

MiTek®

# EWP PRODUCT GUIDE



For Use With Products Manufactured by



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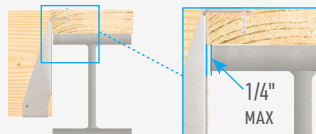
800-328-5934

# GENERAL NOTES

Follow these instructions to ensure the proper installation of MiTek products.

- See current MiTek Product Catalog for General Notes, Warranty, and installation information for hanger models, joist sizes, and header situations not shown.
  - Loads listed address hanger/header/fastener limitations assuming header material is Douglas Fir-Larch, Southern Pine, or LVL manufactured in the U.S. Joist reaction should be checked by a qualified designer to ensure proper hanger selection.
  - Uplift loads have been increased 60% for wind or seismic loads and no further increase shall be permitted. Reduce loads according to code for normal duration loading such as cantilever construction.
  - Hangers for joists without web stiffeners must support the I-Joist's top flange and provide lateral resistance with no less than 1/8" contact. Hangers for joists with web stiffeners must support a minimum of 60% of joist depth or potential joist rotation must be addressed. For hangers less than 60% joist depth, install framing angles, one on each side, for lateral stability. See page 3.
  - The type and quantity of fasteners used to install MiTek products is critical to connector performance.
- To achieve the allowable loads shown in this guide, install with the fasteners specified for that particular product. All specified fasteners must be properly installed prior to applying load of any kind to the connection.
- Throughout this guide, dimensions are expressed in inches and allowable loads in pounds, unless specifically noted otherwise.
  - Load values for 10d and 16d designations in the fastener schedules throughout this guide refer to common wire nails, unless noted otherwise.
  - The allowable loads shown in this guide are based on Allowable Stress Design methodology.
  - **Multiple I-Joist Plies:** Fasten together multiple plies of wood I-Joists, in accordance with the manufacturer's installation guidelines, such that the joists act as a single unit.
  - **Sloped I-Joists:** Use hangers with sloped seats and beveled web stiffeners whenever the slope exceeds the following: 1/2:12 for seat bearing lengths of 2 1/2" or less; 3/8:12 for bearing lengths between 2 1/2" and 3 1/2"; and 1/4:12 for bearing lengths in excess of 3 1/2".

## NAILER INSTALLATIONS



### Correct Attachment

Avoid direct contact between hangers and steel beams which may cause squeaks

### Correct Hanger Attachment to Nailer

A nailer or sill plate is considered to be any wood member attached to a steel beam, concrete block wall, concrete stem wall, or other structure unsuitable for nailing, which is used as a nailing surface for top mount hangers to hold beams or joists.

### Nailer Sized Correctly

Top flange of hanger is fully supported and recommended nails have full penetration into nailer, resulting in a carried member hanging safely at the proper height. The nailer must be sized to fit the support width as shown and be of sufficient thickness to satisfy recommended top flange nailing requirements. A design professional must specify nailer attachment to steel beams.

## Wrong Nailer Size Causes Component Failure



### ! TOO NARROW

Top flange not fully supported can cause nail breakout. Or, by fully supporting top flange, hanger is tilted back, causing lifting of carried member which results in uneven surfaces and squeaky floors.



### ! TOO THIN

Top flange nailing cannot fully penetrate nailer, causing reduced allowable loads. Never use hangers which require multiple face nails since the allowable loads are dependent on all nail holes being used.



### ! TOO WIDE

Loading can cause cross grain breaking of nailer. The recommended nailer overhang is 1/4" maximum per side.

# GENERAL NOTES

## BACKER BLOCKS

Pattern the nails used to install backer blocks or web stiffeners in wood BCI Joist to avoid splitting the block. The nail pattern should be sufficiently spaced to avoid the same grain line, particularly with solid sawn backer blocks. Backer blocks must be installed on wood BCI Joists acting as the header, or supporting member. Install in accordance with the Boise Cascade installation guidelines. The nails used to install hangers mounted to an BCI Joist header must penetrate through the web and into the backer block on the opposite side.

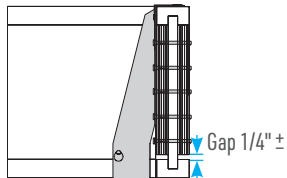
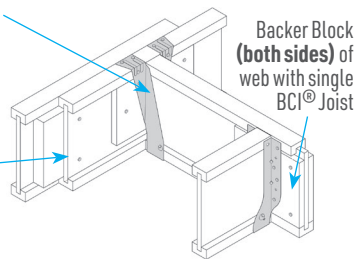
**With top flange hangers, backer block required only for downward loads exceeding 250 lbs or for uplift conditions**

### Backer Block Installation:

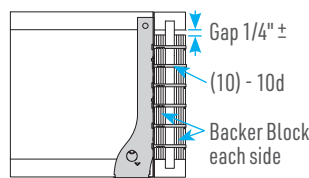
Minimum 12" wide. Install tight to top flange (tight to bottom flange with face mount hangers). Attach with ten 10d (3") nails, clinched when possible

### Filler Block Installation:

Nail with ten 10d (3") nails, clinched. Use ten (3-1/2") nails from each side with BCI® Joists



Typical Top Mount Hanger backer block installation



Typical Face Mount Hanger backer block installation

## Filler and Backer Block sizes

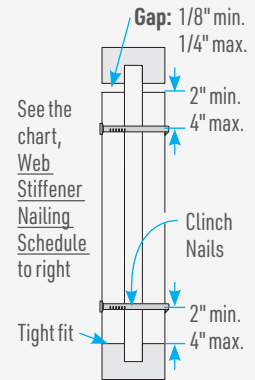
BCI® Series	Backer Block Thickness	Filler Block Thickness
4500s 1.8	5/8" or 3/4" wood panels	Two 5/8" wood panels or 2x _
5000 1.7	3/4" or 7/8" wood panels	Two 3/4" wood panels or 2x _
5000s 1.8		
6000 1.8		
6000s 1.8	1-1/8" or two 1/2" wood panels	2x _ + 7/16" or 1/2" wood panel
6500 1.8	1-1/8" or two 5/8" wood panels	2x _ + 5/8" or 3/4" wood panel
6500s 1.8	two 5/8" wood panels	3/4" wood panel
60 2.0	1-1/8" or two 1/2" wood panels	2x _ + 7/16" or 1/2" wood panel
60s 2.0	two 1/2" wood panels	1/2" wood panel
90 2.0	2x _ lumber	Double 2x _ lumber
90s 2.0		

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

## WEB STIFFENER ATTACHMENT

### Web Stiffeners may be required as noted below:

- Web stiffeners are always required at supports on 18" & 20" BCI® Joists.
- Web stiffeners are always required 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 Boise Cascade installation requirements.



Web Stiffener Specifications			
BCI® Series	For Structural Capacity (Min. Thick)	Lateral Restraint in Hanger	Minimum Width
4500s 1.8	5/8"	5/8"	2-5/16"
5000 1.7	5/8"	3/4"	2-5/16"
5000s 1.8			
6000 1.8	3/4"	7/8"	2-5/16"
6000s 1.8			
6500 1.8			
6500s 1.8	3/4"	1" or 1-1/8"	2-5/16"
60 2.0			
60s 2.0	3/4"	7/8"	2-5/16"
90 2.0			
90s 2.0			
2x4 lumber (vertical)			

## Web Stiffener Nailing Schedule

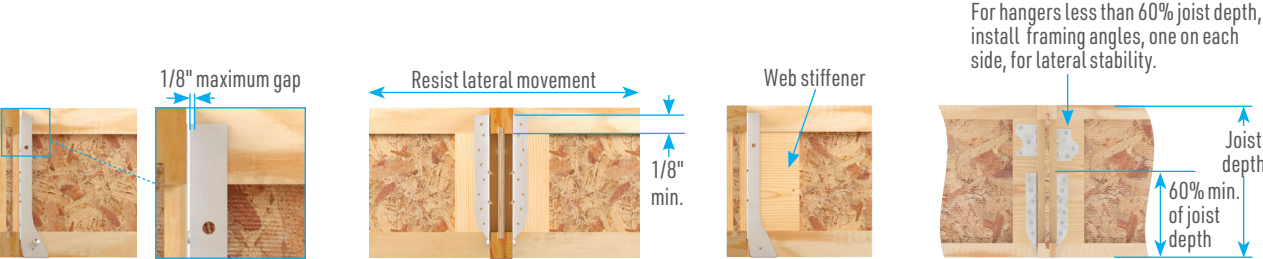
Web Stiffener Nailing Schedule				Web Stiffener Nailing Schedule			
BCI® Joist Series	Joist Depth	Bearing Location		BCI® Joist Series	Joist Depth	Bearing Location	
		End	Intermediate			End	Intermediate
5000 1.7	9-1/2"	(2) 8d	(2) 8d	4500s 1.8	9-1/2"	(2) 8d	(2) 8d
	11-7/8"	(2) 8d	(3) 8d		11-7/8"	(2) 8d	(3) 8d
	14"	(2) 8d	(5) 8d		14"	(2) 8d	(5) 8d
	16"	(2) 8d	(6) 8d		16"	(2) 8d	(6) 8d
6000 1.8	9-1/2"	(2) 8d	(2) 8d	5000s 1.8	9-1/2"	(2) 8d	(2) 8d
	11-7/8"	(2) 8d	(3) 8d		11-7/8"	(2) 8d	(3) 8d
	14"	(2) 8d	(5) 8d		14"	(2) 8d	(5) 8d
	16"	(2) 8d	(6) 8d		16"	(2) 8d	(6) 8d
6500 1.8	9-1/2"	(2) 8d	(2) 8d	6000s 1.8	9-1/2"	(2) 8d	(2) 8d
	11-7/8"	(2) 8d	(3) 8d		11-7/8"	(2) 8d	(3) 8d
	14"	(2) 8d	(5) 8d		14"	(2) 8d	(5) 8d
	16"	(2) 8d	(6) 8d		16"	(2) 8d	(6) 8d
60 2.0	11-7/8"	(2) 8d	(3) 8d	6500s 1.8	9-1/2"	(2) 8d	(2) 8d
	14"	(2) 8d	(5) 8d		11-7/8"	(2) 8d	(3) 8d
	16"	(2) 8d	(6) 8d		14"	(2) 8d	(5) 8d
	18"	(3) 8d	(7) 8d		16"	(2) 8d	(6) 8d
90 2.0	11-7/8"	(3) 16d	(3) 16d	60s 2.0	11-7/8"	(2) 8d	(3) 8d
	14"	(5) 16d	(5) 16d		14"	(2) 8d	(5) 8d
	16"	(6) 16d	(6) 16d		16"	(2) 8d	(6) 8d
	18"	(7) 16d	(7) 16d		18"	(2) 8d	(6) 8d
	20"	(8) 16d	(8) 16d		20"	(2) 8d	(6) 8d
90s 2.0	11-7/8"	(3) 16d	(3) 16d	90s 2.0	11-7/8"	(3) 16d	(3) 16d
	14"	(5) 16d	(5) 16d		14"	(5) 16d	(5) 16d
	16"	(6) 16d	(6) 16d		16"	(6) 16d	(6) 16d

# EWP INSTALLATION

## SUPPORT HEIGHT & LATERAL STABILITY

Hangers for joists **without web stiffeners** must support the I-Joist's top flange and provide lateral resistance with no less than 1/8" of contact with the top flange. MiTek recommends that hangers for joist

**with web stiffeners** should be 60% of the joist height for stability during construction. If this cannot be accomplished, potential joist rotation must be resolved by other means.



(Top flange support requirements can be verified in EWP Top Mount Hangers charts under Web stiffener Req. column of MiTek's Product Catalog)

## TOP FLANGE HANGERS

The thickness of the hanger metal and nail heads on top mount hangers must be evaluated for the effect on subsequent sheathing. Ensure that the top mount hanger is installed so the flanges of the hanger are not over-spread which tends to elevate the supported I-Joist

causing uneven floor surfaces and squeaking. Similarly, ensure that the hanger is installed plumb such that the face flanges of the hanger are mounted firmly against the wide-face surface of the header.



**FLUSH FRAMING**



**! HANGER OVER-SPREAD**



**! HANGER NOT PLUMB**

# SINGLE BCI® JOISTS



Joist Height	BCI® Max End Reactions <sup>8</sup>	Top Mount Hangers <sup>4,7</sup>							Face Mount Hangers							
		MiTek Stock No. <sup>1,6</sup>	Fastener Schedule <sup>5</sup>				Uplift <sup>3</sup> 160%	Down <sup>2</sup> 100%	MiTek Stock No. <sup>1,6</sup>	Fastener Schedule <sup>5</sup>				Uplift <sup>3</sup> 160%	Down <sup>2</sup> 100%	
			Header		Joist					Min/Max	Header		Joist			
Qty	Type	Qty	Type	Qty	Type	Qty	Type	Qty	Type	Qty	Type	Qty	Type	Qty	Type	
<b>BCI® 4500s Series</b>																
Joist Width = 1-3/4"																
9-1/2	1125	THO17950	6	10d	2	10d x 1-1/2	230	1235	IHFL17925	--	8	10d	--	--	50	960
11-7/8	1425	THO17118	6	10d	2	10d x 1-1/2	230	1235	IHFL17112	--	10	10d	--	--	50	1200
14	1525	TFL1714	6	10d	2	10d x 1-1/2	130	1585	IHFL1714	Max	14	10d	--	--	50	1680
16	1625	TFL1716	6	10d	2	10d x 1-1/2	130	1585	IHFL1716	Min	14	10d	--	--	50	1680
<b>BCI® 5000 1.7/5000s 1.8 Series</b>																
Joist Width = 2"																
9-1/2	1125	TFL2095	6	10d	2	10d x 1-1/2	130	1585	IHFL20925	--	8	10d	--	--	50	960
11-7/8	1425	TFL20118	6	10d	2	10d x 1-1/2	130	1585	IHFL20112	--	10	10d	--	--	50	1200
14	1525	TFL2014	6	10d	2	10d x 1-1/2	130	1585	IHFL2014	Max	14	10d	--	--	50	1680
16	1625	TFL2016	6	10d	2	10d x 1-1/2	130	1585	IHFL2016	Min	14	10d	--	--	50	1680
<b>BCI® 6000 1.8/6000s 1.8 Series</b>																
Joist Width = 2-5/16"																
9-1/2	1375	TFL2395	6	10d	2	10d x 1-1/2	130	1585	IHFL23925	--	8	10d	--	--	50	960
11-7/8	1425	TFL23118	6	10d	2	10d x 1-1/2	130	1585	IHFL23112	--	10	10d	--	--	50	1200
14	1525	TFL2314	6	10d	2	10d x 1-1/2	130	1585	IHFL2314	Max	14	10d	--	--	50	1680
16	1625	TFL2316	6	10d	2	10d x 1-1/2	130	1585	IHFL2316	Min	14	10d	--	--	50	1680
<b>BCI® 6500 1.8/6500s 1.8 Series</b>																
Joist Width = 2-9/16"																
9-1/2	1375	THO26950	10	10d	2	10d x 1-1/2	230	2525	THFI2595	--	8	10d	--	--	125	960
11-7/8	1425	THO26118	10	10d	2	10d x 1-1/2	230	2370	THFI25118	--	10	10d	--	--	125	1200
14	1525	THO26140	12	10d	2	10d x 1-1/2	230	2400	THFI2514	Max	14	10d	--	--	125	1680
16	1625	THO26160	12	10d	2	10d x 1-1/2	230	2400	IHF2616	Min	14	10d	2	10d x 1-1/2	330	1750
<b>BCI® 60 2.0/60s 2.0</b>																
Joist Width = 2-5/16"																
11-7/8	1425	TFL23118	6	10d	2	10d x 1-1/2	130	1585	IHFL23112	--	10	10d	--	--	50	1200
14	1525	TFL2314	6	10d	2	10d x 1-1/2	130	1585	IHFL2314	Max	14	10d	--	--	50	1680
16	1625	TFL2316	6	10d	2	10d x 1-1/2	130	1585	IHFL2316	Min Max	14 16	10d	--	--	50	1680 1920
18	2175	TFI3518	6	16d	2	10d x 1-1/2	215	2715	IHFL2316	Min Max	14 16	10d	--	--	50	1680 1920
<b>BCI® 90 2.0/90s 2.0 Series</b>																
Joist Width = 3-1/2"																
11-7/8	1850	THO35118	10	10d	2	10d x 1-1/2	230	2525	IHFL35112	Min Max	10 12	10d	--	--	50	1200 1440
14	1950	THO35140	12	10d	2	10d x 1-1/2	230	2400	IHFL3514	Min Max	12 14	10d	--	--	50	1440 1680
16	2150	THO35160	12	10d	2	10d x 1-1/2	230	2400	IHFL3516	Min Max	14 16	10d	--	--	50	1680 1920
18	2300	TFI418	6	16d	2	10d x 1-1/2	215	2715	IHFL3516	Min Max	14 16	10d	--	--	50	1680 1920
20	2500	TFI420	6	16d	2	10d x 1-1/2	215	2715	IHFL3516	Min Max	14 16	10d	--	--	50	1680 1920

1) Shaded hangers require web stiffeners at joist ends. Web stiffeners may be required for non-shaded hangers by Boise Cascade

2) Loads listed are based on hanger attachment to a DF or SP species solid sawn, or Versa-Lam® LVL header. Some loads may be increased for duration of load adjustments. Refer to MiTek Product Catalog for details.

3) Uplift loads have been increased 60% for wind and seismic loading; no further increase shall be permitted.

4) Top Mount Hangers require minimum 3" header thickness for THO series hangers; 3-1/2" minimum header thickness for all other stock numbers.

5) 10d x 1-1/2 nails are 0.148" diameter x 1-1/2" long, 10d nails are 0.148" diameter x 3" long, and 16d nails are 0.162" diameter x 3-1/2" long. 16d sinkers are 0.148" diameter x 3-1/4" long and may be used where 10d commons are specified.

6) Hangers utilizing 16d nails are not compatible with BCI® joists.

7) For top mount hangers supported by BCI headers with a flange thickness less than 1-1/2", the reduction factor for a 1-1/4" flange is 0.69 and 0.84 for a 1-3/8" flange.

8) BCI® Max End Reactions are based on BCI® Design Properties of 3 1/2" Bearing End Reaction (Lbs) with Web Stiffeners from Boise Cascade's Product Specifier Guide.

# SINGLE BCI® JOISTS



MSH



SKH\_L - left shown

Joist Height	BCI® Max End Reactions <sup>10</sup>	Adjustable Height Hangers						Skewed 45° Hangers							
		MiTek Stock No. <sup>1,7</sup>	Fastener Schedule <sup>4</sup>				Down <sup>2</sup> 100%	MiTek Stock No. <sup>1,5</sup>	Fastener Schedule <sup>4</sup>				Uplift <sup>3</sup> 160%	Down <sup>2</sup> 100%	
			Header		Joist				Min/Max	Header		Joist			
Qty	Type	Qty	Type	Qty	Type	Qty	Type	Qty	Type	Qty	Type	Qty	Type		
<b>BCI® 4500s Series</b>															
<b>Joist Width = 1-3/4"</b>															
9-1/2	1125	MSH1722 <sup>9</sup>	6	10d	4	10d x 1-1/2	2390	SKH1720L/R	--	14	10d	10	10d x 1-1/2	1530	1650
11-7/8	1425	MSH1722	6	10d	4	10d x 1-1/2	2390	SKH1720L/R	--	14	10d	10	10d x 1-1/2	1530	1650
14	1525	MSH1722	6	10d	4	10d x 1-1/2	2390	SKH1724L/R	--	16	10d	10	10d x 1-1/2	1530	1890
16	1625	MSH1722	6	10d	4	10d x 1-1/2	2390	SKH1724L/R	--	16	10d	10	10d x 1-1/2	1530	1890
<b>BCI® 5000 1.7/5000s 1.8 Series</b>															
<b>Joist Width = 2"</b>															
9-1/2	1125	MSH2022 <sup>9</sup>	6	10d	4	10d	2390	SKH2020L/R	--	14	10d	10	10d x 1-1/2	1530	1650
11-7/8	1425	MSH2022	6	10d	4	10d	2390	SKH2020L/R	--	14	10d	10	10d x 1-1/2	1530	1650
14	1525	MSH2022	6	10d	4	10d	2390	SKH2024L/R	--	16	10d	10	10d x 1-1/2	1530	1890
16	1625	MSH2022	6	10d	4	10d	2390	SKH2024L/R	--	16	10d	10	10d x 1-1/2	1530	1890
<b>BCI® 6000 1.8/6000s 1.8 Series</b>															
<b>Joist Width = 2-5/16"</b>															
9-1/2	1375	MSH2322 <sup>9</sup>	6	10d	4	10d x 1-1/2	2395	SKH2320L/R	--	14	10d	10	10d x 1-1/2	1530	1650
11-7/8	1425	MSH2322	6	10d	4	10d x 1-1/2	2395	SKH2320L/R	--	14	10d	10	10d x 1-1/2	1530	1650
14	1525	MSH2322	6	10d	4	10d x 1-1/2	2395	SKH2324L/R	--	16	10d	10	10d x 1-1/2	1530	1890
16	1625	MSH2322	6	10d	4	10d x 1-1/2	2395	SKH2324L/R	--	16	10d	10	10d x 1-1/2	1530	1890
<b>BCI® 6500 1.8/6500s 1.8 Series</b>															
<b>Joist Width = 2-9/16"</b>															
9-1/2	1375	MSH322 <sup>9</sup>	6	10d	4	10d x 1-1/2	2395	SKH2520L/R	--	14	10d	10	10d x 1-1/2	1530	1650
11-7/8	1425	MSH322	6	10d	4	10d x 1-1/2	2395	SKH2520L/R	--	14	10d	10	10d x 1-1/2	1530	1650
14	1525	MSH322	6	10d	4	10d x 1-1/2	2395	SKH2524L/R	--	16	10d	10	10d x 1-1/2	1530	1890
16	1625	MSH322	6	10d	4	10d x 1-1/2	2395	SKH2524L/R	--	16	10d	10	10d x 1-1/2	1530	1890
<b>BCI® 60 2.0/60s 2.0</b>															
<b>Joist Width = 2-5/16"</b>															
11-7/8	1425	MSH2322	6	10d	4	10d x 1-1/2	2395	SKH2320L/R	--	14	10d	10	10d x 1-1/2	1530	1650
14	1525	MSH2322	6	10d	4	10d x 1-1/2	2395	SKH2324L/R	--	16	10d	10	10d x 1-1/2	1530	1890
16	1625	MSH2322	6	10d	4	10d x 1-1/2	2395	SKH2324L/R	--	16	10d	10	10d x 1-1/2	1530	1890
18	2175	MSH2322	6	10d	4	10d x 1-1/2	2395	SKH2324L/R	--	16	10d	10	10d x 1-1/2	1530	1890
<b>BCI® 90 2.0/90s 2.0 Series</b>															
<b>Joist Width = 3-1/2"</b>															
11-7/8	1850	MSH422	6	10d	6	10d	2530	HD410_SK45L/R_BV <sup>6,8</sup>	Min	14	16d	6	10d	880	2155
									Max	20		10		1465	3080
14	1950	MSH422	6	10d	6	10d	2530	HD414_SK45L/R_BV <sup>6,8</sup>	Min	18	16d	8	10d	1135	2770
									Max	26		12		1755	4005
16	2150	MSH422	6	10d	6	10d	2530	HD414_SK45L/R_BV <sup>6,8</sup>	Min	18	16d	8	10d	1135	2770
									Max	26		12		1755	4005
18	2300	MSH422	6	10d	6	10d	2530	HD414_SK45L/R_BV <sup>6,8</sup>	Min	18	16d	8	10d	1135	2770
									Max	26		12		1755	4005
20	2500	MSH422	6	10d	6	10d	2530	HD414_SK45L/R_BV <sup>6,8</sup>	Min	18	16d	8	10d	1135	2770
									Max	26		12		1755	4005

1) Shaded hangers require web stiffeners at joist ends.

2) Loads listed are based on hanger attachment to a DF or SP species solid sawn, or Versa-Lam® LVL header. Some loads may be increased for duration of load adjustments. Refer to MiTek Product Catalog for details.

3) Uplift loads have been increased 60% for wind and seismic loading; no further increase shall be permitted.

4) 10d x 1-1/2 nails are 0.148" diameter x 1-1/2" long, 10d nails are 0.148" diameter x 3" long, and 16d nails are 0.162" diameter x 3-1/2" long. 16d sinkers are 0.148" diameter x 3-1/4" long and may be used where 10d commons are specified.

5) Hangers utilizing 16d nails are not compatible with BCI® joists.

6) Bevel cut required on end of joist to achieve design loads.

7) MSH allowable loads listed in this table assume Top-Min mounting condition installed with 4 - 10d top nails and 2 - 10d face nails. For MSH Face-Max and Top-Max mounting conditions not included in this table, refer to the current MiTek Product Catalog.

8) Hangers are special order. Contact MiTek for pricing and lead times.

9) Flanges on the bucket of the hanger may extend above the top of the joist.

10) BCI® Max End Reactions are based on BCI® Design Properties of 3 1/2" Bearing End Reaction (Lbs) with Web Stiffeners from Boise Cascade's Product Specifier Guide.

# DOUBLE BCI® JOISTS

Joist Height	BCI® Max End Reactions <sup>8</sup>	Top Mount Hangers <sup>4,7</sup>							Face Mount Hangers							
		MiTek Stock No. <sup>1,6</sup>	Fastener Schedule <sup>5</sup>				Uplift <sup>3</sup> 160%	Down <sup>2</sup> 100%	MiTek Stock No. <sup>1,6</sup>	Min/Max	Fastener Schedule <sup>5</sup>				Uplift <sup>3</sup> 160%	Down <sup>2</sup> 100%
			Header Qty	Type	Joist Qty	Type					Header Qty	Type	Joist Qty	Type		
<b>Double BCI® 4500s Series</b>																
<b>Joist Width = 3-1/2"</b>																
9-1/2	2250	THO35950	10	10d	2	10d x 1-1/2	230	2370	IHF35925	Min Max	10 24	10d 16d	2	10d x 1-1/2	330	1250 2085
11-7/8	2850	THO35118	10	10d	2	10d x 1-1/2	230	2525	IHF35112	Min Max	10 24	10d 16d	2	10d x 1-1/2	330	1250 2220
14	3050	THO35140	12	10d	2	10d x 1-1/2	230	2400	IHF3514	Min Max	12 28	10d 16d	2	10d x 1-1/2	330	1500 2220
16	3250	THO35160	12	10d	2	10d x 1-1/2	230	2400	IHF3516	Min Max	14 30	10d 16d	2	10d x 1-1/2	330	1750 2220
<b>Double BCI® 5000 1.7/5000s 1.8 Series</b>																
<b>Joist Width = 4"</b>																
9-1/2	2250	THO20950-2	10	16d	6	10d	1135	2920	IHF20925-2	Min Max	10 24	10d 16d	2	10d x 1-1/2	330	1250 2290
11-7/8	2850	THO20118-2	10	16d	6	10d	1135	2920	IHF20112-2	Min Max	10 24	10d 16d	2	10d x 1-1/2	330	1250 2400
14	3050	THO20140-2	10	16d	6	10d	1145	3640	IHF2014-2	Min Max	12 28	10d 16d	2	10d x 1-1/2	330	1500 2400
16	3250	THO20160-2	10	16d	6	10d	1145	3640	IHF2014-2	Min Max	12 28	10d 16d	2	10d x 1-1/2	330	1500 2400
<b>Double BCI® 6000 1.8/6000s 1.8 Series</b>																
<b>Joist Width = 4-5/8"</b>																
9-1/2	2750	THO23950-2	10	16d	6	10d	1145	3640	IHF23925-2	Min Max	10 24	10d 16d	2	10d x 1-1/2	330	1250 3530
11-7/8	2850	THO23118-2	10	16d	6	10d	1145	3640	THF23118-2	--	16	10d	6	10d	1135	1890
14	3050	THO23140-2	12	16d	6	10d	1145	4420	THF23140-2	--	20	10d	6	10d	1275	2660
16	3250	THO23160-2	12	16d	6	10d	1145	4420	THF23160-2	--	24	10d	6	10d	1275	3190
<b>Double BCI® 6500 1.8/6500s 1.8 Series</b>																
<b>Joist Width = 5-1/8"</b>																
9-1/2	2750	THO25950-2	10	16d	6	10d	1145	3640	IHF25925-2	Min Max	10 24	10d 16d	2	10d	330	1250 3530
11-7/8	2850	THO25118-2	10	16d	6	10d	1145	3640	IHF25112-2	Min Max	10 24	10d 16d	2	10d	330	1250 3530
14	3050	THO25140-2	12	16d	6	10d	1145	4420	THF25140-2	--	20	10d	6	10d	1275	2660
16	3250	THO25160-2	12	16d	6	10d	1145	4420	THF25160-2	--	24	10d	6	10d	1275	3190
<b>Double BCI® 60 2.0/60s 2.0</b>																
<b>Joist Width = 4-5/8"</b>																
11-7/8	2850	THO23118-2	10	16d	6	10d	1145	3640	THF23118-2	--	16	10d	6	10d	1135	1890
14	3050	THO23140-2	12	16d	6	10d	1145	4420	THF23140-2	--	20	10d	6	10d	1275	2660
16	3250	THO23160-2	12	16d	6	10d	1145	4420	THF23160-2	--	24	10d	6	10d	1275	3190
18	4350	THO23180-2	14	16d	6	10d	1145	5000	THF23160-2	--	24	10d	6	10d	1275	3190
<b>Double BCI® 90 2.0/90s 2.0 Series</b>																
<b>Joist Width = 7"</b>																
11-7/8	3700	BPH71118	10	16d	6	10d	1275	3075	HD7120	Min Max	16 22	16d 8	6 8	16d	1305 1845	2465 3390
14	3900	BPH7114	10	16d	6	10d	1275	3075	HD7140	Min Max	20 26	16d 12	8 12	16d	1845 2765	3080 4005
16	4300	BPH7116	10	16d	6	10d	1275	3075	HD7160	--	24	16d	8	10d	1560	3695
18	4600	BPH7118	10	16d	6	10d	1275	3075	HD7160	--	24	16d	8	10d	1560	3695
20	5000	BPH7120	10	16d	6	10d	1275	3075	HD7160	--	24	16d	8	10d	1560	3695



THO Double



BPH



THF Double



IHF



HD

1) Shaded hangers require web stiffeners at joist ends. Web stiffeners may be required for non-shaded hangers by Boise Cascade

2) Loads listed are based on hanger attachment to a DF or SP species solid sawn, or Versa-Lam® LVL header. Some loads may be increased for duration of load adjustments. Refer to MiTek Product Catalog for details.

3) Uplift loads have been increased 60% for wind and seismic loading; no further increase shall be permitted.

4) Top Mount Hangers require minimum 3" header thickness for THO series hangers; 3-1/2" minimum header thickness for all other stock numbers.

5) 10d x 1-1/2 nails are 0.148" diameter x 1-1/2" long, 10d

nails are 0.148" diameter x 3" long, and 16d nails are 0.162" diameter x 3-1/2" long. 16d sinkers are 0.148" diameter x 3-1/4" long and may be used where 10d commons are specified.

6) Hangers utilizing 16d nails are not compatible with BCI® joists.

7) For top mount hangers supported by BCI headers with a flange thickness less than 1-1/2", the reduction factor for a 1-1/4" flange is 0.69 and 0.84 for a 1-3/8" flange.

8) BCI® Max End Reactions are based on BCI® Design Properties of 3 1/2" Bearing End Reaction (Lbs) with Web Stiffeners from Boise Cascade's Product Specifier Guide.

# DOUBLE BCI® JOISTS

Joist Height	BCI® Max End Reactions <sup>11</sup>	Adjustable Height Hangers						Skewed 45° Hangers													
		MiTek Stock No. <sup>1,5,9</sup>	Fastener Schedule <sup>4,9</sup>				Down <sup>2</sup> 100%	MiTek Stock No. <sup>1,6</sup>	Fastener Schedule <sup>4,9</sup>				Uplift <sup>3</sup> 160%	Down <sup>2</sup> 100%							
			Header		Joist				Min/Max	Header		Joist									
Qty	Type	Qty	Type	Qty	Type	Qty	Type	Qty	Type	Qty	Type	Qty	Type								
<b>Double BCI® 4500s Series</b>														<b>Joist Width = 3-1/2"</b>							
9-1/2	2250	MSH422 <sup>10</sup>	6	10d	6	10d	2530	HD410_SK45L/R_BV <sup>7,8</sup>	Min	14	16d	6	10d	880	2155						
									Max	20		10		1465	3080						
11-7/8	2850	MSH422	6	10d	6	10d	2530	HD410_SK45L/R_BV <sup>7,8</sup>	Min	14	16d	6	10d	880	2155						
									Max	20		10		1465	3080						
14	3050	MSH422	6	10d	6	10d	2530	HD414_SK45L/R_BV <sup>7,8</sup>	Min	18	16d	8	10d	1135	2770						
									Max	26		12		1755	4005						
16	3250	MSH422	6	10d	6	10d	2530	HD414_SK45L/R_BV <sup>7,8</sup>	Min	18	16d	8	10d	1135	2770						
									Max	26		12		1755	4005						
<b>Double BCI® 5000 1.7/5000s 1.8 Series</b>														<b>Joist Width = 4"</b>							
9-1/2	2250	See current MiTek Product Catalog or BC Framers for specialty hanger options						SKH2020L/R-2 <sup>7</sup>	--	14	10d	10	10d	1645	1710						
11-7/8	2850							SKH2020L/R-2 <sup>7</sup>	--	14	10d	10	10d	1645	1710						
14	3050							SKH2024L/R-2 <sup>7</sup>	--	16	10d	10	10d	1680	1950						
16	3250							SKH2024L/R-2 <sup>7</sup>	--	16	10d	10	10d	1680	1950						
<b>Double BCI® 6000 1.8/6000s 1.8 Series</b>														<b>Joist Width = 4-5/8"</b>							
9-1/2	2750	MSH2322-2	6	10d	4	10d	2530	SKH2320L/R-2 <sup>7</sup>	--	14	10d	10	10d	1645	1710						
11-7/8	2850	MSH2322-2	6	10d	4	10d	2530	SKH2320L/R-2 <sup>7</sup>	--	14	10d	10	10d	1645	1710						
14	3050	MSH2322-2	6	10d	4	10d	2530	SKH2324L/R-2 <sup>7</sup>	--	16	10d	10	10d	1680	1950						
16	3250	MSH2322-2	6	10d	4	10d	2530	SKH2324L/R-2 <sup>7</sup>	--	16	10d	10	10d	1680	1950						
<b>Double BCI® 6500 1.8/6500s 1.8 Series</b>														<b>Joist Width = 5-1/8"</b>							
9-1/2	2750	MSH2622-2	6	10d	4	10d	2530	SKH2520L/R-2 <sup>7</sup>	--	14	10d	10	10d	1645	1710						
11-7/8	2850	MSH2622-2	6	10d	4	10d	2530	SKH2520L/R-2 <sup>7</sup>	--	14	10d	10	10d	1645	1710						
14	3050	MSH2622-2	6	10d	4	10d	2530	SKH2524L/R-2 <sup>7</sup>	--	16	10d	10	10d	1680	1950						
16	3250	MSH2622-2	6	10d	4	10d	2530	SKH2524L/R-2 <sup>7</sup>	--	16	10d	10	10d	1680	1950						
<b>Double BCI® 60 2.0/60s 2.0</b>														<b>Joist Width = 4-5/8"</b>							
11-7/8	2850	MSH2322-2	6	10d	4	10d	2530	SKH2320L/R-2 <sup>7</sup>	--	14	10d	10	10d	1645	1710						
14	3050	MSH2322-2	6	10d	4	10d	2530	SKH2324L/R-2 <sup>7</sup>	--	16	10d	10	10d	1680	1950						
16	3250	MSH2322-2	6	10d	4	10d	2530	SKH2324L/R-2 <sup>7</sup>	--	16	10d	10	10d	1680	1950						
18	4350	MSH2322-2	6	10d	4	10d	2530	SKH2324L/R-2 <sup>7</sup>	--	16	10d	10	10d	1680	1950						
<b>Double BCI® 90 2.0/90s 2.0 Series</b>														<b>Joist Width = 7"</b>							
11-7/8	3700	MSH422-2	8	16d	6	16d	3740	HD7120-SK45L/R_BV <sup>7,8</sup>	Min	16	16d	6	16d	980	2465						
									Max	22		8		1385	3390						
14	3900	MSH422-2	8	16d	6	16d	3740	HD7140-SK45L/R_BV <sup>7,8</sup>	Min	20	16d	8	16d	1385	3080						
									Max	26		12		2075	4005						
16	4300	MSH422-2	8	16d	6	16d	3740	HD7160-SK45L/R_BV <sup>7,8</sup>		24	16d	8	10d	1170	3695						
18	4600	--	--	--	--	--	--	HD7180-SK45L/R_BV <sup>7,8</sup>	--	28	16d	8	10d	1170	4310						
20	5000	--	--	--	--	--	--	HD7180-SK45L/R_BV <sup>7,8</sup>	--	28	16d	8	10d	1170	4310						



SKH\_L Double - Left shown



MSH

- 1) Shaded hangers require web stiffeners at joist ends.
- 2) Loads listed are based on hanger attachment to a DF or SP species solid sawn, or Versa-Lam® LVL header. Some loads may be increased for duration of load adjustments. Refer to MiTek Product Catalog for details.
- 3) Uplift loads have been increased 60% for wind and seismic loading; no further increase shall be permitted.
- 4) 10d x 1-1/2" nails are 0.148" diameter x 1-1/2" long, 10d nails are 0.148" diameter x 3" long, and 16d nails are 0.162" diameter x 3-1/2" long. 16d sinkers are 0.148" diameter x 3-1/4" long and may be used where 10d commons are specified.
- 5) For additional sizes, stock numbers, and modifications not shown, refer to MiTek's Product Catalog.
- 6) Bevel cut required on end of joist to achieve design loads.
- 7) Hangers utilizing 16d nails are not compatible with BCI® joists.
- 8) Hangers are special order. Consult MiTek for pricing and lead times.
- 9) MSH allowable loads listed in this table assume Top-Min mounting condition installed with 4 - 10d top nails and 2 - 10d face nails. For MSH Face-Max and Top-Max mounting conditions not included in this table, refer to the current MiTek Product Catalog.
- 10) Flanges on the bucket of the hanger may extend above the top of the joist.
- 11) BCI® Max End Reactions are based on BCI® Design Properties of 3 1/2" Bearing End Reaction (Lbs) with Web Stiffeners from Boise Cascade's Product Specifier Guide.



# VERSA-LAM® LVL BEAMS & HEADERS



Joist Height	Versa-Lam® LVL Allowable Shear (Lbs) <sup>8</sup>	Top Mount Hangers <sup>3</sup>								Face Mount Hangers								
		MiTek Stock No.	D Dim <sup>7</sup>	Fastener Schedule <sup>4</sup>				Uplift <sup>2</sup> 160%	Down <sup>1</sup> 100%	MiTek Stock No.	D Dim <sup>7</sup>	Fastener Schedule <sup>4</sup>				Uplift <sup>2</sup> 160%	Down <sup>1</sup> 100%	
				Qty	Type	Qty	Type					Min/Max	Header Qty	Type	Joist Qty			Type
<b>1-3/4" Versa-Lam® LVL</b>																		
7-1/4	2411	PHXU17725	3-1/4	8	16d	6	10d x 1-1/2	930	4350	HD1770	2-1/2	Min	12	16d	4	10d x 1 1/2	760	1850
												Max	16	16d	8	10d x 1 1/2	1190	2465
9-1/4	3076	BPH17925	2-3/8	10	16d	4	10d x 1-1/2	850	2970	HD17925	2-1/2	Min	18	16d	6	10d x 1 1/2	1170	2770
		PHXU17925	3-1/4	8	16d	6	10d x 1-1/2	930	4350	HUS179 <sup>5</sup>	3	--	30	16d	10	16d	4110	5580
9-1/2	3159	THO17950	2	6	10d	2	10d x 1-1/2	230	1235	HD17925	2-1/2	Min	18	16d	6	10d x 1 1/2	1170	2770
		PHXU1795	3-1/4	8	16d	6	10d x 1-1/2	930	4350	HUS179 <sup>5</sup>	3	--	30	16d	10	16d	4110	5580
11-1/4	3741	BPH17112	2-3/8	10	16d	4	10d x 1-1/2	850	2970	HD17112	2-1/2	Min	22	16d	6	10d x 1 1/2	1170	3390
		PHXU17112	3-1/4	8	16d	6	10d x 1-1/2	930	4350	HUS179 <sup>5</sup>	3	--	30	16d	12	10d x 1 1/2	1900	4320
11-7/8	3948	THO17118	2	6	10d	2	10d x 1-1/2	230	1235	HD17112	2-1/2	Min	22	16d	6	10d x 1 1/2	1170	3390
		PHXU17118	3-1/4	8	16d	6	10d x 1-1/2	930	4350	HUS179 <sup>5</sup>	3	--	30	16d	10	16d	4110	5580
14	4655	BPH1714	2-3/8	10	16d	4	10d x 1-1/2	850	2970	HD1714	2-1/2	Min	28	16d	8	10d x 1 1/2	1510	3790
		PHXU1714	3-1/4	8	16d	6	10d x 1-1/2	930	4350	HUS179 <sup>5</sup>	3	--	30	16d	10	16d	4110	5580
<b>2 Ply 1-3/4" Versa-Lam® LVL or 3-1/2" Versa-Lam® LVL</b>																		
7-1/4	4822	PHXU35725	3-1/4	8	16d	6	10d	1120	5910	THD48	3	--	28	16d	16	10d	2595	4310
		HBPH35925	3-1/2	22	16d	10	16d	2705	6310	THD410	3	--	38	16d	20	10d	3905	5850
9-1/4	6152	HLBH35925	6	15	NA16D-RS	6	16d	1420	10045	THDH410 <sup>5</sup>	4	--	46	16d	12	16d	4345	9020
		HBPH3595	3-1/2	22	16d	10	16d	2705	6310	THD410	3	--	38	16d	20	10d	3905	5850
9-1/2	6318	HLBH3595	6	15	NA16D-RS	6	16d	1420	10045	THDH410 <sup>5</sup>	4	--	46	16d	12	16d	4345	9020
		HBPH35112	3-1/2	22	16d	10	16d	2705	6310	THD410	3	--	38	16d	20	10d	3905	5850
11-1/4	7482	HLBH35112	6	15	NA16D-RS	6	16d	1420	10045	THDH412 <sup>5</sup>	4	--	56	16d	14	16d	5290	9710
		HBPH35118	3-1/2	22	16d	10	16d	2705	6310	THD410	3	--	38	16d	20	10d	3905	5850
11-7/8	7896	HLBH35118	6	15	NA16D-RS	6	16d	1420	10045	THDH412 <sup>5</sup>	4	--	56	16d	14	16d	5290	9710
		HBPH3514	3-1/2	22	16d	10	16d	2705	6310	THD410	3	--	38	16d	20	10d	3905	5850
14	9310	HLBH3514	6	15	NA16D-RS	6	16d	1420	10045	THDH414 <sup>5</sup>	4	--	66	16d	16	16d	5305	11325
		HBPH3516	3-1/2	22	16d	10	16d	2705	6310	THD412	3	--	48	16d	20	10d	3905	7045
16	10640	HLBH3516	6	15	NA16D-RS	6	16d	1420	10045	THDH414 <sup>5</sup>	4	--	66	16d	16	16d	5305	11325
		HBPH3518	3-1/2	22	16d	10	16d	2705	6310	THD412	3	--	48	16d	20	10d	3905	7045
18	11970	HLBH3518	6	15	NA16D-RS	6	16d	1420	10045	THDH414 <sup>5</sup>	4	--	66	16d	16	16d	5305	11325
		HBPH3520	3-1/2	22	16d	10	16d	2705	6310	THD414	3	--	58	16d	20	10d	3905	7045
20	13300	HLBH3520	6	15	NA16D-RS	6	16d	1420	10045	THDH414 <sup>5,7</sup>	4	--	66	16d	16	16d	5305	11325
		PHXU3522	3-1/4	8	16d	6	10d	1120	5910	HD418	2-1/2	--	28	16d	8	10d	1560	4310
22	14630	HBPH3522	3-1/2	22	16d	10	16d	2705	6310	THDH414 <sup>5,7</sup>	4	--	66	16d	16	16d	5305	11325
24	15960	HBPH3524	3-1/4	22	16d	10	16d	2705	6310	HD418	2-1/2	--	28	16d	8	10d	1560	4310

1) Loads listed are based on hanger attachment to a DF or SP species LVL header. Some loads may be increased for duration of load adjustments. Refer to MiTek's Product Catalog for details.

2) Uplift loads have been increased 60% for wind and seismic loading; no further increase shall be permitted.

3) Top Mount Hangers require a minimum 3" header thickness for THO series hangers; 3-1/2" minimum header thickness for all other stock numbers.

4) 10d x 1-1/2 nails are 0.148" diameter x 1-1/2" long, 10d nails are 0.148" diameter x 3" long, and 16d nails are 0.162" diameter x 3-1/2" long. 16d sinkers are 0.148" diameter x 3-1/4" long and may be used where 10d commons are specified.

5) Joist nails need to be toe nailed at a 30° to 45° angle with the carried member to achieve listed loads for THDH and HUS models.

6) Supplemental lateral support connection recommended when hanger height is less than 60% of joist height.

7) D Dim is the length of the hanger seat.

8) Versa-Lam® LVL Allowable Shear values were obtained from Boise Cascade's Product Specifier Guide.

# VERSA-LAM® LVL BEAMS & HEADERS



Joist Height	Versa-Lam® LVL Allowable Shear (Lbs) <sup>10</sup>	Top Mount Hangers <sup>3</sup>								Face Mount Hangers								
		MiTek Stock No. <sup>6</sup>	D Dim <sup>9</sup>	Fastener Schedule <sup>4</sup>				Uplift <sup>2</sup> 160%	Down <sup>1</sup> 100%	MiTek Stock No. <sup>6</sup>	D Dim <sup>9</sup>	Fastener Schedule <sup>4</sup>				Uplift <sup>2</sup> 160%	Down <sup>1</sup> 100%	
				Qty	Type	Qty	Type					Min/Max	Header Qty	Type	Joist Qty			Type
<b>3 Ply 1-3/4" Versa-Lam® LVL or 5-1/4" Versa-Lam® LVL</b>																		
7-1/4	<b>7232</b>	BPH55725	2-1/4	10	16d	6	10d	850	3065	HD68	2-1/2	Min	10	16d	4	16d	920	1540
												Max	14	16d	6	16d	1305	2155
9-1/4	<b>9227</b>	HBPB55925	3-1/2	22	16d	10	16d	2705	6185	THD610	3	--	38	16d	20	10d	4035	6535
		HLBH55925	6	15	NA16D-RS	6	16d	1580	10045	THDH610 <sup>5</sup>	4	--	46	16d	16	16d	5290	9020
9-1/2	<b>9476</b>	HBPB5595	3-1/2	22	16d	10	16d	2705	6185	THD610	3	--	38	16d	20	10d	4035	6535
		HLBH5595	6	15	NA16D-RS	6	16d	1580	10045	THDH610 <sup>5</sup>	4	--	46	16d	16	16d	5290	9020
11-1/4	<b>11222</b>	HBPB55112	3-1/2	22	16d	10	16d	2705	6185	THD610	3	--	38	16d	20	10d	4035	6535
		HLBH55112	6	15	NA16D-RS	6	16d	1580	10045	THDH612 <sup>5</sup>	4	--	56	16d	20	16d	5290	9530
11-7/8	<b>11845</b>	HBPB55118	3-1/2	22	16d	10	16d	2705	6185	THD610	3	--	38	16d	20	10d	4035	6535
		HLBH55118	6	15	NA16D-RS	6	16d	1580	10045	THDH612 <sup>5</sup>	4	--	56	16d	20	16d	5290	9530
14	<b>13965</b>	HBPB5514	3-1/2	22	16d	10	16d	2705	6185	THD610	3	--	38	16d	20	10d	4035	6535
		HLBH5514	6	15	NA16D-RS	6	16d	1580	10045	THDH614 <sup>5</sup>	4	--	66	16d	22	16d	5305	11325
16	<b>15960</b>	HBPB5516	3-1/2	22	16d	10	16d	2705	6185	THD612	3	--	48	16d	20	10d	4035	8255
		HLBH5516	6	15	NA16D-RS	6	16d	1580	10045	THDH614 <sup>5</sup>	4	--	66	16d	22	16d	5305	11325
18	<b>17955</b>	HBPB5518	3-1/2	22	16d	10	16d	2705	6185	THD612	3	--	48	16d	20	10d	4035	8255
		HLBH5518	6	15	NA16D-RS	6	16d	1580	10045	THDH614 <sup>5</sup>	4	--	66	16d	22	16d	5305	11325
20	<b>19950</b>	HBPB5520	3-1/2	22	16d	10	16d	2705	6185	THD614 <sup>9</sup>	3	--	58	16d	20	10d	4035	8285
		HLBH5520	6	15	NA16D-RS	6	16d	1580	10045	THDH614 <sup>5</sup>	4	--	66	16d	22	16d	5305	11325
22	<b>21945</b>	XHLBH5522 <sup>8</sup>	6	15	NA16D-RS	6	16d	1580	10045	THD614 <sup>9</sup>	3	--	58	16d	20	10d	4035	8285
		--	--	--	--	--	--	--	--	THDH614 <sup>5</sup>	4	--	66	16d	22	16d	5305	11325
24	<b>23940</b>	XHLBH5524 <sup>8</sup>	6	15	NA16D-RS	6	16d	1580	10045	THD614 <sup>9</sup>	3	--	58	16d	20	10d	4035	8285
		--	--	--	--	--	--	--	--	THDH614 <sup>5</sup>	4	--	66	16d	22	16d	5305	11325
<b>4 Ply 1-3/4" Versa-Lam® LVL or 7" Versa-Lam® LVL</b>																		
9-1/4	<b>12303</b>	HBPB71925	3-1/2	22	16d	10	16d	2705	6185	THD7210	3	--	38	16d	20	10d	4035	6535
		HLBH71925	6	15	NA16D-RS	6	16d	1580	10045	THDH7210 <sup>5</sup>	4	--	46	16d	12	16d	4345	9020
9-1/2	<b>12635</b>	HBPB7195	3-1/2	22	16d	10	16d	2705	6185	THD7210	3	--	38	16d	20	10d	4035	6535
		HLBH7195	6	15	NA16D-RS	6	16d	1580	10045	THDH7210 <sup>5</sup>	4	--	46	16d	12	16d	4345	9020
11-1/4	<b>14963</b>	HBPB71112	3-1/2	22	16d	10	16d	2705	6185	THD7210	3	--	38	16d	20	10d	4035	6535
		HLBH71112	6	15	NA16D-RS	6	16d	1580	10045	THDH7212 <sup>5</sup>	4	--	56	16d	14	16d	5290	9020
11-7/8	<b>15794</b>	HBPB71118	3-1/2	22	16d	10	16d	2705	6185	THD7210	3	--	38	16d	20	10d	4035	6535
		HLBH71118	6	15	NA16D-RS	6	16d	1580	10045	THDH7212 <sup>5</sup>	4	--	56	16d	14	16d	5290	9020
14	<b>18620</b>	HBPB7114	3-1/2	22	16d	10	16d	2705	6185	THD7210	3	--	38	16d	20	10d	4035	6535
		HLBH7114	6	15	NA16D-RS	6	16d	1580	10045	THDH7214 <sup>5</sup>	4	--	66	16d	16	16d	5305	11325
16	<b>21280</b>	HBPB7116	3-1/2	22	16d	10	16d	2705	6185	HD7120	2-1/2	Min	16	16d	6	16d	1305	2465
		HLBH7116	6	15	NA16D-RS	6	16d	1580	10045	THDH7214 <sup>5</sup>	4	--	66	16d	16	16d	5305	11325
18	<b>23940</b>	HBPB7118	3-1/2	22	16d	10	16d	2705	6185	HD7140	2-1/2	Min	20	16d	8	16d	1845	3080
		HLBH7118	6	15	NA16D-RS	6	16d	1580	10045	THDH7214 <sup>5</sup>	4	--	66	16d	16	16d	5305	11325
20	<b>26600</b>	HBPB7120	3-1/2	22	16d	10	16d	2705	6185	HD7140	2-1/2	Max	26	16d	12	16d	2765	4005
		HLBH7120	6	15	NA16D-RS	6	16d	1580	10045	THDH7214 <sup>5</sup>	4	--	66	16d	16	16d	5305	11325
22	<b>29260</b>	HBPB7122	3-1/2	22	16d	10	16d	2705	6185	HD7180	2-1/2	--	28	16d	8	10d	1560	4310
		HLBH7122	6	15	NA16D-RS	6	16d	1580	10045	THDH7214 <sup>5</sup>	4	--	66	16d	16	16d	5305	11325
24	<b>31920</b>	HBPB7124	3-1/2	22	16d	10	16d	2705	6185	HD7180	2-1/2	--	28	16d	8	10d	1560	4310
		HLBH7124	6	15	NA16D-RS	6	16d	1580	10045	THDH7214 <sup>5</sup>	4	--	66	16d	16	16d	5305	11325

Footnotes on page 11

# VERSA-LAM<sup>®</sup> LVL BEAMS & HEADERS

- 1) Loads listed are based on hanger attachment to a DF or SP species LVL header. Some loads may be increased for duration of load adjustments. Refer to MiTek's Product Catalog for details.
- 2) Uplift loads have been increased 60% for wind and seismic loading; no further increase shall be permitted.
- 3) Top Mount Hangers require a minimum 3" header thickness for THO series hangers; 3-1/2" minimum header thickness for all other stock numbers.
- 4) 10d x 1-1/2" nails are 0.148" diameter x 1-1/2" long, 10d nails are 0.148" diameter x 3" long, and 16d nails are 0.162" diameter x 3-1/2" long. 16d sinkers are 0.148" diameter x 3-1/4" long and may be used where 10d commons are specified.
- 5) Joist nails need to be toe nailed at a 30° to 45° angle with the carried member to achieve listed loads for THDH models.
- 6) For additional sizes, stock numbers, and modifications not shown, refer to MiTek's Product Catalog.
- 7) Hangers are special order. Contact MiTek for pricing and lead times.
- 8) Supplemental lateral support connection recommended when hanger height is less than 60% of joist height.
- 9) D Dim is the length of the hanger seat.
- 10) Versa-Lam<sup>®</sup> LVL Allowable Shear values were obtained from Boise Cascade's Product Specifier Guide.

# SLOPE/SKEW HANGERS

The LSSH series connects rafters to ridge beams in vaulted roof structures. This series is field adjustable to meet a variety of skew and/or slope applications. Slopes and skews 0° to 45°.

## Installation:

→ Use all specified fasteners.

**Steps:** (See LSSH Figure 1)

1. Position LSSH connector against plumb-cut end of joist. Fasten joist side flanges on both sides with 10d (0.148") x 1-1/2" nails. Bend seat up to fit against joist bottom and drive (1) 10d (0.148") x 1-1/2" nail through bottom seat into joist bottom flange. Drive (2) 10d (0.148") x 1-1/2" nail at downward angle through dimpled nailing guides.
2. Lean connector and rafter end against ridge beam at desired position. Install 10d (0.148" x 3") or 16d (0.162" x 3-1/2") nails through nail holes into ridge beam at right 90° angle. If skewing the rafter, only drive nails into ridge beam on inside flange.
3. Bend flange to desired angle.
4. Hammer outside flange until edge touches header. Fasten outside flange to ridge by driving 10d (0.148" x 3") or 16d (0.162" x 3-1/2") nails through nail holes.

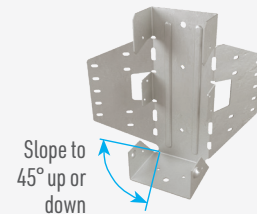
→ Web stiffeners are required for all wood I-Joist installations.

→ Designer may consider adding a tension restraint for the supported member for roof slopes exceeding 6/12.

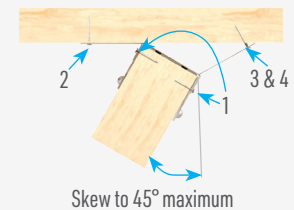
Typical LSSH installation



LSSH



LSSH Figure 1



Joist Height	MiTek Stock No. <sup>1,6</sup>	Installation Type	Fastener Schedule <sup>4,7</sup>				DF	
			Header		Joist		Uplift <sup>3</sup> 160%	Down <sup>2</sup> 100%
			Qty	Type	Qty	Type		
<b>BCI® 4500s 1.8 Series</b>			<b>Joist Width = 1-3/4"</b>					
9-1/2– 16	LSSH179-TZ	Sloped Only	10	10d	7	10d x 1-1/2	880	1200
		Skewed Only <u>or</u> Sloped & Skewed	10	10d	7	10d x 1-1/2	880	1200
<b>BCI® 5000 1.7/5000s 1.8 Series</b>			<b>Joist Width = 2"</b>					
9-1/2– 16	LSSH20-TZ	Sloped Only	10	10d	7	10d x 1-1/2	795	1200
		Skewed Only <u>or</u> Sloped & Skewed	10	10d	7	10d x 1-1/2	795	1200
<b>BCI® 6000 1.8/6000s 1.8 Series</b>			<b>Joist Width = 2-5/16"</b>					
9-1/2– 16	LSSH23-TZ	Sloped Only	10	10d	7	10d x 1-1/2	795	1200
		Skewed Only <u>or</u> Sloped & Skewed	10	10d	7	10d x 1-1/2	795	1200
<b>BCI® 6500 1.8/6500s 1.8 Series</b>			<b>Joist Width = 2-9/16"</b>					
9-1/2– 16	LSSH25-TZ	Sloped Only	18	16d	12	10d x 1-1/2	945	2095
		Skewed Only <u>or</u> Sloped & Skewed	14	16d	12	10d x 1-1/2	945	1610
<b>BCI® 60 2.0/60s 2.0 Series</b>			<b>Joist Width = 2-5/16"</b>					
11-7/8– 18	LSSH23-TZ	Sloped Only	10	10d	7	10d x 1-1/2	795	1200
		Skewed Only <u>or</u> Sloped & Skewed	10	10d	7	10d x 1-1/2	795	1200
<b>BCI® 90 2.0/90s 2.0 Series</b>			<b>Joist Width = 3-1/2"</b>					
11-7/8– 20	LSSH35-TZ	Sloped Only	18	16d	12	10d x 1-1/2	1310	2645
		Skewed Only <u>or</u> Sloped & Skewed	14	16d	12	10d x 1-1/2	1310	1610

1) Shaded hangers require web stiffeners at joist ends.

2) Loads listed are based on hanger attachment to a DF or SP species solid sawn, or Versa-Lam® LVL header. Some loads may be increased for duration of load adjustments. Refer to MiTek Product Catalog for details.

3) Uplift loads have been increased 60% for wind and seismic loading; no further increase shall be permitted.

4) For exterior applications, hot-dip galvanized (HDG) fasteners must be used.

5) Hangers utilizing 16d nails are not compatible with BCI® joists.

6) Supplemental lateral support connection recommended when hanger height is less than 60% of joist height.

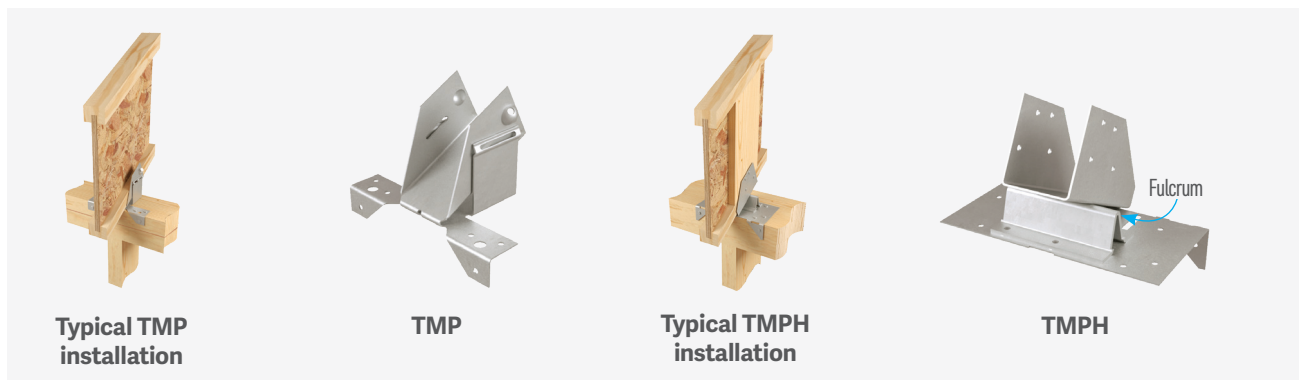
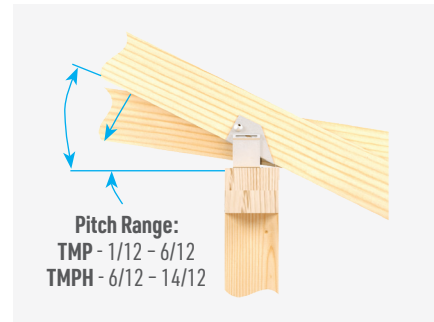
7) **NAILS:** 10d x 1-1/2" nails are 0.148" diameter x 1-1/2" long and 10d nails are 0.148" diameter x 3" long.

# VARIABLE PITCH CONNECTORS

The TMP and TMPH are designed to make rafter-to-plate connections and eliminate time-consuming bird's-mouth notching or bevel plate installation.

## Installation:

- Use all specified fasteners.
- Position connector on top plate. Fasten connector to outside of top plate with specified nails. Insert rafter into rafter pocket. Adjust rafter and pocket to correct pitch. Fasten rafter to connector with specified nails. Installing the **TMP** require driving specified nails through the opposing slots in the pocket. **TMPH** installation involves sliding the fulcrum until it supports the pocket at the desired pitch and nailing down through the fulcrum base into the top plate to lock the fulcrum into position.



## TMP Chart

Joist Height	MiTek Stock No.	Fastener Schedule <sup>4</sup>				DF	
		Plate		Rafter		Uplift <sup>3</sup> 160%	Down <sup>2</sup> 100%
	Qty	Type	Qty	Type			
<b>BCI<sup>®</sup> 4500s Series</b>							
Joist Width = 1-3/4"							
All	TMP175	6	10d	4	10d x 1-1/2	245	1705
<b>BCI<sup>®</sup> 5000 1.7/5000s 1.8 Series</b>							
Joist Width = 2"							
All	TMP21	6	10d	4	10d x 1-1/2	245	1705
<b>BCI<sup>®</sup> 6000 1.8/6000s 1.8/60 2.0/60s 2.0 Series</b>							
Joist Width = 2-5/16"							
All	TMP23	6	10d	4	10d x 1-1/2	245	1705
<b>BCI<sup>®</sup> 6500 1.8/6500s 1.8 Series</b>							
Joist Width = 2-9/16"							
All	TMP25	6	10d	4	10d x 1-1/2	245	1705
<b>BCI<sup>®</sup> 90 2.0/90s 2.0 Series</b>							
Joist Width = 3-1/2"							
All	TMP4	6	10d	4	10d x 1-1/2	245	1705

- 1) Web stiffeners may be required for hanger by Boise Cascade.
- 2) Loads listed are based on hanger attachment to a DF species solid sawn or Versa-Lam<sup>®</sup> LVL header. Loads are governed by test results; no further increase shall be permitted.
- 3) Uplift loads have been increased 60% for wind and seismic loading; no further increase shall be permitted.
- 4) **NAILS:** 10d x 1-1/2 nails are 0.148" diameter x 1-1/2" long, 10d nails are 0.148" diameter x 3" long.

## TMPH Chart

Joist Height	MiTek Stock No. <sup>1</sup>	Fastener Schedule <sup>4</sup>				DF										
		Plate		Rafter		According to Pitch <sup>2</sup>										
	Top Qty	Side Qty	Type	Qty	Type	6/12	7/12	8/12	9/12	10/12	11/12	12/12	13/12	14/12	Uplift <sup>3</sup> 160%	
<b>BCI<sup>®</sup> 4500s Series</b>																
Joist Width = 1-3/4"																
All	TMPH175	8	2	10d	8	10d x 1-1/2	3190	3290	3390	3140	2900	2710	2520	2230	1950	330
<b>BCI<sup>®</sup> 5000 1.7/5000s 1.8 Series</b>																
Joist Width = 2"																
All	TMPH21	8	2	10d	8	10d x 1-1/2	3190	3290	3390	3140	2900	2710	2520	2230	1950	330
<b>BCI<sup>®</sup> 6000 1.8/6000s 1.8/60 2.0/60s 2.0 Series</b>																
Joist Width = 2-5/16"																
All	TMPH23	8	2	10d	8	10d x 1-1/2	3190	3290	3390	3140	2900	2710	2520	2230	1950	330
<b>BCI<sup>®</sup> 6500 1.8/6500s 1.8 Series</b>																
Joist Width = 2-9/16"																
All	TMPH25	8	2	10d	8	10d x 1-1/2	3190	3290	3390	3140	2900	2710	2520	2230	1950	330
<b>BCI<sup>®</sup> 90 2.0/90s 2.0 Series</b>																
Joist Width = 3-1/2"																
All	TMPH4	8	2	10d	8	10d x 1-1/2	3190	3290	3390	3140	2900	2710	2520	2230	1950	330

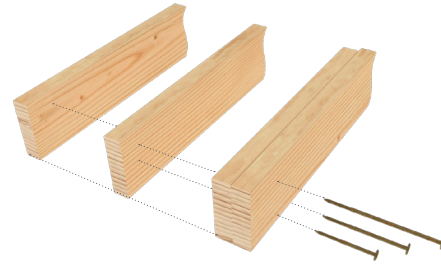
- 1) Web stiffeners are required for all Wood I-Joist installations.
- 2) Loads listed are based on hanger attachment to a DF species solid sawn or Versa-Lam<sup>®</sup> LVL header. Loads are governed by test results; no further increase shall be permitted.
- 3) Uplift loads have been increased 60% for wind and seismic loading; no further increase shall be permitted.
- 4) **NAILS:** 10d x 1-1/2 nails are 0.148" diameter x 1-1/2" long, 10d nails are 0.148" diameter x 3" long.

# JOINING 2, 3, OR 4 PLY VERSA-LAM® LVL MEMBERS

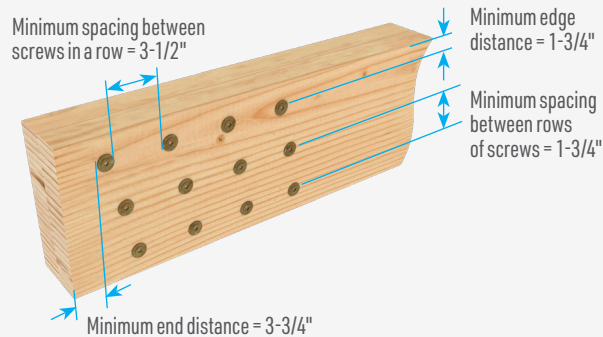
## WSWH WASHER HEAD INTERIOR STRUCTURAL WOOD SCREW APPLICATIONS

### Installation Notes:

- Using a standard 1/2" low speed/high torque drill, install screws into the side of the outermost ply. As the threads fully engage the final ply, allow the underside of the washer head to pull the plies firmly together. Washer head will install flush with the surface of the wood, but do not overdrive as this may damage the beam.
- Refer to the information in this bulletin for proper WSWH screw size selection and fastening pattern.



### Minimum Spacing Requirements:



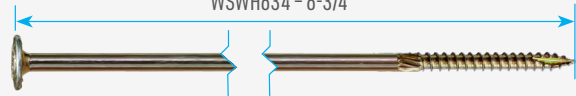
### Fastener Identification

For easier selection and post installation inspection, all MiTek Structural Wood Screws carry an identifying headmarking



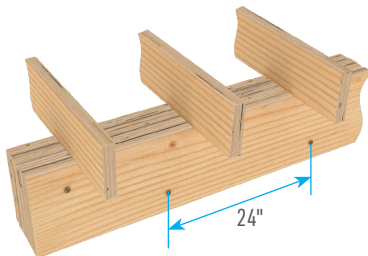
### Screw Length

WSWH338 - 3-3/8"  
WSWH5 - 5"  
WSWH634 - 6-3/4"

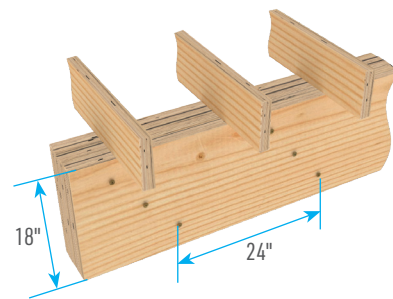


### Top Loaded Beams

Where floor joists rest on all plies of the beam, WSWH screws should be installed in two staggered rows at 24" O.C. spacing. Maintain the minimum end and edge distance as indicated above.



For beam depths of 18" or more, this pattern should be increased to three staggered rows of WSWH screws every 24" on center.



### General Guidelines:

- Beams wider than 7" require special consideration by the design professional. The values on the next page do not apply.
- Excessively warped or curved lumber should never be forced into alignment by use of clamps, screws or bolts as splitting may occur, potentially decreasing the carrying capacity of the beam.
- Refer to MiTek's Joining Multiple Member (Multi-ply) Engineered Wood (EWP) Beams Technical Bulletin as a guide for selecting the proper length wood screw for that application.
- A qualified designer or engineer should always be consulted for critical assemblies and fastening requirements.

# JOINING 2, 3, OR 4 PLY VERSA-LAM® LVL MEMBERS

## WSWH WASHER HEAD INTERIOR STRUCTURAL WOOD SCREW APPLICATIONS

### Fastener Size Selection by Assembly Type

(2 rows shown)



### Side Loaded Beams

Where floor joists are joined to the side of the beam (typically using a joist hanger), this load chart must be used to establish the proper pattern based on the design load as determined by the engineer and noted on the plans.

Length (in)	MiTek USP Stock No.	No. of Screws Vertical Column	Spacing Between Screws in a Row (in)	Allowable Side Loads by Assembly Type (lbs/lineal ft) (See Graphics) <sup>1,2,3,4,5</sup>					
				A	B	C	D	E	F
3-3/8	WSWH338	2	24	640					
			19.2	800	--	--	--	--	--
			16	955					
		3	24	955					
			19.2	1195	--	--	--	--	--
			16	1435					
5	WSWH5	2	24		535	535			
			19.2	--	670	670	--	--	--
			16		805	805			
		3	24		805	805			
			19.2	--	1005	1005	--	--	--
			16		1210	1210			
6-3/4	WSWH634	2	24				475	715	475
			19.2	--	--	--	595	895	595
			16				715	1075	715
		3	24				715	1075	715
			19.2	--	--	--	895	1345	895
			16				1075	1610	1075

- 1) Allowable loads are derived from tested fastener values as reported in ICC-ES ESR-2761.
- 2) The uniform loads in this table relate only to the capacity of the fastener to transfer shear loads between plies. The specific gravity (SG) and the capacity of the EWP should be verified with manufacturer's literature.
- 3) Values listed reflect 100% load duration. (CD=1.0) The designer may apply adjustment factors to increase or decrease these loads per the NDS based on conditions for each assembly.
- 4) Load values depicted assume all uniform load is applied to the outermost ply or point of entry for the screw.
- 5) To minimize rotation, 7" wide beams shall be side loaded only when loads are applied to both sides of the beam with the lesser loaded side bearing at least 25% of the overall design load.
- 6) Tip side loading to beam is allowed for 50% of listed allowable head side load. Head side and tip side of beam can be loaded concurrently so long as they do not exceed 150% listed head side capacity. (Example: A 3-ply assembly with a head side load of 1,200 plf and tip side load of 600 plf may be fastened together with 3 rows of WSWH5 screws at 16" O.C. spacing between fasteners in a row).

