



by Weyerhaeuser

Trus Joist®

TJI® 110

TJI® 210

TJI® 230

TJI® 360

TJI® 560

Joists

September 2008 • Reorder TJI-9001

# FRAMING DETAILS FOR FLOOR AND ROOF

## Structural Framers's Pocket Guide



### WARNING:

**DO NOT** walk on joists until braced. **INJURY MAY RESULT.**



### WARNING:

**DO NOT** stack building materials on unsheathed joists. Stack only over beams or walls.



### WARNING:

**DO NOT** walk on joists that are lying flat.

**IMPORTANT: PLEASE READ CAREFULLY!**

## WARNING: JOISTS ARE UNSTABLE UNTIL BRACED Laterally

Bracing Includes: Blocking, Hangers, Rim Board, Sheathing, Rim Joist, Strut Lines

Lack of proper bracing during construction can result in serious accidents. Observe the following guidelines:

1. Properly install all blocking, hangers, rim boards, and rim joists at TJI® joist end supports.
2. Establish a permanent deck (sheathing), fastened to the first 4 feet of joists at the end of the bay or braced end wall.
3. Safety bracing of 1x4 (minimum) must be nailed to a braced end wall or sheathed area and to each joist.
4. Sheathing must be completely attached to each TJI® joist before additional loads can be placed on the system.
5. Ends of cantilevers require safety bracing on both the top and bottom flanges.
6. The flanges must remain straight within ½" from true alignment.

*This guide is intended for the products shown, and for untreated Parallam® PSL, in dry-use conditions.*

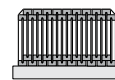
### La Sécurité Avant Tout AVERTISSEMENT Lire Attentionnement

- Les solives non contreventées latéralement sont instables. Voir le guide d'installation **avant** la pose des solives TJI®.
- Ne pas circuler sur les solives TJI® **avant** qu'elles ne soient adéquatement contreventées. Risque de blessure.
- Ne pas empiler des matériaux sur des solives avant d'avoir installé les sous-plancher. Les entreposer temporairement au-dessus des poutres et murs.

### La Seguridad Ante Todo ADVERTENCIA Por Favor Lea Cuidadosamente

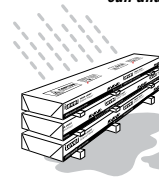
- Las viguetas son inestables hasta que sean reforzadas lateralmente. Vea la guía de instalaciones **antes** de instalar las viguetas TJI®.
- No camine sobre las viguetas hasta que sean apuntaladas.
- No ponga materiales de construcción sobre las viguetas TJI® antes de instalar el triplay. Ponga materiales únicamente sobre vigas o muros.

### Product Storage



**Store and handle joists in vertical orientation.**

*Protect products from sun and water.*



**CAUTION:**  
Wrap is slippery when wet or icy.

*Use support blocks at 10' on-center to keep products out of mud and water.*

## Floor

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### BUILD SAFELY

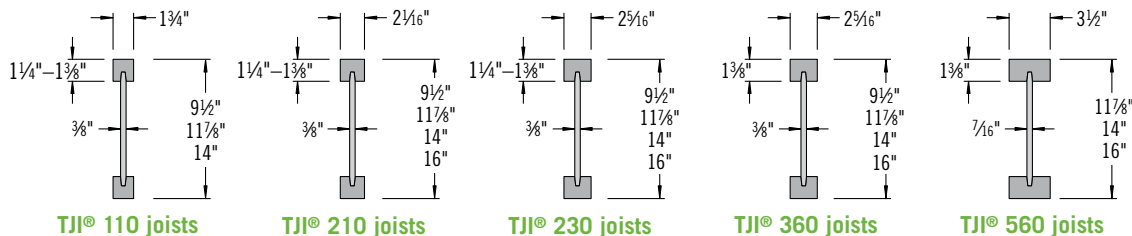
We at iLevel are committed to working safely and want to remind you to do the same.

We encourage you to follow the recommendations of OSHA ([www.osha.gov](http://www.osha.gov)) in the U.S. or provincial regulations ([www.canoshweb.org/en/](http://www.canoshweb.org/en/)) in Canada regarding:

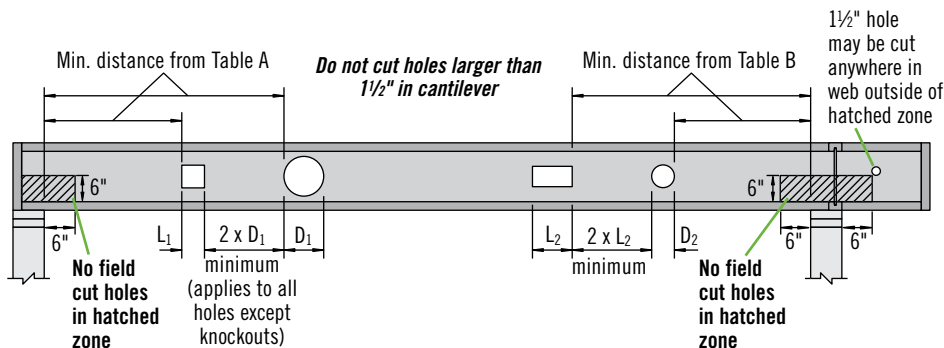
- Personal protective equipment (PPE) for hands, feet, head, and eyes
- Fall protection
- Use of pneumatic nailers and other hand tools
- Forklift safety

Please adhere to the iLevel product installation details, including the installation of safety bracing on unsheathed floors and roofs.

## PRODUCT IDENTIFICATION



## ALLOWABLE HOLES—TJI® JOISTS



**DO NOT** cut holes in cantilever reinforcement.



**DO NOT** cut or notch flange.

**Table A—End Support**

Minimum distance from edge of hole to inside face of nearest end support

Joist Depth	TJI®	Round Hole Size							Square or Rectangular Hole Size						
		2"	3"	4"	6½"	8¾"	11"	13"	2"	3"	4"	6½"	8¾"	11"	13"
9½"	110	1'-0"	1'-6"	2'-0"	5'-0"				1'-0"	1'-6"	2'-6"	4'-6"			
	210	1'-0"	1'-6"	2'-0"	5'-0"				1'-0"	2'-0"	2'-6"	5'-0"			
	230	1'-0"	2'-0"	2'-6"	5'-6"				1'-0"	2'-0"	3'-0"	5'-0"			
	360	1'-6"	2'-0"	3'-0"	6'-0"				1'-6"	2'-6"	3'-6"	5'-6"			
11½"	110	1'-0"	1'-0"	1'-0"	2'-6"	5'-0"			1'-0"	1'-0"	1'-6"	4'-6"	6'-0"		
	210	1'-0"	1'-0"	1'-0"	2'-6"	5'-6"			1'-0"	1'-0"	2'-0"	5'-0"	6'-6"		
	230	1'-0"	1'-0"	1'-0"	3'-0"	6'-0"			1'-0"	1'-0"	2'-0"	5'-6"	7'-0"		
	360	1'-0"	1'-0"	1'-6"	4'-6"	7'-0"			1'-0"	1'-0"	2'-6"	6'-6"	7'-6"		
	560	1'-0"	1'-0"	1'-6"	5'-0"	8'-0"			1'-0"	2'-0"	3'-6"	7'-0"	8'-0"		
14"	110	1'-0"	1'-0"	1'-0"	1'-0"	2'-6"	5'-0"		1'-0"	1'-0"	1'-0"	3'-6"	6'-0"	8'-0"	
	210	1'-0"	1'-0"	1'-0"	1'-0"	3'-0"	6'-0"		1'-0"	1'-0"	1'-0"	4'-0"	6'-6"	8'-6"	
	230	1'-0"	1'-0"	1'-0"	1'-6"	3'-6"	6'-6"		1'-0"	1'-0"	1'-0"	4'-0"	7'-0"	9'-0"	
	360	1'-0"	1'-0"	1'-0"	2'-6"	5'-6"	8'-0"		1'-0"	1'-0"	1'-0"	5'-6"	8'-0"	9'-6"	
	560	1'-0"	1'-0"	1'-0"	2'-6"	6'-0"	9'-0"		1'-0"	1'-0"	1'-6"	6'-6"	9'-0"	10'-0"	
16"	210	1'-0"	1'-0"	1'-0"	1'-0"	1'-6"	3'-6"	6'-0"	1'-0"	1'-0"	1'-0"	2'-6"	6'-6"	8'-0"	10'-6"
	230	1'-0"	1'-0"	1'-0"	1'-0"	2'-0"	4'-0"	6'-6"	1'-0"	1'-0"	1'-0"	3'-0"	7'-0"	9'-0"	11'-0"
	360	1'-0"	1'-0"	1'-0"	1'-0"	3'-0"	6'-0"	9'-0"	1'-0"	1'-0"	1'-0"	4'-0"	9'-0"	10'-0"	11'-6"
	560	1'-0"	1'-0"	1'-0"	1'-0"	3'-0"	6'-6"	10'-0"	1'-0"	1'-0"	1'-0"	5'-0"	10'-0"	11'-0"	12'-0"

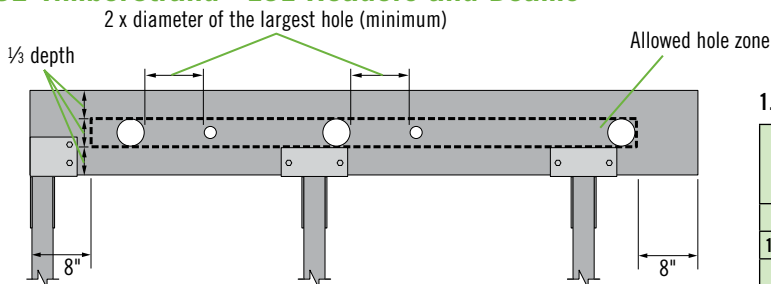
**Table B—Intermediate or Cantilever Support**

Minimum distance from edge of hole to inside face of nearest intermediate or cantilever support

Joist Depth	TJI®	Round Hole Size							Square or Rectangular Hole Size						
		2"	3"	4"	6½"	8¾"	11"	13"	2"	3"	4"	6½"	8¾"	11"	13"
9½"	110	1'-6"	2'-6"	3'-0"	7'-6"				1'-6"	2'-6"	3'-6"	6'-6"			
	210	2'-0"	2'-6"	3'-6"	7'-6"				2'-0"	3'-0"	4'-0"	7'-0"			
	230	2'-6"	3'-0"	4'-0"	8'-0"				2'-6"	3'-0"	4'-6"	7'-6"			
	360	3'-0"	4'-0"	5'-6"	9'-0"				3'-0"	4'-6"	5'-6"	8'-0"			
11½"	110	1'-0"	1'-0"	1'-6"	4'-0"	8'-0"			1'-0"	1'-6"	2'-6"	6'-6"	9'-0"		
	210	1'-0"	1'-0"	2'-0"	4'-6"	9'-0"			1'-0"	2'-0"	3'-0"	7'-6"	10'-0"		
	230	1'-0"	2'-0"	2'-6"	5'-0"	9'-6"			1'-0"	2'-6"	3'-6"	8'-0"	10'-0"		
	360	2'-0"	3'-0"	4'-0"	7'-0"	11'-0"			2'-0"	3'-6"	5'-0"	9'-6"	11'-0"		
	560	1'-6"	3'-0"	4'-6"	8'-0"	12'-0"			3'-0"	4'-6"	6'-0"	10'-6"	12'-0"		
14"	110	1'-0"	1'-0"	1'-0"	2'-0"	4'-6"	8'-0"		1'-0"	1'-0"	1'-0"	5'-0"	9'-0"	12'-0"	
	210	1'-0"	1'-0"	1'-0"	2'-6"	5'-0"	9'-0"		1'-0"	1'-0"	2'-0"	6'-0"	10'-0"	12'-6"	
	230	1'-0"	1'-0"	1'-0"	3'-0"	5'-6"	10'-0"		1'-0"	1'-0"	2'-6"	6'-0"	10'-6"	13'-0"	
	360	1'-0"	1'-0"	2'-0"	5'-6"	8'-6"	12'-6"		1'-0"	2'-0"	4'-0"	9'-0"	12'-0"	14'-0"	
	560	1'-0"	1'-0"	1'-6"	5'-6"	9'-6"	13'-6"		1'-0"	3'-0"	5'-0"	10'-0"	13'-6"	15'-0"	
16"	210	1'-0"	1'-0"	1'-0"	1'-0"	3'-0"	5'-6"	9'-6"	1'-0"	1'-0"	1'-0"	4'-6"	9'-6"	12'-6"	15'-6"
	230	1'-0"	1'-0"	1'-0"	1'-6"	4'-0"	6'-6"	10'-6"	1'-0"	1'-0"	1'-0"	5'-0"	10'-6"	13'-0"	16'-0"
	360	1'-0"	1'-0"	1'-0"	3'-0"	6'-6"	10'-0"	13'-6"	1'-0"	1'-0"	2'-0"	7'-6"	13'-0"	14'-6"	17'-0"
	560	1'-0"	1'-0"	1'-0"	2'-6"	7'-0"	11'-0"	15'-0"	1'-0"	1'-0"	3'-6"	9'-0"	14'-6"	16'-0"	18'-0"

- Leave ⅛" of web (minimum) at top and bottom of hole. **DO NOT cut joist flanges.**
- Tables are based on uniform load tables in current design literature.
- For simple span (5' minimum), uniformly loaded joists used in residential applications, one maximum size round hole may be located at the center of the joist span **provided that no other holes occur in the joist.**

## 1.55E TimberStrand® LSL Headers and Beams



1.55E TimberStrand® LSL

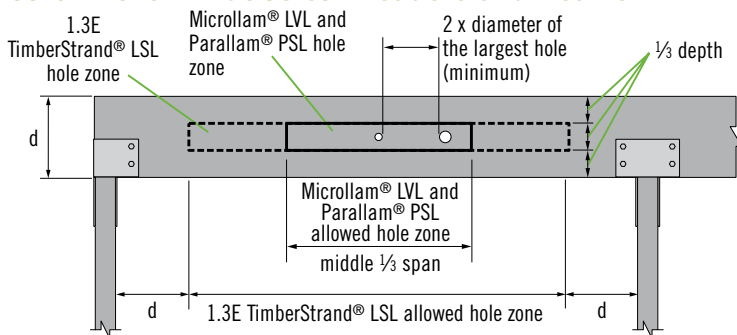
Header or Beam Depth	Maximum Round Hole Size
9¼"–9½"	3"
11¼"–11⅝"	3⅝"
14"–16"	4⅝"

- See illustration for allowed hole zone.

### GENERAL NOTES

- Allowed hole zone suitable for headers and beams with **uniform and/or concentrated loads**.
- Round holes only.
- No holes in headers or beams in plank orientation.

## Other iLevel® Trus Joist® Headers and Beams



Other iLevel® Beams

Header or Beam Depth	Maximum Round Hole Size
4⅜"	1"
5½"	1⅜"
7¼"–20"	2"

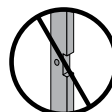
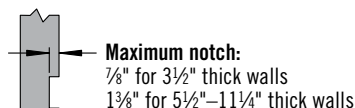
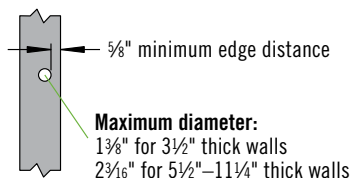
- See illustration for allowed hole zone.

### GENERAL NOTES

- Allowed hole zone suitable for headers and beams with **uniform loads only**.
- Round holes only.
- No holes in cantilevers.
- No holes in headers or beams in plank orientation.

## TimberStrand® LSL Wall Studs

*The notch shown may be cut anywhere except the middle ⅓ of the length of the stud. One hole may be drilled anywhere along the length of the stud or column but must be at least ⅝" from the edge.*

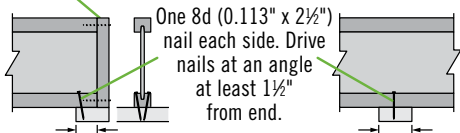


**DO NOT cut a notch and a hole in the same cross section.**

# TJI® JOIST NAILING REQUIREMENTS AT BEARING

## TJI® Joist to Bearing Plate

1¼" TimberStrand® LSL or iLevel® 1½" rim board



1¾" minimum end bearing for single-family applications

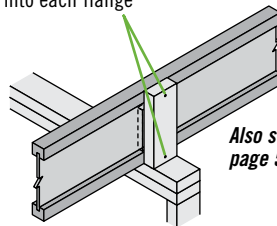
3½" minimum intermediate bearing  
5¼" may be required for maximum capacity

- Increased bearing capacities may be achieved with increased bearing lengths. See plans for required bearing lengths.

**Shear transfer:** Connections equivalent to floor panel nailing schedule. See page 4.

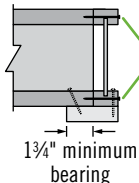
## Squash Blocks to TJI® Joist (Load bearing wall above)

One 10d (0.128" x 3") nail into each flange



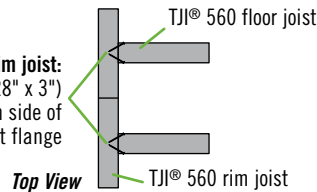
*Also see detail B2, page 5*

## Rim to TJI® Joist



1¼" TimberStrand® LSL rim board, iLevel® 1½" rim board, or TJI® 110 rim joist:  
One 10d (0.128" x 3") nail into each flange  
TJI® 210, 230, and 360 rim joist:  
One 16d (0.135" x 3½") nail into each flange

**TJI® 560 rim joist:**  
Toenail with 10d (0.128" x 3") nails, one each side of TJI® joist flange



*Locate rim board joint between joists*

# TJ-PRO™ RATED FLOOR SYSTEM

## TJ-PRO™ RATED FLOOR SYSTEM COMPONENTS

- Structurwood Edge Gold® floor panels
- TJI® joists
- 1¼" TimberStrand® LSL or iLevel® 1½" rim board

## ADHESIVE RECOMMENDATIONS

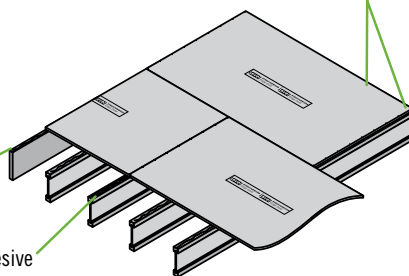
- Adhesives must meet the requirements of ASTM D3498 (AFG-01), and they must have a minimum dry shear strength of 350 psi. For more information, contact your iLevel representative.

Nail panel to joist at 12" on-center in field and 6" on-center along panel edges. Apply fasteners ¾" from panel edges.

- For ¾" panels, use 8d (0.131" x 2½") or 6d (0.120" x 2") deformed-shank nails or other code-approved fasteners.
- For 7/8" panels, use 8d (0.131" x 2½") or 8d (0.120" x 2½") deformed-shank nails or other code-approved fasteners.

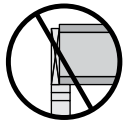
Apply a ¼" or larger bead of adhesive

At abutting panel edges, apply two ¼" beads of adhesive



- Fully nail floor panel within 10 minutes of applying adhesive (or sooner if required by adhesive manufacturer).
- Screws may be substituted for the nails noted above if the screws have equivalent lateral load capacity.

*Silent Floor® joist framing does not require bridging or mid-span blocking*



*Use only engineered lumber for rim board or blocking.*

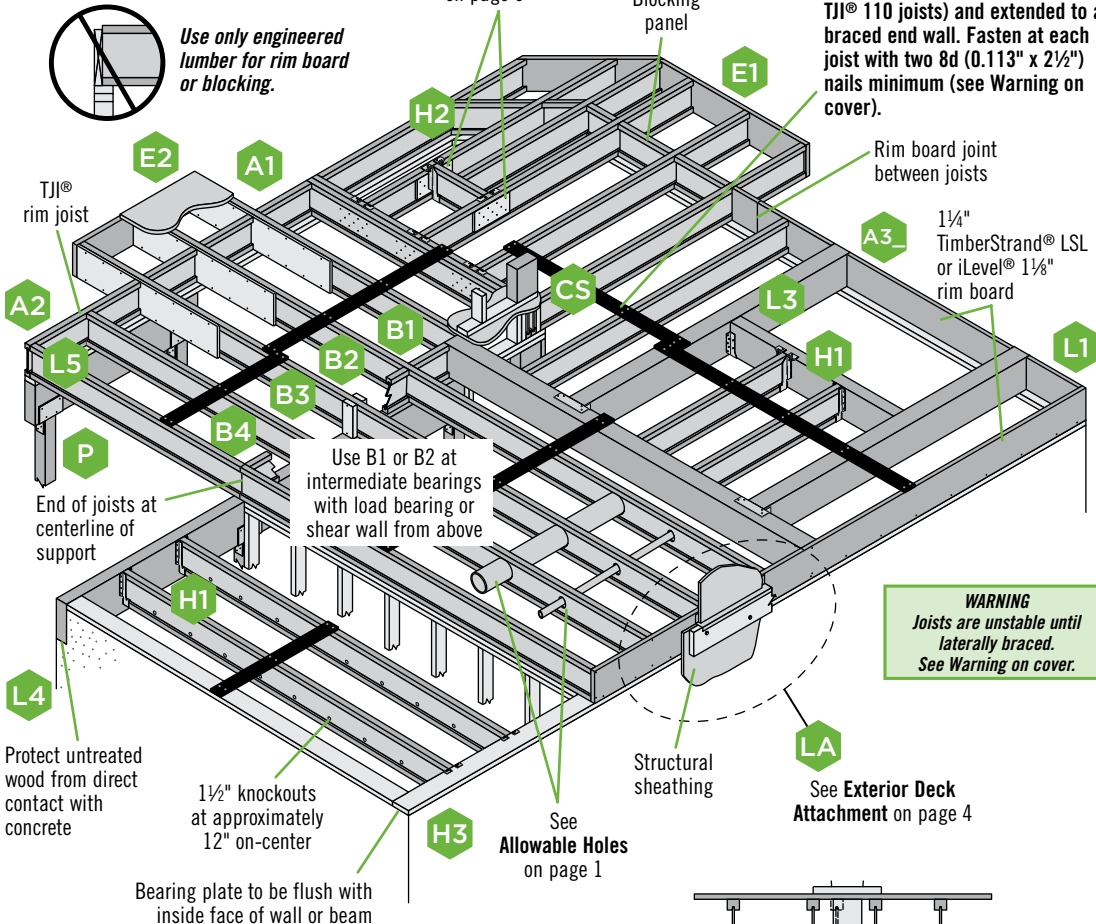
See **Filler and Backer Blocks** on page 5

Blocking panel

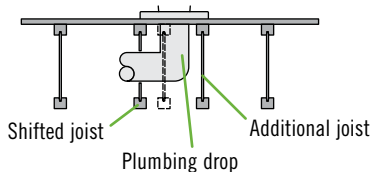
**Safety bracing (1x4 minimum) at 8' on-center (6' on-center for TJI® 110 joists) and extended to a braced end wall. Fasten at each joist with two 8d (0.113" x 2½") nails minimum (see Warning on cover).**

Rim board joint between joists

1¼" TimberStrand® LSL or iLevel® 1½" rim board



**WARNING**  
Joists are unstable until laterally braced. See Warning on cover.



## INSTALLATION TIPS

- Subfloor adhesive will improve floor performance, but may not be required.
- Squash blocks and blocking panels carry stacked vertical loads (details B1 and B2). Packing out the web of a TJI® joist (with web stiffeners) is not a substitute for squash blocks or blocking panels.
- When joists are doubled at non-load bearing parallel partitions, space joists apart the width of the wall for plumbing or HVAC.
- Additional joist at plumbing drop (see detail above).

## DETAIL SCHEDULE

### End bearings (see page 4)

- A1** with blocking panels
- A2** with TJI® rim joist
- A3** with rim board

### Intermediate bearings\* (see page 5)

- B1** with blocking panels to support load bearing wall above
- B2** with squash blocks to support load bearing wall above
- B3** without blocking panels or squash blocks (no wall above)

### Cantilever details (see page 5)

- E1** no reinforcement
- E1W** no reinforcement, with web stiffener
- E2** ¾" reinforcement on one side
- E3** ¾" reinforcement both sides
- E4** joist reinforcement
- F1** deck cantilever
- PB1** permanent bracing

### Cantilever over brick ledge (see page 5)

- E5** ¾" reinforcement on one side, with vertical blocking
- E6** ¾" reinforcement both sides, with vertical blocking
- E7** ¾" reinforcement on one side, with horizontal blocking
- E8** ¾" reinforcement on both sides, with horizontal blocking

### Hanger details (more connector information on page 8)

- H1** TJI® joist to beam (see page 8)
- H2** TJI® joist to joist (see page 5)
- H3** TJI® joist on masonry wall or steel beam (see page 8)

### Other details

- B4** butting joists with blocking panels (see above)
- CS** column support (see page 4)
- LA** exterior deck attachment (see page 4)
- W** web stiffeners (see page 6)
- L** beam details (see page 9)
- P** column details (see page 9)

*\*Load bearing wall must stack over wall below. Blocking panels may be required at shear walls above or below.*

## iLevel® TJ-Xpert® SOFTWARE FRAMING PLANS

**B\_W** Web stiffeners required on each side of joist at intermediate bearings. Refer to your TJ-Xpert® framing plan.

Bearing requirements as shown on the TJ-Xpert® framing plan are job-specific and supersede minimum bearing requirements listed.

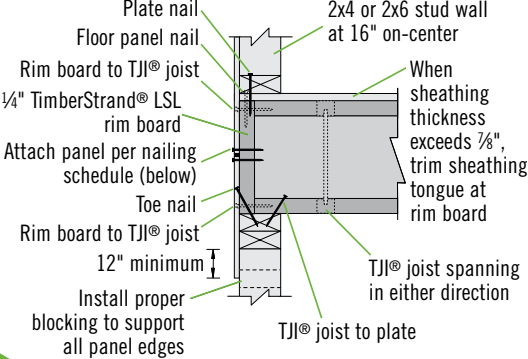
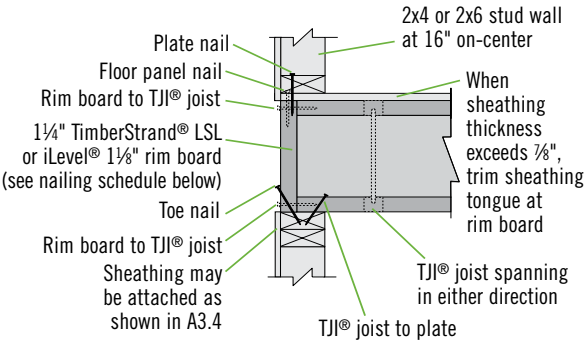
## FASTENING OF FLOOR PANELS

### Guidelines for Closest On-Center Spacing per Row

Nail Size	TJI®(1)		Rim board		1½" TimberStrand® LSL or wider	Microllam® LVL	Parallam® PSL
	110, 210, and 230	360 and 560	iLevel® 1⅝"	1¼" TimberStrand® LSL			
8d (0.131" x 2½")	4"	3"	6"	4"	3"	3"	3"
10d (0.148" x 3"), 12d (0.148" x 3¼")	4"	4"	6"	4"	4"	4"	4"
16d (0.162" x 3½")	6"	6"	16"	6" (2)	6" (2)	8"	6"

- (1) One row of fasteners permitted (two at abutting panel edges) for diaphragms. Stagger nails when using 4" on-center spacing and maintain ⅜" joist and panel edge distance. For other applications, multiple rows of fasteners are permitted if the rows are offset at least ½" and staggered.
- (2) Can be reduced to 4" on-center if nail penetration into the narrow edge is no more than 1⅜" (to avoid splitting).

- Recommended nailing is 12" on-center in field and 6" on-center along panel edge. Fastening requirements on engineered drawings supersede recommendations listed above.
- iLevel recommends using a non-polyurethane subfloor adhesive on all contact points between panels and floor framing.
- Nailing rows must be offset at least ½" and staggered.
- 14 ga. staples may be substituted for 8d (0.113" x 2½") nails if minimum penetration of 1" into the TJI® joist or rim board is achieved.
- Maximum spacing of nails is 18" on-center for TJI® joists.



A3.1 A3.2 A3.3

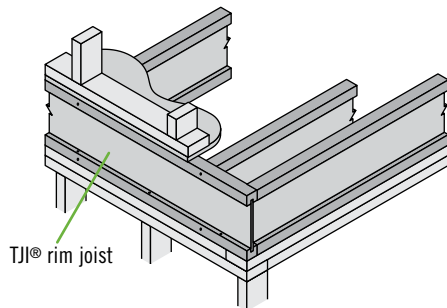
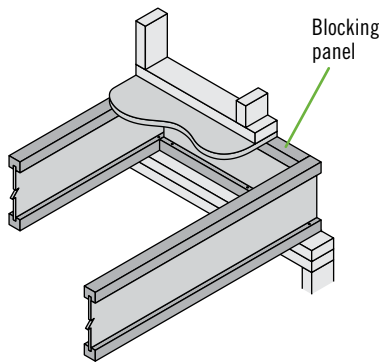
A3.4

Specifications			Rim Board Installation Detail				
			A3.1 <sup>(1)(2)</sup>	A3.2 <sup>(1)(2)</sup>	A3.3 <sup>(1)</sup>	A3.4 <sup>(1)</sup>	
Rim Board Thickness			1⅛"	1¼"	1¼"	1¼"	
Plate Nail—16d (0.135" x 3½")			16" o.c.	12" o.c.	8" o.c.	12" o.c.	
Floor Panel Nail—8d (0.131" x 2½")			6" o.c.				
Rim Board to TJI® Joist—10d (0.128" x 3")			One into each flange				
Toe Nail—10d (0.128" x 3")			6" o.c.	6" o.c.	4" o.c.	6" o.c.	
TJI® Joist to Plate—8d (0.113" x 2½")			Two nails driven at an angle into bottom flange, one each side of web at least 1½" from end				
Wall Framing	Exterior Face	Sheathing	Per Code	Per Code	⅞" structural 1 sheathing <sup>(3)</sup>	⅜" structural 1 sheathing in all areas <sup>(4)</sup>	
		Boundary Nailing			8d (0.131" x 2½") at 6" o.c.	8d (0.131" x 2½") at 4" o.c.	
		Intermediate Nailing			8d (0.131" x 2½") at 12" o.c.	8d (0.131" x 2½") at 12" o.c.	
		Max. Window Opening Height			5'-4" <sup>(5)</sup>	5'-4" <sup>(5)</sup>	
		% of Wall with Full Height Sheathing			70%	70%	
	Interior Face	Sheathing	Per Code	Per Code	½" gypsum	½" gypsum	
		Boundary Nailing			5d (0.086" x 1⅝") at 7" o.c.	5d (0.086" x 1⅝") at 7" o.c.	
		Intermediate Nailing			5d (0.086" x 1⅝") at 10" o.c.	5d (0.086" x 1⅝") at 10" o.c.	
		90 mph Wind Zone			none		
		120 mph Wind Zone			16" o.c. within 10' of corners <sup>(6)</sup>	16" o.c. within 6' of corners <sup>(6)</sup>	16" o.c. within 4' of corners <sup>(6)</sup>

- (1) All sheathing shall be properly blocked and nailed.
- (2) Verify the lateral capacity of the wall. Not all types of code-allowed wall construction provide the same lateral resistance. Check with your local building official or design professional.
- (3) Detail A3.3 shall be a segmented wall, location of full-height structural sheathing per code.
- (4) Sheathing shall be continuous over all plate-to-plate and plate-to-rim-board interfaces and may butt together at mid-depth of rim board as shown in A3.4. At foundation, fasten the bottom edge of the sheathing to the sill plate.
- (5) In addition, one 6'-8" standard door opening is allowed.
- (6) If required, holdowns shall be Simpson Strong-Tie® CS20 (or equivalent) straps attached with four 8d (0.131" x 2 1/2") nails at each end. As an alternative to holdown straps, wall sheathing may be attached as shown in A3.4. See footnote 4.



# FLOOR DETAILS

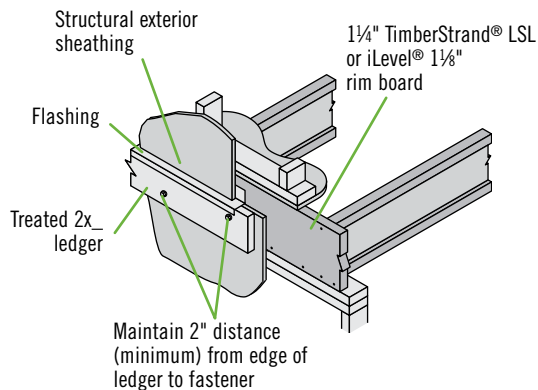
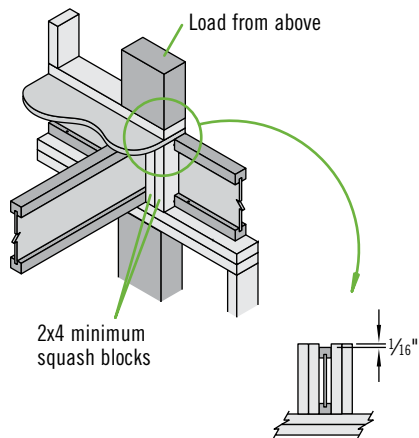


A1

A2

*Must have 1¼" minimum joist bearing at ends*

## Exterior Deck Attachment

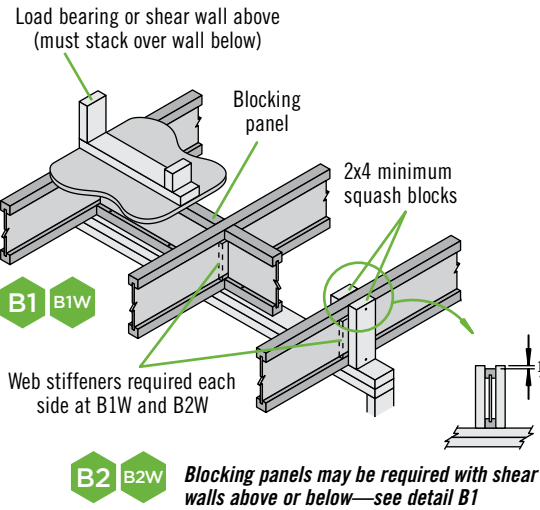


CS

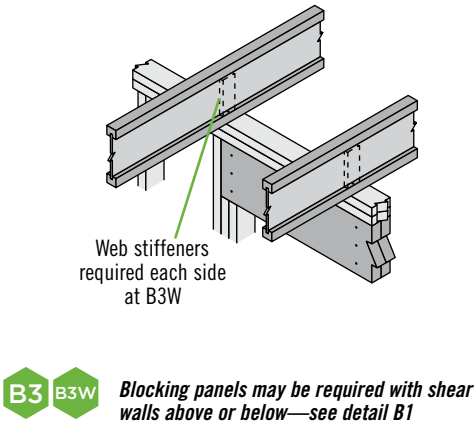
*Use 2x4 minimum squash blocks to transfer load around TJI® joist*

LA

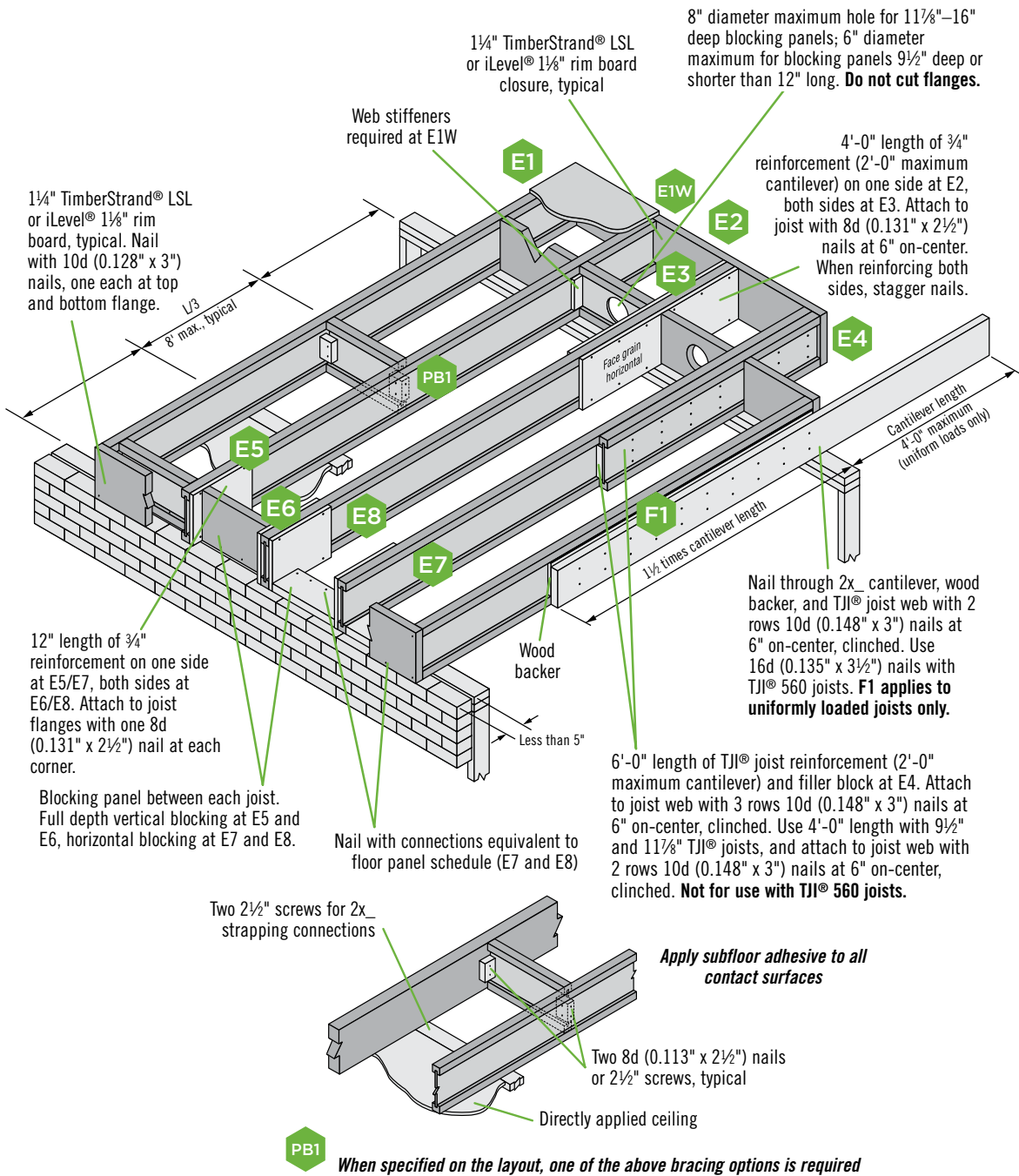
*Corrosion-resistant fasteners required for wet-service applications*



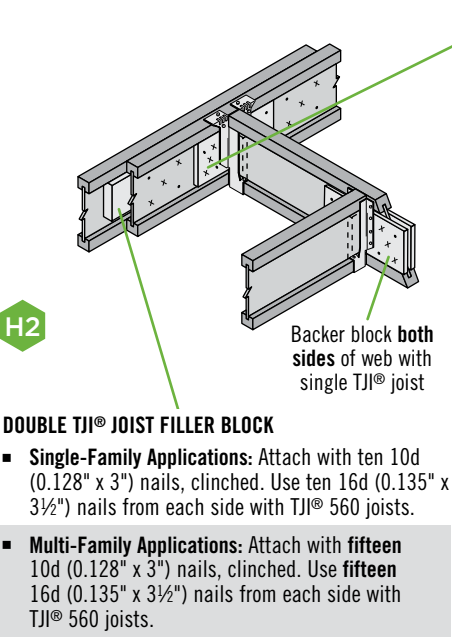
Intermediate Bearing —  
No Load Bearing Wall Above



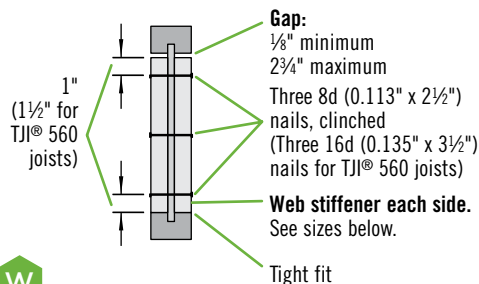
CANTILEVER DETAILS



FILLER AND BACKER BLOCKS



- HANGER BACKER BLOCK**
- Install tight to top flange (tight to bottom flange with face mount hangers).
- Single-Family Applications: Attach with ten 10d (0.128" x 3") nails, clinched when possible.
  - Multi-Family Applications: Attach with fifteen 10d (0.128" x 3") nails, clinched when possible.
  - If necessary, increase filler and backer block height for face mount hangers and maintain 1/8" gap at top of joist; see detail W on page 6.
  - Filler and backer block dimensions should accommodate required nailing without splitting. The suggested minimum length is 24" for filler and 12" for backer blocks.
- DOUBLE TJI® JOIST FILLER SIZES**
- TJI® 110 joists: 2x\_, minimum length 24"
  - TJI® 210 joists: 2x\_ + 3/8" sheathing, minimum length 24"
  - TJI® 230 and 360 joists: 2x\_ + 1/2" sheathing, minimum length 24"
  - TJI® 560 joists: Two 2x\_, minimum length 24"
- HANGER BACKER BLOCK SIZES**
- TJI® 110 joists: 5/8" or 3/4", minimum length 12"
  - TJI® 210 joists: 3/4" or 7/8", minimum length 12"
  - TJI® 230 and 360 joists: 1" net, minimum length 12"
  - TJI® 560 joists: 2x\_, minimum length 12"



## WEB STIFFENER REQUIREMENTS

*Required at all birdsmouth cuts.*

*Required at all sloped hangers. For TJI® 560 joists, web stiffeners are required at all hanger locations.*

*Required if the sides of the hanger do not extend to laterally support at least ¾" of the TJI® joist top flange.*

*Web stiffeners are required at intermediate bearing locations only where noted on framing plan.*

## WEB STIFFENER SIZES

- TJI® 110 joists: ⅝" x 2⅝" minimum
- TJI® 210 joists: ¾" x 2⅝" minimum
- TJI® 230 and 360 joists: ⅞" x 2⅝" minimum
- TJI® 560 joists: 2x4

# TYPICAL ROOF AND WALL FRAMING

## DETAIL SCHEDULE

### Roof details (see page 7)

- R1** on bevel plate
- R3** with variable slope seat connector
- R5** with birdsmouth cut
- R7** intermediate bearing
- R8** 2x4 outrigger and filler with birdsmouth cut
- R9** 2x4 outrigger without filler
- R10** 2x4 outrigger and filler
- R14** ridge detail

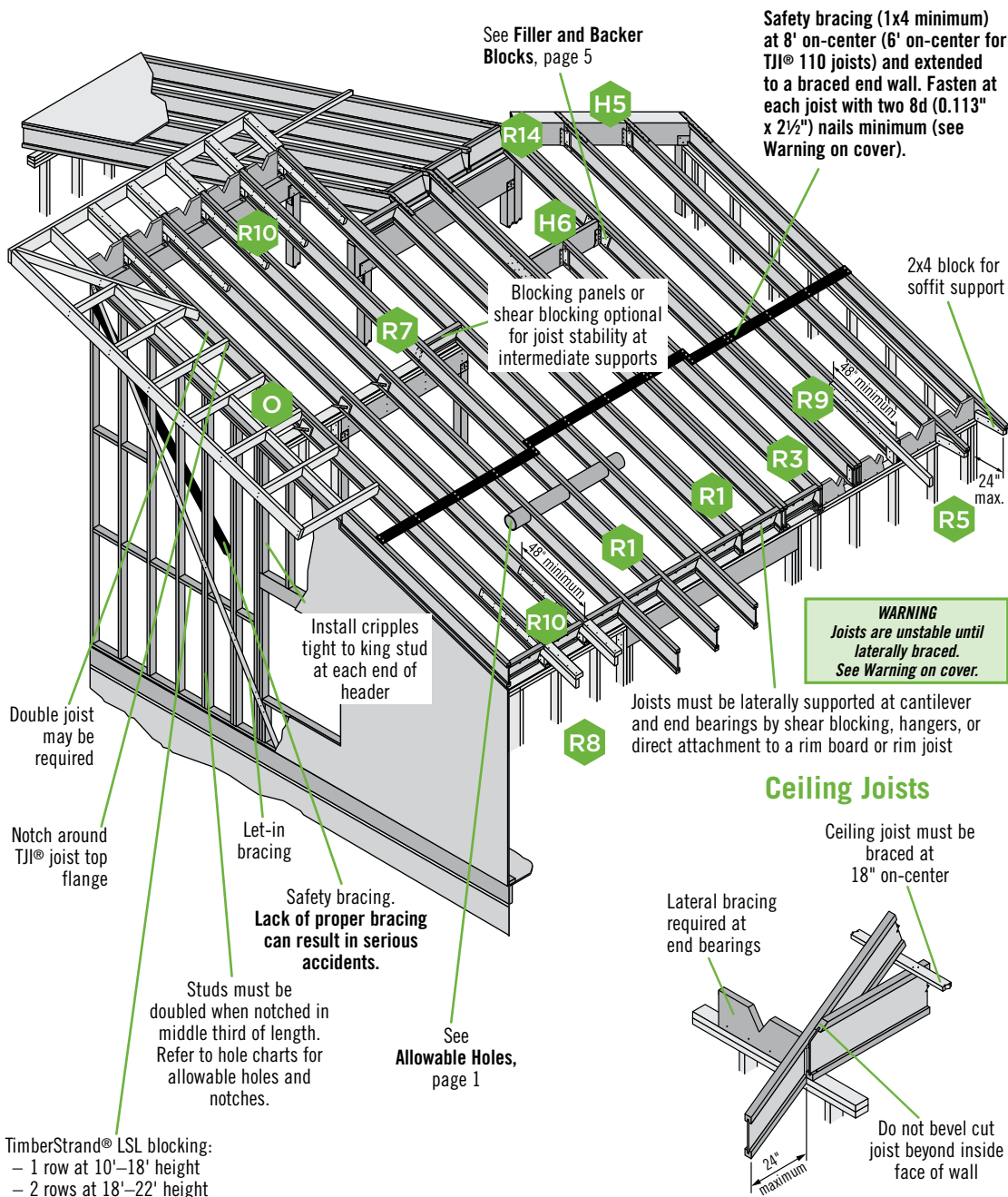
### Other details

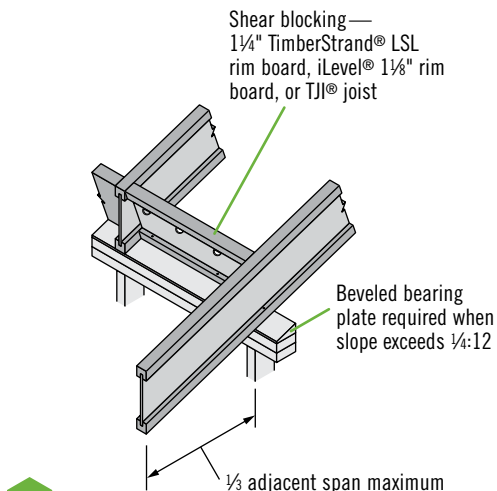
- O** 2x\_ overhang at end wall
- SB** shear blocking (see page 8)
- W** web stiffeners

### Hanger details (see page 8)

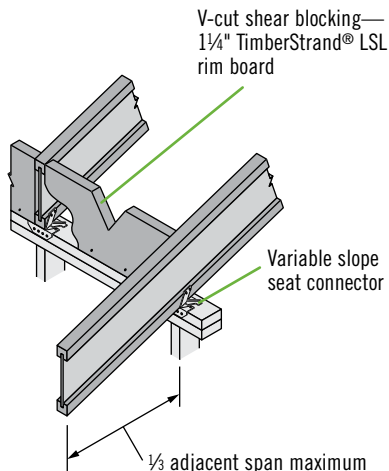
- H5** slope adjusted hanger
- H6** header on slope

*Joists must be laterally supported at cantilever and end bearings by blocking panels, hangers, or direct attachment to a rim board or rim joist.*





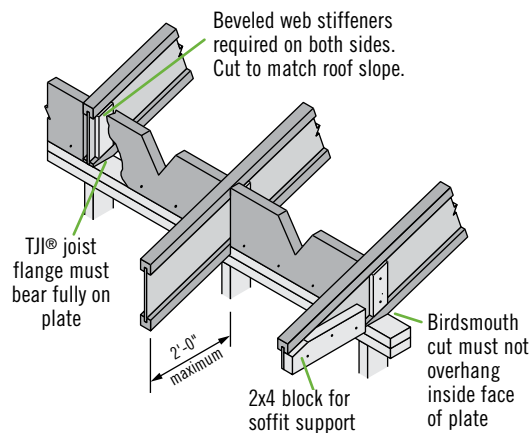
R1



R3

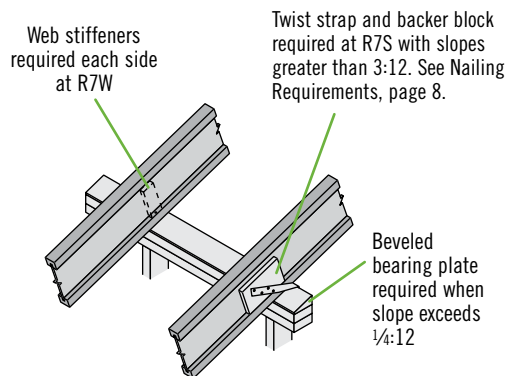
## Intermediate Bearing

**Blocking panels or shear blocking may be specified for joist stability at intermediate supports**



R5

**Birdsmouth cut allowed at low end of joist only**

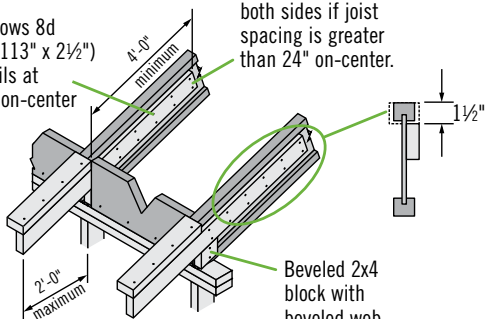


R7 R7W R7S

2 rows 8d  
(0.113" x 2½")  
nails at  
8" on-center

2x4 one side. Use 2x4  
both sides if joist  
spacing is greater  
than 24" on-center.

Beveled 2x4  
block with  
beveled web  
stiffener on  
opposite side of  
web



R8

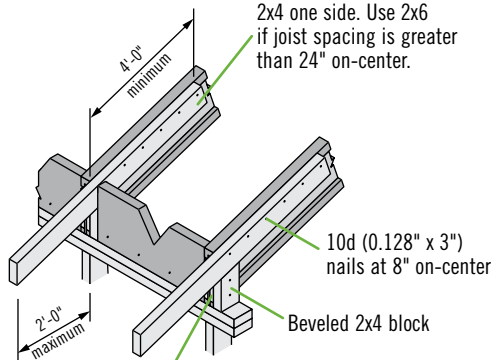
*Birdsmouth cut allowed at low end of joist only*

2x4 one side. Use 2x6  
if joist spacing is greater  
than 24" on-center.

10d (0.128" x 3")  
nails at 8" on-center

Beveled 2x4 block

Beveled web stiffeners  
on both sides



R9

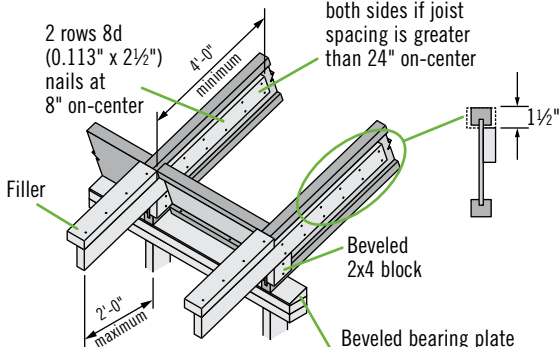
*Birdsmouth cut allowed at low end of joist only*

2 rows 8d  
(0.113" x 2½")  
nails at  
8" on-center

2x4 one side. Use 2x4  
both sides if joist  
spacing is greater  
than 24" on-center

Beveled  
2x4 block

Beveled bearing plate  
required when slope  
exceeds ¼:12



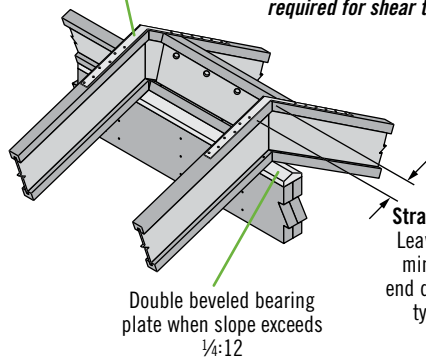
R10

LSTA18 (Simpson or USP)  
strap with twelve  
10d (0.148" x 1½") nails

*Additional blocking may be  
required for shear transfer*

Double beveled bearing  
plate when slope exceeds  
¼:12

Strap nails:  
Leave 2⅜"  
minimum  
end distance,  
typical



R14

### APPROVED HANGERS

- The following manufacturers are approved to supply hangers for iLevel products:
  - Simpson Strong-Tie Co., Inc.: 1-800-999-5099
  - USP Structural Connectors: 1-800-328-5934
- Hanger design loads differ by support type and may exceed the capacity of the support and/or supported member. Contact your iLevel representative or refer to iLevel® software.

### NAILING REQUIREMENTS

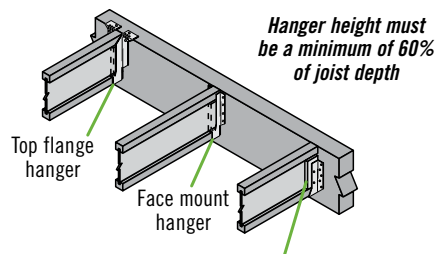
- Fill all round holes with the proper nails. Hanger nails are usually a heavier gauge because of the higher loads they need to carry.
- Unless specified otherwise, full capacity of straps or connectors can only be achieved if the following nail penetration is provided:

	FACE MOUNT	TOP FLANGE
10d (0.148" x 1½")	1½" minimum	1½" minimum
10d (0.148" x 3")	1¾" minimum	3" minimum
16d (0.162" x 3½")	2" minimum	3½" minimum

- Top flange hangers should be fastened to TJI® joist headers with 10d (0.148" x 1½") nails. Fasten face mount hangers to 3½" or wider TJI® joist headers with 10d (0.148" x 3") or 16d (0.162" x 3½") nails.

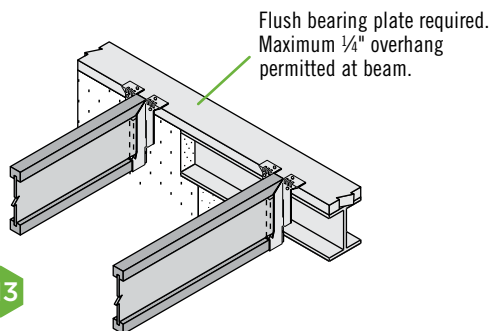
### CONNECTOR INSTALLATION AND SQUEAK PREVENTION TIPS

- Nails must be completely set.
- Leave 1/16" clearance between the member and the support member or hanger.
- Joist to beam connections require hangers; do not toenail.
- Seat the supported member tight to the bottom of the hanger. On Simpson Strong-Tie® ITT, IUT, and VPA connectors, bend the bottom flange tabs over and nail to TJI® joist bottom flange.
- Reduce squeaks by adding subfloor adhesive to the hanger seat.

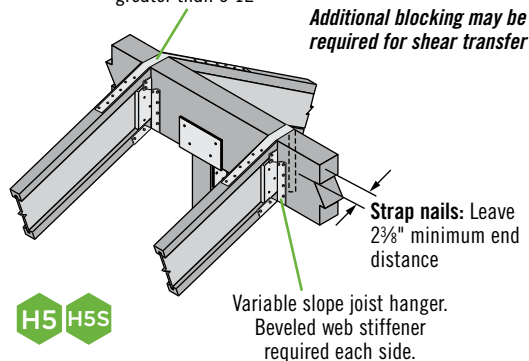


**H1**

Web stiffeners required if the sides of the hanger do not laterally support at least ¾" of the TJI® joist top flange



LSTA24 (Simpson or USP) strap with twelve 10d (0.148" x 1½") nails required at H5S with slopes greater than 3:12





**Filler block:** Attach with ten 10d (0.128" x 3") nails, clinched. Use ten 16d (0.135" x 3½") nails from each side with TJI® 560 joists.

**Backer block:** Install tight to bottom flange (tight to top flange with top flange hangers). Attach with ten 10d (0.128" x 3") nails, clinched when possible.

**Strap nails:** Leave 2⅝" minimum end distance, typical

LSTA18 strap required at H6S with slopes greater than 3:12

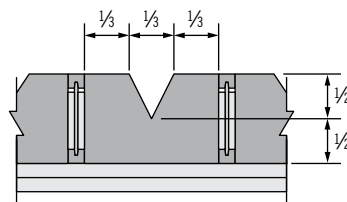
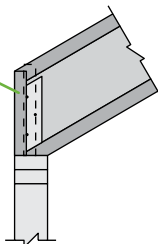
Variable slope joist hanger. Beveled web stiffeners required each side.



## SHEAR BLOCKING AND VENTILATION HOLES (Roof Only)

1¼" TimberStrand® LSL rim board for shear blocking (between joists). Field trim to match joist depth at outer edge of wall or locate on wall to match joist depth.

*For TJI® joists with slopes of 10:12 to 12:12, the vertical depth at bearing will require 1¼" TimberStrand® LSL or iLevel® 1⅝" rim board (for shear blocking) that is one size deeper than the TJI® joist.*

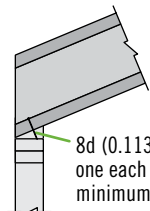


Maximum allowable V-cut

## TJI® JOIST NAILING REQUIREMENTS AT BEARING

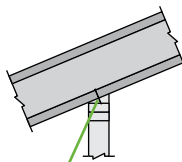
### TJI® Joist to Bearing Plate

**END BEARING**  
(1¼" minimum bearing required)



8d (0.113" x 2½") nail, one each side, 1½" minimum from end

**INTERMEDIATE BEARING**  
(3½" minimum bearing required)



**Slopes 3:12 or less:**

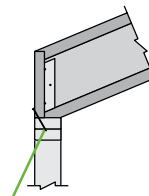
One 8d (0.113" x 2½") nail each side. See detail R7.

**Slopes greater than 3:12:**

Two 8d (0.113" x 2½") nails each side, plus a twist strap and backer block. See detail R7S.

*When slope exceeds ¼:12, a beveled bearing plate, variable slope seat connector, or birdsmouth cut (at low end of joist only) is required.*

### Blocking to Bearing Plate



**1¼" TimberStrand® LSL or iLevel® 1⅝" rim board:**

Toenail with 10d (0.128" x 3") nails at 6" on-center or 16d (0.135" x 3½") nails at 12" on-center

**TJI® joist blocking:**

10d (0.128" x 3") nails at 6" on-center

**Shear transfer nailing:**

Use connections equivalent to sheathing nail schedule



## DETAIL SCHEDULE

### Beam and header details

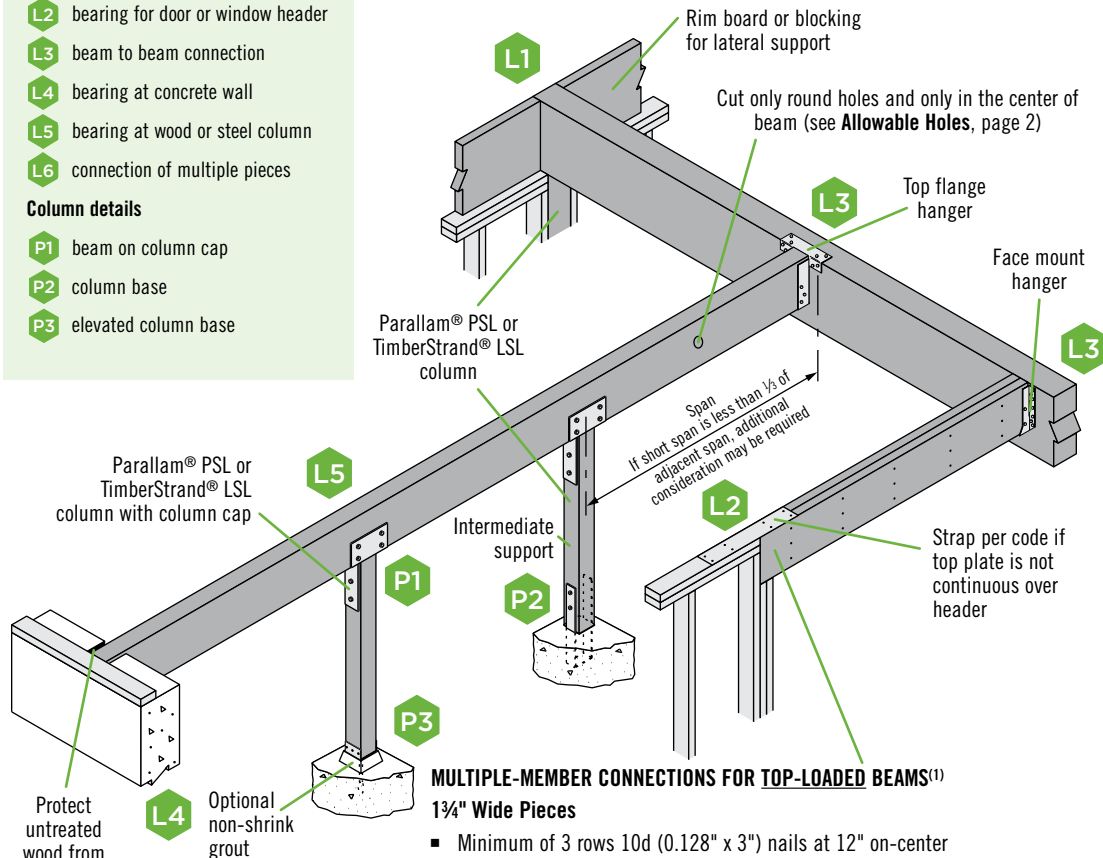
- L1** bearing at wood wall
- L2** bearing for door or window header
- L3** beam to beam connection
- L4** bearing at concrete wall
- L5** bearing at wood or steel column
- L6** connection of multiple pieces

### Column details

- P1** beam on column cap
- P2** column base
- P3** elevated column base

This guide is intended for the products shown, and for untreated Parallam® PSL, in dry-use conditions

*Bearing length is extremely critical and must be considered for each application. See table below for minimum end and intermediate bearing lengths, and your iLevel® TJ-Xpert® framing plan, if applicable.*



### MULTIPLE-MEMBER CONNECTIONS FOR TOP-LOADED BEAMS<sup>(1)</sup>

#### 1 1/4" Wide Pieces

- Minimum of 3 rows 10d (0.128" x 3") nails at 12" on-center
- Minimum of 4 rows 10d (0.128" x 3") nails at 12" on-center for 14" and deeper
- If using 12d–16d (0.148"–0.162" diameter) nails, the number of nailing rows may be reduced by one

#### 3 1/2" Wide Pieces

- Minimum of 2 rows 1/2" bolts at 24" on-center, staggered

(1) Load must be applied evenly across entire beam width. Otherwise, use connections for side-loaded beams.

### MULTIPLE-MEMBER CONNECTIONS FOR SIDE-LOADED BEAMS

- Additional nailing or bolting may be required with side-loaded multiple-member beams. Refer to current product literature.

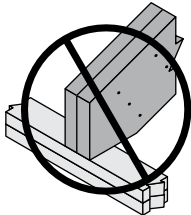
**L6** Multiple pieces can be nailed or bolted together to form a header or beam of the required size, up to a maximum width of 7"

# BEAM AND HEADER BEARINGS

## Minimum Bearing Length for Beams and Headers

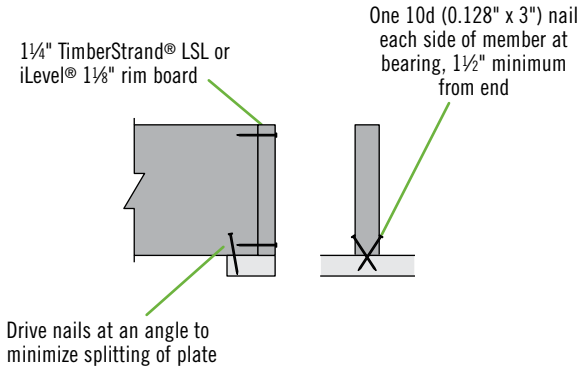
Beam Depth	Bearing	Span of Header or Beam								
		4'	6'	8'	10'	12'	16'	20'	24'	28'
5½"	End/Int.	2¼" / 4½"	1½" / 3½"	1½" / 3½"	1½" / 3½"	1½" / 3½"				
7¼"	End/Int.	3½" / 6¼"	2¼" / 5½"	1¾" / 4¼"	1½" / 3½"	1½" / 3½"	1½" / 3½"			
8⅝"	End/Int.	3½" / 8½"	2¼" / 5¾"	1¾" / 4¼"	1½" / 3½"	1½" / 3½"	1½" / 3½"	1½" / 3½"	1½" / 3½"	
9¼", 9½"	End/Int.		4¼" / 8"	3¼" / 7½"	2½" / 6¼"	2" / 5¼"	1½" / 4"	1½" / 3½"	1½" / 3½"	1½" / 3½"
11¼", 11½"	End/Int.				4" / 9¼"	3¼" / 8"	2¼" / 6"	1¾" / 4¾"	1½" / 4"	1½" / 3½"
14"	End/Int.					4½" / 10¾"	3¼" / 8¼"	2½" / 6½"	2" / 5½"	1¾" / 4¾"
16"	End/Int.						4¼" / 10½"	3¼" / 8½"	2¾" / 7"	2¼" / 6"
18"	End/Int.							4¼" / 10½"	3¼" / 8¾"	2¾" / 7½"
20"	End/Int.								4¼" / 10¾"	3½" / 9¼"

- **Minimum bearing length:** 1½" at ends, 3½" at intermediate supports.
- Bearing across full beam width is required.
- Bearing lengths are based on bearing stress for TimberStrand® LSL, Microllam® LVL, or Parallam® PSL. Lengths may need to be increased if support member's allowable bearing stress is less (e.g., flat wood plate).
- Table assumes maximum allowable uniform load. For other conditions, contact your iLevel representative.
- Beams and headers require lateral support at bearing points and along the top (or compression edge) at 24" on-center or closer.
- 1¾" x 16" and deeper beams and headers are to be used in multiple-member units only.



**DO NOT** overhang seat cuts on beams beyond inside face of support member

## Beam Attachment at Bearing





## PRODUCT WARRANTY

iLevel warrants that its Trus Joist® products and iLevel® rim board will be free from manufacturing errors or defects in workmanship and material.

In addition, provided the product is correctly installed and used, the company warrants the adequacy of its design for the normal and expected life of the building.

**1-888-453-8358**

2910 E. Amity Road ■ Boise, Idaho 83716



## TJ-XPert® LIMITED WARRANTY

The iLevel® TJ-XPert® program is Design Software developed by iLevel. iLevel warrants that the sizing of its products by TJ-XPert® will be in accordance with iLevel product design criteria. The TJ-XPert® Limited Warranty applies when the iLevel Framer's Guide is used in accordance with a completed, unmodified TJ-XPert® framing plan. Output via other CAD programs using DXF file output (or other reproductions or copies of TJ-XPert® output) and statements made via "Operator Notes" are excluded from the TJ-XPert® Limited Warranty.

The iLevel products called out on the TJ-XPert® framing plan have been sized for the loads and dimensions specified by the Purchaser and entered by the computer operator into the TJ-XPert® computer program. Purchaser acknowledges receipt of the iLevel Framer's Guide and that the TJ-XPert® Limited Warranty applies only if all products are installed in accordance with the iLevel Framer's Guide and the TJ-XPert® framing plan. All loads and dimensions used by the TJ-XPert® program to design the framing plan have been specified solely by the Purchaser and checked solely by the Purchaser to ensure that they are complete, correct, up-to-date, accurate, and comply with applicable code requirements.

The loads, dimensions, and resulting framing plan have NOT been checked by an iLevel employee or engineer. iLevel RECOMMENDS THAT YOU VERIFY THE RESULTS OF THE SOFTWARE WITH A DESIGN PROFESSIONAL.

Full details of the TJ-XPert® Limited Warranty are provided in the Software License Agreement or a copy can be provided to you by your iLevel representative upon request.



*For conditions not shown in this guide,  
or other assistance, contact your  
iLevel representative or call*

**1-888-iLevel8 (888-453-8358)**

### CODE EVALUATIONS, See

#### TJI® Joists

- HUD SEB 689 Rev. 11 ■ CCMC 13132-R
- ICC ES ESR-1153

#### TimberStrand® LSL

- HUD MR 1265d ■ CCMC 12627-R
- ICC ES ESR-1387

#### Parallam® PSL

- HUD MR 1303b ■ CCMC 11161-R
- ICC ES ESR-1387

#### Microllam® LVL

- HUD MR 925k ■ CCMC 08675-R
- ICC ES ESR-1387

#### iLevel® Rim Board

- ICC ES ESR-1387
- CCMC 13261-R



by Weyerhaeuser

[www.iLevel.com](http://www.iLevel.com)

FOR MORE INFORMATION, CONTACT YOUR DEALER

September 2008  
Reorder TJ-9001

This document supersedes all previous versions. If this is more than one year old, contact your dealer or iLevel rep.

NW

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