \frac{270\,wL^4}{Ebh^3} + \frac{28.8\,wL^2}{Ebh}$$

Where:
δ = estimated deflection, inches,
L = span, feet,
b = beam width, inches, and
w = uniform load, plf
E = tabulated modulus of elasticity, psi
h = beam depth, inches

Table 2. Fastener Details for GP Lam 1.8-SP, 1.9-ES, 2.0-ES and 2.1-ES LVL

Fastener Description	Equivalent Specific Gravity
Nail Withdrawal	
Installed perpendicular to the wide face	Douglas fir-larch (0.50)
Installed parallel to the wide face	
Nail Dowel Bearing	
Installed perpendicular to the wide face	Douglas fir-larch (0.50)
Installed parallel to the wide face	
Bolt Dowel Bearing	
Parallel to grain	Douglas fir-larch (0.50)
Perpendicular to grain	

Table 3. Allowable Fastener Spacing for GP Lam LVL [(a)]

Member Species	Minimum Member Size (inches)	Connector Size	Nails Installed in the Narrow Face On-Center Spacing (inches)
Southern pine Yellow poplar Eastern species	3/4 x 3-1/2	10d box and common nail	6
		16d sinker and 12d common nail	6
		14 gage staple	6
Yellow poplar	1-3/4 x 3-1/2	10d box and common nail	4
		16d sinker and 12d common nail	4
		14 gage staple	4
Southern pine Eastern species	1-3/4 x 3-1/2	10d box and common nail	6
		16d sinker and 12d common nail	6
		14 gage staple	6
	1-3/4 x 5-1/2	10d box and common nail	4
		16d sinker and 12d common nail	4
		14 gage staple	4
Southern pine Yellow poplar Eastern species	1-3/4 x 5-1/2	16d common nail	8

For SI: 1 inch = 25.4 mm.

[(a)] The minimum on-center spacing permitted for nails installed in the wide face of GP Lam LVL is the same as that permitted by the applicable code for solid-sawn lumber.

APA – The Engineered Wood Association is an accredited certification body under ISO 65 by Standards Council of Canada (SCC) and an accredited inspection agency by the International Code Council (ICC) International Accreditation Service (IAS) under ISO/IEC 17020. APA is also an accredited testing organization recognized by IAS and SCC under ISO/IEC 17025. APA is a recognized testing laboratory by Miami-Dade County, and a Product Testing Laboratory, Product Quality Assurance Entity, and Product Validation Entity by the Florida Department of Community Affairs (DCA).

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