

I-Joist Construction Details

**PERFORMANCE RATED I-JOISTS
IN FLOOR AND ROOF FRAMING**



APA

This installation guide includes recommended construction details for Performance Rated I-Joists in floor and roof applications. In addition to floor and roof framing details, this guide includes recommendations for cantilevers and placement of web holes.

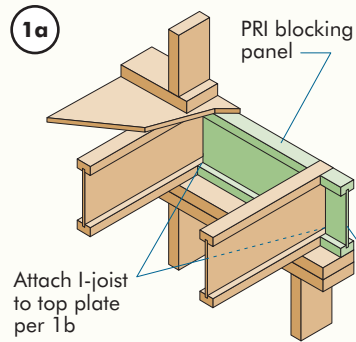
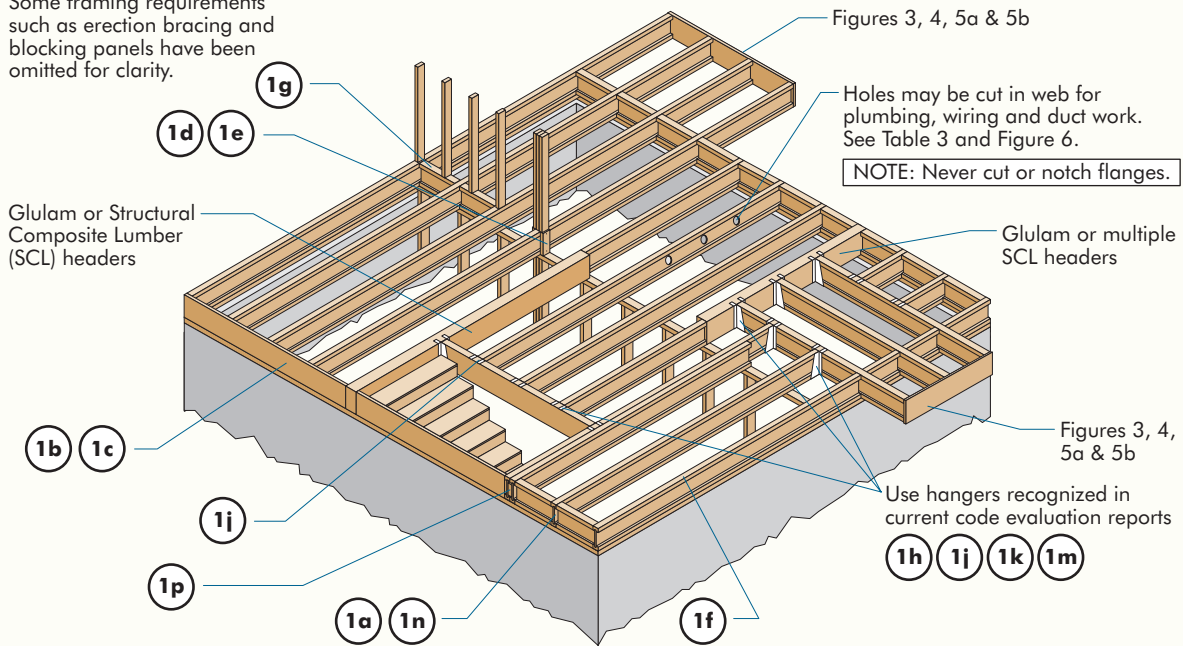
Good installation begins with specification of the correct joist for the application. Many Performance Rated I-Joists include in their trademarks allowable spans for uniformly loaded residential floor construction at various I-joist spacings. To determine which I-joist is needed, select the span and then choose the I-joist that meets the span, spacing, and loading criteria. For more information on selecting APA I-joists, and for design tables, refer to ***APA Performance Rated I-Joists, Form Z725***, available on APA's web site at www.apawood.org

Click on circled numbers for enlarged view of detail.

FIGURE 1

TYPICAL PERFORMANCE RATED I-JOIST FLOOR FRAMING AND CONSTRUCTION

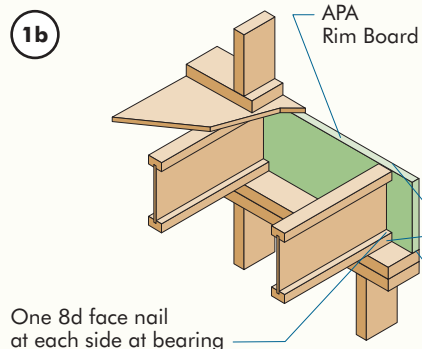
Some framing requirements such as erection bracing and blocking panels have been omitted for clarity.



Blocking Panel or Rim Joist	Uniform Vertical Load Transfer Capacity* (plf)
PRI Joists	2000

*The uniform vertical load capacity is limited to a joist depth of 16 inches or less and is based on the normal (10-yr) load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer capacity, see 1d.

8d nails @ 6" o.c. to top plate (when used for lateral shear transfer, nail to bearing plate with same nailing as required for decking)



Blocking Panel or Rim Joist	Uniform Vertical Load Transfer Capacity* (plf)
1-1/8" APA Rim Board Plus	4850
1-1/8" APA Rim Board	4400
1" APA Rim Board	3300

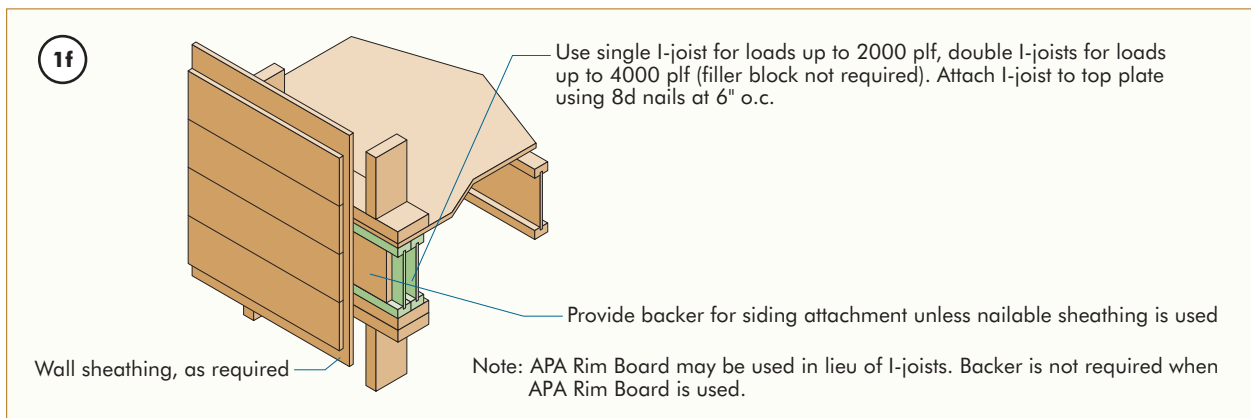
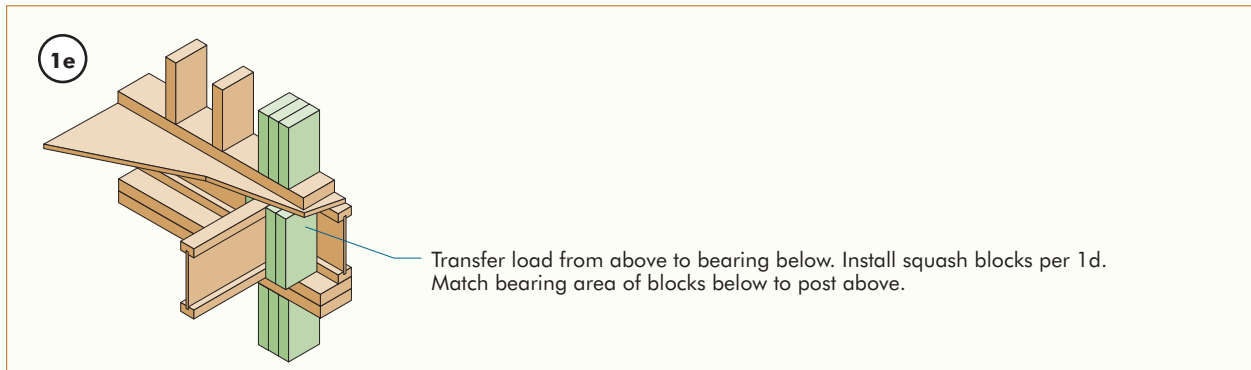
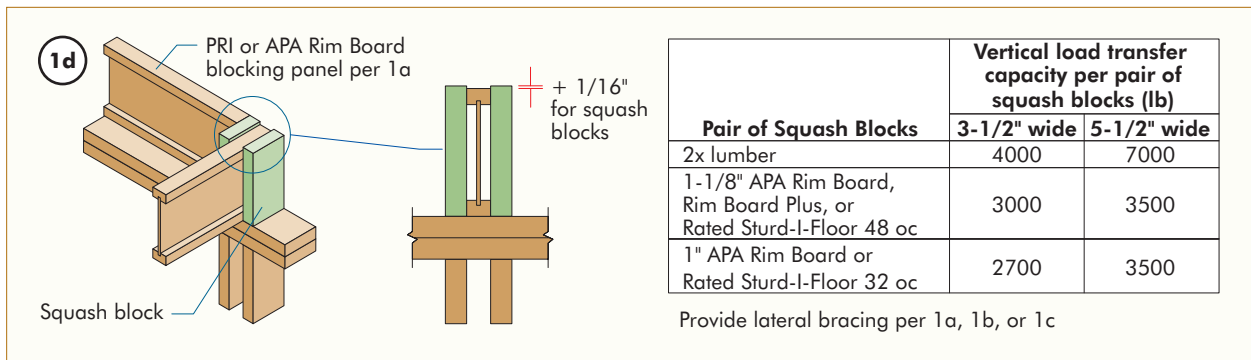
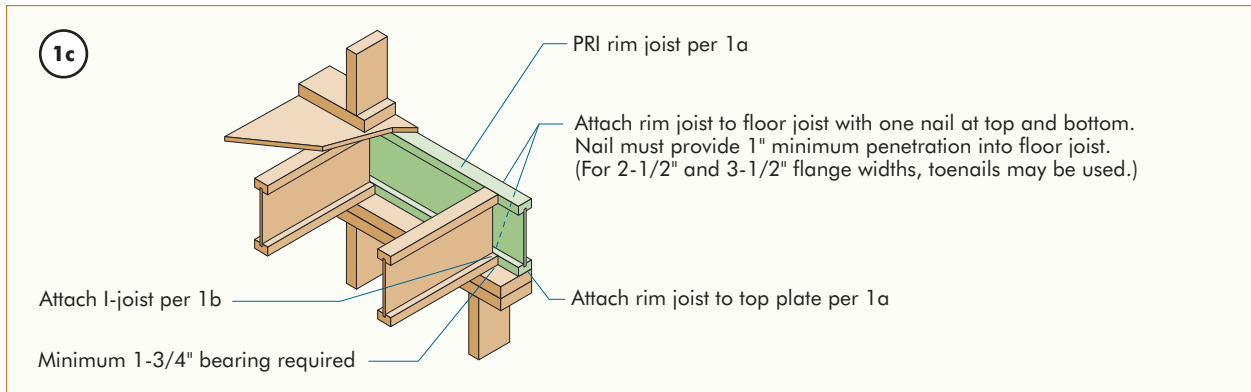
*The uniform vertical load capacity is limited to a Rim Board depth of 16 inches or less and is based on the normal (10-yr) load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer capacity, see 1d.

One 8d common or box nail at top and bottom flange

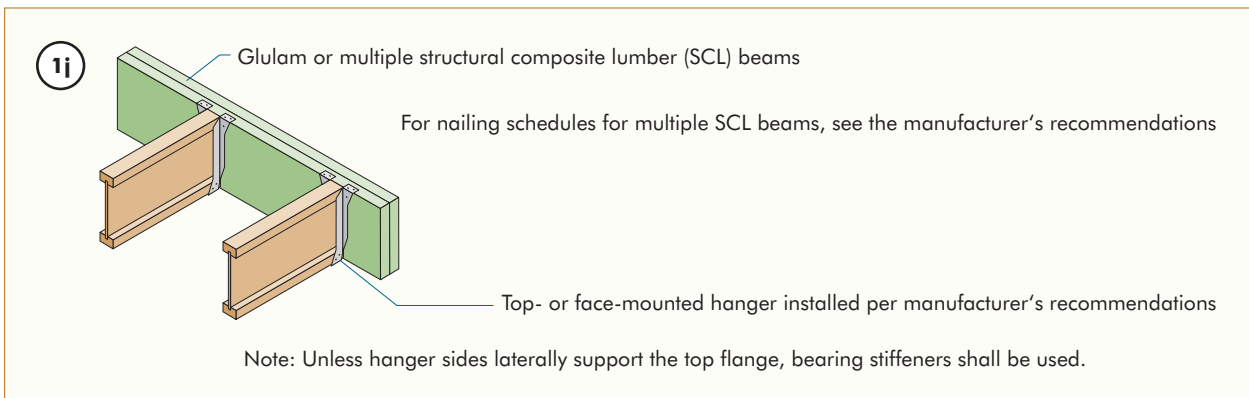
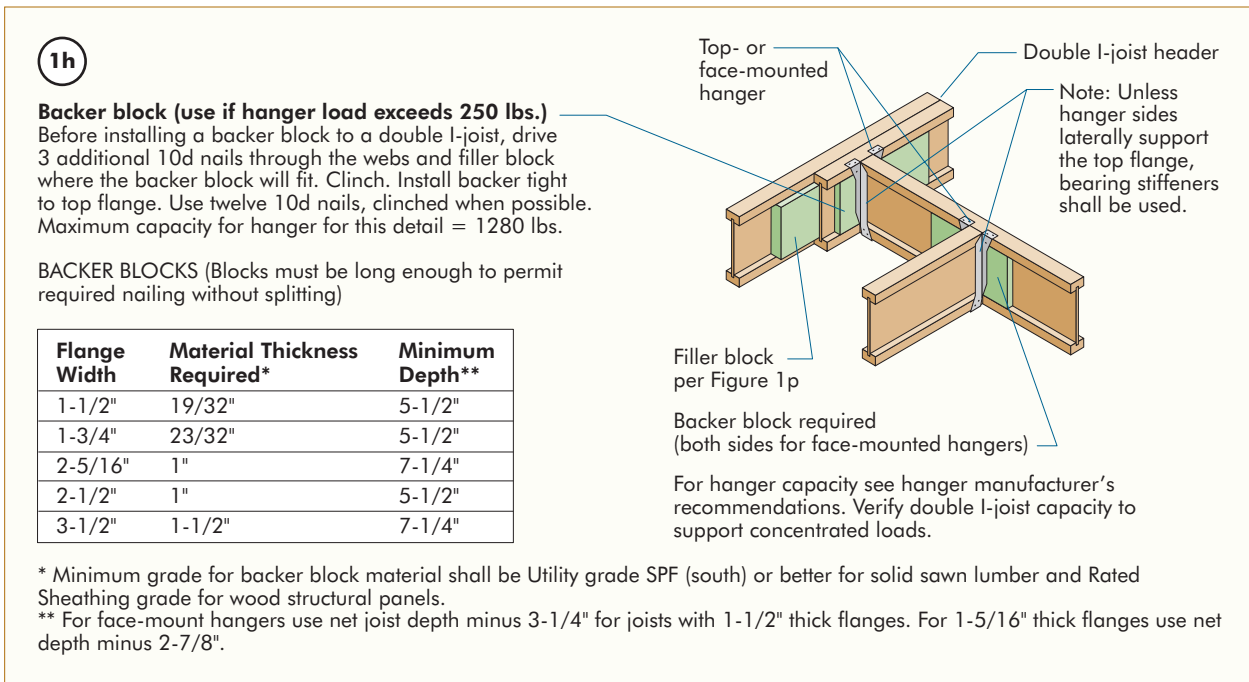
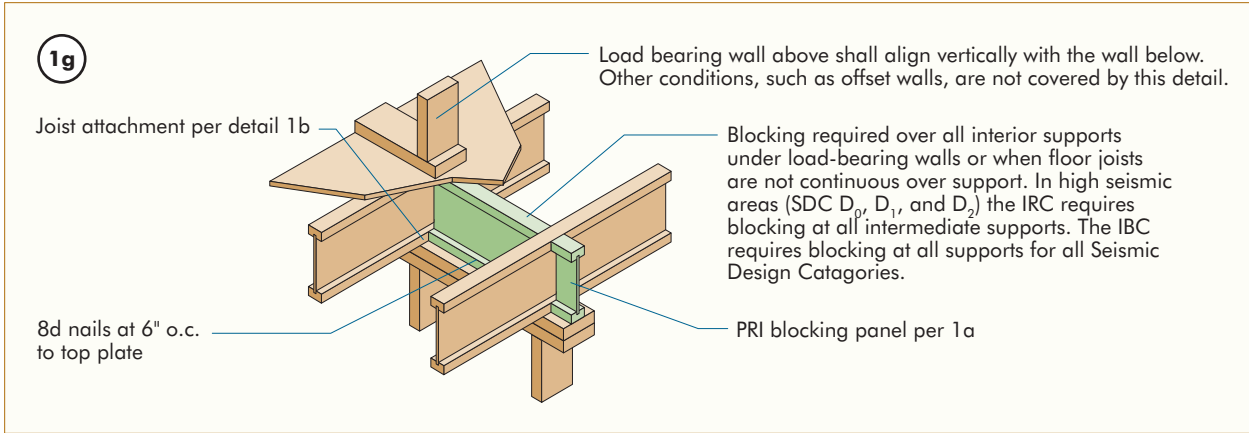
Attach APA Rim Board to top plate using 8d common or box toenails @ 6" o.c.

Note: To avoid splitting flange, start nails at least 1-1/2" from end of I-joist. Nails may be driven at an angle to avoid splitting of bearing plate.

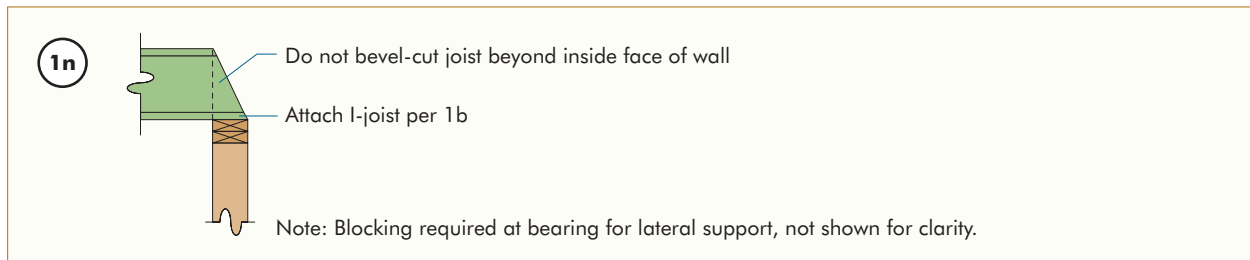
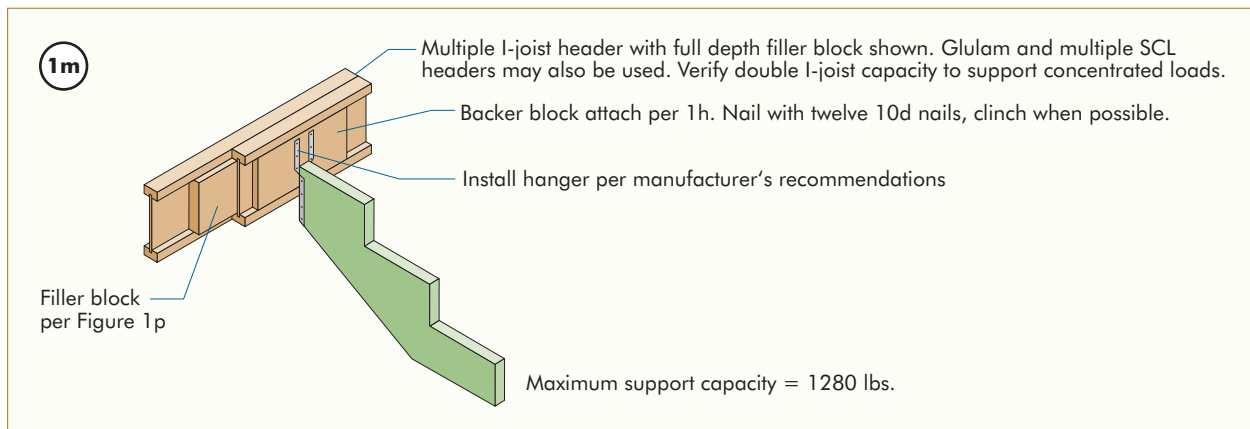
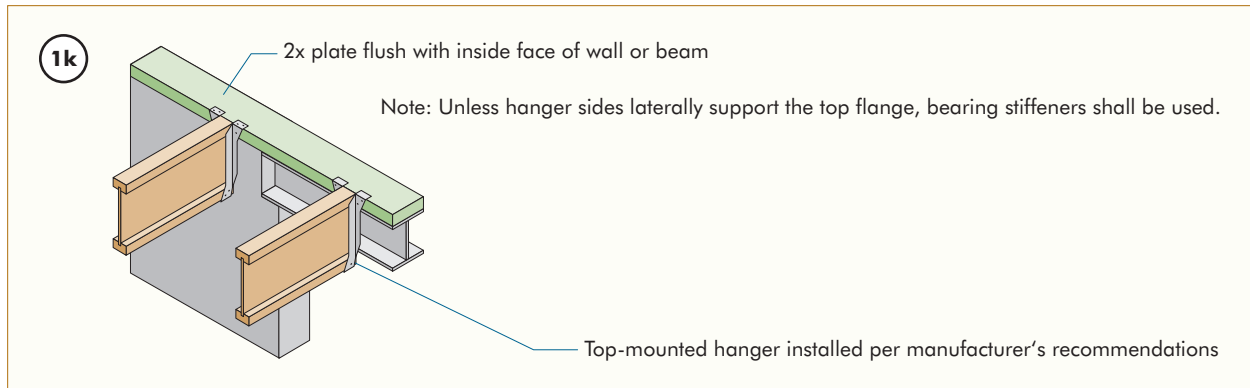
All nails shown in the details above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.



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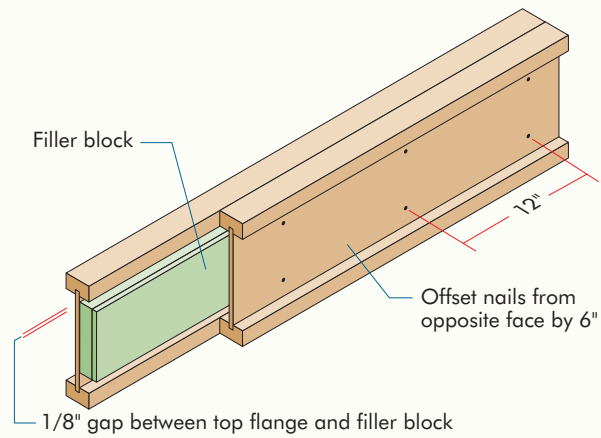
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1p FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION

Flange Width	Net Depth	Filler Block Size
1-1/2"	9-1/2" 11-7/8"	1-1/8" x 6" high 1-1/8" x 8" high
1-3/4"	9-1/2" 11-7/8" 14" 16"	1-3/8" x 6" 1-3/8" x 8" 1-3/8" x 10" 1-3/8" x 12"
2-5/16"	11-7/8" 14" 16"	2" x 8" 2" x 10" 2" x 12"
2-1/2"	9-1/2" 11-7/8" 14" 16"	2-1/8" x 6" 2-1/8" x 8" 2-1/8" x 10" 2-1/8" x 12"
3-1/2"	11-7/8" 14" 16"	3" x 8" 3" x 10" 3" x 12"



Notes:

1. Support back of I-joist web during nailing to prevent damage to web/flange connection.
2. Leave a 1/8-inch gap between top of filler block and bottom of top I-joist flange.
3. Filler block is required between joists for full length of span.
4. Nail joists together with two rows of 10d nails at 12 inches o.c. (clinched when possible) on each side of the double I-joist. Total of 4 nails per foot required. If nails can be clinched, only 2 nails per foot are required.
5. The maximum load that may be applied to one side of the double joist using this detail is 620 lbf/ft.

All nails shown in the details above are assumed to be common nails unless otherwise noted. Individual components not shown to scale for clarity.

TABLE 1

STIFFENER SIZE REQUIREMENTS

PRI Flange Width	Web Stiffener Size Each Side of Web
1-1/2"	15/32" x 2-5/16" minimum width
1-3/4"	19/32" x 2-5/16" minimum width
2-5/16"	1" x 2-5/16" minimum width
2-1/2"	1" x 2-5/16" minimum width
3-1/2"	1-1/2" x 2-5/16" minimum width

FIGURE 2

WEB STIFFENER INSTALLATION DETAILS

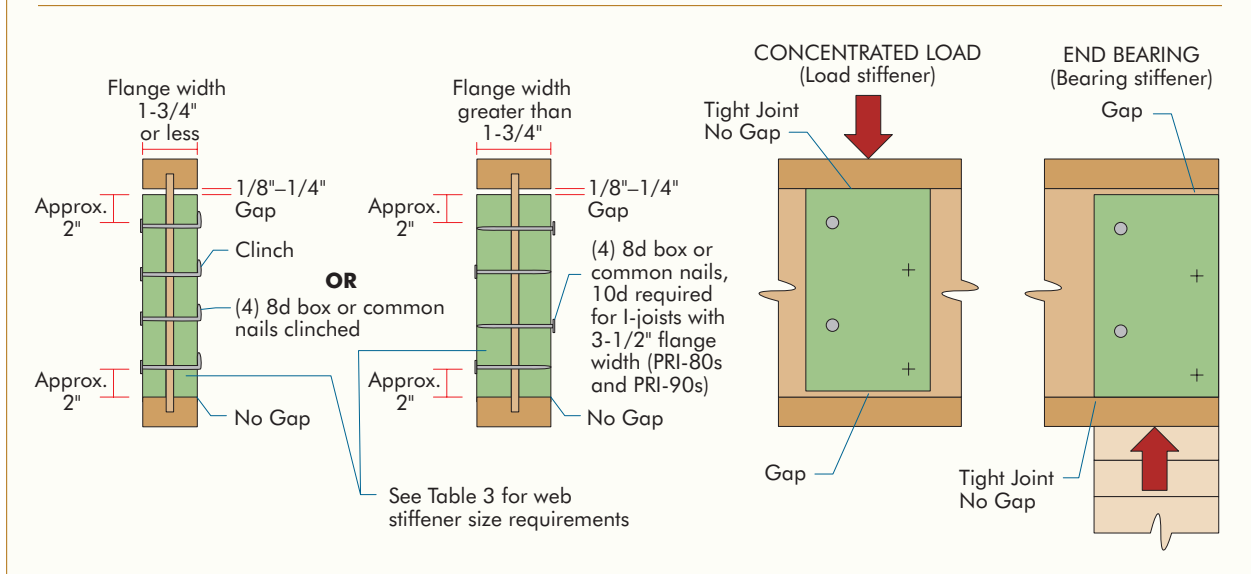


FIGURE 3

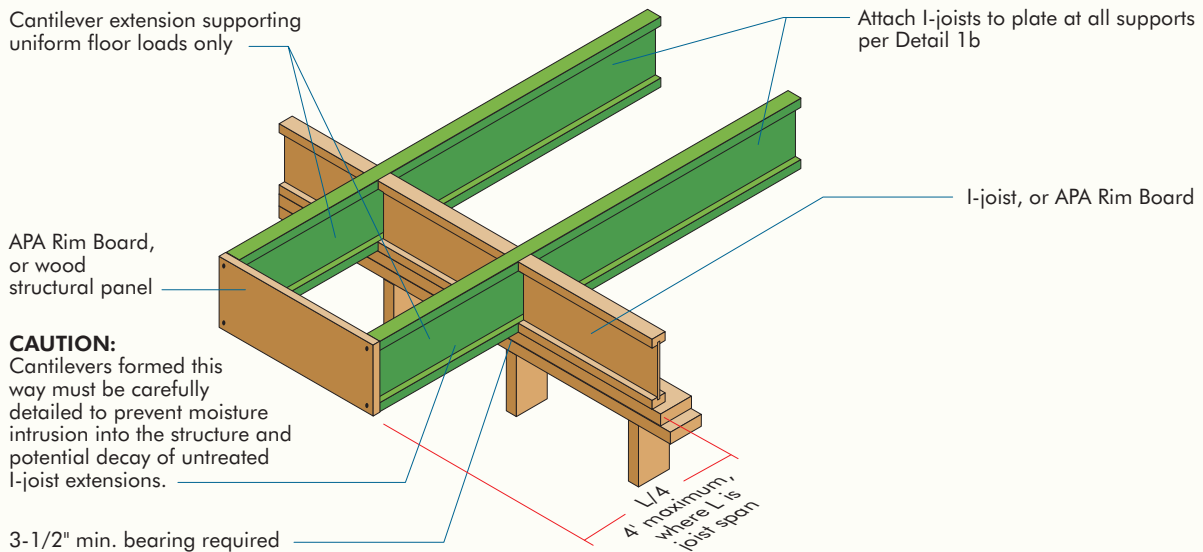
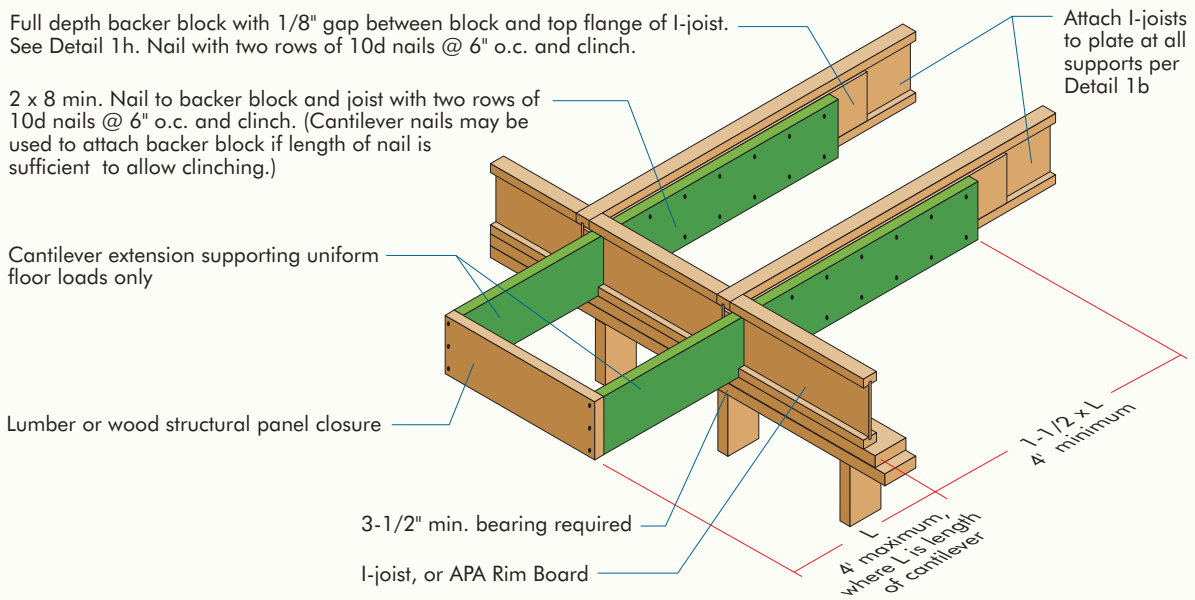
I-JOIST CANTILEVER DETAIL FOR BALCONIES

FIGURE 4

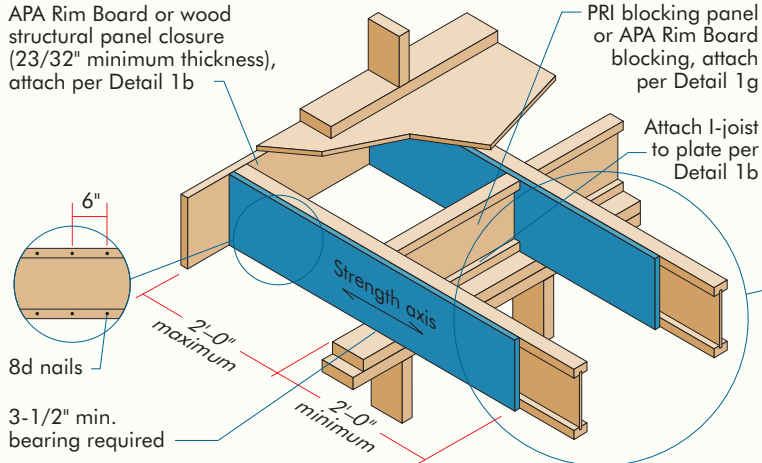
LUMBER CANTILEVER DETAIL FOR BALCONIES

All nails shown in the details above are assumed to be common nails unless otherwise noted. Individual components not shown to scale for clarity.

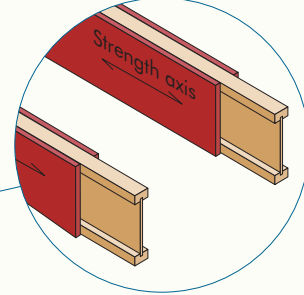
FIGURE 5A

CANTILEVER DETAIL FOR VERTICAL BUILDING OFFSET**Method 1****SHEATHING REINFORCEMENT ONE SIDE**

APA Rim Board or wood structural panel closure (23/32" minimum thickness), attach per Detail 1b

**Method 2****SHEATHING REINFORCEMENT TWO SIDES**

Use same installation as Method 1 but reinforce both sides of I-joist with sheathing or APA Rim Board.

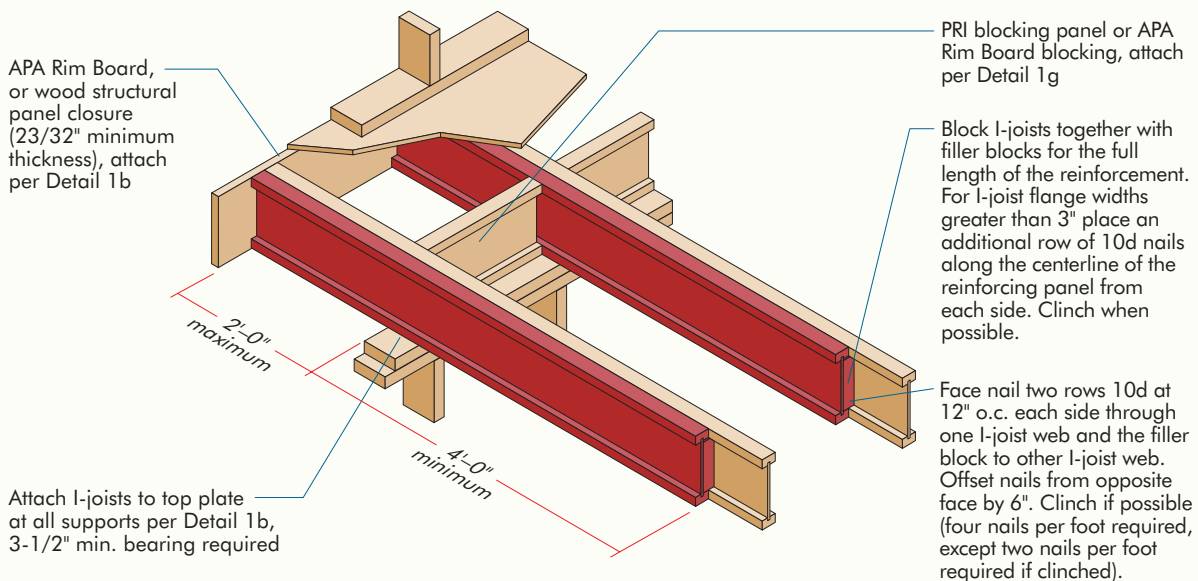


Use nailing pattern shown for Method 1 with opposite face nailing offset by 3".

Note: APA RATED SHEATHING 48/24 (minimum thickness 23/32") required on sides of joist. Depth shall match the full height of the joist. Nail with 8d nails at 6" o.c., top and bottom flange. Install with face grain horizontal. Attach I-joist to plate at all supports per Detail 1b.

Alternate Method 2
DOUBLE I-JOIST

APA Rim Board, or wood structural panel closure (23/32" minimum thickness), attach per Detail 1b



All nails shown in the details above are assumed to be common nails unless otherwise noted. Individual components not shown to scale for clarity.

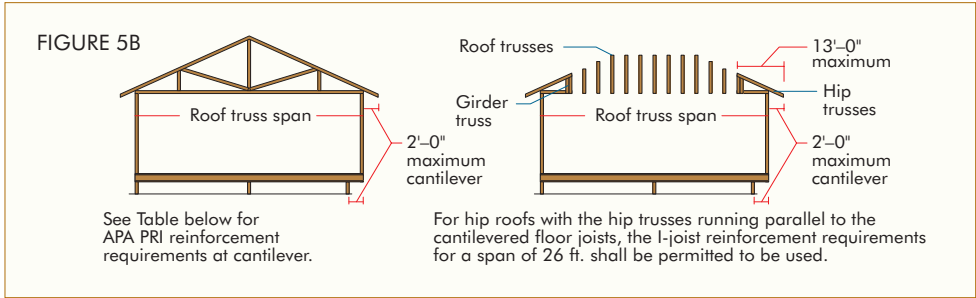


TABLE 2

PRI CANTILEVER REINFORCEMENT METHODS ALLOWED

Joist Depth (in.)	Roof Truss Span (ft)	ROOF LOADINGS											
		TL = 35 psf LL not to exceed 20 psf				TL = 45 psf LL not to exceed 30 psf				TL = 55 psf LL not to exceed 40 psf			
		Joist Spacing (in.)				Joist Spacing (in.)				Joist Spacing (in.)			
		12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
9-1/2	26	N	N	N	1,2	N	N	1,2	2	N	1,2	2	X
	28	N	N	1,2	1,2	N	N	1,2	2	N	1,2	2	X
	30	N	N	1,2	1,2	N	1,2	1,2	2	N	1,2	2	X
	32	N	N	1,2	2	N	1,2	1,2	X	N	1,2	2	X
	34	N	N	1,2	2	N	1,2	2	X	N	2	X	X
	36	N	N	1,2	2	N	1,2	2	X	N	2	X	X
11-7/8	26	N	N	N	1,2	N	N	1,2	1,2	N	1,2	1,2	2
	28	N	N	1,2	1,2	N	1,2	1,2	1,2	N	1,2	1,2	2
	30	N	N	1,2	1,2	N	1,2	1,2	2	N	1,2	1,2	2
	32	N	N	1,2	1,2	N	1,2	1,2	2	N	1,2	1,2	2
	34	N	N	1,2	1,2	N	1,2	1,2	2	N	1,2	2	2
	36	N	N	1,2	1,2	N	1,2	1,2	2	N	1,2	2	2
	38	N	1,2	1,2	2	N	1,2	1,2	2	1,2	1,2	2	X
14	26	N	N	N	1,2	N	N	N	1,2	N	N	1,2	1,2
	28	N	N	N	1,2	N	N	1,2	1,2	N	N	1,2	2
	30	N	N	N	1,2	N	N	1,2	1,2	N	1,2	1,2	2
	32	N	N	N	1,2	N	N	1,2	1,2	N	1,2	1,2	2
	34	N	N	N	1,2	N	N	1,2	2	N	1,2	1,2	2
	36	N	N	1,2	1,2	N	1,2	1,2	2	N	1,2	1,2	2
	38	N	N	1,2	1,2	N	1,2	1,2	2	N	1,2	1,2	2
	40	N	N	1,2	1,2	N	1,2	1,2	2	N	1,2	2	2
16	26	N	N	N	1,2	N	N	1,2	1,2	N	N	1,2	1,2
	28	N	N	N	1,2	N	N	1,2	1,2	N	1,2	1,2	2
	30	N	N	N	1,2	N	N	1,2	1,2	N	1,2	1,2	2
	32	N	N	N	1,2	N	N	1,2	1,2	N	1,2	1,2	2
	34	N	N	1,2	1,2	N	N	1,2	2	N	1,2	1,2	2
	36	N	N	1,2	1,2	N	1,2	1,2	2	N	1,2	1,2	2
	38	N	N	1,2	1,2	N	1,2	1,2	2	N	1,2	2	2
	40	N	N	1,2	1,2	N	1,2	1,2	2	N	1,2	2	2
	42	N	N	1,2	1,2	N	1,2	1,2	2	N	1,2	2	X

Notes

1. N = No reinforcement required.
 1 = PRIs reinforced with 23/32" wood structural panel on one side only.
 2 = PRIs reinforced with 23/32" wood structural panel on both sides or double I-joist.
 X = Try a deeper joist or closer spacing.
2. Color coding in table is matched to details in Figure 5a.
3. Maximum load shall be: 15 psf roof dead load, 50 psf floor total load, and 80 plf wall load. Wall load is based on 3'-0" maximum width window

or door openings. For larger openings, or multiple 3'-0" width openings spaced less than 6'-0" o.c., additional joists beneath the opening's cripple studs may be required.

4. Table applies to joists 12" to 24" o.c. Use 12" o.c. requirements for lesser spacings.
5. For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge board, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.

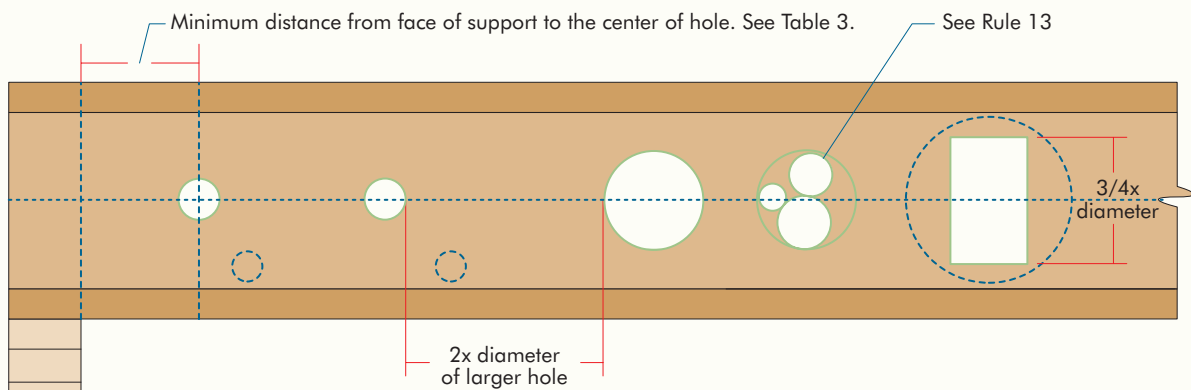
WEB HOLE SPECIFICATIONS

One of the benefits of using I-joists in residential floor construction is that holes may be cut in the joist webs to accommodate electrical wiring, plumbing lines and other mechanical systems, therefore minimizing the depth of the floor system.

Rules for cutting holes in PRI Joists

1. The distance between the inside edge of the support and the centerline of any hole shall be in compliance with the requirements of Table 3.
2. I-joist top and bottom flanges must NEVER be cut, notched or otherwise modified.
3. Whenever possible, field-cut holes should be centered on the middle of the web.
4. The maximum size hole that can be cut into an I-joist web shall equal the clear distance between the flanges of the I-joist minus 1/4 inch. A minimum of 1/8 inch should always be maintained between the top or bottom of the hole and the adjacent I-joist flange.
5. The sides of square holes or longest sides of rectangular holes should not exceed three-fourths of the diameter of the maximum round hole permitted at that location.
6. Where more than one hole is necessary, the distance between adjacent hole edges shall exceed twice the diameter of the largest round hole or twice the size of the largest square hole (**or twice the length of the longest side of the longest rectangular hole**) and each hole must be sized and located in compliance with the requirements of Table 3.
7. A knockout is **not** considered a hole, may be utilized anywhere it occurs and may be ignored for purposes of calculating minimum distances between holes.
8. One and one-half-inch-diameter holes are permitted anywhere in a cantilevered section of a PRI Joist. Holes of greater size may be permitted subject to verification.
9. A maximum 1-1/2-inch-diameter hole can be placed anywhere in the web provided that it meets the requirements of rule No. 6 above.
10. For joists with more than one span, use the longest span to determine the hole location in either span.
11. All holes shall be cut in a workmanlike manner in accordance with the restrictions listed above and as illustrated in Figure 6.
12. Limit three maximum-size holes per span.
13. A group of round holes at approximately the same location is permitted if they meet the requirements for a single round hole circumscribed around them.

FIGURE 6

PRI JOIST TYPICAL HOLES

Knockouts are prescored holes often provided by I-joist manufacturers for the contractor's convenience to install electrical or small plumbing lines. They are typically 1-3/8 to 1-3/4 inches in diameter, and are spaced 12 to 24 inches on center along the length of the I-joist. Where possible, it is preferable to use knockouts instead of field-cutting holes.

Cutting the Hole

- Never drill, cut or notch the flange, or over-cut the web.
- Holes in webs should be cut with a sharp saw.
- For rectangular holes, avoid over cutting the corners, as this can cause unnecessary stress concentrations. Slightly rounding the corners is recommended. Starting the rectangular hole by drilling a 1-inch-diameter hole in each of the four corners and then making the cuts between the holes is another good method to minimize damage to the I-joist.

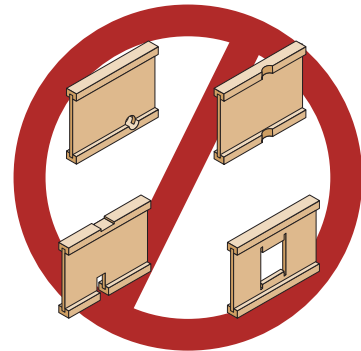


TABLE 3

LOCATION OF CIRCULAR HOLES IN PRI JOIST WEBSSimple or Multiple Span for Dead Loads up to 10 psf and Live Loads up to 40 psf^{(a)(b)(c)(d)}

Joist Depth	Joist	SAF ^(e)	Minimum Distance from Inside Face of Any Support to Center of Hole (ft-in.)														
			Round Hole Diameter (in.)														
			2	3	4	5	6	6-1/4	7	8	8-5/8	9	10	10-3/4	11	12	12-3/4
9-1/2"	PRI-20	13'-5"	0'-7"	0'-11"	2'-2"	3'-6"	5'-3"	5'-8"									
	PRI-30	13'-10"	0'-9"	2'-0"	3'-3"	4'-7"	6'-1"	6'-6"									
	PRI-40	14'-6"	0'-7"	1'-8"	3'-0"	4'-4"	5'-9"	6'-3"									
	PRI-50	14'-5"	1'-1"	2'-4"	3'-8"	5'-0"	6'-6"	6'-11"									
	PRI-60	15'-3"	1'-8"	3'-0"	4'-4"	5'-8"	7'-3"	7'-8"									
11-7/8"	PRI-20	13'-5"	0'-7"	0'-8"	0'-8"	0'-9"	1'-11"	2'-5"	3'-10"	5'-11"	7'-4"						
	PRI-30	15'-0"	0'-7"	0'-8"	0'-8"	1'-9"	3'-4"	3'-9"	5'-0"	6'-10"	8'-0"						
	PRI-40	16'-7"	0'-7"	0'-8"	1'-2"	2'-5"	3'-9"	4'-1"	5'-1"	6'-8"	7'-11"						
	PRI-50	16'-1"	0'-7"	0'-8"	0'-11"	2'-6"	4'-1"	4'-6"	5'-10"	7'-8"	8'-11"						
	PRI-60	18'-2"	0'-8"	1'-10"	3'-2"	4'-5"	5'-10"	6'-2"	7'-4"	8'-11"	10'-0"						
	PRI-70	18'-6"	0'-7"	1'-2"	2'-5"	3'-9"	5'-2"	5'-8"	7'-0"	8'-10"	10'-2"						
	PRI-80	19'-10"	1'-11"	3'-2"	4'-6"	5'-10"	7'-3"	7'-8"	8'-10"	10'-6"	11'-7"						
	PRI-90	20'-5"	0'-7"	0'-8"	1'-4"	3'-0"	4'-9"	5'-3"	6'-8"	8'-8"	10'-0"						
14"	PRI-40	18'-3"	0'-7"	0'-8"	0'-8"	0'-9"	1'-10"	2'-2"	3'-2"	4'-7"	5'-5"	6'-0"	7'-7"	9'-4"			
	PRI-50	16'-1"	0'-7"	0'-8"	0'-8"	0'-9"	0'-9"	1'-1"	2'-6"	4'-6"	5'-9"	6'-7"	8'-10"	10'-7"			
	PRI-60	19'-9"	0'-7"	0'-8"	0'-8"	1'-7"	3'-2"	3'-6"	4'-9"	6'-6"	7'-8"	8'-4"	10'-4"	11'-11"			
	PRI-70	18'-6"	0'-7"	0'-8"	0'-8"	0'-11"	2'-6"	2'-11"	4'-2"	5'-11"	7'-0"	7'-10"	10'-1"	12'-0"			
	PRI-80	22'-7"	0'-7"	1'-9"	3'-0"	4'-4"	5'-8"	6'-1"	7'-1"	8'-7"	9'-7"	10'-3"	12'-2"	13'-10"			
	PRI-90	23'-2"	0'-7"	0'-8"	0'-9"	2'-4"	3'-11"	4'-4"	5'-7"	7'-4"	8'-6"	9'-3"	11'-3"	12'-10"			
16"	PRI-40	19'-8"	0'-7"	0'-8"	0'-8"	0'-9"	0'-9"	0'-10"	1'-5"	2'-9"	3'-7"	4'-1"	5'-6"	6'-7"	7'-0"	8'-9"	10'-9"
	PRI-50	16'-1"	0'-7"	0'-8"	0'-8"	0'-9"	0'-9"	0'-10"	0'-10"	0'-10"	1'-9"	2'-6"	4'-6"	6'-0"	6'-8"	9'-7"	11'-11"
	PRI-60	19'-9"	0'-7"	0'-8"	0'-8"	0'-9"	0'-9"	0'-10"	1'-10"	3'-6"	4'-6"	5'-2"	7'-3"	8'-11"	9'-6"	11'-10"	13'-9"
	PRI-70	18'-6"	0'-7"	0'-8"	0'-8"	0'-9"	0'-9"	0'-10"	1'-0"	2'-11"	4'-1"	4'-10"	6'-11"	8'-7"	9'-1"	11'-6"	13'-6"
	PRI-80	23'-11"	0'-7"	0'-8"	0'-8"	1'-7"	3'-2"	3'-7"	4'-10"	6'-6"	7'-7"	8'-3"	10'-2"	11'-8"	12'-2"	14'-3"	16'-0"
PRI-90	25'-7"	0'-7"	0'-8"	0'-8"	0'-10"	2'-3"	2'-8"	3'-10"	5'-5"	6'-5"	7'-1"	8'-10"	10'-4"	10'-10"	13'-3"	15'-3"	

Notes:

- (a) Above tables may be used for I-joist spacing of 24 inches o.c. or less.
 (b) Hole location distance is measured from inside face of supports to center of hole.
 (c) Distances in this chart are based on uniformly loaded joists.
 (d) Hole sizes and/or locations that fall outside the scope of this table may be acceptable based on analysis of actual hole size, span, spacing and loading conditions. The I-joist shear capacity at the location of a circular web hole (V_{rh}) is calculated using the following equation:

$$V_{rh} = \text{Published Shear Value} \times \left[\frac{\text{Joist Depth} - \text{Hole Diameter}}{\text{Joist Depth}} \right]$$

- (e) SAF = Span Adjustment Factor, used as defined below:

OPTIONAL:

Table 3 is based on the I-joists used at their maximum span. If the I-joists are placed at less than their full allowable span, the maximum distance from the centerline of the hole to the face of any support (D) as given above may be reduced as follows:

$$D_{\text{reduced}} = \frac{L_{\text{actual}}}{\text{SAF}} \times D$$

Where: D_{reduced} = Distance from the inside face of any support to center of hole, reduced for less-than-maximum span applications (ft). The reduced distance shall not be less than 6 inches from the face of the support to edge of the hole.

L_{actual} = The actual measured span distance between the inside faces of supports (ft).

SAF = Span Adjustment Factor given in this table.

D = The minimum distance from the inside face of any support to center of hole from this table.

If $\frac{L_{\text{actual}}}{\text{SAF}}$ is greater than 1, use 1 in the above calculation for $\frac{L_{\text{actual}}}{\text{SAF}}$.

RIM BOARD HOLE SPECIFICATIONS

The maximum allowable hole size for an APA Rim Board shall be $\frac{2}{3}$ of the Rim Board depth, as shown below. The length of the Rim Board segment containing a hole shall be at least eight times the hole size.

TABLE 4

RIM BOARD HOLE SIZES AND MINIMUM LENGTH

Rim Board Depth (in.)	Maximum Allowable Hole Size ^{(a)(b)} (in.)	Minimum Length of Rim Board Segment ^(c) for the Maximum Allowable Hole Size (in.)
9-1/2	6-1/4	50
11-7/8	7-3/4	62
14	9-1/4	74
16	10-1/2	84

(a) These hole provisions do not apply to Rim Board installed over openings, such as doors or windows.

(b) The diameter of a round hole or the longer dimension of a rectangular hole.

(c) The length of Rim Board segment per wall line. For multiple holes, the minimum length of Rim Board segment shall be eight times the sum of all hole sizes.

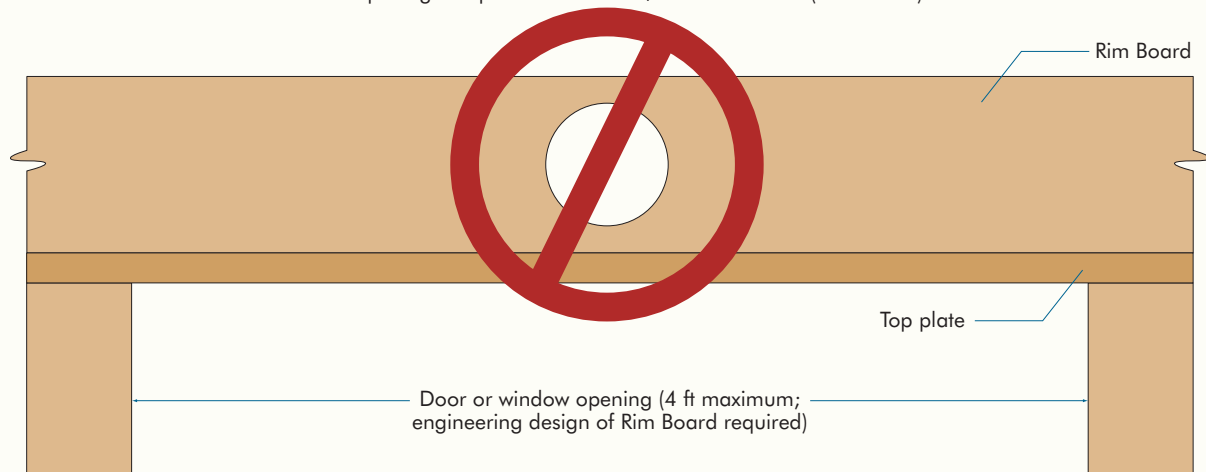
Rim Board Hole Application Notes

- Do not cut holes in Rim Board installed over openings, such as doors or windows, where the Rim Board is not fully supported, except that holes of 1-1/2 inches or less in size are permitted provided they are positioned at the mid-depth and in the middle one-third of the span (see Application Note 5 for minimum hole spacing).

FIGURE 7

RIM BOARD OVER AN OPENING

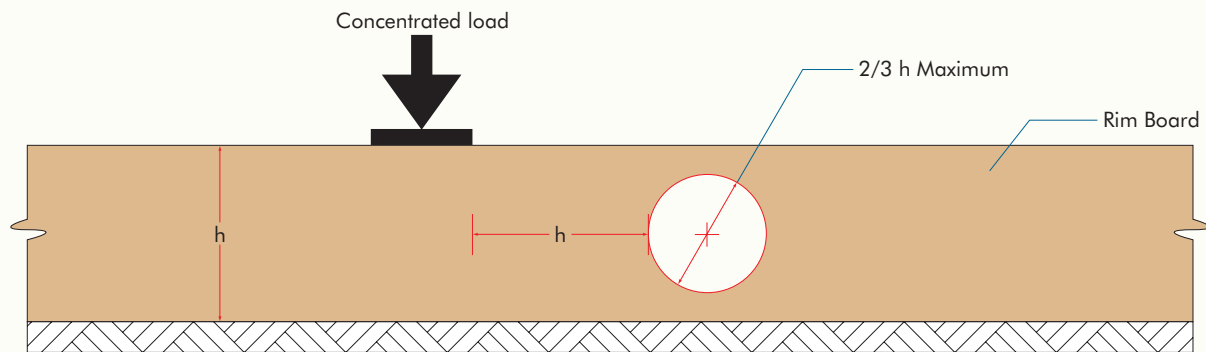
Do not cut holes in Rim Board over opening except for holes of 1-1/2" or less in size (see Note 1).



- Field-cut holes should be vertically centered in the Rim Board and at least one hole diameter or 6-inches, whichever is less, clear distance away from the end of the wall line. Holes should never be placed such that they interfere with the attachment of the Rim Board to the ends of the floor joist, or any other code-required nailing.

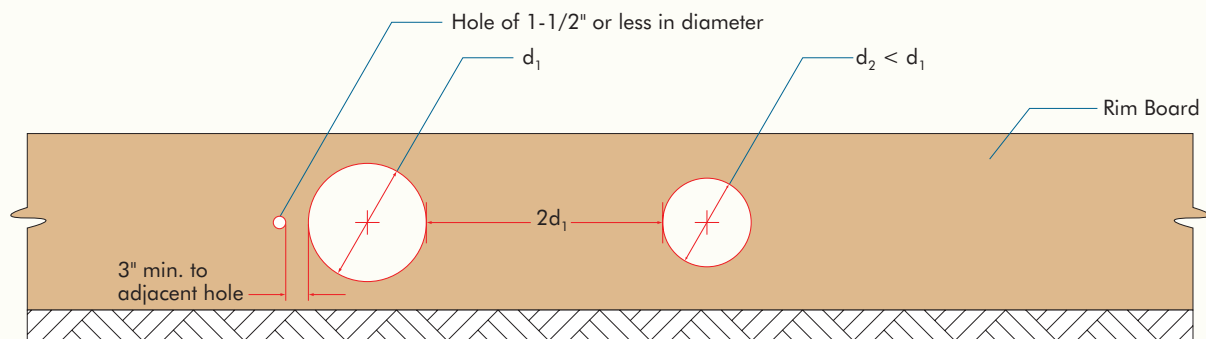
3. While round holes are preferred, rectangular holes may be used providing the corners are not over-cut. Slightly rounding corners by pre-drilling with a 1-inch-diameter bit is recommended.
4. When concentrated loads are present on the Rim Board (loads not supported by any other vertical-load-carrying members such as squash blocks), holes should not be placed in the Rim Board within a distance equal to the depth of the Rim Board from the area of loading.

FIGURE 8

RIM BOARD NEAR CONCENTRATED VERTICAL LOAD

5. For multiple holes, the clear spacing between holes shall be at least two times the diameter of the larger hole, or twice the length of the longest side of the longest rectangular hole. This minimum hole spacing does not apply to holes of 1-1/2-inches or less in diameter, which can be placed anywhere in the Rim Board (see Note-1 for holes over opening) except that the clear distance to the adjacent hole shall be 3-inches minimum.

FIGURE 9

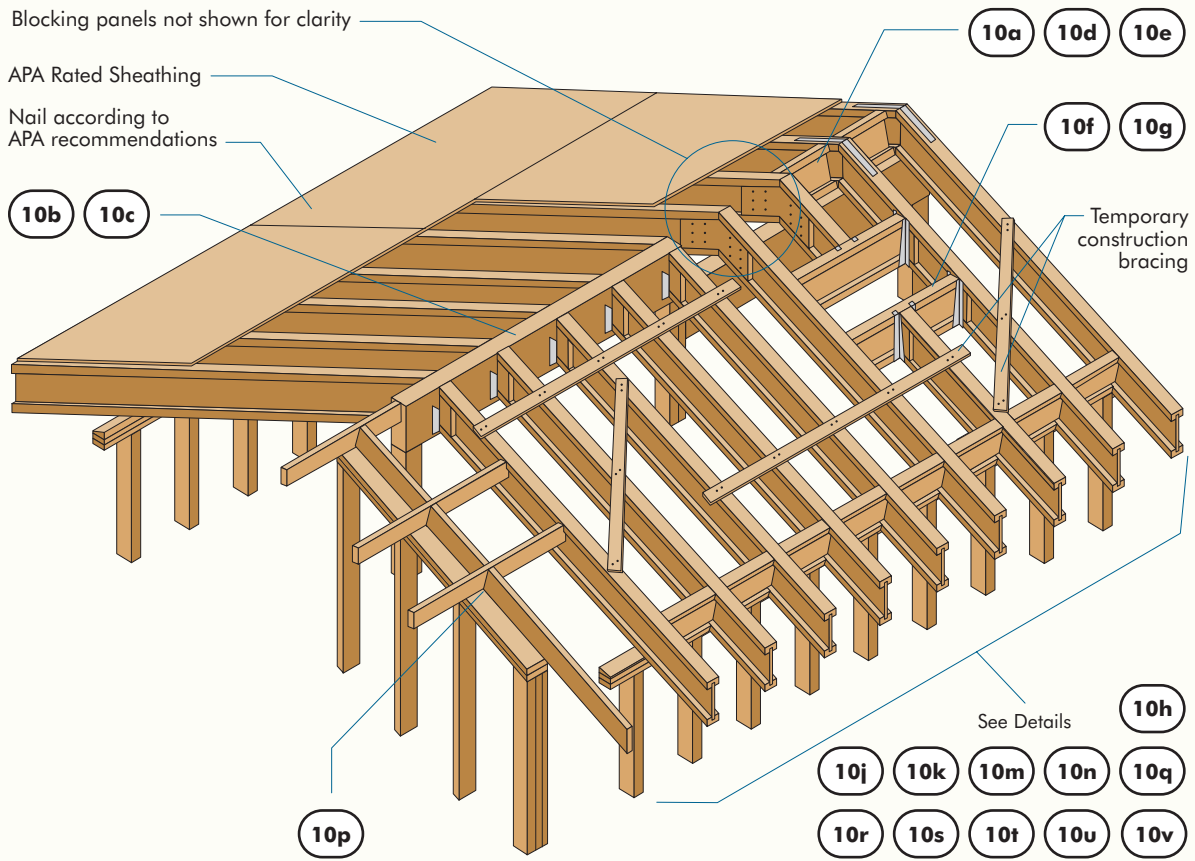
MULTIPLE HOLES FOR RIM BOARD

6. All holes shall be cut in a workman-like manner in accordance with the limitations listed above.

FIGURE 10

TYPICAL PERFORMANCE RATED I-JOIST ROOF FRAMING AND CONSTRUCTION

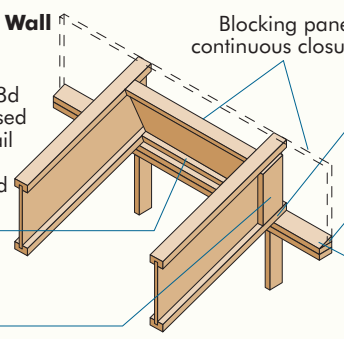
Click on circled numbers for enlarged view of detail.



10a Upper End, Bearing on Wall

8d nails at 6" o.c. – minimum 3 - 8d nails per blocking panel. (When used for lateral shear transfer, match nail type and sheathing edge nailing ("boundary nailing" for engineered diaphragm applications.) Use minimum 8d nails.

Bearing stiffener required when end reaction exceeds 1550 lbs.



Blocking panel, x-bridging, or 23/32" APA Rated Sheathing 48/24 as continuous closure. (Validate use of x-bridging with local building code.)

Minimum attachment: For slope 1/4:12, one 10d box nail, face nail at each side of bearing. For slope > 1/4:12 design joist attachment to beveled plate to transfer lateral thrust.

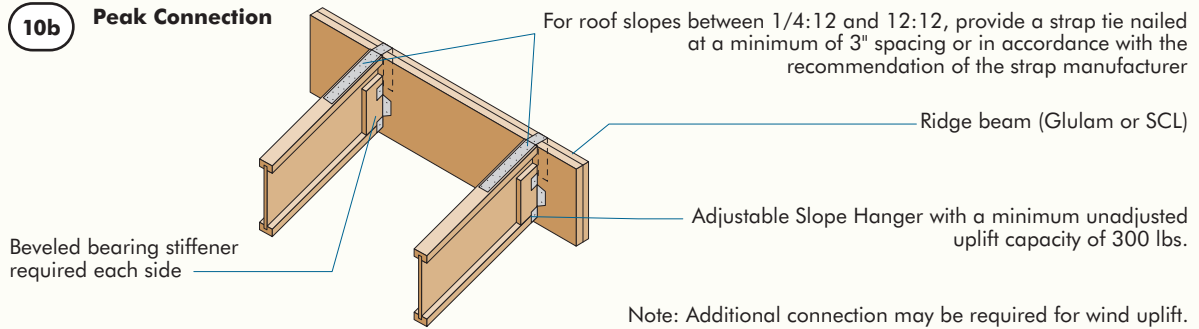
Attach beveled plate to framing with 1 - 16d at 16" o.c.

Beveled plate for slopes greater than 1/4:12. Code-recognized connectors may be substituted. For slopes greater than 4:12 connectors are required to resist lateral thrust.

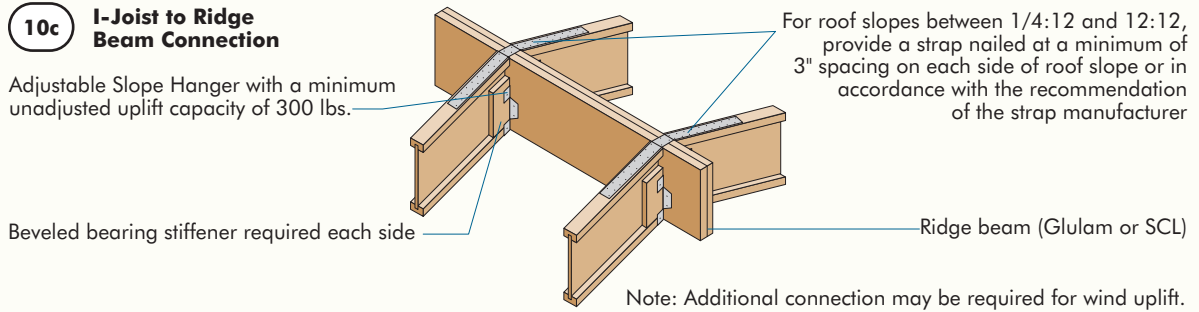
Note: Additional connection may be required for wind uplift.

All nails shown in the details above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

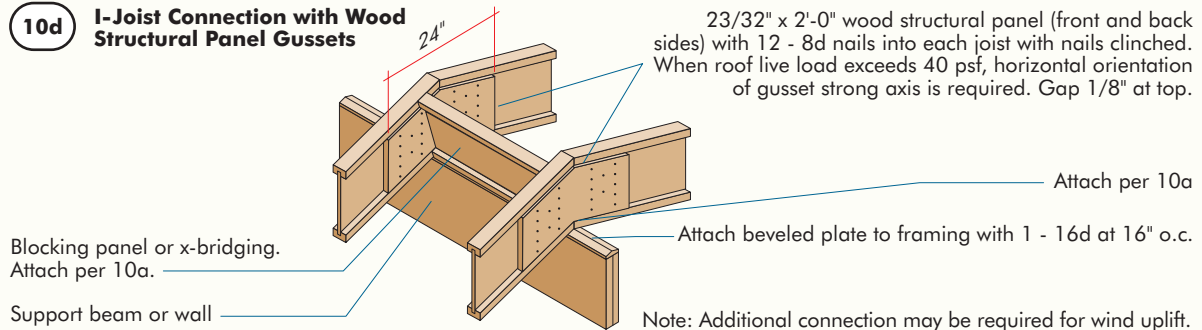
10b Peak Connection



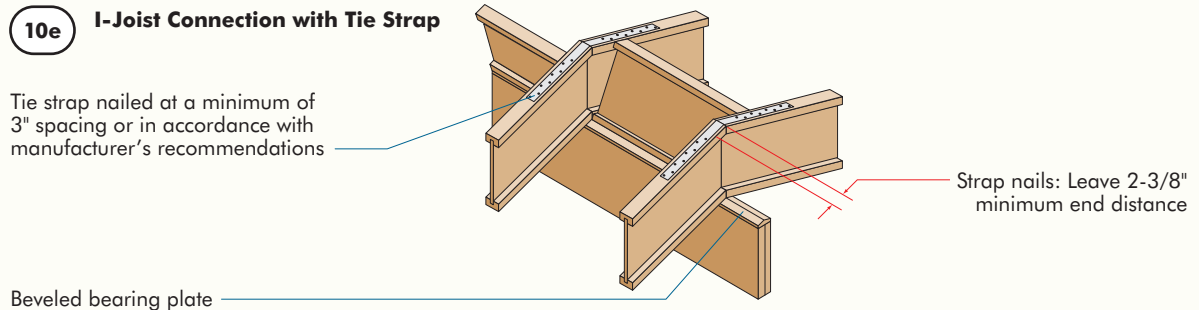
10c I-Joist to Ridge Beam Connection



10d I-Joist Connection with Wood Structural Panel Gussets



10e I-Joist Connection with Tie Strap



All nails shown in the details above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

10f Roof Opening Top Mounted Hangers

Bearing stiffeners required when hanger does **NOT** support I-joist top flange

Application limited to 4:12 slope or less

10g Roof Opening, Face-Mounted Hangers

Header may be I-joist, LVL, glulam, or lumber

Bearing stiffeners required when hanger does not support I-joist top flange

10h Birdsmouth Cut & Bevel Cut Bearing Stiffener

Permitted on low end of I-joist only

Bearing stiffeners required each side of I-joist. Bevel-cut bearing stiffener to match roof slope.

4 - 8d nails (two each side) clinched when possible

Birdsmouth cut shall bear fully and not overhang the inside face of plate

Note: Additional connection may be required for wind uplift.

10j Birdsmouth Cut with Overhang (Permitted on low end of I-joist only)

Bearing stiffener required each side (attach per 10h)

Attach joist to top plate per 10h

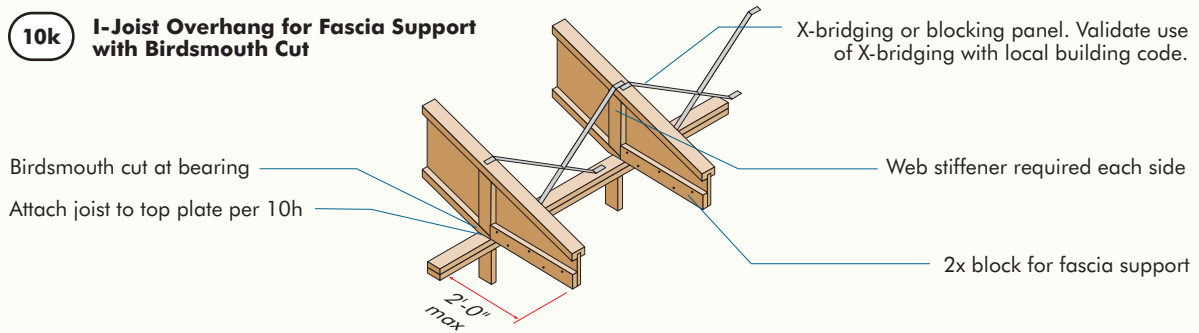
Birdsmouth cut at bearing

Note: Additional connection may be required for wind uplift.

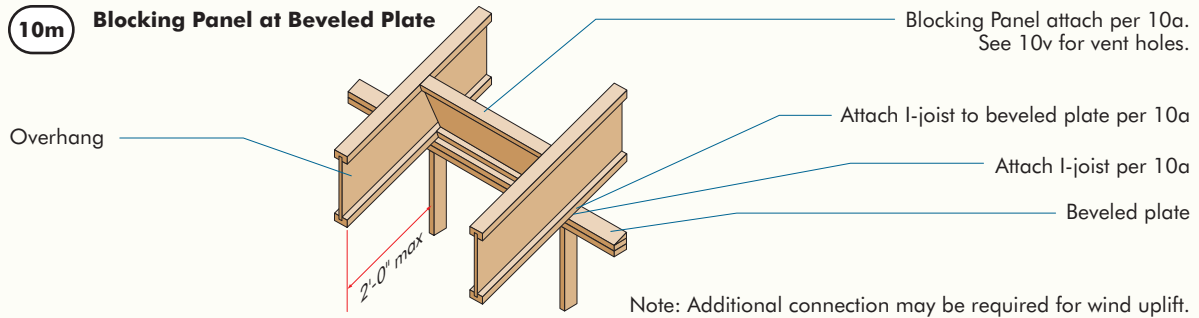
Note: Outside corner of blocking panel may be trimmed if it interferes with roof sheathing. In such cases, position blocking panel on top plate to minimize trimming and still allow required nailing into top plate.

All nails shown in the details above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

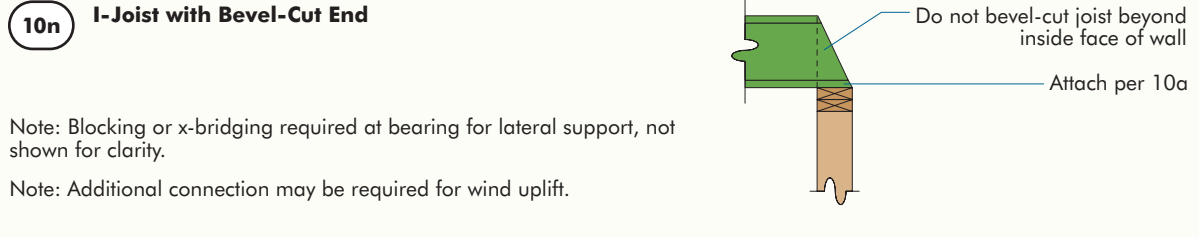
10k I-Joist Overhang for Fascia Support with Birdsmouth Cut



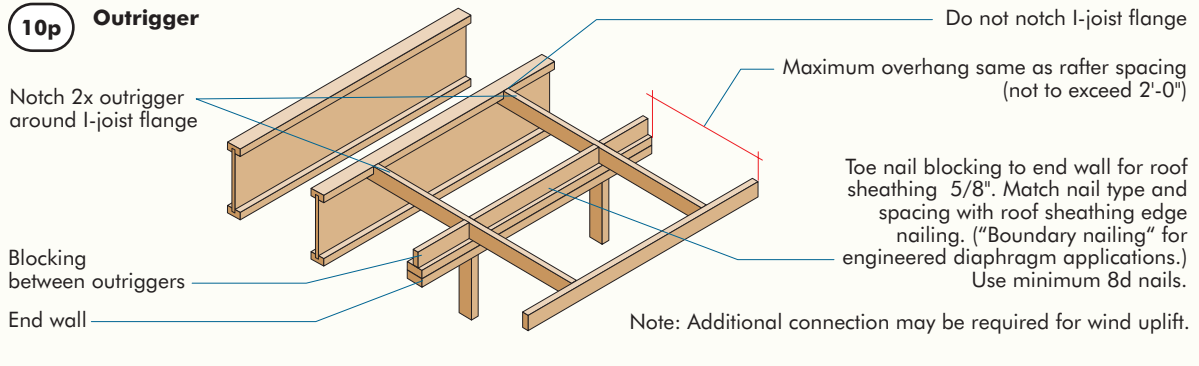
10m Blocking Panel at Beveled Plate



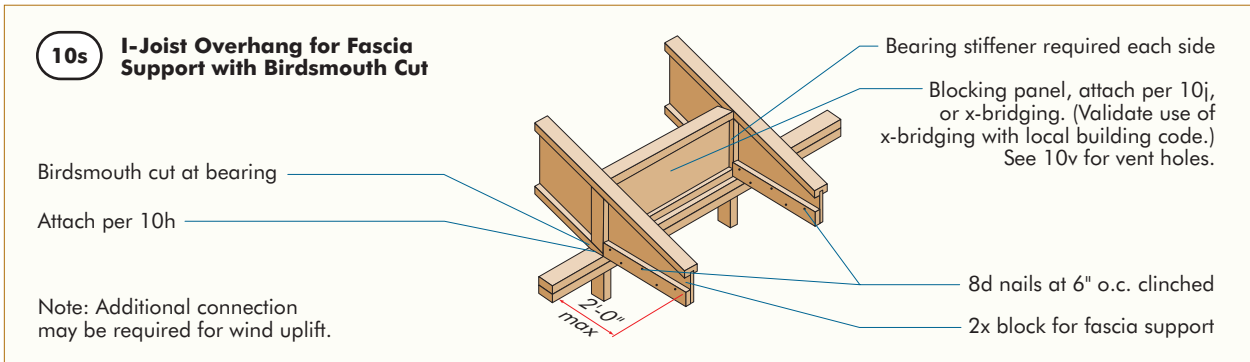
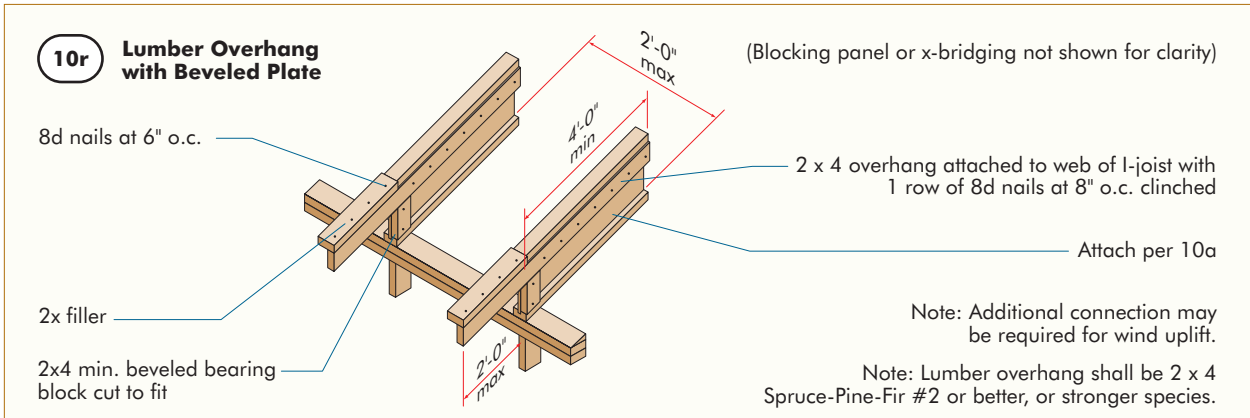
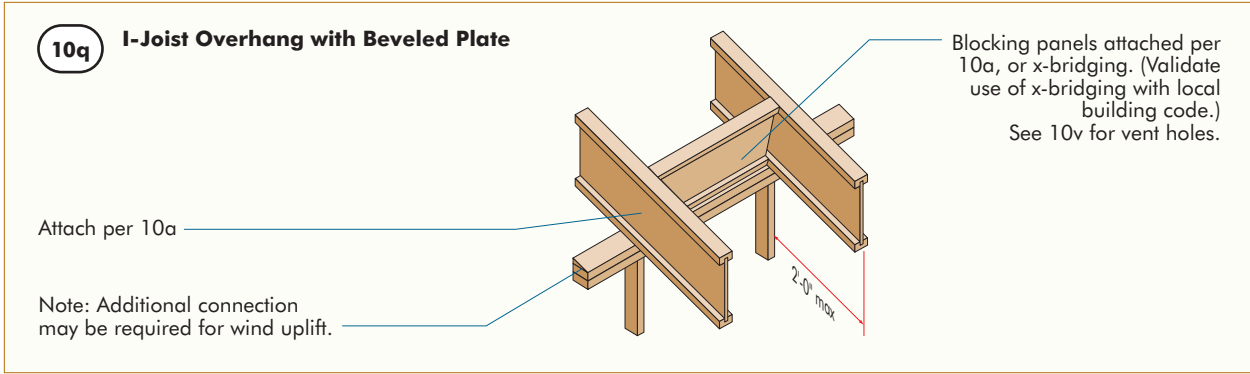
10n I-Joist with Bevel-Cut End



10p Outrigger



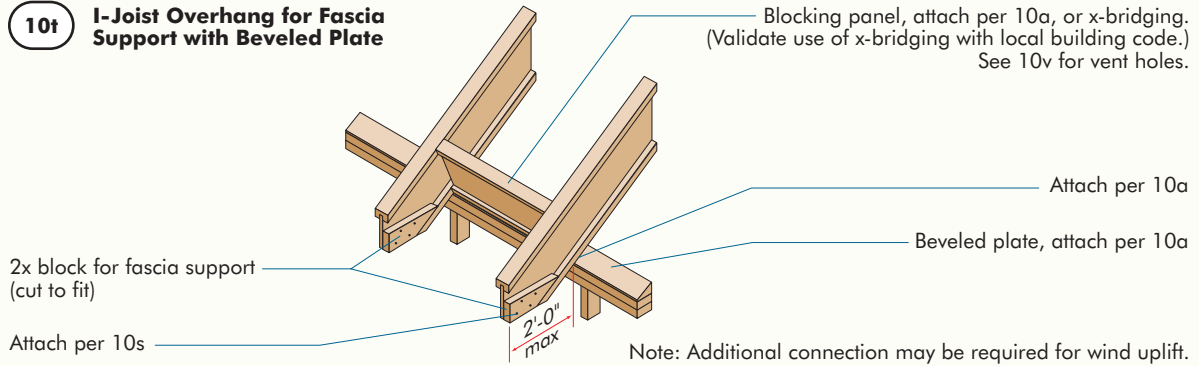
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All nails shown in the details above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

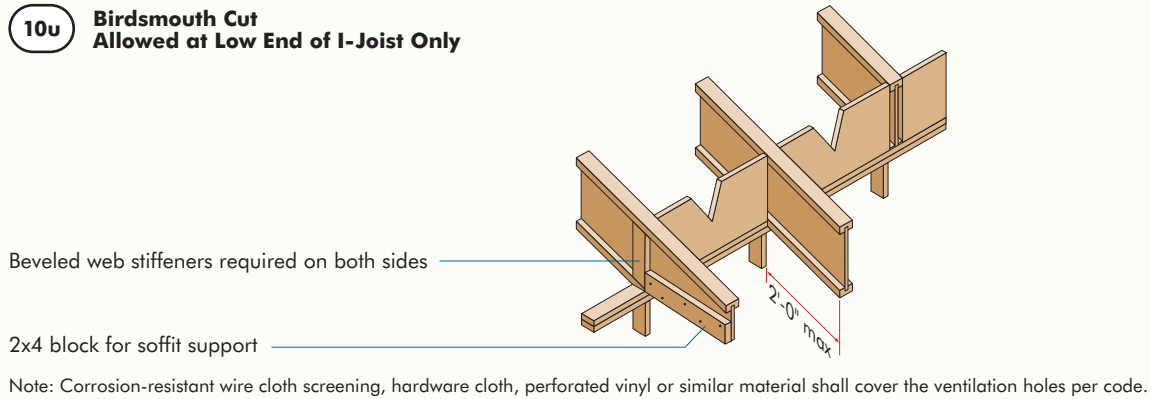
10t

I-Joist Overhang for Fascia Support with Beveled Plate



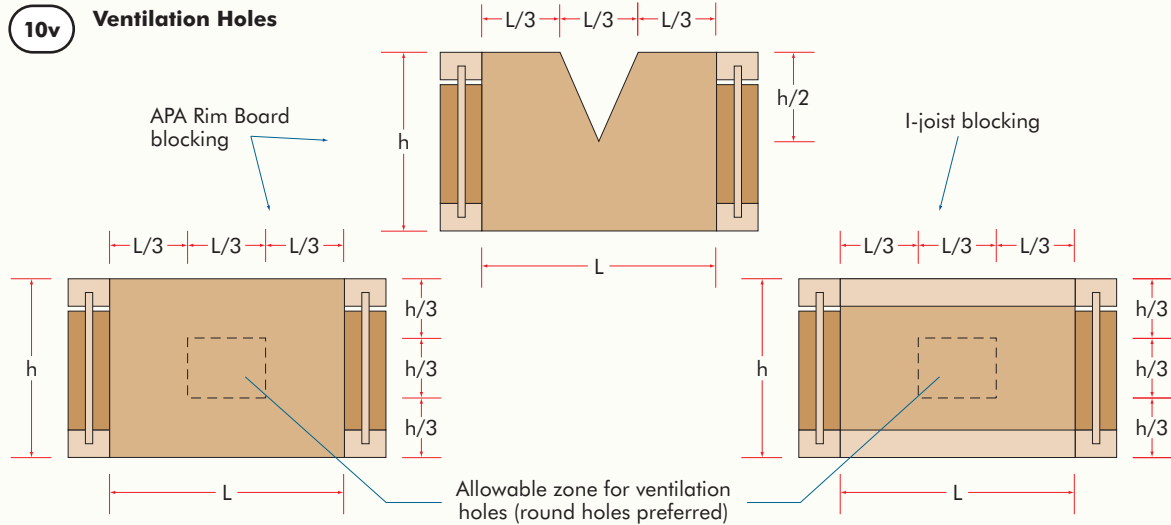
10u

Birdsmouth Cut Allowed at Low End of I-Joist Only



10v

Ventilation Holes



All nails shown in the details above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

I-Joist Construction Details

We have field representatives in many major U.S. cities and in Canada who can help answer questions involving APA trademarked products. For additional assistance in specifying engineered wood products, contact us:

APA HEADQUARTERS

7011 So. 19th St. ■ Tacoma, Washington 98466 ■ (253) 565-6600 ■ Fax: (253) 565-7265

PRODUCT SUPPORT HELP DESK

(253) 620-7400 ■ E-mail Address: help@apawood.org

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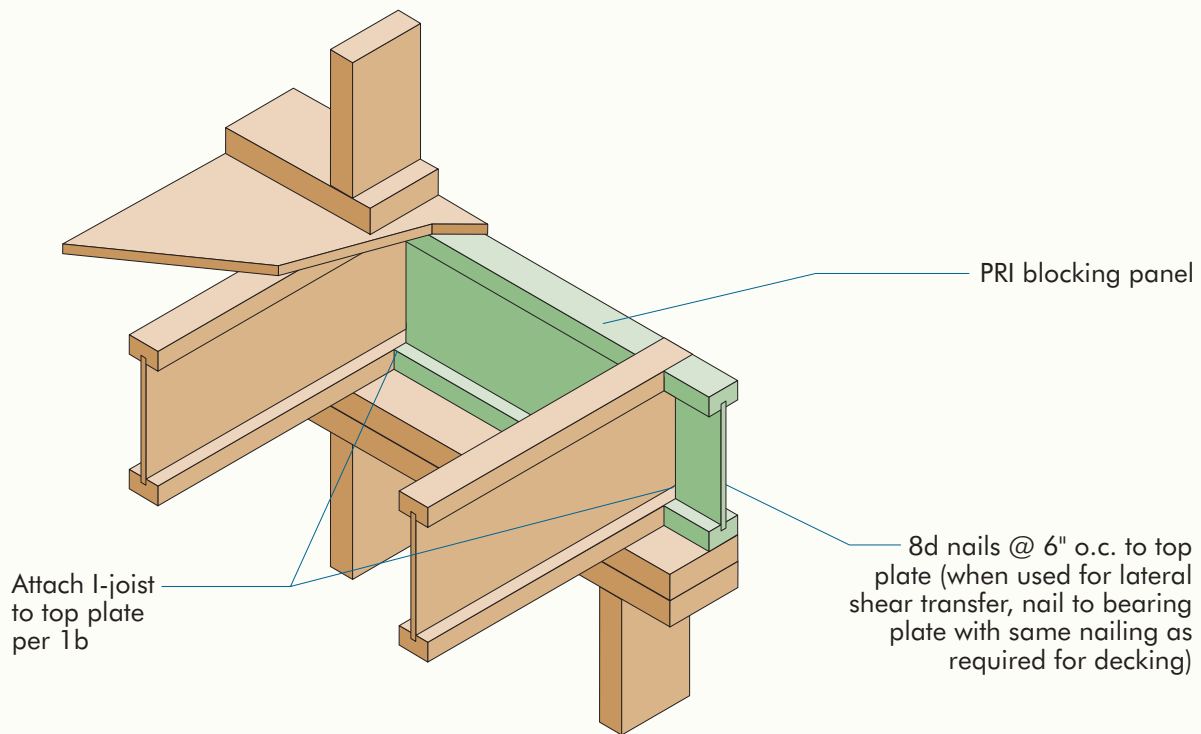


REPRESENTING THE ENGINEERED WOOD INDUSTRY

1a

Blocking Panel or Rim Joist	Uniform Vertical Load Transfer Capacity* (plf)
PRI Joists	2000

*The uniform vertical load capacity is limited to a joist depth of 16 inches or less and is based on the normal (10-yr) load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer capacity, see 1d.

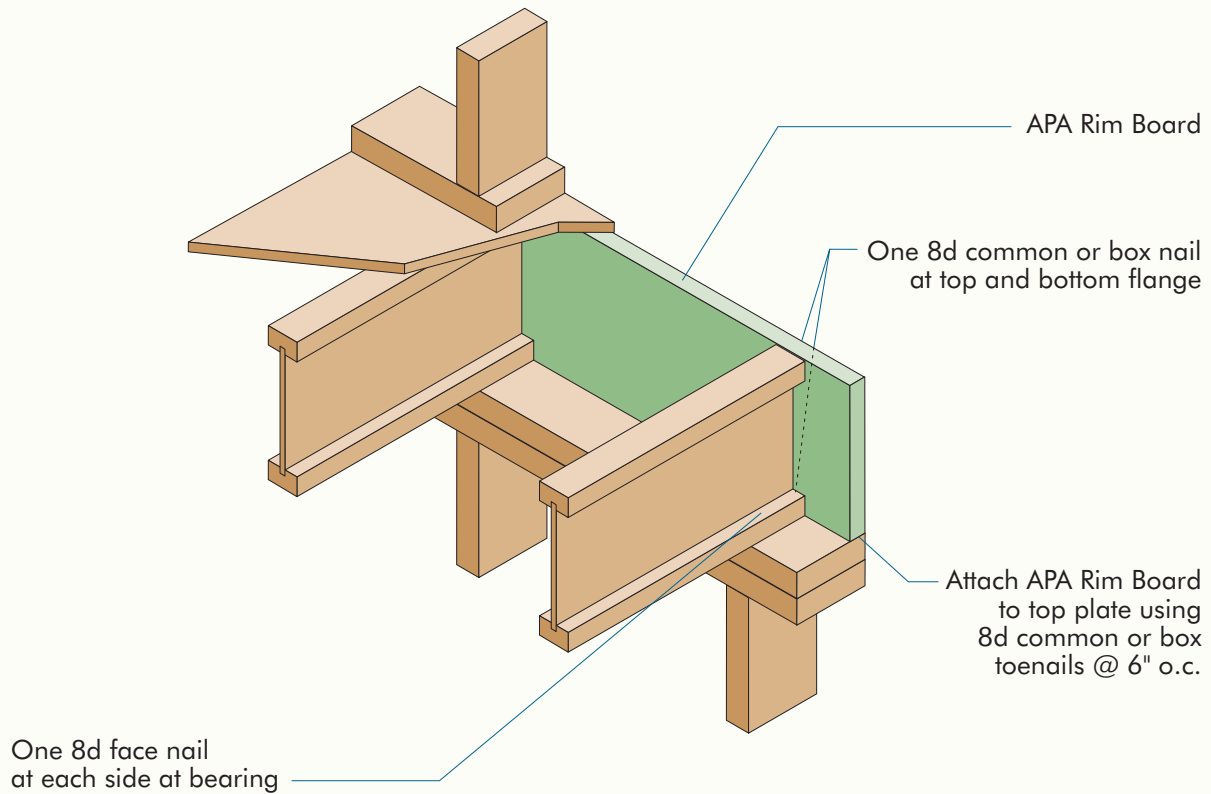


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1b

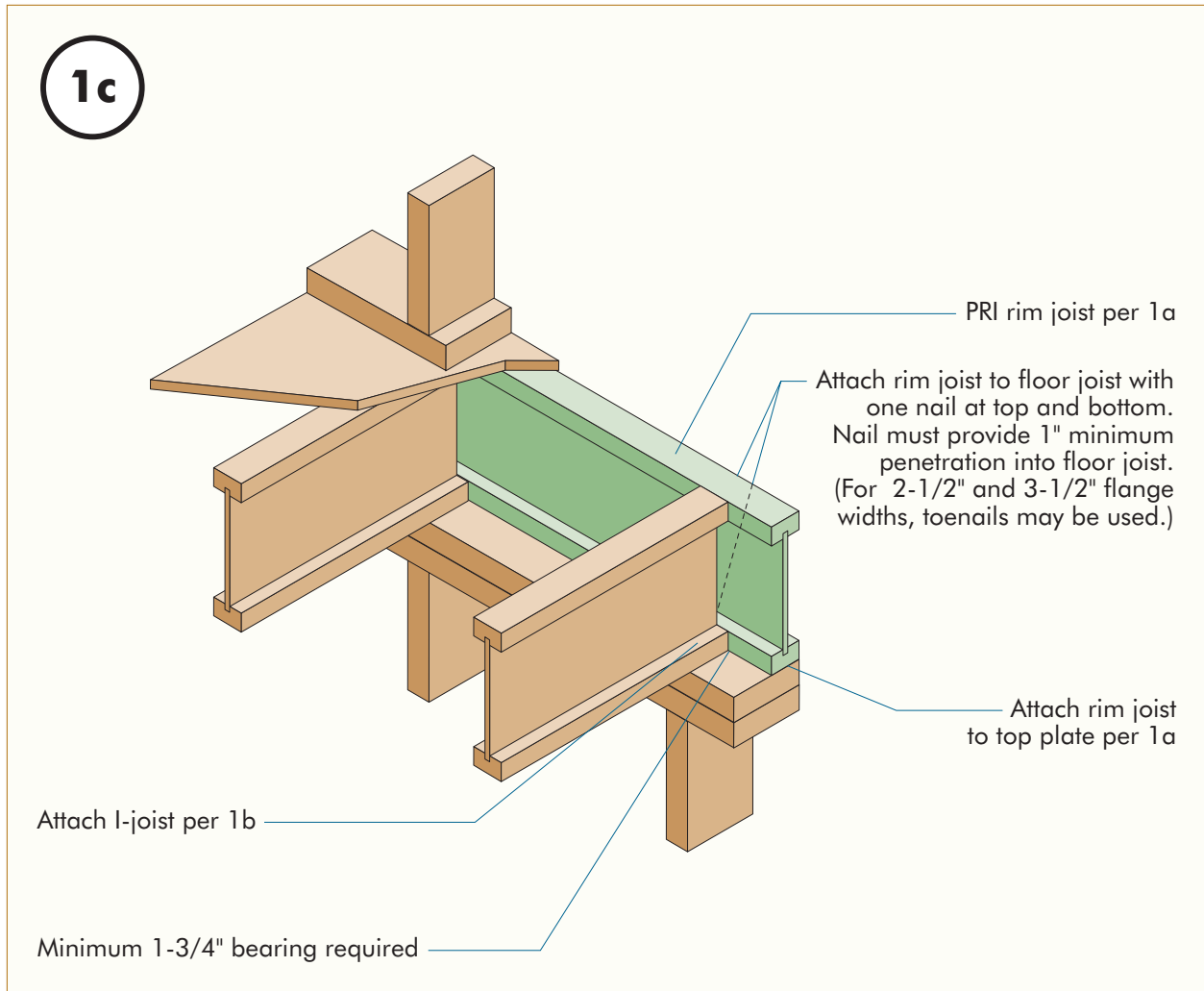
Blocking Panel or Rim Joist	Uniform Vertical Load Transfer Capacity* (plf)
1-1/8" APA Rim Board Plus	4850
1-1/8" APA Rim Board	4400
1" APA Rim Board	3300

*The uniform vertical load capacity is limited to a Rim Board depth of 16 inches or less and is based on the normal (10-yr) load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer capacity, see 1d.



To avoid splitting flange, start nails at least 1-1/2" from end of I-joist. Nails may be driven at an angle to avoid splitting of bearing plate.

All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

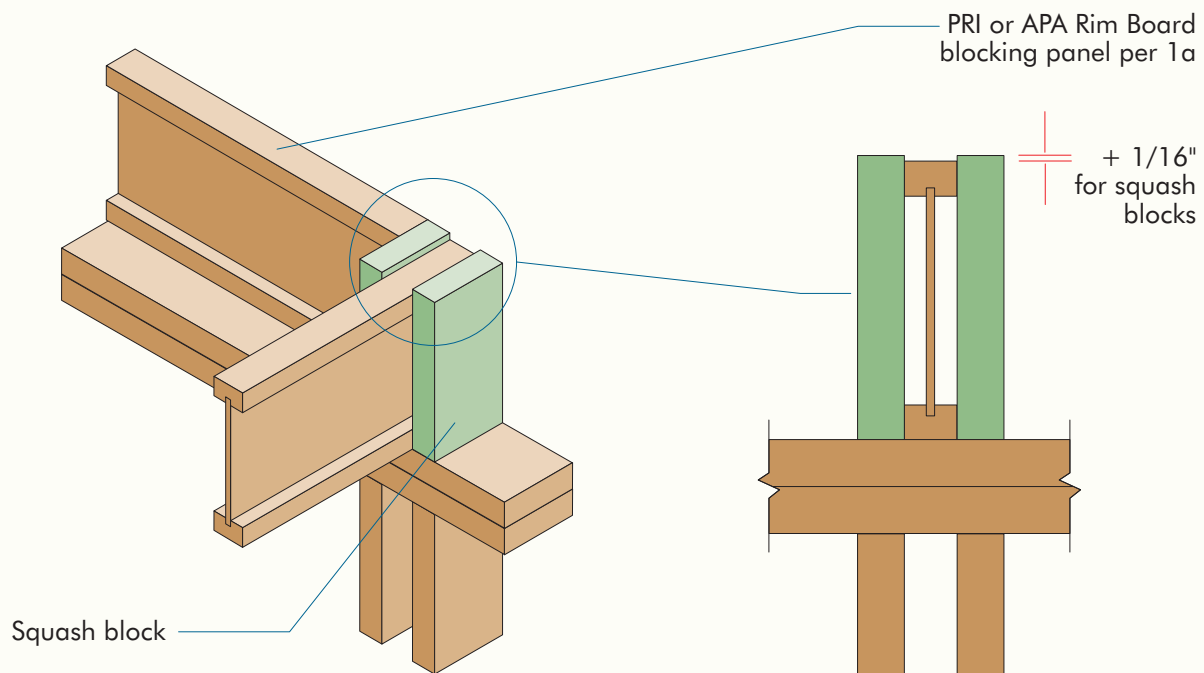


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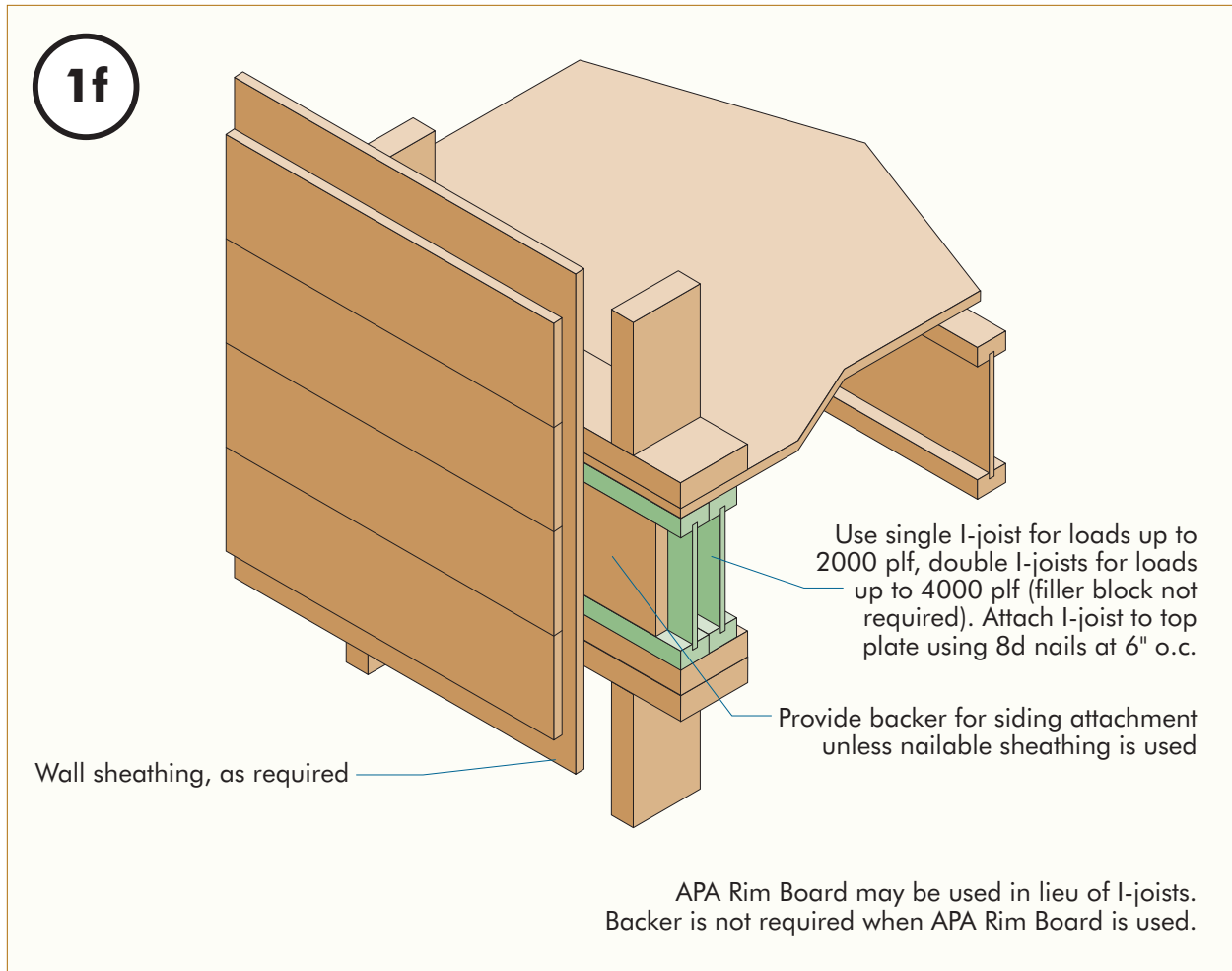
1d

Pair of Squash Blocks	Vertical load transfer capacity per pair of squash blocks (lb)	
	3-1/2" wide	5-1/2" wide
2x lumber	4000	7000
1-1/8" APA Rim Board, Rim Board Plus, or Rated Sturd-I-Floor 48 oc	3000	3500
1" APA Rim Board or Rated Sturd-I-Floor 32 oc	2700	3500

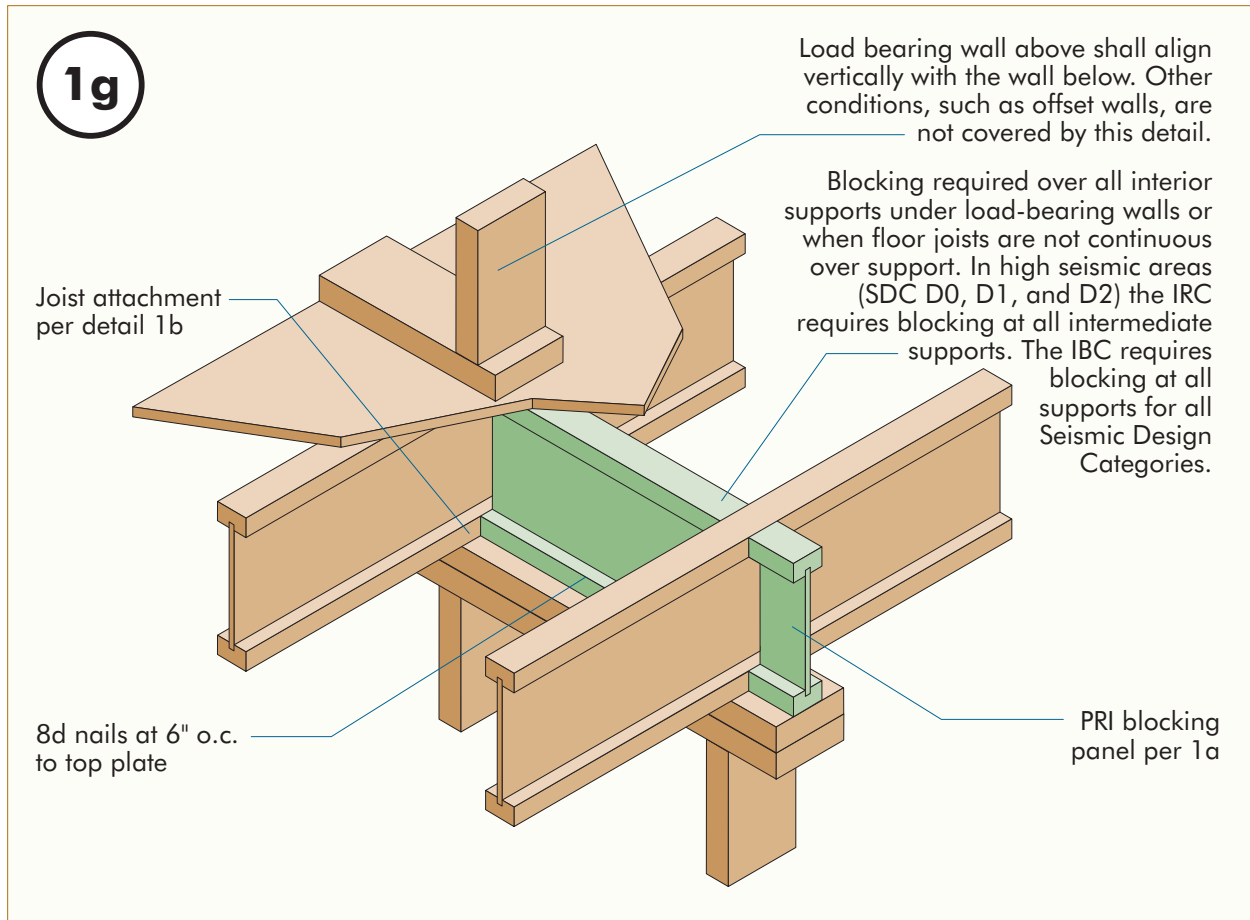
Provide lateral bracing per 1a, 1b, or 1c



All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.



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1h

Backer block (use if hanger load exceeds 250 lbs.) Before installing a backer block to a double I-joist, drive 3 additional 10d nails through the webs and filler block where the backer block will fit. Clinch. Install backer tight to top flange. Use twelve 10d nails, clinched when possible. Maximum capacity for hanger for this detail = 1280 lbs.

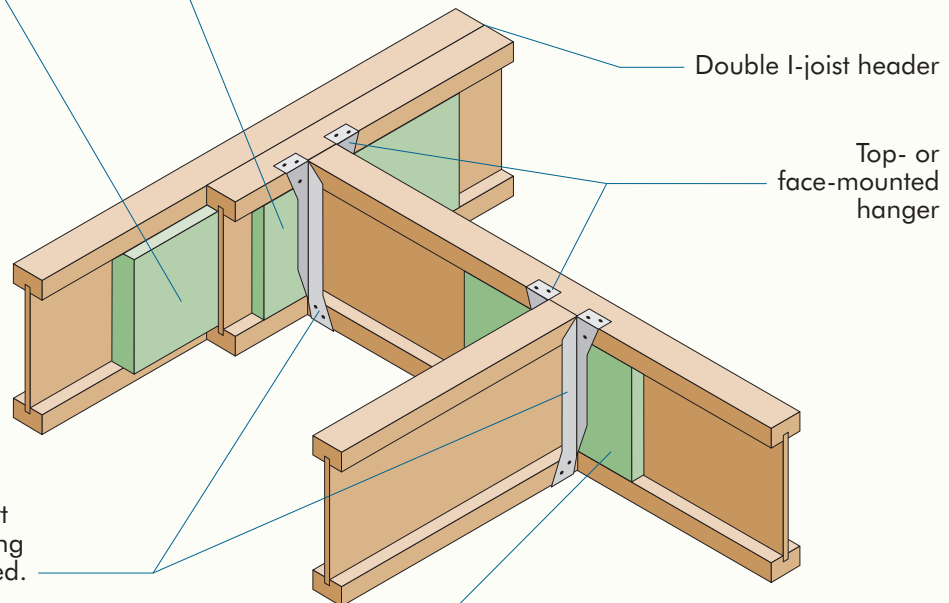
Flange Width	Material Thickness Required*	Minimum Depth**
1-1/2"	19/32"	5-1/2"
1-3/4"	23/32"	5-1/2"
2-5/16"	1"	7-1/4"
2-1/2"	1"	5-1/2"
3-1/2"	1-1/2"	7-1/4"

* Minimum grade for backer block material shall be Utility grade SPF (south) or better for solid sawn lumber and Rated Sheathing grade for wood structural panels.

** For face-mount hangers use net joist depth minus 3-1/4" for joists with 1-1/2" thick flanges. For 1-5/16" thick flanges use net depth minus 2-7/8".

BACKER BLOCKS (Blocks must be long enough to permit required nailing without splitting)

Filler block per Figure 1p

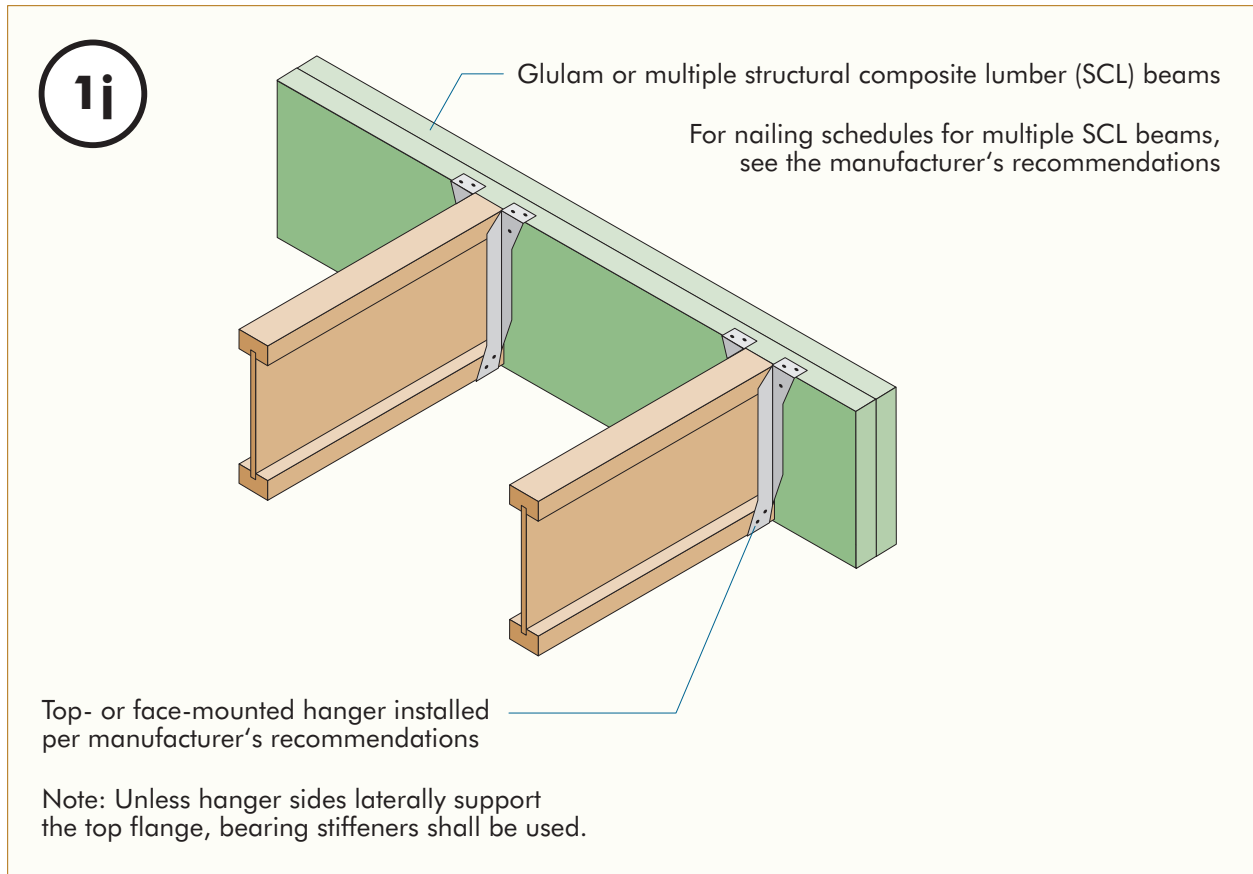


Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

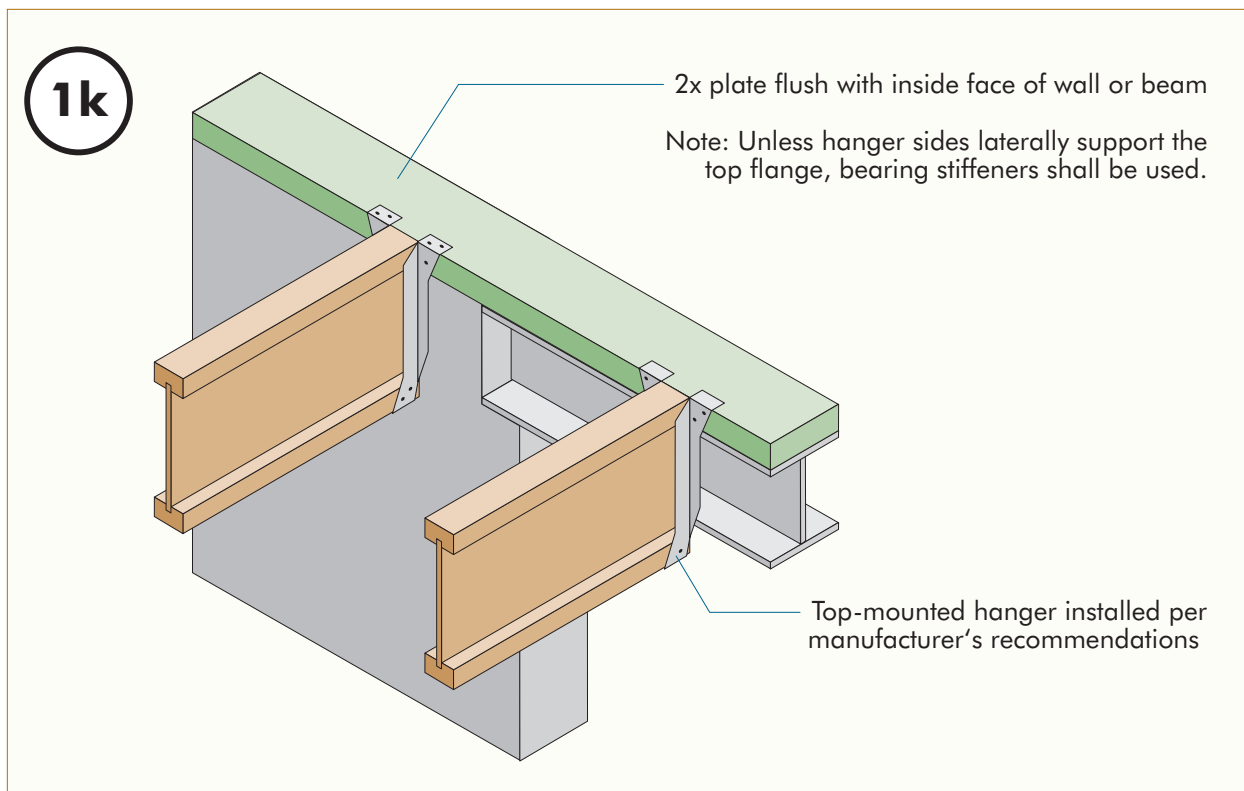
Backer block required (both sides for face-mounted hangers)

For hanger capacity see hanger manufacturer's recommendations. Verify double I-joist capacity to support concentrated loads.

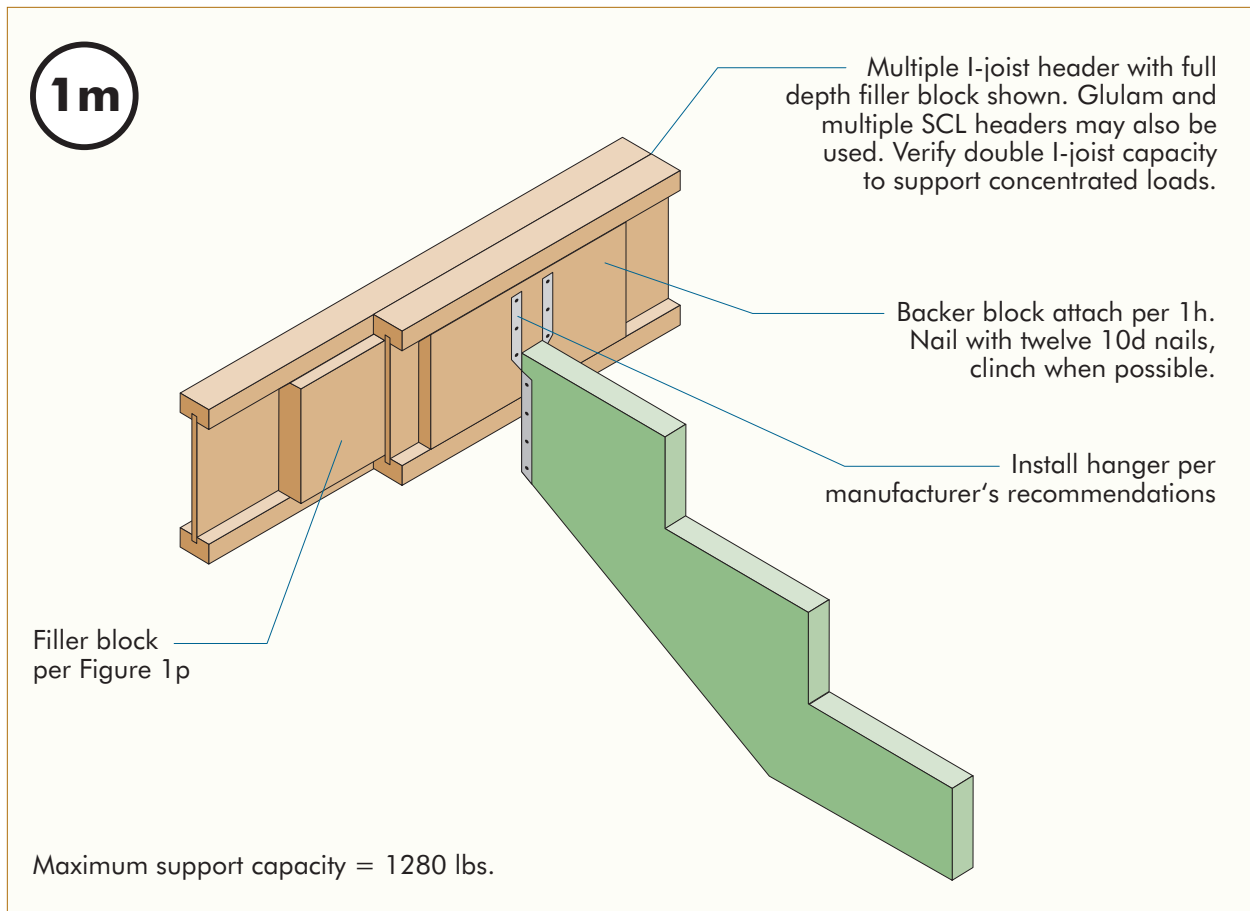
All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.



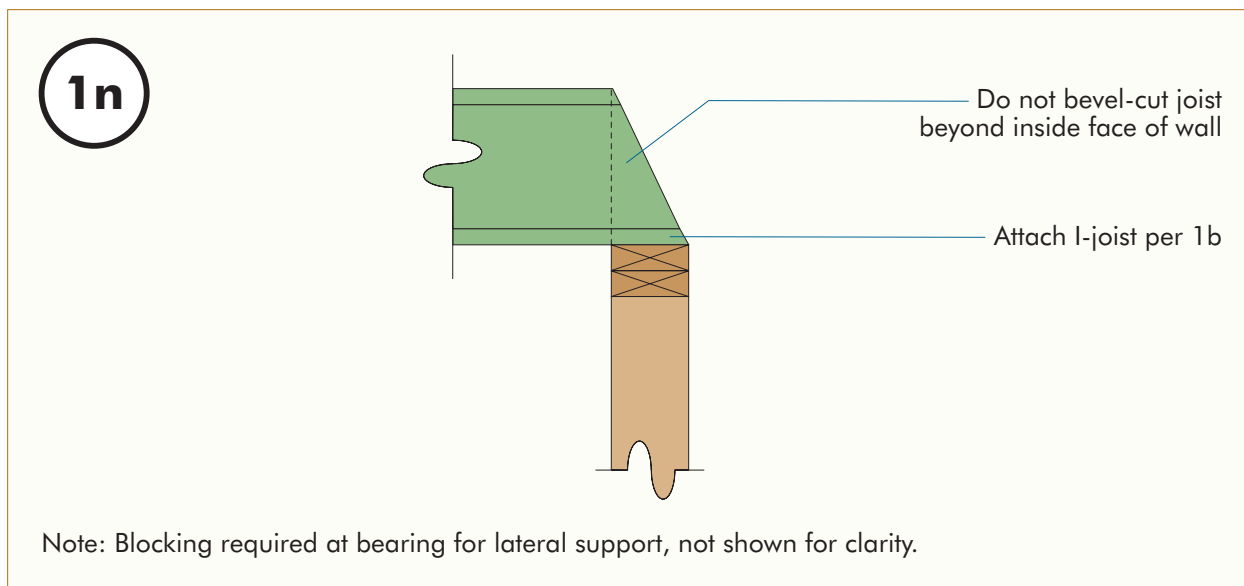
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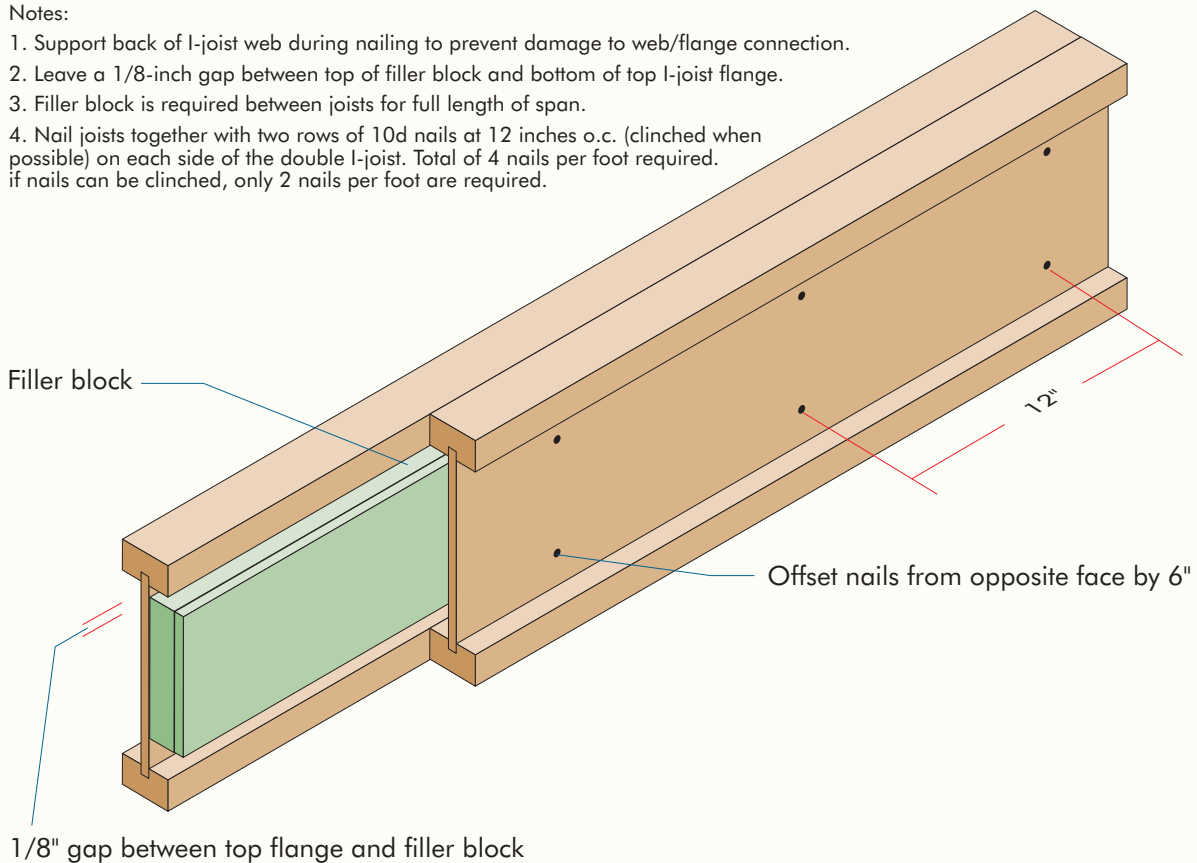
1p

FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION

Flange Width	Net Depth	Filler Block Size
1-1/2"	9-1/2"	1-1/8" x 6" high
	11-7/8"	1-1/8" x 8" high
1-3/4"	9-1/2"	1-3/8" x 6"
	11-7/8"	1-3/8" x 8"
	14"	1-3/8" x 10"
	16"	1-3/8" x 12"
2-5/16"	11-7/8"	2" x 8"
	14"	2" x 10"
	16"	2" x 12"
2-1/2"	9-1/2"	2-1/8" x 6"
	11-7/8"	2-1/8" x 8"
	14"	2-1/8" x 10"
	16"	2-1/8" x 12"
3-1/2"	11-7/8"	3" x 8"
	14"	3" x 10"
	16"	3" x 12"

Notes:

1. Support back of I-joist web during nailing to prevent damage to web/flange connection.
2. Leave a 1/8-inch gap between top of filler block and bottom of top I-joist flange.
3. Filler block is required between joists for full length of span.
4. Nail joists together with two rows of 10d nails at 12 inches o.c. (clinched when possible) on each side of the double I-joist. Total of 4 nails per foot required. if nails can be clinched, only 2 nails per foot are required.



All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

10a

Upper End, Bearing on Wall

Blocking panel, x-bridging, or 23/32" APA Rated Sheathing 48/24 as continuous closure. (Validate use of x-bridging with local building code.)

Minimum attachment:
For slope 1/4:12, one 10d box nail, face nail at each side of bearing. For slope > 1/4:12 design joist attachment to beveled plate to transfer lateral thrust.

8d nails at 6" o.c. – minimum 3 - 8d nails per blocking panel. (When used for lateral shear transfer, match nail type and sheathing edge nailing ("boundary nailing" for engineered diaphragm applications.) Use minimum 8d nails.

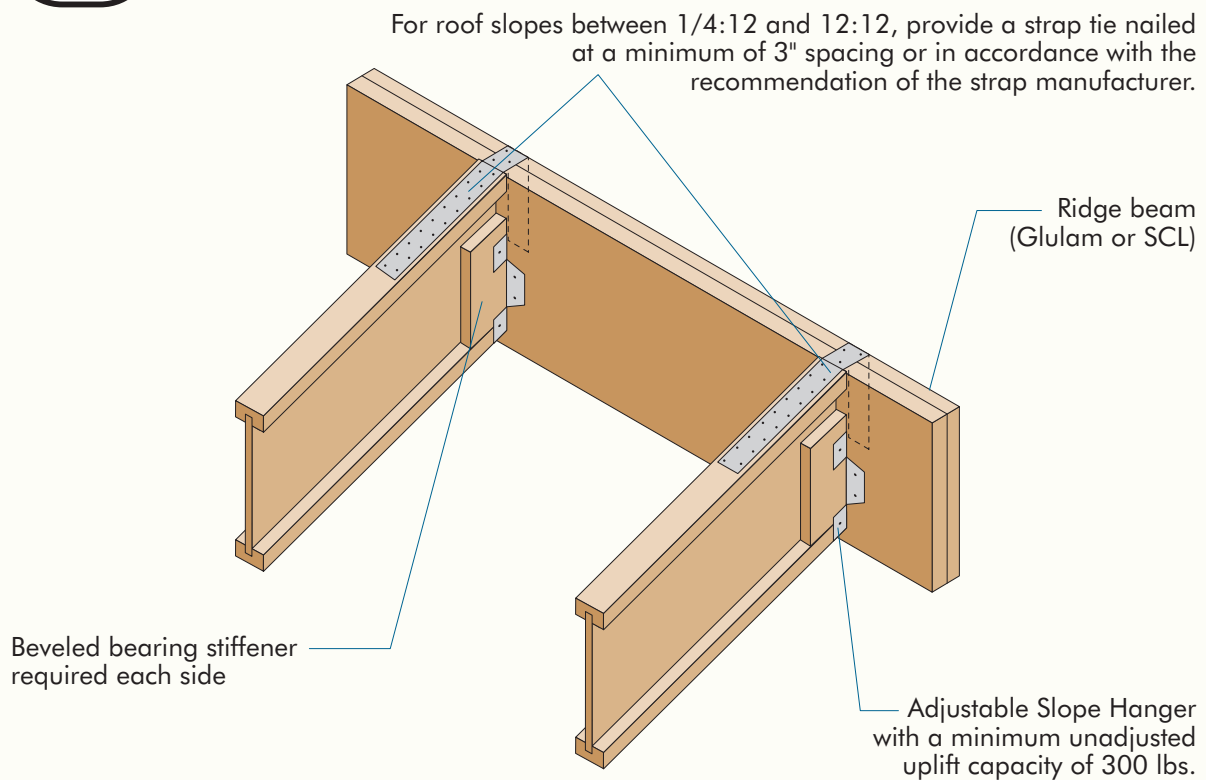
Bearing stiffener required when end reaction exceeds 1550 lbs.

Beveled plate for slopes greater than 1/4:12. Code-recognized connectors may be substituted. For slopes greater than 4:12 connectors are required to resist lateral thrust.

Note: Additional connection may be required for wind uplift.

Attach beveled plate a to framing with 1 - 16d at 16" o.c.

All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

10b**Peak Connection**

Note: Additional connection may be required for wind uplift.

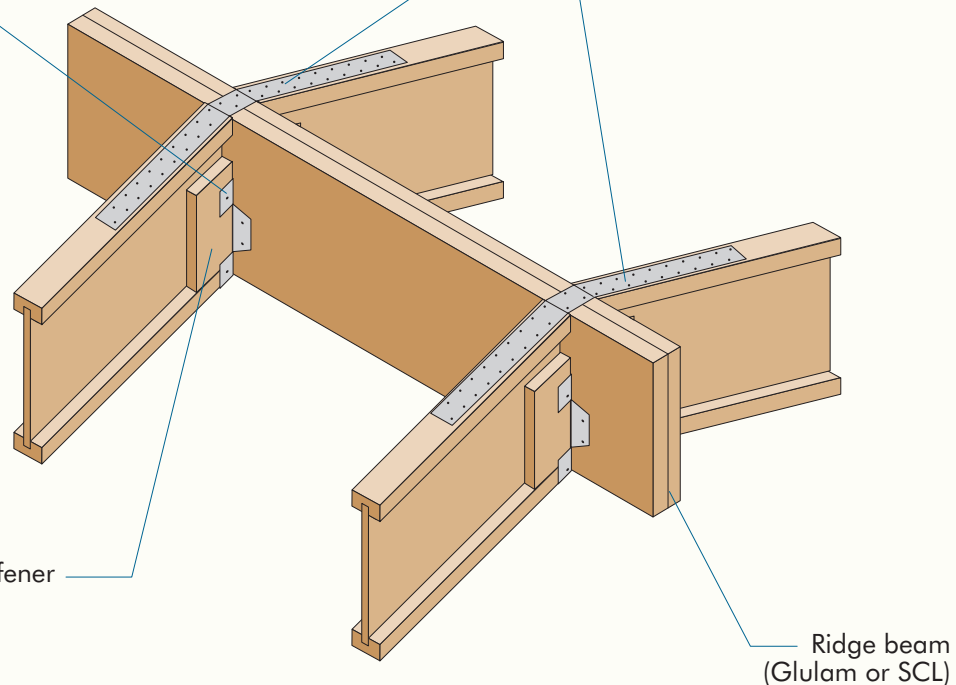
All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

10c**I-Joist to Ridge Beam Connection**

For roof slopes between 1/4:12 and 12:12, provide a strap nailed at a minimum of 3" spacing on each side of roof slope or in accordance with the recommendation of the strap manufacturer

Adjustable Slope Hanger with a minimum unadjusted uplift capacity of 300 lbs.

Beveled bearing stiffener required each side



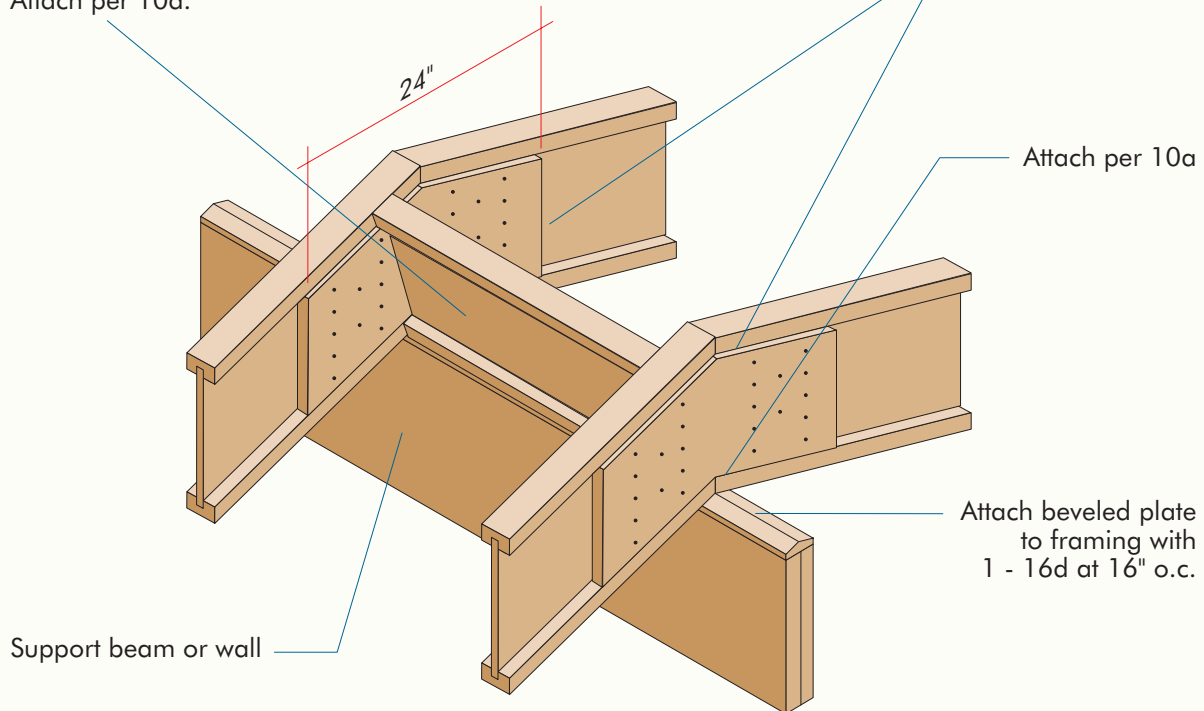
Note: Additional connection may be required for wind uplift.

All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

10d**I-Joist Connection with Wood Structural Panel Gussets**

23/32" x 2'-0" wood structural panel (front and back sides) with 12 - 8d nails into each joist with nails clinched. When roof live load exceeds 40 psf, horizontal orientation of gusset strong axis is required. Gap 1/8" at top.

Blocking panel or x-bridging.
Attach per 10a.



Attach per 10a

Attach beveled plate
to framing with
1 - 16d at 16" o.c.

Support beam or wall

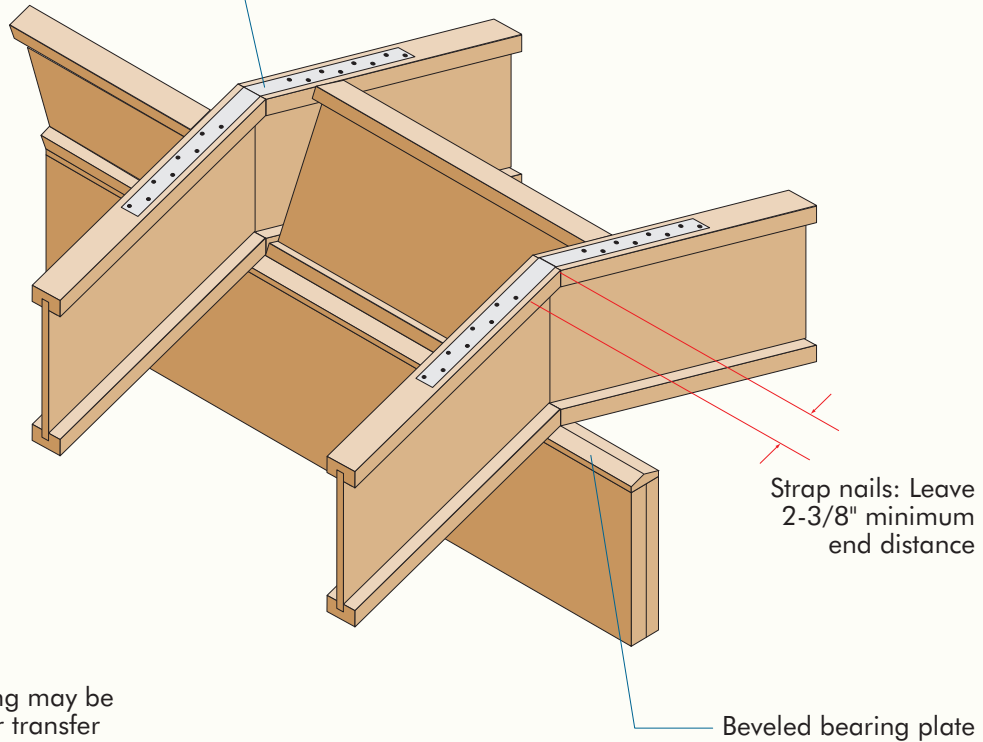
Note: Additional connection may be required for wind uplift.

All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

10e

I-Joist Connection with Tie Strap

Tie strap nailed at a minimum of 3" spacing or in accordance with manufacturer's recommendations



Additional blocking may be required for shear transfer

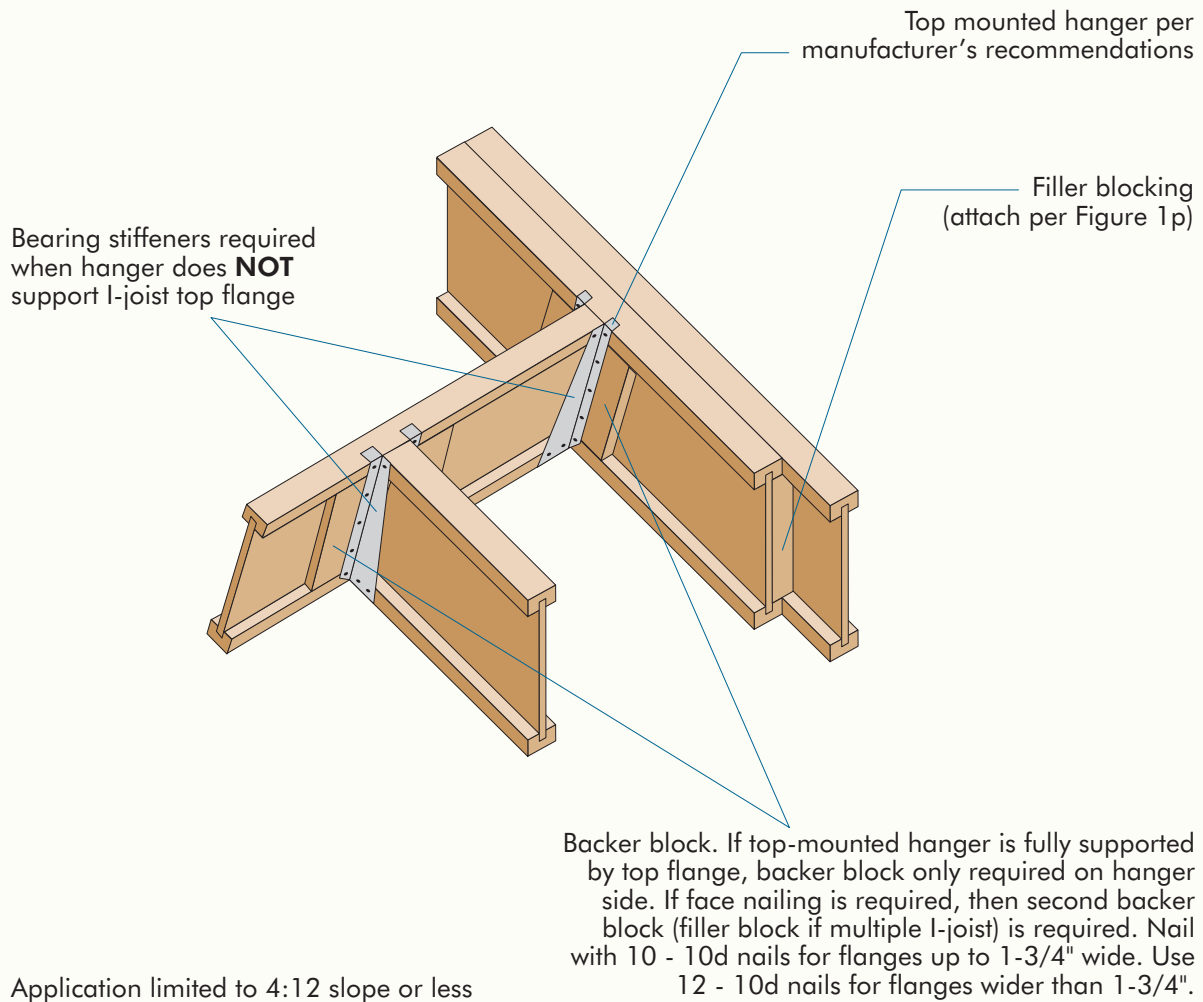
Strap nails: Leave 2-3/8" minimum end distance

Beveled bearing plate

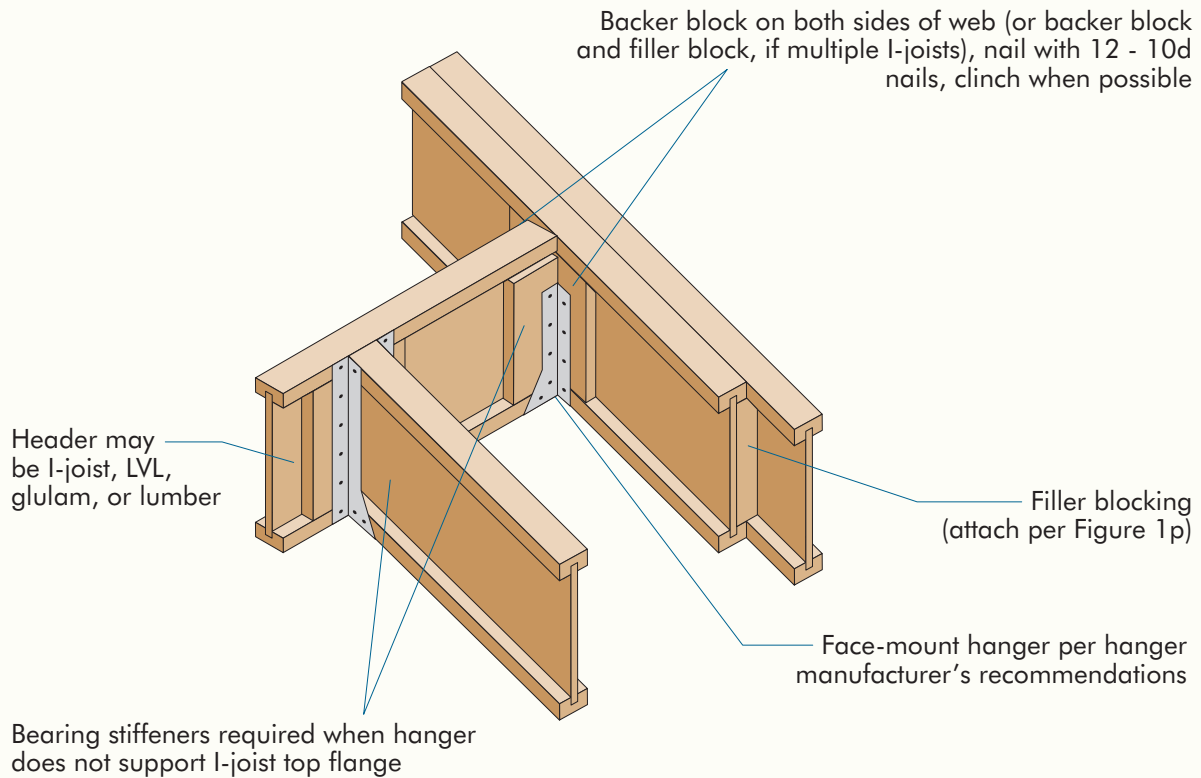
All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

10f

Roof Opening Top Mounted Hangers



All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

10g**Roof Opening, Face-Mounted Hangers**

All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

10h**Birdsmouth Cut & Bevel Cut Bearing Stiffener**

Permitted on low end of I-joist only

Bearing stiffeners required each side of I-joist. Bevel-cut bearing stiffener to match roof slope.

4 - 8d nails (two each side) clinched when possible

Birdsmouth cut shall bear fully and not overhang the inside face of plate

1/8" gap at top

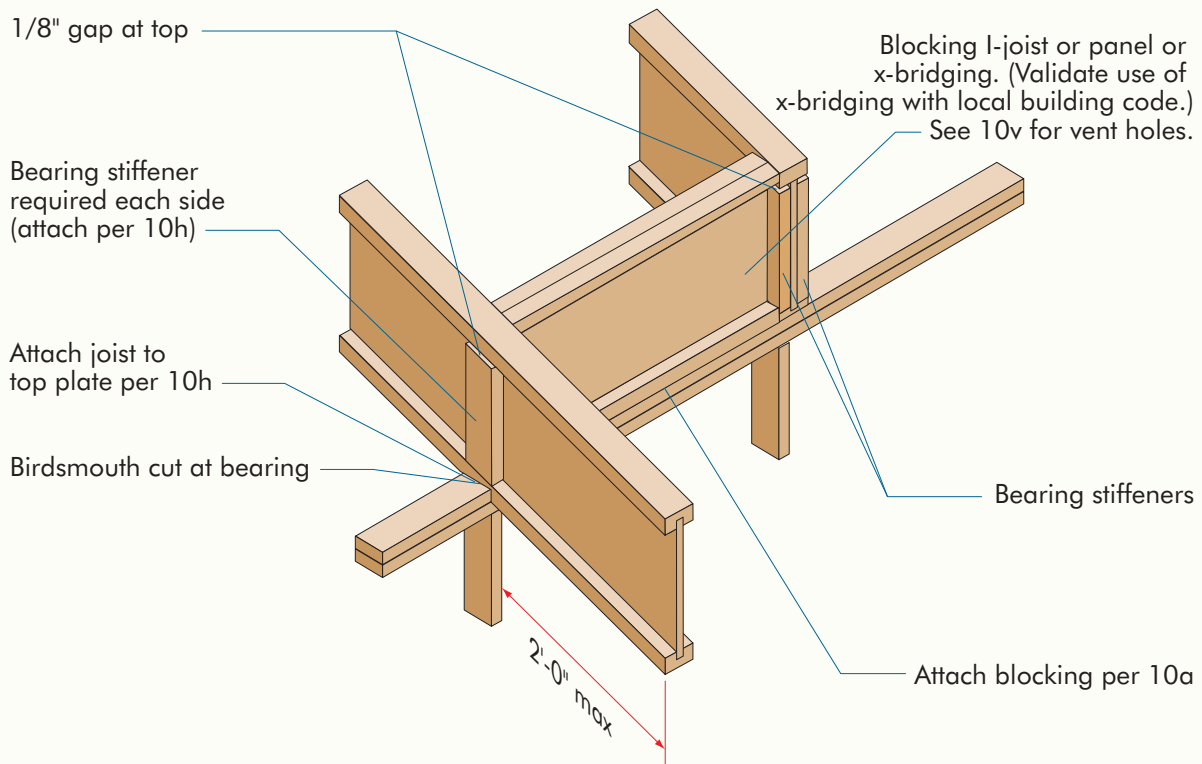
One 10d box nail, face nail at each side of bearing (face nail where flange is 7/8" to 1" thick)

Note: Additional connection may be required for wind uplift.

All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

10j

Birdsmouth Cut with Overhang (Permitted on low end of I-joist only)



Note: Additional connection may be required for wind uplift.

Note: Outside corner of blocking panel may be trimmed if it interferes with roof sheathing. In such cases, position blocking panel on top plate to minimize trimming and still allow required nailing into top plate.

All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

10k

I-Joist Overhang for Fascia Support with Birdsmouth Cut

X-bridging or blocking panel.
Validate use of X-bridging with
local building code.

Birdsmouth
cut at bearing

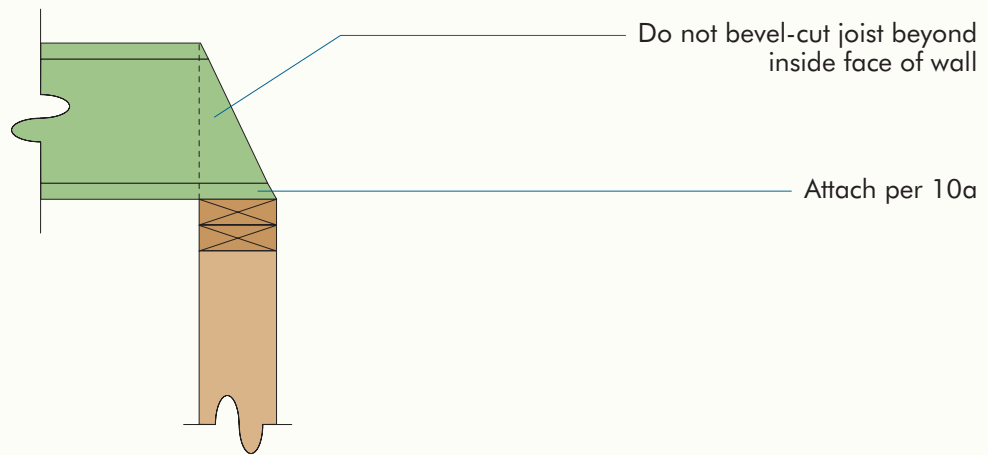
Attach joist to top
plate per 10h

2'-0" max

Web stiffener
required each side

2x block for
fascia support

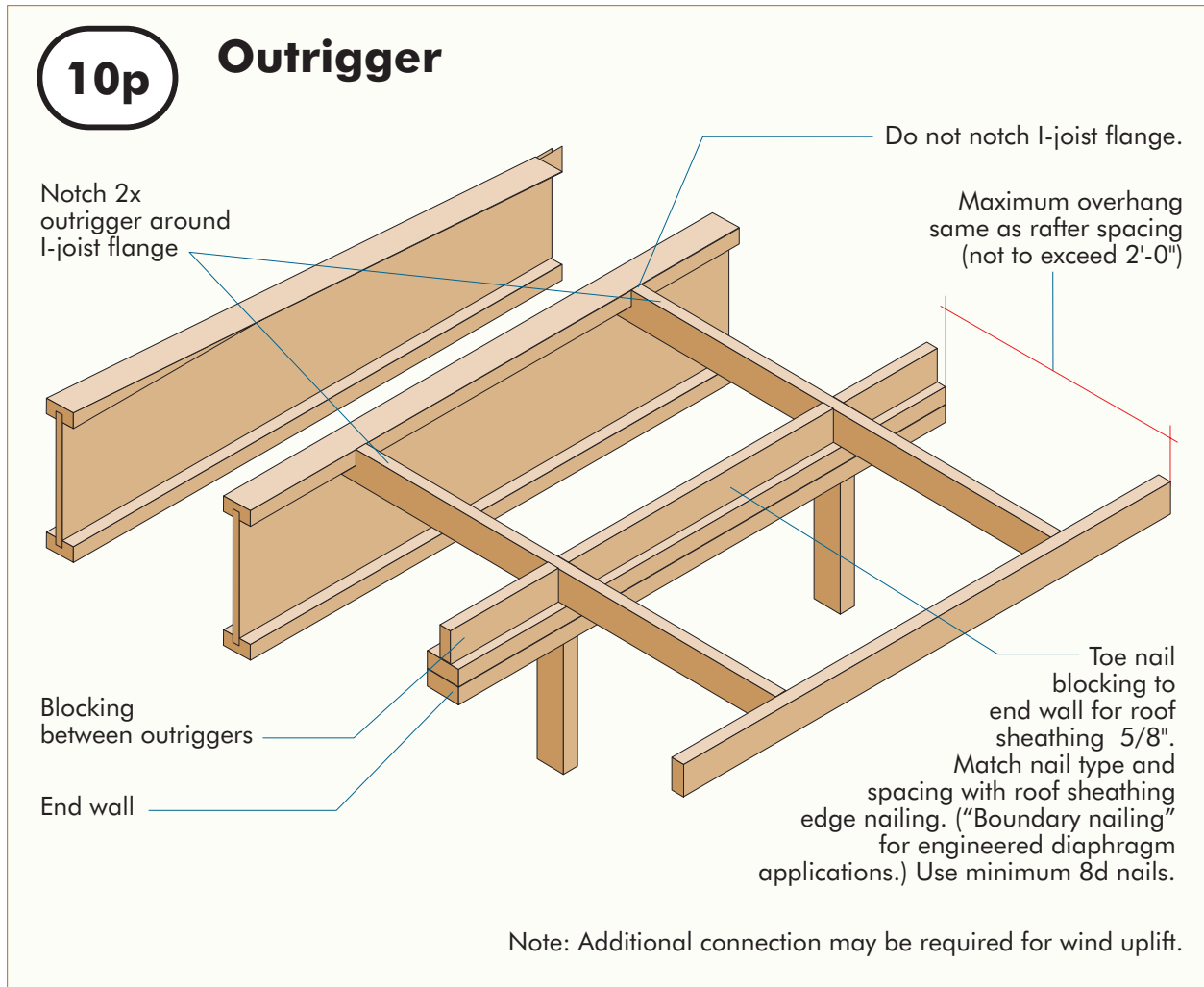
All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

10n**I-Joist with Bevel-Cut End**

Note: Blocking or x-bridging required at bearing for lateral support, not shown for clarity.

Note: Additional connection may be required for wind uplift.

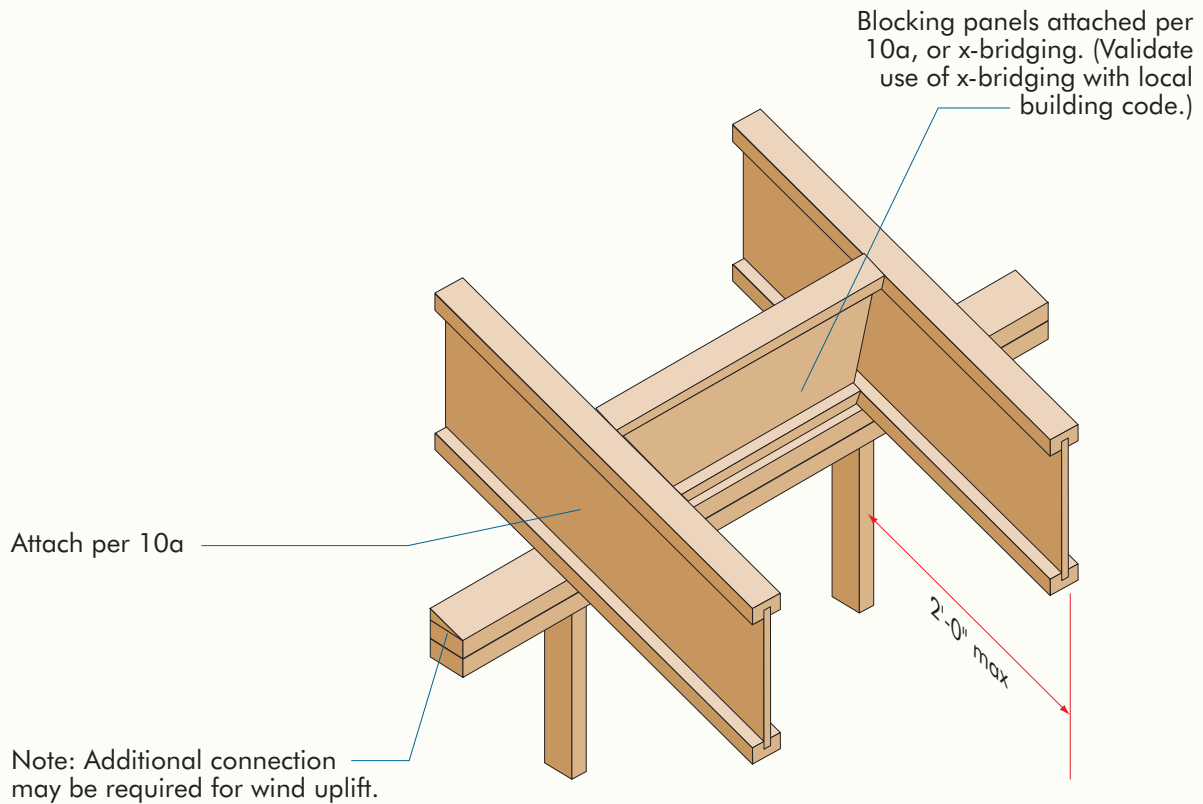
All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.



All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

10q

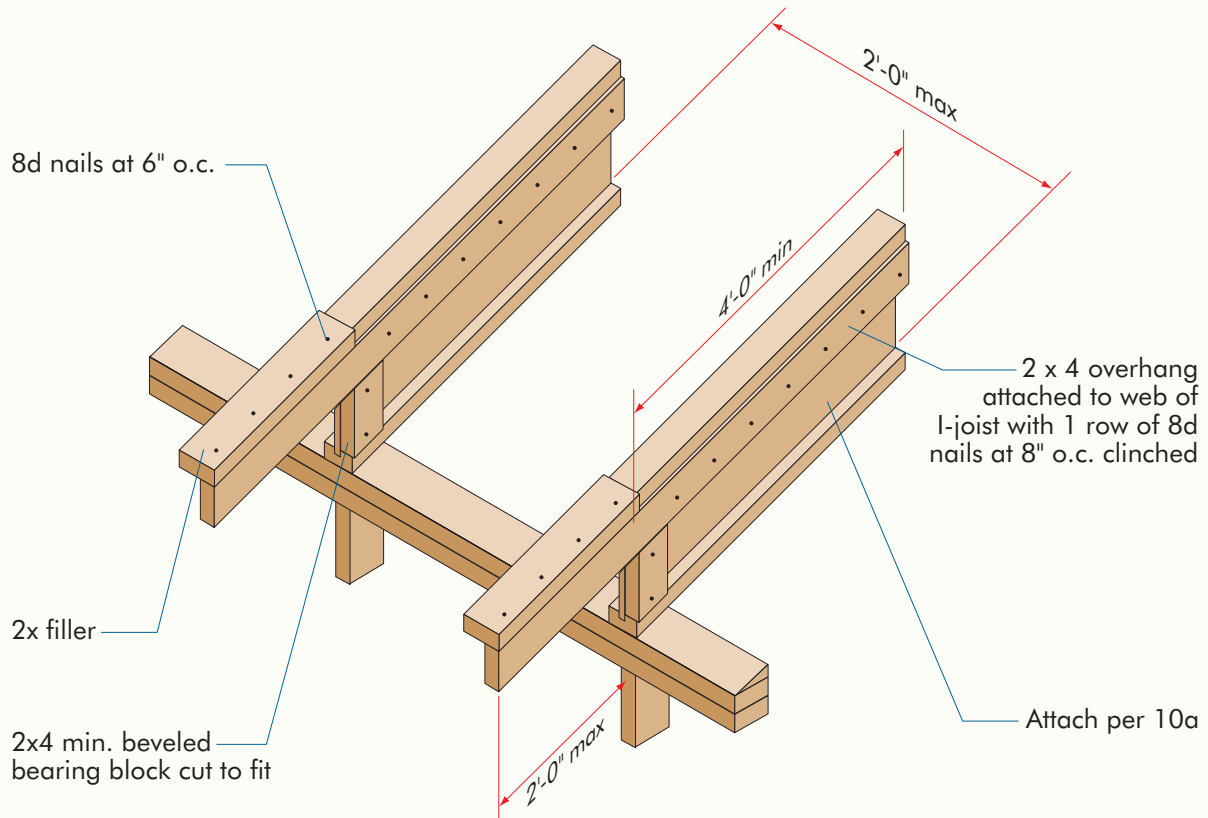
I-Joist Overhang with Beveled Plate



All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

10r**Lumber Overhang with Beveled Plate**

(Blocking panel or x-bridging not shown for clarity)



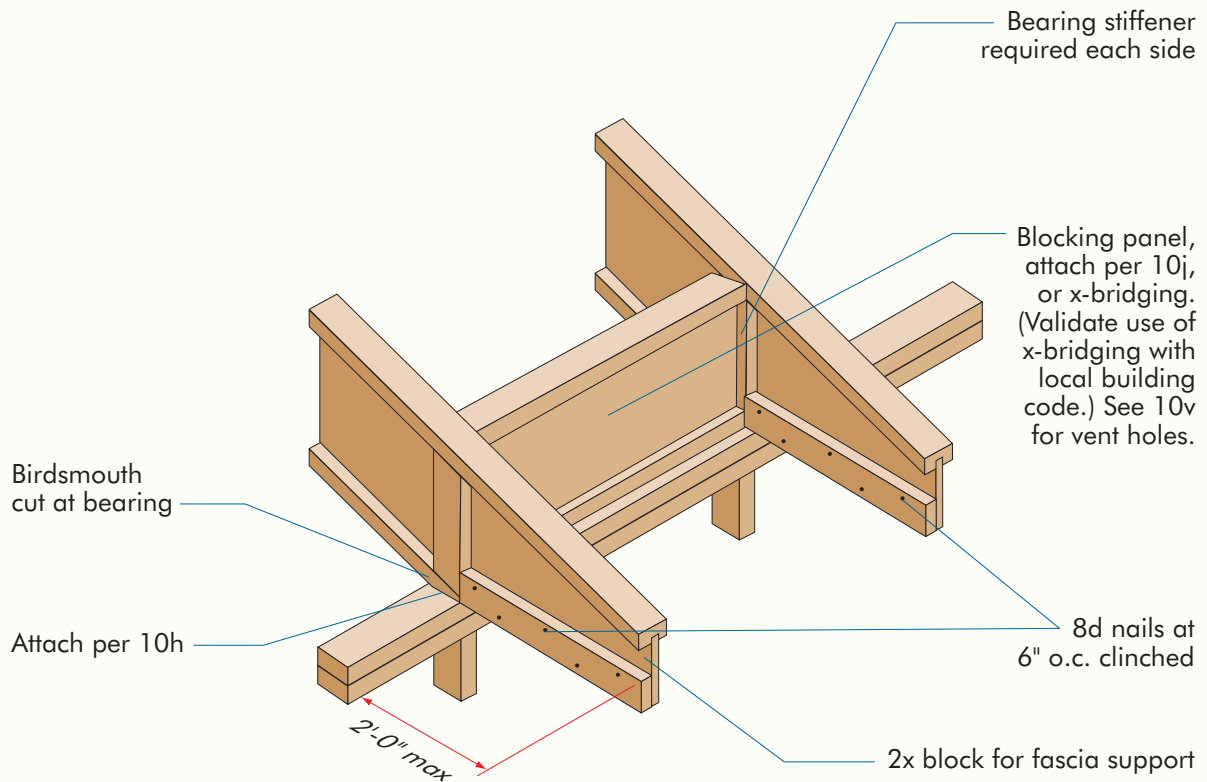
Note: Additional connection may be required for wind uplift.

Note: Lumber overhang shall be 2 x 4 Spruce-Pine-Fir #2 or better, or stronger species.

All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

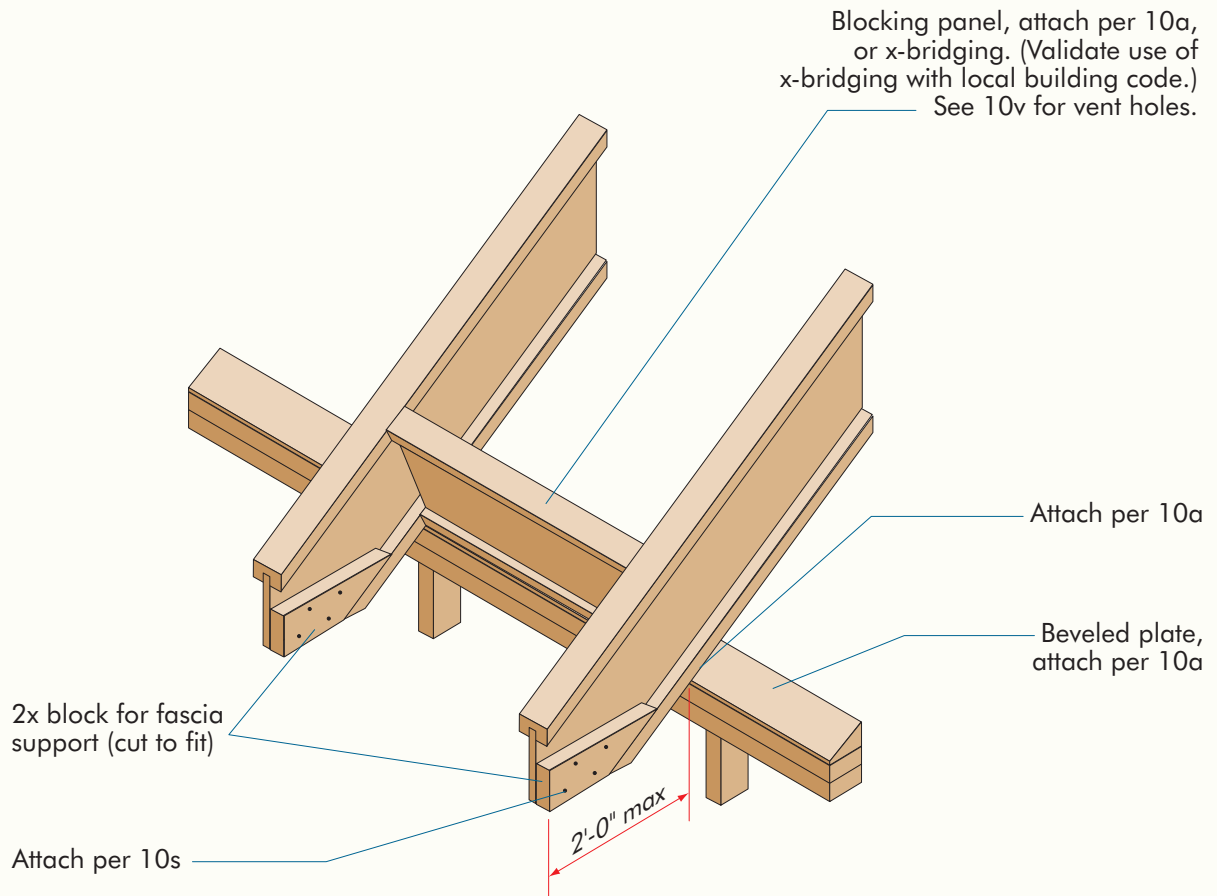
10s

I-Joist Overhang for Fascia Support with Birdsmouth Cut



Note: Additional connection may be required for wind uplift.

All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

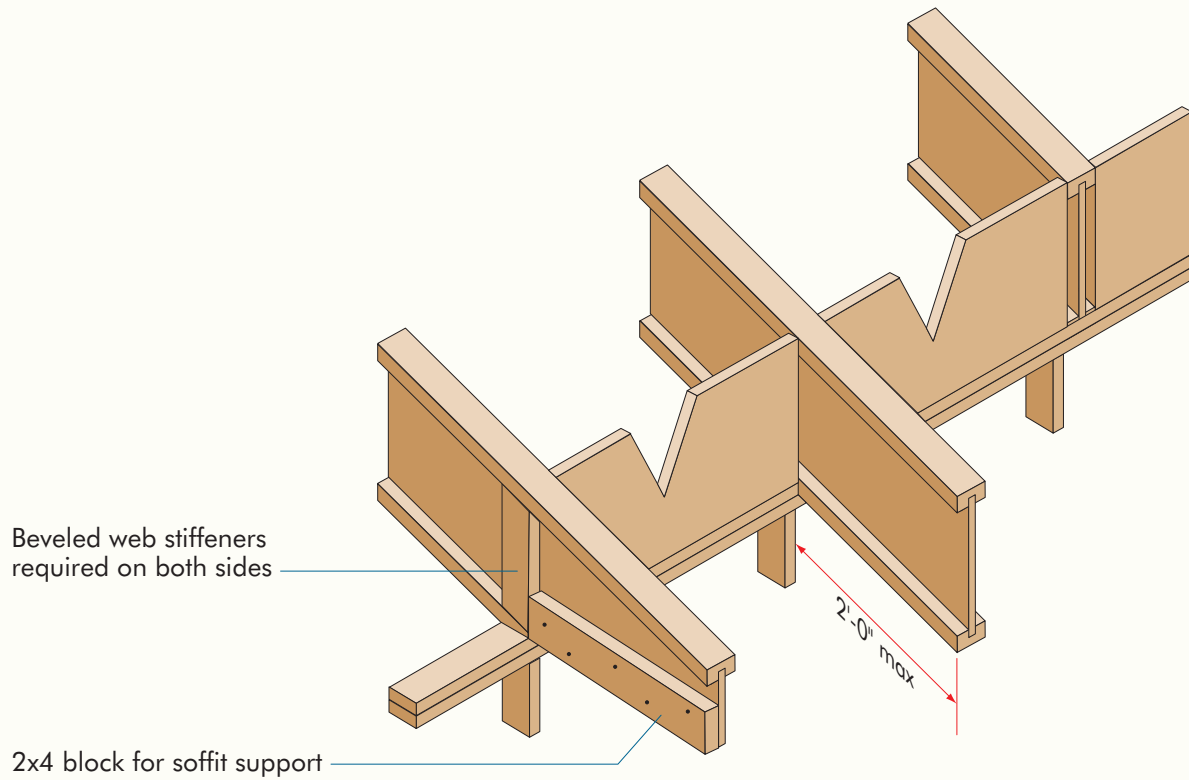
10t**I-Joist Overhang for Fascia Support with Beveled Plate**

Note: Additional connection may be required for wind uplift.

All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

10u

Birdsmouth Cut Allowed at Low End of I-Joist Only

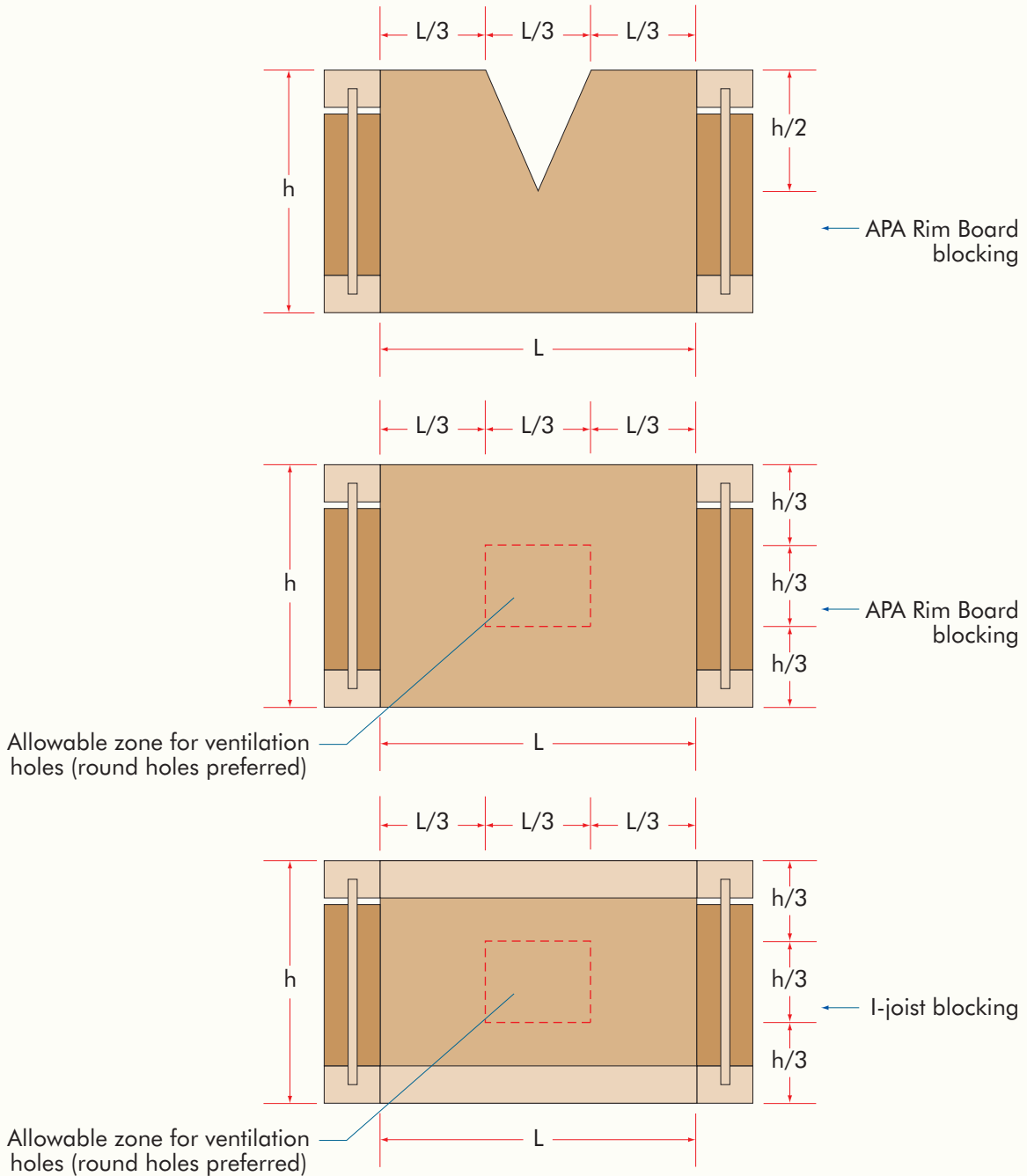


Note: Corrosion-resistant wire cloth screening, hardware cloth, perforated vinyl or similar material shall cover the ventilation holes per code.

All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.

10v

Ventilation Holes



Note: Corrosion-resistant wire cloth screening, hardware cloth, perforated vinyl or similar material shall cover the ventilation holes per code.

All nails shown in the detail above are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common (0.131 x 2-1/2 in.) shown in detail. Individual components not shown to scale for clarity.