



Boise Cascade®
ENGINEERED WOOD PRODUCTS

WESTERN UNITED STATES



VERSA-LAM® LVL DESIGN GUIDE

Western US | For Products Manufactured in White City, Oregon

FLOORS | ROOFS | WALLS

www.BC.com/ewp



Design Property	Versa-Lam® LVL Beams		Versa-Lam® LVL Columns	Versa-Stud® LVL	Versa-Lam® LVL
	1¾"	3½" & Wider			
Grade	2.1E 2800	2.1E 3100	1.8E 2650	1.8E 2400	1.5E 1800
Modulus of Elasticity True (Shear-Free) E ($\times 10^6$ psi) ^{(1) (7)}	2.1	2.1	1.8	1.8	1.5
Modulus of Elasticity Apparent E ($\times 10^6$ psi) ⁽¹⁾	2.0	2.0	1.7	1.7	1.4
Modulus of Elasticity for Stability E_{min} ($\times 10^6$ psi) ^{(1) (8)}	1.1	1.1	0.9	0.9	0.7
Bending F_b (psi) ⁽²⁾⁽³⁾	2800	3100	2650	2400	1800
Horizontal Shear F_v (psi) ^{(2) (4)}	285	285	285	285	225
Tension Parallel to Grain F_t (psi) ^{(2) (5)}	1950	1950	1500	1500	1100
Compression Parallel to Grain F_{cl} (psi) ⁽²⁾	3000	3000	3000	3000	2500
Compression Perpendicular to Grain F_c (psi) ^{(2) (6)}	750	750	750	750	525
Equivalent Specific Gravity for Fastener Design (SG)	0.5	0.5	0.5	0.5	0.5

1. This value cannot be adjusted for load duration.
2. This value is based upon a load duration of 100% and may be adjusted for other load durations.
3. Fiber stress bending value shall be multiplied by the depth factor, $(12/d)^{1/9}$ where d = member depth [in].
4. Stress applied perpendicular to the gluelines.
5. Tension value shall be multiplied by a length factor, $(4/L)^{1/8}$ where L = member length [ft]. Use $L = 4$ for members less than four feet long.

6. Stress applied parallel to the gluelines.
 7. True or shear-free modulus of elasticity does not account for shear deformation.
 8. E_{min} is the reference modulus of elasticity for beam and column stability calculations. It is calculated using $E_{apparent}$ in accordance with Appendix D of the 2018 NDS. When calculating E_{min} , the coefficient of modulus of elasticity, COV_E , may be taken as 0.10, and the adjustment factor to convert E to a pure bending basis may be taken as 1.05.
- * Design properties are limited to dry conditions of use where the maximum moisture content of the material will not exceed 16%.

VERSA-LAM® LVL DESIGN VALUES

Grade	Width [in]	Depth [in]	Weight [lb/ft]	Allowable Shear [lb]	Allowable Moment [ft-lb]	Moment of Inertia [in ⁴]	
Versa-Lam® 1.5E 1800	1 ⁵ / ₁₆	9½	3.2	1,870	3,039	93.8	
		11⅞	4.0	2,338	4,632	183.2	
		14	4.7	2,756	6,322	300.1	
		16	5.4	3,150	8,136	448.0	
		18	6.1	3,544	10,163	637.9	
		20	6.7	3,938	12,401	875.0	
Versa-Lam® 1.8E 2400	1½	3½	1.3	998	702	5.4	
		5½	2.1	1,568	1,649	20.8	
		7¼	2.8	2,066	2,779	47.6	
		9¼	3.6	2,636	4,404	98.9	
		9½	3.7	2,708	4,631	107.2	
		11¼	4.3	3,206	6,374	178.0	
		11⅞	4.6	3,384	7,059	209.3	
		14	5.4	3,990	9,634	343.0	
Versa-Lam® 2.1E 2800	1¾	5½	2.5	1,829	2,245	24.3	
		7¼	3.3	2,411	3,783	55.6	
		9¼	4.2	3,076	5,994	115.4	
		9½	4.3	3,159	6,304	125.0	
		11¼	5.1	3,741	8,675	207.6	
		11⅞	5.3	3,948	9,608	244.2	
		14	6.3	4,655	13,112	400.2	
		16	7.2	5,320	16,874	597.3	
		18	8.1	5,985	21,079	850.5	
		Versa-Lam® 2.1E 3100	3½	5½	4.9	3,658	4,971
7¼	6.5			4,821	8,377	111.1	
9¼	8.3			6,151	13,272	230.8	
9½	8.5			6,318	13,958	250.1	
11¼	10.1			7,481	19,210	415.3	
11⅞	10.7			7,897	21,275	488.4	
14	12.6			9,310	29,035	800.3	
16	14.4			10,640	37,364	1194.7	
18	16.2			11,970	46,674	1701.0	
20	18.0			13,300	56,952	2333.3	
5¼	5¼			7.1	5,237	6,830	63.3
	5½			7.4	5,486	7,457	72.8
	7¼		9.8	7,232	12,566	166.7	
	9¼		12.5	9,227	19,908	346.3	
	9½		12.8	9,476	20,937	375.1	
	11¼		15.2	11,222	28,814	622.9	
	11⅞		16.0	11,845	31,913	732.6	
	14		18.9	13,965	43,552	1200.5	
	16		21.6	15,960	56,046	1792.0	
	18		24.3	17,955	70,011	2551.5	
	20		27.0	19,950	85,428	3500.0	
	7		24	32.4	23,940	120,549	6048.0
9¼			16.6	12,303	26,544	461.7	
9½			17.1	12,635	27,916	500.1	
11¼		20.2	14,963	38,419	830.6		
11⅞		21.4	15,794	42,550	976.8		
14		25.2	18,620	58,069	1600.7		
16		28.8	21,280	74,728	2389.3		
18		32.4	23,940	93,348	3402.0		
20		36.0	26,600	113,904	4666.7		
24		43.2	31,920	160,732	8064.0		

VERSA-LAM® 1.8E 2650 COLUMN TABLES

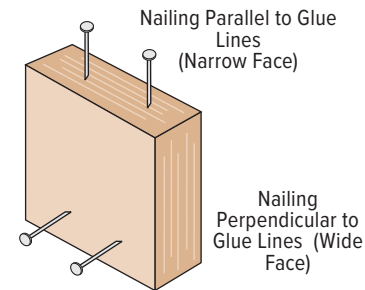
Column Length [ft]	3 1/2" Allowable Axial Load (lb)														
	3 1/2" x 3 1/2"			3 1/2" x 5 1/4"			3 1/2" x 7"			3 1/2" x 7"			3 1/2" x 7 1/4"		
	100%	115%	125%	100%	115%	125%	100%	115%	125%	100%	115%	125%	100%	115%	125%
4	14,700	16,090	16,930	22,070	24,165	25,430	29,450	32,240	33,920						
5	12,270	13,150	13,660	18,425	19,740	20,515	24,580	26,330	27,365						
6	10,080	10,650	10,980	15,140	15,995	16,495	20,195	21,335	22,000						
7	8,310	8,705	8,930	12,480	13,075	13,415	16,650	17,435	17,890						
8	6,930	7,205	7,370	10,405	10,825	11,070	13,880	14,440	14,760						
9	5,840	6,050	6,160	8,770	9,080	9,260	11,700	12,115	12,350						
10	4,980	5,135	5,225	7,480	7,715	7,850	9,975	10,290	10,470						
11	4,290	4,410	4,480	6,445	6,625	6,730	8,595	8,835	8,975						
12	3,730	3,825	3,880	5,600	5,745	5,830	7,475	7,665	7,775						
13	3,270	3,350	3,390	4,915	5,030	5,095	6,555	6,710	6,795						
14	2,890	2,950	2,990	4,340	4,435	4,490	5,790	5,915	5,990						

Column Length [ft]	5 1/4" Allowable Axial Load (lb)												7" Allowable Axial Load (lb)						
	5 1/4" x 5 1/4"			5 1/4" x 5 1/2"			5 1/4" x 7"			5 1/4" x 7 1/4"			7" x 7"			7" x 7 1/4"			
	100%	115%	125%	100%	115%	125%	100%	115%	125%	100%	115%	125%	100%	115%	125%	100%	115%	125%	
6	33,070	36,220	38,110	34,670	37,950	39,930													
7	29,420	31,730	33,085	30,830	33,240	34,660													
8	25,875	27,570	28,565	27,110	28,880	29,930	34,525	36,790	38,115	35,760	38,090	39,480							
9	22,690	23,970	24,715	23,770	25,110	25,900	30,275	31,985	32,980	31,360	33,130	34,160							
10	19,930	20,920	21,495	20,880	21,920	22,520	26,600	27,920	28,685	27,550	28,920	29,710							
11	17,585	18,375	18,820	18,420	19,250	19,720	23,465	24,510	25,125	24,310	25,400	26,010							
12	15,590	16,220	16,585	16,340	16,990	17,380	20,805	21,650	22,130	21,550	22,420	22,930							
13	13,895	14,410	14,700	14,560	15,100	15,400	18,545	19,225	19,620	19,210	19,920	20,320							
14	12,450	12,870	13,115	13,040	13,480	13,740	16,615	17,180	17,500	17,210	17,790	18,130	33,260	34,825	35,740	34,460	36,070	37,030	
15	11,210	11,560	11,760	11,740	12,110	12,320	14,960	15,425	15,695	15,490	15,980	16,260	30,325	31,645	32,395	31,410	32,780	33,560	
16	10,135	10,430	10,600	10,620	10,930	11,110	13,525	13,920	14,150	14,010	14,420	14,650	27,720	28,835	29,490	28,710	29,870	30,540	
17	9,205	9,455	9,600	9,650	9,910	10,060	12,285	12,620	12,810	12,730	13,070	13,270	25,415	26,375	26,920	26,330	27,320	27,880	
18	8,395	8,610	8,735	8,800	9,020	9,150	11,205	11,495	11,655	11,610	11,900	12,070	23,370	24,195	24,665	24,210	25,060	25,560	
19	7,685	7,870	7,975	8,050	8,250	8,360	10,260	10,505	10,645	10,620	10,880	11,030	21,550	22,270	22,670	22,320	23,070	23,490	
20	7,060	7,220	7,310	7,400	7,560	7,660	9,420	9,635	9,760	9,760	9,980	10,110	19,925	20,550	20,910	20,640	21,280	21,660	
21	6,505	6,645	6,725	6,820	6,960	7,050	8,680	8,870	8,980	8,990	9,190	9,300	18,475	19,020	19,330	19,130	19,700	20,020	
22													17,165	17,650	17,925	17,780	18,280	18,570	
23													15,990	16,420	16,660	16,560	17,010	17,260	
24													14,930	15,310	15,525	15,460	15,860	16,080	

- Table assumes that the column is braced at column ends only. Effective column length is equal to actual column length.
- Allowable loads are based upon one-piece (solid) column members used in dry service conditions. BC Calc® sizing software (www.BCCalc.com) may be used for multi-piece column design.
- Allowable loads are based on an eccentricity value equal to 0.167 multiplied by either the column thickness or width (worst case).
- Allowable loads are based on axial loaded columns using the design provisions of the 2018 National Design Specification (NDS) for Wood Construction. Table capacity values based upon a buckling length coefficient, K_{le} , equal to 1.0 (rotation free, translation fixed at each column end per NDS Appendix G). A K_{le} coefficient of 1.0 conservatively models typical wood column applications. For other end fixity conditions, contact Boise Cascade EWP Engineering. For side or other combined bending and axial loads, see provisions in 2018 NDS.
- Load values are not shown for short lengths due to loads exceeding common connector capacities. Load values are not shown for longer lengths if the controlling slenderness ratio exceeds 50 (per NDS).
- Lateral loads (wind loading) are not considered in this table. BC Calc® sizing software (www.BCCalc.com) may be used for out of plane lateral load column application design.

CLOSEST ALLOWABLE NAIL SPACING

Versa-Lam® Products Nail Size	Nailing Parallel to Glue Lines (Narrow Face) ⁽¹⁾						Nailing Perpendicular to Glue Lines (Wide Face)			
	Versa-Lam® 1.5E 1800 1 5/16"		Versa-Lam® 1 3/4"		Versa-Lam® 3 1/2" & Wider		All Products			
	O.C. [in]	End [in]	O.C. [in]	End [in]	O.C. [in]	End [in]	O.C. [in]	End [in]	O.C. [in]	End [in]
8d Box (0.113"ø x 2.5")	3	1 1/2	2	1	2	1/2	2	1/2	2	1/2
8d Common (0.131"ø x 2.5")	3	2	3	2	2	1	2	1	2	1
10d & 12d Box (0.128"ø x 3", 3.25")	3	2	3	2	2	1	2	1	2	1
16d Box (0.135"ø x 3.5")	3	2	3	2	2	1	2	1	2	1
10d & 12d Common & 16d Sinker (0.148"ø x 3", 3.25")	4	3	4	3	2	2	2	2	2	2
16d Common (0.162"ø x 3.5")	6	4	6	3	2	2	2	2	2	2



- For 1 3/4" thickness and greater, 2 rows of nails (such as for a metal strap) are allowed (use 1/2" minimum offset between rows and stagger nails).

KEY TO TABLE: **Top Figure** - Allowable Total Load [plf]
Middle Figure - Allowable Live Load [plf]
Bottom Figure - Minimum Required Bearing Length at End / Intermediate Supports [inches]

SPAN (ft)	1 3/4" Versa-Lam® 2.1E 2800						3 1/2" Versa-Lam® 2.1E 3100						5 1/4" Versa-Lam® 2.1E 3100						7" Versa-Lam® 2.1E 3100					
	7 1/4"	9 1/2"	11 7/8"	14"	16" (1)	18" (1)	7 1/4"	9 1/2"	11 7/8"	14"	16"	18"	9 1/2"	11 7/8"	14"	16"	18"	20"	11 7/8"	14"	16"	18"	20"	24"
6	763	1063	1425	1796	2194	2398	1526	2127	2850	3591	4388	4796	3190	4275	5387	6583	7194	7192	5700	7183	8777	9593	9589	9582
	693	-	-	-	-	-	1385	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.8/4.4	2.4/6.1	3.3/8.2	4.1/10.3	5/12.6	5.5/13.8	1.8/4.4	2.4/6.1	3.3/8.2	4.1/10.3	5/12.6	5.5/13.8	2.4/6.1	3.3/8.2	4.1/10.3	5/12.6	5.5/13.8	5.5/13.8	3.3/8.2	4.1/10.3	5/12.6	5.5/13.8	5.5/13.8	5.5/13.8
7	614	877	1161	1445	1742	2054	1272	1754	2322	2889	3484	4109	2632	3483	4334	5226	6163	6161	4644	5778	6967	8218	8214	8207
	452	-	-	-	-	-	905	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.6/4.1	2.4/5.9	3.1/7.8	3.9/9.7	4.7/11.7	5.5/13.8	1.7/4.3	2.4/5.9	3.1/7.8	3.9/9.7	4.7/11.7	5.5/13.8	2.4/5.9	3.1/7.8	3.9/9.7	4.7/11.7	5.5/13.8	5.5/13.8	3.1/7.8	3.9/9.7	4.7/11.7	5.5/13.8	5.5/13.8	5.5/13.8
8	462	746	979	1208	1444	1702	925	1493	1958	2416	2887	3404	2239	2938	3624	4331	5106	5387	3917	4832	5775	6808	7183	7176
	310	660	-	-	-	-	621	1321	-	-	-	-	1981	-	-	-	-	-	-	-	-	-	-	-
	1.5/3.5	2.3/5.7	3/7.5	3.7/9.3	4.4/11.1	5.2/13	1.5/3.5	2.3/5.7	3/7.5	3.7/9.3	4.4/11.1	5.2/13	2.3/5.7	3/7.5	3.7/9.3	4.4/11.1	5.2/13	5.5/13.8	3/7.5	3.7/9.3	4.4/11.1	5.2/13	5.5/13.8	5.5/13.8
9	329	618	846	1038	1232	1443	659	1299	1693	2076	2465	2886	1948	2539	3113	3697	4328	4786	3386	4151	4930	5771	6381	6374
	222	477	-	-	-	-	444	954	-	-	-	-	1431	-	-	-	-	-	-	-	-	-	-	-
	1.5/3	2.1/5.3	2.9/7.3	3.6/8.9	4.3/10.6	5/12.4	1.5/3	2.2/5.6	2.9/7.3	3.6/8.9	4.3/10.6	5/12.4	2.2/5.6	2.9/7.3	3.6/8.9	4.3/10.6	5/12.4	5.5/13.8	2.9/7.3	3.6/8.9	4.3/10.6	5/12.4	5.5/13.8	5.5/13.8
10	242	500	745	909	1075	1252	485	1056	1491	1819	2150	2504	1584	2236	2728	3225	3756	4304	2981	3638	4299	5008	5739	5732
	164	355	660	-	-	-	327	710	1321	-	-	-	1065	1981	-	-	-	-	2642	-	-	-	-	-
	1.5/3	1.9/4.8	2.9/7.1	3.5/8.7	4.1/10.3	4.8/12	1.5/3	2/5.1	2.9/7.1	3.5/8.7	4.1/10.3	4.8/12	2/5.1	2.9/7.1	3.5/8.7	4.1/10.3	4.8/12	5.5/13.8	2.9/7.1	3.5/8.7	4.1/10.3	4.8/12	5.5/13.8	5.5/13.8
11	183	402	630	809	953	1105	366	804	1331	1618	1906	2211	1205	1997	2428	2858	3316	3803	2662	3237	3811	4422	5071	5207
	124	271	508	798	-	-	248	541	1015	1595	-	-	812	1523	2393	-	-	-	2031	3190	-	-	-	-
	1.5/3	1.7/4.3	2.7/6.7	3.4/8.5	4/10.1	4.7/11.7	1.5/3	1.7/4.3	2.8/7.3	3.4/8.5	4/10.1	4.7/11.7	1.7/4.3	2.8/7.3	3.4/8.5	4/10.1	4.7/11.7	5.4/13.4	2.8/7.3	3.4/8.5	4/10.1	4.7/11.7	5.4/13.4	5.5/13.8
12	141	312	528	722	856	989	282	624	1171	1457	1711	1979	937	1757	2186	2567	2968	3393	2343	2915	3422	3958	4524	4769
	96	211	398	629	-	-	193	422	796	1258	-	-	633	1194	1887	-	-	-	1592	2517	-	-	-	-
	1.5/3	1.5/3.6	2.4/6.1	3.3/8.3	3.9/9.9	4.6/11.4	1.5/3	1.5/3.6	2.7/6.8	3.4/8.4	3.9/9.9	4.6/11.4	1.5/3.6	2.7/6.8	3.4/8.4	3.9/9.9	4.6/11.4	5.2/13	2.7/6.8	3.4/8.4	3.9/9.9	4.6/11.4	5.2/13	5.5/13.8
13	111	247	449	614	776	895	222	494	942	1325	1552	1791	741	1413	1988	2328	2686	3062	1884	2651	3104	3581	4083	4399
	76	168	318	504	728	-	152	335	635	1009	1456	-	503	953	1513	2185	-	-	1270	2017	2913	-	-	-
	1.5/3	1.5/3.1	2.3/5.6	3.1/7.7	3.9/9.7	4.5/11.2	1.5/3	1.5/3.1	2.4/5.9	3.3/8.3	3.9/9.7	4.5/11.2	1.5/3.1	2.4/5.9	3.3/8.3	3.9/9.7	4.5/11.2	5.1/12.7	2.4/5.9	3.3/8.3	3.9/9.7	4.5/11.2	5.1/12.7	5.5/13.8
14	89	198	380	529	682	817	177	397	761	1172	1420	1635	595	1141	1759	2130	2452	2789	1522	2345	2840	3270	3719	4082
	61	135	257	410	594	-	123	270	514	820	1189	-	405	771	1230	1783	-	-	1029	1640	2378	-	-	-
	1.5/3	1.5/3	2.1/5.1	2.9/7.1	3.7/9.2	4.4/11	1.5/3	1.5/3	2.1/5.1	3.2/7.9	3.8/9.6	4.4/11	1.5/3	2.1/5.1	3.2/7.9	3.8/9.6	4.4/11	5/12.5	2.1/5.1	3.2/7.9	3.8/9.6	4.4/11	5/12.5	5.5/13.8
15	72	162	311	460	593	741	143	323	622	1000	1309	1504	485	934	1500	1963	2256	2561	1245	2000	2617	3008	3415	3807
	50	111	211	338	491	680	100	221	422	675	982	1359	332	633	1013	1473	2039	-	844	1350	1964	2718	-	-
	1.5/3	1.5/3	1.8/4.5	2.7/6.7	3.4/8.6	4.3/10.7	1.5/3	1.5/3	1.8/4.5	2.9/7.2	3.8/9.5	4.3/10.9	1.5/3	1.8/4.5	2.9/7.2	3.8/9.5	4.3/10.9	4.9/12.3	1.8/4.5	2.9/7.2	3.8/9.5	4.3/10.9	4.9/12.3	5.5/13.8
16	59	133	257	403	520	651	117	266	515	830	1153	1392	399	772	1246	1730	2088	2367	1030	1661	2306	2784	3156	3566
	41	92	175	281	410	569	83	183	350	562	820	1138	275	526	843	1230	1707	2279	701	1124	1640	2277	3038	-
	1.5/3	1.5/3	1.6/4	2.5/6.2	3.2/8	4/10	1.5/3	1.5/3	1.6/4	2.6/6.4	3.6/8.9	4.3/10.7	1.5/3	1.6/4	2.6/6.4	3.6/8.9	4.3/10.7	4.9/12.2	1.6/4	2.6/6.4	3.6/8.9	4.3/10.7	4.9/12.2	5.5/13.8
17	111	215	348	460	575	97	221	430	696	1020	1276	332	645	1044	1530	1914	2200	861	1393	2040	2552	2933	3354	
	77	147	236	346	481	69	153	294	473	691	962	230	441	709	1037	1443	1931	588	945	1382	1924	2575	-	
	1.5/3	1.5/3.6	2.3/5.7	3/7.6	3.8/9.4	1.5/3	1.5/3	1.5/3.6	2.3/5.7	3.3/8.4	4.2/10.5	1.5/3	1.5/3.6	2.3/5.7	3.3/8.4	4.2/10.5	4.8/12	1.5/3.6	2.3/5.7	3.3/8.4	4.2/10.5	4.8/12	5.5/13.8	
18	93	181	295	409	512	81	186	363	589	867	1136	279	544	884	1301	1704	2055	726	1178	1735	2273	2740	3165	
	65	124	201	294	410	58	130	249	401	588	820	194	373	602	882	1230	1650	498	802	1176	1640	2200	-	
	1.5/3	1.5/3.2	2.1/5.2	2.9/7.1	3.6/8.9	1.5/3	1.5/3	1.5/3.2	2.1/5.2	3/7.6	4/9.9	1.5/3	1.5/3.2	2.1/5.2	3/7.6	4/9.9	4.8/11.9	1.5/3.2	2.1/5.2	3/7.6	4/9.9	4.8/11.9	5.5/13.8	
19	79	154	251	367	459	68	157	308	502	741	1018	236	462	753	1112	1527	1866	617	1004	1483	2036	2488	2996	
	55	106	172	252	352	50	110	213	343	504	704	166	319	515	756	1056	1420	425	686	1008	1408	1893	-	
	1.5/3	1.5/3	1.9/4.7	2.7/6.8	3.4/8.5	1.5/3	1.5/3	1.5/3	1.9/4.7	2.7/6.8	3.7/9.4	1.5/3	1.5/3	1.9/4.7	2.7/6.8	3.7/9.4	4.6/11.4	1.5/3	1.9/4.7	2.7/6.8	3.7/9.4	4.6/11.4	5.5/13.8	
20	67	132	216	319	413	57	134	264	431	638	897	201	396	647	957	1346	1682	528	862	1276	1794	2242	2844	
	47	92	148	217	304	43	95	183	296	435	609	142	275	444	652	913	1230	366	592	870	1218	1640	2718	
	1.5/3	1.5/3	1.7/4.2	2.5/6.2	3.2/8	1.5/3	1.5/3	1.5/3	1.7/4.2	2.5/6.2	3.5/8.7	1.5/3	1.5/3	1.7/4.2	2.5/6.2	3.5/8.7	4.3/10.8	1.5/3	1.7/4.2	2.5/6.2	3.5/8.7	4.3/10.8	5.5/13.8	
22	98	162	241	340	-	-	99	197	324	481	680	148	295	485	722	1019	1383	394	647	962	1359	1844	2582	
	69	112	165	232	-	-	72	138	224	330	464	107	208	336	496	696	940	277	448	661	928	1253	2091	
	1.5/3	1.5/3.5	2.1/5.2	2.9/7.3	-	-	1.5/3	1.5/3	1.5/3.5	2.1/5.2	2.9/7.3	1.5/3	1.5/3	1.5/3.5	2.1/5.2	2.9/7.3	3.9/9.8	1.5/3	1.5/3.5	2.1/5.2	2.9/7.3	3.9/9.8	5.5/13.8	
24	75	124	185	263	-	-	74	150	248	371	526	112	225	372	556	788	1073	300	496	741	1051	1431	2189	
	54	87	128	181	-	-	55	107	174	257	361	83	161	261	385	542	733	214	348	513	722	978	1640	
	1.5/3	1.5/3	1.8/4.4	2.5/6.2	-	-	1.5/3	1.5/3	1.5/3	1.8/4.4	2.5/6.2	1.5/3	1.5/3	1.5/3	1.8/4.4	2.5/6.2	3.4/8.4	1.5/3	1.5/3	1.8/4.4	2.5/6.2	3.4/8.4	5.1/12.8	
26	58	97	145	207	-	-	57	116	194	290	413	85	174	290	436	620	847	232	387	581	827	1130	1859	
	42	69																						

US WEST ROOF SNOW LOAD TABLES

VERSA-LAM® 2.1E 2800 & 2.1E 3100
(115% Load Duration)

KEY TO TABLE:
Top Figure - Allowable Total Load [plf]
Middle Figure - Allowable Live Load [plf]
Bottom Figure - Minimum Required Bearing Length at End / Intermediate Supports [inches]

SPAN (ft)	1 3/4" Versa-Lam® 2.1E 2800						3 1/2" Versa-Lam® 2.1E 3100						5 1/4" Versa-Lam® 2.1E 3100						7" Versa-Lam® 2.1E 3100					
	7 1/4"	9 1/2"	11 7/8"	14"	16" (1)	18" (1)	7 1/4"	9 1/2"	11 7/8"	14"	16"	18"	9 1/2"	11 7/8"	14"	16"	18"	20"	11 7/8"	14"	16"	18"	20"	24"
6	878	1224	1640	2066	2399	2398	1756	2447	3279	4132	4798	4796	3671	4919	6198	7197	7194	7192	6558	8264	9596	9593	9589	9582
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	2/5	2.8/7	3.8/9.4	4.7/11.8	5.5/13.8	5.5/13.8	2/5	2.8/7	3.8/9.4	4.7/11.8	5.5/13.8	5.5/13.8	2.8/7	3.8/9.4	4.7/11.8	5.5/13.8	5.5/13.8	3.8/9.4	4.7/11.8	5.5/13.8	5.5/13.8	5.5/13.8	5.5/13.8	5.5/13.8
	707	1009	1336	1662	2004	2054	1464	2019	2672	3325	4008	4109	3028	4008	4987	6013	6163	6161	5344	6649	8017	8218	8214	8207
8	678	-	-	-	-	-	1357	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.9/4.7	2.7/6.8	3.6/8.9	4.4/11.1	5.4/13.4	5.5/13.8	2/4.9	2.7/6.8	3.6/8.9	4.4/11.1	5.4/13.4	5.5/13.8	2.7/6.8	3.6/8.9	4.4/11.1	5.4/13.4	5.5/13.8	5.5/13.8	3.6/8.9	4.4/11.1	5.4/13.4	5.5/13.8	5.5/13.8	5.5/13.8
9	541	859	1127	1390	1661	1797	1198	1718	2254	2780	3323	3593	2577	3381	4171	4984	5390	5387	4508	5561	6645	7186	7183	7176
	466	-	-	-	-	-	931	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	1.7/4.1	2.6/6.6	3.5/8.6	4.3/10.6	5.1/12.7	5.5/13.8	1.8/4.6	2.6/6.6	3.5/8.6	4.3/10.6	5.1/12.7	5.5/13.8	2.6/6.6	3.5/8.6	4.3/10.6	5.1/12.7	5.5/13.8	5.5/13.8	3.5/8.6	4.3/10.6	5.1/12.7	5.5/13.8	5.5/13.8	5.5/13.8
	426	712	974	1194	1418	1596	881	1495	1948	2389	2837	3192	2242	2923	3583	4255	4788	4786	3897	4778	5673	6384	6381	6374
11	333	-	-	-	-	-	665	1431	-	-	-	-	2146	-	-	-	-	-	-	-	-	-	-	-
	1.5/3.7	2.5/6.1	3.4/8.4	4.1/10.3	4.9/12.2	5.5/13.8	1.5/3.8	2.6/6.4	3.4/8.4	4.1/10.3	4.9/12.2	5.5/13.8	2.6/6.4	3.4/8.4	4.1/10.3	4.9/12.2	5.5/13.8	5.5/13.8	3.4/8.4	4.1/10.3	4.9/12.2	5.5/13.8	5.5/13.8	5.5/13.8
12	324	576	858	1047	1237	1436	648	1276	1716	2094	2474	2871	1913	2574	3140	3711	4307	4304	3431	4187	4949	5743	5739	5732
	246	532	-	-	-	-	491	1065	-	-	-	-	1597	-	-	-	-	-	-	-	-	-	-	-
13	1.5/3.1	2.2/5.5	3.3/8.2	4/10	4.7/11.9	5.5/13.8	1.5/3.1	2.4/6.1	3.3/8.2	4/10	4.7/11.9	5.5/13.8	2.4/6.1	3.3/8.2	4/10	4.7/11.9	5.5/13.8	5.5/13.8	3.3/8.2	4/10	4.7/11.9	5.5/13.8	5.5/13.8	5.5/13.8
	245	475	725	932	1097	1272	490	1053	1532	1863	2194	2545	1579	2299	2795	3290	3817	3911	3065	3726	4387	5090	5214	5207
14	186	406	-	-	-	-	372	812	1523	-	-	-	1218	2285	-	-	-	-	3046	-	-	-	-	-
	1.5/3	2/5	3.1/7.7	3.9/9.8	4.6/11.6	5.4/13.4	1.5/3	2.2/5.6	3.2/8.1	3.9/9.8	4.6/11.6	5.4/13.4	2.2/5.6	3.2/8.1	3.9/9.8	4.6/11.6	5.4/13.4	5.5/13.8	3.2/8.1	3.9/9.8	4.6/11.6	5.4/13.4	5.5/13.8	5.5/13.8
15	189	398	609	831	985	1139	379	835	1349	1678	1970	2278	1253	2023	2517	2955	3417	3582	2697	3356	3940	4556	4777	4769
	144	317	597	-	-	-	289	633	1194	-	-	-	950	1791	-	-	-	2389	-	-	-	-	-	-
16	1.5/3	1.8/4.6	2.8/7	3.8/9.6	4.5/11.3	5.2/13.1	1.5/3	1.9/4.8	3.1/7.8	3.9/9.7	4.5/11.3	5.2/13.1	1.9/4.8	3.1/7.8	3.9/9.7	4.5/11.3	5.2/13.1	5.5/13.8	3.1/7.8	3.9/9.7	4.5/11.3	5.2/13.1	5.5/13.8	5.5/13.8
	149	331	518	708	894	1031	298	662	1147	1526	1787	2062	992	1721	2289	2681	3092	3305	2295	3052	3574	4123	4406	4399
17	114	251	476	-	-	-	229	503	953	1513	-	-	754	1429	2269	-	-	-	1905	3026	-	-	-	-
	1.5/3	1.7/4.1	2.6/6.5	3.5/8.8	4.5/11.2	5.1/12.9	1.5/3	1.7/4.1	2.9/7.2	3.8/9.5	4.5/11.2	5.1/12.9	1.7/4.1	2.9/7.2	3.8/9.5	4.5/11.2	5.1/12.9	5.5/13.8	2.9/7.2	3.8/9.5	4.5/11.2	5.1/12.9	5.5/13.8	5.5/13.8
18	119	266	446	609	785	941	239	532	988	1350	1635	1883	798	1482	2025	2453	2824	3067	1976	2701	3271	3765	4089	4082
	92	203	386	-	-	-	184	405	771	1230	-	-	608	1157	1845	-	-	-	1543	2460	-	-	-	-
19	1.5/3	1.5/3.6	2.4/6	3.3/8.2	4.2/10.6	5.1/12.7	1.5/3	1.5/3.6	2.7/6.7	3.6/9.1	4.4/11	5.1/12.7	1.5/3.6	2.7/6.7	3.6/9.1	4.4/11	5.1/12.7	5.5/13.8	2.7/6.7	3.6/9.1	4.4/11	5.1/12.7	5.5/13.8	5.5/13.8
	97	217	388	530	683	854	193	434	833	1175	1507	1732	650	1250	1762	2261	2598	2861	1667	2349	3014	3464	3814	3807
20	75	166	317	506	-	-	150	332	633	1013	1473	-	497	950	1519	2210	-	-	1266	2025	2946	-	-	-
	1.5/3	1.5/3.2	2.2/5.6	3.1/7.7	3.9/9.9	4.9/12.3	1.5/3	1.5/3.2	2.4/6	3.4/8.5	4.3/10.9	5/12.5	1.5/3.2	2.4/6	3.4/8.5	4.3/10.9	5/12.5	5.5/13.8	2.4/6	3.4/8.5	4.3/10.9	5/12.5	5.5/13.8	5.5/13.8
21	79	179	340	465	599	749	159	358	690	1031	1328	1603	536	1035	1546	1993	2405	2680	1380	2062	2657	3207	3573	3566
	62	137	263	421	-	-	124	275	526	843	1230	-	412	788	1264	1845	-	-	1051	1686	2460	-	-	-
22	1.5/3	1.5/3	2.1/5.3	2.9/7.2	3.7/9.2	4.6/11.5	1.5/3	1.5/3	2.1/5.3	3.2/7.9	4.1/10.2	4.9/12.3	1.5/3	2.1/5.3	3.2/7.9	4.1/10.2	4.9/12.3	5.5/13.8	2.1/5.3	3.2/7.9	4.1/10.2	4.9/12.3	5.5/13.8	5.5/13.8
	66	149	289	411	530	663	132	298	577	912	1175	1470	447	866	1368	1763	2204	2521	1155	1823	2350	2939	3361	3354
23	52	115	220	354	518	-	104	230	441	709	1037	1443	345	661	1063	1555	2165	-	-	882	1418	2074	2886	-
	1.5/3	1.5/3	1.9/4.8	2.7/6.8	3.5/8.7	4.3/10.9	1.5/3	1.5/3	1.9/4.8	3/7.5	3.9/9.6	4.8/12	1.5/3	1.9/4.8	3/7.5	3.9/9.6	4.8/12	5.5/13.8	1.9/4.8	3/7.5	3.9/9.6	4.8/12	5.5/13.8	5.5/13.8
24	55	125	244	366	472	590	110	251	487	790	1047	1309	376	731	1184	1570	1964	2367	975	1579	2093	2618	3156	3165
	44	97	187	301	441	-	87	194	373	602	882	1230	291	560	902	1322	1845	-	747	1203	1763	2460	-	-
25	1.5/3	1.5/3	1.7/4.3	2.6/6.4	3.3/8.2	4.1/10.3	1.5/3	1.5/3	1.7/4.3	2.8/6.9	3.6/9.1	4.5/11.4	1.5/3	1.7/4.3	2.8/6.9	3.6/9.1	4.5/11.4	5.5/13.8	1.7/4.3	2.8/6.9	3.6/9.1	4.5/11.4	5.5/13.7	5.5/13.8
	46	106	207	328	423	529	93	212	415	674	938	1173	319	622	1011	1407	1760	2150	829	1347	1876	2347	2867	2996
26	37	83	160	257	378	528	74	166	319	515	756	1056	249	479	772	1133	1584	2130	638	1029	1511	2112	2839	-
	1.5/3	1.5/3	1.5/3.8	2.4/6	3.1/7.8	3.9/9.7	1.5/3	1.5/3	1.5/3.8	2.5/6.2	3.4/8.6	4.3/10.8	1.5/3	1.5/3.8	2.5/6.2	3.4/8.6	4.3/10.8	5.3/13.1	1.5/3.8	2.5/6.2	3.4/8.6	4.3/10.8	5.3/13.1	5.5/13.8
27	91	178	289	381	477	79	181	355	579	845	1057	272	533	868	1267	1586	1938	711	1158	1690	2135	2584	2844	
	71	137	222	326	457	64	142	275	444	652	913	214	412	666	979	1370	1845	549	887	1305	1827	2460	-	
28	1.5/3	1.5/3.5	2.3/5.6	3/7.4	3.7/9.2	1.5/3	1.5/3	1.5/3.5	2.3/5.6	3.3/8.2	4.1/10.2	1.5/3	1.5/3.5	2.3/5.6	3.3/8.2	4.1/10.2	5/12.5	1.5/3.5	2.3/5.6	3.3/8.2	4.1/10.2	5/12.5	5.5/13.8	
	67	133	218	314	393	58	135	266	436	646	871	202	399	654	970	1307	1597	532	871	1293	1742	2129	2582	
29	54	104	168	248	348	48	107	208	336	496	696	161	311	504	743	1044	1410	1410	415	672	991	1392	1880	-
	1.5/3	1.5/3	1.9/4.7	2.7/6.7	3.4/8.4	1.5/3	1.5/3	1.5/3	1.9/4.7	2.8/6.9	3.7/9.3	1.5/3	1.5/3	1.9/4.7	2.8/6.9	3.7/9.3	4.5/11.3	1.5/3	1.9/4.7	2.8/6.9	3.7/9.3	4.5/11.3	5.5/13.8	
30	51	102	168	249	329	43	102	204	335	499	706	153	305	503	748	1059	1337	407	670	998	1412	1783	2363	
	42	80	130	193	271	37	83	161	261	385	542	125	241	391	578	813	1100	321	521	770	1083	1467	-	
31	1.5/3	1.5/3	1.6/4	2.3/5.9	3.1/7.7	1.5/3	1.5/3	1.5/3	1.6/4	2.3/5.9														

KEY TO TABLE:

- Top Figure** - Allowable Total Load [plf]
- Middle Figure** - Allowable Live Load [plf]
- Bottom Figure** - Minimum Required Bearing Length at End / Intermediate Supports [inches]

SPAN (ft)	1 3/4" Versa-Lam® 2.1E 2800						3 1/2" Versa-Lam® 2.1E 3100						5 1/4" Versa-Lam® 2.1E 3100						7" Versa-Lam® 2.1E 3100					
	7 1/4"	9 1/2"	11 7/8"	14"	16" (1)	18" (1)	7 1/4"	9 1/2"	11 7/8"	14"	16"	18"	9 1/2"	11 7/8"	14"	16"	18"	20"	11 7/8"	14"	16"	18"	20"	24"
6	955	1330	1783	2246	2399	2398	1909	2661	3565	4492	4798	4796	3991	5348	6738	7197	7194	7192	7131	8984	9596	9593	9589	9582
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	2.2/5.5	3.1/7.6	4.1/10.2	5.1/12.9	5.5/13.8	5.5/13.8	2.2/5.5	3.1/7.6	4.1/10.2	5.1/12.9	5.5/13.8	5.5/13.8	3.1/7.6	4.1/10.2	5.1/12.9	5.5/13.8	5.5/13.8	5.5/13.8	4.1/10.2	5.1/12.9	5.5/13.8	5.5/13.8	5.5/13.8	5.5/13.8
	769	1098	1453	1807	2055	2054	1592	2195	2905	3615	4111	4109	3293	4358	5422	6166	6163	6161	5810	7229	8221	8218	8214	8207
8	678	-	-	-	-	-	1357	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2.1/5.1	2.9/7.3	3.9/9.7	4.8/12.1	5.5/13.8	5.5/13.8	2.1/5.3	2.9/7.3	3.9/9.7	4.8/12.1	5.5/13.8	5.5/13.8	2.9/7.3	3.9/9.7	4.8/12.1	5.5/13.8	5.5/13.8	5.5/13.8	3.9/9.7	4.8/12.1	5.5/13.8	5.5/13.8	5.5/13.8	5.5/13.8
9	588	934	1225	1512	1797	1797	1235	1868	2451	3023	3595	3593	2802	3676	4535	5392	5390	5387	4901	6047	7190	7186	7183	7176
	466	-	-	-	-	-	931	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	1.8/4.5	2.9/7.1	3.8/9.4	4.6/11.6	5.5/13.8	5.5/13.8	1.9/4.7	2.9/7.1	3.8/9.4	4.6/11.6	5.5/13.8	5.5/13.8	2.9/7.1	3.8/9.4	4.6/11.6	5.5/13.8	5.5/13.8	5.5/13.8	3.8/9.4	4.6/11.6	5.5/13.8	5.5/13.8	5.5/13.8	5.5/13.8
	440	774	1059	1299	1542	1596	881	1625	2119	2598	3085	3192	2438	3178	3897	4627	4788	4786	4238	5195	6169	6384	6381	6374
11	333	715	-	-	-	-	665	1431	-	-	-	-	2146	-	-	-	-	-	-	-	-	-	-	-
	1.5/3.8	2.7/6.7	3.7/9.1	4.5/11.2	5.3/13.3	5.5/13.8	1.5/3.8	2.8/7.7	3.7/9.1	4.5/11.2	5.3/13.3	5.5/13.8	2.8/7.7	3.7/9.1	4.5/11.2	5.3/13.3	5.5/13.8	5.5/13.8	3.7/9.1	4.5/11.2	5.3/13.3	5.5/13.8	5.5/13.8	5.5/13.8
12	324	626	933	1138	1345	1436	648	1387	1866	2277	2691	2871	2081	2799	3415	4036	4307	4304	3732	4554	5381	5743	5739	5732
	246	532	-	-	-	-	491	1065	-	-	-	-	1597	-	-	-	-	-	-	-	-	-	-	-
13	1.5/3.1	2.4/6.6	3.6/8.9	4.4/10.9	5.2/12.9	5.5/13.8	1.5/3.1	2.7/6.6	3.6/8.9	4.4/10.9	5.2/12.9	5.5/13.8	2.7/6.6	3.6/8.9	4.4/10.9	5.2/12.9	5.5/13.8	5.5/13.8	3.6/8.9	4.4/10.9	5.2/12.9	5.5/13.8	5.5/13.8	5.5/13.8
	245	517	789	1013	1193	1304	490	1074	1667	2026	2386	2609	1611	2500	3039	3578	3913	3911	3333	4052	4771	5218	5214	5207
14	186	406	762	-	-	-	372	812	1523	-	-	-	1218	2285	-	-	-	-	3046	-	-	-	-	-
	1.5/3	2.2/5.5	3.3/8.3	4.3/10.7	5.1/12.6	5.5/13.8	1.5/3	2.3/5.7	3.5/8.8	4.3/10.7	5.1/12.6	5.5/13.8	2.3/5.7	3.5/8.8	4.3/10.7	5.1/12.6	5.5/13.8	5.5/13.8	3.5/8.8	4.3/10.7	5.1/12.6	5.5/13.8	5.5/13.8	5.5/13.8
15	189	418	662	904	1071	1195	379	835	1467	1825	2142	2390	1253	2200	2737	3214	3585	3582	2934	3650	4285	4780	4777	4769
	144	317	597	-	-	-	289	633	1194	-	-	-	950	1791	-	-	-	-	2389	-	-	-	-	-
16	1.5/3	1.9/4.8	3.1/7.6	4.2/10.4	4.9/12.3	5.5/13.8	1.5/3	1.9/4.8	3.4/8.4	4.2/10.5	4.9/12.3	5.5/13.8	1.9/4.8	3.4/8.4	4.2/10.5	4.9/12.3	5.5/13.8	5.5/13.8	3.4/8.4	4.2/10.5	4.9/12.3	5.5/13.8	5.5/13.8	5.5/13.8
	149	331	563	770	972	1102	298	662	1248	1660	1944	2205	992	1872	2490	2916	3307	3305	2496	3320	3888	4410	4406	4399
17	114	251	476	756	-	-	229	503	953	1513	-	-	754	1429	2269	-	-	-	1905	3026	-	-	-	-
	1.5/3	1.7/4.1	2.8/7.7	3.8/9.6	4.8/12.1	5.5/13.8	1.5/3	1.7/4.1	3.1/7.8	4.1/10.4	4.8/12.1	5.5/13.8	1.7/4.1	3.1/7.8	4.1/10.4	4.8/12.1	5.5/13.8	5.5/13.8	3.1/7.8	4.1/10.4	4.8/12.1	5.5/13.8	5.5/13.8	5.5/13.8
18	119	266	485	663	854	1023	239	532	1018	1469	1779	2046	798	1527	2203	2668	3069	3067	2036	2938	3558	4093	4089	4082
	92	203	386	615	-	-	184	405	771	1230	-	-	608	1157	1845	-	-	-	1543	2460	-	-	-	-
19	1.5/3	1.5/3.6	2.6/6.5	3.6/8.9	4.6/11.5	5.5/13.8	1.5/3	1.5/3.6	2.7/6.9	4/9.9	4.8/12	5.5/13.8	1.5/3.6	2.7/6.9	4/9.9	4.8/12	5.5/13.8	5.5/13.8	2.7/6.9	4/9.9	4.8/12	5.5/13.8	5.5/13.8	5.5/13.8
	97	217	417	576	743	929	193	434	833	1278	1639	1884	650	1250	1917	2459	2826	2861	1667	2556	3279	3768	3814	3807
20	75	166	317	506	737	-	150	332	633	1013	1473	-	497	950	1519	2210	-	-	1266	2025	2946	-	-	-
	1.5/3	1.5/3.2	2.4/6.6	3.3/8.3	4.3/10.7	5.4/13.4	1.5/3	1.5/3.2	2.4/6.6	3.7/9.2	4.7/11.8	5.4/13.6	1.5/3.2	2.4/6.6	3.7/9.2	4.7/11.8	5.4/13.6	5.5/13.8	2.4/6.6	3.7/9.2	4.7/11.8	5.4/13.6	5.5/13.8	5.5/13.8
21	79	179	345	506	652	815	159	358	690	1111	1445	1744	536	1035	1667	2168	2616	2680	1380	2223	2890	3488	3573	3566
	62	137	263	421	615	-	124	275	526	843	1230	1707	412	788	1264	1845	2561	-	1051	1686	2460	3415	-	-
22	1.5/3	1.5/3	2.1/5.3	3.1/7.8	4/10	5/12.5	1.5/3	1.5/3	2.1/5.3	3.4/8.6	4.4/11.1	5.4/13.4	1.5/3	2.1/5.3	3.4/8.6	4.4/11.1	5.4/13.4	5.5/13.8	2.1/5.3	3.4/8.6	4.4/11.1	5.4/13.4	5.5/13.8	5.5/13.8
	66	149	289	447	577	721	132	298	577	933	1278	1599	447	866	1399	1918	2398	2521	1155	1865	2557	3198	3361	3354
23	52	115	220	354	518	-	104	230	441	709	1037	1443	345	661	1063	1555	2165	-	882	1418	2074	2886	-	-
	1.5/3	1.5/3	1.9/4.8	2.9/7.3	3.8/9.5	4.7/11.8	1.5/3	1.5/3	1.9/4.8	3.1/7.7	4.2/10.5	5.2/13.1	1.5/3	1.9/4.8	3.1/7.7	4.2/10.5	5.2/13.1	5.5/13.8	1.9/4.8	3.1/7.7	4.2/10.5	5.2/13.1	5.5/13.8	5.5/13.8
24	55	125	244	395	514	642	110	251	487	790	1139	1424	376	731	1184	1708	2137	2379	975	1579	2278	2849	3172	3165
	44	97	187	301	441	615	87	194	373	602	882	1230	291	560	902	1322	1845	-	747	1203	1763	2460	-	-
25	1.5/3	1.5/3	1.7/4.3	2.8/6.9	3.6/8.9	4.5/11.2	1.5/3	1.5/3	1.7/4.3	2.8/6.9	4/9.9	4.9/12.3	1.5/3	1.7/4.3	2.8/6.9	4/9.9	4.9/12.3	5.5/13.8	1.7/4.3	2.8/6.9	4/9.9	4.9/12.3	5.5/13.8	5.5/13.8
	46	106	207	337	460	576	93	212	415	674	993	1277	319	622	1011	1490	1915	2253	829	1347	1986	2553	3004	2996
26	37	83	160	257	378	528	74	166	319	515	756	1056	249	479	772	1133	1584	2130	638	1029	1511	2112	2839	-
	1.5/3	1.5/3	1.5/3.8	2.5/6.2	3.4/8.5	4.2/10.6	1.5/3	1.5/3.8	2.5/6.2	3.6/9.1	4.7/11.7	1.5/3	1.5/3.8	2.5/6.2	3.6/9.1	4.7/11.7	5.5/13.8	5.5/13.8	1.5/3.8	2.5/6.2	3.6/9.1	4.7/11.7	5.5/13.8	5.5/13.8
27	39	91	178	289	415	519	79	181	355	579	855	1151	272	533	868	1283	1726	2109	711	1158	1711	2301	2812	2844
	32	71	137	222	326	457	64	142	275	444	652	913	214	412	666	979	1370	1845	549	887	1305	1827	2460	-
28	1.5/3	1.5/3	1.5/3.5	2.3/5.6	3.2/8	4/10	1.5/3	1.5/3	1.5/3.5	2.3/5.6	3.3/8.3	4.4/11.1	1.5/3	1.5/3.5	2.3/5.6	3.3/8.3	4.4/11.1	5.4/13.6	1.5/3.5	2.3/5.6	3.3/8.3	4.4/11.1	5.4/13.6	5.5/13.8
	67	133	218	323	427	58	135	266	436	646	912	202	399	654	970	1367	1738	532	871	1293	1823	2317	2582	-
29	54	104	168	248	348	48	107	208	336	496	696	161	311	504	743	1044	1410	415	672	991	1392	1880	-	-
	1.5/3	1.5/3	1.9/4.7	2.8/6.9	3.6/9.1	1.5/3	1.5/3	1.5/3	1.9/4.7	2.8/6.9	3.9/9.7	1.5/3	1.5/3	1.9/4.7	2.8/6.9	3.9/9.7	4.9/12.3	1.5/3	1.9/4.7	2.8/6.9	3.9/9.7	4.9/12.3	5.5/13.8	5.5/13.8
30	51	102	168	249	353	43	102	204	335	499	706	153	305	503	748	1059	1440	407	670	998	1412	1920	2363	-
	42	80	130	193	271	37	83	161	261	385	542	125	241	391	578	813	1100	321	521	770	1083	1467	-	-
31	1.5/3	1.5/3	1.6/4	2.3/																				

MULTIPLE MEMBER CONNECTORS

Side-Loaded Applications

Number of Members	Maximum Uniform Side Load [plf]							
	Nailed ⁽³⁾		½" Dia. Through Bolt ⁽¹⁾			⅝" Dia. Through Bolt ⁽¹⁾		
	2 rows 16d Sinkers @ 12" o.c.	3 rows 16d Sinkers @ 12" o.c.	2 rows @ 24" o.c. staggered	2 rows @ 12" o.c. staggered	2 rows @ 6" o.c. staggered	2 rows @ 24" o.c. staggered	2 rows @ 12" o.c. staggered	2 rows @ 6" o.c. staggered
1¾" Versa-Lam® (Depths of 18" and less)								
2	470	705	505	1010	2020	560	1120	2245
3 ⁽²⁾	350	525	375	755	1515	420	840	1685
4 ⁽³⁾	use bolt schedule		335	670	1345	370	745	1495
3½" Versa-Lam®								
2 ⁽³⁾	use bolt schedule		855	1715	N/A	1125	2250	N/A

- Design values apply to common bolts that conform to ANSI/ASME standard B18.21-1981 (ASTM A307 Grades A&B, SAE J429 Grades 1 or 2, or higher). A washer not less than a standard cut washer shall be between the wood and the bolt head and between the wood and the nut. The distance from the edge of the beam to the bolt holes must be at least 2" for ½" bolts and 2½" for ⅝" bolts. Bolt holes shall be the same diameter as the bolt.
- The nail schedules shown apply to both sides of a 3-member beam.
- 16d box nails = 0.135" diameter x 3.5" length, 16d sinker nails = 0.148" diameter x 3.25" length.
- 7" wide beams must be top-loaded or loaded from both sides (lesser side shall be no less than 25% of opposite side).

Top-Loaded Applications

For top-loaded beams and beams with side loads less than shown in Side-Loaded Applications table above:			
Ply	Depth	Nailing ⁽²⁾	Maximum Uniform Load From One Side
(2) 1¾" plies	Depths 11⅝" & less	2 rows 16d box/sinker nails @ 12" o.c.	400 plf
	Depths 14" - 18"	3 rows 16d box/sinker nails @ 12" o.c.	600 plf
(3) 1¾" plies ⁽¹⁾	Depths 11⅝" & less	2 rows 16d box/sinker nails @ 12" o.c.	300 plf
	Depths 14" - 18"	3 rows 16d box/sinker nails @ 12" o.c.	450 plf
(4) 1¾" plies	Depths 18" & less	2 rows ½" bolts @ 24" o.c., staggered	335 plf
(2) 3½" plies	Depths 18" & less	2 rows ½" bolts @ 24" o.c., staggered	855 plf
	Depth 20" - 24"	3 rows ½" bolts @ 24" o.c., staggered every 8"	1285 plf

- The nail schedules shown apply to both sides of a 3-member beam.
- 16d box nails = 0.135" diameter x 3.5" length, 16d sinker nails = 0.148" diameter x 3.25" length.
- Beams wider than 7" must be designed by the engineer of record.
- All values in these tables may be increased by 15% for snow-load roofs and by 25% for non-snow load roofs where the building code allows.
- Use allowable load tables or BC Calc® software to size beams.
- An equivalent specific gravity of 0.5 may be used when designing specific connections with Versa-Lam®.
- Connection values are based upon the 2018 NDS.
- FastenMaster TrussLOK®, Simpson Strong-Tie SDW or SDS, and USP WS screws may also be used to connect multiple member Versa-Lam® beams, contact Boise Cascade EWP Engineering for further information.

VERSA-STUD® 1.8E 2400

Reference Design Values

Product	Bending F _b [psi]	Compression Parallel to Grain F _c [psi]	Compression Perp to Grain F _{c⊥} [psi]	Modulus of Elasticity - Apparent E [psi]	Horizontal Shear F _v [psi]
Versa-Stud® 1.8E 2400 1½" x 5½"	2617	3000	450	1,700,000	285
Douglas-Fir # 2 Grade 2 x 6	1170	1350	625	1,600,000	180
Spruce Pine Fir (North) # 1 / 2 Grade 2 x 6	1138	1150	425	1,400,000	135
Hem-Fir # 2 Grade 2 x 6	1105	1300	405	1,300,000	150
Western Woods # 2 Grade 2 x 6	878	900	335	1,000,000	135

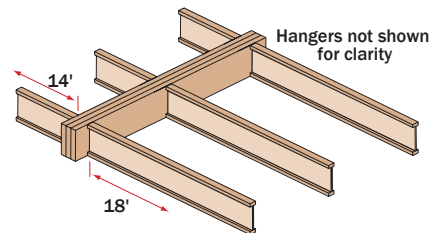
- Design values are for loads applied to the narrow face of the studs.
- Dimension lumber values taken from 2018 NDS Supplement: Design Values for Wood Construction (per 2018 IBC/IRC).
- Repetitive member factors have not been applied to the bending values. Depth (size) factors per ICC-ES ESR-1040 and 2018 NDS have been applied to the corresponding bending values.

For further design information, please see Versa-Stud 1.8E 2400 Western Tall Wall Guide.

DESIGNING CONNECTIONS FOR MULTIPLE VERSA-LAM® MEMBERS

When using multiple ply Versa-Lam® beams to create a wider member, the connection of the plies is as critical as determining the beam size. When side loaded beams are not connected properly, the inside plies do not support their share of the load and thus the load-carrying capacity of the full member decreases significantly. The following is an example of how to size and connect a multiple-ply Versa-Lam® floor beam.

Given: Beam shown below is supporting residential floor load (40 psf live load, 10 psf dead load) and is spanning 16'-0". Beam depth is limited to 14".



Find: A multiple 1¾" ply Versa-Lam® that is adequate to support the design loads and the member's proper connection schedule.

- Calculate the tributary width that beam is supporting:
 $14' / 2 + 18' / 2 = 16'$
- Use PLF tables on pages 3-5 of this guide or BC Calc® to size beam.
A Triple Versa-Lam® 2.1 2800 1¾" x 14" is found to adequately support the design loads
- Calculate the maximum plf load from one side (the right side in this case).
Max. Side Load = $(18' / 2) \times (40 + 10 \text{ psf}) = 450 \text{ plf}$
- Go to the Multiple Member Connection Table, Side-Loaded Applications, 1¾" Versa-Lam®, 3 members.
- The proper connection schedule must have a capacity greater than the max. side load:
Nailed: 3 rows 16d sinkers @ 12" o.c.
525 plf is greater than 450 plf OK
Bolts: ½" diameter 2 rows @ 12" staggered:
755 plf is greater than 450 plf OK

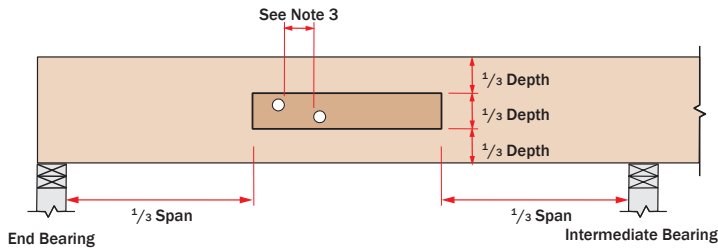
VERSA-LAM® LVL BEAM DETAILS

<p>BEARING AT CONCRETE/MASONRY WALLS</p> <p>Provide moisture barrier and lateral restraint at bearing.</p> <p>1/2" air space required between concrete and wood.</p> <p>B01</p>	<p>BEARING FOR DOOR OR WINDOW HEADER</p> <p>Strap per code if top plate is not continuous over header.</p> <p>Trimmers</p> <p>B02</p>	<p>BEAM TO BEAM CONNECTOR</p> <p>Hanger per design professional of record.</p> <p>B03</p>	<p>BEARING AT COLUMN</p> <p>Versa-Lam® column</p> <p>Column connector per design professional of record.</p> <p>B04</p>
<p>SLOPE SEAT CUT</p> <p>Sloped seat cut. Not to exceed inside face of bearing.</p> <p>Blocking not shown for clarity.</p> <p>B06</p>	<p>BEVEL CUT</p> <p>DO NOT bevel cut Versa-Lam® beyond inside face of wall without approval from Boise Cascade EWP Engineering or BC Calc® software analysis.</p> <p>B07</p>	<p>BEAM TO CONCRETE/MASONRY WALLS</p> <p>Wood top plate must be flush with inside of wall.</p> <p>Hanger</p> <p>Moisture barrier between concrete and wood.</p> <p>B08</p>	<p>BEARING FRAMING INTO WALL</p> <p>Strap per code if top plate is not continuous.</p> <p>B09</p>

INSTALLATION NOTES

- Minimum of 1/2" air space between beam and wall pocket or adequate barrier must be provided between beam and concrete/masonry.
- Adequate bearing shall be provided. If not shown on plans, please refer to load tables on pages 3-5 of this guide.
- Versa-Lam® beams are intended for interior applications only and should be kept as dry as possible during construction.
- Continuous lateral support of top of beam shall be provided (side or top bearing framing).

ALLOWABLE HOLES IN VERSA-LAM® LVL BEAMS



1. Square and rectangular holes are not permitted.
2. Round holes may be drilled or cut with a hole saw anywhere within the shaded area of the beam.
3. The horizontal distance between adjacent holes must be at least two times the size of the larger hole.
4. Do not drill more than three access holes in any four foot long section of beam.

5. The maximum round hole diameter permitted is:

Beam Depth	Max. Hole Diameter
5 1/2"	3/4"
7 1/4"	1"
9 1/4" and greater	2"

6. These limitations apply to holes drilled for plumbing or wiring access only. The size and location of holes drilled for fasteners are governed by the provisions of the *National Design Specification® for Wood Construction*.
7. Beams deflect under load. Size holes to provide clearance where required.
8. This hole chart is valid for beams supporting uniform load only. For beams supporting concentrated loads or for beams with larger holes, use BC Calc® sizing software (www.BCCalc.com) or contact Boise Cascade EWP Engineering.



Boise Cascade®
ENGINEERED WOOD PRODUCTS

**WESTERN UNITED STATES
DESIGN GUIDE**

Rev 06.20.19

