

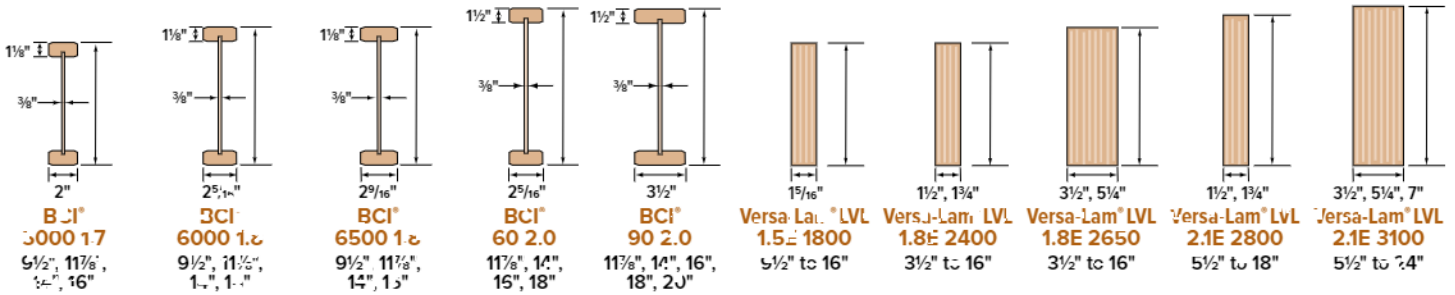
WESTERN BUILDER GUIDE



Introducing the
BCI® 6000 1.8

for Residential Construction with
**BCI® Joists, Versa-Lam® LVL and
Boise Cascade® Rimboard Products**





Product depths offered are listed below the product name

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

BCI and Versa-Lam LVL products shall be installed in dry-use applications only per their respective ICC-ES ESR-1043 and ESR-1044 joint LSR evaluation reports.

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 deflection, 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 ★				
		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.
9 1/2"	5000 1.7	17-1'	16-1'	14-9"	13-9"	12-0"	11-5"	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"	13-11"	11-5"	11-6"	10-0"	10-0"	9-10"	19-10"	18-2"	17-2"	15-9"	14-3"
	6500 1.8	16-5"	16-10"	15-11"	14-10"	13-6"	11-5"	11-6"	10-0"	10-0"	10-0"	20-5"	18-8"	17-6"	16-5"	14-3"
11 1/2"	5000 1.7	20-2"	18-5"	17-5"	15-9"	13-4"	15-5"	14-4"	13-6"	12-11"	11-5"	22-3"	19-4"	17-7"	15-9"	13-11"
	6000 1.8	21-11"	19-5"	18-4"	17-1"	14-10"	15-6"	15-1"	14-3"	13-11"	12-0"	23-6"	21-6"	20-0"	17-11"	14-10"
	6500 1.8	21-11"	20-0"	18-11"	17-1"	14-10"	16-0"	15-7"	14-9"	13-11"	12-5"	24-3"	22-2"	20-11"	18-10"	14-10"
14"	60 2.0	23-3"	21-3"	20-11"	18-8"	16-1"	18-0"	16-7"	15-7"	14-6"	13-2"	25-9"	23-6"	22-11"	20-9"	16-4"
	90 2.0	23-3"	23-11"	22-3"	20-11"	18-1"	19-0"	18-7"	17-3"	16-2"	14-8"	29-0"	26-6"	25-0"	23-3"	19-4"
	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"
16"	6000 1.8	24-2"	22-2"	20-11"	19-6"	15-5"	18-11"	17-3"	16-3"	15-2"	13-11"	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"	17-6"	16-8"	15-6"	14-1"	27-6"	25-1"	22-11"	20-6"	15-5"
	60 2.0	23-5"	24-2"	22-9"	21-3"	16-1"	20-8"	18-10"	17-9"	16-5"	14-11"	29-3"	26-8"	25-3"	21-10"	16-4"
18"	90 2.0	29-9"	27-11"	25-6"	23-3"	19-6"	23-3"	21-4"	19-9"	18-4"	16-11"	32-10"	30-0"	28-3"	26-0"	19-6"
	6000 1.8	25-9"	24-5"	23-1"	20-10"	15-11"	20-11"	19-1"	18-0"	16-9"	15-7"	29-9"	25-6"	23-6"	20-10"	15-11"
	6500 1.8	27-5"	25-11"	23-8"	21-1"	15-11"	21-5"	19-7"	18-5"	17-2"	15-11"	30-4"	26-11"	24-6"	21-1"	15-11"
20"	60 2.0	29-3"	26-8"	25-2"	21-10"	16-1"	22-10"	20-10"	18-7"	18-2"	16-1"	32-4"	29-6"	27-4"	21-10"	16-4"
	90 2.0	32-11"	29-11"	28-2"	26-2"	19-11"	25-8"	23-4"	21-11"	20-3"	18-4"	36-4"	33-2"	31-3"	26-2"	19-11"
	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"

- Span table is based on a residential floor load of 40 psf live load and 10 psf dead load (12 psf dead load for 90 2.0 joists).
- Span values assume 3/4" minimum plywood/OSB rated sheathing is glued and nailed to joists for composite action (joists spaced at 32" o.c. require sheathing rated for such spacing - 7/8" plywood/OSB).
- Span values represent 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.
- Span values are the maximum allowable clear distance between supports.

- Table values assume minimum bearing lengths without web stiffeners for joist depths of 1 1/2" inches and less (18" & 20" 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.

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Additional floor framing details available with BC Framer® software

END BEARING DETAILS

F07

Nail Boise Cascade Rimboard to BCI Joists with 8d nail into each flange.

Dimension lumber is not suitable for use as rim board with BCI Joists.

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.

F02

BCI® rim joist.

Use of BCI rimjoist requires 2x6 wall for minimum joist bearing.

F01

BCI® Joist blocking.

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

Solid block all posts from above to bearing below.

F03

Boise Cascade Rimboard

NOTE: BCI® floor joist must be designed to carry all above and not stacked over all below.

Blocking required underneath braced wall panels and shear walls, consult design professional of record.

INTERMEDIATE BEARING DETAILS

F06

For load bearing wall above (stacked over wall below).

BCI® Joist blocking.

F09

Load bearing wall above (stacked over wall below)

2x block.

*See info for Double Squash Block Vertical Load [lb/ft]

F08

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 provisions.

F28

Intermediate Bearing.

Cross bracing OK as blocking only if support below is not a braced wall panel or shear wall and no wall exists above.

F10

Joist Hanger

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

Filler block. Nail with 10-10d nails.

Backer block required where top flange joist hanger load exceeds 250 lbs. Install tight to top flange.

F58

Double BCI Joist Connection

Filler Block (if required) See IN J-13 for requirements.

Web Filler Nailing See TN J-13 for joist schedule.

- Filler block not required when all loads are top loaded and only applied to each joist except BCI 500 and AJS 25, 30.
- Side loads and/or uneven top loads require filler block.
- See Boise Cascade Technical Bulletin for further information.
- Use tenon sheathing on each joist end diaphragm nail schedule.

F05

Structural Panel reinforcement (when required).

BCI® Joist blocking required for cantilever.

For load bearing cantilever, see pages 8 and 9. Uplift on backspan shall be considered in all cantilever designs.

BCI Joist Slope Cut Reinforcement

Detail below restores full axial load capacity. Detail below end of BCI joist. BCI Joist shall not be used as a collar or rafter tension tie.

2 x 6 min. after 12" after shall be supported by ridge beam or other upper bearing support

F14

Heel Depth (sole below)

6 min, 12, 16" max. LCI depth, 24"

2x blocking required at bearing (not shown for clarity).

2 x 2 min. plywood/OSB or tied sheathing as reinforcement. Install reinforcement with face grain horizontal. Install on both sides of the joist, tight to bottom flange. Leave minimum 1/2" 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.

End Wall Bearing	Minimum Heel Depth					
	Roof Pitch					
6/12	7/12	8/12	9/12	10/12	12/12	
2 x 4	4 3/8"	5 1/8"	4 1/4"	4 1/4"	4 1/4"	
2 x 6	5 1/8"	6 1/8"	2 1/4"	2 3/4"	2 1/4"	

LATERAL SUPPORT

- BCI Joists shall be laterally supported at the ends with hangers, rimboard, BCI rim joist or blocking panels. BCI blocking panels or rimboard are required at cantilever supports.
- Blocking may be required at intermediate bearings for floor diaphragm per IRC in high seismic areas, consult local building official.

MINIMUM BEARING LENGTH FOR BCI JOISTS

- Minimum end bearing: 1 1/2" for all BCI Joists. 3/8" 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.

NAILING REQUIREMENTS

- BCI rim joist, rim board or closure panel to BCI joist:
 - Rims or closure panel 1 1/2 inches thick and less: 2-8d nails, one each in the top and bottom flange.
 - BCI 500 rim joist: 2-10d box nails, one each in the top and bottom flange.
 - BCI 650/90 rim joist: 2-16d box nails, one each in the top and bottom flange.
 - BCI 650/90 rim joist: Toe-nail top flange to rim joist with 2-10d box nails, one each side of flange.
- BCI rim joist, rim board or BCI blocking panel to support:
 - Min. 8d nails @ 6" o.c. per IRC.
 - Connection per design professional of record's specification for shear transfer.
- BCI joist to support:
 - 2-8d nails, one on each side of the web, placed 1 1/2 inches minimum from the end of the BCI Joist to limit splitting.
- Sheathing to BCI joist:
 - Prescriptive residential sheathing nail schedule: 8d common nails @ 6" o.c. on edges and @ 12" o.c. in the field (IRC Table R602.3(1)).

- See close available nail spacing limits on page 2 of floor diaphragm nailing specified at closer spacing than listed.
- Maximum bracing spacing for full lateral stability: 18" for BCI 500, 24" for larger BCI joist series.
- 14 gauge staples may be substituted for 8d nails if the staples penetrate at least 1 inch into the joist.
- Wood screws may be acceptable, contact local building official and/or Boise Cascade EWP Engineering for further information.

JACKER AND FILLER BLOCK DIMENSIONS

Series	Backer Block Thickness	Filler Block Thickness
5000 1.7	3/4" or 1/2" wood panels	Two 3/4" wood panels or 2 x 6
6500 1.8	1 1/8" or two 1/2" wood panels	2 x 6 + 7/16" or 1/2" wood panel
6500 1.8	1 1/8" or two 1/2" wood panels	2 x 6 + 3/8" or 3/4" wood panel
60 2.0	1 1/8" or two 1/2" wood panels	2 x 6 + 7/16" or 1/2" wood panel
60 2.0	2 x 1 lumber	Double 2 x 4 lumber

- Put backer and filler blocks to a maximum depth equal to the web depth minus 1/4" to avoid a forced fit.

Detail F 9 Table Double Squash Block Vertical Load [lb/ft]

Size	Joist Spacing [in]			
	12	16	19.2	24
2x4	4465	3577	2789	2233
2x6	7013	5209	3983	3006

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

WEB STIFFENER REQUIREMENTS

- See Web Stiffener Requirements on page 9 of the Western Specifier Guide.
- PROTECT BCI JOISTS FROM THE WEATHER**
- BCI Joists are intended only for applications that provide permanent protection from the weather. Bundles of product should be covered and stored off of the ground on stickers.

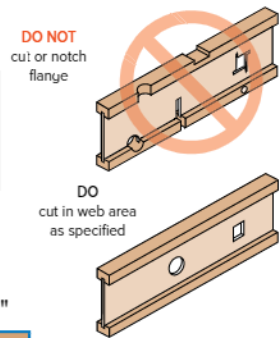
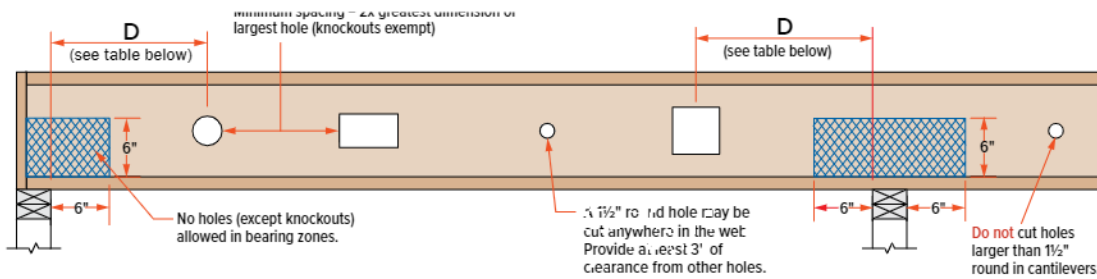
BCI RIM JOISTS AND BLOCKING

Depth [in]	Series	Vertical Load Capacity (plf)	
		No W.S. ⁽¹⁾	W.S. ⁽²⁾
9 1/2"	5000 1.7, 6000 1.8, 6500 1.8	2300	N/A
	5000 1.7, 6000 1.8, 6500 1.8	2150	N/A
11 1/2"	60 2.0, 90 2.0	2500	N/A
	5000 1.7, 6000 1.8, 6500 1.8	2060	N/A
14"	60 2.0, 90 2.0	2400	N/A
	6000 1.8, 6500 1.8	1900	2500
16"	60 2.0, 90 2.0	2300	2700
	60 2.0, 90 2.0	N/A	2700
18"	60 2.0, 90 2.0	N/A	2700
20"	90 2.0	N/A	2700

(1) No web stiffeners required.
 (2) Web stiffeners required at each end of blocking, values not applicable for rim joists.
 N/A: Not applicable

BCI® Joist Hole Location & Sizing

BCI® Joists are manufactured with 1/2" round perforated knockouts in the web at approximately 12" on center



Minimum distance from support, listed in tables below, is required for all holes greater than 1 1/2"

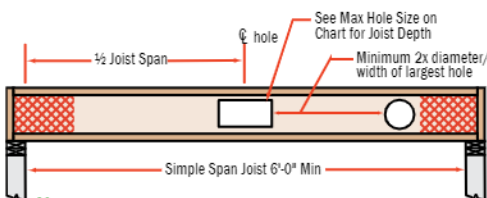
MINIMUM DISTANCE (D) FROM ANY SUPPORT TO THE CENTERLINE OF THE HOLE																
Round Hole Diameter [in]	2	3	4	5	6	7	8	8 7/8	10	11	12	13	14	15		
Rectangular Hole Side [in]	-	-	-	3	5	7	-	-	-	-	-	-	-	-		
Any 9 1/2" Joist	Span [ft]	8	1'-0"	1'-3"	1'-8"	2'-4"	2'-11"	3'-5"								
		12	1'-0"	1'-7"	2'-7"	3'-6"	4'-5"	5'-4"								
		16	1'-0"	2'-2"	3'-5"	4'-6"	5'-11"	7'-2"								
Round Hole Diameter [in]	2	3	4	5	6	7	8	8 7/8	10	11	12	13	14	15		
Rectangular Hole Side [in]	-	-	-	2	3	5	7	8	-	-	-	-	-	-		
Any 1 1/8" Joist	Span [ft]	8	1'-0"	1'-3"	1'-6"	2'-0"	2'-5"	2'-11"	3'-5"	3'-10"						
		12	1'-0"	1'-7"	2'-3"	3'-0"	3'-6"	4'-5"	5'-1"	5'-9"						
		16	1'-2"	2'-1"	3'-0"	4'-0"	4'-11"	5'-10"	6'-10"	7'-3"						
		2	1'-5"	2'-1"	3'-10"	5'-0"	6'-2"	7'-4"	8'-3"	9'-1"						
Round Hole Diameter [in]	2	3	4	5	6	7	8	8 7/8	10	11	12	13	14	15		
Rectangular Hole Side [in]	-	-	-	-	2	3	5	6	8	9	-	-	-	-		
Any 1 1/4" Joist	Span [ft]	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'-4"	1'-2"	1'-7"	2'-3"	2'-11"	3'-3"	4'-1"	4'-10"	5'-6"				
		16	1'-0"	1'-1"	1'-3"	2'-2"	3'-0"	3'-10"	4'-9"	5'-6"	6'-3"	7'-4"				
		2	1'-0"	1'-3"	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'-3"	5'-10"	7'-1"	8'-3"	9'-9"	11'-0"				
Round Hole Diameter [in]	2	3	4	5	6	7	8	8 7/8	10	11	12	13	14	15		
Rectangular Hole Side [in]	-	-	-	-	-	2	3	5	6	8	9	10	-	-		
Any 1 3/8" Joist	Span [ft]	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'-1"	6'-4"	7'-2"		
		2	1'-0"	1'-1"	1'-2"	1'-2"	2'-0"	3'-0"	4'-0"	5'-1"	6'-11"	7'-11"	8'-11"			
		24	1'-0"	1'-1"	1'-2"	1'-3"	2'-5"	3'-1"	4'-9"	5'-10"	7'-2"	8'-4"	9'-5"	10'-9"		
Round Hole Diameter [in]	2	3	4	5	6	7	8	8 7/8	10	11	12	13	14	15		
Rectangular Hole Side [in]	-	-	-	-	-	-	2	3	5	6	7	9	10	11		
18 BC 9.0 Joist	Span [ft]	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'-1"	1'-11"	2'-1"	3'-2"	3'-8"	4'-5"	5'-1"	5'-7"	6'-3"	6'-10"	7'-5"
		20	1'-0"	1'-1"	1'-2"	1'-8"	2'-5"	3'-3"	4'-0"	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"	10'-3"	11'-2"	
		28	1'-0"	1'-1"	1'-4"	2'-5"	3'-5"	4'-6"	5'-7"	6'-6"	7'-9"	8'-9"	9'-10"	10'-11"	12'-0"	13'-1"
Round Hole Diameter [in]	2	3	4	5	6	7	8	8 7/8	10	11	12	13	14	15		
Rectangular Hole Side [in]	-	-	-	-	-	-	-	2	3	5	6	7	8	10		
20 BC 9.0 Joist	Span [ft]	12	1'-0"	1'-3"	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'-6"	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'-1"	7'-4"	8'-0"
		24	1'-0"	1'-4"	1'-2"	1'-6"	2'-4"	3'-1"	3'-11"	4'-1"	5'-6"	6'-4"	7'-2"	7'-11"	8'-9"	9'-7"
28	1'-0"	1'-1"	1'-2"	1'-9"	2'-0"	3'-3"	4'-7"	5'-5"	6'-3"	7'-5"	8'-4"	9'-3"	10'-3"	11'-2"		

- Select a table row based on joist depth and the actual joist span rounded up to the nearest table span. Scan across the row to the column headed by the appropriate round hole diameter or rectangular hole side. Use the longest side of a rectangular hole. The table value is the closest that the centerline of the hole may be to the centerline of the nearest support.
- The entire web may be cut out. **DO NOT** cut the flanges. Holes apply to either single or multiple joists in repetitive member conditions.
- For multiple holes, the amount of uncut web between holes must equal at least twice the diameter (or longest side) of the largest hole.
- 1/2" round knockouts in the web may be removed by using a short piece of metal pipe and hammer.
- Holes may be positioned vertically in the web, provided they don't extend into either flange.
- This table was designed to apply to design conditions covered by uniform load PLF tables only, shown elsewhere in this publication. Use BC Calc® software to check other hole sizes or holes under other design conditions, including joists supporting concentrated loads. It may be possible to exceed the limitations of this table by analyzing a specific application with the BC Calc® software.

Large Rectangular Holes in BCI® Joists

Hole size table based on maximum uniform load of 40 psf live load and 10 psf dead load, at maximum spacing of 24" on-center

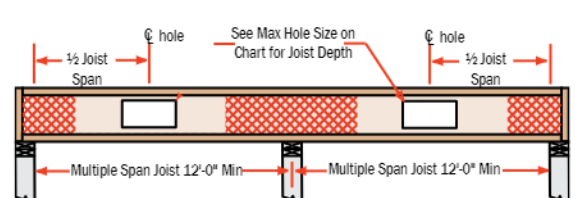
Single Span Joist



Notes:
Additional holes may be cut in the web provided they meet the specifications as shown in the hole distance chart shown above or as allowed using BC Calc® sizing software.

Joist Depth	Maximum Hole Size	
	Simple Span	Multiple Span
9 1/2"	6" x 14"	6" x 12"
11 1/8"	7" x 16" 8" x 15"	8" x 12"
14"	9" x 16" 10" x 15"	3" x 15"
16"	9" x 18" 11" x 16"	10" x 14"

Multiple Span Joist



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

GENERAL NOTES

- Continuous lateral support at the top of the beam is assumed.
- Minimum 3-inch end bearing or see BC CALC® software requirements
- Bearing length specifications assume bearing across the full width of the beam.
- Uniform loading is assumed for all tables.
- Multiple member beams require proper connection schedules.
- Dry service conditions are assumed.
- It may be possible to exceed the limitations of this table by analyzing a specific application with the BC CALC® software.

Roof Notes (see pages 7, 8 & 9)

- Always use roof live and dead loads that meet or exceed the required design loading.
- No roof load reductions have been taken.
- Table assumes 2'-0" roof overhang.

Ridge Bear. (see page 8)

- Deflection is limited to L/240 live load and L/180 total load.
- Table based upon either simple or continuous beam span conditions.

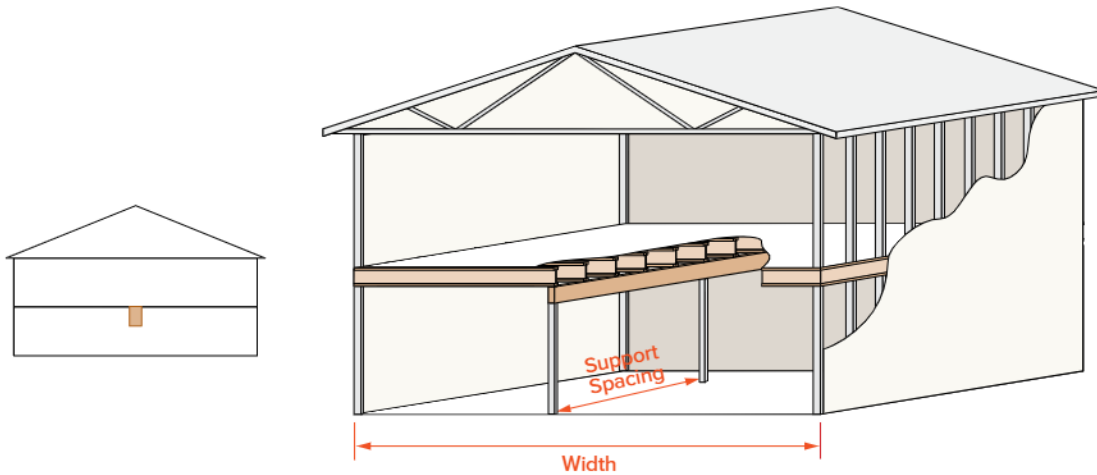
Floor Notes (see pages 5, 6, 9)

- Floor loads are 40 psf live load and 10 psf dead load
- Deflection is limited to L/360 live load and L/240 total load.
- Table based upon either simple or continuous floor joist spans.
- Tables assume a wall weight of 100 plf (pages 6, 9).
- Interior floor support may vary a maximum of 4 feet from centerline (page 9).

Header (Roof) (see page 7)

- Deflection is limited to L/240 live load and L/180 total load.

One Floor Beam Span Table

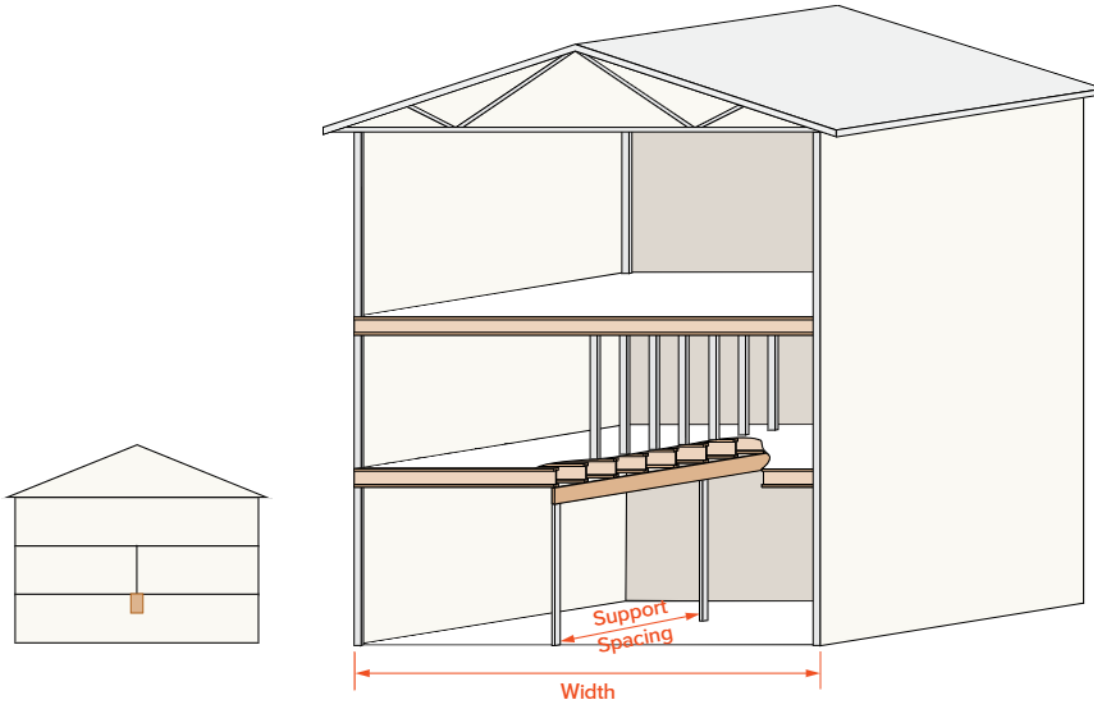


Required Beam Depths and Bearing Lengths [in]

Versa-Lam® LVL 2.1E 3100

Load Duration %	Floor Load [psf]		Beam Support Spacing [Feet]	Width of Building Segment [feet]																			
	Live	Dead		KEY: Beam Breadth [in] x Beam Depth [in] End Support / Intermediate Support Bearing Length Requirements [in]																			
				20	24	26	28	30	32	36	40												
100%	40	10	8	3.5 x 7.25	1.5/3	3.5 x 7.25	1.5/3	3.5 x 9.5	1.5/3	3.5 x 9.5	1.5/3	3.5 x 9.5	1.5/4.5	3.5 x 9.5	1.5/4.5	3.5 x 9.5	3/4.5	3.5 x 9.5	3/4.5				
				5.25 x 7.25	1.5/1.5	5.25 x 7.25	1.5/3	5.25 x 7.25	1.5/3	5.25 x 7.25	1.5/3	5.25 x 7.25	1.5/3	5.25 x 7.25	1.5/3	5.25 x 7.25	1.5/3	5.25 x 7.25	1.5/3	5.25 x 7.25	1.5/3	5.25 x 9.5	1.5/3
			10	3.5 x 9.5	1.5/3	3.5 x 9.5	1.5/4.5	3.5 x 9.5	1.5/4.5	3.5 x 9.5	1.5/4.5	3.5 x 11.075	3/4.5	3.5 x 11.075	3/4.5	3.5 x 11.075	3/4.5	3.5 x 11.075	3/6	3.5 x 11.075	3/6	3.5 x 11.075	3/6
				5.25 x 9.5	1.5/3	5.25 x 9.5	1.5/3	5.25 x 9.5	1.5/3	5.25 x 9.5	1.5/3	5.25 x 9.5	1.5/3	5.25 x 9.5	1.5/3	5.25 x 9.5	1.5/3	5.25 x 9.5	1.5/4.5	5.25 x 9.5	1.5/4.5	5.25 x 9.5	1.5/4.5
			12	3.5 x 11.075	1.5/4.5	3.5 x 11.075	3/4.5	3.5 x 11.075	3/4.5	3.5 x 11.075	3/4.5	3.5 x 11.075	3/4.5	3.5 x 11.075	3/6	3.5 x 11.075	3/6	3.5 x 14	3/6	3.5 x 14	3/6	3.5 x 14	3/7.5
				5.25 x 9.5	1.5/3	5.25 x 9.5	1.5/3	5.25 x 11.075	1.5/3	5.25 x 11.075	1.5/3	5.25 x 11.075	1.5/3	5.25 x 11.075	1.5/3	5.25 x 11.075	1.5/4.5	5.25 x 11.075	1.5/4.5	5.25 x 11.075	1.5/4.5	5.25 x 11.075	3/4.5
			14	3.5 x 11.075	1.5/4.5	3.5 x 14	3/4.5	3.5 x 14	3/6	3.5 x 14	3/6	3.5 x 14	3/6	3.5 x 14	3/6	3.5 x 14	3/6	3.5 x 14	3/6	3.5 x 14	3/6	3.5 x 14	3/7.5
				5.25 x 11.075	1.5/3	5.25 x 11.075	1.5/3	5.25 x 11.075	1.5/4.5	5.25 x 11.075	1.5/4.5	5.25 x 11.075	1.5/4.5	5.25 x 11.075	1.5/4.5	5.25 x 14	3/4.5	5.25 x 14	3/4.5	5.25 x 14	3/4.5	5.25 x 14	3/6
			16	3.5 x 14	3/4.5	3.5 x 14	3/6	3.5 x 14	3/6	3.5 x 14	3/6	3.5 x 14	3/6	3.5 x 14	3/7.5	3.5 x 14	3/7.5	3.5 x 18	4.5/9	3.5 x 14	4.5/9	3.5 x 14	4.5/9
				5.25 x 11.075	1.5/3	5.25 x 14	1.5/4.5	5.25 x 14	1.5/4.5	5.25 x 14	1.5/4.5	5.25 x 14	1.5/4.5	5.25 x 14	1.5/4.5	5.25 x 14	1.5/4.5	5.25 x 14	3/6	5.25 x 14	3/6	5.25 x 14	3/6
			18	3.5 x 14	3/6	3.5 x 14	3/6	3.5 x 18	3/7.5	3.5 x 14	3/6	3.5 x 14	3/6	3.5 x 14	3/7.5	3.5 x 14	3/7.5	3.5 x 18	4.5/9	3.5 x 14	4.5/9	3.5 x 14	3/7.5
				5.25 x 14	1.5/4.5	5.25 x 14	3/4.5	5.25 x 14	3/4.5	5.25 x 14	3/4.5	5.25 x 14	3/4.5	5.25 x 14	3/6	5.25 x 14	3/6	5.25 x 14	3/6	5.25 x 14	3/6	5.25 x 14	3/6
	20	3.5 x 14	3/6	3.5 x 14	3/7.5	5.25 x 14	3/6	5.25 x 14	3/6	5.25 x 14	3/6	5.25 x 14	3/6	5.25 x 14	3/6	5.25 x 18	3/7.5						
		5.25 x 14	1.5/4.5	5.25 x 14	3/4.5	5.25 x 14	1.5/4.5	5.25 x 14	1.5/4.5	5.25 x 14	1.5/4.5	5.25 x 14	1.5/4.5	5.25 x 14	1.5/4.5	5.25 x 18	3/7.5						

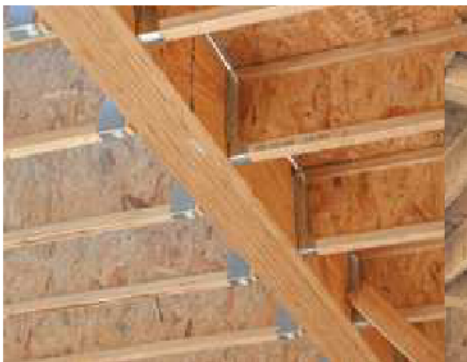
Two Floor Beam Span Tables



Required Beam Depths and Bearing Lengths [in]

Versa-Lam® LVL 2.1E 3100

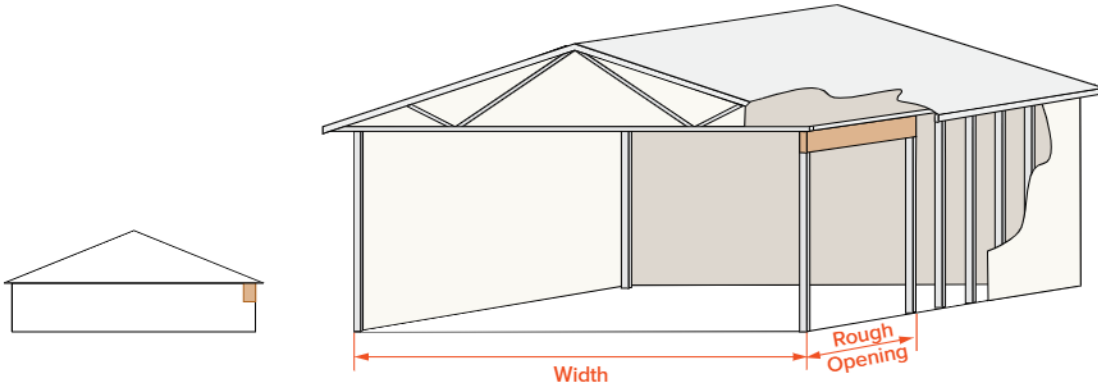
Load Duration %	Floor Load [psf]		Beam Support Spacing [Feet]	Width of Building Segment [feet]															
	Live	Dead		KEY: Beam Breadth [in] X Beam Depth [in] End Support / Intermediate Support Bearing Length Requirements [in]															
				20	24	26	28	30	32	36	40								
100%	40	10	8	3.5 x 9.5	3/4.5	3.5 x 11.875	3/6	3.5 x 11.875	3/6	3.5 x 11.875	3/7.5	3.5 x 14	3/7.5	3.5 x 14	4.5/9	3.5 x 16	4.5/9		
				5.25 x 9.5	1.5/3	5.25 x 9.5	1.5/4.5	5.25 x 9.5	3/4.5	5.25 x 9.5	3/4.5	5.25 x 9.5	3/4.5	5.25 x 9.5	3/6	5.25 x 11.875	3/6	5.25 x 11.875	3/6
			10	3.5 x 11.875	3/6	3.5 x 14	3/7.5	3.5 x 14	3/7.5	3.5 x 14	3/7.5	3.5 x 14	4.5/9	3.5 x 16	4.5/9	3.5 x 18	4.5/10.5	5.25 x 14	3/7.5
				5.25 x 9.5	1.5/4.5	5.25 x 11.875	3/4.5	5.25 x 11.875	3/6	5.25 x 11.875	3/6	5.25 x 11.875	3/6	5.25 x 11.875	3/6	5.25 x 14	3/7.5	7 x 11.875	3/6
			12	3.5 x 14	3/7.5	3.5 x 16	4.5/9	3.5 x 16	4.5/9	3.5 x 18	4.5/9	3.5 x 18	4.5/10.5	5.25 x 14	3/7.5	5.25 x 16	4.5/9	5.25 x 16	4.5/9
				5.25 x 11.875	3/4.5	5.25 x 11.875	3/6	5.25 x 14	3/6	5.25 x 14	3/6	5.25 x 14	3/7.5	7 x 11.875	3/6	7 x 14	3/6	7 x 14	3/7.5
			14	3.5 x 16	4.5/9	3.5 x 18	4.5/10.5	5.25 x 16	3/7.5	5.25 x 16	3/7.5	5.25 x 16	4.5/9	5.25 x 16	4.5/9	5.25 x 18	4.5/10.5		
				5.25 x 14	3/6	5.25 x 14	3/7.5	7 x 14	3/6	7 x 14	3/6	7 x 14	3/6	7 x 14	3/6	7 x 14	3/7.5	7 x 16	4.5/9
			16	3.5 x 18	4.5/9	5.25 x 16	3/7.5	5.25 x 18	4.5/9	5.25 x 18	4.5/9	5.25 x 18	4.5/9						
				5.25 x 16	3/6	7 x 16	3/6	7 x 16	3/6	7 x 16	3/6	7 x 16	3/7.5	7 x 16	3/7.5	7 x 18	4.5/9	7 x 18	4.5/9
			18	5.25 x 18	3/7.5	5.25 x 18	4.5/9												
				7 x 16	3/6	7 x 16	3/6	7 x 18	3/7.5	7 x 18	3/7.5	7 x 18	3/7.5	7 x 18	4.5/9				
			20																
				7 x 18	3/6	7 x 18	3/7.5												



See General Notes on page 5.



Roof Header Span Tables



- Minimum end bearing 3 inches or see BC Calc® software requirement.
- 4.5 inch bearing length required in shaded areas.
- See General Notes on page 5.

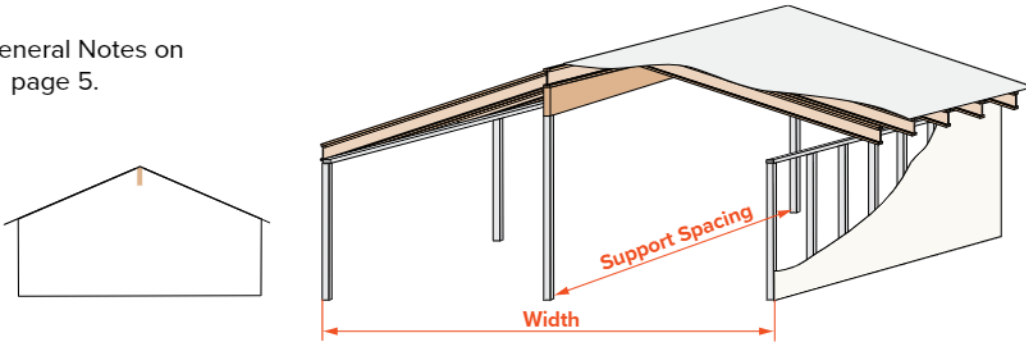
Required Beam Depths and Bearing Lengths [in]

Versa-Lam® LVL 2.1E 3100

Load Duration %	Roof Load [psf]		Rough Opening [Feet]	Width of Building Segment [feet]									
	Live	Dead		KEY: Beam Breadth [in] X Beam Depth [in]									
				20	24	26	28	30	32	36	40		
125%	20	15	9	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25
				5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25
			12	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5
				5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5
			16	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14
				5.25 x 9.5	5.25 x 9.5	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875
	20	20	9	3.5 x 11.875	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14
				5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875
			12	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25
				5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25
			16	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5
				5.25 x 7.25	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5
115%	20	15	9	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	
				5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	
			12	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	
				5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	
			16	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 14	3.5 x 14	3.5 x 14	
				5.25 x 9.5	5.25 x 9.5	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	
25	15	9	3.5 x 11.875	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14		
			5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875		
		12	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 9.5		
			5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5		
		16	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 14	3.5 x 14	3.5 x 14		
			5.25 x 9.5	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875		
30	15	9	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 16	3.5 x 16		
			5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 14	5.25 x 14	5.25 x 14		
		12	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 9.5		
			5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5		
		16	3.5 x 11.875	3.5 x 11.875	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 16		
			5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875		
40	15	9	3.5 x 7.25	3.5 x 7.25	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5		
			5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25		
		12	3.5 x 9.5	3.5 x 9.5	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 14		
			5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 11.875		
		16	3.5 x 11.875	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16		
			5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875	5.25 x 14	5.25 x 14	5.25 x 14	5.25 x 14	5.25 x 14		
50	15	9	3.5 x 14	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	5.25 x 16		
			5.25 x 11.875	5.25 x 14	5.25 x 14	5.25 x 14	5.25 x 14	5.25 x 14	5.25 x 14	5.25 x 16	7 x 14		
		12	3.5 x 7.25	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 11.875		
			5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 7.25	5.25 x 9.5	5.25 x 9.5		
		16	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 14	3.5 x 14		
			5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 9.5	5.25 x 11.875	5.25 x 11.875	5.25 x 11.875		
18	3.5 x 14	3.5 x 14	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18				
	5.25 x 11.875	5.25 x 14	5.25 x 14	5.25 x 14	5.25 x 14	5.25 x 14	5.25 x 14	5.25 x 14	5.25 x 16				

Roof Ridge Beam Span Tables

See General Notes on page 5.

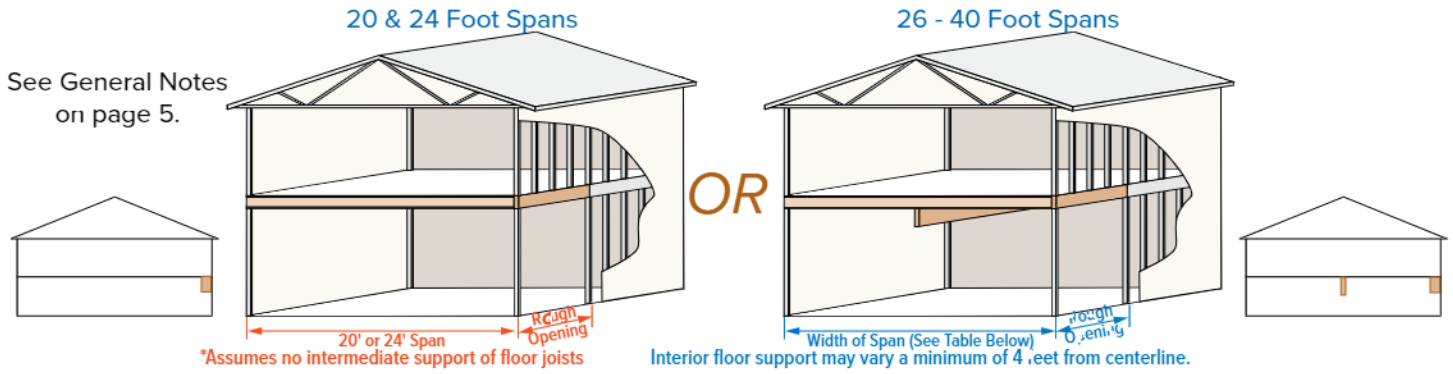


Required Beam Depths and Bearing Lengths [in]

Versa-Lam® LVL 2.1E 3100

Load Duration %	Roof Load [psf]		Beam Support Spacing [Feet]	Width of Building Segment [feet]																			
	Live	Dead		KEY: Beam Breadth [in] X Beam Depth [in] End Support / Intermediate Support Bearing Length Requirements [in]																			
				20	24	26	28	30	32	36	40												
125%	20	15	12	3.5 x 7.25	1.5/3	3.5 x 9.5	1.5/3	3.5 x 9.5	1.5/3	3.5 x 9.5	1.5/3	3.5 x 9.5	1.5/3	3.5 x 9.5	1.5/4.5	3.5 x 9.5	1.5/4.5						
			115%	20	15	12	3.5 x 7.25	1.5/3	3.5 x 9.5	1.5/3	3.5 x 9.5	1.5/3	3.5 x 9.5	1.5/3	3.5 x 9.5	1.5/3	3.5 x 9.5	1.5/4.5	3.5 x 9.5	1.5/4.5			
						50	15	15	12	3.5 x 9.5	1.5/3	3.5 x 9.5	1.5/3	3.5 x 9.5	1.5/3	3.5 x 9.5	1.5/3	3.5 x 9.5	1.5/4.5	3.5 x 9.5	1.5/4.5	3.5 x 9.5	1.5/4.5

Roof and One Floor Span Tables



Required Beam Depths and Bearing Lengths [in]

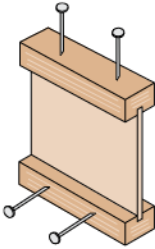
Versa-Lam® LVL 2.1E 3100

Load Duration %	Roof Load [psf]		Rough Opening [Feet]	Width of Building Segment [feet]									
	Live	Dead		KEY: Beam Breadth [in] ^ Beam Depth [in]									
	20	24		26	28	30	32	36	40				
125%	20	15	6	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.5	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	
			9	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 11.875
			12	3.5 x 11.875	3.5 x 14	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11	3.5 x 11	3.5 x 11	3.5 x 11	3.5 x 14
			16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 18
			18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18
			20	20	6	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25
		9	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 11.875	
		12	3.5 x 11.875	3.5 x 14	3.5 x 11.875	3.5 x 11.875	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	
		16	3.5 x 16	3.5 x 18	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	
		18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	
		20	15	6	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25
		9	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 11.875	
	12	3.5 x 11.875	3.5 x 14	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875		
	16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 18		
	18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18		
	25	15	6	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	
	9	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 11.875		
	12	3.5 x 11.875	3.5 x 14	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875		
	16	3.5 x 16	3.5 x 18	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16		
	18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18		
	115%	30	15	6	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	
	9	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 9.5	3.5 x 11.875		
	12	3.5 x 11.875	3.5 x 14	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875		
	16	3.5 x 16	3.5 x 18	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16		
18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18			
40	15	6	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 9.5		
9	3.5 x 9.5	3.5 x 11.875	3.5 x 9.5	3.5 x 11.875	3.5 x 9.5	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 9.5		
12	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 14	3.5 x 16		
16	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18		
18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18		
50	15	6	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 7.25	3.5 x 9.5		
9	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 11.875	3.5 x 14		
12	3.5 x 14	3.5 x 16	3.5 x 14	3.5 x 16	3.5 x 14	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 16	3.5 x 18		
16	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18		
18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18	3.5 x 18		

• Minimum end bearing 3 inches or see BC CALC* software requirement. • 4.5 inch bearing length required in shaded areas. • See General Notes on page 5.

BCI® Closest Allowable Nail Spacing

Nailing Perpendicular to Glue Lines (Wide Face)



Nailing Parallel to Glue Lines (Narrow Face)

Nail Size	All BCI® Joists			
	Nailing Perpendicular to Glue Line (Wide Face)		Nailing Parallel to Glue Line (Narrow Face)	
	O.C. Spacing [inches]	End of Joist [inches]	O.C. Spacing [inches]	End of Joist [inches]
6d Box (0.135"Ø x 2.5")	2	1½	4	1½
8d Common (0.131"Ø x 2.5")	2	1½	4	3
10d & 12d Common (0.126"Ø x 3" 3.25")	2	1½	4	3
16d Box (0.145"Ø x 3.5")	2	1½	4	3
10d & 12d Common (0.126"Ø x 3" 3.25")	3	2	5	4
16d Common (0.162"Ø x 3.5")	3	2	6	4

- If more than one row of nails is used, the rows must be offset at least ½ inch.
- Simpson Strong-Tie A35 connectors may be attached to the side of BCI® 60 & 90 joist flanges only. 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 (2)(3) [lb/ft]	
	Unblocked	Blocked
5000	As permitted for 2x framing in building code	320 lb/ft for 6" o.c. nailing @ panel edges 425 lb/ft for 4" o.c. nailing, staggered @ panel edges
6000, 6500	As permitted for 3x framing in building code	360 lb/ft for 6" o.c. nailing @ panel edges 480 lb/ft for 4" o.c. nailing, staggered @ panel edges
60, 90	As permitted for 3x framing in building code	As permitted for 3x framing in building code with nail spacing no closer than 3" o.c.

NOTES:

- See table 6 of ICC-ES®/APA® ESR-1336.
- BCI® joists may be substituted for solid sawn framing in horizontal wood diaphragms as shown in Table 2306.3.1 of the IBC® or Table 23-II-H of the UBC.
- Diaphragm nailing shall not exceed BCI® closest allowable nail spacing limits.

Versa-Lam® LVL Multiple Member Connectors

Side-Loaded Applications

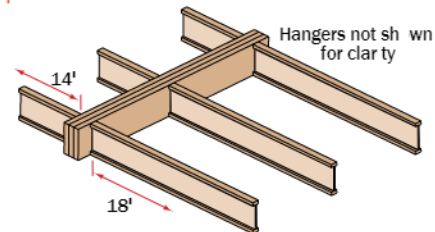
Number of Members	Maximum Uniform Side Load [plf]						
	Nailed (1)		½" Dia. Through Bolt (1)		¾" Dia. Through Bolt (1)		
	2 rows 16d Sinkers @ 12" o.c.	2 rows 16d Sinkers @ 12" o.c. staggered	2 rows 12" o.c. staggered	2 rows 6" o.c. staggered	2 rows @ 24" o.c. staggered	2 rows @ 12" o.c. staggered	2 rows @ 6" o.c. staggered
1¾" Versa-Lam® LVL (Depth of 18" and less)							
2	470	705	535	1010	2020	560	1120
3 (2)	350	525	375	755	1515	420	840
4 (3)	use bolt schedule		335	670	1345	370	745
3½" Versa-Lam® LVL							
2 (2)	use bolt schedule		855	1715	N/A	1125	2250

- 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 ¾" bolts. Bolt holes shall be the same diameter as the bolt.
- The nail schedules shown apply to both sides of a 3-member beam.
- 16d box nails = 0.135" diameter x 3.5" length, 16d sinker nails = 0.148" diameter x 3.25" length.

Designing Connections For Multiple Versa-Lam® LVL Members

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 is an example of how to size and connect a multiple-ply Versa-Lam® LVL floor beam.

Given: Beam shown below is supporting residential floor load of 40 psf live load, 10 psf dead load and is spanning 16'-0". Beam depth is limited to 14".



Find: A multiple 1¾" ply Versa-Lam® LVL that is adequate to support the design loads and the member per the connection schedule.

- Calculate the tributary width that beam is supporting:
 $16' / 2 = 18' / 2 = 16'$
- Use PLF tables on pages 3-5 of this guide or BCI Calc® to size beam. A Triple Versa-Lam® LVL 2.1 2800 1¾" x 11" is found to adequately support the design loads.
- Calculate the maximum plf load from one side (the right side in this case).
 $Max. Side Load = (18' / 2) \times (40 + 10 psf) = 450 plf$
- Go to the Multiple Member Connection Table, Side-Loaded Applications, 1¾" Versa-Lam® LVL, 3 member.
- The proper connection schedule must have a capacity greater than the max. side load:

Nailed: 3 rows 16d sinkers @ 12" o.c.
525 plf is greater than 450 plf OK
Bolts: ½" diameter 2 rows @ 12" staggered:
755 plf is greater than 450 plf OK

Top-Loaded Applications

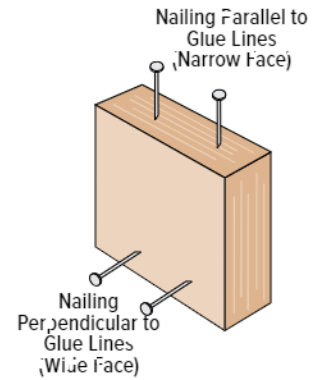
For top-loaded beams and beams with side loads less than shown in Side-Loaded Applications table above.			
Plyes	Depth	Nailing (2)	Maximum Uniform Load From One Side
(2) 1¾ plies	Depths 17/8" & less	2 rows 16d box/sinker nails @ 12" o.c.	400 plf
	Depths 14" - 18"	3 rows 16d box/sinker nails @ 12" o.c.	600 plf
	Depth = 24"	4 rows 16d box/sinker nails @ 12" o.c.	800 plf
(3) 1¾ plies (1)	Depths 11/8" & less	2 rows 16d box/sinker nails @ 12" o.c.	300 plf
	Depths 14" - 18"	3 rows 16d box/sinker nails @ 12" o.c.	450 plf
	Depth = 24"	4 rows 16d box/sinker nails @ 12" o.c.	600 plf
(4) 1¾ plies	Depths 18" & less	2 rows ½" bolts @ 24" o.c., staggered	335 plf
	Depth = 24"	3 rows ½" bolts @ 24" o.c., staggered every 8"	505 plf
(2) 3½ plies	Depths 18" & less	2 rows ½" bolts @ 24" o.c., staggered	855 plf
	Depth 20" - 24"	3 rows ½" bolts @ 24" o.c., staggered every 8"	1285 plf

- The nail schedules shown apply to both sides of a 3-member beam.
- 16d box nails = 0.135" dia. x 3.5" length, 16d sinker nails = 0.148" dia. x 3.25" length.
- Beams wider than 7" must be designed by the engineer or fabricator.
- 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 BCI Calc software to size beams.
- An equivalent specific gravity of 0.5 may be used when designing specific connections with Versa-Lam.
- Connection values are based upon the NDS, 2018 Edition.
- See the Member TrussLOK® Simpson Strong-Tie S&W or C&W Truss WPS screws may also be used to connect multiple members. See the LVL Beams Connection Schedule EWP Engineering for further information.

Closest Allowable Nail Spacing

Versa-Lam® LVL Products Nail Size		Nailing Parallel to Glue Lines (Narrow Face) ¹⁾						Nailing Perpendicular to Glue Lines (Wide Face)	
		Versa-Lam® LVL 1.5E 1800 1 1/16"		Versa-Lam® LVL 1 1/4"		Versa-Lam® LVL 3 1/2" & Wider		All Products	
		O.C. [in]	End [in]	O.C. [in]	End [in]	O.C. [in]	End [in]	O.C. [in]	End [in]
8d Box (0.113"ø x 2.5")		3	1 1/2	2	1	2	1/2	2	1/2
8d Common (0.131"ø x 2.5")		3	2	3	2	2	1	2	1
10d & 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	1
10d & 12d Common & 16d Sinkers (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	2	2

- 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 Versa-Lam LVL/Versa-Rim LVL. Use nails as specified by Simpson Strong Tie.



- 1) For 1 1/4" thickness and greater, 2 rows of nails (such as for a metal strap) are allowed; use 1/2" minimum offset between rows and stagger nails.

Versa-Lam® LVL Beam Details

BEARING AT CONCRETE/MASONRY WALLS

Provide moisture barrier and lateral restraint at bearing.

1/2" air space required between concrete and wood.

B01

BEARING FOR DOOR OR WINDOW HEADER

Strap per code if top plate is not continuous over header.

Trippers

B02

BEAM TO BEAM CONNECTOR

Verify hanger capacity with hanger manufacturer.

B03

BEARING AT COLUMN

Versa-Lam® LVL column.

Column connector per design professional of record.

B04

SLOPE SEAT CJT

Sloped seat cut. Not to exceed inside face of bearing.

Blocking not shown for clarity.

B06

BEVEL CUT

DO NOT bevel cut Versa-Lam® LVL beyond inside face of wall without approval from Boise Cascade EWP Engineering or BC Calc software analysis.

B07

BEAM TO CONCRETE/MASONRY WALLS

Wood top plate must be flush with inside of wall.

Hanger.

Moisture barrier between concrete and wood.

B08

BEARING FRAMING INTO WALL

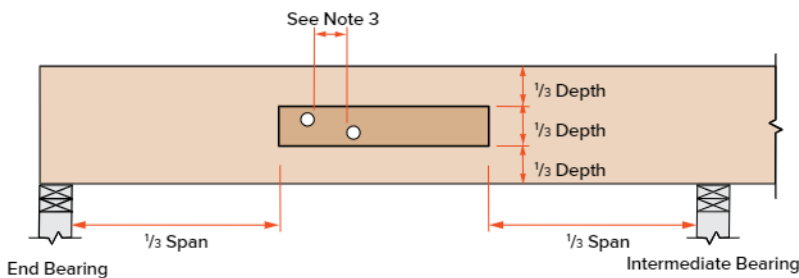
Strap per code if top plate is not continuous.

B09

INSTALLATION NOTES

- Minimum of 1/2" 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 3-5 of this guide.
- 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).

Allowable Holes in Versa-Lam® LVL Beams



1. Square and rectangular holes are not permitted.
2. Round holes may be drilled or cut with a hole saw anywhere within the shaded area of the beam.
3. The horizontal distance between adjacent holes must be at least two times the size of the larger hole.
4. Do not drill more than three access holes in any four foot long section of beam.

5. The maximum round hole diameter permitted is:

Beam Depth	Max. Hole Diameter
5 1/2"	3/4"
7 1/4"	1"
9 1/4" and greater	2"

6. These limitations apply to holes drilled for plumbing or wiring access only. The size and location of holes drilled for fasteners are governed by the provisions of the *National Design Specification® for Wood Construction*.
7. Beams deflect under load. Size holes to provide clearance where required.
8. This hole chart is valid for beams supporting uniform load only. For beams supporting concentrated loads or for beams with larger holes, use BC Calc® sizing software (www.BCCalc.com) or contact Boise Cascade EWP Engineering.



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

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Lifetime Guaranteed Quality and Performance

Boise Cascade warrants its BCI® Joist, Versa-Lam®, and ALLJOIST® products to comply with our specifications, to be free from defects in material and workmanship, and to meet or exceed our performance specifications for the normal and expected life of the structure when correctly stored, installed and used according to our Installation Guide.

BCI® Joists, Versa-Lam® LVL and ALLJOIST® must be stored, installed and used in accordance with this Installation Guide, building codes and to the extent not inconsistent with this Installation Guide, usual and customary building practices and standards. Versa-Lam® LVL, ALLJOIST® and BCI® Joists must be wrapped, covered and stored off of the ground on stickers at all times prior to installation. Versa-Lam® LVL, ALLJOIST® and BCI® Joists are intended only for applications that assure 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. Failure to correctly store, use or install Versa-Lam® LVL, ALLJOIST®, and BCI® joist in accordance with this Installation Guide will void the limited warranty.

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