NYC BUILDINGS

NYC Department of Buildings
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Patricia Lancaster, FAIA, Commissioner
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Report of Materials and Equipment Acceptance Division

Pursuant to Administrative Code Section 27-131, the following equipment or material has been found acceptable for use subject to the terms and conditions contained herein.

MEA 97-94-E Vol.8

1.0 GENERAL

1.1 Manufacturer

LOUISIANA-PACIFIC CORPORATION (LP BUILDING PRODUCTS)
2706 HWY 421 NORTH
WILMINGTON, NC 28401
(910) 762-9878
www.lpcorp.com

ADDITIONAL LISTEE:

WESBEAM PTY. LTD
190 PEDERICK ROAD
NEERABUP, WA 6019
AUSTRALIA

1.2 Trade Name

LP LVL* (LAMINATED VENEER LUMBER) AND LP OSL (ORIENTED STRAND LUMBER)

*PREVIOUSLY KNOWN AS GANG-LAM LVL

1.3 Product

LP LVL and LP OSL. See Table 1 for specific product designations.

2.0 USES

LP LVL and LP OSL products are intended for structural applications such as, but not limited to, beams, headers, joists, rafters, columns, studs and rim board. They are also used as components in built-up structural members such as flanges for I-joists, chords for trusses and laminations for glue-laminated members.

3.0 DESCRIPTION

3.1 Pertinent Code Sections

Pertinent code sections for LP LVL and LP OSL are: Article 7 Wood, Section 27-617; Reference Standards RS-10; Section 27-133 acceptance requirements.

3.2 General

The wood veneer/strand properties and species, adhesive, manufacturing parameters, and finished product thickness, width and length shall meet the requirements noted in the accepted quality control manual that contains the manufacturing standard.

The grades of LP LVL and LP OSL are given in Table 1.

3.3 LP LVL

LP LVL is made up of layers of wood veneers laminated together using an exterior-type structural adhesive. The manufacturing process consists of rotary peeling a log into veneers that are then dried and graded. After the veneers are coated with adhesive they are laid-up into a billet that is then fed into a hot press that cures the adhesive under heat and pressure. The cured and compressed billet then leaves the hot press and is ripped into boards, which completes the LVL manufacturing process. LP LVL "Billet Beams" are fabricated by face laminating primary thicknesses.

3.4 LP OSL

LP OSL is made up of wood strands bonded together using an exterior-type structural adhesive. The manufacturing process consists of flaking a log into strands that are then dried. After the dried strands are coated with adhesive they are formed into a mat that is then fed into a hot press that cures the adhesive under heat and pressure. The cured and compressed mat then leaves the hot press and is ripped into boards, which completes the OSL manufacturing process.

4.0 DESIGN AND INSTALLATION

4.1 Design

4.1.1 General

The design provisions for solid-sawn lumber in the ANSI/AF&PA NDS-2005 *National Design Specification for Wood Construction* (NDS®-05), except as modified herein, are applicable to the LVL and OSL described in this acceptance report. The allowable design values for the evaluated products in this report under dry-use conditions are given in Tables 1, 2 and 5. The allowable design values may be adjusted for duration of load in accordance with the building code.

4.1.2 Connections

The design of connections for the LVL and OSL described in this evaluation report shall be in accordance with the NDS®-05 for a solid wood species with an equivalent specific gravity. The equivalent specific gravity characteristics for nail and bolt design for dry-use conditions are found in Table 2. The nail spacing requirements are found in Tables 3 and 4. Specific approval by the Department of Buildings is required for connections other than those indicated in Tables 2, 3 and 4.

4.1.3 Rim Board

Rim board is defined as a continuously supported structural member (except as noted in 4.1.3 Item 7), located at the joist elevation either perpendicular to, or parallel to, the joist framing, that is the full depth of the joist and is used for the following purposes:

1. Transfer, from above to below, of vertical loads at the rim board location. Allowable vertical loads are noted in Table 5.
2. Provide diaphragm attachment (sheathing to top edge of rim board).
3. Transfer in-plane lateral loads from the diaphragm to the wall plate below.
4. Provide lateral support to the joist or rafter (resistance against rotation) through attachments to the joist or rafter.
5. Provide closure for ends of joists or rafters.
6. Provide attachment base for siding or exterior deck ledger.
7. Design of rim board to span over wall openings shall not exceed the allowable stress design values noted in Table 1.

4.1.4 Wall Studs

LP LVL may be used as a direct replacement for stud-grade lumber wall framing in accordance with the prescriptive requirements of the codes listed in Section 1.0 and as wall studs in engineered applications such as "tall walls" under the following conditions:

1. Minimum LP LVL thickness is 1-1/2".
2. Nailing requirements:
   a. For sheathing attached with 8d common nails or smaller, spaced a minimum 6" oc, a single LP LVL stud may be used for framing at adjoining panel edges (see Detail A in Figure 1).
   b. For sheathing attached with nails larger than 8d common (2-1/2" x 0.131" diameter) or spaced closer than 6" oc, a double LP LVL stud is required for framing at adjoining panel edges as follows (see Detail B in Figure 1):
      i. Double LP LVL studs shall be stitch-nailed together with 2 staggered rows of 10d common nails spaced 8" oc in each row. In an engineered application, the stitch nailing for a double stud may be designed to transfer the required lateral shear in lieu of the prescribed stitch nailing above.
      ii. Panel-edge nails shall be installed with a minimum 1/2" edge distance from both the panel and stud edges, and shall be staggered a minimum 1/4" horizontally within each line of nails.
      iii. Minimum Nail Spacing (box or common) is 3" oc for 8d and smaller nails, 4" oc for 10d nails.
      iv. Maximum Nail Size is 10d common (3" x 0.148" diameter).
3. When designing for notches and holes, the stress concentration factors in Table 6 shall be applied to the calculated values that are based on net cross section remaining after the notch or hole has been made.

LP LVL wall studs are permitted to be used in fire-resistive construction. LP LVL can be considered as a direct replacement for solid-sawn lumber, having the same dimensions, in any code-approved fire-resistive assembly.

4.2 Installation

LP LVL and LP OSL shall be installed in accordance with this acceptance report and the building code, the specifications of the design professional responsible for the design of the structure and the latest edition of LP Building Product's installation guidelines.

5.0 EVIDENCE SUBMITTED

Tests – Edgewise MOE and MOR, flatwise MOE and MOR, tensile strength parallel to grain, compressive strength parallel to grain, compressive perpendicular to grain, longitudinal shear strength, nail and bolt lateral load capacity, nail withdrawal, nail spacing, evaluation of duration of load and creep effects, rim board lateral load capacity, rim board vertical uniform load capacity, rim board vertical concentrated load capacity.

Laboratory – In-house and contract lab testing performed by Louisiana-Pacific Corporation and APA – The Engineered Wood Association and witnessed by PFS Corporation and APA – The Engineered Wood Association. Tables contained in this report were prepared by Louisiana-Pacific Corporation and sealed by Daniel M. McGee, P.E., New York State License No.: 04103.

Test Reports for LP LVL are as follows:

1. R. G. Person and J. G. Midgetlee, Department of Wood and Paper Science, North Carolina Test Report Project WPL B5-322, dated September 4, 1985 per BS&A No. 948-87-SM.
2. Gang-Lam W LVL Test Data by L-P witnessed by PFS Corp., September 1997.
3. Qualification Test Data for Mechanical Properties, 1650F_b-1.3E and 1750F_b-1.3E Gang-Lam W LVL.
4. Connection Test Data for Gang-Lam LVL Rim Board.
5. Rim Board Qualification for Gang-Lam LVL Rim Board.
6. Gang-Lam P and PS LVL Test Data Volume I and Volume II by L-P, witnessed by PFS Corp., September 1997.
7. Gang-Lam P and PS LVL Connection Test Data and Calculations by L-P, witnessed by PFS Corp., January 1996.
8. Gang-Lam LVL Test Data for Mechanical Properties by L-P, witnessed by PFS Corp., January 1998.
9. Gang-Lam LVL Test Data for Connection Properties by L-P, witnessed by PFS Corp., January 1998.
10. Gang-Lam L and LW LVL Test Data for Mechanical Properties by L-P, witnessed by PFS Corp., January 1999.
11. Qualification Test Data for Mechanical Properties, 2650F_b-1.9E Gang-Lam L LVL.
12. Connection Test Data for Gang-Lam L LVL, 2001 Modification.
13. Connection Test Data for Gang-Lam LW LVL, 2001 Modification.
14. Gang-Lam LVL (Aspen) Test Data for Mechanical Properties by L-P, witnessed by PFS Corp., October 1998.
15. Gang-Lam LVL (Aspen) Test Data for Connection Properties by L-P, witnessed by PFS Corp., October 1998.
16. Connection Test Data for Gang-Lam A LVL, 2001 Modification.
17. APA Report T2004P-72A, LVL Stud Qualification Tests for Louisiana-Pacific Corporation, Golden, BC, Canada dated August 8, 2005.
18. APA Report T2005P-47, LVL Stud Qualification Tests for Louisiana-Pacific Corporation, Golden, BC, Canada (1.4E Lodgepole Pine) dated August 2, 2005.
19. APA Report T2005P-48, LVL Stud Qualification Tests for Louisiana-Pacific Corporation, Hines, OR (2.35E Douglas Fir) dated August 8, 2005.
20. APA Report T2005P-49, LVL Stud Shear Wall Qualification Tests for Louisiana-Pacific Corporation, Golden, BC, Canada and Hines, OR (1.4E Lodgepole Pine, 1.55E Lodgepole Pine and 2.35E Douglas Fir) dated August 3, 2005.
21. APA Report T2005P-72, 1.4E Laminated Veneer Lumber Qualification for Louisiana-Pacific Canada, Ltd., Golden, BC, Canada dated October 3, 2005.
22. APA Report T2005P-75, Qualification of 2.0E Laminated Veneer Lumber Manufactured by Wesbeam Pty. Ltd., Neerabup, Western Australia, Australia for Louisiana-Pacific Corporation dated October 26, 2005.
23. APA Report T2005P-76A, 1.7E Laminated Veneer Lumber Qualification for Louisiana-Pacific Canada, Ltd., Golden, BC, Canada dated November 10, 2005.
24. APA Report T2005P-82, Nail Splitting Tests for SYP LVL Studs Manufactured by Louisiana-Pacific Corporation, Wilmington, NC dated November 1, 2005.
25. APA Report T2005P-85, 1.7E Laminated Veneer Lumber Qualification for Louisiana-Pacific Corporation, Wilmington, NC dated November 14, 2005.
26. APA Report T2005P-89, 1.7E Laminated Veneer Lumber Qualification for Louisiana-Pacific Corporation, Hines, OR dated November 29, 2005.
27. APA Report T2005P-91, Creep Testing of 2.0E Laminated Veneer Lumber (LVL) Manufactured by Wesbeam Pty. Ltd., Neerabup, Western Australia, Australia for Louisiana-Pacific Corporation dated November 23, 2005.
28. APA Report T2005P-93, 1.1E Laminated Veneer Lumber Qualification for Louisiana-Pacific Canada, Ltd., Golden, BC, Canada dated November 28, 2005.
29. APA Report T2005P-95, APA Rim Board Qualification for Louisiana-Pacific Canada, Ltd., Golden, BC, Canada (1-1/4-inch 1.1E LVL) dated December 6, 2005.
30. Intertek Testing Services NA, Inc. Report 3080897, ASTM E119-00a Fire Tests of Building Construction and Materials, Fire Resistance Test of a Fully Loaded LVL Stud Wall Insulated with Mineral Wool Insulation dated September 9, 2005.
31. APA Report T2006P-05, Evaluation of Edgewise Shear Strength and Nail Spacing and End Distance Requirements for LVL Manufactured by Wesbeam Pty. Ltd., Neerabup, Western Australia, Australia for Louisiana-Pacific Corporation.
32. APA Report T2006-06, 1.7E Lodgepole Pine Laminated Veneer Lumber Qualification for Louisiana-Pacific Canada, Ltd., Golden, British Columbia, Canada.

Test Reports for LP OSL are as follows:

1. APA Report T2002P-4, Rim Board Qualification for Louisiana-Pacific Corporation, Hayward, WI dated February 5, 2002.
2. APA Report T2002P-6, Qualification of Oriented Strand Lumber (OSL) for Louisiana-Pacific Corporation, Hayward, WI dated February 21, 2002.
3. APA Report T2002P-26, Creep Testing of Oriented Strand Lumber (OSL) for Louisiana-Pacific Corporation, Hayward, WI dated May 8, 2002.
4. APA Report T2002P-47, Qualification of 1-1/2" Thick Oriented Strand Lumber (OSL) for Louisiana-Pacific Corporation, Hayward, WI dated September 20, 2002.
5. APA Report T2002P-48, Nail Spacing and End Distance for Oriented Strand Lumber (OSL) for Louisiana-Pacific Corporation, Hayward, WI dated September 23, 2002.

Quality Assurance Manuals – Quality assurance manuals for manufacture of LVL and OSL products are as follows:

1. Quality Assurance Manual for LVL Products, 2005.
2. Quality Assurance Manual for Oriented Strand Lumber (OSL) Manufactured at LP Hayward, WI 2002.

6.0 IDENTIFICATION

LP LVL and LP OSL shall be identified with stamps noting the manufacturer's name and/or logo; plant number; product designation; grade; evaluation report number (MEA 97-94-E); and the quality control agency name and/or logo (APA-The Engineered Wood Association).

TABLE 1 – ALLOWABLE STRESS DESIGN VALUES[6, 7]

Grade	Bending Strength, F_b (psi)		Tensile Strength Parallel to Grain, F_t (psi)	Compression Strength Parallel to Grain, $F_{c//}$ (psi)	Compressive Strength Perpendicular to Grain, $F_{c\perp}$ (psi)		Horizontal Shear Strength, F_v (psi)		Modulus of Elasticity ($x10^6$ psi)	
	Beam	Plank			Beam	Plank	Beam	Plank	Beam	Plank
LP OSL										
$1750F_b$-1.3E	1750[1]	2650	1450[4]	1940	1675	520	430	135	1.30	1.55
LP LVL										
$1400F_b$-1.1E	1400[2]	1400	1200[5]	1700	680	450	250	95	1.10	1.00
$1650F_b$-1.3E	1650[2]	1650	1200[5]	1700	680	450	250	140	1.30	1.10
$1750F_b$-1.3E	1750[2]	1750	1200[5]	1700	680	450	250	140	1.30	1.30
$2000F_b$-1.3E	2000[3]	2000	1200[5]	2350	680	450	250	140	1.30	1.30
$2250F_b$-1.5E	2250[3]	2200	1350[5]	2350	750	450	285	140	1.50	1.40
$2400F_b$-1.7E	2400[3]	2300	1350[5]	2350	750	450	285	140	1.70	1.70
$2600F_b$-1.7E	2600[3]	2600	1350[5]	2350	750	450	285	140	1.70	1.70
$2250F_b$-1.8E	2250[3]	2200	1600[5]	2350	750	550	285	140	1.80	1.80
$2650F_b$-1.8E	2650[3]	2600	1600[5]	2350	550	450	285	140	1.80	1.80
$2750F_b$-1.8E	2750[3]	2600	1600[5]	2350	750	550	285	140	1.80	1.80
$2650F_b$-1.9E	2650[3]	2600	1600[5]	2350	750	550	285	140	1.90	1.80
$2850F_b$-2.0E	2850[3]	2850	1800[5]	3200	750	550	290	140	2.00	2.00
$2950F_b$-2.0E	2950[3]	2950	1800[5]	3200	750	550	290	140	2.00	2.00
$3100F_b$-2.0E	3100[3]	3100	1800[5]	3200	750	550	290	140	2.00	2.00
$3400F_b$-2.1E	3400[3]	3400	1800[5]	3350	750	550	350	120	2.10	2.10
$3200F_b$-2.2E	3200[3]	3200	1800[5]	2950	750	550	285	140	2.20	2.20

For **SI**: 1 psi = 6.89 kPa, 1 inch = 25.4 mm.
NA = Not Applicable

NOTES:

1. The allowable bending strength, F_b, is assigned for a standard depth of 12 inches. For other depths, multiply F_b by $(12/depth)^{0.143}$. For depths less than 2 ½ inches, multiply F_b by 1.243. Note: "depth" is the depth of the member in inches.
2. The allowable bending strength, F_b, is assigned for a standard depth of 12 inches. For other depths, multiply F_b as follows:
   - For thicknesses < 1 ¼": multiply F_b by $(12/depth)^{0.323}$. For depths less than 3 ½ inches, multiply F_b by 1.488.
   - For thicknesses ≥ 1 ¼": multiply F_b by $(12/depth)^{0.261}$. For depths less than 3 ½ inches, multiply F_b by 1.379.

   Note: "depth" is the depth of the member in inches.
3. The allowable bending strength, F_b, is assigned for a standard depth of 12 inches. For depths greater than 12 inches, multiply F_b by $(12/depth)^{0.143}$. For depths less than 12 inches, multiply F_b by $(12/depth)^{0.111}$. For depths less than 3 ½ inches, multiply F_b by 1.147. Note: "depth" is the depth of the member in inches.
4. The allowable tension strength, F_t, is assigned for a standard length of 4 feet. For lengths other than 4 feet, multiply F_t by $(4/length)^{0.070}$. For lengths less than 2 feet, multiply F_t by 1.050. Note: "length" is the length of the member in feet.
5. The allowable tension strength, F_t, is assigned for a standard length of 3 feet. For lengths other than 3 feet, multiply F_t by $(3/length)^{0.111}$. For lengths less than 3 feet, use the design tension stresses in the table above, unadjusted.
6. Allowable design stresses in the above table are for normal load duration and shall be adjusted (with the exception of modulus of elasticity and compressive strength perpendicular to grain) using the load duration factors found in the *NDS*.
7. Allowable design stresses in the above table shall apply to product installation conditions of use that are dry, well ventilated and covered. Dry conditions are product installation conditions where ambient moisture content is 16% or less.

TABLE 2 – EQUIVALENT SPECIFIC GRAVITY FOR FASTENER DESIGN[1, 2, 6]

Grade	Equivalent Specific Gravity							
	Nails				Bolts Installed in Face[3]			
	Withdrawal Load		Lateral Load		Lateral Load (1/2" Dia.)		Lateral Load (3/4" Dia.)	
	Installed in Edge	Installed in Face	Installed in Edge	Installed in Face	Load Applied // to Grain	Load Applied ⊥ to Grain	Load Applied // to Grain	Load Applied ⊥ to Grain
1.3E LP OSL[4]	0.42	0.46	0.51	0.62	0.54	0.54	0.54	0.54
1.1E LP LVL Rim[5] 1.3E LP LVL	0.45	0.42	0.49	0.50	0.43	0.45	0.39	0.50
1.3E LP LVL Rim[5] 1.5E – 2.2E LP LVL	0.46	0.50	0.50	0.50	0.46	0.50	0.42	0.50

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

NOTES:

1. Fastener sizes and orientation not specifically described above are beyond the scope of this report.
2. Fastener values based on the equivalent specific gravities in the above table are for normal load duration and shall be adjusted using the load duration factors found in the *NDS*.
3. The bolt edge distance for ½- and ¾-inch-diameter bolts when loaded parallel and perpendicular to the grain shall be a minimum of four times the bolt diameter.
4. For LP OSL, the lateral capacity of ½-inch lag screws installed into the face is 500 lbs. for 1 ¼-inch thickness and greater, based on a 1 ½-inch-thick side member with full penetration of the lag screw.
5. For LP LVL Rim, the lateral capacity of ½-inch lag screws installed into the face are as follows:
   - For 1" thickness: 350 lbs.
   - For 1-1/8" thickness: 400 lbs.
   - For thicknesses ≥ 1 ¼": 450 lbs

   Note: values are based on a 1 ½-inch-thick side member with full penetration of the lag screw.
6. Equivalent specific gravities for fastener design for LP LVL manufactured with Aspen and Yellow Poplar species veneers shall be as follows:

Veneer Species	Equivalent Specific Gravity							
	Nails				Bolts Installed in Face[3]			
	Withdrawal Load		Lateral Load		Lateral Load (1/2" Dia.)		Lateral Load (3/4" Dia.)	
	Installed in Edge	Installed in Face	Installed in Edge	Installed in Face	Load Applied // to Grain	Load Applied ⊥ to Grain	Load Applied // to Grain	Load Applied ⊥ to Grain
Aspen	0.43	0.43	0.42	0.43	0.42	0.43	0.39	0.43
Yellow Poplar	0.46	0.46	0.50	0.50	0.42	0.55	0.42	0.55

TABLE 3 - NAIL SPACING REQUIREMENTS FOR LP LVL

Thickness (inches)	Orientation	Fastener	Closest End Distance (inches)	Closest On-Center Spacing (inches)
< 1 ½	Edge	8d & smaller	2 ½	4
		10d & 12d	2 ½	4
		16d	3 ½	5
	Face[1]	8d & smaller	1 ½	3
		10d & 12d	1 ½	3
		16d	1 ½	5
≥ 1 ½	Edge	8d & smaller	2 ½	3
		10d & 12d	2 ½	4
		16d	3 ½	5
	Face[1]	8d & smaller	1 ½	3
		10d & 12d	1 ½	3
		16d	1 ½	5

For **SI**: 1 inch = 25.4 mm.

NOTES:

1. Tabulated closest on-center spacing for face orientation is applicable to nails that are installed in rows that are parallel to the direction of the grain (length) of the LVL. For nails that are installed in rows that are perpendicular to the direction of the grain (width/depth) of the LVL, the closest on-center spacing for face orientation shall be sufficient to prevent splitting of the wood.
2. Fastener sizes and closest spacing not specifically described above are beyond the scope of this report.
3. Fasteners are common wire or box nails.
4. Edge distance shall be sufficient to prevent splitting.
5. Nail penetration for edge nailing shall not exceed 2 inches for 16d nails and 2 ½ inches for 10d and 12d nails.
6. 16d sinkers (3 ¼" x 0.148") may be spaced the same as a 12d common wire nail.
7. For multiple rows of nails, the rows must be offset ½ inch or more from each other, and staggered.
8. For multiple rows of nails, rows must be equally spaced from the centerline of the product edge or face (whichever applies).

TABLE 4 - NAIL SPACING REQUIREMENTS FOR LP OSL

Thickness (inches)	Orientation	Fastener	Closest End Distance (inches)	Closest On-Center Spacing (inches)
< 1 ½	Edge	8d & smaller	2	3
		10d & 12d	2	3 ½
		16d	2 ½	3 ½
	Face[1]	8d & smaller	7/8	1
		10d & 12d	7/8	1
		16d	7/8	1 ½
≥ 1 ½	Edge	8d & smaller	2	3
		10d & 12d	2	3
		16d	2 ½	3
	Face[1]	8d & smaller	7/8	
		10d & 12d	7/8	
		16d	7/8	

For **SI**: 1 inch = 25.4 mm.

NOTES:

1. Tabulated closest on-center spacing for face orientation is applicable to nails that are installed in rows that are parallel to the direction of the grain (length) of the OSL. For nails that are installed in rows that are perpendicular to the direction of the grain (width/depth) of the OSL, the closest on-center spacing for face orientation shall be sufficient to prevent splitting of the wood.
2. Fastener sizes and closest spacings not specifically described above are beyond the scope of this report.
3. Fasteners are common wire or box nails.
4. Edge distance shall be sufficient to prevent splitting.
5. Nail penetration for edge nailing shall not exceed 2 inches for 16d nails and 2 ½ inches for 10d and 12d nails.
6. 16d sinkers (3 ¼" x 0.148") may be spaced the same as a 12d common wire nail.
7. For multiple rows of nails, the rows must be offset ½ inch or more from each other, and staggered.
8. For multiple rows of nails, rows must be equally spaced from the centerline of the product edge or face (whichever applies).

TABLE 5 – ALLOWABLE STRESS DESIGN VALUES FOR RIM BOARD[2,3]

Thickness (inches)	Grade	Lateral Load Capacity[1,4] (lb./ft)	Vertical Uniform Load Capacity[5] (lb./ft)		Vertical Concentrated Load Capacity (lbs.)
			Depth ≤ 16 Inches	Depth > 16 Inches	Depth > 16 Inches
1-1/4	1.1E LP LVL	290	8000	5070	4210
1-1/4 and 1-1/2	1.3E LP OSL	215	9750	4650	5160
1	1.3E LP LVL	190	7210	4990	3870
1-1/8	1.3E LP LVL	220	8280	5030	4040
1-1/4	1.3E LP LVL	300	9350	5070	4210

For SI: 1 inch = 25.4 mm, 1 lb. = 4.45 N, 1 lb./ft = 14.6 N/m.

NOTES:

1. Toe-nailed connections are limited by the 150 plf lateral load capacity noted for seismic Zones 3 and 4 in Section 2314.3.4 of the UBC, or Seismic Design Categories D, E and F in Section 2305.1.4 of the IBC.
2. Allowable design loads in the above table cannot be increased for load duration.
3. See Tables 3 and 4 for minimum nail spacing requirements.
4. The nailing schedule for sheathing to rim and rim board to sill plate (toe-nailed) is based on 8d box nails @ 6 inches on center (refer to AC124 for full details). Commercial framing connectors may be used to achieve lateral load capacities exceeding the values in this table. Calculations shall be based on the equivalent specific gravity listed in Table 2 and shall not exceed the nail spacing requirements of Table 3 (LVL) or Table 4 (OSL).
5. The allowable Vertical Uniform Load Capacity is based on the strength of the rim board and may need to be reduced based on the bearing capacity of the supporting wall plate. Bearing Capacity for an SPF plate is limited to 5100 lb./ft for 1-inch-thick rim board (425 psi x 12 in. x 1 in.), 5700 lb./ft for 1 1/8-inch-thick rim board (425 psi x 12 in. x 1-1/8 in.), and 6350 lb./ft for 1 1/4-inch-thick rim board (425 psi x 12 in. x 1-1/4 in.). The 425 psi compression perpendicular to grain design value for SPF is found in Table 4A of the *NDS Supplement*.

TABLE 6 – STRESS CONCENTRATION FACTORS FOR NOTCHES AND HOLES IN LP LVL

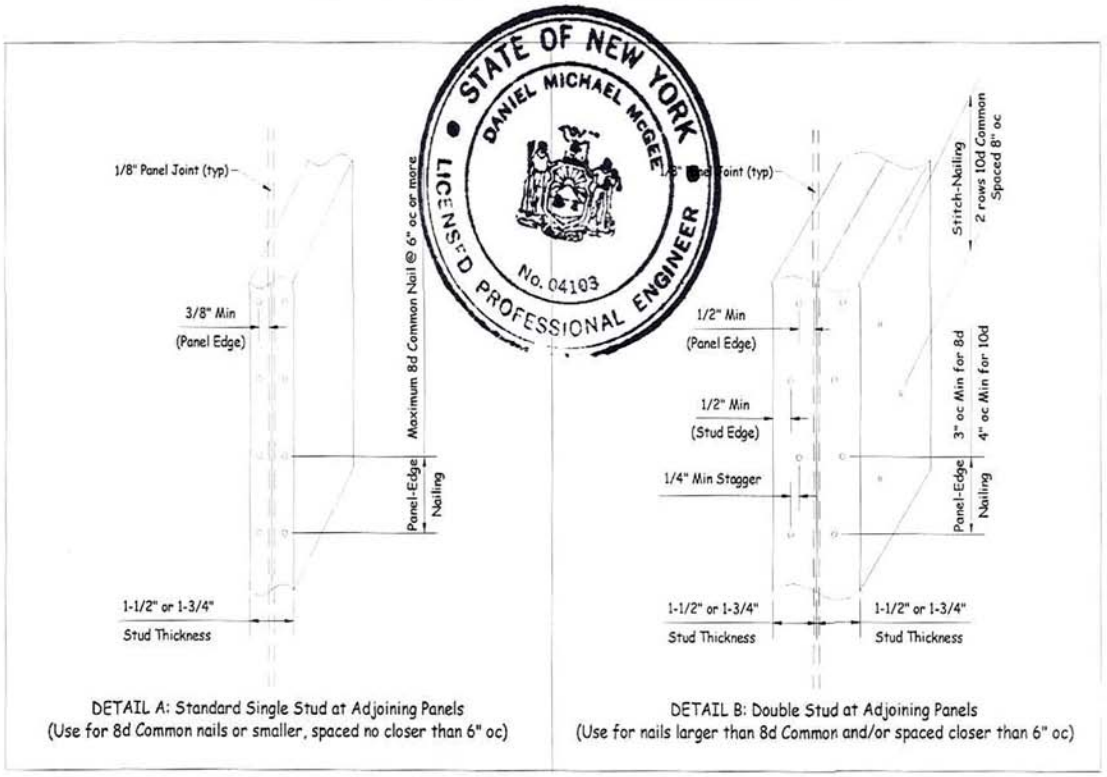
Grade	Stress Concentration Factors[1]					
	Bending		Tension		Compression	
	20%[2]	40%[2]	20%[2]	40%[2]	20%[2]	40%[2]
1.4E – 1.5E	0.75	0.80	0.70	0.60	0.85	0.90
1.7E – 2.1E	0.85	0.85	0.85	0.80	[illegible]	[illegible]0

NOTES:

1. When designing for notches and holes, the stress concentration factors in Table 6 shall be applied to the calculated values that are based on net cross section remaining after the notch or hole has been made.
2. Percentage of the cross-section removed by the notch or hole.

STATE OF NEW YORK
DANIEL MICHAEL McGEE
No. 04103
LICENSED PROFESSIONAL ENGINEER

FIGURE 1 – NAILING REQUIREMENTS FOR LP LVL STUDS



DETAIL A: Standard Single Stud at Adjoining Panels
(Use for 8d Common nails or smaller, spaced no closer than 6" oc)

DETAIL B: Double Stud at Adjoining Panels
(Use for nails larger than 8d Common and/or spaced closer than 6" oc)

7.0 RECOMMENDATIONS

That the LP LVL and LP OSL described in this report 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:

1. Structures designed using this material 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. Fabrication, quality control, and connection restrictions comply with this report.
3. Design stresses comply with this report.
4. The material is limited to areas in which its moisture content will not exceed 16 percent and shall be used in locations that will ultimately be protected from the weather.
5. This material shall at all time be stored in waterproof wrapping to avoid warping, splitting, cupping, etc. and be replaced if so damaged.
6. The glue used shall not delaminate during a fire.
7. Firestopping shall be provided between the ceiling and the floor or roof above. Beams less than 1 ½" thick shall be firestopped and shall be divided into approximately equal areas of 500 square feet of floor construction.
8. The cutting of openings for ducts, pipes, conduits, etc. shall be subject to a controlled inspection.
9. LP LVL is produced by Louisiana-Pacific Corporation under a quality control program with inspections by APA-The Engineered Wood Association (AA-649) at the following facilities: Golden, British Columbia, Canada; Wilmington, North Carolina; Hines, Oregon and Wesbeam Pty. Ltd in Neerabup, WA, Australia.
10. LP OSL is produced by Louisiana-Pacific Corporation at its Hayward, Wisconsin facility under a quality control program with inspections by APA-The Engineered Wood Association (AA-649).

All shipments and deliveries of LP LVL and LP OSL shall be permanently labeled, certifying that the material shipped or delivered is equivalent to that tested and accepted for use, as provided for in Section 27-131 of the Building Code.

Final Acceptance April 11, 2006.

Examined by Donald