Rosboro

Growing Today • Building Tomorrow®

Glulam Technical Guide

- X-Beam
- BigBeam
- Treated Glulam

Wood, The Natural Choice for Today and Tomorrow

Rosboro has long been committed to sustainable manufacturing processes and responsibly managed forestlands. Now it looks like we're ahead of the curve.

In March 2011 the U.S. Department of Agriculture (USDA) introduced a strategy to promote the use of wood as a green building material. "Wood has a vital role to play in meeting the growing demand for green building materials," said Agricultural Secretary Tom Vilsack.

Concurrently, Forest Service Chief Tom Tidwell issued a directive calling for increased use of locally milled timber in all new agency buildings and facilities. "Our country has the resources, the work force and the innovative spirit to reintroduce wood products into all aspects of the next generation of buildings," Tidwell said. "As we move forward with restoring America's forests, we are getting smarter and more efficient in how we use wood products as both an energy and green building source, which will help maintain rural jobs."

A recent Forest Service lifecycle analysis found that harvesting, transporting, manufacturing and using wood (lumber and panel products) yields fewer greenhouse gas emissions than other commonly-used building materials. In response, Rosboro will continue to do what we do best: offer the building community a range of high quality wood products and maintaining our focus on a sustainable future.

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

Table of Contents

The Power of Glulam

As the largest glulam manufacturer in North America, Rosboro offers a full line of glulam products to meet the needs of residential and commercial builders. Rosboro's glulam products, such as X-Beam, BigBeam, and Treated Glulam, are stocked throughout the country to provide next-day shipment. These popular brands are sold to distributors in long lengths, which are cut to length when ordered, and shipped with the balance of the framing package.

In 2009, Rosboro added custom glulam to the product line. Capabilities include beams in depths up to 53", widths up to 14 1/4", and lengths to 100', as well as specified camber, curved glulam, and beam fabrication. Species include Douglas fir, yellow cedar, and Port Orford cedar, and all beams can be specified with preservative treatment that fits a specific commercial, industrial, or residential application. Available with FSC® certification, Rosboro Custom Glulam is offered in many different appearances, including framing, industrial, architectural, premium, and rough-sawn. Rosboro can also manufacture a wide array of curved shapes up to 100 feet long.

Certifications

- APA/EWS
- Independent Inspection Title 24
- FSC
- JAS (Japan)
- CSA (Canada)

FSC
www.fsc.org
FSC® C011382
The mark of responsible forestry

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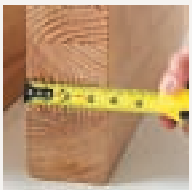
Rosboro Glulam Products - Descriptions and Available Appearance Classifications

X-Beam™



24F V4 Layup, Full Framing-Width, I-Joist and Conventional Depths, *Architectural Appearance*

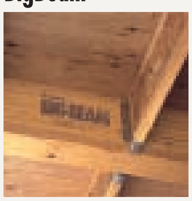
5000' Radius

Rosboro X-Beam™

X-Beam is the building industry's first full framing-width stock glulam in architectural appearance. As a preferred option for saving time and money, X-Beam frames flush and eliminates the need to fill $^{3}/_{8}$" gaps on the jobsite, which helps builders lower installed costs, win bids, and execute their projects on time and on budget.

With beams and columns available in $3^{1}/_{2}$", $5^{1}/_{2}$", $6^{3}/_{4}$", and $8^{3}/_{4}$" widths, and I-Joist compatible and conventional depths, X-Beam has gained a reputation as the most adaptable and cost-effective EWP in the market. Major hardware manufacturers like Simpson Strong-Tie and USP support X-Beam products with full lines of compatible hardware. Backed by Rosboro's signature customer support, X-Beam is the ideal glulam for today's building marketplace.

BigBeam®



High Strength, I-Joist Depth Glulam, Balanced Layup, *Framing Appearance*

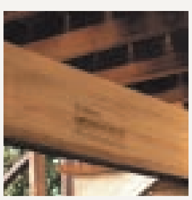
Zero Camber

Rosboro BigBeam®

Rosboro BigBeam is our highest-strength I-Joist compatible glulam beam. From modern residential to commercial applications, BigBeam has become the high-performance glulam of choice for architects, engineers, and builders looking for a beam with maximum strength, stability and versatility.

With a balanced layup and zero camber, BigBeam ensures a flat, consistent surface when used in conjunction with engineered floor systems. This hybrid glulam (LVL and dimension lumber) matches standard I-Joist depths and wall-framing widths, making BigBeam one of the market's favorite multi-purpose, high-strength glulam solutions.

Treated Glulam



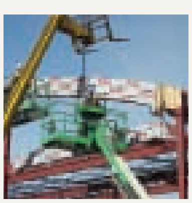
Rosboro 24F 1.8E Pressure Treated, I-Joist Depth Glulam, Balanced Layup, *Framing Appearance*

Zero Camber

Rosboro Treated Glulam

Here's the glulam that can brave the elements. **Rosboro Treated Glulam Beams** are made from southern yellow pine and then treated with a clear preservative to resist rot, decay, and insect attack, making this product the ideal choice for above-ground and severe-weather applications. Excellent for decks, porches, and balconies, Rosboro Treated Glulam has a balanced lay-up and is available in standard framing widths of $3^{1}/_{2}$" and $5^{7}/_{16}$" and I-Joist compatible depths ranging from $9^{1}/_{2}$" through 18". **Rosboro Treated Glulam Columns** are available in $3^{3}/_{8}$", $5^{1}/_{4}$", and 7"widths and $3^{1}/_{2}$", $5^{1}/_{2}$", and 7" depths. Rosboro Treated Glulam Columns are pressure treated with a mineral spirit-borne copper naphthenate preservative that provides an ideal fungicide and insecticide for the long-term preservation of glulam columns in both ground contact and above-ground uses.

Custom Glulam



Wide Range of Appearances and Textures Including *Premium Hand Select Appearance*

Rosboro Custom Glulam

We are able to offer our industry-leading glulam in custom sizes that give our customers greater flexibility and the convenience of combining custom orders with other building materials.

Manufactured from Douglas fir, Alaska cedar, and Port Orford cedar, Rosboro's Custom Glulam is available in a wide range of appearances, I-Joist compatible and conventional depths, and curved shapes. Products can be manufactured up to 100' long, 53" deep, and $14^{1}/_{4}$" wide.

As an engineered wood product, glulam is manufactured to meet specific design stresses. This is accomplished by placing the strongest lams on the top and bottom of the beam, where maximum tension and compression stresses occur. This process ensures that we use lumber resources efficiently while producing glulam beams with maximum structural quality.

Individual lams typically are $1^{3}/_{8}$" thick for southern pine and $1^{1}/_{2}$" thick for Douglas fir and other western species, though other thicknesses may also be used. Offering glulam products ranging in net widths from $3^{1}/_{8}$" to $14^{1}/_{4}$", Rosboro is the first manufacturer to offer full framing-width stock glulam in architectural appearance (X-Beam™).

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 and MOE, are assigned. The family of standard Rosboro glulam beam products and their corresponding allowable stresses are shown below.

Balanced and Unbalanced Beams

Rosboro glulam is manufactured in balanced or unbalanced configurations.

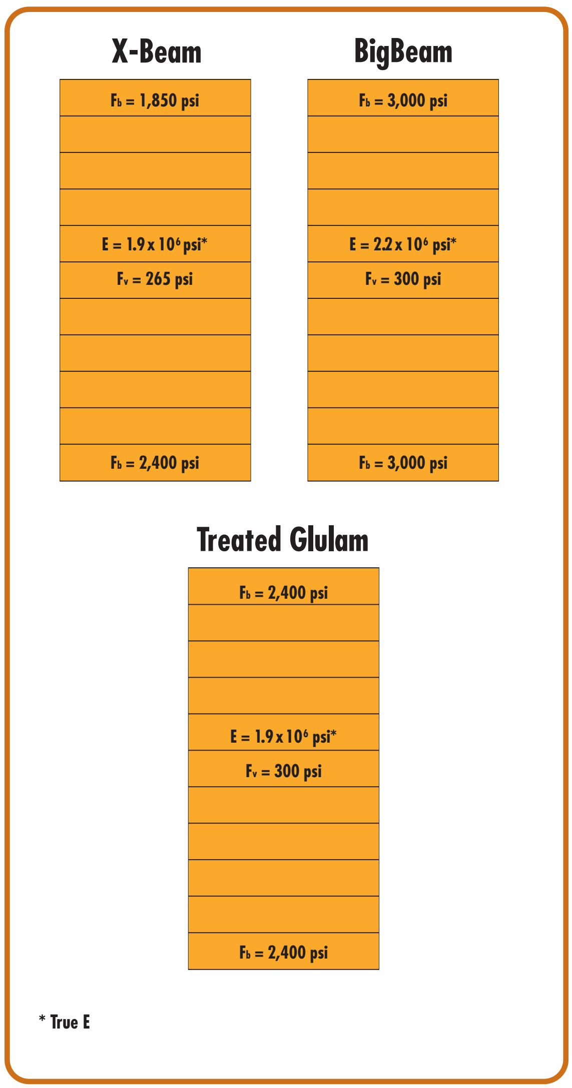
In unbalanced beams, the strength of lumber used on the beam's tension side is higher than the lumber used on the corresponding compression side. As a result, unbalanced beams have different bending stresses assigned to the compression and tension zones and must be installed accordingly. To help ensure proper installation of unbalanced beams, Rosboro clearly stamps the top of the beam with the word " TOP ".

Balanced members are symmetrical in lumber quality from the horizontal center line to the top and bottom. Balanced beams are often 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, though an unbalanced beam is more efficient for this use. Conversely, unbalanced beams work in multi and cantilever applications.

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.

Rosboro Beam Design Stress Comparison



Apparent E vs True (shear-free) E

In theory, the total deflection, or elasticity, of a structural member accounts for both bending and shear stresses, but not all engineered wood manufacturers use the same standards in their published materials. This leads to the question, what is the difference between Apparent E and True E, and is one more “true” than the other?

Shear-free modulus of elasticity, commonly known as True E in the engineered wood industry, measures bending deflection of a structural member without accounting for shear deflection. This may raise the structural values on paper, but when it comes to code compliance, shear deflection ultimately must be calculated and combined with bending deflection.

Apparent E, on the other hand, does account for shear deflection by following an equation for simply supported beams subjected to uniform loads. That’s why most glulam manufacturers publish Apparent E values, but some companies elect to publish only True E values, and the result is that there’s some confusion in the industry.

Rosboro has chosen to solve this dilemma by including both True E and Apparent E in our values charts, which our clients will find clearly indicated on the pages of this Technical Guide and other Rosboro publications.

The following table can be used as a rule of thumb to convert a published $E_{apparent}$ to E_{true}, or vice versa, so that an equitable comparison between similar products can be made:

$$E_{true} = 1.05 \times E_{apparent}$$

Equivalent $E_{apparent}$ and E_{true}(a)

$E_{apparent}$ (10^6 psi)(b)	Equivalent E_{true} (10^6 psi)
1.5	1.6
1.6	1.7
1.7	1.8
1.8	1.9
1.9	2.0
2.0	2.1
2.1	2.2

(a) Refer to APA Technical Topics TT-082 for detailed information.
(b) As published for glulam.

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 A190.1-2007, Structural Glued Laminated Timber. ANSI A190.1-2007 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 10^6 psi(*apparent*)) needed for typical residential applications, while greatly simplifying the design specification.

(7) Designation of appearance classification. *FRAMING*, *INDUSTRIAL*, *ARCHITECTURAL*, or *PREMIUM*.

Rosboro Appearance Classifications

It should be noted that “appearance” classifications refer strictly to finish criteria rather than performance capabilities. The term “grade” is often mistakenly used in conjunction with appearance, but grade traditionally refers only to structural characteristics. Rosboro glulam is available in the following appearances:

Architectural Appearance
Used when finished appearance is important but not the overriding consideration. Suitable for applications where glulam is exposed in the finished structure, such as residences, office buildings, restaurants, and schools.

- Voids larger than 3/4" are filled
- Low laminations are repaired
- All exposed faces are sanded
- Corners of the wide faces exposed to view are eased

Industrial Appearance
Used in applications where appearance is not primary importance, such as industrial and warehouse buildings.

- Voids on the edges of laminations are not filled
- Narrow faces of the beam are not surfaced
- Edges are not eased
- Occasional misses, low laminations, and light wane are permitted

Framing Appearance
Intended for concealed applications and available in widths designed to fit flush with standard wall framing. The Framing appearance standard allows for more irregularities than either Architectural or Industrial appearance standards.

- Two wide faces are “hit and miss” surfaced
- Low laminations, glue lines squeeze-out and light wane are permitted
- Voids are not filled

Premium “Hand Select” Appearance (Rosboro Standard)
Rosboro’s top appearance classification; for use when aesthetic appeal is the primary consideration. The finished glulam will still exhibit the natural visual character of the lumber, such as knots and distorted grain.

- Lumber is pre-graded for sound-tight knots and limited defect
- Maximum open void of 1/2" on either face or side
- No filler unless specified
- Sanded finish misses not permitted
- Edges eased as specified
- Wane not permitted
- Rosboro Hand Select exceeds the industry premium appearance standard

Premium Appearance (Industry Standard)
Matches the industry standard for premium appearance; specified for applications in which appearances are critical. The finished glulam will still exhibit the natural visual character of the lumber, such as knots and distorted grain.

- All voids greater than 1/4" filled with wood filler
- Sanded finish misses not permitted
- Edges eased as specified
- Wane not permitted

Framing-L Appearance
A sub-classification of the Framing Appearance category, 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 Framing Appearance.

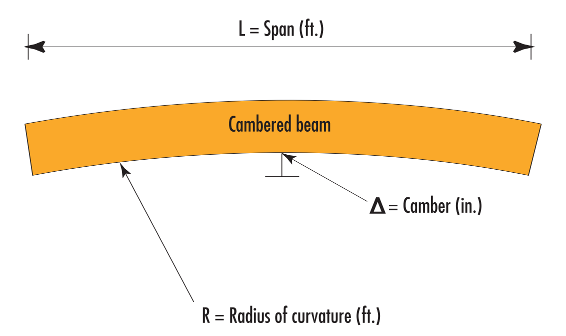
Custom Glulam Beams – Architectural Appearance

Among engineered wood products, glulam is unique in that it can be easily cambered to suit specific load-bearing spans and decrease the effects of deflection. While the ability to pre-engineer glulam beams is a distinct advantage for many longer span applications, it can be a disadvantage in circumstances where too much camber can cause jobsite framing problems. In fact, camber may not be necessary when framing elements are rarely subjected to the specified design live loads and the deflection due to dead loads is minimal. In such applications, camber designed into a beam may never relax. In floor construction this can cause a permanent, unwanted crown, and in multi-story applications it may increase the difficulty of framing successive floors.

Rosboro X-Beam is manufactured with a very slight 5,000 foot radius, while BigBeam and Treated Glulam are manufactured with zero camber. Rosboro Custom Glulam can be ordered with specified camber anywhere from a fraction of an inch up to a tight curve or arch. Custom glulam typically has a lead time of 2 to 3 weeks.

For additional information on cambering glulam beams, go to the Glulam Terms & Species page at www.rosboro.com.

Beam Camber Parameters



Camber for 5,000-foot radius

Span in feet:	10	12	14	16	18	20	22	24	26	28
Camber in inches:	—	—	—	—	1/8	1/8	1/8	1/8	1/4	1/4

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.)	$\text{Radius} = \dfrac{(\text{length in feet})^2 \times 1.5}{\text{Camber in inches}}$	Length = 20′, Camber = 1/4″ or .25″ $\dfrac{20^2 \text{ X } 1.5}{.25''} = 2{,}400'$ Radius
To Calculate the Camber (in.)	$\text{Camber} = \dfrac{(\text{length in feet})^2 \times 1.5}{\text{Radius in feet}}$	Length = 24′, Radius = 5,000′ $\dfrac{24^2 \text{ X } 1.5}{5{,}000'} = 0.17''$ Camber

Camber Chart (in.)

Length	12			14			16			18		
	Min	Target	Max	Min	Target	Max	Min	Target	Max	Min	Target	Max
Radius 3500'	-1/4	0	1/4	-1/8	1/8	3/8	-1/8	1/8	3/8	-1/8	1/8	3/8
Radius 5000'	-1/4	0	1/4	-1/4	0	1/4	-1/8	1/8	3/8	-1/8	1/8	3/8
No Camber	-1/4	0	1/4	-1/4	0	1/4	-1/4	0	1/4	-1/4	0	1/4

Length	20			22			24			26		
	Min	Target	Max	Min	Target	Max	Min	Target	Max	Min	Target	Max
Radius 3500'	-1/8	1/8	3/8	-1/8	1/4	5/8	-1/8	1/4	5/8	-1/8	1/4	5/8
Radius 5000'	-1/8	1/8	3/8	-1/8	1/8	1/2	-1/4	1/8	1/2	-1/8	1/4	5/8
No Camber	-1/4	0	1/4	-3/8	0	3/8	-3/8	0	3/8	-3/8	0	3/8

ANSI: A 190 1-2007 Tolerances. Tabulated values are inches.

4.2.2 The tolerances are applicable at the time of manufacture without allowance for dead load deflection. Up to 20 ft. the tolerance is plus or minus 1/4 in. Over 20 ft. increase tolerance 1/8 in. per each additional 20 ft. or fraction thereof, but not to exceed 3/4 in.

Up to 20' = plus or minus 1/4" 21' - 40' = plus or minus 3/8" 41' - 60' = plus or minus 1/2" 61' - 72' = plus or minus 5/8"

Rosboro glulam products are often distributed alongside other manufacturers products. We have found that we can best serve the industry by supplying a 5,000 foot-radius X-Beam or zero camber BigBeam and Treated Glulam. Other manufacturers' may produce their beams with anywhere from zero to 3,500 foot-radius camber. As the table clearly indicates, when the manufacturing tolerance is taken into consideration, the actual difference between the values is very close at distances less than 26 feet, which represents the majority of residential beam applications.

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. 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 dimension lumber ranging from 16 to 19 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 and timber.

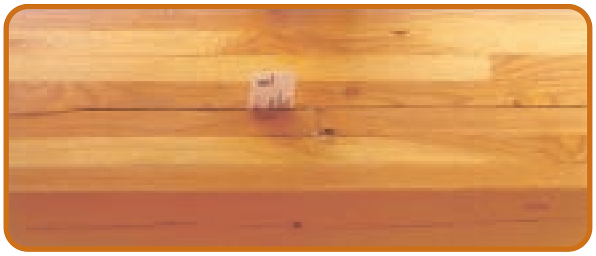
Model building codes specify minimum requirements for ventilation of floor and roof spaces. These ventilation requirements can vary depending on whether or not vapor retarders are used and whether or not roofs are pitched and to what degree.

Rosboro glulams are 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 also 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.

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.



Typical glulam checking is shown above. 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.)

Glulam beams typically exhibit fewer and less severe checks than comparable size sawn timbers due to their relatively low and consistent 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.

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.

To learn more, go to www.Rosboro.com and click on Custom Glulam under the Our Products tab (sidebar content, “What is checking?”).

Connection Detailing

As with any structural material, proper connection detailing is essential to ensure 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 connections and indicate the consequences of an incorrect detail. Major hardware manufacturers like Simpson Strong-Tie and USP supply a full line of compatible products for the proper connection of glulam members.

Treated Glulam Beams and Columns You Can Trust

As the leading producer of glulam products in the U.S., Rosboro continues to respond to demand by producing Treated Glulam Beams and Columns. These beams and columns are made from southern pine and then treated to resist rot, decay and insect attack or other conditions that can destroy wood. Installation is easy because the beams and columns are straight and manufactured to match standard framing widths and depths. Backed with a 25-year warranty, Rosboro Treated Glulam products are a solid choice for decks, porches and balconies.

Chemical Resistance to Bugs and Mold

Rosboro Treated Glulam Beams are pressure treated with a clear industrial wood preservative that provides chemical resistance against insect attack, decay, mold, mildew, bacterial growths and is also effective against the Formosan termite. Treated Glulam Beams are intended to be used in above ground exterior applications. The treatment is clean, non-swelling and non-leaching and leaves the beam a light honey color. The 24F-1.8E zero camber beam is made in a balanced layup, meaning there is no top or bottom, making installation clean and simple. For additional information, go to www.Rosboro.com and click on Treated Glulam under the Our Products tab.

Columns Approved for Ground Contact

Rosboro Treated Glulam Columns are pressure treated with a mineral spirit-borne copper naphthenate preservative that provides an ideal fungicide and insecticide for the long-term preservation of glulam columns in both ground contact and above-ground uses. This treatment is effective against the dampwood termite, drywood termite and subterranean termites including the Formosan termite. Rosboro recommends that columns be placed on pier blocks, but if the column is used in a direct ground contact application, then it should sit in a gravel bed that allows proper drainage. This treatment is intended for exterior applications only and has a color range between chocolate-brown and dark green. For additional information, go to www.Rosboro.com and click on Treated Glulam under the Our Products tab.

Appearance Classification

Rosboro Treated Glulam is sized to match standard framing widths. The beams and columns are manufactured to Framing Appearance standards that allow light wane, glue squeeze and many other visual imperfections. Rosboro limits wane and lightly sands the beams and columns to remove excess glue and reduce blemishes associated with the Framing Appearance classification. These enhancements give Rosboro treated products the advantage of full framing width and an appearance that is acceptable for the intended use.

Restricted Uses

Although Rosboro Treated Glulam Beams and Columns are pressure treated, they should not be used in marine applications such as docks and marinas and in conditions where the product is in contact with standing water.

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, structural integrity is reduced by improperly drilling holes, but by adhering to Rosboro's Allowable Horizontal Hole Chart, holes can indeed be safely drilled into or through glulam beam products.

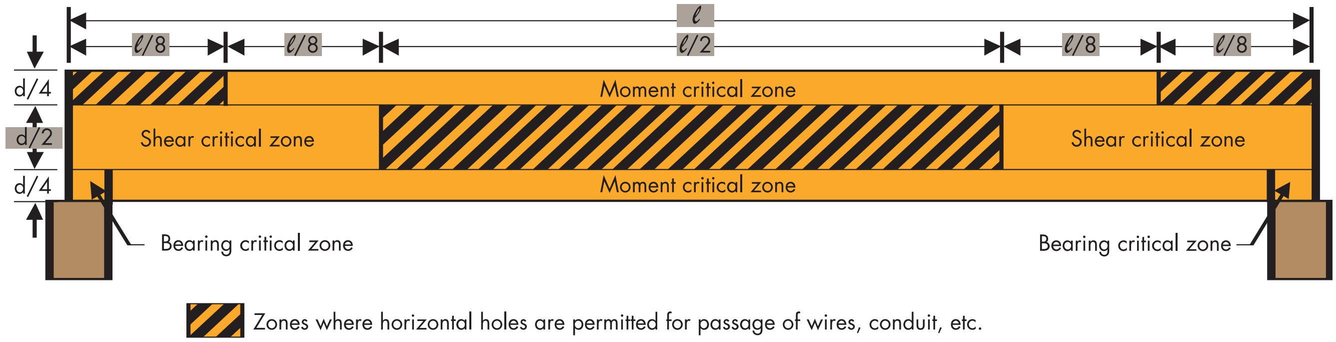
The chart below provides guidance for drilling horizontal holes without compromising the structural integrity of the glulam. For drilling vertical holes, the structural capacity of the glulam will be reduced. The following formula may be used to determine the reduction in the beam's load-carrying capacity: 1.5x (hole diameter) / (beam width) = the reduction. For instance, a 1/2" hole in the middle of a 5-1/2" ridge beam for a ceiling fan wire would cause a loss in carrying capacity at that point in the beam of 14% [1.5 x .5 / 5.5 = .136 = 14%].

For more in-depth information on field drilling (and notching) of glulams, go to www.Rosboro.com and click on Glulam Guidelines under the Technical Data and Support tab. Even using these simple guidelines, remember: if you are not sure, don't drill. Call Rosboro Technical Support at 1-877-457-4139 for guidance.

Drilling holes in glulam is permissible if done properly. *(See below for details.)*

Allowable Horizontal Hole Chart

Zones where small horizontal holes are permitted in a uniformly loaded, simply supported beam



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 1½" 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.

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.

Water Resistant Glue

Rosboro glulam is manufactured with EcoBind™ Resin Technology that meets or exceeds the most stringent global emissions standards. EcoBind Resin Technology is a licensed trademark of Momentive Specialty Chemicals. The requirements for the manufacture of glued laminated beams are covered in the American National Standard, ANSI A190.1 "Structural Glued Laminated Timbers." This standard requires that all adhesives used in glulam comply with ASTM D2559 "Standard Specification for Adhesives for Structural Laminated Wood Products for Use Under Exterior (Wet Use) Exposure Conditions." Therefore glulam must be produced exclusively with moisture resistant adhesives such as phenolic or melamines.

Because formaldehyde levels associated with glulam are so low, these products easily meet or have been exempted from two of the world's most stringent formaldehyde emissions standards and regulations:

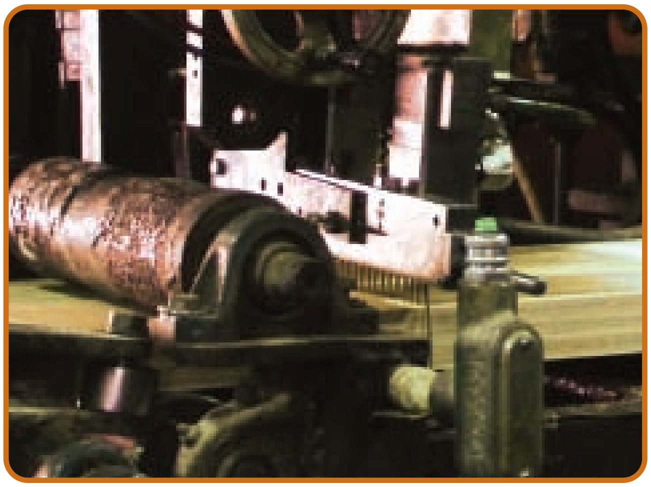
- California Air Resources Board (CARB) Air Toxic Control Measure for Composite Wood Products
- Japanese Agricultural Standards (JAS)

For more information go to www.rosboro.com and click on Technical Library under the Technical Data and Support tab.

Glulam Fire Resistance

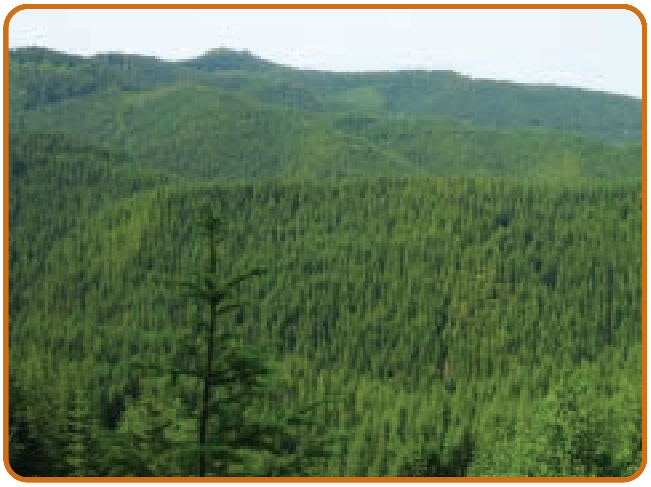
Glulam beams and columns provide natural fire resistance. In the presence of fire the outer portion of a glulam member becomes charred. This layer of charred wood then functions as an insulator, helping to protect the undamaged interior of the member from the heat. Glulam can be designed with a one-hour or two-hour fire rating. For more information go to www.rosboro.com and click on Technical Library under the Technical Data and Support tab.

Photo courtesy of the APA



Forest Stewardship Council

Rosboro is pleased to offer Forest Stewardship Council (FSC®) Chain of Custody certification for its custom glulam products. With this designation, Rosboro assures customers that, when requested, the wood they purchase is sourced from FSC-certified forests and meets strict tracking requirements. The FSC Chain of Custody procedure tracks material through the production process - from the forest to the consumer - including the stages of processing, manufacturing, and distribution.



FSC
www.fsc.org
FSC® C011382

The mark of responsible forestry

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 beams 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

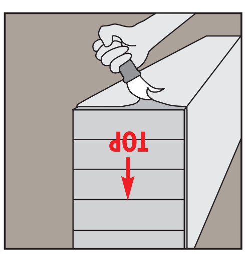
Delivery: Your Rosboro Glulam Dealer has taken every reasonable precaution to protect the beam during shipment to your project site. **Caution:** The beams are heavy and can be awkward to handle, so during the unloading process, take extreme care.

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

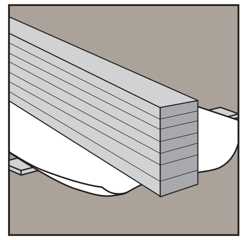
- Turn the beams so the paper folds and the staples are facing down (beam is then upside down) and carefully cut the paper. Use a hooked utility blade (or similar cutting tool) when cutting the paper to avoid damaging the finish. *(See Figure 1.)* Do not remove the paper, allow it to drop away from the beam, still held in place by the staples. During the inspection, look for areas that may need repair. *(See Figure 2.)*

Figure 1. *Cut Paper Wrap With A Hooked Utility Blade.*



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

Figure 2. *Inspect Beam On The Ground Before Installation.*



Installation: Forklift and handling damage can occur 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.

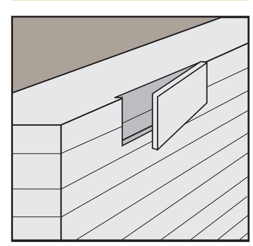
Solution: Excessive burns cannot be repaired, leaving the beam unsuitable for transparent finishes. In cases of mild exposure, sand the affected areas to remove the sunburned marks on the beam. **Caution:** Sand with the grain of the wood. Do not cross sand.

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 3.)*

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 3. *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.

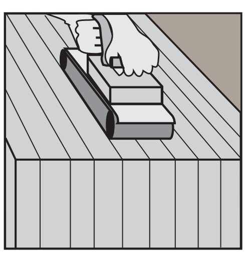
Solution: First, allow the beam to dry. Once dry, remove the dried dirt by brushing or sanding. If only a small area is affected, feather out the sanding from the damaged area. If a large part of the beam is affected, we recommend that you sand the entire beam to maintain a uniform finish.

Mold and Fungus: Rosboro glulams are wrapped in ultraviolet resistant paper, which can hold 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 discoloration with a belt sander. *(See Figure 4.)*

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-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.

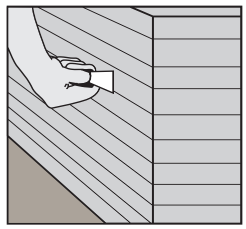
Figure 4. *Remove Blemishes With A Belt Sander.*



Caution: If punkiness 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 delamination 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.

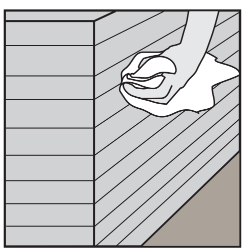
Figure 5. *Apply Putty To Cosmetically Repair Seasoning Checks.*



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 with putty, just fill enough to cover the opening (at least $^{1}/_{8}$" 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.

Figure 6. *Remove Excess Putty With Mineral Spirits.*



Rosboro Beams: Design Values

Product	Layup Combination	Flexural Stress F_{bx} (psi)[1]		Compression Perpendicular to Grain $F_{c\perp}$ (psi)	Shear[2] F_v (psi)	E_x (10^6 psi)	
		Tension Zone	Compression Zone			Apparent	True
X-Beam	24F-V4	2,400	1,850	650	265	1.8	1.9
BigBeam	30F-E2M3	3,000	3,000	650	300	2.1	2.2
Treated Glulam	24F-V5MI/SP	2,400	2,400	740	300	1.8	1.9
Wet-Use factor		0.80	0.80	0.53	0.875	0.833	0.833

Notes for Glulam Beam Design Values:

(1) F_{bx} shall be adjusted by the volume effect factor using the following formula:

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

Where: b = beam width (in.), d = beam depth (in.), L = beam length (ft.), x = 10 for X-Beam and BigBeam, x = 20 for Treated Glulam.

(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_v) shall be multiplied by a factor of 0.72.

X-Beam Camber at Midpoint of the Beam Length (inches)

	5,000 ft. Radius																									
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	1/8	1/8	1/4	1/4	1/4	3/8	3/8	3/8	1/2	1/2	1/2	1/2	1/2	3/4	3/4	3/4	7/8	1	1	1	1 1/8	1 1/4	1 1/4

Notes for Camber at Midpoint of Beam Length Table:

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

(2) Camber is measured prior to installation while beam is laying on its side.

Minimum Bearing Length (in.)

Product	Width (in.)	Reaction (lbs)															
		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
BigBeam	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
	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
X-Beam	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
	5 1/2	1.50	1.50	1.50	1.68	1.96	2.24	2.52	2.80	3.36	3.92	4.48	5.03	5.59	6.15	6.71	7.27	7.83	8.39
	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
Treated Glulam Dry-Use	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
	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 Wet-Use	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
	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 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 $F_{c\perp}$ (psi) values.

Rosboro BIGBEAM®
High Performance 2.1E LJC-Glulam

Design Properties

F_b = 3,000 psi
F_v = 300 psi
E = 2.1 x 10^6 psi
True E = 2.2 x 10^6 psi
$F_{c\perp}$ = 650 psi

Width (in.)	Depth (in.)	Weight (lbf/ft.)	Maximum Resistive Shear (lbf) 100%	115%	125%	Maximum Resistive Moment (ft.-lbf) 100%	115%	125%	EI (apparent) (10^6 in.²- lb.)
3 1/2	9 1/2	8.3	6,650	7,648	8,313	13,161	15,136	16,452	525
	11 7/8	10.4	8,313	9,559	10,391	20,565	23,649	25,706	1,026
	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
5 7/16	9 1/2	12.9	10,331	11,881	12,914	20,447	23,514	25,559	816
	11 7/8	16.1	12,914	14,851	16,143	31,949	36,741	39,936	1,593
	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
7	9 1/2	16.6	13,300	15,295	16,625	26,323	30,271	32,904	1,050
	11 7/8	20.8	16,625	19,119	20,781	41,130	47,299	51,412	2,051
	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.
(3) Design properties assume beam is loaded perpendicular to the wide faces of laminations (x-x axis).

Rosboro TREATED GLULAM
When You Need It To Last

Design Properties

Dry-Use
F_b = 2,400 psi
F_v = 300 psi
E = 1.8 x 10^6 psi
True E = 1.9 x 10^6 psi
$F_{c\perp}$ = 740 psi

Width (in.)	Depth (in.)	Weight (lbf/ft.)	Maximum Resistive Shear (lbf) 100%	115%	125%	Maximum Resistive Moment (ft.-lbf) 100%	115%	125%	EI (apparent) (10^6 in.²- lb.)
3 1/2	9 1/2	9.5	6,650	7,648	8,313	10,529	12,109	13,161	450
	11 7/8	11.8	8,313	9,559	10,391	16,452	18,920	20,565	878
	14	14.0	9,800	11,270	12,250	22,867	26,297	28,583	1,440
	16	15.9	11,200	12,880	14,000	29,867	34,347	37,333	2,151
	18	17.9	12,600	14,490	15,750	37,800	43,470	47,250	3,062
5 7/16	9 1/2	14.7	10,331	11,881	12,914	16,358	18,811	20,447	698
	11 7/8	18.4	12,914	14,851	16,143	25,559	29,393	31,949	1,366
	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.
(3) Design properties assume beam is loaded perpendicular to the wide faces of laminations (x-x axis).

Rosboro XBEAM Next-Generation Glulam

Design Properties

EWS 24F-V4

Dry-Use

F_b = 2,400 psi

F_v = 265 psi

E = 1.8 x 10^6 psi

True E = 1.9 x 10^6 psi

$F_{c\perp}$ = 650 psi

Width (in.)	Depth (in.)	Weight (lbf/ft.)	Maximum Resistive Shear (lbf)			Maximum Resistive Moment (ft.-lbf)			EI (Apparent)
			100%	115%	125%	100%	115%	125%	(10^6 in.^{2}- lbf)
3 1/2	6	5.1	3,710	4,267	4,638	4,200	4,830	5,250	113
	7 1/2	6.4	4,638	5,333	5,797	6,563	7,547	8,203	221
	9	7.7	5,565	6,400	6,956	9,450	10,868	11,813	383
	9 1/2	8.1	5,874	6,755	7,343	10,529	12,109	13,161	450
	10 1/2	8.9	6,493	7,466	8,116	12,863	14,792	16,078	608
	11 7/8	10.1	7,343	8,444	9,178	16,452	18,920	20,565	879
	13 1/2	11.5	8,348	9,600	10,434	21,263	24,452	26,578	1,292
	14	11.9	8,657	9,955	10,821	22,867	26,297	28,583	1,441
	15	12.8	9,275	10,666	11,594	26,250	30,188	32,813	1,772
	16	13.6	9,893	11,377	12,367	29,867	34,347	37,333	2,150
	16 1/2	14.0	10,203	11,733	12,753	31,763	36,527	39,703	2,358
	18	15.3	11,130	12,800	13,913	37,800	43,470	47,250	3,062
	19 1/2	16.6	12,058	13,866	15,072	44,363	51,017	55,453	3,893
5 1/2	6	8.0	5,830	6,705	7,288	6,600	7,590	8,250	178
	7 1/2	10.0	7,288	8,381	9,109	10,313	11,859	12,891	348
	9	12.0	8,745	10,057	10,931	14,850	17,078	18,563	601
	9 1/2	12.7	9,231	10,615	11,539	16,546	19,028	20,682	707
	10 1/2	14.0	10,203	11,733	12,753	20,213	23,244	25,266	955
	11 7/8	15.9	11,539	13,269	14,423	25,853	29,731	32,316	1,382
	13 1/2	18.0	13,118	15,085	16,397	33,413	38,424	41,766	2,030
	14	18.7	13,603	15,644	17,004	35,933	41,323	44,917	2,264
	15	20.1	14,575	16,761	18,219	41,250	47,438	51,563	2,784
	16	21.4	15,547	17,879	19,433	46,933	53,973	58,667	3,379
	16 1/2	22.1	16,033	18,437	20,041	49,913	57,399	62,391	3,706
	18	24.1	17,490	20,114	21,863	59,400	68,310	74,250	4,811
	19 1/2	26.1	18,948	21,790	23,684	69,713	80,169	87,141	6,117
	21	28.1	20,405	23,466	25,506	80,850	92,978	101,063	7,640
	22 1/2	30.1	21,863	25,142	27,328	92,813	106,734	116,016	9,397
	24	32.1	23,320	26,818	29,150	105,600	121,440	132,000	11,405
6 3/4	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
	13 1/2	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
	18	29.5	21,465	24,685	26,831	72,900	83,835	91,125	5,905
	19 1/2	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
8 3/4	9	19.1	13,913	15,999	17,391	23,625	27,169	29,531	957
	10 1/2	22.3	16,231	18,666	20,289	32,156	36,980	40,195	1,519
	12	25.5	18,550	21,333	23,188	42,000	48,300	52,500	2,268
	13 1/2	28.7	20,869	23,999	26,086	53,156	61,130	66,445	3,229
	15	31.9	23,188	26,666	28,984	65,625	75,469	82,031	4,430
	16 1/2	35.1	25,506	29,332	31,883	79,406	91,317	99,258	5,896
	18	38.3	27,825	31,999	34,781	94,500	108,675	118,125	7,655
	19 1/2	41.5	30,144	34,665	37,680	110,906	127,542	138,633	9,732

Notes for X-Beam 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.

(3) Design properties assume beam is loaded perpendicular to the wide faces of laminations (x-x axis).

Floor Beams Allowable Loads

Simple Spans
(LDF=1.00)
F_b = 2,400 psi
F_v = 265 psi
E = 1.8 x 10^6 psi
True E = 1.9 x 10^6 psi
$F_{c\perp}$ = 650 psi

Width (in.)	Depth (in.)	Span (feet) 8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
3 1/2	6	405	205	116	71	-	-	-	-	-	-	-	-	-	-	-	-	-
	7 1/2	795	404	231	143	94	64	-	-	-	-	-	-	-	-	-	-	-
	9	1,174	701	403	251	165	114	81	59	-	-	-	-	-	-	-	-	-
	9 1/2	1,308	825	474	296	195	135	96	70	52	-	-	-	-	-	-	-	-
	10 1/2	1,599	1,020	642	401	266	184	132	97	72	55	-	-	-	-	-	-	-
	11 7/8	2,046	1,306	904	583	387	269	193	143	108	83	64	50	-	-	-	-	-
	13 1/2	2,646	1,690	1,170	856	573	399	288	213	162	125	97	77	62	-	-	-	-
	14	2,846	1,817	1,258	921	639	446	322	239	181	140	110	87	70	56	-	-	-
	15	3,268	2,087	1,446	1,059	788	550	397	295	225	174	137	109	87	71	58	-	-
	16	3,696	2,376	1,646	1,205	920	669	484	360	274	213	168	134	108	88	72	59	-
	16 1/2	3,873	2,527	1,751	1,282	979	735	532	396	302	234	185	148	119	97	80	66	54
	18	4,437	3,009	2,085	1,528	1,166	918	693	517	395	307	243	195	158	129	106	88	73
	19 1/2	5,060	3,532	2,448	1,794	1,370	1,079	866	660	505	394	312	250	203	167	138	115	96
	21	5,753	3,978	2,840	2,082	1,590	1,249	998	814	633	494	392	316	257	211	175	146	123
	22 1/2	6,528	4,433	3,262	2,392	1,827	1,426	1,139	929	771	611	485	391	319	263	218	183	154
Width (in.)	**Depth (in.)**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
5 1/2	6	637	322	183	112	73	-	-	-	-	-	-	-	-	-	-	-	-
	7 1/2	1,249	635	363	225	147	100	71	51	-	-	-	-	-	-	-	-	-
	9	1,844	1,102	633	394	260	179	127	93	69	51	-	-	-	-	-	-	-
	9 1/2	2,056	1,297	745	465	307	212	151	110	82	62	-	-	-	-	-	-	-
	10 1/2	2,513	1,603	1,009	630	418	289	207	152	114	87	67	51	-	-	-	-	-
	11 7/8	3,216	2,052	1,420	916	609	423	304	224	169	130	101	79	62	-	-	-	-
	13 1/2	4,159	2,655	1,838	1,346	900	626	452	335	254	196	153	121	97	78	63	50	-
	14	4,473	2,856	1,978	1,448	1,005	700	505	375	285	220	172	137	109	88	71	58	-
	15	5,136	3,280	2,272	1,664	1,239	864	624	464	353	273	215	171	137	111	90	74	61
	16	5,809	3,733	2,586	1,894	1,433	1,052	761	566	431	335	264	210	170	138	113	93	76
	16 1/2	6,086	3,971	2,751	2,015	1,520	1,155	836	622	474	368	291	232	187	153	125	103	85
	18	6,972	4,728	3,276	2,383	1,795	1,396	1,090	813	620	483	382	306	248	203	167	138	115
	19 1/2	7,952	5,551	3,847	2,777	2,091	1,627	1,299	1,038	793	618	490	393	320	262	217	180	151
	21	9,041	6,250	4,432	3,199	2,410	1,875	1,498	1,221	995	777	616	496	404	332	275	230	193
	22 1/2	10,258	6,966	5,055	3,649	2,749	2,140	1,709	1,394	1,156	960	763	614	501	413	343	287	242
	24	11,628	7,741	5,716	4,126	3,110	2,421	1,934	1,578	1,309	1,101	930	750	612	505	421	353	298

Tabulated values are pounds per lineal foot.

Notes for X-Beam Floor Beams:
(1) For preliminary design use only. Final design should include a complete analysis, including bearing stresses and lateral stability.
(2) Span = simply supported beam.
(3) Maximum deflection = L/360 under live load. Where additional stiffness is desired or for other live/total load ratios, design for deflection must be modified per requirements.
(4) Service condition = dry.
(5) Tabulated values represent total loads based on live/total load = 0.8 and are in addition to the beam weight (assumed 35 pcf).
(6) Sufficient bearing length shall be provided at supports.
(7) Maximum beam shear is located at a distance from the supports equal to the depth of the beam.
(8) Allowable loads assume beam is loaded perpendicular to the wide faces of laminations (x-x axis).

Special order sizes in green.

Rosboro XBEAM™ Next-Generation Glulam

Floor Beams Allowable Loads

Simple Spans
(LDF=1.00)
F_b = 2,400 psi
F_v = 265 psi
E = 1.8 x 10^6 psi
True E = 1.9 x 10^6 psi
$F_{c\perp}$ = 650 psi

		Span (feet)																
Width (in.)	**Depth (in.)**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
6 3/4	9	2,263	1,352	776	483	319	220	156	114	84	63	-	-	-	-	-	-	-
	10 1/2	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	-	-	-
	13 1/2	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
	16 1/2	7,469	4,873	3,364	2,427	1,827	1,417	1,026	764	582	452	357	285	230	187	153	126	105
	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
	19 1/2	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
	28 1/2	20,868	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	23,801	14,261	10,172	7,591	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.)	**Depth (in.)**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
8 3/4	9	2,934	1,753	1,006	627	413	285	202	147	109	82	62	-	-	-	-	-	-
	10 1/2	3,997	2,550	1,606	1,003	665	460	329	242	181	138	106	82	64	-	-	-	-
	12	5,224	3,334	2,308	1,505	1,000	695	499	369	278	213	166	130	103	81	64	51	-
	13 1/2	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
	16 1/2	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	7,373	5,016	3,618	2,724	2,119	1,691	1,293	987	768	607	487	394	322	266	220	183
	19 1/2	12,651	8,587	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	9,889	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	16,320	11,082	7,675	5,539	4,173	3,248	2,594	2,115	1,753	1,475	1,213	978	797	657	546	457	385
	24	18,499	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	20,969	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	23,793	15,120	10,862	7,842	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	27,051	16,723	12,040	8,694	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	9,587	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

Tabulated values are pounds per lineal foot.

Notes for X-Beam Floor Beams:

(1) For preliminary design use only. Final design should include a complete analysis, including bearing stresses and lateral stability.
(2) Span = simply supported beam.
(3) Maximum deflection = L/360 under live load. Where additional stiffness is desired or for other live/total load ratios, design for deflection must be modified per requirements.
(4) Service condition = dry.
(5) Tabulated values represent total loads based on live/total load = 0.8 and are in addition to the beam weight (assumed 35 pcf).
(6) Sufficient bearing length shall be provided at supports.
(7) Maximum beam shear is located at a distance from the supports equal to the depth of the beam.
(8) Allowable loads assume beam is loaded perpendicular to the wide faces of laminations (x-x axis).

Special order sizes in green.

Rosboro XBEAM Next-Generation Glulam

Roof Beams Allowable Loads: Snow

Simple Spans
(LDF=1.15)
F_b = 2,400 psi
F_v = 265 psi
$E = 1.8 \times 10^6$ psi
True $E = 1.9 \times 10^6$ psi
F_{cL} = 650 psi

Width (in.)	Depth (in.)	Span (feet)																
		8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
3 1/2	6	599	331	189	117	77	53	-	-	-	-	-	-	-	-	-	-	-
	7 1/2	937	597	373	233	154	106	76	55	-	-	-	-	-	-	-	-	-
	9	1,351	862	596	406	269	187	134	99	74	57	-	-	-	-	-	-	-
	9 1/2	1,505	961	665	478	318	221	159	117	88	68	53	-	-	-	-	-	-
	10 1/2	1,840	1,174	813	595	431	300	216	160	121	94	73	58	-	-	-	-	-
	11 7/8	2,355	1,503	1,041	762	581	437	316	235	178	138	109	86	69	56	-	-	-
	13 1/2	3,045	1,945	1,347	987	753	592	467	348	265	206	163	130	105	86	71	58	-
	14	3,275	2,092	1,449	1,061	810	637	514	389	297	231	183	146	118	97	80	66	55
	15	3,761	2,402	1,664	1,219	931	733	591	480	367	286	226	182	147	121	100	83	69
	16	4,253	2,734	1,895	1,388	1,060	834	673	554	447	349	277	222	181	148	123	103	86
	16 1/2	4,456	2,908	2,015	1,477	1,127	888	717	590	490	384	304	245	199	164	136	113	95
	18	5,104	3,462	2,400	1,759	1,343	1,058	854	698	579	487	398	321	262	216	179	150	126
	19 1/2	5,822	4,065	2,818	2,066	1,578	1,243	998	814	675	568	484	411	335	277	231	194	164
	21	6,619	4,577	3,269	2,397	1,831	1,440	1,150	938	779	655	558	481	417	349	291	245	207
	22 1/2	7,510	5,101	3,754	2,753	2,103	1,642	1,313	1,071	889	748	638	549	477	418	361	304	258
Width (in.)	**Depth (in.)**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
5 1/2	6	941	520	298	184	121	83	58	-	-	-	-	-	-	-	-	-	-
	7 1/2	1,472	939	587	366	242	167	119	87	65	-	-	-	-	-	-	-	-
	9	2,123	1,354	937	637	423	294	211	155	117	89	69	54	-	-	-	-	-
	9 1/2	2,366	1,510	1,044	751	499	347	249	184	139	107	83	65	51	-	-	-	-
	10 1/2	2,892	1,846	1,277	935	677	471	340	252	191	147	115	91	72	58	-	-	-
	11 7/8	3,700	2,363	1,636	1,198	913	686	496	369	280	217	171	136	109	88	72	59	-
	13 1/2	4,785	3,056	2,117	1,550	1,183	927	734	547	417	324	256	205	165	135	111	92	76
	14	5,147	3,287	2,277	1,668	1,273	994	793	611	466	363	287	230	186	152	125	104	86
	15	5,910	3,775	2,615	1,916	1,459	1,135	906	738	577	449	356	286	232	190	157	130	109
	16	6,683	4,296	2,977	2,182	1,651	1,284	1,025	835	692	548	435	349	284	233	193	161	135
	16 1/2	7,002	4,570	3,167	2,321	1,751	1,362	1,088	886	735	603	478	385	313	257	213	178	150
	18	8,021	5,441	3,771	2,744	2,067	1,609	1,285	1,048	869	730	622	504	411	339	281	236	199
	19 1/2	9,149	6,387	4,428	3,197	2,409	1,875	1,498	1,222	1,013	852	726	624	527	435	362	304	257
	21	10,401	7,192	5,101	3,683	2,775	2,161	1,726	1,408	1,168	983	837	721	626	548	457	384	326
	22 1/2	11,801	8,015	5,817	4,200	3,166	2,466	1,970	1,607	1,334	1,123	957	824	715	626	552	477	405
	24	13,377	8,907	6,578	4,750	3,581	2,789	2,229	1,819	1,510	1,271	1,083	933	811	710	626	555	495

Tabulated values are pounds per lineal foot.

Notes for X-Beam Roof Beams:
(1) For preliminary design use only. Final design should include a complete analysis, including bearing stresses and lateral stability.
(2) Span = simply supported beam.
(3) Maximum deflection = L/180 under live load. Other deflection limits may apply.
(4) Service condition = dry.
(5) Tabulated values represent total loads and include beam weight (assumed 35 pcf).
(6) Sufficient bearing length shall be provided at supports.
(7) Maximum beam shear is located at a distance from the supports equal to the depth of the beam.
(8) Allowable loads assume beam is loaded perpendicular to the wide faces of laminations (x-x axis).

Special order sizes in green.

Rosboro XBEAM Next-Generation Glulam

Roof Beams Allowable Loads: Snow

Simple Spans

(LDF=1.15)

F_b = 2,400 psi

F_v = 265 psi

E = 1.8 x 10^6 psi

True E = 1.9 x 10^6 psi

$F_{c\perp}$ = 650 psi

Width (in.)	Depth (in.)	Span (feet) 8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
6 3/4	9	2,605	1,662	1,150	782	519	360	259	191	143	110	85	66	52	-	-	-	-
	10 1/2	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
	13 1/2	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
	16 1/2	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
	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
	19 1/2	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
	22 1/2	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
	28 1/2	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**
8 3/4	9	3,337	2,154	1,490	1,014	673	467	335	247	186	142	110	86	67	53	-	-	-
	10 1/2	4,600	2,936	2,032	1,487	1,077	750	540	400	303	234	183	144	115	92	74	-	-
	12	6,012	3,838	2,658	1,921	1,445	1,123	814	606	461	357	281	223	180	145	119	97	79
	13 1/2	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
	16 1/2	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
	19 1/2	14,554	9,882	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	16,547	11,379	7,745	5,591	4,213	3,280	2,620	2,137	1,772	1,491	1,270	1,093	948	830	727	612	518
	22 1/2	18,775	12,752	8,833	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	21,281	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	24,123	15,713	11,211	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	27,370	17,396	12,500	9,027	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
	28 1/2	31,118	19,240	13,855	10,007	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
	30	35,490	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

Tabulated values are pounds per lineal foot.

Notes for X-Beam Roof Beams:

(1) For preliminary design use only. Final design should include a complete analysis, including bearing stresses and lateral stability.
(2) Span = simply supported beam.
(3) Maximum deflection = L/180 under live load. Other deflection limits may apply.
(4) Service condition = dry.
(5) Tabulated values represent total loads and include beam weight (assumed 35 pcf).
(6) Sufficient bearing length shall be provided at supports.
(7) Maximum beam shear is located at a distance from the supports equal to the depth of the beam.
(8) Allowable loads assume beam is loaded perpendicular to the wide faces of laminations (x-x axis).

Special order sizes in green.

Rosboro XBEAM Next-Generation Glulam

Roof Beams Allowable Loads: Non-snow

Simple Spans

(LDF=1.25)

F_b = 2,400 psi

F_v = 265 psi

E = 1.8 x 10^6 psi

True E = 1.9 x 10^6 psi

$F_{c\perp}$ = 650 psi

Width (in.)	Depth (in.)	Span (feet) 8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
3 1/2	6	651	331	189	117	77	53	-	-	-	-	-	-	-	-	-	-	-
	7 1/2	1,019	650	373	233	154	106	76	55	-	-	-	-	-	-	-	-	-
	9	1,469	937	649	406	269	187	134	99	74	57	-	-	-	-	-	-	-
	9 1/2	1,637	1,045	723	478	318	221	159	117	88	68	53	-	-	-	-	-	-
	10 1/2	2,001	1,277	884	647	431	300	216	160	121	94	73	58	-	-	-	-	-
	11 7/8	2,560	1,635	1,132	829	626	437	316	235	178	138	109	86	69	56	-	-	-
	13 1/2	3,311	2,115	1,465	1,073	819	645	467	348	265	206	163	130	105	86	71	58	-
	14	3,561	2,275	1,576	1,155	881	694	522	389	297	231	183	146	118	97	80	66	55
	15	4,089	2,612	1,810	1,327	1,013	797	643	480	367	286	226	182	147	121	100	83	69
	16	4,624	2,973	2,060	1,510	1,153	908	733	585	447	349	277	222	181	148	123	103	86
	16 1/2	4,844	3,162	2,192	1,606	1,227	966	780	642	491	384	304	245	199	164	136	113	95
	18	5,550	3,765	2,610	1,913	1,461	1,151	930	760	631	501	398	321	262	216	179	150	126
	19 1/2	6,329	4,420	3,064	2,247	1,716	1,353	1,086	886	736	619	509	411	335	277	231	194	164
	21	7,196	4,976	3,555	2,607	1,992	1,566	1,252	1,022	848	714	609	516	422	349	291	245	207
	22 1/2	8,165	5,546	4,082	2,994	2,288	1,787	1,428	1,166	968	815	695	599	520	432	361	304	258
Width (in.)	**Depth (in.)**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**	**32**	**34**	**36**	**38**	**40**
5 1/2	6	1,023	520	298	184	121	83	58	-	-	-	-	-	-	-	-	-	-
	7 1/2	1,601	1,021	587	366	242	167	119	87	65	-	-	-	-	-	-	-	-
	9	2,308	1,473	1,019	637	423	294	211	155	117	89	69	54	-	-	-	-	-
	9 1/2	2,573	1,642	1,136	751	499	347	249	184	139	107	83	65	51	-	-	-	-
	10 1/2	3,144	2,007	1,390	1,017	677	471	340	252	191	147	115	91	72	58	-	-	-
	11 7/8	4,024	2,569	1,779	1,303	983	686	496	369	280	217	171	136	109	88	72	59	-
	13 1/2	5,203	3,323	2,302	1,687	1,287	1,010	734	547	417	324	256	205	165	135	111	92	76
	14	5,596	3,575	2,477	1,815	1,385	1,083	820	611	466	363	287	230	186	152	125	104	86
	15	6,425	4,105	2,845	2,085	1,588	1,235	986	755	577	449	356	286	232	190	157	130	109
	16	7,266	4,672	3,238	2,373	1,796	1,398	1,116	910	703	548	435	349	284	233	193	161	135
	16 1/2	7,612	4,969	3,444	2,524	1,905	1,483	1,184	965	772	603	478	385	313	257	213	178	150
	18	8,721	5,916	4,101	2,985	2,249	1,751	1,399	1,141	946	787	625	504	411	339	281	236	199
	19 1/2	9,946	6,945	4,815	3,478	2,621	2,041	1,631	1,330	1,104	929	791	645	527	435	362	304	257
	21	11,308	7,820	5,547	4,005	3,019	2,351	1,879	1,533	1,272	1,071	913	786	663	548	457	384	326
	22 1/2	12,830	8,715	6,326	4,568	3,444	2,683	2,144	1,750	1,453	1,223	1,043	898	780	678	567	477	405
	24	14,543	9,685	7,153	5,166	3,895	3,034	2,426	1,980	1,644	1,385	1,180	1,017	884	774	683	584	496

Tabulated values are pounds per lineal foot.

Notes for X-Beam Roof Beams:

(1) For preliminary design use only. Final design should include a complete analysis, including bearing stresses and lateral stability.
(2) Span = simply supported beam.
(3) Maximum deflection = L/180 under live load. Other deflection limits may apply.
(4) Service condition = dry.
(5) Tabulated values represent total loads and include beam weight (assumed 35 pcf).
(6) Sufficient bearing length shall be provided at supports.
(7) Maximum beam shear is located at a distance from the supports equal to the depth of the beam.
(8) Allowable loads assume beam is loaded perpendicular to the wide faces of laminations (x-x axis).

Special order sizes in green.

Roof Beams Allowable Loads: Non-snow

Simple Spans
(LDF=1.25)
F_b = 2,400 psi
F_v = 265 psi
E = 1.8 x 10^6 psi
True E = 1.9 x 10^6 psi
$F_{c\perp}$= 650 psi

Width (in.)	Depth (in.)	Span (feet) 8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
6 3/4	9	2,833	1,808	1,251	782	519	360	259	191	143	110	85	66	52	-	-	-	-
	10 1/2	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
	13 1/2	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
	16 1/2	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
	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
	19 1/2	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
	22 1/2	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**
8 3/4	9	3,672	2,343	1,621	1,014	673	467	335	247	186	142	110	86	67	53	-	-	-
	10 1/2	5,002	3,193	2,221	1,618	1,007	750	540	400	303	234	183	144	115	92	74	60	-
	12	6,537	4,174	2,891	2,090	1,573	1,127	814	606	461	357	281	223	180	145	119	97	79
	13 1/2	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
	16 1/2	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
	19 1/2	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	17,990	12,372	8,422	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	20,412	13,865	9,605	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	23,136	15,407	10,861	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	26,225	17,084	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	29,755	18,914	13,592	9,817	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	33,829	20,919	15,065	10,882	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

Tabulated values are pounds per lineal foot.

Notes for X-Beam Roof Beams:
(1) For preliminary design use only. Final design should include a complete analysis, including bearing stresses and lateral stability.
(2) Span = simply supported beam.
(3) Maximum deflection = L/180 under live load. Other deflection limits may apply.
(4) Service condition = dry.
(5) Tabulated values represent total loads and include beam weight (assumed 35 pcf).
(6) Sufficient bearing length shall be provided at supports.
(7) Maximum beam shear is located at a distance from the supports equal to the depth of the beam.
(8) Allowable loads assume beam is loaded perpendicular to the wide faces of laminations (x-x axis).

Special order sizes in green.

Rosboro X-Beam Columns: Design Values

Layup Combination	Bending about Y-Y Axis F_{by} (psi)	Bending about X-X Axis F_{bx} (psi)	Compression Parallel F_c (psi)[3]	E_{axial} (10^6 psi)
EWS 3 DF	2100[(1)]	2000[(2)]	2300[(3)]	1.9

Notes:
1. Applicable to 4 or more lams. This value shall be reduced to 1,850 psi for 3 lams and 1,550 psi for 2 lams.
2. Applicable to column depths up to 15". For column depths exceeding 15", F_{bx} = 1,760 psi.
3. Applicable to 4 or more lams. This value shall be reduced to 1,900 psi for 2 or 3 lams.

Allowable Axial Loads (Pounds) for Combination No. 3 Glulam Columns

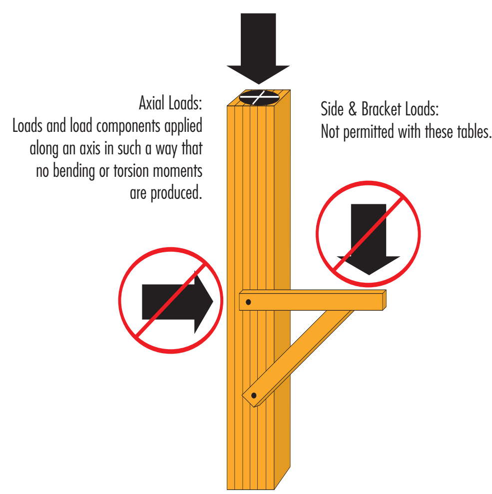
Side loads are not permitted. End loads are limited to a maximum eccentricity of either 1/6 column width or depth, whichever is worse.

Effective Column Length (ft.)	Lamination Net Width = 3 1/2 in.						Lamination Net Width = 5 1/2 in.								
	Net Depth = 4 1/2 in. (3 lams)			Net Depth = 6 in. (4 lams)			Net Depth = 5 1/2 in. (4 lams)			Net Depth = 6 in. (4 lams)			Net Depth = 7 1/2 in. (5 lams)		
	Load Duration Factor			Load Duration Factor			Load Duration Factor			Load Duration Factor			Load Duration Factor		
	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25
8	8,570	8,970	9,190	11,940	12,440	12,720	26,850	29,050	30,350	30,600	33,220	34,770	38,900	41,980	43,780
9	7,290	7,570	7,740	10,090	10,450	10,660	24,130	25,810	26,790	27,660	29,670	30,770	34,800	37,120	38,460
10	6,250	6,470	6,590	8,610	8,880	9,040	21,580	22,890	23,640	24,790	26,210	27,030	30,990	32,760	33,790
11	5,410	5,570	5,670	7,420	7,630	7,750	19,300	20,330	20,930	22,080	23,190	23,830	27,600	28,980	29,780
12	4,720	4,850	4,920	6,460	6,620	6,720	17,290	18,120	18,600	19,700	20,590	21,100	24,630	25,740	26,380
13	4,150	4,250	4,310	5,660	5,800	5,870	15,540	16,220	16,610	17,650	18,370	18,790	22,070	22,970	23,480
14	3,670	3,760	3,810	5,010	5,110	5,180	14,020	14,580	14,900	15,880	16,470	16,810	19,850	20,590	21,020
15	—	-	-	-	-	-	12,690	13,160	13,430	14,340	14,840	15,120	17,930	18,550	18,900
16	-	-	-	-	-	-	11,540	11,930	12,160	13,010	13,420	13,660	16,260	16,780	17,080
17	-	-	-	-	-	-	10,530	10,860	11,060	11,840	12,200	12,400	14,800	15,250	15,500
18	-	-	-	-	-	-	9,640	9,930	10,090	10,820	11,130	11,300	13,530	13,910	14,120
19	-	-	-	-	-	-	8,850	9,100	9,250	9,920	10,190	10,340	12,410	12,730	12,920
20	-	-	-	-	-	-	8,160	8,370	8,500	9,130	9,360	9,490	11,410	11,700	11,860
21	-	-	-	-	-	-	7,540	7,730	7,840	8,430	8,630	8,740	10,530	10,780	10,920
22	-	-	-	-	-	-	6,980	7,150	7,250	7,800	7,980	8,070	9,750	9,970	10,090

Notes:
(1) The tabulated allowable loads apply only to one-piece glulam members made with all L2D laminations (Combination 3) without special tension laminations.
(2) Applicable service conditions = dry.
(3) The tabulated allowable loads are based on simply axially loaded columns subjected to a maximum eccentricity of either 1/6 column width or 1/6 column depth, whichever is worse. For side loads, other eccentric end loads, or other combined axial and flexural loads, see 2005 NDS.
(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:
Compression parallel to grain (F_c) = 2,300 psi for 4 or more lams, or 1,900 psi for 2 or 3 lams.
Modulus of elasticity (E) = 1.9 x 10^6 psi
Flexural stress when loaded parallel to wide faces of lamination (F_{by}) = 2,100 psi for 4 or more lams, or 1,850 psi for 3 lams. Flexural stress when loaded perpendicular to wide faces of lamination (F_{bx}) = 2,000 psi for 2 lams to 15 in. deep without special tension laminations. Volume factor for F_{bx} is in accordance with 2005 NDS. Size factor for F_{by} is $(12/d)^{1/9}$, where d is equal to the lamination width in inches.

Axial Loads

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



Rosboro **BIG BEAM**®

High Performance 2.1E IJC-Glulam

Floor Beams Allowable Loads

Simple Span

(LDF=1.00)

F_b = 3,000 psi

F_v = 300 psi

E = 2.1 x 10^6 psi

True E = 2.2 x 10^6 psi

$F_{c\perp}$ = 650 psi

Width (in.)	Depth (in.)	Load Condition		Span (feet)											
				8	10	12	14	16	18	20	22	24	26	28	30
3 1/2	9 1/4	Live Load	L/360	1,403	718	416	262	175	123	90	67	52	-	-	-
			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	-	-
	9 1/2	Live Load	L/360	1,520	778	450	284	190	133	97	73	56	-	-	-
			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	-	-
	11 1/4	Live Load	L/360	2,297	1,292	748	471	315	222	161	121	93	74	59	-
			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
	11 7/8	Live Load	L/360	2,560	1,520	879	554	371	261	190	143	110	86	69	56
			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
	14	Live Load	L/360	3,447	2,274	1,441	907	608	427	311	234	180	142	113	92
			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
	16	Live Load	L/360	4,186	2,973	2,060	1,354	907	637	465	349	269	211	169	138
			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
	18	Live Load	L/360	5,024	3,584	2,609	1,913	1,292	907	662	497	383	301	241	196
			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
Width (in.)	**Depth (in.)**	**Load Condition**		**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**
5 7/16	9 1/4	Live Load	L/360	2,179	1,116	646	407	272	191	139	105	81	63	51	-
			L/480	1,634	837	484	305	204	143	105	79	61	-	-	-
		Total Load	L/240	2,411	1,538	956	597	396	274	197	145	108	83	64	-
	9 1/2	Live Load	L/360	2,361	1,209	699	440	295	207	151	114	87	69	55	-
			L/480	1,770	906	525	330	221	155	113	85	66	52	-	-
		Total Load	L/240	2,543	1,623	1,036	648	430	298	214	157	118	90	70	54
	11 1/4	Live Load	L/360	3,569	2,007	1,162	731	490	344	251	189	145	114	91	74
			L/480	2,940	1,505	871	549	368	258	188	141	109	86	69	56
		Total Load	L/240	3,569	2,279	1,578	1,082	720	501	361	267	203	156	122	96
	11 7/8	Live Load	L/360	3,977	2,361	1,366	860	576	405	295	222	171	134	108	87
			L/480	3,458	1,770	1,025	645	432	304	221	166	128	101	81	66
		Total Load	L/240	3,977	2,540	1,759	1,274	848	591	426	316	240	185	145	115
	14	Live Load	L/360	5,354	3,533	2,239	1,410	944	663	484	363	280	220	176	143
			L/480	5,354	2,901	1,679	1,057	708	497	363	272	210	165	132	107
		Total Load	L/240	5,354	3,533	2,448	1,793	1,369	976	706	526	401	311	245	196
	16	Live Load	L/360	6,503	4,618	3,200	2,104	1,410	990	722	542	418	329	263	214
			L/480	6,503	4,331	2,506	1,578	1,057	743	541	407	313	246	197	160
		Total Load	L/240	6,503	4,618	3,200	2,346	1,777	1,383	1,061	792	605	471	373	299
	18	Live Load	L/360	7,806	5,568	4,054	2,954	2,007	1,410	1,028	772	595	468	375	305
			L/480	7,806	5,568	3,568	2,247	1,505	1,057	771	579	446	351	281	228
		Total Load	L/240	7,806	5,568	4,054	2,954	2,226	1,733	1,384	1,128	868	677	537	432

Tabulated values are pounds per lineal foot.

Rosboro **BIGBEAM**®

High Performance 2.1E LJC-Glulam

Floor Beams Allowable Loads Cont'd.

Simple Span

(LDF=1.00)

F_b = 3,000 psi

F_v = 300 psi

E = 2.1 x 10^6 psi

True E = 2.2 x 10^6 psi

F_{cL} = 650 psi

				Span (feet)											
Width (in.)	**Depth (in.)**	**Load Condition**		**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**26**	**28**	**30**
7	9 1/4	Live Load	L/360	2,805	1,436	831	523	351	246	180	135	104	82	65	53
			L/480	2,104	1,077	623	393	263	185	135	101	78	61	-	-
		Total Load	L/240	3,103	1,980	1,231	769	510	353	253	186	140	106	82	64
	9 1/2	Live Load	L/360	3,039	1,556	900	567	380	267	194	146	113	89	71	58
			L/480	2,279	1,167	675	425	285	200	146	110	84	66	53	-
		Total Load	L/240	3,274	2,089	1,334	834	553	384	275	203	152	116	90	70
	11 1/4	Live Load	L/360	4,595	2,584	1,495	942	631	443	323	243	187	147	118	96
			L/480	3,785	1,938	1,122	706	473	332	242	182	140	110	88	72
		Total Load	L/240	4,595	2,933	2,031	1,393	927	645	465	344	261	201	157	124
	11 7/8	Live Load	L/360	5,120	3,039	1,759	1,108	742	521	380	285	220	173	138	113
			L/480	4,452	2,279	1,319	831	556	391	285	214	165	130	104	84
		Total Load	L/240	5,120	3,270	2,264	1,640	1,092	761	549	407	309	239	187	148
	14	Live Load	L/360	6,893	4,549	2,882	1,815	1,216	854	622	468	360	283	227	184
			L/480	6,893	3,735	2,161	1,361	912	640	467	351	270	212	170	138
		Total Load	L/240	6,893	4,549	3,151	2,295	1,728	1,256	909	677	516	400	316	252
	16	Live Load	L/360	8,372	5,945	4,104	2,709	1,815	1,275	929	698	538	423	339	275
			L/480	8,372	5,575	3,226	2,032	1,361	956	697	524	403	317	254	206
		Total Load	L/240	8,372	5,945	4,104	2,961	2,230	1,735	1,366	1,019	779	606	480	385
	18	Live Load	L/360	10,049	7,169	5,136	3,707	2,584	1,815	1,323	994	766	602	482	392
			L/480	10,049	7,169	4,594	2,893	1,938	1,361	992	745	574	452	362	294
		Total Load	L/240	10,049	7,169	5,136	3,707	2,793	2,174	1,736	1,416	1,117	872	692	557

Tabulated values are pounds per lineal foot.

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.

(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.

(6) Allowable loads assume beam is loaded perpendicular to the wide faces of laminations (x-x axis).

Rosboro BIGBEAM®

High Performance 2.1E LJC-Glulam

Roof Beams Allowable Loads: Snow

Simple Span

(LDF=1.15)

F_b = 3,000 psi

F_v = 300 psi

E = 2.1 x 10^6 psi

True E = 2.2 x 10^6 psi

$F_{c\perp}$ = 650 psi

Width (in.)	Depth (in.)	Load Condition		Span (feet) 8	10	12	14	16	18	20	22	24	26	28	30
3 1/2	9 1/4	Live Load	L/240	1,786	1,077	623	393	263	185	135	101	78	61	-	-
			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	-
	9 1/2	Live Load	L/240	1,884	1,167	675	425	285	200	146	110	84	66	53	-
			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	-
	11 1/4	Live Load	L/240	2,643	1,688	1,122	706	473	332	242	182	140	110	88	72
			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
	11 7/8	Live Load	L/240	2,946	1,882	1,303	831	556	391	285	214	165	130	104	84
			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
	14	Live Load	L/240	3,965	2,617	1,814	1,329	912	640	467	351	270	212	170	138
			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
	16	Live Load	L/240	4,816	3,421	2,371	1,738	1,328	956	697	524	403	317	254	206
			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
	18	Live Load	L/240	5,780	4,124	3,003	2,202	1,682	1,326	992	745	574	452	362	294
			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 Condition		8	10	12	14	16	18	20	22	24	26	28	30
5 7/16	9 1/4	Live Load	L/240	2,774	1,674	969	610	409	287	209	157	121	95	76	62
			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	532	370	266	197	149	114	89	70
	9 1/2	Live Load	L/240	2,926	1,813	1,049	661	443	311	227	170	131	103	83	67
			L/360	2,361	1,209	699	440	295	207	151	114	87	69	55	-
		Total Load	L/180	2,926	1,868	1,293	868	577	402	289	214	162	125	97	77
	11 1/4	Live Load	L/240	4,107	2,623	1,742	1,097	735	516	376	283	218	171	137	112
			L/360	3,920	2,007	1,162	731	490	344	251	189	145	114	91	74
		Total Load	L/180	4,107	2,623	1,817	1,331	965	673	487	362	275	213	168	133
	11 7/8	Live Load	L/240	4,577	2,923	2,025	1,290	865	607	443	333	256	201	161	131
			L/360	4,577	2,361	1,366	860	576	405	295	222	171	134	108	87
		Total Load	L/180	4,577	2,923	2,025	1,483	1,132	793	574	427	325	252	199	159
	14	Live Load	L/240	6,161	4,066	2,818	2,065	1,417	995	725	545	420	330	264	215
			L/360	6,161	3,868	2,239	1,410	944	663	484	363	280	220	176	143
		Total Load	L/180	6,161	4,066	2,818	2,065	1,577	1,234	948	708	541	421	333	268
	16	Live Load	L/240	7,482	5,314	3,684	2,701	2,047	1,485	1,083	813	627	493	395	321
			L/360	7,482	5,314	3,342	2,104	1,410	990	722	542	418	329	263	214
		Total Load	L/180	7,482	5,314	3,684	2,701	2,047	1,594	1,273	1,038	814	635	504	406
	18	Live Load	L/240	8,980	6,407	4,665	3,401	2,563	1,996	1,542	1,158	892	702	562	457
			L/360	8,980	6,407	4,665	2,996	2,007	1,410	1,028	772	595	468	375	305
		Total Load	L/180	8,980	6,407	4,665	3,401	2,563	1,996	1,595	1,301	1,080	909	725	585

Tabulated values are pounds per lineal foot.

Rosboro **BIGBEAM**®

High Performance 2.1E LJC-Glulam

Roof Beams Allowable Loads: Snow Cont'd.

Simple Span

(LDF=1.15)

F_b = 3,000 psi

F_v = 300 psi

E = 2.1 x 10^6 psi

True E = 2.2 x 10^6 psi

$F_{c\perp}$ = 650 psi

Width (in.)	Depth (in.)	Load Condition		Span (feet) 8	10	12	14	16	18	20	22	24	26	28	30
7	9 1/4	Live Load	L/240	3,571	2,155	1,247	785	526	369	269	202	156	123	98	80
			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
	9 1/2	Live Load	L/240	3,767	2,334	1,351	851	570	400	292	219	169	133	106	86
			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
	11 1/4	Live Load	L/240	5,287	3,376	2,243	1,413	946	665	484	364	280	221	177	144
			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
	11 7/8	Live Load	L/240	5,892	3,763	2,607	1,661	1,113	782	570	428	330	259	208	169
			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
	14	Live Load	L/240	7,931	5,235	3,628	2,643	1,824	1,281	934	702	540	425	340	277
			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
	16	Live Load	L/240	9,632	6,841	4,723	3,409	2,569	1,912	1,394	1,047	807	634	508	413
			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
	18	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
			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

Tabulated values are pounds per lineal foot.

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.

(6) Allowable loads assume beam is loaded perpendicular to the wide faces of laminations (x-x axis).

High Performance 2.1E IJC-Glulam

Roof Beams Allowable Loads: Non-snow

Simple Span
(LDF=1.25)
F_b = 3,000 psi
F_v = 300 psi
E = 2.1 x 10^6 psi
True E = 2.2 x 10^6 psi
$F_{c\perp}$ = 650 psi

Width (in.)	Depth (in.)	Load Condition		Span (feet)											
				8	10	12	14	16	18	20	22	24	26	28	30
3 1/2	9 1/4	Live Load	L/240	1,942	1,077	623	393	263	185	135	101	78	61	-	-
			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	-
	9 1/2	Live Load	L/240	2,048	1,167	675	425	285	200	146	110	84	66	53	-
			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	-
	11 1/4	Live Load	L/240	2,874	1,836	1,122	706	473	332	242	182	140	110	88	72
			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
	11 7/8	Live Load	L/240	3,203	2,046	1,319	831	556	391	285	214	165	130	104	84
			L/360	2,968	1,520	879	554	371	261	190	143	110	86	69	56
		Total Load	L/180	3,203	2,046	1,418	1,039	732	511	369	275	209	163	128	102
	14	Live Load	L/240	4,311	2,846	1,973	1,361	912	640	467	351	270	212	170	138
			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
	16	Live Load	L/240	5,236	3,719	2,579	1,891	1,361	956	697	524	403	317	254	206
			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
	18	Live Load	L/240	6,284	4,484	3,266	2,395	1,830	1,361	992	745	574	452	362	294
			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.)	Load Condition		8	10	12	14	16	18	20	22	24	26	28	30
5 7/16	9 1/4	Live Load	L/240	3,016	1,674	969	610	409	287	209	157	121	95	76	62
			L/360	2,179	1,116	646	407	272	191	139	105	81	63	51	-
		Total Load	L/180	3,016	1,926	1,279	801	532	370	266	197	149	114	89	70
	9 1/2	Live Load	L/240	3,182	1,813	1,049	661	443	311	227	170	131	103	83	67
			L/360	2,361	1,209	699	440	295	207	151	114	87	69	55	-
		Total Load	L/180	3,182	2,032	1,386	868	577	402	289	214	162	125	97	77
	11 1/4	Live Load	L/240	4,465	2,852	1,742	1,097	735	516	376	283	218	171	137	112
			L/360	3,920	2,007	1,162	731	490	344	251	189	145	114	91	74
		Total Load	L/180	4,465	2,852	1,976	1,448	965	673	487	362	275	213	168	133
	11 7/8	Live Load	L/240	4,976	3,179	2,049	1,290	865	607	443	333	256	201	161	131
			L/360	4,611	2,361	1,366	860	576	405	295	222	171	134	108	87
		Total Load	L/180	4,976	3,179	2,203	1,614	1,137	793	574	427	325	252	199	159
	14	Live Load	L/240	6,698	4,422	3,065	2,115	1,417	995	725	545	420	330	264	215
			L/360	6,698	3,868	2,239	1,410	944	663	484	363	280	220	176	143
		Total Load	L/180	6,698	4,422	3,065	2,247	1,716	1,308	948	708	541	421	333	268
	16	Live Load	L/240	8,135	5,778	4,006	2,937	2,115	1,485	1,083	813	627	493	395	321
			L/360	8,135	5,774	3,342	2,104	1,410	990	722	542	418	329	263	214
		Total Load	L/180	8,135	5,778	4,006	2,937	2,227	1,734	1,386	1,063	814	635	504	406
	18	Live Load	L/240	9,763	6,967	5,073	3,699	2,788	2,115	1,542	1,158	892	702	562	457
			L/360	9,763	6,967	4,758	2,996	2,007	1,410	1,028	772	595	468	375	305
		Total Load	L/180	9,763	6,967	5,073	3,699	2,788	2,172	1,736	1,417	1,165	911	725	585

Tabulated values are pounds per lineal foot.

Rosboro **BIGBEAM**®

High Performance 2.1E LJC-Glulam

Roof Beams Allowable Loads: Non-snow Cont'd.

Simple Span

(LDF=1.25)

F_b = 3,000 psi

F_v = 300 psi

E = 2.1 x 10^6 psi

True E = 2.2 x 10^6 psi

F_{cL}= 650 psi

Width (in.)	Depth (in.)	Load Condition		Span (feet) 8	10	12	14	16	18	20	22	24	26	28	30
7	9 1/4	Live Load	L/240	3,883	2,155	1,247	785	526	369	269	202	156	123	98	80
			L/360	2,805	1,436	831	523	351	246	180	135	104	82	65	53
		Total Load	L/180	3,883	2,479	1,646	1,031	685	476	343	254	192	147	115	90
	9 1/2	Live Load	L/240	4,096	2,334	1,351	851	570	400	292	219	169	133	106	86
			L/360	3,039	1,556	900	567	380	267	194	146	113	89	71	58
		Total Load	L/180	4,096	2,616	1,784	1,117	743	517	372	276	208	160	125	99
	11 1/4	Live Load	L/240	5,748	3,672	2,243	1,413	946	665	484	364	280	221	177	144
			L/360	5,047	2,584	1,495	942	631	443	323	243	187	147	118	96
		Total Load	L/180	5,748	3,672	2,544	1,864	1,242	866	626	466	354	274	216	172
	11 7/8	Live Load	L/240	6,406	4,092	2,638	1,661	1,113	782	570	428	330	259	208	169
			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
	14	Live Load	L/240	8,623	5,692	3,945	2,722	1,824	1,281	934	702	540	425	340	277
			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
	16	Live Load	L/240	10,472	7,439	5,137	3,708	2,722	1,912	1,394	1,047	807	634	508	413
			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
	18	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
			L/360	12,569	8,969	6,125	3,857	2,584	1,815	1,323	994	766	602	482	392
		Total Load	L/180	12,569	8,969	6,428	4,642	3,499	2,725	2,178	1,777	1,475	1,173	933	753

Tabulated values are pounds per lineal foot.

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.

(6) Allowable loads assume beam is loaded perpendicular to the wide faces of laminations (x-x axis).

Rosboro TREATED GLULAM
When You Need It To Last

Roof Beams Allowable Loads: Non-Snow

Simple or Multiple Span

Dry-Use

(LDF = 1.25)

F_b = 2,400 psi

F_v = 300 psi

$E = 1.8 \times 10^6$ psi

True $E = 1.9 \times 10^6$ psi

$F_{c\perp}$ = 740 psi

Width (in.)	Depth (in.)	Load Condition	Span (feet) 8	10	12	14	16	18	20	24	28	32
3 1/2	9 1/2	Total Load	1,636	1,043	652	407	270	187	133	73	NA	NA
		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
	11 7/8	Total Load	2,559	1,633	1,131	802	533	371	267	150	90	56
		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
	14	Total Load	3,182	2,273	1,574	1,153	879	613	443	251	153	98
		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
	16	Total Load	3,802	2,832	2,058	1,508	1,151	906	667	379	233	151
		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
	18	Total Load	4,482	3,298	2,607	1,911	1,459	1,149	927	545	336	219
		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
5 7/16	9 1/2	Total Load	2,541	1,621	1,013	633	419	290	207	114	66	NA
		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
	11 7/8	Total Load	3,975	2,538	1,757	1,246	828	576	415	233	140	87
		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
	14	Total Load	4,943	3,531	2,445	1,791	1,366	953	689	389	237	152
		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
	16	Total Load	5,907	4,399	3,197	2,343	1,781	1,394	1,036	589	362	234
		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
	18	Total Load	6,963	5,123	4,050	2,959	2,244	1,757	1,410	846	522	341
		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: Snow

Simple or Multiple Span

Dry-Use

(LDF = 1.15)

F_b = 2,400 psi

F_v = 300 psi

$E = 1.8 \times 10^6$ psi

True $E = 1.9 \times 10^6$ psi

$F_{c\perp}$ = 740 psi

Width (in.)	Depth (in.)	Load Condition	Span (feet) 8	10	12	14	16	18	20	24	28	32
3 1/2	9 1/2	Total Load	1,504	959	652	407	270	187	133	73	NA	NA
		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
	11 7/8	Total Load	2,353	1,502	1,039	760	533	371	267	150	90	56
		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
	14	Total Load	2,926	2,090	1,447	1,059	808	613	443	251	153	98
		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
	16	Total Load	3,497	2,604	1,892	1,386	1,057	832	667	379	233	151
		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
	18	Total Load	4,122	3,033	2,397	1,756	1,341	1,055	851	545	336	219
		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
5 7/16	9 1/2	Total Load	2,337	1,490	1,013	633	419	290	207	114	66	NA
		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
	11 7/8	Total Load	3,656	2,333	1,615	1,181	828	576	415	233	140	87
		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
	14	Total Load	4,546	3,247	2,248	1,646	1,255	953	689	389	237	152
		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
	16	Total Load	5,433	4,045	2,940	2,153	1,636	1,280	1,027	589	362	234
		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
	18	Total Load	6,404	4,711	3,724	2,720	2,062	1,614	1,295	846	522	341
		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

See Notes on following page.

Rosboro
TREATED GLULAM
When You Need It To Last

Floor Beams Allowable Loads

Simple or Multiple Span

Dry-Use

(LDF = 1.0)

F_b = 2,400 psi

F_v = 300 psi

$E = 1.8 \times 10^6$ psi

True $E = 1.9 \times 10^6$ psi

$F_{c\perp}$ = 740 psi

Width (in.)	Depth (in.)	Load Condition	Span (feet)									
			8	10	12	14	16	18	20	24	28	32
3 1/2	9 1/2	Total Load	1,307	833	517	322	213	146	104	NA	NA	NA
		Live Load	1,302	667	386	243	163	114	83	NA	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	NA
	11 7/8	Total Load	2,045	1,304	902	635	422	293	210	117	69	NA
		Live Load	-	1,302	754	475	318	223	163	94	59	NA
		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	NA
	14	Total Load	2,543	1,815	1,256	919	697	485	350	197	119	75
		Live Load	-	-	1,235	778	521	366	267	154	97	65
		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
	16	Total Load	3,039	2,262	1,643	1,203	917	722	527	298	182	117
		Live Load	-	-	-	1,161	778	546	398	230	145	97
		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	1.5/3.5
	18	Total Load	3,582	2,635	2,082	1,525	1,163	915	738	430	264	171
		Live Load	-	-	-	-	1,107	778	567	328	207	138
		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	1.5/3.5
5 7/16	9 1/2	Total Load	2,030	1,294	803	500	330	228	162	87	NA	NA
		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	1.5/3.5	NA	NA
	11 7/8	Total Load	3,177	2,026	1,402	987	655	455	327	181	107	66
		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
	14	Total Load	3,950	2,820	1,952	1,428	1,082	754	543	305	184	116
		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
	16	Total Load	4,721	3,514	2,553	1,869	1,420	1,110	819	463	283	181
		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
	18	Total Load	5,565	4,093	3,235	2,362	1,790	1,400	1,122	667	410	265
		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/240 and L/480, multiply live load values by 1.5 and 0.75 respectively. The resulting live load shall not exceed the total load shown.
(11) Allowable loads assume beam is loaded perpendicular to the wide faces of laminations (x-x axis).

Rosboro TREATED GLULAM When You Need It To Last

Columns-Dry Allowable Axial Loads (Pounds) for Combination No. 50 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 Column Length (ft.)	Lamination Net Width = 3 3/8 in.						Lamination Net Width = 5 1/4 in.						Lamination Net Width = 7 in.		
	Net Depth = 3 1/2 in. (3 lams)			Net Depth = 5 1/2 in. (4 lams)			Net Depth = 5 1/2 in. (4 lams)			Net Depth = 7 in. (6 lams)			Net Depth = 7 in. (6 lams)		
	Load Duration Factor			Load Duration Factor			Load Duration Factor			Load Duration Factor			Load Duration Factor		
	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25
8	6,220	6,500	6,660	10,270	10,660	10,880	25,780	27,780	28,960	36,090	38,920	40,560	53,460	59,380	63,060
9	5,280	5,490	5,610	8,620	8,910	9,070	23,020	24,530	25,410	32,240	34,340	35,550	50,270	55,300	58,360
10	4,530	4,680	4,770	7,330	7,540	7,670	20,480	21,650	22,320	28,650	30,240	31,160	46,900	51,070	53,550
11	3,920	4,030	4,100	6,300	6,460	6,550	18,230	19,150	19,680	25,460	26,700	27,420	43,460	46,860	48,850
12	3,410	3,500	3,550	5,460	5,590	5,670	16,280	17,010	17,430	22,680	23,670	24,240	40,070	42,840	44,450
13	2,990	3,060	3,100	4,780	4,880	4,940	14,590	15,180	15,530	20,290	21,090	21,550	36,840	39,110	40,430
14	2,640	2,700	2,730	4,220	4,300	4,350	13,120	13,620	13,900	18,220	18,880	19,260	33,840	35,730	36,830
15							11,860	12,270	12,500	16,440	16,980	17,300	31,110	32,700	33,620
16							10,760	11,100	11,280	14,890	15,350	15,610	28,630	29,990	30,770
17							9,790	10,070	10,220	13,540	13,930	14,160	26,410	27,570	28,240
18							8,940	9,160	9,290	12,370	12,700	12,890	24,400	25,400	25,980
19							8,180	8,370	8,490	11,330	11,620	11,780	22,600	23,470	23,970
20							7,510	7,680	7,780	10,420	10,670	10,810	20,980	21,740	22,180
21							6,920	7,070	7,150	9,610	9,830	9,950	19,510	20,180	20,570
22													18,190	18,780	19,120
23													16,990	17,510	17,820
24													15,900	16,370	16,640

Rosboro TREATED GLULAM When You Need It To Last

Columns-Wet Allowable Axial Loads (Pounds) for Combination No. 50 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 Column Length (ft.)	Lamination Net Width = 3 3/8 in.						Lamination Net Width = 5 1/4 in.						Lamination Net Width = 7 in.		
	Net Depth = 3 1/2 in. (3 lams)			Net Depth = 5 1/2 in. (4 lams)			Net Depth = 5 1/2 in. (4 lams)			Net Depth = 7 in. (6 lams)			Net Depth = 7 in. (6 lams)		
	Load Duration Factor			Load Duration Factor			Load Duration Factor			Load Duration Factor			Load Duration Factor		
	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25	1.00	1.15	1.25
8	5,080	5,320	5,460	8,430	8,760	8,960	20,650	22,380	23,400	28,810	31,250	32,690	41,890	46,720	49,750
9	4,330	4,510	4,610	7,100	7,340	7,480	18,610	19,920	20,670	25,990	27,830	28,890	39,670	43,860	46,430
10	3,720	3,860	3,930	6,040	6,220	6,330	16,660	17,660	18,240	23,270	24,660	25,450	37,300	40,840	42,960
11	3,230	3,330	3,380	5,200	5,340	5,420	14,890	15,670	16,130	20,780	21,850	22,470	34,820	37,750	39,470
12	2,820	2,890	2,930	4,510	4,620	4,690	13,330	13,960	14,320	18,570	19,420	19,910	32,310	34,710	36,100
13	2,470	2,530	2,560	3,950	4,040	4,090	11,970	12,480	12,770	16,650	17,330	17,730	29,870	31,830	32,970
14	2,180	2,230	2,260	3,490	3,560	3,600	10,790	11,200	11,440	14,980	15,540	15,860	27,550	29,170	30,110
15							9,760	10,110	10,310	13,530	14,000	14,260	25,390	26,760	27,550
16							8,860	9,150	9,320	12,270	12,660	12,880	23,430	24,580	25,250
17							8,080	8,310	8,440	11,170	11,500	11,690	21,640	22,630	23,200
18							7,380	7,570	7,680	10,210	10,490	10,650	20,030	20,880	21,370
19							6,760	6,920	7,020	9,360	9,600	9,740	18,570	19,310	19,740
20							6,210	6,350	6,440	8,610	8,820	8,940	17,250	17,900	18,270
21							5,720	5,850	5,920	7,940	8,130	8,230	16,060	16,630	16,960
22													14,980	15,490	15,770
23													14,000	14,450	14,710
24													13,110	13,510	13,740

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 N1D14 southern pine laminations (Combination 50) 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 F_{bx} 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) = 2,300 psi for 4 or more lams, or 1,700 psi for 2 or 3 lams. For Wet-Use, compression parallel to grain (F_c) = 2,300 x 0.73 psi for 4 or more lams, or 1,700 x 0.73 psi for 2 or 3 lams.

(8) Dry-Use modulus of elasticity (E) = 1.9×10^6 psi. Wet-Use Modulus of elasticity (E) = $1.9 \times 0.833 \times 10^6$ psi.

(9) Dry-Use flexural stress when loaded parallel to wide faces of lamination (F_{by}) = 2,300 psi for 4 or more lams, or 2,100 psi for 3 lams. Wet-Use flexural stress when loaded parallel to wide faces of lamination (F_{by}) = 2,300 x 0.8 psi for 4 or more lams, or 2,100 x 0.8 psi for 3 lams.

(10) Dry-Use flexural stress when loaded perpendicular to wide faces of lamination (F_{bx}) = 2,100 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_{bx}) = 2,100 x 0.8 psi for 2 lams to 15 in. deep without special tension laminations.

(11) Rosboro Treated Glulam Columns are pressure treated with an oil-soluble copper naphthenate preservative that is recommended for both ground contact and above ground applications.

Software Support

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

This software – isDesign – is an advanced beam design program incorporating all of Rosboro's engineered wood product lines. 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.

isDesign software is free to current Rosboro customers as well as designers and specifiers of Rosboro's engineered wood products. To download the latest version of isDesign go to www.Rosboro.com and click isDesign Software under the Technical Data & Support tab.

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. The Rosboro website contains one of the industry's most extensive technical libraries, with instructive literature published by Rosboro, APA-EWS, and WWPA on engineered wood, plywood, and studs.

The individual product pages offer a wealth of detailed information, including specification tables, species descriptions, and recommended applications. Our regularly updated website is part of Rosboro's commitment to keeping our customers informed and making the process of working with wood products as easy as possible.

For more information go to www.Rosboro.com and click Technical Library under the Technical Data & Support tab. For specific product pages make your selection under the Our Products tab.

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?"
"Can I drill a hole in this beam?"
"Can I substitute BigBeam for this competitor's product?"
"Are treated glulams available?"
"How can I get the isDesign 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.

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.

On average 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®

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