

CITY OF NEW YORK  
DEPARTMENT OF BUILDINGS

Pursuant to Administrative Code Section 27-131, the following equipment or material has been found acceptable for use in accordance with the Report of the Material and Equipment Acceptance (MEA) Division.

Ronny A. Livian, P.E., Acting Commissioner

MEA 94-02-E  
Report of Material and Equipment Acceptance Division

Manufacturer - International Paper, 400 Atlantic Street, Stamford, CN 06921.

Trade Name - Weldwood™ LVL.

Product - Laminated Veneer Lumber (LVL).

Pertinent Code Section(s) - RS-10, Subchapter 10 Article 7.

Tests - ASTM-D5456, ASTM-D198, ASTM-D143, Tension parallel to grain, Bending tests, Compression parallel and perpendicular to grain, Longitudinal shear, Connections, Moisture content, Specific gravity.

Laboratory - APA-Engineered Wood Association P.O. Box 11700 Tacoma, WA 98411-0700. In plant qualification testing is conducted by International Paper and witnessed by APA-EWS. Allowable Design Stresses were certified by Scott Rutland, P.E., New York State License Number 078840-1.

Test Reports -

- a. APA-The Engineered Wood Association (APA) Report No. T2000P-13, Long Term Testing of LVL for Sunpine Forest Products (Weldwood™)," dated April 7, 2000.
- b. APA Report No. T99P-37, "Qualification of 1.3E LVL for Sunpine Forest Products (Weldwood™)," dated November 23, 1999.
- c. APA Report No. T99P-41, "Qualification of 1.6E LVL for Sunpine Forest Products (Weldwood™)," dated December 31, 1999.
- d. Intertek Testing Services (ITS) - Warnock Hersey Report for "Qualification of 1.8E LVL for Sunpine Forest Products (Weldwood™)," dated September 29, 1998.
- e. APA Report No. T99P-40, "Qualification of 2.0E LVL for Sunpine Forest Products (Weldwood™)," dated December 31, 1999.

- f. APA Report No. T97P-26, "Laminated Veneer Lumber Tests," dated August 11, 1998.
- g. APA Report No. T98P-10, "Long Term Testing of LVL," dated April 14, 1998.
- h. APA Report No. T2000P-24, "Bending Analysis of 2.0E LVL," dated September 22, 2000.
- i. Quality Control Manual for Weldwood™ Laminated Veneer Lumber dated September 2000.

**Description** – Weldwood™ LVL is manufactured by laminating sheets of veneer on top of each other. Veneer sheets are graded using the Ultrasonic Propagation Time (UPT) grading method. Graded veneers are scarfed or lapped before being sent to the sheet feeder, where the veneers are sequenced into prescribed lay-ups, with glue applied on the top face of each veneer sheet, with the exception of the top veneer. The glue is exterior-grade phenolic adhesive complying with ASTM-D2559. Lay-up patterns with veneers are specified in International Paper's approved Quality Control manual. The grain of all veneer is oriented along the length of the billet. The lay-up is then subjected to hot pressing until the glue is cured. Products are available in thicknesses of ¼-inch to 3 ½-inches, depths of 1 ½-inches to 48-inches and lengths of up to 80 feet.

Table 1. – Allowable Design Stresses For Weldwood™ LVL<sup>1,2,3,4,5,6</sup>

Property		Allowable Stresses (psi)					
		1.3E Grade	1.6E Grade	1.8E Grade <sup>1</sup>	2.0E Grade <sup>5</sup>	2.0E Grade <sup>5</sup>	2.0E Grade <sup>5</sup>
Bending	Joist	1700	2500	2850	2750	2950	3100
	Plank	1900	2600	3000	3200	3200	3500
Tension parallel to grain, $F_t$		1300	1950	2100	2000	2300	2300
Longitudinal shear, $F_v$	Joist	220	240	285	270	285	285
Compression parallel, $F_c$		1800	2350	2500	3000	3000	3000
Compression perpendicular, $F_{\perp}$	Joist	600	750	750	900	900	900
Modulus of elasticity		$1.3 \times 10^6$	$1.6 \times 10^6$	$1.8 \times 10^6$	$2.0 \times 10^6$	$2.0 \times 10^6$	$2.0 \times 10^6$

For SI: 1 inch = 25.4 mm, 1 psi = 6.89 kPa.

<sup>1</sup>Tabulated values are based on loads of normal duration and reference depth of 12 inches. For depths of 1 1/2 inches and deeper, when loading is edgewise, the allowable bending stress shall be modified by  $(12/d)^{1.9}$  for 1.3E and 1.6E, and  $(12/d)^{1.65}$  for 2.0E as shown in tables below. For 1.8E grade, the allowable bending stress shall be modified by  $(12/d)^{0.98}$ .

<sup>2</sup>Tension ( $F_t$ ) of the 1.3E, 1.6E, 1.8E and 2.0E grades are based on a gage length of 4 feet. For specimens longer than 4 feet, a length factor of  $(4/L)^{1.1}$  should be used to adjust the  $F_t$ , where L is the actual length in feet.

<sup>3</sup>Load parallel to glue line is for joist and perpendicular is for plank.

<sup>4</sup>Stresses may be adjusted for duration of load in accordance with applicable code.

<sup>5</sup>Tabulated flexural stresses shall be permitted to be increased by 4 percent when the member qualifies as repetitive member as defined in AFPA NDS-97.

<sup>6</sup>Species include southern pine, sweetgum, yellow poplar, white spruce, aspen and Douglas fir (singularly or in combination).

1.3E and 1.6E Grades $(12/d)^{1.9}$									
Depth (in.)	3 1/2	5 1/2	7 1/4	9 1/2	11 7/8	14	16	18	24
Multiply by	1.15	1.09	1.06	1.03	1.00	0.98	0.97	0.96	0.93
1.8E Grades $(12/d)^{0.98}$									
Depth (in.)	3 1/2	5 1/2	7 1/4	9 1/2	11 7/8	14	16	18	24
Multiply by	1.1	1.06	1.04	1.02	1.00	0.99	0.98	0.97	0.95

2.0E Grades $(12/d)^{1.65}$									
Depth (in.)	3 1/2	5 1/2	7 1/4	9 1/2	11 7/8	14	16	18	24
Multiply by	1.08	1.08	1.08	1.04	1.00	0.98	0.96	0.94	0.90

**Recommendation - That the above Weldwood™ LVL be accepted on condition that all uses, locations and installations shall comply with the applicable requirements of the New York City Building Code and on further condition that the design provisions and specifications as listed in the above laboratory report shall apply and on further condition that:**

1. Structures designed using Weldwood™ LVL lumber shall conform to the manufacturer's specifications except that appropriate design load(s), deflection limitation(s) and other performance standards of the New York City Building Code shall apply.
2. Weldwood™ LVL lumber shall be for interior use only and stamped "INTERIOR" "MEA 94-02-E" on each beam.
3. Weldwood™ LVL, when stored out-of-doors or exposed to wet weather conditions during construction, be inspected by the user for swelling or warping, etc. and replaced if so damaged.
4. Beams less than 1-1/2" thick shall be firestopped every 500 square feet in floor construction.

All shipments and deliveries of such materials shall be provided with a permanent marking suitably placed, certifying that the materials shipped or delivered is equivalent to those tested and accepted for use, as provided for in Section 27-131 of the Building Code.

Final Acceptance April 10, 2002

Examined by Mark J. Kelly