



BEAMS, HEADERS, AND COLUMNS



Featuring Trus Joist® TimberStrand® LSL,
Microllam® LVL, and Parallam® PSL

- Uniform and Predictable
- Minimal Bowing, Twisting, and Shrinking
- Strong and Straight
- Limited Product Warranty





The products in this guide are readily available through our nationwide network of distributors and dealers. For more information on other applications or other Trus Joist® products, contact your Weyerhaeuser representative.

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Why Choose Trus Joist® Beams, Columns, and Headers?

- Reliable performance
- Consistent quality and dependable uniformity
- Flexible solutions for your beam and header needs
- Backed by a limited product warranty

Using advanced technology, Weyerhaeuser manufactures engineered lumber that is consistently straight and strong, and that resists bowing, twisting, and shrinking. That means less waste, easier installation, and higher design values for starters; plus fewer callbacks, shorter cycle times, more design flexibility, and lower overall installed cost in the end. Trus Joist® TimberStrand® LSL, Microllam® LVL, and Parallam® PSL are structural solutions you can count on—guaranteed.

This guide features Trus Joist® engineered lumber in the following widths and depths:

TimberStrand® LSL

1.55E TimberStrand® LSL header and beam sizes:

Widths: 1¾" and 3½"

Depths: 9½", 11⅞", 14", and 16"

Microllam® LVL

2.0E Microllam® LVL header and beam sizes:

Width: 1¾"

Depths: 5½", 7¼", 9¼", 9½", 11¼", 11⅞", 14", 16", 18", and 20"

Parallam® PSL

2.2E Parallam® PSL header and beam sizes:

Widths: 3½", 5¼", and 7"

Depths: 9¼", 9½", 11¼", 11⅞", 14", 16", and 19"

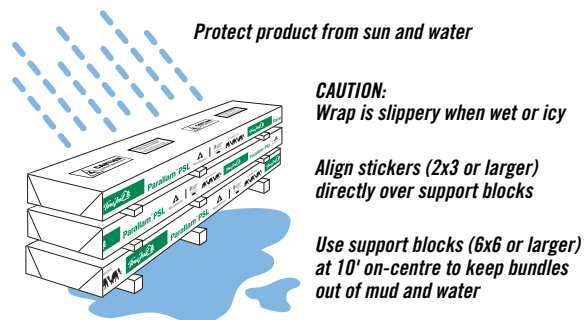
1.8E Parallam® PSL column and post sizes:

3½" x 3½" 3½" x 5¼" 3½" x 7" 5¼" x 5¼" 5¼" x 7" 7" x 7"

For deeper depth Parallam® PSL beams, see the Trus Joist® 2.2E Parallam® PSL Deep Beam Technical Resource Sheet, #TJ-7501, or contact your Weyerhaeuser representative.

Grades shown are available in Western Canada; some sizes may not be available in your region.

PRODUCT STORAGE



Trus Joist® TimberStrand® Laminated Strand Lumber (LSL)

- One-piece members reduce labor time
- Every piece is straight and strong
- Unique properties allow you to drill larger holes through 1.55E TimberStrand® LSL. See **Allowable Holes** on page 12.

Code Evaluations: See CCMC 12627-R



Trus Joist® Microllam® Laminated Veneer Lumber (LVL)

- Can easily be built up on site to reduce heavy lifting
- Offers reliable and economical solutions for beam and header applications
- Manufacturing process minimizes many of the natural inconsistencies found in wood

Code Evaluations: See CCMC 08675-R



Trus Joist® Parallam® Parallel Strand Lumber (PSL)

- Allows long spans for open floor plans without intermediate posts or columns
- Has warm, unique grain that is perfect for applications with exposed beams
- Provides ideal solutions for cantilever and multi-span applications
- Solid sections save time on site assembly

Code Evaluations: See CCMC 11161-R



General Assumptions for Products Shown in this Guide

- Specified strengths and factored resistances are based on Limit States Design per CSA O86.
- Lateral support is required at bearing and along the span at 24" on-centre, maximum.
- Bearing lengths are based on each product's bearing resistance for applicable grade and orientation.
- All members 7¼" and less in depth are restricted to a maximum deflection of 5⁄16".
- Beams that are 1¾" x 16" and deeper require multiple plies.
- No camber.
- Beams and columns must remain straight to within 5L⁄4608 (in.) of true alignment. L is the unrestrained length of the member in feet.

For applications not covered in this guide, contact your Weyerhaeuser representative.

See pages 14–16 for multiple-member beam connections.

TimberStrand® LSL, Microllam® LVL, and untreated Parallam® PSL are intended for dry-use applications

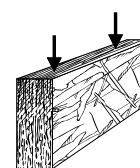
DESIGN PROPERTIES

Factored Resistances⁽¹⁾ (Standard Term)

Grade	Width	Design Property	Depth										
			5½"	7¼"	9¼"	9½"	11¼"	11½"	14"	16"	18"	19"	20"
TimberStrand® LSL													
1.55E	1¾"	Factored Moment Resistance (ft-lbs)				8,665		13,260	18,155	23,425			
		Factored Shear Resistance (lbs)				5,735		7,170	8,455	9,660			
		Moment of Inertia (in. ⁴)				125		244	400	597			
		Weight (plf)				5.2		6.5	7.7	8.8			
	3½"	Factored Moment Resistance (ft-lbs)				17,325		26,525	36,310	46,850			
		Factored Shear Resistance (lbs)				11,470		14,340	16,905	19,320			
		Moment of Inertia (in. ⁴)				250		488	800	1,195			
		Weight (plf)				10.4		13.0	15.3	17.5			
Microllam® LVL													
2.0E	1¾"	Factored Moment Resistance (ft-lbs)	3,535	5,915	9,315	9,790	13,420	14,845	20,175	25,875	32,230		39,220
		Factored Shear Resistance (lbs)	3,060	4,035	5,150	5,285	6,260	6,610	7,790	8,905	10,015		11,130
		Moment of Inertia (in. ⁴)	24	56	115	125	208	244	400	597	851		1,167
		Weight (plf)	2.8	3.7	4.7	4.8	5.7	6.1	7.1	8.2	9.2		10.2
Parallam® PSL													
2.2E	3½"	Factored Moment Resistance (ft-lbs)			20,655	21,720	29,890	33,105	45,180	58,145		80,445	
		Factored Shear Resistance (lbs)			10,490	10,775	12,760	13,465	15,875	18,145		21,545	
		Moment of Inertia (in. ⁴)			231	250	415	488	800	1,195		2,001	
		Weight (plf)			10.1	10.4	12.3	13.0	15.3	17.5		20.8	
	5¼"	Factored Moment Resistance (ft-lbs)			30,980	32,580	44,840	49,660	67,775	87,220		120,665	
		Factored Shear Resistance (lbs)			15,735	16,160	19,135	20,200	23,815	27,215		32,320	
		Moment of Inertia (in. ⁴)			346	375	623	733	1,201	1,792		3,001	
		Weight (plf)			15.2	15.6	18.5	19.5	23.0	26.3		31.2	
	7"	Factored Moment Resistance (ft-lbs)			41,305	43,440	59,785	66,215	90,365	116,290		160,890	
		Factored Shear Resistance (lbs)			20,980	21,545	25,515	26,935	31,750	36,290		43,090	
		Moment of Inertia (in. ⁴)			462	500	831	977	1,601	2,389		4,001	
		Weight (plf)			20.2	20.8	24.6	26.0	30.6	35.0		41.6	

(1) For product in beam orientation, unless otherwise noted.

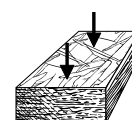
Beam
Orientation



Column
Orientation



Plank
Orientation



Specified Strengths⁽¹⁾ and Moduli of Elasticity (Standard Term)

Grade	Orientation	G Shear Modulus of Elasticity (psi)	E Modulus of Elasticity (psi)	f _b Flexural Stress ⁽²⁾ (psi)	f _t Tension Stress ⁽³⁾ (psi)	f _{cL} Compression Perpendicular to Grain ⁽⁴⁾ (psi)	f _c Compression Parallel to Grain (psi)	f _v Horizontal Shear Parallel to Grain (psi)	SG Equivalent Specific Gravity ⁽⁵⁾
TimberStrand® LSL									
1.55E	Beam	96,875	1.55 x 10 ⁶	4,295	1,975 ⁽⁷⁾	1,455	3,270	575 ⁽⁷⁾	0.50 ⁽⁶⁾
Microllam® LVL									
2.0E	Beam	125,000	2.0 x 10 ⁶	4,805	2,870	1,365	4,005	530	0.50
Parallam® PSL									
1.8E	Column	112,500	1.8 x 10 ⁶	4,435 ⁽⁸⁾	3,245	775 ⁽⁸⁾	3,990	355 ⁽⁸⁾	0.50
2.2E	Beam	137,500	2.2 x 10 ⁶	5,360	3,750	1,365	4,630 ⁽⁹⁾	540	0.50

(1) To obtain factored resistances, apply the appropriate formulae from CSA O86 to the specified strengths shown.

(2) For 12" depth. For other depths, multiply f_b by the appropriate factor as follows:

- For TimberStrand® LSL, multiply by $\left[\frac{12}{d}\right]^{0.092}$
- For Microllam® LVL, multiply by $\left[\frac{12}{d}\right]^{0.136}$
- For Parallam® PSL, multiply by $\left[\frac{12}{d}\right]^{0.111}$

(3) f_t has been adjusted to reflect the volume effects for most standard applications.

(4) f_{cL} must not be increased for duration of load.

(5) For lateral connection design only.

(6) Specific gravity of 0.58 may be used for bolts installed perpendicular to face and loaded perpendicular to grain.

(7) Value accounts for large hole capabilities. See **Allowable Holes** on page 12.

(8) Value shown is for plank orientation.

(9) For column applications, use a specified strength of 800 psi.

TimberStrand® LSL, Microllam® LVL, and untreated Parallam® PSL are intended for dry-use applications

FLOOR AND/OR SNOW LOAD TABLES

How to Use This Table

1. Calculate the factored and unfactored total load (TL) (neglect beam weight) and the unfactored live load (LL) on the beam or header in pounds per linear foot (plf).
2. Select appropriate **Span** (centre-to-centre of bearing).
3. Scan horizontally to find the proper width and a depth that has a capacity that meets or exceeds actual loads.
4. Review bearing length requirements to ensure adequacy.

General Notes

- Table is based on:
 - Uniform loads (beam weight considered).
 - More restrictive of simple or continuous span.
 - Deflection criteria of L/360 live load (LL) and L/240 total load (TL).
- For a live load deflection limit of L/480, multiply **Unfactored Resistance (LL)** by 0.75. For a total load limit of L/180 multiply **Unfactored Resistance (TL)** by 1.33. The resulting loads must not exceed the **Total Factored Resistance** shown.

Also **General Assumptions** on page 3.

1.55E TimberStrand® LSL: Floor and/or Snow—Standard Term (PLF)

Span	Condition	1¾" Width			3½" Width				5¼" Width (2- or 3-ply)			
		9½"	11½"	14"	9½"	11½"	14"	16"	9½"	11½"	14"	16"
4'	Unfactored Resistance (LL)	*	*	*	*	*	*	*	*	*	*	*
	Unfactored Resistance (TL)	*	*	*	*	*	*	*	*	*	*	*
	Total Factored Resistance	3,351	4,574	4,574	6,702	9,145	9,145	9,145	10,053	13,717	13,717	13,717
	Min. End/Int. Bearing (in.)	3.3/8.2	4.5/11.3	4.5/11.3	3.3/8.2	4.5/11.3	4.5/11.3	4.5/11.3	3.3/8.2	4.5/11.3	4.5/11.3	4.5/11.3
5'	Unfactored Resistance (LL)	1,658	*	*	3,317	*	*	*	4,975	*	*	*
	Unfactored Resistance (TL)	*	*	*	*	*	*	*	*	*	*	*
	Total Factored Resistance	2,452	3,349	3,657	4,903	6,699	7,311	7,311	7,355	10,048	10,967	10,967
	Min. End/Int. Bearing (in.)	3.0/7.5	4.1/10.3	4.5/11.3	3.0/7.5	4.1/10.3	4.5/11.3	4.5/11.3	3.0/7.5	4.1/10.3	4.5/11.3	4.5/11.3
6'	Unfactored Resistance (LL)	1,049	*	*	2,098	*	*	*	3,146	*	*	*
	Unfactored Resistance (TL)	*	*	*	*	*	*	*	*	*	*	*
	Total Factored Resistance	1,919	2,589	3,046	3,837	5,178	6,089	6,089	5,756	7,767	9,134	9,134
	Min. End/Int. Bearing (in.)	2.8/7.1	3.8/9.6	4.5/11.3	2.8/7.1	3.8/9.6	4.5/11.3	4.5/11.3	2.8/7.1	3.8/9.6	4.5/11.3	4.5/11.3
8'	Unfactored Resistance (LL)	487	887	1,353	975	1,774	2,706	*	1,462	2,660	4,058	*
	Unfactored Resistance (TL)	726	*	*	1,452	*	*	*	2,178	*	*	*
	Total Factored Resistance	1,076	1,650	2,195	2,153	3,299	4,391	4,561	3,229	4,949	6,586	6,842
	Min. End/Int. Bearing (in.)	2.1/5.3	3.3/8.1	4.3/10.8	2.1/5.3	3.3/8.1	4.3/10.8	4.5/11.3	2.1/5.3	3.3/8.1	4.3/10.8	4.5/11.3
9'-6"	Unfactored Resistance (LL)	303	561	870	605	1,121	1,740	2,456	908	1,682	2,611	3,685
	Unfactored Resistance (TL)	449	*	*	897	*	*	*	1,346	*	*	*
	Total Factored Resistance	761	1,167	1,600	1,523	2,335	3,200	3,838	2,284	3,502	4,799	5,757
	Min. End/Int. Bearing (in.)	1.8/4.5	2.7/6.9	3.8/9.4	1.8/4.5	2.7/6.9	3.8/9.4	4.5/11.3	1.8/4.5	2.7/6.9	3.8/9.4	4.5/11.3
10'	Unfactored Resistance (LL)	262	487	760	524	975	1,520	2,155	786	1,462	2,280	3,232
	Unfactored Resistance (TL)	388	725	*	775	1,449	*	*	1,163	2,174	*	*
	Total Factored Resistance	687	1,053	1,443	1,373	2,106	2,886	3,645	2,060	3,158	4,329	5,467
	Min. End/Int. Bearing (in.)	1.7/4.3	2.6/6.5	3.6/9.0	1.7/4.3	2.6/6.5	3.6/8.9	4.5/11.3	1.7/4.3	2.6/6.5	3.6/8.9	4.5/11.3
12'	Unfactored Resistance (LL)	156	294	464	311	588	929	1,335	467	881	1,393	2,002
	Unfactored Resistance (TL)	228	434	689	457	868	1,378	*	685	1,303	2,067	*
	Total Factored Resistance	475	729	999	950	1,457	1,998	2,581	1,424	2,186	2,997	3,871
	Min. End/Int. Bearing (in.)	1.5/3.5	2.2/5.4	3.0/7.5	1.5/3.5	2.2/5.4	3.0/7.4	3.9/9.6	1.5/3.5	2.2/5.4	3.0/7.4	3.9/9.6
14'	Unfactored Resistance (LL)	100	190	303	199	380	605	877	299	569	908	1,316
	Unfactored Resistance (TL)	144	278	446	289	556	892	1,299	433	835	1,339	1,948
	Total Factored Resistance	347	533	731	694	1,066	1,463	1,890	1,041	1,600	2,194	2,835
	Min. End/Int. Bearing (in.)	1.5/3.5	1.9/4.7	2.6/6.4	1.5/3.5	1.9/4.7	2.5/6.4	3.3/8.3	1.5/3.5	1.9/4.7	2.5/6.4	3.3/8.3
16'-6"	Unfactored Resistance (LL)	62	118	190	123	237	380	555	185	355	570	833
	Unfactored Resistance (TL)	87	171	277	175	342	555	815	262	513	832	1,223
	Total Factored Resistance	248	382	524	496	763	1,048	1,355	744	1,145	1,572	2,032
	Min. End/Int. Bearing (in.)	1.5/3.5	1.6/3.9	2.2/5.4	1.5/3.5	1.6/3.9	2.2/5.4	2.8/7.0	1.5/3.5	1.6/3.9	2.2/5.4	2.8/7.0
18'-6"	Unfactored Resistance (LL)	44	85	137	88	170	274	401	132	255	410	602
	Unfactored Resistance (TL)	61	121	198	122	242	395	584	183	362	593	877
	Total Factored Resistance	196	302	415	392	604	830	1,073	588	906	1,244	1,610
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.5	1.9/4.8	1.5/3.5	1.5/3.5	1.9/4.8	2.5/6.3	1.5/3.5	1.5/3.5	1.9/4.8	2.5/6.3
20'	Unfactored Resistance (LL)		68	109	70	135	218	321	105	203	327	481
	Unfactored Resistance (TL)		95	156	95	190	312	464	142	285	468	696
	Total Factored Resistance		257	354	334	514	707	915	500	771	1,061	1,373
	Min. End/Int. Bearing (in.)		1.5/3.5	1.8/4.5	1.5/3.5	1.5/3.5	1.8/4.5	2.3/5.8	1.5/3.5	1.5/3.5	1.8/4.5	2.3/5.8

* Indicates **Total Factored Resistance** value controls.

FLOOR AND/OR SNOW LOAD TABLES

How to Use This Table

1. Calculate the factored and unfactored total load (TL) (neglect beam weight) and the unfactored live load (LL) on the beam or header in pounds per linear foot (plf).
2. Select appropriate **Span** (centre-to-centre of bearing).
3. Scan horizontally to find the proper width and a depth that has a capacity that meets or exceeds actual loads.
4. Review bearing length requirements to ensure adequacy.

Also see **General Notes** on page 7.

2.OE Microllam® LVL: Floor and/or Snow—Standard Term (PLF)

Span	Condition	1¾" Width							3½" Width (2-ply)						
		5½"	7¼"	9¼"	9½"	11¼"	11½"	14"	5½"	7¼"	9¼"	9½"	11¼"	11½"	14"
6'	Unfactored Resistance (LL)	305	660	*	*	*	*	*	611	1,319	*	*	*	*	*
	Unfactored Resistance (TL)	455	*	*	*	*	*	*	911	*	*	*	*	*	*
	Total Factored Resistance	782	1,278	1,722	1,781	2,219	2,386	2,859	1,564	2,556	3,444	3,562	4,438	4,773	5,713
	Min. End/Int. Bearing (in.)	1.5/3.5	2/5	2.7/6.8	2.8/7	3.5/8.7	3.8/9.4	4.5/11.3	1.5/3.5	2/5	2.7/6.8	2.8/7	3.5/8.7	3.8/9.4	4.5/11.3
8'	Unfactored Resistance (LL)	134	296	585	629	992	*	*	267	591	1,169	1,258	1,985	*	*
	Unfactored Resistance (TL)	154	343	*	*	*	*	*	308	686	*	*	*	*	*
	Total Factored Resistance	438	735	1,159	1,218	1,534	1,640	2,024	877	1,470	2,318	2,436	3,068	3,280	4,047
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.9	2.4/6.1	2.6/6.4	3.2/8.1	3.4/8.6	4.3/10.6	1.5/3.5	1.5/3.9	2.4/6.1	2.6/6.4	3.2/8.1	3.4/8.6	4.3/10.6
9'-6"	Unfactored Resistance (LL)	80	178	362	390	624	723	*	160	357	724	781	1,248	1,447	*
	Unfactored Resistance (TL)	77	175	539	581	*	*	*	154	349	1,077	1,162	*	*	*
	Total Factored Resistance	310	520	820	862	1,182	1,308	1,624	620	1,040	1,640	1,724	2,365	2,616	3,248
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.5	2.1/5.1	2.2/5.4	3/7.4	3.3/8.2	4.1/10.1	1.5/3.5	1.5/3.5	2.1/5.1	2.2/5.4	3/7.4	3.3/8.2	4.1/10.1
10'	Unfactored Resistance (LL)	65	146	313	338	542	629	981	131	292	627	676	1,084	1,258	1,961
	Unfactored Resistance (TL)	62	142	465	502	*	*	*	125	285	931	1,004	*	*	*
	Total Factored Resistance	279	469	739	777	1,066	1,180	1,524	559	937	1,479	1,555	2,133	2,360	3,047
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.5	2/4.9	2/5.1	2.8/7	3.1/7.8	4/10	1.5/3.5	1.5/3.5	2/4.9	2/5.1	2.8/7	3.1/7.8	4/10
12'	Unfactored Resistance (LL)	32	72	186	201	326	379	599	64	143	372	402	651	758	1,198
	Unfactored Resistance (TL)	29	68	274	297	483	563	*	58	136	549	593	965	1,125	*
	Total Factored Resistance	193	324	512	538	738	817	1,112	386	648	1,023	1,076	1,477	1,634	2,224
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.5	1.6/4.1	1.7/4.3	2.3/5.9	2.6/6.5	3.5/8.8	1.5/3.5	1.5/3.5	1.6/4.1	1.7/4.3	2.3/5.9	2.6/6.5	3.5/8.8
14'	Unfactored Resistance (LL)		39	119	129	210	245	390	35	78	238	257	420	490	781
	Unfactored Resistance (TL)		35	174	188	309	361	*	29	71	348	376	618	723	*
	Total Factored Resistance		237	374	394	541	598	814	282	474	749	787	1,081	1,197	1,629
	Min. End/Int. Bearing (in.)		1.5/3.5	1.5/3.5	1.5/3.7	2/5	2.2/5.5	3/7.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.7	2/5	2.2/5.5	3/7.5
16'-6"	Unfactored Resistance (LL)			74	80	130	153	245	18	41	147	159	261	305	490
	Unfactored Resistance (TL)			106	115	190	223	361	12	33	212	229	380	446	721
	Total Factored Resistance			268	282	387	429	584	201	338	536	563	774	857	1,168
	Min. End/Int. Bearing (in.)			1.5/3.5	1.5/3.5	1.7/4.3	1.9/4.7	2.6/6.4	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.7/4.3	1.9/4.7	2.6/6.4
18'-6"	Unfactored Resistance (LL)			53	57	93	109	176		26	105	114	187	219	353
	Unfactored Resistance (TL)			74	81	134	158	258		19	148	161	269	316	515
	Total Factored Resistance			212	223	307	339	463		267	424	446	613	679	925
	Min. End/Int. Bearing (in.)			1.5/3.5	1.5/3.5	1.5/3.8	1.7/4.2	2.3/5.7		1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.8	1.7/4.2	2.3/5.7
20'	Unfactored Resistance (LL)			42	45	74	87	141		19	84	90	149	174	282
	Unfactored Resistance (TL)			58	63	106	125	204		12	116	126	212	249	408
	Total Factored Resistance			180	190	261	289	395		227	361	380	522	579	789
	Min. End/Int. Bearing (in.)			1.5/3.5	1.5/3.5	1.5/3.5	1.6/3.9	2.1/5.3		1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.6/3.9	2.1/5.3
24'	Unfactored Resistance (LL)					43	51	83			49	53	87	102	166
	Unfactored Resistance (TL)					59	70	117			64	69	119	141	234
	Total Factored Resistance					179	199	271			247	260	358	397	543
	Min. End/Int. Bearing (in.)					1.5/3.5	1.5/3.5	1.8/4.4			1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.8/4.4
28'	Unfactored Resistance (LL)							53			31	33	55	65	105
	Unfactored Resistance (TL)							72			37	40	71	85	144
	Total Factored Resistance							197			178	188	260	288	394
	Min. End/Int. Bearing (in.)							1.5/3.8			1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.8

* Indicates **Total Factored Resistance** value controls.

FLOOR AND/OR SNOW LOAD TABLES

General Notes

- Table is based on:
 - Uniform loads (beam weight considered).
 - More restrictive of simple or continuous span.
 - Deflection criteria of L/360 live load (LL) and L/240 total load (TL).
- For a live load deflection limit of L/480, multiply **Unfactored Resistance (LL)** by 0.75. For a total load limit of Lr/180 multiply **Unfactored Resistance (TL)** by 1.33. The resulting loads must not exceed the **Total Factored Resistance** shown.

Also see **How to Use This Table** on page 6 and **General Assumptions** on page 3.

2.OE Microllam® LVL: Floor and/or Snow—Standard Term (PLF) *continued*

Span	Condition	3½" Width (2-ply)			5¼" Width (3-ply)									
		16"	18"	20"	5½"	7¼"	9¼"	9½"	11¼"	11½"	14"	16"	18"	20"
6'	Unfactored Resistance (LL)	*	*	*	916	1,979	*	*	*	*	*	*	*	*
	Unfactored Resistance (TL)	*	*	*	1,366	*	*	*	*	*	*	*	*	*
	Total Factored Resistance	5,713	5,713	5,713	2,346	3,834	5,166	5,343	6,656	7,159	8,569	8,569	8,569	8,569
	Min. End/Int. Bearing (in.)	4.5/11.3	4.5/11.3	4.5/11.3	1.5/3.5	2/5	2.7/6.8	2.8/7	3.5/8.7	3.8/9.4	4.5/11.3	4.5/11.3	4.5/11.3	4.5/11.3
8'	Unfactored Resistance (LL)	*	*	*	401	887	1,754	1,887	2,977	*	*	*	*	*
	Unfactored Resistance (TL)	*	*	*	462	1,028	*	*	*	*	*	*	*	*
	Total Factored Resistance	4,279	4,279	4,279	1,315	2,205	3,476	3,654	4,602	4,921	6,071	6,419	6,419	6,419
	Min. End/Int. Bearing (in.)	4.5/11.3	4.5/11.3	4.5/11.3	1.5/3.5	1.5/3.9	2.4/6.1	2.6/6.4	3.2/8.1	3.4/8.6	4.3/10.6	4.5/11.3	4.5/11.3	4.5/11.3
9'-6"	Unfactored Resistance (LL)	*	*	*	240	535	1,087	1,171	1,873	2,170	*	*	*	*
	Unfactored Resistance (TL)	*	*	*	231	524	1,616	1,742	*	*	*	*	*	*
	Total Factored Resistance	3,600	3,600	3,600	930	1,560	2,460	2,586	3,547	3,924	4,872	5,401	5,401	5,401
	Min. End/Int. Bearing (in.)	4.5/11.3	4.5/11.3	4.5/11.3	1.5/3.5	1.5/3.5	2.1/5.1	2.2/5.4	3/7.4	3.3/8.2	4.1/10.1	4.5/11.3	4.5/11.3	4.5/11.3
10'	Unfactored Resistance (LL)	*	*	*	196	439	940	1,014	1,626	1,887	2,942	*	*	*
	Unfactored Resistance (TL)	*	*	*	187	427	1,396	1,506	*	*	*	*	*	*
	Total Factored Resistance	3,419	3,419	3,419	838	1,406	2,218	2,332	3,199	3,540	4,571	5,129	5,129	5,129
	Min. End/Int. Bearing (in.)	4.5/11.3	4.5/11.3	4.5/11.3	1.5/3.5	1.5/3.5	2/4.9	2/5.1	2.8/7	3.1/7.8	4/10	4.5/11.3	4.5/11.3	4.5/11.3
12'	Unfactored Resistance (LL)	*	*	*	95	215	558	603	977	1,137	1,798	2,583	*	*
	Unfactored Resistance (TL)	*	*	*	87	204	823	890	1,448	1,688	*	*	*	*
	Total Factored Resistance	2,846	2,846	2,846	579	972	1,535	1,614	2,215	2,451	3,336	4,269	4,269	4,269
	Min. End/Int. Bearing (in.)	4.5/11.3	4.5/11.3	4.5/11.3	1.5/3.5	1.5/3.5	1.6/4.1	1.7/4.3	2.3/5.9	2.6/6.5	3.5/8.8	4.5/11.3	4.5/11.3	4.5/11.3
14'	Unfactored Resistance (LL)	1,132	1,561	*	52	117	357	386	629	735	1,171	1,698	2,342	*
	Unfactored Resistance (TL)	*	*	*	43	106	522	565	927	1,084	*	*	*	*
	Total Factored Resistance	2,092	2,437	2,437	422	711	1,123	1,181	1,622	1,795	2,443	3,138	3,655	3,655
	Min. End/Int. Bearing (in.)	3.9/9.7	4.5/11.3	4.5/11.3	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.7	2/5	2.2/5.5	3/7.5	3.9/9.7	4.5/11.3	4.5/11.3
16'-6"	Unfactored Resistance (LL)	716	996	1,331	27	61	221	239	391	458	735	1,074	1,493	1,996
	Unfactored Resistance (TL)	*	*	*	19	50	317	344	570	669	1,082	*	*	*
	Total Factored Resistance	1,500	1,871	2,064	301	508	804	845	1,162	1,286	1,752	2,250	2,807	3,096
	Min. End/Int. Bearing (in.)	3.3/8.2	4.1/10.2	4.5/11.3	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.7/4.3	1.9/4.7	2.6/6.4	3.3/8.2	4.1/10.2	4.5/11.3
18'-6"	Unfactored Resistance (LL)	518	723	971	17	39	158	171	280	328	529	777	1,084	1,456
	Unfactored Resistance (TL)	760	*	*	9	28	223	242	403	474	773	1,140	*	*
	Total Factored Resistance	1,189	1,484	1,808	237	401	636	668	920	1,018	1,388	1,784	2,226	2,712
	Min. End/Int. Bearing (in.)	2.9/7.3	3.6/9.1	4.4/11.1	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.8	1.7/4.2	2.3/5.7	2.9/7.3	3.6/9.1	4.4/11.1
20'	Unfactored Resistance (LL)	414	580	781	13	29	125	136	223	262	423	621	870	1,171
	Unfactored Resistance (TL)	605	851	*	4	17	174	189	318	374	612	907	1,277	*
	Total Factored Resistance	1,015	1,266	1,543	202	341	541	569	784	868	1,184	1,522	1,899	2,315
	Min. End/Int. Bearing (in.)	2.7/6.8	3.4/8.4	4.1/10.3	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.6/3.9	2.1/5.3	2.7/6.8	3.4/8.4	4.1/10.3
24'	Unfactored Resistance (LL)	244	344	466		14	73	79	130	153	248	367	516	698
	Unfactored Resistance (TL)	350	498	678		3	95	104	178	211	351	526	746	1,017
	Total Factored Resistance	698	872	1,064		233	371	390	538	596	814	1,048	1,308	1,596
	Min. End/Int. Bearing (in.)	2.3/5.6	2.8/7.0	3.4/8.6		1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.8/4.4	2.3/5.6	2.8/7.0	3.4/8.6
28'	Unfactored Resistance (LL)	156	220	299			46	50	83	97	158	234	330	448
	Unfactored Resistance (TL)	217	311	428			55	60	107	127	215	326	467	641
	Total Factored Resistance	508	635	775			268	282	389	432	591	761	952	1,162
	Min. End/Int. Bearing (in.)	1.9/4.8	2.4/6.0	2.9/7.3			1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.8	1.9/4.8	2.4/6.0	2.9/7.3

* Indicates **Total Factored Resistance** value controls.

FLOOR AND/OR SNOW LOAD TABLES

How to Use This Table

1. Calculate the factored and unfactored total load (TL) (neglect beam weight) and the unfactored live load (LL) on the beam or header in pounds per linear foot (plf).
2. Select appropriate **Span** (centre-to-centre of bearing).
3. Scan horizontally to find the proper width and a depth that has a capacity that meets or exceeds actual loads.
4. Review bearing length requirements to ensure adequacy.

Also see **General Notes** on page 9.

2.2E Parallam® PSL: Floor and/or Snow—Standard Term (PLF)

Span	Condition	3½" Width							5¼" Width						
		9¼"	9½"	11¼"	11½"	14"	16"	19"	9¼"	9½"	11¼"	11½"	14"	16"	19"
8'	Unfactored Resistance (LL)	1,286	1,384	*	*	*	*	*	1,929	2,076	*	*	*	*	*
	Unfactored Resistance (TL)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	Total Factored Resistance	2,468	2,547	3,125	3,342	4,122	4,279	4,279	3,701	3,820	4,687	5,012	6,184	6,418	6,418
	Min. End/Int. Bearing (in.)	2.6/6.5	2.7/6.7	3.3/8.2	3.5/8.8	4.3/10.8	4.5/11.3	4.5/11.3	2.6/6.5	2.7/6.7	3.3/8.2	3.5/8.8	4.3/10.8	4.5/11.3	4.5/11.3
9'-6"	Unfactored Resistance (LL)	797	859	1,373	1,591	*	*	*	1,195	1,288	2,060	2,387	*	*	*
	Unfactored Resistance (TL)	1,185	1,278	*	*	*	*	*	1,778	1,917	*	*	*	*	*
	Total Factored Resistance	1,818	1,912	2,536	2,705	3,309	3,600	3,600	2,727	2,868	3,804	4,058	4,963	5,400	5,400
	Min. End/Int. Bearing (in.)	2.3/5.7	2.4/6	3.2/7.9	3.4/8.5	4.1/10.3	4.5/11.3	4.5/11.3	2.3/5.7	2.4/6	3.2/7.9	3.4/8.5	4.1/10.3	4.5/11.3	4.5/11.3
10'	Unfactored Resistance (LL)	689	743	1,193	1,384	*	*	*	1,034	1,115	1,789	2,076	*	*	*
	Unfactored Resistance (TL)	1,024	1,105	*	*	*	*	*	1,536	1,657	*	*	*	*	*
	Total Factored Resistance	1,640	1,725	2,376	2,544	3,104	3,419	3,419	2,459	2,587	3,564	3,816	4,656	5,129	5,129
	Min. End/Int. Bearing (in.)	2.2/5.4	2.3/5.7	3.1/7.8	3.3/8.4	4.1/10.2	4.5/11.3	4.5/11.3	2.2/5.4	2.3/5.7	3.1/7.8	3.3/8.4	4.1/10.2	4.5/11.3	4.5/11.3
12'	Unfactored Resistance (LL)	409	442	716	834	1,318	1,894	*	614	663	1,074	1,251	1,977	2,841	*
	Unfactored Resistance (TL)	604	653	1,062	1,238	*	*	*	906	979	1,593	1,857	*	*	*
	Total Factored Resistance	1,135	1,194	1,645	1,823	2,488	2,846	2,846	1,702	1,790	2,468	2,735	3,731	4,269	4,269
	Min. End/Int. Bearing (in.)	1.8/4.5	1.9/4.7	2.6/6.5	2.9/7.2	3.9/9.8	4.5/11.3	4.5/11.3	1.8/4.5	1.9/4.7	2.6/6.5	2.9/7.2	3.9/9.8	4.5/11.3	4.5/11.3
14'	Unfactored Resistance (LL)	262	283	461	539	859	1,245	*	393	425	692	808	1,288	1,868	*
	Unfactored Resistance (TL)	383	414	680	795	*	*	*	574	621	1,020	1,193	*	*	*
	Total Factored Resistance	830	874	1,205	1,335	1,825	2,351	2,436	1,245	1,310	1,807	2,003	2,738	3,527	3,654
	Min. End/Int. Bearing (in.)	1.5/3.9	1.6/4.1	2.2/5.6	2.5/6.2	3.4/8.4	4.3/10.9	4.5/11.3	1.5/3.9	1.6/4.1	2.2/5.6	2.5/6.2	3.4/8.4	4.3/10.9	4.5/11.3
16'-6"	Unfactored Resistance (LL)	162	175	287	336	539	788	1,272	243	263	431	504	809	1,182	1,907
	Unfactored Resistance (TL)	233	252	418	491	794	*	*	349	379	627	736	1,190	*	*
	Total Factored Resistance	594	625	863	957	1,309	1,687	2,064	891	938	1,294	1,435	1,963	2,530	3,096
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.5	1.9/4.7	2.1/5.2	2.9/7.2	3.7/9.2	4.5/11.3	1.5/3.5	1.5/3.5	1.9/4.7	2.1/5.2	2.9/7.2	3.7/9.2	4.5/11.3
18'-6"	Unfactored Resistance (LL)	116	125	206	241	388	570	926	174	188	308	361	582	854	1,388
	Unfactored Resistance (TL)	163	177	296	348	567	837	*	245	266	444	522	851	1,255	*
	Total Factored Resistance	470	495	683	758	1,037	1,337	1,839	705	742	1,025	1,136	1,555	2,006	2,758
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.5	1.7/4.2	1.9/4.7	2.6/6.4	3.3/8.2	4.5/11.3	1.5/3.5	1.5/3.5	1.7/4.2	1.9/4.7	2.6/6.4	3.3/8.2	4.5/11.3
20'	Unfactored Resistance (LL)	92	99	164	192	310	456	743	138	149	245	288	465	683	1,115
	Unfactored Resistance (TL)	128	139	233	275	449	666	*	192	208	350	412	674	999	*
	Total Factored Resistance	400	421	582	646	885	1,141	1,583	601	632	874	969	1,327	1,712	2,374
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.5	1.6/3.9	1.7/4.3	2.4/5.9	3/7.6	4.2/10.5	1.5/3.5	1.5/3.5	1.6/3.9	1.7/4.3	2.4/5.9	3/7.6	4.2/10.5
24'	Unfactored Resistance (LL)	54	58	96	112	182	269	442	80	87	144	168	273	403	663
	Unfactored Resistance (TL)	70	77	131	155	258	386	642	105	115	197	233	387	579	964
	Total Factored Resistance	274	289	400	444	608	786	1,091	411	433	600	665	913	1,179	1,637
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.6	2/4.9	2.5/6.3	3.5/8.8	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.6	2/4.9	2.5/6.3	3.5/8.8
28'	Unfactored Resistance (LL)	34	37	61	71	116	171	283	51	55	91	107	174	257	425
	Unfactored Resistance (TL)	41	45	79	94	158	240	404	61	67	118	141	237	359	606
	Total Factored Resistance	198	209	290	322	442	571	795	297	313	434	482	663	857	1,192
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.7/4.2	2.2/5.4	3/7.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.7/4.2	2.2/5.4	3/7.5
32'	Unfactored Resistance (LL)			41	48	78	116	192	34	37	61	72	117	174	288
	Unfactored Resistance (TL)			49	59	102	156	267	36	40	73	88	153	234	400
	Total Factored Resistance			218	242	334	432	602	223	235	327	364	501	649	904
	Min. End/Int. Bearing (in.)			1.5/3.5	1.5/3.5	1.5/3.7	1.9/4.8	2.6/6.6	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.7	1.9/4.8	2.6/6.6

* Indicates **Total Factored Resistance** value controls.

FLOOR AND/OR SNOW LOAD TABLES

General Notes

- Table is based on:
 - Uniform loads (beam weight considered).
 - More restrictive of simple or continuous span.
 - Deflection criteria of L/360 live load (LL) and L/240 total load (TL).
- For a live load deflection limit of L/480, multiply **Unfactored Resistance (LL)** by 0.75. For a total load limit of L/180 multiply **Unfactored Resistance (TL)** by 1.33. The resulting loads must not exceed the **Total Factored Resistance** shown.

Also see **How to Use This Table** on page 8 and **General Assumptions** on page 3.

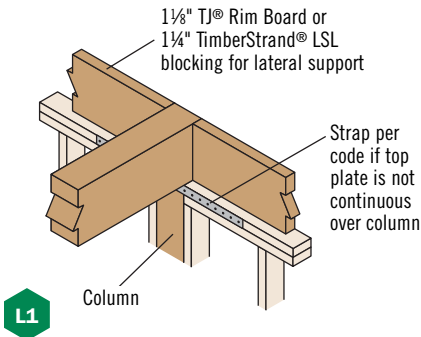
2.2E Parallam® PSL: Floor and/or Snow— Standard Term (PLF) *continued*

Span	Condition	7" Width						
		9¼"	9½"	11¼"	11⅝"	14"	16"	19"
8'	Unfactored Resistance (LL)	2,572	2,767	*	*	*	*	*
	Unfactored Resistance (TL)	*	*	*	*	*	*	*
	Total Factored Resistance	4,935	5,094	6,250	6,683	8,245	8,558	8,558
	Min. End/Int. Bearing (in.)	2.6/6.5	2.7/6.7	3.3/8.2	3.5/8.8	4.3/10.8	4.5/11.3	4.5/11.3
9'-6"	Unfactored Resistance (LL)	1,594	1,718	2,747	3,183	*	*	*
	Unfactored Resistance (TL)	2,371	2,556	*	*	*	*	*
	Total Factored Resistance	3,636	3,825	5,072	5,411	6,617	7,200	7,200
	Min. End/Int. Bearing (in.)	2.3/5.7	2.4/6	3.2/7.9	3.4/8.5	4.1/10.3	4.5/11.3	4.5/11.3
10'	Unfactored Resistance (LL)	1,379	1,487	2,385	2,767	*	*	*
	Unfactored Resistance (TL)	2,048	2,210	*	*	*	*	*
	Total Factored Resistance	3,279	3,449	4,752	5,087	6,208	6,838	6,838
	Min. End/Int. Bearing (in.)	2.2/5.4	2.3/5.7	3.1/7.8	3.3/8.4	4.1/10.2	4.5/11.3	4.5/11.3
12'	Unfactored Resistance (LL)	819	884	1,432	1,668	2,636	3,788	*
	Unfactored Resistance (TL)	1,208	1,306	2,124	2,476	*	*	*
	Total Factored Resistance	2,269	2,387	3,291	3,646	4,975	5,691	5,691
	Min. End/Int. Bearing (in.)	1.8/4.5	1.9/4.7	2.6/6.5	2.9/7.2	3.9/9.8	4.5/11.3	4.5/11.3
14'	Unfactored Resistance (LL)	524	566	923	1,078	1,718	2,491	*
	Unfactored Resistance (TL)	766	829	1,360	1,590	*	*	*
	Total Factored Resistance	1,661	1,747	2,409	2,670	3,650	4,703	4,872
	Min. End/Int. Bearing (in.)	1.5/3.9	1.6/4.1	2.2/5.6	2.5/6.2	3.4/8.4	4.3/10.9	4.5/11.3
16'-6"	Unfactored Resistance (LL)	324	350	574	672	1,079	1,576	2,543
	Unfactored Resistance (TL)	466	505	837	981	1,587	*	*
	Total Factored Resistance	1,188	1,250	1,726	1,913	2,617	3,373	4,128
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.5	1.9/4.7	2.1/5.2	2.9/7.2	3.7/9.2	4.5/11.3
18'-6"	Unfactored Resistance (LL)	231	250	411	482	777	1,139	1,851
	Unfactored Resistance (TL)	327	355	592	697	1,134	1,674	*
	Total Factored Resistance	940	989	1,367	1,515	2,074	2,675	3,677
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.5	1.7/4.2	1.9/4.7	2.6/6.4	3.3/8.2	4.5/11.3
20'	Unfactored Resistance (LL)	184	199	327	384	620	911	1,487
	Unfactored Resistance (TL)	256	278	466	549	899	1,332	*
	Total Factored Resistance	801	843	1,165	1,292	1,769	2,282	3,166
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.5	1.6/3.9	1.7/4.3	2.4/5.9	3/7.6	4.2/10.5
24'	Unfactored Resistance (LL)	107	116	191	224	364	538	884
	Unfactored Resistance (TL)	140	153	262	311	516	772	1,285
	Total Factored Resistance	548	577	800	887	1,217	1,571	2,183
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.6	2/4.9	2.5/6.3	3.5/8.8
28'	Unfactored Resistance (LL)	68	73	121	142	231	343	566
	Unfactored Resistance (TL)	81	89	157	187	317	479	808
	Total Factored Resistance	396	417	579	643	884	1,143	1,590
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.7/4.2	2.2/5.4	3/7.5
32'	Unfactored Resistance (LL)	46	49	82	96	156	231	384
	Unfactored Resistance (TL)	48	53	98	118	203	312	534
	Total Factored Resistance	297	313	436	485	668	865	1,205
	Min. End/Int. Bearing (in.)	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.7	1.9/4.8	2.6/6.6

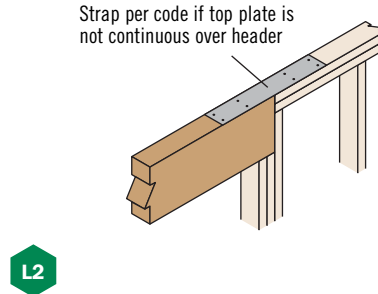
* Indicates **Total Factored Resistance** value controls.

BEAM DETAILS

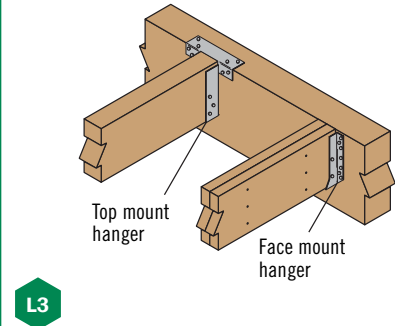
Bearing at Wall



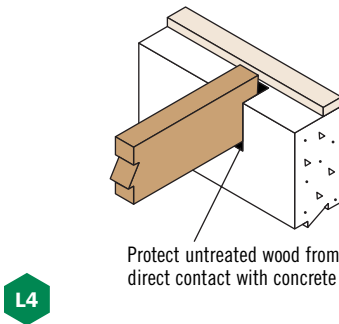
Bearing for Door or Window Header



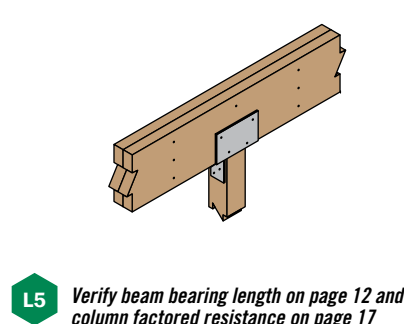
Beam to Beam Connection



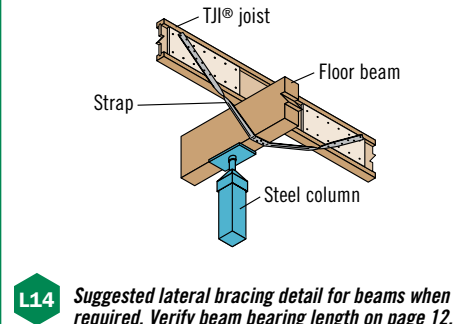
Bearing at Concrete Wall



Bearing at Column



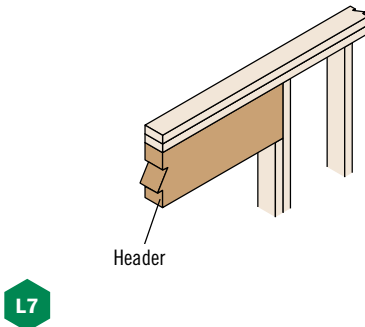
Beam to Column Lateral Brace



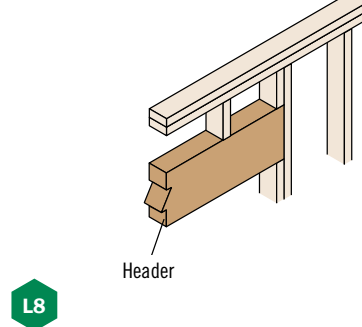
WINDOW AND DOOR HEADER DETAILS

2x4 Wall Framing

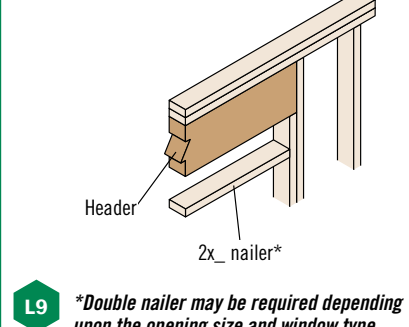
Full Depth Header



Low Header



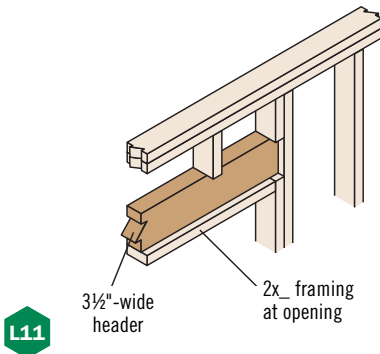
High Header



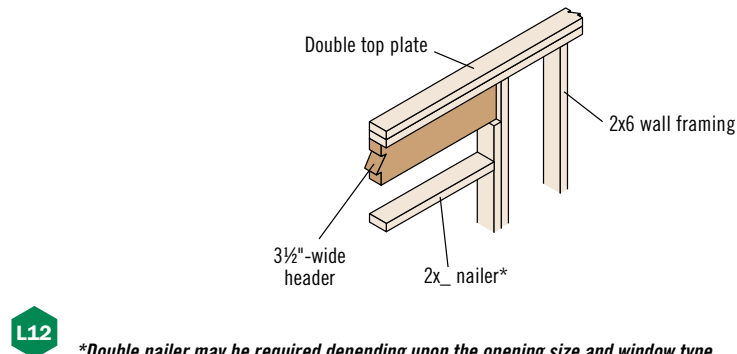
2x6 Wall Framing

Headers not matching wall thickness may be installed flush to the inside or outside of the wall depending upon sheathing and trim attachment requirements

Low Header



High Header



*Double nailer may be required depending upon the opening size and window type

WINDOW AND DOOR HEADER DETAILS

Dropped Header with Full Lateral Bracing

One 8d (0.113" x 2½") nail each side of joist or blocking. Blocking is required if joist framing is parallel to beam. Joist spacing must be 24" on-centre or less.

Nail continuous king studs to the end of the beam using:
 – Four 10d (0.131" x 3") nails for beams 11⅞" deep or less
 – Six 10d (0.131" x 3") nails for beams 18" deep or less
 – Ten 10d (0.131" x 3") nails for beams greater than 18" deep

Continuous king stud

Framing above must be sheathed to provide lateral stability to the top of the beam

Main structural header. See pages 14–16 for connecting multiple plies.

Low header

Fasten 2x_ plate to low header with 10d (0.131" x 3") nails at 8" on-centre, staggered

L15

Dropped Header with Acceptable Lateral Bracing

One 8d (0.113" x 2½") nail each side of joist or blocking. Blocking is required if joist framing is parallel to beam. Joist spacing must be 24" on-centre or less.

Nail continuous king studs to the end of the beam using:
 – Four 10d (0.131" x 3") nails for beams 11⅞" deep or less
 – Six 10d (0.131" x 3") nails for beams 16" deep or less

Sheathing strength axis

Continuous king stud

4'-0" maximum height cripple wall. Wall studs at 24" on-centre, maximum.

Fasten 2x_ plate to header below with 10d (0.131" x 3") nails at 8" on-centre, staggered

See pages 14–16 for connecting multiple plies

Rated wall sheathing (⅞" nominal) continuous from bottom of beam to top of wall. Fasten sheathing with 8d (0.113" x 2½") nails at 6" on-centre at panel edges and 12" on-centre in panel field.

L16

When framed as shown above, the following dropped headers are considered fully braced under uniform-load, simple-span conditions:

Single-ply:

- 1¾" wide headers, 11⅞" deep or less
- 3½" wide headers, 16" deep or less, with a maximum span of 18'-6"

Multiple-ply:

- Headers up to four 1¾" plies, 11⅞" deep or less
- Headers up to four 1¾" x 14" plies, with a maximum span of 8'-6"

NAILING ON NARROW FACE

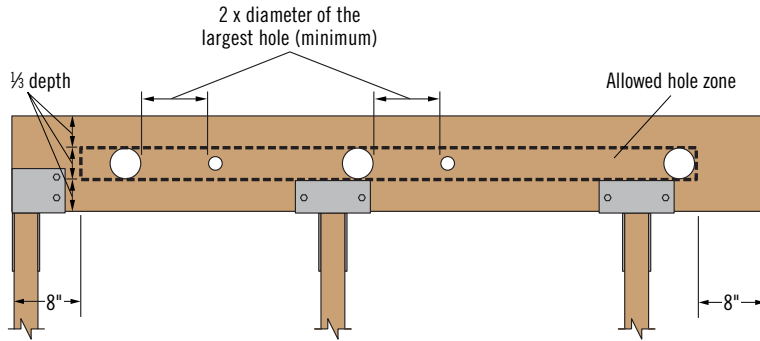
Nails Installed on the Narrow Face

Nail Size	Closest On-Centre Spacing Per Row			
	1¾" TimberStrand® LSL	3½" TimberStrand® LSL	Microllam® LVL	Parallam® PSL
8d (0.131" x 2½") or 10d (0.128" x 3")	3"	3"	3"	3"
10d (0.148" x 3") or 12d (0.148" x 3¼")	4"	3"	4"	4"
16d (0.162" x 3½")	6"	3½"	8"	6"

- If more than one row of nails is used, the rows must be offset at least ½" and staggered.

ALLOWABLE HOLES

1.55E TimberStrand® LSL Headers and Beams



General Notes

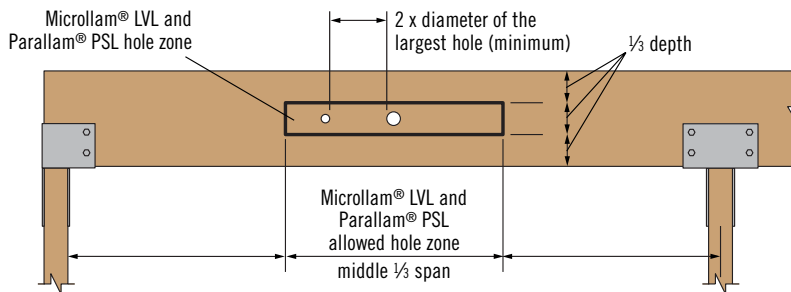
- Allowed hole zone suitable for headers and beams with **uniform and/or concentrated loads** anywhere along member.
- Round holes only.
- No holes in headers or beams in plank orientation.

1.55E TimberStrand® LSL

Header or Beam Depth	Maximum Round Hole Size
9½"	3"
11¾"	3⅝"
14"-16"	4⅝"

- See illustration for allowed hole zone.

Microllam® LVL and Parallam® PSL Headers and Beams



General Notes

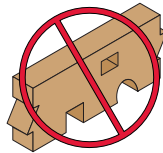
- Allowed hole zone suitable for headers and beams with **uniform loads only**.
- Round holes only.
- No holes in cantilevers.
- No holes in headers or beams in plank orientation.

Microllam® LVL and Parallam® PSL

Header or Beam Depth	Maximum Round Hole Size
5½"	1¾"
7¼"-20"	2"

- See illustration for allowed hole zone.

Larger holes in Trus Joist® structural composite lumber may be possible; refer to Forte® or Javelin® software.



DO NOT cut, notch, or drill holes in headers or beams except as indicated in the illustrations and tables

BEARING LENGTH REQUIREMENTS

Factored Reaction (lbs)	1.55E TimberStrand® LSL			2.0E Microllam® LVL			2.2E Parallam® PSL		
	Beam Orientation			Beam Orientation			Beam Orientation		
	Width			Width			Width		
	1¾"	3½"	5¼"	1¾"	3½"	5¼"	3½"	5¼"	7"
6,000	3"	1½"	1½"	3¼"	1¾"	1½"	1¾"	1½"	1½"
8,000	4"	2"	1½"	4¼"	2¼"	1½"	2¼"	1½"	1½"
10,000	5"	2½"	1¾"	5¼"	2¾"	1¾"	2¾"	1¾"	1½"
12,000	6"	3"	2"	6½"	3¼"	2¼"	3¼"	2¼"	1¾"
14,000	7"	3½"	2½"	7½"	3¾"	2½"	3¾"	2½"	2"
16,000	8"	4"	2¾"		4¼"	3"	4¼"	3"	2¼"
18,000		4½"	3"		4¾"	3¼"	4¾"	3¼"	2½"
20,000		5"	3½"		5¼"	3½"	5¼"	3½"	2¾"
22,000		5½"	3¾"		6"	4"	6"	4"	3"
24,000		6"	4"		6½"	4¼"	6½"	4¼"	3¼"
26,000		6½"	4½"		7"	4¾"	7"	4¾"	3½"
28,000		7"	4¾"		7½"	5"	7½"	5"	3¾"
30,000		7½"	5"		8"	5¼"	8"	5¼"	4"
32,000		8"	5¼"			5¾"		5¾"	4¼"
34,000			5¾"			6"		6"	4½"

General Notes

- Minimum bearing length:** 1½" at ends, 3½" at intermediate supports.
- Bearing across full beam width required.
- Interpolation between reaction loads is permitted for determining bearing lengths.
- Bearing lengths based on the following factored bearing resistances:
 - 1.55E TimberStrand® LSL:** 1,165 psi.
 - 2.0E Microllam® LVL:** 1,090 psi.
 - 2.2E Parallam® PSL:** 1,090 psi.

TAPERED END CUTS

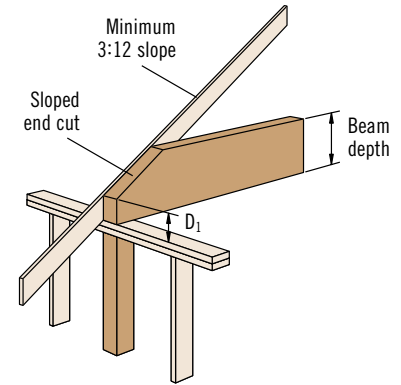
Factored Reactions for 3½"⁽¹⁾ TimberStrand® LSL Headers and Beams (lbs)

Bearing	Beam Depth	Outside Heel Height D ₁							
		4½"	5"	5½"	6"	6½"	7"	7½"	8"
3½" Wood Plate ⁽²⁾	9½"-11½"	7,595	7,595	7,595	7,595	7,595	7,595	7,595	7,595
	14"		7,595	7,595	7,595	7,595	7,595	7,595	7,595
	16"				7,595	7,595	7,595	7,595	7,595
5¼" Wood Plate ⁽²⁾	9½"	8,775	9,530	10,285	11,035	11,395	11,395	11,395	11,395
	11½"-14"	8,775	9,530	10,285	11,035	11,395	11,395	11,395	11,395
	16"			10,285	11,035	11,395	11,395	11,395	11,395
3½" Column ⁽³⁾	9½"	8,115	8,870	9,620	10,375	11,130	11,470	11,470	11,470
	11½"	8,115	8,870	9,620	10,375	11,130	11,885	12,640	13,395
	14"		8,870	9,620	10,375	11,130	11,885	12,640	13,395
	16"				10,375	11,130	11,885	12,640	13,395

(1) For 1¾" and 5¼" beams, multiply by 0.5 and 1.5, respectively.

(2) Bearing lengths are based on factored bearing resistance of 615 psi.

(3) Bearing lengths are based on factored bearing resistance of 1,165 psi.



Tapered end cut detailed above is not allowed with TJI® joists

Factored Reactions for 3½"⁽¹⁾ Microllam® LVL and Parallam® PSL Headers and Beams (lbs)

Bearing	Beam Depth	Outside Heel Height D ₁								
		4½"	5"	5½"	6"	6½"	7"	7½"	8"	10"
3½" Wood Plate ⁽²⁾	7¼"	7,480	7,595	7,595	7,595	7,595	7,595			
	9¼"	7,480	7,595	7,595	7,595	7,595	7,595	7,595	7,595	
	9½"	7,480	7,595	7,595	7,595	7,595	7,595	7,595	7,595	
	11¼"	7,480	7,595	7,595	7,595	7,595	7,595	7,595	7,595	7,595
	11½"	7,480	7,595	7,595	7,595	7,595	7,595	7,595	7,595	7,595
	14"		7,595	7,595	7,595	7,595	7,595	7,595	7,595	7,595
	16"				7,595	7,595	7,595	7,595	7,595	7,595
	18"					7,595	7,595	7,595	7,595	7,595
	19"						7,595	7,595	7,595	7,595
	20"							7,595	7,595	7,595
5¼" Wood Plate ⁽²⁾	7¼"	8,070	8,070	8,070						
	9¼"	8,085	8,780	9,480	10,175	10,295	10,295			
	9½"	8,085	8,780	9,480	10,175	10,575	10,575	10,575	10,575	
	11¼"	8,085	8,780	9,480	10,175	10,870	11,395	11,395	11,395	11,395
	11½"	8,085	8,780	9,480	10,175	10,870	11,395	11,395	11,395	11,395
	14"	8,085	8,780	9,480	10,175	10,870	11,395	11,395	11,395	11,395
	16"			9,480	10,175	10,870	11,395	11,395	11,395	11,395
	18"				10,175	10,870	11,395	11,395	11,395	11,395
	19"					10,870	11,395	11,395	11,395	11,395
	20"						11,395	11,395	11,395	11,395
3½" Column ⁽³⁾	7¼"	7,480	8,070	8,070	8,070					
	9¼"	7,480	8,175	8,870	9,565	10,260	10,295	10,295	10,295	
	9½"	7,480	8,175	8,870	9,565	10,260	10,575	10,575	10,575	
	11¼"	7,480	8,175	8,870	9,565	10,260	10,955	11,650	12,345	12,520
	11½"	7,480	8,175	8,870	9,565	10,260	10,955	11,650	12,345	13,215
	14"		8,175	8,870	9,565	10,260	10,955	11,650	12,345	13,375
	16"				9,565	10,260	10,955	11,650	12,345	13,375
	18"					10,260	10,955	11,650	12,345	13,375
	19"						10,955	11,650	12,345	13,375
	20"							11,650	12,345	13,375

(1) For 1¾", 5¼", and 7" beams, multiply by 0.5, 1.5, and 2.0, respectively.

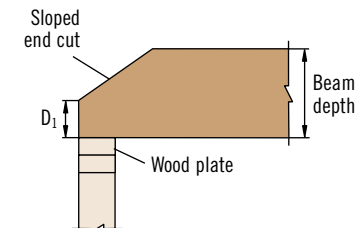
(2) Bearing lengths based on a factored bearing resistance of 620 psi.

(3) Bearing lengths based on factored bearing resistance of 1,090 psi for Microllam® LVL and Parallam® PSL.

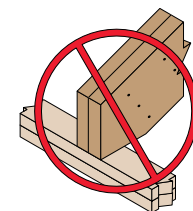
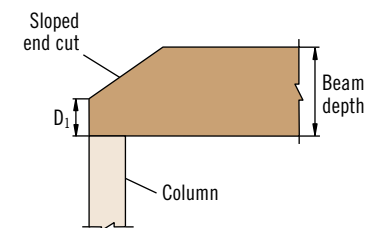
General Notes

- No increase for duration of load is permitted above standard term.
- No holes or concentrated load within tapered cut.
- Table considers only downward loading. Contact your Weyerhaeuser representative for assistance with uplift loading or other conditions.

Wood Plate Connection



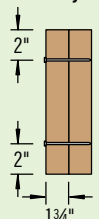
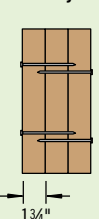
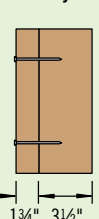
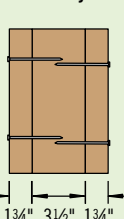
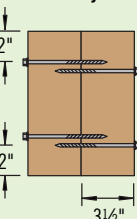
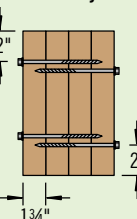
Column Connection



DO NOT overhang seat cuts on beams beyond inside face of support member

MULTIPLE-MEMBER CONNECTIONS FOR SIDE-LOADED BEAMS

L17 Factored Uniform Load—Maximum Factored Uniform Load Applied to Either Outside Member (PLF)

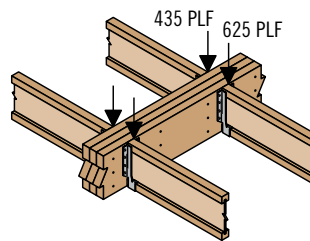
Fastener Type	Location	Number of Rows	Fastener On-Centre Spacing	Fastener Pattern					
				Assembly A 	Assembly B 	Assembly C 	Assembly D 	Assembly E 	Assembly F 
				3½" wide, 2-ply	5¼" wide, 3-ply	5¼" wide, 2-ply	7" wide, 3-ply	7" wide, 2-ply	7" wide, 4-ply
10d (0.128" x 3") Nail ⁽¹⁾	As shown	2 ⁽⁵⁾	12"	575	430	430	385		
		3	12"	865	650	650	575		
½" A307 Through Bolt ⁽²⁾⁽³⁾	—	2	24"	780	585	880	780	1,560	520
			19.2"	975	730	1,095	975	1,950	650
			16"	1,170	880	1,315	1,170	2,340	780
Screw Length ▶				3½"	3½"	3½"	3½"	6"	6"
SDS ⁽³⁾	As shown	2	24"	870	655	655	580	2,040	680
			19.2"	1,090	815	815	725	2,550	850
			16"	1,305	980	980	870	3,060	1,020
USP WS ⁽³⁾	As shown	2	24"	905	680	680	605		765 ⁽⁶⁾
			19.2"	1,130	850	850	755		960 ⁽⁶⁾
			16"	1,355	1,015	1,015	905		1,150 ⁽⁶⁾
Screw Length ▶				3¾"	5"	3¾"	6¾"	6¾"	6¾"
TrussLOK-EWP™ ⁽³⁾	One side only	2	24"	585	550	440	490	730	490
			19.2"	735	685	550	610	915	610
			16"	880	825	660	730	1,100	730
SDW22 ⁽³⁾⁽⁴⁾	One side only	2	24"	680	625	585	555	1,140	555
			19.2"	850	780	730	690	1,425	690
			16"	1,020	935	880	830	1,710	830

- (1) Nailed connection values may be doubled for 6" on-centre or tripled for 4" on-centre nail spacing.
 (2) Washers required. Bolt holes to be 1/16" maximum.
 (3) Factored resistance for 24" on-centre bolted or screwed connection values may be doubled for 12" on-centre spacing.
 (4) When loading the head side of a SDW22 screw, assemblies A, B, D, and F can be increased by 15%.
 (5) For beams up to 14" deep, maximum.
 (6) Assembly F is not recommended for TimberStrand® LSL or Parallam® PSL.

General Notes for Side-Loaded Beam Tables

- Connections are based on Limit States Design per CSA 086.
- Use specific gravity of 0.5 when designing lateral connections.
- Values listed are for standard term loading.
- When fasteners are required on both sides, stagger fasteners on the second side so they fall halfway between fasteners on the first side.
- Verify adequacy of beam in allowable load tables on pages 5–9.
- 7" wide beams should be side-loaded only when loads are applied to both sides of the members (to minimize rotation).
- Minimum end distance for bolts and screws is 6".
- Beams wider than 7" require special consideration by the design professional of record.

Uniform Load Design Example

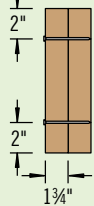
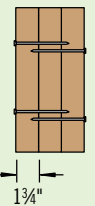
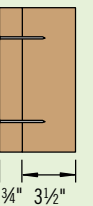
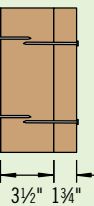
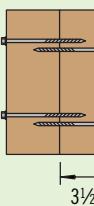
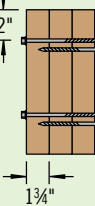


First, check load tables on pages 5–9 to verify that three pieces can carry the total factored load of 1,060 plf with proper live load deflection criteria. Total factored load = (1.25 x dead load) + (1.5 x live load). Maximum factored load applied to either outside member is 625 plf. For an assembly of three 1 1/4" plies (Assembly B), two rows of 10d (0.128" x 3") nails at 12" on-centre is good for only 430 plf. Therefore, use three rows of 10d (0.128" x 3") nails at 12" on-centre (good for 650 plf).

Alternatives: Two rows of 1/2" bolts or 5" TrussLOK-EWP™ screws at 19.2" on-centre.

MULTIPLE-MEMBER CONNECTIONS FOR SIDE-LOADED BEAMS

L18 Factored Point Load—Maximum Factored Point Load Applied to Either Outside Member (lbs)

Fastener Type	Location	Number of Fasteners per Side	Fastener Pattern					
			Assembly A 	Assembly B 	Assembly C 	Assembly D 	Assembly E 	Assembly F 
10d (0.128" x 3") Nail	As shown	6	1,730	1,295	1,295			
		12	3,455	2,590	2,590	2,305		
		18	5,185	3,890	3,890	3,455		
		24	6,910	5,185	5,185	4,610		
1/2" A307 Through Bolt ⁽¹⁾	—	4	3,120	2,340	3,510	3,120	6,240	2,080
		6	4,680	3,510	5,265	4,680	9,360	3,120
		8	6,240	4,680	7,020	6,240	12,480	4,160
		Screw Length ▶	3 1/2"	3 1/2"	3 1/2"	3 1/2"	6"	6"
SDS	As shown	4	3,480	2,610	2,610	2,320	8,160	2,720
		6	5,220	3,915	3,915	3,480	12,240	4,080
		8	6,960	5,220	5,220	4,640	16,320	5,440
USP WS	As shown	4	3,615	2,710	2,710	2,410		3,065 ⁽³⁾
		6	5,425	4,070	4,070	3,615		4,600 ⁽³⁾
		8	7,230	5,425	5,425	4,820		6,135 ⁽³⁾
TrussLOK-EWP™	One side only	Screw Length ▶	3 3/8"	5"	3 3/8"	6 3/4"	6 3/4"	6 3/4"
		4	2,345	2,195	1,760	1,950	2,930	1,950
		6	3,515	3,295	2,635	2,930	4,390	2,930
SDW22 ⁽²⁾	One side only	8	4,690	4,390	3,515	3,905	5,855	3,905
		4	2,720	2,490	2,340	2,215	4,560	2,215
		6	4,080	3,735	3,510	3,320	6,840	3,320
		8	5,440	4,980	4,680	4,425	9,120	4,425

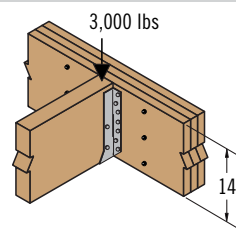
(1) Washers required. Bolt holes to be 1/16" maximum.

(2) When loading the head side of a SDW22 screw, assemblies A, B, D, and F can be increased by 15%.

(3) Assembly F is not recommended for TimberStrand® LSL or Parallam® PSL.

Point Load Design Example

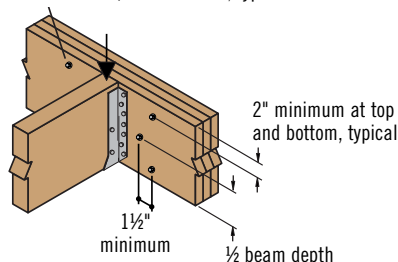
First, verify that a 3-ply, 1 3/4" x 14" beam can support the factored 3,000 lb point load and all other loads applied. The factored 3,000 lb point load is being transferred to the beam with a face mount hanger. For an assembly of three 1 3/4" plies (Assembly B), six 5"-long TrussLOK-EWP™ screws are good for 3,295 lbs with a face mount hanger.



Point Load Connector Spacing

4- or 6-Bolt or Screw Connection

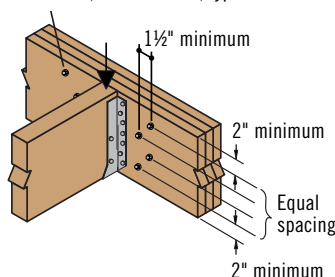
1/2" A307 through bolt, or SDS, USP WS, TrussLOK-EWP™, or SDW screw, typical



L19 Minimum beam depth is 9 1/2" for 1/2" diameter bolts

8-Bolt or Screw Connection

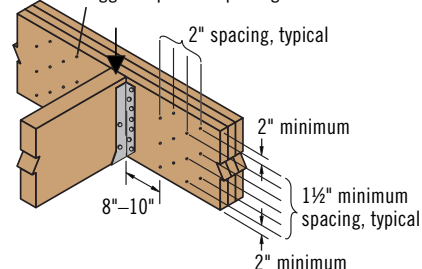
1/2" A307 through bolt, or SDS, USP WS, TrussLOK-EWP™, or SDW screw, typical



L20 Minimum beam depth is 11 1/8" for 1/2" diameter bolts

Nail Connection

10d (0.128" x 3") nails, typical. Stagger to prevent splitting.



L21 There must be an equal number of nails on each side of the connection

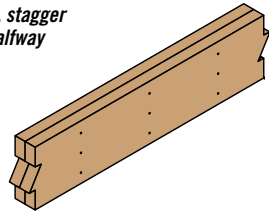
MULTIPLE-MEMBER CONNECTIONS FOR TOP-LOADED BEAMS

Fastener Installation Requirements

Piece Width	Number of Plies	Fastener				
		Type ⁽¹⁾	Min. Length	# Rows	O.C. Spacing	Location
1¾"	2	10d nails	3"	3 ⁽²⁾	12"	One side
		12d–16d nails	3¼"	2 ⁽²⁾		
		Screws	3¾" or 3½"	2		
	3	10d nails	3"	3 ⁽²⁾	12"	Both sides
		12d–16d nails	3¼"	2 ⁽²⁾		
		Screws	3¾" or 3½"	2	24"	Both sides
			5"			
	4	10d nails ⁽³⁾	3"	3 ⁽²⁾	12"	One side (per ply)
		12d–16d nails ⁽³⁾	3¼"	2 ⁽²⁾		
		Screws	5" or 6"	2	24"	Both sides
			6¾"			
3½"	2	Screws	5" or 6"	2	24"	Both sides
			6¾"			One side
		½" bolts	8"			—

- (1) 10d nails are 0.128" diameter; 12d–16d nails are 0.148"–0.162" diameter; screws are SDS, USP WS, TrussLOK-EWP™ or SDW.
 (2) An additional row of nails is required with depths of 14" or greater.
 (3) When connecting 4-ply members, nail each ply to the other and offset nail rows by 2" from the rows in ply below.

When fasteners are required on both sides, stagger fasteners on the second side so they fall halfway between fasteners on the first side.



Load must be applied evenly across entire beam width. Otherwise, use connections for side-loaded beams

L6 Multiple pieces can be nailed or bolted together to form a header or beam of the required size, up to a maximum width of 7"

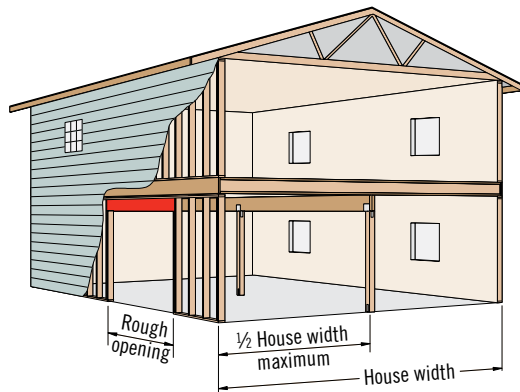
Metric to Imperial Conversions

Metric Unit	Imperial Conversion
1 kN	0.2248 kip
1 N	0.2248 lb
1 m	3.281 ft
1 mm	0.0394 in.
1 kg	2.205 lb mass
1 N • m	0.7376 lb • ft
1 N • m	8.851 lb • in.
1 mm ⁴	2.402 x 10 ⁻⁶ in. ⁴
1 Pa	0.0209 lb/ft ²
1 kPa	0.1450 lb/in. ²

Imperial to Metric Conversions

Imperial Unit	Metric Conversion
1 kip	4.448 kN
1 lb	4.448 N
1 ft	0.3048 m
1 in.	25.40 mm
1 lb mass	0.4536 kg
1 lb • ft	1.356 N • m
1 lb • in.	0.1130 N • m
1 in. ⁴	0.4162 x 10 ⁶ mm ⁴
1 lb/ft ²	47.88 Pa
1 lb/in. ²	6.895 kPa

HEADER DESIGN EXAMPLE PROBLEM



Determine the size of 1.55E TimberStrand® LSL header required for a 10' rough opening for the given loads and assumptions:

- House width = 36'
- Trussed roof with 24" roof truss overhangs
- Roof Load = 30 psf snow + 15 psf dead
- Floor Load = 40 psf live + 12 psf dead

Calculated unfactored plf loads acting on the beam (20' roof and 9' floor tributary):

- Snow = 600 plf
- Floor = 360 plf
- Dead = 490 plf (includes wall load at 80 plf)

Next, calculate design loads per 2010 NBCC load combinations (primary load and companion load action).

1. Unfactored live load:

Case 2: $1.0 \times 360 + 0.5 \times 600 = 660$ plf

Case 3: $1.0 \times 600 + 0.5 \times 360 = 780$ plf

Therefore use Case 3 at 780 plf

2. Unfactored total load:

For Cases 2 and 3:

Unfactored dead load = $1.0 \times 490 = 490$ plf

Unfactored total load = 780 plf + 490 plf = $1,270$ plf

3. Factored total load:

Case 2: $1.5 \times 360 + 0.5 \times 600 = 840$ plf

Case 3: $1.5 \times 600 + 0.5 \times 360 = 1,080$ plf

Therefore use Case 3 at 1,080 plf

Factored dead load = $1.25 \times 490 = 613$ plf

Factored total load = $1,080 + 613 = 1,693$ plf

Try using a 3½" x 11½" 1.55E TimberStrand® LSL header. See page 5 of this guide.

1.55E TimberStrand® LSL: Floor and/or Snow—Standard

Span	Condition	3½" Width				5½"
		9½"	11½"	14"	16"	
10'	Unfactored Resistance (LL)	524	975	1,520	2,155	786
	Unfactored Resistance (TL)	775	1,449	*	*	1,163
	Total Factored Resistance	1,373	2,106	2,886	3,645	2,066
	Min. End/Int. Bearing (in.)	1.7/4.3	2.6/6.5	3.6/8.9	4.5/11.3	1.7/2
	Unfactored Resistance (LL)	311	588	929	1,335	467
14'	Unfactored Resistance (TL)	457	968	1,370	*	

Summary:

1. Unfactored Resistance (LL) = 975 > 780 OK

2. Unfactored Resistance (TL) = 1,449 > 1,270 OK

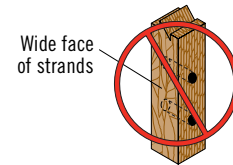
3. Total Factored Resistance = 2,106 > 1,693 OK

Therefore, a 3½" x 11½" 1.55E TimberStrand® LSL header is acceptable. The beam requires 2.6" of bearing at end supports and 6.5" of bearing at intermediate support.

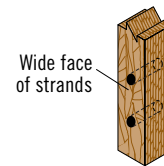
Axial Factored Resistances (lbs) for 1.8E Parallam® PSL

Column Bearing Type	Effective Column Length	Column Size					
		3½" x 3½"	3½" x 5¼"	3½" x 7"	5¼" x 5¼"	5¼" x 7"	7" x 7"
On Column Base	6'	15,342	23,013	30,684	43,054	57,406	81,855
	7'	13,216	19,823	26,431	40,209	53,612	78,921
	8'	11,227	16,841	22,455	37,152	49,536	75,642
	9'	9,450	14,175	18,900	34,003	45,338	71,899
	10'	7,910	11,871	15,821	30,869	41,160	67,984
	12'	5,522	8,287	11,048	24,964	33,285	59,793
	14'	3,892	5,837	7,782	19,853	26,470	51,644
	16'	Slenderness ratio exceeds 50			15,664	20,885	43,999
	18'				12,357	16,464	37,135
	20'				9,773	13,030	31,166
	22'						26,111
	24'						21,852

The column values listed are for dry-service conditions ONLY. When wet-service conditions exist, contact your Weyerhaeuser representative for other product solutions.



DO NOT install bolts or screws into the narrow face of strands



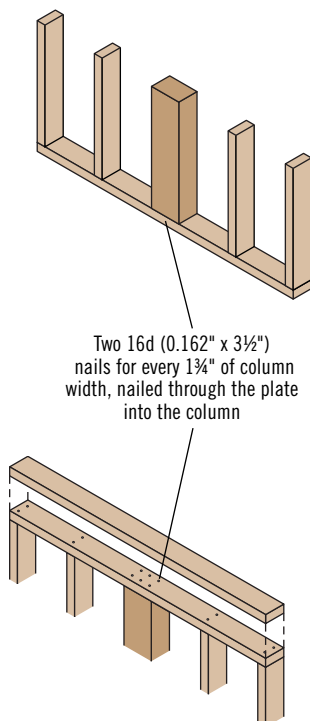
In order to use the manufacturer's published capacities when designing column caps, bases, or holdowns for uplift, the bolts or screws must be installed perpendicular to the wide face of strands, as shown above.

General Notes

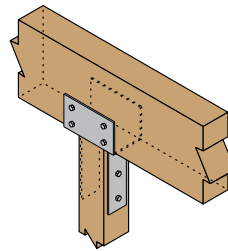
- Tables are based on:
 - Solid, one-piece column members used in dry-service conditions.
 - Bracing in both directions at column ends.
 - CSA O86.
 - Simple columns with axial loads only. For side loads or other combined bending and axial loads, see the CSA O86 provisions.
 - $K_D = 1.0$, where the specified snow or live load is greater than the specified dead load. For other load cases, use Weyerhaeuser software.
- Factored resistances have been adjusted to accommodate the worst case of the following eccentric conditions: ½ of column thickness (first dimension) or ⅓ of column width.
- Beams and columns must remain straight to within $5L/4608$ (in.) of true alignment. L is the unrestrained length of the member in feet.

For column specified strengths see page 4.

Top or Bottom Plate Connection

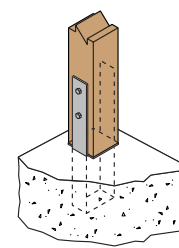


Beam on Column Cap



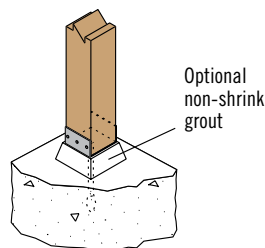
P1

Column Base



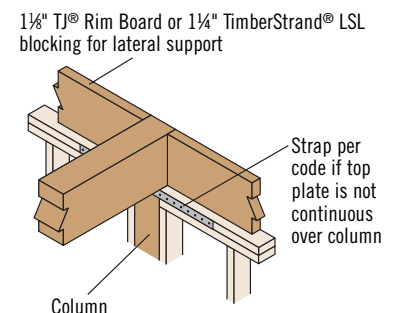
P2

Elevated Column Base



P3

Beam on Column



L1

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