

ROSBORO **X-BEAM[®]2.0E** NEXT-GEN GLULAM



STRENGTH YOU CAN RELY ON

X-Beam 2.0E stock glulam from Rosboro is your go-to for beam and header applications. Our full framing-width, Architectural-appearance Douglas Fir glulam is engineered to a 2.0E true modulus of elasticity, delivering superior strength and the rich, natural beauty of Douglas Fir. Available through our extensive distribution network, X-Beam 2.0E is ready to arrive at your jobsite as early as today.



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Our full-framing-width 2.0E architectural appearance glulam, X-Beam is ideal for both exposed and concealed framing applications. 24F-V4-2.0E_{TRUE}

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X-Beam® Stock Columns	23 - 25
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Glulam columns allow builders to run framing from floor to ceiling with one continuous piece. X-Beam™ glulam columns are architectural appearance and are available in lengths up to 60 feet.

X-Rim™ ($1,450F_b - 1.6E_{TRUE}$)	27
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The first glulam beam manufactured specifically for rim applications, X-Rim is zero-camber, kiln-dried and manufactured to tighter depth tolerances to provide stability throughout the building envelope.

Engineered Structural Lumber ($2,000F_b - 1.7E_{TRUE}$)	28
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1.6E ESL is an industrial finish beam for headers and other light-duty framing applications. Balanced layup for ease of use.

Rosboro Custom Glulam	29
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Our custom glulam division is your source for custom sizes, variable lengths, alternate layups, job packs, industrial uses, exterior applications, and even metric dimensions.

Rosboro Laminated Decking (RLD)	30 - 31
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A cost-effective glulam decking alternative to other mass timber flooring and roof systems. Manufactured in a variety of ANSI Standard layups and appearances.

Alaskan Yellow Cedar (AYC)	32 - 34
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AYC is the naturally durable species for exterior framing applications. Rosboro can manufacture AYC glulam in a variety of ANSI Standard layups and appearances.

Who We Are

Rosboro is North America's largest producer of glulam beams, manufacturing a wide range of glued-laminated timber products including our flagship X-Beam® 2.0E, the industry's premier stock glulam. We began producing glulam in 1964 and have been leading the way ever since. Our production process is vertically integrated from the log to the finished beam, which allows us to have full control over the production, grading, and quality control of our raw materials. The result is a suite of timber products that we can stand behind and that you can trust to do the job. X-Beam 2.0E is a proprietary, enhanced version of the more traditional 24F-V4 Douglas Fir glulam, manufactured at full-framing-widths to fit the wall and engineered with a 2.0E true modulus of elasticity. Distributors that stock Rosboro X-Beam 2.0E have a distinct advantage over their competitors. In addition to the stock X-Beam 2.0E, Rosboro manufactures a full suite of glued-laminated timber products to provide our dealers and distributors with every tool they need to win the next job. Over the years, we have grown with our customers to become the most sought-after glulam partner in North America.

Now glulam is all we do.

Building Green

Rosboro glulam is an engineered wood product designed for sustainability and efficiency. Our products are produced from renewable 2nd and 3rd generation forests, optimizing fiber use by placing high-grade material only where needed. Our adhesives meet strict global emissions standards, including the California Air Resources Board (CARB). X-Beam also holds the APA Green Verification Report GR-L251, supporting LEED and ICC 700 green building certifications.

Field and Technical Support - (877) 457-4139

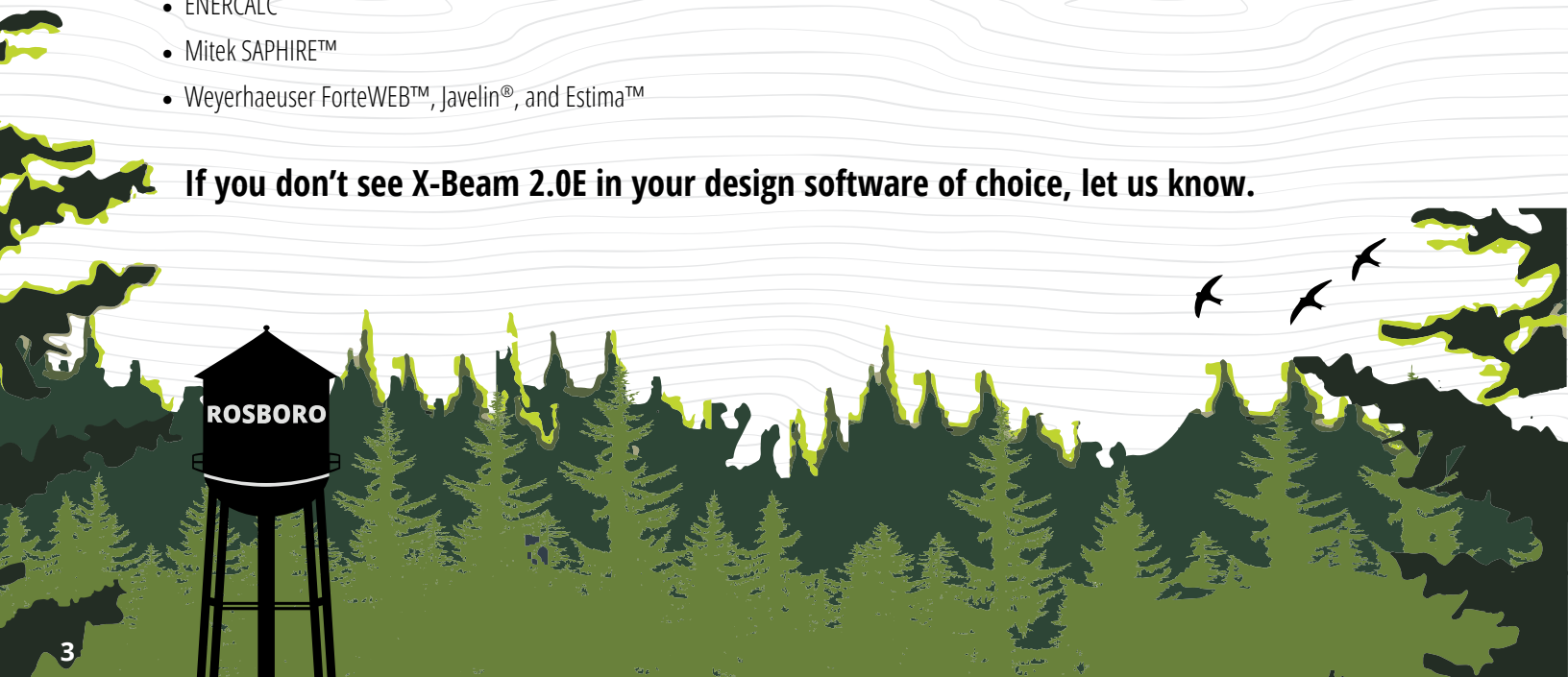
Our representatives are available to assist by phone and even in-person with any glulam challenge. Call us any time to speak with one of our Market Development Managers or a Professional Engineer. We are here to help!

Design Software

Rosboro glulam, including X-Beam 2.0E (24F-V4-2.0E_{TRUE}), can be found in the following structural design software:

- Simpson CSD iStruct® Suite
- ENERCALC
- Mitek SAPPHIRE™
- Weyerhaeuser ForteWEB™, Javelin®, and Estima™

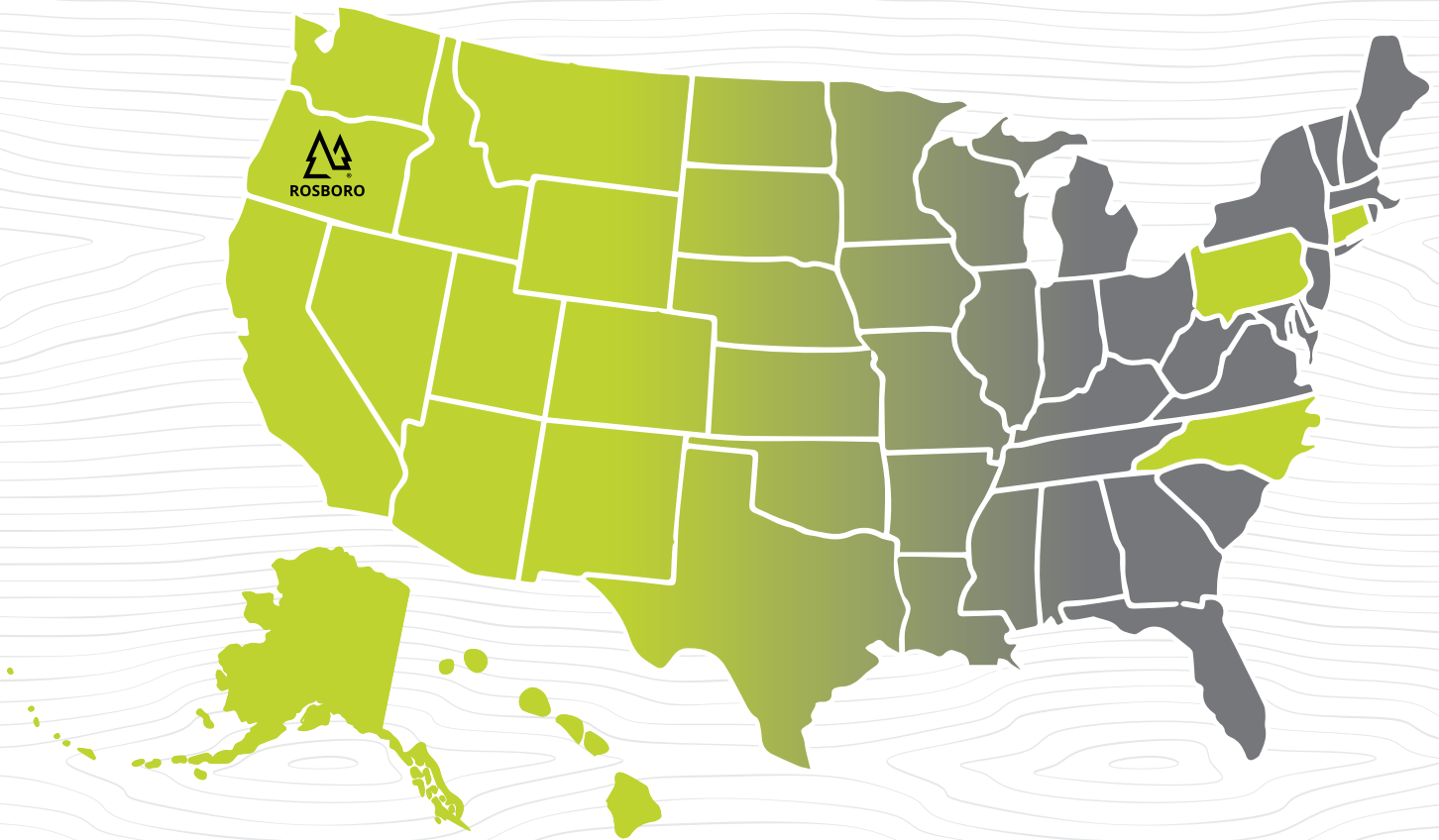
If you don't see X-Beam 2.0E in your design software of choice, let us know.



Depend on the Largest Glulam Distribution Footprint in North America

Get access to on-the-ground inventory available for next-day jobsite delivery via our expansive distribution network. Currently stretching across 24 states, Rosboro continues to expand our market availability to help serve you best.

NATIONWIDE DISTRIBUTION



Alaska
Arizona
California
Colorado
Connecticut
Hawaii
Idaho
Illinois

Kansas
Minnesota
Missouri
Montana
Nebraska
Nevada
New Mexico
North Carolina

Oklahoma
Oregon
Pennsylvania
Texas
Utah
Washington
Wisconsin
Wyoming

To locate a distributor near you, view our interactive distribution map at Rosboro.com/find-a-distributor



BUILD WITH CONFIDENCE

Proven Performance | 2.0E True | 1.9E Apparent

There is NO Substitute

Rosboro is the only stock glulam manufacturer in the nation with a proprietary ICC ESR Report that includes the City of LA Supplement. This ensures that ALL Rosboro Products, including X-Beam 2.0E (24F-V4-2.0E_{TRUE}), are codified and accepted for use in all US jurisdictions.

Scan the code to access your copy.



ICC-ES Evaluation Report

ESR-5752

Issued May 2025 This report also contains:
 Revised May 22, 2025 - [City of LA Supplement](#)
 Subject to renewal May 2026

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DIVISION: 06 00 00— WOOD, PLASTICS AND COMPOSITES Section: 06 02 00— Design Information Section: 06 18 13— Glued-Laminated Beams	REPORT HOLDER: ROSBORO COMPANY, LLC	EVALUATION SUBJECT: GLUED-LAMINATED TIMBER	
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Trust in the Stamp

X-Beam's internally produced, proprietary laminating stock is continually tested and rated to give you confidence that it will carry the load. Compliance is stamped on every beam.



24F-V4-2.0E^{TRUE}

ARCH UNBALANCED DF/L

APA	MILL 1001 ANSI A190.1	ICC-ES ESR-S752	ICC ES [®]
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Guaranteed to Perform

All Rosboro products are manufactured to meet ANSI Standard compliance and are backed by a 25-year Manufacturer's Warranty against defect.



Builders Rely on X-Beam 2.0E

- Architectural appearance makes it ready for exposed applications
- Matches standard framing dimensions
- Single-piece installation
- Compatible with I-Joist and traditional depths
- Made from renewable second and third growth resources
- Longer span capacity than any other 24F-V4 Douglas Fir stock glulam
- Uses readily available timber hangers, not more costly 1/8" hangers
- Inventoried locally at most reputable distributors for immediate shipment

X-BEAM 2.0E Technical Specifications

Stock Glulam Specs

This stock glulam specification is intended to provide design values and product attributes for X-Beam Glulam that is inventoried in standard sizes by a nationwide network of distributors and lumber dealers that provide next-day delivery.

Certification Specs

Rosboro glulam products are inspected and certified by the APA/EWS to ANSI A190.1 and ANSI 117 standards. The products meet all International Residential Code (IRC) and International Building Code (IBC) specifications as reported by ICC-ES ESR-5752 and APA Product Report PR-L251.

Design Values

Glulam shall be Douglas Fir combination 24F-V4-2.0E_{TRUE}.

ROSBORO X-BEAM® 2.0E DESIGN VALUES

Product	Layup Combination	Bending F_b (psi) ²		Compression Perpendicular to Grain $F_{c\perp}$ (psi)	Shear F_v (psi) ³	MOE (10 ⁶ psi)	
		Tension Zone	Compression Zone			Apparent	True
X-Beam 2.0E	24F-V4-2.0E _{TRUE}	2400	1850	650	265	1.9	2.0

1. F_b shall be adjusted by the volume factor using the formula:

$$C_v = (21/L)^{1/10} \times (12/d)^{1/10} \times (5.125/b)^{1/10} \leq 1.0$$
 (NDS-18 EQ. 5.3-1)
 where: b = beam width (in.), d = beam depth (in.), L = beam length (ft)
2. For non-prismatic members, notched members, members subject to impact or cyclic loading, or shear design of bending members at connections (NDS-Current), the design shear (F_v) shall be multiplied by a factor of 0.72.
3. The F_v values do not include adjustments for checking.

X-Beam Widths

3½" • 5½" • 6¾" • 8¾"

X-Beam Depths

Conventional depths 6" to 24" in 1½" increments

I-Joist compatible depths 9½" • 11⅞" • 14" • 16" • 18"

ROSBORO X-BEAM 2.0 DESIGN PROPERTIES

24F-V4-2.0E_{TRUE} | Dry-Use | F_b = 2,400 psi | F_v = 265 psi | F_c = 650 psi | E_{Apparent} = 1.9x 10⁶ psi | E_{True} = 2.0 x 10⁶ psi

Width (in.)	Depth (in.)	Weight (lb/ft)	Maximum Resistive Shear (lbf)			Maximum Resistive Moment (lb-ft)			EI (10 ⁶ in ² -lb/f)
			100%	115%	125%	100%	115%	125%	
3 1/2	6	5.1	3710	4267	4638	4200	4830	5250	120
	7 1/2	6.4	4638	5333	5797	6563	7547	8203	234
	9	7.7	5565	6400	6956	9450	10868	11813	404
	9 1/2	8.1	5874	6755	7343	10529	12109	13161	475
	10 1/2	8.9	6493	7466	8116	12863	14792	16078	642
	11 7/8	10.1	7343	8444	9178	16452	18920	20565	928
	13 1/2	11.5	8348	9600	10434	21263	24452	26578	1363
	14	11.9	8657	9955	10821	22867	26297	28583	1521
	15	12.8	9275	10666	11594	26250	30188	32813	1870
	16	13.6	9893	11377	12367	29867	34347	37333	2270
	16 1/2	14.0	10203	11733	12753	31763	36527	39703	2489
	18	15.3	11130	12800	13913	37800	43470	47250	3232
5 1/2	19 1/2	16.6	12058	13866	15072	44363	51017	55453	4109
	6	8.0	5830	6705	7288	6600	7590	8250	188
	7 1/2	10.0	7288	8381	9109	10313	11859	12891	367
	9	12.0	8745	10057	10931	14850	17078	18563	635
	9 1/2	12.7	9231	10615	11539	16546	19028	20682	747
	10 1/2	14.0	10203	11733	12753	20213	23244	25266	1008
	11 7/8	15.9	11539	13269	14423	25853	29731	32316	1458
	13 1/2	18.0	13118	15085	16397	33413	38424	41766	2143
	14	18.7	13603	15644	17004	35933	41323	44917	2390
	15	20.1	14575	16761	18219	41250	47438	51563	2939
	16	21.4	15547	17879	19433	46933	53973	58667	3567
	16 1/2	22.1	16033	18437	20041	49913	57399	62391	3912
	18	24.1	17490	20114	21863	59400	68310	74250	5079
	19 1/2	26.1	18948	21790	23684	69713	80169	87141	6457
	21	28.1	20405	23466	25506	80850	92978	101063	8065
6 3/4	22 1/2	30.1	21863	25142	27328	92813	106734	116016	9919
	24	32.1	23320	26818	29150	105600	121440	132000	12038
	9	14.8	10733	12342	13416	18225	20959	22781	779
	10 1/2	17.2	12521	14399	15652	24806	28527	31008	1237
	11 7/8	19.5	14161	16285	17701	31729	36488	39661	1790
	13 1/2	22.1	16099	18514	20123	41006	47157	51258	2630
	15	24.6	17888	20571	22359	50625	58219	63281	3607
	16 1/2	27.1	19676	22628	24595	61256	70445	76570	4801
	18	29.5	21465	24685	26831	72900	83835	91125	6233
	19 1/2	32.0	23254	26742	29067	85556	98390	106945	7925
8 3/4	21	34.5	25043	28799	31303	99225	114109	124031	9898
	22 1/2	36.9	26831	30856	33539	113906	130992	142383	12174
	24	39.4	28620	32913	35775	129600	149040	162000	14774
	9	19.1	13913	15999	17391	23625	27169	29531	1010
	10 1/2	22.3	16231	18666	20289	32156	36980	40195	1604
	11 7/8	25.3	18357	21110	22946	41130	47299	51412	2320
	13 1/2	28.7	20869	23999	26086	53156	61130	66445	3409
	15	31.9	23188	26666	28984	65625	75469	82031	4676
	16 1/2	35.1	25506	29332	31883	79406	91317	99258	6223
	18	38.3	27825	31999	34781	94500	108675	118125	8080
	19 1/2	41.5	30144	34665	37680	110906	127542	138633	10273

Notes:

1. Beam Weight is assumed to be 35 pcf.
2. Maximum resistive moment shall be adjusted by volume factor based on NDS-Current.

 Indicates I-Joist Compatible (IJC) Depth

Tabulated values are pounds per lineal foot

ALLOWABLE UNIFORM LOAD VALUES FOR SIMPLE SPAN APPLICATIONS - FLOOR BEAMS (LDF=1.00)

24F-V4-2.0E_{TRUE} | Dry-Use | F_b = 2,400 psi | F_v = 265 psi | F_c = 650 psi | E_{Apparent} = 1.9x 10⁶ psi | E_{True} = 2.0 x 10⁶ psi

Width	Depth	Span												
			8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'
3 1/2"	6"	LL (plf)	346	177	103	65	43	-	-	-	-	-	-	-
		TL (plf)	514	261	149	92	60	-	-	-	-	-	-	-
		BRG (in.)	1.5	1.5	1.5	1.5	1.5	-	-	-	-	-	-	-
	7 1/2"	LL (plf)	676	346	200	126	85	59	43	-	-	-	-	-
		TL (plf)	914	513	294	183	120	83	59	-	-	-	-	-
		BRG (in.)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-	-	-	-	-
	9"	LL (plf)	1169	599	346	218	146	103	75	56	43	-	-	-
		TL (plf)	1174	748	512	320	212	146	105	77	57	-	-	-
		BRG (in.)	2.1	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-	-	-
	9 1/2"	LL (plf)		704	407	257	172	121	88	66	51	40	-	-
		TL (plf)	1308	834	577	377	250	173	124	91	68	52	-	-
		BRG (in.)	2.3	1.9	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-	-
	10 1/2"	LL (plf)		950	550	346	232	163	119	89	69	54	43	-
		TL (plf)	1599	1020	706	511	339	236	169	125	94	72	56	-
		BRG (in.)	2.8	2.3	1.9	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-
	11 7/8"	LL (plf)			796	501	336	236	172	129	99	78	63	51
		TL (plf)	2046	1306	904	661	493	343	248	184	139	107	84	66
		BRG (in.)	3.6	2.9	2.4	2.1	1.8	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	13 1/2"	LL (plf)			1169	736	493	346	252	190	146	115	92	75
		TL (plf)	2646	1690	1170	856	653	508	367	273	208	161	127	101
		BRG (in.)	4.7	3.7	3.1	2.7	2.3	2.1	1.7	1.5	1.5	1.5	1.5	1.5
	14"	LL (plf)				821	550	386	282	212	163	128	103	83
		TL (plf)	2846	1817	1258	921	703	553	410	305	233	180	142	113
		BRG (in.)	5.0	4.0	3.4	2.9	2.5	2.2	1.9	1.5	1.5	1.5	1.5	1.5
	15"	LL (plf)				1010	676	475	346	260	200	158	126	103
		TL (plf)	3268	2087	1446	1059	808	635	507	378	288	224	177	141
		BRG (in.)	5.8	4.6	3.8	3.3	2.9	2.6	2.3	1.9	1.6	1.5	1.5	1.5
	16"	LL (plf)					821	577	420	316	243	191	153	125
		TL (plf)	3720	2376	1646	1205	920	724	584	460	351	273	216	173
		BRG (in.)	6.6	5.3	4.4	3.8	3.3	2.9	2.6	2.3	1.9	1.6	1.5	1.5
	16 1/2"	LL (plf)					900	632	461	346	267	210	168	137
		TL (plf)	3956	2527	1751	1282	979	770	621	505	386	301	238	191
		BRG (in.)	7.0	5.6	4.7	4.0	3.5	3.1	2.8	2.5	2.1	1.8	1.6	1.5
	18"	LL (plf)						821	599	450	346	272	218	177
		TL (plf)	4710	3009	2085	1528	1166	918	741	605	501	393	312	251
		BRG (in.)	8.3	6.6	5.5	4.7	4.2	3.7	3.3	3.0	2.7	2.3	2.0	1.8
	19 1/2"	LL (plf)							1044	761	572	440	346	277
		TL (plf)	5529	3532	2448	1794	1370	1079	866	706	585	492	399	322
		BRG (in.)	9.8	7.8	6.5	5.6	4.9	4.3	3.9	3.5	3.2	2.9	2.6	2.2

Notes per page 12

Tabulated values are pounds per lineal foot

ALLOWABLE UNIFORM LOAD VALUES FOR SIMPLE SPAN APPLICATIONS - FLOOR BEAMS (LDF=1.00)

24F-V4-2.0E_{TRUE} | Dry-Use | F_b = 2,400 psi | F_v = 265 psi | F_c = 650 psi | E_{Apparent} = 1.9x 10⁶ psi | E_{True} = 2.0 x 10⁶ psi

Width	Depth	Span												
			8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'
5 1/2"	6"	LL (plf)	544	279	161	102	68	48	-	-	-	-	-	-
		TL (plf)	808	410	234	144	94	64	-	-	-	-	-	-
		BRG (in.)	1.5	1.5	1.5	1.5	1.5	1.5	-	-	-	-	-	-
	7 1/2"	LL (plf)	1063	544	315	198	133	93	68	51	-	-	-	-
		TL (plf)	1279	806	462	287	189	130	92	67	-	-	-	-
		BRG (in.)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-	-	-	-
	9"	LL (plf)	1837	941	544	343	230	161	118	88	68	54	43	-
		TL (plf)	1844	1176	804	502	332	230	164	120	90	68	52	-
		BRG (in.)	2.1	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-
	9 1/2"	LL (plf)		1106	640	403	270	190	138	104	80	63	50	-
		TL (plf)		2056	1311	907	592	392	272	195	143	107	82	-
		BRG (in.)		2.3	1.9	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-
	10 1/2"	LL (plf)		1493	864	544	365	256	187	140	108	85	68	55
		TL (plf)		2513	1603	1109	802	533	370	266	196	148	113	88
		BRG (in.)		2.8	2.3	1.9	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	11 7/8"	LL (plf)			1250	787	527	370	270	203	156	123	98	80
		TL (plf)		3216	2052	1420	1039	775	540	389	288	219	169	132
		BRG (in.)		3.6	2.9	2.4	2.1	1.8	1.5	1.5	1.5	1.5	1.5	1.5
	13 1/2"	LL (plf)			1837	1157	775	544	397	298	230	181	145	118
		TL (plf)		4159	2655	1838	1346	1026	798	577	429	326	253	199
		BRG (in.)		4.7	3.7	3.1	2.7	2.3	2.1	1.7	1.5	1.5	1.5	1.5
	14"	LL (plf)				1290	864	607	443	332	256	201	161	131
		TL (plf)		4473	2856	1978	1448	1104	862	645	480	365	283	223
		BRG (in.)		5.0	4.0	3.4	2.9	2.5	2.2	1.9	1.5	1.5	1.5	1.5
	15"	LL (plf)				1587	1063	747	544	409	315	248	198	161
		TL (plf)		5136	3280	2272	1664	1266	984	785	593	452	352	277
		BRG (in.)		5.8	4.6	3.8	3.3	2.9	2.5	2.3	1.9	1.6	1.5	1.5
	16"	LL (plf)					1290	906	661	496	382	301	241	196
		TL (plf)		5845	3733	2586	1894	1433	1114	889	723	552	430	340
		BRG (in.)		6.6	5.3	4.4	3.8	3.3	2.9	2.5	2.3	1.9	1.6	1.5
	16 1/2"	LL (plf)					1415	994	724	544	419	330	264	215
		TL (plf)		6217	3971	2751	2015	1520	1182	943	768	607	473	374
		BRG (in.)		7.0	5.6	4.7	4.0	3.4	3.0	2.7	2.4	2.1	1.8	1.6
	18"	LL (plf)						1290	941	707	544	428	343	279
		TL (plf)		7401	4728	3276	2383	1795	1396	1114	908	752	618	490
		BRG (in.)		8.3	6.6	5.5	4.7	4.1	3.6	3.2	2.9	2.6	2.3	2.0
	19 1/2"	LL (plf)							1196	898	692	544	436	354
		TL (plf)		8688	5551	3847	2777	2091	1627	1299	1059	878	738	628
		BRG (in.)		9.8	7.8	6.5	5.5	4.7	4.2	3.7	3.3	3.0	2.8	2.6
	21"	LL (plf)							1493	1122	864	680	544	443
		TL (plf)		10078	6440	4432	3199	2410	1875	1498	1221	1012	851	725
		BRG (in.)		11.3	9.0	7.5	6.3	5.5	4.8	4.3	3.8	3.5	3.2	2.9
	22 1/2"	LL (plf)								1380	1063	836	669	544
		TL (plf)		11571	7395	5055	3649	2749	2140	1709	1394	1156	972	828
		BRG (in.)		13.0	10.4	8.5	7.2	6.2	5.5	4.9	4.4	4.0	3.6	3.4
	24"	LL (plf)									1290	1015	812	661
		TL (plf)		13168	8397	5716	4126	3110	2421	1934	1578	1309	1101	938
		BRG (in.)		14.8	11.8	9.6	8.1	7.0	6.2	5.5	5.0	4.5	4.1	3.8

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Tabulated values are pounds per lineal foot

ALLOWABLE UNIFORM LOAD VALUES FOR SIMPLE SPAN APPLICATIONS - FLOOR BEAMS (LDF=1.00)

24F-V4-2.0E_{TRUE} | Dry-Use | $F_b = 2,400$ psi | $F_v = 265$ psi | $F_c = 650$ psi | $E_{\text{Apparent}} = 1.9 \times 10^6$ psi | $E_{\text{True}} = 2.0 \times 10^6$ psi

Width	Depth	Span												
			8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'
6 3/4"	9"	LL (plf)	2254	1154	668	421	282	198	144	108	83	66	53	-
		TL (plf)	2263	1443	987	616	408	282	202	148	110	84	64	-
		BRG (in.)	2.1	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-
	10 1/2"	LL (plf)		1833	1061	668	447	314	229	172	133	104	83	68
		TL (plf)	3084	1967	1361	985	654	454	326	241	182	139	108	85
		BRG (in.)	2.8	2.3	1.9	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	11 7/8"	LL (plf)			1534	966	647	455	331	249	192	151	121	98
		TL (plf)	3947	2519	1743	1276	951	662	478	354	268	207	162	128
		BRG (in.)	3.6	2.9	2.4	2.1	1.8	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	13 1/2"	LL (plf)			2254	1420	951	668	487	366	282	222	177	144
		TL (plf)	5104	3258	2256	1652	1244	966	708	527	401	310	244	194
		BRG (in.)	4.7	3.7	3.1	2.7	2.3	2.0	1.7	1.5	1.5	1.5	1.5	1.5
	15"	LL (plf)				1947	1305	916	668	502	387	304	243	198
		TL (plf)	6304	4025	2788	2023	1522	1183	943	728	555	431	341	272
		BRG (in.)	5.8	4.6	3.8	3.3	2.8	2.5	2.2	1.9	1.6	1.5	1.5	1.5
	16 1/2"	LL (plf)					1736	1220	889	668	515	405	324	263
		TL (plf)	7630	4873	3364	2427	1827	1420	1133	923	745	580	459	368
		BRG (in.)	7.0	5.6	4.6	3.9	3.4	3.0	2.6	2.4	2.1	1.8	1.6	1.5
	18"	LL (plf)						1583	1154	867	668	525	421	342
		TL (plf)	9083	5802	3972	2865	2157	1678	1339	1091	904	759	601	483
		BRG (in.)	8.3	6.6	5.5	4.6	4.0	3.5	3.1	2.8	2.6	2.3	2.0	1.8
	19 1/2"	LL (plf)							1468	1103	849	668	535	435
		TL (plf)	10663	6800	4626	3338	2514	1956	1562	1272	1055	886	754	620
		BRG (in.)	9.8	7.8	6.4	5.4	4.6	4.1	3.6	3.3	3.0	2.7	2.5	2.2
	21"	LL (plf)								1377	1061	834	668	543
		TL (plf)	12369	7830	5328	3845	2897	2254	1800	1467	1216	1023	871	748
		BRG (in.)	11.3	9.0	7.3	6.2	5.3	4.7	4.2	3.8	3.4	3.1	2.9	2.7
	22 1/2"	LL (plf)									1305	1026	822	668
		TL (plf)	14201	8929	6077	4386	3305	2572	2054	1675	1389	1169	995	856
		BRG (in.)	13.0	10.2	8.4	7.1	6.1	5.4	4.8	4.3	3.9	3.6	3.3	3.1
	24"	LL (plf)										1245	997	811
		TL (plf)	16155	10096	6872	4961	3738	2910	2325	1896	1573	1323	1127	970
		BRG (in.)	14.8	11.6	9.5	8.0	6.9	6.1	5.4	4.9	4.4	4.0	3.7	3.4

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Tabulated values are pounds per lineal foot

ALLOWABLE UNIFORM LOAD VALUES FOR SIMPLE SPAN APPLICATIONS - FLOOR BEAMS (LDF=1.00)

24F-V4-2.0E_{TRUE} | Dry-Use | $F_b = 2,400$ psi | $F_v = 265$ psi | $F_c = 650$ psi | $E_{\text{Apparent}} = 1.9 \times 10^6$ psi | $E_{\text{True}} = 2.0 \times 10^6$ psi

Width	Depth	Span												
			8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'
8 3/4"	9"	LL (plf)	2922	1496	866	545	365	257	187	141	108	85	68	55
		TL (plf)	2934	1871	1280	799	529	366	261	192	143	109	83	64
		BRG (in.)	2.1	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	10 1/2"	LL (plf)		2376	1375	866	580	407	297	223	172	135	108	88
		TL (plf)	3997	2550	1764	1276	848	589	423	312	235	180	140	110
		BRG (in.)	2.8	2.3	1.9	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	11 7/8"	LL (plf)			1989	1253	839	589	430	323	249	196	157	127
		TL (plf)	5091	3265	2260	1634	1228	859	619	459	348	268	210	166
		BRG (in.)	3.6	2.9	2.4	2.0	1.8	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	13 1/2"	LL (plf)				1840	1233	866	631	474	365	287	230	187
		TL (plf)	6616	4224	2897	2088	1570	1220	918	683	519	402	316	252
		BRG (in.)	4.7	3.7	3.1	2.6	2.2	2.0	1.7	1.5	1.5	1.5	1.5	1.5
	15"	LL (plf)				2524	1691	1188	866	651	501	394	316	257
		TL (plf)	8171	5210	3542	2554	1922	1494	1191	944	720	559	441	353
		BRG (in.)	5.8	4.6	3.8	3.2	2.7	2.4	2.1	1.9	1.6	1.5	1.5	1.5
	16 1/2"	LL (plf)					2251	1581	1152	866	667	525	420	341
		TL (plf)	9891	6247	4249	3064	2306	1793	1430	1164	964	752	595	477
		BRG (in.)	7.0	5.5	4.5	3.8	3.3	2.9	2.6	2.3	2.1	1.8	1.6	1.5
	18"	LL (plf)						2052	1496	1124	866	681	545	443
		TL (plf)	11774	7373	5016	3618	2724	2119	1691	1377	1141	958	780	627
		BRG (in.)	8.3	6.5	5.3	4.5	3.9	3.4	3.0	2.7	2.5	2.3	2.0	1.8
	19 1/2"	LL (plf)							1902	1429	1101	866	693	564
		TL (plf)	13745	8587	5843	4215	3174	2470	1971	1606	1331	1119	951	804
		BRG (in.)	9.7	7.6	6.2	5.2	4.5	4.0	3.5	3.2	2.9	2.7	2.4	2.2

Notes:

1. Applicable to simply-supported beam with sufficient bracing to avoid lateral buckling ($C_L = 1.0$).
2. Applicable to dry-use service conditions ($C_M = 1.0$).
3. Tabulated live load (LL) is based on the deflection criterion of span/360.
4. Tabulated total load (TL) is based on the deflection criterion of span/240.
5. Tabulated total load (TL) is in addition to beam weight (assumed 35 pcf).
6. Selected beam size shall satisfy both live load and total load.
7. "--" indicates the allowable load is smaller than 50 plf.
8. Blank live load indicates the live load is greater than or equal to total load.
9. Bearing "BRG" is in inches and is calculated based on the total load including the beam weight.

Tabulated values are pounds per lineal foot

ALLOWABLE UNIFORM LOAD FOR SIMPLE SPAN APPLICATIONS - ROOF BEAMS, SNOW LOAD (LDF=1.15)

24F-V4-2.0E_{TRUE} | Dry-Use | $F_b = 2,400$ psi | $F_v = 265$ psi | $F_c = 650$ psi | $E_{\text{Apparent}} = 1.9 \times 10^6$ psi | $E_{\text{True}} = 2.0 \times 10^6$ psi

Width	Depth		Span											
			8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'
3 1/2"	6"	LL (plf)	520	266	154	97	65	46	33	-	-	-	-	-
		TL (plf)	599	350	200	124	81	56	39	-	-	-	-	-
		BRG (in.)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-	-	-	-	-
	7 1/2"	LL (plf)		520	301	189	127	89	65	49	38	30	-	-
		TL (plf)	937	597	394	246	163	112	80	59	44	33	-	-
		BRG (in.)	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-	-
	9"	LL (plf)			520	327	219	154	112	84	65	51	41	33
		TL (plf)	1351	862	596	429	285	198	142	105	79	60	47	37
		BRG (in.)	2.4	1.9	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	9 1/2"	LL (plf)			611	385	258	181	132	99	76	60	48	39
		TL (plf)	1505	961	665	486	336	233	168	124	94	72	56	44
		BRG (in.)	2.7	2.1	1.8	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	10 1/2"	LL (plf)				520	348	244	178	134	103	81	65	53
		TL (plf)	1840	1174	813	595	453	317	229	170	129	99	78	61
		BRG (in.)	3.3	2.6	2.2	1.9	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	11 7/8"	LL (plf)				752	503	354	258	194	149	117	94	76
		TL (plf)	2355	1503	1041	762	581	457	334	248	189	146	115	92
		BRG (in.)	4.2	3.3	2.8	2.4	2.1	1.8	1.5	1.5	1.5	1.5	1.5	1.5
	13 1/2"	LL (plf)					740	520	379	285	219	172	138	112
		TL (plf)	3045	1945	1347	987	753	592	478	368	281	218	173	138
		BRG (in.)	5.4	4.3	3.6	3.1	2.7	2.4	2.1	1.8	1.5	1.5	1.5	1.5
	14"	LL (plf)						579	422	317	244	192	154	125
		TL (plf)	3275	2092	1449	1061	810	637	514	411	314	244	193	155
		BRG (in.)	5.8	4.6	3.9	3.3	2.9	2.6	2.3	2.0	1.7	1.5	1.5	1.5
	15"	LL (plf)						713	520	390	301	236	189	154
		TL (plf)	3761	2402	1664	1219	931	733	591	486	388	303	240	192
		BRG (in.)	6.6	5.3	4.4	3.8	3.3	2.9	2.7	2.4	2.1	1.8	1.6	1.5
	16"	LL (plf)							631	474	365	287	230	187
		TL (plf)	4280	2734	1895	1388	1060	834	673	554	462	369	293	235
		BRG (in.)	7.5	6.0	5.0	4.3	3.8	3.4	3.0	2.7	2.5	2.2	1.9	1.6
	16 1/2"	LL (plf)							691	520	400	315	252	205
		TL (plf)	4552	2908	2015	1477	1127	888	717	590	490	406	322	259
		BRG (in.)	8.0	6.4	5.4	4.6	4.0	3.6	3.2	2.9	2.7	2.4	2.1	1.8
	18"	LL (plf)								674	520	409	327	266
		TL (plf)	5418	3462	2400	1759	1343	1058	854	698	579	487	415	339
		BRG (in.)	9.6	7.6	6.4	5.5	4.8	4.2	3.8	3.4	3.1	2.9	2.6	2.3
	19 1/2"	LL (plf)									661	520	416	338
		TL (plf)	6361	4065	2818	2066	1578	1243	998	814	675	568	484	416
		BRG (in.)	11.2	9.0	7.5	6.4	5.6	5.0	4.5	4.0	3.6	3.3	3.1	2.9

Notes:

1. Applicable to simply-supported beam with sufficient bracing to avoid lateral buckling ($C_L = 1.0$).
2. Applicable to dry-use service conditions ($C_M = 1.0$).
3. Tabulated live load (LL) is based on the deflection criterion of span/240.
4. Tabulated total load (TL) is based on the deflection criterion of span/180.
5. Tabulated total load (TL) is in addition to beam weight (assumed 35 pcf).
6. Selected beam size shall satisfy both live load and total load.
7. "--" indicates the allowable load is smaller than 40 plf.
8. Blank live load indicates the live load is greater than or equal to total load.
9. Bearing "BRG" is in inches and is calculated based on the total load including the beam weight.

Tabulated values are pounds per lineal foot

ALLOWABLE UNIFORM LOAD FOR SIMPLE SPAN APPLICATIONS - ROOF BEAMS, SNOW LOAD (LDF=1.15)

24F-V4-2.0E_{TRUE} | Dry-Use | F_b = 2,400 psi | F_v = 265 psi | F_c = 650 psi | E_{Apparent} = 1.9x 10⁶ psi | E_{True} = 2.0 x 10⁶ psi

Width	Depth		Span											
			8'	10'	16'	14'	16'	18'	20'	22'	24'	26'	28'	30'
5 1/2"	6"	LL (plf)	816	418	242	152	102	72	52	39	30	-	-	-
		TL (plf)	941	549	315	195	128	88	62	44	32	-	-	-
		BRG (in.)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-	-	-
	7 1/2"	LL (plf)		816	472	298	199	140	102	77	59	46	37	30
		TL (plf)	1472	939	620	387	256	177	126	92	69	52	40	30
		BRG (in.)	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	9"	LL (plf)			816	514	344	242	176	132	102	80	64	52
		TL (plf)	2123	1354	937	673	447	310	223	165	124	95	74	58
		BRG (in.)	2.4	1.9	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	9 1/2"	LL (plf)			960	605	405	284	207	156	120	94	76	61
		TL (plf)	2366	1510	1044	764	527	367	264	195	147	113	88	69
		BRG (in.)	2.7	2.1	1.8	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	10 1/2"	LL (plf)				816	547	384	280	210	162	127	102	83
		TL (plf)	2892	1846	1277	935	712	498	359	266	202	156	122	97
		BRG (in.)	3.3	2.6	2.2	1.9	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	11 7/8"	LL (plf)				1181	791	556	405	304	234	184	148	120
		TL (plf)	3700	2363	1636	1198	913	718	524	390	297	230	181	144
		BRG (in.)	4.2	3.3	2.8	2.4	2.1	1.8	1.5	1.5	1.5	1.5	1.5	1.5
	13 1/2"	LL (plf)					1162	816	595	447	344	271	217	176
		TL (plf)	4785	3056	2117	1550	1183	927	740	578	441	343	271	217
		BRG (in.)	5.4	4.3	3.6	3.1	2.7	2.4	2.1	1.8	1.5	1.5	1.5	1.5
	14"	LL (plf)						911	664	499	384	302	242	197
		TL (plf)	5147	3287	2277	1668	1273	994	793	646	493	384	304	244
		BRG (in.)	5.8	4.6	3.9	3.3	2.9	2.6	2.3	2.0	1.7	1.5	1.5	1.5
	15"	LL (plf)						1120	816	613	472	372	298	242
		TL (plf)	5910	3775	2615	1916	1459	1135	906	738	610	475	377	302
		BRG (in.)	6.6	5.3	4.4	3.8	3.3	2.9	2.6	2.3	2.1	1.8	1.6	1.5
	16"	LL (plf)							991	744	573	451	361	294
		TL (plf)	6725	4296	2977	2182	1651	1284	1025	835	692	580	460	370
		BRG (in.)	7.5	6.0	5.0	4.3	3.7	3.3	2.9	2.6	2.4	2.2	1.9	1.6
	16 1/2"	LL (plf)							1087	816	629	495	396	322
		TL (plf)	7153	4570	3167	2321	1751	1362	1088	886	735	617	506	407
		BRG (in.)	8.0	6.4	5.4	4.6	4.0	3.5	3.1	2.8	2.5	2.3	2.1	1.8
	18"	LL (plf)									816	642	514	418
		TL (plf)	8515	5441	3771	2744	2067	1609	1285	1048	869	730	622	533
		BRG (in.)	9.6	7.6	6.4	5.4	4.7	4.1	3.7	3.3	3.0	2.7	2.5	2.3
	19 1/2"	LL (plf)										816	654	531
		TL (plf)	9995	6387	4428	3197	2409	1875	1498	1222	1013	852	726	624
		BRG (in.)	11.2	9.0	7.5	6.3	5.4	4.8	4.3	3.8	3.5	3.2	2.9	2.7
	21"	LL (plf)											816	664
		TL (plf)	11594	7410	5101	3683	2775	2161	1726	1408	1168	983	837	721
		BRG (in.)	13.0	10.4	8.6	7.3	6.3	5.5	4.9	4.4	4.0	3.7	3.4	3.1
	22 1/2"	LL (plf)												816
		TL (plf)	13312	8509	5817	4200	3166	2466	1970	1607	1334	1123	957	824
		BRG (in.)	14.9	11.9	9.8	8.3	7.2	6.3	5.6	5.0	4.6	4.2	3.9	3.6
	24"	LL (plf)												
		TL (plf)	15148	9662	6578	4750	3581	2789	2229	1819	1510	1271	1083	933
		BRG (in.)	17.0	13.6	11.1	9.4	8.1	7.1	6.3	5.7	5.2	4.7	4.4	4.0

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Tabulated values are pounds per lineal foot

ALLOWABLE UNIFORM LOAD FOR SIMPLE SPAN APPLICATIONS - ROOF BEAMS, SNOW LOAD (LDF=1.15)

24F-V4-2.0E_{TRUE} | Dry-Use | F_b = 2,400 psi | F_v = 265 psi | F_c = 650 psi | E_{Apparent} = 1.9x 10⁶ psi | E_{True} = 2.0 x 10⁶ psi

Width	Depth		Span											
			8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'
6 3/4"	9"	LL (plf)			1002	631	423	297	216	163	125	99	79	64
		TL (plf)	2605	1662	1150	827	549	381	274	202	152	117	90	71
		BRG (in.)	2.4	1.9	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	10 1/2"	LL (plf)				1002	671	471	344	258	199	156	125	102
		TL (plf)	3549	2265	1568	1147	874	611	441	327	248	191	150	119
		BRG (in.)	3.3	2.6	2.2	1.9	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	11 7/8"	LL (plf)				1449	971	682	497	374	288	226	181	147
		TL (plf)	4541	2900	2008	1470	1121	872	643	479	364	282	222	177
		BRG (in.)	4.2	3.3	2.8	2.4	2.1	1.8	1.5	1.5	1.5	1.5	1.5	1.5
	13 1/2"	LL (plf)					1427	1002	730	549	423	332	266	216
		TL (plf)	5873	3750	2598	1903	1434	1115	889	710	541	421	333	266
		BRG (in.)	5.4	4.3	3.6	3.1	2.7	2.3	2.1	1.8	1.5	1.5	1.5	1.5
	15"	LL (plf)							1002	753	580	456	365	297
		TL (plf)	7253	4633	3210	2330	1754	1364	1089	887	734	583	462	371
		BRG (in.)	6.6	5.3	4.4	3.8	3.2	2.8	2.5	2.3	2.1	1.8	1.6	1.5
	16 1/2"	LL (plf)								1002	772	607	486	395
		TL (plf)	8779	5609	3873	2795	2105	1637	1307	1065	883	742	621	500
		BRG (in.)	8.0	6.4	5.3	4.5	3.9	3.4	3.0	2.7	2.5	2.3	2.1	1.8
	18"	LL (plf)									1002	788	631	513
		TL (plf)	10450	6677	4572	3299	2485	1934	1544	1259	1044	878	747	642
		BRG (in.)	9.6	7.6	6.3	5.3	4.6	4.0	3.6	3.2	2.9	2.7	2.5	2.3
	19 1/2"	LL (plf)										1002	802	652
		TL (plf)	12267	7824	5325	3844	2896	2254	1801	1468	1218	1024	872	750
		BRG (in.)	11.2	9.0	7.3	6.2	5.3	4.7	4.2	3.8	3.4	3.1	2.9	2.7
	21"	LL (plf)											1002	815
		TL (plf)	14229	9010	6133	4427	3336	2598	2075	1692	1404	1182	1006	866
		BRG (in.)	13.0	10.3	8.4	7.1	6.1	5.4	4.8	4.3	3.9	3.6	3.3	3.1
	22 1/2"	LL (plf)												
		TL (plf)	16337	10274	6994	5050	3806	2964	2368	1932	1603	1349	1150	990
		BRG (in.)	14.9	11.8	9.6	8.1	7.0	6.2	5.5	4.9	4.5	4.1	3.8	3.5
	24"	LL (plf)												
		TL (plf)	18584	11617	7909	5711	4305	3353	2679	2186	1815	1528	1302	1121
		BRG (in.)	17.0	13.3	10.9	9.2	7.9	7.0	6.2	5.6	5.1	4.6	4.3	4.0
8 3/4"	9"	LL (plf)			1299	818	548	385	281	211	162	128	102	83
		TL (plf)	3377	2154	1490	1071	711	494	355	262	197	151	117	92
		BRG (in.)	2.4	1.9	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	10 1/2"	LL (plf)				1299	870	611	445	335	258	203	162	132
		TL (plf)	4600	2936	2032	1487	1118	792	572	424	321	248	194	154
		BRG (in.)	3.3	2.6	2.2	1.9	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	11 7/8"	LL (plf)				1879	1259	884	644	484	373	293	235	191
		TL (plf)	5887	3759	2602	1882	1416	1100	834	620	472	366	288	229
		BRG (in.)	4.2	3.3	2.8	2.3	2.0	1.8	1.5	1.5	1.5	1.5	1.5	1.5
	13 1/2"	LL (plf)	5225	4170				1299	947	711	548	431	345	281
		TL (plf)	7613	4862	3336	2405	1810	1407	1122	913	702	546	431	345
		BRG (in.)	5.4	4.3	3.5	3.0	2.6	2.3	2.0	1.8	1.5	1.5	1.5	1.5
	15"	LL (plf)							1299	976	752	591	473	385
		TL (plf)	9402	5996	4078	2942	2215	1722	1374	1119	927	756	599	481
		BRG (in.)	6.6	5.3	4.3	3.7	3.2	2.8	2.5	2.2	2.0	1.8	1.6	1.5
	16 1/2"	LL (plf)								1299	1000	787	630	512
		TL (plf)	11380	7189	4891	3529	2657	2067	1650	1344	1114	936	796	648
		BRG (in.)	8.0	6.4	5.2	4.4	3.8	3.3	3.0	2.7	2.4	2.2	2.0	1.8
	18"	LL (plf)									1299	1022	818	665
		TL (plf)	13546	8485	5774	4166	3138	2442	1950	1589	1317	1108	942	810
		BRG (in.)	9.6	7.5	6.1	5.2	4.5	3.9	3.5	3.1	2.9	2.6	2.4	2.2
	19 1/2"	LL (plf)											1040	845
		TL (plf)	15813	9882	6725	4854	3657	2846	2273	1853	1537	1293	1100	946
		BRG (in.)	11.2	8.7	7.1	6.0	5.2	4.6	4.1	3.7	3.3	3.0	2.8	2.6

ALLOWABLE UNIFORM LOAD FOR SIMPLE SPAN APPLICATIONS - ROOF BEAMS, NON-SNOW LOAD (LDF=1.25)

24F-V4-2.0E_{TRUE} | Dry-Use | F_b = 2,400 psi | F_v = 265 psi | F_c = 650 psi | E_{Apparent} = 1.9x 10⁶ psi | E_{True} = 2.0 x 10⁶ psi

Width	Depth		Span											
			8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'
3 1/2"	6"	LL (plf)	520	266	154	97	65	46	33	-	-	-	-	-
		TL (plf)	651	350	200	124	81	56	39	-	-	-	-	-
		BRG (in.)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-	-	-	-	-
	7 1/2"	LL (plf)	1015	520	301	189	127	89	65	49	38	30	-	-
		TL (plf)	1019	650	394	246	163	112	80	59	44	33	-	-
		BRG (in.)	1.8	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-	-
	9"	LL (plf)		898	520	327	219	154	112	84	65	51	41	33
		TL (plf)	1469	937	649	429	285	198	142	105	79	60	47	37
		BRG (in.)	2.6	2.1	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	9 1/2"	LL (plf)			611	385	258	181	132	99	76	60	48	39
		TL (plf)	1637	1045	723	505	336	233	168	124	94	72	56	44
		BRG (in.)	2.9	2.3	1.9	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	10 1/2"	LL (plf)			825	520	348	244	178	134	103	81	65	53
		TL (plf)	2001	1277	884	647	455	317	229	170	129	99	78	61
		BRG (in.)	3.5	2.8	2.4	2.0	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	11 7/8"	LL (plf)				752	503	354	258	194	149	117	94	76
		TL (plf)	2560	1635	1132	829	633	461	334	248	189	146	115	92
		BRG (in.)	4.5	3.6	3.0	2.6	2.3	1.9	1.5	1.5	1.5	1.5	1.5	1.5
	13 1/2"	LL (plf)					740	520	379	285	219	172	138	112
		TL (plf)	3311	2115	1465	1073	819	645	494	368	281	218	173	138
		BRG (in.)	5.8	4.7	3.9	3.3	2.9	2.6	2.2	1.8	1.5	1.5	1.5	1.5
	14"	LL (plf)					825	579	422	317	244	192	154	125
		TL (plf)	3561	2275	1576	1155	881	694	551	411	314	244	193	155
		BRG (in.)	6.3	5.0	4.2	3.6	3.1	2.8	2.5	2.0	1.7	1.5	1.5	1.5
	15"	LL (plf)						713	520	390	301	236	189	154
		TL (plf)	4089	2612	1810	1327	1013	797	643	508	388	303	240	192
		BRG (in.)	7.2	5.8	4.8	4.1	3.6	3.2	2.9	2.5	2.1	1.8	1.6	1.5
	16"	LL (plf)						865	631	474	365	287	230	187
		TL (plf)	4653	2973	2060	1510	1153	908	733	603	473	369	293	235
		BRG (in.)	8.2	6.6	5.5	4.7	4.1	3.6	3.3	3.0	2.6	2.2	1.9	1.6
	16 1/2"	LL (plf)						949	691	520	400	315	252	205
		TL (plf)	4830	3162	2192	1606	1227	966	780	642	520	406	322	259
		BRG (in.)	8.5	7.0	5.8	5.0	4.4	3.9	3.5	3.2	2.8	2.4	2.1	1.8
	18"	LL (plf)							898	674	520	409	327	266
		TL (plf)	5891	3765	2610	1913	1461	1151	930	760	631	530	421	339
		BRG (in.)	10.4	8.3	6.9	5.9	5.2	4.6	4.2	3.7	3.4	3.1	2.7	2.3
	19 1/2"	LL (plf)								858	661	520	416	338
		TL (plf)	6915	4420	3064	2247	1716	1353	1086	886	736	619	528	434
		BRG (in.)	12.2	9.8	8.1	7.0	6.1	5.4	4.8	4.4	4.0	3.6	3.3	3.0

Notes:

1. Applicable to simply-supported beam with sufficient bracing to avoid lateral buckling ($C_L = 1.0$).
2. Applicable to dry-use service conditions ($C_M = 1.0$).
3. Tabulated live load (LL) is based on the deflection criterion of span/240.
4. Tabulated total load (TL) is based on the deflection criterion of span/180.
5. Tabulated total load (TL) is in addition to beam weight (assumed 35 pcf).
6. Selected beam size shall satisfy both live load and total load.
7. "--" indicates the allowable load is smaller than 40 plf.
8. Blank live load indicates the live load is greater than or equal to total load
9. Bearing "BRG" is in inches and is calculated based on the total load including the beam weight.

Tabulated values are pounds per lineal foot

ALLOWABLE UNIFORM LOAD FOR SIMPLE SPAN APPLICATIONS - ROOF BEAMS, NON-SNOW LOAD (LDF=1.25)

24F-V4-2.0E_{TRUE} | Dry-Use | F_b = 2,400 psi | F_v = 265 psi | F_c = 650 psi | E_{Apparent} = 1.9x 10⁶ psi | E_{True} = 2.0 x 10⁶ psi

Width	Depth		Span											
			8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'
5 1/2"	6"	LL (plf)	816	418	242	152	102	72	52	39	30	-	-	-
		TL (plf)	1023	549	315	195	128	88	62	44	32	-	-	-
		BRG (in.)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-	-	-
	7 1/2"	LL (plf)	1595	816	472	298	199	140	102	77	59	46	37	-
		TL (plf)	1601	1021	620	387	256	177	126	92	69	52	40	-
		BRG (in.)	1.8	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-
	9"	LL (plf)		1411	816	514	344	242	176	132	102	80	64	52
		TL (plf)	2308	1473	1019	673	447	310	223	165	124	95	74	58
		BRG (in.)	2.6	2.1	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	9 1/2"	LL (plf)			960	605	405	284	207	156	120	94	76	61
		TL (plf)	2573	1642	1136	794	527	367	264	195	147	113	88	69
		BRG (in.)	2.9	2.3	1.9	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	10 1/2"	LL (plf)			1296	816	547	384	280	210	162	127	102	83
		TL (plf)	3144	2007	1390	1017	715	498	359	266	202	156	122	97
		BRG (in.)	3.5	2.8	2.4	2.0	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	11 7/8"	LL (plf)				1181	791	556	405	304	234	184	148	120
		TL (plf)	4024	2569	1779	1303	994	725	524	390	297	230	181	144
		BRG (in.)	4.5	3.6	3.0	2.6	2.3	1.9	1.5	1.5	1.5	1.5	1.5	1.5
	13 1/2"	LL (plf)					1162	816	595	447	344	271	217	176
		TL (plf)	5203	3323	2302	1687	1287	1010	776	578	441	343	271	217
		BRG (in.)	5.8	4.7	3.9	3.3	2.9	2.6	2.2	1.8	1.5	1.5	1.5	1.5
	14"	LL (plf)					1296	911	664	499	384	302	242	197
		TL (plf)	5596	3575	2477	1815	1385	1083	864	646	493	384	304	244
		BRG (in.)	6.3	5.0	4.2	3.6	3.1	2.8	2.5	2.0	1.7	1.5	1.5	1.5
	15"	LL (plf)						1120	816	613	472	372	298	242
		TL (plf)	6425	4105	2845	2085	1588	1235	986	798	610	475	377	302
		BRG (in.)	7.2	5.8	4.8	4.1	3.6	3.2	2.8	2.5	2.1	1.8	1.6	1.5
	16"	LL (plf)						1359	991	744	573	451	361	294
		TL (plf)	7312	4672	3238	2373	1796	1398	1116	910	743	580	460	370
		BRG (in.)	8.2	6.6	5.5	4.7	4.1	3.6	3.2	2.9	2.6	2.2	1.9	1.6
	16 1/2"	LL (plf)							1087	816	629	495	396	322
		TL (plf)	7777	4969	3444	2524	1905	1483	1184	965	800	637	506	407
		BRG (in.)	8.7	7.0	5.8	5.0	4.3	3.8	3.4	3.0	2.8	2.4	2.1	1.8
	18"	LL (plf)								1060	816	642	514	418
		TL (plf)	9257	5916	4101	2985	2249	1751	1399	1141	946	796	661	533
		BRG (in.)	10.4	8.3	6.9	5.9	5.1	4.5	4.0	3.6	3.3	3.0	2.7	2.3
	19 1/2"	LL (plf)									1038	816	654	531
		TL (plf)	10867	6945	4815	3478	2621	2041	1631	1330	1104	929	791	681
		BRG (in.)	12.2	9.8	8.1	6.9	5.9	5.2	4.6	4.2	3.8	3.5	3.2	3.0
	21"	LL (plf)										1020	816	664
		TL (plf)	12605	8057	5547	4005	3019	2351	1879	1533	1272	1071	913	786
		BRG (in.)	14.1	11.3	9.4	7.9	6.8	6.0	5.3	4.8	4.4	4.0	3.7	3.4
	22 1/2"	LL (plf)											1004	816
		TL (plf)	14472	9251	6326	4568	3444	2683	2144	1750	1453	1223	1043	898
		BRG (in.)	16.2	13.0	10.7	9.0	7.8	6.8	6.1	5.5	5.0	4.6	4.2	3.9
	24"	LL (plf)												991
		TL (plf)	16468	10505	7153	5166	3895	3034	2426	1980	1644	1385	1180	1017
		BRG (in.)	18.5	14.7	12.1	10.2	8.8	7.7	6.9	6.2	5.6	5.2	4.7	4.4

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Tabulated values are pounds per lineal foot

ALLOWABLE UNIFORM LOAD FOR SIMPLE SPAN APPLICATIONS - ROOF BEAMS, NON-SNOW LOAD (LDF=1.25)

24F-V4-2.0E_{TRUE} | Dry-Use | F_b = 2,400 psi | F_v = 265 psi | F_c = 650 psi | E_{Apparent} = 1.9x 10⁶ psi | E_{True} = 2.0 x 10⁶ psi

Width	Depth		Span											
			8'	10'	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'
6 3/4"	9"			1731	1002	631	423	297	216	163	125	99	79	64
		TL (plf)	2833	1808	1251	827	549	381	274	202	152	117	90	71
		BRG (in.)	2.6	2.1	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	10 1/2"				1591	1002	671	471	344	258	199	156	125	102
		TL (plf)	3859	2463	1705	1248	878	611	441	327	248	191	150	119
		BRG (in.)	3.5	2.8	2.4	2.0	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	11 7/8"					1449	971	682	497	374	288	226	181	147
		TL (plf)	4938	3153	2184	1599	1220	890	643	479	364	282	222	177
		BRG (in.)	4.5	3.6	3.0	2.6	2.3	1.9	1.5	1.5	1.5	1.5	1.5	1.5
	13 1/2"						1427	1002	730	549	423	332	266	216
		TL (plf)	6385	4078	2826	2070	1560	1214	952	710	541	421	333	266
		BRG (in.)	5.8	4.7	3.9	3.3	2.9	2.5	2.2	1.8	1.5	1.5	1.5	1.5
	15"							1374	1002	753	580	456	365	297
		TL (plf)	7886	5038	3491	2534	1909	1485	1185	966	749	583	462	371
		BRG (in.)	7.2	5.8	4.8	4.1	3.5	3.1	2.8	2.5	2.1	1.8	1.6	1.5
	16 1/2"								1334	1002	772	607	486	395
		TL (plf)	9544	6099	4212	3040	2290	1782	1423	1160	962	782	621	500
		BRG (in.)	8.7	7.0	5.8	4.9	4.2	3.7	3.3	3.0	2.7	2.4	2.1	1.8
	18"									1301	1002	788	631	513
		TL (plf)	11361	7260	4972	3589	2704	2105	1681	1371	1137	957	812	654
		BRG (in.)	10.4	8.3	6.8	5.8	5.0	4.4	3.9	3.5	3.2	2.9	2.7	2.3
	19 1/2"										1274	1002	802	652
		TL (plf)	13336	8507	5791	4181	3151	2453	1960	1599	1326	1116	951	818
		BRG (in.)	12.2	9.7	8.0	6.7	5.8	5.1	4.5	4.1	3.7	3.4	3.1	2.9
	21"											1251	1002	815
		TL (plf)	15469	9796	6669	4815	3629	2826	2259	1843	1529	1287	1097	944
		BRG (in.)	14.1	11.2	9.2	7.7	6.7	5.9	5.2	4.7	4.3	3.9	3.6	3.3
	22 1/2"												1232	1002
		TL (plf)	17761	11171	7605	5492	4140	3225	2577	2103	1746	1470	1253	1079
		BRG (in.)	16.2	12.8	10.5	8.8	7.6	6.7	6.0	5.4	4.9	4.5	4.1	3.8
	24"													1216
		TL (plf)	20204	12630	8600	6211	4682	3648	2916	2380	1976	1664	1419	1222
		BRG (in.)	18.5	14.4	11.8	10.0	8.6	7.6	6.7	6.1	5.5	5.0	4.7	4.3
8 3/4"	9"	LL (plf)		2244	1299	818	548	385	281	211	162	128	102	83
		TL (plf)	3672	2343	1621	1071	711	494	355	262	197	151	117	92
		BRG (in.)	2.6	2.1	1.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	10 1/2"	LL (plf)			2062	1299	870	611	445	335	258	203	162	132
		TL (plf)	5002	3193	2211	1618	1138	792	572	424	321	248	194	154
		BRG (in.)	3.5	2.8	2.4	2.0	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	11 7/8"	LL (plf)				1879	1259	884	644	484	373	293	235	191
		TL (plf)	6401	4088	2831	2048	1541	1153	834	620	472	366	288	229
		BRG (in.)	4.5	3.6	3.0	2.6	2.2	1.9	1.5	1.5	1.5	1.5	1.5	1.5
	13 1/2"	LL (plf)					1849	1299	947	711	548	431	345	281
		TL (plf)	8277	5287	3628	2617	1970	1532	1222	920	702	546	431	345
		BRG (in.)	5.8	4.7	3.9	3.3	2.8	2.5	2.2	1.8	1.5	1.5	1.5	1.5
	15"	LL (plf)						1782	1299	976	752	591	473	385
		TL (plf)	10222	6520	4436	3200	2410	1875	1496	1219	970	756	599	481
		BRG (in.)	7.2	5.8	4.7	4.0	3.4	3.0	2.7	2.4	2.1	1.8	1.6	1.5
	16 1/2"	LL (plf)							1729	1299	1000	787	630	512
		TL (plf)	12372	7818	5320	3839	2892	2250	1797	1464	1214	1014	805	648
		BRG (in.)	8.7	6.9	5.6	4.8	4.1	3.6	3.2	2.9	2.6	2.4	2.1	1.8
	18"	LL (plf)								1686	1299	1022	818	665
		TL (plf)	14727	9226	6279	4532	3414	2658	2123	1731	1435	1207	1028	848
		BRG (in.)	10.4	8.1	6.7	5.6	4.9	4.3	3.8	3.4	3.1	2.8	2.6	2.3
	19 1/2"	LL (plf)									1651	1299	1040	845
		TL (plf)	17192	10745	7313	5280	3978	3098	2474	2018	1674	1409	1200	1032
		BRG (in.)	12.1	9.5	7.8	6.5	5.7	5.0	4.4	4.0	3.6	3.3	3.1	2.8

Notes per page 16

Tabulated values are pounds per lineal foot

CAMBER CONTROL IN X-BEAM 2.0

ALLOWABLE TOLERANCES ARE PER ANSI A109.1. TOLERANCES FOR MANUFACTURING. TOLERANCES (+/-)

Good for all widths: $3\frac{1}{2}$, $5\frac{1}{2}$, $6\frac{3}{4}$ and $8\frac{3}{4}$ $\leq 20'$ = $\frac{1}{4}$, $21'$ to $40'$ = $\frac{3}{8}$, $41'$ to $60'$ = $\frac{1}{2}$

Fraction (in)

Length (ft)	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
Maximum	1/4	1/4	1/4	3/8	3/8	3/8	1/2	1/2	5/8	5/8	5/8	5/8	3/4	3/4	3/4	7/8
X-Beam*	0	0	0	1/8	1/8	1/8	1/8	1/8	1/4	1/4	1/4	1/4	3/8	3/8	3/8	1/2
Minimum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Decimal (in)

Length (ft)	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
Maximum	0.280	0.293	0.309	0.327	0.347	0.370	0.520	0.548	0.578	0.610	0.645	0.682	0.722	0.764	0.808	0.855
X-Beam*	0.030	0.043	0.059	0.077	0.097	0.120	0.145	0.173	0.203	0.235	0.270	0.307	0.347	0.389	0.433	0.480
Minimum	-0.220	-0.207	-0.191	-0.017	-0.153	-0.130	-0.230	-0.202	-0.172	-0.140	-0.105	-0.068	-0.028	0.014	0.058	0.105

***Manufactured with 5,000 ft inside radius**

E APPARENT AND E TRUE

For structural glued laminated timber (glulam) and most structural composite lumber (SCL) marketed in North America, such as laminated veneer lumber (LVL) and parallel strand lumber (PSL), the values of apparent modulus of elasticity (E_{Apparent}) are generally published. Some SCL manufacturers, however, elect to publish shear-free modulus of elasticity (E_{True}) values. The difference between E_{Apparent} and E_{True} is that E_{Apparent} includes both bending deflection and shear deflection, while E_{True} does not. Therefore, **for those proprietary products for which the E_{True} is published, the shear deflection must be calculated separately from the bending deflection and the two values must be combined for code-compliance.** Otherwise, the structural design could be nonconservative when deflection governs. The publication of either the E_{Apparent} or E_{True} values for a wide variety of engineered wood products without identifying which E value is being tabulated can be a cause of confusion when comparing similar products offered by different manufacturers or when the need for product substitution arises. To avoid confusion, Equation 1 or Table 1 can be used as a rule of thumb to convert a published E_{True} to E_{Apparent} or vice versa, so that an equitable comparison between similar products can be made:

$$E_{\text{True}} = 1.05 \times E_{\text{Apparent}} \text{ (Equation 1)}$$

Table 1. Equivalent E_{Apparent} and E_{True} ^(a)

E_{Apparent} (10^6 psi) ^(b)	Equivalent E_{True} (10^6 psi)
1.5	1.6
1.6	1.7
1.7	1.8
1.8	1.9
1.9	2.0
2.0	2.1
2.1	2.2

a) Refer to APA Technical Topics TT-082 for detailed information.

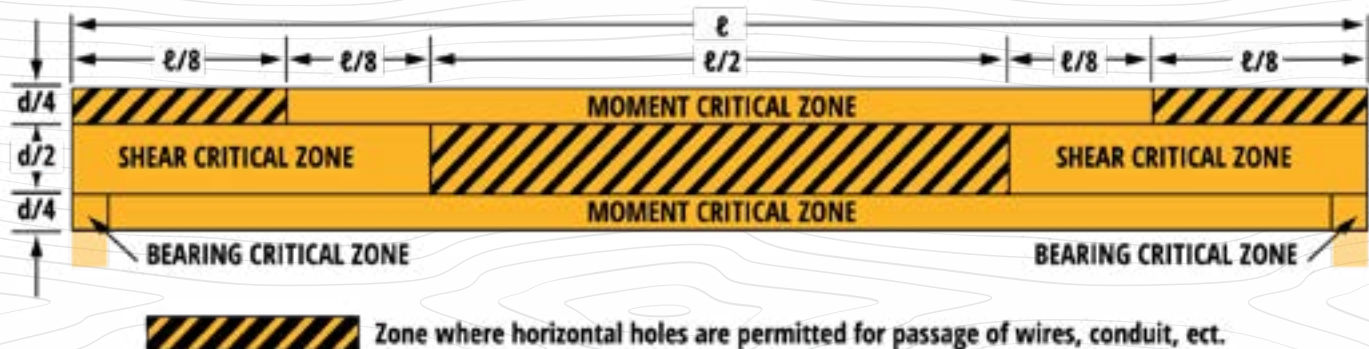
b) As published for glulam.

ALLOWABLE HORIZONTAL HOLE PLACEMENT

Horizontal holes to allow for the pass-through of small plumbing pipes, electrical conduits and lightweight HVAC materials are allowed in Rosboro glulam beam products. Two methods for acceptable horizontal hole placement exist:

The **Prescriptive Horizontal Hole Method** allowing for small diameter holes with **no reduction** in structural capacity.

ALLOWABLE PRESCRIPTIVE METHOD FOR SMALL DIAMETER HORIZONTAL HOLE PLACEMENT



1. The above diagram applies to horizontal holes and beams properly sized using APA or Rosboro uniform load tables. For concentrated load conditions, contact Rosboro Technical Support.
2. Field holes should be drilled for access only (small diameter wires, conduit, cable and other lightweight materials) and not for load bearing hardware attachments unless designed specifically by the project engineer. Square and rectangular holes are not allowed.
3. These field drilled holes should meet the following guidelines:
 - A. Hole Size: The hole diameter should not exceed $1\frac{1}{2}$ " or one-tenth the beam depth, whichever is smaller. Exception: In beams 9" or greater in depth, the maximum hole diameter shall be allowed to be increased to 2" provided that the central permitted hole zone is reduced to $\frac{l}{3}$ for both the member length and depth.
 - B. Hole Location: The hole should have a minimum clear distance, as measured from the edge of the hole to the nearest edge of the beam, of 4 hole diameters to the top or bottom of the beam and 8 hole diameters from the end of the beam. Otherwise as shown in the shaded areas.
 - C. Hole Spacing: The minimum clear spacing between adjacent holes, as measured between the nearest edge of the holes, should be 2 hole diameters based on the largest diameter of any adjacent hole in the beam.
 - D. Number of holes: The maximum number of holes should not exceed 3 holes per any 4 feet of beam length. The hole spacing limitation, as given above, should be satisfied separately.
4. For glulam members that have been over-sized, these guidelines may be relaxed based on an engineering analysis.
5. Holes in cantilevered beams require additional analysis, contact Rosboro Technical Support.

This **Analytical Procedure** is an engineered solution that was developed to allow **Design Professionals** to place large diameter horizontal holes in glulam beams to account for the necessary **structural design capacity reductions** of the beams when the hole diameters fall outside of the prescriptive limits on page 21. For more information see APA Technical Note V700

ANALYTICAL DESIGN METHOD FOR LARGE DIAMETER HORIZONTAL HOLE PLACEMENT

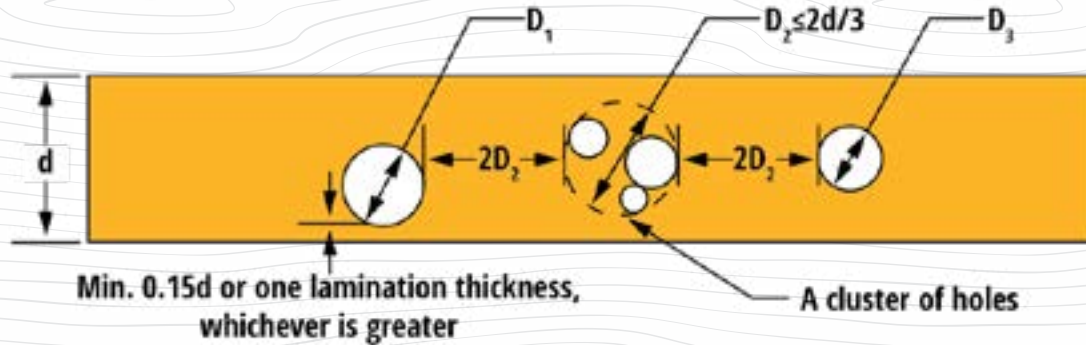


Fig. 1: Hole clusters and hole clear distance

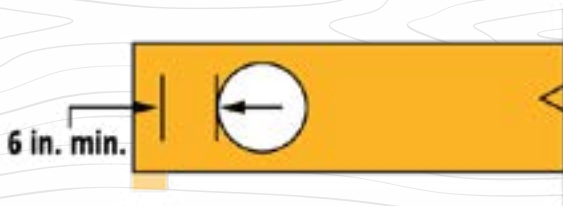


Fig. 2: Min. distance from edge of hole and face of support

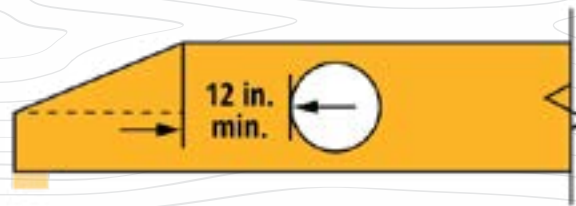


Fig. 3: Min. distance from edge of hole and end of taper

(1) Field drilled holes designed under this procedure should meet the following placement guidelines:

- Holes shall be round and neatly cut using a hole saw or router and template. Use of other methods, such as a reciprocating saw, and square holes are prohibited.
- Hole Size: The hole diameter should not exceed $2/3$ the beam depth, $D \leq 2d/3$.
- Hole Location: The hole should have a minimum clear distance of 6 in. from the face of any support (Fig. 2) and 12" from the end of a top chord taper (Fig. 3) along the beam length. Placement of holes in cantilevers is not allowed. In no instance should the tension laminations be cut in the beam.
- Hole Spacing: The minimum clear distance between adjacent holes, as measured between the nearest edge of the holes, should be 2 hole diameters based on the largest diameter of any adjacent hole in the beam (Fig. 1). Cluster of small holes shall be analyzed as a single large hole (Fig. 1).
- Number of Holes: The maximum number of holes should not exceed 3 holes in any part of the beam with hole diameters greater than $d/3$. Otherwise the maximum number of holes shall not exceed 8 in any given span.

(2) All beams with holes drilled following this procedure shall be designed in accordance with Equations 1 through 3 below to determine the reduced structural capacities of the beams:

Eq. 1. Effect of Horizontal Holes on the Bending Capacity

$$M_{net} = C_{hole,M} M_{gross} = (S_{net}/S_{gross}) M_{gross}$$

where: M_{net} = Net bending capacity with holes, lbf-ft; $C_{hole,M}$ = hole effect factor on bending capacity, M_{gross} = gross bending capacity without holes, lbf-ft; S_{net} = net section modulus with holes, in³; S_{gross} = gross section modulus without holes, in³

Eq. 2. Effect of Horizontal Holes on the Bending Stiffness

$$(EI)_{net} = C_{hole,EI} (EI)_{gross} = (1 - ((1.6 * N * D)/L)) (EI)_{gross}$$

where: $(EI)_{net}$ = net bending stiffness with holes, lbf-in²; $C_{hole,EI}$ = hole effect factor for bending stiffness; $(EI)_{gross}$ = gross bending stiffness without holes, lbf-in²;

N = number of holes ≤ 3 ; D = hole diameter $\leq 2d/3$, in.; L = member span, in.

Eq. 3. Effect of horizontal Holes on the Shear Capacity

$$V_{net} = C_{hole,V} V_{gross} = (d-D/d)^2 V_{gross}$$

where: V_{net} = net shear capacity with holes, lbf; $C_{hole,V}$ = hole effect factor on shear capacity; V_{gross} = gross shear capacity without holes, lbf; d = glulam beam

depth, in.; D = hole diameter $\leq 2d/3$, in.; Field holes should be drilled for access only and not for load bearing hardware attachments unless designed specifically by the product engineer. Square and rectangular holes are not allowed.



X-BEAM COLUMNS

Compressive Strength | 2,300 F_c | 1.9E_{Apparent} | 2.0E_{True} | 1.0E_{Min.}

Rosboro X-Beam™ glulam columns are the most cost-effective installed engineered wood option on the market today.

What Makes X-Beam Columns Great

- Allows builders to run framing from floor to ceiling with one continuous piece
- Same column material can be used for the horizontal framing in tall wall construction
- Architectural appearance
- Surfaced on four sides and all four edges are eased

Dimensions

- These glulam columns remain straight and true and are inventoried in the following sizes:
3½" x 6", 5½" x 5½", and 5½" x 6"
- Other cross sections are available on a custom order basis

X-BEAM COLUMNS

Technical Specifications

Layup Combination	Bending about Y-Y Axis	Bending about X-X Axis	Compression Parallel to Grain	MOE (10 ⁶ psi)		
	F _{by} (psi) ¹	F _{bx} (psi) ²	F _c (psi) ³	E _{Apparent}	E _{True}	E _{min4}
Comb. 3 DF	2,100	2,000	2,300	1.9	2.0	1.0

Notes:

1. Applicable to 4 or more lams. This value shall be reduced to 1,850 psi for three lams and 1,550 for two lams.
2. Applicable to column depths up to 15". For column depths exceeding 15", F_{bx} = 1,760 psi.
3. Applicable to 4 or more lams. This value shall be reduced to 1,900 psi for two or three lams.
4. Applicable to column stability calculations for member buckling. (NDS-Current Version)

ALLOWABLE AXIAL LOAD VALUES FOR COMBINATION NO. 3 GLULAM COLUMNS

End loads are limited to a maximum eccentricity of either 1/6 column width or depth, whichever is greater. Side loads are not permitted without engineered analysis.

Effec. Column Length (ft.)	Lamination Net Width = 3 1/2 in.						Lamination Net Width = 5 1/2 in.								
	Net Depth = 4 1/2 in. (3 lams)			Net Depth = 6 in. (4 lams)			Net Depth = 5 1/2 in. (4 lams)			Net Depth = 6 in. (4 lams)			Net Depth = 7 1/2 in. (5 lams)		
	Load Duration Factor			Load Duration Factor			Load Duration Factor			Load Duration Factor			Load Duration Factor		
	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25
8	9190	9960	10240	12850	13880	14230	27990	31070	32610	30530	33890	35570	40610	45020	47180
9	7850	8470	8670	10900	11730	11990	25380	27960	29140	27690	30500	31790	36690	40340	41970
10	6760	7270	7420	9330	10020	10210	22870	25030	25950	24950	27310	28310	32920	35960	37210
11	5860	6290	6410	8060	8640	8790	20560	22400	23120	22430	24440	25230	29470	32040	33020
12	5130	5490	5580	7030	7520	7630	18500	20080	20660	20190	21900	22540	26420	28610	29400
13	4520	4830	4900	6180	6590	6690	16690	18060	18530	18210	19700	20220	23750	25650	26280
14	4010	4280	4340	5470	5830	5910	15100	16290	16690	16470	17780	18210	21420	23080	23600
15	--	--	--	--	--	--	13700	14760	15090	14950	16100	16460	19390	20850	21290
16	--	--	--	--	--	--	12480	13420	13700	13620	14640	14950	17620	18920	19280
17	--	--	--	--	--	--	11410	12250	12480	12450	13360	13620	16070	17230	17540
18	--	--	--	--	--	--	10460	11210	11420	11410	12230	12460	14710	15750	16010
19	--	--	--	--	--	--	9620	10300	10480	10500	11240	11430	13510	14440	14670
20	--	--	--	--	--	--	8880	9490	9650	9680	10360	10530	12440	13290	13490
21	--	--	--	--	--	--	8210	8770	8910	8960	9570	9720	11490	12270	12440
22	--	--	--	--	--	--	7620	8130	8250	8310	8870	9000	10650	11360	11510

Notes:

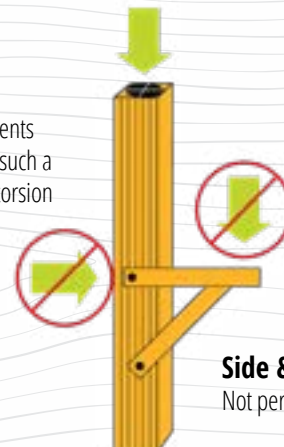
1. The tabulated allowable loads apply only to one-piece glulam members with all L2D laminations (ANSI Combination 3) without special tension laminations.
2. Applicable to dry-use service conditions (C_M = 1.0).
3. The tabulated allowable loads are based on simply axially loaded columns subjected to a maximum eccentricity of either 1/6 column width or 1/6 column depth, whichever is worse. For side loads, other eccentric loads, or other combined axial and flexural loads, see NDS-Current Version.
4. The column is assumed to be unbraced, except at the column ends, and the effective column length is equal to the actual column length.
5. Volume factor for F_{bx} is in accordance with NDS-Current Version.
6. Size factor for F_{by} is (12/d)^{1/3}, where d is equal to the lamination width in inches.

Axial Loads:

Allowable Axial Load Tables: Side loads and bracket loads are not permitted. End loads are limited to a maximum eccentricity of either 1/6 column width or 1/6 column depth.

Axial Loads:

Loads and load components applied along an axis in such a way that no bending or torsion moments are produced.



Side & Bracket Loads:

Not permitted with these tables.

TALL WALL COLUMNS

ALLOWABLE WIND AND AXIAL LOAD VALUES FOR NO. 3 GLULAM COLUMNS USED IN EXTERIOR TALL WALLS

Wind loads are permitted at maximum shown. Axial loads are limited to a maximum eccentricity of either 1/6 column width or depth, whichever is greater.

Deflection Ratio	Wall Height (ft.)	Max. Defl. (in.)	3 1/2 in. Wall Thickness					5 1/2 in. Wall Thickness				
			Column Width					Column Width				
			3 1/2"	4 1/2"	5 1/2"	6"	7"	4 1/2"	5 1/2"	6"	7"	7 1/2"
L/360	12	0.40	30 / 3,071	39 / 3,933	47 / 5,120	52 / 5,560	60 / 6,510	149 / 10,068	182 / 12,768	199 / 13,929	232 / 16,250	249 / 17,411
	14	0.47	--	24 / 3,169	30 / 4,043	32 / 4,437	38 / 5,151	94 / 8,718	115 / 11,653	126 / 12,681	147 / 14,796	157 / 15,870
	16	0.53	--	--	--	--	--	63 / 7,491	77 / 9,875	84 / 10,775	99 / 12,511	106 / 13,406
	18	0.60	--	--	--	--	--	44 / 6,465	54 / 8,415	59 / 9,178	69 / 10,694	74 / 11,459
	20	0.67	--	--	--	--	--	32 / 5,603	40 / 7,190	43 / 7,882	50 / 9,205	54 / 9,837
	22	0.73	--	--	--	--	--	24 / 4,881	30 / 6,236	32 / 6,847	38 / 7,948	41 / 8,500
L/240	12	0.60	45 / 2,527	58 / 3,244	71 / 4,324	78 / 4,700	91 / 5,484	224 / 6,376	274 / 9,691	298 / 10,607	348 / 12,371	373 / 13,252
	14	0.70	28 / 2,103	36 / 2,705	45 / 3,508	49 / 3,828	57 / 4,476	142 / 6,204	173 / 8,894	189 / 9,697	220 / 11,338	236 / 12,123
	16	0.80	--	--	--	--	--	95 / 5,725	116 / 7,908	127 / 8,598	148 / 10,050	159 / 10,748
	18	0.90	--	--	--	--	--	67 / 5,132	82 / 6,927	89 / 7,585	104 / 8,843	112 / 9,445
	20	1.00	--	--	--	--	--	49 / 4,569	60 / 6,084	65 / 6,660	76 / 7,758	81 / 8,340
	22	1.10	--	--	--	--	--	36 / 4,121	45 / 5,368	49 / 5,862	57 / 6,843	61 / 7,339
L/180	12	0.80	60 / 1,999	78 / 2,540	95 / 3,561	104 / 3,872	121 / 4,529	298 / 2,451	365 / 5,494	376 / 7,046	376 / 11,101	376 / 13,107
	14	0.93	38 / 1,732	49 / 2,223	60 / 3,006	65 / 3,294	76 / 3,836	189 / 3,665	231 / 6,129	252 / 6,688	294 / 7,803	315 / 8,360
	16	1.07	--	--	--	--	--	127 / 3,952	155 / 5,976	169 / 6,523	198 / 7,576	212 / 8,123
	18	1.20	--	--	--	--	--	89 / 3,877	109 / 5,550	119 / 6,044	139 / 7,043	149 / 7,549
	20	1.33	--	--	--	--	--	65 / 3,630	80 / 5,024	87 / 5,496	101 / 6,437	109 / 6,853
	22	1.47	--	--	--	--	--	49 / 3,335	60 / 4,547	65 / 4,986	76 / 5,807	82 / 6,186

Notes:

- Design per NDS-Current Version. Load duration factor = 1.6. Buckling length coefficient, $K_e = 1.0$. Dry-use service conditions only ($CM = 1.0$).
- Table assumes wood structural panel exterior sheathing and gypsum on interior.
- Full width blocking at 8'-0" on center maximum.
- Deflection limits are based on Main Wind Force Resisting System pressures, which were estimated by multiplying the Components and Cladding (C&C) pressure by 0.7 (IRC, Table R301.7; IBC, Table 1604.3).
- Deflection is calculated using:

$$\Delta = \frac{240wL^4}{Ebd^3} + \frac{28.8wL^2}{Ebd}$$

w = uniform load (plf), L = span (ft), b = member width parallel to wall (in.)

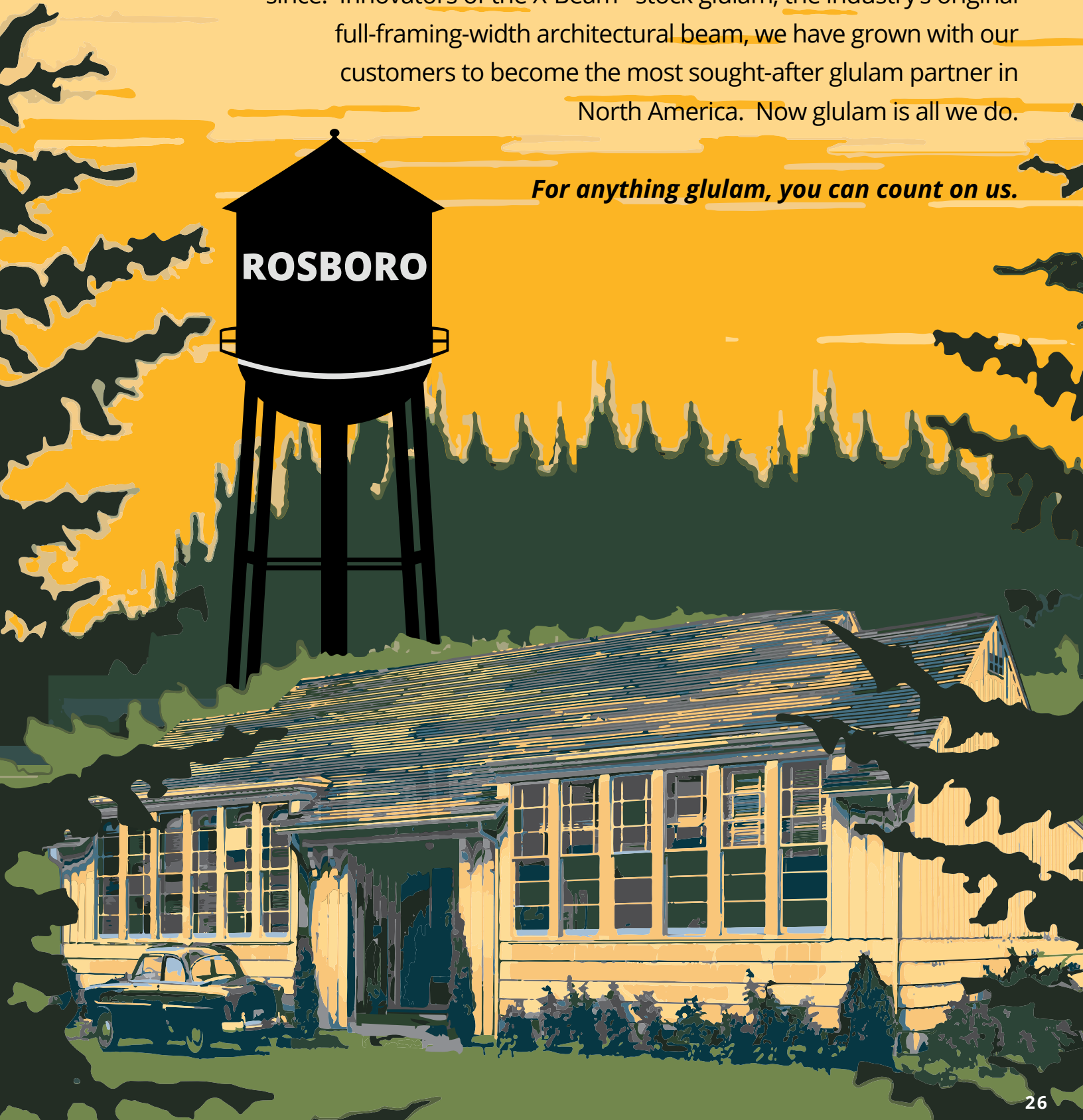
d = member depth = wall thickness (in.), E = modulus of elasticity (psi)

- Axial loads are applied eccentrically, at a maximum distance 1/6 the wall thickness dimension of the column, measured from the centerline of the column.
- Compression perpendicular to grain stress of 425 psi is assumed for the bearing plate (SPF).
- The maximum lateral load is limited to the lesser of the deflection limit, allowable bending stress, allowable shear stress, or the connection limit.
- One round hole with a maximum diameter of 25% the depth of the column shall be permitted to be placed anywhere along the column at the centerline of the depth, except holes shall be at least 6" away from the end of the column.
- These values are for preliminary design use only. Final design shall include a complete analysis, including bearing capacity of the foundation supporting the column.
- Table illustrates maximum allowable loads as wind/axial. Tabulated values are in pounds per lineal foot.

STRENGTH YOU CAN RELY ON

Rosboro began producing glulam in 1964 and has been leading the way ever since. Innovators of the X-Beam® stock glulam, the industry's original full-framing-width architectural beam, we have grown with our customers to become the most sought-after glulam partner in North America. Now glulam is all we do.

For anything glulam, you can count on us.





The First Glulam Beam Manufactured Specifically for Rim Applications

Fits Tight | 1,250 F_b | 265 F_v | 1.5E_{Apparent} | 1.6E_{True}

Heavy timber X-Rim™ glulam is used as a firestop in floor systems, around stairwells and elevator shafts and it is installed in walls perpendicular to the floor joist eliminating high cost standoff hangers. X-Rim is also specified in stacked framing applications where dimensional stability is critical.

Advantages

- Zero camber so it installs flat in floor systems
- Fits flush with 2x4 and 2x6 framing with depths that match EWP and conventional framing systems
- Ideal as a fire stop and easily meets a 1-hour fire rating
- Kiln-dried to an average moisture content of 13% and manufactured to tight depth tolerances
- Available in manageable lengths such as 20' with both ends square cut and sealed

Because X-Rim is a glulam product it is less prone to swelling and moisture related issues than other EWP products like PSL, LVL and LSL because it has less open wood fiber from the manufacturing process.

Sizes

- Widths: 1½", 1¾", 3½", 5½", 6¾"
- Depths: 9¼", 9½", 11¼", 11⅞", 14", 16", 18"

Also Available with Water Resistant Sealer

Rosboro Sealed X-Rim glulam was specifically developed for rim applications in regions that experience extended periods of rain during construction. Rosboro Sealed X-Rim is coated on all four sides and both ends with Liquid Wrap™ sealer, significantly reducing water penetration and minimizing swelling and shrinkage.



ESL | 1.6 E™

ENGINEERED STRUCTURAL LUMBER

The Solution for Lighter Framing Applications

Industrial Appearance | 2,000 F_b | 1.6E_{Apparent} | 1.7E_{True}

Rosboro ESL 1.6E™ is the perfect choice for engineered beam, header and joist applications. The full 3½" and 5½" widths make it ideal for wall framing. Produced in I-joist depths for compatibility with EWP floors, a single-piece of ESL replaces multi-piece assemblies of other EWP or lumber. The balanced layup means hassle-free use in cantilever and multi-span applications.

Advantages

- Balanced layup so you don't have to worry about top orientation
- ESL is 25% lighter than LSL and is easier to cut, drill, and nail
- Straight, dimensionally stable, consistent sizes
- Does not require special hangers or screws and no nailing or bolting multiple plys
- Enhanced Industrial appearance - planed smooth with no off-set laminations

Industrial Applications

- Factory-built walls and trusses
- Concrete forming
- Shoring

Sizes

- Full width 3½" and 5½"
- EWP depths: 9½" • 11⅞" • 14" • 16"



ROSBORO CUSTOM GLULAM

Glulam can be manufactured in a wide variety of shapes, appearances, grades, and sizes. Our custom glulam division is your source for custom sizes, variable lengths, job packs, industrial uses, exterior applications, and even metric dimensions.

Flexibility of Custom Glulam

- Beams can be built-to-order based on the unique needs of the job
- Can be tailored to a wide range of structural and industrial uses
- Pressure treating of Douglas fir glulam beams can be provided to your specifications
- Alaska Yellow Cedar beams available when a naturally durable species is preferred over treated products
- Lead times as short as 1 week for those must-have orders

Appearances Offered

- Architectural
- Industrial
- Framing
- Premium (Industry Specification)
- Premium Hand Select (Best)
- Rough Sawn

Rosboro is the single source manufacturer for all your glulam beam needs. When your project requires something special, we are here to help. Custom orders can be packaged with stock shipments through our extensive network of wholesale distributors.

Other customization options are available upon request.



Mass timber decking system

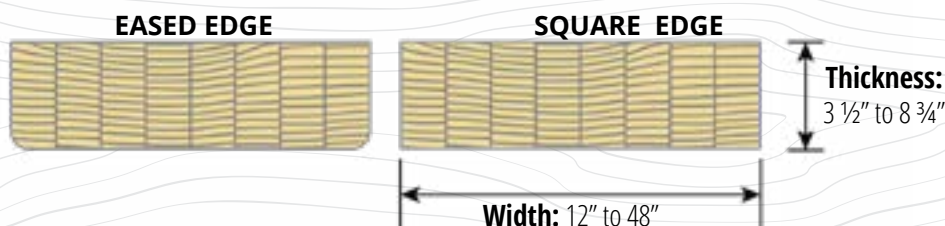
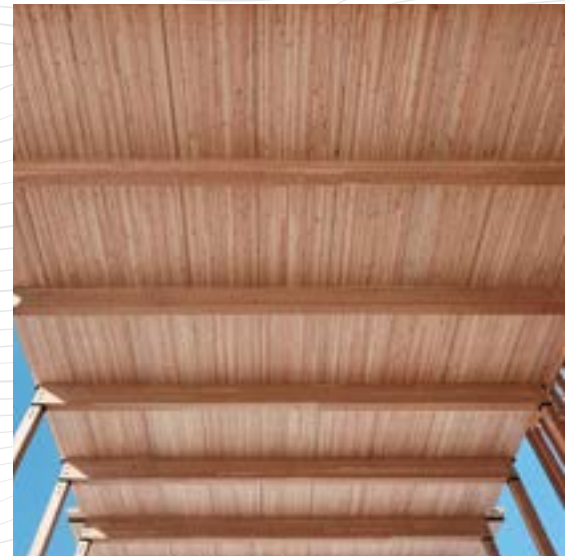
Rosboro Laminated Decking™ is a cost-effective alternative to other mass timber floor and roof systems such as CLT (Cross Laminated Timber).

With all laminations oriented on the strong axis RLD is stronger than CLT, allowing you to use smaller sections and reduce project costs. 3 ½" RLD can replace 3-ply CLT while 5 ½" RLD can replace 5-ply CLT in most floor and roof applications.

The exposed surface is available with either architectural or industrial appearance to fit a variety of project needs. Designed for single and multi-span applications, Rosboro Laminated Decking™ provides a high-strength, visually appealing base for any Mass Timber structure.

Features and Benefits of Laminated Decking

- Easier to handle and install than bulky panel systems
- Wide face of lumber is not exposed, greatly reducing the visibility of checking
- Ideal for floor or roof designs that include a space between panels in the exposed ceiling for utility chases
- Bearing support only required perpendicular to span allowing for the use of floor-to-ceiling curtain wall systems below panel edges
- Can be pre-fabricated with all connections and openings just like CLT
- 1-hour and 2-hour fire rated conformance
- Wide range of size options make RLD the most cost effective wood roof and floor decking on the market



Rosboro Laminated Decking™

DESIGN VALUES

Product	Layup Combination	Bending 4 or more lams (psi)			Comp Perp to Grain F _c (psi)	Shear Parallel to Grain F _{vy} (psi) 4 or more	MOE (10 ⁶ psi)	
		F _{by}	C _{fu} ¹	F'by			Apparent	True
3-1/2" Decking	EWS 1	1,450	1.147	1,663	560	230	1.5	1.6
5-1/2" Decking	EWS 1	1,450	1.091	1,581	560	230	1.5	1.6
6-3/4" Decking	EWS 1	1,450	1.066	1,546	560	230	1.5	1.6
8-3/4" Decking	EWS 1	1,450	1.036	1,502	560	230	1.5	1.6

Notes:

1. Flat-use factor (C_{fu}) per 2018 NDS Section 5.3.7.
2. Applicable to dry-use service conditions (C_M = 1.0).
3. Applicable to in service temperature conditions ≤ 100°F (C_t = 1.0).
4. Values assume minimum 12 inch decking width.

DESIGN PROPERTIES

Depth (in)	Weight (psf)	Maximum Resistive Shear (lbf)			Maximum Resistive Moment (ft-lb)			EI (10 ⁶ in ² -lb)
		100%	115%	125%	100%	115%	125%	
3 1/2	10.2	6440	7406	8050	3395	3904	4243	64
5 1/2	16.0	10120	11638	12650	7972	9168	9965	250
6 3/4	19.7	12420	14283	15525	11738	13499	14672	461
8 3/4	25.5	16100	18515	20125	19163	22038	23954	1005

Notes:

1. Beam weight is assumed to be 35 pcf.
2. Tabulated Maximum Resistive Shear and Maximum Resistive Moment values are reported per one foot of decking width.

Diaphragm Design

Shear design values for Rosboro Laminated Decking in horizontal wood diaphragm assemblies are governed by the allowable unit shear capacity values as specified in AWC Special Design Provisions for Wind and Seismic (SDPWS) 2015 Edition. Due to the nature of Rosboro Laminated Decking construction, diaphragms using wood structural panels are considered to be **Fully Blocked** achieving the values given in SDPWS Table 4.2A. Rosboro Laminated Decking is also capable of achieving the higher shear capacities of **High Load Diaphragms** with the increased nailing specifications given in SDPWS Table 4.2B.

Fire Rated Design

Rosboro Laminated Decking floor and roof diaphragms take advantage of the natural char capabilities of the Doug Fir wood species. By evaluating the design thickness of the decking to include the Effective Char Depth set forth by NDS-18 Chapter 16 for one-sided fire exposure, Rosboro Laminated Decking can be utilized in both 1-HR and 2-HR assemblies without the need for sacrificial laminations.

Expansion Gap Allowance

Rosboro Laminated Decking should be installed with 1/4" expansion gaps between adjacent panels to allow for the potential of shrinkage or expansion during acclimation. After the panels have sufficiently acclimatized, these gaps can be filled with an elastomeric material to provide a more uniform finished appearance if desired.



Available Sizes in RLD

- Thickness: 3 1/2", 5 1/2", 6 3/4", and 8 3/4"
- Widths: 12" through 48"
- Length: 10' to 60'



ALASKA YELLOW CEDAR

Revered for its attractive, tight-grain appearance and natural resistance to decay and insects.

It is an ideal solution for outdoor applications where pressure-treated materials are not suitable. Rosboro produces a wide range of AYC glulam products that can be tailored to your needs.

Applications

Because of its natural durability, resistance to decay, stability and workability, Alaska Yellow Cedar (AYC) has a wide variety of uses. Native Americans in the Pacific Northwest carved canoes from AYC, and it has been used in Japan for centuries to build temples. In modern construction, it is a popular choice for decks, gazebos, and other outdoor structures where the wood is exposed to the elements.

AYC is available for beam applications in balanced (V13) and unbalanced (V12) layups, and as columns (Combination 69)

Appearances

Alaska Yellow Cedar can be produced in Premium, Architectural, Industrial, or Framing appearance and can even be rough-sawn for a more rugged texture. Due to the natural oils present in AYC, it is recommended that you consult with a reputable coatings supplier prior to applying paints or stains.

Available Sizes in AYC

- Widths: 3 1/2", 5 1/2", 6 3/4", 8 3/4", 10 3/4", 12 1/4", 14 1/4"
- Length: Up to 100 feet



ROSBORO ALASKAN YELLOW CEDAR (AYC) BEAM DESIGN VALUES

20F-V12 | $F_b = 2,000 \text{ psi}$ | $F_v = 265 \text{ psi}$ | $F_c = 560 \text{ psi}$ | $E_{\text{Apparent}} = 1.5 \times 10^6 \text{ psi}$ | $E_{\text{True}} = 1.6 \times 10^6 \text{ psi}$

Width (in.)	Depth (in.)	Weight (lb/ft)	Maximum Resistive Shear (lb/ft)			Maximum Resistive Moment (lb-ft)			EI (10 ⁶ in ² -lb/ft)
			100%	115%	125%	100%	115%	125%	
3 1/2	6	5.1	3710	4267	4638	3500	4025	4375	95
	7 1/2	6.4	4638	5333	5797	5469	6289	6836	185
	9	7.7	5565	6400	6956	7875	9056	9844	319
	10 1/2	8.9	6493	7466	8116	10719	12327	13398	506
	12	10.2	7420	8533	9275	14000	16100	17500	756
	13 1/2	11.5	8348	9600	10434	17719	20377	22148	1076
	15	12.8	9275	10666	11594	21875	25156	27344	1477
	16 1/2	14.0	10203	11733	12753	26469	30439	33086	1965
	18	15.3	11130	12800	13913	31500	36225	39375	2552
	19 1/2	16.6	12058	13866	15072	36969	42514	46211	3244
	21	17.9	12985	14933	16231	42875	49306	53594	4052
	22 1/2	19.1	13913	15999	17391	49219	56602	61523	4983
5 1/2	24	20.4	14840	17066	18550	56000	64400	70000	6048
	6	8.0	5830	6705	7288	5500	6325	6875	149
	7 1/2	10.0	7288	8381	9109	8594	9883	10742	290
	9	12.0	8745	10057	10931	12375	14231	15469	501
	10 1/2	14.0	10203	11733	12753	16844	19370	21055	796
	12	16.0	11660	13409	14575	22000	25300	27500	1188
	13 1/2	18.0	13118	15085	16397	27844	32020	34805	1692
	15	20.1	14575	16761	18219	34375	39531	42969	2320
	16 1/2	22.1	16033	18437	20041	41594	47833	51992	3088
	18	24.1	17490	20114	21863	49500	56925	61875	4010
	19 1/2	26.1	18948	21790	23684	58094	66808	72617	5098
	21	28.1	20405	23466	25506	67375	77481	84219	6367
6 3/4	22 1/2	30.1	21863	25142	27328	77344	88945	96680	7831
	24	32.1	23320	26818	29150	88000	101200	110000	9504
	9	14.8	10733	12342	13416	15188	17466	18984	615
	10 1/2	17.2	12521	14399	15652	20672	23773	25840	977
	12	19.7	14310	16457	17888	27000	31050	33750	1458
	13 1/2	22.1	16099	18514	20123	34172	39298	42715	2076
	15	24.6	17888	20571	22359	42188	48516	52734	2848
	16 1/2	27.1	19676	22628	24595	51047	58704	63809	3790
	18	29.5	21465	24685	26831	60750	69863	75938	4921
	19 1/2	32.0	23254	26742	29067	71297	81991	89121	6256
	21	34.5	25043	28799	31303	82688	95091	103359	7814
	22 1/2	36.9	26831	30856	33539	94922	109160	118652	9611
8 3/4	24	39.4	28620	32913	35775	108000	124200	135000	11664
	9	19.1	13913	15999	17391	19688	22641	24609	797
	10 1/2	22.3	16231	18666	20289	26797	30816	33496	1266
	12	25.5	18550	21333	23188	35000	40250	43750	1890
	13 1/2	28.7	20869	23999	26086	44297	50941	55371	2691
	15	31.9	23188	26666	28984	54688	62891	68359	3691
	16 1/2	35.1	25506	29332	31883	66172	76098	82715	4913
	18	38.3	27825	31999	34781	78750	90563	98438	6379
	19 1/2	41.5	30144	34665	37680	92422	106285	115527	8110
	21	44.7	32463	37332	40578	107188	123266	133984	10129
	22 1/2	47.9	34781	39998	43477	123047	141504	153809	12458
	24	51.0	37100	42665	46375	140000	161000	175000	15120

Notes:

1. Beam Weight is assumed to be 31 pcf.
2. Maximum resistive moment shall be adjusted by volume factor based on NDS-18.

Tabulated values are pounds per square foot

ROSBORO AYC COLUMN DESIGN VALUES

Comb. 69 AC | Dry-Use | $F_{by}^1 = 1,100$ psi | $F_{bx}^2 = 1,000$ psi | $F_c^3 = 1,150$ psi | $E_{\text{Apparent}} = 1.2 \times 10^6$ psi | $E_{\text{Min}}^4 = 0.63 \times 10^6$ psi

Notes:

1. Applicable to 4 or more lams. This value shall be reduced to 975 psi for three lams and 775 for two lams.
2. Applicable to column depths up to 15". For column depths exceeding 15", $F_{bx} = 880$ psi.
3. Applicable to 4 or more lams. This value shall be reduced to 1,100 psi for two or three lams.
4. Applicable to column stability calculations for member buckling. (NDS-18 5.2.7)

ALLOWABLE AXIAL LOAD VALUES FOR COMBINATION NO. 3 GLULAM COLUMNS

Side loads are not permitted. End loads are limited to a maximum eccentricity of either 1/6 column width or depth, whichever is greater.

Effec. Column Length (ft.)	Lamination Net Width = 3 1/2 in.						Lamination Net Width = 5 1/2 in.								
	Net Depth = 4 1/2 in. (3 lams)			Net Depth = 6 in. (4 lams)			Net Depth = 5 1/2 in. (4 lams)			Net Depth = 6 in. (4 lams)			Net Depth = 7 1/2 in. (5 lams)		
	Load Duration Factor			Load Duration Factor			Load Duration Factor			Load Duration Factor			Load Duration Factor		
	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25
8	5450	5740	5910	7580	7960	8180	15110	16620	17540	17060	18840	19930	22430	24630	25950
9	4690	4910	5030	6490	6770	6930	13970	15190	15920	15880	17340	18200	20660	22410	23430
10	4060	4230	4320	5590	5810	5930	12810	13780	14350	14640	15810	16490	18860	20220	21010
11	3540	3670	3740	4860	5030	5120	11680	12460	12910	13410	14340	14890	17110	18180	18800
12	3110	3210	3270	4260	4390	4460	10630	11260	11620	12240	13000	13430	15490	16340	16830
13	2750	2830	2880	3750	3860	3920	9670	10180	10490	11170	11780	12100	14030	14720	15120
14	2440	2510	2550	3330	3420	3470	8810	9240	9490	10180	10640	10900	12730	13300	13630
15	--	--	--	--	--	--	8040	8400	8610	9260	9640	9860	11580	12060	12330
16	--	--	--	--	--	--	7360	7670	7850	8450	8770	8960	10560	10970	11200
17	--	--	--	--	--	--	6760	7020	7170	7730	8010	8170	9670	10010	10210
18	--	--	--	--	--	--	6220	6450	6580	7100	7340	7470	8880	9170	9340
19	--	--	--	--	--	--	5740	5940	6050	6540	6740	6860	8170	8430	8570
20	--	--	--	--	--	--	5310	5480	5580	6040	6210	6310	7540	7770	7890
21	--	--	--	--	--	--	4930	5080	5170	5590	5740	5830	6980	7180	7290
22	--	--	--	--	--	--	4580	4720	4790	5190	5320	5400	6480	6650	6750

Tabulate values are in pounds.

Notes:

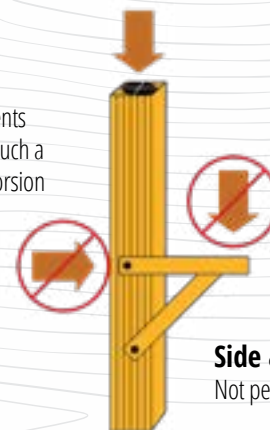
1. The tabulated allowable loads apply only to one-piece glulam members with all L3 laminations (Combination 69) without special tension laminations.
2. Applicable to dry-use service conditions ($CM = 1.0$).
3. The tabulated allowable loads are based on simply axially loaded columns subjected to a maximum eccentricity of either 1/6 column width or 1/6 column depth, whichever is worse. For side loads, other eccentric loads, or other combined axial and flexural loads, see NDS-Current version.
4. The column is assumed to be unbraced, except at the column ends, and the effective column length is equal to the actual column length.
5. Volume factor for F_{bx} is in accordance with NDS-Current version.
6. Size factor for F_{by} is $(12/d)^{1/9}$, where d is equal to the lamination width in inches.

Axial Loads:

Allowable Axial Load Tables: Side loads and bracket loads are not permitted. End loads are limited to a maximum eccentricity of either 1/6 column width or 1/6 column depth.

Axial Loads:

Loads and load components applied along an axis in such a way that no bending or torsion moments are produced.



Side & Bracket Loads:

Not permitted with these tables.



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