

West Fraser™ LVL

LVL User's Guide

Technical Data for LVL Headers, Beams, Column Applications for Residential Floor and Roof Systems



Quality Products – Committed Service

OUR HISTORY

In 1955, three Ketcham brothers, Henry Jr., William, and Samuel, started West Fraser by acquiring a small lumber planing mill in Quesnel, BC. Throughout the years, they continued to make various sawmill acquisitions in the interior of British Columbia, which included the associated timber rights. In 1979, West Fraser entered the pulp industry, constructing a joint venture mill in Quesnel. West Fraser's expansion continued into Alberta in 1989 when they entered into a joint venture newsprint mill in Whitecourt. The Company's growth continued in Alberta with the acquisition of a sawmill, MDF plant, and pulp mill in 1995 and a plywood mill, stud mill and veneer mill in 1999. In 2000, West Fraser entered the United States by

acquiring two sawmills in the U.S. south. A major acquisition occurred in 2005 with the purchase of Weldwood of Canada. With this purchase, West Fraser entered the engineered wood business by acquiring the world's first continuous laminated veneer lumber press.

West Fraser expanded further in 2007 when the Company acquired 13 additional sawmills in the southern U.S. from International Paper Co. This added 1.8 billion board feet of lumber capacity to West Fraser for a total capacity of more than 6 billion board feet, making West Fraser one of the largest lumber producers in North America.

OUR ENVIRONMENTAL STEWARDSHIP

West Fraser Timber Co. Ltd. is committed to responsible stewardship of the environment. A philosophy of continual improvement of our forest practices and manufacturing procedures has been adopted to optimize the use of resources and minimize or eliminate the impact of our operations on the environment.

West Fraser recognizes that environmental excellence is an integral aspect of long-term business success. Our Company and its employees are committed to the following:

- Complying with all applicable environmental laws and regulations, and with other requirements to which the organization subscribes.

- Preventing pollution and continuing to improve our environmental performance by setting and reviewing environmental objectives and targets.
- Conducting periodic environmental audits.
- Providing training for employees and contractors to ensure environmentally responsible work practices.
- Communicating our environmental performance to employees, customers, shareholders, local communities and other stakeholders.
- Reviewing, on a regular basis, this policy to ensure that it reflects the Company's ongoing commitment to environmental stewardship.

OUR VISION

West Fraser's vision is to be the leading forest products company in Canada. Our goals are simple – leadership in profits, responsibility in communities, excellence in people and strength in products.

A Word About LVL Grades

DID YOU KNOW THAT . . .

If you are using 2.0E beams and headers exclusively in residential wood construction, you are leaving money on the table approximately 85% of the time.

When sizing beams and headers, you need to have sufficient moment capacity (F_b), sufficient shear capacity (F_v), sufficient stiffness (EI) to satisfy the live and total load deflection criteria and you need to have adequate bearing sizes ($F_{c\perp}$).

The industry markets LVL beams and headers based on the MOE value (modulus of elasticity = E) which along with the size of the beam (moment of inertia = I) determines the stiffness (EI) of the beam. The stiffness of a beam determines how much deflection a beam will experience under a given load. Deflection is a performance criteria established by



building codes ($L/360$). Stiffness is not the same as strength!

Not all applications are controlled by stiffness, many are controlled by strength (F_b and F_v). In some applications, a 1.9E or 2.0E beam cannot be used as a substitute for a 1.8E beam that has superior strength properties (F_b and F_v).

A beam 16' long, carrying 300 PLF, with 1.9E material will deflect 0.0344 inches less ($1/32$ ") under total load compared to the same beam with 1.8E material. This is not much, especially when you consider the premium you pay for high MOE products.



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PRODUCT LINE



With the use of ultrasonic grading technology, West Fraser wisely utilizes the inherent attributes of its wood resources to manufacture products that effectively satisfy the needs of the market while at the same time, contribute to a greener, more sustainable environment. In addition, these attributes also allow for superior fiber bending strength and workability.

West Fraser™ LVL 3100F_b-2.0E

- 1¾" and 3½" thick in I-Joist and lumber compatible depths to 24" deep

West Fraser™ LVL 3000F_b-1.9E

- 1¾" thick in I-Joist and lumber compatible depths to 24" deep

West Fraser™ LVL 3000F_b-1.8E

- 1½", 1¾", and 3½" thick in I-Joist and lumber compatible depths to 18". (1¾" and 3½" to 24"), 3½" thick in columns

West Fraser™ LVL 2750F_b-1.7E

- 1¾" and 3½" thick in I-Joist and lumber compatible depths to 24" deep

All products have face, back and edges sealed for improved performance under normal construction exposure

CODE EVALUATION REPORT NUMBERS: ICC ESR-1618, CITY OF LOS ANGELES – RR 25570

Check product availability with supplier prior to specifying LVL sizes.

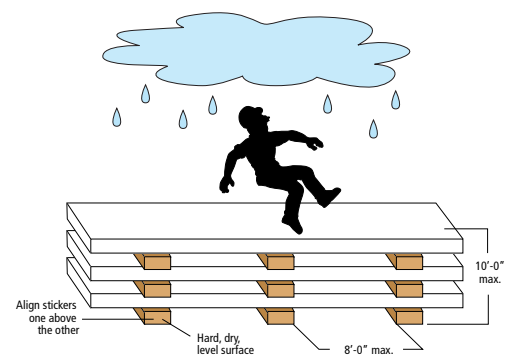
For seismic design, see California Building Code.

STORAGE, HANDLING AND INSTALLATION

Failure to follow good procedures for installation, storage and handling could result in unsatisfactory performance and unsafe structures.

- West Fraser™ LVL should be stored lying flat and protected from the weather.
- Stickers to be aligned one above the other and spaced no more than 8'-0" apart.
- Do not exceed a storage bundle height of 10'-0".
- Keep the material above ground to minimize the absorption of ground moisture and allow circulation of air.
- Report all forklift damage prior to shipment.
- West Fraser™ LVL is for use in covered, dry conditions only. Protect from the weather on the job site both before and after installation.
- Except for cutting to length, West Fraser™ LVL shall not be cut, drilled or notched. Heel cuts may be possible. Contact your West Fraser representative.
- Place first set of stickers on hard, level surface.
- **Do not install any damaged LVL.**

CAUTION: Wrap may be slippery when wet



These are general recommendations and in some cases, additional precautions may be required.



West Fraser™ LVL

3100F_b – 2.0E LVL



3100F_b – 2.0E 1³/₄" and 3¹/₂" THICK

HEADERS AND BEAMS

DESIGN PROPERTIES

3100F_b-2.0E 1³/₄" WEST FRASER™ LVL ALLOWABLE DESIGN VALUES

Design Property	Depth										
	5½"	7¼"	9¼"	9½"	11¼"	11½"	11¾"	14"	16"	18"	24"
Moment (ft. lbs.)	2486	4189	6636	6979	9605	10012	10638	14517	18682	23337	40183
Shear (lbs.)	1925	2538	3238	3325	3938	4025	4156	4900	5600	6300	8400
Moment of Inertia (in ⁴)	24	56	115	125	208	222	244	400	597	851	2016
Weight (lbs./lin. Ft.)	2.7	3.6	4.6	4.7	5.6	5.7	5.9	7.0	8.0	9.0	12.0

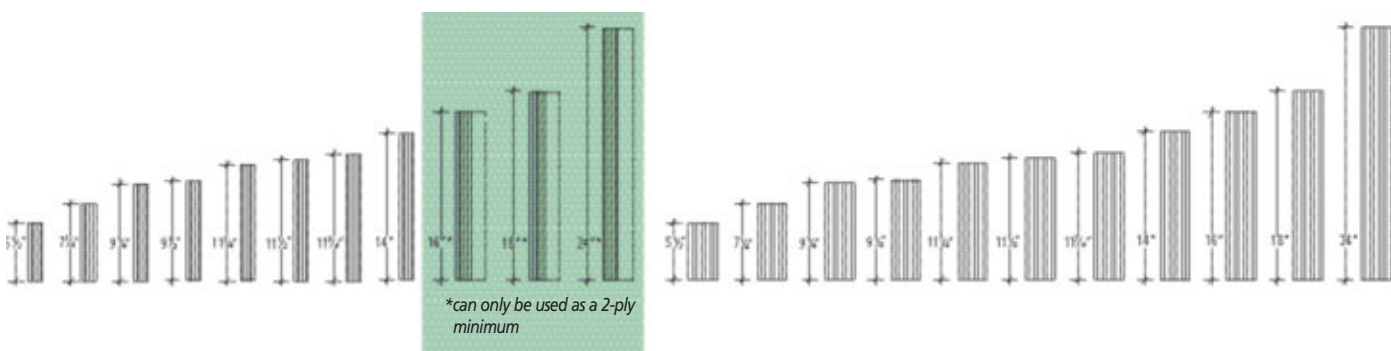
1. Lateral support of beam compression edge is required at intervals of 24" o/c or closer.
2. Lateral support of beam is required at bearing locations.
3. All 16", 18" and 24" beam depths are to be used in multiple member units only.
4. Values are based on 100% load duration.

3100F_b-2.0E 3¹/₂" WEST FRASER™ LVL ALLOWABLE DESIGN VALUES

Design Property	Depth										
	5½"	7¼"	9¼"	9½"	11¼"	11½"	11¾"	14"	16"	18"	24"
Moment (ft. lbs.)	4971	8377	13272	13958	19210	20024	21275	29035	37364	46674	80366
Shear (lbs.)	3850	5076	6476	6650	7876	8050	8312	9800	11200	12600	16800
Moment of Inertia (in ⁴)	49	112	230	250	416	444	488	800	1194	1702	4032
Weight (lbs./lin. Ft.)	5.5	7.2	9.2	9.4	11.2	11.5	11.8	14.0	16.0	18.0	23.9

1. Lateral support of beam compression edge is required at intervals of 24" o/c or closer.
2. Lateral support of beam is required at bearing locations.
3. Values are based on 100% load duration.

3100F_b - 2.0E 1³/₄" AND 3¹/₂" WEST FRASER™ LVL AVAILABLE SIZES



3100F_b - 2.0E WEST FRASER™ LVL ALLOWABLE DESIGN STRESSES

Modulus of Elasticity	E = 2.0 x 10 ⁶ psi
Bending Stress	F _b = 3100 psi
Shear (joist)	F _v = 300 psi
Compression Perpendicular to Grain (joist)	F _{c(perp)} = 750 psi
Compression Parallel to Grain	F _{c(para)} = 3000 psi

1. F_b based on 12" depths. For others depths, multiply by (12/d)^(1/9).
2. Design stresses are based on 100% load duration.
3. F_{c(perp)} and E shall not be increased for duration of load.

ALLOWABLE UNIFORM LOADS (POUNDS PER LINEAL FOOT)

ROOF SNOW 115% – 3100F_b-2.0E

1 3/4" WIDTH

Span (ft)	Condition	5-1/2"	7-1/4"	9-1/4"	9-1/2"	11-1/4"	11-1/2"	11-7/8"	14"	16"*	18"*	24"*
6	LL (L/240)	458										
	TL (L/180)	608	924	1245	1288	1604	1652	1726	2174	2657	3211	5508
	BEARING	1.5/3.5	2.4/6.1	3.3/8.3	3.4/8.6	4.3/10.7	4.4/11.0	4.6/11.5	5.8/14.5	7.1/17.7	8.6/21.4	14.7/36.7
7	LL (L/240)	295	646									
	TL (L/180)	391	770	1028	1062	1312	1349	1406	1749	2109	2511	4055
	BEARING	1.5/3.5	2.1/5.2	3.2/8.0	3.3/8.3	4.1/10.2	4.2/10.5	4.4/10.9	5.4/13.6	6.6/16.4	7.8/19.5	12.6/31.6
8	LL (L/240)	201	444									
	TL (L/180)	265	588	876	904	1109	1140	1186	1463	1748	2061	3208
	BEARING	1.5/3.5	1.8/4.5	2.9/7.2	3.0/7.6	3.9/9.9	4.1/10.1	4.2/10.6	5.2/13.0	6.2/15.6	7.3/18.3	11.4/28.5
9	LL (L/240)	142	317	632	681							
	TL (L/180)	187	419	749	786	960	986	1025	1257	1493	1747	2653
	BEARING	1.5/3.5	1.5/3.6	2.6/6.4	2.7/6.8	3.7/9.3	3.9/9.7	4.1/10.3	5.0/12.6	6.0/14.9	7.0/17.5	10.6/26.5
10	LL (L/240)	104	234	470	507	813	864					
	TL (L/180)	137	308	606	637	847	869	903	1102	1302	1516	2261
	BEARING	1.5/3.5	1.5/3.5	2.3/5.8	2.4/6.1	3.3/8.4	3.5/8.7	3.7/9.3	4.9/12.2	5.8/14.5	6.7/16.9	10.1/25.1
11	LL (L/240)		177	358	387	624	663	725				
	TL (L/180)		233	473	511	725	756	803	980	1154	1339	1970
	BEARING		1.5/3.5	2.0/5.0	2.1/5.4	3.0/7.6	3.2/7.9	3.4/8.4	4.6/11.5	5.6/14.1	6.6/16.4	9.6/24.1
12	LL (L/240)		138	279	301	488	520	569				
	TL (L/180)		180	368	397	608	634	674	883	1036	1199	1744
	BEARING		1.5/3.5	1.7/4.2	1.8/4.5	2.8/6.9	2.9/7.2	3.1/7.7	4.2/10.5	5.4/13.6	6.4/16.0	9.3/23.3
13	LL (L/240)		109	222	239	389	414	454	720			
	TL (L/180)		141	291	314	513	539	573	783	940	1085	1565
	BEARING		1.5/3.5	1.5/3.6	1.6/3.9	2.5/6.4	2.7/6.7	2.8/7.1	3.9/9.7	5.0/12.5	6.2/15.6	9.1/22.6
14	LL (L/240)		88	179	193	315	335	367	586			
	TL (L/180)		113	234	253	414	441	484	674	849	990	1419
	BEARING		1.5/3.5	1.5/3.5	1.5/3.5	2.2/5.5	2.4/5.9	2.6/6.5	3.6/9.0	4.6/11.6	5.8/14.5	8.8/22.1
15	LL (L/240)			146	158	258	275	301	482			
	TL (L/180)			190	206	338	361	396	587	701	911	1298
	BEARING			1.5/3.5	1.5/3.5	1.9/4.8	2.1/5.2	2.3/5.7	3.4/8.4	4.3/10.8	5.4/13.5	8.7/21.7
16	LL (L/240)			121	131	214	228	250	401			
	TL (L/180)			157	170	280	298	328	515	586	813	1196
	BEARING			1.5/3.5	1.5/3.5	1.7/4.3	1.8/4.5	2.0/5.0	3.1/7.8	4.0/10.1	5.1/12.6	8.5/21.3
17	LL (L/240)			101	109	179	191	210	338			
	TL (L/180)			130	141	234	249	274	443	494	687	1108
	BEARING			1.5/3.5	1.5/3.5	1.5/3.8	1.6/4.0	1.8/4.4	2.9/7.2	3.8/9.5	4.8/11.9	8.2/20.5
18	LL (L/240)			86	93	152	162	178	286			
	TL (L/180)			109	119	197	210	231	375	420	586	1032
	BEARING			1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.6	1.6/4.0	2.6/6.4	3.6/9.0	4.5/11.2	7.7/19.4
19	LL (L/240)			79	130	138	152	245				
	TL (L/180)			100	167	179	197	320	468	503	585	966
	BEARING			1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.6	2.3/5.8	3.4/8.5	4.2/10.6	7.3/18.3
20	LL (L/240)					112	119	131	211			
	TL (L/180)					143	153	168	275	311	435	908
	BEARING					1.5/3.5	1.5/3.5	1.5/3.5	2.1/5.2	3.1/7.7	4.0/10.1	6.9/17.4
21	LL (L/240)					97	103	113	183			
	TL (L/180)					123	132	145	237	270	379	826
	BEARING					1.5/3.5	1.5/3.5	1.5/3.5	1.9/4.7	2.8/7.0	3.8/9.6	6.6/16.5
22	LL (L/240)					84	90	99	160			
	TL (L/180)					107	114	126	207	236	331	747
	BEARING					1.5/3.5	1.5/3.5	1.5/3.5	1.7/4.3	2.6/6.4	3.6/9.1	6.3/15.8
23	LL (L/240)							87	141			
	TL (L/180)							110	181	207	292	660
	BEARING							1.5/3.5	1.6/4.0	2.4/5.9	3.3/8.3	6.0/15.0
24	LL (L/240)							124	183			
	TL (L/180)							159	236	236	258	586
	BEARING							1.5/3.6	2.2/5.4	3.1/7.7	5.8/14.4	
25	LL (L/240)							110	163			
	TL (L/180)							140	209	209	229	522
	BEARING							1.5/3.5	2.0/5.0	2.8/7.1	5.5/13.8	
26	LL (L/240)							98	145			
	TL (L/180)							124	186	186	205	467
	BEARING							1.5/3.5	1.8/4.6	2.6/6.5	5.3/13.2	
27	LL (L/240)							88	130			
	TL (L/180)							110	165	165	183	420
	BEARING							1.5/3.5	1.7/4.2	2.4/6.1	5.1/12.7	
28	LL (L/240)							79	117			
	TL (L/180)							98	148	148	165	379
	BEARING							1.5/3.5	1.6/3.9	2.3/5.6	4.9/12.3	
29	LL (L/240)								105			
	TL (L/180)								133	133	149	342
	BEARING								1.5/3.7	2.1/5.2	4.7/11.8	
30	LL (L/240)								95			
	TL (L/180)								119	119	135	311
	BEARING								1.5/3.5	2.0/4.9	4.6/11.4	
31	LL (L/240)								87			
	TL (L/180)								108	108	122	283
	BEARING								1.5/3.5	1.8/4.5	4.3/10.8	
32	LL (L/240)								79			
	TL (L/180)								97	97	112	258
	BEARING								1.5/3.5	1.7/4.3	4.0/10.1	

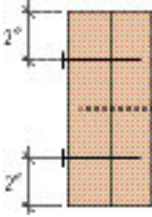
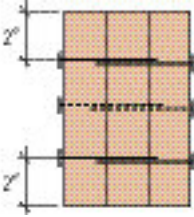
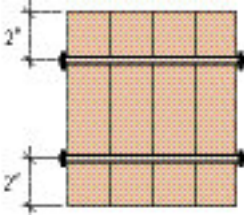
BEARING = Minimum End / Intermediate Bearing Length (inches)

* All 16", 18" and 24" beam depths are to be used in multiple member units only.

MULTIPLE MEMBER CONNECTIONS FOR SIDE-LOADED BEAMS: 3100F_b – 2.0E

Verify adequacy of beam in uniform load tables prior to using values listed below.

3100F_b - 2.0E 1¾" WEST FRASER™ LVL

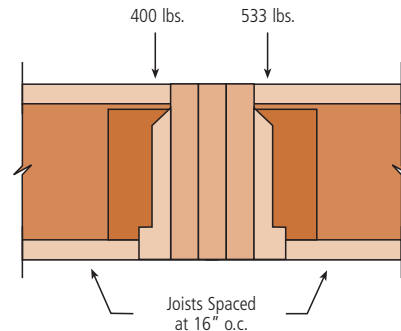
Maximum Uniform Load (PLF) Applied to Either Outside Member			 2-PLY LVL	 3-PLY LVL	 4-PLY LVL*
Connector	Spacing	Rows	Nails On One Side or Through Bolts	Nails Both Sides or Through Bolts	Through Bolts Only
16d (3½") Common Wire Nails	12" o.c.	2 Rows	507	381	Not Applicable
		3 Rows	761	571	
	6" o.c.	2 Rows	1015	761	Not Applicable
		3 Rows	1522	1142	
	4" o.c.	2 Rows	1522	1142	Not Applicable
		3 Rows	2283	1712	
½" A307 Through Bolts	24" o.c.	2 Rows	410	308	273
	12" o.c.	2 Rows	820	615	547
	6" o.c.	2 Rows	1640	1230	1093

* 4-ply beams should only be side-loaded when loads are applied to both sides of the member.

- Nails to be located a minimum of 2" from the top and bottom of the member with a minimum spacing of 2" between rows. Start all nails a minimum of 2½" in from ends.
- Bolts are to be material conforming to ANSI/ASME Standard B18.2.1-1981. Bolt holes are to be the same diameter as the bolt, and located 2" from the top and bottom of the member. Washers should be used under head and nut. Start all bolts a minimum of 2½" in from ends.
- Verify adequacy of beam in uniform load tables (pages 7-9).
- Values listed are for 100% stress level. Increase 15% for snow loaded roof conditions or 25% for non-snow roof conditions, where code allows.

EXAMPLE

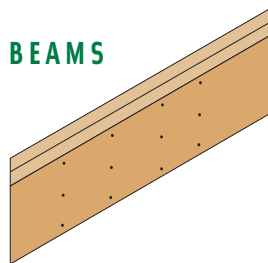
First, convert joist reactions to plf load on each side of the beam by taking the joist reactions (lbs.) divided by the joist spacing (ft.). 400 lbs/(16/12) = 300 plf and 533 lbs/(16/12) = 400 plf. Check allowable load tables to verify that 3 pieces can carry the total load of 700 plf. The maximum load applied to either outside member is 400 plf. For a 3-piece 1¾" multiple assembly, use 3 rows of 16d (3½") common wire nails at 12" o.c. (good for 571 plf). Alternate: 2 rows of ½" bolts at 12" o.c.



CONNECTION OF MULTIPLE PIECES FOR TOP-LOADED BEAMS

2.0E (1¾" wide pieces)

- Minimum of 2 rows of 16d (3½") nails at 12" o.c. for 5½" through 11⅞" beams
- Minimum of 3 rows of 16d (3½") nails at 12" o.c. for 14", 16", 18" and 24" beams





West Fraser™ LVL

3000F_b – 1.9E LVL



3000F_b – 1.9E 1³/₄" THICK

HEADERS AND BEAMS

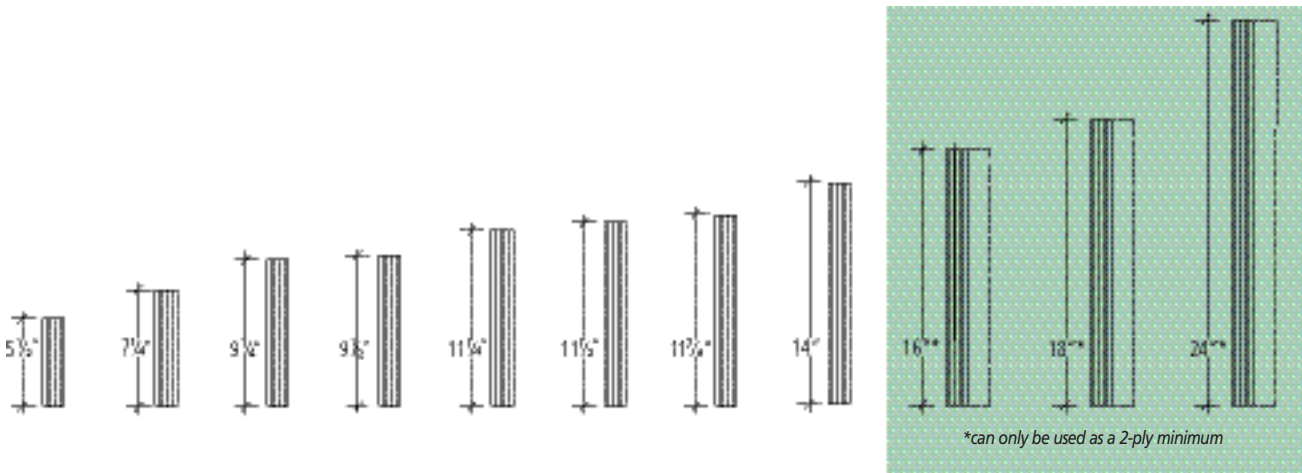
DESIGN PROPERTIES

3000F_b-1.9E 1³/₄" WEST FRASER™ ALLOWABLE DESIGN VALUES

Design Property	Depth										
	5½"	7¼"	9¼"	9½"	11¼"	11½"	11¾"	14"	16"	18"	24"
Moment (ft. lbs.)	2453	4105	6464	6793	9310	9699	10297	13995	17950	22357	38220
Shear (lbs.)	1925	2538	3238	3325	3938	4025	4156	4900	5600	6300	8400
Moment of Inertia (in ⁴)	24	56	115	125	208	222	244	400	597	851	2016
Weight (lbs./lin. Ft.)	2.7	3.6	4.6	4.7	5.6	5.7	5.9	7.0	8.0	8.1	12.0

- Lateral support of beam compression edge is required at intervals of 24" o/c or closer.
- Lateral support of beam is required at bearing locations.
- All 16", 18" and 24" beam depths are to be used in multiple member units only.
- Values are based on 100% load duration.

3000F_b - 1.9E 1³/₄" WEST FRASER™ LVL AVAILABLE SIZES



3000F_b - 1.9E WEST FRASER™ LVL ALLOWABLE DESIGN STRESSES

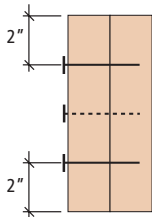
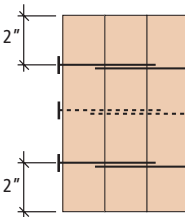
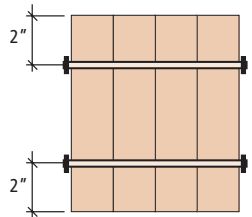
Modulus of Elasticity	E	=	1.9 x 10 ⁶ psi
Flexural Stress	F _b	=	3000 psi
Horizontal Shear (joist)	F _v	=	300 psi
Compression Perpendicular to Grain (joist)	F _{c(perp)}	=	750 psi
Compression Parallel to Grain	F _{c(para)}	=	2500 psi

- F_b based on 12" depths. For other depths, multiply by (12/d)^(1/7.35).
- F_{c(perp)} and E shall not be increased for duration of load.
- Design stresses are based on 100% load duration.

MULTIPLE MEMBER CONNECTIONS FOR SIDE-LOADED BEAMS: $3000F_b - 1.9E$

Verify adequacy of beam in uniform load tables prior to using values listed below.

$3000F_b - 1.9E$ $1\frac{3}{4}$ " WEST FRASER™ LVL

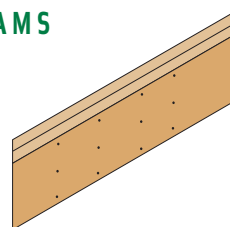
Maximum Uniform Load (PLF) Applied to Either Outside Member			 2-PLY LVL	 3-PLY LVL	 4-PLY LVL*
Connector	Spacing	Rows	Nails On One Side or Through Bolts	Nails Both Sides or Through Bolts	Through Bolts Only
16d (3½") Common Wire Nails	12" o.c.	2 Rows	500	380	Not Applicable
		3 Rows	765	575	
	6" o.c.	2 Rows	1000	760	Not Applicable
		3 Rows	1530	1150	
	4" o.c.	2 Rows	1500	1140	Not Applicable
		3 Rows	2295	1725	
½" A307 Through Bolts	24" o.c.	2 Rows	410	308	273
	12" o.c.	2 Rows	820	615	547
	6" o.c.	2 Rows	1640	1230	1093

- Nails to be located a minimum of 2" from the top and bottom of the member with a minimum spacing of 2" between rows. Start all nails a minimum of 2½" in from ends.
- Bolts are to be material conforming to ANSI/ASME Standard B18.2.1-1981. Bolt holes are to be the same diameter as the bolt, and located 2" from the top and bottom of the member. Washers should be used under head and nut. Start all bolts a minimum of 2½" in from ends.
- Verify adequacy of beam in uniform load tables (pages 13-14).
- Values listed are for 100% stress level. Increase 15% for snow loaded roof conditions or 25% for non-snow roof conditions, where code allows.

CONNECTION OF MULTIPLE PIECES FOR TOP-LOADED BEAMS

1.9E ($1\frac{3}{4}$ " wide pieces)

- Minimum of 2 rows of 16d (3½") nails at 12" o.c. for 5½" through 11⅞" beams
- Minimum of 3 rows of 16d (3½") nails at 12" o.c. for 14", 16", 18" and 24" beams



NOTES

Ruled area for notes with horizontal lines.



West Fraser™ LVL

3000F_b – 1.8E LVL



3000F_b – 1.8E 1 1/2", 1 3/4" and 3 1/2" THICK

HEADERS AND BEAMS

DESIGN PROPERTIES

3000F_b-1.8E 1 1/2" WEST FRASER™ LVL ALLOWABLE DESIGN VALUES

Design Property	Depth								
	5 1/2"	7 1/4"	9 1/4"	9 1/2"	11 1/2"	11 7/8"	14"	16"	18"
Moment (ft. lbs.)	2102	3518	5540	5823	8314	8826	11996	15386	19163
Shear (lbs.)	1595	2103	2683	2755	3335	3444	4060	4640	5220
Moment of Inertia (in ⁴)	21	48	99	107	190	209	343	512	729
Weight (lbs./lin. Ft.)	2.1	2.8	3.6	3.7	4.4	4.6	5.4	6.2	6.9

1. Lateral support of beam compression edge is required at intervals of 24" o/c or closer.
2. Lateral support of beam is required at bearing locations.
3. All 14, 16" and 18" beam depths are to be used in multiple member units only.
4. Values are based on 100% load duration.

3000F_b-1.8E 1 3/4" WEST FRASER™ LVL ALLOWABLE DESIGN VALUES

Design Property	Depth									
	5 1/2"	7 1/4"	9 1/4"	9 1/2"	11 1/2"	11 7/8"	14"	16"	18"	24"
Moment (ft. lbs.)	2453	4105	6464	6793	9699	10297	13995	17950	22357	38220
Shear (lbs.)	1861	2453	3130	3214	3891	4018	4737	5413	6090	8120
Moment of Inertia (in ⁴)	24	56	115	125	222	244	400	597	851	2016
Weight (lbs./lin. Ft.)	2.5	3.3	4.2	4.3	5.2	5.3	6.3	7.2	8.1	10.8

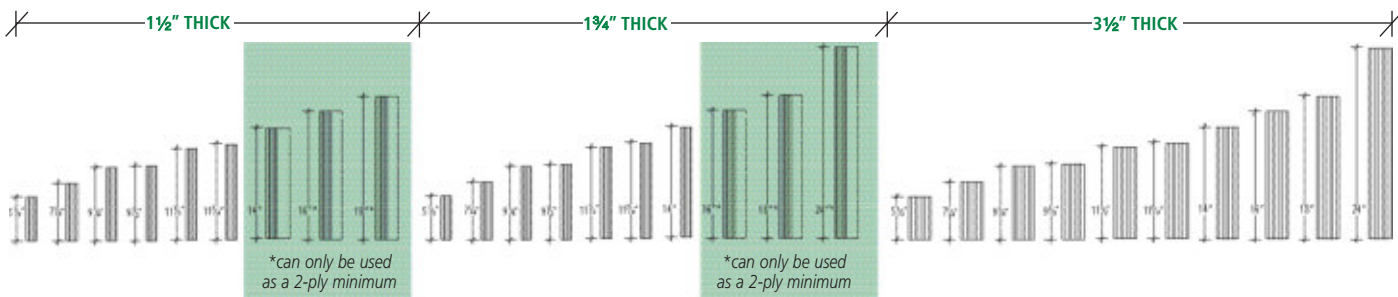
1. Lateral support of beam compression edge is required at intervals of 24" o/c or closer.
2. Lateral support of beam is required at bearing locations.
3. All 16", 18" and 24" beam depths are to be used in multiple member units only.
4. Values are based on 100% load duration.

3000F_b-1.8E 3 1/2" WEST FRASER™ LVL ALLOWABLE DESIGN VALUES

Design Property	Depth									
	5 1/2"	7 1/4"	9 1/4"	9 1/2"	11 1/2"	11 7/8"	14"	16"	18"	24"
Moment (ft. lbs.)	4906	8209	12928	13587	19398	20594	27990	35900	44714	76440
Shear (lbs.)	3722	4906	6259	6428	7782	8035	9473	10827	12180	16240
Moment of Inertia (in ⁴)	49	111	231	250	444	488	800	1195	1701	4032
Weight (lbs./lin. Ft.)	4.9	6.5	8.3	8.5	10.3	10.7	12.6	14.4	16.2	21.6

1. Lateral support of beam compression edge is required at intervals of 24" o/c or closer.
2. Lateral support of beam is required at bearing locations.
3. Values are based on 100% load duration.

3000F_b -1.8E 1 1/2", 1 3/4", AND 3 1/2" WEST FRASER™ LVL AVAILABLE SIZES



3000F_b -1.8E WEST FRASER™ LVL ALLOWABLE DESIGN STRESSES

Modulus of Elasticity	E = 1.8 x 10 ⁶ psi
Flexural Stress	F _b = 3000 psi
Horizontal Shear (joist)	F _v = 290 psi
Compression Perpendicular to Grain (joist)	F _{c(perp)} = 750 psi
Compression Parallel to Grain	F _{c(para)} = 2350 psi

1. F_b based on 12" depths. For depths, d, between 3 1/2" and 24", multiply by (12/d)^(1/7.35).
2. Design stresses are based on 100% load duration.
3. F_{c(perp)} shall not be increased for duration of load.

ALLOWABLE UNIFORM LOADS (POUNDS PER LINEAL FOOT)

ROOF SNOW 115% – 3000F_b-1.8E

Span (ft)	Condition	1½" WIDTH								
		5-1/2"	7-1/4"	9-1/4"	9-1/2"	11-1/2"	11-7/8"	14"*	16"*	18"*
6	LL (L/240)	353	763							
	TL (L/180)	469	766	1032	1067	1369	1430	1802	2202	2661
	BEARING	1.5/3.5	2.0/5.1	2.8/6.9	2.8/7.1	3.7/9.1	3.8/9.5	4.8/12.0	5.9/14.7	7.1/17.7
7	LL (L/240)	228	498							
	TL (L/180)	301	638	852	881	1118	1165	1450	1748	2081
	BEARING	1.5/3.5	2.0/5.0	2.7/6.6	2.7/6.9	3.5/8.7	3.6/9.1	4.5/11.3	5.4/13.6	6.5/16.2
8	LL (L/240)	155	342							
	TL (L/180)	204	453	726	749	944	983	1213	1449	1708
	BEARING	1.5/3.5	1.6/4.0	2.6/6.5	2.7/6.7	3.4/8.4	3.5/8.7	4.3/10.8	5.2/12.9	6.1/15.2
9	LL (L/240)	110	244							
	TL (L/180)	144	323	626	652	817	850	1042	1237	1448
	BEARING	1.5/3.5	1.5/3.5	2.5/6.3	2.6/6.5	3.3/8.2	3.4/8.5	4.2/10.4	4.9/12.4	5.8/14.5
10	LL (L/240)	81	180							
	TL (L/180)	105	238	480	518	720	748	913	1079	1257
	BEARING	1.5/3.5	1.5/3.5	2.1/5.3	2.3/5.8	3.2/8.0	3.3/8.3	4.1/10.1	4.8/12.0	5.6/14.0
11	LL (L/240)	137	276							
	TL (L/180)	180	365	394	394	628	666	813	957	1110
	BEARING		1.5/3.5	1.8/4.5	1.9/4.8	3.1/7.7	3.3/8.1	4.0/9.9	4.7/11.7	5.4/13.6
12	LL (L/240)	106	215							
	TL (L/180)	139	284	306	306	527	559	732	859	994
	BEARING		1.5/3.5	1.5/3.8	1.6/4.1	2.8/7.0	3.0/7.5	3.9/9.8	4.6/11.5	5.3/13.3
13	LL (L/240)	84	171							
	TL (L/180)	109	224	242	242	422	462	648	780	899
	BEARING		1.5/3.5	1.5/3.5	1.5/3.5	2.4/6.1	2.7/6.7	3.7/9.4	4.5/11.3	5.2/13.0
14	LL (L/240)	68	138							
	TL (L/180)	87	180	195	195	340	373	558	713	821
	BEARING		1.5/3.5	1.5/3.5	1.5/3.5	2.1/5.3	2.3/5.8	3.5/8.7	4.4/11.1	5.1/12.8
15	LL (L/240)									
	TL (L/180)			113	122	212	233	372	541	749
	BEARING			1.5/3.5	1.5/3.5	1.9/4.6	2.0/5.1	3.2/8.1	4.2/10.4	5.0/12.6
16	LL (L/240)									
	TL (L/180)			93	101	176	193	310	452	627
	BEARING			1.5/3.5	1.5/3.5	1.6/4.1	1.8/4.5	2.9/7.2	3.9/9.7	4.8/12.1
17	LL (L/240)									
	TL (L/180)			78	84	148	162	260	381	530
	BEARING			1.5/3.5	1.5/3.5	1.5/3.6	1.6/4.0	2.6/6.5	3.7/9.1	4.6/11.4
18	LL (L/240)									
	TL (L/180)			66	71	125	137	221	324	452
	BEARING			1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.6	2.3/5.8	3.4/8.5	4.3/10.7
19	LL (L/240)									
	TL (L/180)					107	117	189	278	388
	BEARING					1.5/3.5	1.5/3.5	2.1/5.2	3.1/7.7	4.1/10.2
20	LL (L/240)									
	TL (L/180)					92	101	163	240	336
	BEARING					1.5/3.5	1.5/3.5	1.9/4.7	2.8/7.0	3.9/9.6
21	LL (L/240)									
	TL (L/180)					80	87	141	208	292
	BEARING					1.5/3.5	1.5/3.5	1.7/4.3	2.5/6.3	3.6/8.9
22	LL (L/240)									
	TL (L/180)					69	76	124	182	256
	BEARING					1.5/3.5	1.5/3.5	1.6/3.9	2.3/5.8	3.3/8.2
23	LL (L/240)									
	TL (L/180)							67	108	160
	BEARING							85	139	207
24	LL (L/240)									
	TL (L/180)									
	BEARING							1.5/3.5	1.5/3.6	2.1/5.3
25	LL (L/240)									
	TL (L/180)							96	141	199
	BEARING							122	182	258
26	LL (L/240)									
	TL (L/180)							85	126	177
	BEARING							108	161	229
27	LL (L/240)									
	TL (L/180)							1.5/3.5	1.8/4.5	2.5/6.4
	BEARING							76	112	158
28	LL (L/240)									
	TL (L/180)							96	143	204
	BEARING							1.5/3.5	1.7/4.1	2.4/5.9
29	LL (L/240)									
	TL (L/180)							68	100	141
	BEARING							85	128	182
30	LL (L/240)									
	TL (L/180)							1.5/3.5	1.5/3.8	2.2/5.5
	BEARING								90	127
31	LL (L/240)									
	TL (L/180)									
	BEARING								114	163
32	LL (L/240)									
	TL (L/180)									
	BEARING								81	115

BEARING = Minimum End / Intermediate Bearing Length (inches)
 * All 14", 16" and 18" beam depths are to be used in multiple member units only.

ALLOWABLE UNIFORM LOADS (POUNDS PER LINEAL FOOT)

ROOF NON-SNOW 125% – 3000F_b-1.8E

		1½" WIDTH								
Span (ft)	Condition	5-1/2"	7-1/4"	9-1/4"	9-1/2"	11-1/2"	11-7/8"	14"*	16"*	18"*
6	LL (L/240)	353	763							
	TL (L/180)	469	833	1122	1160	1489	1555	1959	2394	2893
	BEARING	1.5/3.5	2.2/5.6	3.0/7.5	3.1/7.7	4.0/9.9	4.1/10.4	5.2/13.1	6.4/16.0	7.7/19.3
7	LL (L/240)	228	498							
	TL (L/180)	301	662	927	957	1216	1267	1576	1901	2263
	BEARING	1.5/3.5	2.1/5.1	2.9/7.2	3.0/7.4	3.8/9.5	3.9/9.9	4.9/12.3	5.9/14.8	7.0/17.6
8	LL (L/240)	155	342	676	728					
	TL (L/180)	204	453	789	815	1027	1069	1319	1576	1857
	BEARING	1.5/3.5	1.6/4.0	2.8/7.0	2.9/7.2	3.7/9.1	3.8/9.5	4.7/11.7	5.6/14.0	6.6/16.5
9	LL (L/240)	110	244	488	526	888				
	TL (L/180)	144	323	647	697	889	924	1133	1345	1575
	BEARING	1.5/3.5	1.5/3.5	2.6/6.5	2.8/7.0	3.6/8.9	3.7/9.2	4.5/11.3	5.4/13.5	6.3/15.8
10	LL (L/240)	81	180	363	391	666	728			
	TL (L/180)	105	238	480	518	783	814	993	1173	1367
	BEARING	1.5/3.5	1.5/3.5	2.1/5.3	2.3/5.8	3.5/8.7	3.6/9.0	4.4/11.0	5.2/13.0	6.1/15.2
11	LL (L/240)		137	276	298	512	560	879		
	TL (L/180)		180	365	394	678	725	884	1040	1207
	BEARING		1.5/3.5	1.8/4.5	1.9/4.8	3.3/8.3	3.5/8.9	4.3/10.8	5.1/12.7	5.9/14.8
12	LL (L/240)		106	215	233	401	439	693		
	TL (L/180)		139	284	306	530	580	796	934	1081
	BEARING		1.5/3.5	1.5/3.8	1.6/4.1	2.8/7.1	3.1/7.7	4.2/10.6	5.0/12.5	5.8/14.4
13	LL (L/240)		84	171	185	319	350	556	803	
	TL (L/180)		109	224	242	422	462	704	848	978
	BEARING		1.5/3.5	1.5/3.5	1.5/3.5	2.4/6.1	2.7/6.7	4.1/10.2	4.9/12.2	5.7/14.1
14	LL (L/240)		68	138	149	259	283	452	655	
	TL (L/180)		87	180	195	340	373	597	776	893
	BEARING		1.5/3.5	1.5/3.5	1.5/3.5	2.1/5.3	2.3/5.8	3.7/9.3	4.8/12.1	5.6/13.9
15	LL (L/240)			113	122	212	233	372	541	749
	TL (L/180)			147	159	278	305	491	678	822
	BEARING			1.5/3.5	1.5/3.5	1.9/4.6	2.0/5.1	3.3/8.2	4.5/11.3	5.5/13.7
16	LL (L/240)			93	101	176	193	310	452	627
	TL (L/180)			121	131	230	253	407	595	742
	BEARING			1.5/3.5	1.5/3.5	1.6/4.1	1.8/4.5	2.9/7.2	4.2/10.6	5.3/13.2
17	LL (L/240)			78	84	148	162	260	381	530
	TL (L/180)			101	109	192	211	342	502	656
	BEARING			1.5/3.5	1.5/3.5	1.5/3.6	1.6/4.0	2.6/6.5	3.8/9.5	5.0/12.4
18	LL (L/240)			66	71	125	137	221	324	452
	TL (L/180)			84	92	162	178	289	426	585
	BEARING			1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.6	2.3/5.8	3.4/8.5	4.7/11.7
19	LL (L/240)				107	117		189	278	388
	TL (L/180)				138	152		247	364	510
	BEARING				1.5/3.5	1.5/3.5		2.1/5.2	3.1/7.7	4.3/10.8
20	LL (L/240)				92	101		163	240	336
	TL (L/180)				118	130		212	313	440
	BEARING				1.5/3.5	1.5/3.5		1.9/4.7	2.8/7.0	3.9/9.8
21	LL (L/240)				80	87		141	208	292
	TL (L/180)				102	112		183	271	382
	BEARING				1.5/3.5	1.5/3.5		1.7/4.3	2.5/6.3	3.6/8.9
22	LL (L/240)				69	76		124	182	256
	TL (L/180)				88	97		159	237	334
	BEARING				1.5/3.5	1.5/3.5		1.6/3.9	2.3/5.8	3.3/8.2
23	LL (L/240)					67		108	160	225
	TL (L/180)					85		139	207	293
	BEARING					1.5/3.5		1.5/3.6	2.1/5.3	3.0/7.5
24	LL (L/240)							96	141	199
	TL (L/180)							122	182	258
	BEARING							1.5/3.5	1.9/4.9	2.8/6.9
25	LL (L/240)							85	126	177
	TL (L/180)							108	161	229
	BEARING							1.5/3.5	1.8/4.5	2.5/6.4
26	LL (L/240)							76	112	158
	TL (L/180)							96	143	204
	BEARING							1.5/3.5	1.7/4.1	2.4/5.9
27	LL (L/240)							68	100	141
	TL (L/180)							85	128	182
	BEARING							1.5/3.5	1.5/3.8	2.2/5.5
28	LL (L/240)								90	127
	TL (L/180)								114	163
	BEARING								1.5/3.5	2.0/5.1
29	LL (L/240)								81	115
	TL (L/180)								102	146
	BEARING								1.5/3.5	1.9/4.7
30	LL (L/240)								74	104
	TL (L/180)								92	132
	BEARING								1.5/3.5	1.8/4.4
31	LL (L/240)								67	94
	TL (L/180)								83	119
	BEARING								1.5/3.5	1.6/4.1
32	LL (L/240)									86
	TL (L/180)									108
	BEARING									1.5/3.8

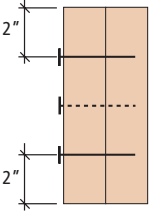
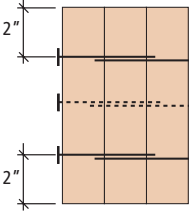
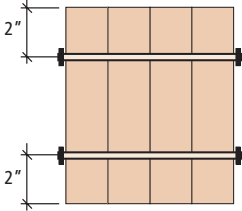
BEARING = Minimum End / Intermediate Bearing Length (inches)

* All 14", 16" and 18" beam depths are to be used in multiple member units only.

MULTIPLE MEMBER CONNECTIONS FOR SIDE-LOADED BEAMS: $3000F_b - 1.8E$

Verify adequacy of beam in uniform load tables prior to using values listed below.

$3000F_b - 1.8E$ 1½" WEST FRASER™ LVL

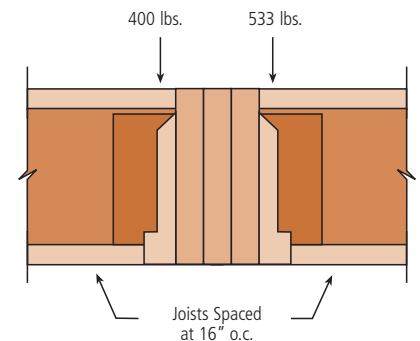
Maximum Uniform Load (PLF) Applied to Either Outside Member			 2-PLY LVL	 3-PLY LVL	 4-PLY LVL*
Connector	Spacing	Rows	Nails On One Side or Through Bolts	Nails Both Sides or Through Bolts	Through Bolts Only
10d (3") Common Wire Nails	12" o.c.	2 Rows	414	315	Not Applicable
		3 Rows	633	476	
	6" o.c.	2 Rows	828	629	Not Applicable
		3 Rows	1266	952	
	4" o.c.	2 Rows	1241	944	Not Applicable
		3 Rows	1899	1428	
½" A307 Through Bolts	24" o.c.	2 Rows	351	264	234
	12" o.c.	2 Rows	703	527	469
	6" o.c.	2 Rows	1406	1054	937

* 4-ply beams should only be side-loaded when loads are applied to both sides of the member.

- Nails to be located a minimum of 2" from the top and bottom of the member with a minimum spacing of 2" between rows. Start all nails a minimum of 2½" in from ends.
- Bolts are to be material conforming to ANSI/ASME Standard B18.2.1-1981. Bolt holes are to be the same diameter as the bolt, and located 2" from the top and bottom of the member. Washers should be used under head and nut. Start all bolts a minimum of 2½" in from ends.
- Verify adequacy of beam in uniform load tables (pages 19-21).
- Values listed are for 100% stress level. Increase 15% for snow loaded roof conditions or 25% for non-snow roof conditions, where code allows.

EXAMPLE

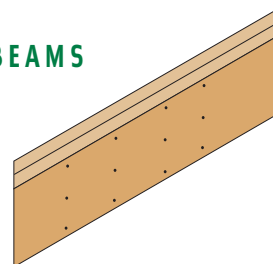
First, convert joist reactions to plf load on each side of the beam by taking the joist reactions (lbs.) divided by the joist spacing (ft.). $400 \text{ lbs}/(16/12) = 300 \text{ plf}$ and $533 \text{ lbs}/(16/12) = 400 \text{ plf}$. Check allowable load tables to verify that 3 pieces can carry the total load of 700 plf. The maximum load applied to either outside member is 400 plf. For a 3-piece 1½" multiple assembly, 2 rows of 10d (3") common wire nails at 12" o.c. is good for only 315 plf. Therefore, use 3 rows of 10d (3") common wire nails (good for 476 plf). Alternate: 2 rows of ½" bolts at 12" o.c.



CONNECTION OF MULTIPLE PIECES FOR TOP-LOADED BEAMS

1.8E (1½" wide pieces)

- Minimum of 2 rows of 10d (3") nails at 12" o.c. for depths up to and including 11⅞".
- Minimum of 3 rows of 10d (3") nails at 12" o.c. for depths greater than 11⅞".



MULTIPLE MEMBER CONNECTIONS FOR SIDE-LOADED BEAMS: $3000F_b - 1.8E$

Verify adequacy of beam in uniform load tables prior to using values listed below.

$3000F_b-1.8E$ $1\frac{3}{4}$ " WEST FRASER™ LVL

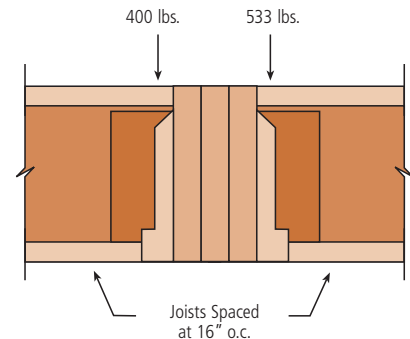
Maximum Uniform Load (PLF) Applied to Either Outside Member			2-PLY LVL	3-PLY LVL	4-PLY LVL*
Connector	Spacing	Rows	Nails On One Side or Through Bolts	Nails Both Sides or Through Bolts	Through Bolts Only
16d (3½") Common Wire Nails	12" o.c.	2 Rows	500	380	Not Applicable
		3 Rows	765	575	
	6" o.c.	2 Rows	1000	760	Not Applicable
		3 Rows	1530	1150	
	4" o.c.	2 Rows	1500	1140	Not Applicable
		3 Rows	2295	1725	
½" A307 Through Bolts	24" o.c.	2 Rows	410	308	273
	12" o.c.	2 Rows	820	615	547
	6" o.c.	2 Rows	1640	1230	1093

* 4-ply beams should only be side-loaded when loads are applied to both sides of the member.

- Nails to be located a minimum of 2" from the top and bottom of the member with a minimum spacing of 2" between rows. Start all nails a minimum of 2½" in from ends.
- Bolts are to be material conforming to ANSI/ASME Standard B18.2.1-1981. Bolt holes are to be the same diameter as the bolt, and located 2" from the top and bottom of the member. Washers should be used under head and nut. Start all bolts a minimum of 2½" in from ends.
- Verify adequacy of beam in uniform load tables (pages 22-24).
- Values listed are for 100% stress level. Increase 15% for snow loaded roof conditions or 25% for non-snow roof conditions, where code allows.

EXAMPLE

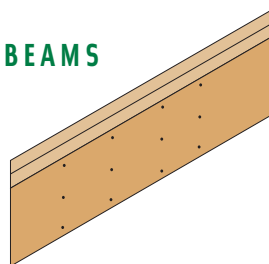
First, convert joist reactions to plf load on each side of the beam by taking the joist reactions (lbs.) divided by the joist spacing (ft.). $400 \text{ lbs}/(16/12) = 300 \text{ plf}$ and $533 \text{ lbs}/(16/12) = 400 \text{ plf}$. Check allowable load tables to verify that 3 pieces can carry the total load of 700 plf. The maximum load applied to either outside member is 400 plf. For a 3-piece $1\frac{3}{4}$ " multiple assembly, 2 rows of 16d (3½") common wire nails at 12" o.c. is good for only 380 plf. Therefore, use 3 rows of 16d (3½") common wire nails at 12" o.c. (good for 575 plf). Alternate: 2 rows of ½" bolts at 12" o.c.



CONNECTION OF MULTIPLE PIECES FOR TOP-LOADED BEAMS

1.8E ($1\frac{3}{4}$ " wide pieces)

- Minimum of 2 rows of 16d (3½") nails at 12" o.c. for 5½" through 11⅞" beams
- Minimum of 3 rows of 16d (3½") nails at 12" o.c. for 14", 16", 18" and 24" beams



COLUMNS: $3000F_b - 1.8E$

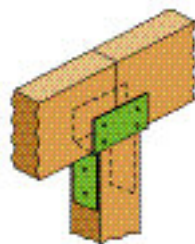
ALLOWABLE AXIAL LOADS (LBS)

Column Length (ft)	3½" x 3½"			3½" x 4¾"			3½" x 5½"			3½" x 7¼"			3½" x 8⅝"		
	100%	115%	125%	100%	115%	125%	100%	115%	125%	100%	115%	125%	100%	115%	125%
3	12091	13622	14602	15343	17334	18620	19443	21984	23639	25705	29105	31313	30550	34625	37251
4	10866	12042	12777	13965	15542	16522	17826	19866	21137	23675	26441	28141	28195	31516	33569
5	9482	10315	10817	12327	13460	14133	15824	17287	18172	21112	23091	24259	25176	27561	28980
6	8097	8673	9016	10612	11393	11852	13668	14669	15265	18245	19590	20376	21795	23395	24331
7	6872	7289	7522	9050	9601	9923	11646	12359	12763	15555	16494	17052	18596	19712	20346
8	5856	6162	6333	7718	8116	8345	9933	10453	10742	13271	13931	14337	15848	16633	17086
9	5023	5243	5378	6630	6921	7090	8528	8894	9105	11368	11850	12129	13554	14158	14490
10	4337	4520	4618	5727	5957	6079	7354	7642	7796	9795	10175	10378	11683	12135	12377
12	3320	3430	3491	4379	4517	4594	5602	5775	5871	7460	7663	7790	8875	9147	9298
14	2609	2683	2720	3430	3522	3568	4389	4485	4562	5811	5963	6039	6943	7094	7185

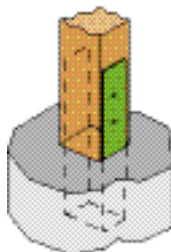
1. Loads are based on the allowable crushing of the LVL material, i.e., steel bearing connections.

COLUMN DETAILS

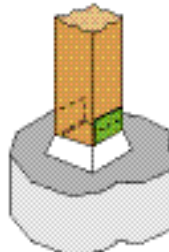
BEAM ON COLUMN CAP



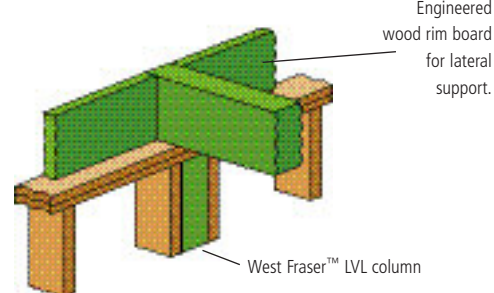
COLUMN BASE



ELEVATED COLUMN BASE



BEAM ON COLUMN



ALLOWABLE AXIAL LOADS (LBS) – WOOD PLATE BEARING CONNECTIONS ($F_{c\perp} = 400$ PSI)

Column Length (ft)	3½" x 3½"			3½" x 4¾"			3½" x 5½"			3½" x 7¼"			3½" x 8⅝"		
	100%	115%	125%	100%	115%	125%	100%	115%	125%	100%	115%	125%	100%	115%	125%
3-7	5425	5425	5425	6650	6650	6650	8225	8225	8225	10675	10675	10675	12600	12600	12600
8	5425	5425	5425	6650	6650	6650	8225	8225	8225	10675	10675	10675	12600	12600	12600
9	5023	5243	5378	6630	6650	6650	8225	8225	8225	10675	10675	10675	12600	12600	12600
10	4337	4520	4618	5727	5957	6079	7354	7642	7796	9795	10175	10378	11683	12135	12377
12	3320	3430	3491	4379	4517	4594	5602	5775	5871	7460	7663	7790	8875	9147	9298
14	2609	2683	2720	3430	3522	3568	4389	4485	4562	5811	5963	6039	6943	7094	7185

GENERAL NOTES

- Tables apply to solid, one-piece members only.
- Column members to be used in dry service conditions only.
- Tables include an eccentricity equal to 1/6 of the larger column dimension (thickness or width).
- Loads are based on simple axial loaded columns. For side loads or other combined bending and axial loads, see the provisions of NDS, 2005 Edition.
- Tables assume that columns are unbraced, except at column ends.
- Column length is the distance between the centers of the restraining members.



West Fraser™ LVL

2750F_b – 1.7E LVL



2750F_b – 1.7E 1³/₄" and 3¹/₂" THICK

HEADERS AND BEAMS

DESIGN PROPERTIES

2750F_b-1.7E 1³/₄" WEST FRASER™ LVL ALLOWABLE DESIGN VALUES

Design Property	Depth									
	5-1/2"	7-1/4"	9-1/4"	9-1/2"	11-1/2"	11-7/8"	14"	16"	18"	24"
Moment (ft. lbs.)	2205	3716	5887	6191	8882	9436	12878	16573	20702	35646
Shear (lbs.)	1861	2453	3130	3214	3891	4018	4737	5413	6090	8120
Moment of Inertia (in ⁴)	24	56	115	125	222	244	400	597	851	2016
Weight (lbs./lin. Ft.)	2.5	3.3	4.2	4.3	5.2	5.3	6.3	7.2	8.1	10.8

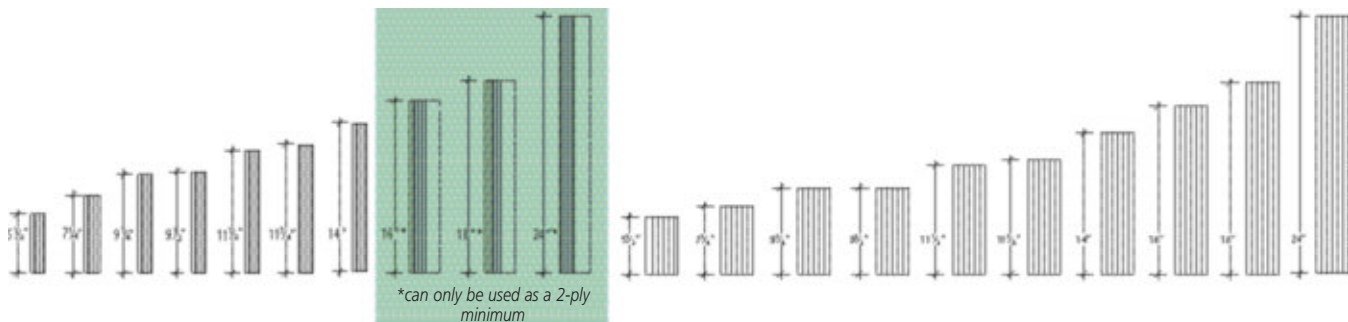
1. Lateral support of beam compression edge is required at intervals of 24" o/c or closer.
2. Lateral support of beam is required at bearing locations.
3. All 16", 18" and 24" beam depths are to be used in multiple member units only.
4. Values are based on 100% load duration.

2750F_b-1.7E 3¹/₂" WEST FRASER™ LVL ALLOWABLE DESIGN VALUES

Design Property	Depth									
	5-1/2"	7-1/4"	9-1/4"	9-1/2"	11-1/2"	11-7/8"	14"	16"	18"	24"
Moment (ft. lbs.)	4410	7431	11774	12382	17763	18873	25756	33146	41405	71292
Shear (lbs.)	3722	4906	6259	6428	7782	8035	9473	10827	12180	16240
Moment of Inertia (in ⁴)	49	111	231	250	444	488	800	1195	1701	4032
Weight (lbs./lin. Ft.)	4.9	6.5	8.3	8.5	10.3	10.7	12.6	14.4	16.2	21.6

1. Lateral support of beam compression edge is required at intervals of 24" o/c or closer.
2. Lateral support of beam is required at bearing locations.
3. Values are based on 100% load duration.

2750F_b -1.7E 1³/₄" and 3¹/₂" WEST FRASER™ LVL AVAILABLE SIZES



2750F_b -1.7E WEST FRASER™ LVL ALLOWABLE DESIGN STRESSES

Modulus of Elasticity	E = 1.7 x 10 ⁶ psi
Flexural Stress	F _b = 2750 psi
Horizontal Shear (joist)	F _v = 290 psi
Compression Perpendicular to Grain (joist)	F _{c(perp)} = 700 psi
Compression Parallel to Grain	F _{c(para)} = 2350 psi

1. F_b based on 12" depths. For depths, d, between 1³/₄" and 24", multiply by (12/d)^(1/9).
2. Design stresses are based on 100% load duration.
3. F_{c(perp)} shall not be increased for duration of load.

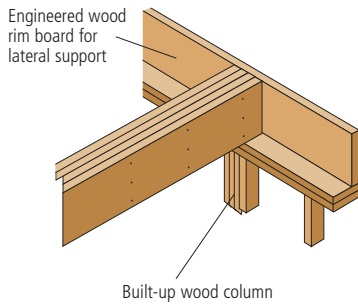


Miscellaneous Details, Software and Warranty Information

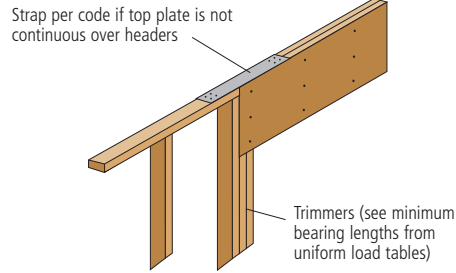


BEARING DETAILS

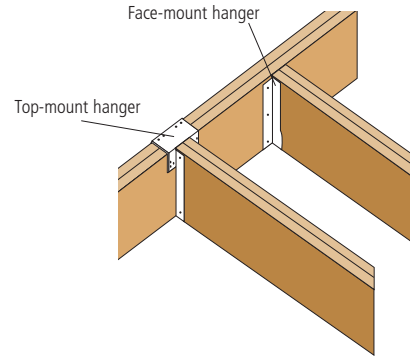
B1 BEARING AT WALL



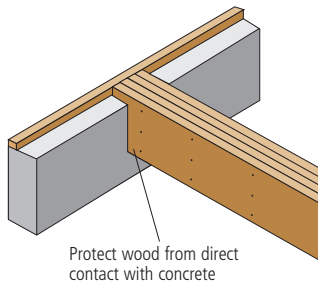
B2 BEARING FOR DOOR OR WINDOW HEADER



B3 BEAM-TO-BEAM CONNECTION

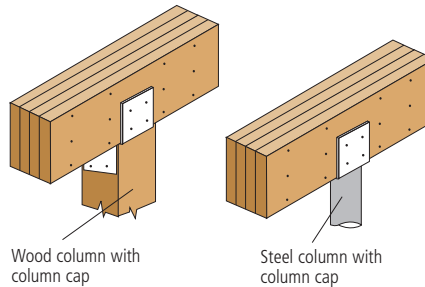


B4 BEARING AT CONCRETE WALL



B5 BEARING AT WOOD OR STEEL COLUMN

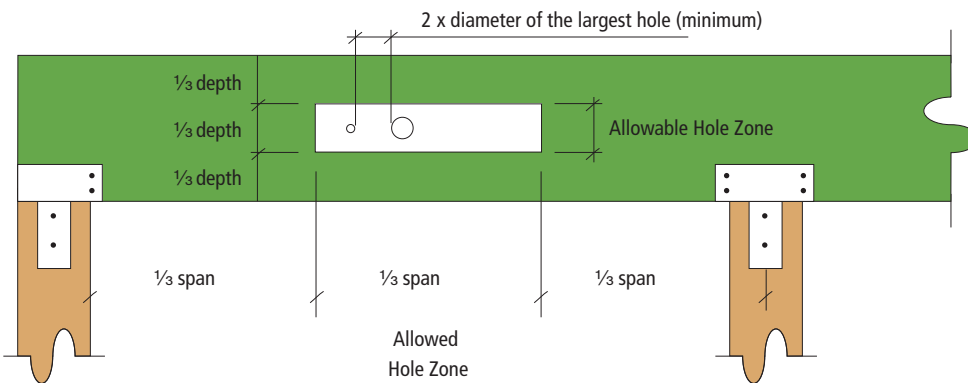
Verify column capacity and bearing length.



BEARING LENGTH IS EXTREMELY CRITICAL AND MUST BE CONSIDERED FOR EACH APPLICATION.

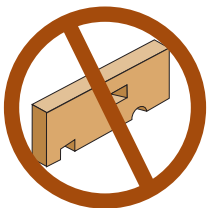
Multiple pieces of West Fraser™ LVL can be nailed or bolted together to form a header or beam of the required size, up to a maximum width of 5 inches for 1¼" wide pieces and 7 inches for 1¾" wide pieces. See pages 10, 15, 25 and 26 for details.

ALLOWABLE HOLES



GENERAL NOTES

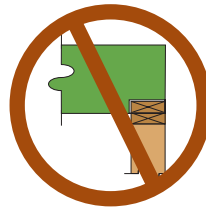
- The Allowed Hole Zone in this chart is suitable for **Uniformly loaded beams** using maximum loads for any tables listed. For other load conditions or hole configurations, please contact West Fraser.
- If more than one hole is to be cut in the beam, the length of the uncut beam between holes must be a minimum of twice the diameter of the largest hole.
- Rectangular holes are not allowed.
- Holes in cantilevers require additional analysis.
- For beam depths of 3½", 5½" and 7¼", the maximum hole diameter is ¾", 1⅞" and 1½" respectively. For deeper beams, the maximum hole diameter is 2". The maximum number of holes for each span is limited to 3.



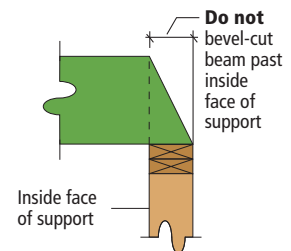
Do not cut, notch or drill holes in West Fraser™ LVL except as indicated in illustration for allowable holes



Do not overhang seat cuts on West Fraser™ LVL beams from inside face of support member



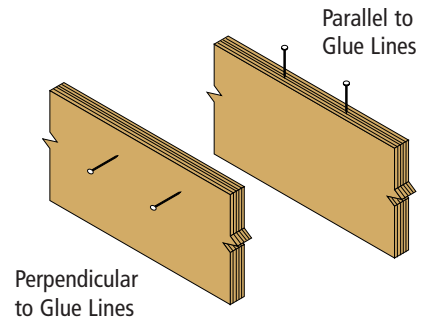
Do not notch underside of beam at bearing location



MINIMUM NAIL SPACING

Connector	Nailing Parallel to Glue Line	Nailing Perpendicular to Glue Line
8d Box	3"	2"
8d Common	3"	2"
10d and 12d Box	4"	2"
10d and 12d Common	4"	3"
16d Common	8"*	3"

* Not allowed on product thickness less than 1 1/2"



OUR WEATHER RESISTANT COATING

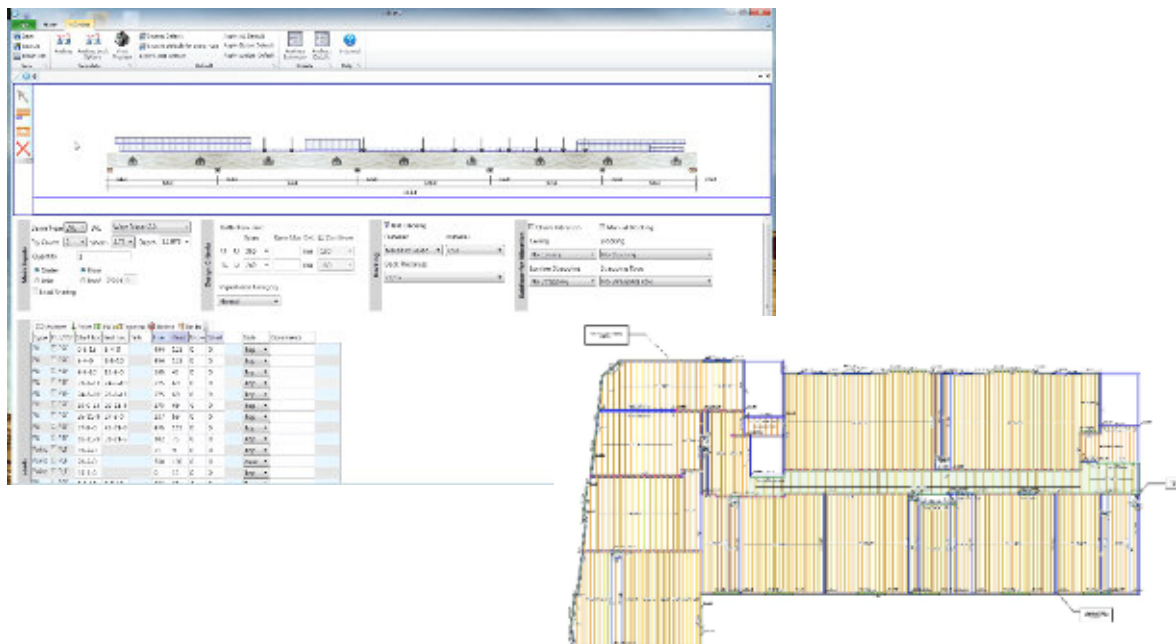


Photo shows example of the beading that occurs because of our coating process.

One of the inherent problems with LVL is its inability to resist the effects of moisture. West Fraser addresses this problem by coating all our LVL beams and headers with a protective sealer. This sealer gives our LVL superior resistance to warping, cupping, and swelling compared to other unprotected competitive products. While this coating is not intended to provide long-term protection, it does improve protection against the moisture associated with the construction process.

OUR SOFTWARE

West Fraser provides its LVL customers with quality design software. Using the latest technology it's fast and reliable, providing you with an easy to understand output. Our software will enhance your in-house design capabilities and productivity.



LIMITED LIFETIME WARRANTY

(*to non-consumer buyers)

Sundre Forest Products Inc. warrants that its WEST FRASER™ LVL is free from defects in materials and workmanship, and, when correctly installed, will perform in accordance with Sundre Forest Products Inc.'s published specifications for the lifetime of the building.

West Fraser™ LVL used anywhere else except as shown in our published specifications is not covered in this warranty.

**A non-consumer is a person or entity who purchases a product for purposes of resale or to incorporate into another product which will be resold.*

LIMITATIONS

Sundre Forest Products Inc. must be given a reasonable opportunity to inspect its WEST FRASER™ LVL before it will honor any claims under the above warranty.

If, after inspection, Sundre Forest Products Inc. determines that a product failure exists covered by the above warranty, Sundre Forest Products Inc. will pay to the owner of the structure an amount equal to the reasonable cost of labor and materials required to remove and replace or repair the defective product. The product must be protected from exposure to moisture from whatever source in accordance with provisions of the applicable building standards. Failure to protect the product from moisture, except for incidental exposure during construction, may cause the product to fail to perform as warranted and will void this limited lifetime warranty. Exposure to standing water and accumulations of snow and ice without reasonably prompt removal thereof will void this limited lifetime warranty.

DISCLAIMER

Except for the express warranty and remedy set out above, Sundre Forest Products Inc. disclaims all other warranties and guaranties, express or implied, including implied warranties of merchantability or fitness for a particular purpose. No other warranty or guaranty will be made by or on behalf of the manufacturer or the seller or by operation of law with respect to the product or its installation, storage, handling, maintenance, use, replacement or repair. Neither Sundre Forest Products Inc. nor the seller shall be liable by virtue of any warranty or guaranty, or otherwise, for any special, incidental or consequential loss or damage resulting from the use of the product. Sundre Forest Products Inc. makes no warranty or guaranty with respect to installation of the product by the builder or the builder's contractor or any other installer.

For information on the above warranty, contact West Fraser LVL Sales Office at 250-991-5350.



(250) 991-5350

EMAIL: LVL@WESTFRASER.COM

WWW.WESTFRASER.COM/PRODUCTS/LVL-LAMINATED-VENEER-LUMBER

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