Boise Cascade®
ENGINEERED WOOD PRODUCTS

Specifier Guide | West
BCI Joists and Versa-Lam LVL

# BCI JOIST AND VERSA-LAM LVL WEST SPECIFIER GUIDE

**BCI Joists 5000, 6000, 6500, 60, 90**
**Versa-Lam LVL 1.5E 1800, 1.8E 2400, 1.8E 2650, 2.1E 2800, 2.1E 3100**

bc.com/ewp

Reorder #MTP-W7000

# FASTER. STRONGER. EASIER.

## The Boise Cascade Difference

When specifying products, choices matter. Finding the right balance of durability, cost-effectiveness, and proven performance is no small task. With Boise Cascade, you're choosing a product that's backed by our commitment to quality and reliability that has earned the trust of specifiers for over 60 years.

- EWP sourced from sustainably managed forests.
- Peace of mind with our limited lifetime warranty.
- Engineered and manufactured with reliability in mind.
- Dedicated product support from knowledgeable engineers.
- Boise Cascade® suite of software helps design, size, and analyze projects.

## BCI® Joist Advantages

High-performance floors start with BCI® Joists — providing strong, high-quality results along with the consistency and easy handling needed to get the job done efficiently.

- 20% stronger than comparably sized dimension lumber.
- Light weight reduces installation times.
- Greater strength = longer span capability.
- Pre-stamped knockouts and allowances for on-site hole cutting.
- Flanges made with Versa-Lam® LVL.

## Versa-Lam® LVL Advantages

Get industry-leading overall value without sacrificing strength. Versa-Lam LVL beams and headers resist twisting, shrinking, and splitting — creating flatter, quieter floors that keep customers happy.

- Longer spans while remaining stable.
- No camber for flat floors and walls.
- Wide range of applications.
- Best-in-class bending strength and stiffness.
- Depths designed to match BCI® and AJS® joists.

## Boise Cascade Chain-Of-Custody Certifications

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

Boise Cascade engineered wood products build better homes with stronger, stiffer floors using only wood purchased in compliance with a number of green building programs.

Take a moment to view our sustainability certification at bc.com/certification-wp/ or go to bc.com/sustainability for more information.

Boise Cascade engineered wood products throughout North America can be ordered FSC® Chain-of-Custody (COC) certified, enabling homebuilders to achieve LEED® points residential and commercial green building programs including LEED for Homes and LEED for New Construction.

Boise Cascade engineered wood products are available as PEFC® Chain-of-Custody certified, SFI® Chain-of-Custody certified and SFI® Fiber-Sourcing certified, as well as NAHB Research Center Green Approved, enabling homebuilders to also obtain green building points through the Green Building Standards.

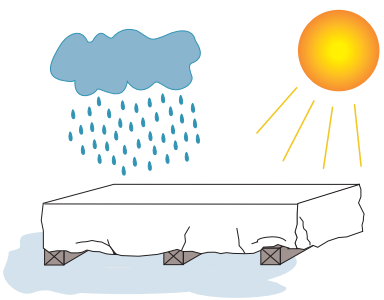
**Code Evaluation Report: ICC-ES®/APA® ESR-1336 (IBC®, IRC®)**

## TABLE OF CONTENTS


| | |
|---|---|
| Boise Cascade Chain-Of-Custody Certifications | 2 |
| Product Storage and Handling | 2 |
| **BCI JOISTS** | **3** |
| Product Profiles | 3 |
| Architectural Specifications | 3 |
| Residential Floor Span Tables | 4 |
| One-Hour Fire Resistance Assembly | 4 |
| Floor Framing Details | 5-6 |
| Hole Location and Sizing | 7 |
| Large Rectangular Holes | 7 |
| Cantilevers: Bearing and Non-Bearing | 8-9 |
| Web Stiffener Requirements | 9 |
| Floor Load Tables | 10-12 |
| Roof Framing Details | 13-14 |
| Roof Span Tables | 15-18 |
| Roof Load Tables | 19-23 |
| BCI Joist Design Properties | 24 |
| Closest Allowable Nail Spacing | 24 |
| Rim Board Details and Properties | 25 |
| **Versa-Lam LVL Beams** | **26** |
| Product Profiles and Architectural Specifications | 26 |
| Versa-Lam LVL Allowable Holes | 26 |
| Versa-Lam LVL Beam Details | 27 |
| Versa-Lam LVL Beam Multiple Member Connections | 27 |
| Versa-Lam LVL Beam Floor Load Table | 28 |
| Versa-Lam LVL Beam Roof Load Tables | 29-30 |
| Versa-Lam LVL Beam Allowable Nailing | 31 |
| Versa-Lam LVL Beam Design and Allowable Stress Values | 31 |
| Versa-Lam LVL Columns and Studs | 32 |
| Framing Connectors | 34-35 |


## PRODUCT STORAGE AND HANDLING

*Protect product from rain and sun.*

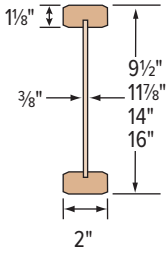


*Keep product level and off the ground.*

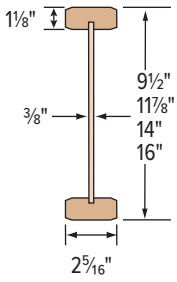
- BCI® and AJS® joists and Versa-Lam® LVL
  - must be stored, installed and used in accordance with the Boise Cascade EWP Installation Guide, building codes and, to the extent not inconsistent with the Boise Cascade EWP Installation Guide, usual and customary building practices and standards.
  - must be wrapped, covered, and stored off of the ground on stickers at all times prior to installation.
  - are intended only for applications that ensure no exposure to weather or the elements and an environment that is free from moisture from any source, or any pest, organism or substance which degrades or damages wood or glue bonds.
- Unload products carefully and support to reduce excessive bowing. Use forklifts and cranes carefully to avoid damaging product
- Do not use a visibly damaged product. Contact your local Boise Cascade representative for assistance.
- Failure to correctly store, use, or install BCI® and AJS® joists or Versa-Lam® LVL in accordance with the Boise Cascade EWP Installation Guide will void the limited warranty.

# BCI JOISTS

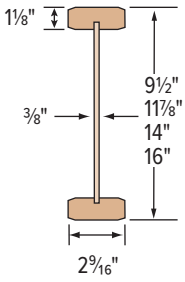
## Product Profiles



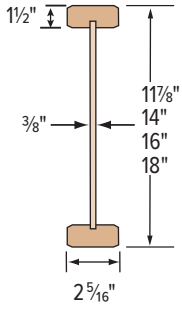

**BCI® 5000 1.7**



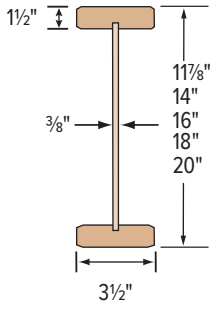

**BCI® 6000 1.8**




**BCI® 6500 1.8**




**BCI® 60 2.0**




**BCI® 90 2.0**

- ► Some products may not be available in all markets; Contact your Boise Cascade EWP representative for availability.
- ► BCI® joists products shall be installed in dry-use applications only, per ICC-ES/APA ESR report.

## Architectural Specifications

**Scope —** This work includes the complete furnishing and installation of all BCI® joists as shown on the drawings, herein specified and necessary to complete the work.

**Materials —** BCI® joists shall be manufactured by Boise Cascade Engineered Wood Products with oriented strand board webs, Versa-Lam® laminated veneer lumber flanges, and waterproof, structural adhesives.

Joist webs shall be rated Structural I Exposure 1 by an agency listed by a model code evaluation service. Strands on the face layers of the web panels shall be oriented vertically in the joist. The web panels shall be glued together to form a continuous web member. The web panels shall be machined to fit into a groove in the center of the wide face of the flange members to form a pressed glue joint at that junction.

**Design —** The BCI® joists shall be sized and detailed to fit the dimensions and loads indicated on the plans. All designs shall be in accordance with allowable values and section properties developed in accordance with ASTM D5055, and listed in the governing code evaluation service's report.

**Drawing —** Additional drawings showing layout and detail necessary for determining fit and placement in the building are (are not) to be provided by the supplier.

**Fabrication —** The BCI® joists and section properties shall be manufactured in a plant evaluated for fabrication by the governing code evaluation service and under the supervision of a third-party inspection agency listed by the corresponding evaluation service.

**Storage and Installation —** The BCI® joists, if stored prior to erection, shall be stored in a vertical and level position and protected from the weather. They shall be handled with care so they are not damaged.

The BCI® joists are to be installed in accordance with the plans and the Boise Cascade Engineered Wood Products Installation Guide. Temporary construction loads which cause stresses beyond design limits are not permitted. Erection bracing shall be provided to keep the BCI® joists straight and plumb as required and to assure adequate lateral support for the individual BCI® joists and the entire system until the sheathing material has been applied.

**Codes —** The BCI® joists shall be evaluated by a model code evaluation service.

# Residential Floor Span Tables

## About Floor Performance

Homeowner's expectations and opinions vary greatly due to the subjective nature of rating a new floor. Communication with the ultimate end user to determine their expectation is critical. ***Vibration*** is usually the cause of most complaints. Installing lateral bridging may help; however, squeaks may occur if not installed properly. Spacing the joists closer together does little to affect the perception of the floor's performance. The most common methods used to increase the performance and reduce vibration of wood floor systems is to ***increase the joist depth, limit joist deflections, glue and screw a thicker, tongue-and-groove subfloor, install the joists vertically plumb with level-bearing supports, and install a direct-attached ceiling to the bottom flanges of the joists.***

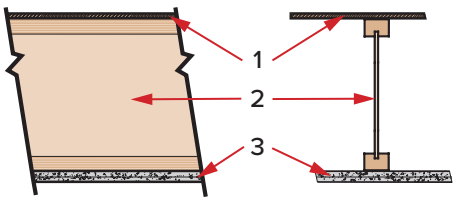
The floor span tables listed below offer three very different performance options, based on performance requirements of the homeowner.

| Joist Depth | BCI® Joist Series | ★★★ THREE STAR ★★★ | | | | | ★★★★ FOUR STAR ★★★★ | | | | | CAUTION | ★ MINIMUM STIFFNESS ALLOWED BY CODE ★ | | | CAUTION |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Live Load deflection limited to L/480:** The common industry and design community standard for residential floor joists, **33% stiffer than L/360 code minimum**. However, floor performance may still be an issue in certain applications, especially with 9½" and 11⅞" deep joists without a direct-attached ceiling. | | | | | **Live Load deflection limited to L/960+:** In addition to providing a floor that is **100% stiffer than the three star floor,** field experience has been incorporated into the values to provide a floor with a premium performance level for the more discriminating homeowner. | | | | | **Live Load deflection limited to L/360:** Floors that **meet the minimum building code** L/360 criteria are structurally sound to carry the specified loads; however, there is a much higher risk of floor performance issues. This table should only be used for applications where floor performance is not a concern. | | | | |
| | | 12" o.c. | 16" o.c. | 19.2" o.c. | 24" o.c. | 32" o.c. | 12" o.c. | 16" o.c. | 19.2" o.c. | 24" o.c. | 32" o.c. | 12" o.c. | 16" o.c. | 19.2" o.c. | 24" o.c. | 32" o.c. |
| 9½" | 5000 1.7 | 17'–1" | 15'–7" | 14'–9" | 13'–9" | 12'–0" | 11'–6" | 11'–6" | 10'–0" | 10'–0" | 9'–6" | 18'–11" | 17'–0" | 15'–6" | 13'–11" | 12'–0" |
| | 6000 1.8 | 17'–11" | 16'–5" | 15'–6" | 14'–5" | 13'–2" | 11'–6" | 11'–6" | 10'–0" | 10'–0" | 9'–10" | 19'–10" | 18'–2" | 17'–2" | 15'–9" | 13'–8" |
| | 6500 1.8 | 18'–5" | 16'–10" | 15'–11" | 14'–10" | 13'–6" | 11'–6" | 11'–6" | 10'–0" | 10'–0" | 10'–0" | 20'–5" | 18'–8" | 17'–8" | 16'–5" | 14'–3" |
| 11⅞" | 5000 1.7 | 20'–2" | 18'–5" | 17'–5" | 15'–9" | 13'–4" | 15'–6" | 14'–4" | 13'–6" | 12'–7" | 11'–5" | 22'–3" | 19'–4" | 17'–7" | 15'–9" | 13'–4" |
| | 6000 1.8 | 21'–3" | 19'–5" | 18'–4" | 17'–1" | 14'–10" | 15'–6" | 15'–1" | 14'–3" | 13'–3" | 12'–0" | 23'–6" | 21'–6" | 20'–0" | 17'–11" | 14'–10" |
| | 6500 1.8 | 21'–11" | 20'–0" | 18'–11" | 17'–7" | 14'–10" | 16'–0" | 15'–7" | 14'–9" | 13'–8" | 12'–5" | 24'–3" | 22'–2" | 20'–11" | 18'–10" | 14'–10" |
| | 60 2.0 | 23'–3" | 21'–3" | 20'–1" | 18'–8" | 16'–4" | 18'–0" | 16'–7" | 15'–7" | 14'–6" | 13'–2" | 25'–9" | 23'–6" | 22'–3" | 20'–9" | 16'–4" |
| | 90 2.0 | 26'–3" | 23'–11" | 22'–6" | 20'–11" | 19'–1" | 19'–0" | 18'–7" | 17'–6" | 16'–2" | 14'–8" | 29'–0" | 26'–6" | 25'–0" | 23'–3" | 19'–4" |
| 14" | 5000 1.7 | 22'–11" | 21'–0" | 19'–2" | 17'–2" | 13'–11" | 18'–0" | 16'–5" | 15'–6" | 14'–5" | 13'–1" | 24'–4" | 21'–0" | 19'–2" | 17'–2" | 13'–11" |
| | 6000 1.8 | 24'–2" | 22'–2" | 20'–11" | 19'–6" | 15'–5" | 18'–11" | 17'–3" | 16'–3" | 15'–2" | 13'–9" | 26'–9" | 23'–11" | 21'–10" | 19'–6" | 15'–5" |
| | 6500 1.8 | 24'–10" | 22'–9" | 21'–5" | 20'–0" | 15'–5" | 19'–5" | 17'–9" | 16'–8" | 15'–6" | 14'–1" | 27'–6" | 25'–1" | 22'–11" | 20'–6" | 15'–5" |
| | 60 2.0 | 26'–5" | 24'–2" | 22'–9" | 21'–3" | 16'–4" | 20'–8" | 18'–10" | 17'–9" | 16'–5" | 14'–11" | 29'–3" | 26'–8" | 25'–3" | 21'–10" | 16'–4" |
| | 90 2.0 | 29'–9" | 27'–1" | 25'–6" | 23'–8" | 19'–6" | 23'–3" | 21'–1" | 19'–9" | 18'–4" | 16'–7" | 32'–10" | 30'–0" | 28'–3" | 26'–0" | 19'–6" |
| 16" | 6000 1.8 | 26'–9" | 24'–5" | 23'–1" | 20'–10" | 15'–9" | 20'–11" | 19'–1" | 18'–0" | 16'–9" | 15'–2" | 29'–6" | 25'–6" | 23'–4" | 20'–10" | 15'–9" |
| | 6500 1.8 | 27'–5" | 25'–1" | 23'–8" | 21'–1" | 15'–9" | 21'–6" | 19'–7" | 18'–5" | 17'–2" | 15'–7" | 30'–4" | 26'–11" | 24'–6" | 21'–1" | 15'–9" |
| | 60 2.0 | 29'–3" | 26'–8" | 25'–2" | 21'–10" | 16'–4" | 22'–10" | 20'–10" | 19'–7" | 18'–2" | 16'–4" | 32'–4" | 29'–6" | 27'–4" | 21'–10" | 16'–4" |
| | 90 2.0 | 32'–11" | 29'–11" | 28'–2" | 26'–2" | 19'–7" | 25'–8" | 23'–4" | 21'–11" | 20'–3" | 18'–4" | 36'–4" | 33'–2" | 31'–3" | 26'–2" | 19'–7" |
| 18" | 90 2.0 | 35'–11" | 32'–8" | 30'–9" | 28'–7" | 23'–10" | 28'–1" | 25'–5" | 23'–11" | 22'–2" | 20'–0" | 39'–8" | 36'–2" | 34'–1" | 31'–9" | 23'–10" |
| 20" | 90 2.0 | 38'–10" | 35'–4" | 33'–4" | 30'–11" | 24'–8" | 30'–4" | 27'–6" | 25'–11" | 24'–0" | 21'–8" | 42'–11" | 39'–1" | 36'–10" | 32'–11" | 24'–8" |

**NOTES**

- Tables are based on
  - — residential floor load of 40 psf live load and 10 psf dead load (12 psf dead load for 90 2.0 joists).
  - — 23/32" minimum plywood/OSB rated sheathing glued and nailed to joists for composite action (joists spaced at 32" o.c. require sheathing rated for such spacing, such as ⅞" plywood/OSB).
  - — the most restrictive of simple or multiple span applications. Analyze multiple span joists with BC Calc® sizing software if the length of any span is less than half the length of an adjacent span.
  - — maximum allowable clear distance between supports.
  - — minimum bearing lengths without web stiffeners for joist depths of 16" and less.
- All 18" and 20" BCI® joists require web stiffeners at all bearing locations
- Floor tile will increase dead load and may require specific deflection limits, contact Boise Cascade EWP Engineering for further information.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® sizing software.

# One-Hour Fire Resistance Assembly (ICC-ES/APA ESR-1336)




See the US version of the *Boise Cascade Fire Design and Installation Guide* for specific assembly information and other fire resistance assemblies and details.

### Fire Assembly Components

(1) Min. 23/32" thick tongue and groove sheathing (exterior glue), installed with long edge perpendicular to joist length, staggered one joist spacing with adjacent sheets, and glued to joists with construction adhesive.

(2) BCI® joists at 24" o.c. or less.

(3) Two layers ⅝" Type X or two layers ½" Type C gypsum board, installed per Figures 2 or 3 of ICC-ES®/APA® ESR-1336.

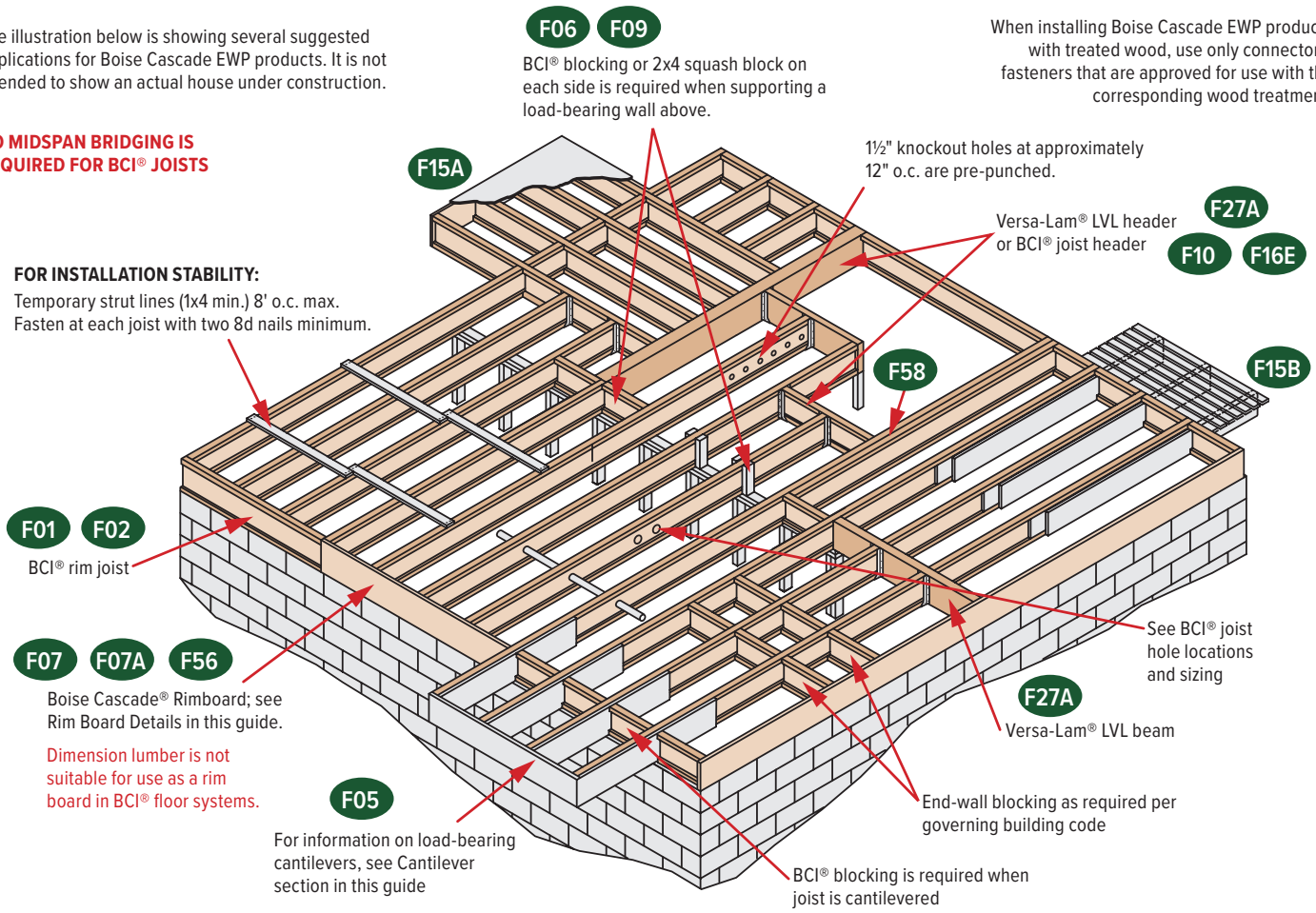
### Sound Assembly Components *(when constructed with resilient channels)*

| | | | |
|---|---|---|---|
| *Add* carpet and pad to fire assembly | STC = 54 | IIC = 68 | *or* |
| *Add* 3½" glass fiber insulation to fire assembly | STC = 55 | IIC = 46 | *or* |
| *Add* an additional layer of minimum ⅝" sheathing and 9½" glass fiber insulation to fire assembly | STC = 61 | IIC = 50 | |

# Floor Framing

The illustration below is showing several suggested applications for Boise Cascade EWP products. It is not intended to show an actual house under construction.

When installing Boise Cascade EWP products with treated wood, use only connectors/ fasteners that are approved for use with the corresponding wood treatment.




## SAFETY WARNING

**DO NOT allow workers on BCI® joists until all hangers, BCI® rim joists, rim boards, BCI® blocking panels, x-bracing and temporary 1x4 strut lines are installed as specified below. Serious accidents can result from insufficient attention to proper bracing during construction. Accidents can be avoided under normal conditions by following these guidelines:**

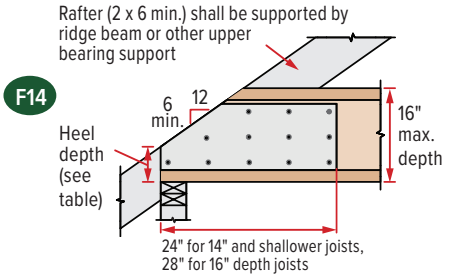
- Build a braced end wall at the end of the bay, or permanently install the first eight feet of BCI® joists and the first course of sheathing. As an alternate, temporary sheathing may be nailed to the first four feet of BCI® joists at the end of the bay.
- All rim joists, rim boards, x-bracing, blocking panels and hangers must be completely installed and properly nailed as each BCI® joist is set.
- Install temporary 1x4 strut lines at 8' on-center or closer as additional BCI® joists are set. Nail the strut lines to the sheathed area or braced end wall, and to each BCI® joist with two 2½" (8d) nails.
- The ends of cantilevers must be temporarily secured by strut lines on both the top and bottom flanges.
- Straighten the BCI® joists to within ½" of true alignment before attaching strut lines and sheathing.
- Remove the temporary strut lines only as required to install the permanent sheathing.
- Failure to install temporary bracing may result in sideways buckling or roll-over under light construction loads.
- Do not stack construction materials (sheathing, drywall, etc.) in the middle of BCI® joist spans. Contact Boise Cascade EWP Engineering for proper storage and shoring information.

## Nailing Requirements

- **BCI® rim joist, rim board or closure panel to BCI® joist:**
  - **Rim or closure panel:** Two nails, one each in the top and bottom flange. **For rim 1-1/2" thick or less**, use 8d x 2½" nails; **1¾" thick rim,** use 10d x 3" box nails.
  - **BCI® 5000 rim joist:** Two 10d box nails, one each in the top and bottom flange.
  - **BCI® 6000/60 rim joist:** Two 16d box nails, one each in the top and bottom flange.
  - **BCI® 6500/90 rim joist:** Toe-nail top flange to rim joist with two 10d box nails, one each side of flange.
- **BCI® rim joist, rim board or BCI® blocking panel to support:**
  - Min. 8d nails at 6" o.c. per IRC®.
  - Connect per design professional of record's specification for shear transfer.
- **BCI® joist to support:**
  - Two 8d nails, one on each side of the web, placed 1½" minimum from the end of the BCI® joist to limit splitting.
- **Sheathing to BCI® joist:**
  - Prescriptive nailing for residential floor sheathing requires 8d common nails at 6" o.c. at edges and 12" o.c. in the field (IRC® Table R602.3(1)).
  - See Closest Allowable Nail Spacing limits on page 24 for floor diaphragm nailing specified at closer spacing than IRC®.
  - For full lateral stability, maximum nail spacing for bracing is 18" for BCI® 5000, and 24" for larger BCI® joist series.
  - 14 gauge staples may be substituted for 8d nails if the staples penetrate at least 1" into the joist.
  - Wood screws may be acceptable, contact local building official and/or Boise Cascade EWP Engineering for more information.

## BCI® Joist Slope Cut Reinforcement

Detail below restores the original allowable shear/reaction value to cut end of BCI® joist. BCI® joists shall not be used as a collar or rafter tension tie.




2x blocking required at bearing (not shown for clarity). 23/32" min. plywood/OSB-rated sheathing as reinforcement. Install reinforcement with face grain horizontal. Install on both sides of the joist, tight to bottom flange. Leave minimum ¼" gap between reinforcement and bottom of top flange. Apply construction adhesive to contact surfaces and fasten with 3 rows of min. 10d box nails at 6" o.c. Alternate nailing from each side and clinch.

| Minimum Heel Depth | | | | | | |
|---|---|---|---|---|---|---|
| End Wall Bearing | Roof Pitch | | | | | |
| | 6:12 | 7:12 | 8:12 | 9:12 | 10:12 | 12:12 |
| 2 x 4 | 4⅜" | 4⁵⁄₁₆" | 4¼" | 4¼" | 4¼" | 4¼" |
| 2 x 6 | 3⅜" | 3⁵⁄₁₆" | 2⁵⁄₁₆" | 2¾" | 2⁹⁄₁₆" | 2¼" |

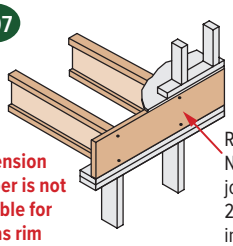
## PROTECT BCI® JOISTS FROM THE WEATHER

**BCI® joists are intended only for applications that provide permanent protection from the weather. Product bundles should be covered and stored off of the ground on stickers. Also see PRODUCT STORAGE AND HANDLING on page 2.**

# Floor Framing Details

## End Bearing Details

**F07**

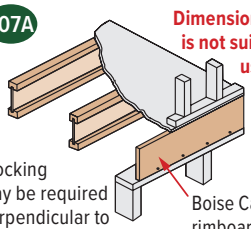


**Dimension lumber is not suitable for use as rim board with BCI® joists.**

Rim board: Nail to BCI® joists with 2½" (8d) nail into each flange.

**F07A**

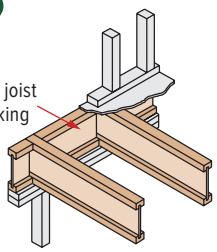
**Dimension lumber is not suitable for use as rim board with BCI® joists.**



Blocking may be required perpendicular to wall, consult design professional of record and/or local building official.

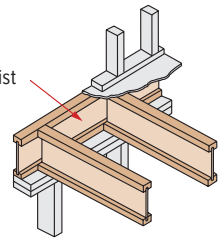
Boise Cascade® rimboard or BCI® joist

**F01**



BCI® joist blocking

**F02**

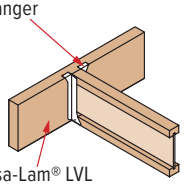


BCI® rim joist

BCI® rim joist requires 2x6 wall for minimum bearing

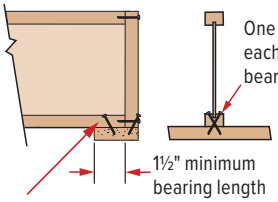
**F27A**

Top flange or face mount joist hanger



Versa-Lam® LVL

**F52**



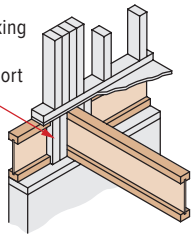
One 8d nail each side at bearing

1½" minimum bearing length

To limit splitting flange, start nails at least 1½" from end. Nails may need to be driven at an angle to limit splitting of bearing plate.

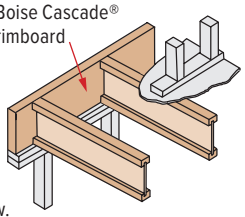
**F08**

Use solid blocking under all posts above for support to the bearing plate.



**F03**

Boise Cascade® rimboard

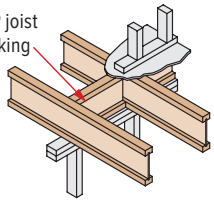


BCI® floor joist must be designed to carry wall above when not stacked over wall below.

Blocking required underneath braced wall panels and shear walls. Consult design profession of record.

## Intermediate Bearing Details

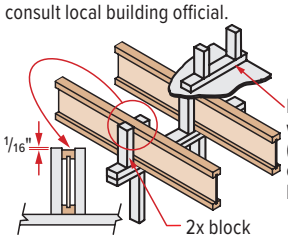
**F06** For load bearing wall above (stacked over wall below)



BCI® joist blocking

Per IRC, blocking may be required at intermediate bearing for floor diaphragm in high seismic areas; consult local building official.

**F09**



1/16"

Load bearing wall above (stacked over wall below)

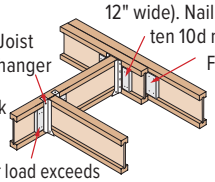
2x block

**Double Squash Block Vertical Load (lb/ft)**

| Size | Joist Spacing | | | |
|---|---|---|---|---|
| | 12" | 16" | 19.2" | 24" |
| 2x4 | 4,463 | 3,347 | 2,789 | 2,231 |
| 2x6 | 7,013 | 5,259 | 4,383 | 3,506 |

- Squash blocks are to be in full contact with upper floor and lower wall plate.
- Capacities shown are for double squash blocks at each joist, SPF or better.

**F10**



Backer block (minimum 12" wide). Nail with ten 10d nails.

Joist hanger

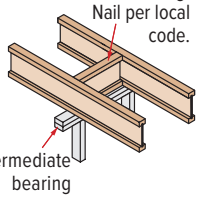
Filler block. Nail with ten 10d nails.

A backer block is required where top flange hanger load exceeds 250 lbs. All face mount hangers require backer blocks on both sides of the supporting joist's web.

For top flange hangers install tight to top flange. For face mount hangers, install tight to the bottom flange.

**F28**

*Floor Joist Blocking per IRC® 502.7 required in seismic design categories D0 and higher for floor diaphragm (required for all joist types).*

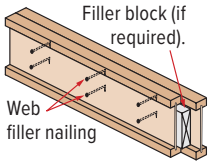


BCI® joist or Boise Cascade® Rimboard blocking. Nail per local code.

Intermediate bearing

Cross-bracing is allowed as blocking only if the supporting wall is not a braced or shear wall and there is no wall above.

**F58** **Double BCI® Joist Connection**



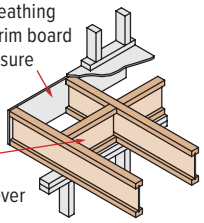
Filler block (if required).

Web filler nailing

- Filler block not required when all loads are top loaded and evenly applied to each ply (except BCI® 90 joist).
- Side loads or uneven top loads require filler block.
- Fasten floor sheathing to each ply per diaphragm nailing schedule.

*See BC Tech Note IJ-13 for more information on nailing and filler block requirements.*

**F05**



Sheathing or rim board closure

BCI® joist blocking required for cantilever

For load bearing cantilever, see page 9. Uplift on backspan shall be considered in all cantilever designs.

### Lateral Support

- BCI® joists shall be laterally supported at the ends with hangers, rim board, BCI® rim joists or blocking panels. BCI® blocking panels or rim board are required at cantilever supports.
- Per IRC®, blocking may be required at intermediate bearings for floor diaphragm. In high seismic areas, consult local building official.

### Minimum Bearing Length For BCI® Joists

- 1½" is required at end supports. 3½" is required at cantilever and intermediate supports.
- Longer bearing lengths allow higher reaction values. Refer to the building code evaluation report or the BC Calc® software.

### BCI® Rim Joists and Blocking

| Depth | Series | Vertical Load Capacity (PLF) | |
|---|---|---|---|
| | | No W.S.(1) | W.S.(2) |
| 9½" | 5000, 6000, 6500 | 2,300 | N/A |
| 11⅞" | 5000, 6000, 6500 | 2,150 | N/A |
| | 60, 90 | 2,500 | N/A |
| 14" | 5000, 6000, 6500 | 2,000 | N/A |
| | 60, 90 | 2,400 | N/A |
| 16" | 6000, 6500 | 1,900 | 2,500 |
| | 60, 90 | 2,300 | 2,700 |
| 18" | 60, 90 | N/A | 2,700 |
| 20" | 90 | N/A | 2,700 |

(1) No web stiffeners required.

(2) Web stiffeners required at each end of blocking panel, values not applicable to rim joists.

N/A: Not applicable

### Web Stiffeners

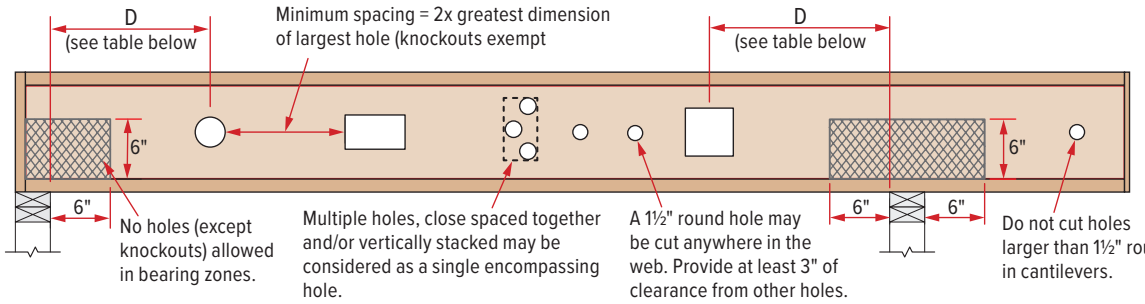
- See **Web Stiffener Requirements** on page 9.

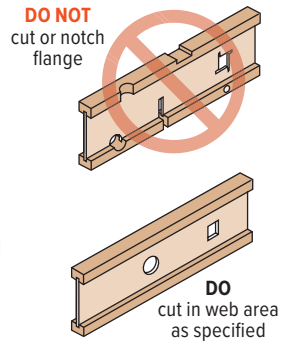
### Backer and Filler Block Dimensions

| Series | Backer Block Thickness | Filler Block Thickness |
|---|---|---|
| 5000 | ¾" or ⅞" wood panels | Two ¾" wood panels or 2 x _ |
| 6000 | 1⅛" or two ½" wood panels | 2 x _ + 7/16" or ½" wood panel |
| 6500 | 1⅛" or two ⅝" wood panels | 2 x _ + ⅝" or ¾" wood panel |
| 60 | 1⅛" or two ½" wood panels | 2 x _ + 7/16" or ½" wood panel |
| 90 | 2 x _ lumber | Double 2 x _ lumber |

- Cut backer and filler blocks to a maximum depth equal to the web depth minus ¼" to avoid a forced fit.

# Hole Location and Sizing




BCI® joists are manufactured with 1½" round perforated knockouts in the web at approximately 12" o.c. Minimum distance from support, listed in table below, is required for all holes greater than 1½".

| Minimum Distance (D) From Any Support To The Centerline Of The Hole | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Round Hole Diameter | | | 2" | 3" | 4" | 5" | 6" | 7" | 8" | 8⅞" | 10" | 11" | 12" | 13" | 14" | 15" |
| Rectangular Hole Side | | | – | – | – | 3" | 5" | 7" | – | – | – | – | – | – | – | – |
| Any 9½" Joist | Span | 8' | 1'-0" | 1'-1" | 1'-8" | 2'-4" | 2'-11" | 3'-7" | | | | | | | | |
| | | 12' | 1'-0" | 1'-7" | 2'-7" | 3'-6" | 4'-5" | 5'-4" | | | | | | | | |
| | | 16' | 1'-0" | 1'-2" | 3'-5" | 4'-8" | 5'-11" | 7'-2" | | | | | | | | |
| Round Hole Diameter | | | 2" | 3" | 4" | 5" | 6" | 7" | 8" | 8⅞" | 10" | 11" | 12" | 13" | 14" | 15" |
| Rectangular Hole Side | | | – | – | – | 2 | 3" | 5" | 7" | 8" | – | – | – | – | – | – |
| Any 11⅞" Joist | Span | 8' | 1'-0" | 1'-1" | 1'-6" | 2'-0" | 2'-5" | 2'-11" | 3'-5" | 3'-10" | | | | | | |
| | | 12' | 1'-0" | 1'-7" | 2'-3" | 3'-0" | 3'-8" | 4'-5" | 5'-1" | 5'-9" | | | | | | |
| | | 16' | 1'-2" | 2'-1" | 3'-0" | 4'-0" | 4'-11" | 5'-10" | 6'-10" | 7'-8" | | | | | | |
| | | 20' | 1'-5" | 2'-7" | 3'-10" | 5'-0" | 6'-2" | 7'-4" | 8'-6" | 9'-7" | | | | | | |
| Round Hole Diameter | | | 2" | 3" | 4" | 5" | 6" | 7" | 8" | 8⅞" | 10" | 11" | 12" | 13" | 14" | 15" |
| Rectangular Hole Side | | | – | – | – | – | 2" | 3" | 5" | 6" | 8" | 9" | – | – | – | – |
| Any 14" Joist | Span | 8' | 1'-0" | 1'-1" | 1'-2" | 1'-2" | 1'-6" | 1'-11" | 2'-4" | 2'-9" | 3'-3 | 3'-8" | | | | |
| | | 12' | 1'-0" | 1'-1" | 1'-2" | 1'-7" | 2'-3" | 2'-11" | 3'-6" | 4'-1" | 4'-10" | 5'-6" | | | | |
| | | 16' | 1'-0" | 1'-1" | 1'-3" | 2'-2" | 3'-0" | 3'-10" | 4'-9" | 5'-6" | 6'-6" | 7'-4" | | | | |
| | | 20' | 1'-0" | 1'-1" | 1'-7" | 2'-8" | 3'-9" | 4'-10" | 5'-11" | 6'-10" | 8'-1" | 9'-2" | | | | |
| | | 24' | 1'-0" | 1'-1" | 1'-11" | 3'-3" | 4'-6" | 5'-10" | 7'-1" | 8'-3" | 9'-9" | 11'-0" | | | | |
| Round Hole Diameter | | | 2" | 3" | 4" | 5" | 6" | 7" | 8" | 8⅞" | 10" | 11" | 12" | 13" | 14" | 15" |
| Rectangular Hole Side | | | – | – | – | – | – | 2" | 3" | 5" | 6" | 7" | 8" | 10" | – | – |
| Any 16" Joist | Span | 8' | 1'-0" | 1'-1" | 1'-2" | 1'-2" | 1'-3" | 1'-3" | 1'-7" | 1'-11" | 2'-4" | 2'-9" | 3'-2" | 3'-7" | | |
| | | 12' | 1'-0" | 1'-1" | 1'-2" | 1'-2" | 1'-3" | 1'-9" | 2'-4" | 2'-11" | 3'-7" | 4'-2" | 4'-9" | 5'-4" | | |
| | | 16' | 1'-0" | 1'-1" | 1'-2" | 1'-2" | 1'-7" | 2'-5" | 3'-2" | 3'-10" | 4'-9" | 5'-7" | 6'-4" | 7'-2" | | |
| | | 20' | 1'-0" | 1'-1" | 1'-2" | 1'-2" | 2'-0" | 3'-0" | 4'-0" | 4'-10" | 5'-11" | 6'1-1" | 7'-11" | 8'-11" | | |
| | | 24' | 1'-0" | 1'-1" | 1'-2" | 1'-3" | 2'-5" | 3'-7" | 4'-9" | 5'-10" | 7'-2" | 8'-4" | 9'-6" | 10'-9" | | |
| Round Hole Diameter | | | 2" | 3" | 4" | 5" | 6" | 7" | 8" | 8⅞" | 10" | 11" | 12" | 13" | 14" | 15" |
| Rectangular Hole Side | | | – | – | – | – | – | – | 2" | 3" | 5" | 6" | 7" | 8" | 10" | 11" |
| 18" BCI® 90 2.0 Joist | Span | 12' | 1'-0" | 1'-1" | 1'-2" | 1'-2" | 1'-5" | 1'-11" | 2'-4" | 2'-9" | 3'-3" | 3'-9" | 4'-2" | 4'-8" | 5'-1" | 5'-7" |
| | | 16' | 1'-0" | 1'-1" | 1'-2" | 1'-4" | 1'-11" | 2'-7" | 3'-2" | 3'-8" | 4'-5" | 5'-0" | 5'-7" | 6'-3" | 6'-10" | 7'-5" |
| | | 20' | 1'-0" | 1'-1" | 1'-2" | 1'-8" | 2'-5" | 3'-3" | 4'-0" | 4'-8" | 5'-6" | 6'-3" | 7'-0" | 7'-9" | 8'-7" | 9'-4" |
| | | 24' | 1'-0" | 1'-1" | 1'-2" | 2'-0" | 2'-11" | 3'-10" | 4'-9" | 5'-7" | 6'-7" | 7'-6" | 8'-5" | 9'-4" | 10'-3" | 11'-2" |
| | | 28' | 1'-0" | 1'-1" | 1'-4" | 1'-5" | 3'-5" | 4'-6" | 5'-7" | 6'-6" | 7'-9" | 8'-9" | 9'-10" | 10'-11" | 12'-0" | 13'-1" |
| Round Hole Diameter | | | 2" | 3" | 4" | 5" | 6" | 7" | 8" | 8⅞" | 10" | 11" | 12" | 13" | 14" | 15" |
| Rectangular Hole Side | | | – | – | – | – | – | – | – | 2" | 3" | 5" | 6" | 7" | 8" | 10" |
| 20" BCI® 90 2.0 Joist | Span | 12' | 1'-0" | 1'-1" | 1'-2" | 1'-2" | 1'-3" | 1'-6" | 1'-11" | 2'-3" | 2'-9" | 3'-2" | 3'-7" | 3'-11" | 4'-4" | 4'-9" |
| | | 16' | 1'-0" | 1'-1" | 1'-2" | 1'-2" | 1'-6" | 2'-1" | 2'-7" | 3'-1" | 3'-8" | 4'-3" | 4'-9" | 5'-3" | 5'-10" | 6'-4" |
| | | 20' | 1'-0" | 1'-1" | 1'-2" | 1'-3" | 1'-11" | 2'-7" | 3'-3" | 3'-10" | 4'-7" | 5'-3" | 5'-11" | 6'-7" | 7'-4" | 8'-0" |
| | | 24' | 1'-0" | 1'-1" | 1'-2" | 1'-6" | 2'-4" | 3'-1" | 3'-11" | 4'-7" | 5'-6" | 6'-4" | 7'-2" | 7'-11" | 8'-9" | 9'-7" |
| | | 28' | 1'-0" | 1'-1" | 1'-2" | 1'-9" | 2'-8" | 3'-8" | 4'-7" | 5'-5" | 6'-6" | 7'-5" | 8'-4" | 9'-3" | 10'-3" | 11'-2" |

### HOW TO USE THIS TABLE

(1) Select a table row based on joist depth and the actual joist span rounded up to the nearest span shown in the table.

(2) Scan across the row to the column for the appropriate round hole diameter or rectangular hole side. Use the longest side of a rectangular hole.

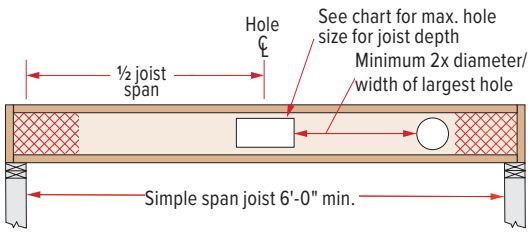
(3) The table value shown is the closest that the centerline of the hole may be to the edge or face of the nearest support.

### NOTES

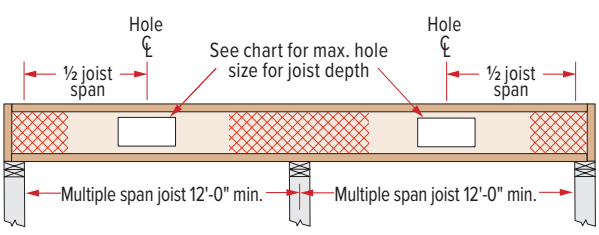
- **DO NOT** cut joist flanges.
- Holes apply to either single or multiple joists in repetitive member conditions.
- For multiple holes, the amount of horizontal uncut web between holes must equal at least twice the diameter (or longest side) of the largest hole.
- Table assumes one hole per horizontal location. Holes located above or below another should be considered as a single hole that encompasses all the holes.
- 1½" round knockouts in the web may be removed by using a short piece of metal pipe and hammer.
- Single holes may be positioned anywhere vertically in the web, provided they do not extend into either flange.
- This table was designed to apply *only* to the design conditions covered by tables elsewhere in this publication (maximum uniform PLF load).
- Use the BC Calc® software to check other hole sizes or holes in other design conditions. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® software.

# Large Rectangular Holes

## Single Span Joist




## Multiple Span Joist




- Hole sizes in table (right) are based on maximum uniform load of 40 psf live load and 10 psf dead load, at maximum spacing of 24" on-center.
- Additional holes may be cut in the web provided they meet the specifications shown in the Minimum Distance hole chart above or as allowed using BC Calc® sizing software.

### Maximum Hole Size

| Joist Depth | Simple Span | Multiple Span |
|---|---|---|
| 9½" | 6" x 14" | 6" x 12" |
| 11⅞" | 7" x 16"<br>8" x 15" | 8" x 12" |
| 14" | 9" x 16"<br>10" x 15" | 8" x 15" |
| 16" | 9" x 18"<br>11" x 16" | 10" x 14" |

Larger holes may be possible for either single or multiple span joists; use BC Calc® sizing software for specific analysis.

# BCI Joists—Reinforced Load-Bearing Cantilevers

| Joist Depth | Joist Series | Roof Truss Span | Roof Total Load (PSF) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 35 | | | 45 | | | 55 | | |
| | | | Joist Spacing (inches) | | | | | | | | |
| | | | 16 | 19.2 | 24 | 16 | 19.2 | 24 | 16 | 19.2 | 24 |
| 9½" | 5000 | 24' | 0 | 0 | 0 | 0 | 0 | X | 0 | X | X |
| | | 26' | 0 | 0 | 0 | 0 | 0 | X | 0 | X | X |
| | | 28' | 0 | 0 | X | 0 | 0 | X | 0 | X | X |
| | | 30' | 0 | 0 | X | 0 | X | X | X | X | X |
| | | 32' | 0 | 0 | X | 0 | X | X | X | X | X |
| | | 34' | 0 | 0 | X | 0 | X | X | X | X | X |
| | | 36' | 0 | 0 | X | 0 | X | X | X | X | X |
| | | 38' | 0 | X | X | X | X | X | X | X | X |
| | | 40' | 0 | X | X | X | X | X | X | X | X |
| | 6000 | 24' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X |
| | | 26' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X |
| | | 28' | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | X |
| | | 30' | 0 | 0 | 0 | 0 | 0 | X | 0 | 1 | X |
| | | 32' | 0 | 0 | 0 | 0 | 0 | X | 0 | X | X |
| | | 34' | 0 | 0 | 0 | 0 | 0 | X | 0 | X | X |
| | | 36' | 0 | 0 | WS | 0 | 0 | X | 0 | X | X |
| | | 38' | 0 | 0 | 1 | 0 | 1 | X | 0 | X | X |
| | | 40' | 0 | 0 | X | 0 | X | X | 1 | X | X |
| | 6500 | 24' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | | 26' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | X |
| | | 28' | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | X |
| | | 30' | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | X |
| | | 32' | 0 | 0 | 0 | 0 | 0 | X | 0 | 1 | X |
| | | 34' | 0 | 0 | 0 | 0 | 0 | X | 0 | 1 | X |
| | | 36' | 0 | 0 | WS | 0 | 0 | X | 0 | 1 | X |
| | | 38' | 0 | 0 | 1 | 0 | 1 | X | 0 | X | X |
| | | 40' | 0 | 0 | 1 | 0 | 1 | X | 1 | X | X |
| 11⅞" | 5000 | 24' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | X |
| | | 26' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | X |
| | | 28' | 0 | 0 | 0 | 0 | 0 | WS | 0 | WS | X |
| | | 30' | 0 | 0 | 0 | 0 | 0 | X | 0 | WS | X |
| | | 32' | 0 | 0 | WS | 0 | 0 | X | 0 | X | X |
| | | 34' | 0 | 0 | WS | 0 | 0 | X | 0 | X | X |
| | | 36' | 0 | 0 | WS | 0 | WS | X | 0 | X | X |
| | | 38' | 0 | 0 | 1 | 0 | WS | X | WS | X | X |
| | | 40' | 0 | 0 | X | 0 | X | X | X | X | X |
| | 6000 | 24' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X |
| | | 26' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X |
| | | 28' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | X |
| | | 30' | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | X |
| | | 32' | 0 | 0 | 0 | 0 | 0 | 1 | 0 | WS | X |
| | | 34' | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | X |
| | | 36' | 0 | 0 | WS | 0 | 0 | X | 0 | 1 | X |
| | | 38' | 0 | 0 | WS | 0 | 0 | X | 0 | 1 | X |
| | | 40' | 0 | 0 | 1 | 0 | WS | X | 0 | 1 | X |
| | 6500 | 24' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X |
| | | 26' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X |
| | | 28' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | X |
| | | 30' | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | X |
| | | 32' | 0 | 0 | 0 | 0 | 0 | 1 | 0 | WS | X |
| | | 34' | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | X |
| | | 36' | 0 | 0 | WS | 0 | 0 | X | 0 | 1 | X |
| | | 38' | 0 | 0 | WS | 0 | 0 | X | 0 | 1 | X |
| | | 40' | 0 | 0 | 1 | 0 | WS | X | 0 | X | X |

| Joist Depth | Joist Series | Roof Truss Span | Roof Total Load (PSF) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 35 | | | 45 | | | 55 | | |
| | | | Joist Spacing (inches) | | | | | | | | |
| | | | 16 | 19.2 | 24 | 16 | 19.2 | 24 | 16 | 19.2 | 24 |
| 11⅞" | 90 | 24' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 26' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 28' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 30' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 32' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 34' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | | 36' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS | 1 |
| | | 38' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| | | 40' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |
| | 60 | 24' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | | 26' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS | 1 |
| | | 28' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | X |
| | | 30' | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | X |
| | | 32' | 0 | 0 | 0 | 0 | 0 | 1 | 0 | X | X |
| | | 34' | 0 | 0 | 0 | 0 | 0 | X | 0 | X | X |
| | | 36' | 0 | 0 | 0 | 0 | 0 | X | 0 | X | X |
| | | 38' | 0 | 0 | 0 | 0 | 0 | X | 0 | X | X |
| | | 40' | 0 | 0 | 1 | 0 | 0 | X | 0 | X | X |
| 14" | 5000 | 24' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 26' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | WS |
| | | 28' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | 1 |
| | | 30' | 0 | 0 | 0 | 0 | 0 | WS | 0 | WS | X |
| | | 32' | 0 | 0 | 0 | 0 | 0 | WS | 0 | WS | X |
| | | 34' | 0 | 0 | WS | 0 | 0 | 1 | 0 | WS | X |
| | | 36' | 0 | 0 | WS | 0 | 0 | 1 | 0 | WS | X |
| | | 38' | 0 | 0 | WS | 0 | WS | X | 0 | 1 | X |
| | | 40' | 0 | 0 | WS | 0 | WS | X | WS | X | X |
| | 6000 | 24' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 26' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | WS |
| | | 28' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | WS |
| | | 30' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | 1 |
| | | 32' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | 1 |
| | | 34' | 0 | 0 | 0 | 0 | 0 | WS | 0 | WS | X |
| | | 36' | 0 | 0 | 0 | 0 | 0 | WS | 0 | WS | X |
| | | 38' | 0 | 0 | WS | 0 | 0 | 1 | 0 | WS | X |
| | | 40' | 0 | 0 | WS | 0 | 0 | 1 | 0 | 1 | X |
| | 6500 | 24' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 26' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 28' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | WS |
| | | 30' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | 1 |
| | | 32' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | X |
| | | 34' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | X |
| | | 36' | 0 | 0 | WS | 0 | 0 | WS | 0 | WS | X |
| | | 38' | 0 | 0 | WS | 0 | 0 | 1 | 0 | WS | X |
| | | 40' | 0 | 0 | WS | 0 | 0 | X | 0 | 1 | X |
| | 60 | 24' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 26' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 28' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 30' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | 1 |
| | | 32' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | 1 |
| | | 34' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | 1 |
| | | 36' | 0 | 0 | 0 | 0 | 0 | WS | 0 | WS | 1 |
| | | 38' | 0 | 0 | 0 | 0 | 0 | 1 | 0 | WS | X |
| | | 40' | 0 | 0 | WS | 0 | 0 | 1 | 0 | 1 | X |

| Joist Depth | Joist Series | Roof Truss Span | Roof Total Load (PSF) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 35 | | | 45 | | | 55 | | |
| | | | Joist Spacing (inches) | | | | | | | | |
| | | | 16 | 19.2 | 24 | 16 | 19.2 | 24 | 16 | 19.2 | 24 |
| 14" | 90 | 24' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 26' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 28' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 30' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 32' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 34' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 36' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 38' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | | 40' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 16" | 6000 | 24' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 26' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 28' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 30' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | WS |
| | | 32' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | WS |
| | | 34' | 0 | 0 | 0 | 0 | 0 | WS | 0 | WS | WS |
| | | 36' | 0 | 0 | 0 | 0 | 0 | WS | 0 | WS | X |
| | | 38' | 0 | 0 | WS | 0 | 0 | WS | 0 | WS | X |
| | | 40' | 0 | 0 | WS | 0 | 0 | WS | 0 | WS | X |
| | 6500 | 24' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 26' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 28' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | WS |
| | | 30' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | WS |
| | | 32' | 0 | 0 | 0 | 0 | 0 | WS | 0 | 0 | WS |
| | | 34' | 0 | 0 | 0 | 0 | 0 | WS | 0 | WS | WS |
| | | 36' | 0 | 0 | 0 | 0 | 0 | WS | 0 | WS | X |
| | | 38' | 0 | 0 | WS | 0 | 0 | WS | 0 | WS | X |
| | | 40' | 0 | 0 | WS | 0 | 0 | WS | 0 | WS | X |
| | 60 | 24' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 26' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 28' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 30' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 32' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 34' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 36' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 38' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |
| | | 40' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | WS |

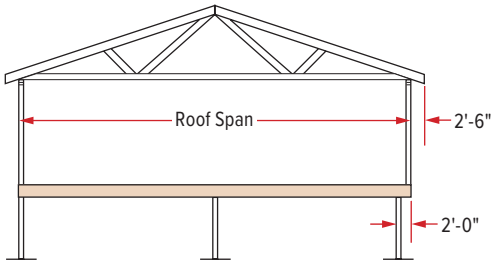
**KEY TO TABLES**

0 = No reinforcement required
WS = Web stiffeners at support
1 = Web stiffeners plus one reinforcer
2 = Web stiffeners plus two reinforcers
X = Use deeper joists or closer spacing

**NOTES**

- Cut 48" long reinforcers to match the joist depth. Use min. 23/32" plywood / OSB-rated sheathing, Exposure 1, 48/24 span-rated. The face grain must be horizontal (measure the 48" dimension along the long edge of the panel).
- Fasten the reinforcer to the joist flanges with 8d nails at 6" o.c. When reinforcing both sides, stagger the nails to limit splitting the joist flanges.
- Attach web stiffeners per intermediate Web Stiffener Nailing Schedule on page 9.
- Use the BC Calc® sizing software to analyze conditions that are not covered by this table. It may be possible to exceed the limitations of this table by analyzing a specific application with BC Calc® software.

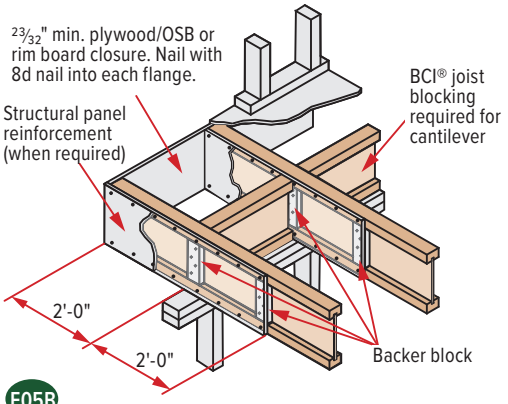
# Reinforced Load-Bearing Cantilever Details




- The tables and details on pages 8 and 9 indicate the type of reinforcements, if any, that are required for load-bearing cantilevers up to a maximum length of 2'-0". Cantilevers longer than 2'-0" cannot be reinforced. However, longer cantilevers with lower loads may be allowable without reinforcement. Analyze specific applications with the BC Calc® software.

**PLYWOOD / OSB REINFORCEMENT**
**(If required, per table on page 8 or per BC Calc® analysis)**

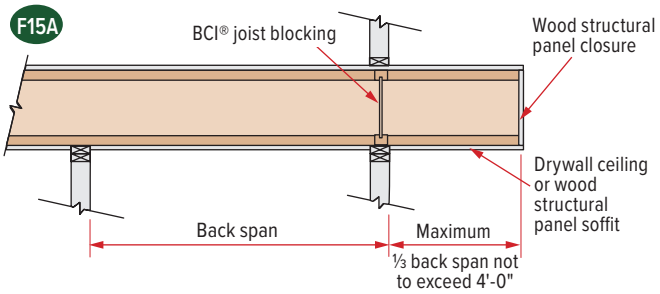
- 23/32" min. x 48" long plywood/OSB rated sheathing must match the full depth of the BCI® joist. Nail to the BCI® joist with 8d nails at 6" o.c. and nail with 4-8d nails into backer block. When reinforcing both sides, stagger nails to limit splitting. Install with face grain horizontal.
- The tables on page 8 assume a wall weight of 100 PLF, in addition to the roof loading shown. Applications with loading that exceeds the loads shown shall be analyzed with BC Calc® software.




Uplift on back span shall be considered in all cantilever designs

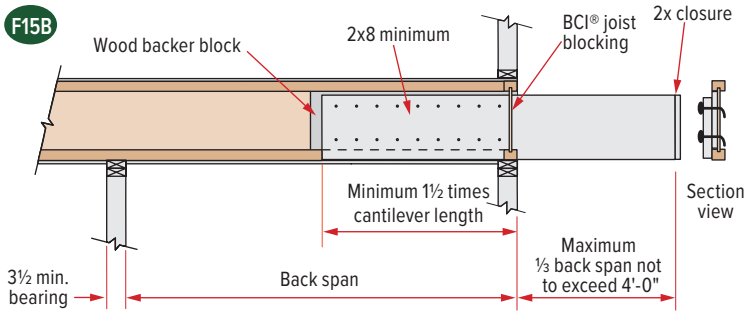
# Non-Load-Bearing Wall Cantilever Details

- BCI® Joists are intended only for applications that provide permanent protection from the weather. Impervious moisture barrier systems shall be detailed and installed in details F15A and F15B in accordance with 2018 IBC® Sections 107.2.5 and 110.3.6, or 2021 IBC Sections 107.2.5 and 110.3.7.



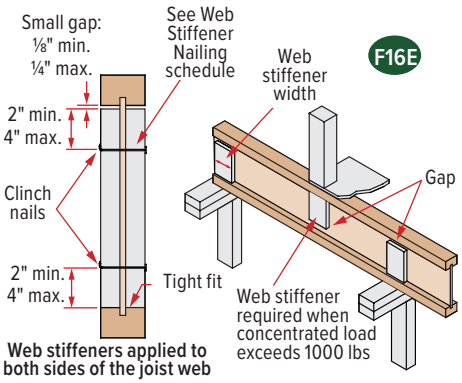

- These details apply to cantilevers with uniform loads only.
- Analyze BCI® joist cantilever condition with BC Calc® software.

- Fasten the 2x8 minimum to the BCI® joist by nailing through the backer block and joist web with two rows of 10d nails at 6" o.c. Clinch all nails. For BCI® 90 joists, use two rows of 16d nails on each side (four rows total) at 6" o.c.




- Loading shall not exceed 60 PSF live load and 10 PSF dead load. At least three joist members shall be present and spaced at 24" o.c. or less.
- Lumber joist shall be No. 2 Dense Southern Pine, No.1/No.2 SPF, No.2 Hem-fir, or No.2 Douglas fir, or higher grade.
- Provide positive drainage, durable materials, and venting as required in 2018 IBC Sections 2304.12.2.5 and 2304.12.2.6, or 2021 IBC Sections 2304.12.2.4 and 2304.12.2.5.. Lumber joist shall be sloped.

# Web Stiffener Requirements




Web stiffeners applied to both sides of the joist web

## Web Stiffener Specifications

| BCI® Joist Series | For Structural Capacity (Min. Thick) | Lateral Restraint in Hanger | Minimum Width |
|---|---|---|---|
| 5000 | 5/8" | 3/4" | 2 5/16" |
| 6000 | 3/4" | 7/8" | 2 5/16" |
| 6500 | 3/4" | 1" or 1 1/8" | 2 5/16" |
| 60 | 3/4" | 7/8" | 2 5/16" |
| 90 | 2x4 lumber (vertical) | | |

## NOTES

Web stiffeners are optional except as noted below.

- Web stiffeners are always required:
  - for all 18" and 20" joists at all bearing locations.
  - in hangers that do not extend up to support the top flange of the BCI® joist. Web stiffeners may be required with certain sloped or skewed hangers or to achieve uplift values. Refer to the hanger manufacturer's installation requirements.
  - in certain roof applications. See Roof Framing Details on page 14.
  - under concentrated loads that exceed 1000 pounds. Install the web stiffeners snug to the top flange in this situation. Follow the nailing schedule for intermediate bearings.
  - when hanger does not laterally support the top flange (e.g., adjustable height hangers). Web stiffeners may be of multiple thickness (e.g., BCI® 6500, double ½" panel OK).
  - as needed for structural capacity, to increase the BCI® joist's reaction capacity at a specific bearing location.
- Web stiffeners may be cut from structural rated wood panels, engineered rimboard or 2x lumber (BCI® 90 only).
- Web stiffeners may be used to increase allowable reaction values. See BCI® Joist Design Properties on page 24 or use BC Calc® software.

## Web Stiffener Nailing Schedule

| BCI® Joist | | Bearing Location | |
|---|---|---|---|
| Series | Depth | End | Intermediate |
| 5000 | 9½" | 2-8d | 2-8d |
| | 11⅞" | 2-8d | 3-8d |
| | 14" | 2-8d | 5-8d |
| | 16" | 2-8d | 6-8d |
| 6000 | 9½" | 2-8d | 2-8d |
| | 11⅞" | 2-8d | 3-8d |
| | 14" | 2-8d | 5-8d |
| | 16" | 2-8d | 6-8d |
| 6500 | 9½" | 2-8d | 2-8d |
| | 11⅞" | 2-8d | 3-8d |
| | 14" | 2-8d | 5-8d |
| | 16" | 2-8d | 6-8d |
| 60 | 11⅞" | 2-8d | 3-8d |
| | 14" | 2-8d | 5-8d |
| | 16" | 2-8d | 6-8d |
| 90 | 11⅞" | 3-16d | 3-16d |
| | 14" | 5-16d | 5-16d |
| | 16" | 6-16d | 6-16d |
| | 18" | 7-16d | 7-16d |
| | 20" | 8-16d | 8-16d |

# Floor Load Tables

## Allowable Uniform Floor Load (in pounds per lineal foot [PLF])

### 100% Load Duration

| Span Length | BCI® 5000 1.7 Joist 2" Flange Width | | | | | | BCI® 6000 1.8 Joist 2 5/16" Flange Width | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9½" | | 11⅞" | | 14" | | 9½" | | 11⅞" | | 14" | | 16" | |
| | Live Load | Total Load | Live Load | Total Load | Live Load | Total Load | Live Load | Total Load | Live Load | Total Load | Live Load | Total Load | Live Load | Total Load |
| 6' | – | 280 | – | 300 | – | 313 | – | 320 | – | 333 | – | 346 | – | 353 |
| 7' | – | 240 | – | 257 | – | 268 | – | 274 | – | 285 | – | 297 | – | 302 |
| 8' | – | 210 | – | 225 | – | 235 | – | 240 | – | 250 | – | 260 | – | 265 |
| 9' | – | 186 | – | 200 | – | 208 | – | 213 | – | 222 | – | 231 | – | 235 |
| 10' | 151 | 168 | – | 180 | – | 188 | 175 | 192 | – | 200 | – | 208 | – | 212 |
| 11' | 117 | 152 | – | 163 | – | 170 | 135 | 174 | – | 181 | – | 189 | – | 192 |
| 12' | 91 | 136 | 146 | 150 | – | 156 | 107 | 160 | – | 166 | – | 173 | – | 176 |
| 13' | 73 | 116 | 117 | 138 | – | 144 | 85 | 147 | 138 | 153 | – | 160 | – | 163 |
| 14' | 59 | 100 | 95 | 128 | – | 134 | 69 | 129 | 113 | 142 | – | 148 | – | 151 |
| 15' | 48 | 87 | 78 | 112 | 115 | 125 | 57 | 112 | 93 | 133 | 135 | 138 | – | 141 |
| 16' | 40 | 76 | 65 | 98 | 96 | 116 | 47 | 95 | 78 | 125 | 113 | 130 | – | 132 |
| 17' | | | 55 | 87 | 80 | 103 | 40 | 80 | 65 | 112 | 95 | 122 | – | 124 |
| 18' | | | 47 | 77 | 68 | 92 | | | 56 | 100 | 81 | 115 | 108 | 117 |
| 19' | | | 40 | 69 | 58 | 82 | | | 48 | 89 | 70 | 106 | 93 | 111 |
| 20' | | | | | 50 | 74 | | | 41 | 81 | 60 | 96 | 80 | 106 |
| 21' | | | | | 44 | 67 | | | | | 52 | 87 | 70 | 99 |
| 22' | | | | | | | | | | | 46 | 79 | 61 | 90 |
| 23' | | | | | | | | | | | | | | |
| 24' | | | | | | | | | | | | | | |
| 25' | | | | | | | | | | | | | | |

**NOTES**

- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® software.
- Live Load values are limited by deflection equal to L/480. For deflection limits of L/360 and L/960, multiply the Live Load values by 1.33 and 0.50 respectively.
- Total Load values are limited by shear, moment, or deflection equal to L/240.
- Both the Total Load and Live Load columns must be checked. Where a Live Load value is not shown, the Total Load value will control.
- Total Load values assume minimum bearing lengths without web stiffeners for joist depths of 16" and less. Web stiffeners are required for 18" or 20" joists.
- Table values
  - apply to either simple or multiple span joists. Span is measured center to center of the minimum required bearing length. Analyze multiple span joists with the BC Calc® software if the length of any span is less than half the length of an adjacent span.
  - do not consider composite action from gluing and nailing floor sheathing (composite action is considered in floor span tables on page 4).
- For assistance with floor design, consult the section About Floor Performance on page 4.

# Floor Load Tables

## Allowable Uniform Floor Load (in pounds per lineal foot [PLF])

### 100% Load Duration

| Span Length | BCI® 6500 1.8 Joist 2⁹⁄₁₆" Flange Width | | | | | | | | BCI® 60 2.0 Joist 2⁵⁄₁₆" Flange Width | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9½" | | 11⅞" | | 14" | | 16" | | 11⅞" | | 14" | | 16" | |
| | Live Load | Total Load | Live Load | Total Load | Live Load | Total Load | Live Load | Total Load | Live Load | Total Load | Live Load | Total Load | Live Load | Total Load |
| 6' | – | 320 | – | 333 | – | 346 | – | 353 | – | 366 | – | 366 | – | 366 |
| 7' | – | 274 | – | 285 | – | 297 | – | 302 | – | 314 | – | 314 | – | 314 |
| 8' | – | 240 | – | 250 | – | 260 | – | 265 | – | 275 | – | 275 | – | 275 |
| 9' | – | 213 | – | 222 | – | 231 | – | 235 | – | 244 | – | 244 | – | 244 |
| 10' | 190 | 192 | – | 200 | – | 208 | – | 212 | – | 220 | – | 220 | – | 220 |
| 11' | 147 | 174 | – | 181 | – | 189 | – | 192 | – | 200 | – | 200 | – | 200 |
| 12' | 116 | 160 | – | 166 | – | 173 | – | 176 | – | 183 | – | 183 | – | 183 |
| 13' | 93 | 147 | 152 | 153 | – | 160 | – | 163 | – | 169 | – | 169 | – | 169 |
| 14' | 76 | 137 | 124 | 142 | – | 148 | – | 151 | 149 | 157 | – | 157 | – | 157 |
| 15' | 62 | 124 | 103 | 133 | – | 138 | – | 141 | 123 | 146 | – | 146 | – | 146 |
| 16' | 52 | 104 | 85 | 125 | 123 | 130 | – | 132 | 103 | 137 | – | 137 | – | 137 |
| 17' | 44 | 88 | 72 | 117 | 104 | 122 | – | 124 | 87 | 129 | 125 | 129 | – | 129 |
| 18' | | | 61 | 110 | 88 | 115 | 117 | 117 | 74 | 122 | 106 | 122 | – | 122 |
| 19' | | | 52 | 99 | 76 | 109 | 101 | 111 | 63 | 115 | 92 | 115 | – | 115 |
| 20' | | | 45 | 89 | 65 | 104 | 87 | 106 | 55 | 110 | 79 | 110 | 105 | 110 |
| 21' | | | | | 57 | 96 | 76 | 100 | 48 | 96 | 69 | 104 | 92 | 104 |
| 22' | | | | | 50 | 88 | 66 | 96 | 42 | 84 | 60 | 100 | 81 | 100 |
| 23' | | | | | 44 | 80 | 58 | 92 | | | 53 | 95 | 71 | 95 |
| 24' | | | | | | | 52 | 84 | | | 47 | 91 | 63 | 91 |
| 25' | | | | | | | 46 | 77 | | | 42 | 84 | 56 | 88 |
| 26' | | | | | | | 41 | 72 | | | | | 50 | 84 |
| 27' | | | | | | | | | | | | | 45 | 81 |
| 28' | | | | | | | | | | | | | 40 | 78 |
| 29' | | | | | | | | | | | | | | |
| 30' | | | | | | | | | | | | | | |

**NOTES**

- Total Load values are limited by shear, moment, or deflection equal to L/240.
- Live Load values are limited by deflection equal to L/480. For deflection limits of L/360 and L/960, multiply the Live Load values by 1.33 and 0.50 respectively.
- Both the Total Load and Live Load columns must be checked. Where a Live Load value is not shown, the Total Load value will control.
- Table values apply to either simple or multiple span joists. Span is measured center to center of the minimum required bearing length. Analyze multiple span joists with the BC Calc® software if the length of any span is less than half the length of an adjacent span.
- Table values do not consider composite action from gluing and nailing floor sheathing (composite action is considered in floor span tables on page 4).
- Total Load values assume minimum bearing lengths without web stiffeners for joist depths of 16" and less.
- For assistance with floor design, consult the section *About Floor Performance* on page 4.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® software.

# Floor Load Tables

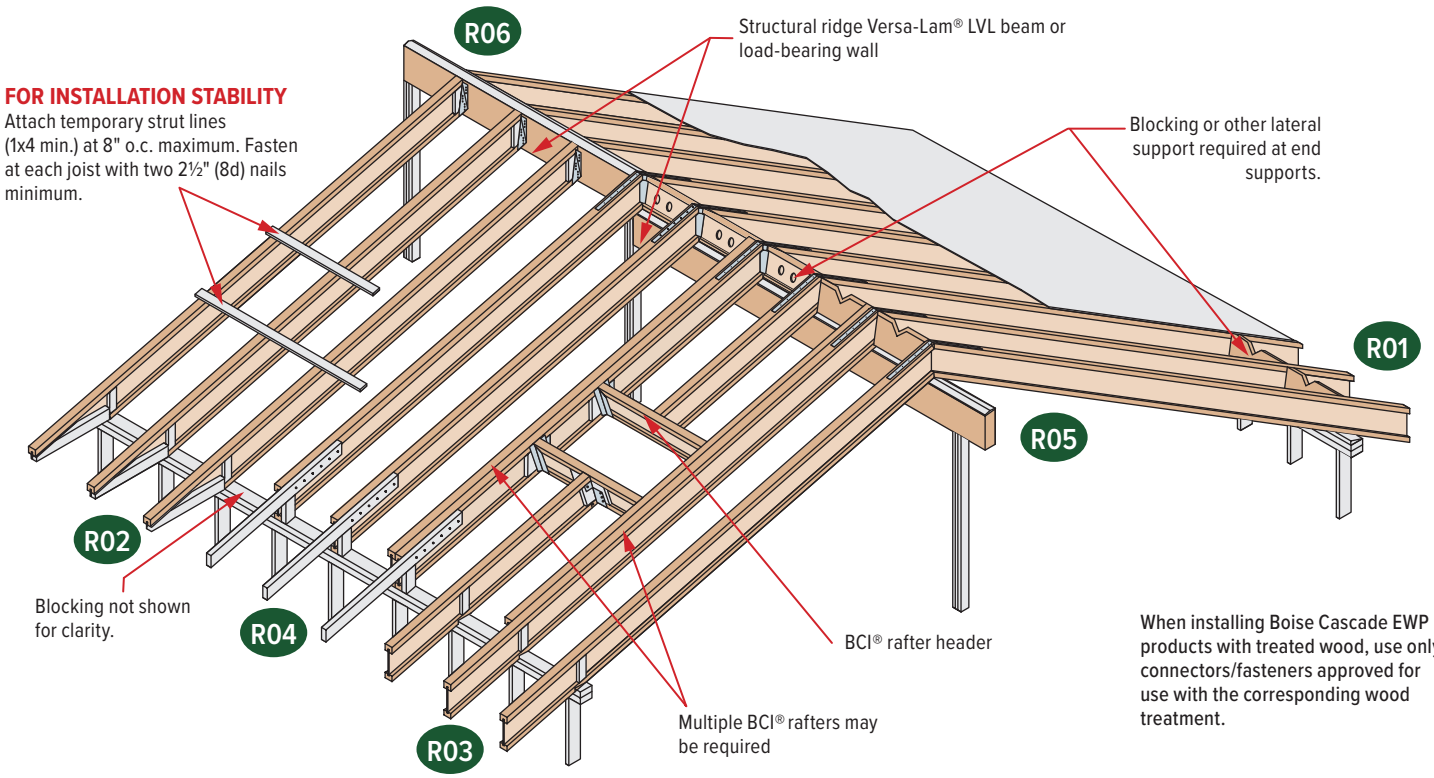
## Allowable Uniform Floor Load (in pounds per lineal foot (PLF)

### 100% Load Duration

| Span Length | BCI® 90 2.0 Joist 3½" Flange Width | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 11⅞" | | 14" | | 16" | | 18" | | 20" | |
| | Live Load | Total Load | Live Load | Total Load | Live Load | Total Load | Live Load | Total Load | Live Load | Total Load |
| 6' | – | 450 | – | 453 | – | 456 | – | 553 | – | 573 |
| 7' | – | 385 | – | 388 | – | 391 | – | 474 | – | 491 |
| 8' | – | 337 | – | 340 | – | 342 | – | 415 | – | 430 |
| 9' | – | 300 | – | 302 | – | 304 | – | 368 | – | 382 |
| 10' | – | 270 | – | 272 | – | 274 | – | 332 | – | 344 |
| 11' | – | 245 | – | 247 | – | 249 | – | 301 | – | 312 |
| 12' | – | 225 | – | 226 | – | 228 | – | 276 | – | 286 |
| 13' | – | 207 | – | 209 | – | 210 | – | 255 | – | 264 |
| 14' | – | 192 | – | 194 | – | 195 | – | 237 | – | 245 |
| 15' | 174 | 180 | – | 181 | – | 182 | – | 221 | – | 229 |
| 16' | 146 | 168 | – | 170 | – | 171 | – | 207 | – | 215 |
| 17' | 124 | 158 | – | 160 | – | 161 | – | 195 | – | 202 |
| 18' | 106 | 150 | 150 | 151 | – | 152 | – | 184 | – | 191 |
| 19' | 91 | 142 | 129 | 143 | – | 144 | – | 174 | – | 181 |
| 20' | 79 | 135 | 112 | 136 | – | 137 | – | 166 | – | 172 |
| 21' | 69 | 128 | 86 | 129 | – | 130 | – | 158 | – | 163 |
| 22' | 61 | 122 | 90 | 123 | 115 | 124 | 146 | 150 | – | 156 |
| 23' | 53 | 107 | 76 | 118 | 101 | 119 | 129 | 144 | – | 149 |
| 24' | 47 | 95 | 68 | 113 | 90 | 114 | 115 | 138 | – | 143 |
| 25' | 42 | 85 | 60 | 108 | 80 | 109 | 103 | 132 | 128 | 137 |
| 26' | | | 54 | 104 | 72 | 105 | 92 | 127 | 115 | 132 |
| 27' | | | 48 | 97 | 65 | 101 | 83 | 122 | 104 | 127 |
| 28' | | | 44 | 88 | 58 | 97 | 75 | 118 | 94 | 122 |
| 29' | | | | | 53 | 94 | 68 | 114 | 85 | 118 |
| 30' | | | | | 48 | 91 | 62 | 110 | 77 | 114 |

**NOTES**

- Total Load values are limited by shear, moment, or deflection equal to L/240.
- Live Load values are limited by deflection equal to L/480. For deflection limits of L/360 and L/960, multiply the Live Load values by 1.33 and 0.50 respectively.
- Both the Total Load and Live Load columns must be checked. Where a Live Load value is not shown, the Total Load value will control.
- Table values apply to either simple or multiple span joists. Span is measured center to center of the minimum required bearing length. Analyze multiple span joists with the BC Calc® software if the length of any span is less than half the length of an adjacent span.
- Table values do not consider composite action from gluing and nailing floor sheathing (composite action is considered in floor span tables on page 4).
- Total Load values assume minimum bearing lengths without web stiffeners for joist depths of 16" and less.
- For assistance with floor design, consult the section *About Floor Performance* on page 4.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® software.




**SAFETY WARNING**

**DO NOT ALLOW WORKERS ON BCI® JOISTS UNTIL ALL HANGERS, BCI® RIM JOISTS, RIM BOARDS, BCI® BLOCKING PANELS, X-BRACING AND TEMPORARY 1x4 STRUT LINES ARE INSTALLED AS SPECIFIED BELOW. SERIOUS ACCIDENTS CAN RESULT FROM INSUFFICIENT ATTENTION TO PROPER BRACING DURING CONSTRUCTION. ACCIDENTS CAN BE AVOIDED UNDER NORMAL CONDITIONS BY FOLLOWING THE GUIDELINES BELOW.**

- Build a braced end wall at the end of the bay, or permanently install the first eight feet of BCI® joists and the first course of sheathing. As an alternate, temporary sheathing may be nailed to the first four feet of BCI® joists at the end of the bay.
- All hangers, BCI® rim joists, rim boards, BCI® blocking panels, and x-bracing must be completely installed and properly nailed as each BCI® joist is set.
- Install temporary 1x4 strut lines at no more than eight feet on-center as additional BCI® joists are set. Nail the strut lines to the sheathed area, or braced end wall, and to each BCI® joist with two 2½" (8d) nails.
- The ends of cantilevers must be temporarily secured by strut lines on both the top and bottom flanges.
- Straighten the BCI® joist to within ½" of true alignment before attaching strut lines and sheathing.
- Remove the temporary strut lines only as required to install the permanent sheathing.
- Failure to install temporary bracing may result in sideways buckling or roll-over under light construction loads.

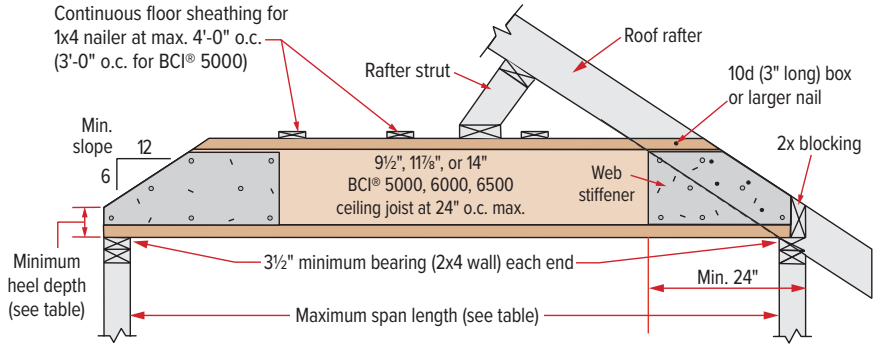
## BCI® Ceiling Joist with Bevel End Cut

***(For limited-access attics only)***

**CAUTION:** DO NOT use BCI® joists as a collar/tension tie. Roof rafters shall be supported by ridge beam or other upper bearing support.

**NOTES:**

- Ceiling joist must be designed to carry all roof load transferred through rafter struts as shown.
- BCI® ceiling joist end reaction may not exceed 550 pounds.
- Minimum roof slope is 6:12.
- Detail is to be used only for ceiling joists with no access to attic space.
- Nail roof rafter to BCI® top flange with one 3" (10d) sinker or box nail.
- 1x4 nailers must be continuous and nailed to a braced end wall.
- Install a web stiffener on each side of BCI® joist at beveled ends. Connect roof rafter to BCI® joist per code.




**Ceiling loads: Live Load 10 PSF Dead Load 7 PSF**

**Minimum Heel Depths**

| Joist Depth | End Wall | |
|---|---|---|
| | 2 x 4 | 2 x 6 |
| 9½" | 2½" | 1½" |
| 11⅞" | 3½" | 2½" |
| 14" | 4½" | 3½" |

**Maximum Span Lengths Without Roof Loads**

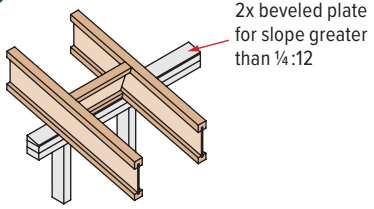
| | |
|---|---|
| 9½" BCI® 5000, /6000, 6500 | 19'-6" |
| 11⅞" BCI® 5000, 6000, 6500 | 22'-0" |
| 14" BCI® 6000, 6500 | 25'-0" |

- If roof loads are present, see first two notes at left.

# Roof Framing Details

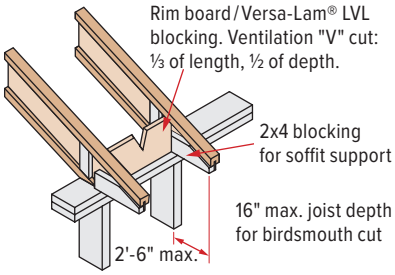
## Additional roof framing details available with BC Framer® software

**R01**



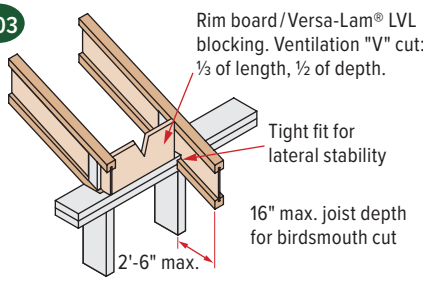

Simpson Strong-Tie VPA or MiTek TMP connectors or equal can be used in lieu of beveled plate for slopes from 3:12 to 12:12.

**R02**



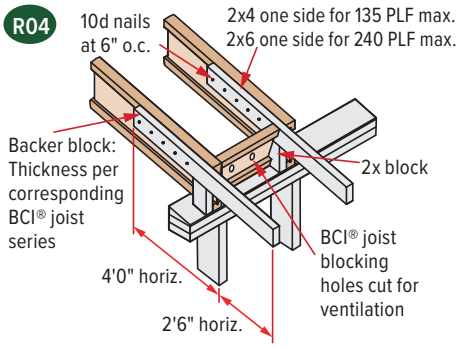

BCI® joist flanges may be birdsmouth cut only at the low end of the joist, and cut flange must bear fully on plate. Web stiffener required on each side.

**R03**

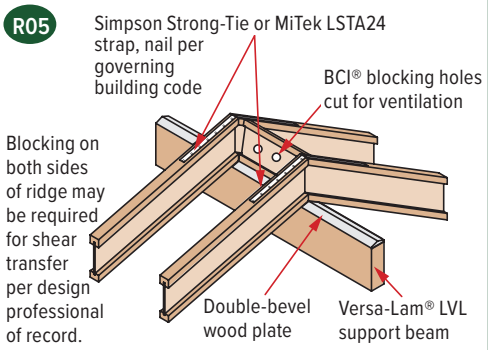



BCI® joist flanges may be birdsmouth cut only at the low end of the joist, and cut flange must bear fully on plate. Web stiffener required on each side.

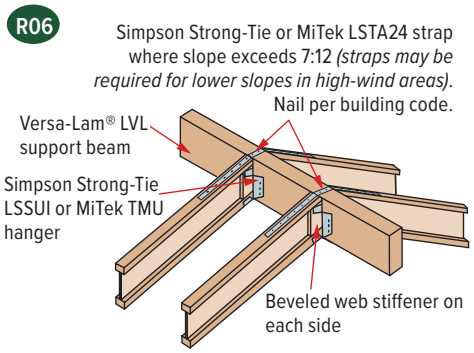
**R04**



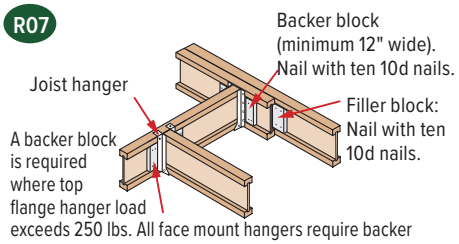

**R05**




**R06**



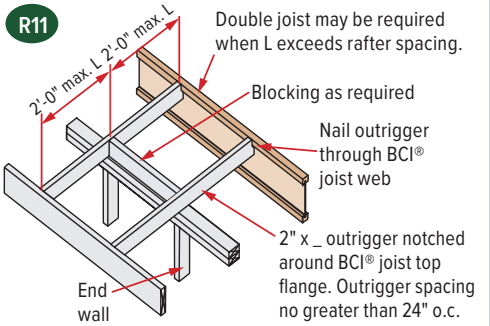

**R07**



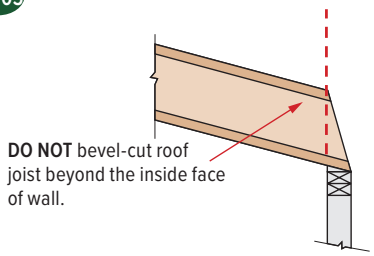

exceeds 250 lbs. All face mount hangers require backer blocks on both sides of the supporting joist's web.

For top flange hangers install tight to top flange. For face mount hangers, install tight to the bottom flange.

**R11**




**DN05**




### Lateral Support

- BCI® joists must be laterally supported at the ends (including supports adjacent to overhangs) with hangers, rim board, or blocking (Versa-Lam LVL®, Boise Cascade® Rimboard, or BCI® joist). Metal cross bracing or other x-bracing provides adequate lateral support for BCI® joists. Consult governing building code for roof diaphragm connection provisions.

### Minimum Bearing Length For BCI® Joists

- Minimum end bearing: 1½" for all BCI® joists. 3½" required at cantilever and intermediate supports.
- Longer bearing lengths allow higher reaction values. Refer to the building code evaluation report or the BC Calc® software.

### Nailing Requirements

- **BCI® rim joist, rim board or closure panel to BCI® joist:**
  - **Rims or closure panel:** Two nails, one each in the top and bottom flange; Up to 1½" thick rim, use 8d x 2½" nails; for 1¾" thick rim, use 10d box x 3" nails.
  - **BCI® 5000 rim joist:** Two 10d box nails, one each in the top and bottom flange.
  - **BCI® 6000/60 rim joist:** Two 16d box nails, one each in the top and bottom flange.
  - **BCI® 6500/90 rim joist:** Toe-nail top flange to rim joist with Two 10d box nails, one each side of flange.
- **BCI® rim joist, rim board or BCI® blocking panel to support:**
  - Min. 8d nails at 6" o.c. per IRC®.
  - Connection per design professional of record's specification for shear transfer.
- **BCI® joist to support:**
  - Two 8d nails, one on each side of the web, placed 1½" minimum from the end of the BCI® joist to limit splitting.
- **Sheathing to BCI® joist:**
  - Prescriptive residential roof sheathing nailing requires 8d common nails at 6" o.c. on edges and at 12" o.c. in the field (IRC® Table R602.3(1)).
  - See closest allowable nail spacing limits on page 24 for floor diaphragm nailing specified at closer spacing than IRC®.
  - For full lateral stability, maximum nail spacing for bracing is 18" for BCI® 5000, and 24" for larger BCI® joist series.
  - 14 gauge staples may be substituted for 8d nails if the staples penetrate at least 1" into the joist.
  - Wood screws may be acceptable, contact local building official and/or Boise Cascade EWP Engineering for more information.

### Web Stiffeners

- See Web Stiffener Requirements on page 9.

### Maximum Slope

- Unless otherwise noted, all roof details are valid for slopes of 12:12 or less.

### Ventilation

- All 1½", prepunched knock-out holes spaced at 12" o.c. along the BCI® joist may be knocked out and used for cross ventilation. When designing ventilation, using deeper joists than what is structurally required may be an advantage. Consult local building officials and/or ventilation specialists for specific requirements.

### Birdsmouth Cuts

- BCI® joists may be birdsmouth cut only at the low end support.
- BCI® joists with birdsmouth cuts may cantilever up to 2'-6" past the low end support.
- The bottom flange must sit fully on the support and may not overhang the inside face of the support.
- Birdsmouth cuts are NOT allowed at high end or intermediate supports.

### Backer and Filler Block Dimensions

| Series | Backer Block Thickness | Filler Block Thickness |
|---|---|---|
| 5000 | ¾" or ⅞" wood panels | Two ¾" wood panels or 2 x _ |
| 6000 | 1⅛" or two ½" wood panels | 2 x _ + 7/16" or ½" wood panel |
| 6500 | 1⅛" or two ⅝" wood panels | 2 x _ + ⅝" or ¾" wood panel |
| 60 | 1⅛" or two ½" wood panels | 2 x _ + 7/16" or ½" wood panel |
| 90 | 2 x _ lumber | Double 2 x _ lumber |

- Cut backer and filler blocks to a maximum depth equal to the web depth minus ¼" to avoid a forced fit.

# Roof Span Tables

Maximum clear span in feet and inches, based on horizontal spans.

## 115% and 125% Load Duration

| Condition | | | | BCI® 5000 1.7 Joist | | | | | | | | | BCI® 6000 1.8 Joist | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 9½" | | | 11⅞" | | | 14" | | | 9½" | | | 11⅞" | | | 14" | | | 16" | | |
| O.C. Spacing and Load Duration | | Live Load (psf) | Dead Load (psf) | 4:12 or Less | 4:12 to 8:12 | 8:12 to 12:12 | 4:12 or Less | 4:12 to 8:12 | 8:12 to 12:12 | 4:12 or Less | 4:12 to 8:12 | 8:12 to 12:12 | 4:12 or Less | 4:12 to 8:12 | 8:12 to 12:12 | 4:12 or Less | 4:12 to 8:12 | 8:12 to 12:12 | 4:12 or Less | 4:12 to 8:12 | 8:12 to 12:12 | 4:12 or Less | 4:12 to 8:12 | 8:12 to 12:12 |
| 12" o.c. | Non-Snow 125% | 20 | 10 | 24'-1" | 22'-9" | 21'-1" | 28'-7" | 26'-11" | 25'-0" | 32'-7" | 30'-8" | 28'-6" | 25'-6" | 24'-1" | 22'-4" | 30'-5" | 28'-8" | 26'-7" | 34'-8" | 32'-8" | 30'-4" | 38'-4" | 36'-2" | 33'-6" |
| | | 20 | 15 | 22'-10" | 21'-5" | 19'-9" | 27'-1" | 25'-5" | 23'-5" | 30'-10" | 29'-0" | 26'-9" | 24'-2" | 22'-8" | 20'-11" | 28'-10" | 27'-1" | 25'-0" | 32'-10" | 30'-10" | 28'-5" | 36'-4" | 34'-1" | 31'-5" |
| | | 20 | 20 | 21'-9" | 20'-5" | 18'-9" | 25'-10" | 24'-2" | 22'-3" | 29'-5" | 27'-7" | 25'-4" | 23'-1" | 21'-7" | 19'-10" | 27'-6" | 25'-9" | 23'-8" | 31'-4" | 29'-4" | 26'-11" | 34'-8" | 32'-5" | 29'-10" |
| | Snow 115% | 25 | 10 | 22'-11" | 21'-8" | 20'-2" | 27'-2" | 25'-8" | 23'-10" | 30'-10" | 29'-3" | 27'-2" | 24'-3" | 22'-11" | 21'-4" | 28'-11" | 27'-4" | 25'-5" | 32'-11" | 31'-1" | 28'-11" | 36'-5" | 34'-5" | 32'-0" |
| | | 25 | 15 | 21'-10" | 20'-7" | 19'-0" | 25'-10" | 24'-4" | 22'-7" | 28'-9" | 27'-9" | 25'-8" | 23'-1" | 21'-9" | 20'-2" | 27'-7" | 25'-11" | 24'-0" | 31'-5" | 29'-7" | 27'-4" | 34'-9" | 32'-8" | 30'-3" |
| | | 30 | 10 | 21'-11" | 20'-9" | 19'-4" | 25'-11" | 24'-7" | 22'-11" | 28'-10" | 28'-0" | 26'-1" | 23'-2" | 21'-11" | 20'-6" | 27'-7" | 26'-2" | 24'-5" | 31'-6" | 29'-9" | 27'-9" | 34'-10" | 32'-11" | 30'-9" |
| | | 30 | 15 | 21'-0" | 19'-10" | 18'-4" | 24'-10" | 23'-5" | 21'-9" | 27'-2" | 26'-6" | 24'-10" | 22'-3" | 21'-0" | 19'-5" | 26'-6" | 25'-0" | 23'-2" | 30'-2" | 28'-5" | 26'-5" | 33'-0" | 31'-6" | 29'-3" |
| | | 40 | 10 | 19'-11" | 19'-1" | 18'-0" | 23'-7" | 22'-8" | 21'-4" | 25'-10" | 25'-5" | 24'-4" | 21'-1" | 20'-3" | 19'-1" | 25'-1" | 24'-1" | 22'-9" | 28'-8" | 27'-5" | 25'-11" | 31'-4" | 30'-5" | 28'-8" |
| | | 40 | 15 | 19'-7" | 18'-7" | 17'-3" | 22'-6" | 22'-0" | 20'-6" | 24'-7" | 24'-1" | 23'-4" | 20'-9" | 19'-8" | 18'-4" | 24'-9" | 23'-5" | 21'-10" | 27'-11" | 26'-8" | 24'-10" | 29'-10" | 29'-3" | 27'-6" |
| | | 50 | 10 | 18'-5" | 17'-8" | 16'-9" | 21'-7" | 20'-11" | 19'-11" | 23'-7" | 23'-3" | 22'-8" | 19'-6" | 18'-9" | 17'-9" | 23'-3" | 22'-4" | 21'-2" | 26'-6" | 25'-5" | 24'-2" | 28'-8" | 28'-2" | 26'-8" |
| | | 50 | 15 | 18'-3" | 17'-7" | 16'-5" | 20'-9" | 20'-5" | 19'-5" | 22'-7" | 22'-3" | 21'-8" | 19'-6" | 18'-7" | 17'-4" | 23'-3" | 22'-2" | 20'-8" | 25'-8" | 25'-3" | 23'-7" | 27'-5" | 27'-0" | 26'-1" |
| 16" o.c. | Non-Snow 125% | 20 | 10 | 21'-10" | 20'-7" | 19'-1" | 25'-11" | 24'-5" | 22'-8" | 29'-6" | 27'-10" | 25'-10" | 23'-2" | 21'-10" | 20'-3" | 27'-7" | 26'-0" | 24'-2" | 31'-5" | 29'-7" | 27'-6" | 34'-9" | 32'-9" | 30'-5" |
| | | 20 | 15 | 20'-8" | 19'-5" | 17'-11" | 24'-6" | 23'-0" | 21'-3" | 27'-8" | 26'-3" | 24'-3" | 21'-11" | 20'-7" | 19'-0" | 26'-1" | 24'-6" | 22'-8" | 29'-9" | 27'-11" | 25'-9" | 32'-11" | 30'-11" | 28'-6" |
| | | 20 | 20 | 19'-9" | 18'-6" | 17'-0" | 23'-5" | 21'-11" | 20'-2" | 25'-10" | 25'-0" | 22'-11" | 20'-11" | 19'-7" | 18'-0" | 24'-11" | 23'-4" | 21'-5" | 28'-5" | 26'-7" | 24'-5" | 31'-5" | 29'-5" | 27'-0" |
| | Snow 115% | 25 | 10 | 20'-9" | 19'-7" | 18'-3" | 24'-6" | 23'-3" | 21'-8" | 26'-8" | 26'-1" | 24'-8" | 22'-0" | 20'-9" | 19'-4" | 26'-2" | 24'-9" | 23'-0" | 29'-10" | 28'-2" | 26'-3" | 32'-5" | 31'-2" | 29'-0" |
| | | 25 | 15 | 19'-9" | 18'-7" | 17'-3" | 22'-10" | 22'-1" | 20'-5" | 24'-10" | 24'-3" | 23'-4" | 20'-11" | 19'-9" | 18'-3" | 24'-11" | 23'-6" | 21'-9" | 28'-3" | 26'-9" | 24'-10" | 30'-3" | 29'-5" | 27'-5" |
| | | 30 | 10 | 19'-10" | 18'-9" | 17'-6" | 22'-11" | 22'-3" | 20'-9" | 24'-11" | 24'-6" | 23'-8" | 21'-0" | 19'-11" | 18'-7" | 25'-0" | 23'-8" | 22'-1" | 28'-4" | 27'-0" | 25'-2" | 30'-4" | 29'-9" | 27'-10" |
| | | 30 | 15 | 19'-0" | 17'-11" | 16'-8" | 21'-6" | 21'-0" | 19'-9" | 23'-5" | 22'-11" | 22'-2" | 20'-1" | 19'-0" | 17'-7" | 24'-0" | 22'-7" | 21'-0" | 26'-8" | 25'-9" | 23'-11" | 28'-6" | 27'-10" | 26'-6" |
| | | 40 | 10 | 18'-0" | 17'-4" | 16'-4" | 20'-6" | 20'-2" | 19'-4" | 22'-4" | 22'-0" | 21'-7" | 19'-1" | 18'-4" | 17'-3" | 22'-9" | 21'-10" | 20'-7" | 25'-5" | 24'-11" | 23'-6" | 27'-2" | 26'-9" | 26'-0" |
| | | 40 | 15 | 17'-2" | 16'-10" | 15'-8" | 19'-6" | 19'-1" | 18'-7" | 21'-3" | 20'-10" | 20'-3" | 18'-9" | 17'-9" | 16'-7" | 22'-2" | 21'-2" | 19'-9" | 24'-2" | 23'-8" | 22'-6" | 25'-10" | 25'-4" | 24'-8" |
| | | 50 | 10 | 16'-6" | 16'-0" | 15'-2" | 18'-8" | 18'-6" | 18'-0" | 20'-4" | 20'-1" | 19'-9" | 17'-8" | 16'-11" | 16'-1" | 21'-1" | 20'-2" | 19'-2" | 23'-2" | 22'-11" | 21'-10" | 24'-9" | 24'-6" | 24'-1" |
| | | 50 | 15 | 15'-10" | 15'-6" | 14'-10" | 17'-11" | 17'-7" | 17'-3" | 19'-6" | 19'-2" | 18'-9" | 17'-8" | 16'-10" | 15'-9" | 20'-4" | 20'-0" | 18'-9" | 22'-2" | 21'-10" | 21'-4" | 23'-9" | 23'-4" | 22'-10" |
| 19.2" o.c. | Non-Snow 125% | 20 | 10 | 20'-6" | 19'-4" | 18'-0" | 24'-4" | 22'-11" | 21'-4" | 27'-5" | 26'-2" | 24'-3" | 21'-9" | 20'-6" | 19'-0" | 25'-11" | 24'-5" | 22'-8" | 29'-6" | 27'-10" | 25'-10" | 32'-8" | 30'-10" | 28'-7" |
| | | 20 | 15 | 19'-5" | 18'-3" | 16'-10" | 23'-0" | 21'-8" | 20'-0" | 25'-3" | 24'-6" | 22'-9" | 20'-7" | 19'-4" | 17'-10" | 24'-6" | 23'-0" | 21'-3" | 27'-11" | 26'-3" | 24'-3" | 30'-8" | 29'-0" | 26'-10" |
| | | 20 | 20 | 18'-6" | 17'-4" | 15'-11" | 21'-8" | 20'-7" | 18'-11" | 23'-7" | 22'-9" | 21'-7" | 19'-7" | 18'-4" | 16'-11" | 23'-4" | 21'-11" | 20'-2" | 26'-8" | 24'-11" | 22'-11" | 28'-8" | 27'-7" | 25'-5" |
| | Snow 115% | 25 | 10 | 19'-6" | 18'-5" | 17'-2" | 22'-4" | 21'-10" | 20'-4" | 24'-4" | 23'-10" | 23'-2" | 20'-7" | 19'-6" | 18'-2" | 24'-7" | 23'-3" | 21'-8" | 27'-8" | 26'-6" | 24'-8" | 29'-7" | 28'-11" | 27'-3" |
| | | 25 | 15 | 18'-4" | 17'-6" | 16'-2" | 20'-10" | 20'-3" | 19'-2" | 22'-8" | 22'-1" | 21'-4" | 19'-8" | 18'-6" | 17'-2" | 23'-5" | 22'-1" | 20'-5" | 25'-9" | 25'-1" | 23'-4" | 27'-7" | 26'-10" | 25'-9" |
| | | 30 | 10 | 18'-5" | 17'-8" | 16'-5" | 20'-11" | 20'-6" | 19'-6" | 22'-9" | 22'-4" | 21'-10" | 19'-8" | 18'-8" | 17'-5" | 23'-6" | 22'-3" | 20'-9" | 25'-10" | 25'-4" | 23'-8" | 27'-8" | 27'-2" | 26'-2" |
| | | 30 | 15 | 17'-4" | 16'-10" | 15'-8" | 19'-7" | 19'-2" | 18'-6" | 21'-5" | 20'-11" | 20'-3" | 18'-11" | 17'-10" | 16'-7" | 22'-4" | 21'-3" | 19'-9" | 24'-4" | 23'-9" | 22'-6" | 26'-0" | 25'-5" | 24'-7" |
| | | 40 | 10 | 16'-6" | 16'-3" | 15'-4" | 18'-8" | 18'-5" | 18'-0" | 20'-4" | 20'-1" | 19'-8" | 17'-11" | 17'-2" | 16'-3" | 21'-3" | 20'-6" | 19'-4" | 23'-2" | 22'-10" | 22'-1" | 24'-9" | 24'-5" | 23'-11" |
| | | 40 | 15 | 15'-8" | 15'-4" | 14'-8" | 17'-9" | 17'-5" | 16'-11" | 19'-4" | 19'-0" | 18'-6" | 17'-8" | 16'-8" | 15'-7" | 20'-2" | 19'-10" | 18'-7" | 22'-0" | 21'-7" | 21'-0" | 23'-6" | 23'-1" | 22'-6" |
| | | 50 | 10 | 15'-0" | 14'-10" | 14'-3" | 17'-0" | 16'-10" | 16'-7" | 18'-7" | 18'-4" | 18'-0" | 16'-7" | 15'-11" | 15'-1" | 19'-5" | 19'-0" | 18'-0" | 21'-1" | 20'-10" | 20'-6" | 22'-7" | 22'-4" | 21'-11" |
| | | 50 | 15 | 14'-5" | 14'-2" | 13'-10" | 16'-4" | 16'-1" | 15'-8" | 17'-10" | 17'-6" | 17'-1" | 16'-4" | 15'-9" | 14'-9" | 18'-7" | 18'-3" | 17'-7" | 20'-3" | 19'-11" | 19'-5" | 21'-8" | 21'-3" | 20'-10" |
| 24" o.c. | Non-Snow 125% | 20 | 10 | 19'-0" | 17'-11" | 16'-8" | 22'-5" | 21'-3" | 19'-9" | 24'-6" | 23'-11" | 22'-6" | 20'-1" | 19'-0" | 17'-7" | 24'-0" | 22'-7" | 21'-0" | 27'-4" | 25'-9" | 23'-11" | 29'-9" | 28'-6" | 26'-6" |
| | | 20 | 15 | 18'-0" | 16'-11" | 15'-7" | 20'-9" | 20'-0" | 18'-6" | 22'-7" | 21'-11" | 21'-0" | 19'-0" | 17'-11" | 16'-6" | 22'-8" | 21'-4" | 19'-8" | 25'-8" | 24'-4" | 22'-5" | 27'-5" | 26'-7" | 24'-10" |
| | | 20 | 20 | 17'-1" | 16'-1" | 14'-9" | 19'-4" | 18'-8" | 17'-6" | 21'-1" | 20'-4" | 19'-5" | 18'-2" | 17'-0" | 15'-8" | 21'-8" | 20'-3" | 18'-8" | 23'-11" | 23'-1" | 21'-3" | 25'-7" | 24'-9" | 23'-6" |
| | Snow 115% | 25 | 10 | 17'-7" | 17'-1" | 15'-11" | 19'-11" | 19'-6" | 18'-10" | 21'-9" | 21'-3" | 20'-8" | 19'-1" | 18'-1" | 16'-10" | 22'-8" | 21'-6" | 20'-0" | 24'-8" | 24'-2" | 22'-10" | 26'-5" | 25'-10" | 25'-2" |
| | | 25 | 15 | 16'-5" | 15'-11" | 15'-0" | 18'-7" | 18'-1" | 17'-5" | 20'-3" | 19'-9" | 19'-0" | 18'-2" | 17'-2" | 15'-10" | 21'-2" | 20'-5" | 18'-11" | 23'-0" | 22'-5" | 21'-7" | 24'-8" | 24'-0" | 23'-2" |
| | | 30 | 10 | 16'-5" | 16'-2" | 15'-3" | 18'-8" | 18'-4" | 17'-10" | 20'-4" | 20'-0" | 19'-6" | 18'-3" | 17'-3" | 16'-2" | 21'-2" | 20'-7" | 19'-3" | 23'-1" | 22'-8" | 21'-11" | 24'-9" | 24'-3" | 23'-8" |
| | | 30 | 15 | 15'-5" | 15'-1" | 14'-6" | 17'-6" | 17'-1" | 16'-7" | 19'-1" | 18'-8" | 18'-1" | 17'-6" | 16'-6" | 15'-4" | 19'-11" | 19'-6" | 18'-3" | 21'-9" | 21'-3" | 20'-6" | 23'-3" | 22'-8" | 21'-11" |
| | | 40 | 10 | 14'-8" | 14'-6" | 14'-2" | 16'-8" | 16'-5" | 16'-1" | 18'-2" | 17'-11" | 17'-7" | 16'-7" | 15'-11" | 15'-0" | 19'-0" | 18'-8" | 17'-11" | 20'-8" | 20'-4" | 20'-0" | 22'-1" | 21'-9" | 21'-4" |
| | | 40 | 15 | 14'-0" | 13'-8" | 13'-4" | 15'-10" | 15'-7" | 15'-2" | 17'-3" | 16'-11" | 16'-6" | 15'-11" | 15'-5" | 14'-5" | 18'-0" | 17'-8" | 17'-2" | 19'-8" | 19'-3" | 18'-9" | 21'-0" | 20'-7" | 19'-8" |
| | | 50 | 10 | 13'-5" | 13'-3" | 13'-0" | 15'-3" | 15'-0" | 14'-9" | 16'-7" | 16'-5" | 16'-1" | 15'-3" | 14'-8" | 14'-0" | 17'-4" | 17'-1" | 16'-8" | 18'-10" | 18'-8" | 18'-4" | 19'-10" | 19'-5" | 18'-9" |
| | | 50 | 15 | 12'-10" | 12'-8" | 12'-4" | 14'-7" | 14'-4" | 14'-0" | 15'-11" | 15'-8" | 14'-11" | 14'-7" | 14'-4" | 13'-8" | 16'-7" | 16'-4" | 15'-11" | 17'-11" | 17'-4" | 16'-6" | 18'-3" | 17'-8" | 16'-10" |

**NOTES**

- Table values
  - are limited by shear, moment, total load deflection equal to L/180 and live load deflection equal to L/240. Check the local building code for other deflection limits that may apply.
  - represent the most restrictive of simple or multiple span applications. Analyze multiple span joists with the BC Calc® software if the length of any span is less than half the length of an adjacent span.
  - assume minimum bearing lengths without web stiffeners for joist depths of 16" and less.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® software.
- Slope roof joists at least ¼:12 to minimize ponding.
- Allowable spans and loads shall be adjusted and checked for wind load as required by local building code.

# Roof Span Tables

Maximum clear span in feet and inches, based on horizontal spans.

## 115% and 125% Load Duration

| Condition | | | | BCI® 6500 1.8 Joist | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 9½" | | | 11⅞" | | | 14" | | | 16" | | |
| O.C. Spacing and Load Duration | | Live Load (psf) | Dead Load (psf) | 4:12 or Less | 4:12 to 8:12 | 8:12 to 12:12 | 4:12 or Less | 4:12 to 8:12 | 8:12 to 12:12 | 4:12 or Less | 4:12 to 8:12 | 8:12 to 12:12 | 4:12 or Less | 4:12 to 8:12 | 8:12 to 12:12 |
| 12" o.c. | Non-Snow 125% | 20 | 10 | 26'-5" | 24'-11" | 23'-1" | 31'-5" | 29'-7" | 27'-5" | 35'-9" | 33'-8" | 31'-3" | 39'-6" | 37'-3" | 34'-7" |
| | | 20 | 15 | 25'-0" | 23'-6" | 21'-8" | 29'-9" | 27'-11" | 25'-9" | 33'-10" | 31'-9" | 29'-4" | 37'-5" | 35'-2" | 32'-5" |
| | | 20 | 20 | 23'-10" | 22'-4" | 20'-6" | 28'-4" | 26'-7" | 24'-5" | 32'-3" | 30'-3" | 27'-9" | 35'-8" | 33'-5" | 30'-9" |
| | Snow 115% | 25 | 10 | 25'-1" | 23'-8" | 22'-1" | 29'-10" | 28'-2" | 26'-2" | 33'-11" | 32'-1" | 29'-10" | 37'-6" | 35'-5" | 33'-0" |
| | | 25 | 15 | 23'-11" | 22'-6" | 20'-10" | 28'-5" | 26'-9" | 24'-9" | 32'-4" | 30'-5" | 28'-2" | 35'-9" | 33'-8" | 31'-2" |
| | | 30 | 10 | 23'-11" | 22'-8" | 21'-2" | 28'-6" | 27'-0" | 25'-2" | 32'-5" | 30'-8" | 28'-8" | 35'-10" | 33'-11" | 31'-8" |
| | | 30 | 15 | 23'-0" | 21'-8" | 20'-1" | 27'-4" | 25'-9" | 23'-11" | 31'-1" | 29'-4" | 27'-3" | 34'-5" | 32'-5" | 30'-1" |
| | | 40 | 10 | 21'-10" | 20'-11" | 19'-9" | 25'-11" | 24'-10" | 23'-6" | 29'-6" | 28'-4" | 26'-9" | 32'-8" | 31'-4" | 29'-7" |
| | | 40 | 15 | 21'-5" | 20'-4" | 18'-11" | 25'-6" | 24'-2" | 22'-6" | 29'-1" | 27'-6" | 25'-7" | 31'-5" | 30'-5" | 28'-4" |
| | | 50 | 10 | 20'-2" | 19'-4" | 18'-4" | 24'-0" | 23'-0" | 21'-10" | 27'-4" | 26'-3" | 24'-11" | 30'-2" | 29'-0" | 27'-6" |
| | | 50 | 15 | 20'-2" | 19'-3" | 18'-0" | 24'-0" | 22'-10" | 21'-4" | 27'-0" | 26'-0" | 24'-4" | 28'-11" | 28'-5" | 26'-11" |
| 16" o.c. | Non-Snow 125% | 20 | 10 | 23'-11" | 22'-7" | 20'-11" | 28'-5" | 26'-10" | 24'-11" | 32'-5" | 30'-6" | 28'-4" | 35'-10" | 33'-9" | 31'-4" |
| | | 20 | 15 | 22'-8" | 21'-3" | 19'-8" | 26'-11" | 25'-4" | 23'-4" | 30'-8" | 28'-10" | 26'-7" | 33'-11" | 31'-10" | 29'-5" |
| | | 20 | 20 | 21'-7" | 20'-3" | 18'-7" | 25'-8" | 24'-1" | 22'-1" | 29'-3" | 27'-5" | 25'-2" | 32'-4" | 30'-3" | 27'-10" |
| | Snow 115% | 25 | 10 | 22'-8" | 21'-6" | 20'-0" | 27'-0" | 25'-6" | 23'-9" | 30'-9" | 29'-1" | 27'-1" | 34'-0" | 32'-2" | 29'-11" |
| | | 25 | 15 | 21'-8" | 20'-5" | 18'-11" | 25'-9" | 24'-3" | 22'-5" | 29'-4" | 27'-7" | 25'-7" | 31'-10" | 30'-6" | 28'-3" |
| | | 30 | 10 | 21'-8" | 20'-7" | 19'-2" | 25'-10" | 24'-5" | 22'-10" | 29'-5" | 27'-10" | 26'-0" | 31'-11" | 30'-9" | 28'-9" |
| | | 30 | 15 | 20'-10" | 19'-8" | 18'-3" | 24'-9" | 23'-4" | 21'-8" | 28'-1" | 26'-7" | 24'-8" | 30'-0" | 29'-4" | 27'-4" |
| | | 40 | 10 | 19'-9" | 18'-11" | 17'-10" | 23'-6" | 22'-6" | 21'-3" | 26'-9" | 25'-8" | 24'-3" | 28'-7" | 28'-2" | 26'-9" |
| | | 40 | 15 | 19'-5" | 18'-5" | 17'-2" | 23'-1" | 21'-11" | 20'-5" | 25'-5" | 24'-11" | 23'-3" | 27'-2" | 26'-8" | 25'-8" |
| | | 50 | 10 | 18'-3" | 17'-6" | 16'-8" | 21'-9" | 20'-10" | 19'-10" | 24'-5" | 23'-9" | 22'-7" | 26'-1" | 25'-9" | 24'-11" |
| | | 50 | 15 | 18'-3" | 17'-5" | 16'-3" | 21'-5" | 20'-9" | 19'-4" | 23'-5" | 23'-0" | 22'-0" | 25'-0" | 24'-7" | 24'-0" |
| 19.2" o.c. | Non-Snow 125% | 20 | 10 | 22'-6" | 21'-2" | 19'-8" | 26'-9" | 25'-2" | 23'-5" | 30'-5" | 28'-8" | 26'-8" | 33'-8" | 31'-9" | 29'-5" |
| | | 20 | 15 | 21'-3" | 20'-0" | 18'-5" | 25'-4" | 23'-9" | 21'-11" | 28'-10" | 27'-1" | 25'-0" | 31'-10" | 29'-11" | 27'-7" |
| | | 20 | 20 | 20'-3" | 19'-0" | 17'-6" | 24'-2" | 22'-7" | 20'-9" | 27'-6" | 25'-9" | 23'-8" | 30'-2" | 28'-5" | 26'-2" |
| | Snow 115% | 25 | 10 | 21'-4" | 20'-2" | 18'-9" | 25'-4" | 24'-0" | 22'-4" | 28'-11" | 27'-4" | 25'-5" | 31'-1" | 30'-2" | 28'-1" |
| | | 25 | 15 | 20'-4" | 19'-2" | 17'-9" | 24'-2" | 22'-9" | 21'-1" | 27'-2" | 25'-11" | 24'-0" | 29'-0" | 28'-3" | 26'-7" |
| | | 30 | 10 | 20'-4" | 19'-4" | 18'-0" | 24'-3" | 23'-0" | 21'-5" | 27'-3" | 26'-2" | 24'-5" | 29'-1" | 28'-7" | 27'-0" |
| | | 30 | 15 | 19'-6" | 18'-5" | 17'-1" | 23'-3" | 21'-11" | 20'-4" | 25'-7" | 25'-0" | 23'-2" | 27'-5" | 26'-9" | 25'-8" |
| | | 40 | 10 | 18'-6" | 17'-9" | 16'-9" | 22'-1" | 21'-2" | 20'-0" | 24'-4" | 24'-0" | 22'-9" | 26'-1" | 25'-8" | 25'-2" |
| | | 40 | 15 | 18'-3" | 17'-3" | 16'-1" | 21'-3" | 20'-7" | 19'-2" | 23'-2" | 22'-9" | 21'-10" | 24'-9" | 24'-4" | 23'-8" |
| | | 50 | 10 | 17'-1" | 16'-5" | 15'-7" | 20'-5" | 19'-7" | 18'-7" | 22'-3" | 22'-0" | 21'-2" | 23'-9" | 23'-6" | 23'-1" |
| | | 50 | 15 | 17'-1" | 16'-4" | 15'-3" | 19'-7" | 19'-3" | 18'-2" | 21'-4" | 21'-0" | 20'-6" | 22'-10" | 22'-2" | 21'-2" |
| 24" o.c. | Non-Snow 125% | 20 | 10 | 20'-10" | 19'-8" | 18'-3" | 24'-9" | 23'-4" | 21'-8" | 28'-2" | 26'-7" | 24'-8" | 31'-2" | 29'-5" | 27'-4" |
| | | 20 | 15 | 19'-8" | 18'-6" | 17'-1" | 23'-5" | 22'-0" | 20'-4" | 26'-8" | 25'-1" | 23'-2" | 28'-11" | 27'-9" | 25'-7" |
| | | 20 | 20 | 18'-9" | 17'-7" | 16'-2" | 22'-4" | 20'-11" | 19'-3" | 25'-3" | 23'-10" | 21'-11" | 26'-11" | 26'-0" | 24'-3" |
| | Snow 115% | 25 | 10 | 19'-9" | 18'-8" | 17'-5" | 23'-6" | 22'-3" | 20'-8" | 26'-0" | 25'-4" | 23'-7" | 27'-10" | 27'-3" | 26'-1" |
| | | 25 | 15 | 18'-10" | 17'-9" | 16'-5" | 22'-3" | 21'-1" | 19'-6" | 24'-3" | 23'-7" | 22'-3" | 25'-11" | 25'-3" | 24'-4" |
| | | 30 | 10 | 18'-10" | 17'-10" | 16'-8" | 22'-4" | 21'-3" | 19'-10" | 24'-4" | 23'-11" | 22'-7" | 26'-0" | 25'-7" | 24'-11" |
| | | 30 | 15 | 18'-1" | 17'-1" | 15'-10" | 21'-0" | 20'-4" | 18'-10" | 22'-10" | 22'-4" | 21'-6" | 24'-5" | 23'-11" | 23'-1" |
| | | 40 | 10 | 17'-1" | 16'-5" | 15'-6" | 20'-0" | 19'-7" | 18'-6" | 21'-9" | 21'-5" | 21'-0" | 23'-3" | 22'-11" | 22'-3" |
| | | 40 | 15 | 16'-9" | 16'-0" | 14'-11" | 19'-0" | 18'-7" | 17'-9" | 20'-8" | 20'-4" | 19'-3" | 21'-7" | 20'-9" | 19'-8" |
| | | 50 | 10 | 15'-10" | 15'-2" | 14'-5" | 18'-3" | 18'-0" | 17'-3" | 19'-6" | 19'-0" | 18'-5" | 19'-10" | 19'-5" | 18'-9" |
| | | 50 | 15 | 15'-5" | 15'-1" | 14'-1" | 17'-3" | 16'-8" | 15'-11" | 17'-11" | 17'-4" | 16'-6" | 18'-3" | 17'-8" | 16'-10" |

**NOTES**

- Table values
  - are limited by shear, moment, total load deflection equal to L/180 and live load deflection equal to L/240. Check the local building code for other deflection limits that may apply.
  - represent the most restrictive of simple or multiple span applications. Analyze multiple span joists with the BC Calc® software if the length of any span is less than half the length of an adjacent span.
  - assume minimum bearing lengths without web stiffeners for joist depths of 16" and less.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® software.
- Slope roof joists at least ¼:12 to minimize ponding.
- Allowable spans and loads shall be adjusted and checked for wind load as required by local building code.

# Roof Span Tables

Maximum clear span in feet and inches, based on horizontal spans.

## 115% and 125% Load Duration

| Condition | | | | BCI® 60 2.0 Joist | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 11⅞ | | | 14" | | | 16" | | |
| O.C. Spacing and Load Duration | | Live Load (psf) | Dead Load (psf) | 4:12 or Less | 4:12 to 8:12 | 8:12 to 12:12 | 4:12 or Less | 4:12 to 8:12 | 8:12 to 12:12 | 4:12 or Less | 4:12 to 8:12 | 8:12 to 12:12 |
| 12" o.c. | Non-Snow 125% | 20 | 10 | 33'-7" | 31'-8" | 29'-5" | 38'-4" | 36'-1" | 33'-6" | 42'-5" | 40'-0" | 37'-1" |
| | | 20 | 15 | 31'-10" | 29'-11" | 27'-7" | 36'-3" | 34'-1" | 31'-5" | 40'-2" | 37'-8" | 34'-10" |
| | | 20 | 20 | 30'-4" | 28'-5" | 26'-2" | 34'-7" | 32'-5" | 29'-9" | 38'-4" | 35'-10" | 33'-0" |
| | Snow 115% | 25 | 10 | 31'-11" | 30'-2" | 28'-1" | 36'-4" | 34'-4" | 32'-0" | 40'-3" | 38'-1" | 35'-5" |
| | | 25 | 15 | 30'-5" | 28'-8" | 26'-6" | 34'-8" | 32'-8" | 30'-3" | 38'-5" | 36'-2" | 33'-6" |
| | | 30 | 10 | 30'-6" | 28'-11" | 26'-11" | 34'-9" | 32'-11" | 30'-8" | 38'-6" | 36'-5" | 34'-0" |
| | | 30 | 15 | 29'-3" | 27'-7" | 25'-7" | 33'-4" | 31'-5" | 29'-2" | 36'-11" | 34'-10" | 32'-4" |
| | | 40 | 10 | 27'-9" | 26'-7" | 25'-2" | 31'-8" | 30'-4" | 28'-8" | 35'-0" | 33'-7" | 31'-9" |
| | | 40 | 15 | 27'-4" | 25'-10" | 24'-1" | 31'-2" | 29'-6" | 27'-6" | 34'-6" | 32'-8" | 30'-5" |
| | | 50 | 10 | 25'-9" | 24'-8" | 23'-5" | 29'-4" | 28'-1" | 26'-8" | 32'-5" | 31'-1" | 29'-6" |
| | | 50 | 15 | 25'-9" | 24'-6" | 22'-11" | 29'-4" | 27'-11" | 26'-1" | 32'-5" | 30'-11" | 28'-11" |
| 16" o.c. | Non-Snow 125% | 20 | 10 | 30'-5" | 28'-9" | 26'-8" | 34'-9" | 32'-9" | 30'-5" | 38'-5" | 36'-3" | 33'-8" |
| | | 20 | 15 | 28'-10" | 27'-1" | 25'-0" | 32'-10" | 30'-10" | 28'-6" | 36'-5" | 34'-2" | 31'-7" |
| | | 20 | 20 | 27'-6" | 25'-9" | 23'-8" | 31'-4" | 29'-4" | 27'-0" | 34'-9" | 32'-6" | 29'-11" |
| | Snow 115% | 25 | 10 | 28'-11" | 27'-4" | 25'-5" | 32'-11" | 31'-2" | 29'-0" | 36'-6" | 34'-6" | 32'-1" |
| | | 25 | 15 | 27'-7" | 26'-0" | 24'-1" | 31'-5" | 29'-7" | 27'-5" | 34'-10" | 32'-9" | 30'-4" |
| | | 30 | 10 | 27'-8" | 26'-2" | 24'-5" | 31'-6" | 29'-10" | 27'-10" | 34'-11" | 33'-0" | 30'-10" |
| | | 30 | 15 | 26'-6" | 25'-0" | 23'-3" | 30'-2" | 28'-6" | 26'-6" | 33'-5" | 31'-7" | 29'-4" |
| | | 40 | 10 | 25'-2" | 24'-1" | 22'-9" | 28'-8" | 27'-6" | 26'-0" | 31'-9" | 30'-5" | 28'-9" |
| | | 40 | 15 | 24'-9" | 23'-5" | 21'-10" | 28'-3" | 26'-8" | 24'-11" | 31'-3" | 29'-7" | 27'-7" |
| | | 50 | 10 | 23'-3" | 22'-4" | 21'-2" | 26'-6" | 25'-5" | 24'-2" | 29'-5" | 28'-2" | 26'-9" |
| | | 50 | 15 | 23'-3" | 22'-2" | 20'-9" | 26'-6" | 25'-3" | 23'-8" | 28'-7" | 27'-8" | 26'-2" |
| 19.2" o.c. | Non-Snow 125% | 20 | 10 | 28'-7" | 27'-0" | 25'-1" | 32'-7" | 30'-9" | 28'-7" | 36'-1" | 34'-1" | 31'-7" |
| | | 20 | 15 | 27'-1" | 25'-5" | 23'-6" | 30'-10" | 29'-0" | 26'-9" | 34'-2" | 32'-1" | 29'-8" |
| | | 20 | 20 | 25'-10" | 24'-2" | 22'-3" | 29'-5" | 27'-7" | 25'-4" | 32'-7" | 30'-6" | 28'-1" |
| | Snow 115% | 25 | 10 | 27'-2" | 25'-8" | 23'-11" | 30'-11" | 29'-3" | 27'-3" | 34'-3" | 32'-5" | 30'-2" |
| | | 25 | 15 | 25'-11" | 24'-5" | 22'-7" | 29'-6" | 27'-10" | 25'-9" | 32'-8" | 30'-9" | 28'-6" |
| | | 30 | 10 | 25'-11" | 24'-7" | 22'-11" | 29'-7" | 28'-0" | 26'-2" | 32'-9" | 31'-0" | 29'-0" |
| | | 30 | 15 | 24'-11" | 23'-6" | 21'-10" | 28'-4" | 26'-9" | 24'-10" | 31'-5" | 29'-8" | 27'-6" |
| | | 40 | 10 | 23'-7" | 22'-8" | 21'-5" | 26'-11" | 25'-10" | 24'-5" | 29'-10" | 28'-7" | 27'-0" |
| | | 40 | 15 | 23'-3" | 22'-0" | 20'-6" | 26'-6" | 25'-1" | 23'-5" | 28'-1" | 27'-0" | 25'-7" |
| | | 50 | 10 | 21'-10" | 21'-0" | 19'-11" | 24'-11" | 23'-11" | 22'-8" | 25'-10" | 25'-3" | 24'-5" |
| | | 50 | 15 | 21'-10" | 20'-10" | 19'-6" | 23'-9" | 23'-0" | 21'-11" | 23'-9" | 23'-0" | 21'-11" |
| 24" o.c. | Non-Snow 125% | 20 | 10 | 26'-6" | 25'-0" | 23'-3" | 30'-2" | 28'-6" | 26'-6" | 33'-5" | 31'-7" | 29'-4" |
| | | 20 | 15 | 25'-1" | 23'-7" | 21'-9" | 28'-7" | 26'-10" | 24'-10" | 31'-8" | 29'-9" | 27'-6" |
| | | 20 | 20 | 23'-11" | 22'-5" | 20'-7" | 27'-3" | 25'-6" | 23'-6" | 30'-2" | 28'-3" | 26'-0" |
| | Snow 115% | 25 | 10 | 25'-2" | 23'-9" | 22'-2" | 28'-8" | 27'-1" | 25'-3" | 31'-9" | 30'-0" | 28'-0" |
| | | 25 | 15 | 24'-0" | 22'-7" | 20'-11" | 27'-4" | 25'-9" | 23'-10" | 30'-3" | 28'-6" | 26'-5" |
| | | 30 | 10 | 24'-0" | 22'-9" | 21'-3" | 27'-5" | 25'-11" | 24'-3" | 30'-4" | 28'-9" | 26'-10" |
| | | 30 | 15 | 23'-0" | 21'-9" | 20'-2" | 26'-3" | 24'-9" | 23'-0" | 27'-4" | 26'-1" | 24'-5" |
| | | 40 | 10 | 21'-10" | 21'-0" | 19'-10" | 24'-9" | 23'-11" | 22'-7" | 24'-9" | 24'-1" | 23'-1" |
| | | 40 | 15 | 21'-6" | 20'-4" | 19'-0" | 22'-5" | 21'-6" | 20'-5" | 22'-5" | 21'-6" | 20'-5" |
| | | 50 | 10 | 20'-2" | 19'-5" | 18'-5" | 20'-8" | 20'-2" | 19'-6" | 20'-8" | 20'-2" | 19'-6" |
| | | 50 | 15 | 19'-0" | 18'-4" | 17'-6" | 19'-0" | 18'-4" | 17'-6" | 19'-0" | 18'-4" | 17'-6" |

**NOTES**

- Table values
  - are limited by shear, moment, total load deflection equal to L/180 and live load deflection equal to L/240. Check the local building code for other deflection limits that may apply.
  - represent the most restrictive of simple or multiple span applications. Analyze multiple span joists with the BC Calc® software if the length of any span is less than half the length of an adjacent span.
  - assume minimum bearing lengths without web stiffeners for joist depths of 16" and less.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® software.
- Slope roof joists at least ¼:12 to minimize ponding.
- Allowable spans and loads shall be adjusted and checked for wind load as required by local building code.

# Roof Span Tables

Maximum clear span in feet and inches, based on horizontal spans.

## 115% and 125% Load Duration

| Condition | | | | BCI® 90 2.0 Joist | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 11⅞" | | | 14" | | | 16" | | | 18" | | | 20" | | |
| O.C. Spacing and Load Duration | | Live Load (psf) | Dead Load (psf) | 4:12 or Less | 4:12 to 8:12 | 8:12 to 12:12 | 4:12 or Less | 4:12 to 8:12 | 8:12 to 12:12 | 4:12 or Less | 4:12 to 8:12 | 8:12 to 12:12 | 4:12 or Less | 4:12 to 8:2 | 8:12 to 12:12 | 4:12 or Less | 4:12 to 8:12 | 8:12 to 12:12 |
| 12" o.c. | Non-Snow 125% | 20 | 10 | 38'-5" | 36'-3" | 33'-8" | 43'-7" | 41'-2" | 38'-2" | 48'-4" | 45'-7" | 42'-3" | 50'-0" | 49'-9" | 46'-2" | 50'-0" | 50'-0" | 50'-0" |
| | | 20 | 15 | 36'-5" | 34'-2" | 31'-7" | 41'-4" | 38'-10" | 35'-10" | 45'-9" | 43'-0" | 39'-8" | 50'-0" | 46'-11" | 43'-4" | 50'-0" | 50'-0" | 46'-11" |
| | | 20 | 20 | 34'-9" | 32'-6" | 29'-11" | 39'-5" | 36'-11" | 33'-11" | 43'-8" | 40'-10" | 37'-7" | 47'-8" | 44'-8" | 41'-1" | 50'-0" | 48'-4" | 44'-5" |
| | Snow 115% | 25 | 10 | 36'-6" | 34'-6" | 32'-1" | 41'-5" | 39'-2" | 36'-5" | 45'-10" | 43'-4" | 40'-4" | 50'-0" | 47'-5" | 44'-1" | 50'-0" | 50'-0" | 47'-9" |
| | | 25 | 15 | 34'-10" | 32'-9" | 30'-4" | 39'-6" | 37'-2" | 34'-5" | 43'-9" | 41'-2" | 38'-2" | 47'-10" | 45'-0" | 41'-8" | 50'-0" | 48'-8" | 45'-1" |
| | | 30 | 10 | 34'-11" | 33'-1" | 30'-10" | 39'-7" | 37'-6" | 35'-0" | 43'-10" | 41'-6" | 38'-9" | 47'-11" | 45'-5" | 42'-4" | 50'-0" | 49'-1" | 45'-10" |
| | | 30 | 15 | 33'-5" | 31'-7" | 29'-4" | 38'-0" | 35'-10" | 33'-3" | 42'-1" | 39'-8" | 36'-10" | 45'-11" | 43'-4" | 40'-3" | 49'-9" | 46'-11" | 43'-7" |
| | | 40 | 10 | 31'-9" | 30'-5" | 28'-9" | 36'-0" | 34'-7" | 32'-8" | 39'-11" | 38'-3" | 36'-2" | 43'-7" | 41'-10" | 39'-6" | 47'-2" | 45'-3" | 42'-9" |
| | | 40 | 15 | 31'-3" | 29'-7" | 27'-7" | 35'-6" | 33'-7" | 31'-3" | 39'-3" | 37'-2" | 34'-8" | 42'-11" | 40'-8" | 37'-10" | 46'-5" | 44'-0" | 41'-0" |
| | | 50 | 10 | 29'-5" | 28'-2" | 26'-9" | 33'-4" | 32'-0" | 30'-5" | 36'-11" | 35'-5" | 33'-8" | 40'-5" | 38'-9" | 36'-9" | 43'-8" | 41'-11" | 39'-10" |
| | | 50 | 15 | 29'-5" | 28'-0" | 26'-2" | 33'-4" | 31'-9" | 29'-8" | 36'-11" | 35'-3" | 32'-11" | 40'-5" | 38'-6" | 36'-0" | 43'-8" | 41'-8" | 38'-11" |
| 16" o.c. | Non-Snow 125% | 20 | 10 | 34'-10" | 32'-10" | 30'-6" | 39'-6" | 37'-4" | 34'-7" | 43'-9" | 41'-4" | 38'-4" | 47'-10" | 45'-2" | 41'-11" | 50'-0" | 48'-10" | 45'-4" |
| | | 20 | 15 | 33'-0" | 31'-0" | 28'-7" | 37'-5" | 35'-2" | 32'-6" | 41'-5" | 38'-11" | 36'-0" | 45'-4" | 42'-7" | 39'-4" | 49'-0" | 46'-1" | 42'-6" |
| | | 20 | 20 | 31'-6" | 29'-6" | 27'-1" | 35'-8" | 33'-5" | 30'-9" | 39'-7" | 37'-0" | 34'-1" | 43'-3" | 40'-6" | 37'-3" | 46'-9" | 43'-10" | 40'-3" |
| | Snow 115% | 25 | 10 | 33'-1" | 31'-3" | 29'-1" | 37'-6" | 35'-6" | 33'-1" | 41'-7" | 39'-4" | 36'-7" | 45'-5" | 42'-11" | 40'-0" | 49'-2" | 46'-6" | 43'-3" |
| | | 25 | 15 | 31'-6" | 29'-8" | 27'-6" | 35'-9" | 33'-8" | 31'-3" | 39'-8" | 37'-4" | 34'-7" | 43'-4" | 40'-10" | 37'-9" | 46'-10" | 44'-2" | 40'-11" |
| | | 30 | 10 | 31'-7" | 29'-11" | 27'-11" | 35'-10" | 34'-0" | 31'-9" | 39'-9" | 37'-8" | 35'-2" | 43'-5" | 41'-2" | 38'-5" | 47'-0" | 44'-6" | 41'-6" |
| | | 30 | 15 | 30'-4" | 28'-7" | 26'-7" | 34'-5" | 32'-5" | 30'-2" | 38'-1" | 35'-11" | 33'-5" | 41'-7" | 39'-3" | 36'-6" | 45'-0" | 42'-6" | 39'-6" |
| | | 40 | 10 | 28'-9" | 27'-7" | 26'-1" | 32'-7" | 31'-4" | 29'-7" | 36'-2" | 34'-8" | 32'-9" | 39'-6" | 37'-11" | 35'-10" | 42'-9" | 41'-0" | 38'-9" |
| | | 40 | 15 | 28'-4" | 26'-9" | 25'-0" | 32'-1" | 30'-5" | 28'-4" | 35'-7" | 33'-8" | 31'-5" | 38'-10" | 36'-10" | 34'-4" | 42'-1" | 39'-10" | 37'-2" |
| | | 50 | 10 | 26'-7" | 25'-6" | 24'-3" | 30'-2" | 29'-0" | 27'-6" | 33'-5" | 32'-1" | 30'-6" | 36'-7" | 35'-1" | 33'-4" | 39'-7" | 38'-0" | 36'-1" |
| | | 50 | 15 | 26'-7" | 25'-4" | 23'-9" | 30'-2" | 28'-9" | 26'-11" | 33'-5" | 31'-11" | 29'-10" | 36'-7" | 34'-10" | 32'-7" | 39'-7" | 37'-8" | 35'-3" |
| 19.2" o.c. | Non-Snow 125% | 20 | 10 | 32'-9" | 30'-11" | 28'-8" | 37'-2" | 35'-0" | 32'-6" | 41'-2" | 38'-10" | 36'-0" | 44'-11" | 42'-5" | 39'-4" | 48'-8" | 45'-11" | 42'-7" |
| | | 20 | 15 | 31'-0" | 29'-1" | 26'-11" | 35'-2" | 33'-0" | 30'-6" | 38'-11" | 36'-7" | 33'-9" | 42'-7" | 40'-0" | 36'-11" | 46'-0" | 43'-3" | 39'-11" |
| | | 20 | 20 | 29'-6" | 27'-8" | 25'-5" | 33'-6" | 31'-5" | 28'-11" | 37'-2" | 34'-9" | 32'-0" | 40'-7" | 38'-0" | 35'-0" | 43'-11" | 41'-2" | 37'-10" |
| | Snow 115% | 25 | 10 | 31'-1" | 29'-5" | 27'-4" | 35'-3" | 33'-4" | 31'-1" | 39'-0" | 36'-11" | 34'-5" | 42'-8" | 40'-4" | 37'-7" | 46'-2" | 43'-8" | 40'-8" |
| | | 25 | 15 | 29'-7" | 27'-11" | 25'-10" | 33'-7" | 31'-8" | 29'-4" | 37'-3" | 35'-1" | 32'-6" | 40'-8" | 38'-4" | 35'-6" | 44'-0" | 41'-6" | 38'-5" |
| | | 30 | 10 | 29'-8" | 28'-1" | 26'-3" | 33'-8" | 31'-11" | 29'-10" | 37'-4" | 35'-4" | 33'-0" | 40'-9" | 38'-8" | 36'-1" | 44'-1" | 41'-10" | 39'-0" |
| | | 30 | 15 | 28'-5" | 26'-10" | 24'-11" | 32'-3" | 30'-6" | 28'-4" | 35'-9" | 33'-9" | 31'-4" | 39'-1" | 36'-11" | 34'-3" | 42'-3" | 39'-11" | 37'-1" |
| | | 40 | 10 | 27'-0" | 25'-11" | 24'-6" | 30'-7" | 29'-5" | 27'-9" | 33'-11" | 32'-7" | 30'-9" | 37'-1" | 35'-7" | 33'-7" | 40'-1" | 38'-6" | 36'-5" |
| | | 40 | 15 | 26'-7" | 25'-2" | 23'-5" | 30'-2" | 28'-7" | 26'-7" | 33'-5" | 31'-7" | 29'-6" | 36'-6" | 34'-7" | 32'-3" | 39'-6" | 37'-5" | 34'-11" |
| | | 50 | 10 | 24'-11" | 24'-0" | 22'-9" | 28'-4" | 27'-2" | 25'-10" | 31'-5" | 30'-2" | 28'-8" | 34'-4" | 32'-11" | 31'-4" | 37'-1" | 35'-8" | 33'-10" |
| | | 50 | 15 | 24'-11" | 23'-10" | 22'-3" | 28'-4" | 27'-0" | 25'-3" | 29'-8" | 28'-8" | 27'-5" | 34'-4" | 32'-8" | 30'-7" | 37'-1" | 35'-5" | 33'-1" |
| 24" o.c. | Non-Snow 125% | 20 | 10 | 30'-4" | 28'-7" | 26'-7" | 34'-5" | 32'-5" | 30'-2" | 38'-1" | 35'-11" | 33'-5" | 41'-7" | 39'-3" | 36'-6" | 45'-0" | 42'-6" | 39'-6" |
| | | 20 | 15 | 28'-8" | 26'-11" | 24'-11" | 32'-6" | 30'-7" | 28'-3" | 36'-1" | 33'-11" | 31'-4" | 39'-5" | 37'-0" | 34'-2" | 42'-8" | 40'-1" | 37'-0" |
| | | 20 | 20 | 27'-4" | 25'-7" | 23'-7" | 31'-0" | 29'-1" | 26'-9" | 34'-4" | 32'-2" | 29'-8" | 37'-7" | 35'-2" | 32'-5" | 40'-8" | 38'-1" | 35'-1" |
| | Snow 115% | 25 | 10 | 28'-9" | 27'-2" | 25'-4" | 32'-7" | 30'-10" | 28'-9" | 36'-2" | 34'-2" | 31'-10" | 39'-6" | 37'-4" | 34'-10" | 42'-9" | 40'-5" | 37'-8" |
| | | 25 | 15 | 27'-5" | 25'-10" | 23'-11" | 31'-1" | 29'-4" | 27'-2" | 34'-5" | 32'-6" | 30'-1" | 37'-8" | 35'-6" | 32'-11" | 40'-9" | 38'-5" | 35'-7" |
| | | 30 | 10 | 27'-6" | 26'-0" | 24'-4" | 31'-2" | 29'-7" | 27'-7" | 34'-6" | 32'-9" | 30'-7" | 37'-9" | 35'-9" | 33'-5" | 40'-10" | 38'-9" | 36'-2" |
| | | 30 | 15 | 26'-4" | 24'-10" | 23'-1" | 29'-10" | 28'-2" | 26'-3" | 33'-1" | 31'-3" | 29'-1" | 36'-2" | 34'-2" | 31'-9" | 39'-2" | 37'-0" | 34'-4" |
| | | 40 | 10 | 24'-11" | 24'-0" | 22'-8" | 28'-4" | 27'-2" | 25'-9" | 30'-11" | 30'-0" | 28'-6" | 34'-4" | 32'-11" | 31'-2" | 37'-1" | 35'-8" | 33'-8" |
| | | 40 | 15 | 24'-7" | 23'-3" | 21'-9" | 27'-9" | 26'-5" | 24'-8" | 28'-0" | 26'-11" | 25'-6" | 33'-9" | 32'-0" | 29'-10" | 35'-2" | 33'-10" | 32'-1" |
| | | 50 | 10 | 23'-1" | 22'-2" | 21'-1" | 25'-7" | 24'-11" | 23'-11" | 25'-9" | 25'-2" | 24'-4" | 31'-3" | 30'-6" | 29'-0" | 32'-5" | 31'-8" | 30'-7" |
| | | 50 | 15 | 23'-1" | 22'-0" | 20'-7" | 23'-6" | 22'-9" | 21'-8" | 23'-8" | 22'-11" | 21'-10" | 28'-9" | 27'-10" | 26'-7" | 29'-10" | 28'-10" | 27'-6" |

**NOTES**

- Table values
  - are limited by shear, moment, total load deflection equal to L/180 and live load deflection equal to L/240. Check the local building code for other deflection limits that may apply.
  - represent the most restrictive of simple or multiple span applications. Analyze multiple span joists with the BC Calc® software if the length of any span is less than half the length of an adjacent span.
  - assume minimum bearing lengths without web stiffeners for joist depths of 16" and less.
- All 18" and 20" BCI® joists require web stiffeners.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® software.
- Slope roof joists at least ¼:12 to minimize ponding.
- Allowable spans and loads shall be adjusted and checked for wind load as required by local building code.

# Roof Load Tables

## Allowable Uniform Roof Load in pounds per lineal foot (PLF)

### 115% and 125% Load Duration

Use of these tables should be limited to roof slopes of 3½:12 or less. For steeper slopes, see pages 15–18.

| Span Length | BCI® 5000 1.7 Joist | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 9½" | | | 11⅞" | | | 14" | | |
| | Total Load | | Deflection | Total Load | | Deflection | Total Load | | Deflection |
| | Snow (115%) | Non-Snow (125%) | L/240 | Snow (115%) | Non-Snow (125%) | L/240 | Snow (115%) | Non-Snow (125%) | L/240 |
| 6' | 315 | 343 | – | 338 | 367 | – | 353 | 383 | – |
| 7' | 270 | 294 | – | 289 | 315 | – | 302 | 329 | – |
| 8' | 236 | 257 | – | 253 | 275 | – | 264 | 287 | – |
| 9' | 210 | 228 | – | 225 | 245 | – | 235 | 255 | – |
| 10' | 189 | 205 | – | 202 | 220 | – | 211 | 230 | – |
| 11' | 172 | 187 | – | 184 | 200 | – | 192 | 209 | – |
| 12' | 154 | 167 | – | 169 | 183 | – | 176 | 191 | – |
| 13' | 131 | 142 | – | 156 | 169 | – | 162 | 177 | – |
| 14' | 113 | 123 | 110 | 144 | 157 | – | 151 | 164 | – |
| 15' | 98 | 107 | 90 | 126 | 137 | – | 141 | 153 | – |
| 16' | 86 | 94 | 75 | 110 | 120 | – | 131 | 142 | – |
| 17' | 76 | 82 | 63 | 98 | 106 | – | 116 | 126 | – |
| 18' | 68 | 70 | 53 | 87 | 95 | – | 103 | 112 | – |
| 19' | 59 | 59 | 45 | 78 | 85 | 74 | 93 | 101 | – |
| 20' | 51 | 51 | 39 | 71 | 77 | 64 | 84 | 91 | – |
| 21' | | | | 64 | 70 | 55 | 76 | 83 | – |
| 22' | | | | 58 | 63 | 48 | 69 | 75 | – |
| 23' | | | | 53 | 55 | 42 | 63 | 69 | 62 |
| 24' | | | | | | | 58 | 63 | 55 |
| 25' | | | | | | | 53 | 58 | 49 |
| 26' | | | | | | | | | |
| 27' | | | | | | | | | |
| 28' | | | | | | | | | |

**NOTES**

- Total Load values are limited by shear, moment, or deflection equal to L/180.
- Deflection values are limited by live load deflection equal to L/240. Check the local building code for other deflection limits that may apply.
- Both the Total Load and Deflection columns must be checked. Where a deflection value is not shown, the total load value will control.
- Table values assume minimum bearing lengths without web stiffeners for joist depths of 16" and less.
- Slope roof joists at least ¼:12 to minimize ponding.
- Table values apply to either simple or multiple span joists. Span is measured center-to-center of the minimum required bearing length. Analyze multiple span joists with the BC Calc® software if the length of any span is less than half the length of an adjacent span.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® software.
- Allowable spans and loads shall be adjusted and checked for wind load as required by local building code.

# Roof Load Tables

## Allowable Uniform Roof Load in pounds per lineal foot (PLF)

## 115% and 125% Load Duration

Use of these tables should be limited to roof slopes of 3½:12 or less. For steeper slopes, see pages 15–18.

| Span Length | BCI® 6000 1.8 Joist | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9½" | | | 11⅞" | | | 14" | | | 16" | | |
| | Total Load | | Deflection | Total Load | | Deflection | Total Load | | Deflection | Total Load | | Deflection |
| | Snow (115%) | Non-Snow (125%) | L/240 | Snow (115%) | Non-Snow (125%) | L/240 | Snow (115%) | Non-Snow (125%) | L/240 | Snow (115%) | Non-Snow (125%) | L/240 |
| 6' | 360 | 392 | – | 375 | 408 | – | 390 | 424 | – | 398 | 432 | – |
| 7' | 309 | 336 | – | 322 | 350 | – | 334 | 364 | – | 341 | 371 | – |
| 8' | 270 | 294 | – | 281 | 306 | – | 293 | 318 | – | 298 | 324 | – |
| 9' | 240 | 261 | – | 250 | 272 | – | 260 | 283 | – | 265 | 288 | – |
| 10' | 216 | 235 | – | 225 | 245 | – | 234 | 254 | – | 238 | 259 | – |
| 11' | 196 | 213 | – | 204 | 222 | – | 213 | 231 | – | 217 | 236 | – |
| 12' | 180 | 196 | – | 187 | 204 | – | 195 | 212 | – | 199 | 216 | – |
| 13' | 166 | 180 | 159 | 173 | 188 | – | 180 | 196 | – | 183 | 199 | – |
| 14' | 145 | 158 | 129 | 161 | 175 | – | 167 | 182 | – | 170 | 185 | – |
| 15' | 126 | 137 | 106 | 150 | 163 | – | 156 | 169 | – | 159 | 173 | – |
| 16' | 111 | 115 | 88 | 140 | 153 | – | 146 | 159 | – | 149 | 162 | – |
| 17' | 97 | 97 | 74 | 126 | 137 | 122 | 137 | 149 | – | 140 | 152 | – |
| 18' | 82 | 82 | 63 | 112 | 122 | 103 | 130 | 141 | – | 132 | 144 | – |
| 19' | 70 | 70 | 53 | 101 | 110 | 89 | 120 | 130 | – | 125 | 136 | – |
| 20' | 60 | 60 | 46 | 91 | 99 | 76 | 108 | 117 | – | 119 | 129 | – |
| 21' | 52 | 52 | 40 | 83 | 87 | 66 | 98 | 107 | 97 | 112 | 122 | – |
| 22' | | | | 75 | 76 | 58 | 89 | 97 | 85 | 102 | 111 | – |
| 23' | | | | 67 | 67 | 51 | 82 | 89 | 75 | 93 | 101 | – |
| 24' | | | | 59 | 59 | 45 | 75 | 81 | 66 | 86 | 93 | – |
| 25' | | | | 52 | 52 | 40 | 69 | 75 | 58 | 79 | 86 | 78 |
| 26' | | | | | | | 64 | 68 | 52 | 73 | 79 | 70 |
| 27' | | | | | | | 59 | 61 | 47 | 67 | 73 | 63 |
| 28' | | | | | | | 55 | 55 | 42 | 63 | 68 | 56 |

**NOTES**

- Total Load values are limited by shear, moment, or deflection equal to L/180.
- Deflection values are limited by live load deflection equal to L/240. Check the local building code for other deflection limits that may apply.
- Both the Total Load and Deflection columns must be checked. Where a deflection value is not shown, the total load value will control.
- Table values assume minimum bearing lengths without web stiffeners for joist depths of 16" and less.
- Slope roof joists at least ¼:12 to minimize ponding.
- Table values apply to either simple or multiple span joists. Span is measured center-to-center of the minimum required bearing length. Analyze multiple span joists with the BC Calc® software if the length of any span is less than half the length of an adjacent span.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® software.
- Allowable spans and loads shall be adjusted and checked for wind load as required by local building code.

# Roof Load Tables

## Allowable Uniform Roof Load in pounds per lineal foot (PLF)

## 115% and 125% Load Duration

Use of these tables should be limited to roof slopes of 3½:12 or less. For steeper slopes, see pages 15–18.

| Span Length | BCI® 6500 1.8 Joist | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9½" | | | 11⅞" | | | 14" | | | 16" | | |
| | Total Load | | Deflection | Total Load | | Deflection | Total Load | | Deflection | Total Load | | Deflection |
| | Snow (115%) | Non-Snow (125%) | L/240 | Snow (115%) | Non-Snow (125%) | L/240 | Snow (115%) | Non-Snow (125%) | L/240 | Snow (115%) | Non-Snow (125%) | L/240 |
| 6' | 360 | 392 | – | 375 | 408 | – | 390 | 424 | – | 398 | 432 | – |
| 7' | 309 | 336 | – | 322 | 350 | – | 334 | 364 | – | 341 | 371 | – |
| 8' | 270 | 294 | – | 281 | 306 | – | 293 | 318 | – | 298 | 324 | – |
| 9' | 240 | 261 | – | 250 | 272 | – | 260 | 283 | – | 265 | 288 | – |
| 10' | 216 | 235 | – | 225 | 245 | – | 234 | 254 | – | 238 | 259 | – |
| 11' | 196 | 213 | – | 204 | 222 | – | 213 | 231 | – | 217 | 236 | – |
| 12' | 180 | 196 | – | 187 | 204 | – | 195 | 212 | – | 199 | 216 | – |
| 13' | 166 | 180 | – | 173 | 188 | – | 180 | 196 | – | 183 | 199 | – |
| 14' | 154 | 168 | 141 | 161 | 175 | – | 167 | 182 | – | 170 | 185 | – |
| 15' | 140 | 152 | 116 | 150 | 163 | – | 156 | 169 | – | 159 | 173 | – |
| 16' | 123 | 126 | 97 | 140 | 153 | – | 146 | 159 | – | 149 | 162 | – |
| 17' | 106 | 106 | 81 | 132 | 144 | – | 137 | 149 | – | 140 | 152 | – |
| 18' | 90 | 90 | 69 | 125 | 135 | 114 | 130 | 141 | – | 132 | 144 | – |
| 19' | 77 | 77 | 59 | 112 | 122 | 97 | 123 | 134 | – | 125 | 136 | – |
| 20' | 66 | 66 | 51 | 101 | 110 | 84 | 117 | 127 | – | 119 | 129 | – |
| 21' | 57 | 57 | 44 | 91 | 95 | 73 | 108 | 118 | 106 | 113 | 123 | – |
| 22' | 50 | 50 | 38 | 83 | 83 | 64 | 99 | 107 | 92 | 108 | 118 | – |
| 23' | | | | 73 | 73 | 56 | 90 | 98 | 81 | 103 | 112 | – |
| 24' | | | | 64 | 64 | 49 | 83 | 90 | 72 | 95 | 103 | – |
| 25' | | | | 57 | 57 | 44 | 76 | 83 | 64 | 87 | 95 | 85 |
| 26' | | | | 51 | 51 | 39 | 71 | 74 | 57 | 81 | 88 | 76 |
| 27' | | | | | | | 65 | 67 | 51 | 75 | 81 | 68 |
| 28' | | | | | | | 60 | 60 | 46 | 69 | 76 | 61 |
| 29' | | | | | | | 54 | 54 | 41 | 65 | 70 | 55 |
| 30' | | | | | | | | | | 60 | 66 | 50 |
| 31' | | | | | | | | | | 57 | 60 | 45 |
| 32' | | | | | | | | | | 53 | 54 | 41 |
| 33' | | | | | | | | | | 50 | 50 | 38 |
| 34' | | | | | | | | | | | | |
| 35' | | | | | | | | | | | | |

**NOTES**

- Total Load values are limited by shear, moment, or deflection equal to L/180.
- Deflection values are limited by live load deflection equal to L/240. Check the local building code for other deflection limits that may apply.
- Both the Total Load and Deflection columns must be checked. Where a deflection value is not shown, the total load value will control.
- Table values assume minimum bearing lengths without web stiffeners for joist depths of 16" and less.
- Slope roof joists at least ¼:12 to minimize ponding.
- Table values apply to either simple or multiple span joists. Span is measured center-to-center of the minimum required bearing length. Analyze multiple span joists with the BC Calc® software if the length of any span is less than half the length of an adjacent span.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® software.
- Allowable spans and loads shall be adjusted and checked for wind load as required by local building code.

# Roof Load Tables

## Allowable Uniform Roof Load in pounds per lineal foot (PLF)

## 115% and 125% Load Duration

Use of these tables should be limited to roof slopes of 3½:12 or less. For steeper slopes, see pages 15–18.

| Span Length | BCI® 60 2.0 Joist | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 11⅞" | | | 14" | | | 16" | | |
| | Total Load | | Deflection | Total Load | | Deflection | Total Load | | Deflection |
| | Snow (115%) | Non-Snow (125%) | L/240 | Snow (115%) | Non-Snow (125%) | L/240 | Snow (115%) | Non-Snow (125%) | L/240 |
| 6' | 413 | 449 | – | 413 | 449 | – | 413 | 449 | – |
| 7' | 354 | 385 | – | 354 | 385 | – | 354 | 385 | – |
| 8' | 309 | 336 | – | 309 | 336 | – | 309 | 336 | – |
| 9' | 275 | 299 | – | 275 | 299 | – | 275 | 299 | – |
| 10' | 247 | 269 | – | 247 | 269 | – | 247 | 269 | – |
| 11' | 225 | 245 | – | 225 | 245 | – | 225 | 245 | – |
| 12' | 206 | 224 | – | 206 | 224 | – | 206 | 224 | – |
| 13' | 190 | 207 | – | 190 | 207 | – | 190 | 207 | – |
| 14' | 177 | 192 | – | 177 | 192 | – | 177 | 192 | – |
| 15' | 165 | 179 | – | 165 | 179 | – | 165 | 179 | – |
| 16' | 154 | 168 | – | 154 | 168 | – | 154 | 168 | – |
| 17' | 145 | 158 | – | 145 | 158 | – | 145 | 158 | – |
| 18' | 137 | 149 | – | 137 | 149 | – | 137 | 149 | – |
| 19' | 130 | 141 | 118 | 130 | 141 | – | 130 | 141 | – |
| 20' | 123 | 133 | 102 | 123 | 134 | – | 123 | 134 | – |
| 21' | 116 | 116 | 88 | 118 | 128 | – | 118 | 128 | – |
| 22' | 101 | 101 | 77 | 112 | 122 | – | 112 | 122 | – |
| 23' | 89 | 89 | 68 | 107 | 117 | 99 | 107 | 117 | – |
| 24' | 79 | 79 | 60 | 103 | 112 | 88 | 103 | 112 | – |
| 25' | 70 | 70 | 53 | 99 | 102 | 78 | 99 | 107 | – |
| 26' | 62 | 62 | 47 | 91 | 91 | 69 | 95 | 103 | 93 |
| 27' | 56 | 56 | 42 | 81 | 81 | 62 | 91 | 99 | 84 |
| 28' | 50 | 50 | 38 | 73 | 73 | 56 | 88 | 96 | 75 |
| 29' | | | | 66 | 66 | 50 | 85 | 89 | 68 |
| 30' | | | | 60 | 60 | 46 | 81 | 81 | 61 |
| 31' | | | | 54 | 54 | 41 | 73 | 73 | 56 |
| 32' | | | | | | | 67 | 67 | 51 |
| 33' | | | | | | | 61 | 61 | 46 |
| 34' | | | | | | | 56 | 56 | 43 |
| 35' | | | | | | | 51 | 51 | 39 |

**NOTES**

- Total Load values are limited by shear, moment, or deflection equal to L/180.
- Deflection values are limited by live load deflection equal to L/240. Check the local building code for other deflection limits that may apply.
- Both the Total Load and Deflection columns must be checked. Where a deflection value is not shown, the total load value will control.
- Table values assume minimum bearing lengths without web stiffeners for joist depths of 16" and less.
- Slope roof joists at least ¼:12 to minimize ponding.
- Table values apply to either simple or multiple span joists. Span is measured center-to-center of the minimum required bearing length. Analyze multiple span joists with the BC Calc® software if the length of any span is less than half the length of an adjacent span.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® software.
- Allowable spans and loads shall be adjusted and checked for wind load as required by local building code.

# Roof Load Tables

## Allowable Uniform Roof Load in pounds per lineal foot (PLF)

## 115% and 125% Load Duration

Use of these tables should be limited to roof slopes of 3½:12 or less. For steeper slopes, see pages 15–18.

| Span Length | BCI® 90 2.0 Joist | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 11⅞" | | | 14" | | | 16" | | | 18" | | | 20" | | |
| | Total Load | | Deflection | Total Load | | Deflection | Total Load | | Deflection | Total Load | | Deflection | Total Load | | Deflection |
| | Snow (115%) | Non-Snow (125%) | L/240 | Snow (115%) | Non-Snow (125%) | L/240 | Snow (115%) | Non-Snow (125%) | L/240 | Snow (115%) | Non-Snow (125%) | L/240 | Snow (115%) | Non-Snow (125%) | L/240 |
| 6' | 507 | 551 | – | 510 | 555 | – | 514 | 559 | – | 623 | 677 | – | 646 | 702 | – |
| 7' | 434 | 472 | – | 437 | 476 | – | 441 | 479 | – | 534 | 581 | – | 553 | 602 | – |
| 8' | 380 | 413 | – | 383 | 416 | – | 385 | 419 | – | 467 | 508 | – | 484 | 526 | – |
| 9' | 338 | 367 | – | 340 | 370 | – | 343 | 372 | – | 415 | 451 | – | 430 | 468 | – |
| 10' | 304 | 330 | – | 306 | 333 | – | 308 | 335 | – | 374 | 406 | – | 387 | 421 | – |
| 11' | 276 | 300 | – | 278 | 302 | – | 280 | 305 | – | 340 | 369 | – | 352 | 383 | – |
| 12' | 253 | 275 | – | 255 | 277 | – | 257 | 279 | – | 311 | 338 | – | 323 | 351 | – |
| 13' | 234 | 254 | – | 235 | 256 | – | 237 | 258 | – | 287 | 312 | – | 298 | 324 | – |
| 14' | 217 | 236 | – | 218 | 238 | – | 220 | 239 | – | 267 | 290 | – | 276 | 301 | – |
| 15' | 202 | 220 | – | 204 | 222 | – | 205 | 223 | – | 249 | 271 | – | 258 | 280 | – |
| 16' | 190 | 206 | – | 191 | 208 | – | 192 | 209 | – | 233 | 254 | – | 242 | 263 | – |
| 17' | 178 | 194 | – | 180 | 196 | – | 181 | 197 | – | 220 | 239 | – | 228 | 247 | – |
| 18' | 169 | 183 | – | 170 | 185 | – | 171 | 186 | – | 207 | 225 | – | 215 | 234 | – |
| 19' | 160 | 174 | – | 161 | 175 | – | 162 | 176 | – | 196 | 214 | – | 204 | 221 | – |
| 20' | 152 | 165 | 148 | 153 | 166 | – | 154 | 167 | – | 187 | 203 | – | 193 | 210 | – |
| 21' | 144 | 157 | 129 | 145 | 158 | – | 147 | 159 | – | 178 | 193 | – | 184 | 200 | – |
| 22' | 138 | 148 | 113 | 139 | 151 | – | 140 | 152 | – | 170 | 184 | – | 176 | 191 | – |
| 23' | 130 | 130 | 100 | 133 | 144 | – | 134 | 145 | – | 162 | 176 | – | 168 | 183 | – |
| 24' | 115 | 115 | 88 | 127 | 138 | 126 | 128 | 139 | – | 155 | 169 | – | 161 | 175 | – |
| 25' | 103 | 103 | 78 | 122 | 133 | 112 | 123 | 134 | – | 149 | 162 | – | 155 | 168 | – |
| 26' | 92 | 92 | 70 | 117 | 128 | 100 | 118 | 129 | – | 143 | 156 | – | 149 | 162 | – |
| 27' | 82 | 82 | 63 | 113 | 118 | 90 | 114 | 124 | – | 138 | 150 | – | 143 | 156 | – |
| 28' | 74 | 74 | 56 | 106 | 106 | 81 | 110 | 119 | 109 | 133 | 145 | – | 138 | 150 | – |
| 29' | 67 | 67 | 51 | 96 | 96 | 73 | 106 | 115 | 98 | 129 | 140 | 127 | 133 | 145 | – |
| 30' | 60 | 60 | 46 | 87 | 87 | 67 | 102 | 111 | 89 | 124 | 135 | 115 | 129 | 140 | – |
| 31' | 55 | 55 | 42 | 79 | 79 | 60 | 99 | 106 | 81 | 120 | 131 | 105 | 125 | 135 | – |
| 32' | 50 | 50 | 38 | 72 | 72 | 55 | 96 | 97 | 74 | 116 | 125 | 96 | 121 | 131 | 120 |
| 33' | | | | 66 | 66 | 50 | 89 | 89 | 68 | 113 | 114 | 88 | 117 | 127 | 110 |
| 34' | | | | 60 | 60 | 46 | 81 | 81 | 62 | 105 | 105 | 80 | 114 | 123 | 101 |
| 35' | | | | 56 | 56 | 42 | 75 | 75 | 57 | 97 | 97 | 74 | 110 | 120 | 93 |

**NOTES**

- Total Load values are limited by shear, moment, or deflection equal to L/180.
- Deflection values are limited by live load deflection equal to L/240. Check the local building code for other deflection limits that may apply.
- Both the Total Load and Deflection columns must be checked. Where a deflection value is not shown, the total load value will control.
- Table values assume minimum bearing lengths without web stiffeners for joist depths of 16" and less.
- All 18" and 20" BCI® joists require web stiffeners.
- Slope roof joists at least ¼:12 to minimize ponding.
- Table values apply to either simple or multiple span joists. Span is measured center-to-center of the minimum required bearing length. Analyze multiple span joists with the BC Calc® software if the length of any span is less than half the length of an adjacent span.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® software.
- Allowable spans and loads shall be adjusted and checked for wind load as required by local building code.

# BCI Joist Design Properties

| BCI® Joist Series | Joist Depth | Weight (PLF) | Moment (ft-lbs) | EI x $10^6$ (lb-in$^2$) | K x $10^6$ (lbs) | Shear (lbs) | End Reaction (lbs) | | | | Intermediate Reaction (lbs) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1½" Bearing | | 3½" Bearing | | 3½" Bearing | | 5¼" Bearing | |
| | | | | | | | No WS (1) | WS (2) | No WS (1) | WS (2) | No WS (1) | WS (2) | No WS (1) | WS (2) |
| 5000 1.7 | 9½" | 2.0 | 2460 | 160 | 5.0 | 1475 | 950 | 1125 | 1125 | 1275 | 2100 | 2350 | 2525 | 2750 |
| | 11⅞" | 2.3 | 3150 | 265 | 6.0 | 1625 | 950 | 1425 | 1425 | 1475 | 2250 | 2850 | 2525 | 3000 |
| | 14" | 2.5 | 3735 | 390 | 8.0 | 1825 | 950 | 1525 | 1475 | 1725 | 2350 | 3050 | 2525 | 3200 |
| 6000 1.8 | 9½" | 2.2 | 3165 | 190 | 5.0 | 1575 | 1175 | 1375 | 1375 | 1425 | 2400 | 2650 | 2700 | 2750 |
| | 11⅞" | 2.5 | 4060 | 320 | 6.0 | 1675 | 1175 | 1425 | 1425 | 1475 | 2500 | 2850 | 2900 | 3000 |
| | 14" | 2.7 | 4815 | 470 | 8.0 | 1925 | 1175 | 1525 | 1525 | 1725 | 2600 | 3150 | 2925 | 3200 |
| | 16" | 2.9 | 5495 | 635 | 9.0 | 2175 | 1175 | 1625 | 1550 | 1975 | 2650 | 3350 | 2950 | 3350 |
| 6500 1.8 | 9½" | 2.3 | 3505 | 210 | 5.0 | 1575 | 1175 | 1375 | 1375 | 1425 | 2400 | 2650 | 2700 | 2750 |
| | 11⅞" | 2.6 | 4495 | 350 | 7.0 | 1675 | 1175 | 1425 | 1425 | 1475 | 2500 | 2850 | 2900 | 3000 |
| | 14" | 3.0 | 5330 | 515 | 8.0 | 1925 | 1175 | 1525 | 1525 | 1725 | 2600 | 3150 | 2925 | 3200 |
| | 16" | 3.2 | 6085 | 695 | 9.0 | 2175 | 1175 | 1625 | 1550 | 1975 | 2650 | 3350 | 2950 | 3350 |
| 60 2.0 | 11⅞" | 2.9 | 6235 | 430 | 7.0 | 1675 | 1175 | 1425 | 1425 | 1475 | 2750 | 2850 | 3200 | 3250 |
| | 14" | 3.1 | 7440 | 635 | 8.0 | 1925 | 1175 | 1525 | 1525 | 1725 | 2750 | 3450 | 3200 | 3650 |
| | 16" | 3.3 | 8520 | 860 | 9.0 | 2175 | 1175 | 1625 | 1550 | 1975 | 2750 | 3650 | 3200 | 3750 |
| 90 2.0 | 11⅞" | 3.9 | 9550 | 645 | 7.0 | 2150 | 1425 | 1850 | 1800 | 1950 | 3375 | 3700 | 4000 | 4300 |
| | 14" | 4.1 | 11390 | 940 | 8.0 | 2350 | 1450 | 1950 | 1850 | 2150 | 3400 | 3850 | 4100 | 4450 |
| | 16" | 4.4 | 13050 | 1275 | 9.0 | 2550 | 1475 | 2150 | 1900 | 2350 | 3425 | 4000 | 4200 | 4650 |
| | 18" | 4.6 | 14690 | 1660 | 10.0 | 2750 | N/A(3) | 2300 | N/A(3) | 2550 | N/A(3) | 4150 | N/A(3) | 4750 |
| | 20" | 4.8 | 16310 | 2100 | 11.0 | 2850 | N/A(3) | 2500 | N/A(3) | 2650 | N/A(3) | 4300 | N/A(3) | 4850 |

(1) No web stiffeners required.

(2) Web stiffeners required.

(3) All 18" and 20" BCI® joists require web stiffeners.

**NOTES**

- Moment, shear and reaction values based upon a load duration of 100% and may be adjusted for other load durations.
- Design values listed are applicable for Allowable Stress Design (ASD).
- No additional repetitive member increase allowed.

$$\Delta = \frac{5wl^4}{384\,EI} + \frac{wl^2}{K}$$

$\Delta$ = deflection (in)
$w$ = uniform load (lb/in)
$l$ = clear span (in)
$EI$ = bending stiffness (lb-in$^2$)
$K$ = shear deformation coefficient (lb)

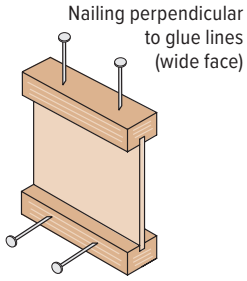
**Code Evaluation Report: ICC-ES®/APA® ESR-1336 (IBC®, IRC®)**

# Closest Allowable Nail Spacing

| Nail Size | All BCI® Joists | | | |
|---|---|---|---|---|
| | Nailing Perpendicular to Glue Line (Wide Face) | | Nailing Parallel to Glue Line (Narrow Face) | |
| | O.C. Spacing | End of Joist | O.C. Spacing | End of Joist |
| 8d Box (0.113"ø x 2.5") | 2" | 1½" | 4" | 1½" |
| 8d Common (0.131"ø x 2.5") | 2" | 1½" | 4" | 3" |
| 10d & 12d Box (0.128"ø x 3", 3.25") | 2" | 1½" | 4" | 3" |
| 16d Box (0.135"ø x 3.5") | 2" | 1½" | 4" | 3" |
| 10d & 12d Common and 16d Sinker (0.148"ø x 3", 3.25") | 3" | 2" | 6" | 4" |
| 16d Common (0.162"ø x 3.5") | 3" | 2" | 6" | 4" |

**NOTES**

- If more than one row of nails is used, the rows must be offset at least ½".
- Connectors that mount to sides of flanges (such as Simpson Strong-Tie A35) may only be used on BCI® 60 and 90 joist flanges. Use nails as specified by Simpson Strong-Tie; do not attach connectors on both sides of a flange at the same location.




## BCI® Diaphragm Table (1)

| BCI® Series | Diaphragm Capacity (lb/ft) (2) (3) | |
|---|---|---|
| | Unblocked | Blocked |
| 5000 | As permitted for 2x framing in building code | 320 lb/ft for 6" o.c. nailing at panel edges |
| | | 425 lb/ft for 4" o.c. nailing, staggered, at panel edges |
| 6000, 6500 | As permitted for 3x framing in building code | 360 lb/ft for 6" o.c. nailing at panel edges |
| | | 480 lb/ft for 4" o.c. nailing, staggered at panel edges |
| 60, 90 | As permitted for 3x framing in building code | As permitted for 3x framing in building code not to exceed 690 lb/ft. |

**NOTES**

(1) See ICC-ES®/APA® ESR-1336, Table 7.

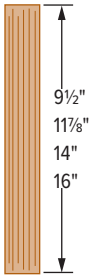
(2) As noted in table, BCI® joists may be substituted for solid sawn framing in horizontal wood diaphragms as shown in ANSI/AWC SDPWS, Tables 4.2A and 4.2C (referenced in IBC).

(3) Diaphragm nailing shall not exceed the limits of BCI® joist closest allowable nail spacing.

# Rim Board Details and Properties

## Rim Board Product Profiles

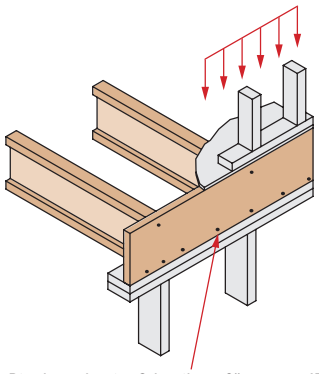
1⅛"
Boise Cascade® Rimboard OSB




1⁵⁄₁₆"
Versa-Lam® LVL 1.5E 1800

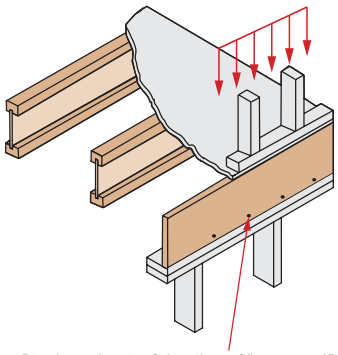
*18 inch and 20 inch deep rimboard are special order products, contact local supplier or Boise Cascade representative for product availability.

**F07 Perpendicular**



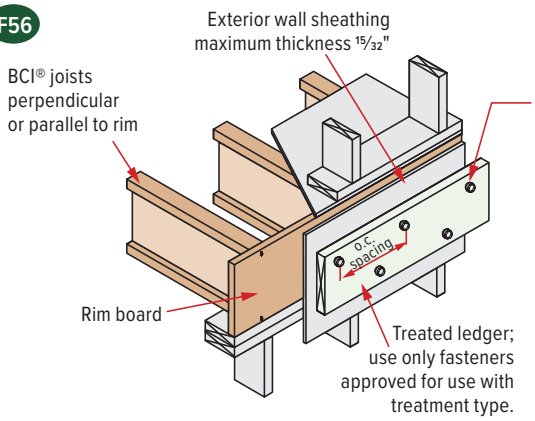
- Rim board: min. 8d nails at 6" o.c. per IRC. Connection per design professional of record's specification for shear transfer.
- See table for vertical load capacity

**F07A Parallel**



- Rim board: min. 8d nails at 6" o.c. per IRC. Connection per design professional of record's specification for shear transfer.
- See table for vertical load capacity

**F56**




## Rim Board with Ledger Attachment

½" diameter through bolts (ASTM A307 Grades A & B, SAE J429 Grades 1 or 2, or higher with washer and nuts) or ½" diameter lag screws (full penetration), staggered.

Minimum connection for 40/10 psf deck loading:

| Deck Joist Length | Connection |
|---|---|
| 12'-0" and less | 2 rows ½" bolts or lag screws, 24" o.c. (300 PLF max.) |
| 12'-1" to 18'-0" | 2 rows ½" bolts or lag screws, 16" o.c. (450 PLF max.) |

For snow loads greater than 40 psf and/or dead loads greater than 10 psf, size connection per max. PLF values shown above.

**NOTES**

- Design of moisture control by others (only structural components shown above).
- For information on deck lateral load connections per IRC section R507.2.3, contact Boise Cascade EWP Engineering.
- For use of proprietary screws to attach ledger, consult screw manufacturer literature.
- For further information on residential deck design, see AWC DCA 6 *Prescriptive Residential Wood Deck Construction Guide*.

## Rim Board Properties

| Product | Vertical Load Capacity | | | | Maximum Floor Diaphragm Lateral Capacity (lb/ft) | Specific Gravity for Lateral Nail Design | Allowable Design Values | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Uniform (PLF) | | Point (lb) | | | | Flexural Stress (lb/in²) | Modulus of Elasticity—True (lb/in²) | Horizontal Shear (lb/in²) | Compression Perpendicular to Grain (lb/in²) |
| | 16" Depth & Less | 18" & 20" Depth | 16" Depth & Less | 18" & 20" Depth | | | | | | |
| 1⅛" Boise Cascade® Rimboard OSB (C1)[1] | 4,850 | 4,150 | 3,500 | 3,500 | 180 | 0.5 | Limited span capabilities, see publication in note 1 | | | |
| 1⁵⁄₁₆" Versa-Lam® LVL 1.5E 1800[1] | 6,000 | 5,450 | 4,450 | 4,450 | Permitted per building code for all nominal 2" thick framing blocked and unblocked diaphragms (4" nail spacing and eater) | 0.5 | 1,800 | 1,500,000 | 225 | 525 |

(1) Rim board grade C1 per APA Form W345 U.S. Edition *APA Performance-Rated Rim Boards*.
(2) See ICC-ES/APA ESR-1040 for more information.

## Closest Allowable Nail Spacing (Narrow Face)

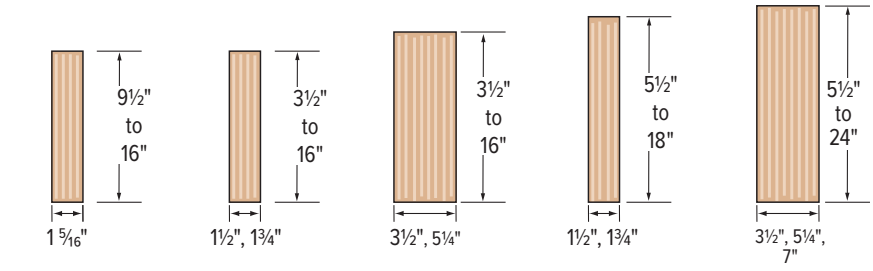
| Nail Size | 1⅛" Boise Cascade® Rimboard OSB[1] | Versa-Lam® LVL 1⁵⁄₁₆"Rim Board[2] |
|---|---|---|
| 8d box (0.113"ø x 2.5") | 3" | 3 |
| 8d common (0.131"ø x 2.5") | 3" | 3 |
| 10d and 12d box (0.128"ø x 3", 3.25") | See publication listed in note (1) for additional nailing information. | 3 |
| 16d box (0.135"ø x 3.5") | | 3 |
| 10d and 12d common and 16d sinker (0.148"ø x 3", 3.25") | | 4 |
| 16d common (0.162"ø x 3.5") | | 6 |

(1) See *Performance Rated Rim Boards*, APA Form #W345 for more product information.
(2) See ICC-ES/APA ESR-1040 for more information.

# Versa-Lam LVL Product Profiles

When you specify headers and beams made of Versa-Lam® laminated veneer lumber (LVL), you are building quality into your design. They are excellent for floor and roof framing supports and as headers for doors, windows, and garage doors. Versa-Lam® LVL can even be used in column applications. Because they have no camber, Versa-Lam® LVL products provide flatter, quieter floors—which helps ensure happier customers and significantly fewer builder call backs.

Versa-Lam® LVL products shall be installed in dry-use applications only, per ICC-ES/APA evaluation report.




**Versa-Lam® LVL 1.5E 1800** | **Versa-Lam® LVL 1.8E 2400** | **Versa-Lam® LVL 1.8E 2650** | **Versa-Lam® LVL 2.1E 2800** | **Versa-Lam® LVL 2.1E 3100**

Some products may not be available in all markets. Contact your Boise Cascade EWP representative for availability.

# Architectural Specifications

**Scope —** This work includes the complete furnishing and installation of all Versa-Lam® LVL beams as shown on the drawings, herein specified and necessary to complete the work.

**Materials —** Southern Pine or Douglas fir veneers, laminated in a press with all grain parallel with the length of the member. Glues used in lamination are phenol formaldehyde and isocyanate exterior-type adhesives which comply with ASTM D2559.

**Design —** Versa-Lam® LVL beams shall be sized and detailed to fit the dimensions and loads indicated on the plans. All designs shall be in accordance with allowable values developed in accordance with ASTM D5456 and listed in the governing code evaluation service's report and section properties based upon standard engineering principles. Verification of design of the Versa-Lam® LVL beams by complete calculations shall be available upon request.

**Drawings —** Additional drawings showing layout and detail necessary for determining fit and placement in the buildings are (are not) to be provided by the supplier.

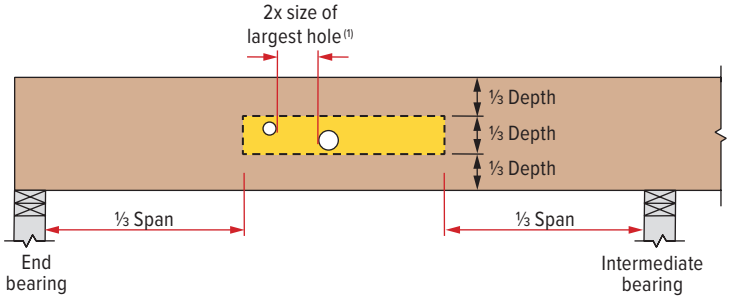
**Fabrication —** Versa-Lam® LVL beams shall be manufactured in a plant evaluated for fabrication by the governing code evaluation service and under the supervision of a third-party inspection agency listed by the corresponding evaluation service.

**Storage and Installation —** Versa-Lam® LVL beams, if stored prior to erection, shall be stored on stickers spaced a maximum of 15 ft. apart. Beams shall be stored on a dry, level surface and protected from the weather. They shall be handled with care so they are not damaged.

Versa-Lam® LVL beams are to be installed in accordance with the plans and Boise Cascade EWP's Installation Guide. Temporary construction loads which cause stresses beyond design limits are not permitted. Erection bracing shall be provided to assure adequate lateral support for the individual beams and the entire system until the sheathing material has been applied.

**Codes —** Versa-Lam® LVL beams shall be evaluated by a model code evaluation service.

# Versa-Lam LVL Allowable Holes




## Allowable Round Holes

*Table valid only for beams supporting uniform load.*

| Beam Depth | Max. Hole Diameter |
|---|---|
| 5½" to less than 7¼" | ¾" |
| 7¼" to less than 9¼" | 1" |
| 9¼" to less than 18" | 2" |
| 18" to less than 24" | 3" |
| 24" | 4" |

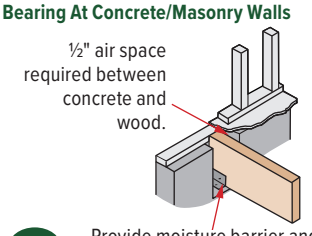
**NOTES**

(1) The horizontal distance between adjacent holes must be at least two times the diameter of the larger hole. This restriction also applies to the location of holes relative to bolt holes in multiple ply beams. Holes shall not be stacked vertically.

- Round holes may be drilled or cut with a hole saw anywhere within the shaded area of the beam.
- Square and rectangular holes are not permitted.
- Do not drill more than three access holes in any four foot long section of beam.
- These limitations apply to holes drilled for plumbing or wiring access only. The size and location of holes drilled for fasteners are governed by the provisions of the *National Design Specification® for Wood Construction.*
- Beams deflect under load. Size holes to provide clearance where required.
- Allowable Round Holes table at left is valid for beams supporting uniform load only. For beams supporting concentrated loads or beams with larger holes, use BC Calc® software or contact Boise Cascade EWP Engineering.

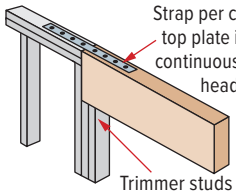
# Versa-Lam LVL Beam Details

### Bearing At Concrete/Masonry Walls



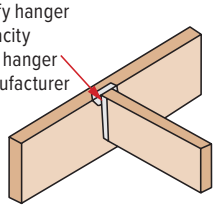

B01

### Bearing For Door Or Window Header



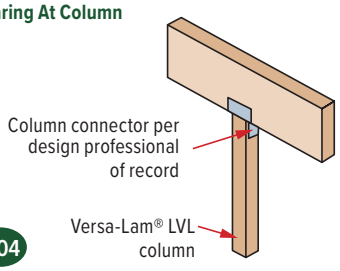

B02

### Beam To Beam Connector



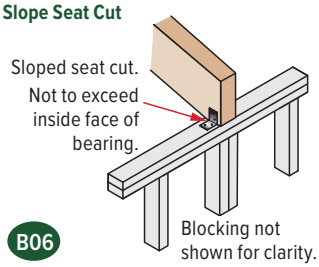

B03

### Bearing At Column



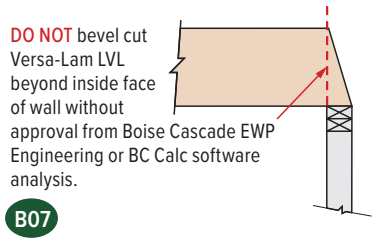

B04

### Slope Seat Cut



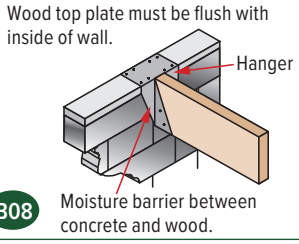

B06

### Bevel Cut



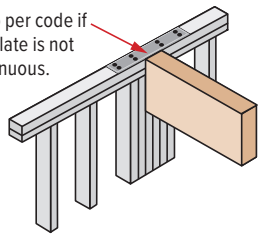

B07

### Beam To Concrete/Masonry Walls




B08

### Bearing Framing Into Wall




B09

**NOTES**

- Minimum of ½" air space between beam and wall pocket or adequate barrier must be provided between beam and concrete/masonry.
- Adequate bearing shall be provided. If not shown on plans, please refer to load tables on pages 28 – 30.
- Versa-Lam® LVL beams are intended for interior applications only and should be kept as dry as possible during construction.
- Continuous lateral support of top of beam shall be provided (side or top bearing framing).

# Versa-Lam LVL Beam Multiple Member Connections

## Side-Loaded Applications — *Maximum uniform side load (PLF)*

| Number of Plies | Nailed[3] | | ½" Dia. Through Bolt[1] | | | ⅝" Dia. Through Bolt[1] | | |
|---|---|---|---|---|---|---|---|---|
| | 2 Rows 16d Sinkers @ 12" o.c.[5] | 3 Rows 16d Sinkers @ 12" o.c. | 2 Rows @ 24" o.c. Staggered | 2 Rows @ 12" o.c. Staggered | 2 Rows @ 6" o.c. Staggered | 2 Rows @ 24" o.c. Staggered | 2 Rows @ 12" o.c. Staggered | 2 Rows @ 6" o.c. Staggered |
| 1¾" Versa-Lam® LVL (Depths of 18" and less) | | | | | | | | |
| 2 | 470 | 705 | 505 | 1,010 | 2,020 | 560 | 1,120 | 2,245 |
| 3[2] | 350 | 525 | 375 | 755 | 1,515 | 420 | 840 | 1,685 |
| 4[4] | Use bolt schedule | | 335 | 670 | 1,345 | 370 | 745 | 1,495 |
| 3½" Versa-Lam® LVL | | | | | | | | |
| 2[4] | Use bolt schedule | | 855 | 1,715 | N/A | 1,125 | 2,250 | N/A |

| Number of Plies | Nailed[3] | | ½" Dia. Through Bolt[1] | | | ⅝" Dia. Through Bolt[1] | | |
|---|---|---|---|---|---|---|---|---|
| | 3 Rows 16d Sinkers @ 12" o.c. | 4 Rows 16d Sinkers @ 12" o.c. | 3 Rows @ 24" o.c. 8" Staggered | 3 Rows @ 18" o.c. 6" Staggered | 3 Rows @ 12" o.c. 4" Staggered | 3 Rows @ 24" o.c. 8" Staggered | 3 Rows @ 18" o.c. 6" Staggered | 3 Rows @ 12" o.c. 4" Staggered |
| 1¾" Versa-Lam® LVL (Depths of 24" and less) | | | | | | | | |
| 2 | 705 | 940 | 755 | 1,010 | 1,515 | 840 | 1,120 | 1,685 |
| 3[2] | 525 | 705 | 565 | 755 | 1,135 | 630 | 840 | 1,260 |
| 4[4] | Use bolt schedule | | 505 | 670 | 1,010 | 560 | 745 | 1,120 |

## Top-Loaded Applications — *For top-loaded beams and beams with side loads less than those shown in table above.*

| Plies | Depth | Number of Rows | Fastening[1] [3] | Maximum Uniform Load From One Side |
|---|---|---|---|---|
| Two 1¾" plies | Depths 11⅞" & less | 2 | 16d box/sinker nails @ 12" o.c. | 400 PLF |
| | Depths 14"- 18" | 3 | | 600 PLF |
| | Depth = 24" | 4 | | 800 PLF |
| Three 1¾" plies [2] | Depths 11⅞" & less | 2 | | 300 PLF |
| | Depths 14"-18" | 3 | | 450 PLF |
| | Depth = 24" | 4 | | 600 PLF |
| Four 1¾" plies | Depths 18" & less | 2 | 2 rows ½" bolts @ 24" o.c., staggered | 335 PLF |
| | Depth = 24" | 3 | 3 rows ½" bolts @ 24" o.c., staggered every 8" | 505 PLF |
| Two 3½" plies | Depths 18" & less | 2 | 2 rows ½" bolts @ 24" o.c., staggered | 855 PLF |
| | Depth 20"- 24" | 3 | 3 rows ½" bolts @ 24" o.c., staggered every 8" | 1,285 PLF |

(1) Design values apply to common bolts that conform to ANSI/ASME standard B18.21-1981 (ASTM A307 Grades A&B, SAE J429 Grades 1 or 2, or higher). A washer not less than a standard cut washer shall be between the wood and the bolt head and between the wood and the nut. The distance from the edge of the beam to the bolt holes must be at least 2" for ½" bolts and 2½" for ⅝" bolts. Bolt holes shall be the same diameter as the bolt.
(2) The nail schedules shown apply to both sides of a 3-ply beam.
(3) 16d box nails = 0.135" diameter x 3.5" length, 16d sinker nails = 0.148" diameter x 3.25" length.
(4) When side-loaded, 7" wide beams must be properly braced to prevent rotation.
(5) 14" and deeper 1¾" beams require minimum 3 rows of nails.

**NOTES**

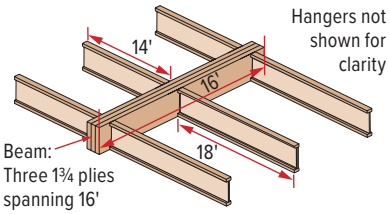
- Beams wider than 7" must be designed by the engineer of record.
- All values in these tables may be increased by 15% for snow-load roofs and by 25% for non-snow load roofs where the building code allows.
- Use allowable load tables or BC Calc® software to size beams.
- An equivalent specific gravity of 0.5 may be used when designing specific connections with Versa-Lam® LVL.
- Connection values are based upon the NDS, 2018 Edition.
- FastenMaster TrussLOK®, Simpson Strong-Tie SDW or SDS, and MiTek WS screws may also be used to connect multiple member Versa-Lam® LVL beams. Contact Boise Cascade EWP Engineering for more information.

## Designing Connections For Multiple-Ply Versa-Lam® LVL Beams

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

The following example shows how to size and connect a multiple-ply Versa-Lam® LVL floor beam.

**Given:** Beam with a 16'-0" span *(shown above)* supports a residential floor load (40 psf live load, 10 psf dead load). Beam depth is limited to 14".




**Find:** A beam of multiple 1¾" plies of Versa-Lam® LVL that can support the design loads, plus the beam's proper connection schedule.

1. Calculate tributary width and load the beam is supporting:
   14'/2 + 18'/2 = **16 ft. tributary width**
   Live Load: 40 psf * 16 ft. = **640 PLF**
   Dead Load: 10 psf x 16 ft. = **160 PLF**
   Total Load: 640 PLF + 160 PLF = **800 PLF**
2. Use PLF table on page 28 or BC Calc® software to size the beam.
   A 3-ply Versa-Lam® LVL 1¾" x 14" beam will adequately support the calculated design load.
3. Calculate the maximum PLF load from longest side (18' in this case).
   Max. Side Load = (18'/2) x (40 + 10 psf) = 450 PLF
4. See the Side-Loaded Applications table (at left) for 1¾" Versa-Lam® LVL, 3 plies.
5. The proper connection schedule must have a capacity greater than the maximum side load:
   **Nailed:** 3 rows 16d sinkers at 12" o.c:
   525 PLF is greater than 450 PLF ***OK***
   **Bolts:** ½" diameter 2 rows at 12" staggered:
   755 PLF is greater than 450 PLF ***OK***

# Versa-Lam LVL Beam Floor Load Table

**Versa-Lam® LVL 2.1E 2800 and 2.1E 3100**
**(100% Load Duration)**

**Table Key:** **Top value** = Allowable Total Load (PLF)
**Middle value** = Allowable Live Load (PLF)
**Bottom value** = Min. Required Bearing Length (inches) at End / Intermediate supports

| Beam Span | 1¾" Versa-Lam® LVL 2.1E 2800 | | | | | | 3½" Versa-Lam® LVL 2.1E 3100 | | | | | | 5¼" Versa-Lam® LVL 2.1E 3100 | | | | | | 7" Versa-Lam® LVL 2.1E 3100 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Beam Depth | | | | | | Beam Depth | | | | | | Beam Depth | | | | | | Beam Depth | | | | | |
| | 7¼" | 9½" | 11⅞" | 14" | 16" (1) | 18" (1) | 7¼" | 9½" | 11⅞" | 14" | 16" | 18" | 9½" | 11⅞" | 14" | 16" | 18" | 20" | 11⅞" | 14" | 16" | 18" | 20" | 24" |
| 6' | 763 | 1,063 | 1,425 | 1,796 | 2,194 | 2,398 | 1,526 | 2,127 | 2,850 | 3,591 | 4,388 | 4,796 | 3,190 | 4,275 | 5,387 | 6,583 | 7,194 | 7,192 | 5,700 | 7,183 | 8,777 | 9,593 | 9,589 | 9,582 |
| | 693 | – | – | – | – | – | 1,385 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| | 1.8 / 4.4 | 2.4 / 6.1 | 3.3 / 8.2 | 4.1 / 10.3 | 5 / 12.6 | 5.5 / 13.8 | 1.8 / 4.4 | 2.4 / 6.1 | 3.3 / 8.2 | 4.1 / 10.3 | 5 / 12.6 | 5.5 / 13.8 | 2.4 / 6.1 | 3.3 / 8.2 | 4.1 / 10.3 | 5 / 12.6 | 5.5 / 13.8 | 5.5 / 13.8 | 3.3 / 8.2 | 4.1 / 10.3 | 5 / 12.6 | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 |
| 7' | 614 | 877 | 1,161 | 1,445 | 1,742 | 2,054 | 1,272 | 1,754 | 2,322 | 2,889 | 3,484 | 4,109 | 2,632 | 3,483 | 4,334 | 5,226 | 6,163 | 6,161 | 4,644 | 5,778 | 6,967 | 8,218 | 8,214 | 8,207 |
| | 452 | – | – | – | – | – | 905 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| | 1.6 / 4.1 | 2.4 / 5.9 | 3.1 / 7.8 | 3.9 / 9.7 | 4.7 / 11.7 | 5.5 / 13.8 | 1.7 / 4.3 | 2.4 / 5.9 | 3.1 / 7.8 | 3.9 / 9.7 | 4.7 / 11.7 | 5.5 / 13.8 | 2.4 / 5.9 | 3.1 / 7.8 | 3.9 / 9.7 | 4.7 / 11.7 | 5.5 / 13.8 | 5.5 / 13.8 | 3.1 / 7.8 | 3.9 / 9.7 | 4.7 / 11.7 | 5.5 / 13.8 | 5.5 / 13.8 | 5.5 / 13.8 |
| 8' | 462 | 746 | 979 | 1,208 | 1,444 | 1,702 | 925 | 1,493 | 1,958 | 2,416 | 2,887 | 3,404 | 2,239 | 2,938 | 3,624 | 4,331 | 5,106 | 5,387 | 3,917 | 4,832 | 5,775 | 6,808 | 7,183 | 7,176 |
| | 310 | 660 | – | – | – | – | 621 | 1,321 | – | – | – | – | 1,981 | – | – | – | – | – | – | – | – | – | – | – |
| | 1.5 / 3.5 | 2.3 / 5.7 | 3 / 7.5 | 3.7 / 9.3 | 4.4 / 11.1 | 5.2 / 13 | 1.5 / 3.5 | 2.3 / 5.7 | 3 / 7.5 | 3.7 / 9.3 | 4.4 / 11.1 | 5.2 / 13 | 2.3 / 5.7 | 3 / 7.5 | 3.7 / 9.3 | 4.4 / 11.1 | 5.2 / 13 | 5.5 / 13.8 | 3 / 7.5 | 3.7 / 9.3 | 4.4 / 11.1 | 5.2 / 13 | 5.5 / 13.8 | 5.5 / 13.8 |
| 9' | 329 | 618 | 846 | 1,038 | 1,232 | 1,443 | 659 | 1,299 | 1,693 | 2,076 | 2,465 | 2,886 | 1,948 | 2,539 | 3,113 | 3,697 | 4,328 | 4,786 | 3,386 | 4,151 | 4,930 | 5,771 | 6,381 | 6,374 |
| | 222 | 477 | – | – | – | – | 444 | 954 | – | – | – | – | 1,431 | – | – | – | – | – | – | – | – | – | – | – |
| | 1.5 / 3 | 2.1 / 5.3 | 2.9 / 7.3 | 3.6 / 8.9 | 4.3 / 10.6 | 5 / 12.4 | 1.5 / 3 | 2.2 / 5.6 | 2.9 / 7.3 | 3.6 / 8.9 | 4.3 / 10.6 | 5 / 12.4 | 2.2 / 5.6 | 2.9 / 7.3 | 3.6 / 8.9 | 4.3 / 10.6 | 5 / 12.4 | 5.5 / 13.8 | 2.9 / 7.3 | 3.6 / 8.9 | 4.3 / 10.6 | 5 / 12.4 | 5.5 / 13.8 | 5.5 / 13.8 |
| 10' | 242 | 500 | 745 | 909 | 1,075 | 1,252 | 485 | 1,056 | 1,491 | 1,819 | 2,150 | 2,504 | 1,584 | 2,236 | 2,728 | 3,225 | 3,756 | 4,304 | 2,981 | 3,638 | 4,299 | 5,008 | 5,739 | 5,732 |
| | 164 | 355 | 660 | – | – | – | 327 | 710 | 1,321 | – | – | – | 1,065 | 1,981 | – | – | – | – | 2,642 | – | – | – | – | – |
| | 1.5 / 3 | 1.9 / 4.8 | 2.9 / 7.1 | 3.5 / 8.7 | 4.1 / 10.3 | 4.8 / 12 | 1.5 / 3 | 2 / 5.1 | 2.9 / 7.1 | 3.5 / 8.7 | 4.1 / 10.3 | 4.8 / 12 | 2 / 5.1 | 2.9 / 7.1 | 3.5 / 8.7 | 4.1 / 10.3 | 4.8 / 12 | 5.5 / 13.8 | 2.9 / 7.1 | 3.5 / 8.7 | 4.1 / 10.3 | 4.8 / 12 | 5.5 / 13.8 | 5.5 / 13.8 |
| 11' | 183 | 402 | 630 | 809 | 953 | 1,105 | 366 | 804 | 1,331 | 1,618 | 1,906 | 2,211 | 1,205 | 1,997 | 2,428 | 2,858 | 3,316 | 3,803 | 2,662 | 3,237 | 3,811 | 4,422 | 5,071 | 5,207 |
| | 124 | 271 | 508 | 798 | – | – | 248 | 541 | 1,015 | 1,595 | – | – | 812 | 1,523 | 2,393 | – | – | – | 2,031 | 3,190 | – | – | – | – |
| | 1.5 / 3 | 1.7 / 4.3 | 2.7 / 6.7 | 3.4 / 8.5 | 4 / 10.1 | 4.7 / 11.7 | 1.5 / 3 | 1.7 / 4.3 | 2.8 / 7 | 3.4 / 8.5 | 4 / 10.1 | 4.7 / 11.7 | 1.7 / 4.3 | 2.8 / 7 | 3.4 / 8.5 | 4 / 10.1 | 4.7 / 11.7 | 5.4 / 13.4 | 2.8 / 7 | 3.4 / 8.5 | 4 / 10.1 | 4.7 / 11.7 | 5.4 / 13.4 | 5.5 / 13.8 |
| 12' | 141 | 312 | 528 | 722 | 856 | 989 | 282 | 624 | 1,171 | 1,457 | 1,711 | 1,979 | 937 | 1,757 | 2,186 | 2,567 | 2,968 | 3,393 | 2,343 | 2,915 | 3,422 | 3,958 | 4,524 | 4,769 |
| | 96 | 211 | 398 | 629 | – | – | 193 | 422 | 796 | 1,258 | – | – | 633 | 1,194 | 1,887 | – | – | – | 1,592 | 2,517 | – | – | – | – |
| | 1.5 / 3 | 1.5 / 3.6 | 2.4 / 6.1 | 3.3 / 8.3 | 3.9 / 9.9 | 4.6 / 11.4 | 1.5 / 3 | 1.5 / 3.6 | 2.7 / 6.8 | 3.4 / 8.4 | 3.9 / 9.9 | 4.6 / 11.4 | 1.5 / 3.6 | 2.7 / 6.8 | 3.4 / 8.4 | 3.9 / 9.9 | 4.6 / 11.4 | 5.2 / 13 | 2.7 / 6.8 | 3.4 / 8.4 | 3.9 / 9.9 | 4.6 / 11.4 | 5.2 / 13 | 5.5 / 13.8 |
| 13' | 111 | 247 | 449 | 614 | 776 | 895 | 222 | 494 | 942 | 1,325 | 1,552 | 1,791 | 741 | 1,413 | 1,988 | 2,328 | 2,686 | 3,062 | 1,884 | 2,651 | 3,104 | 3,581 | 4,083 | 4,399 |
| | 76 | 168 | 318 | 504 | 728 | – | 152 | 335 | 635 | 1,009 | 1,456 | – | 503 | 953 | 1,513 | 2,185 | – | – | 1,270 | 2,017 | 2,913 | – | – | – |
| | 1.5 / 3 | 1.5 / 3.1 | 2.3 / 5.6 | 3.1 / 7.7 | 3.9 / 9.7 | 4.5 / 11.2 | 1.5 / 3 | 1.5 / 3.1 | 2.4 / 5.9 | 3.3 / 8.3 | 3.9 / 9.7 | 4.5 / 11.2 | 1.5 / 3.1 | 2.4 / 5.9 | 3.3 / 8.3 | 3.9 / 9.7 | 4.5 / 11.2 | 5.1 / 12.7 | 2.4 / 5.9 | 3.3 / 8.3 | 3.9 / 9.7 | 4.5 / 11.2 | 5.1 / 12.7 | 5.5 / 13.8 |
| 14' | 89 | 198 | 380 | 529 | 682 | 817 | 177 | 397 | 761 | 1,172 | 1,420 | 1,635 | 595 | 1,141 | 1,759 | 2,130 | 2,452 | 2,789 | 1,522 | 2,345 | 2,840 | 3,270 | 3,719 | 4,082 |
| | 61 | 135 | 257 | 410 | 594 | – | 123 | 270 | 514 | 820 | 1,189 | – | 405 | 771 | 1,230 | 1,783 | – | – | 1,029 | 1,640 | 2,378 | – | – | – |
| | 1.5 / 3 | 1.5 / 3 | 2.1 / 5.1 | 2.9 / 7.1 | 3.7 / 9.2 | 4.4 / 11 | 1.5 / 3 | 1.5 / 3 | 2.1 / 5.1 | 3.2 / 7.9 | 3.8 / 9.6 | 4.4 / 11 | 1.5 / 3 | 2.1 / 5.1 | 3.2 / 7.9 | 3.8 / 9.6 | 4.4 / 11 | 5 / 12.5 | 2.1 / 5.1 | 3.2 / 7.9 | 3.8 / 9.6 | 4.4 / 11 | 5 / 12.5 | 5.5 / 13.8 |
| 15' | 72 | 162 | 311 | 460 | 593 | 741 | 143 | 323 | 622 | 1,000 | 1,309 | 1,504 | 485 | 934 | 1,500 | 1,963 | 2,256 | 2,561 | 1,245 | 2,000 | 2,617 | 3,008 | 3,415 | 3,807 |
| | 50 | 111 | 211 | 338 | 491 | 680 | 100 | 221 | 422 | 675 | 982 | 1,359 | 332 | 633 | 1,013 | 1,473 | 2,039 | – | 844 | 1,350 | 1,964 | 2,718 | – | – |
| | 1.5 / 3 | 1.5 / 3 | 1.8 / 4.5 | 2.7 / 6.7 | 3.4 / 8.6 | 4.3 / 10.7 | 1.5 / 3 | 1.5 / 3 | 1.8 / 4.5 | 2.9 / 7.2 | 3.8 / 9.5 | 4.3 / 10.9 | 1.5 / 3 | 1.8 / 4.5 | 2.9 / 7.2 | 3.8 / 9.5 | 4.3 / 10.9 | 4.9 / 12.3 | 1.8 / 4.5 | 2.9 / 7.2 | 3.8 / 9.5 | 4.3 / 10.9 | 4.9 / 12.3 | 5.5 / 13.8 |
| 16' | 59 | 133 | 257 | 403 | 520 | 651 | 117 | 266 | 515 | 830 | 1,153 | 1,392 | 399 | 772 | 1,246 | 1,730 | 2,088 | 2,367 | 1,030 | 1,661 | 2,306 | 2,784 | 3,156 | 3,566 |
| | 41 | 92 | 175 | 281 | 410 | 569 | 83 | 183 | 350 | 562 | 820 | 1,138 | 275 | 526 | 843 | 1,230 | 1,707 | 2,279 | 701 | 1,124 | 1,640 | 2,277 | 3,038 | – |
| | 1.5 / 3 | 1.5 / 3 | 1.6 / 4 | 2.5 / 6.2 | 3.2 / 8 | 4 / 10 | 1.5 / 3 | 1.5 / 3 | 1.6 / 4 | 2.6 / 6.4 | 3.6 / 8.9 | 4.3 / 10.7 | 1.5 / 3 | 1.6 / 4 | 2.6 / 6.4 | 3.6 / 8.9 | 4.3 / 10.7 | 4.9 / 12.2 | 1.6 / 4 | 2.6 / 6.4 | 3.6 / 8.9 | 4.3 / 10.7 | 4.9 / 12.2 | 5.5 / 13.8 |
| 17' | | 111 | 215 | 348 | 460 | 575 | 97 | 221 | 430 | 696 | 1,020 | 1,276 | 332 | 645 | 1,044 | 1,530 | 1,914 | 2,200 | 861 | 1,393 | 2,040 | 2,552 | 2,933 | 3,354 |
| | | 77 | 147 | 236 | 346 | 481 | 69 | 153 | 294 | 473 | 691 | 962 | 230 | 441 | 709 | 1,037 | 1,443 | 1,931 | 588 | 945 | 1,382 | 1,924 | 2,575 | – |
| | | 1.5 / 3 | 1.5 / 3.6 | 2.3 / 5.7 | 3 / 7.6 | 3.8 / 9.4 | 1.5 / 3 | 1.5 / 3 | 1.5 / 3.6 | 2.3 / 5.7 | 3.3 / 8.4 | 4.2 / 10.5 | 1.5 / 3 | 1.5 / 3.6 | 2.3 / 5.7 | 3.3 / 8.4 | 4.2 / 10.5 | 4.8 / 12 | 1.5 / 3.6 | 2.3 / 5.7 | 3.3 / 8.4 | 4.2 / 10.5 | 4.8 / 12 | 5.5 / 13.8 |
| 18' | | 93 | 181 | 295 | 409 | 512 | 81 | 186 | 363 | 589 | 867 | 1,136 | 279 | 544 | 884 | 1,301 | 1,704 | 2,055 | 726 | 1,178 | 1,735 | 2,273 | 2,740 | 3,165 |
| | | 65 | 124 | 201 | 294 | 410 | 58 | 130 | 249 | 401 | 588 | 820 | 194 | 373 | 602 | 882 | 1,230 | 1,650 | 498 | 802 | 1,176 | 1,640 | 2,200 | – |
| | | 1.5 / 3 | 1.5 / 3.2 | 2.1 / 5.2 | 2.9 / 7.1 | 3.6 / 8.9 | 1.5 / 3 | 1.5 / 3 | 1.5 / 3.2 | 2.1 / 5.2 | 3 / 7.6 | 4 / 9.9 | 1.5 / 3 | 1.5 / 3.2 | 2.1 / 5.2 | 3 / 7.6 | 4 / 9.9 | 4.8 / 11.9 | 1.5 / 3.2 | 2.1 / 5.2 | 3 / 7.6 | 4 / 9.9 | 4.8 / 11.9 | 5.5 / 13.8 |
| 19' | | 79 | 154 | 251 | 367 | 459 | 68 | 157 | 308 | 502 | 741 | 1,018 | 236 | 462 | 753 | 1,112 | 1,527 | 1,866 | 617 | 1,004 | 1,483 | 2,036 | 2,488 | 2,996 |
| | | 55 | 106 | 172 | 252 | 352 | 50 | 110 | 213 | 343 | 504 | 704 | 166 | 319 | 515 | 756 | 1,056 | 1,420 | 425 | 686 | 1,008 | 1,408 | 1,893 | – |
| | | 1.5 / 3 | 1.5 / 3 | 1.9 / 4.7 | 2.7 / 6.8 | 3.4 / 8.5 | 1.5 / 3 | 1.5 / 3 | 1.5 / 3 | 1.9 / 4.7 | 2.7 / 6.8 | 3.7 / 9.4 | 1.5 / 3 | 1.5 / 3 | 1.9 / 4.7 | 2.7 / 6.8 | 3.7 / 9.4 | 4.6 / 11.4 | 1.5 / 3 | 1.9 / 4.7 | 2.7 / 6.8 | 3.7 / 9.4 | 4.6 / 11.4 | 5.5 / 13.8 |
| 20' | | 67 | 132 | 216 | 319 | 413 | 57 | 134 | 264 | 431 | 638 | 897 | 201 | 396 | 647 | 957 | 1,346 | 1,682 | 528 | 862 | 1,276 | 1,794 | 2,242 | 2,844 |
| | | 47 | 92 | 148 | 217 | 304 | 43 | 95 | 183 | 296 | 435 | 609 | 142 | 275 | 444 | 652 | 913 | 1,230 | 366 | 592 | 870 | 1,218 | 1,640 | 2,718 |
| | | 1.5 / 3 | 1.5 / 3 | 1.7 / 4.2 | 2.5 / 6.2 | 3.2 / 8 | 1.5 / 3 | 1.5 / 3 | 1.5 / 3 | 1.7 / 4.2 | 2.5 / 6.2 | 3.5 / 8.7 | 1.5 / 3 | 1.5 / 3 | 1.7 / 4.2 | 2.5 / 6.2 | 3.5 / 8.7 | 4.3 / 10.8 | 1.5 / 3 | 1.7 / 4.2 | 2.5 / 6.2 | 3.5 / 8.7 | 4.3 / 10.8 | 5.5 / 13.8 |
| 22' | | | 98 | 162 | 241 | 340 | | 99 | 197 | 324 | 481 | 680 | 148 | 295 | 485 | 722 | 1,019 | 1,383 | 394 | 647 | 962 | 1,359 | 1844 | 2,582 |
| | | | 69 | 112 | 165 | 232 | | 72 | 138 | 224 | 330 | 464 | 107 | 208 | 336 | 496 | 696 | 940 | 277 | 448 | 661 | 928 | 1,253 | 2,091 |
| | | | 1.5 / 3 | 1.5 / 3.5 | 2.1 / 5.2 | 2.9 / 7.3 | | 1.5 / 3 | 1.5 / 3 | 1.5 / 3.5 | 2.1 / 5.2 | 2.9 / 7.3 | 1.5 / 3 | 1.5 / 3 | 1.5 / 3.5 | 2.1 / 5.2 | 2.9 / 7.3 | 3.9 / 9.8 | 1.5 / 3 | 1.5 / 3.5 | 2.1 / 5.2 | 2.9 / 7.3 | 3.9 / 9.8 | 5.5 / 13.8 |
| 24' | | | 75 | 124 | 185 | 263 | | 74 | 150 | 248 | 371 | 526 | 112 | 225 | 372 | 556 | 788 | 1,073 | 300 | 496 | 741 | 1,051 | 1,431 | 2,189 |
| | | | 54 | 87 | 128 | 181 | | 55 | 107 | 174 | 257 | 361 | 83 | 161 | 261 | 385 | 542 | 733 | 214 | 348 | 513 | 722 | 978 | 1,640 |
| | | | 1.5 / 3 | 1.5 / 3 | 1.8 / 4.4 | 2.5 / 6.2 | | 1.5 / 3 | 1.5 / 3 | 1.5 / 3 | 1.8 / 4.4 | 2.5 / 6.2 | 1.5 / 3 | 1.5 / 3 | 1.5 / 3 | 1.8 / 4.4 | 2.5 / 6.2 | 3.4 / 8.4 | 1.5 / 3 | 1.5 / 3 | 1.8 / 4.4 | 2.5 / 6.2 | 3.4 / 8.4 | 5.1 / 12.8 |
| 26' | | | 58 | 97 | 145 | 207 | | 57 | 116 | 194 | 290 | 413 | 85 | 174 | 290 | 436 | 620 | 847 | 232 | 387 | 581 | 827 | 1,130 | 1,859 |
| | | | 42 | 69 | 102 | 143 | | 44 | 85 | 137 | 203 | 286 | 65 | 127 | 206 | 305 | 430 | 583 | 169 | 275 | 407 | 573 | 777 | 1,308 |
| | | | 1.5 / 3 | 1.5 / 3 | 1.5 / 3.8 | 2.1 / 5.3 | | 1.5 / 3 | 1.5 / 3 | 1.5 / 3 | 1.5 / 3.8 | 2.1 / 5.3 | 1.5 / 3 | 1.5 / 3 | 1.5 / 3 | 1.5 / 3.8 | 2.1 / 5.3 | 2.9 / 7.2 | 1.5 / 3 | 1.5 / 3 | 1.5 / 3.8 | 2.1 / 5.3 | 2.9 / 7.2 | 4.7 / 11.8 |
| 28' | | | | 77 | 116 | 165 | | | 91 | 153 | 231 | 330 | 66 | 137 | 230 | 347 | 495 | 679 | 182 | 306 | 462 | 660 | 905 | 1,547 |
| | | | | 55 | 82 | 115 | | | 68 | 110 | 164 | 231 | 53 | 102 | 166 | 245 | 346 | 470 | 136 | 221 | 327 | 462 | 627 | 1,060 |
| | | | | 1.5 / 3 | 1.5 / 3.3 | 1.8 / 4.6 | | | 1.5 / 3 | 1.5 / 3 | 1.5 / 3.3 | 1.8 / 4.6 | 1.5 / 3 | 1.5 / 3 | 1.5 / 3 | 1.5 / 3.3 | 1.8 / 4.6 | 2.5 / 6.3 | 1.5 / 3 | 1.5 / 3 | 1.5 / 3.3 | 1.8 / 4.6 | 2.5 / 6.3 | 4.2 / 10.6 |
| 30' | | | | 61 | 93 | 133 | | | 72 | 123 | 186 | 267 | 51 | 109 | 184 | 279 | 400 | 551 | 145 | 245 | 372 | 534 | 734 | 1,262 |
| | | | | 45 | 67 | 94 | | | 55 | 90 | 134 | 189 | 43 | 83 | 135 | 200 | 283 | 385 | 111 | 180 | 267 | 378 | 513 | 870 |
| | | | | 1.5 / 3 | 1.5 / 3 | 1.6 / 4 | | | 1.5 / 3 | 1.5 / 3 | 1.5 / 3 | 1.6 / 4 | 1.5 / 3 | 1.5 / 3 | 1.5 / 3 | 1.5 / 3 | 1.6 / 4 | 2.2 / 5.5 | 1.5 / 3 | 1.5 / 3 | 1.5 / 3 | 1.6 / 4 | 2.2 / 5.5 | 3.7 / 9.3 |

(1) 1¾ inch members deeper than 14" are to be used as multiple-member beams only..

- **Total Load** values are limited by shear, moment or deflection equal to L/240. **Total Load** values are the capacity of the beam in addition to its own weight.
- **Live Load** values are limited by deflection equal to L/360. Check the local building code for other deflection limits that may apply. .
- Where a **Live Load** value is not shown, the **Total Load** value will control.
- Table values represent the most restrictive of simple or multiple span applications. Span is measured center-to-center of the supports. Analyze multiple span beams with BC Calc® software if the length of any span is less than half the length of an adjacent span.
- Table values assume that lateral support is provided at each support and continuously along the top edge and applicable compression edges of the beam.
- Table values for Minimum Required Bearing Lengths are based on the allowable compression design value perpendicular to grain for the beam and the Total Load value shown. Other design considerations, such as a weaker support material, may warrant longer bearing lengths. Table values assume that support is provided across the full width of the beam.
- For 2-ply, 3-ply or 4-ply beams; double, triple or quadruple allowable total load and allowable live load values. Minimum required bearing lengths remain the same for any number of plies.
- For 2-ply, 3-ply or 4-ply beams; double, triple or quadruple Allowable Total Load and Allowable Live Load values. Minimum Required Bearing Lengths remain the same for any number of plies.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with BC Calc® software.

# Versa-Lam LVL Beam Snow Roof Load Table

**Versa-Lam® LVL 2.1E 2800 and 2.1E 3100**

## Snow (115%) Load Duration

**Table Key:** **Top value** = Allowable Total Load (PLF)
**Middle value** = Allowable Live Load (PLF)
**Bottom value** = Min. Required Bearing Length (inches) at End / Intermediate supports

| Beam Span | 1¾" Versa-Lam® LVL 2.1E 2800 | | | | | | 3½" Versa-Lam® LVL 2.1E 3100 | | | | | | 5¼" Versa-Lam® LVL 2.1E 3100 | | | | | | 7" Versa-Lam® LVL 2.1E 3100 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Beam Depth | | | | | | Beam Depth | | | | | | Beam Depth | | | | | | Beam Depth | | | | | |
| | 7¼" | 9½" | 11⅞" | 14" | 16" (1) | 18" (1) | 7¼" | 9½" | 11⅞" | 14" | 16" | 18" | 9½" | 11⅞" | 14" | 16" | 18" | 20" | 11⅞" | 14" | 16" | 18" | 20" | 24" |
| 6' | 878 | 1,224 | 1,640 | 2,066 | 2,399 | 2,398 | 1,756 | 2,447 | 3,279 | 4,132 | 4,798 | 4,796 | 3,671 | 4,919 | 6,198 | 7,197 | 7,194 | 7,192 | 6,558 | 8,264 | 9,596 | 9,593 | 9,589 | 9,582 |
| | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| | 2/5 | 2.8/7 | 3.8/9.4 | 4.7/11.8 | 5.5/13.8 | 5.5/13.8 | 2/5 | 2.8/7 | 3.8/9.4 | 4.7/11.8 | 5.5/13.8 | 5.5/13.8 | 2.8/7 | 3.8/9.4 | 4.7/11.8 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 | 3.8/9.4 | 4.7/11.8 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 7' | 707 | 1,009 | 1336 | 1,,662 | 2,004 | 2,054 | 1,464 | 2,019 | 2,672 | 3,325 | 4,008 | 4,109 | 3,028 | 4,008 | 4,987 | 6,013 | 6,163 | 6,161 | 5,344 | 6,649 | 8,017 | 8,218 | 8,214 | 8,207 |
| | 678 | – | – | – | – | – | 1,357 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| | 1.9/4.7 | 2.7/6.8 | 3.6/8.9 | 4.4/11.1 | 5.4/13.4 | 5.5/13.8 | 2/4.9 | 2.7/6.8 | 3.6/8.9 | 4.4/11.1 | 5.4/13.4 | 5.5/13.8 | 2.7/6.8 | 3.6/8.9 | 4.4/11.1 | 5.4/13.4 | 5.5/13.8 | 5.5/13.8 | 3.6/8.9 | 4.4/11.1 | 5.4/13.4 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 8' | 541 | 859 | 1,127 | 1,390 | 1,661 | 1,797 | 1,198 | 1,718 | 2,254 | 2,780 | 3,323 | 3,593 | 2,577 | 3,381 | 4,171 | 4,984 | 5,390 | 5,387 | 4,508 | 5,561 | 6,645 | 7,186 | 7,183 | 7,176 |
| | 466 | – | – | – | – | – | 931 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| | 1.7/4.1 | 2.6/6.6 | 3.5/8.6 | 4.3/10.6 | 5.1/12.7 | 5.5/13.8 | 1.8/4.6 | 2.6/6.6 | 3.5/8.6 | 4.3/10.6 | 5.1/12.7 | 5.5/13.8 | 2.6/6.6 | 3.5/8.6 | 4.3/10.6 | 5.1/12.7 | 5.5/13.8 | 5.5/13.8 | 3.5/8.6 | 4.3/10.6 | 5.1/12.7 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 9' | 426 | 712 | 974 | 1,194 | 1,418 | 1,596 | 881 | 1,495 | 1,948 | 2,389 | 2,837 | 3,192 | 2,242 | 2,923 | 3,583 | 4,255 | 4,788 | 4,786 | 3,897 | 4,778 | 5,673 | 6,384 | 6,381 | 6,374 |
| | 333 | – | – | – | – | – | 665 | 1,431 | – | – | – | – | 2,146 | – | – | – | – | – | – | – | – | – | – | – |
| | 1.5/3.7 | 2.5/6.1 | 3.4/8.4 | 4.1/10.3 | 4.9/12.2 | 5.5/13.8 | 1.5/3.8 | 2.6/6.4 | 3.4/8.4 | 4.1/10.3 | 4.9/12.2 | 5.5/13.8 | 2.6/6.4 | 3.4/8.4 | 4.1/10.3 | 4.9/12.2 | 5.5/13.8 | 5.5/13.8 | 3.4/8.4 | 4.1/10.3 | 4.9/12.2 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 10' | 324 | 576 | 858 | 1,047 | 1,237 | 1,436 | 648 | 1,276 | 1,716 | 2,094 | 2,474 | 2,871 | 1,913 | 2,,574 | 3140 | 3,711 | 4,307 | 4,304 | 3,431 | 4,187 | 4,949 | 5,743 | 5,739 | 5,732 |
| | 246 | 532 | – | – | – | – | 491 | 1,065 | – | – | – | – | 1,597 | – | – | – | – | – | – | – | – | – | – | – |
| | 1.5/3.1 | 2.2/5.5 | 3.3/8.2 | 4/10 | 4.7/11.9 | 5.5/13.8 | 1.5/3.1 | 2.4/6.1 | 3.3/8.2 | 4/10 | 4.7/11.9 | 5.5/13.8 | 2.4/6.1 | 3.3/8.2 | 4/10 | 4.7/11.9 | 5.5/13.8 | 5.5/13.8 | 3.3/8.2 | 4/10 | 4.7/11.9 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 11' | 245 | 475 | 725 | 932 | 1,097 | 1,272 | 490 | 1,053 | 1,532 | 1,863 | 2,194 | 2,545 | 1,579 | 2,299 | 2,795 | 3,290 | 3,817 | 3,911 | 3,065 | 3,726 | 4,387 | 5,090 | 5,214 | 5,207 |
| | 186 | 406 | – | – | – | – | 372 | 812 | 1,523 | – | – | – | 1,218 | 2,285 | – | – | – | – | 3,046 | – | – | – | – | – |
| | 1.5/3 | 2/5 | 3.1/7.7 | 3.9/9.8 | 4.6/11.6 | 5.4/13.4 | 1.5/3 | 2.2/5.6 | 3.2/8.1 | 3.9/9.8 | 4.6/11.6 | 5.4/13.4 | 2.2/5.6 | 3.2/8.1 | 3.9/9.8 | 4.6/11.6 | 5.4/13.4 | 5.5/13.8 | 3.2/8.1 | 3.9/9.8 | 4.6/11.6 | 5.4/13.4 | 5.5/13.8 | 5.5/13.8 |
| 12' | 189 | 398 | 609 | 831 | 985 | 1,139 | 379 | 835 | 1,349 | 1,678 | 1,970 | 2,278 | 1,253 | 2,023 | 2,517 | 2,955 | 3,417 | 3,582 | 2,697 | 3,356 | 3,940 | 4,556 | 4,777 | 4,769 |
| | 144 | 317 | 597 | – | – | – | 289 | 633 | 1,194 | – | – | – | 950 | 1,791 | – | – | – | – | 2389 | – | – | – | – | – |
| | 1.5/3 | 1.8/4.6 | 2.8/7 | 3.8/9.6 | 4.5/11.3 | 5.2/13.1 | 1.5/3 | 1.9/4.8 | 3.1/7.8 | 3.9/9.7 | 4.5/11.3 | 5.2/13.1 | 1.9/4.8 | 3.1/7.8 | 3.9/9.7 | 4.5/11.3 | 5.2/13.1 | 5.5/13.8 | 3.1/7.8 | 3.9/9.7 | 4.5/11.3 | 5.2/13.1 | 5.5/13.8 | 5.5/13.8 |
| 13' | 149 | 331 | 518 | 708 | 894 | 1,031 | 298 | 662 | 1,147 | 1,526 | 1,787 | 2,062 | 992 | 1,721 | 2,289 | 2,681 | 3,092 | 3,305 | 2,295 | 3,052 | 3,574 | 4,123 | 4,406 | 4,399 |
| | 114 | 251 | 476 | – | – | – | 229 | 503 | 953 | 1,513 | – | – | 754 | 1,429 | 2,269 | – | – | – | 1,905 | 3,026 | – | – | – | – |
| | 1.5/3 | 1.7/4.1 | 2.6/6.5 | 3.5/8.8 | 4.5/11.2 | 5.1/12.9 | 1.5/3 | 1.7/4.1 | 2.9/7.2 | 3.8/9.5 | 4.5/11.2 | 5.1/12.9 | 1.7/4.1 | 2.9/7.2 | 3.8/9.5 | 4.5/11.2 | 5.1/12.9 | 5.5/13.8 | 2.9/7.2 | 3.8/9.5 | 4.5/11.2 | 5.1/12.9 | 5.5/13.8 | 5.5/13.8 |
| 14' | 119 | 266 | 446 | 609 | 785 | 941 | 239 | 532 | 988 | 1,350 | 1,635 | 1,883 | 798 | 1,482 | 2,025 | 2,453 | 2,824 | 3,067 | 1,976 | 2,701 | 3,271 | 3,765 | 4,089 | 4,082 |
| | 92 | 203 | 386 | – | – | – | 184 | 405 | 771 | 1,230 | – | – | 608 | 1,157 | 1,845 | – | – | – | 1,543 | 2,460 | – | – | – | – |
| | 1.5/3 | 1.5/3.6 | 2.4/6 | 3.3/8.2 | 4.2/10.6 | 5.1/12.7 | 1.5/3 | 1.5/3.6 | 2.7/6.7 | 3.6/9.1 | 4.4/11 | 5.1/12.7 | 1.5/3.6 | 2.7/6.7 | 3.6/9.1 | 4.4/11 | 5.1/12.7 | 5.5/13.8 | 2.7/6.7 | 3.6/9.1 | 4.4/11 | 5.1/12.7 | 5.5/13.8 | 5.5/13.8 |
| 15' | 97 | 217 | 388 | 530 | 683 | 854 | 193 | 434 | 833 | 1,175 | 1,507 | 1,732 | 650 | 1,250 | 1,762 | 2,261 | 2,598 | 2,861 | 1,667 | 2,349 | 3,014 | 3,464 | 3,814 | 3,807 |
| | 75 | 166 | 317 | 506 | – | – | 150 | 332 | 633 | 1,013 | 1,473 | – | 497 | 950 | 1,519 | 2,210 | – | – | 1266 | 2025 | 2946 | – | – | – |
| | 1.5/3 | 1.5/3.2 | 2.2/5.6 | 3.1/7.7 | 3.9/9.9 | 4.9/12.3 | 1.5/3 | 1.5/3.2 | 2.4/6 | 3.4/8.5 | 4.3/10.9 | 5/12.5 | 1.5/3.2 | 2.4/6 | 3.4/8.5 | 4.3/10.9 | 5/12.5 | 5.5/13.8 | 2.4/6 | 3.4/8.5 | 4.3/10.9 | 5/12.5 | 5.5/13.8 | 5.5/13.8 |
| 16' | 79 | 179 | 340 | 465 | 599 | 749 | 159 | 358 | 690 | 1,031 | 1,328 | 1,603 | 536 | 1,035 | 1,546 | 1,993 | 2,405 | 2,680 | 1,380 | 2,062 | 2,657 | 3,207 | 3,573 | 3,566 |
| | 62 | 137 | 263 | 421 | – | – | 124 | 275 | 526 | 843 | 1,230 | – | 412 | 788 | 1,264 | 1,845 | – | – | 1,051 | 1,686 | 2,460 | – | – | – |
| | 1.5/3 | 1.5/3 | 2.1/5.3 | 2.9/7.2 | 3.7/9.2 | 4.6/11.5 | 1.5/3 | 1.5/3 | 2.1/5.3 | 3.2/7.9 | 4.1/10.2 | 4.9/12.3 | 1.5/3 | 2.1/5.3 | 3.2/7.9 | 4.1/10.2 | 4.9/12.3 | 5.5/13.8 | 2.1/5.3 | 3.2/7.9 | 4.1/10.2 | 4.9/12.3 | 5.5/13.8 | 5.5/13.8 |
| 17' | 66 | 149 | 289 | 411 | 530 | 663 | 132 | 298 | 577 | 912 | 1,175 | 1,470 | 447 | 866 | 1,368 | 1,763 | 2,204 | 2,521 | 1,155 | 1,823 | 2,350 | 2,939 | 3,361 | 3,354 |
| | 52 | 115 | 220 | 354 | 518 | – | 104 | 230 | 441 | 709 | 1,037 | 1,443 | 345 | 661 | 1,063 | 1,555 | 2,165 | – | 882 | 1,418 | 2,074 | 2,886 | – | – |
| | 1.5/3 | 1.5/3 | 1.9/4.8 | 2.7/6.8 | 3.5/8.7 | 4.3/10.9 | 1.5/3 | 1.5/3 | 1.9/4.8 | 3/7.5 | 3.9/9.6 | 4.8/12 | 1.5/3 | 1.9/4.8 | 3/7.5 | 3.9/9.6 | 4.8/12 | 5.5/13.8 | 1.9/4.8 | 3/7.5 | 3.9/9.6 | 4.8/12 | 5.5/13.8 | 5.5/13.8 |
| 18' | 55 | 125 | 244 | 366 | 472 | 590 | 110 | 251 | 487 | 790 | 1,047 | 1,309 | 376 | 731 | 1,184 | 1,570 | 1,964 | 2,367 | 975 | 1,579 | 2,093 | 2,618 | 3,156 | 3,165 |
| | 44 | 97 | 187 | 301 | 441 | – | 87 | 194 | 373 | 602 | 882 | 1,230 | 291 | 560 | 902 | 1,322 | 1,845 | – | 747 | 1,203 | 1,763 | 2,460 | – | – |
| | 1.5/3 | 1.5/3 | 1.7/4.3 | 2.6/6.4 | 3.3/8.2 | 4.1/10.3 | 1.5/3 | 1.5/3 | 1.7/4.3 | 2.8/6.9 | 3.6/9.1 | 4.5/11.4 | 1.5/3 | 1.7/4.3 | 2.8/6.9 | 3.6/9.1 | 4.5/11.4 | 5.5/13.7 | 1.7/4.3 | 2.8/6.9 | 3.6/9.1 | 4.5/11.4 | 5.5/13.7 | 5.5/13.8 |
| 19' | 46 | 106 | 207 | 328 | 423 | 529 | 93 | 212 | 415 | 674 | 938 | 1,173 | 319 | 622 | 1,011 | 1,407 | 1,760 | 2,150 | 829 | 1,347 | 1,876 | 2,347 | 2,867 | 2,996 |
| | 37 | 83 | 160 | 257 | 378 | 528 | 74 | 166 | 319 | 515 | 756 | 1,056 | 249 | 479 | 772 | 1133 | 1584 | 2130 | 638 | 1,029 | 1,511 | 2,112 | 2,839 | – |
| | 1.5/3 | 1.5/3 | 1.5/3.8 | 2.4/6 | 3.1/7.8 | 3.9/9.7 | 1.5/3 | 1.5/3 | 1.5/3.8 | 2.5/6.2 | 3.4/8.6 | 4.3/10.8 | 1.5/3 | 1.5/3.8 | 2.5/6.2 | 3.4/8.6 | 4.3/10.8 | 5.3/13.1 | 1.5/3.8 | 2.5/6.2 | 3.4/8.6 | 4.3/10.8 | 5.3/13.1 | 5.5/13.8 |
| 20' | | 91 | 178 | 289 | 381 | 477 | 79 | 181 | 355 | 579 | 845 | 1,057 | 272 | 533 | 868 | 1267 | 1586 | 1938 | 711 | 1,158 | 1,690 | 2,115 | 2,584 | 2,844 |
| | | 71 | 137 | 222 | 326 | 457 | 64 | 142 | 275 | 444 | 652 | 913 | 214 | 412 | 666 | 979 | 1370 | 1845 | 549 | 887 | 1,305 | 1,827 | 2,460 | – |
| | | 1.5/3 | 1.5/3.5 | 2.3/5.6 | 3/7.4 | 3.7/9.2 | 1.5/3 | 1.5/3 | 1.5/3.5 | 2.3/5.6 | 3.3/8.2 | 4.1/10.2 | 1.5/3 | 1.5/3.5 | 2.3/5.6 | 3.3/8.2 | 4.1/10.2 | 5/12.5 | 1.5/3.5 | 2.3/5.6 | 3.3/8.2 | 4.1/10.2 | 5/12.5 | 5.5/13.8 |
| 22' | | 67 | 133 | 218 | 314 | 393 | 58 | 135 | 266 | 436 | 646 | 871 | 202 | 399 | 654 | 970 | 1307 | 1597 | 532 | 871 | 1,293 | 1,742 | 2,129 | 2,582 |
| | | 54 | 104 | 168 | 248 | 348 | 48 | 107 | 208 | 336 | 496 | 696 | 161 | 311 | 504 | 743 | 1044 | 1410 | 415 | 672 | 991 | 1,392 | 1,880 | – |
| | | 1.5/3 | 1.5/3 | 1.9/4.7 | 2.7/6.7 | 3.4/8.4 | 1.5/3 | 1.5/3 | 1.5/3 | 1.9/4.7 | 2.8/6.9 | 3.7/9.3 | 1.5/3 | 1.5/3 | 1.9/4.7 | 2.8/6.9 | 3.7/9.3 | 4.5/11.3 | 1.5/3 | 1.9/4.7 | 2.8/6.9 | 3.7/9.3 | 4.5/11.3 | 5.5/13.8 |
| 24' | | 51 | 102 | 168 | 249 | 329 | 43 | 102 | 204 | 335 | 499 | 706 | 153 | 305 | 503 | 748 | 1059 | 1337 | 407 | 670 | 998 | 1,412 | 1,783 | 2,363 |
| | | 42 | 80 | 130 | 193 | 271 | 37 | 83 | 161 | 261 | 385 | 542 | 125 | 241 | 391 | 578 | 813 | 1100 | 321 | 521 | 770 | 1,083 | 1,467 | – |
| | | 1.5/3 | 1.5/3 | 1.6/4 | 2.3/5.9 | 3.1/7.7 | 1.5/3 | 1.5/3 | 1.5/3 | 1.6/4 | 2.3/5.9 | 3.3/8.3 | 1.5/3 | 1.5/3 | 1.6/4 | 2.3/5.9 | 3.3/8.3 | 4.2/10.4 | 1.5/3 | 1.6/4 | 2.3/5.9 | 3.3/8.3 | 4.2/10.4 | 5.5/13.8 |
| 26' | | | 79 | 131 | 196 | 278 | | 79 | 158 | 262 | 392 | 557 | 118 | 238 | 393 | 588 | 835 | 1136 | 317 | 524 | 784 | 1,113 | 1,514 | 2,144 |
| | | | 63 | 103 | 152 | 215 | | 65 | 127 | 206 | 305 | 430 | 98 | 190 | 309 | 457 | 645 | 874 | 254 | 412 | 610 | 859 | 1,166 | 1,963 |
| | | | 1.5/3 | 1.5/3.4 | 2/5 | 2.8/7.1 | | 1.5/3 | 1.5/3 | 1.5/3.4 | 2/5 | 2.8/7.1 | 1.5/3 | 1.5/3 | 1.5/3.4 | 2/5 | 2.8/7.1 | 3.8/9.6 | 1.5/3 | 1.5/3.4 | 2/5 | 2.8/7.1 | 3.8/9.6 | 5.4/13.5 |
| 28' | | | 63 | 104 | 156 | 223 | | 61 | 125 | 208 | 313 | 446 | 92 | 188 | 313 | 469 | 668 | 914 | 250 | 417 | 626 | 891 | 1,219 | 1,843 |
| | | | 51 | 83 | 123 | 173 | | 53 | 102 | 166 | 245 | 346 | 79 | 153 | 249 | 368 | 520 | 706 | 204 | 331 | 491 | 693 | 941 | 1,590 |
| | | | 1.5/3 | 1.5/3 | 1.7/4.4 | 2.5/6.2 | | 1.5/3 | 1.5/3 | 1.5/3 | 1.7/4.4 | 2.5/6.2 | 1.5/3 | 1.5/3 | 1.5/3 | 1.7/4.4 | 2.5/6.2 | 3.3/8.4 | 1.5/3 | 1.5/3 | 1.7/4.4 | 2.5/6.2 | 3.3/8.4 | 5/12.6 |
| 30' | | | 50 | 84 | 126 | 181 | | 48 | 100 | 168 | 253 | 361 | 73 | 150 | 251 | 379 | 542 | 743 | 200 | 335 | 506 | 723 | 991 | 1,600 |
| | | | 42 | 68 | 100 | 142 | | 43 | 83 | 135 | 200 | 283 | 64 | 125 | 203 | 301 | 425 | 578 | 166 | 270 | 401 | 566 | 770 | 1,305 |
| | | | 1.5/3 | 1.5/3 | 1.5/3.8 | 2.2/5.4 | | 1.5/3 | 1.5/3 | 1.5/3 | 1.5/3.8 | 2.2/5.4 | 1.5/3 | 1.5/3 | 1.5/3 | 1.5/3.8 | 2.2/5.4 | 2.9/7.3 | 1.5/3 | 1.5/3 | 1.5/3.8 | 2.2/5.4 | 2.9/7.3 | 4.7/11.7 |

(1) 1¾ inch members deeper than 14" are to be used as multiple-member beams only.

- **Total Load** values are limited by shear, moment or deflection equal to L/180. **Total Load** values are the capacity of the beam in addition to its own weight.
- **Live Load** values are limited by deflection equal to L/240. Check the local building code for other deflection limits that may apply. Flat and low slope roofs may require more restrictive deflection limits, consult project's design professional of record.
- Where a **Live Load** value is not shown, the **Total Load** value will control.
- Table values represent the most restrictive of simple or multiple span applications. Span is measured center-to-center of the supports. Analyze multiple span beams with BC Calc® software if the length of any span is less than half the length of an adjacent span.
- Table values assume that lateral support is provided at each support and continuously along the top edge and applicable compression edges of the beam.
- Table values for **Minimum Required Bearing** Lengths are based on the allowable compression design value perpendicular to grain for the beam and the **Total Load** value shown. Other design considerations, such as a weaker support material, may warrant longer bearing lengths. Table values assume that support is provided across the full width of the beam.
- For 2-ply, 3-ply or 4-ply beams; double, triple or quadruple allowable total load and allowable live load values. Minimum required bearing lengths remain the same for any number of plies.
- 1¾" members deeper than 14" are to be used as multiple-member beams only. It may be possible to exceed this limitation by analyzing a specific, properly braced application using BC Calc® software.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with BC Calc® software.

# Versa-Lam LVL Beam Non-Snow Roof Load Table

**Table Key:** **Top value** = Allowable Total Load (PLF)
**Middle value** = Allowable Live Load (PLF)
**Bottom value** = Min. Required Bearing Length (inches) at End / Intermediate supports

**Versa-Lam® LVL 2.1E 2800 and 2.1E 3100**

## Non-Snow (125%) Load Duration

| Beam Span | 1¾" Versa-Lam® LVL 2.1E 2800 | | | | | | 3½" Versa-Lam® LVL 2.1E 3100 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Beam Depth | | | | | | Beam Depth | | | | | |
| | 7¼" | 9½" | 11⅞" | 14" | 16" (1) | 18" (1) | 7¼" | 9½" | 11⅞" | 14" | 16" | 18" |
| 6' | 955 | 1,330 | 1,783 | 2,246 | 2,399 | 2,398 | 1,909 | 2,661 | 3,565 | 4,492 | 4,798 | 4,796 |
| | – | – | – | – | – | – | – | – | – | – | – | – |
| | 2.2/5.5 | 3.1/7.6 | 4.1/10.2 | 5.1/12.9 | 5.5/13.8 | 5.5/13.8 | 2.2/5.5 | 3.1/7.6 | 4.1/10.2 | 5.1/12.9 | 5.5/13.8 | 5.5/13.8 |
| 7' | 769 | 1,098 | 1,453 | 1,807 | 2,055 | 2,054 | 1592 | 2,195 | 2,905 | 3,615 | 4,111 | 4,109 |
| | 678 | – | – | – | – | – | 1357 | – | – | – | – | – |
| | 2.1/5.1 | 2.9/7.3 | 3.9/9.7 | 4.8/12.1 | 5.5/13.8 | 5.5/13.8 | 2.1/5.3 | 2.9/7.3 | 3.9/9.7 | 4.8/12.1 | 5.5/13.8 | 5.5/13.8 |
| 8' | 588 | 934 | 1,225 | 1,512 | 1,797 | 1,797 | 1,235 | 1,868 | 2,451 | 3,023 | 3,595 | 3,593 |
| | 466 | – | – | – | – | – | 931 | – | – | – | – | – |
| | 1.8/4.5 | 2.9/7.1 | 3.8/9.4 | 4.6/11.6 | 5.5/13.8 | 5.5/13.8 | 1.9/4.7 | 2.9/7.1 | 3.8/9.4 | 4.6/11.6 | 5.5/13.8 | 5.5/13.8 |
| 9' | 440 | 774 | 1,059 | 1,299 | 1,542 | 1,596 | 881 | 1,625 | 2,119 | 2,598 | 3,085 | 3,192 |
| | 333 | 715 | – | – | – | – | 665 | 1,431 | – | – | – | – |
| | 1.5/3.8 | 2.7/6.7 | 3.7/9.1 | 4.5/11.2 | 5.3/13.3 | 5.5/13.8 | 1.5/3.8 | 2.8/7 | 3.7/9.1 | 4.5/11.2 | 5.3/13.3 | 5.5/13.8 |
| 10' | 324 | 626 | 933 | 1,138 | 1,345 | 1,436 | 648 | 1,387 | 1,866 | 2,277 | 2,691 | 2,871 |
| | 246 | 532 | – | – | – | – | 491 | 1,065 | – | – | – | – |
| | 1.5/3.1 | 2.4/6 | 3.6/8.9 | 4.4/10.9 | 5.2/12.9 | 5.5/13.8 | 1.5/3.1 | 2.7/6.6 | 3.6/8.9 | 4.4/10.9 | 5.2/12.9 | 5.5/13.8 |
| 11' | 245 | 517 | 789 | 1,013 | 1,193 | 1,304 | 490 | 1,074 | 1,667 | 2,026 | 2,386 | 2,609 |
| | 186 | 406 | 762 | – | – | – | 372 | 812 | 1,523 | – | – | – |
| | 1.5/3 | 2.2/5.5 | 3.3/8.3 | 4.3/10.7 | 5/12.6 | 5.5/13.8 | 1.5/3 | 2.3/5.7 | 3.5/8.8 | 4.3/10.7 | 5/12.6 | 5.5/13.8 |
| 12' | 189 | 418 | 662 | 904 | 1,071 | 1,195 | 379 | 835 | 1,467 | 1,825 | 2,142 | 2,390 |
| | 144 | 317 | 597 | – | – | – | 289 | 633 | 1,194 | – | – | – |
| | 1.5/3 | 1.9/4.8 | 3.1/7.6 | 4.2/10.4 | 4.9/12.3 | 5.5/13.8 | 1.5/3 | 1.9/4.8 | 3.4/8.4 | 4.2/10.5 | 4.9/12.3 | 5.5/13.8 |
| 13' | 149 | 331 | 563 | 770 | 972 | 1,102 | 298 | 662 | 1,248 | 1,660 | 1,944 | 2,205 |
| | 114 | 251 | 476 | 756 | – | – | 229 | 503 | 953 | 1,513 | – | – |
| | 1.5/3 | 1.7/4.1 | 2.8/7 | 3.8/9.6 | 4.8/12.1 | 5.5/13.8 | 1.5/3 | 1.7/4.1 | 3.1/7.8 | 4.1/10.4 | 4.8/12.1 | 5.5/13.8 |
| 14' | 119 | 266 | 485 | 663 | 854 | 1,023 | 239 | 532 | 1,018 | 1,469 | 1,779 | 2,046 |
| | 92 | 203 | 386 | 615 | – | – | 184 | 405 | 771 | 1,230 | – | – |
| | 1.5/3 | 1.5/3.6 | 2.6/6.5 | 3.6/8.9 | 4.6/11.5 | 5.5/13.8 | 1.5/3 | 1.5/3.6 | 2.7/6.9 | 4/9.9 | 4.8/12 | 5.5/13.8 |
| 15' | 97 | 217 | 417 | 576 | 743 | 929 | 193 | 434 | 833 | 1,278 | 1,639 | 1,884 |
| | 75 | 166 | 317 | 506 | 737 | – | 150 | 332 | 633 | 1,013 | 1,473 | – |
| | 1.5/3 | 1.5/3.2 | 2.4/6 | 3.3/8.3 | 4.3/10.7 | 5.4/13.4 | 1.5/3 | 1.5/3.2 | 2.4/6 | 3.7/9.2 | 4.7/11.8 | 5.4/13.6 |
| 16' | 79 | 179 | 345 | 506 | 652 | 815 | 159 | 358 | 690 | 1,111 | 1,445 | 1,744 |
| | 62 | 137 | 263 | 421 | 615 | – | 124 | 275 | 526 | 843 | 1,230 | 1,707 |
| | 1.5/3 | 1.5/3 | 2.1/5.3 | 3.1/7.8 | 4/10 | 5/12.5 | 1.5/3 | 1.5/3 | 2.1/5.3 | 3.4/8.6 | 4.4/11.1 | 5.4/13.4 |
| 17' | 66 | 149 | 289 | 447 | 577 | 721 | 132 | 298 | 577 | 933 | 1,278 | 1,599 |
| | 52 | 115 | 220 | 354 | 518 | – | 104 | 230 | 441 | 709 | 1,037 | 1,443 |
| | 1.5/3 | 1.5/3 | 1.9/4.8 | 2.9/7.3 | 3.8/9.5 | 4.7/11.8 | 1.5/3 | 1.5/3 | 1.9/4.8 | 3.1/7.7 | 4.2/10.5 | 5.2/13.1 |
| 18' | 55 | 125 | 244 | 395 | 514 | 642 | 110 | 251 | 487 | 790 | 1,139 | 1,424 |
| | 44 | 97 | 187 | 301 | 441 | 615 | 87 | 194 | 373 | 602 | 882 | 1,230 |
| | 1.5/3 | 1.5/3 | 1.7/4.3 | 2.8/6.9 | 3.6/8.9 | 4.5/11.2 | 1.5/3 | 1.5/3 | 1.7/4.3 | 2.8/6.9 | 4/9.9 | 4.9/12.3 |
| 19' | 46 | 106 | 207 | 337 | 460 | 576 | 93 | 212 | 415 | 674 | 993 | 1,277 |
| | 37 | 83 | 160 | 257 | 378 | 528 | 74 | 166 | 319 | 515 | 756 | 1,056 |
| | 1.5/3 | 1.5/3 | 1.5/3.8 | 2.5/6.2 | 3.4/8.5 | 4.2/10.6 | 1.5/3 | 1.5/3 | 1.5/3.8 | 2.5/6.2 | 3.6/9.1 | 4.7/11.7 |
| 20' | 39 | 91 | 178 | 289 | 415 | 519 | 79 | 181 | 355 | 579 | 855 | 1,151 |
| | 32 | 71 | 137 | 222 | 326 | 457 | 64 | 142 | 275 | 444 | 652 | 913 |
| | 1.5/3 | 1.5/3 | 1.5/3.5 | 2.3/5.6 | 3.2/8 | 4/10 | 1.5/3 | 1.5/3 | 1.5/3.5 | 2.3/5.6 | 3.3/8.3 | 4.4/11.1 |
| 22' | | 67 | 133 | 218 | 323 | 427 | 58 | 135 | 266 | 436 | 646 | 912 |
| | | 54 | 104 | 168 | 248 | 348 | 48 | 107 | 208 | 336 | 496 | 696 |
| | | 1.5/3 | 1.5/3 | 1.9/4.7 | 2.8/6.9 | 3.6/9.1 | 1.5/3 | 1.5/3 | 1.5/3 | 1.9/4.7 | 2.8/6.9 | 3.9/9.7 |
| 24' | | 51 | 102 | 168 | 249 | 353 | 43 | 102 | 204 | 335 | 499 | 706 |
| | | 42 | 80 | 130 | 193 | 271 | 37 | 83 | 161 | 261 | 385 | 542 |
| | | 1.5/3 | 1.5/3 | 1.6/4 | 2.3/5.9 | 3.3/8.3 | 1.5/3 | 1.5/3 | 1.5/3 | 1.6/4 | 2.3/5.9 | 3.3/8.3 |
| 26' | | 39 | 79 | 131 | 196 | 278 | | 79 | 158 | 262 | 392 | 557 |
| | | 33 | 63 | 103 | 152 | 215 | | 65 | 127 | 206 | 305 | 430 |
| | | 1.5/3 | 1.5/3 | 1.5/3.4 | 2/5 | 2.8/7.1 | | 1.5/3 | 1.5/3 | 1.5/3.4 | 2/5 | 2.8/7.1 |
| 28' | | | 63 | 104 | 156 | 223 | | 61 | 125 | 208 | 313 | 446 |
| | | | 51 | 83 | 123 | 173 | | 53 | 102 | 166 | 245 | 346 |
| | | | 1.5/3 | 1.5/3 | 1.7/4.4 | 2.5/6.2 | | 1.5/3 | 1.5/3 | 1.5/3 | 1.7/4.4 | 2.5/6.2 |
| 30' | | | 50 | 84 | 126 | 181 | | 48 | 100 | 168 | 253 | 361 |
| | | | 42 | 68 | 100 | 142 | | 43 | 83 | 135 | 200 | 283 |
| | | | 1.5/3 | 1.5/3 | 1.5/3.8 | 2.2/5.4 | | 1.5/3 | 1.5/3 | 1.5/3 | 1.5/3.8 | 2.2/5.4 |

| Beam Span | 5¼" Versa-Lam® LVL 2.1E 3100 | | | | | | 7" Versa-Lam® LVL 2.1E 3100 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Beam Depth | | | | | | Beam Depth | | | | | |
| | 9½" | 11⅞" | 14" | 16" | 18" | 20" | 11⅞" | 14" | 16" | 18" | 20" | 24" |
| 6' | 3,991 | 5,348 | 6,738 | 7,197 | 7,194 | 7,192 | 7,131 | 8,984 | 9,596 | 9,593 | 9,589 | 9,582 |
| | – | – | – | – | – | – | – | – | – | – | – | – |
| | 3.1/7.6 | 4.1/10.2 | 5.1/12.9 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 | 4.1/10.2 | 5.1/12.9 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 7' | 3,293 | 4,358 | 5,422 | 6,166 | 6,163 | 6,161 | 5,810 | 7,229 | 8,221 | 8,218 | 8,214 | 8,207 |
| | – | – | – | – | – | – | – | – | – | – | – | – |
| | 2.9/7.3 | 3.9/9.7 | 4.8/12.1 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 | 3.9/9.7 | 4.8/12.1 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 8' | 2,802 | 3,676 | 4,535 | 5,392 | 5,390 | 5,387 | 4,901 | 6,047 | 7,190 | 7,186 | 7,183 | 7,176 |
| | – | – | – | – | – | – | – | – | – | – | – | – |
| | 2.9/7.1 | 3.8/9.4 | 4.6/11.6 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 | 3.8/9.4 | 4.6/11.6 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 9' | 2,438 | 3,178 | 3,897 | 4,627 | 4,788 | 4,786 | 4,238 | 5,195 | 6,169 | 6,384 | 6,381 | 6,374 |
| | 2146 | – | – | – | – | – | – | – | – | – | – | – |
| | 2.8/7 | 3.7/9.1 | 4.5/11.2 | 5.3/13.3 | 5.5/13.8 | 5.5/13.8 | 3.7/9.1 | 4.5/11.2 | 5.3/13.3 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 10' | 2,081 | 2,799 | 3,415 | 4,036 | 4,307 | 4,304 | 3,732 | 4,554 | 5,381 | 5,743 | 5,739 | 5,732 |
| | 1,597 | – | – | – | – | – | – | – | – | – | – | – |
| | 2.7/6.6 | 3.6/8.9 | 4.4/10.9 | 5.2/12.9 | 5.5/13.8 | 5.5/13.8 | 3.6/8.9 | 4.4/10.9 | 5.2/12.9 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 11' | 1,611 | 2,500 | 3,039 | 3,578 | 3,913 | 3,911 | 3,333 | 4,052 | 4,771 | 5,218 | 5,214 | 5,207 |
| | 1,218 | 2285 | – | – | – | – | 3,046 | – | – | – | – | – |
| | 2.3/5.7 | 3.5/8.8 | 4.3/10.7 | 5/12.6 | 5.5/13.8 | 5.5/13.8 | 3.5/8.8 | 4.3/10.7 | 5/12.6 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 12' | 1,253 | 2,200 | 2,737 | 3,214 | 3,585 | 3,582 | 2,934 | 3,650 | 4,285 | 4,780 | 4,777 | 4,769 |
| | 950 | 1791 | – | – | – | – | 2,389 | – | – | – | – | – |
| | 1.9/4.8 | 3.4/8.4 | 4.2/10.5 | 4.9/12.3 | 5.5/13.8 | 5.5/13.8 | 3.4/8.4 | 4.2/10.5 | 4.9/12.3 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 13' | 992 | 1,872 | 2,490 | 2,916 | 3,307 | 3,305 | 2,496 | 3,320 | 3,888 | 4,410 | 4,406 | 4,399 |
| | 754 | 1,429 | 2,269 | – | – | – | 1,905 | 3,026 | – | – | – | – |
| | 1.7/4.1 | 3.1/7.8 | 4.1/10.4 | 4.8/12.1 | 5.5/13.8 | 5.5/13.8 | 3.1/7.8 | 4.1/10.4 | 4.8/12.1 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 14' | 798 | 1,527 | 2,203 | 2,668 | 3,069 | 3,067 | 2036 | 2,,938 | 3,558 | 4,093 | 4,089 | 4,082 |
| | 608 | 1,157 | 1,845 | – | – | – | 1,543 | 2,460 | – | – | – | – |
| | 1.5/3.6 | 2.7/6.9 | 4/9.9 | 4.8/12 | 5.5/13.8 | 5.5/13.8 | 2.7/6.9 | 4/9.9 | 4.8/12 | 5.5/13.8 | 5.5/13.8 | 5.5/13.8 |
| 15' | 650 | 1,250 | 1,917 | 2,459 | 2,826 | 2,861 | 1,667 | 2,556 | 3,279 | 3,768 | 3,814 | 3,807 |
| | 497 | 950 | 1,519 | 2,210 | – | – | 1,266 | 2,025 | 2,946 | – | – | – |
| | 1.5/3.2 | 2.4/6 | 3.7/9.2 | 4.7/11.8 | 5.4/13.6 | 5.5/13.8 | 2.4/6 | 3.7/9.2 | 4.7/11.8 | 5.4/13.6 | 5.5/13.8 | 5.5/13.8 |
| 16' | 536 | 1,035 | 1,667 | 2,168 | 2,616 | 2,680 | 1,380 | 2,223 | 2,890 | 3,488 | 3,573 | 3,566 |
| | 412 | 788 | 1,264 | 1,845 | 2,561 | – | 1,051 | 1,686 | 2,460 | 3,415 | – | – |
| | 1.5/3 | 2.1/5.3 | 3.4/8.6 | 4.4/11.1 | 5.4/13.4 | 5.5/13.8 | 2.1/5.3 | 3.4/8.6 | 4.4/11.1 | 5.4/13.4 | 5.5/13.8 | 5.5/13.8 |
| 17' | 447 | 866 | 1,399 | 1,918 | 2,398 | 2,521 | 1,155 | 1,865 | 2,557 | 3,198 | 3,361 | 3,354 |
| | 345 | 661 | 1,063 | 1,555 | 2,165 | – | 882 | 1,418 | 2,074 | 2,886 | – | – |
| | 1.5/3 | 1.9/4.8 | 3.1/7.7 | 4.2/10.5 | 5.2/13.1 | 5.5/13.8 | 1.9/4.8 | 3.1/7.7 | 4.2/10.5 | 5.2/13.1 | 5.5/13.8 | 5.5/13.8 |
| 18' | 376 | 731 | 1,184 | 1,708 | 2,137 | 2,379 | 975 | 1,579 | 2,278 | 2,849 | 3,172 | 3,165 |
| | 291 | 560 | 902 | 1,322 | 1,845 | – | 747 | 1,203 | 17,63 | 2,460 | – | – |
| | 1.5/3 | 1.7/4.3 | 2.8/6.9 | 4/9.9 | 4.9/12.3 | 5.5/13.8 | 1.7/4.3 | 2.8/6.9 | 4/9.9 | 4.9/12.3 | 5.5/13.8 | 5.5/13.8 |
| 19' | 319 | 622 | 1,011 | 1,490 | 1,915 | 2,253 | 829 | 1,347 | 1,986 | 2,553 | 3,004 | 2,996 |
| | 249 | 479 | 772 | 1,133 | 1,584 | 2,130 | 638 | 1,029 | 1,511 | 2,112 | 2,839 | – |
| | 1.5/3 | 1.5/3.8 | 2.5/6.2 | 3.6/9.1 | 4.7/11.7 | 5.5/13.8 | 1.5/3.8 | 2.5/6.2 | 3.6/9.1 | 4.7/11.7 | 5.5/13.8 | 5.5/13.8 |
| 20' | 272 | 533 | 868 | 1,283 | 1,726 | 2,109 | 711 | 1,158 | 1,711 | 2,301 | 2,812 | 2,844 |
| | 214 | 412 | 666 | 979 | 1,370 | 1,845 | 549 | 887 | 1,305 | 1,827 | 2,460 | – |
| | 1.5/3 | 1.5/3.5 | 2.3/5.6 | 3.3/8.3 | 4.4/11.1 | 5.4/13.6 | 1.5/3.5 | 2.3/5.6 | 3.3/8.3 | 4.4/11.1 | 5.4/13.6 | 5.5/13.8 |
| 22' | 202 | 399 | 654 | 970 | 1,367 | 1,738 | 532 | 871 | 1,293 | 1,823 | 2317 | 2582 |
| | 161 | 311 | 504 | 743 | 1,044 | 1,410 | 415 | 672 | 991 | 1,392 | 1880 | – |
| | 1.5/3 | 1.5/3 | 1.9/4.7 | 2.8/6.9 | 3.9/9.7 | 4.9/12.3 | 1.5/3 | 1.9/4.7 | 2.8/6.9 | 3.9/9.7 | 4.9/12.3 | 5.5/13.8 |
| 24' | 153 | 305 | 503 | 748 | 1,059 | 1,440 | 407 | 670 | 998 | 1,412 | 1,920 | 2,363 |
| | 125 | 241 | 391 | 578 | 813 | 1,100 | 321 | 521 | 770 | 1083 | 1,467 | – |
| | 1.5/3 | 1.5/3 | 1.6/4 | 2.3/5.9 | 3.3/8.3 | 4.5/11.2 | 1.5/3 | 1.6/4 | 2.3/5.9 | 3.3/8.3 | 4.5/11.2 | 5.5/13.8 |
| 26' | 118 | 238 | 393 | 588 | 835 | 1,139 | 317 | 524 | 784 | 1,113 | 1,518 | 2,178 |
| | 98 | 190 | 309 | 457 | 645 | 874 | 254 | 412 | 610 | 859 | 1,166 | 1,963 |
| | 1.5/3 | 1.5/3 | 1.5/3.4 | 2/5 | 2.8/7.1 | 3.8/9.6 | 1.5/3 | 1.5/3.4 | 2/5 | 2.8/7.1 | 3.8/9.6 | 5.5/13.8 |
| 28' | 92 | 188 | 313 | 469 | 668 | 914 | 250 | 417 | 626 | 891 | 1,219 | 2,007 |
| | 79 | 153 | 249 | 368 | 520 | 706 | 204 | 331 | 491 | 693 | 941 | 1,590 |
| | 1.5/3 | 1.5/3 | 1.5/3 | 1.7/4.4 | 2.5/6.2 | 3.3/8.4 | 1.5/3 | 1.5/3 | 1.7/4.4 | 2.5/6.2 | 3.3/8.4 | 5.5/13.7 |
| 30' | 73 | 150 | 251 | 379 | 542 | 743 | 200 | 335 | 506 | 723 | 991 | 1,696 |
| | 64 | 125 | 203 | 301 | 425 | 578 | 166 | 270 | 401 | 566 | 770 | 1,305 |
| | 1.5/3 | 1.5/3 | 1.5/3 | 1.5/3.8 | 2.2/5.4 | 2.9/7.3 | 1.5/3 | 1.5/3 | 1.5/3.8 | 2.2/5.4 | 2.9/7.3 | 5/12.4 |

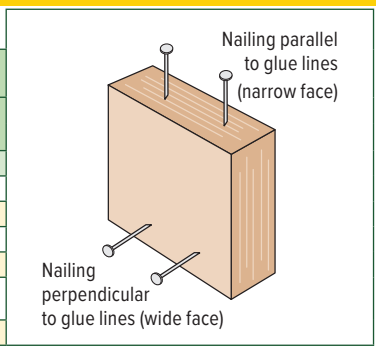
(1) 1¾ inch members deeper than 14" are to be used as multiple-member beams only..

- **Total Load** values are limited by shear, moment or deflection equal to L/180. **Total Load** values are the capacity of the beam in addition to its own weight.
- **Live Load** values are limited by deflection equal to L/240. Check the local building code for other deflection limits that may apply. Flat and low slope roofs may require more restrictive deflection limits, consult project's design professional of record.
- Where a **Live Load** value is not shown, the **Total Load** value will control.
- Table values represent the most restrictive of simple or multiple span applications. Span is measured center-to-center of the supports. Analyze multiple span beams with BC Calc® software if the length of any span is less than half the length of an adjacent span.
- Table values assume that lateral support is provided at each support and continuously along the top edge and applicable compression edges of the beam.
- Table values for **Minimum Required Bearing** Lengths are based on the allowable compression design value perpendicular to grain for the beam and the **Total Load** value shown. Other design considerations, such as a weaker support material, may warrant longer bearing lengths. Table values assume that support is provided across the full width of the beam.
- For 2-ply, 3-ply or 4-ply beams; double, triple or quadruple allowable total load and allowable live load values. Minimum required bearing lengths remain the same for any number of plies.
- 1¾" members deeper than 14" are to be used as multiple-member beams only. It may be possible to exceed this limitation by analyzing a specific, properly braced application using BC Calc® software.
- This table was designed to apply to a broad range of applications. It may be possible to exceed the limitations of this table by analyzing a specific application with BC Calc® software.

# Versa-Lam LVL Beam Allowable Nailing

## Closest Allowable Nail Spacing

| Nail Size | Nailing Parallel to Glue Lines (Narrow Face)[1] | | | | | | Nailing Perpendicular to Glue Lines (Wide Face) | |
|---|---|---|---|---|---|---|---|---|
| | Versa-Lam® LVL | | | | | | All Versa-Lam® LVL Products | |
| | 1 5/16" | | 1¾" | | 3½" and wider | | | |
| | O.C. | End | O.C. | End | O.C. | End | O.C. | End |
| 8d Box (0.113"ø x 2.5") | 3" | 1½" | 2" | 1" | 2" | ½" | 2" | 1" |
| 8d Common (0.131"ø x 2.5") | 3" | 2" | 3" | 2" | 2" | 1" | 2" | 1" |
| 10d and 12d Box (0.128"ø x 3", 3.25") | 3" | 2" | 3" | 2" | 2" | 1" | 2" | 1" |
| 16d Box (0.135"ø x 3.5") | 3" | 2" | 3" | 2" | 2" | 1" | 2" | 2" |
| 10d and 12d Common and 16d Sinker (0.148"ø x 3", 3.25") | 4" | 3" | 4" | 3" | 2" | 2" | 2" | 2" |
| 16d Common (0.162"ø x 3.5") | 6" | 4" | 6" | 3" | 2" | 2" | 3" | 2" |




(1) For 1¾" thickness and greater, two rows of nails (such as for a metal strap) are allowed (use ½" minimum offset between rows and stagger nails).

- Offset and stagger nail rows from floor sheathing and wall sole plate.
- Simpson Strong-Tie A35 and LPT4 connectors may be attached to the side of Versa-Lam® LVL. Use nails as specified by Simpson Strong-Tie.

# Versa-Lam LVL Beam Design Values

| Grade | Width | Depth | Weight (lb/ft) | Allowable Shear (lb) | Allowable Moment (ft-lb) | Moment of Inertia (in⁴) |
|---|---|---|---|---|---|---|
| Versa-Lam® LVL 1.5E 1800 | 1 5/16" | 9½" | 3.2 | 1,870 | 3,039 | 93.8 |
| | | 11⅞" | 4.0 | 2,338 | 4,632 | 183.2 |
| | | 14" | 4.7 | 2,756 | 6,322 | 300.1 |
| | | 16" | 5.4 | 3,150 | 8,136 | 448.0 |
| | | 18" | 6.1 | 3,544 | 10,163 | 637.9 |
| | | 20" | 6.7 | 3,938 | 12,401 | 875.0 |
| Versa-Lam® LVL 1.8E 2400 | 1½ | 3½ | 1.3 | 998 | 702 | 5.4 |
| | | 5½ | 2.1 | 1,568 | 1,649 | 20.8 |
| | | 7¼ | 2.8 | 2,066 | 2,779 | 47.6 |
| | | 9¼ | 3.6 | 2,636 | 4,404 | 98.9 |
| | | 9½ | 3.7 | 2,708 | 4,631 | 107.2 |
| | | 11¼ | 4.3 | 3,206 | 6,374 | 178.0 |
| | | 11⅞ | 4.6 | 3,384 | 7,059 | 209.3 |
| | | 14 | 5.4 | 3,990 | 9,634 | 343.0 |
| | | 16 | 6.2 | 4,560 | 12,397 | 512.0 |
| Versa-Lam® LVL 2.1E 2800 | 1¾" | 5½" | 2.5 | 1,829 | 2,245 | 24.3 |
| | | 7¼" | 3.3 | 2,411 | 3,783 | 55.6 |
| | | 9¼" | 4.2 | 3,076 | 5,994 | 115.4 |
| | | 9½" | 4.3 | 3,159 | 6,304 | 125.0 |
| | | 11¼" | 5.1 | 3,741 | 8,675 | 207.6 |
| | | 11⅞" | 5.3 | 3,948 | 9,608 | 244.2 |
| | | 14" | 6.3 | 4,655 | 13,112 | 400.2 |
| | | 16" | 7.2 | 5,320 | 16,874 | 597.3 |
| | | 18" | 8.1 | 5,985 | 21,079 | 850.5 |

| Grade | Width | Depth | Weight (lb/ft) | Allowable Shear (lb) | Allowable Moment (ft-lb) | Moment of Inertia (in⁴) |
|---|---|---|---|---|---|---|
| Versa-Lam® LVL 2.1E 3100 | 3½" | 5½" | 4.9 | 3,658 | 4,971 | 48.5 |
| | | 7¼" | 6.5 | 4,821 | 8,377 | 111.1 |
| | | 9¼" | 8.3 | 6,151 | 13,272 | 230.8 |
| | | 9½" | 8.5 | 6,318 | 13,958 | 250.1 |
| | | 11¼" | 10.1 | 7,481 | 19,210 | 415.3 |
| | | 11⅞" | 10.7 | 7,897 | 21,275 | 488.4 |
| | | 14" | 12.6 | 9,310 | 29,035 | 800.3 |
| | | 16" | 14.4 | 10,640 | 37,364 | 1,194.7 |
| | | 18" | 16.2 | 11,970 | 46,674 | 1,701.0 |
| | | 20" | 18.0 | 13,300 | 56,952 | 2,333.3 |
| | 5¼" | 5¼" | 7.1 | 5,237 | 6,830 | 63.3 |
| | | 5½" | 7.4 | 5,486 | 7,457 | 72.8 |
| | | 7¼" | 9.8 | 7,232 | 12,566 | 166.7 |
| | | 9¼" | 12.5 | 9,227 | 19,908 | 346.3 |
| | | 9½" | 12.8 | 9,476 | 20,937 | 375.1 |
| | | 11¼" | 15.2 | 11,222 | 28,814 | 622.9 |
| | | 11⅞" | 16.0 | 11,845 | 31,913 | 732.6 |
| | | 14" | 18.9 | 13,965 | 43,552 | 1,200.5 |
| | | 16" | 21.6 | 15,960 | 56,046 | 1,792.0 |
| | | 18" | 24.3 | 17,955 | 70,011 | 2,551.5 |
| | | 20" | 27.0 | 19,950 | 85,428 | 3,500.0 |
| | | 24" | 32.4 | 23,940 | 120,549 | 6,048.0 |
| | 7" | 9¼" | 16.6 | 12,303 | 26,544 | 461.7 |
| | | 9½" | 17.1 | 12,635 | 27,916 | 500.1 |
| | | 11¼" | 20.2 | 14,963 | 38,419 | 830.6 |
| | | 11⅞" | 21.4 | 15,794 | 42,550 | 976.8 |
| | | 14" | 25.2 | 18,620 | 58,069 | 1,600.7 |
| | | 16" | 28.8 | 21,280 | 74,728 | 2,389.3 |
| | | 18" | 32.4 | 23,940 | 93,348 | 3,402.0 |
| | | 20" | 36.0 | 26,600 | 113,904 | 4,666.7 |
| | | 24" | 43.2 | 31,920 | 160,732 | 8,064.0 |

# Versa-Lam LVL Beam Allowable Stress Values

| Design Property | Grade | Modulus of Elasticity True (Shear-Free) E (x $10^6$ psi)[1][7] | Modulus of Elasticity Apparent E (x $10^6$ psi)[1] | Modulus of Elasticity for Stability $E_{min}$ (x $10^6$ psi)[1][8] | Bending $F_b$ (psi)[2][3] | Horizontal Shear $F_v$ (psi)[2][4] | Tension Parallel to Grain $F_t$ (psi)[2][5] | Compression Parallel to Grain $F_{c\|\|}$ (psi)[2] | Compression Perpendicular to Grain $F_{c\perp}$ (psi)[1][6] | Equivalent Specific Gravity for Fastener Design (SG) |
|---|---|---|---|---|---|---|---|---|---|---|
| Versa-Lam® LVL Beams 1 ¾" | 2.1E 2800 | 2.1 | 2.0 | 1.1 | 2,800 | 285 | 1,950 | 3,000 | 750 | 0.5 |
| Versa-Lam® LVL Beams 3½" or Wider | 2.1E 3100 | 2.1 | 2.0 | 1.1 | 3,100 | 285 | 1,950 | 3,000 | 750 | 0.5 |
| Versa-Lam® LVL Studs | 1.8E 2400 | 1.8 | 1.7 | 0.9 | 2,400 | 285 | 1,500 | 3,000 | 750 | 0.5 |
| Versa-Lam® LVL Columns | 1.8E 2650 | 1.8 | 1.7 | 0.9 | 2,650 | 285 | 1,650 | 3,000 | 750 | 0.5 |

**NOTES**

(1) Value cannot be adjusted for load duration.

(2) Value is based on 100% load duration and may be adjusted for other load durations.

(3) Fiber stress bending value shall be multiplied by the depth factor, $(12/d)^{1/9}$ where d = member depth (in).

(4) Stress applied perpendicular to the gluelines.

(5) Tension value shall be multiplied by a length factor, $(4/L)^{1/8}$ where L = member length (ft). Use L = 4 for members less than four feet long.

(6) Stress applied parallel to the gluelines.

(7) True or shear-free modulus of elasticity does not account for shear deformation.

(8) $E_{min}$ is the reference modulus of elasticity for beam and column stability calculations. It is calculated using $E_{apparent}$ in accordance with Appendix D of the 2018 NDS. When calculating $E_{min}$, the coefficient of modulus of elasticity, $COV_E$, may be taken as 0.10, and the adjustment factor to convert E to a pure bending basis may be taken as 1.05.

- Design properties are limited to dry conditions of use where the maximum moisture content of the material will not exceed 16%.

# Versa-Lam LVL 1.8E 2650 Columns

## Allowable Axial Load (lb)

| Column Length | 3½" x 3½" | | | 3½" x 5¼" | | | 3½" x 7" | | | 3½" x 7¼" | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 100% | 115% | 125% | 100% | 115% | 125% | 100% | 115% | 125% | 100% | 115% | 125% |
| 4' | 14,700 | 16,090 | 16,930 | 22,070 | 24,165 | 25,430 | 29,450 | 32,240 | 33,920 | 30,500 | 33,390 | 35,130 |
| 5' | 12,270 | 13,150 | 13,660 | 18,425 | 19,740 | 20,515 | 24,580 | 26,330 | 27,365 | 25,460 | 27,270 | 28,340 |
| 6' | 10,080 | 10,650 | 10,980 | 15,140 | 15,995 | 16,495 | 20,195 | 21,335 | 22,000 | 20,910 | 22,090 | 22,780 |
| 7' | 8,310 | 8,705 | 8,930 | 12,480 | 13,075 | 13,415 | 16,650 | 17,435 | 17,890 | 17,250 | 18,060 | 18,530 |
| 8' | 6,930 | 7,205 | 7,370 | 10,405 | 10,825 | 11,070 | 13,880 | 14,440 | 14,760 | 14,370 | 14,960 | 15,290 |
| 9' | 5,840 | 6,050 | 6,160 | 8,770 | 9,080 | 9,260 | 11,700 | 12,115 | 12,350 | 12,120 | 12,540 | 12,790 |
| 10' | 4,980 | 5,135 | 5,225 | 7,480 | 7,715 | 7,850 | 9,975 | 10,290 | 10,470 | 10,330 | 10,660 | 10,840 |
| 11' | 4,290 | 4,410 | 4,480 | 6,445 | 6,625 | 6,730 | 8,595 | 8,835 | 8,975 | 8,900 | 9,150 | 9,300 |
| 12' | 3,730 | 3,825 | 3,880 | 5,600 | 5,745 | 5,830 | 7,475 | 7,665 | 7,775 | 7,740 | 7,940 | 8,050 |
| 13' | 3,270 | 3,350 | 3,390 | 4,915 | 5,030 | 5,095 | 6,555 | 6,710 | 6,795 | 6,790 | 6,950 | 7,040 |
| 14' | 2,890 | 2,950 | 2,990 | 4,340 | 4,435 | 4,490 | 5,790 | 5,915 | 5,990 | 6,000 | 6,130 | 6,200 |

| Column Length | 5¼" x 5¼" | | | 5¼" x 5½" | | | 5¼" x 7" | | | 5¼" x 7¼" | | | 7" x 7" | | | 7 x 7¼" | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 100% | 115% | 125% | 100% | 115% | 125% | 100% | 115% | 125% | 100% | 115% | 125% | 100% | 115% | 125% | 100% | 115% | 125% |
| 6' | 33,070 | 36,220 | 38,110 | 34,670 | 37,950 | 39,930 | | | | | | | | | | | | |
| 7' | 29,420 | 31,730 | 33,085 | 30,830 | 33,240 | 34,660 | | | | | | | | | | | | |
| 8' | 25,875 | 27,570 | 28,565 | 27,110 | 28,880 | 29,930 | 34,525 | 36,790 | 38,115 | 35,760 | 38,090 | 39,480 | | | | | | |
| 9' | 22,690 | 23,970 | 24,715 | 23,770 | 25,110 | 25,900 | 30,275 | 31,985 | 32,980 | 31,360 | 33,130 | 34,160 | | | | | | |
| 10' | 19,930 | 20,920 | 21,495 | 20,880 | 21,920 | 22,520 | 26,600 | 27,920 | 28,685 | 27,550 | 28,920 | 29,710 | | | | | | |
| 11' | 17,585 | 18,375 | 18,820 | 18,420 | 19,250 | 19,720 | 23,465 | 24,510 | 25,125 | 24,310 | 25,400 | 26,010 | | | | | | |
| 12' | 15,590 | 16,220 | 16,585 | 16,340 | 16,990 | 17,380 | 20,805 | 21,650 | 22,130 | 21,550 | 22,420 | 22,930 | | | | | | |
| 13' | 13,895 | 14,410 | 14,700 | 14,560 | 15,100 | 15,400 | 18,545 | 19,225 | 19,620 | 19,210 | 19,920 | 20,320 | | | | | | |
| 14' | 12,450 | 12,870 | 13,115 | 13,040 | 13,480 | 13,740 | 16,615 | 17,180 | 17,500 | 17,210 | 17,790 | 18,130 | 33,260 | 34,825 | 35,740 | 34,460 | 36,070 | 37,030 |
| 15' | 11,210 | 11,560 | 11,760 | 11,740 | 12,110 | 12,320 | 14,960 | 15,425 | 15,695 | 15,490 | 15,980 | 16,260 | 30,325 | 31,645 | 32,395 | 31,410 | 32,780 | 33,560 |
| 16' | 10,135 | 10,430 | 10,600 | 10,620 | 10,930 | 11,110 | 13,525 | 13,920 | 14,150 | 14,010 | 14,420 | 14,650 | 27,720 | 28,835 | 29,490 | 28,710 | 29,870 | 30,540 |
| 17' | 9,205 | 9,455 | 9,600 | 9,650 | 9,910 | 10,060 | 12,285 | 12,620 | 12,810 | 12,730 | 13,070 | 13,270 | 25,415 | 26,375 | 26,920 | 26,330 | 27,320 | 27,880 |
| 18' | 8,395 | 8,610 | 8,735 | 8,800 | 9,020 | 9,150 | 11,205 | 11,495 | 11,655 | 11,610 | 11,900 | 12,070 | 23,370 | 24,195 | 24,665 | 24,210 | 25,060 | 25,560 |
| 19' | 7,685 | 7,870 | 7,975 | 8,050 | 8,250 | 8,360 | 10,260 | 10,505 | 10,645 | 10,620 | 10,880 | 11,030 | 21,550 | 22,270 | 22,670 | 22,320 | 23,070 | 23,490 |
| 20' | 7,060 | 7,220 | 7,310 | 7,400 | 7,560 | 7,660 | 9,420 | 9,635 | 9,760 | 9,760 | 9,980 | 10,110 | 19,925 | 20,550 | 20,910 | 20,640 | 21,280 | 21,660 |
| 21' | 6,505 | 6,645 | 6,725 | 6,820 | 6,960 | 7,050 | 8,680 | 8,870 | 8,980 | 8,990 | 9,190 | 9,300 | 18,475 | 19,020 | 19,330 | 19,130 | 19,700 | 20,020 |
| 22' | | | | | | | | | | | | | 17,165 | 17,650 | 17,925 | 17,780 | 18,280 | 18,570 |
| 23' | | | | | | | | | | | | | 15,990 | 16,420 | 16,660 | 16,560 | 17,010 | 17,260 |
| 24' | | | | | | | | | | | | | 14,930 | 15,310 | 15,525 | 15,460 | 15,860 | 16,080 |

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

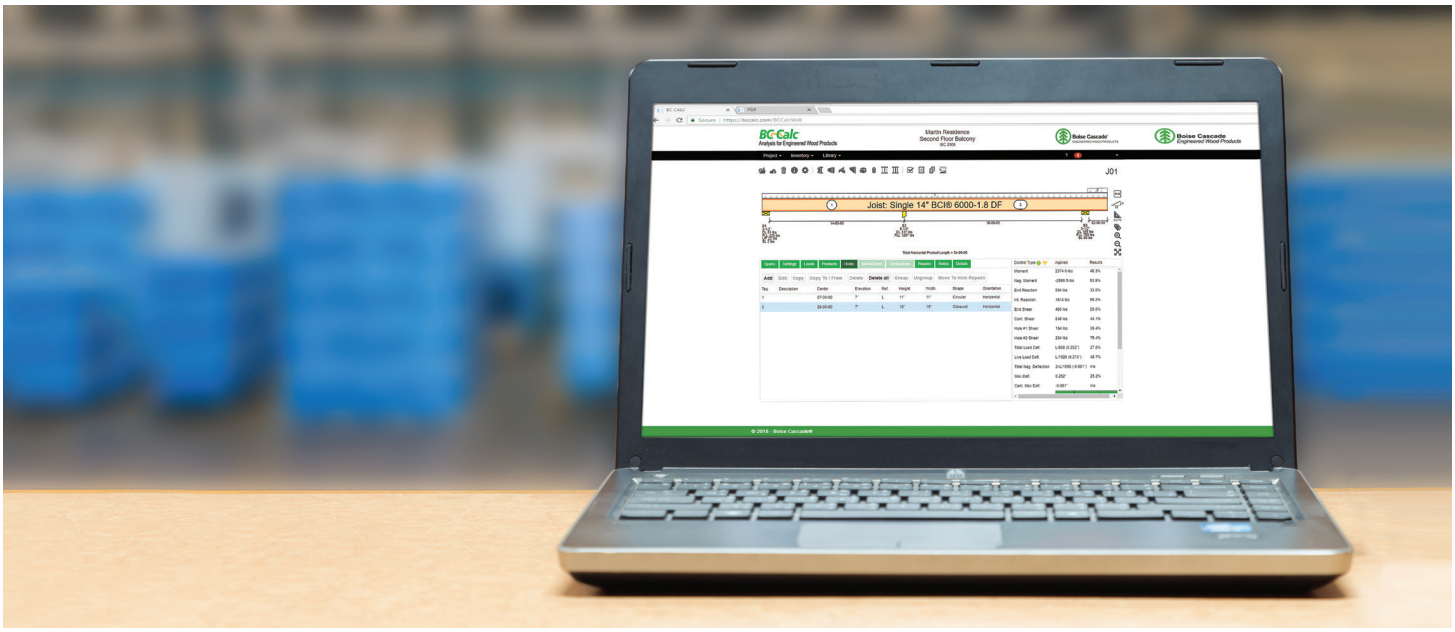
# Versa-Lam LVL 1.8E 2400 Studs

## Reference Design Values

| Product | Bending $F_b$ (psi) | Compression Parallel to Grain $F_{c\|\|}$ (psi) | Compression Perp to Grain $F_{c\perp}$ (psi) | Modulus of Elasticity – Apparent E (psi) | Horizontal Shear $F_v$ (psi) |
|---|---|---|---|---|---|
| Versa-Lam LVL 1.8E 2400 Studs | 2,617 | 3,000 | 610 | 1,700,000 | 285 |
| Douglas Fir # 2 Grade 2 x 6 | 1,170 | 1,350 | 625 | 1,600,000 | 180 |
| Spruce Pine Fir (North) # 1 / 2 Grade 2 x 6 | 1,138 | 1,150 | 425 | 1,400,000 | 135 |
| Hem-Fir # 2 Grade 2 x 6 | 1,105 | 1,300 | 405 | 1,300,000 | 150 |
| Western Woods # 2 Grade 2 x 6 | 878 | 900 | 335 | 1,000,000 | 135 |

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

***For additional design information, please see the Versa-Stud Eastern Tall Wall Guide.***

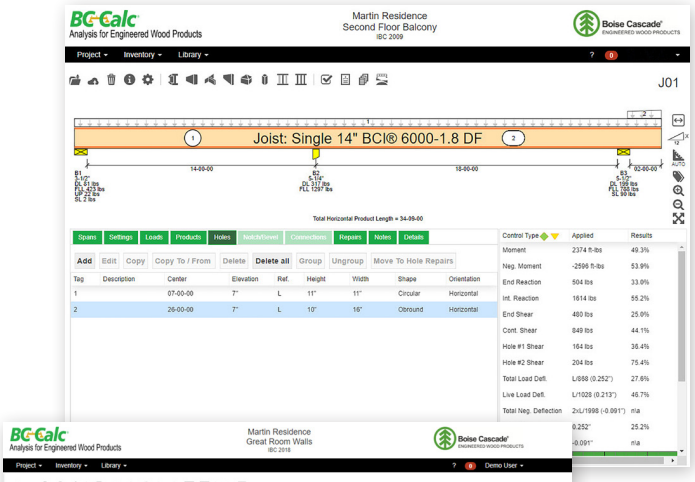


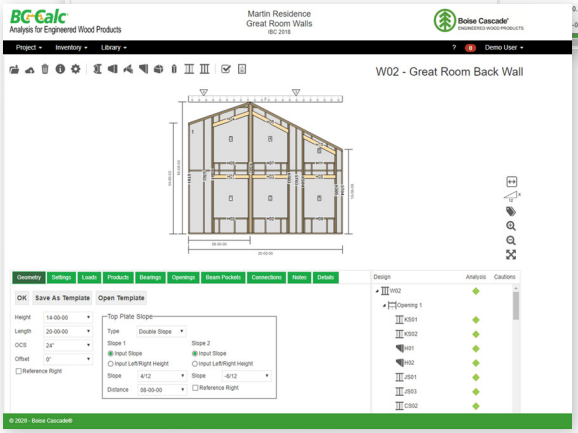

# INTEGRATED SOFTWARE FOR EASY SPECIFICATION

All Boise Cascade's engineered wood products are incorporated into Boise Cascade®'s software suite. BC Framer®, BC Connect®, BC Calc®, and SawTek® all work together, seamlessly integrating design and processing technology into one automated system.

## SOFTWARE BENEFITS

- Design member by member in BC Calc, or create a complete 3D model in BC Framer
- Dealers can manage projects and material lists and optimize manual or automated saw cut patterns in BC Connect
- SawTek's processing software cuts, drills, and labels job packs according to your specifications



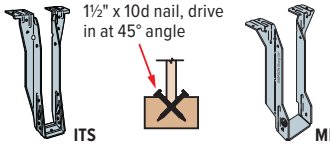




With Boise Cascade's software suite, there's no need to worry about missing pieces or manual entry errors. The software applications share data digitally, ensuring nothing gets lost or mistyped.

**Boise Cascade's software suite is available at www.bc.com/ewp/software/**

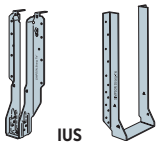
# Framing Connectors: Simpson Strong-Tie

## Single Joist – Top Flange




| Joist Depth | BCI® | Hanger | Capacity (lbs) | Nailing | |
|---|---|---|---|---|---|
| | | | | Header | Joist |
| 9½" | 5000 | ITS2.06/9.5 | 993 | (6) 10d | (2) 10dx1½" |
| | 6000 | ITS2.37/9.5 | 1225 | (6) 10d | (2) 10dx1½" |
| | 6500 | ITS2.56/9.5 | 1225 | (6) 10d | (2) 10dx1½" |
| 11⅞" | 5000 | ITS2.06/11.88 | 1068 | (6) 10d | (2) 10dx1½" |
| | 6000 | ITS2.37/11.88 | 1237 | (6) 10d | (2) 10dx1½" |
| | 6500 | ITS2.56/11.88 | 1237 | (6) 10d | (2) 10dx1½" |
| | 60 | ITS2.37/11.88 | 1210 | (6) 10d | (2) 10dx1½" |
| | 90 | ITS3.56/11.88 | 1478 | (6) 10d | (2) 10dx1½" |
| 14" | 5000 | ITS2.06/14 | 1081 | (6) 10d | (2) 10dx1½" |
| | 6000 | ITS2.37/14 | 1262 | (6) 10d | (2) 10dx1½" |
| | 6500 | ITS2.56/14 | 1262 | (6) 10d | (2) 10dx1½" |
| | 60 | ITS2.37/14 | 1225 | (6) 10d | (2) 10dx1½" |
| | 90 | ITS3.56/14 | 1507 | (6) 10d | (2) 10dx1½" |
| 16" | 6000 | ITS2.37/16 | 1268 | (6) 10d | (2) 10dx1½" |
| | 6500 | ITS2.56/16 | 1362 | (6) 16d | (2) 10dx1½" |
| | 60 | ITS2.37/16 | 1228 | (6) 16d | (2) 10dx1½" |
| | 90 | ITS3.56/16 | 1520 | (6) 10d | (2) 10dx1½" |
| 18" | 90 | **MIT418** | 2400 | (6) 16d | (2) 10dx1½" |
| 20" | 90 | **MIT420** | 2400 | (6) 16d | (2) 10dx1½" |

## Single Joist – Face Mount

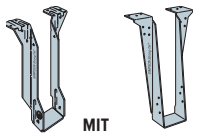



| Joist Depth | BCI® | Hanger | Capacity (lbs) | Nailing | |
|---|---|---|---|---|---|
| | | | | Header | Joist |
| 9½" | 5000 | IUS2.06/9.5 | 950 | (8) 10d | – |
| | 6000 | IUS2.37/9.5 | 950 | (8) 10d | – |
| | 6500 | IUS2.56/9.5 | 950 | (8) 10d | – |
| 11⅞" | 5000 | IUS2.06/11.88 | 1068 | (10) 10d | – |
| | 6000 | IUS2.37/11.88 | 1070 | (10) 10d | – |
| | 6500 | IUS2.56/11.88 | 1185 | (10) 10d | – |
| | 60 | IUS2.37/11.88 | 1185 | (10) 10d | – |
| | 90 | IUS3.56/11.88 | 1420 | (12) 10d | – |
| 14" | 5000 | IUS2.06/14 | 1080 | (12) 10d | – |
| | 6000 | IUS2.37/14 | 1262 | (12) 10d | – |
| | 6500 | IUS2.56/14 | 1262 | (12) 10d | – |
| | 60 | IUS2.37/14 | 1262 | (12) 10d | – |
| | 90 | IUS3.56/14 | 1420 | (12) 10d | – |
| 16" | 6000 | IUS2.37/16 | 1268 | (14) 10d | – |
| | 6500 | IUS2.56/16 | 1268 | (14) 10d | – |
| | 60 | IUS2.37/16 | 1268 | (14) 10d | – |
| | 90 | IUS3.56/16 | 1580 | (14) 10d | – |
| 18" | 90 | **MIU3.56/18** | 2425 | (26) 16d | (2) 10dx1½" |
| 20" | 90 | **MIU3.56/20** | 2575 | (26) 16d | (2) 10dx1½" |

## Face Mount Skewed 45° Joist Hanger

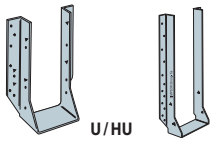
| Joist Depth | BCI® | Hanger | Capacity (lbs) | Nailing | |
|---|---|---|---|---|---|
| | | | | Header | Joist |
| 9½" | 5000 | **SUR/L2.06/9** | 1,251 | (14) 16d | (6) 10dx1½" |
| | 6000 | **SUR/L2.37/9** | 1,417 | (14) 16d | (6) 10dx1½" |
| | 6500 | **SUR/L2.56/9** | 1,417 | (14) 16d | (6) 10dx1½" |
| 11⅞" | 5000 | **SUR/L2.06/11** | 1,467 | (14) 16d | (6) 10dx1½" |
| | 6000 | **SUR/L2.37/11** | 1,467 | (16) 16d | (6) 10dx1½" |
| | 6500 | **SUR/L2.56/11** | 1,467 | (14) 16d | (2) 10dx1½" |
| | 60 | **SUR/L2.37/11** | 1,466 | (14) 16d | (6) 10dx1½" |
| | 90 | **SUR/L410** | 1,860 | (14) 16d | (6) 16d |
| 14" | 5000 | **SUR/L2.06/11** | 1,693 | (18) 16d | (8) 10dx1½" |
| | 6000 | **SUR/L2.37/14** | 1,693 | (18) 16d | (8) 10dx1½" |
| | 6500 | **SURI/L2.56/14** | 1,693 | (18) 16d | (8) 10dx1½" |
| | 60 | **SUR/L2.37/14** | 1,689 | (18) 16d | (8) 10dx1½" |
| | 90 | **SUR/L414** | 2,035 | (18) 16d | (8) 16d |
| 16" | 6000 | **SUR/L2.37/14** | 1,920 | (18) 16d | (8) 10dx1½" |
| | 6500 | **SURI/L2.56/14** | 1,920 | (18) 16d | (8) 10dx1½" |
| | 60 | **SUR/L2.37/14** | 1,912 | (18) 16d | (8) 10dx1½" |
| | 90 | **SUR/L414** | 2,235 | (18) 16d | (8) 16d |
| 18" | 90 | **SUR/L414** | 2,395 | (18) 16d | (8) 16d |
| 20" | 90 | **SUR/L414** | 2,395 | (18) 16d | (8) 16d |

## Double Joist – Top Flange



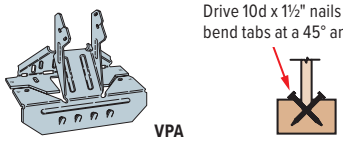

| Joist Depth | BCI® | Hanger | Capacity (lbs) | Nailing | |
|---|---|---|---|---|---|
| | | | | Header | Joist |
| 9½" | 5000 | **MIT4.12/9.5** | 2305 | (10) 16d | (2) 10dx1½" |
| | 6000 | **MIT359.5-2** | 2400 | (8) 16d | (2) 10dx1½" |
| | 6500 | **MIT39.5** | 2400 | (8) 16d | (2) 10dx1½" |
| 11⅞" | 5000 | **MIT4.12/11.88** | 2305 | (10) 16d | (2) 10dx1½" |
| | 6000 | **MIT3511.88-2** | 2000 | (8) 16d | (2) 10dx1½" |
| | 6500 | **MIT311.88-2** | 2400 | (8) 16d | (2) 10dx1½" |
| | 60 | MIT3511.88-2 | 2000 | (8) 16d | (2) 10dx1½" |
| | 90 | **B7.12/11.88** | 3785 | (14) 16d | (6) 16d |
| 14" | 5000 | **MIT4.12/14** | 2305 | (8) 16d | (2) 10dx1½" |
| | 6000 | **MIT3514-2** | 2400 | (8) 16d | (2) 10dx1½" |
| | 6500 | **MIT314-2** | 2400 | (8) 16d | (2) 10dx1½" |
| | 60 | MIT3514-2 | 2400 | (8) 16d | (2) 10dx1½" |
| | 90 | **B7.12/14** | 3800 | (14) 16d | (6) 10d |
| 16" | 6000 | **MIT4.75/16** | 2305 | (8) 16d | (2) 10dx1½" |
| | 6500 | **MIT5.12/16** | 2400 | (8) 16d | (2) 10dx1½" |
| | 60 | MIT4.75/16 | 2305 | (3) 16d | (2) 10dx1½" |
| | 90 | **B7.12/16** | 3800 | (14) 16d | (6) 16d |
| 18" | 90 | **B7.12/18** | 3800 | (3) 16d | (6) 16d |
| 20" | 90 | **B7.12/20** | 3800 | (3) 16d | (6) 16d |

## Double Joist – Face Mount



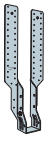

| Joist Depth | BCI® | Hanger | Capacity (lbs) | Nailing | |
|---|---|---|---|---|---|
| | | | | Header | Joist |
| 9½" | 5000 | **MIU4.12/9** | 2270 | (14) 16d | (6) 10d |
| | 6000 | **MIU4.75/9** | 1860 | (14) 16d | (2) 10dx1½" |
| | 6500 | **MIU5.12/9** | 2270 | (14) 16d | (2) 10dx1½" |
| 11⅞" | 5000 | **MIU4.12/11** | 2840 | (16) 16d | (6) 10d |
| | 6000 | **MIU4.75/11** | 2130 | (16) 16d | (2) 10dx1½" |
| | 6500 | **MIU5.12/11** | 2840 | (16) 16d | (2) 10dx1½" |
| | 60 | MIU4.75/11 | 2130 | (16) 16d | (2) 10dx1½" |
| | 90 | **HU412-2** | 2145 | (16) 16d | (6) 16d |
| 14" | 5000 | **MIU4.12/14** | 3125 | (18) 16d | (2) 10dx1½" |
| | 6000 | **MIU4.75/14** | 2395 | (18) 16d | (2) 10dx1½" |
| | 6500 | **MIU5.12/14** | 3125 | (18) 16d | (2) 10dx1½" |
| | 60 | MIU4.75/14 | 2395 | (18) 16d | (2) 10dx1½" |
| | 90 | **HU414-2** | 2680 | (20) 16d | (8) 16d |
| 16" | 6000 | **MIU4.75/16** | 2660 | (20) 16d | (2) 10dx1½" |
| | 6500 | **MIU5.12/16** | 3125 | (20) 16d | (2) 10dx1½" |
| | 60 | MIU4.75/16 | 2660 | (20) 16d | (2) 10dx1½" |
| | 90 | **HU414-2** | 2680 | (20) 16d | (8) 16d |
| 18" | 90 | **HU414-2** | 2680 | (20) 16d | (8) 16d |
| 20" | 90 | **HU414-2** | 2680 | (20) 16d | (8) 16d |

## Variable Pitch Joist Connector



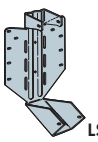

| Joist Depth | BCI® | Hanger | Capacity (lbs) | Fastener | |
|---|---|---|---|---|---|
| | | | | Top Plate | Rafter |
| 9½" | 5000 | VPA2.06 | 993 | (8) 10d | (2) 10dx1½" |
| | 6000 | VPA35 | 1225 | (8) 10d | (2) 10dx1½" |
| | 6500 | VPA3 | 1225 | (9) 10d | (2) 10dx1½" |
| 11⅞" | 5000 | VPA2.06 | 1068 | (8) 10d | (2) 10dx1½" |
| | 6000 | VPA35 | 1230 | (8) 10d | (2) 10dx1½" |
| | 6500 | VPA3 | 1230 | (9) 10d | (2) 10dx1½" |
| | 60 | VPA35 | 1210 | (9) 10d | (2) 10dx1½" |
| | 90 | VPA4 | 1230 | (11) 10d | (2) 10dx1½" |
| 14" | 5000 | VPA2.06 | 1081 | (9) 10d | (2) 10dx1½" |
| | 6000 | VPA35 | 1230 | (9) 10d | (2) 10dx1½" |
| | 6500 | VPA3 | 1230 | (9) 10d | (2) 10dx1½" |
| | 60 | VPA35 | 1225 | (9) 10d | (2) 10dx1½" |
| | 90 | VPA4 | 1230 | (11) 10d | (2) 10dx1½" |
| 16" | 6000 | VPA35 | 1230 | (9) 10d | (2) 10dx1½" |
| | 6500 | VPA3 | 1230 | (9) 10d | (2) 10dx1½" |
| | 60 | VPA35 | 1228 | (9) 10d | (2) 10dx1½" |
| | 90 | VPA4 | 1230 | (11) 10d | (2) 10dx1½" |
| 18" | 90 | **VPA4** | 1230 | (11) 10d | (2) 10dx1½" |
| 20" | 90 | **VPA4** | 1230 | (11) 10d | (2) 10dx1½" |

## Adjustable Height Joist Hanger




| Joist Depth | BCI® | Hanger | Capacity (lbs) | Nailing | |
|---|---|---|---|---|---|
| | | | | Header | Joist |
| 9½" | 5000 | **THAI2.06/22** | 1,181 | (6) 10d | (2) 10dx1½" |
| | 6000 | **THAI3522** | 1,393 | (6) 10d | (2) 10dx1½" |
| | 6500 | **THAI322** | 1,393 | (6) 10d | (2) 10dx1½" |
| 11⅞" | 5000 | **THAI2.06/22** | 1,443 | (6) 10d | (2) 10dx1½" |
| | 6000 | **THAI3522** | 1,443 | (6) 10d | (2) 10dx1½" |
| | 6500 | **THAI322** | 1,443 | (6) 10d | (2) 10dx1½" |
| | 60 | **THAI3522** | 1,439 | (6) 10d | (2) 10dx1½" |
| | 90 | **THAI422** | 1,715 | (6) 10d | (2) 10dx1½" |
| 14" | 5000 | **THAI2.06/22** | 1,600 | (6) 10d | (2) 10dx1½" |
| | 6000 | **THAI3522** | 1,600 | (6) 10d | (2) 10dx1½" |
| | 6500 | **THAI322** | 1,600 | (6) 10d | (2) 10dx1½" |
| | 60 | **THAI3522** | 1,582 | (6) 10d | (2) 10dx1½" |
| | 90 | **THAI422** | 1,715 | (6) 10d | (2) 10dx1½" |

## Field Slope and Skew Joist Hanger




| Joist Depth | BCI® | Hanger | Capacity (lbs) | Nailing | |
|---|---|---|---|---|---|
| | | | | Header | Joist |
| 9½" | 5000 | **LSSU2.06** | 995 | (9) 10d | (7) 10dx1½" |
| | 6000 | **LSSUI35** | 995 | (9) 10d | (7) 10dx1½" |
| | 6500 | **LSSUH310** | 1,425 | (14) 10d | (12) 10dx1½" |
| 11⅞" | 5000 | **LSSU2.06** | 995 | (9) 10d | (7) 10dx1½" |
| | 6000 | **LSSUI35** | 995 | (9) 10d | (7) 10dx1½" |
| | 6500 | **LSSUH310** | 1,475 | (14) 10d | (12) 10dx1½" |
| | 60 | **LSSUI35** | 995 | (9) 10d | (7) 10dx1½" |
| | 90 | **LSSU410** | 1,625 | (14) 16d | (12) 10dx1½" |
| 14" | 5000 | **LSSU2.06** | 995 | (9) 10d | (7) 10dx1½" |
| | 6000 | **LSSUI35** | 995 | (9) 10d | (7) 10dx1½" |
| | 6500 | **LSSUH310** | 1,600 | (14) 10d | (12) 10dx1½" |
| | 60 | **LSSUI35** | 995 | (9) 10d | (7) 10dx1½" |
| | 90 | **LSSU410** | 1,625 | (14) 16d | (12) 10dx1½" |

SIMPSON Strong-Tie® CONNECTORS

**For more information, contact Simpson Strong-Tie at 1-800-999-5099 or *strongtie.com***

### NOTES

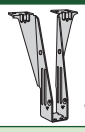
- **Bold shaded** hangers require web stiffeners.
- Capacities will vary with different nailing criteria and/or support conditions; contact supplier or Simpson Strong-Tie for further information.
- Capacity values shown are either hanger capacity values (see support requirements below) or BCI® joist end reaction capacities — whichever is less.
- All capacity values are downward loads at 100% load duration.
- Use sloped seat hangers and beveled web stiffeners when BCI® joist slope exceeds ¼" per foot.
- Leave 1/16" clearance (⅛" maximum) between the end of the supported joist and the head of the hanger.
- At max design capacity shown, hangers may exceed standard ⅛" deflection by 1/32".
- For VPA hanger, the two 10d x 1½" joist nails must be installed through the bend tabs at approximately a 45-degree angle.

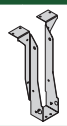
### Support Requirements

- ***Support material assumed to be Boise Cascade structural composite lumber or sawn lumber (Douglas fir or southern pine species).***
- Minimum support width for single- and double-joist top mount hangers is 3".
- Minimum support width for face mount hangers with 10d and 16d nails is 1¾" and 2", respectively.

# Framing Connectors: MiTek Structural Connectors

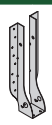
## Single Joist – Top Flange


THO


TFL

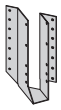
| Joist Depth | BCI® Series | Hanger | Capacity (lbs) | Nailing | |
|---|---|---|---|---|---|
| | | | | Header | Joist |
| 9½" | 5000 | TFL2095 | 993 | (6) 10d | (2) 10dx1½" |
| | 6000 | TFL2395 | 1,225 | (6) 10d | (2) 10dx1½" |
| | 6500 | THO26950 | 1,262 | (10) 10d | (2) 10dx1½" |
| 11⅞" | 5000 | TFL20118 | 1,068 | (6) 10d | (2) 10dx1½" |
| | 6000 | TFL23118 | 1,237 | (6) 10d | (2) 10dx1½" |
| | 6500 | THO26118 | 1,284 | (10) 10d | (2) 10dx1½" |
| | 60 | TFL23118 | 1,237 | (6) 10d | (2) 10dx1½" |
| | 90 | THO35118 | 1,589 | (10) 10d | (2) 10dx1½" |
| 14" | 5000 | TFL2014 | 1,081 | (6) 10d | (2) 10dx1½" |
| | 6000 | TFL2314 | 1,262 | (6) 10d | (2) 10dx1½" |
| | 6500 | THO26140 | 1,328 | (12) 10d | (2) 10dx1½" |
| | 60 | TFL2314 | 1,262 | (6) 10d | (2) 10dx1½" |
| | 90 | THO35140 | 1,625 | (12) 10d | (2) 10dx1½" |
| 16" | 5000 | TFL2016 | 1,087 | (6) 10d | (2) 10dx1½" |
| | 6000 | TFL2316 | 1,268 | (6) 10d | (2) 10dx1½" |
| | 6500 | THO26160 | 1,339 | (12) 10d | (2) 10dx1½" |
| | 60 | TFL2316 | 1,268 | (6) 10d | (2) 10dx1½" |
| | 90 | THO35160 | 1,660 | (12) 10d | (2) 10dx1½" |
| 18" | 90 | **TFI1418** | 2,425 | (6) 16d | (2) 10dx1½" |
| 20" | 90 | **TFI1420** | 2,575 | (6) 16d | (2) 10dx1½" |

## Single Joist – Face Mount


THF

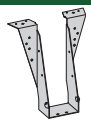
| Joist Depth | BCI® Series | Hanger | Capacity (lbs) | Nailing | |
|---|---|---|---|---|---|
| | | | | Header | Joist |
| 9½" | 5000 | IHFL20925 | 960 | (8) 10d | – |
| | 6000 | IHFL23925 | 960 | (8) 10d | – |
| | 6500 | THFI2595 | 1,250 | (8) 10d | – |
| 11⅞" | 5000 | IHFL20112 | 1,187 | (10) 10d | – |
| | 6000 | IHFL23112 | 1,200 | (10) 10d | – |
| | 6500 | THF25118 | 1,250 | (10) 10d | – |
| | 60 | IHFL23112 | 1,200 | (10) 10d | – |
| | 90 | IHFL35112 | 1,200 | (10) 10d | – |
| 14" | 5000 | IHFL2014 | 1,212 | (12) 10d | – |
| | 6000 | IHFL2314 | 1,350 | (12) 10d | – |
| | 6500 | THF2514 | 1,350 | (14) 10d | – |
| | 60 | IHFL2314 | 1,350 | (12) 10d | – |
| | 90 | IHFL3514 | 1,440 | (12) 10d | – |
| 16" | 5000 | IHFL2016 | 1,225 | (14) 10d | – |
| | 6000 | IHFL2316 | 1,362 | (14) 10d | – |
| | 6500 | IHF2616 | 1,362 | (14) 10d | (2) 10dx1½" |
| | 60 | IHFL2316 | 1,362 | (14) 10d | – |
| | 90 | IHFL3516 | 1,680 | (14) 10d | – |
| 18" | 90 | **IHFL3516** | 1,680 | (14) 10d | – |
| 20" | 90 | **IHFL3516** | 1,680 | (14) 10d | – |

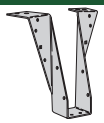
## Single Joist — Face Mount Skewed 45°


SKH

| Joist Depth | BCI® Series | Hanger | Capacity (lbs) | Nailing | |
|---|---|---|---|---|---|
| | | | | Header | Joist |
| 9½" | 5000 | **SKH2020L/R** | 1,153 | (14) 10d | (10) 10dx1½" |
| | 6000 | **SKH2320L/R** | 1,384 | (14) 10d | (10) 10dx1½" |
| | 6500 | **SKH2520L/R** | 1,384 | (14) 10d | (10) 10dx1½" |
| 11⅞" | 5000 | **SKH2020L/R** | 1,434 | (14) 10d | (10) 10dx1½" |
| | 6000 | **SKH2320L/R** | 1,434 | (14) 10d | (10) 10dx1½" |
| | 6500 | **SKH2520L/R** | 1,434 | (14) 10d | (10) 10dx1½" |
| | 60 | **SKH2320L/R** | 1,434 | (14) 10d | (10) 10dx1½" |
| | 90 | **SKH410L/R** | 1,900 | (16) 10d | (10) 16d |
| 14" | 5000 | **SKH2020L/R** | 1,562 | (14) 10d | (10) 10dx1½" |
| | 6000 | **SKH2320L/R** | 1,562 | (14) 10d | (10) 10dx1½" |
| | 6500 | **SKH2520L/R** | 1,562 | (14) 10d | (10) 10dx1½" |
| | 60 | **SKH2320L/R** | 1,562 | (14) 10d | (10) 10dx1½" |
| | 90 | **SKH410L/R** | 2,050 | (16) 10d | (10) 16d |
| 16" | 5000 | **SKH2024L/R** | 1,562 | (16) 10d | (10) 10dx1½" |
| | 6000 | **SKH2324L/R** | 1,690 | (16) 10d | (10) 10dx1½" |
| | 6500 | **SKH2524L/R** | 1,690 | (16) 10d | (10) 10dx1½" |
| | 60 | **SKH2324L/R** | 1,690 | (16) 10d | (10) 10dx1½" |
| | 90 | **SKH414L/R** | 2,250 | (22) 16d | (10) 16d |
| 18" | 90 | **SKH414L/R** | 2,478 | (22) 16d | (10) 16d |
| 20" | 90 | **SKH414L/R** | 2,607 | (22) 16d | (10) 16d |

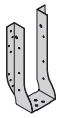
## Double Joist – Top Flange


THO Double


BPH

| Joist Depth | BCI® Series | Hanger | Capacity (lbs) | Nailing | |
|---|---|---|---|---|---|
| | | | | Header | Joist |
| 9½" | 5000 | THO20950-2 | 2,475 | (10) 16d | (6) 10d |
| | 6000 | THO23950-2 | 2,825 | (10) 16d | (6) 10d |
| | 6500 | THO25950-2 | 2,825 | (10) 16d | (6) 10d |
| 11⅞" | 5000 | **THO20118-2** | 2,920 | (10) 16d | (6) 10d |
| | 6000 | **THO23118-2** | 2,925 | (10) 16d | (6) 10d |
| | 6500 | **THO25118-2** | 2,925 | (10) 16d | (6) 10d |
| | 60 | **THO23118-2** | 3,212 | (10) 16d | (6) 10d |
| | 90 | **BPH71118** | 3,075 | (10) 16d | (6) 10d |
| 14" | 5000 | **THO20140-2** | 3,350 | (10) 16d | (6) 10d |
| | 6000 | **THO23140-2** | 3,350 | (12) 16d | (6) 10d |
| | 6500 | **THO25140-2** | 3,350 | (12) 16d | (6) 10d |
| | 60 | **THO23140-2** | 3,587 | (12) 16d | (6) 10d |
| | 90 | **BPH7114** | 3,075 | (10) 16d | (6) 10d |
| 16" | 5000 | **THO20160-2** | 3,137 | (10) 16d | (6) 10d |
| | 6000 | **THO23160-2** | 3,137 | (12) 16d | (6) 10d |
| | 6500 | **THO25160-2** | 3,137 | (12) 16d | (6) 10d |
| | 60 | **THO23160-2** | 4,050 | (12) 16d | (6) 10d |
| | 90 | **BPH7116** | 3,075 | (10) 16d | (6) 10d |
| 18" | 90 | **BPH7118** | 3,070 | (10) 16d | (6) 10d |
| 20" | 90 | **BPH7120** | 3,070 | (10) 16d | (6) 10d |

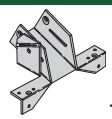
## Double Joist – Face Mount


THF Double

HD

| Joist Depth | BCI® Series | Hanger | Capacity (lbs) | Nailing | |
|---|---|---|---|---|---|
| | | | | Header | Joist |
| 9½" | 5000 | IHF20925-2 | 1,250 | (10) 10d | (2) 10dx1½" |
| | 6000 | IHF23925-2 | 1,250 | (10) 10d | (2) 10dx1½" |
| | 6500 | THF25925-2 | 1,250 | (10) 10d | (2) 10dx1½" |
| 11⅞" | 5000 | **THF20112-2** | 1,250 | (10) 10d | (2) 10dx1½" |
| | 6000 | **THF23118-2** | 1,890 | (16) 10d | (6) 10d |
| | 6500 | **THF26112-2** | 1,250 | (10) 10d | (2) 10dx1½" |
| | 60 | **THF23118-2** | 1,890 | (16) 10d | (6) 10d |
| | 90 | **HD7120** | 2,465 | (16) 16d | (6) 16d |
| 14" | 5000 | **IHF2014-2** | 1,500 | (12) 10d | (2) 10dx1½" |
| | 6000 | **THF23140-2** | 2,660 | (20) 10d | (6) 10d |
| | 6500 | **THF25140-2** | 2,660 | (20) 10d | (6) 10d |
| | 60 | **THF23140-2** | 2,660 | (20) 10d | (6) 10d |
| | 90 | **HD7140** | 3,080 | (20) 16d | (8) 16d |
| 16" | 5000 | **IHF2014-2** | 1,500 | (12) 10d | (2) 10dx1½" |
| | 6000 | **THF23160-2** | 3,175 | (24) 10d | (6) 10d |
| | 6500 | **THF25160-2** | 3,175 | (24) 10d | (6) 10d |
| | 60 | **THF23160-2** | 3,190 | (24) 10d | (6) 10d |
| | 90 | **HD7160** | 3,695 | (24) 16d | (8) 16d |
| 18" | 90 | **HD7160** | 3,695 | (24) 16d | (8) 16d |
| 20" | 90 | **HD7160** | 3,695 | (24) 16d | (8) 16d |

## Single Joist — Variable Pitch Connector


TMP

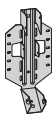
| Joist Depth | BCI® Series | Hanger | Capacity (lbs) | Nailing | |
|---|---|---|---|---|---|
| | | | | Header | Joist |
| 9½" | 5000 | TMP21 | 1,125 | (6) 10d | (4) 10dx1½" |
| | 6000 | TMP23 | 1,375 | (6) 10d | (4) 10dx1½" |
| | 6500 | TMP25 | 1,375 | (6) 10d | (4) 10dx1½" |
| 11⅞" | 5000 | TMP21 | 1,425 | (6) 10d | (4) 10dx1½" |
| | 6000 | TMP23 | 1,425 | (6) 10d | (4) 10dx1½" |
| | 6500 | TMP25 | 1,425 | (6) 10d | (4) 10dx1½" |
| | 60 | TMP23 | 1,425 | (6) 10d | (4) 10dx1½" |
| | 90 | TMP4 | 1,705 | (6) 10d | (4) 10dx1½" |
| 14" | 5000 | TMP21 | 1,475 | (6) 10d | (4) 10dx1½" |
| | 6000 | TMP23 | 1,525 | (6) 10d | (4) 10dx1½" |
| | 6500 | TMP25 | 1,525 | (6) 10d | (4) 10dx1½" |
| | 60 | TMP23 | 1,525 | (6) 10d | (4) 10dx1½" |
| | 90 | TMP4 | 1,705 | (6) 10d | (4) 10dx1½" |
| 16" | 5000 | TMP21 | 1,500 | (6) 10d | (4) 10dx1½" |
| | 6000 | TMP23 | 1,550 | (6) 10d | (4) 10dx1½" |
| | 6500 | TMP25 | 1,550 | (6) 10d | (4) 10dx1½" |
| | 60 | TMP23 | 1,550 | (6) 10d | (4) 10dx1½" |
| | 90 | TMP4 | 1,705 | (6) 10d | (4) 10dx1½" |
| 18" | 90 | **TMP4** | 1,705 | (6) 10d | (4) 10dx1½" |
| 20" | 90 | **TMP4** | 1,705 | (6) 10d | (4) 10dx1½" |

## Single Joist — Adjustable Height

MSH

| Joist Depth | BCI® Series | Hanger | Capacity (lbs) | Nailing | |
|---|---|---|---|---|---|
| | | | | Header | Joist |
| 9½" | 5000 | **MSH2022** | 1,143 | (6) 10d | (4) 10d |
| | 6000 | **MSH2322** | 1,381 | (6) 10d | (4) 10dx1½" |
| | 6500 | **MSH322** | 1,381 | (6) 10d | (4) 10dx1½" |
| 11⅞" | 5000 | **MSH2022** | 1,431 | (6) 10d | (4) 10d |
| | 6000 | **MSH2318** | 1,431 | (6) 10d | (4) 10dx1½" |
| | 6500 | **MSH318** | 1,431 | (6) 10d | (4) 10dx1½" |
| | 60 | **MSH2318** | 1,431 | (6) 10d | (4) 10dx1½" |
| | 90 | **MSH422** | 1,862 | (6) 10d | (6) 10d |
| 14" | 5000 | **MSH2022** | 1,550 | (6) 10d | (4) 10d |
| | 6000 | **MSH2322** | 1,550 | (6) 10d | (4) 10dx1½" |
| | 6500 | **MSH318** | 1,550 | (6) 10d | (4) 10dx1½" |
| | 60 | **MSH2322** | 1,550 | (6) 10d | (4) 10dx1½" |
| | 90 | **MSH422** | 1,975 | (6) 10d | (6) 10d |
| 16" | 5000 | **MSH2022** | 1,668 | (6) 10d | (4) 10d |
| | 6000 | **MSH2322** | 1,668 | (6) 10d | (4) 10dx1½" |
| | 6500 | **MSH318** | 1,668 | (6) 10d | (4) 10dx1½" |
| | 60 | **MSH2322** | 1,712 | (6) 10d | (4) 10dx1½" |
| | 90 | **MSH422** | 2,175 | (6) 10d | (6) 10d |

## Single Joist — Field Slope and Skew


LSSH

| Joist Depth | BCI® Series | Hanger | Capacity (lbs) | Nailing | |
|---|---|---|---|---|---|
| | | | | Header | Joist |
| 9½" | 5000 | **LSSH20-TZ** | 1,200 | (10) 10d | (7) 10dx1½" |
| | 6000 | **LSSH23-TZ** | 1,200 | (10) 10d | (7) 10dx1½" |
| | 6500 | **LSSH25-TZ** | 1,610 | (14) 10d | (12) 10dx1½" |
| 11⅞" | 5000 | **LSSH20-TZ** | 1,200 | (10) 10d | (7) 10dx1½" |
| | 6000 | **LSSH23-TZ** | 1,200 | (10) 10d | (7) 10dx1½" |
| | 6500 | **LSSH25-TZ** | 1,610 | (14) 10d | (12) 10dx1½" |
| | 60 | **LSSH23-TZ** | 1,200 | (10) 10d | (7) 10dx1½" |
| | 90 | **LSSH35-TZ** | 1,610 | (14) 16d | (12) 10dx1½" |
| 14" | 5000 | **LSSH20-TZ** | 1,200 | (10) 10d | (7) 10dx1½" |
| | 6000 | **LSSH23-TZ** | 1,200 | (10) 10d | (7) 10dx1½" |
| | 6500 | **LSSH25-TZ** | 1,610 | (14) 10d | (12) 10dx1½" |
| | 60 | **LSSH23-TZ** | 1,200 | (10) 10d | (7) 10dx1½" |
| | 90 | **LSSH35-TZ** | 1,610 | (14) 16d | (12) 10dx1½" |
| 16" | 5000 | **LSSH20-TZ** | 1,200 | (10) 10d | (7) 10dx1½" |
| | 6000 | **LSSH23-TZ** | 1,200 | (10) 10d | (7) 10dx1½" |
| | 6500 | **LSSH25-TZ** | 1,610 | (14) 10d | (12) 10dx1½" |
| | 60 | **LSSH23-TZ** | 1,200 | (10) 10d | (7) 10dx1½" |
| | 90 | **LSSH35-TZ** | 1,610 | (14) 16d | (12) 10dx1½" |

MiTek®

**For more information, contact MiTek Structural Connectors at 1-800-328-5934 or *MiTek-US.com***

### NOTES

(1) Flanges on the back of hanger may extend above top of joist.

- **Bold shaded** hangers require web stiffeners at joist ends. Web stiffeners may be required for non-shaded hangers by Boise Cascade.
- Capacities will vary with different nailing criteria and/or support conditions: contact supplier or MiTek Structural Connectors for further information.
- Capacity values shown are either hanger capacity values (see support requirements below) or BCI® joist end reaction capacities — whichever is less.
- All capacity values are downward loads at 100% load duration.
- Use sloped seat hangers and beveled web stiffeners when BCI® joist slope exceeds ¼" per foot.
- Leave 1/16" clearance (⅛" maximum) between the end of the supported joist and the head of the hanger.
- For BCI® joist applications, consult MiTek for capacity reduction.

### Support Requirements

- *Support material assumed to be Boise Cascade structural composite lumber or sawn lumber (Douglas fir or southern pine species).*
- Minimum support width for single- and double-joist top mount hangers is 3": (1½" for THO hangers).
- Minimum support width for face mount hangers with 10d and 16d nails is 1¾" and 2", respectively.

Boise Cascade is one of the largest producers of engineered wood products in North America. With coast-to-coast distribution, we strive to meet our customer's needs through regional product offerings, on-time delivery, and continued technical support long after the sale. We know our success depends upon yours. And that's why we offer a full line of innovative engineered wood products that give you the strength, stability, and consistent performance you need for each project—and every challenge.

### BCI® Joists
Straight and strong, yet lightweight and easy to install, our joists give you flat, stable, quiet floors and strong roofs with crisp ridge lines.

### Boise Cascade® Rimboard
Offered in long lengths and depths that match BCI® joists, our rim board product installs quickly and saves you time.

### Versa-Lam® LVL Beams and Headers
With superior strength and stability, our Versa-Lam® LVL beams are ideal for floors and roofs, and our headers make installing doors and window a snap.

### Versa-Stud® Wall Framing
Facing a tall wall challenge? Versa-Stud wall framing has the length, strength and wind resistance you need. It's also ideal for applications where a straight, stiff wall is critical.

### BC Calc® Sizing Software
Whether you're a dealer creating material lists or an architect or builder looking to quickly analyze product options, BC Calc® software makes it easy. What's more, this cloud-based application is freely available to everyone and includes a full line of technical support.

When you put it all together, Boise Cascade's Engineered Wood Products (EWP) and software tools make building strong homes easier, faster, and more profitable for home builders.

## FASTER. STRONGER. EASIER.

### Limited Lifetime Warranty
All Boise Cascade BCI® joist, Versa-Lam® LVL, and AJS® joist products are covered by a limited lifetime warranty for the expected life of the structure. View the complete warranty on our website.

bc.com/terms-conditions/sales-terms-and-conditions

## NEED MORE INFORMATION?

Visit bc.com/ewp
or call 1-800-232-0788

Boise Cascade®
ENGINEERED WOOD PRODUCTS

*Information provided herein was current at the time of printing but may be superseded by an updated version. Visit bc.com/ewp to confirm that this is the most current guide.*

Boise Cascade, AJS, AllJoist, BC Calc, BCI, Versa-Lam, and Versa-Stud are registered trademarks of Boise Cascade Company or its affiliates. © 2025 Boise Cascade Company. All rights reserved.

**Reorder #MTP-W7000 | Rev. 03/25**