West Fraser™ LVL

LVL User's Guide

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

CANADIAN VERSION

West Fraser LVL

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.

West Fraser LVL

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

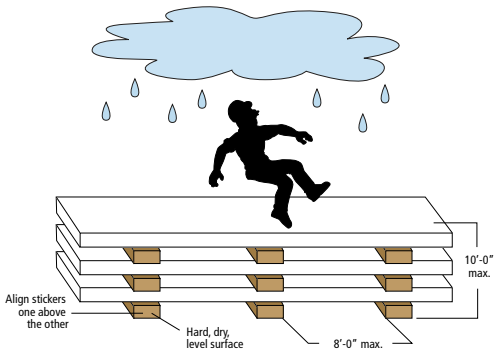
CODE EVALUATION REPORT NUMBERS: CCMC 12904-R
Check product availability with supplier prior to specifying LVL sizes.

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 dry 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.

3100Fb – 2.0E LVL

West Fraser LVL

3100Fb – 2.0E 1¾" and 3½" THICK

HEADERS AND BEAMS

DESIGN PROPERTIES

3100F_b-2.0E 1¾" WEST FRASER™ LVL FACTORED RESISTANCES (STANDARD TERM)

Design Property	Depth									
	5½"	7¼"	9¼"	9½"	11½"	11⅞"	14"	16"	18"	24"
Moment (ft.lbs.)	4134	6967	11037	11608	16652	17693	24146	31073	38816	66835
Shear (lbs.)	3199	4217	5381	5526	6690	6908	8144	9307	10471	13961
Moment of Inertia (in^4)	24	56	115	125	222	244	400	597	851	2016
Weight (lbs./lin.ft.)	2.7	3.6	4.6	4.7	5.7	5.9	7.0	8.0	9.0	12.0

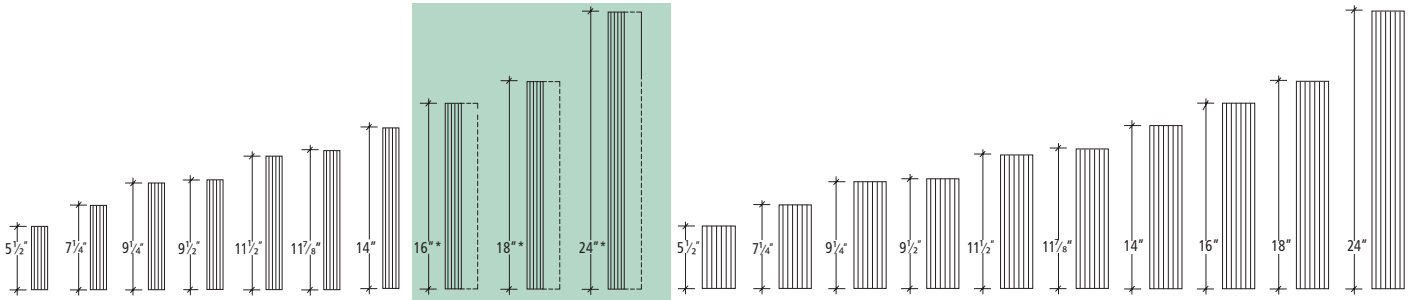
1. Lateral support of beam compression edge is required at intervals of 24" o/c or closer.
2. Lateral support of beam is required at bearing locations.
3. All 16" and greater beam depths are to be used in multiple member units only.

3100F_b-2.0E 3½" WEST FRASER™ LVL FACTORED RESISTANCES (STANDARD TERM)

Design Property	Depth									
	5½"	7¼"	9¼"	9½"	11½"	11⅞"	14"	16"	18"	24"
Moment (ft.lbs.)	8269	13933	22075	23215	33305	35386	48292	62146	77631	133669
Shear (lbs.)	6398	8434	10762	11052	13380	13816	16288	18614	20942	27922
Moment of Inertia (in^4)	49	111	231	250	444	488	800	1195	1701	4032
Weight (lbs./lin.ft.)	5.5	7.2	9.2	9.5	11.5	11.8	14.0	15.9	17.9	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.

3100F_b -2.0E 1¾" AND 3½" WEST FRASER™ LVL AVAILABLE SIZES



*can only be used as a 2-ply minimum

3100F_b -2.0E WEST FRASER™ LVL SPECIFIED STRENGTHS (STANDARD TERM)

Modulus of Elasticity	E	= 2.0 x 10^6 psi
Bending Stress	F_b	= 5729 psi
Shear (joist)	F_v	= 554 psi
Compression Perpendicular to Grain (joist)	$F_{c(perp)}$	= 1300 psi
Compression Parallel to Grain	$F_{c(para)}$	= 4786 psi

1. F_b based on 12" depths. For other depths, multiply by (12/d)^(1/9).
2. $F_{c(perp)}$ and E shall not be increased for duration of load.

FACTORED RESISTANCE TABLES

GENERAL NOTES

- Tables are for one-ply 1¾" beams. When properly connected, double the values for two-ply beams, triple for three. Minimum bearing lengths shown for one-ply will be the same for two-ply and three-ply. See page 9 for multiple-ply connection details.
- Resistances shown are the maximum factored and/or unfactored resistances, in pounds per lineal foot, that can be applied to the beam in addition to its own weight.
- Tables are based on uniform loads and the most restrictive of simple or continuous spans and dry-use conditions. Refer to West Fraser's sizing software for other loads or span configurations.
- Lateral support of beam compression edges is required at intervals of 24" o/c or closer.
- Lateral support of beams is required at bearing locations.
- Spans of multiple spans must be at least 40% of adjacent span.
- West Fraser™ LVL beams are made without camber; therefore, in addition to complying with the deflection limits of the applicable building code, other deflection considerations, such as long term deflection under sustained loads (including creep), must be evaluated.
- All 16" and deeper beams are to be used in multiple member units only.
- Unfactored total load resistance is limited to a deflection of L/240. Unfactored live load resistance is based on a deflection of L/360. Check local code requirements for other deflection criteria.
- For an unfactored live load deflection limit of L/480, multiply UNFACTORED LOAD L/360 resistance by 0.75. The resulting unfactored live load shall not exceed the total factored load shown.
- Roof must have positive slope in order to prevent ponding.
- Tables will accommodate beam slopes to a maximum of 2:12.
- Bearing lengths are based on 1300 psi specified strength for 3100F_b-2.0E Grade materials which cannot be increased for duration of load. Bearing length may need to be increased if support member's allowable bearing stress is less.
- Spans shown are measured centre-to-centre of bearing.
- Tables are in accordance with NBC 2015 and CSA 086-14.

INSTRUCTIONS FOR USE

1. Determine the factored total load and unfactored total and live load on the beam in pounds per lineal foot (plf).
2. Locate a span that meets or exceeds the required beam span, centre-to-centre of bearing.
3. Scan from left to right within the SPAN row until you find a cell where; (1) the UNFACTORED LOAD L/360 resistance meets or exceeds the unfactored live load, (2) the UNFACTORED LOAD L/240 resistance meets or exceeds the unfactored total load and (3) the FACTORED TOTAL LOAD resistance meets or exceeds the factored total load. All three rows must be checked and satisfied. Where no unfactored resistances are shown, factored total load will control.
4. To size a member for a span not shown, use capacities for the next larger span shown.

FACTORED RESISTANCE TABLE (POUNDS PER LINEAL FOOT)

3100F_b-2.0E West Fraser™ LVL — FLOOR or ROOF (Standard Term)

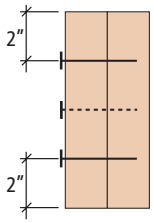
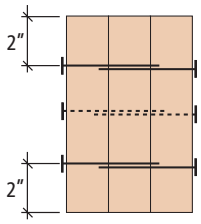
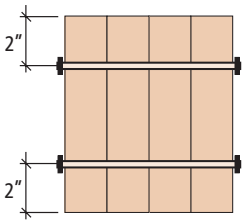
Span (ft)	Depth	1¾" WIDTH									
		5-1/2"	7-1/4"	9-1/4"	9-1/2"	11-1/2"	11-7/8"	14"	16"	18"	24"
6	Unfactored Load (LL) L/360	305	660	1263	1353	2186	2363				
	Unfactored Load (TL) L/240	455	986								
	Factored Total Load	916	1337	1802	1863	2391	2496	3145	3843	4645	7966
	Min. End / Int. Bearing (in)	1.5/3.8	2.5/6.4	3.5/8.7	3.6/9.0	4.6/11.5	4.8/12.0	6.1/15.1	7.4/18.5	8.9/22.4	15.3/38.3
7	Unfactored Load (LL) L/360	197	431	840	903	1488	1614	2423			
	Unfactored Load (TL) L/240	292	643	1256	1349						
	Factored Total Load	672	1115	1488	1537	1952	2035	2531	3052	3633	5866
	Min. End / Int. Bearing (in)	1.5/3.5	2.2/5.5	3.3/8.4	3.5/8.6	4.4/11.0	4.6/11.4	5.7/14.2	6.9/17.1	8.2/20.4	13.2/32.9
8	Unfactored Load (LL) L/360	134	296	585	629	1052	1144	1746	2423		
	Unfactored Load (TL) L/240	198	440	872	939	1572	1711				
	Factored Total Load	514	867	1268	1308	1649	1717	2117	2530	2983	4642
	Min. End / Int. Bearing (in)	1.5/3.5	1.9/4.8	3.0/7.6	3.2/7.9	4.2/10.6	4.4/11.0	5.4/13.6	6.5/16.2	7.7/19.1	11.9/29.8
9	Unfactored Load (LL) L/360	95	211	422	454	768	837	1293	1816	2423	
	Unfactored Load (TL) L/240	140	313	628	677	1146	1250				
	Factored Total Load	406	684	1086	1139	1428	1484	1820	2161	2529	3839
	Min. End / Int. Bearing (in)	1.5/3.5	1.7/4.2	2.7/6.7	2.8/7.1	4.1/10.1	4.3/10.7	5.3/13.1	6.2/15.6	7.3/18.3	11.1/27.7
10	Unfactored Load (LL) L/360	70	156	313	338	576	629	981	1390	1873	
	Unfactored Load (TL) L/240	102	230	465	502	858	938	1464			
	Factored Total Load	328	554	878	924	1258	1307	1595	1885	2195	3273
	Min. End / Int. Bearing (in)	1.5/3.5	1.5/3.8	2.4/6.0	2.5/6.3	3.6/9.1	3.9/9.7	5.1/12.8	6.1/15.1	7.0/17.6	10.5/26.3
11	Unfactored Load (LL) L/360		118	239	258	442	484	760	1085	1473	
	Unfactored Load (TL) L/240		174	354	382	658	719	1132	1619		
	Factored Total Load		457	725	763	1095	1164	1420	1672	1939	2852
	Min. End / Int. Bearing (in)		1.5/3.5	2.2/5.5	2.3/5.8	3.3/8.3	3.5/8.8	4.8/12.0	5.9/14.8	6.8/17.1	10.1/25.2
12	Unfactored Load (LL) L/360		92	186	201	346	379	599	861	1176	2423
	Unfactored Load (TL) L/240		134	275	297	514	563	892	1283		
	Factored Total Load		383	609	640	919	977	1279	1501	1736	2526
	Min. End / Int. Bearing (in)		1.5/3.5	2.0/5.0	2.1/5.3	3.0/7.6	3.2/8.1	4.4/11.0	5.7/14.2	6.7/16.7	9.7/24.3
13	Unfactored Load (LL) L/360		73	148	160	276	302	480	694	952	1994
	Unfactored Load (TL) L/240		105	217	235	408	448	713	1032	1419	
	Factored Total Load		326	518	545	783	832	1136	1362	1571	2267
	Min. End / Int. Bearing (in)		1.5/3.5	1.9/4.6	1.9/4.9	2.8/7.0	3.0/7.4	4.1/10.1	5.2/13.1	6.5/16.3	9.5/23.7
14	Unfactored Load (LL) L/360		58	119	129	223	245	390	566	781	1657
	Unfactored Load (TL) L/240		84	174	188	329	361	579	841	1162	
	Factored Total Load		281	446	469	674	716	979	1247	1435	2056
	Min. End / Int. Bearing (in)		1.5/3.5	1.7/4.3	1.8/4.5	2.6/6.5	2.8/6.9	3.8/9.4	4.8/12.1	6.1/15.1	9.2/23.1
15	Unfactored Load (LL) L/360		48	97	105	183	201	321	468	647	1390
	Unfactored Load (TL) L/240		68	141	153	269	296	475	694	962	
	Factored Total Load		244	388	408	586	623	852	1097	1321	1881
	Min. End / Int. Bearing (in)		1.5/3.5	1.6/4.0	1.7/4.2	2.4/6.0	2.6/6.4	3.5/8.8	4.5/11.3	5.6/14.1	9.1/22.7
16	Unfactored Load (LL) L/360			81	87	152	167	268	390	542	1176
	Unfactored Load (TL) L/240			116	126	222	244	394	578	804	
	Factored Total Load			340	358	515	547	748	963	1204	1733
	Min. End / Int. Bearing (in)			1.5/3.7	1.6/3.9	2.3/5.7	2.4/6.0	3.3/8.2	4.2/10.6	5.3/13.2	8.9/22.3
17	Unfactored Load (LL) L/360			67	73	128	140	225	329	458	1003
	Unfactored Load (TL) L/240			97	105	186	204	331	486	678	1492
	Factored Total Load			301	317	455	484	661	852	1066	1607
	Min. End / Int. Bearing (in)			1.5/3.5	1.5/3.7	2.1/5.3	2.3/5.7	3.1/7.7	4.0/9.9	5.0/12.4	8.6/21.5
18	Unfactored Load (LL) L/360			57	62	108	119	191	280	390	861
	Unfactored Load (TL) L/240			81	88	156	172	279	412	577	1279
	Factored Total Load			268	282	405	431	589	759	949	1497
	Min. End / Int. Bearing (in)			1.5/3.5	1.5/3.5	2.0/5.0	2.1/5.3	2.9/7.3	3.8/9.4	4.7/11.7	8.1/20.3
19	Unfactored Load (LL) L/360				53	92	101	163	240	335	744
	Unfactored Load (TL) L/240				74	133	146	238	352	494	1104
	Factored Total Load				253	363	386	528	681	851	1402
	Min. End / Int. Bearing (in)				1.5/3.5	1.9/4.7	2.0/5.0	2.8/6.9	3.6/8.9	4.4/11.1	7.7/19.2
20	Unfactored Load (LL) L/360					79	87	141	207	290	647
	Unfactored Load (TL) L/240					113	125	204	303	426	959
	Factored Total Load					327	348	476	613	767	1318
	Min. End / Int. Bearing (in)					1.8/4.5	1.9/4.8	2.6/6.5	3.4/8.4	4.2/10.5	7.3/18.2
21	Unfactored Load (LL) L/360					69	76	122	180	252	566
	Unfactored Load (TL) L/240					97	107	176	262	370	837
	Factored Total Load					296	315	431	556	695	1200
	Min. End / Int. Bearing (in)					1.7/4.3	1.8/4.5	2.5/6.2	3.2/8.0	4.0/10.0	6.9/17.3
22	Unfactored Load (LL) L/360					60	66	107	157	221	498
	Unfactored Load (TL) L/240					84	93	153	228	322	735
	Factored Total Load					270	287	392	506	633	1093
	Min. End / Int. Bearing (in)					1.6/4.1	1.7/4.3	2.4/5.9	3.1/7.6	3.8/9.6	6.6/16.5
23	Unfactored Load (LL) L/360						58	94	138	194	440
	Unfactored Load (TL) L/240						81	134	200	283	648
	Factored Total Load						262	358	462	578	999
	Min. End / Int. Bearing (in)						1.7/4.1	2.3/5.7	2.9/7.3	3.7/9.1	6.3/15.8
24	Unfactored Load (LL) L/360							83	122	172	390
	Unfactored Load (TL) L/240							117	175	249	574
	Factored Total Load							328	424	530	916
	Min. End / Int. Bearing (in)							2.2/5.4	2.8/7.0	3.5/8.7	6.0/15.1
26	Unfactored Load (LL) L/360							65	97	136	312
	Unfactored Load (TL) L/240							91	137	196	455
	Factored Total Load							279	360	450	779
	Min. End / Int. Bearing (in)							2.0/5.0	2.6/6.4	3.2/8.0	5.6/13.9
28	Unfactored Load (LL) L/360							53	78	110	252
	Unfactored Load (TL) L/240							72	109	156	367
	Factored Total Load							239	309	387	670
	Min. End / Int. Bearing (in)							1.8/4.6	2.4/5.9	3.0/7.4	5.2/12.9
30	Unfactored Load (LL) L/360								64	90	207
	Unfactored Load (TL) L/240								87	126	299
	Factored Total Load								268	336	582
	Min. End / Int. Bearing (in)								2.2/5.5	2.8/6.9	4.8/12.0

* 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

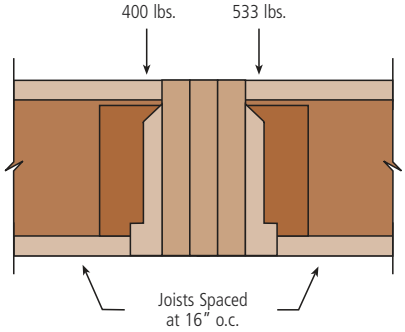
Maximum Factored Uniform Load (PLF) Applied to Either Outside Member			 2-PLY LVL	 3-PLY LVL	 4-PLY LVL*
Connector	**Spacing**	**Rows**	**Nails On One Side or Through Bolts**	**Nails Both Sides or Through Bolts**	**Through Bolts Only**
16d (3½") Common Wire Nails	12" o.c.	2 Rows	885	663	Not Applicable
		3 Rows	1327	995	
	6" o.c.	2 Rows	1770	1326	Not Applicable
		3 Rows	2654	1990	
	4" o.c.	2 Rows	2655	1989	Not Applicable
		3 Rows	3981	2985	
½" A307 Through Bolts	24" o.c.	2 Rows	671	503	448
	12" o.c.	2 Rows	1342	1006	895
	6" o.c.	2 Rows	2684	2012	1790

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

1. Nails to be located a minimum of 2" from the top and bottom of the member. Start all nails a minimum of 2½" in from ends.
2. Bolts are to be material conforming to ASTM Standard A307. 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.
3. Values listed are for standard term loading.

EXAMPLE (All loads shown are total factored)

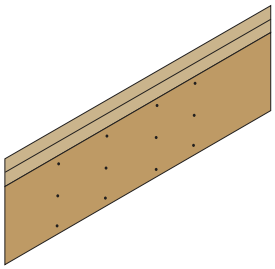
First, convert joist reactions to plf load on each side of the beam by taking the joist reaction (lbs.) divided by the joist spacing (ft.). 400 lbs/(16/12) = 300 plf and 533 lbs/(16/12) = 400 plf. Check factored resistance tables to verify that 3 plys can carry the total factored load of 700 plf. The maximum load applied to either outside member is 400 plf. Use 2 rows of 16d (3½") common wire nails at 12" o.c. (good for 663 plf).



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" through 24" beams



NOTES


West Fraser™ LVL
3000Fb – 1.9E LVL
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West Fraser LVL

LVL 3000Fb – 1.9E 1¾" THICK

HEADERS AND BEAMS

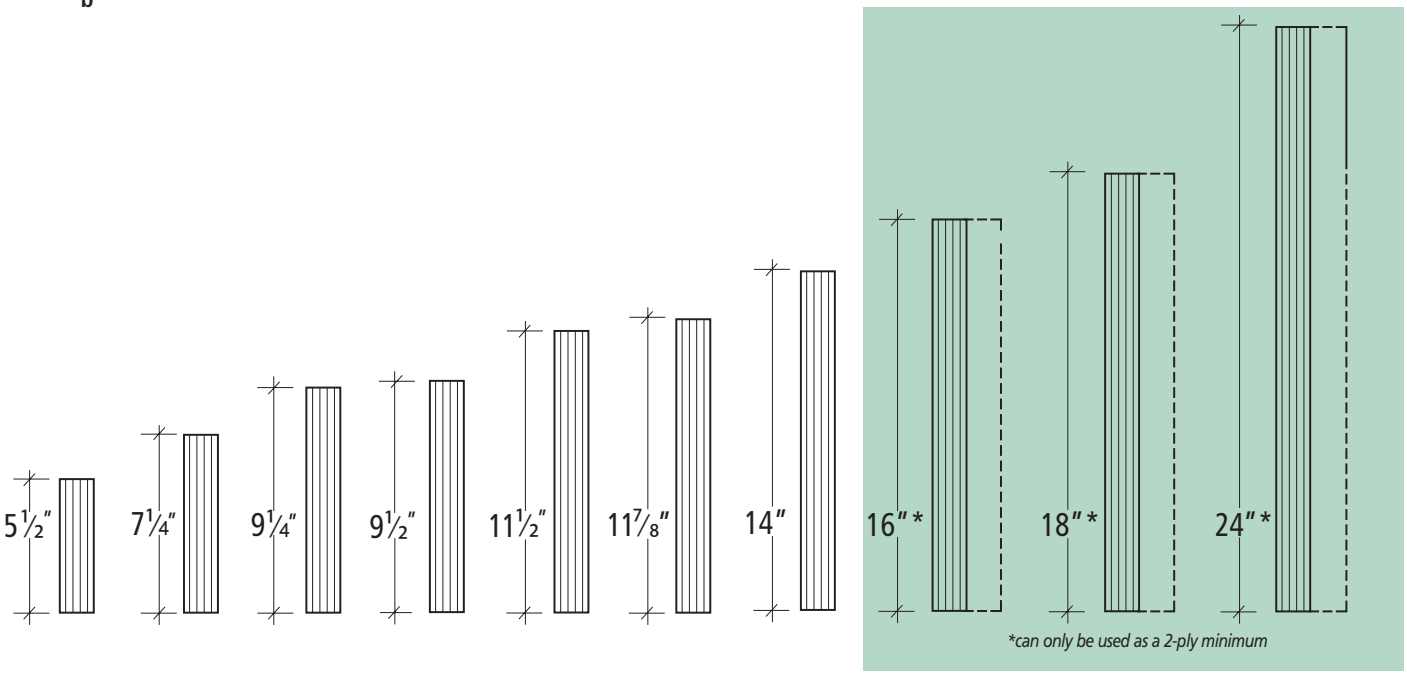
DESIGN PROPERTIES

3000Fb-1.9E 1¾" WEST FRASER™ LVL FACTORED RESISTANCES (STANDARD TERM)

Design Property	Depth									
	5½"	7¼"	9¼"	9½"	11½"	11⅞"	14"	16"	18"	24"
Moment (ft.lbs.)	4079	6827	10751	11299	16132	17126	23277	29855	37184	63568
Shear (lbs.)	3199	4217	5381	5526	6690	6908	8144	9307	10471	13961
Moment of Inertia (in^4)	24	56	115	125	222	244	400	597	851	2016
Weight (lbs./lin.ft.)	2.7	3.6	4.6	4.7	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" and greater beam depths are to be used in multiple member units only.

3000Fb -1.9E 1¾" WEST FRASER™ LVL AVAILABLE SIZES*



3000Fb -1.9E WEST FRASER™ LVL SPECIFIED STRENGTHS (STANDARD TERM)

Modulus of Elasticity	E	=	1.9 x 10^6 psi
Bending Stress	Fb	=	5544 psi
Shear (joist)	Fv	=	554 psi
Compression Perpendicular to Grain (joist)	Fc(perp)	=	1300 psi
Compression Parallel to Grain	Fc(para)	=	4000 psi

1. Fb based on 12" depths. For other depths, multiply by (12/d)^(1/7.35).
2. Fc(perp) and E shall not be increased for duration of load.

FACTORED RESISTANCE TABLES

GENERAL NOTES

- Tables are for one-ply 1¾" beams. When properly connected, double the values for two-ply beams, triple for three. Minimum bearing lengths shown for one-ply will be the same for two-ply and three-ply. See page 15 for multiple-ply connection details.
- Resistances shown are the maximum factored and/or unfactored resistances, in pounds per lineal foot, that can be applied to the beam in addition to its own weight.
- Tables are based on uniform loads and the most restrictive of simple or continuous spans and dry-use conditions. Refer to West Fraser's sizing software for other loads or span configurations.
- Lateral support of beam compression edges is required at intervals of 24" o/c or closer.
- Lateral support of beams is required at bearing locations.
- West Fraser™ LVL beams are made without camber; therefore, in addition to complying with the deflection limits of the applicable building code, other deflection considerations, such as long term deflection under sustained loads (including creep), must be evaluated.
- All 16" and deeper beams are to be used in multiple member units only.
- Unfactored total load resistance is limited to a deflection of L/240. Unfactored live load resistance is based on a deflection of L/360. Check local code requirements for other deflection criteria.
- For an unfactored live load deflection limit of L/480, multiply UNFACTORED LOAD L/360 resistance by 0.75.
- Roof must have positive slope in order to prevent ponding.
- Spans of multiple spans must be at least 40% of adjacent span.
- Bearing lengths are based on 1300 psi specified strength for 1.9E Grade materials which cannot be increased for duration of load. Bearing length may need to be increased if support member's allowable bearing stress is less.
- Tables will accommodate beam slopes to a maximum of 2:12.
- Tables are in accordance with NBC 2015 and CSA 086-14.

INSTRUCTIONS FOR USE

1. Determine the factored total load and unfactored total and live load on the beam in pounds per lineal foot (plf).
2. Locate a span that meets or exceeds the required beam span, centre-to-centre of bearing.
3. Scan from left to right within the SPAN row until you find a cell where; (1) the UNFACTORED LOAD L/360 resistance meets or exceeds the unfactored live load, (2) the UNFACTORED LOAD L/240 resistance meets or exceeds the unfactored total load and (3) the FACTORED TOTAL LOAD resistance meets or exceeds the factored total load. All three rows must be checked and satisfied. Where no unfactored resistances are shown, factored total load will control.
4. To size a member for a span not shown, use capacities for the next larger span shown.

FACTORED RESISTANCE TABLE (POUNDS PER LINEAL FOOT)

3000F_b-1.9E West Fraser™ LVL — FLOOR or ROOF (Standard Term)

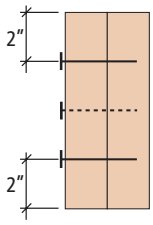
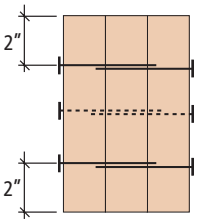
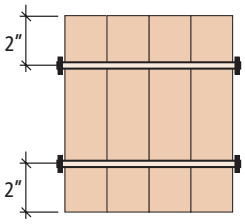
Span (ft)		1¾" WIDTH									
	Depth	5-1/2"	7-1/4"	9-1/4"	9-1/2"	11-1/2"	11-7/8"	14"	16"	18"	24"
6	Unfactored Load (LL) L/360	290	627	1200	1286	2077	2245				
	Unfactored Load (TL) L/240	433	936	1795							
	Factored Total Load	904	1337	1802	1863	2391	2496	3145	3843	4645	7966
	Min. End / Int. Bearing (in)	1.5/3.7	2.5/6.2	3.5/8.7	3.6/9.0	4.6/11.5	4.8/12.0	6.1/15.1	7.4/18.5	8.9/22.4	15.3/38.3
7	Unfactored Load (LL) L/360	187	409	798	858	1413	1533	2302			
	Unfactored Load (TL) L/240	277	610	1193	1282						
	Factored Total Load	663	1111	1488	1537	1952	2035	2531	3052	3633	5866
	Min. End / Int. Bearing (in)	1.5/3.5	2.1/5.3	3.3/8.4	3.5/8.6	4.4/11.0	4.6/11.4	5.7/14.2	6.9/17.1	8.2/20.4	13.2/32.9
8	Unfactored Load (LL) L/360	127	281	555	598	999	1087	1658	2302		
	Unfactored Load (TL) L/240	188	418	828	892	1493	1625				
	Factored Total Load	507	850	1268	1308	1649	1717	2117	2530	2983	4642
	Min. End / Int. Bearing (in)	1.5/3.5	1.9/4.7	2.9/7.4	3.1/7.7	4.2/10.6	4.4/11.0	5.4/13.6	6.5/16.2	7.7/19.1	11.9/29.8
9	Unfactored Load (LL) L/360	90	201	401	431	729	795	1228	1725	2302	
	Unfactored Load (TL) L/240	132	297	596	643	1088	1187				
	Factored Total Load	400	671	1057	1111	1428	1484	1820	2161	2529	3839
	Min. End / Int. Bearing (in)	1.5/3.5	1.7/4.1	2.6/6.5	2.7/6.9	3.9/9.8	4.2/10.4	5.3/13.1	6.2/15.6	7.3/18.3	11.1/27.7
10	Unfactored Load (LL) L/360	66	148	298	321	547	598	932	1321	1779	
	Unfactored Load (TL) L/240	97	219	442	477	815	890	1390			
	Factored Total Load	324	543	855	899	1258	1307	1595	1885	2195	3273
	Min. End / Int. Bearing (in)	1.5/3.5	1.5/3.7	2.3/5.9	2.5/6.2	3.5/8.8	3.7/9.4	5.1/12.7	6.1/15.1	7.0/17.6	10.5/26.3
11	Unfactored Load (LL) L/360		112	227	245	420	459	722	1031	1399	2828
	Unfactored Load (TL) L/240		165	336	363	624	683	1075	1538		
	Factored Total Load		448	706	742	1061	1126	1420	1672	1939	2852
	Min. End / Int. Bearing (in)		1.5/3.5	2.1/5.3	2.2/5.6	3.2/8.0	3.4/8.5	4.6/11.6	5.9/14.8	6.8/17.1	10.1/25.2
12	Unfactored Load (LL) L/360		87	177	191	329	360	569	818	1117	2302
	Unfactored Load (TL) L/240		127	261	282	488	534	847	1219	1667	
	Factored Total Load		376	593	623	890	946	1279	1501	1736	2526
	Min. End / Int. Bearing (in)		1.5/3.5	2.0/4.9	2.1/5.1	2.9/7.3	3.1/7.8	4.2/10.6	5.4/13.6	6.7/16.7	9.7/24.3
13	Unfactored Load (LL) L/360		69	140	152	262	287	456	659	905	1894
	Unfactored Load (TL) L/240		100	206	223	388	425	677	980	1348	
	Factored Total Load		320	504	530	758	805	1095	1362	1571	2267
	Min. End / Int. Bearing (in)		1.5/3.5	1.8/4.5	1.9/4.7	2.7/6.8	2.9/7.2	3.9/9.8	5.0/12.5	6.3/15.6	9.5/23.7
14	Unfactored Load (LL) L/360		55	113	122	212	233	371	538	742	1574
	Unfactored Load (TL) L/240		80	165	179	313	343	549	799	1104	
	Factored Total Load		275	434	456	653	693	943	1211	1435	2056
	Min. End / Int. Bearing (in)		1.5/3.5	1.7/4.2	1.8/4.4	2.5/6.3	2.7/6.7	3.6/9.1	4.7/11.6	5.8/14.5	9.2/23.1
15	Unfactored Load (LL) L/360		45	93	100	174	191	305	444	615	1321
	Unfactored Load (TL) L/240		64	134	145	255	280	451	658	913	
	Factored Total Load		239	378	397	568	603	821	1054	1313	1881
	Min. End / Int. Bearing (in)		1.5/3.5	1.6/3.9	1.6/4.1	2.3/5.9	2.5/6.2	3.4/8.5	4.3/10.9	5.4/13.5	9.1/22.7
16	Unfactored Load (LL) L/360			77	83	144	159	254	371	515	1117
	Unfactored Load (TL) L/240			110	119	211	232	374	548	763	1664
	Factored Total Load			331	348	498	529	720	925	1153	1733
	Min. End / Int. Bearing (in)			1.5/3.6	1.5/3.8	3.2/5.5	2.3/5.8	3.2/7.9	4.1/10.2	5.1/12.7	8.7/21.7
17	Unfactored Load (LL) L/360			64	69	121	133	214	313	435	953
	Unfactored Load (TL) L/240			92	99	176	194	314	461	644	1417
	Factored Total Load			293	308	441	468	637	818	1020	1607
	Min. End / Int. Bearing (in)			1.5/3.5	1.5/3.6	2.1/5.1	2.2/5.5	3.0/7.4	3.8/9.6	4.8/11.9	8.2/20.4
18	Unfactored Load (LL) L/360			54	59	103	113	181	266	371	818
	Unfactored Load (TL) L/240			77	83	148	163	265	391	547	1215
	Factored Total Load			261	274	393	417	568	729	909	1497
	Min. End / Int. Bearing (in)			1.5/3.5	1.5/3.5	1.9/4.9	2.1/5.2	2.8/7.0	3.6/9.0	4.5/11.2	7.7/19.3
19	Unfactored Load (LL) L/360				50	88	96	155	228	319	707
	Unfactored Load (TL) L/240				70	126	138	226	334	469	1049
	Factored Total Load				246	352	374	509	654	815	1397
	Min. End / Int. Bearing (in)				1.5/3.5	1.8/4.6	2.0/4.9	2.7/6.6	3.4/8.5	4.3/10.6	7.3/18.2
20	Unfactored Load (LL) L/360					75	83	134	197	275	615
	Unfactored Load (TL) L/240					107	118	194	287	404	910
	Factored Total Load					317	337	459	589	735	259
	Min. End / Int. Bearing (in)					1.7/4.4	1.9/4.6	2.5/6.3	3.2/8.1	4.0/10.1	6.9/17.3
21	Unfactored Load (LL) L/360					65	72	116	171	240	538
	Unfactored Load (TL) L/240					92	102	167	248	351	795
	Factored Total Load					287	305	415	534	666	1141
	Min. End / Int. Bearing (in)					1.7/4.1	1.8/4.4	2.4/6.0	3.1/7.7	3.8/9.6	6.6/16.5
22	Unfactored Load (LL) L/360					57	63	101	149	210	473
	Unfactored Load (TL) L/240					80	88	145	216	306	697
	Factored Total Load					261	277	378	485	606	1039
	Min. End / Int. Bearing (in)					1.6/3.9	1.7/4.2	2.3/5.7	2.9/7.3	3.7/9.2	6.3/15.7
23	Unfactored Load (LL) L/360						55	89	131	185	418
	Unfactored Load (TL) L/240						76	127	189	268	615
	Factored Total Load						253	345	444	553	949
	Min. End / Int. Bearing (in)						1.6/4.0	2.2/5.4	2.8/7.0	3.5/8.7	6.0/15.0
24	Unfactored Load (LL) L/360							79	116	163	371
	Unfactored Load (TL) L/240							111	166	236	544
	Factored Total Load							316	407	507	871
	Min. End / Int. Bearing (in)							2.1/5.2	2.7/6.7	3.3/8.4	5.7/14.4
26	Unfactored Load (LL) L/360							62	92	130	296
	Unfactored Load (TL) L/240							86	130	185	432
	Factored Total Load							268	345	431	740
	Min. End / Int. Bearing (in)							1.9/4.8	2.5/6.2	3.1/7.7	5.3/13.2
28	Unfactored Load (LL) L/360							50	74	104	240
	Unfactored Load (TL) L/240							68	103	148	348
	Factored Total Load							231	297	370	637
	Min. End / Int. Bearing (in)							1.8/4.4	2.3/5.7	2.8/7.1	4.9/12.3
30	Unfactored Load (LL) L/360								60	85	197
	Unfactored Load (TL) L/240								83	119	283
	Factored Total Load								257	322	553
	Min. End / Int. Bearing (in)								2.1/5.3	2.7/6.6	4.6/11.4

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

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 1¾" WEST FRASER™ LVL

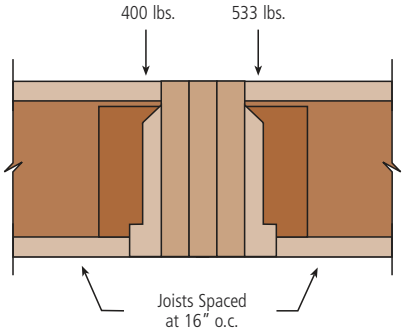
Maximum Factored Uniform Load (PLF) Applied to Either Outside Member			 2-PLY LVL	 3-PLY LVL	 4-PLY LVL*
Connector	**Spacing**	**Rows**	**Nails On One Side or Through Bolts**	**Nails Both Sides or Through Bolts**	**Through Bolts Only**
16d (3½") Common Wire Nails	12" o.c.	2 Rows	827	620	Not Applicable
		3 Rows	1241	930	
	6" o.c.	2 Rows	1654	1240	Not Applicable
		3 Rows	2482	1860	
	4" o.c.	2 Rows	2481	1860	Not Applicable
		3 Rows	3723	2790	
½" A307 Through Bolts	24" o.c.	2 Rows	671	503	448
	12" o.c.	2 Rows	1342	1006	895
	6" o.c.	2 Rows	2684	2012	1790

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

1. Nails to be located a minimum of 2" from the top and bottom of the member. Start all nails a minimum of 2½" in from ends.
2. Bolts are to be material conforming to ASTM Standard A307. 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.
3. Values listed are for standard term loading.

EXAMPLE (All loads shown are total factored)

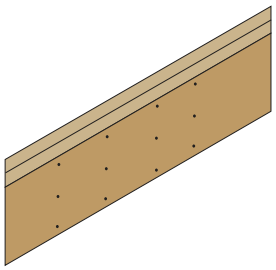
First, convert joist reactions to plf load on each side of the beam by taking the joist reaction (lbs.) divided by the joist spacing (ft.). 400 lbs/(16/12) = 300 plf and 533 lbs/(16/12) = 400 plf. Check factored resistance tables to verify that 3 plys can carry the total factored load of 700 plf. The maximum load applied to either outside member is 400 plf. Use 2 rows of 16d (3½") common wire nails at 12" o.c. (good for 620 plf).



CONNECTION OF MULTIPLE PIECES FOR TOP-LOADED BEAMS

1.9E (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" through 24" beams



NOTES

3000Fb – 1.8E LVL

West Fraser LVL

LVL 3000Fb – 1.8E 1½" THICK

HEADERS AND BEAMS

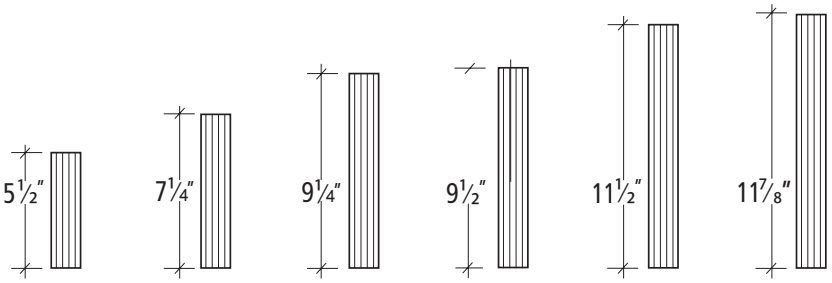
DESIGN PROPERTIES

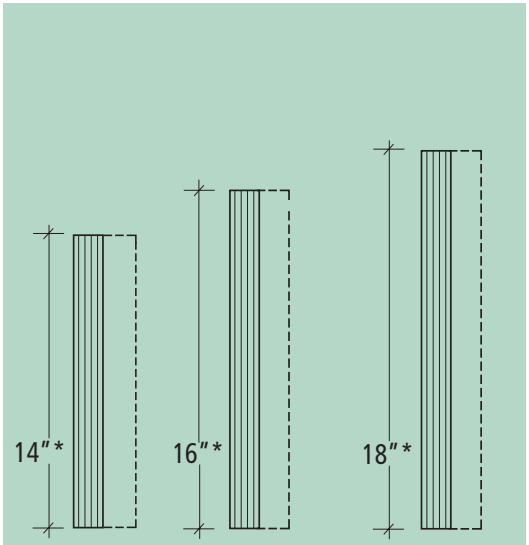
3000F_b-1.8E 1½" WEST FRASER™ LVL FACTORED RESISTANCES (STANDARD TERM)

Design Property	Depth								
	5½"	7¼"	9¼"	9½"	11½"	11⅞"	14"	16"	18"
Moment (ft.lbs.)	3497	5852	9215	9684	13827	14679	19951	25590	31872
Shear (lbs.)	2653	3497	4462	4583	5548	5729	6754	7718	8683
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" and greater beam depths are to be used in multiple member units only (1½" thick).

3000F_b-1.8E 1½" WEST FRASER™ LVL AVAILABLE SIZES





*can only be used as a 2-ply minimum

3000F_b-1.8E WEST FRASER™ LVL SPECIFIED STRENGTHS (STANDARD TERM)

Modulus of Elasticity	E	=	1.8 x 10^6 psi
Bending Stress	F_b	=	5544 psi
Shear (joist)	F_v	=	536 psi
Compression Perpendicular to Grain (joist)	$F_{c(perp)}$	=	1365 psi
Compression Parallel to Grain	$F_{c(para)}$	=	3750 psi

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

FACTORED RESISTANCE TABLES

GENERAL NOTES

- Tables are for one-ply 1½" beams. When properly connected, double the values for two-ply beams, triple for three. Minimum bearing lengths shown for one-ply will be the same for two-ply and three-ply. See page 21 for multiple-ply connection details.
- Resistances shown are the maximum factored and/or unfactored resistances, in pounds per lineal foot, that can be applied to the beam in addition to its own weight.
- Tables are based on uniform loads and the most restrictive of simple or continuous spans and dry-use conditions. Refer to West Fraser's sizing software for other loads or span configurations.
- Lateral support of beam compression edges is required at intervals of 24" o/c or closer.
- Lateral support of beams is required at bearing locations.
- West Fraser™ LVL beams are made without camber; therefore, in addition to complying with the deflection limits of the applicable building code, other deflection considerations, such as long term deflection under sustained loads (including creep), must be evaluated.
- All 14" and deeper beams are to be used in multiple member units only.
- Unfactored total load resistance is limited to a deflection of L/240. Unfactored live load resistance is based on a deflection of L/360. Check local code requirements for other deflection criteria.
- For an unfactored live load deflection limit of L/480, multiply UNFACTORED LOAD L/360 resistance by 0.75.
- Roof must have positive slope in order to prevent ponding.
- Spans of multiple spans must be at least 40% of adjacent span.
- Bearing lengths are based on 1365 psi specified strength for 1.8E Grade materials which cannot be increased for duration of load. Bearing length may need to be increased if support member's allowable bearing stress is less.
- Tables will accommodate beam slopes to a maximum of 2:12.
- Tables are in accordance with NBC 2015 CSA 086-14.

INSTRUCTIONS FOR USE

1. Determine the factored total load and unfactored total and live load on the beam in pounds per lineal foot (plf).
2. Locate a span that meets or exceeds the required beam span, centre-to-centre of bearing.
3. Scan from left to right within the SPAN row until you find a cell where; (1) the UNFACTORED LOAD L/360 resistance meets or exceeds the unfactored live load, (2) the UNFACTORED LOAD L/240 resistance meets or exceeds the unfactored total load and (3) the FACTORED TOTAL LOAD resistance meets or exceeds the factored total load. All three rows must be checked and satisfied. Where no unfactored resistances are shown, factored total load will control.
4. To size a member for a span not shown, use capacities for the next larger span shown.

FACTORED RESISTANCE TABLE (POUNDS PER LINEAL FOOT)

3000F_b-1.8E West Fraser™ LVL — FLOOR or ROOF (Standard Term)

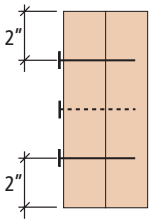
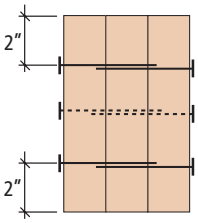
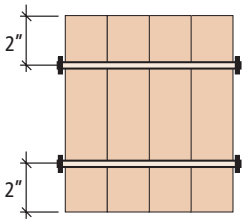
Span (ft)		1½" WIDTH								
	Depth	5-1/2"	7-1/4"	9-1/4"	9-1/2"	11-1/2"	11-7/8"	14"	16"	18"
6	Unfactored Load (LL) L/360	236	509	974	1044	1686	1823			
	Unfactored Load (TL) L/240	351	760	1458						
	Factored Total Load	775	1109	1494	1545	1983	2071	2609	3188	3852
	Min. End / Int. Bearing (in)	1.5/3.5	2.0/5.1	2.7/6.8	2.8/7.1	3.6/9.1	3.8/9.5	4.8/11.9	5.8/14.6	7.1/17.6
7	Unfactored Load (LL) L/360	152	332	648	696	1148	1245	1869		
	Unfactored Load (TL) L/240	225	496	969	1041					
	Factored Total Load	569	925	1235	1275	1619	1688	2100	2531	3013
	Min. End / Int. Bearing (in)	1.5/3.5	2.0/4.9	2.6/6.6	2.7/6.8	3.5/8.6	3.6/9.0	4.5/11.2	5.4/13.5	6.4/16.1
8	Unfactored Load (LL) L/360	103	228	451	485	811	883	1347	1869	2466
	Unfactored Load (TL) L/240	153	339	673	724	1213	1320			
	Factored Total Load	435	729	1052	1085	1368	1424	1756	2099	2474
	Min. End / Int. Bearing (in)	1.5/3.5	1.8/4.5	2.6/6.4	2.6/6.6	3.3/8.4	3.5/8.7	4.3/10.7	5.1/12.8	6.0/15.1
9	Unfactored Load (LL) L/360	73	163	325	350	592	646	997	1401	1869
	Unfactored Load (TL) L/240	108	242	484	522	884	964	1491		
	Factored Total Load	343	575	907	945	1184	1231	1509	1792	2098
	Min. End / Int. Bearing (in)	1.5/3.5	1.6/3.9	2.5/6.2	2.6/6.5	3.3/8.1	3.4/8.5	4.1/10.4	4.9/12.3	5.8/14.4
10	Unfactored Load (LL) L/360	54	120	242	261	444	485	757	1072	1445
	Unfactored Load (TL) L/240	78	178	359	387	662	723	1129		
	Factored Total Load	278	465	734	771	1044	1084	1323	1564	1821
	Min. End / Int. Bearing (in)	1.5/3.5	1.5/3.5	2.2/5.6	2.4/5.9	3.2/8.0	3.3/8.3	4.0/10.1	4.8/11.9	5.6/13.9
11	Unfactored Load (LL) L/360		91	184	199	341	373	586	837	1136
	Unfactored Load (TL) L/240		134	273	295	507	555	874	1249	
	Factored Total Load		384	606	637	910	966	1178	1387	1609
	Min. End / Int. Bearing (in)		1.5/3.5	2.0/5.1	2.1/5.3	3.1/7.6	3.2/8.1	4.0/9.9	4.7/11.6	5.4/13.5
12	Unfactored Load (LL) L/360		71	144	155	267	292	462	664	907
	Unfactored Load (TL) L/240		103	212	229	396	434	688	990	1354
	Factored Total Load		322	508	534	764	811	1061	1245	1440
	Min. End / Int. Bearing (in)		1.5/3.5	1.9/4.7	2.0/4.9	2.8/7.0	3.0/7.4	3.9/9.7	4.6/11.4	5.3/13.2
13	Unfactored Load (LL) L/360		56	114	123	213	233	375	535	735
	Unfactored Load (TL) L/240		81	167	181	315	345	550	796	1095
	Factored Total Load		274	433	455	650	690	939	1130	1304
	Min. End / Int. Bearing (in)		1.5/3.5	1.7/4.3	1.8/4.5	2.6/6.4	2.7/6.8	3.7/9.3	4.5/11.2	5.2/12.9
14	Unfactored Load (LL) L/360		45	92	99	172	189	301	437	602
	Unfactored Load (TL) L/240		65	134	145	254	279	446	649	896
	Factored Total Load		236	373	392	560	595	809	1035	1191
	Min. End / Int. Bearing (in)		1.5/3.5	1.6/4.0	1.7/4.2	2.4/6.0	2.5/6.4	3.5/8.6	4.4/11.1	5.1/12.7
15	Unfactored Load (LL) L/360		37	75	81	141	155	248	361	499
	Unfactored Load (TL) L/240		52	109	118	208	228	367	535	742
	Factored Total Load		205	324	341	487	517	704	904	1096
	Min. End / Int. Bearing (in)		1.5/3.5	1.5/3.7	1.6/3.9	2.2/5.6	2.4/5.9	3.2/8.1	4.1/10.3	5.0/12.5
16	Unfactored Load (LL) L/360			62	67	117	129	206	301	418
	Unfactored Load (TL) L/240			90	97	172	188	304	446	620
	Factored Total Load			284	299	428	454	618	794	989
	Min. End / Int. Bearing (in)			1.5/3.5	1.5/3.7	2.1/5.2	2.2/5.5	3.0/7.5	3.9/9.7	4.8/12.1
17	Unfactored Load (LL) L/360			52	56	98	108	174	254	353
	Unfactored Load (TL) L/240			75	81	143	157	255	375	523
	Factored Total Load			252	264	378	402	547	702	875
	Min. End / Int. Bearing (in)			1.5/3.5	1.5/3.5	2.0/4.9	2.1/5.2	2.8/7.1	3.6/9.1	4.5/11.4
18	Unfactored Load (LL) L/360			44	48	83	91	147	216	301
	Unfactored Load (TL) L/240			62	68	121	133	216	318	445
	Factored Total Load			224	235	337	358	487	626	780
	Min. End / Int. Bearing (in)			1.5/3.5	1.5/3.5	1.9/4.6	2.0/4.9	2.7/6.7	3.4/8.6	4.3/10.7
19	Unfactored Load (LL) L/360				41	71	78	126	185	259
	Unfactored Load (TL) L/240				57	102	113	184	271	381
	Factored Total Load				211	302	321	437	561	699
	Min. End / Int. Bearing (in)				1.5/3.5	1.8/4.4	1.9/4.7	2.5/6.3	3.3/8.1	4.1/10.1
20	Unfactored Load (LL) L/360					61	67	109	160	224
	Unfactored Load (TL) L/240					87	96	158	233	329
	Factored Total Load					272	289	394	506	630
	Min. End / Int. Bearing (in)					1.7/4.2	1.8/4.4	2.4/6.0	3.1/7.7	3.8/9.6
21	Unfactored Load (LL) L/360					53	58	94	139	195
	Unfactored Load (TL) L/240					75	83	136	202	285
	Factored Total Load					246	262	357	458	571
	Min. End / Int. Bearing (in)					1.6/3.9	1.7/4.2	2.3/5.7	2.9/7.3	3.7/9.2
22	Unfactored Load (LL) L/360					46	51	82	121	170
	Unfactored Load (TL) L/240					65	72	118	176	249
	Factored Total Load					224	238	324	417	520
	Min. End / Int. Bearing (in)					1.5/3.8	1.6/4.0	2.2/5.4	2.8/7.0	3.5/8.7
23	Unfactored Load (LL) L/360						45	72	107	150
	Unfactored Load (TL) L/240						62	103	154	218
	Factored Total Load						217	296	381	475
	Min. End / Int. Bearing (in)						1.5/3.8	2.1/5.2	2.7/6.7	3.3/8.3
24	Unfactored Load (LL) L/360							64	94	133
	Unfactored Load (TL) L/240							90	135	192
	Factored Total Load							272	349	436
	Min. End / Int. Bearing (in)							2.0/5.0	2.6/6.4	3.2/8.0
26	Unfactored Load (LL) L/360							50	75	105
	Unfactored Load (TL) L/240							70	106	151
	Factored Total Load							231	297	370
	Min. End / Int. Bearing (in)							1.8/4.6	2.4/5.9	2.9/7.3
28	Unfactored Load (LL) L/360							41	60	85
	Unfactored Load (TL) L/240							55	84	120
	Factored Total Load							198	255	318
	Min. End / Int. Bearing (in)							1.7/4.2	2.2/5.4	2.7/6.8
30	Unfactored Load (LL) L/360								49	69
	Unfactored Load (TL) L/240								67	97
	Factored Total Load								221	276
	Min. End / Int. Bearing (in)								2.0/5.1	2.5/6.3

* 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

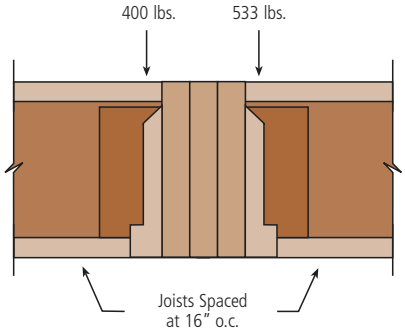
Maximum Factored Uniform Load (PLF) Applied to Either Outside Member			 2-PLY LVL	 3-PLY LVL	 4-PLY LVL*
Connector	**Spacing**	**Rows**	**Nails On One Side or Through Bolts**	**Nails Both Sides or Through Bolts**	**Through Bolts Only**
10d (3") Common Wire Nails	12" o.c.	2 Rows	698	524	Not Applicable
		3 Rows	1047	785	
	6" o.c.	2 Rows	1396	1048	Not Applicable
		3 Rows	2094	1570	
	4" o.c.	2 Rows	2094	1572	Not Applicable
		3 Rows	3141	2355	
½" A307 Through Bolts	24" o.c.	2 Rows	575	432	384
	12" o.c.	2 Rows	1150	863	767
	6" o.c.	2 Rows	2300	1726	1534

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

1. Nails to be located a minimum of 2" from the top and bottom of the member. Start all nails a minimum of 2½" in from ends.
2. Bolts are to be material conforming to ASTM Standard A307. 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.
3. Values listed are for standard term loading.

EXAMPLE (All loads shown are total factored)

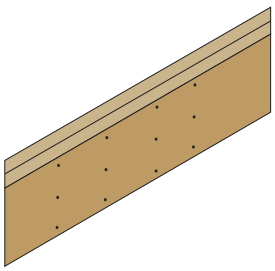
First, convert joist reactions to plf load on each side of the beam by taking the joist reaction (lbs.) divided by the joist spacing (ft.). 400 lbs/(16/12) = 300 plf and 533 lbs/(16/12) = 400 plf. Check factored resistance tables to verify that 3 plys can carry the total factored load of 700 plf. The maximum load applied to either outside member is 400 plf. Use 2 rows of 10d (3") common wire nails at 12" o.c. (good for 524 plf).



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 5½" through 11⅞" beams
- Minimum of 3 rows of 10d (3") nails at 12" o.c. for 14" through 18" beams



West Fraser LVL

3000Fb – 1.8E 1¾" and 3½" THICK

HEADERS AND BEAMS

DESIGN PROPERTIES

3000F_b-1.8E 1¾" WEST FRASER™ LVL FACTORED RESISTANCES (STANDARD TERM)

Design Property	Depth									
	5½"	7¼"	9¼"	9½"	11½"	11⅞"	14"	16"	18"	24"
Moment (ft.lbs.)	4079	6827	10751	11299	16132	17126	23277	29855	37184	63568
Shear (lbs.)	3095	4080	5206	5347	6472	6683	7879	9005	10130	13507
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

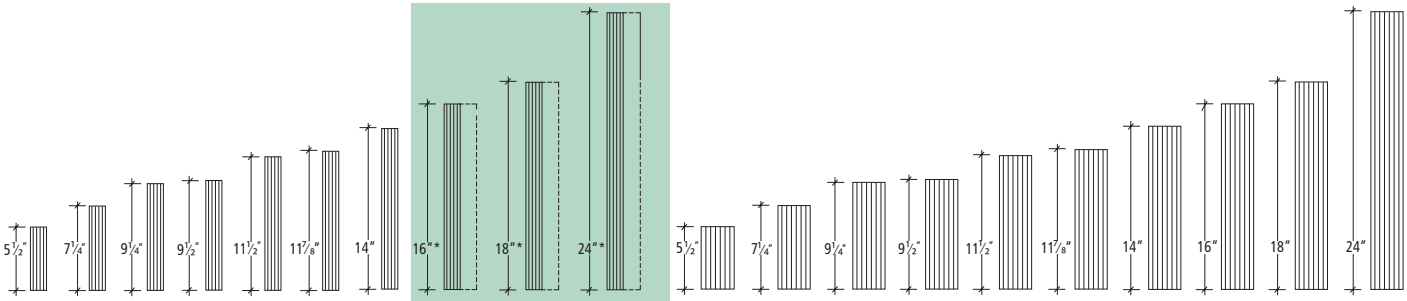
1. Lateral support of beam compression edge is required at intervals of 24" o/c or closer.
2. Lateral support of beam is required at bearing locations.
3. All 16" and greater beam depths are to be used in multiple member units only.

3000F_b-1.8E 3½" WEST FRASER™ LVL FACTORED RESISTANCES (STANDARD TERM)

Design Property	Depth									
	5½"	7¼"	9¼"	9½"	11½"	11⅞"	14"	16"	18"	24"
Moment (ft.lbs.)	8159	13654	21501	22597	32264	34252	46553	59709	74368	127136
Shear (lbs.)	6191	8161	10412	10693	12944	13367	15758	18010	20261	27014
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.

3000F_b -1.8E 1¾" AND 3½" WEST FRASER™ LVL AVAILABLE SIZES



*can only be used as a 2-ply minimum (except for 3 1/2" thick)

3000F_b -1.8E WEST FRASER™ LVL SPECIFIED STRENGTHS (STANDARD TERM)

Modulus of Elasticity	E = 1.8 x 10^6 psi
Bending Stress	F_b = 5544 psi
Shear (joist)	F_v = 536 psi
Compression Perpendicular to Grain (joist)	$F_{c(perp)}$ = 1365 psi
Compression Parallel to Grain	$F_{c(para)}$ = 3750 psi

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

FACTORED RESISTANCE TABLES

GENERAL NOTES

- Tables are for one-ply 1¾" beams. When properly connected, double the values for two-ply beams, triple for three. Minimum bearing lengths shown for one-ply will be the same for two-ply and three-ply. See page 25 for multiple-ply connection details.
- Resistances shown are the maximum factored and/or unfactored resistances, in pounds per lineal foot, that can be applied to the beam in addition to its own weight.
- Tables are based on uniform loads and the most restrictive of simple or continuous spans and dry-use conditions. Refer to West Fraser's sizing software for other loads or span configurations.
- Lateral support of beam compression edges is required at intervals of 24" o/c or closer.
- Lateral support of beams is required at bearing locations.
- West Fraser™ LVL beams are made without camber; therefore, in addition to complying with the deflection limits of the applicable building code, other deflection considerations, such as long term deflection under sustained loads (including creep), must be evaluated.
- All 16" and deeper beams are to be used in multiple member units only.
- Unfactored total load resistance is limited to a deflection of L/240. Unfactored live load resistance is based on a deflection of L/360. Check local code requirements for other deflection criteria.
- For an unfactored live load deflection limit of L/480, multiply UNFACTORED LOAD L/360 resistance by 0.75.
- Roof must have positive slope in order to prevent ponding.
- Spans of multiple spans must be at least 40% of adjacent span.
- Bearing lengths are based on 1365 psi specified strength for 1.8E Grade materials which cannot be increased for duration of load. Bearing length may need to be increased if support member's allowable bearing stress is less.
- Tables will accommodate beam slopes to a maximum of 2:12.
- Tables are in accordance with NBC 2015 and CSA 086-14.

INSTRUCTIONS FOR USE

1. Determine the factored total load and unfactored total and live load on the beam in pounds per lineal foot (plf).
2. Locate a span that meets or exceeds the required beam span, centre-to-centre of bearing.
3. Scan from left to right within the SPAN row until you find a cell where; (1) the UNFACTORED LOAD L/360 resistance meets or exceeds the unfactored live load, (2) the UNFACTORED LOAD L/240 resistance meets or exceeds the unfactored total load and (3) the FACTORED TOTAL LOAD resistance meets or exceeds the factored total load. All three rows must be checked and satisfied. Where no unfactored resistances are shown, factored total load will control.
4. To size a member for a span not shown, use capacities for the next larger span shown.

FACTORED RESISTANCE TABLE (POUNDS PER LINEAL FOOT)

3000F_b-1.8E West Fraser™ LVL — FLOOR or ROOF (Standard Term)

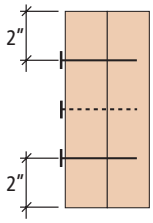
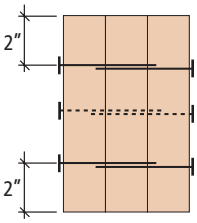
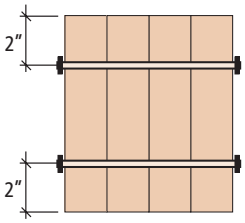
Span (ft)		1¾" WIDTH									
	Depth	5-1/2"	7-1/4"	9-1/4"	9-1/2"	11-1/2"	11-7/8"	14"	16"	18"	24"
6	Unfactored Load (LL) L/360	275	594	1137	1218	1967	2126				
	Unfactored Load (TL) L/240	410	887	1701							
	Factored Total Load	904	1294	1743	1803	2313	2416	3044	3719	4494	7708
	Min. End / Int. Bearing (in)	1.5/3.5	2.0/5.1	2.7/6.8	2.8/7.1	3.6/9.1	3.8/9.5	4.8/11.9	5.8/14.6	7.1/17.6	12.1/30.3
7	Unfactored Load (LL) L/360	177	388	756	812	1339	1453	2181			
	Unfactored Load (TL) L/240	263	578	1131	1214						
	Factored Total Load	664	1079	1440	1488	1889	1969	2450	2953	3516	5676
	Min. End / Int. Bearing (in)	1.5/3.5	2.0/4.9	2.6/6.6	2.7/6.8	3.5/8.6	3.6/9.0	4.5/11.2	5.4/13.5	6.4/16.1	10.4/26.0
8	Unfactored Load (LL) L/360	120	266	526	566	947	1030	1571	2181	2876	
	Unfactored Load (TL) L/240	178	396	785	845	1415	1539				
	Factored Total Load	507	850	1227	1266	1596	1661	2049	2449	2886	4492
	Min. End / Int. Bearing (in)	1.5/3.5	1.8/4.4	2.6/6.4	2.6/6.6	3.3/8.4	3.5/8.7	4.3/10.7	5.1/12.8	6.0/15.1	9.4/23.5
9	Unfactored Load (LL) L/360	85	190	379	409	691	753	1163	1634	2181	
	Unfactored Load (TL) L/240	126	282	565	609	1031	1125	1739			
	Factored Total Load	400	671	1058	1102	1382	1436	1761	2091	2448	3715
	Min. End / Int. Bearing (in)	1.5/3.5	1.6/4.0	2.5/6.2	2.6/6.5	3.3/8.1	3.4/8.5	4.1/10.4	4.9/12.3	5.8/14.4	8.7/21.9
10	Unfactored Load (LL) L/360	63	140	282	304	518	566	883	1251	1685	
	Unfactored Load (TL) L/240	92	207	419	452	772	844	1318			
	Factored Total Load	324	543	856	900	1218	1265	1544	1824	2125	3167
	Min. End / Int. Bearing (in)	1.5/3.5	1.5/3.6	2.2/5.6	2.4/5.9	3.2/8.0	3.3/8.3	4.0/10.1	4.8/11.9	5.6/13.9	8.3/20.7
11	Unfactored Load (LL) L/360		106	215	232	398	435	684	976	1325	2679
	Unfactored Load (TL) L/240		156	318	344	592	647	1019	1457		
	Factored Total Load		448	707	743	1061	1127	1374	1618	1877	2760
	Min. End / Int. Bearing (in)		1.5/3.5	2.0/5.1	2.1/5.3	3.1/7.6	3.2/8.1	4.0/9.9	4.7/11.6	5.4/13.5	7.9/19.9
12	Unfactored Load (LL) L/360		83	168	181	312	341	539	775	1058	2181
	Unfactored Load (TL) L/240		121	247	267	462	506	803	1155	1580	
	Factored Total Load		376	593	623	891	946	1238	1453	1680	2445
	Min. End / Int. Bearing (in)		1.5/3.5	1.9/4.7	2.0/4.9	2.8/7.0	3.0/7.4	3.9/9.7	4.6/11.4	5.3/13.2	7.7/19.2
13	Unfactored Load (LL) L/360		65	133	144	248	272	432	624	857	1795
	Unfactored Load (TL) L/240		95	195	211	368	403	642	929	1277	
	Factored Total Load		320	505	531	758	805	1096	1319	1521	2194
	Min. End / Int. Bearing (in)		1.5/3.5	1.7/4.3	1.8/4.5	2.6/6.4	2.7/6.8	3.7/9.3	4.5/11.2	5.2/12.9	7.5/18.7
14	Unfactored Load (LL) L/360		53	107	116	201	220	351	510	703	1492
	Unfactored Load (TL) L/240		75	157	169	296	325	521	757	1046	
	Factored Total Load		275	435	457	653	694	944	1207	1389	1990
	Min. End / Int. Bearing (in)		1.5/3.5	1.6/4.0	1.7/4.2	2.4/6.0	2.5/6.4	3.5/8.6	4.4/11.1	5.1/12.7	7.3/18.2
15	Unfactored Load (LL) L/360		43	88	95	165	181	289	421	583	1251
	Unfactored Load (TL) L/240		61	127	138	242	266	428	624	866	
	Factored Total Load		239	378	397	568	604	821	1054	1278	1821
	Min. End / Int. Bearing (in)		1.5/3.5	1.5/3.7	1.6/3.9	2.2/5.6	2.4/5.9	3.2/8.1	4.1/10.3	5.0/12.5	7.1/17.9
16	Unfactored Load (LL) L/360			73	78	137	150	241	351	488	1058
	Unfactored Load (TL) L/240			105	113	200	220	355	520	724	1577
	Factored Total Load			332	349	499	530	721	926	1154	1678
	Min. End / Int. Bearing (in)			1.5/3.5	1.5/3.7	2.1/5.2	2.2/5.5	3.0/7.5	3.9/9.7	4.8/12.1	7.0/17.6
17	Unfactored Load (LL) L/360			61	66	115	126	203	296	412	902
	Unfactored Load (TL) L/240			87	94	167	184	298	437	610	1343
	Factored Total Load			293	308	441	469	638	819	1021	1555
	Min. End / Int. Bearing (in)			1.5/3.5	1.5/3.5	2.0/4.9	2.1/5.2	2.8/7.1	3.6/9.1	4.5/11.4	6.9/17.3
18	Unfactored Load (LL) L/360			51	56	97	107	172	252	351	775
	Unfactored Load (TL) L/240			73	79	141	155	252	371	519	1152
	Factored Total Load			261	275	393	418	568	730	910	1449
	Min. End / Int. Bearing (in)			1.5/3.5	1.5/3.5	1.9/4.6	2.0/4.9	2.7/6.7	3.4/8.6	4.3/10.7	6.8/17.1
19	Unfactored Load (LL) L/360				47	83	91	147	216	302	670
	Unfactored Load (TL) L/240				67	119	131	214	317	445	994
	Factored Total Load				246	352	374	510	654	816	1357
	Min. End / Int. Bearing (in)				1.5/3.5	1.7/4.4	1.9/4.6	2.5/6.3	3.3/8.1	4.1/10.1	6.7/16.9
20	Unfactored Load (LL) L/360					71	78	127	186	261	583
	Unfactored Load (TL) L/240					102	112	184	272	383	863
	Factored Total Load					317	337	459	590	736	1261
	Min. End / Int. Bearing (in)					1.7/4.1	1.8/4.4	2.4/6.0	3.1/7.7	3.9/9.6	6.6/16.5
21	Unfactored Load (LL) L/360					62	68	110	162	227	510
	Unfactored Load (TL) L/240					88	97	159	236	333	753
	Factored Total Load					287	305	416	534	666	1142
	Min. End / Int. Bearing (in)					1.6/3.9	1.7/4.2	2.3/5.7	2.9/7.3	3.7/9.1	6.3/15.7
22	Unfactored Load (LL) L/360					54	59	96	142	199	448
	Unfactored Load (TL) L/240					76	84	138	205	290	661
	Factored Total Load					261	278	378	486	607	1040
	Min. End / Int. Bearing (in)					1.5/3.8	1.6/4.0	2.2/5.4	2.8/7.0	3.5/8.7	6.0/15.0
23	Unfactored Load (LL) L/360						52	84	124	175	396
	Unfactored Load (TL) L/240						73	120	180	254	583
	Factored Total Load						254	346	444	554	951
	Min. End / Int. Bearing (in)						1.5/3.8	2.1/5.2	2.7/6.7	3.3/8.3	5.7/14.3
24	Unfactored Load (LL) L/360							74	110	155	351
	Unfactored Load (TL) L/240							105	158	224	516
	Factored Total Load							317	407	508	872
	Min. End / Int. Bearing (in)							2.0/5.0	2.6/6.4	3.2/8.0	5.5/13.7
26	Unfactored Load (LL) L/360							59	87	123	280
	Unfactored Load (TL) L/240							82	123	176	410
	Factored Total Load							269	346	432	741
	Min. End / Int. Bearing (in)							1.8/4.6	2.4/5.9	2.9/7.3	5.0/12.6
28	Unfactored Load (LL) L/360							47	70	99	227
	Unfactored Load (TL) L/240							65	98	140	330
	Factored Total Load							231	297	371	638
	Min. End / Int. Bearing (in)							1.7/4.2	2.2/5.4	2.7/6.8	4.7/11.7
30	Unfactored Load (LL) L/360								57	81	186
	Unfactored Load (TL) L/240								79	113	269
	Factored Total Load								258	322	554
	Min. End / Int. Bearing (in)								2.0/5.1	2.5/6.3	4.3/10.9

* All 16", 18" and 24" 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 1¾" WEST FRASER™ LVL

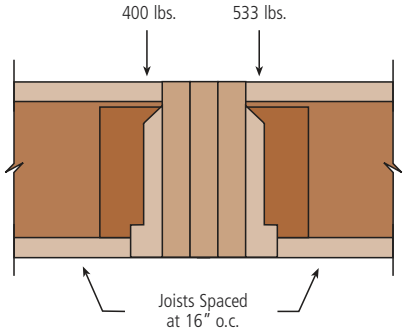
Maximum Factored Uniform Load (PLF) Applied to Either Outside Member			 2-PLY LVL	 3-PLY LVL	 4-PLY LVL*
Connector	**Spacing**	**Rows**	**Nails On One Side or Through Bolts**	**Nails Both Sides or Through Bolts**	**Through Bolts Only**
16d (3½") Common Wire Nails	12" o.c.	2 Rows	827	620	Not Applicable
		3 Rows	1241	930	
	6" o.c.	2 Rows	1654	1240	Not Applicable
		3 Rows	2482	1860	
	4" o.c.	2 Rows	2481	1860	Not Applicable
		3 Rows	3723	2790	
½" A307 Through Bolts	24" o.c.	2 Rows	671	503	448
	12" o.c.	2 Rows	1342	1006	895
	6" o.c.	2 Rows	2684	2012	1790

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

1. Nails to be located a minimum of 2" from the top and bottom of the member. Start all nails a minimum of 2½" in from ends.
2. Bolts are to be material conforming to ASTM Standard A307. 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.
3. Values listed are for standard term loading.

EXAMPLE (All loads shown are total factored)

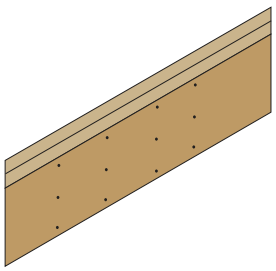
First, convert joist reactions to plf load on each side of the beam by taking the joist reaction (lbs.) divided by the joist spacing (ft.). 400 lbs/(16/12) = 300 plf and 533 lbs/(16/12) = 400 plf. Check factored resistance tables to verify that 3 plys can carry the total factored load of 700 plf. The maximum load applied to either outside member is 400 plf. Use 2 rows of 16d (3½") common wire nails at 12" o.c. (good for 620 plf).



CONNECTION OF MULTIPLE PIECES FOR TOP-LOADED BEAMS

1.8E (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" through 24" beams



COLUMNS: 3000F_b – 1.8E

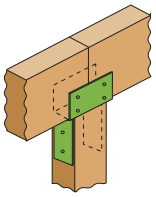
ALLOWABLE FACTORED AXIAL LOADS (LBS)

Column Length (ft)	3½" x 3½"	3½" x 4⅜"	3½" x 5½"	3½" x 7¼"	3½" x 8⅝"
3	25500	30050	34800	41000	44600
4	23000	27000	31400	37000	40600
5	19900	23400	27400	32700	36000
6	16800	19900	23400	28200	31400
7	14000	16650	19700	24000	26900
8	11550	13850	16550	20300	23000
9	9550	11500	13850	17150	19550
10	7900	9600	11600	14500	16600
12	5450	6660	8150	10350	11950
14	3820	4700	5800	7440	8650

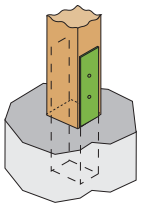
1. Loads are based on the allowable crushing of the LVL material, i.e., steel bearing connections.

COLUMN DETAILS

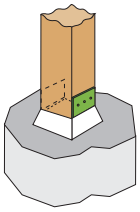
BEAM ON COLUMN CAP



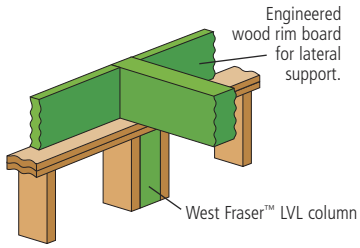
COLUMN BASE



ELEVATED COLUMN BASE



BEAM ON COLUMN



ALLOWABLE FACTORED AXIAL LOADS (LBS) – WOOD PLATE BEARING CONNECTIONS

Column Length (ft)	3½" x 3½"	3½" x 4⅜"	3½" x 5½"	3½" x 7¼"	3½" x 8⅝"
3 – 9	7526	9408	11827	15590	18547
10	7526	9408	11600	14500	16600
12	5450	6660	8150	10350	11950
14	3820	4700	5800	7440	8650

1. Loads are based on the allowable crushing of a wood plate (SPF, any grade), F_{cp} = 768 psi.

GENERAL NOTES

- Tables apply to solid, one-piece members only.
- Tables assumes that columns are unbraced, except at column ends.
- Column members to be used in dry service conditions only.
- Column length is the distance between the centers of restraining members.
- Tables include an eccentricity equal to ⅙ 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 CSA Standard 086-14.
- Factored resistances are based on standard term loading.


West Fraser™ LVL
2750Fb – 1.7E LVL
West Fraser™ LVL
West Fraser™ LVL

West Fraser™ LVL

2750Fb – 1.7E 1¾" and 3½" THICK

HEADERS, BEAMS AND COLUMNS

DESIGN PROPERTIES

2750Fb-1.7E 1¾" WEST FRASER™ LVL FACTORED RESISTANCES (STANDARD TERM)

Design Property	Depth									
	5½"	7¼"	9¼"	9½"	11½"	11⅞"	14"	16"	18"	24"
Moment (ft.lbs.)	3667	6180	9791	10297	14772	15695	21419	27564	34432	59287
Shear (lbs.)	3095	4080	5206	5347	6472	6683	7879	9005	10130	13507
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

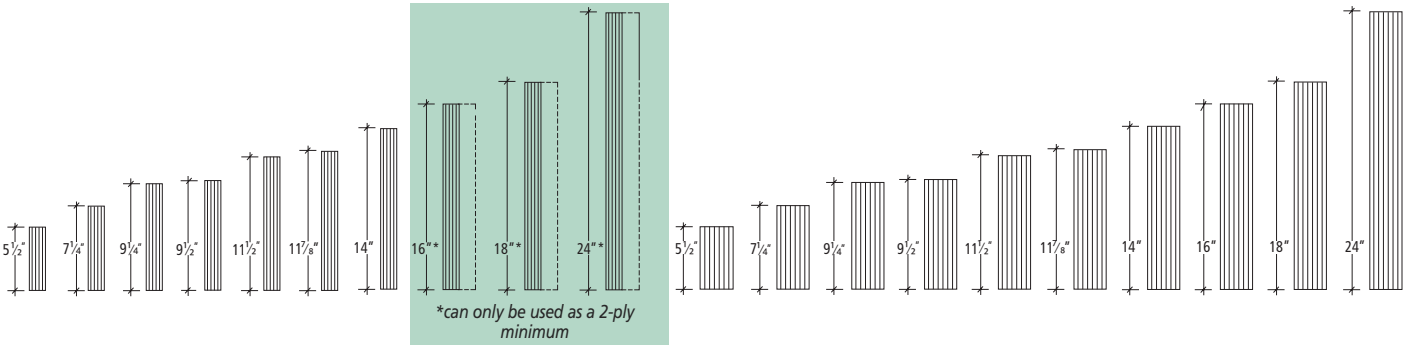
1. Lateral support of beam compression edge is required at intervals of 24" o/c or closer.
2. Lateral support of beam is required at bearing locations.
3. All 16" and greater beam depths are to be used in multiple member units only.

2750Fb-1.7E 3½" WEST FRASER™ LVL FACTORED RESISTANCES (STANDARD TERM)

Design Property	Depth									
	5½"	7¼"	9¼"	9½"	11½"	11⅞"	14"	16"	18"	24"
Moment (ft.lbs.)	7335	12360	19582	20594	29544	31390	42838	55128	68864	118573
Shear (lbs.)	6191	8161	10412	10693	12944	13367	15758	18010	20261	27014
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.

2750Fb -1.7E 1¾" AND 3½" WEST FRASER™ LVL AVAILABLE SIZES



*can only be used as a 2-ply minimum

2750Fb -1.7E WEST FRASER™ LVL SPECIFIED STRENGTHS (STANDARD TERM)

Modulus of Elasticity	E	= 1.7 x 10^6 psi
Bending Stress	F_b	= 5082 psi
Shear (joist)	F_v	= 536 psi
Compression Perpendicular to Grain (joist)	$F_{c(perp)}$	= 1363 psi
Compression Parallel to Grain	$F_{c(para)}$	= 3756 psi

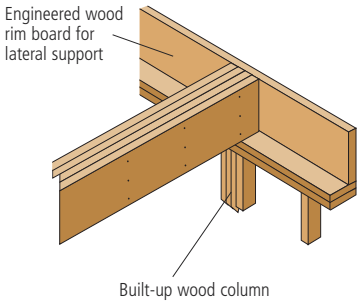
1. F_b based on 12" depths. For other depths, multiply by (12/d)^(1/9).
2. $F_{c(perp)}$ and E shall not be increased for duration of load.

West Fraser™ LVL

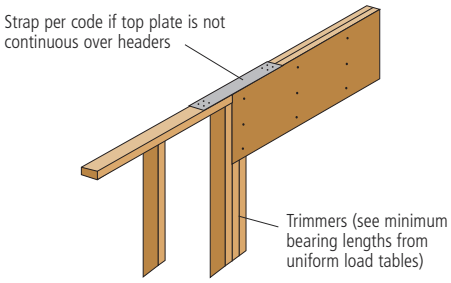
Miscellaneous Details, Software and Warranty Information

BEARING DETAILS

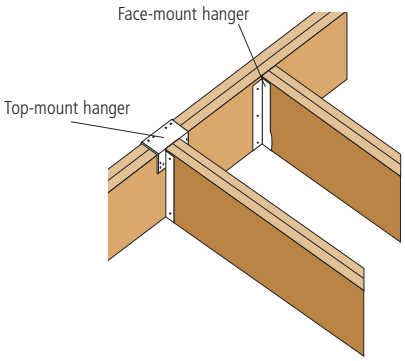
B1 BEARING AT WALL



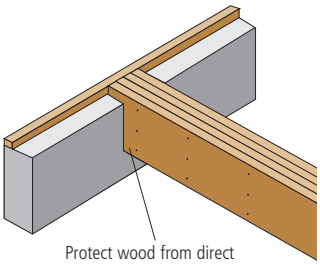
B2 BEARING FOR DOOR OR WINDOW HEADER



B3 BEAM-TO-BEAM CONNECTION

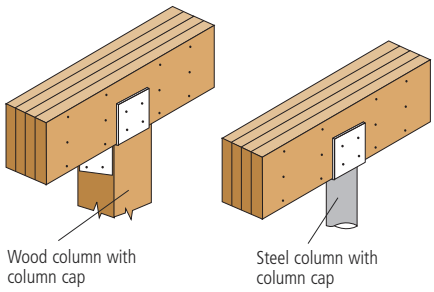


B4 BEARING AT CONCRETE WALL



B5 BEARING AT WOOD OR STEEL COLUMN

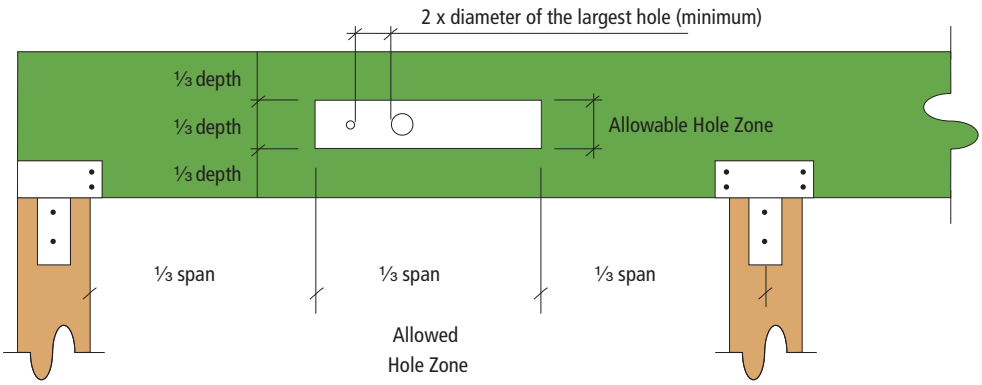
Verify column capacity and bearing length.



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

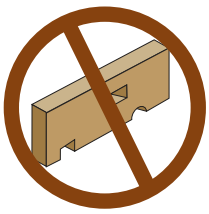
Multiple pieces of West Fraser™ LVL can be nailed or bolted together to form a header or beam of the required size, up to a maximum width of 5 inches for 1¼" wide pieces and 7 inches for 1¾" wide pieces. See pages 9, 15, 21 and 25 for details.

ALLOWABLE HOLES



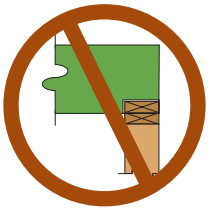
GENERAL NOTES

- 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", 1⅛" and 1½" respectively. For deeper beams, the maximum hole diameter is 2". The maximum number of holes for each span is limited to 3.

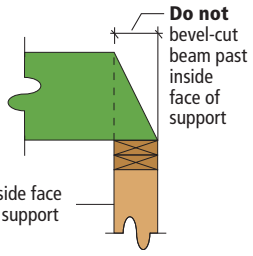


Do not cut, notch or drill holes in West Fraser™ LVL except as indicated in illustration for allowable holes

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



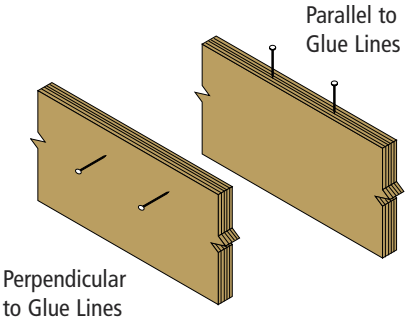
Do not notch underside of beam at bearing location



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 1½"



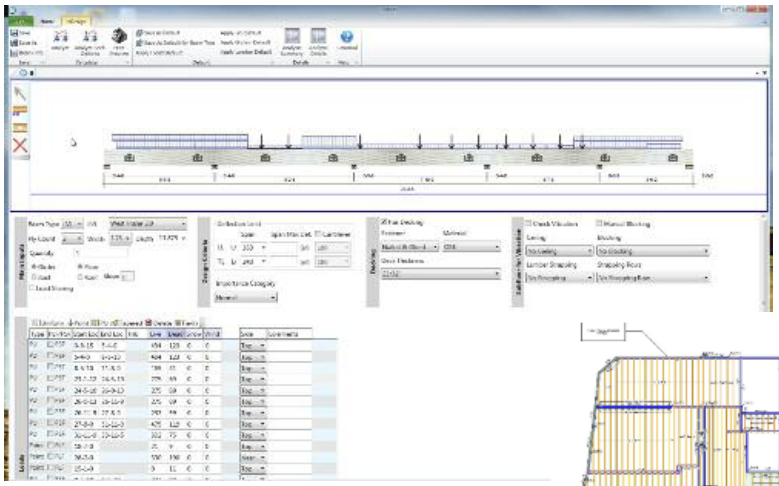
OUR WEATHER RESISTANT COATING

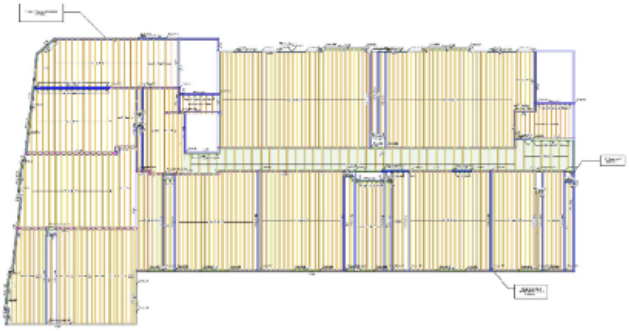
Photo shows example of the beading that occurs because of our coating process.

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.

West Fraser™ LVL

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