



Boise Cascade®
ENGINEERED WOOD PRODUCTS

BOISE GLULAM®

Beam and Column Specifier Guide



Glued laminated timbers from Boise Cascade Engineered Wood Products add functional beauty to any residential or commercial project.

Just ask for BOISE GLULAM® beams.

No discussion of engineered wood products is complete without mention of glued laminated timber. Glulams are sometimes forgotten in what has become an increasingly crowded field of newer products.

Laminated timbers are often the most cost-effective and easy-to-install alternative for beam applications to residential, commercial and light industrial construction. It is usually easy to determine whether to specify a balanced or unbalanced layup and whether to choose Architectural, Industrial or Framing Appearance Classification beams.

The benefit to BOISE GLULAM® beams is that they can be manufactured either with or without camber. Most stock beams are available with either a small amount of camber (5000' radius) or no camber, depending on market demands.

BOISE GLULAM® beams are manufactured primarily from Douglas Fir-Larch and other softwood species and carry the APA trademark.

STOCK BEAMS

For most residential applications, stock beams are the product of choice. BOISE GLULAM® stock beams are available through our trusted distributors, located strategically throughout the country. Our beams are manufactured in widths of 3½", 3½", 5½", 5½", 6¾", and 8¾", with depths ranging from 6" to 24" and lengths up to 66 feet, with or without camber. Stock beams are available in Architectural appearance classification except 3½" and 5½" which are Framing header classification only. Architectural Appearance is intended for exposed applications but can also be used for concealed beams, headers, columns, and rafters. Check with your local distributor for availability.

IJC (I-JOIST COMPATIBLE) BEAMS

IJC (I-Joist Compatible) sizes are readily available. Consult your local distributor for availability. IJC sizes have proven to be cost-effective product options to other structural members such as LVL.

BOISE GLULAM® MANUFACTURING STANDARDS

APA Mill Number: 1107

APA EWS Trademarked Glulam Under These Standards:

– ANSI A190.1-2017

– CSA O122-16 and CSA O177-06



Rough Sawn Glulam
Just one of our custom beams

CUSTOM BEAMS

Custom beams are used when large cross-sections, longer lengths, curved and arched shapes, different appearances, or specific certifications are required.

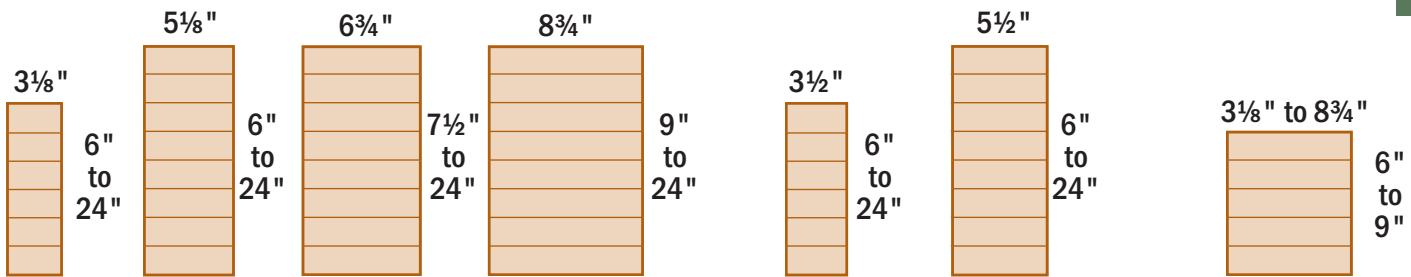
Custom widths: 3½", 3½", 5½", 5½", 6¾", 8¾", 10¾", 12¼", 14¼"

Depths ranging from 6" to 57½" (depending upon the width)

BOISE GLULAM® custom beams are manufactured on a made-to-order basis. Please call to determine availability of BOISE GLULAM® custom beams. See pages 45-47 in our Western Commercial Guide for additional information.

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Architectural and Framing Appearance Beams

Framing Appearance Beams

Columns

ARCHITECTURAL APPEARANCE BEAMS

These beams are the beams of choice in applications where members are exposed to view, because they have a smooth, attractive finish. Stock beams are often supplied with this appearance so they may be exposed to view in the finished structure. Voids greater than $\frac{3}{4}$ " are filled, three sides (excluding the top) are planed or sanded, and edges are eased on the bottom face of the member.

INDUSTRIAL APPEARANCE BEAMS

These beams are used in concealed applications or in other places where appearance is not of primary importance, such as such as commercial buildings, warehouses, and garages. Voids are not filled, and only the two wide surfaces are planed.

FRAMING APPEARANCE BEAMS

BOISE GLULAM® headers are commonly used for concealed applications such as doors and windows where appearance is not of importance. They come in two common widths, $3\frac{1}{2}$ " and $5\frac{1}{2}$ ". Check with your local distributor for availability.

COLUMNS

Glulam columns are straight and dimensionally true, making framing an easy task. Because columns are available in long lengths, the members do not have to be spliced together, as is often necessary with sawn lumber. The columns can be exposed to view as a unique architectural feature of the framing system.

BOISE GLULAM® columns have all four edges eased to match the widths of the Architectural glulams beams and have the same architectural appearance. All sides may be exposed to view.

BALANCED AND UNBALANCED BEAM LAYUPS

The most critical areas of a glulam beam are the outside laminations. Thus, the strongest laminations are placed in these areas in either unbalanced or balanced layups.

In unbalanced beams, typically known as V4s, the bottom lamination is stronger than all the other laminations. This allows for a more efficient use of timber resources. It is very important to install unbalanced BOISE GLULAM® beams with the top side up. (*The word "top" is always printed on the corresponding side.*) V4 glulams may be designed and installed in both single and multiple-span applications, and in relatively short cantilevers.

Balanced glulam beams, or V8s, have the same high-strength laminations on both the top and bottom of the beam, creating a symmetric layup. A V8 glulam can be designed for multiple-span conditions and cantilevers. V8s can also be used for single spans, but V4s are most cost-effective for this type of application. V8 BOISE GLULAM® beams may be special ordered at an additional cost; check with your local distributor for availability.

APPARENT & TRUE MODULUS OF ELASTICITY

A beam's deflection is dependent upon the modulus of elasticity (MOE) and the beam's cross-section. There are two components of deflection, deformation from bending and deformation from shear. An "apparent" MOE is typically published for wood structural products. The apparent MOE encompasses both deflection components. However a "true" MOE value is sometimes referenced, which only corresponds to the bending portion of deflection and thus is "shear-free". A true MOE is approximately 5% higher than the apparent MOE (the difference does vary slightly depending upon span length and beam depth). For example, the true MOE of a 24F-V4/DF glulam is approximately 1,900,000 psi but the apparent and published MOE is 1,800,000 psi. The designer must add the shear deflection component to bending deflection when using the higher true MOE.

LAYUP COMBINATIONS

Balanced Vs Unbalanced Layup Example

No. 2D	T.L.
No. 2	No. 1
No. 2	No. 2
No. 3	No. 3
No. 2	No. 2
No. 1	No. 1
T.L.	T.L.
Unbalanced (V4)	Balanced (V8)
T.L. = Tension Lamination	

ADHESIVES

BOISE GLULAM® beams are manufactured with exterior-grade or wet-use adhesives that comply with all recognized national glulam standards. The purpose of exterior-grade adhesives is to ensure that the design values of the beams are not compromised when the beams are directly exposed to the weather during construction. Though wet-use adhesives are required when glulam beams exceed a moisture content of 16% for extended periods of time after installation, the beams still must be protected from exterior exposure. (*For applications where moisture content may exceed 19%, see Preservative Treatment.*)

(ANSI A190.1-2017 Standard for Wood Products - Structural Glued Laminated Timber) See page 6 of this guide – "Exposed Applications for Glulam"

HANDLING & STORAGE

Water-resistant wrapping is often specified to protect beams from moisture, soiling, and surface scratches during transit and job-site storage. Because exposure to sunlight can discolor beams, opaque wrappings are recommended. Beams can be wrapped individually or by the bundle. In applications where appearance is especially important, individual wrapping should be left intact until installation to minimize exposure to job-site conditions.

Beams are commonly loaded and unloaded with forklifts. For greater stability, the sides of the beams, rather than the bottoms, should rest on the forks. Supporting extremely long beams on their sides, however, can cause them to flex excessively, increasing the risk of damage. Use multiple forklifts to lift long beam members.

A level, well-drained, covered storage site is recommended. **Keep beams off the ground, using lumber blocking, skids, or a rack system. Keep beams level.** The wrapping on beams should be left in place to protect them from moisture, soiling, sunlight, and scratches. For long-term storage, cut slits in the bottom of the wrapping to allow ventilation and draining of any entrapped moisture. Proper ventilation and drainage will reduce the likelihood of water damage, staining, and the start of decay.

CHECKING

Checking occurs naturally in timber when wood fibers dry. As the outer fibers lose moisture and attempt to shrink, they are restrained by the fiber in the inner portion of the beam, which loses moisture at a much slower rate. Rapid drying increases the difference in moisture content between the inner and outer fibers and thus the chances for checking in the timber member. To minimize the potential for checking, BOISE GLULAM® is produced from special grades of lumber specifically dried to less than 16% moisture content.

Example of Checking



End

Side

See Tech Note BG-1 at <https://p.widencdn.net/mslpl/1/BG-1-Glulam-Checking>. Contact Boise Cascade EWP Engineering for any further technical guidance.

FIELD NOTCHING & DRILLING

Glulam beams are generally designed for applications where they will be highly stressed under design loads. For this reason, field modifications such as notching, tapering, or drilling may only be made only after approval has been given by the project's design professional of record and/or Boise Cascade Engineered Wood Products representative. For the proper location of smaller holes, please refer to page 9. Analysis of notches and tapered end cuts on BOISE GLULAM® beams may be performed by a qualified user of BC Calc®, Boise Cascade EWP's engineered wood sizing software (www.BCCalc.com).

DIMENSIONAL TOLERANCES

The tolerances permitted at the time of manufacture per ANSI Standard A190.1-2012 are as follows:

- Width –** Plus or minus $\frac{1}{16}$ " of the specified width.
- Depth –** Plus $\frac{1}{8}$ " per foot of depth. Minus $\frac{3}{16}$ ", or $\frac{1}{16}$ " per foot of depth, whichever is larger.
- Length – Up to 20 feet –** Plus or minus $\frac{1}{16}$ ".
- Over 20 feet –** Plus or minus $\frac{1}{16}$ " per 20 feet of length.

Note that the above tolerances do not apply to rough sawn textured beams.

Camber or Straightness – Tolerances are intended for use with straight or slightly cambered beams. The tolerances permitted at the time of manufacture, without allowance for dead load deflection, are as follows:

- Up to 20 feet –** Plus or minus $\frac{1}{4}$ ".
- Over 20 feet –** Add $\frac{1}{8}$ " per each additional 20 feet or fraction thereof, but not to exceed plus or minus $\frac{3}{4}$ ".

Squareness – The tolerance of the cross section shall be within plus or minus $\frac{1}{8}$ " per foot of specified depth, unless a specially shaped beam is selected.

EXPOSED APPLICATIONS FOR GLULAM

BOISE GLULAM® beams are intended for applications where mold, decay, and/or insect attack are not concerns. For conditions where glulams are permanently exposed to the weather, have direct ground or concrete contact, or are exposed to significant moisture from condensation or other sources, preservative treatment is required as specified by applicable building codes. For information on different treatments for specific applications, please consult a wood treater or treating association. Please note that when glulams are treated, design values may be affected.

All field cuts – including notches, end cuts, and holes – should be performed before the glulam beam is treated. All fasteners used with treated glulam beams must be resistant to corrosion from moisture. Consumer Information Sheets that detail proper use and handling of products with the specified treatments should be obtained from the treater for proper use and handling of products with the specified treatments. In addition, Material Safety Data Sheets (MSDS) and OSHA-required hazard labels provided with each preservative should be reviewed. Please note that when glulams are treated and installed in exterior applications, design values shall be adjusted per building code provisions.

Durable species glulams such as Port Orford Cedar are readily available and provide alternative product for exposed applications. This may be a good option for your top appearance applications. See **Durable Species Flyer** for additional information on options. Consult your local distributor for availability.

FIRE RESISTANCE

BOISE GLULAM® beams, like many other wood products, have advantageous fire-endurance properties. Unlike steel that loses a large percentage of its strength when exposed to typical temperatures during a fire, wood beams char on the surface. Charring forms a self-insulating surface layer when wood is exposed to flame or relatively high temperatures. The wood below this layer retains its structural properties during a fire. Most solid wood members, including BOISE GLULAM® beams, char at a nominal rate of approximately $1\frac{1}{2}$ inches per hour. BOISE GLULAM® may be special ordered to create a beam with a one-hour fire rating. In this beam specification, an additional high grade tension lamination replaces a core lamination in the manufacturing process. The project's design professional of record shall specify this type of fire-resistance requirement.

Larger glulam beams may be utilized in heavy timber construction, and a fire-resistance classification where exposed beams are designed to maintain a specified strength level for a specified duration during a fire. For further information on heavy timber construction, please refer to *Heavy Timber Construction - Wood Construction Data #5*, American Wood Council.

The adhesives used in BOISE GLULAM® beams do not reduce the fire-endurance properties of the wood material. When compared to wood, the adhesives have a higher ignition temperature and char in a very similar manner. When burned, the adhesives do not increase smoke toxicity. See *Boise Cascade Fire Detail & Installation Guide* for further design and detailing information. For further information on fire-resistance design, please contact Boise Cascade EWP Engineering.



BOISE GLULAM® 24F-V4 Design Values

Architectural & Framing Appearance Classification						Architectural & Framing Appearance Classification					
Width (in)	Depth (in)	Weight (plf)	Allowable Shear (lbs)	Allowable Moment Positive (ft-lbs) ⁽¹⁾	Allowable Moment Negative (Multiple Spans) (ft-lbs) ⁽¹⁾	Width (in)	Depth (in)	Weight (plf)	Allowable Shear (lbs)	Allowable Moment Positive (ft-lbs) ⁽¹⁾	Allowable Moment Negative (Multiple Spans) (ft-lbs) ⁽¹⁾
3½"	6	4.6	3313	3750	2891	8¾"	9	19.1	13913	23048	17766
	7½	5.7	4141	5859	4517		10½	22.3	16231	30891	23812
	9	6.8	4969	8438	6504		12	25.5	18550	39812	30689
	10½	8.0	5797	11484	8853		13½	28.7	20869	49798	38386
	12	9.1	6625	15000	11563		15	31.9	23188	60834	46893
	13½	10.3	7453	18984	14634		16½	35.1	25506	72911	56202
	15	11.4	8281	23438	18066		18	38.3	27825	86018	66306
	16½	12.5	9109	28359	21860		19½	41.5	30144	100147	77197
	18	13.7	9938	33750	26016		21	44.7	32463	115290	88869
							22½	47.9	34781	131438	101317
5½"	6	7.5	5433	6150	4741		24	51.0	37100	148585	114534
	7½	9.3	6791	9609	7407						10080.0
	9	11.2	8149	13838	10666						
	10½	13.1	9507	18834	14518						
	12	14.9	10865	24600	18963						
	13½	16.8	12223	30770	23718						
	15	18.7	13581	37589	28975						
	16½	20.6	14939	45052	34727						
	18	22.4	16298	53151	40970						
	19½	24.3	17656	61881	47700						
6¾"	21	26.2	19014	71237	54912						
	22½	28.0	20372	81215	62603						
	24	29.9	21730	91810	70771						
	7½	12.3	8944	12656	9756						
	9	14.8	10733	18225	14048						
	10½	17.2	12521	24457	18852						
	12	19.7	14310	31520	24297						
	13½	22.1	16099	39425	30390						
	15	24.6	17888	48163	37126						
	16½	27.1	19676	57724	44496						
3½"	18	29.5	21465	68102	52495						
	19½	32.0	23254	79288	61118						
	21	34.5	25043	91276	70359						
	22½	36.9	26831	104061	80213						
	24	39.4	28620	117636	90678						

Framing Appearance Classification					
Width (in)	Depth (in)	Weight (plf)	Allowable Shear (lbs)	Allowable Moment Positive (ft-lbs) ⁽¹⁾	Moment of Inertia (in ⁴)
3½"	4½	3.8	2783	2363	1821
	6	5.1	3710	4200	3238
	7½	6.4	4638	6563	5059
	9	7.7	5565	9450	7284
	10½	8.9	6493	12863	9915
	12	10.2	7420	16800	12950
	13½	11.5	8348	21263	16390
	15	12.8	9275	26250	20234
5½"	9	12.0	8745	14850	11447
	10½	14.0	10203	20213	15580
	12	16.0	11660	26214	20207
	13½	18.0	13118	32789	25275
	15	20.1	14575	40056	30876

Notes:

1) Allowable moment calculated using glulam volume factor (C_v) with a span length of 21 ft. Allowable moment shall be multiplied by $(21/\text{Span Length [ft]})^{1/10}$ for longer spans.

BOISE GLULAM® 24F-V4 Allowable Design Stresses

Bending F_b [psi]	Horizontal Shear F_v [psi]	Modulus of Elasticity - Apparent E [psi]	Modulus of Elasticity - True E [psi]	Tension Parallel to Grain F_t [psi]	Compression Parallel to Grain F_c [psi]	Compression Perp to Grain F_{cp} [psi]
2400	1850	265	1,800,000*	1,900,000*	1100	1650
						650

Notes:

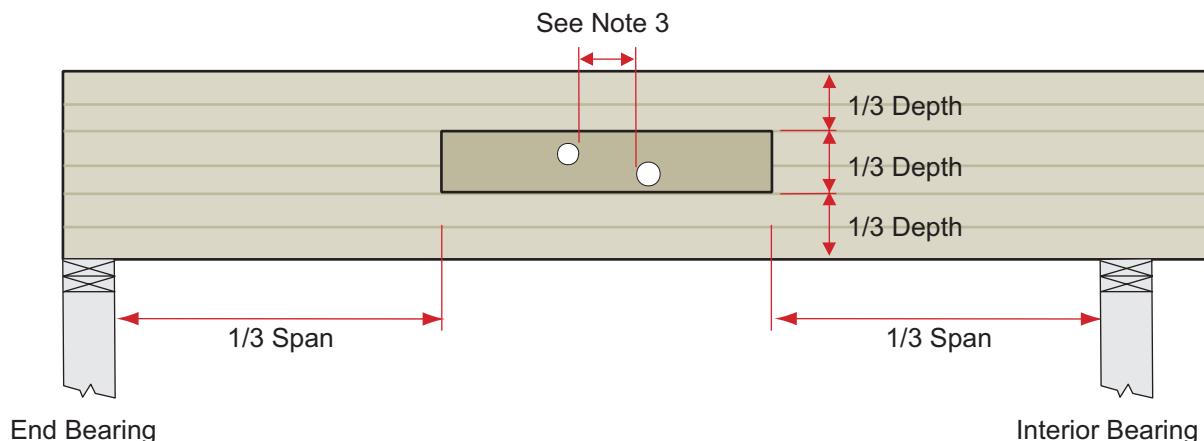
The data is for stock beams. For information on sizes not listed, please use BC Calc® software or consult with Boise Cascade EWP Engineering.

Designer of record shall review the glulam's application and consider the conditions of use. Contact Boise Cascade EWP Engineering for non-standard application design stresses and reduction factors for wet-use and stability conditions.

*See note on Apparent vs True MOE on page 3 for clarification

Horizontal Holes

Allowable Holes in Glulam Beams



Notes:

- 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 shall be at least two times the diameter of the larger hole.
- 4) Do not drill more than three access holes in any 4-foot long section of beam.
- 5) The maximum round hole diameter permitted is:

Beam Depth	6" & 7½"	9" & greater
Maximum Hole Diameter	1"	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 prescriptive hole chart is valid for all BOISE GLULAM® beams. For beams with larger holes, use BC Calc® sizing software (www.BCCalc.com) or contact Boise Cascade EWP Engineering.
- 9) For vertical holes, see page 29 for provisions with ridge beams or contact Boise Cascade EWP Engineering.

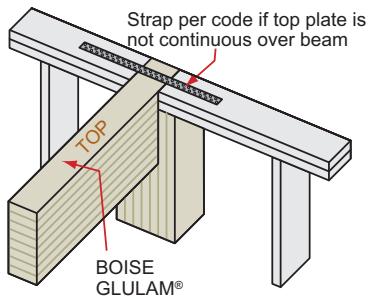


See Tech Note BG-3

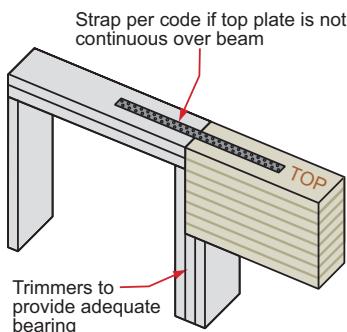


Common Details

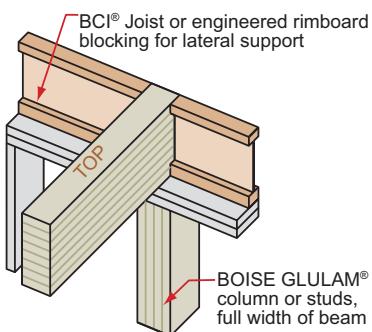
G1 Beam Framing to Wall



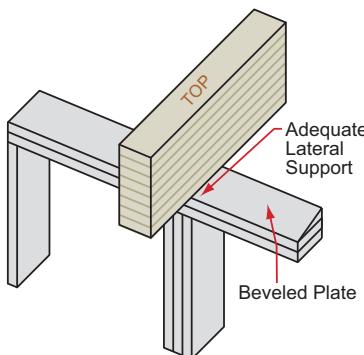
G2 Beam Bearing for Header



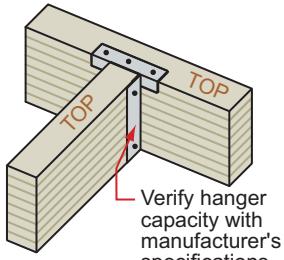
G3 Beam to Wall with Lateral Support



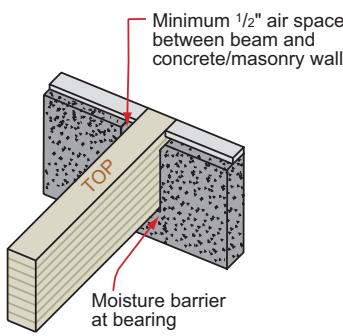
G4 End Wall Bevel Plate



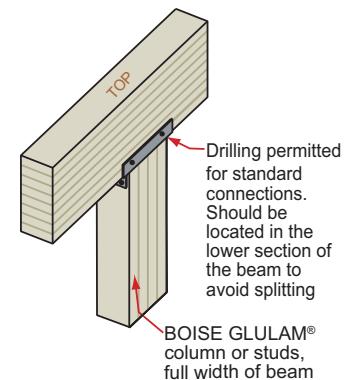
G5 Beam to Beam Connection



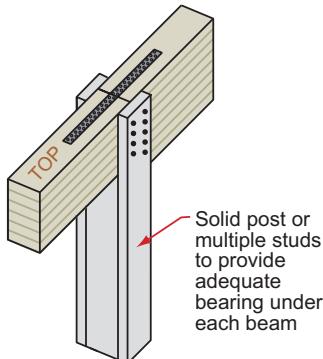
G6 Beam to Concrete / Masonry Wall



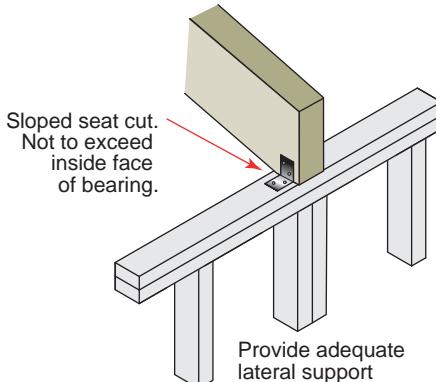
G7 Beam to Column Connection



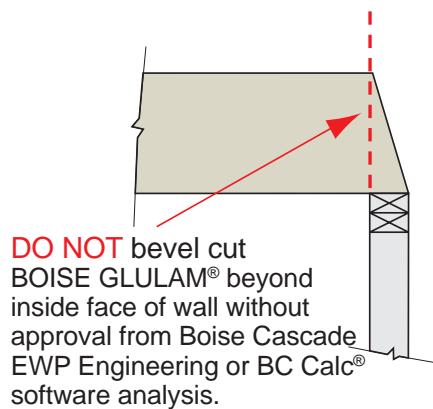
G8 Beam Depth Change at Intermediate Support



G9 Sloped Seat Cut



G10 Bevel Cutting



Architectural Appearance Beams 3½" Floor Load Tables – 100%

Span [ft]	Span Type	24F-V4 Grade – 100% Load Duration In pounds per lineal foot (PLF)									
		6"	7.5"	9"	10.5"	12"	13.5"	15"	16.5"	18"	
6	Simple	829	1296	1868	2544	3303	3965	4721	5593	6611	
	Multiple	638	998	1438	1959	2400	2829	3301	3823	4403	
	Min. Bearing	1.5 / 3	1.9 / 3.7	2.8 / 5.3	3.8 / 7.3	4.9 / 8.9	5.9 / 10.5	7 / 12.2	8.3 / 14.2	9.8 / 16.3	
8	Simple	362	710	1048	1428	1866	2363	2918	3458	3961	
	Multiple	357	559	806	1099	1436	1819	2197	2500	2826	
	Min. Bearing	1.5 / 3	1.5 / 3	2.1 / 4	2.8 / 5.4	3.7 / 7.1	4.7 / 9	5.8 / 10.9	6.8 / 12.4	7.8 / 14	
10	Simple	183	361	626	911	1191	1508	1864	2256	2686	
	Multiple	227	356	513	700	916	1160	1434	1736	2068	
	Min. Bearing	1.5 / 3	1.5 / 3	1.6 / 3.2	2.3 / 4.4	3 / 5.7	3.7 / 7.2	4.6 / 8.9	5.6 / 10.8	6.6 / 12.8	
12	Simple	104	206	359	574	824	1044	1291	1563	1861	
	Multiple	138	245	354	484	633	803	992	1202	1432	
	Min. Bearing	1.5 / 3	1.5 / 3	1.5 / 3	1.7 / 3.6	2.5 / 4.7	3.1 / 6	3.8 / 7.4	4.7 / 9	5.5 / 10.7	
14	Simple	64	128	224	358	538	765	945	1145	1364	
	Multiple	85	170	259	353	463	587	726	880	1048	
	Min. Bearing	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.1	1.9 / 4.1	2.7 / 5.1	3.3 / 6.4	4 / 7.7	4.7 / 9.1	
16	Simple	-	84	148	237	357	511	704	874	1041	
	Multiple	-	112	196	269	352	447	553	671	799	
	Min. Bearing	-	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.6	2.1 / 4.5	2.8 / 5.6	3.5 / 6.7	4.2 / 8	
18	Simple	-	57	102	164	248	356	491	656	820	
	Multiple	-	77	136	211	276	351	435	527	629	
	Min. Bearing	-	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.2	1.6 / 4	2.2 / 4.9	3 / 6	3.7 / 7.1	
20	Simple	-	-	72	118	178	257	355	475	619	
	Multiple	-	-	97	157	222	282	350	425	507	
	Min. Bearing	-	-	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.6	1.8 / 4.4	2.4 / 5.4	3.1 / 6.4	
22	Simple	-	-	53	86	132	190	264	354	462	
	Multiple	-	-	71	116	176	232	287	349	416	
	Min. Bearing	-	-	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.3	1.5 / 4	2 / 4.9	2.6 / 5.8	
24	Simple	-	-	-	65	99	144	201	270	353	
	Multiple	-	-	-	88	134	193	240	291	346	
	Min. Bearing	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.7	1.7 / 4.5	2.2 / 5.3	
26	Simple	-	-	-	-	76	111	155	209	274	
	Multiple	-	-	-	-	103	150	202	245	290	
	Min. Bearing	-	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3.4	1.5 / 4.1	1.8 / 4.9	
28	Simple	-	-	-	-	59	87	122	165	217	
	Multiple	-	-	-	-	81	118	164	208	247	
	Min. Bearing	-	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.8	1.6 / 4.5	
30	Simple	-	-	-	-	-	69	97	132	174	
	Multiple	-	-	-	-	-	94	131	177	211	
	Min. Bearing	-	-	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3.5	1.5 / 4.2	
32	Simple	-	-	-	-	-	55	78	106	141	
	Multiple	-	-	-	-	-	75	106	144	183	
	Min. Bearing	-	-	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3.1	1.5 / 3.9	
34	Simple	-	-	-	-	-	-	63	87	115	
	Multiple	-	-	-	-	-	-	87	118	156	
	Min. Bearing	-	-	-	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3.5	
36	Simple	-	-	-	-	-	-	51	71	95	
	Multiple	-	-	-	-	-	-	71	97	129	
	Min. Bearing	-	-	-	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3.2	
38	Simple	-	-	-	-	-	-	-	59	79	
	Multiple	-	-	-	-	-	-	-	81	108	
	Min. Bearing	-	-	-	-	-	-	-	1.5 / 3	1.5 / 3	
40	Simple	-	-	-	-	-	-	-	-	65	
	Multiple	-	-	-	-	-	-	-	-	90	
	Min. Bearing	-	-	-	-	-	-	-	-	1.5 / 3	

- Both Architectural and Framing appearance classification BOISE GLULAM® beams have the same structural classification, 24F-V4. Appearance classification does not affect the beam's allowable design values.
- Uniform PLF load values are limited by shear, moment, total load deflection limited to L/240 and live load deflection limited to L/360.
- Live load is equal to 0.8 of total load (residential loading).
- Span is measured center to center of the supports.
- Table values assume that lateral support is provided at each support and continuously along the compression edge of the beam.

- Table values for Minimum Required Bearing Lengths are based on the allowable compression design value perpendicular to grain for the beam and the load value shown. Other design considerations, such as a weaker support material, may warrant longer bearing lengths. Table values assume that support is provided across the full width of the beam.
- This table assumes dry-use conditions.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® software.

Architectural Appearance Beams 3½" Roof Load Tables – 115% Snow

Span [ft]	Span Type	24F-V4 Grade – 115% Load Duration In pounds per lineal foot (PLF)								
		6"	7.5"	9"	10.5"	12"	13.5"	15"	16.5"	18"
6	Simple	954	1492	2149	2927	3800	4561	5431	6434	7605
	Multiple	734	1149	1655	2254	2761	3255	3798	4398	5065
	Min. Bearing	1.5 / 3	2.2 / 4.3	3.2 / 6.1	4.3 / 8.4	5.6 / 10.2	6.8 / 12.1	8 / 14.1	9.5 / 16.3	11.3 / 18.8
8	Simple	535	837	1206	1643	2147	2719	3358	3978	4558
	Multiple	411	644	928	1265	1653	2093	2528	2877	3252
	Min. Bearing	1.5 / 3	1.7 / 3.2	2.4 / 4.6	3.3 / 6.3	4.2 / 8.2	5.4 / 10.4	6.6 / 12.5	7.9 / 14.2	9 / 16.1
10	Simple	295	533	769	1049	1371	1736	2145	2597	3091
	Multiple	261	410	592	806	1055	1336	1651	1999	2380
	Min. Bearing	1.5 / 3	1.5 / 3	1.9 / 3.7	2.6 / 5	3.4 / 6.5	4.3 / 8.3	5.3 / 10.2	6.4 / 12.4	7.6 / 14.7
12	Simple	169	333	532	726	949	1203	1486	1799	2143
	Multiple	180	283	409	558	730	925	1143	1384	1648
	Min. Bearing	1.5 / 3	1.5 / 3	1.6 / 3.1	2.2 / 4.2	2.8 / 5.5	3.6 / 6.9	4.4 / 8.5	5.4 / 10.3	6.4 / 12.3
14	Simple	105	208	362	531	695	881	1089	1319	1571
	Multiple	131	206	298	408	534	677	837	1014	1207
	Min. Bearing	1.5 / 3	1.5 / 3	1.5 / 3	1.9 / 3.6	2.4 / 4.7	3.1 / 5.9	3.8 / 7.3	4.6 / 8.8	5.5 / 10.5
16	Simple	69	137	240	385	530	672	831	1007	1199
	Multiple	92	157	227	310	406	516	638	773	921
	Min. Bearing	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.1	2.1 / 4.1	2.7 / 5.2	3.3 / 6.4	4 / 7.7	4.8 / 9.2
18	Simple	47	95	167	268	402	529	654	793	945
	Multiple	63	123	178	243	319	405	502	608	725
	Min. Bearing	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3	1.8 / 3.6	2.4 / 4.6	2.9 / 5.7	3.6 / 6.9	4.2 / 8.2
20	Simple	-	68	120	193	291	417	528	640	763
	Multiple	-	91	143	196	257	326	404	490	585
	Min. Bearing	-	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.3	2.1 / 4.1	2.7 / 5.1	3.2 / 6.2	3.8 / 7.4
22	Simple	-	49	88	143	216	311	429	527	628
	Multiple	-	67	117	160	211	268	332	403	481
	Min. Bearing	-	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3	1.7 / 3.8	2.4 / 4.6	2.9 / 5.6	3.5 / 6.7
24	Simple	-	-	66	108	164	237	328	439	523
	Multiple	-	-	89	133	176	223	277	337	400
	Min. Bearing	-	-	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.5	2 / 4.3	2.7 / 5.2	3.2 / 6.1
26	Simple	-	-	51	84	127	184	255	342	440
	Multiple	-	-	69	112	148	189	234	284	336
	Min. Bearing	-	-	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.2	1.7 / 3.9	2.3 / 4.7	2.9 / 5.6
28	Simple	-	-	-	65	100	145	202	272	355
	Multiple	-	-	-	88	127	161	200	241	286
	Min. Bearing	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.6	2 / 4.4	2.5 / 5.2
30	Simple	-	-	-	52	80	116	162	219	286
	Multiple	-	-	-	70	108	139	172	207	245
	Min. Bearing	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.4	1.7 / 4.1	2.2 / 4.8
32	Simple	-	-	-	-	64	94	132	178	234
	Multiple	-	-	-	-	87	121	149	179	212
	Min. Bearing	-	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3.1	1.5 / 3.8	1.9 / 4.5
34	Simple	-	-	-	-	52	77	108	146	192
	Multiple	-	-	-	-	71	104	129	156	185
	Min. Bearing	-	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.5	1.7 / 4.2
36	Simple	-	-	-	-	-	63	89	121	160
	Multiple	-	-	-	-	-	86	113	137	163
	Min. Bearing	-	-	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3.3	1.5 / 3.9
38	Simple	-	-	-	-	-	52	74	101	134
	Multiple	-	-	-	-	-	72	100	121	144
	Min. Bearing	-	-	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3.1	1.5 / 3.7
40	Simple	-	-	-	-	-	-	62	85	113
	Multiple	-	-	-	-	-	-	85	107	128
	Min. Bearing	-	-	-	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3.5

- Both Architectural and Framing appearance classification BOISE GLULAM® beams have the same structural classification, 24F-V4. Appearance classification does not affect the beam's allowable design values.
- Uniform PLF load values are limited by shear, moment, total load deflection limited to L/180 and live load deflection limited to L/240.
- Live load equal to 0.75 of total load, for greater live/total applications (e.g. 50 psf snow or higher), analyze specific application with BC Calc® software.
- Span is measured center to center of the supports.
- Table values assume that lateral support is provided at each support and continuously along the compression edge of the beam.

- Table values for Minimum Required Bearing Lengths are based on the allowable compression design value perpendicular to grain for the beam and the load value shown. Other design considerations, such as a weaker support material, may warrant longer bearing lengths. Table values assume that support is provided across the full width of the beam.
- Wind loading has not been considered in the above table.
- This table assumes dry-use conditions.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® software.

Architectural Appearance Beams 3 1/8" Roof Load Tables – 125% Non-Snow

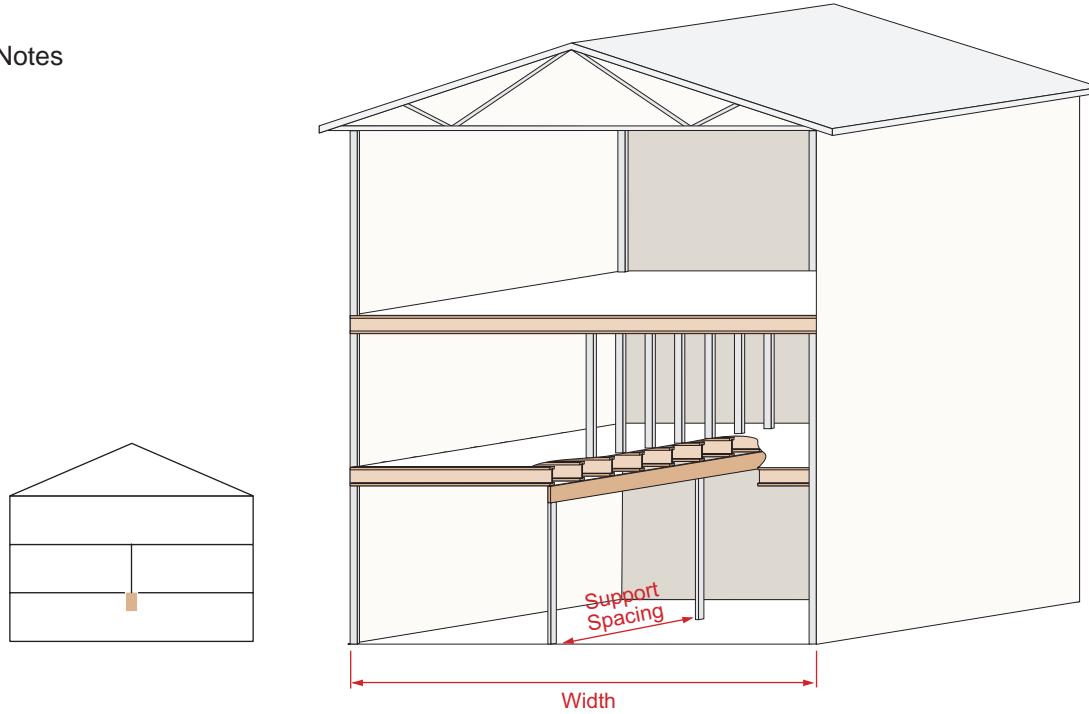
Span [ft]	Span Type	24F-V4 Grade – 125% Load Duration In pounds per lineal foot (PLF)								
		6"	7.5"	9"	10.5"	12"	13.5"	15"	16.5"	18"
6	Simple	1037	1622	2337	3182	4132	4958	5904	6995	
	Multiple	798	1249	1800	2451	3002	3539	4129	4782	
	Min. Bearing	1.5 / 3	2.4 / 4.6	3.5 / 6.7	4.7 / 9.1	6.1 / 11.1	7.3 / 13.1	8.7 / 15.3	10.3 / 17.7	
8	Simple	581	910	1312	1786	2335	2956	3651	4325	4955
	Multiple	447	700	1009	1375	1798	2276	2749	3129	3535
	Min. Bearing	1.5 / 3	1.8 / 3.5	2.6 / 5	3.5 / 6.8	4.6 / 8.9	5.8 / 11.3	7.2 / 13.6	8.5 / 15.5	9.8 / 17.5
10	Simple	295	580	837	1140	1491	1888	2332	2823	3361
	Multiple	285	446	644	877	1147	1453	1795	2174	2588
	Min. Bearing	1.5 / 3	1.5 / 3	2.1 / 4	2.8 / 5.4	3.7 / 7.1	4.7 / 9	5.8 / 11.1	7 / 13.5	8.3 / 16
12	Simple	169	333	579	790	1033	1308	1616	1957	2330
	Multiple	196	308	445	607	794	1006	1243	1506	1793
	Min. Bearing	1.5 / 3	1.5 / 3	1.7 / 3.3	2.4 / 4.5	3.1 / 5.9	3.9 / 7.5	4.8 / 9.3	5.8 / 11.2	6.9 / 13.3
14	Simple	105	208	362	578	756	958	1184	1434	1708
	Multiple	139	225	325	444	581	736	910	1103	1314
	Min. Bearing	1.5 / 3	1.5 / 3	1.5 / 3	2 / 3.9	2.6 / 5.1	3.3 / 6.4	4.1 / 7.9	5 / 9.6	5.9 / 11.4
16	Simple	69	137	240	385	577	731	904	1095	1305
	Multiple	92	171	247	338	443	561	694	841	1003
	Min. Bearing	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.4	2.3 / 4.4	2.9 / 5.6	3.6 / 6.9	4.4 / 8.4	5.2 / 10
18	Simple	47	95	167	268	402	576	712	863	1028
	Multiple	63	126	194	265	348	441	546	662	789
	Min. Bearing	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3	1.8 / 4	2.6 / 5	3.2 / 6.2	3.9 / 7.5	4.6 / 8.9
20	Simple	-	68	120	193	291	417	575	696	830
	Multiple	-	91	156	213	280	356	440	534	637
	Min. Bearing	-	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.6	2.1 / 4.5	2.9 / 5.6	3.5 / 6.7	4.2 / 8
22	Simple	-	49	88	143	216	311	429	573	684
	Multiple	-	67	118	175	230	292	362	439	524
	Min. Bearing	-	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.2	1.7 / 4.1	2.4 / 5.1	3.2 / 6.1	3.8 / 7.3
24	Simple	-	-	66	108	164	237	328	439	570
	Multiple	-	-	89	145	192	244	302	367	436
	Min. Bearing	-	-	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.8	2 / 4.6	2.7 / 5.6	3.4 / 6.6
26	Simple	-	-	51	84	127	184	255	342	447
	Multiple	-	-	69	112	162	206	256	310	366
	Min. Bearing	-	-	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.5	1.7 / 4.3	2.3 / 5.2	2.9 / 6.1
28	Simple	-	-	-	65	100	145	202	272	355
	Multiple	-	-	-	88	135	176	219	263	312
	Min. Bearing	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3.2	1.5 / 4	2 / 4.8	2.5 / 5.6
30	Simple	-	-	-	52	80	116	162	219	286
	Multiple	-	-	-	70	108	152	188	226	268
	Min. Bearing	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.7	1.7 / 4.4	2.2 / 5.2
32	Simple	-	-	-	-	64	94	132	178	234
	Multiple	-	-	-	-	87	127	162	196	232
	Min. Bearing	-	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3.4	1.5 / 4.1	1.9 / 4.8
34	Simple	-	-	-	-	52	77	108	146	192
	Multiple	-	-	-	-	71	104	142	171	203
	Min. Bearing	-	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3.2	1.5 / 3.8	1.7 / 4.5
36	Simple	-	-	-	-	-	63	89	121	160
	Multiple	-	-	-	-	-	86	121	150	178
	Min. Bearing	-	-	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3.6	1.5 / 4.3
38	Simple	-	-	-	-	-	52	74	101	134
	Multiple	-	-	-	-	-	72	101	133	158
	Min. Bearing	-	-	-	-	-	1.5 / 3	1.5 / 3	1.5 / 3.4	1.5 / 4
40	Simple	-	-	-	-	-	-	62	85	113
	Multiple	-	-	-	-	-	-	85	116	140
	Min. Bearing	-	-	-	-	-	-	1.5 / 3	1.5 / 3.2	1.5 / 3.8

- Both Architectural and Framing appearance classification BOISE GLULAM® beams have the same structural classification, 24F-V4. Appearance classification does not affect the beam's allowable design values.
- Uniform PLF load values are limited by shear, moment, total load deflection limited to L/180 and live load deflection limited to L/240.
- Live load no greater than 0.75 of total load.
- Span is measured center to center of the supports.
- Table values assume that lateral support is provided at each support and continuously along the compression edge of the beam.

- Table values for Minimum Required Bearing Lengths are based on the allowable compression design value perpendicular to grain for the beam and the load value shown. Other design considerations, such as a weaker support material, may warrant longer bearing lengths. Table values assume that support is provided across the full width of the beam.
- Wind loading has not been considered in the above table.
- This table assumes dry-use conditions.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® software.

Two Floor Beam Span Tables

See General Notes
on page 26.



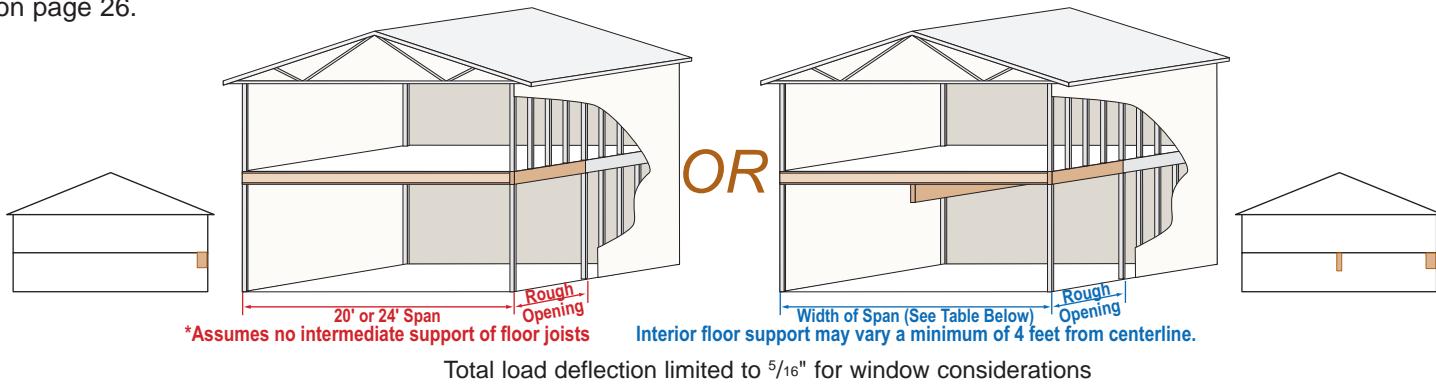
Required Beam Depths and Bearing Lengths [in]

Load Duration %	Floor Load [psf]		Beam Support Spacing [Feet]	Width of Building Segment [feet]											
				24		28		32		36		40			
	Live	Dead													
100%	40	12	6	3.125 x 10.5	2.1 / 5.2	3.125 x 12	2.5 / 6.2	3.125 x 12	2.9 / 7.1	3.125 x 13.5	3.2 / 7.9	3.125 x 15	3.5 / 8.7	3.125 x 15	3.8 / 9.5
				5.125 x 9	1.5 / 3.2	5.125 x 9	1.5 / 3.8	5.125 x 9	1.8 / 4.3	5.125 x 10.5	2.0 / 4.8	5.125 x 10.5	2.2 / 5.3	5.125 x 10.5	2.4 / 5.8
			8	3.125 x 13.5	2.8 / 6.9	3.125 x 15	3.2 / 8	3.125 x 15	3.7 / 9.1	3.125 x 16.5	4.1 / 10.1	3.125 x 18	4.5 / 11.1	5.125 x 13.5	3.0 / 7.3
				5.125 x 10.5	1.7 / 4.2	5.125 x 12	2.0 / 4.9	5.125 x 12	2.3 / 5.6	5.125 x 12	2.5 / 6.2	5.125 x 13.5	2.7 / 6.8	6.75 x 12	2.3 / 5.6
			10	3.125 x 16.5	3.4 / 8.4	3.125 x 16.5	3.9 / 9.7	5.125 x 15	2.7 / 6.7	5.125 x 15	3.0 / 7.4	5.125 x 16.5	3.3 / 8.1	5.125 x 16.5	3.5 / 8.7
				5.125 x 12	2.1 / 5.2	5.125 x 13.5	2.4 / 6	6.75 x 12	2.1 / 5.1	6.75 x 13.5	2.3 / 5.6	6.75 x 13.5	2.5 / 6.1	6.75 x 15	2.7 / 6.6
			12	5.125 x 15	2.4 / 6	5.125 x 16.5	2.8 / 6.9	5.125 x 16.5	3.1 / 7.8	5.125 x 18	3.4 / 8.5	5.125 x 18	3.7 / 9.2	5.125 x 19.5	4.0 / 9.8
				6.75 x 13.5	1.9 / 4.6	6.75 x 13.5	2.1 / 5.3	6.75 x 15	2.4 / 5.9	6.75 x 15	2.6 / 6.5	6.75 x 16.5	2.8 / 7	6.75 x 16.5	3.0 / 7.5
			14	5.125 x 16.5	2.8 / 6.9	5.125 x 18	3.2 / 7.8	5.125 x 19.5	3.5 / 8.7	5.125 x 19.5	3.8 / 9.5	5.125 x 21	4.1 / 10.2	5.125 x 21	4.3 / 10.8
				6.75 x 15	2.1 / 5.2	6.75 x 16.5	2.4 / 6	6.75 x 16.5	2.7 / 6.6	6.75 x 18	2.9 / 7.2	6.75 x 18	3.1 / 7.7	6.75 x 19.5	3.3 / 8.2
			16	5.125 x 19.5	3.1 / 7.6	5.125 x 21	3.5 / 8.7	5.125 x 21	3.9 / 9.6	5.125 x 22.5	4.2 / 10.4	5.125 x 22.5	4.4 / 11	5.125 x 24	4.7 / 11.6
				6.75 x 16.5	2.4 / 5.8	6.75 x 18	2.7 / 6.6	6.75 x 19.5	2.9 / 7.3	6.75 x 19.5	3.2 / 7.9	6.75 x 21	3.4 / 8.4	6.75 x 21	3.5 / 8.8
			18	5.125 x 21	3.4 / 8.4	5.125 x 22.5	3.8 / 9.4	5.125 x 24	4.2 / 10.3	5.125 x 24	4.5 / 11.1	6.75 x 22.5	3.6 / 8.9	6.75 x 24	3.9 / 9.8
				6.75 x 19.5	2.6 / 6.4	6.75 x 19.5	2.9 / 7.2	6.75 x 21	3.2 / 7.9	6.75 x 22.5	3.4 / 8.4				

See General Notes on page 26.

Roof and One Floor Span Tables

See General Notes
on page 26.



Load Duration %	Roof Load [psf]		Width of Bldg Segment [Feet]	Clear Span [feet]				
				6'-3"		9'-3"		
	Live	Dead					12'-3"	
125	20	15	24	3.125 x 7.5	1.8	3.125 x 12	2.4	
				5.125 x 6	1.5	5.125 x 10.5	1.5	
			30	3.125 x 7.5	1.9	3.125 x 12	2.8	
				5.125 x 6	1.5	5.125 x 10.5	1.7	
			36	3.125 x 7.5	2.2	3.125 x 12	3.2	
				5.125 x 6	1.5	5.125 x 10.5	2.0	
115	25	15	24	3.125 x 7.5	2.0	3.125 x 12	2.5	
				5.125 x 6	1.5	5.125 x 10.5	1.6	
			30	3.125 x 7.5	2.0	3.125 x 12	3.0	
				5.125 x 6	1.5	5.125 x 10.5	1.8	
			36	3.125 x 9	2.4	3.125 x 13.5	3.4	
				5.125 x 7.5	1.5	5.125 x 10.5	2.1	
115	30	15	24	3.125 x 9	2.2	3.125 x 12	2.7	
				5.125 x 6	1.5	5.125 x 10.5	1.7	
			30	3.125 x 9	2.2	3.125 x 12	3.2	
				5.125 x 7.5	1.5	5.125 x 10.5	2.0	
			36	3.125 x 9	2.5	3.125 x 13.5	3.7	
				5.125 x 7.5	1.6	5.125 x 10.5	2.3	
115	40	15	24	3.125 x 9	2.4	3.125 x 12	3.0	
				5.125 x 7.5	1.5	5.125 x 10.5	1.9	
			30	3.125 x 9	2.4	3.125 x 13.5	3.6	
				5.125 x 7.5	1.5	5.125 x 10.5	2.2	
			36	3.125 x 9	2.8	3.125 x 13.5	4.1	
				5.125 x 7.5	1.7	5.125 x 12	2.5	

See General Notes on page 26.

BOISE GLULAM® — Steel W Shape Substitution Table

Floor Beam Applications (100%) Duration for BOISE GLULAM®

24F-V4 BOISE GLULAM® Equivalent Member

Span [ft]	W 6x9	W 8x10	W 12x14	W 12x16	W 12x19	W 10x 22	W 12x22	W 14x22	W 12x26	W 14x26	W16x26	W 12x30
10	3.125 x 10.5	3.125 x 13.5	3.125 x 18									
	5.125 x 9	5.125 x 10.5	5.125 x 13.5	5.125 x 15	5.125 x 16.5	5.125 x 16.5	5.125 x 18	5.125 x 19.5	5.125 x 21	5.125 x 22.5	5.125 x 24	5.125 x 24
12	3.125 x 10.5	3.125 x 13.5	3.125 x 18									
	5.125 x 9	5.125 x 10.5	5.125 x 13.5	5.125 x 15	5.125 x 16.5	5.125 x 16.5	5.125 x 18	5.125 x 19.5	5.125 x 21	5.125 x 21	5.125 x 22.5	5.125 x 22.5
14	3.125 x 10.5	3.125 x 13.5	3.125 x 18									
	5.125 x 9	5.125 x 10.5	5.125 x 13.5	5.125 x 15	5.125 x 16.5	5.125 x 16.5	5.125 x 18	5.125 x 19.5	5.125 x 21	5.125 x 21	5.125 x 22.5	5.125 x 22.5
16	3.125 x 10.5	3.125 x 13.5	3.125 x 18									
	5.125 x 9	5.125 x 10.5	5.125 x 15	5.125 x 15	5.125 x 16.5	5.125 x 16.5	5.125 x 18	5.125 x 19.5	5.125 x 21	5.125 x 21	5.125 x 22.5	5.125 x 22.5
18	3.125 x 10.5	3.125 x 13.5	3.125 x 18									
	5.125 x 9	5.125 x 10.5	5.125 x 15	5.125 x 16.5	5.125 x 16.5	5.125 x 16.5	5.125 x 18	5.125 x 19.5	5.125 x 21	5.125 x 21	5.125 x 22.5	5.125 x 22.5
20	3.125 x 10.5	3.125 x 13.5	3.125 x 18									
	5.125 x 9	5.125 x 10.5	5.125 x 15	5.125 x 16.5	5.125 x 18	5.125 x 16.5	5.125 x 18	5.125 x 19.5	5.125 x 21	5.125 x 21	5.125 x 22.5	5.125 x 22.5
22	3.125 x 10.5	3.125 x 13.5	3.125 x 18									
	5.125 x 9	5.125 x 10.5	5.125 x 15	5.125 x 16.5	5.125 x 18	5.125 x 16.5	5.125 x 19.5	5.125 x 19.5	5.125 x 21	5.125 x 21	5.125 x 22.5	5.125 x 22.5
24	3.125 x 10.5	3.125 x 13.5	3.125 x 18									
	5.125 x 9	5.125 x 10.5	5.125 x 16.5	5.125 x 16.5	5.125 x 18	5.125 x 16.5	5.125 x 19.5	5.125 x 21	5.125 x 21	5.125 x 21	5.125 x 22.5	5.125 x 21
26	3.125 x 10.5	3.125 x 13.5	3.125 x 18									
	5.125 x 9	5.125 x 10.5	5.125 x 16.5	5.125 x 16.5	5.125 x 18	5.125 x 16.5	5.125 x 19.5	5.125 x 21	5.125 x 21	5.125 x 21	5.125 x 22.5	5.125 x 21
28	3.125 x 10.5	3.125 x 13.5	3.125 x 18									
	5.125 x 9	5.125 x 10.5	5.125 x 16.5	5.125 x 16.5	5.125 x 18	5.125 x 16.5	5.125 x 19.5	5.125 x 21	5.125 x 21	5.125 x 21	5.125 x 22.5	5.125 x 21
30	3.125 x 10.5	3.125 x 13.5	3.125 x 18									
	5.125 x 9	5.125 x 10.5	5.125 x 16.5	5.125 x 16.5	5.125 x 18	5.125 x 16.5	5.125 x 19.5	5.125 x 21	5.125 x 21	5.125 x 21	5.125 x 22.5	5.125 x 21
32	3.125 x 10.5	3.125 x 13.5	3.125 x 18									
	5.125 x 9	5.125 x 10.5	5.125 x 16.5	5.125 x 16.5	5.125 x 18	5.125 x 16.5	5.125 x 19.5	5.125 x 21	5.125 x 21	5.125 x 21	5.125 x 22.5	5.125 x 21
34	3.125 x 10.5	3.125 x 13.5	3.125 x 18									
	5.125 x 9	5.125 x 10.5	5.125 x 16.5	5.125 x 16.5	5.125 x 18	5.125 x 16.5	5.125 x 19.5	5.125 x 21	5.125 x 21	5.125 x 21	5.125 x 22.5	5.125 x 21
36	3.125 x 10.5	3.125 x 13.5	3.125 x 18									
	5.125 x 9	5.125 x 10.5	5.125 x 16.5	5.125 x 16.5	5.125 x 18	5.125 x 16.5	5.125 x 19.5	5.125 x 21	5.125 x 21	5.125 x 21	5.125 x 22.5	5.125 x 21
38	3.125 x 10.5	3.125 x 13.5	3.125 x 18									
	5.125 x 9	5.125 x 10.5	5.125 x 16.5	5.125 x 16.5	5.125 x 18	5.125 x 16.5	5.125 x 19.5	5.125 x 21	5.125 x 21	5.125 x 21	5.125 x 24	5.125 x 21
40	3.125 x 10.5	3.125 x 13.5	3.125 x 18									
	5.125 x 9	5.125 x 10.5	5.125 x 16.5	5.125 x 16.5	5.125 x 18	5.125 x 16.5	5.125 x 19.5	5.125 x 21	5.125 x 21	5.125 x 21	5.125 x 24	5.125 x 21

NOTES

- Table intended for preliminary design only. Substitutions should always be approved by the project's design professional of record.
- Table assumes that original steel W section was sized properly, loading should always be verified.
- Table was developed by comparing allowable uniform load capacities due to the worst case control of bending, shear and deflection limits for simple span applications. Beam weights are considered.
- Deflection limited to L/360 for live load, based upon a live load/total load ratio of 0.8 (residential floor loading 40/10 psf).
- Steel W Section Allowable Design Values: $F_b = 0.66 \times 36$ ksi, $F_v = 0.4 \times 36$ ksi, MOE = 29×10^6 ksi (allowable stress design assumed).
- Steel Information - W Section Nomenclature: 1st number = approximate depth [in], 2nd number = weight per foot [lb/ft].

BOISE GLULAM® Beams Substitution Tables

BOISE GLULAM® — Douglas Fir-Larch Solid Sawn Substitution Table

Floor Beam Applications (100%) Duration for BOISE GLULAM®

24F-V4 BOISE GLULAM® Equivalent Member

Span [ft]	4x6 Doug Fir-Larch		4x8 Doug Fir-Larch		4x10 Doug Fir-Larch		4x12 Doug Fir-Larch		6x8 Doug Fir-Larch		6x10 Doug Fir-Larch		6x12 Doug Fir-Larch	
	Select Structural	No. 1	Select Structural	No. 1	Select Structural	No. 1	Select Structural	No. 1	Select Structural	No. 1	Select Structural	No. 1	Select Structural	No. 1
10	3.125 x 6	3.125 x 6	3.125 x 7.5	3.125 x 7.5	3.125 x 9	3.125 x 9	3.125 x 9	3.125 x 9	3.125 x 9	3.125 x 9	3.125 x 10.5	3.125 x 10.5	3.125 x 10.5	3.125 x 10.5
											5.125 x 7.5	5.125 x 7.5	5.125 x 9	5.125 x 9
12	3.125 x 6	3.125 x 6	3.125 x 9	3.125 x 7.5	3.125 x 10.5	3.125 x 9	3.125 x 10.5	3.125 x 10.5	3.125 x 9	3.125 x 9	3.125 x 10.5	3.125 x 10.5	3.125 x 12	3.125 x 12
											5.125 x 7.5	5.125 x 7.5	5.125 x 9	5.125 x 9
14	3.125 x 6	3.125 x 6	3.125 x 9	3.125 x 7.5	3.125 x 10.5	3.125 x 9	3.125 x 12	3.125 x 10.5	3.125 x 9	3.125 x 9	3.125 x 12	3.125 x 10.5	3.125 x 13.5	3.125 x 12
											5.125 x 7.5	5.125 x 7.5	5.125 x 10.5	5.125 x 9
16	3.125 x 6	3.125 x 6	3.125 x 9	3.125 x 7.5	3.125 x 10.5	3.125 x 9	3.125 x 12	3.125 x 10.5	3.125 x 9	3.125 x 9	3.125 x 12	3.125 x 12	3.125 x 13.5	3.125 x 13.5
											5.125 x 7.5	5.125 x 7.5	5.125 x 10.5	5.125 x 12
18	3.125 x 6	3.125 x 6	3.125 x 9	3.125 x 7.5	3.125 x 10.5	3.125 x 10.5	3.125 x 12	3.125 x 10.5	3.125 x 9	3.125 x 9	3.125 x 12	3.125 x 12	3.125 x 13.5	3.125 x 13.5
											5.125 x 7.5	5.125 x 7.5	5.125 x 10.5	5.125 x 12
20	3.125 x 6	3.125 x 6	3.125 x 9	3.125 x 7.5	3.125 x 10.5	3.125 x 10.5	3.125 x 12	3.125 x 12	3.125 x 9	3.125 x 9	3.125 x 12	3.125 x 12	3.125 x 13.5	3.125 x 13.5
											5.125 x 7.5	5.125 x 7.5	5.125 x 10.5	5.125 x 12
22	3.125 x 6	3.125 x 6	3.125 x 9	3.125 x 7.5	3.125 x 10.5	3.125 x 10.5	3.125 x 12	3.125 x 12	3.125 x 9	3.125 x 9	3.125 x 12	3.125 x 12	3.125 x 13.5	3.125 x 13.5
											5.125 x 7.5	5.125 x 7.5	5.125 x 10.5	5.125 x 12
24	3.125 x 6	3.125 x 6	3.125 x 9	3.125 x 7.5	3.125 x 10.5	3.125 x 10.5	3.125 x 12	3.125 x 12	3.125 x 9	3.125 x 9	3.125 x 10.5	3.125 x 10.5	3.125 x 13.5	3.125 x 13.5
											5.125 x 7.5	5.125 x 7.5	5.125 x 10.5	5.125 x 12

NOTES

- Table intended for preliminary design only. Substitutions should always be approved by the project's design professional of record.
- Table assumes that original solid sawn beam was sized properly, loading should always be verified.
- Table was developed by comparing allowable uniform load capacities due to the worst case control of bending, shear and deflection limits for simple span applications.
- Deflection limited to L/360 for live load, based upon a live load/total load ratio of 0.8 (residential floor loading 40/10 psf).

BC Framer®

BC Framer® helps customers create floor and roof framing layouts quickly. This easy-to-use computer-aided 3D drafting program frames layouts and creates piece and price reports. It also draws framing drawings that use Boise Cascade's engineered wood products (EWP) and develops schedules. BC Framer's editing and drawing tools allow flexibility when modifying framing layouts. You can also customize the layout drawing with framing details, notes, symbols, and accessories.

- Shrink design time with BC Framer® model sharing.
- Save time & prevent mistakes with best-in-industry file integration.
- Experience the efficiencies of BC Framer® whole house modeling.
- BC Connect® integration – file and work flow management, product optimization.
- Check the plan every possible way with BC Framer® full 3-D viewer.
- BC FloorValue® A floor deflection heat map to help pinpoint deflection problems.

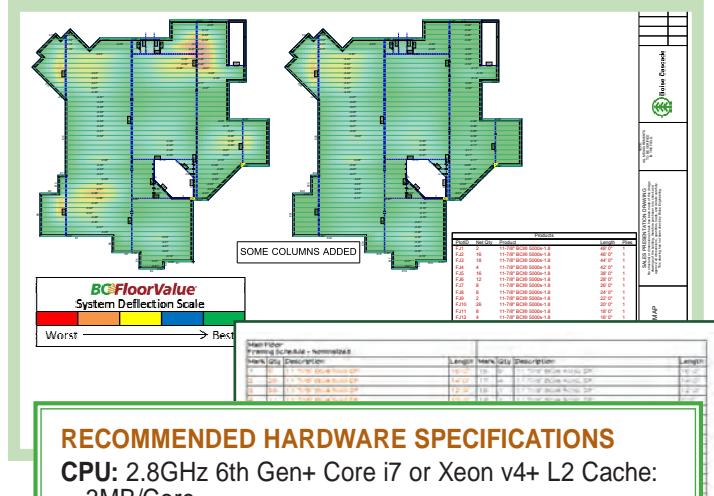
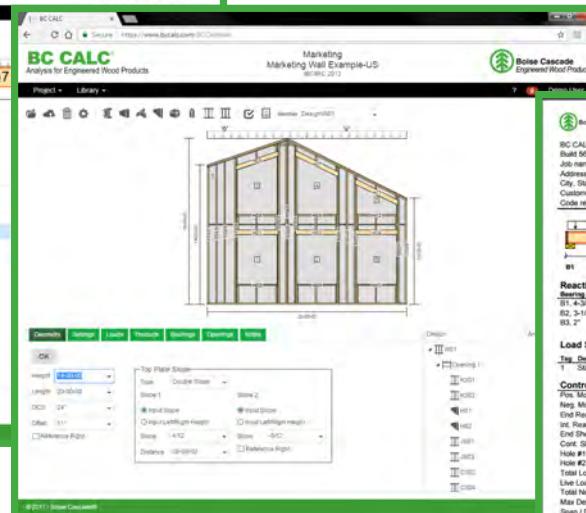
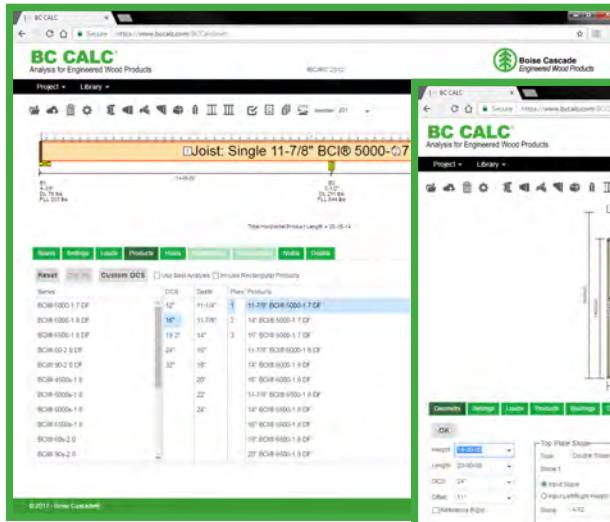
Information can also be obtained at 1-800-405-5969 or email us at EWPSupport@BC.com.

BC Calc®

Analysis for Engineered Wood Products

BC Calc® Sizing Software is simple to use, yet robust enough to analyze most joist, beam, column, stud and tall wall applications. Once an analysis is run, the user may print an easy-to-read design report that displays the span and load information with the analysis results.

BC Calc® is now a web-based application available for free at www.bccalc.com and can be used on Windows or Apple operating systems via Internet Explorer, Edge, Chrome or Safari browsers. Additionally, iOS and Android tablets are now supported.



RECOMMENDED HARDWARE SPECIFICATIONS

CPU: 2.8GHz 6th Gen+ Core i7 or Xeon v4+ L2 Cache: 3MB/Core

RAM: 16GB, 32 GB recommended if multitasking

HDD: 500GB 7200 RPM or SSD

Free Storage: 100GB (average 6,000-8,000 jobs)

Video: Full support for DirectX 9; Single monitor 512MB; Dual monitor 1GB (Resolution 1366x768 Minimum)

Operating Systems: Windows 10 (Pro or Enterprise Edition 64-bit)*, Windows 8.1 (Professional Edition 64-bit), Windows 7 (Professional Edition 64-bit), *Apple Mac or Windows Emulator not supported

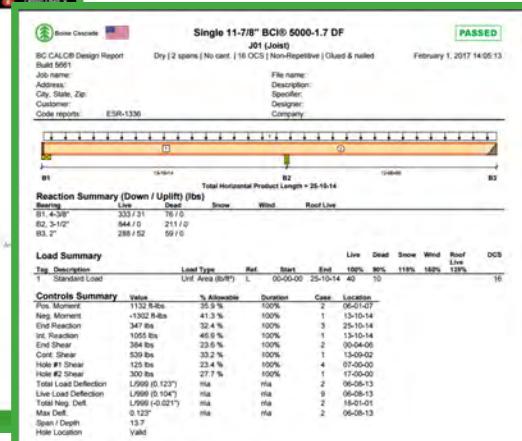


BC-Calc®

In addition to BCI® & AJS® Joists, BOISE GLULAM® and Versa-Lam® LVL, BC Calc® also offers the analysis of solid sawn lumber and timber members. Thus, BC Calc® is the only program needed to analyze structural wood members.

For questions regarding BC Calc®, call 1-800-405-5969 or email EWPSupport@BC.com.

To Download BC CALC US, www.bccalc.com



BOISE GLULAM® BEAM HANGERS

SIMPSON
Strong-Tie®
CONNECTORS®

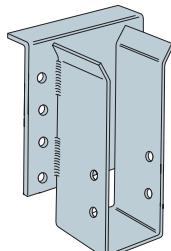
Width	Depth	Top Mount Hanger		Face Mount Hanger	
		Model No. ⁽¹⁾	Allow Load (Floor 100%)	Model No. ⁽¹⁾	Allow Load (Floor 100%)
3 $\frac{1}{8}$ "	6"	HW3.25X	5285	HU26-2	1610
	7 $\frac{1}{2}$ "	GLT3	8165	HU28-2	1875
	9" - 10 $\frac{1}{2}$ "	GLT3	8165	HGUS3.25/10	8780
	12"	GLT3	8165	HGUS3.25/12	9155
	13 $\frac{1}{2}$ " - 18"	HGLT3	11590	HGUS3.25/12	9155
3 $\frac{1}{2}$ "	7 $\frac{1}{2}$ "	HW3.56X	5285	HGUS48	6805
	9"	GLTV4	7000	HGUS48	6805
	10 $\frac{1}{2}$ " - 12"	GLTV4	7000	HGUS412	9155
	13 $\frac{1}{2}$ " - 15"	HGLTV4	8665	HGUS414	10015
5 $\frac{1}{8}$ "	6"	HW5.25X	5285	HU38-2	2015
	7 $\frac{1}{2}$ "	GLT5	8165	HU38-2	2015
	9"	GLT5	8165	HU310-2	2015
	10 $\frac{1}{2}$ " - 12"	GLT5	8165	HGUS5.25/12	9155
	13 $\frac{1}{2}$ " - 16 $\frac{1}{2}$ "	HGLT5	11930	HGUS5.25/12	9155
	18" - 19 $\frac{1}{2}$ "	MEG5	19710	HGUS5.25/12	9155
	21" - 24"	EG5	20895	--- ⁴	---
	9" - 10 $\frac{1}{2}$ "	GLTV6	7000	HGUS5.50/10	8780
5 $\frac{1}{2}$ "	12"	GLTV6	7000	HGUS5.50/12	9155
	7 $\frac{1}{2}$ "	GLT7	8165	--- ⁴	---
6 $\frac{3}{4}$ "	9" - 10 $\frac{1}{2}$ "	GLT7	8165	HGUS6.88/10	8780
	12"	GLT7	8165	HGUS6.88/12	9835
	13 $\frac{1}{2}$ " - 16 $\frac{1}{2}$ "	HGLT7	11930	HGUS6.88/14	11110
	18" - 24"	EG7	25320	HGU7.00	14060
8 $\frac{3}{4}$ "	9" - 10 $\frac{1}{2}$ "	HGLT9	12750	--- ⁴	---
	12" - 15"	HGLT9	12750	HGU9.00	14060

1) Specify height when ordering.

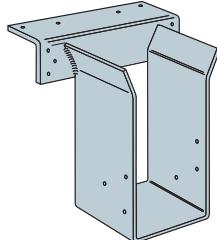
2) Specify width when ordering.

3) Loads assume Douglas Fir-Larch/Douglas Fir-Larch configuration, adjust accordingly for other wood species.

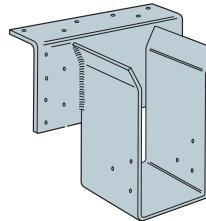
4) Consult current Simpson products catalog for required fasteners, design values and other information at 1-800-999-5099 or visit their website at www.strongtie.com.



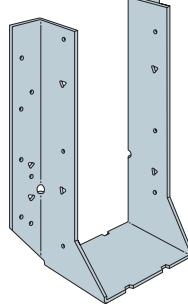
EG



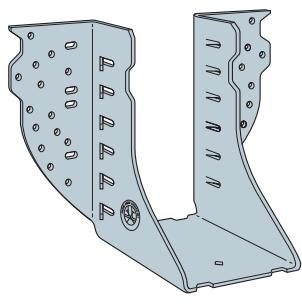
GLT



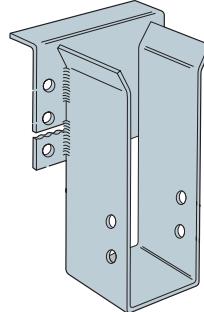
HGLT



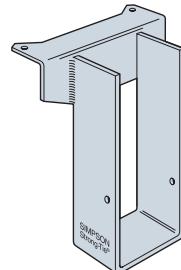
HU



HGUS



LEG/MEG



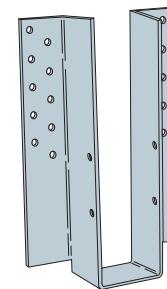
WP



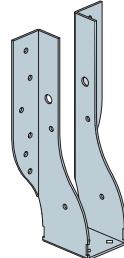
BOISE GLULAM® BEAM HANGERS

Width	Depth	Top Mount Hanger		Face Mount Hanger	
		Model No. ⁽¹⁾	Allow Load (Floor 100%)	Model No. ⁽¹⁾	Allow Load (Floor 100%)
3 $\frac{1}{8}$ "	6"	KHW3	5295	HD26-2	1680
	7 $\frac{1}{2}$ "	KGLT3	7545	HD28-2	1960
	9" - 10 $\frac{1}{2}$ "	KGLT3	7545	THDH3210	8170
	12"	KGLT3	7545	THDH3212	9870
	13 $\frac{1}{2}$ " - 18"	KHGLT3	12965	THDH3212	9870
3 $\frac{1}{2}$ "	7 $\frac{1}{2}$ "	KGLT4	7545	THDH48	6465
	9"	KGLT4	7545	THDH410	8170
	10 $\frac{1}{2}$ " - 12"	KGLT4	7545	THDH412	9875
	13 $\frac{1}{2}$ " - 15"	KGLT4	7545	THDH414	11100
5 $\frac{1}{8}$ "	6"	KGLT5	7545	THDH26-3	3880
	7 $\frac{1}{2}$ "	KGLT5	7545	THDH28-3	6465
	9"	KGLT5	7545	THDH5210	8640
	10 $\frac{1}{2}$ "	KGLT5	7545	THDH5210	8640
	12"	KGLT5	7545	THDH5212	9935
	13 $\frac{1}{2}$ " - 16 $\frac{1}{2}$ "	KHGLT5	12965	THDH614	11645
	18" - 19 $\frac{1}{2}$ "	KMEG5	12185	THDH614	11645
	21" - 24"	KEG5	16115	THDH614	11645
	9" - 10 $\frac{1}{2}$ "	KGLT6	7545	THDH610	8640
5 $\frac{1}{2}$ "	12"	KGLT6	7545	THDH612	9935
	7 $\frac{1}{2}$ "	KGLT7	7545	GHF67750	3505
	9" - 10 $\frac{1}{2}$ "	KGLT7	7545	THDH6710	8170
	12"	KGLT7	7545	THDH6712	9875
	13 $\frac{1}{2}$ " - 16 $\frac{1}{2}$ "	KHGLT7	13400	THDH6714	11580
6 $\frac{3}{4}$ "	18" - 24"	KEG7	17005	THDH6714	11580
	8 $\frac{3}{4}$ "	9" - 15"	KHGLT9	13400	-- --
					-- --

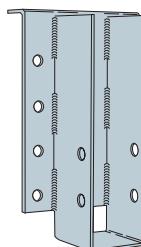
- 1) Specify height when ordering.
- 2) Loads assume Douglas Fir-Larch header/joist material, adjust for other species.
- 3) KGLT load values based on 460 psi perpendicular to grain loading.
KHGLT load values based on 625 psi perpendicular to grain loading.
- 4) Loads depicted are for 100% duration of load factors. Refer to USP Full Line Catalog for load values applicable to other durations of load.
- 5) KEG and KMEG load values are for a supporting member with a width of 5 $\frac{1}{2}$ " and 460 psi perpendicular to grain loading in single shear.
- 6) For additional product information on loading, web stiffeners, nail schedules, and code evaluations, call 1-800-328-5934 or visit their website @ www.USPconnectors.com.



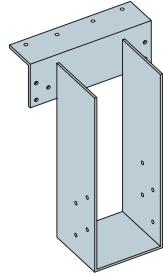
GHF



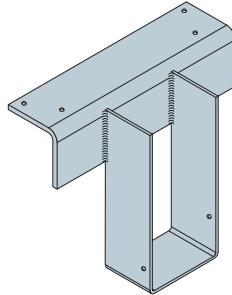
HD



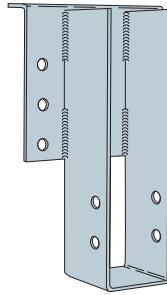
KEG



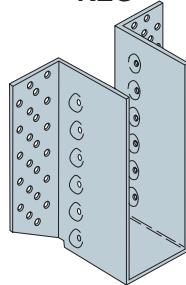
KGLT



KHW



KMEG



THDH

For information about Boise Cascade's engineered wood products, including sales terms and conditions, warranties and disclaimers, visit our website at www.BCewp.com



APA

Referenced Documents:

ANSI A190.1-2017 Standard for Wood Products
- Structural Glued Laminated Timber

EWS Technical Note: Field Notching and Drilling of Glued Laminated Timber Beams, S560

EWS Owner's Guide to Understanding Checks in Glued Laminated Timber, F450

Technical Note: Evaluation of Check Size in Glued Laminated Timber Beams, R475



Your Dealer is:

Boise Cascade has a proven track record of providing quality wood products and a nationwide building materials distribution network for our customers, helping them to enhance their own businesses.

Boise Cascade Engineered Wood Products build better homes with stronger, stiffer floors using only wood purchased in compliance with a number of green building programs. Take a moment to view our sustainability certification site at <http://www.bc.com/sustainability/certification-audits/> or view our green brochure at www.bc.com/inst11.

Boise Cascade Engineered Wood Products throughout North America can now be ordered FSC® Chain-of-Custody (COC) certified, enabling homebuilders to achieve LEED® points under U.S. Green Building Council® residential and commercial green building programs including LEED for Homes and LEED for New Construction. Boise Cascade Engineered Wood Products are available as PEFC® Chain-of-Custody certified, SFI® Chain-of-Custody certified and SFI Fiber-Sourcing certified, as well as NAHB Research Center Green Approved, enabling homebuilders to also obtain green building points through the National Green Building Standard.