

Rosboro Glulam **Technical** Guide

WOOD, THE NATURAL CHOICE

Wood is good. It is the earth's natural, energy efficient and renewable building material.

Engineered wood is a better use of wood. It uses less wood to make more wood products. That's why using APA trademarked I-joists, glued laminated timbers, laminated veneer lumber, plywood, and oriented strand board is the right thing to do.

A few facts about wood.

- We're not running out of trees. One-third of the United States land base 731 million acres is covered by forests. About two-thirds of that 731 million acres is suitable for repeated planting and harvesting of timber. But only about half of the land suitable for growing timber is open to logging. Most of that harvestable acreage is open to other uses as well, such as camping, hiking, hunting, etc.
- We're growing more wood every day. American landowners plant more than two billion trees every year. In addition, millions of trees seed naturally. The forest products industry, which comprises about 15 percent of forestland ownership, is responsible for 41 percent of replanted forest acreage. That works out to more than one billion trees a year, or about three million trees planted every day. This high rate of replanting accounts for the fact that each year, 27 percent more timber is grown than is harvested.
- Manufacturing wood products is energy efficient.
 Unlike cement and steel, wood products consume only four percent of the energy needed to manufacture all industrial raw materials. Wood products make up 47 percent of those manufactured in the United States.
- *Good news for a healthy planet*. For every ton of wood grown, a young forest produces 1.07 tons of oxygen and absorbs 1.47 tons of carbon dioxide.

Wood. It's the right product for the environment.

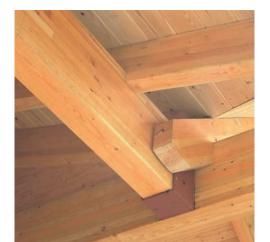
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THE POWER OF GLULAM

Glued laminated timber (glulam) redefines the possibilities for engineered wood construction. Glulam is an engineered wood product that optimizes the structural values of a renewable resource-wood. Glulam members are composed of individual pieces of dimension lumber. The pieces are end-jointed together to produce long lengths that are then bonded together with adhesives to create the required beam dimensions. Because of their composition, large glulam members can be manufactured from smaller trees harvested from second and third-generation forests and plantations. Rosboro manufactures glulam from a variety of species including Douglas Fir, Larch and Southern Pine. With glulam, builders and specifiers can continue to enjoy the strength and versatility of large wood members without relying on the old growth-dependent solid-sawn timbers.

Glulam has greater strength and stiffness than comparable dimensional lumber. Pound for pound, it's stronger than steel. That means glulam beams can span long distances with minimal need for intermediate supports. It also means that designers and builders have virtually unlimited design flexibility when using glulam, whether the application is home construction, a commercial warehouse roof or a highway bridge.

This technical guide describes APA EWS trademarked Rosboro glulam, addresses important design considerations, and includes a guide of recommended specifications. It also highlights just a few of the many applications where Rosboro glulam is used in today's construction.



Rosboro

P.O. Box 20, Springfield, OR 97477 **Glulam Sales:** 1-888-393-2304

Technical Support Hotline: 1-877-457-4139

Fax: 1-541-726-8919 **Web:** www.rosboro.com

A Rosboro glulam is made up of wood laminations, or "lams" that are bonded together with adhesives. The grain of all laminations runs parallel with the length of the member. Individual lams typically are 1³/₈" thick for Southern Pine and 1¹/₂" thick for Douglas Fir and other Western species, although other thicknesses may also be used. Rosboro glulam products typically range in net widths from 3 ¹/₈" to 8 ³/₄" although virtually any member width can be custom produced.

Because they are engineered products, glued laminated timbers are manufactured to meet a range of design stresses. Beams are manufactured with the strongest lams on the bottom and top of the beam, where maximum tension and compression stresses occur. This concept allows the lumber resource to be used more efficiently by placing higher grade lumber in zones that have the maximum stresses, and lumber with less structural quality in lower stressed zones.

Balanced and Unbalanced Beams

Rosboro glulam is manufactured in balanced or unbalanced configurations.

The most critical zone for controlling strength of a glulam bending member is the outermost tension zone.

In unbalanced beams, the quality of lumber used on the tension side of the beam is higher than the lumber used on the corresponding compression side, allowing a more efficient use of the timber resource. Therefore, unbalanced beams have different bending stresses assigned to the compression and tension zones and must be installed accordingly. To assure proper installation of unbalanced beams, the top of the beam is clearly stamped with the word "TOP". Rosboro Stock Glulam is an example of an unbalanced beam.

Balanced members are symmetrical in lumber quality from the horizontal centerline, out. Balanced beams are used in applications such as cantilevers or continuous spans, where either the top or bottom of the member may be stressed in tension due to service loads. They can also be used in single span applications, although an unbalanced beam is more efficient for this use. Rosboro BigBeam is an example of a balanced beam.

Allowable Design Properties

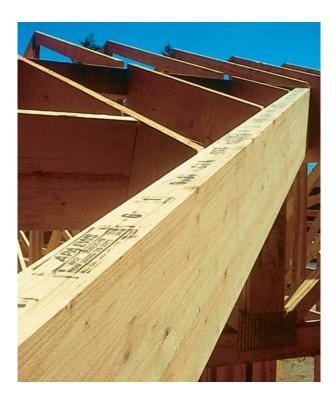
Allowable design properties are a key factor in specifying glulam. Bending members are typically specified on the basis of the maximum allowable bending stress of the member. For example, a 24F designation indicates a member with an allowable bending stress of 2,400 psi. Similarly, a 30F designation refers to a member with an allowable bending stress of 3,000 psi. These different stress levels are achieved by varying the percentages and grade of higher quality lumber in the beam layup.

Use of different species may also result in different stress designations. To identify whether the lumber used in the beam is visually or mechanically graded, the stress combination also includes a second set of designations. For example, on an unbalanced 24F layup using visually graded Douglas Fir lumber, the layup designation is identified as a 24F-V4. The "V" indicates that the layup uses visually graded lumber ("E" is used for mechanically graded lumber). The number "4" further identifies a specific combination of lumber used to which a full set of design stresses such as horizontal shear, E, etc., are assigned. The family of standard Rosboro glulam beam products and their corresponding allowable stresses are shown in Figure 1.

Figure 1. Rosboro Beam Design Stress Comparison



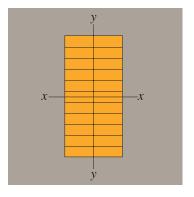
Anatomy of Glulam Rosboro



Axis Orientation

Rosboro glulam beams are nearly always installed with the wide face of the laminations perpendicular to the applied load (the X-X axis), as shown in Figure 2. These are commonly referred to as horizontally laminated members. If this same member is rotated 90 degrees such that the load is applied parallel to the wide face of the laminations (the Y-Y axis), it is considered to be a vertically laminated member. Glulam members have different tabulated stress properties depending on whether the member is used in a horizontal or vertical orientation. For more information on this topic, go to the Rosboro website at: www.rosboro.com/techref-glulam/EWS-Y240-A.pdf.

Figure 2. Beam Cross Section



Look for the APA stamp on all Rosboro glulam products.



- (1) Indicates structural use: B-Simple span bending member, C-Compression member, T-Tension member, CB-Continuous or cantilevered span bending member.
- (2) Mill number.
- (3) Identification of ANSI Standard A190.1-2002, Structural Glued Laminated Timber. ANSI A190.1-2002 is the American National Standard for glulam beams.
- (4) Applicable laminating specification.
- (5) A code that indicates the wood species. In this example, DF = Douglas Fir.
- (6) Structural grade designation. The APA EWS 24F-V4 designation is a glulam grade commonly used in residential applications. Made of Douglas Fir laminations, this grade provides strength (allowable bending stress of 2,400 psi and allowable shear stress of 265 psi) and stiffness (modulus of elasticity of 1.8 x 10⁶ psi) needed for typical residential applications, while greatly simplifying the design specification.
- (7) Designation of appearance grade. INDUSTRIAL, ARCHITECTURAL, PREMIUM, or FRAMING or FRAMING-L.

Glulam Sales: 1-888-393-2304

Figure 3. Rosboro Glulam Products - Available Sizes and Characteristics

Legend



BigBeam® High Strength, I-Joist Depth Glulam



Architectural Architectural Appearance, Stock Glulam



Framing Appearance, Framing-L Appearance, Stock Glulam



1.8E-IJC™ Rosboro 1.8E-IJC, I-Joist Depth Glulam



Treated Glulam™ Rosboro 24F 1.8E Treated With Permapost K-8, I-Joist Depth Glulam

				— Widt	hs —			
		31/8"	31/2"	51/8"	5 7/16"	63/4"	7"	8 ³/4"
	6"	Architectural	-	Architecural	-	Architectural	Framing	Architecural
	71/2"	Architectural	-	Architecural	-	Architectural	Framing	Architecural
	9"	Architectural	Framing	Architecural	Framing	Architectural	Framing	Architecural
	91/4"	-	BigBeam	-	BigBeam	-	BigBeam	-
	91/2"		1.8E-IJC Treated Glulam BigBeam	-	Treated Glulam BigBeam	•	BigBeam	-
	10¹/2"	Architectural	Framing	Architectural	Framing	Architectural	Framing	Architectural
	111/4"	-	BigBeam	-	BigBeam	-	BigBeam	-
	117/8"		1.8E-IJC Treated Glulam BigBeam	-	Treated Glulam BigBeam		BigBeam	
	12"	Architectural	Framing	Architectural	Framing	Architectural	Framing	Architectural
	131/2"	Architectural	Framing	Architectural	Framing	Architectural	Framing	Architectural
	14"	-	1.8E-IJC Treated Glulam BigBeam	-	Treated Glulam BigBeam	-	BigBeam	-
1	15"	Architectural	Framing	Architectural	Framing	Architectural	Framing	Architectural
Depths	16"	-	1.8E-IJC Treated Glulam BigBeam	-	Framing Treated Glulam BigBeam	-	BigBeam	-
I	16 ¹ /2"	Architectural	Framing	Architectural	Framing	Architectural	Framing	Architectural
	18"	-	1.8E-IJC Treated Glulam BigBeam	-	Framing Treated Glulam BigBeam	-	BigBeam	Architectural
	191/2"	Architectural	-	Architectural	-	Architectural	-	Architectural
	20"	-	-	-	Deep BigBeam	-	Deep BigBeam	-
	21"	Architectural	-	Architectural	-	Architectural	-	Architectural
	22"	-	-	-	Deep BigBeam	-	Deep BigBeam	-
	22 1/2"	Architectural	-	Architectural	-	Architectural	-	Architectural
	24"	Architectural	-	Architectural	Deep BigBeam	Architectural	Deep BigBeam	Architectural
	25 ¹ / ₂ "	Architectural	-	Architectural	-	Architectural	-	Architectural
	26"	-	-	-	Deep BigBeam	-	Deep BigBeam	-
	27"	Architectural	-	Architectural	-	Architectural	-	Architectural
	28"	-	-	-	Deep BigBeam	-	Deep BigBeam	-
	28 1/2"	Architectural	-	Architectural	-	Architectural	-	Architectural
	30"	Architectural	-	Architectural	Deep BigBeam	Architectural	Deep BigBeam	Architectural

= I-Joist Depths

Deep BigBeam refers to BigBeam members manufactured in depths of 20 - 30 inches and are otherwise not mentioned in this document. To learn more about Rosboro Deep BigBeam, please visit the Rosboro website (www.rosboro.com) or contact Rosboro Sales at 1-888-393-2304.

Sizes

Rosboro glulam is available in both custom and stock sizes. Stock beams are manufactured in commonly used dimensions and cut to length when the beams are ordered from a distributor or dealer. Rosboro manufactures two products (BigBeam and 1.8E-IJC) specifically designed to match standard I-joist depths.

Stock Widths:

Architectural and Industrial Appearance Stock Glulam: $3^{1}/8^{\circ}$, $5^{1}/8^{\circ}$, $6^{3}/4^{\circ}$ and $8^{3}/4^{\circ}$.

Rosboro BigBeam and *Framing Appearance* Stock Glulam: $3^{1}/2^{"}$, $5^{7}/16^{"}$ and $7^{"}$.

1.8E-IJC: 3¹/₂".

Treated Glulam: $3^{1}/2^{"}$ and $5^{7}/16^{"}$.

Stock Depths:

Architectural, Industrial and Framing Appearance Stock

Beams: 6" through 30" in 11/2" increments.

BigBeam: $9^{1}/4$ ", $9^{1}/2$ ", $11^{1}/4$ ", $11^{7}/8$ ", 14", 16" and 18".

1.8E-IJC: 9¹/₂", 11⁷/₈", 14", 16" and 18". Treated Glulam: 9¹/₂", 11⁷/₈", 14", 16" and 18".

Where long spans, unusually heavy loads, or other circumstances control design, custom members are typically specified. Custom members are available in virtually any size and shape that may be required to meet the design conditions.

Rosboro Appearance Classifications

Rosboro glulam is available in three different appearances. Though they may look different, they have the same structural characteristics for a given strength grade. Rosboro glulam appearance classifications are:

Architectural Appearance: Because it has a smooth, attractive finish, *Architectural Appearance* glulam should be specified in applications where members are exposed to view. Voids (holes and cracks) larger than ³/₄" and low laminations are cosmetically repaired using inserts and wood fillers and all exposed faces are surfaced.

Industrial Appearance: Available as a custom order, these beams are intended for concealed applications where appearance is not of primary importance. Holes, low laminations and other surface defects need not be filled. Narrow faces of the beam are not surfaced.

Framing Appearance: This classification is intended only for use in concealed applications. Beams with this appearance classification are provided in widths designed to fit flush with 2 x 4 and 2 x 6 wall framing. The *Framing Appearance* Standard allows more irregularities than *Architectural Appearance*.

Framing-L Appearance: This appearance classification is a sub-classification of the *Framing Appearance* classification. The "L" indicates that laminated veneer lumber (LVL) has been used for the outer laminations. All other characteristics remain the same as those listed for the *Framing Appearance* classification.

Other Appearance Classification

Premium Appearance: As the highest appearance classification, *Premium Appearance* glulam should be used when the appearance is the primary design consideration. Laminations are selected that minimize visible knot sizes, voids greater than ¹/₁₆" are filled and all exposed surfaced are finished. This product is currently not manufactured by Rosboro.

All appearance classifications permit natural growth characteristics with varying degrees of open voids permitted. The appearance classification is not related to lumber layup requirements and thus does not affect design values for the beam.

Section Properties and Capacities

When selecting a glulam member, the builder, designer, or specifier must use a member with the required section properties to satisfy the load carrying requirements. Different load capacities are possible for different stress level combinations of glulam (tables giving the load carrying capacities for Rosboro glulam are included in this technical guide beginning on page 20). These beam capacities are based on loading perpendicular to the wide faces of the laminations; that is, bending about the X-X axis of the beam as shown in Figure 2.



A glulam beam being tested at the APA Research Center.

The APA EWS trademark is recognized by all major model building codes for the certification of glued laminated timber produced by Engineered Wood Systems members. In residential construction, Rosboro glulam beams are often chosen for their beauty in exposed designs such as rafters in vaulted ceilings or long clear-span ridge beams. They're also ideal for hidden structural applications, such as floor beams and headers. No other product combines the strength and natural beauty of wood like glulam, and nothing provides builders and designers with the design flexibility demanded by today's homeowner.

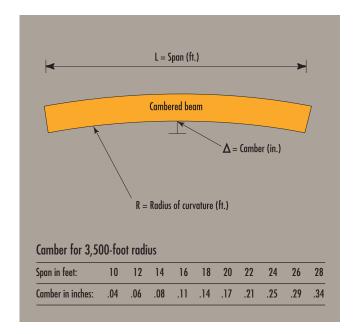
Camber

One of the most important design considerations for wood framing is deflection. For longer spans, deflection is often the controlling design factor. While any wood bending member can be designed to minimize deflection, glulam is the only engineered wood product that can be easily cambered to reduce the aesthetic effect of in-service deflections. Camber is curvature built into a fabricated member which is opposite in direction and magnitude to the calculated deflection which will occur under gravity loads. (See Figure 4.)

Most residential applications require very little or no camber. In fact, the product of choice for an engineered wood floor system is normally zero camber for a perfectly flat construction finish. Rosboro's products BigBeam and 1.8E-IJC are manufactured with zero camber specifically for these situations.

For additional information on cambering glulam beams, refer to the Rosboro website at: www.rosboro.com/techref-glulam/EWS-S550-E.pdf

Figure 4. Beam Camber Parameters



Typical Glulam Applications

Rosboro glulam products are ideal for many common applications found in residential construction.

Floor Beams

The superior strength of glulam allows longer clear spans than solid-sawn lumber. Because Rosboro glulam is manufactured from kiln-dried lumber, shrinkage and warping are minimized. In addition, Rosboro glulam beams have excellent fastener-holding capability, which means a firm subfloor with minimal nail popping or squeaks.

The BigBeam and 1.8E-IJC are I-joist compatible (IJC) beams. IJC beams are supplied in depths of $9^{1}/2^{\circ}$, $11^{7}/8^{\circ}$, 14", 16" and 18" which match the depths of I-joists typically found in residential construction. This allows ceilings to be framed flush with no need for extra furring out.

In the application shown below, a Stock Glulam supports the second floor I-joist framing. The glulam beam was chosen for its size, strength and availability.



Glulam beam supports second-floor I-joist construction.

If you would like to calculate the camber for a select length, or figure the radius for a beam, use the formulas below.

Camber Formulas

	Formula	Example
To Calculate the Radius (ft.)	Radius = $\frac{(\text{length in feet})^2 \times 1.5}{\text{Camber in inches}}$	Length = 20', Camber = $^{1}/_{4}$ " or .25" $\frac{20^{2} \text{ X 1.5}}{.25''}$ = 2,400' Radius
To Calculate the Camber (in.)	Camber = $\frac{\text{(length in feet)}^2 \times 1.5}{\text{Radius in feet}}$	Length = 24', Radius = 3,500' $\frac{24^2 \text{ X } 1.5}{3,500'} = 0.25'' \text{ Camber}$

Ridge and Rafter Beams

The open, airy designs and high ceilings common in residential construction today make glulam the perfect choice for ridge beam applications as shown below. They can span long distances and carry virtually any design load. Sloping glulam rafter beams are the perfect complement to ridge beams in exposed applications.



Glulam ridge beams complement the spacious, open designs common in modern residential construction.



This two-car garage is directly below the second-story room. A glulam beam allows a long clear span with no intermediate supports, eliminating the need for a post in the middle of the garage. This means there's more room to open and close car doors and maneuver vehicles.



All glulam products make great garage door headers. Select the Rosboro glulam product that best carries the required load.



The Rosboro BigBeam is ideal for engineered floor systems where a 30F beam is desired.



Rosboro Treated Glulam is a 24F glulam beam made from Southern Pine and treated to resist rot and decay. Installation is easy because the beam is straight, has no top or bottom, and is manufactured to match standard framing widths.

Headers

Glulam headers can easily span distances long enough to allow garage door openings for two or three cars. And because they are cut to length when you buy them, you pay only for the length you need – nothing is wasted.

A common width of glulam garage door headers is $3^{1}/2^{\circ}$, which fits conventional 2 x 4 wall construction. For 2 x 6 wall construction, a $5^{7}/16^{\circ}$ wide glulam provides the perfect fit. Rosboro BigBeam, 1.8E-IJC, and *Framing Appearance* Stock Glulam are all available in these same standard sizes.

Full-length glulam headers at an end-wall provide an excellent nailing surface for structural wood panels, which help tie the beam to wall framing members on either side of the garage door opening to improve bracing. This construction method adds rigidity and improves resistance to wind and earthquake loads by effectively creating a narrow shear wall as shown in Figure 5.

Figure 5. Braced Wall Detail for Garage Door Opening in One Story Building

Check local building code requirements or contact APA for additional information.

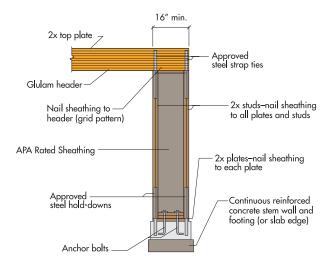
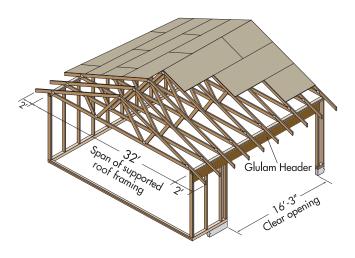


Figure 6. Glulam Garage Door Headers - Design Example

The 16' 3" beam span in this figure supports roof trusses on a 32' wide structure with 2' overhangs, under a 30 psf live load and 15 psf dead load. According to the data in the tables on page 26, five different sizes and types of glulam beams could be selected:

BigBeam: $3\frac{1}{2}$ " x 14" or $5\frac{7}{16}$ " x $11\frac{7}{8}$ " Stock Glulam: $3\frac{1}{8}$ " x $16\frac{1}{2}$ " or $5\frac{1}{8}$ " x $13\frac{1}{2}$ " 1.8E-IJC: $3\frac{1}{2}$ " x 16".

All of these beams are suitable to carry the required design loads with the final choice being based on local availability, cost and designer preference.





A Glulam header extends over an adjacent narrow shear wall. (See Figure 5 for details.)

Columns

Glulam columns are straight and dimensionally true, making framing an easy task. Because Rosboro glulam products are available in long lengths, the members don't have to be spliced together, as is often necessary with sawn lumber. And, they can be exposed to view as a unique architectural feature of the framing system.

Rosboro

Glulam Products

Rosboro has a complete product line of glulams engineered for every application.



Rosboro Glulam (Stock Beam) The workhorse of the glulam products, Rosboro Glulam is available in *Architectural, Industrial* and *Framing Appearances*. Rosboro Glulam is manufactured in widths of 3¹/₈", 3¹/₂", 5¹/₈", 5¹/₂", 6³/₄" and 8³/₄" with depths ranging from 6" to 30" in 1¹/₂" increments. With increased design values this dependable beam is better than ever.



High Performance 2.1E IJC-Glulam

Rosboro BigBeam® The strongest of Rosboro's I-joist compatible beams, the BigBeam (30F) is designed as the perfect beam for engineered flooring systems. Engineered to match standard I-joist depths and wall framing widths, the BigBeam is the beam of choice for today's builder.



Rosboro 1.8E-IJC This I-joist compatible, balanced 24F beam was designed to match standard I-joist depths and framing width of $3^{1}/2^{1}$. 1.8E-IJC has zero camber and is available in depths of $9^{1}/2^{1}$, $11^{7}/8^{1}$, 14^{1} , 16^{1} and 18^{1} and is an ideal component for modern floor systems.



Glulam Sales: 1-888-393-2304

Rosboro Treated Glulam This balanced 24F glulam beam is treated with Permapost K-8 to resist rot and decay. Manufactured in standard framing widths of 3¹/₂" and 5⁷/₁₆" along with I-joist depths, Treated Glulam is designed to protect your investment.

ONE HUNDRED YEARS OF GLULAM



The first patents for glulam were issued in Switzerland and Germany in 1900. A 1906 German patent signaled the true beginning of glued laminated timber construction. One of the first glulam structures erected in the U.S. was a research laboratory built in 1934 at the USDA Forest Products Laboratory in Madison, Wisconsin.

The introduction of fully water-resistant adhesives in 1942 was a significant development in the glulam industry and allowed glulam to be used in exposed exterior environments.

The glulam plant at Rosboro was built in 1963 and was the first in the industry to utilize a continuous pre-glued fingerjointing line, stress wave machinegraded lumber, and radio frequency beam curing equipment.

When the glulam plant was expanded in 1973, a beam press and supporting equipment was installed which doubled the production capabilities. And in 1992 Rosboro increased production capacity, this time by adding a Dimter Beam Press and second production line.

And, with the recent acquisition of the glulam plant in Vaughn, Oregon, Rosboro will continue to lead the way in glulam technology and products.

Moisture Control in Wood Systems

Wood is a natural, porous material that always contains some degree of moisture. Wood moisture content is a measure of the total weight of moisture in the wood as a percentage of the oven-dried weight of the wood. Wood production processes generally involve some drying. At the time of production, glulam beams typically have an average moisture content of about 12 percent. As a comparison, the moisture content of green lumber can range from 20 to 50 percent, with kiln dried lumber at 16 percent.

Once installed, glulam beams in interior applications will equilibrate to approximately 8 to 12 percent moisture content. Exact equilibrium moisture content is primarily a function of interior relative humidity and temperature. The time it takes for the moisture content of a wood member to equilibrate with its environment is a function of size and can be substantial for large glulam beams.

Model building codes specify minimum requirements for ventilation of floor and roof spaces. These ventilation requirements can vary depending on whether or not vapor retarders are used and whether or not roofs are pitched and to what degree.

Rosboro glulams are individually wrapped to protect the beams from surface moisture intrusion during transit, in the lumberyard and on the jobsite. Surface sealants, which can be applied to the top, bottom and sides of beams, resist dirt and moisture and help control checking and grain raising. Use of a penetrating sealant is recommended if beams are to be stained or given a natural finish. Sealants can be field applied by the contractor. The Rosboro BigBeam is coated at the factory with a specially engineered coating for added protection.

Sealants applied to the ends of beams also help guard against moisture penetration and excessive end grain checking. A coat of sealant should be field applied to the ends of beams if they are trimmed to length or otherwise field cut.

For more information on this topic, go to the Rosboro website at: http://www.rosboro.com/techref-glulam/EWS-R540C.pdf

Preservative Treatments

Rosboro recommends the use of our Treated Glulam and Treated BigBeam for above ground applications when the beam may be exposed to the elements. Rosboro Treated Glulam and Treated BigBeam are protected with Permapost K-8, a deeply penetrating, industrial wood preservative and water-repellant treatment containing solubized copper-8-quinolinolate, which provides chemical resistance to insects, decay, mold, mildew and bacterial growths.

K-8 is an odorless, non-crystalline oil-based treatment formulated in conjunction with a water-repellant. K-8 is also low in toxicity to humans and is the only wood preservative approved by the U.S. Food and Drug Administration as registered by the EPA for treatment in wood products that come in contact with foodstuffs.

Rosboro does not recommend its products be treated with any other chemicals, especially waterborne preservatives. As stated in the APA Technical Note 'Preservative Treatment of Glued Laminated Timber' (form # EWS S580B) page 3 – "... waterborne types of treatment can lead to potential discoloration of the wood, possible raised grain, and excessive checking or warping of the member and their use will void the manufacture's warrantee for western species."

Field cuts in Rosboro Treated Glulam should be coated with a 2% solution of copper napthanate, which is available in most hardware stores.

If you are interested in treated glulam, contact your glulam sales representative. For more information on this topic, go to the Rosboro website at:

www.rosboro.com/techref-glulam/EWS-S580-A.pdf.

Recommended Applications

Rosboro Treated Glulam is recommended for applications where the member may be directly exposed to the elements. Around connections such as hangers and at fasteners such as bolts, nails and screws, moisture often accumulates. The K-8 treatment is highly effective at protecting wood from potential decay hazards at these locations. Typical applications for Treated Glulam include decks, trellises, porches, and balconies.

Restricted Uses



Although Rosboro Treated Glulam is pressure treated with K-8, it is not recommended for use in some applications. Examples of these applica-

tions include but are not limited to:

- Marine applications such as docks and marinas
- Applications in direct ground and standing water contact

Checking

A common moisture related phenomenon in wood is checking. Checking occurs naturally to wood in service. Checks are openings that occur in the surface of the wood and follow parallel to the natural grain direction of the piece. A close visual evaluation of a check will always reveal torn wood fibers. The cause of checking is shrinkage of the wood fibers as moisture is lost to the surrounding environment. Rapid drying increases this differential moisture content between the inner and outer fibers and increases the chance for checking to occur.

Rosboro

Glulam beams typically exhibit fewer and less severe checks than comparable size sawn timbers due to their relatively low moisture content at time of manufacture. It is often difficult, however, to control the exposure of glulam to the elements during shipping, storage, and erection. Glulam may pick up surface moisture during any of these stages of the construction process.



Shown is typical glulam checking. As is often the case, this check is near the glueline, and is often confused with delamination, but has NOT affected the structural integrity of the glulam. (The business card that is inserted into this member is a typical way of measuring the depth of a check.)

Checks are often observed near a glueline in a glulam member where differential drying stresses are greatest. This most often occurs near the outermost glueline where the amount of surface exposed by the outermost lamination is greatest. Checks are a natural characteristic of wood and are not normally considered to have a detrimental effect on the strength of the member.

For additional information on checking and the effects of checking on the strength of glulam, refer to the Rosboro website at:

www.rosboro.com/techref-glulam/EWS-R465E.pdf.

Connection Detailing

As with any structural material, proper connection detailing is essential to assure the structural performance of the member. This is particularly true with glulam since an improperly designed and installed connection detail can lead to a serious failure. The designer must consider the effects of moisture changes in the glulam member, proper positioning of the mechanical fasteners, and the number of fasteners required to carry the loads to develop an adequate connection detail.

Based on many years of experience, the glulam industry has developed typical details for most connection situations. These details illustrate the right and wrong way to make these connections and indicate the consequences of an incorrect detail. The details are illustrated and described on the Rosboro website at:

www.rosboro.com/techref-glulam/EWS-T300-D.pdf.

Notching and Drilling of Glulam

Closely related to connection details is notching and drilling of glulam. Since glulam timbers are highly engineered components manufactured from specially selected and positioned lumber laminations, an improperly cut notch or a hole drilled in the wrong place can seriously affect the load carrying capacity of the member. Only holes, notches and tapered cuts approved by the design professional of record and detailed on shop drawings should be made in a glulam member.

Field notching, cutting or drilling of a glulam beam, particularly on the tension side of the member should be avoided. Field conditions may require making a cut, notch or hole that was not originally anticipated. In some instances, these can be made in areas of the glulam that are not highly stressed and will thus have minimal effect on the structural capacity of the member. To address these specific conditions refer to the Rosboro website at: www.rosboro.com/techref-glulam/EWS-S560-C.pdf.



Glulam Specification Guide

Shown here are guidelines for preparing specifications for structural glued laminated timber used for bending members such as purlins, beams, or girders or for axially loaded members such as columns or truss chords.

A. General

- 1. Structural glued laminated timber shall be furnished as shown on the plans and in accordance with the following specifications.
- 2. For custom orders, shop drawings and details shall be furnished and approved before fabrication is commenced.
- 3. The (manufacturer) (seller) (general contractor) shall furnish connection steel and hardware for joining structural glued laminated timber members to each other and to their supports, exclusive of anchorage embedded in masonry or concrete, setting plates, and items field-welded to structural steel. Steel connections shall be finished with one coat of rust-inhibiting paint.

B. Manufacture

- 1. Materials, Manufacture and Quality Assurance. Structural glued laminated timber shall be in conformance with ANSI Standard A190.1-2002, American National Standard for Structural Glued Laminated Timber, or other code-approved design, manufacturing and/or quality assurance procedures.
- 2. End-Use Application. Structural glued laminated timber members shall be manufactured for the following structural uses as applicable:

Simple span bending member-B Continuous or cantilevered span bending member-CB Compression member-C Tension member-T

3A. Design Values. Structural glued laminated timber shall provide design values as shown in Figure 7 for normal load duration and dry-use condition.⁽¹⁾

3B. Lamination Combination Number.

An alternative to specifying the required design stresses is to specify a specific laminating combination symbol if known. (2)

4. Appearance Classification.

Members shall be (Premium) (Architectural) (Industrial) (Framing) (Framing-L) classification in accordance with industry recommendations. (3)

5. Laminating Adhesives. Adhesives used in the manufacture of structural glued laminated timber shall meet requirements for (wet-use) (dry-use) service conditions.⁽¹⁾

- **6.** Camber (when applicable). Structural glued laminated timber (shall) (shall not) be manufactured with a built-in camber. Camber radius shall be (3,500) or (other) feet or a specific amount of camber may be specified in inches.
- 7. Preservative Treatment (when applicable). Members shall be pressure treated in accordance with American Wood Preservers Association (AWPA) Standard C28 with (creosote or creosote/coal tar solution) (pentachlorophenol in oil) (pentachlorophenol in light solvent) (waterborne) preservatives as required for (soil contact) (above ground) exposure. (4)
- 8. Fire Resistance (when applicable). Members shall be sized and manufactured for one-hour fire resistance. (5)
- *9. Protective Sealers and Finishes.* Unless otherwise specified, shall be applied to the ends of all members. Surfaces of members shall be (not sealed) (sealed with primer/sealer coating) (other). (6)
- 10. Trademarks. Members shall be marked with the Engineered Wood Systems APA EWS trademark indicating conformance with the manufacturing, quality assurance and marking provisions of ANSI Standard A190.1-2002.
- 11. Protection for Shipment. Members shall be (not wrapped) (load wrapped) (bundle wrapped) (individually wrapped) with a water-resistant covering for shipment.

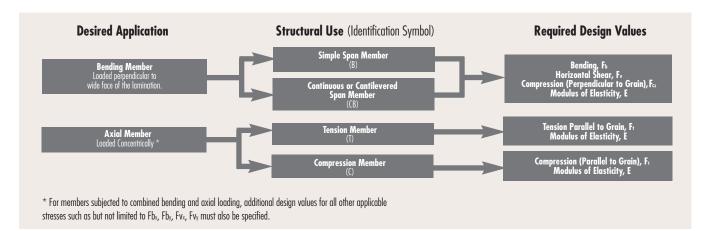
For Footnotes, see page 15.

Proper Specification

In many residential and light commercial applications, stock glulam beams meet the requirements for the job. Other residential applications and many commercial designs require custom members. In either case, the member capacity and size specified must be verified by a design professional.

To properly specify a glulam member, use the tables on pages 20 - 47 of this technical guide. While all possible design considerations cannot be covered by a general specification of this type, most of the common specification concerns are incorporated.

Figure 7. Design Values Specifying Guidelines





Footnotes

- (1) Dry service condition moisture content of the member will be at or below 16 percent in service; wet service condition moisture content of the member will be above 16 percent in service. When structural glued laminated timber members are to be preservative treated, wet-use adhesives must be specified.
- (2) Laminating combination should be based on design requirements and section capacities published in Engineered Wood Systems or manufacturer's brochures. ICC-ES REPORT ESR-1940 provides a tabulation of laminating combinations available from EWS member manufacturers.
- (3) Appearance grades are described as follows.

Premium Appearance – The highest appearance classification for use when appearance is the primary design consideration.

Specific characteristics of this classification are: In exposed surfaces, all knotholes and other voids shall be filled with wood-tone filler or with clear inserts selected for similarity with the grain and color of the adjacent wood. The wide face of laminations exposed to view shall be selected for appearance and shall be free of loose knots with the knot sizes limited to 20 percent of the net face width of the lamination. Not over two maximum size knots or their equivalent shall occur in a 6-foot length. All voids shall be filled in exposed surfaces. Voids greater than 1/16" wide created by edge joints appearing on the wide face lamination exposed to view shall be filled. Exposed surfaces shall be surfaced smooth with no misses permitted. The corners of the wide faces exposed to view shall be eased.

Architectural Appearance – A high quality appearance suitable for applications where appearance is an important but not overriding consideration.

Specific characteristics of this classification are: In exposed surfaces, all knotholes and voids measuring over ³/₄" shall be filled with wood-tone filler or clear wood inserts selected for similarity with the grain and color of the adjacent wood. The wide face of laminations exposed to view shall be free of loose knots and open knotholes shall be filled. Knotholes shall not exceed ³/₄" when measured in the direction of the lamination length with the exception that a void may be longer than ³/₄" if its area is not greater than ¹/₂". Voids greater than ¹/₁₆" wide created by edge joints appearing on the wide face of the lamination exposed to view shall be filled. Exposed surfaces shall be surfaced smooth with no misses permitted. The corners of the wide faces exposed to view shall be eased.

Industrial Appearance – The minimal appearance classification normally suitable for use in industrial plants, warehouses and other similar structures and for concealed applications where appearance is not of primary concern.

Specific characteristics of this grade are: Voids appearing on the edges of laminations need not be filled. Loose knots and knotholes appearing on the wide face of the laminations exposed to view shall be filled. Members are required to be surfaced on two sides only and the appearance requirements apply only to these sides. Occasional misses, low laminations or wane (limited to a maximum of ¹/₄" inch measured across the width) are permitted on a cumulative basis, not to exceed 10 percent of the width of the member at any glueline. The frequency of occurrence shall not exceed one in ten pieces of lumber used. The maximum area

of low laminations shall not exceed 5 percent of the surface area of a side and no more than two low laminations shall be adjacent to one another. Permissible wane in accordance with the provisions of the layup combination is not limited in length.

Framing Appearance – In 1998 the industry introduced the *Framing Appearance* classification in order to accommodate home building and other construction markets where glulam is used in combination with dimension lumber in roof, wall and floor framing. To be compatible with the conventional framing lumber sizes without the need for furring or other specialized framing, Rosboro's *Framing Appearance* glulam is supplied in $3\frac{1}{2}$ ", $5\frac{7}{16}$ " and 7" widths.

Manufacturing characteristics permitted include low laminations, glue smear, end joint offsets and glueline squeeze-out. Lumber characteristics permitted for the given layup combination may include knotholes, splits and wane. Voids appearing on the edge of laminations need not be filled. Loose knots and knotholes appearing on the wide face of the laminations exposed to view need not be filled. Members are required to be surfaced "hit or miss" on two sides only and the appearance requirements apply only to these sides. Wane (limited to a maximum of 1/4" measured across the width) is permitted on a cumulative basis. The accumulative depth of hit and miss and wane shall not exceed 10 percent of the width of the member in any glueline. The frequency of occurrence shall not exceed one in ten pieces of lumber used. The maximum area of low laminations shall not exceed 25 percent of the surface area of a side. Permissible wane in accordance with the provisions of the layup combination is not limited in length.

Framing-L Appearance - This appearance classification is a subclassification of the Framing Appearance classification. The "L" indicates that laminated veneer lumber (LVL) has been used for the outer laminations. All other characteristics remain the same as those listed above for the Framing Appearance classification.

(4) When pentachlorophenol in light solvent or waterborne preservative treatments are specified for protection against decay or insect attack, individual laminations usually are treated prior to manufacturing structural glued laminated timber members. These treatments are not available from all manufacturers and the designer should verify availability prior to specification. Note: Waterborne preservatives are not recommended for glulam manufactured using Western species.

Where paintable surfaces are required, specify pentachlorophenol in light solvent or a waterborne preservative. Wood treated with creosote, creosote/coal tar solution or pentachlorophenol in oil should not be used in contact with materials subject to staining.

- (5) When structural glued laminated timber with one-hour fire resistance is specified, minimum size limitations and additional lamination requirements are applicable. Supporting steel connectors and fasteners also must be protected to achieve a one-hour fire rating. Cover connectors or fasteners with fire-rated (Type X) gypsum wallboard or sheathing, or $1^{1}/2^{1}$ wood, to provide the needed protection.
- (6) Specify a penetrating sealer when the finish will be natural or when a semitransparent stain is to be used. Primer/sealer coatings have a higher solids content and provide greater moisture protection, and are suitable for use with opaque or solid-color finishes.

Glulam Sales: 1-888-393-2304

Software Beam Selection

To determine the load capacity and recommended size for a Rosboro glulam beam, consult the technical pages later in this guide.

As an alternative to using the printed tables in this guide, Rosboro, in association with Keymark Enterprises LLC, has developed engineering software to aid in the process of determining which product and specific beam size will be best suited for your application. This software, Rosboro KeyBeam®, is a single member beam sizing tool that allows you to input span, bearing locations, and additional loads for a single member design.

A sophisticated yet simple program, KeyBeam® is customizable for individual building needs. It takes into account local building codes, member type, length, slope, sheathing, lateral bracing, moisture, bearing locations, loads, and deflection. Additionally, the product inventory list can be modified so options for using only the available Rosboro products will be supplied.

If you are doing a lot of beam specifying, Rosboro KeyBeam® is the right tool for you.

Rosboro KeyBeam® can be easily installed from CD or downloaded from the Rosboro website. For more information on this software tool, go to the Rosboro website at: www.rosboro.com/keybeam.asp or contact Rosboro Technical Support.

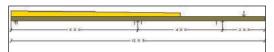




Specify the member type, building code, loads, and deflection criteria.



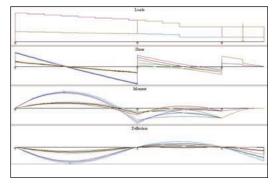
Easily enter complex load situations.



Graphical representation of your load conditions minimizes common errors.

Positive Monert Negative Monert Shear Mas. Reaction U. Deflection TL Deflection U. Defl. 13.	Actual 310 W 290 W 254 M 525 N 0024" 0035"	Alterable 12478 W 12478 W 6475 W 7903 # 1927 2991*	Capacity 2% 2% 3% 6% L/930+ L/930+	Location 2.31 5.70 5.70 5.70 2.67 2.67 2.67	Coding Odd Spane 100% Adjacwit 1 100% Adjacwit 1 100% Deat load Odd Spane 100% Odd Spane 100%
TL Delt , Et. LL Delt , Et. TL Delt , Et.	0023" 0030"	1333*	2L/999+ 2L/999+	11.77	Odd Spans 100% Odd Spans 100%

Analysis presented in text (above) and graphical forms (below).



Storage in the Yard

A level, well-drained covered storage site is recommended. Keep beams off the ground using lumber blocking, skids or rack systems. The wrapping 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 drainage of any entrapped moisture. Proper ventilation and drainage will reduce the likelihood of water damage, staining and the start of decay.

Storage at the Job Site

If possible, store glulam under cover to protect the beams from moisture, soiling and sunlight. Place the beams on spaced lumber blocking on level, well-drained ground. In many instances, the wrappings can be left intact to protect beams until installation. Again, seal ends of beams immediately after trimming or cutting.

Once beams are installed, allow them to gradually season and adjust to the temperature and moisture conditions of the structure. Do not expose glulam members to rapid changes in moisture and temperature such as may occur from temporary heating units. Such exposure may result in excessive surface checking.

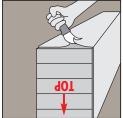
Job Site Handling Procedures

Delivery: Your Rosboro Glulam Dealer has taken every reasonable precaution to protect the beam during shipment to your project site. **Caution:** The beams are very heavy and can be awkward to handle, so during the unloading process, take extreme care.

Inspection: Physically inspect each beam. Repairs are easier to make on the ground before installation.

■ Sort the delivered beams and determine which glulams will be exposed or unexposed in the finished building.

Figure 8. Cut Paper Wrap With A Hooked Utility Blade.



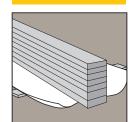
When used in an exposed application, appearance is important—make sure these beams are of *Architectural Appearance* quality.

■ Turn the beams so the paper folds and the staples are facing down (beam is then upside down) and carefully cut the paper. Use a hooked utility blade (or similar cutting tool) when cutting the paper to avoid damaging the finish.

(See Figure 8.) Do not remove the paper, allow it to drop away from the beam, still held in place by the staples. During the inspection, look for areas that may need repair. (See Figure 9.)

Repair (if needed): With beams planned for exposed applications, repair appearance defects such as sunburn,

Figure 9. Inspect Beam On The Ground Before Installation.



forklift damage, and water damage while still on the ground. Do not repair seasoning checks at this time, they most often appear after installation. After necessary repairs have been made, use tape to close the paper wrap so that the beam is protected during the installation process.

Installation: Forklift and handling damage often occurs during the lifting and installation of the beam. Treat the beam with extreme care.

Final Finishing: After the interior of the building is painted or finished, remove paper from beam and apply finish to the beam (unless you've pre-finished prior to installation). Any final cosmetic repairs (for checks and small knots, etc.) are best made after all finishes are applied to the beam.

Tips for Repairing Appearance Defects

Sunburn: If a portion of the beam has been left uncovered in the sun for a period of time, "sunburning" can occur. Sunburn is the result of exposing wood fiber to the ultra-violet rays of the sun. Wood fibers permanently darken when exposed to direct or indirect sunlight. Sunburn is not a problem when an opaque finish is to be used, such as paint.

Cause: Sunburn can result from a tear in the paper or from improperly covering the beam at the job site.

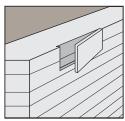
Solution: Excessive burns cannot be repaired, leaving the beam unsuitable for transparent finishes. In cases of mild exposure, sand the affected areas to remove the sunburned marks on the beam. Caution: Sand with the grain of the wood. Do not cross sand.

Forklift damage: Forklift damage is a problem when handling beams at the unloading site. In the case of light damage such as minor dents or scratches, sand the damaged area. Be careful to feather out the sanding as you get farther away from the damage.

Solution: For moderate forklift damage, the most effective repair is an inlay or a dutchman (the inlay wood section should match the wood in the area of repair). It is best to involve the finish carpenter. (*See Figure 10*.)

Caution: If severe damage has occurred (more than 5 percent of the depth of the beam is affected), stop — the beam may have been weakened. Consult your Rosboro Glulam Dealer.

Figure 10. Repairing Moderate Forklift Damage.



To repair moderate forklift damage, make an inlay or dutchman.

Water Damage: The extent of water damage can occur to varying degrees.

Surface Moisture: It is quite common for condensation to occur inside the protective wrapping. Because glulams are manufactured with kiln dried material, this type of moisture is only on the surface of the beam and should dry without affecting the finish.

Solution: If the beam is wet but clean, allow air to circulate and slowly dry all surfaces.

Dirt and Moisture: The handling of the beams can allow dirt to mix with water and stain the beam. This will create a dirty blemish affecting the appearance. **Solution:** First, allow the beam to dry. Once dry, remove the dried dirt by brushing or sanding. If only a small area is affected, feather out the sanding from the damaged area. If a large part of the beam is affected, we recommend that you sand the entire beam to maintain a uniform finish.

Mold and Fungus: Rosboro glulams are wrapped in ultra-violet resistant paper, which holds in moisture and heat. This is an ideal place for mold or fungus to grow. Depending on the climate conditions and the length of time moisture is trapped under the paper, the beam may have developed mold or fungus. Mold or fungus usually appears white or black and feels slimy to the touch. Solution: Remove paper completely from the beam and let it dry naturally. Once dry, inspect the beam looking specifically for areas of punky or rotting wood. If no

punky wood is found, remove blemishes and discol-

oration with a belt sander. (See Figure 11.)

If the fungus growth goes deep into the beam and cannot be easily sanded out, or if punky wood is present, this beam is not suitable for architectural use. The beam can still be used in a non-exposed application. If you have an alternate, non-

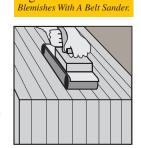


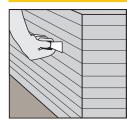
Figure 11. Remove

exposed application, apply a flood-coat of 11 percent industrial bleach (such as Wasaclor[™]) as opposed to store bought 3 percent bleach. This will kill fungus spores and prevent further damage. Follow manufacturer's instructions and precautions during use. **Caution:** If punkyness exceeds 5 percent of the depth of the beam,

the strength of the beam may have been compromised. Consult Rosboro Technical Support.

Seasoning Checks: Checking is a natural occurrence in structural timber. The cause of checking is shrinkage of the wood fibers due to moisture lost to the outside environment and normally occurs after installation. Checking will not affect the structural integrity of the beam. Although checks are commonly found near a glueline, checks should not be confused with delamina-

Figure 12. Apply Putty To Cosmetically Repair Seasoning Checks.



tion which can occur when the glue bond is not adequate. An inadequate glue bond is when less than 75 percent of the gluing surface is bonded. This causes openings which are straight separations between the laminations directly at a glueline. The faces of the separation are smooth and there is no or minimal torn wood fiber on the surfaces of the separation.

Solution: If checking is detected and an opaque finish is to be used (such as paint), fill the voids with any flexible putty then finish as desired. If a transparent finish is to be used (such as stain or varnish), the checks can be cosmetically filled.

A close match may require a blending of colors. A zebra effect (not completely mixing the colors) is also effective in reaching the desired appearance. Remember, perfect matches are not natural, so don't work too hard at it. Press the appropriate putty into the void with a putty knife. You do not need to fill the entire void

Figure 13. Remove Excess Putty With Mineral Spirits.



with putty, just fill enough to cover the opening (at least ¹/s" deep). We recommend a putty that never hardens and thus retains its elasticity. This allows the putty to shrink or swell with the beam over time. Remove excess putty with mineral spirits and a rag. If desired, reapply a final clear finish over the top of the patch, carefully matching the finish on the rest of the beam and let dry.

Guidelines for Drilling Holes

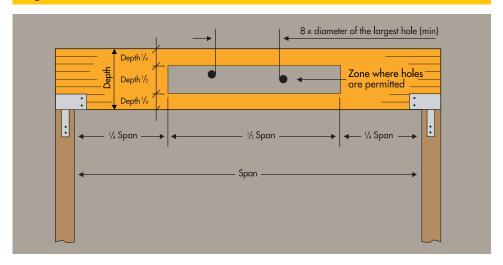
For years there has been confusion in the field about whether holes can be safely drilled into or through glulam beams. It's true, you can damage a beam to the point of reducing its structural integrity by improperly drilling holes in the wrong places. But by adhering to Rosboro's Allowable Hole Chart, holes can indeed be safely drilled into or through glulam beam products. (See Figure 14.)

For additional information on field drilling (and notching) of glulams, refer to the Rosboro website at: www.rosboro.com/techref-glulam/EWS-S560E.pdf. Even using these simple guidelines, remember: If you are not sure, don't drill. Call Rosboro Technical Support for guidance.



Drilling holes in glulam is permissible if done properly. (see Figure 14 for details.)

Figure 14. Allowable Hole Chart



Notes:

- 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 11/2" or 1/10 the beam depth, whichever is smaller.
- 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 area in figure 14.
- C. Hole spacing: The minimum clear spacing between adjacent holes, as measured between the nearest edge of the holes, should be 8 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 1 hole per every 5 feet of beam length. In other words, the maximum number of holes should not exceed 4 for a 20-foot long beam. 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.

Rosboro
Glulam
Beams:
Design
Values

		Flexural St	ress F _b (psi) ¹	Compression	Cl 2	Modulus
Product	Layup Combination	Tension Zone	Compression Zone	Perpendicular to Grain Fa (psi)	Shear ² F _v (psi)	of Elasticity E (106 psi)
BigBeam	30F-E2M3	3,000	3,000	650	300	2.1
Stock Glulam	24F-V4	2,400	1,850	650	265	1.8
1.8E-IJC	24F-V8	2,400	2,400	650	265	1.8
Treated Glulam	24F-V5MI/SP	2,400	2,400	740	300	1.8

Notes for Glulam Beams Design Values:

(1) Fb shall be adjusted by the volume effect factor using the following formula:

 $C_v = (5.125/b)^{1/10} x (12/d)^{1/10} x (21/L)^{1/10} \le 1.0$

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-05 3.4.3.3), the design shear (F_{ν}) shall be multiplied by a factor of 0.72.

Rosboro Glulam Columns: Design Values

	Flexura	l Stress	Compression Parallel to	Modulus of Elasticity
Layup Combination	F _{by} (psi)	F _{bx} (psi)	Grain Far(psi)	E (10 ⁶ psi)
EWS 2 DF	1,800 ¹	1,700 ²	1,900 ³	1.7

Notes for Glulam Columns Design Values:

- (1) Applicable to 4 or more lams. This value shall be reduced to 1,600 psi for 3 lams and 1,300 psi for 2 lams.
- (2) Applicable to column depths up to 15" without tension lam. For column depths exceeding 15" without tension lams, $F_{bx} = 1,500$ psi. When tension lams are used, $F_{bx} = 2,000$ psi for 4 lams or deeper.
- (3) Applicable to 4 or more lams. This value shall be reduced to 1,600 psi for 2 or 3 lams.

Camber at Midpoint of the Beam Length (inches)

												;	3,500	ft. Ro	ıdius											
Length of Beam (ft.)	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66
Camber at Midpoint (in.)	1/8	1/8	1/8	1/4	1/4	1/4	3/8	3/8	1/2	1/2	1/2	5/8	5/8	3/4	7/8	7/8	1	1 1/8	1 1/8	1 1/4	1 3/8	11/2	11/2	1 5/8	1 3/4	17/8

Note for Camber at Midpoint of Beam Length Table:

(1) Industry accepted manufacturing tolerance on camber is $\pm \frac{1}{4}$ " for lengths up to 20 feet with an increase in tolerance of $\frac{1}{8}$ " per additional 20 feet of length or fraction thereof, but not to exceed $\frac{3}{4}$ ".

If you would like to calculate the camber for a select length, or figure the radius for a beam, use the formulas below.

Camber Formulas

	Formula	Example
To Calculate the Radius (ft.)	Radius = $\frac{\text{(length in feet)}^2 \times 1.5}{\text{Camber in inches}}$	Length = 20', Camber = $^{1}/_{4}''$ or .25" $\frac{20^{2} \text{ X 1.5}}{.25''} = 2,400' \text{ Radius}$
To Calculate the Camber (in.)	Camber = $\frac{\text{(length in feet)}^2 \times 1.5}{\text{Radius in feet}}$	Length = 24', Radius = 3,500' $\frac{24^2 \text{ X } 1.5}{3,500'} = 0.25'' \text{ Camber}$



 $F_b = 3,000 \ psi$ $F_v = 300 \ psi$ $E = 2.1 \ x \ 10^6 \ psi$

		Weight	Maximu	m Resistive S	hear (lbf)	Maximum	Resistive Mom	ent (ftlbf)	EI
Width (in.)	Depth (in.)	(lbf/ft.)	100%	115%	125%	100%	115%	125%	(106 in.2 - lb.)
	91/2	8.3	6,650	7,648	8,313	13,161	15,136	16,452	525
	117/8	10.4	8,313	9,559	10,391	20,565	23,649	25,706	1,026
31/2	14	12.3	9,800	11,270	12,250	28,583	32,871	35,729	1,681
	16	14.0	11,200	12,880	14,000	37,333	42,933	46,667	2,509
	18	15.8	12,600	14,490	15,750	47,250	54,338	59,063	3,572
		Weight	Maximu	m Resistive Sl	hear (lbf)	Maximum	Resistive Mom	ent (ftlbf)	EI
Width (in.)	Depth (in.)	(lbf/ft.)	100%	115%	125%	100%	115%	125%	(106 in.2 - lb.)
	91/2	12.9	10,331	11,881	12,914	20,447	23,514	25,559	816
	117/8	16.1	12,914	14,851	16,143	31,949	36,741	39,936	1,593
5 7/16	14	19.0	15,225	17,509	19,031	44,406	51,067	55,508	2,611
	16	21.8	17,400	20,010	21,750	58,000	66,700	72,500	3,898
	18	24.5	19,575	22,511	24,469	73,406	84,417	91,758	5,550
		Weight	Maximu	m Resistive S	hear (lbf)	Maximum	Resistive Mom	ent (ftlbf)	EI
Width (in.)	Depth (in.)	(lbf/ft.)	100%	115%	125%	100%	115%	125%	(10 ⁶ in. ² - lb.)
	91/2	16.6	13,300	15,295	16,625	26,323	30,271	32,904	1,050
	117/8	20.8	16,625	19,119	20,781	41,130	47,299	51,412	2,051
7	14	24.5	19,600	22,540	24,500	57,167	65,742	71,458	3,361
	16	28.0	22,400	25,760	28,000	74,667	85,867	93,333	5,018
	18	31.5	25,200	28,980	31,500	94,500	108,675	118,125	7,144

Notes for BigBeam Design Properties:

- (1) Beam weight is assumed to be 36 pcf.
- (2) Maximum resistive moment shall be adjusted by the volume factor based on NDS-05.

T OF LIGORIUS AND
1.8E JJC GLULAM
No Top-No Bottom-No Camber

Design Properties

$$\begin{split} F_b &= 2,400 \text{ psi} \\ F_v &= 265 \text{ psi} \\ E &= 1.8 \text{ x } 10^6 \text{ psi} \end{split}$$

		Weight	Maximu	m Resistive S	hear (lbf)	Maximum	ı Resistive Mon	nent (ftlbf)	EI
Width (in.)	Depth (in.)	(lbf/ft.)	100%	115%	125%	100%	115%	125%	(10 ⁶ in. ² - lb.)
	91/2	8.1	5,874	6,755	7,343	10,529	12,109	13,161	450
	117/8	10.1	7,343	8,444	9,178	16,452	18,920	20,565	879
$3^{1}/_{2}$	14	11.9	8,657	9,955	10,821	22,867	26,297	28,583	1,441
	16	13.6	9,893	11,377	12,367	29,867	34,347	37,333	2,150
	18	15.3	11,130	12,800	13,913	37,800	43,470	47,250	3,062

Notes for 1.8E-IJC Design Properties:

- (1) Beam weight is assumed to be 35 pcf.
- (2) Maximum resistive moment shall be adjusted by the volume factor based on NDS-05.



Design PropertiesFb = 2,400 psi

 $F_v = 265 \text{ psi}$ $E = 1.8 \times 10^6 \text{ psi}$

		Weight	Maximu	m Resistive S	hear (lhf)	Maximum	Resistive Mom	ent (ft -lhf)	EI
Width (in.)	Depth (in.)	(lbf/ft.)	100%	115%	125%	100%	115%	125%	(106 in.2 - lb.)
	6	4.6	3,313	3,809	4,141	3,750	4,313	4,688	101
	71/2	5.7	4,141	4,762	5,176	5,859	6,738	7,324	198
	9	6.8	4,969	5,714	6,211	8,438	9,703	10,547	342
	101/2	8.0	5,797	6,666	7,246	11,484	13,207	14,355	543
	12	9.1	6,625	7,619	8,281	15,000	17,250	18,750	810
31/8	131/2	10.3	7,453	8,571	9,316	18,984	21,832	23,730	1,153
3 /8	15	11.4	8,281	9,523	10,352	23,438	26,953	29,297	1,582
	161/2	12.5	9,109	10,476	11,387	28,359	32,613	35,449	2,106
	18	13.7	9,938	11,428	12,422	33,750	38,813	42,188	2,734
	191/2	14.8	10,766	12,380	13,457	39,609	45,551	49,512	3,476
	21	16.0	11,594	13,333	14,492	45,938	52,828	57,422	4,341
	22 1/2	17.1	12,422	14,285	15,527	52,734	60,645	65,918	5,339
	24	18.2	13,250	15,238	16,563	60,000	69,000	75,000	6,480
		Weight		m Resistive S		Maximum	Resistive Mom	ent (ftlbf)	El
Width (in.)	Depth (in.)	(lbf/ft.)	100%	115%	125%	100%	115%	125%	(10 ⁶ in. ² - lb.)
	9	7.7	5,565	6,400	6,956	9,450	10,868	11,813	383
	101/2	8.9	6,493	7,466	8,116	12,863	14,792	16,078	608
31/2	12	10.2	7,420	8,533	9,275	16,800	19,320	21,000	907
	131/2	11.5	8,348	9,600	10,434	21,263	24,452	26,578	1,292
	15	12.8	9,275	10,666	11,594	26,250	30,188	32,813	1,772
	161/2	14.0	10,203	11,733	12,753	31,763	36,527	39,703	2,358
\\/:\	Donali (in)	Weight		m Resistive S			Resistive Mome		EI
Width (in.)	Depth (in.)	(lbf/ft.)	100%	115%	125%	100%	7.072	125%	(10 ⁶ in. ² - lb.)
	71/-	7.5 9.3	5,433	6,247	6,791	6,150 9,609	7,073	7,688	166 324
	7 1/2	11.2	6,791 8,149	7,809 9,371	8,488 10,186	13,838	11,051	12,012	560
	10 1/2	13.1	9,507	10,933	11,884	18,834	15,913	23,543	890
	12	14.9	10,865	12,495	13,581	24,600	21,660 28,290	30,750	1,328
	13 1/2	16.8	12,223	14,057	15,279	31,134	35,805	38,918	1,891
	15	18.7	13,581	15,618	16,977	38,438	44,203	48.047	2,595
,	16 1/2	20.6	14,939	17,180	18,674	46,509	53,486	58,137	3,453
51/8	10 / 2	20.0					63,653		4,483
1	18	22.4	16 298	18 742	/0.3//	1 55.350	0,0 00.0	69 188	
	18	22.4	16,298 17.656	18,742 20.304	20,372	55,350 64.959		69,188 81,199	
	18 19 ¹ / ₂ 21	24.3	17,656	20,304	22,070	64,959	74,703	81,199	5,700
	191/2	24.3 26.2	17,656 19,014	20,304 21,866	22,070 23,767	64,959 75,338	74,703 86,638	81,199 94,172	5,700 7,119
	191/2	24.3	17,656 19,014 20,372	20,304	22,070 23,767 25,465	64,959 75,338 86,484	74,703	81,199 94,172 108,105	5,700 7,119 8,757
	19 1/2 21 22 1/2 24	24.3 26.2 28.0	17,656 19,014	20,304 21,866 23,428	22,070 23,767 25,465 27,163	64,959 75,338	74,703 86,638 99,457	81,199 94,172	5,700 7,119
	19 ¹ / ₂ 21 22 ¹ / ₂	24.3 26.2 28.0 29.9	17,656 19,014 20,372 21,730	20,304 21,866 23,428 24,990	22,070 23,767 25,465	64,959 75,338 86,484 98,400	74,703 86,638 99,457 113,160	81,199 94,172 108,105 123,000	5,700 7,119 8,757 10,627
	19 1/2 21 22 1/2 24 25 1/2	24.3 26.2 28.0 29.9 31.8	17,656 19,014 20,372 21,730 23,088	20,304 21,866 23,428 24,990 26,551	22,070 23,767 25,465 27,163 28,860	64,959 75,338 86,484 98,400 111,084	74,703 86,638 99,457 113,160 127,747	81,199 94,172 108,105 123,000 138,855	5,700 7,119 8,757 10,627 12,747

Continued on page 23

Rosboro
Design
Properties

 $\begin{aligned} F_v &= 265 \text{ psi} \\ E &= 1.8 \text{ x } 10^6 \text{ psi} \end{aligned}$

 $F_b = 2,400 \text{ psi}$

		Weight				Maximum	Resistive Mom	e nt (ftlbf)	EI
Width (in.)	Depth (in.)	(lbf/ft.)	100%	115%	125%	100%	115%	125%	(106 in.2 - lb.)
	9	14.8	10,733	12,342	13,416	18,225	20,959	22,781	738
	10 1/2	17.2	12,521	14,399	15,652	24,806	28,527	31,008	1,172
	12	19.7	14,310	16,457	17,888	32,400	37,260	40,500	1,750
	131/2	22.1	16,099	18,514	20,123	41,006	47,157	51,258	2,491
	15	24.6	17,888	20,571	22,359	50,625	58,219	63,281	3,417
	16 ¹ /2	27.1	19,676	22,628	24,595	61,256	70,445	76,570	4,548
63/4	18	29.5	21,465	24,685	26,831	72,900	83,835	91,125	5,905
0,4	191/2	32.0	23,254	26,742	29,067	85,556	98,390	106,945	7,508
	21	34.5	25,043	28,799	31,303	99,225	114,109	124,031	9,377
	22 1/2	36.9	26,831	30,856	33,539	113,906	130,992	142,383	11,533
	24	39.4	28,620	32,913	35,775	129,600	149,040	162,000	13,997
	25 1/2	41.8	30,409	34,970	38,011	146,306	168,252	182,883	16,789
	27	44.3	32,198	37,027	40,247	164,025	188,629	205,031	19,929
	28 1/2	46.8	33,986	39,084	42,483	182,756	210,170	228,445	23,438
	30	49.2	35,775	41,141	44,719	202,500	232,875	253,125	27,338
		Weight	Maximu	n Resistive S	hear (lbf)	Maximum	Resistive Mome	ent (ftlbf)	El
Width (in.)	Depth (in.)	(lbf/ft.)	100%	115%	125%	100%	115%	125%	(10 ⁶ in. ² - lb.)
	12	25.5	18,550	21,333	23,188	42,000	48,300	52,500	2,268
	131/2	00.7							
		28.7	20,869	23,999	26,086	53,156	61,130	66,445	3,229
	15	31.9	20,869 23,188	23,999 26,666	26,086 28,984	53,156 65,625	61,130 75,469	66,445 82,031	3,229 4,430
	15 16 ¹ / ₂		-,	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· ·			<u> </u>
		31.9	23,188	26,666	28,984	65,625	75,469	82,031	4,430
83/4	161/2	31.9 35.1	23,188 25,506	26,666 29,332	28,984 31,883	65,625 79,406	75,469 91,317	82,031 99,258	4,430 5,896
83/4	16 ¹ / ₂	31.9 35.1 38.3	23,188 25,506 27,825	26,666 29,332 31,999	28,984 31,883 34,781	65,625 79,406 94,500	75,469 91,317 108,675	82,031 99,258 118,125	4,430 5,896 7,655
83/4	16 ¹ / ₂ 18 19 ¹ / ₂	31.9 35.1 38.3 41.5	23,188 25,506 27,825 30,144	26,666 29,332 31,999 34,665	28,984 31,883 34,781 37,680	65,625 79,406 94,500 110,906	75,469 91,317 108,675 127,542	82,031 99,258 118,125 138,633	4,430 5,896 7,655 9,732
83/4	16 ½ 18 19 ½ 21	31.9 35.1 38.3 41.5 44.7	23,188 25,506 27,825 30,144 32,463	26,666 29,332 31,999 34,665 37,332	28,984 31,883 34,781 37,680 40,578	65,625 79,406 94,500 110,906 128,625	75,469 91,317 108,675 127,542 147,919	82,031 99,258 118,125 138,633 160,781	4,430 5,896 7,655 9,732 12,155
83/4	16 ½ 18 19 ½ 21 22 ½	31.9 35.1 38.3 41.5 44.7 47.9	23,188 25,506 27,825 30,144 32,463 34,781	26,666 29,332 31,999 34,665 37,332 39,998	28,984 31,883 34,781 37,680 40,578 43,477	65,625 79,406 94,500 110,906 128,625 147,656	75,469 91,317 108,675 127,542 147,919 169,805	82,031 99,258 118,125 138,633 160,781 184,570	4,430 5,896 7,655 9,732 12,155 14,950
83/4	16 1/2 18 19 1/2 21 22 1/2 24	31.9 35.1 38.3 41.5 44.7 47.9 51.0	23,188 25,506 27,825 30,144 32,463 34,781 37,100	26,666 29,332 31,999 34,665 37,332 39,998 42,665	28,984 31,883 34,781 37,680 40,578 43,477 46,375	65,625 79,406 94,500 110,906 128,625 147,656 168,000	75,469 91,317 108,675 127,542 147,919 169,805 193,200	82,031 99,258 118,125 138,633 160,781 184,570 210,000	4,430 5,896 7,655 9,732 12,155 14,950 18,144
83/4	16 ½ 18 19 ½ 21 22 ½ 24 25 ½	31.9 35.1 38.3 41.5 44.7 47.9 51.0 54.2	23,188 25,506 27,825 30,144 32,463 34,781 37,100 39,419	26,666 29,332 31,999 34,665 37,332 39,998 42,665 45,332	28,984 31,883 34,781 37,680 40,578 43,477 46,375 49,273	65,625 79,406 94,500 110,906 128,625 147,656 168,000 189,656	75,469 91,317 108,675 127,542 147,919 169,805 193,200 218,105	82,031 99,258 118,125 138,633 160,781 184,570 210,000 237,070	4,430 5,896 7,655 9,732 12,155 14,950 18,144 21,763

Notes for Stock Glulam Design Properties:

- (1) Beam weight is assumed to be 35 pcf.
- (2) Maximum resistive moment shall be adjusted by the volume factor based on NDS-05.

Design Values and Properties/Minimum Bearing Length

Rosboro TREATED GLULAM When You Need It To Last	Width (in.)	Depth (in.)	Weight (lbf/ft.)	Maximui 100%	m Resistive S 115%	hear (lbf) 125%	Maximum Re	sistive Moment 115%	(ftlbf) 125%	El (106 in.2 - lb.)
		91/2	9.5	6,650	7,648	8,313	10,529	12,109	13,161	450
Design		117/8	11.8	8,313	9,559	10,391	16,452	18,920	20,565	878
Properties	3 1/2	14	14.0	9,800	11,270	12,250	22,867	26,297	28,583	1,440
Dry-Use		16	15.9	11,200	12,880	14,000	29,867	34,347	37,333	2,151
$F_b = 2,400 \text{ psi}$		18	17.9	12,600	14,490	15,750	37,800	43,470	47,250	3,062
$F_{\nu}=300~psi$		91/2	14.7	10,331	11,881	12,914	16,358	18,811	20,447	698
$E = 1.8 \times 10^6 \text{ psi}$		117/8	18.4	12,914	14,851	16,143	25,559	29,393	31,949	1,366
	5 ⁷ /16	14	21.7	15,225	17,509	19,031	35,525	40,854	44,406	2,237
		16	24.8	17,400	20,010	21,750	46,400	53,360	58,000	3,341
		18	27.9	19,575	22,511	24,469	58,725	67,534	73,406	4,757

Notes for Treated Glulam Design Properties

- (1) Beam weight is assumed to be 41 pcf.
- (2) Maximum resistive moment shall be adjusted by the volume factor based on NDS-05.

Minimum
Bearing
Length (in.)

	140 1-1									Reacti	on (lbs)								
Product	Width (in.)	3,000	4,000	5,000	6,000	7,000	8,000	9,000	10,000	12,000	14,000	16,000	18,000	20,000	22,000	24,000	26,000	28,000	30,000
	3 1/2	1.50	1.76	2.20	2.64	3.08	3.52	3.96	4.40	5.27	6.15	7.03	7.91	8.79	9.67	10.55	11.43	12.31	13.19
BigBeam	5 7/16	1.50	1.50	1.50	1.70	1.98	2.26	2.55	2.83	3.40	3.96	4.53	5.09	5.66	6.22	6.79	7.36	7.92	8.49
	7	1.50	1.50	1.50	1.50	1.54	1.76	1.98	2.20	2.64	3.08	3.52	3.96	4.40	4.84	5.27	5.71	6.15	6.59
	3 1/8	1.50	1.97	2.46	2.95	3.45	3.94	4.43	4.92	5.91	6.89	7.88	8.86	9.85	10.83	11.82	12.80	13.78	14.77
	3 1/2	1.50	1.76	2.20	2.64	3.08	3.52	3.96	4.40	5.27	6.15	7.03	7.91	8.79	9.67	10.55	11.43	12.31	13.19
Stock Glul	5 ½	1.50	1.50	1.50	1.80	2.10	2.40	2.70	3.00	3.60	4.20	4.80	5.40	6.00	6.60	7.20	7.80	8.41	9.01
	6 3/4	1.50	1.50	1.50	1.50	1.60	1.82	2.05	2.28	2.74	3.19	3.65	4.10	4.56	5.01	5.47	5.93	6.38	6.84
	8 3/4	1.50	1.50	1.50	1.50	1.50	1.50	1.58	1.76	2.11	2.46	2.81	3.16	3.52	3.87	4.22	4.57	4.92	5.27
1.8E-IJC	3 1/2	1.50	1.76	2.20	2.64	3.08	3.52	3.96	4.40	5.27	6.15	7.03	7.91	8.79	9.67	10.55	11.43	12.31	13.19
Treated Glulam	3 1/2	1.50	1.54	1.93	2.32	2.70	3.09	3.47	3.86	4.63	5.41	6.18	6.95	7.72	8.49	9.27	10.04	10.81	11.58
Dry-Use	5 7/16	1.50	1.50	1.50	1.50	1.74	1.99	2.24	2.49	2.98	3.48	3.98	4.47	4.97	5.47	5.96	6.46	6.96	7.46
Treated Glulam	3 1/2	2.19	2.92	3.64	4.37	5.10	5.83	6.56	7.29	8.75	10.20	11.66	13.12	14.58	16.03	17.49	18.95	20.41	21.87
Wet-Use	5 7/16	1.50	1.88	2.35	2.81	3.28	3.75	4.22	4.69	5.63	6.57	7.51	8.44	9.38	10.32	11.26	12.20	13.14	14.07

Notes for Minimum Bearing Length Table:

- (1) Minimum bearing length is $1 \frac{1}{2}$ ".
- (2) Bearing across full width of the beam is required.
- (3) Bearing length shall be adjusted when the allowable bearing stress of the supporting member is less than the tabulated F_{α} (psi) values.

Application	Roof	Clear				Wid	h of House	(feet)		
Tables:	Loading	Opening (ft.)	Product	20	24	26	30	32	36	40
Single-Story	Simple Span		BigBeam	3 1/2 x 9 1/2	3 1/2 x 9 1/2	3 1/2 x 9 1/2	3 1/2 x 9 1/2	3 1/2 x 9 1/2	3 1/2 x 9 1/2	3 1/2 x 9 1/2
Headers	Non-Snow		DigDealii	5 ⁷ /16 x 9 ¹ / ₂	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ / ₂	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2
Tioudois	(LDF = 1.25)	6'3"	Stock Glulam	3 ½ x 6	3 ½ x 6	3 ½ x 6	3 ½ x 6	31/8 x 6	3 ½ x 6	3 1/8 x 7 1/2
	20 PSF Live		JIOCK OIDIUIII	5 ½ x 6	5 ½ x 6	5 ½ x 6	5 ½ x 6	51/8 x 6	5 ½ x 6	5½x6
	20 PSF Dead		1.8E-IJC	3 1/2 x 9 1/2	3 1/2 x 9 1/2	3 1/2 x 9 1/2	3 ½ x 9 ½	3 1/2 x 9 1/2	3 ½ x 9 ½	3 ½ x 9 ½
			BigBeam	3 1/2 x 9 1/2	3 1/2 x 9 1/2	3 1/2 x 9 1/2	3 1/2 x 9 1/2	3 1/2 x 9 1/2	3 1/2 x 9 1/2	3 1/2 x 9 1/2
			Digocum	5 ⁷ /16 x 9 ¹ / ₂	5 ⁷ /16 x 9 1/2	5 ⁷ /16 x 9 ¹ / ₂	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2
		9'3"	Stock Glulam	3 1/8 x 7 1/2	3 1/8 x 7 1/2	$3^{1}/8 \times 7^{1}/2$	3 ½ x 9	31/8 x 9	3 1/8 x 9	31/8 x 9
		/ 3	JIOCK CIDIUIII	5 ½ x 6	5 1/8 x 7 1/2	5 1/8 x 7 1/2	5 1/8 x 7 1/2	5 1/8 x 7 1/2	5 1/8 x 7 1/2	5 1/8 x 7 1/2
			1.8E-IJC	3 1/2 x 9 1/2	3 ½ x 9 ½	3 1/2 x 9 1/2	3 ½ x 9 ½	3 ½ x 9 ½	3 ½ x 9 ½	3 ½ x 9 ½
			D:D	31/2 x 91/2	3 1/2 x 9 1/2	3 1/2 x 9 1/2	3 1/2 x 9 1/2	3 1/2 x 9 1/2	31/2 x 117/8	31/2 x 117/8
	,		BigBeam	5 ⁷ / ₁₆ x 9 ¹ / ₂	$5^{7}/_{16} \times 9^{1}/_{2}$	5 ⁷ / ₁₆ x 9 ¹ / ₂	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2
		12'3"	Stock Glulam	3 1/8 x 9	3 1/8 x 10 1/2	3 1/8 x 10 1/2	3 1/8 x 10 1/2	31/8 x 12	3 1/8 x 12	31/8 x 12
		12.5	STOCK GIOIGIII	5 ½ x 9	5 ½ x 9	5 ½ x 9	5 ½ x 9	51/8 x 9	5 ½ x 9	51/8 x 101/2
	4		1.8E-IJC	3 1/2 x 9 1/2	3 ½ x 9 ½	3 1/2 x 9 1/2	31/2 x 117/8	3 ½ x 11 ½ s	31/2 x 117/8	31/2 x 117/8
h of house Clear	opening		D:D	3 ½ x 11 ½ s	31/2 x 117/8	31/2 x 117/8	3 ½ x 14	31/2 x 14	31/2 x 14	3 ½ x 14
			BigBeam	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ / ₁₆ x 11 ⁷ / ₈	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ /16 X 11 ⁷ /8	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ /16 x 11 ⁷ /
		16'3"	Stock Glulam	3 ½ x 12	3 1/8 x 13 1/2	3 1/8 x 13 1/2	3 ½ x 15	31/8 x 15	3 ½ x 15	31/8 x 161/2
		10.5	STOCK GIOIGIII	5 ½8 x 10 ½	5 ½ x 10 ½	5 ½ x 12	5 ½ x 12	51/8 x 12	51/8 x 12	51/8 x 131/2
			1.8E-IJC	31/2 x 117/8	31/2 x 14	31/2 x 14	3 ½ x 14	31/2 x 14	3 ½ x 14	31/2 x 16
			D: D	3 ½ x 14	31/2 x 14	3 ½ x 14	3 1/2 x 14	31/2 x 14	31/2 x 16	31/2 x 16
			BigBeam	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ / ₁₆ x 11 ⁷ / ₈	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ / ₁₆ x 14	5 ⁷ /16 x 14	5 ⁷ /16 x 14
		18'3"	Stock Glulam	3 1/8 x 13 1/2	31/8 x 15	3 ½ x 15	3 1/8 x 16 1/2	3 1/8 x 16 1/2	31/8 x 161/2	31/8 x 18
		103	STOCK GIVIAM	5 ½ x 12	51/8 x 12	5 1/8 x 13 1/2	5 1/8 x 13 1/2	5 ½ x 13 ½	51/8 x 131/2	51/8 x 15

Notes for Single-Story Header Table:

1.8E-IJC

- (1) Service condition = dry.
- (2) Maximum deflection under live load = L/240. Maximum deflection under total load = L/180.

 $3^{1}/_{2} \times 14$

- (3) Maximum 2 foot roof overhang.
- (4) Dead loads are in addition to the weight of the beam, which is assumed to be 35 pcf (36 pcf for BigBeam).

 $3^{1}/_{2} \times 14$

 $3^{1}/_{2} \times 14$

3 ½ x 16

31/2 x 16

3 ½ x 16

 $3^{1}/_{2} \times 18$

- (5) Sufficient bearing length shall be provided for resisting applied loads.
- (6) The minimum depth is $9\frac{1}{2}$ " for BigBeam and 1.8E-IJC.

Application Tables: Single-Story Headers

Application	Roof	Clear				Widt	h of House	(feet)		
Tables:	Loading	Opening (ft.)	Product	20	24	26	30	32	36	40
Single-Story	Simple Span		BigBeam	3 ½ x 9 ½	3 ½ x 9½	3 1/2 x 9 1/2	3 1/2 x 9 1/2	3 1/2 x 91/2	3 1/2 x 9 1/2	3 1/2 x 91/2
Headers	Snow		Digbeam	5 ⁷ /16 x 9 ¹ / ₂	5 ⁷ /16 x 9 ¹ / ₂	5 ⁷ / ₁₆ x 9 ¹ / ₂	5 ⁷ /16 x 9 ¹ / ₂	5 ⁷ /16 x 9 ¹ /2	5 ½16 x 9 ½	5 ⁷ /16 x 9 ¹ / ₂
110uuo13	(LDF=1.15)	6'3"	Stock Glulam	3 ½ x 6	31/8 x 6	31/8 x 6	31/8 x 6	31/8 x 71/2	31/8 x 71/2	3 ½ x 7½
	30 PSF Live	0.5	JIOCK GIOIGIII	5 ½ x 6	5 ¹/8 x 6	5 ½ x 6	5 ½ x 6	5 ½ x 6	5 ½ x 6	5 ½ x 6
	15 PSF Dead		1.8E-IJC	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2	3 ½ x 9 ½	3 ½ x 9 ½	31/2 x 91/2
			BigBeam	3 ½ x 9 ½	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2
			Digodin	5 ⁷ /16 x 9 ¹ / ₂	5 ⁷ /16 x 9 ¹ / ₂	5 ⁷ /16 x 9 ¹ / ₂	5 ⁷ /16 x 9 ¹ / ₂	5 ⁷ /16 x 9 ¹ / ₂	5 ⁷ /16 x 9 ¹ / ₂	5 ⁷ /16 x 9 ¹ / ₂
		9'3"	Stock Glulam	3 ½ x 7-1/2	31/8 x 9	31/8 x 9	31/8 x 9	3 ½ x 9	31/8 x 101/2	3 ½ x 10 ½
		/ 3	JIOCK OIDIUIII	5 ½ x 6	5 1/8 x 7 1/2	5 ½8 x 7½	5 ½8 x 7½	5 ½ x 7½	5 1/8 x 7 1/2	5 ½ x 9
			1.8E-IJC	3 ½ x 9 ½	3 1/2 x 9 1/2	31/2 x 91/2	31/2 x 91/2	3 ½ x 9 ½	3 ½ x 9 ½	31/2 x 91/2
			D:D	3 ½ x 9 ½	31/2 x 91/2	31/2 x 91/2	31/2 x 117/8	3½ x 11½	31/2 x 117/8	31/2 x 117/8
			BigBeam	5 ⁷ / ₁₆ x 9 ¹ / ₂	5 ⁷ /16 x 9 ¹ / ₂	5 ⁷ /16 x 9 ¹ / ₂	5 ⁷ /16 x 9 ¹ / ₂	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ / ₂	5 ⁷ /16 x 9 ¹ / ₂
		12'3"	Stock Glulam	3 ½ x 10 ½	3 ½ x 10 ½	3 ½ x 12	3 ½ x 12	3 ½ x 12	3 1/8 x 13 1/2	3 ½ x 13 ½
		12'3"	JIOCK CIGIUIII	5 ½ x 9	5 ½ x 9	5 ½ x 9	5 ½ x 9	5 ½ x 10 ½	5 ½ x 10 ½	5 ½ x 10 ½
	→		1.8E-IJC	31/2 x 91/2	3½ x 11½8	3½ x 11½8	3½ x 11½8	3½ x 11½ s	3½ x 11½ s	31/2 x 14
th of house Clea	ar opening		BigBeam	31/2 x 117/8	31/2 x 117/8	31/2 x 14	31/2 x 14	31/2 x 14	31/2 x 14	31/2 x 16
			Digbeuiii	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ /16 x 11 ⁷ /8
		16'3"	Stock Glulam	3 ½ x 13½	31/8 x 15	31/8 x 15	31/8 x 15	3½ x 16½	3 ½ x 16½	3½ x 18
		100	JIOCK OIDIGIII	5 ½ x 10 ½	5 ½ x 12	5 ½ x 12	5 ½ x 12	5 ½ x 13½	5 ½ x 13½	5 ½8 x 13½
			1.8E-IJC	3 ½ x 14	3 ½ x 14	3 ½ x 14	3 ½ x 16	3 ½ x 16	3 ½ x 16	3 ½ x 18
			DiaDoam	31/2 x 14	31/2 x 14	31/2 x 14	31/2 x 16	31/2 x 16	31/2 x 16	31/2 x 18
			BigBeam	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ /16 x 14	5 ⁷ /16 x 14	5 ⁷ /16 x 14	5 ⁷ / ₁₆ x 14
		18'3"	Stock Glulam	3 ½ x 15	3 ½ x 16 ½	3 ½ x 16 ½	3 ½ x 18	3 ½ x 18	3 ½ x 19½	3 1/8 x 19 1/2
		100	JIOUN OIDIUIII	5 ½ x 12	5 ½8 x 13½	5 ½8 x 13½	5 ½8 x 13½	5 ½ x 15	51/8 x 15	5 ½8 x 16 ½
			1.8E-IJC	3½ x 14	31/2 x 16	31/2 x 16	31/2 x 16	31/2 x 18	31/2 x 18	-

Notes for Single-Story Header Table:

- (1) Service condition = dry.
- (2) Maximum deflection under live load = L/240. Maximum deflection under total load = L/180.
- (3) Maximum 2 foot roof overhang.
- (4) Dead loads are in addition to the weight of the beam, which is assumed to be 35 pcf (36 pcf for BigBeam).
- (5) Sufficient bearing length shall be provided for resisting applied loads.
- (6) The minimum depth is $9\frac{1}{2}$ " for BigBeam and 1.8E-IJC.

Application	Roof	Clear				Widt	h of House (feet)		
Tables:	Loading	Opening (ft.)	Product	20	24	26	30	32	36	40
Single-Story	Simple Span		BigBeam	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2	3½ x 9½
Headers	Snow		Digbeam	5 ⁷ / ₁₆ x 9 ¹ / ₂	5 ½16 x 9½	5 ½/16 x 9 ½	5 ½16 x 91/2	5 ½16 x 9½	5 ½16 x 9½	5 ⁷ /16 x 9 ¹ /:
Heduers	(LDF=1.15)	6'3"	Stock Glulam	31/8 x 6	31/8 x 6	31/8 x 71/2	31/8 x 71/2	31/8 x 71/2	31/8 x 71/2	31/8 x 71/2
	40 PSF Live	0.5	Stock Gloidin	5½ x 6	5½ x 6	5½ x 6	5½ x 6	5½ x 6	5½ x 6	5½ x 6
	15 PSF Dead		1.8E-IJC	3½ x 9½	31/2 x 91/2	31/2 x 91/2	3½ x 9½	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2
			BigBeam	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2
			Digueum	5 ⁷ / ₁₆ x 9 ¹ / ₂	5 ½16 x 9½	5 ⁷ /16 x 9 ¹ /2	5 ½16 x 91/2	5 ½16 x 9½	5 ½16 x 9½	5 ½16 x 9½
		9'3"	Stock Glulam	31/8 x 9	31/8 x 9	31/8 x 9	31/8 x 101/2	31/8 x 101/2	31/8 x 101/2	31/8 x 12
		7 3	Stock Gloidill	51/8 x 71/2	51/8 x 71/2	51/8 x 71/2	51/8 x 71/2	51/8 x 9	5½ x 9	5½ x 9
			1.8E-IJC	3½ x 9½	3½ x 9½	3½ x 9½	3½ x 9½	31/2 x 91/2	3½ x 11½8	3½ x 11½/8
			D:D	3½ x 9½	31/2 x 117/8	3½ x 11½	31/2 x 117/8	31/2 x 117/8	31/2 x 117/8	3½ x 14
			BigBeam	5 ⁷ /16 x 9 ¹ / ₂	5½16 x 9½	5 ½16 x 9½	5 ½16 x 91/2	5½16 x 9½	5½16 x 9½	5 ½16 x 11½
		12'3"	Stock Glulam	3½ x 12	31/8 x 12	31/8 x 12	31/8 x 131/2	31/8 x 131/2	31/8 x 15	31/8 x 15
		12 3	Stock Giviam	5½ x 9	51/8 x 9	5½ x 10½	51/8 x 101/2	5½ x 10½	51/8 x 12	51/8 x 12
	<u> </u>		1.8E-IJC	3½ x 11½8	3½ x 11½8	3½ x 11½8	3½ x 11½8	3½ x 14	3½ x 14	3½ x 14
h of house Clear	opening		D:D.	3½ x 14	31/2 x 14	3½ x 14	3½ x 16	31/2 x 16	31/2 x 16	3½ x 16
			BigBeam	5 ⁷ /16 x 11 ⁷ /8	5 ½16 x 11½8	5 ½16 x 11½8	5 ½16 x 11½8	5 ½16 x 14	5½16 x 14	5 ½16 x 14
		16'3"	Stock Glulam	31/8 x 15	31/8 x 161/2	31/8 x 161/2	31/8 x 18	31/8 x 18	31/8 x 191/2	31/8 x 191/2
		10.5	Stock Gloidiii	5½ x 12	51/8 x 12	5½ x 13½	5½ x 13½	5½ x 13½	51/8 x 15	5½ x 15
			1.8E-IJC	3½ x 14	3½ x 16	3½ x 16	3½ x 16	3½ x 18	3½ x 18	3½ x 18
			D: D	31/2 x 14	31/2 x 16	31/2 x 16	31/2 x 16	31/2 x 18	31/2 x 18	31/2 x 18
			BigBeam	5 ⁷ /16 x 11 ⁷ /8	5 ½16 x 14	5 ⁷ /16 x 14	5 ½16 x 14	5 ½16 x 14	5 ½16 x 14	5 ½16 x 16
		18'3"	Canala Chalassa	31/8 x 161/2	31/8 x 18	31/8 x 18	31/8 x 191/2	31/8 x 191/2	31/8 x 21	31/8 x 221/2
		10 3	Stock Glulam	51/8 x 131/2	5½ x 13½	51/8 x 15	5 ¹ / ₈ x 15	5½ x 16½	5½ x 16½	5½ x 18

Notes for Single-Story Header Table:

1.8E-IJC

- (1) Service condition = dry.
- (2) Maximum deflection under live load = L/240. Maximum deflection under total load = L/180.

3½ x 16

- (3) Maximum 2 foot roof overhang.
- (4) Dead loads are in addition to the weight of the beam, which is assumed to be 35 pcf (36 pcf for BigBeam).

31/2 x 18

31/2 x 18

31/2 x 18

- (5) Sufficient bearing length shall be provided for resisting applied loads.
- (6) The minimum depth is $9\frac{1}{2}$ " for BigBeam and 1.8E-IJC.

Application	Floor	Clear				Widt	h of House	(feet)		
Tables:	Loading	Opening (ft.)	Product	20	24	26	30	32	36	40
Floor Beams	Simple Span		BigBeam	3½ x 9½	31/2 x 91/2	3½ x 9½	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2	3½ x 9½
Tioor bouilis	Floor		Diguedili	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2
	(LDF = 1.00)	8	Stock Glulam	31/8 x 71/2	31/8 x 9	31/8 x 9	31/8 x 9	31/8 x 9	31/8 x 101/2	3½ x 10½
	40 PSF Live		JIOUR GIGIAIII	5½ x 7½	51/8 x 71/2	5 ¹ / ₈ x 7 ¹ / ₂	51/8 x 71/2	51/8 x 71/2	5 ¹ / ₈ x 7 ¹ / ₂	51/8 x 9
	10 PSF Dead		1.8E-IJC	3 ½ x 9 ½	3 ½ x 9 ½	3 ½ x 9 ½	3 ½ x 9 ½	3 ½ x 9 ½	3 ½ x 9 ½	3 ½ x 9 ½
			BigBeam	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2	31/2 x 11 7/8	31/2 x 117/8	31/2 x 11 7/8
			Digocum	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2
		10	Stock Glulam	31/8 x 9	31/8 x 101/2	31/8 x 101/2	31/8 x 12	31/8 x 12	31/8 x 12	3½ x 13½
		10	JIOCK OIGIUM	5¹/8 x 9	51/8 x 9	51/8 x 9	51/8 x 9	51/8 x 9	5 ¹ / ₈ x 10 ¹ / ₂	5 ¹ / ₈ x 10 ¹ / ₂
Width of hor	h of house		1.8E-IJC	3 ½ x 9 ½	3 ½ x 9 ½	3 ½ x 9 ½	3½ x 11½	3 ½ x 11 ½	3½ x 11½	3 ½ x 11 ½ s
	\rightarrow		Dia Damm	31/2 x 11 7/8	3½ x 11½8	3½ x 11 ½	3½ x 11½	31/2 x 11 7/8	31/2 x 14	31/2 x 14
			BigBeam	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ /16 x 11 ⁷ /8
		12	Stock Glulam	3½ x 12	3½ x 12	3½ x 12	31/8 x 131/2	31/8 x 131/2	31/8 x 15	3½ x 15
		'2		51/8 x 101/2	51/8 x 101/2	5 ¹ / ₈ x 10 ¹ / ₂	5 ¹ / ₈ x 10 ¹ / ₂	51/8 x 12	51/8 x 12	5½ x 12
			1.8E-IJC	3 ½ x 11½	3 ½ x 11½ s	3 ½ x 11½8	3½ x 14	3 ½ x 14	3 ½ x 14	3 ½ x 14
	→		BigBeam	3½ x 14	3½ x 14	31/2 x 16	31/2 x 16	31/2 x 16	3½ x 16	3½ x 18
Clear oper	ning		DigDeuili	5 ⁷ /16 x 11 ⁷ /8	5 ⁷ /16 x 14	5½16 x 14	5½16 x 14	5½16 x 14	5 ½16 x 14	5½16 x 16
		16	Stock Glulam	3½ x 15	31/8 x 161/2	31/8 x 161/2	3½ x 18	3½ x 18	31/8 x 191/2	3½ x 21
				51/8 x 131/2	51/8 x 131/2	5 ¹ / ₈ x 13 ¹ / ₂	5 ¹ / ₈ x 15	5 ¹ / ₈ x 15	5½ x 15	51/8 x 161/2
			1.8E-IJC	3 ½ x 14	3 ½ x 16	3½ x 16	3½ x 18	3 ½ x 18	3 ½ x 18	-
			D:D	31/2 x 18	31/2 x 18	31/2 x 18	5 ⁷ /16 x 18	5½16 x 18	5 ½16 x 18	5 ½16 x 18
			BigBeam	5 ⁷ /16 x 16	5½16 x 16	5 ½16 x 16	7 x 16	7 x 16	7 x 16	7 x 18
		20	Stock Glulam	31/8 x 18	31/8 x 191/2	31/8 x 21	31/8 x 221/2	31/8 x 221/2	31/8 x 24	5½ x 21
		20	JIVIN VIVIUIII	51/8 x 161/2	51/8 x 161/2	5½ x 18	5½ x 18	5½ x 18	51/8 x 191/2	6³/4 x 18
			1.8E-IJC	3 ½ x 18	-	-	-	-	-	-

Notes for Floor Beam Table:

- (1) Continuous or Non-continuous floor joists are allowed.
- (2) Service condition = dry.
- (3) Maximum deflection under live load = L/360. Maximum deflection under total load = L/240.
- (4) Dead loads are in addition to the weight of the beam, which is assumed to be 35 pcf (36 pcf for BigBeam).
- (5) Sufficient bearing length shall be provided for resisting applied loads.
- (6) Glulam is located at the centerline of the structure.

Application	Floor	Clear				Widt	h of House	(feet)		
Tables:	Loading	Opening (ft.)	Product	20	24	26	30	32	36	40
Floor Beams	Multiple Span Floor		BigBeam	3½ x 9½ 5½ x 9½	3½ x 9½ 5½ x 9½	3 ¹ / ₂ x 9 ¹ / ₂ 5 ⁷ / ₁₆ x 9 ¹ / ₂	3 ¹ / ₂ x 9 ¹ / ₂ 5 ⁷ / ₁₆ x 9 ¹ / ₂	3 ¹ / ₂ x 9 ¹ / ₂ 5 ⁷ / ₁₆ x 9 ¹ / ₂	3 ¹ / ₂ x 9 ¹ / ₂ 5 ⁷ / ₁₆ x 9 ¹ / ₂	3 ¹ / ₂ x 9 ¹ / ₂ 5 ⁷ / ₁₆ x 9 ¹ / ₂
	(LDF=1.00) 40 PSF Live	8	Stock Glulam	3 ¹ / ₈ x 9 5 ¹ / ₈ x 7 ¹ / ₂	3½ x 9 5½ x 7½	3 ¹ / ₈ x 10 ¹ / ₂ 5 ¹ / ₈ x 7 ¹ / ₂	3 ¹ / ₈ x 10 ¹ / ₂ 5 ¹ / ₈ x 9	3 ¹ / ₈ x 10 ¹ / ₂ 5 ¹ / ₈ x 9	3 ¹ / ₈ x 12 5 ¹ / ₈ x 9	3½ x 12 5½ x 9
	10 PSF Dead		1.8E-IJC	3½ x 9½	31/2 x 91/2	3 ¹ / ₂ x 9 ¹ / ₂	3 ¹ / ₂ x 9 ¹ / ₂	31/2 x 91/2	31/2 x 91/2	31/2 x 91/2
			BigBeam	3 ¹ / ₂ x 9 ¹ / ₂ 5 ⁷ / ₁₆ x 9 ¹ / ₂	3 ¹ / ₂ x 9 ¹ / ₂ 5 ⁷ / ₁₆ x 9 ¹ / ₂	3 ¹ / ₂ x 9 ¹ / ₂ 5 ⁷ / ₁₆ x 9 ¹ / ₂	3½ x 9½ 5½ x 9½	3½ x 9½ 5½ x 9½	3½ x 11½ 5½ x 9½	3½ x 11½ 5½6 x 9½
		10	Stock Glulam	3½8 x 10½ 5½8 x 9	3½ x 12 5½ x 9	3 ¹ / ₈ x 12 5 ¹ / ₈ x 9	3 ¹ / ₈ x 13 ¹ / ₂ 5 ¹ / ₈ x 10 ¹ / ₂	3 ¹ / ₈ x 13 ¹ / ₂ 5 ¹ / ₈ x 10 ¹ / ₂	3 ¹ / ₈ x 13 ¹ / ₂ 5 ¹ / ₈ x 10 ¹ / ₂	3½ x 15 5½ x 12
<i>V</i>	Vidth of house		1.8E-IJC	31/2 x 91/2	3½ x 9½	31/2 x 91/2	3½ x 11½8	3½ x 11½8	3 ¹ / ₂ x 11 ⁷ / ₈	3 ¹ / ₂ x 11 ⁷ / ₈
	→ ·		BigBeam	3½ x 9½ 5½ x 9½	3½ x 11½8 5½ x 9½	3½ x 11½ 5½ x 9½	3½ x 11½ 5½ x 9½	3½ x 11½ 5½ x 9½	3½ x 11½ 5½ x 11½ 5½ x 11½	3½ x 14 5½ x 11½
		12	Stock Glulam	3 ¹ / ₈ x 12 5 ¹ / ₈ x 10 ¹ / ₂	3½ x 13½ 5½ x 10½	3½ x 15 5½ x 12	3 ¹ / ₈ x 15 5 ¹ / ₈ x 12	3½ x 16½ 5½ x 12	3 ¹ / ₈ x 16 ¹ / ₂ 5 ¹ / ₈ x 13 ¹ / ₂	3 ¹ / ₈ x 18 5 ¹ / ₈ x 13 ¹ / ₂
			1.8E-IJC	3½ x 11½8	3½ x 11½8	3½ x 11½8	3½ x 14	3½ x 14	3½ x 14	3½ x 14
Column	spacing		BigBeam	3½ x 14 5½ x 11½	3½ x 14 5½ x 11½	3½ x 14 5½ x 11½	3½ x 16 5½ x 14	3½ x 16 5½ x 14	3½ x 16 5½ x 14	3½ x 18 5½ x 14
		16	Stock Glulam	3 ¹ / ₈ x 16 ¹ / ₂ 5 ¹ / ₈ x 13 ¹ / ₂	3½ x 18 5½ x 15	3 ¹ / ₈ x 19 ¹ / ₂ 5 ¹ / ₈ x 15	3 ¹ / ₈ x 19 ¹ / ₂ 5 ¹ / ₈ x 16 ¹ / ₂	3 ¹ / ₈ x 21 5 ¹ / ₈ x 16 ¹ / ₂	3½ x 22½ 5½ x 18	3½ x 22½ 5½ x 18
			1.8E-IJC	3½ x 14	3½ x 16	3½ x 16	3½ x 18	3½ x 18	3½ x 18	-
			BigBeam	3½ x 16 5½ x 14	3½ x 18 5½ x 14	3½ x 18 5½ x 16	5½16 x 16 7 x 14	5½16 x 16 7 x 16	5½16 x 18 7 x 16	5 ⁷ /16 x 18 7 x 16
		20	Stock Glulam	3 ¹ / ₈ x 21 5 ¹ / ₈ x 16 ¹ / ₂	3½ x 22½ 5½ x 18	3 ¹ / ₈ x 24 5 ¹ / ₈ x 18	5½8 x 19½ 5½8 x 19½	5 ¹ / ₈ x 21 6 ³ / ₄ x 18	5 ¹ / ₈ x 21 6 ³ / ₄ x 19 ¹ / ₂	5½ x 22½ 6¾ x 19½
			1.8E-IJC	3½ x 18						

Notes for Floor Beam Table:

- (1) Continuous or Non-continuous floor joists are allowed.
- (2) Service condition = dry.
- (3) Maximum deflection under live load = L/360. Maximum deflection under total load = L/240.
- (4) Dead loads are in addition to the weight of the beam, which is assumed to be 35 pcf (36 pcf for BigBeam).
- (5) Sufficient bearing length shall be provided for resisting applied loads.
- (6) Glulam is located at the centerline of the structure and the post is located at the center of the member.
- (7) For all other structural configurations, use Rosboro KeyBeam® design software for analysis.



Floor Beams Allowable Loads

Simple Span (LDF=1.00)

									Span	(feet)					
Width (in.)	Depth (in.)	Load Con	dition	8	10	12	14	16	18	20	22	24	26	28	30
vviain (iii.)	Depin(iii.)	Loud Con	L/360	1,403	718	416	262	175	123	90	67	52			
	91/4	Live Load	L/480	1,052	539	312	196	132	92	67	51	-		_	_
	' /	Total Load	L/240	1,552	990	615	384	255	177	127	93	70	53		
			L/360	1,520	778	450	284	190	133	97	73	56	-		
	91/2	Live Load	L/480	1,140	583	338	213	142	100	73	55	-			
	'	Total Load	L/240	1,637	1,045	667	417	277	192	138	101	76	58		
			L/360	2,297	1,292	748	471	315	222	161	121	93	74	59	
	111/4	Live Load	L/480	1,893	969	561	353	237	166	121	91	70	55	-	
	'	Total Load	L/240	2,297	1,467	1,016	696	463	322	232	172	130	100	78	62
			L/360	2,560	1,520	879	554	371	261	190	143	110	86	69	56
31/2	117/8	Live Load	L/480	2,226	1,140	660	415	278	195	142	107	82	65	52	-
","		Total Load	L/240	2,560	1,635	1,132	820	546	380	275	204	154	119	93	74
		P. D. J.	L/360	3,447	2,274	1,441	907	608	427	311	234	180	142	113	92
	14	Live Load	L/480	3,447	1,867	1,081	681	456	320	233	175	135	106	85	69
		Total Load	L/240	3,447	2,274	1,576	1,154	881	628	455	339	258	200	158	126
			L/360	4,186	2,973	2,060	1,354	907	637	465	349	269	211	169	138
	16	Live Load	L/480	4,186	2,788	1,613	1,016	681	478	348	262	202	159	127	103
		Total Load	L/240	4,186	2,973	2,060	1,510	1,153	908	683	510	389	303	240	192
		P. D. I	L/360	5,024	3,584	2,609	1,913	1,292	907	662	497	383	301	241	196
	18	Live Load	L/480	5,024	3,584	2,297	1,446	969	681	496	373	287	226	181	147
		Total Load	L/240	5,024	3,584	2,609	1,913	1,461	1,151	929	730	558	436	346	278
														0.10	270
Width (in.)	Depth (in.)	Load Con		8	10	12	14	16	18	20	22	24	26	28	30
Width (in.)	Depth (in.)								18	20 139	22 105				
Width (in.)	9 1/4	Load Con Live Load	dition	8	10	12	14	16				24	26	28	30
Width (in.)			L/360	8 2,179	10	12 646	14 407	16 272	191	139	105	24 81	26 63	28 51	30
Width (in.)	91/4	Live Load Total Load	L/360 L/480	8 2,179 1,634	10 1,116 837	12 646 484	14 407 305	16 272 204	191 143	139 105	105 79	24 81 61	26 63	28 51	30 - -
Width (in.)		Live Load	L/360 L/480 L/240	2,179 1,634 2,411	10 1,116 837 1,538	12 646 484 956	14 407 305 597	16 272 204 396	191 143 274	139 105 197	105 79 145	81 61 108	26 63 - 83	28 51 - 64	30
Width (in.)	91/4	Live Load Total Load	L/360 L/480 L/240 L/360	2,179 1,634 2,411 2,361	10 1,116 837 1,538 1,209	12 646 484 956 699	14 407 305 597 440	272 204 396 295	191 143 274 207	139 105 197 151	105 79 145 114	24 81 61 108 87	26 63 - 83 69	28 51 - 64 55	30 - - -
Width (in.)	91/4	Live Load Total Load Live Load Total Load	L/360 L/480 L/240 L/360 L/480	2,179 1,634 2,411 2,361 1,770	10 1,116 837 1,538 1,209 906	12 646 484 956 699 525	14 407 305 597 440 330	272 204 396 295 221	191 143 274 207 155	139 105 197 151 113	105 79 145 114 85	24 81 61 108 87 66	26 63 - 83 69 52	28 51 - 64 55 -	
Width (in.)	91/4	Live Load Total Load Live Load	L/360 L/480 L/240 L/360 L/480 L/240	2,179 1,634 2,411 2,361 1,770 2,543	10 1,116 837 1,538 1,209 906 1,623	12 646 484 956 699 525 1,036	14 407 305 597 440 330 648	272 204 396 295 221 430	191 143 274 207 155 298	139 105 197 151 113 214	105 79 145 114 85 157	24 81 61 108 87 66 118	26 63 - 83 69 52 90	28 51 - 64 55 - 70	54
	91/4	Live Load Total Load Live Load Total Load	L/360 L/480 L/240 L/360 L/480 L/240 L/360	2,179 1,634 2,411 2,361 1,770 2,543 3,569	10 1,116 837 1,538 1,209 906 1,623 2,007	12 646 484 956 699 525 1,036 1,162	14 407 305 597 440 330 648 731	272 204 396 295 221 430 490	191 143 274 207 155 298 344	139 105 197 151 113 214 251	105 79 145 114 85 157 189	24 81 61 108 87 66 118	26 63 - 83 69 52 90 114	28 51 - 64 55 - 70 91	30 - - - - - 54 74
Width (in.)	91/4	Live Load Total Load Live Load Total Load Live Load Total Load	L/360 L/480 L/240 L/360 L/480 L/480 L/240 L/360 L/480	2,179 1,634 2,411 2,361 1,770 2,543 3,569 2,940	10 1,116 837 1,538 1,209 906 1,623 2,007 1,505	12 646 484 956 699 525 1,036 1,162 871	14 407 305 597 440 330 648 731 549	16 272 204 396 295 221 430 490 368	191 143 274 207 155 298 344 258	139 105 197 151 113 214 251 188	105 79 145 114 85 157 189	24 81 61 108 87 66 118 145	26 63 - 83 69 52 90 114 86	28 51 - 64 55 - 70 91 69	30 - - - - - - 54 74 56
	91/4	Live Load Total Load Live Load Total Load Live Load	L/360 L/480 L/240 L/360 L/480 L/480 L/240 L/360 L/480 L/240	2,179 1,634 2,411 2,361 1,770 2,543 3,569 2,940 3,569	10 1,116 837 1,538 1,209 906 1,623 2,007 1,505 2,279	12 646 484 956 699 525 1,036 1,162 871 1,578	14 407 305 597 440 330 648 731 549 1,082	16 272 204 396 295 221 430 490 368 720	191 143 274 207 155 298 344 258 501	139 105 197 151 113 214 251 188 361	105 79 145 114 85 157 189 141 267	24 81 61 108 87 66 118 145 109 203	26 63 - 83 69 52 90 114 86 156	28 51 - 64 55 - 70 91 69 122	30 - - - - - - 54 74 56 96
	91/4	Live Load Total Load Live Load Total Load Live Load Total Load	L/360 L/480 L/240 L/360 L/480 L/480 L/240 L/360 L/480 L/240 L/360 L/480 L/240 L/360	2,179 1,634 2,411 2,361 1,770 2,543 3,569 2,940 3,569 3,977	10 1,116 837 1,538 1,209 906 1,623 2,007 1,505 2,279 2,361	12 646 484 956 699 525 1,036 1,162 871 1,578 1,366	14 407 305 597 440 330 648 731 549 1,082 860	272 204 396 295 221 430 490 368 720 576	191 143 274 207 155 298 344 258 501 405	139 105 197 151 113 214 251 188 361 295	105 79 145 114 85 157 189 141 267 222	24 81 61 108 87 66 118 145 109 203 171	26 63 - 83 69 52 90 114 86 156	28 51 - 64 55 - 70 91 69 122 108	30 - - - - - - 54 74 56 96
	91/4	Live Load Total Load Live Load Live Load Total Load Live Load Total Load Total Load	L/360 L/480 L/240 L/360 L/480 L/480 L/240 L/360 L/480 L/240 L/360 L/480 L/240 L/360 L/360 L/480	2,179 1,634 2,411 2,361 1,770 2,543 3,569 2,940 3,569 3,977 3,458	10 1,116 837 1,538 1,209 906 1,623 2,007 1,505 2,279 2,361 1,770	12 646 484 956 699 525 1,036 1,162 871 1,578 1,366 1,025	14 407 305 597 440 330 648 731 549 1,082 860 645	272 204 396 295 221 430 490 368 720 576 432	191 143 274 207 155 298 344 258 501 405	139 105 197 151 113 214 251 188 361 295 221	105 79 145 114 85 157 189 141 267 222 166	24 81 61 108 87 66 118 145 109 203 171 128	26 63 - 83 69 52 90 114 86 156 134	28 51 - 64 55 - 70 91 69 122 108 81	30 - - - - - 54 74 56 96 87 66
	91/4	Live Load Total Load Live Load Total Load Live Load Total Load Live Load	L/360 L/480 L/240	2,179 1,634 2,411 2,361 1,770 2,543 3,569 2,940 3,569 3,977 3,458 3,977	10 1,116 837 1,538 1,209 906 1,623 2,007 1,505 2,279 2,361 1,770 2,540	12 646 484 956 699 525 1,036 1,162 871 1,578 1,366 1,025 1,759	14 407 305 597 440 330 648 731 549 1,082 860 645 1,274	272 204 396 295 221 430 490 368 720 576 432	191 143 274 207 155 298 344 258 501 405 304 591	139 105 197 151 113 214 251 188 361 295 221 426	105 79 145 114 85 157 189 141 267 222 166 316	24 81 61 108 87 66 118 145 109 203 171 128 240	26 63 - 83 69 52 90 114 86 156 134 101	28 51 - 64 55 - 70 91 69 122 108 81 145	30 - - - - - 54 74 56 96 87 66
	91/4	Live Load Total Load Live Load Live Load Total Load Live Load Total Load Total Load	L/360 L/480 L/240 L/360	8 2,179 1,634 2,411 2,361 1,770 2,543 3,569 2,940 3,569 3,977 3,458 3,977 5,354	10 1,116 837 1,538 1,209 906 1,623 2,007 1,505 2,279 2,361 1,770 2,540 3,533	12 646 484 956 699 525 1,036 1,162 871 1,578 1,366 1,025 1,759 2,239	14 407 305 597 440 330 648 731 549 1,082 860 645 1,274 1,410	16 272 204 396 295 221 430 490 368 720 576 432 848	191 143 274 207 155 298 344 258 501 405 304 591 663	139 105 197 151 113 214 251 188 361 295 221 426 484	105 79 145 114 85 157 189 141 267 222 166 316 363	24 81 61 108 87 66 118 145 109 203 171 128 240 280	26 63 - 83 69 52 90 114 86 156 134 101 185 220	28 51 - 64 55 - 70 91 69 122 108 81 145	30 - - - - - 54 74 56 96 87 66 115
	91/4	Live Load Total Load Live Load Live Load Total Load Live Load Total Load Live Load Total Load Total Load Total Load	L/360	2,179 1,634 2,411 2,361 1,770 2,543 3,569 2,940 3,569 3,977 3,458 3,977 5,354	10 1,116 837 1,538 1,209 906 1,623 2,007 1,505 2,279 2,361 1,770 2,540 3,533 2,901	12 646 484 956 699 525 1,036 1,162 871 1,578 1,366 1,025 1,759 2,239 1,679	14 407 305 597 440 330 648 731 549 1,082 860 645 1,274 1,410 1,057	272 204 396 295 221 430 490 368 720 576 432 848 944	191 143 274 207 155 298 344 258 501 405 304 591 663 497	139 105 197 151 113 214 251 188 361 295 221 426 484 363	105 79 145 114 85 157 189 141 267 222 166 316 363 272	24 81 61 108 87 66 118 145 109 203 171 128 240 280 210	26 63 - 83 69 52 90 114 86 156 134 101 185 220 165	28 51 - 64 55 - 70 91 69 122 108 81 145 176 132	30 - - - - - - - - - - - - -
	91/4	Live Load Total Load Live Load Live Load Total Load Live Load Total Load Live Load Live Load Total Load	L/360	2,179 1,634 2,411 2,361 1,770 2,543 3,569 2,940 3,569 3,977 3,458 3,977 5,354 5,354	10 1,116 837 1,538 1,209 906 1,623 2,007 1,505 2,279 2,361 1,770 2,540 3,533 2,901 3,533	12 646 484 956 699 525 1,036 1,162 871 1,578 1,366 1,025 1,759 2,239 1,679 2,448	14 407 305 597 440 330 648 731 549 1,082 860 645 1,274 1,410 1,057 1,793	272 204 396 295 221 430 490 368 720 576 432 848 944 708	191 143 274 207 155 298 344 258 501 405 304 591 663 497 976	139 105 197 151 113 214 251 188 361 295 221 426 484 363 706	105 79 145 114 85 157 189 141 267 222 166 316 363 272 526	24 81 61 108 87 66 118 145 109 203 171 128 240 280 210 401	26 63 - 83 69 52 90 114 86 156 134 101 185 220 165 311	28 51 - 64 55 - 70 91 69 122 108 81 145 176 132 245	30 - - - - - - - - - - - - -
	91/4	Live Load Total Load Live Load Live Load Total Load Live Load Total Load Live Load Total Load Total Load Total Load	L/360 L/480 L/480 L/480 L/480 L/480 L/240 L/360 L/240 L/360 L/240 L/360 L/36	8 2,179 1,634 2,411 2,361 1,770 2,543 3,569 2,940 3,569 3,977 3,458 3,977 5,354 5,354 6,503	10 1,116 837 1,538 1,209 906 1,623 2,007 1,505 2,279 2,361 1,770 2,540 3,533 2,901 3,533 4,618	12 646 484 956 699 525 1,036 1,162 871 1,578 1,366 1,025 1,759 2,239 1,679 2,448 3,200	14 407 305 597 440 330 648 731 549 1,082 860 645 1,274 1,410 1,057 1,793 2,104	16 272 204 396 295 221 430 490 368 720 576 432 848 944 708 1,369	191 143 274 207 155 298 344 258 501 405 304 591 663 497 976 990	139 105 197 151 113 214 251 188 361 295 221 426 484 363 706	105 79 145 114 85 157 189 141 267 222 166 316 363 272 526 542	24 81 61 108 87 66 118 145 109 203 171 128 240 280 210 401 418	26 63 - 83 69 52 90 114 86 156 134 101 185 220 165 311 329	28 51 - 64 55 - 70 91 69 122 108 81 145 176 132 245 263	30 - - - - - - - - - - - - -
	91/4 91/2 111/4 117/8 14	Live Load Total Load Total Load Total Load Total Load	L/360	2,179 1,634 2,411 2,361 1,770 2,543 3,569 2,940 3,569 3,977 3,458 3,977 5,354 5,354 6,503 6,503	10 1,116 837 1,538 1,209 906 1,623 2,007 1,505 2,279 2,361 1,770 2,540 3,533 2,901 3,533 4,618 4,331	12 646 484 956 699 525 1,036 1,162 871 1,578 1,366 1,025 1,759 2,239 1,679 2,448 3,200 2,506	14 407 305 597 440 330 648 731 549 1,082 860 645 1,274 1,410 1,057 1,793 2,104 1,578	272 204 396 295 221 430 490 368 720 576 432 848 944 708 1,369 1,410	191 143 274 207 155 298 344 258 501 405 304 591 663 497 976 990 743	139 105 197 151 113 214 251 188 361 295 221 426 484 363 706 722 541	105 79 145 114 85 157 189 141 267 222 166 316 363 272 526 542 407	24 81 61 108 87 66 118 145 109 203 171 128 240 280 210 401 418 313	26 63 - 83 69 52 90 114 86 156 134 101 185 220 165 311 329 246	28 51 - 64 55 - 70 91 69 122 108 81 145 176 132 245 263 197	30 - - - - - - - - - - - - -
	91/4	Live Load Total Load Live Load Live Load Total Load Live Load Total Load Live Load Total Load Live Load Total Load Live Load Live Load Live Load	L/360	2,179 1,634 2,411 2,361 1,770 2,543 3,569 2,940 3,569 3,977 3,458 3,977 5,354 5,354 6,503 6,503	10 1,116 837 1,538 1,209 906 1,623 2,007 1,505 2,279 2,361 1,770 2,540 3,533 2,901 3,533 4,618 4,331 4,618	12 646 484 956 699 525 1,036 1,162 871 1,578 1,366 1,025 1,759 2,239 1,679 2,448 3,200 2,506 3,200	14 407 305 597 440 330 648 731 549 1,082 860 645 1,274 1,410 1,057 1,793 2,104 1,578 2,346	272 204 396 295 221 430 490 368 720 576 432 848 944 708 1,369 1,410 1,057	191 143 274 207 155 298 344 258 501 405 304 591 663 497 976 990 743 1,383	139 105 197 151 113 214 251 188 361 295 221 426 484 363 706 722 541 1,061	105 79 145 114 85 157 189 141 267 222 166 316 363 272 526 542 407 792	24 81 61 108 87 66 118 145 109 203 171 128 240 280 210 401 418 313 605	26 63 - 83 69 52 90 114 86 156 134 101 185 220 165 311 329 246 471	28 51 - 64 55 - 70 91 69 122 108 81 145 176 132 245 263 197 373	30 - - - - - - - - - - - - -

Continued on page 31

1,366

1,323

1,736

1,019

1,416

1,117

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Rosboro										Span	(feet)
BIG BEAM®	Width (in.)	Depth (in.)	Load Con	dition	8	10	12	14	16	18	20
High Performance 2.1E IJC-Glulam			19 - 1 - 1	L/360	2,805	1,436	831	523	351	246	180
Floor Beams		91/4	Live Load	L/480	2,104	1,077	623	393	263	185	135
Allowable			Total Load	L/240	3,103	1,980	1,231	769	510	353	253
.oads Cont'd. imple Span			Live Load	L/360	3,039	1,556	900	567	380	267	194
		91/2	Live Loud	L/480	2,279	1,167	675	425	285	200	146
			Total Load	L/240	3,274	2,089	1,334	834	553	384	275
(LDF=1.00)			Live Load	L/360	4,595	2,584	1,495	942	631	443	323
		111/4	Live Lodd	L/480	3,785	1,938	1,122	706	473	332	242
			Total Load	L/240	4,595	2,933	2,031	1,393	927	645	465
			151	L/360	5,120	3,039	1,759	1,108	742	521	380
	7	117/8	Live Load	L/480	4,452	2,279	1,319	831	556	391	285
			Total Load	L/240	5,120	3,270	2,264	1,640	1,092	761	549
			Live Lead	L/360	6,893	4,549	2,882	1,815	1,216	854	622
		14	Live Load	L/480	6,893	3,735	2,161	1,361	912	640	467
	1	1									

Total Load

Live Load

Total Load

Live Load

Total Load

Notes for BigBeam Floor Beams:

- (1) Service condition = dry.
- (2) Tabulated live load is based on the deflection criterion of either span/360 or span/480.

L/240

L/360

L/480

L/240

L/360

L/480

L/240

6,893

8,372

8,372

8,372

10,049

10,049

10,049

4,549

5,945

5,575

5,945

7,169

7,169

7,169

3,151

4,104

3,226

4,104

5,136

4,594

5,136

2,295

2,709

2,032

2,961

3,707

2,893

3,707

1,728

1,815

1,361

2,230

2,584

1,938

2,793

1,256

1,275

1,735

1,815

1,361

2,174

- (3) Tabulated total load is based on the deflection criterion of span/240.
- (4) Tabulated total load is in addition to the beam weight (assumed 36 pcf).
- (5) Selected beam size shall satisfy both live load and total load.



Roof Beams Allowable Loads

Simple Span Snow (LDF=1.15)

					Span (feet)													
Width (in.)	Depth (in.)	Load Con	dition	8	10	12	14	16	18	20	22	24	26	28	30			
		Live Load	L/240	1,786	1,077	623	393	263	185	135	101	78	61	-	-			
	91/4	Live Loud	L/360	1,403	718	416	262	175	123	90	67	52	-	-	-			
		Total Load	L/180	1,786	1,140	789	515	343	238	171	127	96	74	57	-			
		Live Load	L/240	1,884	1,167	675	425	285	200	146	110	84	66	53	-			
	91/2	LIVO LOUG	L/360	1,520	778	450	284	190	133	97	73	56	-	-	-			
		Total Load	L/180	1,884	1,203	833	559	372	258	186	138	104	80	63	-			
		Live Load	L/240	2,643	1,688	1,122	706	473	332	242	182	140	110	88	72			
	111/4		L/360	2,523	1,292	748	471	315	222	161	121	93	74	59	-			
		Total Load	L/180	2,643	1,688	1,169	857	621	433	313	233	177	137	108	86			
		Live Load	L/240	2,946	1,882	1,303	831	556	391	285	214	165	130	104	84			
31/2	117/8		L/360	2,946	1,520	879	554	371	261	190	143	110	86	69	56			
		Total Load	L/180	2,946	1,882	1,303	955	729	511	369	275	209	163	128	102			
		Live Load	L/240	3,965	2,617	1,814	1,329	912	640	467	351	270	212	170	138			
	14		L/360	3,965	2,490	1,441	907	608	427	311	234	180	142	113	92			
		Total Load	L/180	3,965	2,617	1,814	1,329	1,015	799	610	455	348	271	215	172			
		Live Load	L/240	4,816	3,421	2,371	1,738	1,328	956	697	524	403	317	254	206			
	16		L/360	4,816	3,421	2,151	1,354	907	637	465	349	269	211	169	138			
		Total Load	L/180	4,816	3,421	2,371	1,738	1,328	1,046	845	684	524	409	325	261			
		Live Load	L/240	5,780	4,124	3,003	2,202	1,682	1,326	992	745	574	452	362	294			
	18		L/360	5,780	4,124	3,003	1,929	1,292	907	662	497	383	301	241	196			
		Total Load	L/180	5,780	4,124	3,003	2,202	1,682	1,326	1,071	876	727	586	466	376			
Width (in.)	Depth (in.)	Load Con	dition	8	10	12	14	16	18	20	22	24	26	28	30			
		Live Load	L/240	2,774	1,674	969	610	409	287	209	157	121	95	76	62			
	91/4		L/360	2,179	1,116	646	407	272	191	139	105	81	63	51	-			
		Total Load	L/180	2,774	1,771	1,226	801	F00	370	266	197	149			70			
				_/	1,771	1,220	001	532	070		177	147	114	89				
	I 0 I / I	Live Load	L/240	2,926	1,813	1,049	661	443	311	227	170	131	114	89	67			
	91/2	Live Load		-						227 151								
	7 / 2	Live Load Total Load	L/240	2,926	1,813	1,049	661	443	311		170	131	103	83	67			
			L/240 L/360 L/180 L/240	2,926 2,361 2,926 4,107	1,813 1,209 1,868 2,623	1,049 699 1,293 1,742	661 440 868 1,097	443 295 577 735	311 207 402 516	151 289 376	170 114 214 283	131 87 162 218	103 69 125 171	83 55 97 137	67 - 77 112			
	111/4	Total Load	L/240 L/360 L/180	2,926 2,361 2,926	1,813 1,209 1,868	1,049 699 1,293	661 440 868	443 295 577	311 207 402	151 289	170 114 214	131 87 162	103 69 125	83 55 97	67 - 77			
F7/		Total Load	L/240 L/360 L/180 L/240 L/360 L/180	2,926 2,361 2,926 4,107 3,920 4,107	1,813 1,209 1,868 2,623 2,007 2,623	1,049 699 1,293 1,742 1,162 1,817	661 440 868 1,097 731 1,331	443 295 577 735 490 965	311 207 402 516 344 673	151 289 376 251 487	170 114 214 283 189 362	131 87 162 218 145 275	103 69 125 171 114 213	83 55 97 137 91 168	67 - 77 112			
57/16	111/4	Total Load Live Load	L/240 L/360 L/180 L/240 L/360 L/180 L/240	2,926 2,361 2,926 4,107 3,920 4,107 4,577	1,813 1,209 1,868 2,623 2,007 2,623 2,923	1,049 699 1,293 1,742 1,162 1,817 2,025	661 440 868 1,097 731 1,331 1,290	443 295 577 735 490 965 865	311 207 402 516 344 673 607	151 289 376 251 487 443	170 114 214 283 189 362 333	131 87 162 218 145 275 256	103 69 125 171 114 213 201	83 55 97 137 91 168 161	67 - 77 112 74 133			
57/16		Total Load Live Load Total Load Live Load	L/240 L/360 L/180 L/240 L/360 L/180 L/240 L/360	2,926 2,361 2,926 4,107 3,920 4,107 4,577 4,577	1,813 1,209 1,868 2,623 2,007 2,623 2,923 2,923	1,049 699 1,293 1,742 1,162 1,817 2,025 1,366	661 440 868 1,097 731 1,331 1,290 860	443 295 577 735 490 965 865 576	311 207 402 516 344 673 607 405	151 289 376 251 487 443 295	170 114 214 283 189 362	131 87 162 218 145 275 256 171	103 69 125 171 114 213 201 134	83 55 97 137 91 168	67 - 77 112 74 133 131 87			
57/16	111/4	Total Load Live Load Total Load	L/240 L/360 L/180 L/240 L/360 L/180 L/240 L/360 L/180	2,926 2,361 2,926 4,107 3,920 4,107 4,577 4,577	1,813 1,209 1,868 2,623 2,007 2,623 2,923 2,361 2,923	1,049 699 1,293 1,742 1,162 1,817 2,025 1,366 2,025	661 440 868 1,097 731 1,331 1,290 860 1,483	443 295 577 735 490 965 865 576 1,132	311 207 402 516 344 673 607 405 793	151 289 376 251 487 443 295 574	170 114 214 283 189 362 333 222 427	131 87 162 218 145 275 256 171 325	103 69 125 171 114 213 201 134 252	83 55 97 137 91 168 161 108	67 - 77 112 74 133 131 87 159			
57/16	111/4	Total Load Live Load Total Load Live Load	L/240 L/360 L/180 L/240 L/360 L/180 L/240 L/360 L/180 L/180	2,926 2,361 2,926 4,107 3,920 4,107 4,577 4,577 4,577 6,161	1,813 1,209 1,868 2,623 2,007 2,623 2,923 2,361 2,923 4,066	1,049 699 1,293 1,742 1,162 1,817 2,025 1,366 2,025 2,818	661 440 868 1,097 731 1,331 1,290 860 1,483 2,065	443 295 577 735 490 965 865 576 1,132 1,417	311 207 402 516 344 673 607 405 793	151 289 376 251 487 443 295 574 725	170 114 214 283 189 362 333 222 427 545	131 87 162 218 145 275 256 171 325 420	103 69 125 171 114 213 201 134 252 330	83 55 97 137 91 168 161 108 199 264	67 - 77 112 74 133 131 87 159 215			
57/16	111/4	Total Load Live Load Total Load Live Load Total Load Live Load Live Load	L/240 L/360 L/180 L/240 L/360 L/180 L/240 L/360 L/180 L/240 L/360	2,926 2,361 2,926 4,107 3,920 4,107 4,577 4,577 4,577 6,161 6,161	1,813 1,209 1,868 2,623 2,007 2,623 2,923 2,361 2,923 4,066 3,868	1,049 699 1,293 1,742 1,162 1,817 2,025 1,366 2,025 2,818 2,239	661 440 868 1,097 731 1,331 1,290 860 1,483 2,065 1,410	443 295 577 735 490 965 865 576 1,132 1,417 944	311 207 402 516 344 673 607 405 793 995 663	151 289 376 251 487 443 295 574 725 484	170 114 214 283 189 362 333 222 427 545 363	131 87 162 218 145 275 256 171 325 420 280	103 69 125 171 114 213 201 134 252 330 220	83 55 97 137 91 168 161 108 199 264 176	67 - 77 112 74 133 131 87 159 215			
57/16	111/4	Total Load Live Load Total Load Live Load Total Load	L/240 L/360 L/180 L/240 L/360 L/180 L/240 L/360 L/180 L/240 L/360 L/180	2,926 2,361 2,926 4,107 3,920 4,107 4,577 4,577 4,577 6,161 6,161	1,813 1,209 1,868 2,623 2,007 2,623 2,923 2,361 2,923 4,066 3,868 4,066	1,049 699 1,293 1,742 1,162 1,817 2,025 1,366 2,025 2,818 2,239 2,818	661 440 868 1,097 731 1,331 1,290 860 1,483 2,065 1,410 2,065	443 295 577 735 490 965 865 576 1,132 1,417 944 1,577	311 207 402 516 344 673 607 405 793 995 663 1,234	151 289 376 251 487 443 295 574 725 484 948	170 114 214 283 189 362 333 222 427 545 363 708	131 87 162 218 145 275 256 171 325 420 280 541	103 69 125 171 114 213 201 134 252 330 220 421	83 55 97 137 91 168 161 108 199 264 176 333	67 - 77 112 74 133 131 87 159 215 143 268			
57/16	111/4	Total Load Live Load Total Load Live Load Total Load Live Load Live Load	L/240 L/360 L/180 L/240 L/360 L/180 L/240 L/360 L/180 L/240 L/360 L/180 L/180	2,926 2,361 2,926 4,107 3,920 4,107 4,577 4,577 6,161 6,161 6,161 7,482	1,813 1,209 1,868 2,623 2,007 2,623 2,923 2,361 2,923 4,066 3,868 4,066 5,314	1,049 699 1,293 1,742 1,162 1,817 2,025 1,366 2,025 2,818 2,239 2,818 3,684	661 440 868 1,097 731 1,331 1,290 860 1,483 2,065 1,410 2,065 2,701	443 295 577 735 490 965 865 576 1,132 1,417 944 1,577 2,047	311 207 402 516 344 673 607 405 793 995 663 1,234 1,485	151 289 376 251 487 443 295 574 725 484 948 1,083	170 114 214 283 189 362 333 222 427 545 363 708	131 87 162 218 145 275 256 171 325 420 280 541 627	103 69 125 171 114 213 201 134 252 330 220 421 493	83 55 97 137 91 168 161 108 199 264 176 333 395	67 - 77 112 74 133 131 87 159 215 143 268 321			
57/16	111/4	Total Load Live Load	L/240 L/360 L/180 L/240 L/360	2,926 2,361 2,926 4,107 3,920 4,107 4,577 4,577 4,577 6,161 6,161 7,482 7,482	1,813 1,209 1,868 2,623 2,007 2,623 2,923 2,361 2,923 4,066 3,868 4,066 5,314	1,049 699 1,293 1,742 1,162 1,817 2,025 1,366 2,025 2,818 2,239 2,818 3,684 3,342	661 440 868 1,097 731 1,331 1,290 860 1,483 2,065 1,410 2,065 2,701 2,104	443 295 577 735 490 965 865 576 1,132 1,417 944 1,577 2,047	311 207 402 516 344 673 607 405 793 995 663 1,234 1,485	151 289 376 251 487 443 295 574 725 484 948 1,083	170 114 214 283 189 362 333 222 427 545 363 708 813 542	131 87 162 218 145 275 256 171 325 420 280 541 627 418	103 69 125 171 114 213 201 134 252 330 220 421 493 329	83 55 97 137 91 168 161 108 199 264 176 333 395 263	67 - 77 112 74 133 131 87 159 215 143 268 321 214			
57/16	111/4	Total Load Live Load Total Load Live Load Total Load Live Load Total Load	L/240 L/360 L/180	2,926 2,361 2,926 4,107 3,920 4,107 4,577 4,577 6,161 6,161 7,482 7,482	1,813 1,209 1,868 2,623 2,007 2,623 2,923 2,361 2,923 4,066 3,868 4,066 5,314 5,314	1,049 699 1,293 1,742 1,162 1,817 2,025 1,366 2,025 2,818 2,239 2,818 3,684 3,342 3,684	661 440 868 1,097 731 1,331 1,290 860 1,483 2,065 1,410 2,065 2,701 2,104 2,701	443 295 577 735 490 965 865 576 1,132 1,417 944 1,577 2,047 1,410 2,047	311 207 402 516 344 673 607 405 793 995 663 1,234 1,485 990	151 289 376 251 487 443 295 574 725 484 948 1,083 722 1,273	170 114 214 283 189 362 333 222 427 545 363 708 813 542 1,038	131 87 162 218 145 275 256 171 325 420 280 541 627 418 814	103 69 125 171 114 213 201 134 252 330 220 421 493 329 635	83 55 97 137 91 168 161 108 199 264 176 333 395 263 504	67 - 77 112 74 133 131 87 159 215 143 268 321 214			
57/16	11 1/4	Total Load Live Load	L/240 L/360 L/180 L/240	2,926 2,361 2,926 4,107 3,920 4,107 4,577 4,577 6,161 6,161 7,482 7,482 7,482 8,980	1,813 1,209 1,868 2,623 2,007 2,623 2,923 2,361 2,923 4,066 3,868 4,066 5,314 5,314 5,314 6,407	1,049 699 1,293 1,742 1,162 1,817 2,025 1,366 2,025 2,818 2,239 2,818 3,684 3,342 3,684 4,665	661 440 868 1,097 731 1,331 1,290 860 1,483 2,065 1,410 2,065 2,701 2,104 2,701 3,401	443 295 577 735 490 965 865 576 1,132 1,417 944 1,577 2,047 1,410 2,047 2,563	311 207 402 516 344 673 607 405 793 995 663 1,234 1,485 990 1,594	151 289 376 251 487 443 295 574 725 484 948 1,083 722 1,273	170 114 214 283 189 362 333 222 427 545 363 708 813 542 1,038 1,158	131 87 162 218 145 275 256 171 325 420 280 541 627 418 814	103 69 125 171 114 213 201 134 252 330 220 421 493 329 635 702	83 55 97 137 91 168 161 108 199 264 176 333 395 263 504 562	67 - 77 112 74 133 131 87 159 215 143 268 321 214 406 457			
57/16	111/4	Total Load Live Load Total Load Live Load	L/240 L/360 L/180	2,926 2,361 2,926 4,107 3,920 4,107 4,577 4,577 6,161 6,161 7,482 7,482	1,813 1,209 1,868 2,623 2,007 2,623 2,923 2,361 2,923 4,066 3,868 4,066 5,314 5,314	1,049 699 1,293 1,742 1,162 1,817 2,025 1,366 2,025 2,818 2,239 2,818 3,684 3,342 3,684	661 440 868 1,097 731 1,331 1,290 860 1,483 2,065 1,410 2,065 2,701 2,104 2,701	443 295 577 735 490 965 865 576 1,132 1,417 944 1,577 2,047 1,410 2,047	311 207 402 516 344 673 607 405 793 995 663 1,234 1,485 990	151 289 376 251 487 443 295 574 725 484 948 1,083 722 1,273	170 114 214 283 189 362 333 222 427 545 363 708 813 542 1,038	131 87 162 218 145 275 256 171 325 420 280 541 627 418 814	103 69 125 171 114 213 201 134 252 330 220 421 493 329 635	83 55 97 137 91 168 161 108 199 264 176 333 395 263 504	67 - 77 112 74 133 131 87 159 215 143 268 321 214			

Continued on page 33

BIG BEAM
Roof Beams Allowable
Loads Cont'd.
Simple Span
Snow
(LDF=1.15)

									Span	(feet)					
Width (in.)	Depth (in.)	Load Condition		8	10	12	14	16	18	20	22	24	26	28	30
		Live Load	L/240	3,571	2,155	1,247	785	526	369	269	202	156	123	98	80
	91/4		L/360	2,805	1,436	831	523	351	246	180	135	104	82	65	53
		Total Load	L/180	3,571	2,280	1,578	1,031	685	476	343	254	192	147	115	90
		Live Load	L/240	3,767	2,334	1,351	851	570	400	292	219	169	133	106	86
	91/2		L/360	3,039	1,556	900	567	380	267	194	146	113	89	71	58
		Total Load	L/180	3,767	2,405	1,665	1,117	743	517	372	276	208	160	125	99
		Live Load	L/240	5,287	3,376	2,243	1,413	946	665	484	364	280	221	177	144
	111/4		L/360	5,047	2,584	1,495	942	631	443	323	243	187	147	118	96
		Total Load	L/180	5,287	3,376	2,339	1,713	1,242	866	626	466	354	274	216	172
		Live Load	L/240	5,892	3,763	2,607	1,661	1,113	782	570	428	330	259	208	169
7	117/8		L/360	5,892	3,039	1,759	1,108	742	521	380	285	220	173	138	113
		Total Load	L/180	5,892	3,763	2,607	1,910	1,453	1,021	739	550	419	325	256	204
		Live Load	L/240	7,931	5,235	3,628	2,643	1,824	1,281	934	702	540	425	340	277
	14		L/360	7,931	4,980	2,882	1,815	1,216	854	622	468	360	283	227	184
		Total Load	L/180	7,931	5,235	3,628	2,643	1,990	1,549	1,220	911	696	542	429	344
		Live Load	L/240	9,632	6,841	4,723	3,409	2,569	1,912	1,394	1,047	807	634	508	413
	16		L/360	9,632	6,841	4,302	2,709	1,815	1,275	929	698	538	423	339	275
		Total Load	L/180	9,632	6,841	4,723	3,409	2,569	2,000	1,597	1,302	1,047	818	649	523
		Live Load	L/240	11,561	8,249	5,912	4,268	3,217	2,505	1,985	1,491	1,148	903	723	588
	18		L/360	11,561	8,249	5,912	3,857	2,584	1,815	1,323	994	766	602	482	392
		Total Load	L/180	11,561	8,249	5,912	4,268	3,217	2,505	2,001	1,633	1,355	1,140	933	753

Notes for BigBeam Roof Beams:

- (1) Service condition = dry.
- (2) Tabulated live load is based on the deflection criterion of either span/240 or span/360.
- (3) Tabulated total load is based on the deflection criterion of span/180.
- (4) Tabulated total load is in addition to the beam weight (assumed 36 pcf).
- (5) Selected beam size shall satisfy both live load and total load.



Roof Beams Allowable Loads

Simple Span Non-Snow (LDF=1.25)

									Span	(feet)					
Width (in.)	Depth (in.)	Load Condition		8	10	12	14	16	18	20	22	24	26	28	30
vvium (m./	Depin (iii.)		L/240	1,942	1,077	623	393	263	185	135	101	78	61		
	91/4	Live Load	L/360	1,403	718	416	262	175	123	90	67	52	-	_	
		Total Load	L/180	1,942	1,240	823	515	343	238	171	127	96	74	57	-
			L/240	2,048	1,167	675	425	285	200	146	110	84	66	53	-
	91/2	Live Load	L/360	1,520	778	450	284	190	133	97	73	56	-	-	
	,	Total Load	L/180	2,048	1,308	892	559	372	258	186	138	104	80	63	
		Live Load	L/240	2,874	1,836	1,122	706	473	332	242	182	140	110	88	72
	111/4	Live Lodd	L/360	2,523	1,292	748	471	315	222	161	121	93	74	59	-
	,	Total Load	L/180	2,874	1,836	1,272	932	621	433	313	233	177	137	108	86
		Live Load	L/240	3,203	2,046	1,319	831	556	391	285	214	165	130	104	84
31/2	117/8	Live Lodd	L/360	2,968	1,520	879	554	371	261	190	143	110	86	69	56
0,1		Total Load	L/180	3,203	2,046	1,418	1,039	732	511	369	275	209	163	128	102
		Live Load	L/240	4,311	2,846	1,973	1,361	912	640	467	351	270	212	170	138
	14	LIVE LOUU	L/360	4,311	2,490	1,441	907	608	427	311	234	180	142	113	92
		Total Load	L/180	4,311	2,846	1,973	1,446	1,104	842	610	455	348	271	215	172
		Live Load	L/240	5,236	3,719	2,579	1,891	1,361	956	697	524	403	317	254	206
	16	LIVE LOUU	L/360	5,236	3,717	2,151	1,354	907	637	465	349	269	211	169	138
		Total Load	L/180	5,236	3,719	2,579	1,891	1,444	1,138	915	684	524	409	325	261
		Live Load	L/240	6,284	4,484	3,266	2,395	1,830	1,361	992	745	574	452	362	294
	18	LIVO LOUG	L/360	6,284	4,484	3,063	1,929	1,292	907	662	497	383	301	241	196
		Total Load	L/180	6,284	4,484	3,266	2,395	1,830	1,443	1,166	954	750	586	466	376
Width (in.)	Depth (in.)	Total Load Load Con		6,284 8	4,484 10	3,266 12	2,395 14	1,830 16	1,443 18	1,166 20	954 22	750 24	586 26	466 28	376 30
Width (in.)	Depth (in.)	Load Con				•				· ·					
Width (in.)	Depth (in.) 9 1/4		dition	8	10	12	14	16	18	20	22	24	26	28	30
Width (in.)		Load Con	L/240	8 3,016	1,674	12 969	610	16 409	18 287	20 209	22 157	24 121	26 95	28 76	30 62
Width (in.)	91/4	Load Con Live Load Total Load	L/240 L/360	8 3,016 2,179	10 1,674 1,116	969 646	14 610 407	16 409 272	18 287 191	20 209 139	22 157 105	24 121 81	26 95 63	28 76 51	30 62
Width (in.)		Load Con Live Load	L/240 L/360 L/180	8 3,016 2,179 3,016	10 1,674 1,116 1,926	969 646 1,279	14 610 407 801	16 409 272 532	18 287 191 370	20 209 139 266	157 105 197	24 121 81 149	95 63 114	28 76 51 89	30 62 - 70
Width (in.)	91/4	Load Con Live Load Total Load	L/240 L/360 L/180 L/240	3,016 2,179 3,016 3,182	10 1,674 1,116 1,926 1,813	969 646 1,279 1,049	14 610 407 801 661	16 409 272 532 443	287 191 370 311	20 209 139 266 227	157 105 197 170	24 121 81 149 131	95 63 114 103	28 76 51 89 83	30 62 - 70 67
Width (in.)	91/4	Live Load Total Load Live Load Live Load Total Load	L/240 L/360 L/180 L/240 L/360	3,016 2,179 3,016 3,182 2,361	10 1,674 1,116 1,926 1,813 1,209	969 646 1,279 1,049 699	14 610 407 801 661 440	16 409 272 532 443 295	287 191 370 311 207	20 209 139 266 227 151	157 105 197 170 114	24 121 81 149 131 87	95 63 114 103 69	28 76 51 89 83 55	30 62 - 70 67
Width (in.)	91/4	Load Con Live Load Total Load Live Load	L/240 L/360 L/180 L/240 L/360 L/180	3,016 2,179 3,016 3,182 2,361 3,182	10 1,674 1,116 1,926 1,813 1,209 2,032	969 646 1,279 1,049 699 1,386	14 610 407 801 661 440 868	16 409 272 532 443 295 577	287 191 370 311 207 402	209 139 266 227 151 289	157 105 197 170 114 214	24 121 81 149 131 87 162	95 63 114 103 69 125	28 76 51 89 83 55 97	30 62 - 70 67 - 77
	91/4	Live Load Total Load Live Load Live Load Total Load	L/240 L/360 L/180 L/240 L/360 L/360 L/180 L/240	3,016 2,179 3,016 3,182 2,361 3,182 4,465	10 1,674 1,116 1,926 1,813 1,209 2,032 2,852	969 646 1,279 1,049 699 1,386 1,742	14 610 407 801 661 440 868 1,097	16 409 272 532 443 295 577 735	287 191 370 311 207 402 516	20 209 139 266 227 151 289 376	157 105 197 170 114 214 283	24 121 81 149 131 87 162 218	95 63 114 103 69 125 171	28 76 51 89 83 55 97 137	30 62 - 70 67 - 77 112
Width (in.) 5 ⁷ /16	91/4	Load Com Live Load Total Load Live Load Total Load Live Load Total Load	L/240 L/360 L/180 L/240 L/360 L/180 L/240 L/360 L/180 L/240 L/360	3,016 2,179 3,016 3,182 2,361 3,182 4,465 3,920	10 1,674 1,116 1,926 1,813 1,209 2,032 2,852 2,007	969 646 1,279 1,049 699 1,386 1,742 1,162	14 610 407 801 661 440 868 1,097 731	16 409 272 532 443 295 577 735 490	287 191 370 311 207 402 516 344	20 209 139 266 227 151 289 376 251	157 105 197 170 114 214 283 189	24 121 81 149 131 87 162 218 145	95 63 114 103 69 125 171 114	28 76 51 89 83 55 97 137 91	30 62 - 70 67 - 77 112 74
	91/4	Live Load Total Load Live Load Total Load Live Load Live Load	L/240 L/360 L/180 L/240 L/360 L/240 L/180 L/240 L/360 L/180	8 3,016 2,179 3,016 3,182 2,361 3,182 4,465 3,920 4,465	10 1,674 1,116 1,926 1,813 1,209 2,032 2,852 2,007 2,852	969 646 1,279 1,049 699 1,386 1,742 1,162 1,976	14 610 407 801 661 440 868 1,097 731	16 409 272 532 443 295 577 735 490 965	287 191 370 311 207 402 516 344 673	20 209 139 266 227 151 289 376 251	157 105 197 170 114 214 283 189 362	24 121 81 149 131 87 162 218 145 275	95 63 114 103 69 125 171 114 213	28 76 51 89 83 55 97 137 91 168	30 62 - 70 67 - 77 112 74
	91/4	Load Com Live Load Total Load Live Load Total Load Live Load Total Load	L/240 L/360 L/180 L/240 L/360 L/180 L/240 L/240 L/360 L/180 L/180 L/240	8 3,016 2,179 3,016 3,182 2,361 3,182 4,465 3,920 4,465 4,976	10 1,674 1,116 1,926 1,813 1,209 2,032 2,852 2,007 2,852 3,179	969 646 1,279 1,049 699 1,386 1,742 1,162 1,976 2,049	14 610 407 801 661 440 868 1,097 731 1,448 1,290	16 409 272 532 443 295 577 735 490 965 865	287 191 370 311 207 402 516 344 673 607	20 209 139 266 227 151 289 376 251 487	157 105 197 170 114 214 283 189 362 333	24 121 81 149 131 87 162 218 145 275 256	95 63 114 103 69 125 171 114 213 201	28 76 51 89 83 55 97 137 91 168 161	30 62 - 70 67 - 77 112 74 133
	91/4	Load Com Live Load Total Load Live Load Total Load Live Load Live Load Live Load	L/240 L/360 L/180 L/240 L/360 L/180 L/240 L/360 L/180 L/240 L/360 L/180 L/240 L/360 L/240 L/360	8 3,016 2,179 3,016 3,182 2,361 3,182 4,465 3,920 4,465 4,976 4,611	10 1,674 1,116 1,926 1,813 1,209 2,032 2,852 2,007 2,852 3,179 2,361	969 646 1,279 1,049 699 1,386 1,742 1,162 1,976 2,049 1,366	14 610 407 801 661 440 868 1,097 731 1,448 1,290 860	16 409 272 532 443 295 577 735 490 965 865 576	287 191 370 311 207 402 516 344 673 607	20 209 139 266 227 151 289 376 251 487 443	157 105 197 170 114 214 283 189 362 333 222	24 121 81 149 131 87 162 218 145 275 256 171	26 95 63 114 103 69 125 171 114 213 201 134	28 76 51 89 83 55 97 137 91 168 161 108	30 62 - 70 67 - 77 112 74 133 131
	91/4	Load Com Live Load Total Load Live Load Total Load Live Load Total Load Live Load Total Load	L/240	8 3,016 2,179 3,016 3,182 2,361 3,182 4,465 3,920 4,465 4,976 4,611 4,976	10 1,674 1,116 1,926 1,813 1,209 2,032 2,852 2,007 2,852 3,179 2,361 3,179	969 646 1,279 1,049 699 1,386 1,742 1,162 1,976 2,049 1,366 2,203	14 610 407 801 661 440 868 1,097 731 1,448 1,290 860 1,614	16 409 272 532 443 295 577 735 490 965 865 576 1,137	287 191 370 311 207 402 516 344 673 607 405 793	20 209 139 266 227 151 289 376 251 487 443 295 574	157 105 197 170 114 214 283 189 362 333 222 427	24 121 81 149 131 87 162 218 145 275 256 171 325	26 95 63 114 103 69 125 171 114 213 201 134 252	28 76 51 89 83 55 97 137 91 168 161 108	30 62 - 70 67 - 77 112 74 133 131 87
	91/4	Load Com Live Load Total Load Live Load Total Load Live Load Total Load Live Load Total Load	L/240 L/360 L/180 L/240	8 3,016 2,179 3,016 3,182 2,361 3,182 4,465 3,920 4,465 4,976 4,611 4,976 6,698	10 1,674 1,116 1,926 1,813 1,209 2,032 2,852 2,007 2,852 3,179 2,361 3,179 4,422	969 646 1,279 1,049 699 1,386 1,742 1,162 1,976 2,049 1,366 2,203 3,065	14 610 407 801 661 440 868 1,097 731 1,448 1,290 860 1,614 2,115	16 409 272 532 443 295 577 735 490 965 865 576 1,137 1,417	287 191 370 311 207 402 516 344 673 607 405 793	20 209 139 266 227 151 289 376 251 487 443 295 574 725	157 105 197 170 114 214 283 189 362 333 222 427 545	24 121 81 149 131 87 162 218 145 275 256 171 325 420	26 95 63 114 103 69 125 171 114 213 201 134 252 330	28 76 51 89 83 55 97 137 91 168 161 108 199 264	30 62 - 70 67 - 77 112 74 133 131 87 159 215
	91/4	Load Com Live Load Total Load Live Load Total Load Live Load Total Load Live Load Live Load Live Load Live Load	L/240 L/360 L/180 L/240 L/360	8 3,016 2,179 3,016 3,182 2,361 3,182 4,465 3,920 4,465 4,976 4,611 4,976 6,698	10 1,674 1,116 1,926 1,813 1,209 2,032 2,852 2,007 2,852 3,179 2,361 3,179 4,422 3,868	969 646 1,279 1,049 699 1,386 1,742 1,162 1,976 2,049 1,366 2,203 3,065 2,239	14 610 407 801 661 440 868 1,097 731 1,448 1,290 860 1,614 2,115 1,410	16 409 272 532 443 295 577 735 490 965 865 576 1,137 1,417 944	287 191 370 311 207 402 516 344 673 607 405 793 995 663	20 209 139 266 227 151 289 376 251 487 443 295 574 725	157 105 197 170 114 214 283 189 362 333 222 427 545 363	24 121 81 149 131 87 162 218 145 275 256 171 325 420 280	26 95 63 114 103 69 125 171 114 213 201 134 252 330 220	28 76 51 89 83 55 97 137 91 168 161 108 199 264 176	30 62 - 70 67 - 77 112 74 133 131 87 159 215
	91/4	Load Com Live Load Total Load Live Load Total Load Live Load Total Load Live Load Total Load Live Load Total Load Total Load Live Load	L/240	8 3,016 2,179 3,016 3,182 2,361 3,182 4,465 3,920 4,465 4,976 4,611 4,976 6,698 6,698	10 1,674 1,116 1,926 1,813 1,209 2,032 2,852 2,007 2,852 3,179 2,361 3,179 4,422 3,868 4,422	969 646 1,279 1,049 699 1,386 1,742 1,162 1,976 2,049 1,366 2,203 3,065 2,239 3,065	14 610 407 801 661 440 868 1,097 731 1,448 1,290 860 1,614 2,115 1,410 2,247	16 409 272 532 443 295 577 735 490 965 865 576 1,137 1,417 944 1,716	287 191 370 311 207 402 516 344 673 607 405 793 995 663 1,308	20 209 139 266 227 151 289 376 251 487 443 295 574 725 484 948	157 105 197 170 114 214 283 189 362 333 222 427 545 363 708	24 121 81 149 131 87 162 218 145 275 256 171 325 420 280 541	26 95 63 114 103 69 125 171 114 213 201 134 252 330 220 421	28 76 51 89 83 55 97 137 91 168 161 108 199 264 176 333	30 62 - 70 67 - 77 112 74 133 131 87 159 215 143 268
	91/4	Load Com Live Load Total Load Live Load Total Load Live Load Total Load Live Load Total Load Live Load Total Load Total Load Live Load	L/240 L/360 L/240 L/360 L/360 L/180 L/240 L/24	8 3,016 2,179 3,016 3,182 2,361 3,182 4,465 3,920 4,465 4,976 4,611 4,976 6,698 6,698 8,135	10 1,674 1,116 1,926 1,813 1,209 2,032 2,852 2,007 2,852 3,179 2,361 3,179 4,422 3,868 4,422 5,778	969 646 1,279 1,049 699 1,386 1,742 1,162 1,976 2,049 1,366 2,203 3,065 2,239 3,065 4,006	14 610 407 801 661 440 868 1,097 731 1,448 1,290 860 1,614 2,115 1,410 2,247 2,937	16 409 272 532 443 295 577 735 490 965 865 576 1,137 1,417 944 1,716 2,115	287 191 370 311 207 402 516 344 673 607 405 793 995 663 1,308	20 209 139 266 227 151 289 376 251 487 443 295 574 725 484 948 1,083	157 105 197 170 114 214 283 189 362 333 222 427 545 363 708	24 121 81 149 131 87 162 218 145 275 256 171 325 420 280 541 627	26 95 63 114 103 69 125 171 114 213 201 134 252 330 220 421 493	28 76 51 89 83 55 97 137 91 168 161 108 199 264 176 333 395	30 62 - 70 67 - 77 112 74 133 131 87 159 215 143 268 321
	91/4	Load Com Live Load	L/240	8 3,016 2,179 3,016 3,182 2,361 3,182 4,465 3,920 4,465 4,976 4,611 4,976 6,698 6,698 6,698 8,135	10 1,674 1,116 1,926 1,813 1,209 2,032 2,852 2,007 2,852 3,179 2,361 3,179 4,422 3,868 4,422 5,778	969 646 1,279 1,049 699 1,386 1,742 1,162 1,976 2,049 1,366 2,203 3,065 2,239 3,065 4,006 3,342	14 610 407 801 661 440 868 1,097 731 1,448 1,290 860 1,614 2,115 1,410 2,247 2,937 2,104	16 409 272 532 443 295 577 735 490 965 865 576 1,137 1,417 944 1,716 2,115 1,410	287 191 370 311 207 402 516 344 673 607 405 793 995 663 1,308 1,485	20 209 139 266 227 151 289 376 251 487 443 295 574 725 484 948 1,083 722	157 105 197 170 114 214 283 189 362 333 222 427 545 363 708 813	24 121 81 149 131 87 162 218 145 275 256 171 325 420 280 541 627 418	26 95 63 114 103 69 125 171 114 213 201 134 252 330 220 421 493 329	28 76 51 89 83 55 97 137 91 168 161 108 199 264 176 333 395 263	30 62 - 70 67 - 77 112 74 133 131 87 159 215 143 268 321 214
	91/4	Load Com Live Load	L/240	8 3,016 2,179 3,016 3,182 2,361 3,182 4,465 3,920 4,465 4,976 4,611 4,976 6,698 6,698 8,135 8,135	10 1,674 1,116 1,926 1,813 1,209 2,032 2,852 2,007 2,852 3,179 2,361 3,179 4,422 3,868 4,422 5,778 5,774	969 646 1,279 1,049 699 1,386 1,742 1,162 1,976 2,049 1,366 2,203 3,065 2,239 3,065 4,006 3,342 4,006	14 610 407 801 661 440 868 1,097 731 1,448 1,290 860 1,614 2,115 1,410 2,247 2,937 2,104 2,937	16 409 272 532 443 295 577 735 490 965 865 576 1,137 1,417 944 1,716 2,115 1,410 2,227	287 191 370 311 207 402 516 344 673 607 405 793 995 663 1,308 1,485 990	20 209 139 266 227 151 289 376 251 487 443 295 574 725 484 948 1,083 722 1,386	157 105 197 170 114 214 283 189 362 333 222 427 545 363 708 813 542 1,063	24 121 81 149 131 87 162 218 145 275 256 171 325 420 280 541 627 418 814	26 95 63 114 103 69 125 171 114 213 201 134 252 330 220 421 493 329 635	28 76 51 89 83 55 97 137 91 168 161 108 199 264 176 333 395 263 504	30 62 - 70 67 - 77 112 74 133 131 87 159 215 143 268 321 214

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Rosboro										Span	(feet)					
BIG BEAM®	Width (in.)	Depth (in.)	Load Con	dition	8	10	12	14	16	18	20	22	24	26	28	30
High Performance 2.1E IJC-Glulam			Live Load	L/240	3,883	2,155	1,247	785	526	369	269	202	156	123	98	80
Roof Beams		91/4	Live Loud	L/360	2,805	1,436	831	523	351	246	180	135	104	82	65	53
Allowable			Total Load	L/180	3,883	2,479	1,646	1,031	685	476	343	254	192	147	115	90
Loads			Live Load	L/240	4,096	2,334	1,351	851	570	400	292	219	169	133	106	86
Cont'd.		91/2	LIVE LOUG	L/360	3,039	1,556	900	567	380	267	194	146	113	89	71	58
Simple Span			Total Load	L/180	4,096	2,616	1,784	1,117	743	517	372	276	208	160	125	99
Non-Snow			Live Lond	L/240	5,748	3,672	2,243	1,413	946	665	484	364	280	221	177	53 90 86 58
(LDF=1.25)		11 ¹ / ₄	LIVE LOUG	L/360	5,047	2,584	1,495	942	631	443	323	243	187	147	118	96
			L/360 5,047 2,584 1,495 942 631 443 323 243 1 Total Load L/180 5,748 3,672 2,544 1,864 1,242 866 626 466 3	354	274	216	172									
			Live Load	L/240	6,406	4,092	2,638	1,661	1,113	782	570	428	330	259	208	169
	7	117/8	LIVE LOUG	L/360	5,936	3,039	1,759	1,108	742	521	380	285	220	173	138	113
			Total Load	L/180	6,406	4,092	2,835	2,078	1,463	1,021	739	550	419	325	256	204
			Live Load	L/240	8,623	5,692	3,945	2,722	1,824	1,281	934	702	540	425	340	277
		14	LIVO LOUG	L/360	8,623	4,980	2,882	1,815	1,216	854	622	468	360	283	227	184
			Total Load	L/180	8,623	5,692	3,945	2,875	2,166	1,683	1,220	911	696	542	429	344
			Live Load	L/240	10,472	7,439	5,137	3,708	2,722	1,912	1,394	1,047	807	634	508	413
		16	LIVO LOUG	L/360	10,472	7,433	4,302	2,709	1,815	1,275	929	698	538	423	339	275
			Total Load	L/180	10,472	7,439	5,137	3,708	2,795	2,176	1,739	1,368	1,047	818	649	523
			Live Load	L/240	12,569	8,969	6,428	4,642	3,499	2,722	1,985	1,491	1,148	903	723	588
		10	LIVO LOUID	1 /0 / 0	10.570	0.070	/ 105	0.057	0.504	1 015	1.000	004	7//	400	400	000

Notes for BigBeam Roof Beams:

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- (1) Service condition = dry.
- (2) Tabulated live load is based on the deflection criterion of either span/240 or span/360.

12,569 8,969

8,969

12,569

6,125

6,428

3,857

4,642

2,584

3,499

1,815

2,725

1,323

2,178

994

1,777

766

1,475

602

1,173

482

933

392

753

L/360

L/180

- (3) Tabulated total load is based on the deflection criterion of span/180.
- (4) Tabulated total load is in addition to the beam weight (assumed 36 pcf).
- (5) Selected beam size shall satisfy both live load and total load.

Total Load



Floor Beams Allowable Loads

Simple Spans (LDF=1.00)

		Span (feet)																
Width (in.)	Depth(in.)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	6	362	183	104	64	-	-	-	-	-	-	-	-	-	-	-	-	-
	71/2	710	361	206	128	84	57	-	-	-	-	-	-	-	-	-	-	-
	9	1,048	626	359	224	148	102	72	53	-	-	-	-	-	-	-	-	-
	101/2	1,428	911	574	358	237	164	118	86	65	-	-	-	-	-	-	-	-
	12	1,866	1,191	824	538	357	248	178	132	99	76	59	-	-	-	-	-	
3 1/8	131/2	2,363	1,508	1,044	765	511	356	257	190	144	111	87	69	55	-	-	-	
	15	2,918	1,864	1,291	945	704	491	355	264	201	155	122	97	78	63	51	-	
	161/2	3,458	2,256	1,563	1,145	874	656	475	354	270	209	165	132	106	87	71	59	-
	18	3,961	2,686	1,861	1,364	1,041	820	619	462	353	274	217	174	141	115	95	79	65
	191/2	4,518	3,154	2,186	1,602	1,223	963	777	590	451	351	278	224	182	149	123	102	86
	21	5,137	3,551	2,536	1,859	1,420	1,118	901	735	566	441	350	282	229	189	156	131	110
	221/2	5,828	3,958	2,913	2,135	1,631	1,285	1,029	839	696	545	433	349	285	234	195	163	137
	24	6,607	4,398	3,294	2,431	1,857	1,457	1,164	950	788	663	528	426	348	287	239	200	169
Width (in.)	Depth(in.)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	9	1,174	701	403	251	165	114	81	59	-	-	-	-	-	-	-	-	-
	101/2	1,599	1,020	642	401	266	184	132	97	72	55	-	-	-	-	-	-	-
31/2	12	2,090	1,334	923	602	400	278	200	148	111	85	66	52	-	-	-	-	-
	131/2	2,646	1,690	1,170	856	573	399	288	213	162	125	97	77	62	-	-	-	-
	15	3,268	2,087	1,446	1,059	788	550	397	295	225	174	137	109	87	71	58	-	-
	161/2	3,873	2,527	1,751	1,282	979	735	532	396	302	234	185	148	119	97	80	66	54
Width (in.)	Depth(in.)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	6	593	300	170	105	68	-	-	-	-	-	-	-	-	-	-	-	-
	71/2	1,164	591	338	210	137	94	66	-	-	-	-	-	-	-	-	-	-
	9	1,718	1,027	589	367	242	167	119	86	64	-	-	-	-	-	-	-	-
	101/2	2,341	1,494	941	588	389	270	193	142	106	81	62	-	-	-	-	-	-
	12	3,060	1,953	1,352	882	586	407	293	216	163	125	97	76	60	-	-	•	•
	131/2	3,875		1,713	1,254	838	584	421	312	237	182	143	113	90	72	58	-	•
	15	4,786	3,056		1,550	1,154	805	582	433	329	255	200	159	128	104	84	69	56
51/8	161/2	5,671		2,563	1,878	1,426	1,076	779	580	442	343	271	216	175	142	117	96	79
	18	<u> </u>	4,406		2,237		1,310	1,015	757	578	450	356	285	231	189	156	129	107
	191/2		5,172			1,963	1,527	1,219	967	739	576	457	367	298	244	202	168	141
	21		5,824		3,002	-	1,760	1,406	1,146	928	724	574	462	376	309	256	214	180
	22 1/2	_	6,491		3,424		2,008	1,604	1,308	1,085	895	711	573	467	385	320	267	225
	24	<u> </u>	7,213		3,873		2,272	1,815		1,228	1,034	867	699	571	471	392	329	278
	25 1/2	-	7,999		4,347		2,551		1,663	1,380	1,162	990	843	689	569	474	398	337
	27		8,856		4,848		2,846		1,856	1,540	1,297	1,105	951	821	679	567	477	404
	28 1/2		9,795		5,374		3,156	2,522		1,709	1,439	1,226	1,056	918	803	671	565	479
	30	18,0/1	10,828	1,/23	5,926	4,467	3,480	2,782	2,2/1	1,885	1,588	1,354	1,166	1,013	888	783	663	563

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Simple Spans (LDF=1.00)

									Sp	an (fe	et)							
Width (in.)	Depth(in.)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	9	2,263	1,352	776	483	319	220	156	114	84	63	-	-	-	-	-	-	-
	101/2	3,084	1,967	1,239	774	513	355	254	187	140	106	82	63	-	-	-	-	-
	12	4,030	2,572	1,780	1,161	771	536	385	285	215	165	128	100	79	63	-	-	-
	131/2	5,104	3,258	2,256	1,652	1,104	769	555	411	312	240	188	149	119	95	77	62	-
	15	6,304	4,025	2,788	2,023	1,520	1,060	766	570	433	335	264	210	169	136	111	91	74
	161/2	7,469	4,873	3,364	2,427	1,827	1,417	1,026	764	582	452	357	285	230	187	153	126	105
63/4	18	8,556	5,802	3,972	2,865	2,157	1,678	1,337	997	761	593	469	375	304	249	205	170	141
	191/2	9,759	6,800	4,626	3,338	2,514	1,956	1,562	1,272	974	759	601	483	392	322	266	221	185
	21	11,096	7,671	5,328	3,845	2,897	2,254	1,800	1,467	1,216	954	757	609	495	407	338	282	237
	22 1/2	12,590	8,549	6,077	4,386	3,305	2,572	2,054	1,675	1,389	1,169	936	754	615	506	421	352	297
	24	14,271	9,501	6,872	4,961	3,738	2,910	2,325	1,896	1,573	1,323	1,127	921	752	620	516	433	366
	25 1/2	16,176	10,535	7,713	5,569	4,197	3,268	2,611	2,130	1,767	1,487	1,267	1,090	907	749	625	525	444
	27	18,354	11,664	8,542	6,210	4,681	3,645	2,913	2,376	1,972	1,660	1,415	1,218	1,058	895	747	628	532
	281/2		12,900	9,329	6,884	5,189	4,042	3,230	2,636	2,188	1,842	1,570	1,352	1,175	1,029	884	744	631
	30		14,261	10,172		5,723	4,458	3,563	2,908	2,414	2,033	1,733	1,493	1,297	1,136	1,002	873	742
Width (in.)		8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	12	5,224	3,334	2,308	1,505	1,000	695	499	369	278	213	166	130	103	81	64	51	-
	131/2	6,616	4,224	2,897	2,088	1,431	997	719	533	404	312	244	193	154	123	99	80	65
	15	8,171	5,210	3,542	2,554	1,922	1,375	993	738	561	435	342	272	218	177	144	118	96
	161/2	9,682	6,247	4,249	3,064	2,306	1,793	1,330	990	755	586	462	369	298	243	199	164	136
	18	11,092	,	5,016	3,618	2,724	2,119	1,691	1,293	987	768	607	487	394	322	266	220	183
83/4	191/2	12,651		5,843	4,215	3,174	2,470	1,971	1,606	1,262	984	780	626	509	417	345	287	240
	21	14,383		6,729	4,856	3,657	2,846	2,272	1,852	1,535	1,236	981	789	642	528	438	366	307
	22 1/2	-,	11,082	,	5,539	4,173	3,248	2,594	2,115	1,753	1,475	1,213	978	797	657	546	457	385
	24		12,316	8,679	6,265	4,720	3,675	2,935	2,394	1,985	1,670	1,422	1,193	974	804	669	561	474
	25 1/2	-, -	13,657	9,741	7,032	5,300	4,126	3,297	2,689	2,231	1,877	1,599	1,376	1,176	971	810	680	575
	27		•	10,862		5,911	4,603	3,678	3,000	2,490	2,096	1,785	1,537	1,335	1,160	968	814	690
	28 1/2			12,040		6,553	5,104	4,079	3,328	2,762	2,325	1,981	1,706	1,482	1,298	1,144	965	819
	30	30,853	18,486	13,186	7,58/	7,227	5,629	4,499	3,672	3,048	2,566	2,187	1,884	1,637	1,434	1,264	1,122	962

Notes for Stock Glulam Floor Beams:

- (1) Span = simply supported beam.
- (2) Maximum deflection = L/360 under live load, based on live/total load = 0.8. Where additional stiffness is desired or for other live/total load ratios, design for deflection must be modified per requirements.
- (3) Service condition = dry.
- (4) Values represent total loads based on live/total load = 0.8 and have taken the dead weight of the beam (assumed 35 pcf) into account.
- (5) Sufficient bearing lengths shall be provided at supports.
- (6) Maximum beam shear is located at a distance from the supports equal to the depth of the beam.
- (7) $F_b = 2,400 \text{ psi}$, $F_v = 265 \text{ psi}$, $E = 1.8 \times 10^6 \text{ psi}$.



Roof Beams Allowable Loads

Simple Span Snow (LDF=1.15)

									Sp	an (fe	et)							
Width (in.)	Depth (in.)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	6	535	295	169	105	69	-	-	-		-	-	-	-	-	-	-	-
	7 1/2	837	533	333	208	137	95	68	-	-	-	-	-	-	-	-	-	-
	9	1,206	769	532	362	240	167	120	88	66	51	-	-	-	-	-	-	-
	101/2	1,643	1,049	726	531	385	268	193	143	108	84	65	52	-	-	-	-	-
	12	2,147	1,371	949	695	530	402	291	216	164	127	100	80	64	52	-	-	-
31/8	131/2	2,719	1,736	1,203	881	672	529	417	311	237	184	145	116	94	77	63	52	-
3./8	15	3,358	2,145	1,486	1,089	831	654	528	429	328	255	202	162	132	108	89	74	62
	161/2	3,978	2,597	1,799	1,319	1,007	793	640	527	439	342	272	219	178	146	121	101	85
	18	4,558	3,091	2,143	1,571	1,199	945	763	628	523	440	355	286	234	192	160	134	113
	191/2	5,198	3,629	2,516	1,844	1,409	1,110	896	735	610	513	437	367	299	247	206	173	146
	21	5,910	4,086	2,919	2,140	1,635	1,288	1,039	848	703	592	504	434	377	311	260	218	185
	221/2	6,705	4,554	3,352	2,458	1,878	1,480	1,186	967	803	676	576	496	431	378	322	271	230
	24	7,601	5,061	3,791	2,798	2,138	1,678	1,341	1,095	909	765	652	562	488	428	377	332	282
Width (in.)	Depth (in.)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	9	1,351	862	596	406	269	187	134	99	74	57	-	-	-	-	-	-	-
	101/2	1,840	1,174	813	595	431	300	216	160	121	94	73	58	-	-	-	-	-
31/2	12	2,405	1,535	1,063	778	594	451	326	242	184	143	112	89	72	58	-	-	-
J / Z	131/2	3,045	1,945	1,347	987	753	592	467	348	265	206	163	130	105	86	71	58	-
	15	3,761	2,402	1,664	1,219	931	733	591	480	367	286	226	182	147	121	100	83	69
	161/2	4,456	2,908	2,015	1,477	1,127	888	717	590	490	384	304	245	199	164	136	113	95
Width (in.)	Depth (in.)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	6	877	485	277	172	113	77	54	-	-	-	-	-	-	-	-	-	-
	7 1/2	1,372	875	547	341	225	155	111	81	60	-	-	-	-	-	-	-	-
	9	1,978	1,262	873	594	394	274	196	145	109	83	64	50	-	-	-	-	-
	101/2	2,694	1,720	1,190	871	631	439	317	235	178	137	107	85	67	54	-	-	-
	12	3,521	2,248	1,557	1,140	869	660	477	355	270	209	164	131	105	85	69	57	-
	131/2	4,459	2,848	1,972	1,445	1,102	867	684	509	389	302	238	191	154	126	103	85	71
	15	5,507	3,518	2,437	1,786	1,363	1,065	850	693	537	419	332	266	216	177	146	121	101
51/8	161/2	6,524	4,258	2,951	2,163	1,643	1,279	1,021	832	689	562	446	358	292	240	199	166	139
5 , 6	18	7,474	5,070	3,514	2,576	1,940	1,510	1,206	983	815	686	583	470	383	316	262	220	185
	191/2	8,525	5,952	4,126	3,001	2,261	1,760	1,406	1,146	951	800	681	586	491	405	338	284	240
	21	9,692	6,702	4,787	3,456	2,605	2,028	1,620	1,322	1,097	923	786	677	587	511	426	358	303
	22 1/2	10,997	7,469	5,459	3,942	2,971	2,314	1,849	1,509	1,252	1,054	898	773	672	588	518	445	377
	24	12,465	8,300	6,173	4,458	3,360	2,618	2,092	1,707	1,417	1,193	1,017	876	761	666	588	521	462
	25 1/2	14,129	9,203	6,820	5,004	3,773	2,939	2,349	1,917	1,592	1,341	1,143	984	856	750	661	587	524
	27	16,031	10,189	7,463	5,580	4,207	3,278	2,621	2,139	1,776	1,496	1,276	1,099	956	837	739	656	585
	28 1/2	18,226	11,269	8,151	6,185	4,664	3,634	2,906	2,372	1,970	1,660	1,416	1,220	1,061	930	820	729	651
	30	20,787	12,457	8,887	6,820	5,143	4,008	3,205	2,617	2,174	1,832	1,562	1,346	1,171	1,027	906	805	719

Continued on page 39

Rosboro GLULAM
Roof Beams
Allowable
Loads
Simple Span
Snow
(LDF=1.15)

									Sp	an (fe	et)							
Width (in.)	Depth (in.)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	9	2,605	1,662	1,150	782	519	360	259	191	143	110	85	66	52		-	-	
	101/2	3,549	2,265	1,568	1,147	831	578	417	309	234	180	141	111	89	71	57	-	-
	12	4,638	2,961	2,050	1,501	1,144	869	628	467	355	275	216	172	139	112	91	75	61
	131/2	5,873	3,750	2,598	1,903	1,434	1,115	889	671	512	398	314	251	203	166	136	112	93
	15	7,253	4,633	3,210	2,330	1,754	1,364	1,089	887	708	551	437	350	284	233	192	160	134
	161/2	8,593	5,609	3,873	2,795	2,105	1,637	1,307	1,065	883	740	587	472	384	316	262	219	183
63/4	18	9,844	6,677	4,572	3,299	2,485	1,934	1,544	1,259	1,044	878	747	618	504	416	345	289	244
0 / 1	191/2	11,228	7,824	5,325	3,844	2,896	2,254	1,801	1,468	1,218	1,024	872	750	647	534	445	373	316
	21	12,765	8,827	6,133	4,427	3,336	2,598	2,075	1,692	1,404	1,182	1,006	866	752	658	561	472	400
	221/2	14,484	9,837	6,994	5,050	3,806	2,964	2,368	1,932	1,603	1,349	1,150	990	859	752	663	586	497
	24	16,417	10,932	7,909	5,711	4,305	3,353	2,679	2,186	1,815	1,528	1,302	1,121	974	853	752	667	595
	25 1/2	18,609	12,122	8,877	6,410	4,833	3,764	3,009	2,456	2,038	1,717	1,463	1,260	1,095	959	846	751	670
	27	21,114	13,420	9,830	7,148	5,389	4,199	3,356	2,740	2,275	1,916	1,633	1,407	1,223	1,072	945	839	749
	281/2	24,005	14,842	10,735	7,924	5,975	4,655	3,722	3,038	2,523	2,125	1,812	1,562	1,358	1,190	1,050	932	832
	30	27,378	16,407	11,705	8,737	6,589	5,134	4,105	3,352	2,784	2,345	2,000	1,724	1,499	1,314	1,160	1,030	920
Width (in.)	Depth (in.)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	12	6,012	3,838	2,658	1,921	1,445	1,123	814	606	461	357	281	223	180	145	119	97	79
	131/2	7,613	4,862	3,336	2,405	1,810	1,407	1,122	870	663	516	407	326	263	215	176	146	121
	15	9,402	5,996	4,078	2,942	2,215	1,722	1,374	1,119	918	715	566	454	369	302	249	207	173
	161/2	11,139	7,189	4,891	3,529	2,657	2,067	1,650	1,344	1,114	936	761	612	498	409	339	283	238
	18	12,761	8,485	5,774	4,166	3,138	2,442	1,950	1,589	1,317	1,108	942	802	654	539	448	375	316
83/4	191/2	14,554		6,725	4,854	3,657	2,846	2,273	1,853	1,537	1,293	1,100	946	821	692	577	484	409
	21		11,379		5,591	4,213	3,280	2,620	2,137	1,772	1,491	1,270	1,093	948	830	727	612	518
	221/2		12,752		6,377	4,806	3,742	2,990	2,439	2,024	1,703	1,451	1,249	1,084	949	836	741	644
	24		14,171	9,988	7,212	5,436	4,234	3,383	2,760	2,291	1,928	1,643	1,415	1,229	1,076	948	841	750
	25 1/2		15,713		8,095	6,103	4,753	3,799	3,100	2,573	2,167	1,847	1,590	1,382	1,210	1,067	947	845
	27		17,396			6,806	5,302	4,238	3,459	2,872	2,418	2,062	1,776	1,543	1,352	1,193	1,058	945
	281/2		19,240			7,545	5,878	4,700	3,836	3,185	2,683	2,288	1,971	1,713	1,501	1,325	1,176	1,050
N 1 C	30		21,269	15,174	11,034	8,320	6,483	5,184	4,232	3,514	2,961	2,525	2,176	1,892	1,658	1,463	1,299	1,160

Notes for Stock Glulam Roof Beams:

- (1) Span = simply supported beam.
- (2) Maximum deflection = L/180 under total load.
- (3) Service condition = dry.
- (4) Tabulated values represent total loads and have taken the dead weight of the beam (assumed 35 pcf) into account.
- (5) Sufficient bearing lengths shall be provided at supports.
- (6) Maximum beam shear is located at a distance from the supports equal to the depth of the beam.
- (7) $F_b = 2,400 \text{ psi}$, $F_v = 265 \text{ psi}$, $E = 1.8 \times 10^6 \text{ psi}$.



Roof Beams Allowable Loads

Simple Span Non-Snow (LDF=1.25)

		Span (feet)																
Width (in.)	Depth (in.)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	6	581	295	169	105	69	-	-	-	-	-	-	-	-	-	-	-	-
	71/2	910	580	333	208	137	95	68	-	-	-	-	-	-	-	-	-	-
	9	1,312	837	579	362	240	167	120	88	66	51	-	-	-		-		-
	101/2	1,786	1,140	790	578	385	268	193	143	108	84	65	52	-	-		-	-
	12	2,335	1,491	1,033	756	577	402	291	216	164	127	100	80	64	52	-	-	-
31/8	131/2	2,956	1,888	1,308	958	731	576	417	311	237	184	145	116	94	77	63	52	-
0 / 0	15	3,651	2,332	1,616	1,184	904	712	575	429	328	255	202	162	132	108	89	74	62
	161/2	4,325	2,823	1,957	1,434	1,095	863	696	573	439	342	272	219	178	146	121	101	85
	18	4,955	3,361	2,330	1,708	1,305	1,028	830	684	570	447	355	286	234	192	160	134	113
	191/2	5,651	3,946	2,736	2,006	1,532	1,208	975	801	664	559	454	367	299	247	206	173	146
	21	6,425	4,443	3,174	2,328	1,778	1,402	1,131	923	766	645	550	460	377	311	260	218	185
	22 1/2	7,290	4,952	3,645	2,673	2,043	1,611	1,290	1,053	874	736	628	541	466	385	322	271	230
	24	8,263	5,503	4,122	3,043	2,326	1,825	1,459	1,191	989	834	711	612	533	467	393	332	282
Width (in.)	Depth (in.)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	9	1,469	937	649	406	269	187	134	99	74	57	-	-	-	-	-	-	-
	101/2	2,001	1,277	884	647	431	300	216	160	121	94	73	58	-	-	-	-	-
31/2	12	2,615	1,670	1,156	847	646	451	326	242	184	143	112	89	72	58	-	-	-
","	131/2	3,311	2,115	1,465	1,073	819	645	467	348	265	206	163	130	105	86	71	58	-
	15	4,089	2,612	1,810	1,327	1,013	797	643	480	367	286	226	182	147	121	100	83	69
	161/2	4,844	3,162	2,192	1,606	1,227	966	780	642	491	384	304	245	199	164	136	113	95
Width (in.)	Depth (in.)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	6	953	485	277	172	113	77	54	-	-	-	-	-	-	-	•	-	-
	71/2	1,492	952	547	341	225	155	111	81	60	-	-	-	-	-	-	-	-
	9	2,151	1,373	950	594	394	274	196	145	109	83	64	50	-	-	•	-	-
	101/2	2,930	1,870	1,295	948	631	439	317	235	178	137	107	85	67	54	-	-	
	12	3,829	2,445	1,693	1,240	946	660	477	355	270	209	164	131	105	85	69	57	
	131/2	4,848	3,097	2,145	1,572	1,199	944	684	509	389	302	238	191	154	126	103	85	71
	15	5,987	3,825	2,651	1,942	1,483	1,160	926	703	537	419	332	266	216	177	146	121	101
51/8	161/2	7,093	4,630	3,209	2,352	1,788	1,392	1,111	906	720	562	446	358	292	240	199	166	139
	18		5,513			2,111		1,313		888	733	583	470	383	316	262	220	185
	191/2	9,268	6,472		3,264	2,460	1,915	1,530	1,248	1,036	872	743	601	491	405	338	284	240
	21		7,287		3,759	2,833	2,207	1,763	1,439	1,194	1,005	857	738	618	511	426	358	303
	22 1/2		8,121		4,287	3,232		2,012	1,642	-	1,148	979	843	732	632	528	445	377
	24		9,024		4,848	3,655	2,848	2,277	1,858	1,543	1,300	1,108	954	830	727	641	544	462
	25 1/2		10,007		5,442	4,103	3,197	2,556	2,087	-	1,460	1,245	1,073	933	817	721	641	558
	27		11,078		6,068	4,576	3,566	2,851	2,328		1,629	1,390	1,198	1,042	913	806	716	639
	28 1/2		12,252		6,726	5,073	3,953		2,582	-	1,807	1,542	1,329	1,156	1,014	895	795	710
	30	22,598	13,544	9,664	7,416	5,594	4,360	3,487	2,848	2,366	1,994	1,701	1,467	1,276	1,119	988	878	785

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Roshoro
Roof Beams Allowable
Loads
Simple Span
Non-Snow

(LDF = 1.25)

									Sp	an (fee	t)							
Width (in.)	Depth (in.)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	9	2,833	1,808	1,251	782	519	360	259	191	143	110	85	66	52	-	-	-	-
	101/2	3,859	2,463	1,705	1,248	831	578	417	309	234	180	141	111	89	71	57	-	-
	12	5,043	3,220	2,230	1,633	1,245	869	628	467	355	275	216	172	139	112	91	75	61
	131/2	6,385	4,078	2,826	2,070	1,560	1,214	900	671	512	398	314	251	203	166	136	112	93
	15	7,886	5,038	3,491	2,534	1,909	1,485	1,185	926	708	551	437	350	284	233	192	160	134
	161/2	9,343	6,099	4,212	3,040	2,290	1,782	1,423	1,160	948	740	587	472	384	316	262	219	183
6 3/4	18	10,703	7,260	4,972	3,589	2,704	2,105	1,681	1,371	1,137	957	767	618	504	416	345	289	244
0 /4	191/2	12,207	8,507	5,791	4,181	3,151	2,453	1,960	1,599	1,326	1,116	951	792	647	534	445	373	316
	21	13,878	9,597	6,669	4,815	3,629	2,826	2,259	1,843	1,529	1,287	1,097	944	813	672	561	472	400
	221/2	15,746	10,696	7,605	5,492	4,140	3,225	2,577	2,103	1,746	1,470	1,253	1,079	937	821	696	586	497
	24	17,848	11,886	8,600	6,211	4,682	3,648	2,916	2,380	1,976	1,664	1,419	1,222	1,062	930	821	716	609
	25 1/2	20,231	13,179	9,652	6,971	5,256	4,095	3,274	2,673	2,219	1,870	1,594	1,373	1,194	1,046	923	820	732
	27	22,954	14,591	10,688	7,773	5,862	4,568	3,652	2,982	2,476	2,086	1,779	1,533	1,333	1,169	1,031	916	818
	28 1/2	26,097	16,137	11,673	8,617	6,498	5,064	4,050	3,307	2,747	2,314	1,974	1,702	1,480	1,297	1,145	1,017	909
	30	29,763	17,838	12,728	9,501	7,166	5,585	4,467	3,647	3,030	2,554	2,178	1,878	1,634	1,433	1,265	1,124	1,004
Width (in.)	Depth (in.)	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
	12	6,537	4,174	2,891	2,090	1,573	1,127	814	606	461	357	281	223	180	145	119	97	79
	131/2	8,277	5,287	3,628	2,617	1,970	1,532	1,167	870	663	516	407	326	263	215	176	146	121
	15	10,222	6,520	4,436	3,200	2,410	1,875	1,496	1,201	918	715	566	454	369	302	249	207	173
	161/2	12,111	7,818	5,320	3,839	2,892	2,250	1,797	1,464	1,214	959	761	612	498	409	339	283	238
	18	13,874	9,226	6,279	4,532	3,414	2,658	2,123	1,731	1,435	1,207	995	802	654	539	448	375	316
8 3/4	191/2	15,824	10,745	7,313	5,280	3,978	3,098	2,474	2,018	1,674	1,409	1,200	1,027	839	692	577	484	409
', '	21		12,372		6,081	4,583	3,569	2,852	2,326	1,930	1,625	1,384	1,191	1,035	872	727	612	518
	22 1/2		13,865		6,936	5,228	4,072	3,254	2,655	2,204	1,855	1,581	1,361	1,183	1,036	902	759	644
	24	-,	15,407	-,	7,844	5,913	4,606	3,682	3,005	2,494	2,101	1,790	1,542	1,340	1,174	1,035	919	789
	25 1/2			12,190	8,804	6,638	5,172	4,134	3,375	2,802	2,360	2,012	1,733	1,507	1,320	1,165	1,034	923
	27			13,592		7,403	5,768	4,612	3,765	3,126	2,634	2,246	1,935	1,683	1,475	1,301	1,156	1,032
	28 1/2			15,065		8,206	6,395	5,114	4,175	3,468	2,922	2,492	2,148	1,868	1,637	1,445	1,284	1,146
	30	38,582	23,124	16,499	11,999	9,049	7,052	5,640	4,605	3,826	3,224	2,750	2,370	2,062	1,808	1,596	1,418	1,267

Notes for Stock Glulam Roof Beams:

- (1) Span = simply supported beam.
- (2) Maximum deflection = L/180 under total load.
- (3) Service condition = dry.
- (4) Tabulated values represent total loads and have taken the dead weight of the beam (assumed 35 pcf) into account.
- (5) Sufficient bearing lengths shall be provided at supports.
- (6) Maximum beam shear is located at a distance from the supports equal to the depth of the beam.
- (7) $F_b=2,\!400$ psi, $F_v=265$ psi, E=1.8 x 10^6 psi.

Rosboro
TREATED GLULAM
When You Need It To Last

Roof Beams Allowable Loads

Simple Span Dry-Use Non-Snow (LDF = 1.25)

							Span	(feet)				
Width (in.)	Depth (in.)	Load Condition	8	10	12	14	16	18	20	24	28	32
		Total Load	1,636	1,043	652	407	270	187	133	73	NA	NA
	91/2	Live Load	-	1,000	579	365	244	172	125	72	NA	NA
		Min. End/Int. Bearing (in.)	2.5/6.4	2.0/5.1	1.5/3.8	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	NA	NA
		Total Load	2,559	1,633	1,131	802	533	371	267	150	90	56
	11 ⁷ /8	Live Load	-	-	-	712	477	335	244	141	89	-
		Min. End/Int. Bearing (in.)	4.0/9.9	3.2/7.9	2.6/6.6	2.2/5.5	1.7/4.2	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5
21/		Total Load	3,182	2,273	1,574	1,153	879	613	443	251	153	98
3 1/2	14	Live Load	-	-	-	-	782	549	400	232	146	-
		Min. End/Int. Bearing (in.)	4.9/12.3	4.4/11.0	3.7/9.2	3.2/7.9	2.8/6.9	2.2/5.4	1.8/4.4	1.5/3.5	1.5/3.5	1.5/3.5
		Total Load	3,802	2,832	2,058	1,508	1,151	906	667	379	233	151
	16	Live Load	-	-	-	-	-	819	597	346	218	146
		Min. End/Int. Bearing (in.)	5.9/14.7	5.5/13.7	4.8/12.0	4.1/10.3	3.6/9.0	3.2/8.0	2.6/6.6	1.8/4.6	1.5/3.5	1.5/3.5
		Total Load	4,482	3,298	2,607	1,911	1,459	1,149	927	545	336	219
	18	Live Load	-	-	-	-	-	-	851	492	310	208
		Min. End/Int. Bearing (in.)	6.9/17.4	6.4/16.0	6.1/15.2	5.2/13.0	4.6/11.4	4.1/10.1	3.6/9.1	2.6/6.5	1.9/4.8	1.5/3.7
		Total Load	2,541	1,621	1,013	633	419	290	207	114	66	NA
	91/2	Live Load	-	1,554	899	566	379	266	194	112	-	NA
		Min. End/Int. Bearing (in)	2.5/6.4	2.0/5.1	1.5/3.8	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	NA
		Total Load	3,975	2,538	1,757	1,246	828	576	415	233	140	87
	117/8	Live Load	-	-	1,756	1,106	741	520	379	220	138	-
		Min. End/Int. Bearing (in.)	4.0/9.9	3.2/7.9	2.6/6.6	2.2/5.5	1.7/4.2	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5
F 7 /		Total Load	4,943	3,531	2,445	1,791	1,366	953	689	389	237	152
5 7/16	14	Live Load	-	-	-	-	1,214	853	622	360	227	-
		Min. End/Int. Bearing (in.)	4.9/12.3	4.4/11.0	3.7/9.2	3.2/7.9	2.8/6.9	2.2/5.4	1.8/4.4	1.5/3.5	1.5/3.5	1.5/3.5
		Total Load	5,907	4,399	3,197	2,343	1,781	1,394	1,036	589	362	234
	16	Live Load	-	-	-	-	-	1,273	928	537	338	227
		Min. End/Int. Bearing (in.)	5.9/14.7	5.5/13.7	4.8/12.0	4.1/10.3	3.6/9.0	3.2/7.9	2.6/6.6	1.8/4.6	1.5/3.5	1.5/3.5
		Total Load	6,963	5,123	4,050	2,959	2,244	1,757	1,410	846	522	341
	18	Live Load	-	-	-	-	-	-	1,321	765	482	323
		Min. End/Int. Bearing (in.)	6.9/17.4	6.4/16.0	6.1/15.2	5.2/13.0	4.5/11.3	4.0/10.0	3.6/8.9	2.6/6.5	1.9/4.8	1.5/3.7

Rosboro
TREATED GLULAM
When You Need It To Last

Roof Beams Allowable Loads Simple Span

Dry-Use Snow (LDF = 1.15)

42

							Span	(feet)				
Width (in.)	Depth (in.)	Load Condition	8	10	12	14	16	18	20	24	28	32
	•	Total Load	1,504	959	652	407	270	187	133	73	NA	NA
	91/2	Live Load	-	-	579	365	244	172	125	72	NA	NA
		Min. End/Int. Bearing (in.)	2.3/5.8	1.9/4.7	1.5/3.8	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	NA	NA
		Total Load	2,353	1,502	1,039	760	533	371	267	150	90	56
	117/8	Live Load	-	-	-	712	477	335	244	141	89	-
		Min. End/Int. Bearing (in.)	3.7/9.1	2.9/7.3	2.4/6.1	2.1/5.2	1.7/4.2	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5
		Total Load	2,926	2,090	1,447	1,059	808	613	443	251	153	98
3 1/2	14	Live Load	-	-	-	-	782	549	400	232	146	-
		Min. End/Int. Bearing (in.)	4.5/11.4	4.1/10.2	3.4/8.5	2.9/7.3	2.5/6.3	2.2/5.4	1.8/4.4	1.5/3.5	1.5/3.5	1.5/3.5
		Total Load	3,497	2,604	1,892	1,386	1,057	832	667	379	233	151
	16	Live Load	-	-	-	-	-	819	597	346	218	146
		Min. End/Int. Bearing (in.)	5.4/13.6	5.1/12.6	4.4/11.1	3.8/9.5	3.3/8.3	2.9/7.4	2.6/6.6	1.8/4.6	1.5/3.5	1.5/3.5
		Total Load	4,122	3,033	2,397	1,756	1,341	1,055	851	545	336	219
	18	Live Load	-	-	-	-	-	-	-	492	310	208
		Min. End/Int. Bearing (in.)	6.4/16.0	5.9/14.7	5.6/14.0	4.8/12.0	4.2/10.5	3.7/9.3	3.4/8.4	2.6/6.5	1.9/4.8	1.5/3.7
		Total Load	2,337	1,490	1,013	633	419	290	207	114	66	NA
	91/2	Live Load	-	-	899	566	379	266	194	112	-	NA
		Min. End/Int. Bearing (in.)	2.3/5.8	1.9/4.7	1.5/3.8	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	NA
		Total Load	3,656	2,333	1,615	1,181	828	576	415	233	140	87
	117/8	Live Load	-	-	-	1,106	741	520	379	220	138	-
		Min. End/Int. Bearing (in.)	3.7/9.1	2.9/7.3	2.4/6.1	2.1/5.2	1.7/4.2	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5	1.5/3.5
F7/		Total Load	4,546	3,247	2,248	1,646	1,255	953	689	389	237	152
5 ⁷ / ₁₆	14	Live Load	-	-	-	-	1,214	853	622	360	227	-
		Min. End/Int. Bearing (in.)	4.5/11.4	4.1/10.2	3.4/8.5	2.9/7.3	2.5/6.3	2.2/5.4	1.8/4.4	1.5/3.5	1.5/3.5	1.5/3.5
		Total Load	5,433	4,045	2,940	2,153	1,636	1,280	1,027	589	362	234
	16	Live Load	-	-	-	-	-	1,273	928	537	338	227
		Min. End/Int. Bearing (in.)	5.4/13.6	5.1/12.6	4.4/11.1	3.8/9.5	3.3/8.3	2.9/7.3	2.6/6.5	1.8/4.6	1.5/3.5	1.5/3.5
		Total Load	6,404	4,711	3,724	2,720	2,062	1,614	1,295	846	522	341
	18	Live Load	-	-	-	-	-	-	-	765	482	323
		Min. End/Int. Bearing (in.)	6.4/16.0	5.9/14.7	5.6/14.0	4.8/12.0	4.2/10.4	3.7/9.2	3.3/8.2	2.6/6.5	1.9/4.8	1.5/3.7

Continued on page 43

Rosboro
TREATED GLULAM
When You Need It To Last

Floor Beams Allowable Loads

Simple Span Dry-Use (LDF = 1.0)

Note Condition Same Sa	32 NA NA NA
3 1/2	NA
Min. End/Int. Bearing (in.) 2.0/5.1 1.6/4.1 1.5/3.5 1.5/3.5 1.5/3.5 1.5/3.5 1.5/3.5 1.5/3.5 NA NA	
3 1/2 Total Load 2,045 1,304 902 635 422 293 210 117 69	NA
3 1/2 111/8	
3 1/2 Min. End/Int. Bearing (in.) 3.2/7.9 2.5/6.4 2.1/5.3 1.7/4.4 1.5/3.5	NA
3 1/2 Total Load 2,543 1,815 1,256 919 697 485 350 197 119	NA
14	NA
Min. End/Int. Bearing (in.) 3.9/9.7 3.5/8.8 2.9/7.4 2.5/6.3 2.2/5.5 1.7/4.3 1.5/3.5 1.5/	75
Total Load 3,039 2,262 1,443 1,203 917 722 527 298 182	65
Live Load	1.5/3.5
Min. End/Int. Bearing (in.) 4.7/11.8 4.4/11.0 3.8/9.6 3.3/8.2 2.9/7.2 2.6/6.4 2.1/5.2 1.5/3.6 1.5/3.5 Total Load 3,582 2,635 2,082 1,525 1,163 915 738 430 264 Live Load -	117
Total Load 3,582 2,635 2,082 1,525 1,163 915 738 430 264 Live Load 1,107 778 567 328 207 Min. End/Int. Bearing (in.) 5.6/13.9 5.1/12.8 4.9/12.2 4.2/10.4 3.6/9.1 3.2/8.1 2.9/7.3 2.1/5.2 1.5/3.8 Total Load 2,030 1,294 803 500 330 228 162 87 NA	97
Live Load - - - - 1,107 778 567 328 207 Min. End/Int. Bearing (in.) 5.6/13.9 5.1/12.8 4.9/12.2 4.2/10.4 3.6/9.1 3.2/8.1 2.9/7.3 2.1/5.2 1.5/3.8 Total Load 2,030 1,294 803 500 330 228 162 87 NA	1.5/3.5
Min. End/Int. Bearing (in.) 5.6/13.9 5.1/12.8 4.9/12.2 4.2/10.4 3.6/9.1 3.2/8.1 2.9/7.3 2.1/5.2 1.5/3.8 Total Load 2,030 1,294 803 500 330 228 162 87 NA	171
Total Load 2,030 1,294 803 500 330 228 162 87 NA	138
	1.5/3.5
01/ 1	NA
9 ¹ / ₂ Live Load 2,023 1,036 600 378 253 178 129 75 NA	NA
Min. End/Int. Bearing (in.) 2.0/5.1 1.6/4.1 1.5/3.5 1.5/3.5 1.5/3.5 1.5/3.5 1.5/3.5 NA	NA
Total Load 3,177 2,026 1,402 987 655 455 327 181 107	66
11 ⁷ /s Live Load - 2,023 1,171 737 494 347 253 146 92	62
Min. End/Int. Bearing (in.) 3.2/7.9 2.5/6.4 2.1/5.3 1.7/4.4 1.5/3.5 1.5/3.5 1.5/3.5 1.5/3.5 1.5/3.5	1.5/3.5
Total Load 3,950 2,820 1,952 1,428 1,082 754 543 305 184	116
5 ⁷ /16 14 Live Load 1,919 1,208 809 569 414 240 151	101
Min. End/Int. Bearing (in.) 3.9/9.9 3.5/8.8 2.9/7.4 2.5/6.3 2.2/5.5 1.7/4.3 1.5/3.5 1.5/3.5 1.5/3.5	1.5/3.5
Total Load 4,721 3,514 2,553 1,869 1,420 1,110 819 463 283	181
16 Live Load 1,804 1,208 849 619 358 225	151
Min. End/Int. Bearing (in.) 4.7/11.8 4.4/11.0 3.8/9.6 3.3/8.2 2.9/7.2 2.5/6.3 2.1/5.2 1.5/3.6 1.5/3.5	1.5/3.5
Total Load 5,565 4,093 3,235 2,362 1,790 1,400 1,122 667 410	265
18 Live Load 1,720 1,208 881 510 321	215
Min. End/Int. Bearing (in.) 5.6/13.9 5.1/12.8 4.9/12.2 4.2/10.4 3.6/9.0 3.2/8.0 2.9/7.1 2.1/5.2 1.5/3.8	1.5/3.5

Notes for Treated Glulam Beams:

- (1) This table is for preliminary design use only. Final design should include a complete analysis, including bearing stresses and lateral stability.
- (2) Table is based on uniform loads (beam weight considered) and the more restrictive of simple or continuous span.
- (3) Tabulated roof live load is based on the deflection criterion of span/240.
- (4) Tabulated floor live load is based on the deflection criterion of span/360.
- (5) Tabulated roof total load is based on the deflection criterion of span/180 and includes creep deflection with an assumed LL/DL ratio of 2 or higher.
- (6) Tabulated floor total load is based on the deflection criterion of span/240 and includes creep deflection with an assumed LL/DL ratio of 4 or higher.
- (7) Tabulated total load is in addition to the beam weight (assumed 41 pcf).
- (8) Selected beam size shall satisfy both live load and total load.
- (9) For roof live load deflection limits of L/180 and L/360, multiply live load values by 1.33 and 0.67 respectively. The resulting live load shall not exceed the total load shown.
- (10) For floor live load deflection limits of L/240and L/480, multiply live load values by 1.5 and 0.75 respectively. The resulting live load shall not exceed the total load shown.



Flexural Stress Fb (psi) Modulus of Elasticity E (10⁶ psi) Layup Combination Shear F_v (psi) **Product** Fc1 (psi) **Tension Zone Compression Zone** BigBeam (Dry) 30F-E2M3 3,000 3,000 650 300 2.1 BigBeam (Wet) 30F-E2M3 2,400 2,400 345 263 1.75

Design Value Comparison for Wet-Use Conditions

 $F_b=2,\!400\;psi$

 $F_{\text{\tiny V}}=263\;\text{psi}$

 $E = 1.75 \times 10^6 \text{ psi}$

Rosboro	
RIG	REAM®
DIO	PLAII
	115116 61 1

Design Properties for Wet-Use Conditions

$$\begin{split} F_b &= 2,400 \text{ psi} \\ F_v &= 263 \text{ psi} \\ E &= 1.75 \text{ x } 10^6 \text{ psi} \end{split}$$

		Maxii	num Resistive She	ear (lbf)	Maximun	El		
Width (in.)	Depth (in.)	100%	115%	125%	100%	115%	125%	(106 in.2 - lb.)
	9 1/2	5,819	6,692	7,273	10,529	12,109	13,161	437
	11 7/8	7,273	8,364	9,092	16,452	18,920	20,565	854
31/2	14	8,575	9,861	10,719	22,867	26,297	28,583	1,400
	16	9,800	11,270	12,250	29,867	34,347	37,333	2,090
	18	11,025	12,679	13,781	37,800	43,470	47,250	2,976
		Maxi	num Resistive She	ear (lbf)	Maximun	n Resistive Mome	ent (ftlbf)	El
Width (in.)	Depth (in.)	100%	115%	125%	100%	115%	125%	(106 in.2 - lb.)
	9 1/2	9,040	10,396	11,300	16,358	18,811	20,447	680
	11 7/8	11,300	12,995	14,125	25,559	29,393	31,949	1,327
57/16	14	13,322	15,320	16,652	35,525	40,854	44,406	2,175
	16	15,225	17,509	19,031	46,400	53,360	58,000	3,247
	18	17,128	19,697	21,410	58,725	67,534	73,406	4,623
		Maxi	mum Resistive She	ear (lbf)	Maximur	El		
Width (in.)	Depth (in.)	100%	115%	125%	100%	115%	125%	(106 in.2 - lb.)
	9 1/2	11,638	13,383	14,547	21,058	24,217	26,323	875
	11 7/8	14,547	16,729	18,184	32,904	37,839	41,130	1,709
7	14	17,150	19,723	21,438	45,733	52,593	57,167	2,800
	16	19,600	22,540	24,500	59,733	68,693	74,667	4,180
	18	22,050	25,358	27,563	75,600	86,940	94,500	5,951

Notes for BigBeam Design Properties:

(1) Maximum resistive moment shall be adjusted by the volume factor based on NDS-05.

Solid Sawn Substitution: Beams

		Douglas Fir	/ Larch - Select St	tructural (in.)										
Product	4 x 8	4 x 10	4 x 12	6 x 8	6 x 10	6 x 12								
BigBeam	31/2 x 91/2	31/2 x 91/2	3 ½ x 11 ½	57/16 x 9 1/2	5 ⁷ / ₁₆ x 9 ¹ / ₂	5½16 x 11½8								
Stock Glulam	31/8 x 9	31/8 x 101/2	3½8 x 12	5½8 x 7½	5½ x 10½	5½ x 12								
1.8E-IJC	31/2 x 91/2	31/2 x 91/2	3 ½ x 11 ½	-	-	-								
	Douglas Fir / Larch - #1 (in.)													
Product	4 x 8	4 x 10	4 x 12	6 x 8	6 x 10	6 x 12								
BigBeam	31/2 x 91/2	31/2 x 91/2	3 ½ x 11 ½	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 11 ⁷ /8								
Stock Glulam	31/8 x 71/2	31/8 x 101/2	3½ x 12	51/8 x 71/2	5½ x 10½	5½ x 12								
1.8E-IJC	31/2 x 91/2	31/2 x 91/2	3 ½ x 11 ½	-	-	-								
		Doug	las Fir / Larch - #	2 (in.)										
Product	4 x 8	4 x 10	4 x 12	6 x 8	6 x 10	6 x 12								
BigBeam	31/2 x 91/2	31/2 x 91/2	3 ¹ / ₂ x 11 ⁷ / ₈	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 9 ¹ /2	5 ⁷ /16 x 11 ⁷ /8								
Stock Glulam	31/8 x 71/2	31/8 x 101/2	31/8 x 12	51/8 x 71/2	51/8 x 9	5½ x 12								
1.8E-IJC	31/2 x 91/2	31/2 x 91/2	3 ½ x 11 ½	-	-	-								

Solid Sawn Substitution: Columns

Douglas Fir / Larch - Select Structural (in.)											
Product	4 x 4	6 x 6									
EWS #2 DF	3 ½ x 6	5½8 x 6									
Douglas Fir / Larch - #1 (in.)											
Product	4 x 4	6 x 6									
EWS #2 DF	3 ½ x 6	5½8 x 6									
Douglas Fir / Larch - #2 (in.)											
Product	4 x 4	6 x 6									
EWS #2 DF	3 ½ x 6	5½ x 6									

Notes for Solid Sawn Substitution Tables:

- (1) Tables may be used in preliminary design of Rosboro glulam beams and columns as replacements for common Douglas Fir/Larch solid sawn members.
- (2) Solid Sawn design stresses are based on NDS-05.
- (3) Equivalent sized glulam are based on minimum sizes required to meet or exceed bending, shear or deflection considerations. Therefore, tables can only be used to go from solid sawn to glulam. (Substitution from glulam to solid sawn may not be appropriate.)

Rosboro Glulam Columns

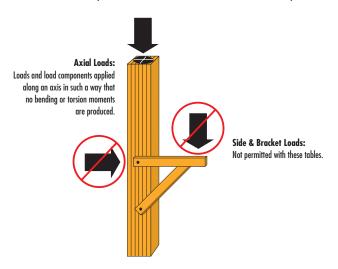
Since compression parallel to grain stresses are distributed uniformly over the cross-section of a typical column member, Rosboro glulam columns are manufactured using a single grade of lumber throughout the depth of the member.

Two distinct values are provided for Fb depending on which axis the load is applied to, i.e., parallel to the wide or to the narrow face of the member. If a column is going to be loaded as a combined axial and bending member, it may be preferable to specify a product engineered to serve as a bending member such as a BigBeam. Such members use a graded lumber layup throughout the depth of the member and are more efficient for resisting high bending stresses.

Figure 15. 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.



EWS 2 Glulam Columns Width = 3 1/8"

Effective	Net D	epth = 4 1/2" ((3 lams)	Net	Depth = 6" (4	lams)	Net Depth = 7 1/2" (5 lams)				
Column	L	oad Duration Fa	ctor	L	oad Duration Fa	ctor	Lo	Load Duration Factor			
Length (ft.)	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25		
8	6,071	6,327	6,474	8,396	8,722	8,909	10,495	10,902	11,137		
9	5,132	5,319	5,426	7,061	7,299	7,436	8,826	9,124	9,295		
10	4,382	4,523	4,604	6,007	6,186	6,288	7,508	7,732	7,860		
11	3,779	3,887	3,950	5,164	5,302	5,381	6,455	6,628	6,727		
12	3,288	3,374	3,423	4,483	4,592	4,654	5,604	5,740	5,817		
13	2,885	2,953	2,993	3,926	4,013	4,062	4,907	5,016	5,078		

EWS 2 Glulam Columns Width = 51/8"

Effective	Net De	epth = 5 1/8"	(4 lams)	Net De	epth = 6" (4 lo	ums)	Net Depth = 71/2" (5 lams)			
Column		ad Duration Fac			ad Duration Fac		Load Duration Factor			
Length (ft.)	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25	
8	19,101	20,580	21,447	24,349	26,269	27,389	30,437	32,837	34,236	
9	17,047	18,167	18,820	21,771	23,206	24,036	27,214	29,008	30,045	
10	15,166	16,032	16,536	19,370	20,464	21,096	24,213	25,580	26,370	
11	13,505	14,189	14,586	17,232	18,087	18,580	21,541	22,609	23,225	
12	12,060	12,611	12,929	15,370	16,051	16,444	19,212	20,064	20,555	
13	10,812	11,261	11,520	13,759	14,312	14,631	17,199	17,890	18,288	
14	9,732	10,103	10,317	12,369	12,824	13,086	15,461	16,030	16,357	
15	8,797	9,107	9,285	11,166	11,545	11,763	13,958	14,431	14,703	
16	7,984	8,245	8,395	10,122	10,441	10,624	12,652	13,051	13,280	
17	7,274	7,496	7,624	9,212	9,483	9,638	11,515	11,853	12,047	
18	6,651	6,842	6,951	8,415	8,647	8,780	10,519	10,809	10,974	
19	6,102	6,267	6,362	7,714	7,914	8,029	9,643	9,893	10,036	
20	5,617	5,761	5,843	7,096	7,269	7,369	8,870	9,087	9,211	
21	5,187	5,312	5,384	6,547	6,699	6,785	8,184	8,373	8,481	

EWS 2 Glulam Columns Width = 63/4"

Effective	Net De	pth = 7 ½" (5 lams)	Net Depth = 9" (6 lams)					
Column	Lo	ad Duration Fac	tor	Lo	Load Duration Factor				
Length (ft.)	1.00	1.15	1.25	1.00	1.15	1.25			
8	46,419	51,735	55,055	57,007	63,204	67,033			
9	43,906	48,470	51,252	53,421	58,620	61,752			
10	41,184	44,902	46,984	49,641	53,883	56,381			
11	38,162	41,002	42,653	45,794	49,203	51,184			
12	35,027	37,314	38,637	42,032	44,777	46,365			
13	32,072	33,936	35,013	38,486	40,723	42,016			
14	29,356	30,897	31,788	35,228	37,077	38,145			
15	26,898	28,188	28,933	32,278	33,826	34,720			
16	24,690	25,782	26,412	29,628	30,938	31,694			
17	22,712	23,644	24,182	27,254	28,373	29,019			
18	20,942	21,745	22,207	25,130	26,094	26,648			
19	19,356	20,052	20,453	23,227	24,062	24,543			
20	17,933	18,541	18,890	21,519	22,249	22,668			
21	16,653	17,187	17,493	19,984	20,624	20,992			
22	15,500	15,971	16,241	18,600	19,165	19,489			
23	14,458	14,876	15,115	17,349	17,851	18,138			
24	13,514	13,886	14,099	16,217	16,663	16,919			

Notes for EWS 2 Glulam Columns:

- (1) The tabulated allowable loads apply to glulam members made with all L2 laminations (Combination 2) without special tension laminations.
- (2) Applicable service conditions = dry.
- (3) The tabulated allowable loads are based on axially loaded columns subjected to a maximum eccentricity of either $\frac{1}{6}$ column width or $\frac{1}{6}$ column depth, whichever is worse. For side loads, other eccentric end loads, or other combined axial and flexural loads, see NDS-05.
- (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) Design properties for normal load duration and dry-use service conditions:
 - a. Compression parallel to grain (F_c) = 1,900 psi for 4 or more lams, or 1,600 psi for 2 or 3 lams.
 - b. Modulus of elasticity (E) = 1.7×10^6 psi.
 - c. Flexural stress when loaded parallel to wide faces of lamination (F_{by}) = 1,800 psi for 4 or more lams, or 1,600 psi for 3 lams.
 - d. Flexural stress when loaded perpendicular to wide faces of lamination (F_{bx}) = 1,700 psi for 2 lams to 15 inches deep without special tension laminations.
 - e. Volume factor for F_{bx} is in accordance with NDS-05. Size factor for F_{by} is $(12/d)^{0.111}$, where d is equal to the lamination width in inches.
- (6) This table is for preliminary design use only. Final design should include a complete analysis, including the bearing capability of the foundation supporting the column.

Rosboro TREATED GLULA When You Need It To La

Columns-Dry Allowable Axial Loads (Pounds) for Combination No. 49 Southern Pine 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 worse.

Effective		Lan	nination Net	Width = 3 ³/s	s in.			Lan	ination Net \		Lamination Net Width = 7 in.						
Column	Net Depth = $3^{1}/2$ in. (3 lams)			Depth = $3^{1}/2$ in. (3 lams) Net Depth = $5^{1}/2$ in. (4 lams)			Net Dept	Net Depth = $5^{1/2}$ in. (4 lams) Net Depth = 7 in. (6 lams)						Net Depth = 7 in. (6 lams)			
Length	Load Duration Factor			Load Duration Factor			Load Duration Factor			Load Duration Factor			Load Duration Factor				
(ft.)	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	5,716	5,998	6,159	9,496	9,880	10,101	23,353	25,260	26,381	31,191	33,568	34,952	46,702	51,791	54,942		
9	4,886	5,091	5,208	8,007	8,288	8,449	20,979	22,432	23,279	27,777	29,550	30,575	43,787	48,081	50,680		
10	4,205	4,353	4,435	6,825	7,037	7,158	18,758	19,884	20,539	24,644	25,996	26,778	40,737	44,272	46,369		
11	3,639	3,750	3,813	5,877	6,041	6,135	16,767	17,658	18,174	21,880	22,938	23,549	37,647	40,523	42,207		
12	3,173	3,260	3,310	5,109	5,238	5,311	15,019	15,736	16,150	19,487	20,331	20,818	34,634	36,980	38,347		
13	2,788	2,858	2,898	4,478	4,582	4,641	13,497	14,081	14,419	17,426	18,111	18,506	31,795	33,728	34,853		
14	2,468	2,524	2,557	3,956	4,040	4,088	12,173	12,656	12,935	15,651	16,215	16,539	29,181	30,793	31,730		
15	-	-	-	-	-	-	11,021	11,425	11,657	14,119	14,588	14,858	26,807	28,167	28,956		
16	-	-	-	-	-	-	10,016	10,356	10,538	12,791	13,186	13,412	24,666	25,823	26,494		
17	-			-		-	9,136	9,405	9,556	11,635	11,970	12,162	22,741	23,734	24,309		
18	-	-		-		-	8,347	8,573	8,702	10,624	10,910	11,075	21,012	21,870	22,367		
19	-		-		-	-	7,649	7,843	7,955	9,735	9,983	10,124	19,457	20,204	20,636		
20	-	-	-		-	-	7,033	7,202	7,298	8,951	9,166	9,289	18,058	18,712	19,089		
21	-	-	-	-	-	-	6,487	6,634	6,719	8,256	8,444	8,551	16,796	17,372	17,703		
22	-	-	-	-	-	-	-	-	-	-	-	-	15,655	16,165	16,457		
23	-	-	-	-	-	-	-	-	-	-	-	-	14,622	15,075	15,335		
24	-	-	-	-	-	-	-	-	-	-	-	-	13,685	14,088	14,320		

Rosboro TREATED GLULAM When You Need It To Last

Columns-Wet Allowable Axial Loads (Pounds) for Combination No. 49 Southern Pine 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 worse.

Effective		Lai	mination Net	Width = 3 ³ /8	in.		Lamination Net Width = 51/4 in.							Lamination Net Width = 7 in. Net Depth = 7 in. (6 lams)		
Column	Net Dep	th = 3 ½ in.	. (3 lams)	Net Depth = 5 1/2 in. (4 lams)			Net Dept	Net Depth = 5 1/2 in. (4 lams)			Net Depth = 7 in. (6 lams)					
Length	Load Duration Factor			Load	Load Duration Factor			Load Duration Factor			Load Duration Factor			Load Duration Factor		
(ft.)	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	4,656	4,901	5,041	7,789	8,118	8,307	18,683	20,317	21,283	24,973	27,031	28,235	36,701	40,865	43,467	
9	4,000	4,177	4,277	6,585	6,825	6,962	16,932	18,185	18,915	22,449	23,991	24,880	34,656	38,240	40,432	
10	3,453	3,583	3,653	5,623	5,804	5,907	15,236	16,204	16,765	20,047	21,216	21,889	32,484	35,491	37,288	
11	2,997	3,092	3,146	4,849	4,988	5,068	13,678	14,439	14,880	17,875	18,784	19,307	30,238	32,712	34,165	
12	2,617	2,691	2,734	4,219	4,329	4,391	12,288	12,899	13,252	15,966	16,688	17,104	27,991	30,012	31,189	
13	2,302	2,361	2,395	3,702	3,789	3,840	11,066	11,563	11,851	14,306	14,891	15,227	25,819	27,480	28,444	
14	2,039	2,087	2,115	3,272	3,343	3,384	9,997	10,408	10,645	12,869	13,350	13,625	23,779	25,160	25,960	
15	-	-		-	-		9,063	9,406	9,603	11,624	12,023	12,252	21,902	23,062	23,735	
16		-					8,245	8,535	8,697	10,541	10,877	11,069	20,193	21,179	21,749	
17		-					7,528	7,764	7,892	9,596	9,881	10,044	18,647	19,491	19,980	
18	-	-		-	-		6,889	7,081	7,191	8,768	9,012	9,152	17,251	17,980	18,402	
19		-					6,317	6,482	6,577	8,040	8,250	8,371	15,992	16,626	16,992	
20	-	-		-	-		5,811	5,955	6,037	7,396	7,579	7,683	14,855	15,410	15,730	
21	-	-	-	-	-		5,363	5,488	5,560	6,825	6,985	7,076	13,828	14,316	14,597	
22		-		-			-			-	-	-	12,898	13,330	13,578	
23	-	-	-	-	-		-	-	-	-	-	-	12,054	12,438	12,658	
24	-	-	-	-	-		-	-	-	-	-	-	11,287	11,630	11,826	

Design property notes for both Dry-Use and Wet-Use service conditions:

- (1) This table is for preliminary design use only. Final design should include a complete analysis, including bearing capacity of the foundation supporting the column.
- (2) The tabulated allowable loads apply only to one-piece glulam members made with all N1M16 Southern pine laminations (Combination 49) without special tension laminations.
- (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.
- (4) For side loads, other eccentric end loads, or other combined axial and flexural loads, see NDS-05.
- (5) The column is assumed to be unbraced, except at the column ends, and the effective column length is equal to the actual column length.
- (6) Volume factor for Fbx is in accordance with NDS-05. Size factor for F_{by} is $(12/d)^{1/9}$, where d is equal to the lamination width in inches.
- (7) Dry-use compression parallel to grain (F_c) = 2,100 psi for 4 or more lams, or 1,450 psi for 2 or 3 lams. For wet-use, compression parallel to grain (F_c) = 2,100 x 0.73 psi for 4 or more lams, or 1,450 x 0.73 psi for 2 or 3 lams.
- (8) Dry-use modulus of elasticity (E) = 1.7×10^6 psi. Wet-use Modulus of elasticity (E) = $1.7 \times 0.833 \times 10^6$ psi.
- (9) Dry-use flexural stress when loaded parallel to wide faces of lamination (F_{by}) = 1,950 psi for 4 or more lams, or 1,750 psi for 3 lams. Wet-use flexural stress when loaded parallel to wide faces of lamination (F_{by}) = 1,950 x 0.8 psi for 4 or more lams, or 1,750 x 0.8 psi for 3 lams.
- (10) Dry-use flexural stress when loaded perpendicular to wide faces of lamination (F_{tot}) = 1,800 psi for 2 lams to 15 in. deep without special tension laminations. Wet-use flexural stress when loaded perpendicular to wide faces of lamination (F_{tot}) = 1,800 x 0.8 psi for 2 lams to 15 in. deep without special tension laminations.
- (11) Treated Glulam Columns are treated with Permapost K-520, which is recommended for ground contact applications.

Glossary of Terms Rosboro

APA EWS: A trademark of Engineered Wood Systems (a related corporation of APA-The Engineered Wood Association). Glulams carrying this trademark meet the requirements of ANSI A190-1 and are manufactured by members of Engineered Wood Systems.

APA-The Engineered Wood Association: A nonprofit trade association of the U.S. and Canada engineered wood products industry. Based in Tacoma, Washington, the association is comprised of and represents manufacturers of structural plywood, oriented strand board (OSB), structural composite panels, glued laminated (glulam) timber, wood I-joists and laminated veneer lumber (LVL).

Appearance Classification: Defines the surface finish of the beam. Architectural, Industrial and Framing are the most common appearance classifications. The structural quality of glulam has no relation to the appearance grade specified. For more information on Appearance Classifications, see page 15 (footnote #3) of this booklet.

Beam: Normally a horizontal or sloping member that is designed to carry vertical loads:

- Simple Span: A member that is supported at both ends.
- Continuous: A single member that is supported at more than two bearing locations.
- Cantilever: A member that has one or both supports away from the ends; one of which overhangs its support.

Camber: The curvature built into a beam (in a direction opposite to the expected deflection) to prevent it from appearing to sag under a loaded condition.

Column: Normally a vertical member that is designed to carry loads from a beam:

- Concentrically Loaded: When the resultant load acts parallel to the axis of the member and is applied at its centerline.
- Eccentrically Loaded: When the resultant load acts parallel to the axis of the member but is applied away from its centerline.

Combination Number: The identification used to describe the type of lamination layup in the glulam member, the associated allowable design stresses and if the lumber used was visually or mechanically graded.

Compression Parallel to Grain: A measurement of the internal compressive stress induced in a wood member when a load is applied to the end of the piece. This would normally be thought of as the stress that occurs on a column.

Compression Perpendicular to Grain: A measurement of the internal compressive stress induced in a wood member when a load is applied to the face of the piece. This is also referred to as the bearing stress placed on a joist, beam or similar piece of lumber as it bears or supports a load. The load tends to compress the fibers and it is thus necessary that the bearing area be sufficient to prevent side grain crushing.

Deflection: The vertical displacement that occurs when a beam is loaded, generally measured at positions between supports or at the end of a cantilever.

Deflection Limit: The maximum amount the beam is permitted to deflect under load. Different deflection limits are normally established for live load and total load.

Design Values: Allowable stress values as they are established for each glulam beam, described in terms of Bending (F_b), Horizontal Shear (F_v), Modulus of Elasticity (E) and other stresses.

Dry-use: A consistent moisture content withing the beam of less than 16 perent.

Engineered Wood Systems: An organization dedicated to the promotion of engineered wood systems. Operating in close cooperation with APA, Engineered Wood Systems serves manufacturers of engineered wood products, including glued laminated timber (glulam). Engineered Wood Systems members certify their products with the APA EWS trademark.

Equilibrium Moisture Content: Any piece of wood will give off or take on moisture from the surrounding atmosphere until the moisture in the wood comes to equilibrium with that in the atmosphere. The moisture content of wood at the point of balance is called the equilibrium moisture content and is expressed as a percentage of the weight of the oven-dried wood.

Header: A beam that is used to support walls and/or floor and roof joists that run perpendicular to it.

Horizontal Shear: The measure of the resistance of the shearing stress along the longitudinal axis of a piece of lumber. When a load is applied to a member supported at each end, there is a stress over each support that tends to slide the fibers across each other horizontally. The internal force that resists this action is the horizontal shear value of wood. The shearing action is greatest at mid-depth of the beam at the supports.

KeyBeam® Beam Sizing CD: A CD-ROM produced by Rosboro containing a powerful, easy-to-use beam specification software that aids in finding the best product for any given application.

Laminations: Individual pieces of lumber that are glued together end-to-end for use in the manufacture of glued laminated timber. These end-jointed laminations are then face bonded together to create the desired member shape and size.

Lamination Layup: The physical arrangement of different grades of laminations throughout the depth of a glulam member.

Modulus of Elasticity (E): A measurement of a member's stiffness determined by the ratio of the amount of deflection in proportion to the applied load. A member with a large MOE will deflect less under the applied load than a member with a smaller MOE when other conditions are equal. MOE is often referred to as the E value.

Moisture Content: The amount of water contained in the wood, usually expressed as a percentage of the weight of ovendry wood.

Purlin: A secondary structural framing member such as a joist or rafter that is normally supported by walls or primary beams.

Radius of Curvature: A dimension that is commonly used as a means of describing the camber requirements in a glulam beam.

"Stock" Glulams: Glulams that are manufactured to common, standard dimensions and characteristics and are held in inventory by distributors or dealers for immediate job site delivery. (May be cut to customer-specified lengths.)

Wet-use: A consistant moisture content within the beam of greater than 16 percent.



Software Support

As an alternative to using our printed tables to manually calculate the proper beam for a given application, Rosboro, in association with Keymark of Boulder, Colorado, has developed computer software to aid customers with the design process.

This software – Rosboro KeyBeam® – is an advanced beam design program incorporating all of Rosboro's engineered wood product line. The user is able to not only find the right product for a simple span application, but can also calculate for multiple spans, point loads, cantilevers, and more. Our software recognizes all the United States building codes and offers printable design calculations and beam capabilities.

Current customers and users of Rosboro's engineered wood products may request a complimentary copy of this software by filling out the form in this document (next page) or by completing the online order form on our website at www.rosboro.com.

Online Support

Along with access to our beam sizing software at www.rosboro.com, users will now find expanded technical resources for all Rosboro products.

Providing technical information that designers, engineers, resellers, and builders often need, the Rosboro website contains an extensive library of technical literature published by Rosboro, APA-EWS, and WWPA. Over 40 documents related to engineered wood, plywood, and studs are currently available in popular Acrobat® (PDF) format.

The Rosboro website also contains a FAQ section with answers to common questions asked of the Rosboro staff. Topics covered include engineered wood, plywood, studs, and general questions about Rosboro. We are committed to keeping our customers informed and making the process of working with wood products as easy as possible.

Live Technical Support

Rosboro's Technical Support Hotline is there for times when you need our help. Whether you are an architect, engineer, designer, framing contractor, general contractor or building official, you may have questions about glulam products:

"Can I notch the beam?"

"What kind of weather protection should I use?"

"Did I ruin the beam with the hole that I just drilled?"

"Can I substitute BigBeam for this competitor's product?"
"What about treated glulam?"

"How do you use Rosboro KeyBeam® software?"

Our Technical Support staff is available to answer your questions when they happen. Things can get complicated, but working with Rosboro glulam products is meant to be easy. Let us help you.

Beam School

Not only does Rosboro have a technical support hotline, but we will bring our Rosboro Beam School to a location near you. During this free three-hour seminar, attendees brush up on glulam basics and learn about the new glulam standards.

Attendees study engineered lay-ups, beam strengths, appearance classifications, dimensional tolerances, load conditions and camber. Rosboro Technical Support staff teaches attendees how to properly specify and select a beam using a printed technical guide or using the Rosboro Rosboro KeyBeam® software – supplied free to every attendee.

To find out if there is a Beam School meeting near you, or if you would like a current schedule of events, speak to a Rosboro distributor or contact Rosboro Technical Support.

Technical Support Hotline:

1-877-457-4139



PLANNING FOR THE FUTURE

The entire Rosboro family shares a commitment to environmentally sound forest management. Because we value the land and the trees it produces, we have developed sound forestry programs and advanced environmental practices. We take a common sense approach that will sustain the forest and the environment for many generations to come.

The environment, our customers and the local community all benefit from our commitment to protect our surroundings. Through our efforts, wildlife has thrived on Rosboro land for many years.

We replant five seedlings for every tree harvested and as the trees grow, we fertilize, control competing vegetation and thin to stimulate growth. We carefully manage young forests on our lands using selective cutting after 25 and 40 years. At 50 years, the remaining large, fully mature trees are harvested. Cutting trees marks the beginning of a truly sustainable forest.

We value water quality and appreciate its impacts on the environment. On our own lands, we use 100-foot buffer strips of live trees to protect the streams and fish habitat. To encourage bird populations, we leave standing "snags" for nesting as well as downed trees for habitat.

Timber harvesting today is strictly regulated to preserve the environment. The Oregon Forest Practices Act was the first law of its kind in the nation and it is still one of the strongest. We are proud to state that Rosboro forest management criteria exceed the standards set by this law.

Rosboro practices sound, sustainable forestry. We are proud of our record and our proactive approach to forest management and environmental health.

Rosboro

Growing Today. Building Tomorrow.®

Rosboro

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