Power Joist®

UNITED STATES INSTALLATION GUIDE (ICC ESR-1262)

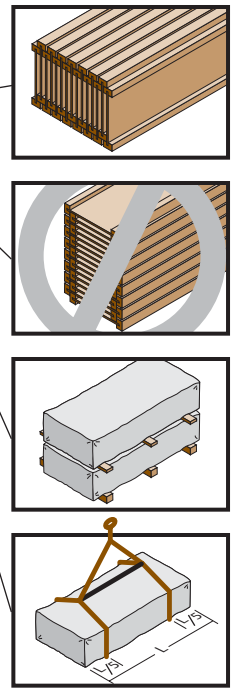
ANTHONY®
ANTHONY FOREST PRODUCTS CO.

MANUFACTURED BY ANTHONY EACOM, INC.
FEBRUARY 2014

ANTHONY **Power Joist®**

Storage and Handling Guidelines

1. Store, stack, and handle Power Joist in a vertical and level position only.
2. Do not store Power Joists in direct contact with the ground; Do not store Power Joists flatwise.
3. Protect Power Joists from weather, and use stickers to separate bundles.
4. To protect Power Joists further from dirt and weather, do not open bundles until time of installation.
5. When lifting Power Joists with a crane on the job site, take a few simple precautions to prevent damage to the Power Joists and to prevent injury to your work crew.
   - Lift Power Joists in bundles as shipped by the supplier.
   - Orient the bundles so that the webs of the Power Joists are vertical.
   - Lift the bundles at the 5th points, using a spreader bar if necessary.
6. Do not twist or apply loads to the Power Joist when horizontal.
7. **Never** use or try to repair a damaged Power Joist.



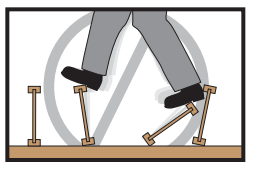
Safety Precautions

WARNING Power Joists are not stable until completely installed and will not carry any load until fully braced and sheathed.

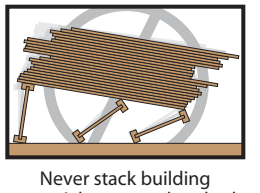
Avoid Accidents by Following These Important Guidelines.

1. Brace and nail each Power Joist as it is installed, using hangers, blocking panels, rim board, and/or cross-bridging at joist ends. When Power Joists are applied continuously over interior supports and a load-bearing wall is planned at the location, blocking will be required at the interior supports.
2. When the building is completed, the floor sheathing will provide lateral support for the top flanges of the Power Joists. Until this sheathing is applied, temporary bracing, often called struts, or temporary sheathing must be applied to prevent Power Joist rollover or buckling.
   - Temporary bracing or struts **must** be 1" x 4" minimum, at least 8' long, spaced no more than 8' on center, and secured with a minimum of two 8d nails fastened to the top surface of each Power Joist. Nail bracing to a lateral restraint at the end of each bay. Lap ends of adjoining bracing over at least two Power Joists.
   - Or, sheathing (temporary or permanent) can be nailed to the top flange of the first 4' of Power Joists at the end of the bay.
3. For cantilevered Power Joists, brace top and bottom flanges, and brace ends with closure panels, rim board, or cross-bridging.
4. Install and nail permanent sheathing to each Power Joist before placing loads on the floor system. Then, stack building materials over beams or walls only.
5. For temporary construction loads such as dry wall stacking, see APA Publication J735A (Temporary Construction Loads Over I-Joist Roofs).

Failure to follow applicable building codes and span ratings, failure to use allowable hole sizes and locations, or failure to use web stiffeners when required can result in serious accidents. Follow these installation guidelines carefully.



Do not allow workers to walk on Power Joists until joists are fully installed and braced, or serious injuries can result.



Never stack building materials over unsheathed Power Joists. Stack only over beams or walls.

Allowable Floor Spans

Maximum Allowable Spans

The specific PJI designation needed for your application is easily determined by selecting the span needed and then by choosing the PJI that meets your span, spacing, and uniform loading criteria.

Tables 1 and 1a are for simple or multiple span applications respectively. The use of these tables will provide maximum spans for the indicated spacings and span conditions.

To illustrate the selection of a PJI product, assume a design simple span of 16'1". For architectural reasons, limit the joist depth to 11-7/8" and joist spacing to 19.2" on center. From the 9-1/2" and 11-7/8" entries in Table 1, look down the 19.2" o.c. spacing column. For depths of 9-1/2", select 9-1/2" PJI 60, and from the 11-7/8" depths, notice that any joist designation will work.

The allowable spans in the table in this user guide indicate the allowable clear span for various joist spacings under typical residential uniform floor loads (40 psf live load and 10 psf dead load) for glued-nailed systems.

In addition, floor sheathing must be field glued to the Power Joist flanges using approved construction adhesives in order to achieve the PJI allowable spans.

Use of these span tables is limited to uniform load conditions, and PJI floor spans shall not exceed these allowable spans. PJI Power Joist can be used for other applications such as roofs and ceilings to support line loads or concentrated loads, etc. when properly engineered, using the appropriate design properties in Tables 19 and 20 of the user guide.

*For other type floor assemblies, please contact Anthony Forest at 800-221-2326.

SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 psf = 47.88 Pa

(1) Allowable clear span is applicable to simple-span or multiple-span residential floor construction with a design dead load of 10 psf and a live load of 40 psf. The live load deflection is limited to L/480. (L = span length in inches). Spans are based on duration factor (LDF) of 1.0.

(2) Spans are based on a composite floor with glue-nailed sheathing meeting the requirements for APA Rated Sheathing STURD-I-FLOOR conforming to PS1 or PS2 with a minimum thickness of 19/32" (40/20 or 20 o.c.) for a joist spacing of 19.2" or less or with a minimum thickness of 23/32" (48/24 or 24 o.c.) for a joist spacing of 24" when floor sheathing is nailed only. Adhesive shall meet APA Specification AFG-01 or ASTM D3498. Spans shall be reduced to 12" when floor sheathing is nailed only.

(3) Minimum bearing length shall be 1-3/4" for the end bearings and 3-1/2" for the intermediate bearings.

(4) Bearing stiffeners are not required when I-Joist are used with the spans and spacing given in the above table, except as required for hangers.

Table 1 LDF = 1.0

Allowable Spans for Floor PJI Power Joist

Simple span only - Glued subfloor* - On center spacing

MAXIMUM FLOOR SPAN (ft)							GLUED SUBFLOOR
Load				On center joist spacing (in)			
Live	Dead	Series	Depth (in)	12	16	19.2	24
40	10	PJI 40	9 1/2	18'-0"	16'-5"	15'-6"	14'-6"
			11 7/8	21'-5"	19'-7"	18'-6"	16'-8"
			14	24'-4"	22'-3"	20'-6"	18'-4"
			16	26'-11"	24'-3"	22'-1"	19'-9"
		PJI 60	9 1/2	18'-11"	17'-4"	16'-4"	15'-3"
			11 7/8	22'-7"	20'-8"	19'-6"	18'-2"
			14	25'-9"	23'-6"	22'-2"	20'-8"
			16	28'-6"	26'-0"	24'-7"	22'-10"
		PJI 80	11 7/8	24'-11"	22'-8"	21'-4"	19'-10"
			14	28'-3"	25'-9"	24'-3"	22'-7"
			16	31'-4"	28'-6"	26'-10"	25'-0"
			18	34'-2"	31'-1"	29'-3"	27'-3"
			20	36'-11"	33'-8"	31'-8"	29'-6"
			22	39'-8"	36'-1"	34'-0"	31'-8"
			24	42'-4"	38'-6"	36'-4"	33'-9"
		PJI 90	11 7/8	25'-7"	23'-3"	21'-11"	20'-5"
			14	29'-0"	26'-5"	24'-11"	23'-2"
			16	32'-1"	29'-3"	27'-6"	25'-5"
			18	35'-1"	31'-11"	30'-1"	27'-11"
			20	37'-11"	34'-6"	32'-6"	30'-3"
			22	40'-9"	37'-7"	34'-11"	32'-6"
			24	43'-5"	39'-6"	37'-3"	34'-8"

Table 1a LDF = 1.0

Allowable Spans for Floor PJI Power Joist

Multiple span only - Glued subfloor* - On center spacing

MAXIMUM FLOOR SPAN (ft)							GLUED SUBFLOOR
Load				On center joist spacing (in)			
Live	Dead	Series	Depth (in)	12	16	19.2	24
40	10	PJI 40	9 1/2	19'-7"	17'-11"	16'-4"	14'-7"
			11 7/8	23'-5"	20'-5"	18'-7"	16'-7"
			14	25'-11"	22'-5"	20'-5"	18'-3"
			16	27'-11"	24'-2"	22'-0"	19'-8"
		PJI 60	9 1/2	20'-8"	18'-10"	17'-9"	16'-6"
			11 7/8	24'-8"	22'-6"	21'-2"	19'-7"
			14	28'-0"	25'-7"	24'-1"	19'-9"
			16	31'-1"	28'-4"	24'-9"	19'-9"
		PJI 80	11 7/8	27'-1"	24'-8"	23'-3"	21'-7"
			14	30'-10"	28'-0"	26'-5"	23'-11"
			16	34'-2"	31'-1"	29'-3"	23'-11
			18	37'-3"	33'-10"	31'-11"	29'-5"
			20	40'-3"	36'-8"	34'-6"	31'-0"
			22	43'-3"	39'-4"	36'-4"	31'-5"
			24	46'-2"	41'-6"	37'-10"	31'-5"
		PJI 90	11 7/8	27'-11"	25'-4"	23'-10"	21'-10"
			14	31'-8"	28'-9"	27'-1"	23'-11"
			16	35'-0"	31'-10"	29'-11"	25'-11"
			18	38'-3"	34'-9"	32'-9"	30'-5"
			20	41'-5"	37'-8"	35'-5"	31'-5"
			22	44'-5"	40'-5"	38'-0"	31'-5"
			24	47'-5"	43'-1"	39'-3"	31'-5"

Web Stiffener Requirements

Minimum Nailing Requirements for Web Stiffeners

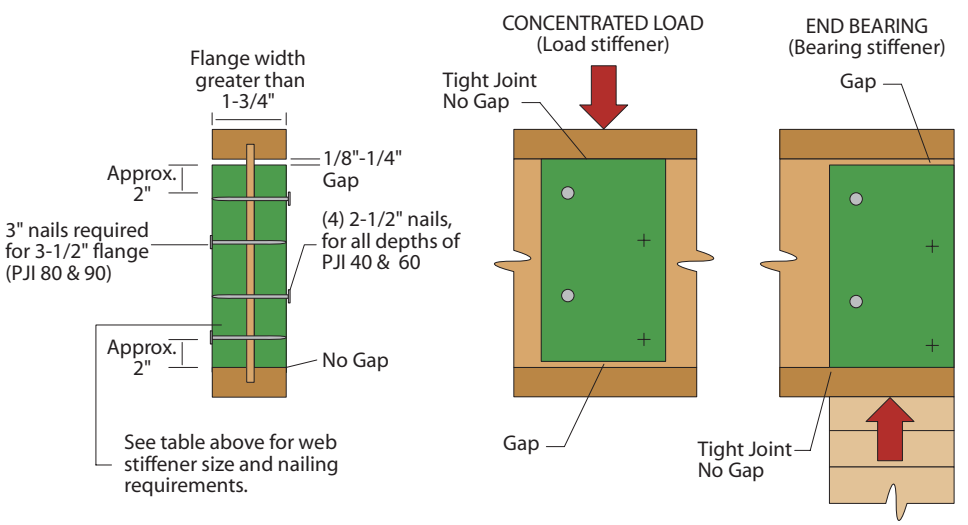
1. Web stiffeners are required
   - When sides of the hangers do not laterally brace the top flange of each Power Joist;
   - When Power Joists are designed to support concentrated loads greater than 1580 lbs. that are applied to the Power Joist's top flange between supports. In these applications **only**, the gap between the load stiffener and the flange shall be at the bottom flange;
   - For all engineered applications with end-reactions greater than 1580 lbs. **A design analysis must be performed for all engineered applications with end-reactions greater than 1580 lbs.**
2. When used at end bearings, install web stiffeners tightly against the bottom flange of the Power Joist. Leave a minimum 1/8" gap between the top of the stiffener and the bottom of the top flange. See Figure 1.
3. Web stiffeners may be supplied by the distributor for field installation or may be cut in the field as required.

Stiffener Size and Nailing Requirements

Joist Depth	2-1/2" Wide Flange	3-1/2" Wide Flange
	8d (2-1/2") nails	10d (3") nails
9-1/2"	4	-
11-7/8"	4	4
14"	4	4
16"	4	4
18"	-	6
20"	-	6
22"	-	8
24"	-	8
Minimum Stiffener Size	1"x2-5/16" (width)	1-1/2"x2-5/16" (width)

Figure 1

Web Stiffener Installation Details



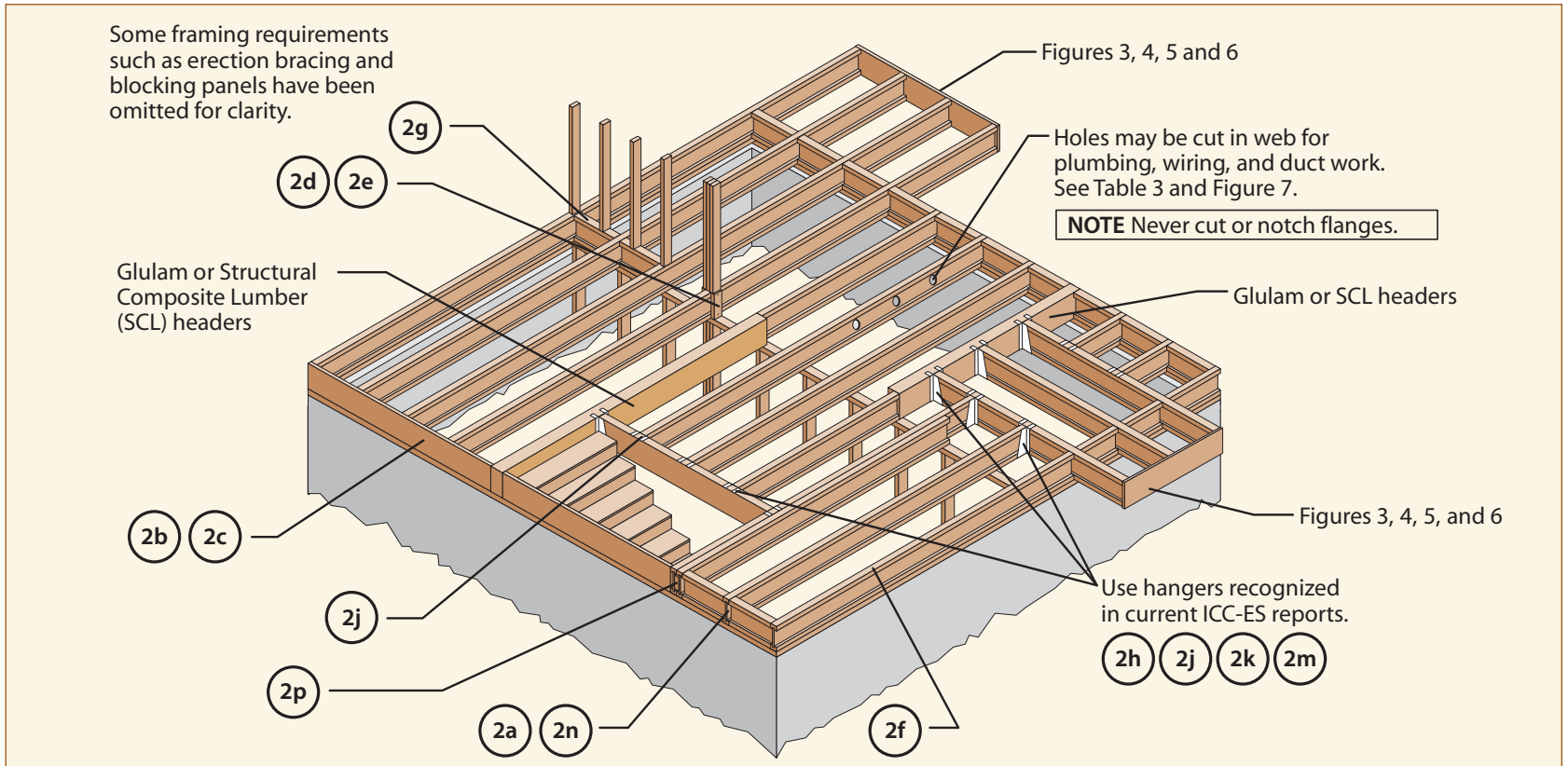
Installing Power Joist

1. Before laying out floor system components, verify that Power Joist flange widths match hanger widths. If not, contact your supplier.
2. Except for cutting to length, **never** cut, drill, or notch Power Joist flanges.
3. Install Power Joists so that top and bottom flanges are within 1/2" of true vertical alignment.
4. Power Joists must be anchored securely to supports before floor sheathing is attached, and supports for multiple-span joists must be level.
5. Minimum bearing lengths are 1-3/4" for end bearings and 3-1/2" for intermediate bearings.
6. When using hangers, seat Power Joists firmly in hanger bottoms to minimize settlement.
7. Leave a 1/16" gap between the Power Joist end and a header.
8. Concentrated loads greater than those that can normally be expected in residential construction should be applied *only* to the top surface of the top flange. Normal concentrated loads include track lighting fixtures, audio equipment, and security cameras. Never suspend unusual or heavy loads from the Power Joist's bottom flange. Whenever possible, suspend *all* concentrated loads from the top of the Power Joist, or attach the load to blocking that has been securely fastened to the Power Joist webs.
9. Never install Power Joists where they will be permanently exposed to weather or where they will remain in direct contact with concrete or masonry.
10. Restrain ends of floor joists to prevent rollover. Use Certified Rim Board, rim joists, or Power Joist blocking panels.
11. For Power Joists installed over and beneath bearing walls, use full depth blocking panels, Certified Rim Board, or squash blocks (cripple members) to transfer gravity loads through the floor system to the wall or foundation below.
12. Due to shrinkage, common framing lumber set on edge **may never** be used as blocking or rim boards. Power Joist blocking panels or other engineered wood products such as Certified Rim Board must be cut to fit between the Power Joists, and a Power Joist-compatible depth must be selected.
13. Provide permanent lateral support of the bottom flange of all Power Joists at interior supports of multiple-span joists. Similarly, support the bottom flange of all cantilevered Power Joists at the end support next to the cantilever extension. In the completed structure, the gypsum wallboard ceiling provides this lateral support. Until the final finished ceiling is applied, temporary bracing or struts must be used.
14. If square-edge panels are used, edges must be supported between Power Joists with 2 x 4 blocking. Glue panels to blocking to minimize squeaks. Blocking is not required under structural finish flooring such as wood strip flooring or if a separate underlayment layer is installed.
15. Nail spacing
    Space the nails installed to the flange's top face in accordance with the applicable building code requirements or approved building plans.

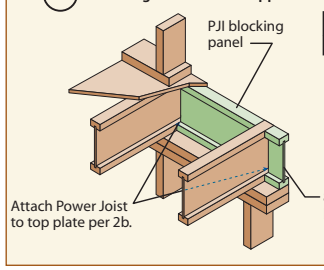
Figure 2

Typical PJI Power Joist Floor Framing and Construction Details

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



2a Blocking Panel at End Support Detail

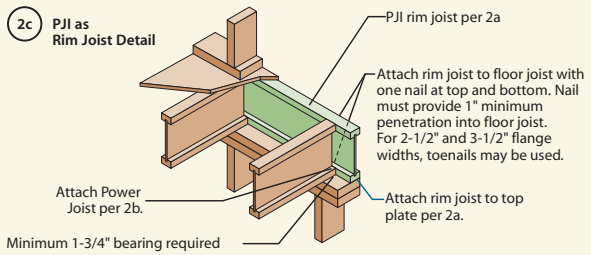


Blocking Panel or Rim Joist	Uniform Vertical Load Transfer Capacity* (plf)
PJI Joists (9 1/2 - 18")	2000

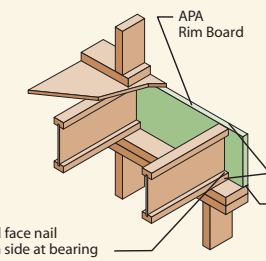
*The uniform vertical load capacity is limited to a joist depth of 18" or less and is based on the normal (10-yr) load duration. It shall not be used in the design of a bending member such as joist, header, or rafter. For concentrated vertical load transfer capacity, see 2d.

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)

2c PJI as Rim Joist Detail



2b Rim Board Detail



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

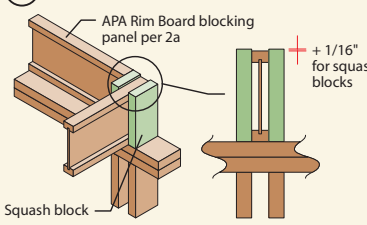
*The uniform vertical load capacity is limited to Rim Board depth of 18" or less and is based on the normal (10-yr) load duration. It shall not be used in the design of a bending member such as joist, header, or rafter. For concentrated vertical load transfer capacity, see 2d.

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.

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

2d Squash Block Detail

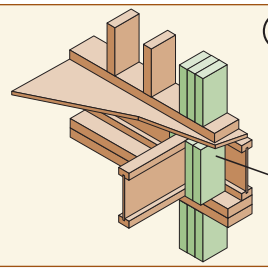


Pair of Squash Blocks	Vertical load transfer capacity per pair of squash blocks (lb)	
	3-1/2" wide	5-1/2" wide
2x lumber	3800	5900
1-1/8" APA Rim Board, Rim Board Plus, or Rated Sturd-I-Floor 48 oc	2600	4000
1" APA Rim Board or Rated Sturd-I-Floor 32 oc	1900	3000

Provide lateral bracing per 2a, 2b, or 2c.

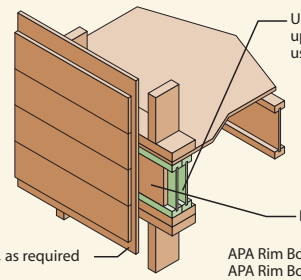
All nails shown in the details below are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3") may be substituted for 8d common (0.131 x 2-1/2") as shown in details. Individual components are not shown to scale for clarity.

2e Load Transfer with Pass Thru Blocking Detail



Transfer load from above to bearing below. Install squash blocks per 2d. Match bearing area of blocks below to post above.

2f Parallel End Power Joist Detail



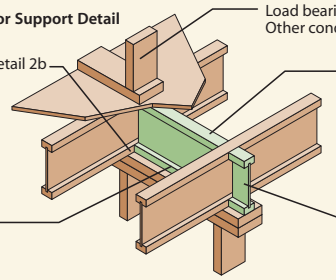
Use single Power Joist for loads up to 2000 plf and double Power Joists for loads up to 4000 plf (filler block not required). Attach Power Joist to top plate using 8d nails at 6" o.c.

Provide backer for siding attachment unless nailable sheathing is used.

Wall sheathing, as required

APA Rim Board may be used in lieu of Power Joists. Backer is not required when APA Rim Board is used.

2g Blocking Panel at Interior Support Detail



Load bearing wall above shall align vertically with the wall below. Other conditions such as offset walls are not covered by this detail.

Power Joist attachment per detail 2b

Blocking required over all interior supports under load-bearing walls or when floor joists are not continuous over support. In high seismic areas (SDC_D, D_1 and D_2), the IRC requires blocking at all intermediate supports. The IBC requires blocking at all supports for all Seismic Design Categories.

8d nails at 6" o.c. to top plate

PJI blocking panel per 2a

2h Power Joist with Backer Blocks for Hanger Detail

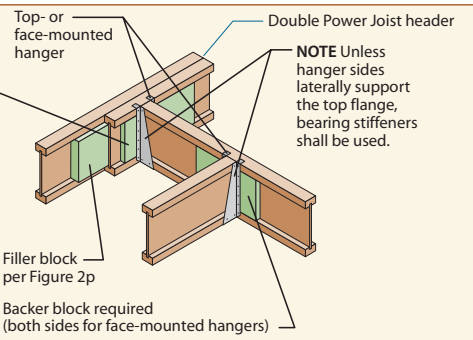
BACKER BLOCK Use if hanger load exceeds 250 lbs. Before installing a backer block to a double Power Joist, drive 3 additional 10d nails through the webs and filler block where the backer block will fit. Clinch. Install backer tightly to top flange. Use twelve 10d nails, clinched when possible. Maximum capacity for hanger for this detail is1280 lbs.

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

Flange Width	Material Thickness Required*	Minimum Depth**
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 shall be 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".



Top- or face-mounted hanger

Double Power Joist header

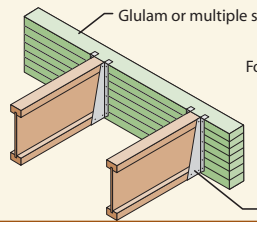
NOTE Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

Filler block per Figure 2p

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

For hanger capacity see hanger manufacturer's recommendations. Verify double Power Joist capacity to support concentrated loads.

2j Power Joist to Flush Beam Detail



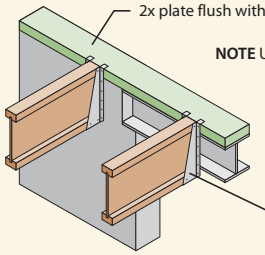
Glulam or multiple structural composite lumber (SCL) beams

For nailing schedules for multiple SCL beams, see the manufacturer's recommendations.

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

Top- or face-mounted hanger installed per manufacturer's recommendations

2k Power Joist with Top Mount Hanger Detail

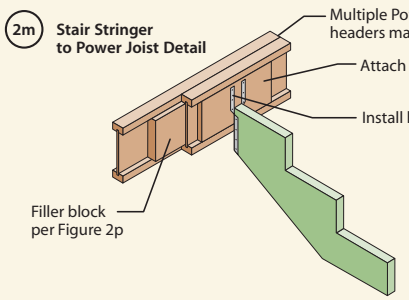


2x plate flush with inside face of wall or beam

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

Top-mounted hanger installed per manufacturer's recommendations

2m Stair Stringer to Power Joist Detail



Multiple Power Joist header with full depth filler block is shown. Glulam and multiple SCL headers may also be used. Verify double Power Joist capacity to support concentrated loads.

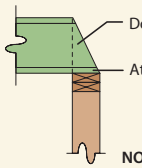
Attach backer block per 2h. Nail with twelve 10d nails and clinch when possible

Install hanger per manufacturer's recommendations.

Filler block per Figure 2p

Maximum support capacity is1280 lbs.

2n Bevel-Cut Power Joist Detail



Do not bevel-cut joist beyond inside face of wall.

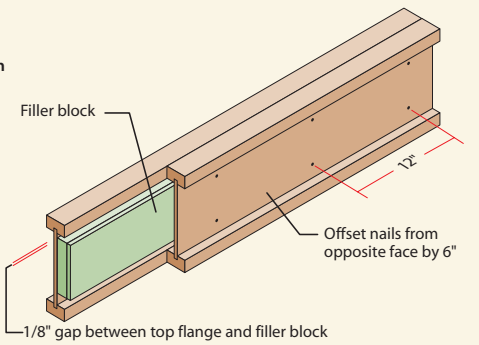
Attach Power Joist per 2b.

NOTE Blocking is required at bearing for lateral support. Not shown for clarity

2p Double Power Joist Construction Detail

Filler Block Requirements for Double Power Joists Construction

Flange Width	Net Depth	Filler Block Size
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"
3-1/2"	18" 20" 22" 24"	3" x 14" 3" x 16" 3" x 18" 3" x 20"



Filler block

12"

Offset nails from opposite face by 6"

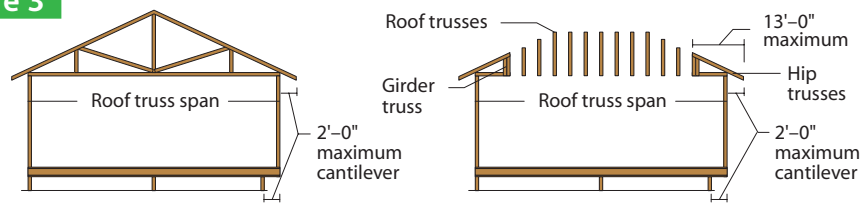
1/8" gap between top flange and filler block

NOTES

1. Support back of I-Joist web during nailing to prevent damage to web/flange connection.
2. Leave a 1/8" 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" o.c. (clinched when possible) on each side of the double Power Joist. Total of 4 nails per foot is 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.

Cantilever Detail for Vertical Building Offset (Concentrated Wall Load)

Figure 3



See Table below for Power Joist reinforcement requirements at cantilever.

For hip roofs with the hip trusses running parallel to the cantilevered floor joists, the Power Joist reinforcement requirements for a span of 26 ft. shall be permitted to be used.

Cantilever Reinforcement Methods

Table 2
PJI Cantilever Reinforcement Methods Allowed

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

NOTES

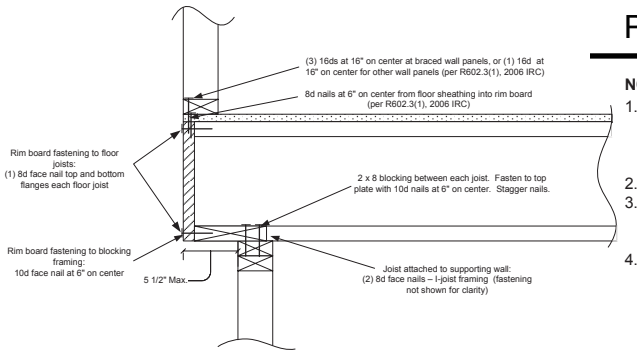
(1) N = No reinforcement required
1 = PJIs reinforced with 23/32" wood structural panel on one side only
2 = PJIs reinforced with 23/32" wood structural panel on both sides or double Power Joist
X = Try a deeper joist or closer spacing.

(2) Color coding in table is matched to details in Figure 6.

(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.



PJI CANTILEVER DETAIL

NOTES

1. The detail to the left is appropriate for one and two-family residential structures constructed in accordance with the 2006/2009/2012 International Residential Code (IRC) Sections R301.2.2.2.2, R602.3(1), and R602.10.
2. Cantilevered joists must be properly sized to support all design loads.
3. Applications that fall outside of the scope of the 2006/2009/2012 IRC shall be designed in accordance with the 2006/2009/2012 International Building Code (IBC).
4. Nail sizes per 2006/2009/2012 IRC:
   8d = 2-1/2" x 0.113"
   10d = 3" x 0.128"
   16d = 3-1/2" x 0.135"

Web Hole Rules and Specifications

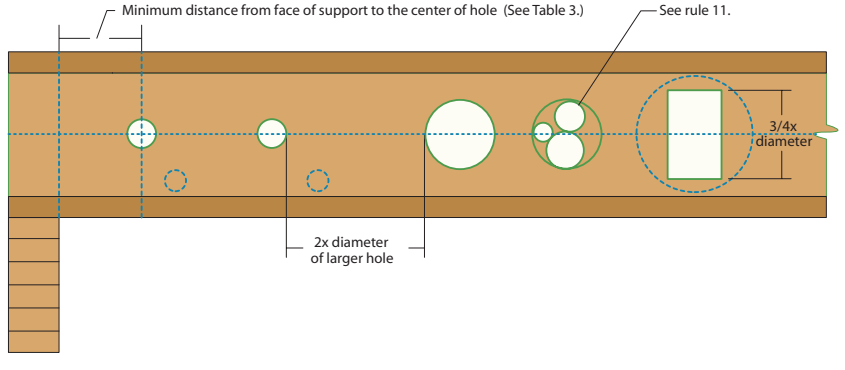
One of the benefits of using Power Joists in residential floor construction is that holes may be cut in the joist webs to accommodate electrical wiring, plumbing lines, and other mechanical systems thereby minimizing the depth of the floor system.

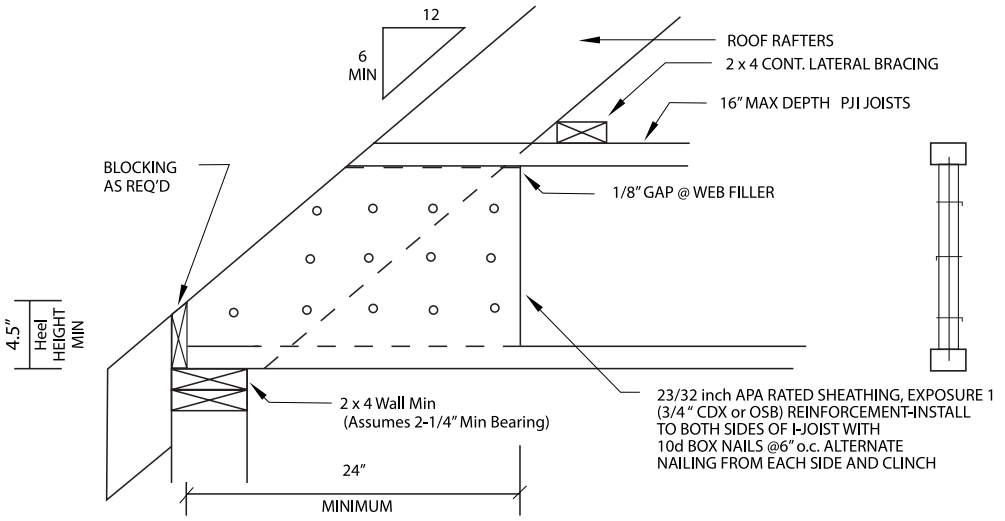
Rules for Cutting Holes in PJI Joists

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. Power 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 a Power Joist web shall equal the clear distance between the flanges of the Power Joist minus 1/4". A minimum of 1/8" should always be maintained between the top or bottom of the hole and the adjacent Power 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. Holes measuring 1-1/2" shall be permitted anywhere in a cantilevered section of a Power Joist. Holes of greater size may be permitted subject to verification.
8. A 1-1/2" hole can be placed anywhere in the web provided that it meets the requirements of rule 6 above.
9. All holes shall be cut in a workman-like manner in accordance with the restrictions listed above and as illustrated in Figure 7.
10. Limit of 3 maximum size holes per span
11. A group of round holes at approximately the same location shall be permitted if they meet the requirements for a single round hole circumscribed around them.

Figure 7

Power Joist Typical Holes



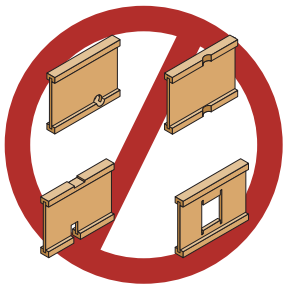


TAPER CUT JOIST REINFORCEMENT DETAIL

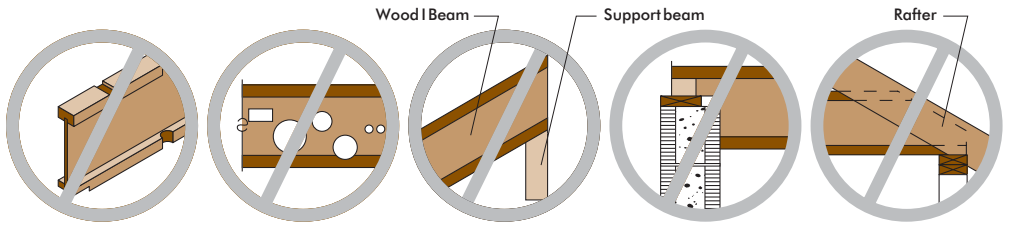
1-1/2" = 1'-0"

Cutting the Holes

- **NEVER** drill, cut, or notch the flange. **NEVER** 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" diameter hole in each of the 4 corners and then making the cuts between the holes is another good method to minimize damage to I-Joist.



Do Not Cut or Drill



Do not cut or notch flanges. (An exception is birdsmouth cuts in roof details 7h & 7j in User Guide.)

Do not violate hole chart rules.

Do not birdsmouth cut bottom flange at high end of rafter.

Do not hang Power Joist by top flange or web.

Do not bevel cut joist beyond inside face of wall.

Web Hole Rules and Specifications Continued

Table 3

Location Of Circular Holes In PJI Joist Webs

Simple or Multiple Span for Dead Loads up to 10 psf and Live Loads up to 40 psf[1][2][3][4]

Joist Depth	Joist	Minimum Distance from Inside Face of any Support to Center of Hole (ft-in.) Round Hole Diameter (in.)															
		SAF[5]	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"	PJI 40	14'-6"	0'-7"	1'-8"	3'-0"	4'-4"	5'-9"	6'-3"									
	PJI 60	15'-3"	1'-8"	3'-0"	4'-4"	5'-8"	7'-3"	7'-8"									
11-7/8"	PJI 40	16'-7"	0'-7"	0'-8"	1'-2"	2'-5"	3'-9"	4'-1"	5'-1"	6'-8"	7'-11"						
	PJI 60	18'-2"	0'-8"	1'-10"	3'-2"	4'-5"	5'-10"	6'-2"	7'-4"	8'-11"	10'-0"						
	PJI 80	19'-10"	1'-11"	3'-2"	4'-6"	5'-10"	7'-3"	7'-8"	8'-10"	10'-6"	11'-7"						
	PJI 90	20'-5"	2'-1"	3'-4"	4'-8"	6'-0"	7'-6"	7'-10"	9'-0"	10'-8"	11'-11"						
14"	PJI 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"			
	PJI 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"			
	PJI 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"			
	PJI 90	23'-2"	0'-7"	1'-9"	3'-0"	4'-4"	5'-8"	6'-1"	7'-1"	8'-8"	9'-10"	10'-7"	12'-8"	14'-4"			
16"	PJI 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"
	PJI 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"
	PJI 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"
	PJI 90	25'-5"	0'-7"	0'-8"	1'-8"	2'-11"	4'-3"	4'-7"	5'-7"	7'-0"	8'-1"	8'-9"	10'-8"	12'-2"	12'-8"	14'-10"	16'-7"
18"	PJI 80	27'-3"	0'-7"	0'-8"	0'-8"	0'-11"	2'-3"	2'-8"	3'-9"	5'-2"	6'-1"	6'-8"	8'-3"	9'-6"	9'-11"	11'-8"	13'-0"
	PJI 90	27'-11"	0'-7"	0'-8"	0'-8"	1'-6"	2'-11"	3'-4"	4'-5"	5'-10"	6'-10"	7'-5"	9'-0"	10'-3"	10'-8"	12'-5"	13'-9"
20"	PJI 80	29'-6"	0'-7"	0'-8"	0'-8"	0'-9"	1'-9"	2'-1"	3'-1"	4'-5"	5'-3"	5'-10"	7'-3"	8'-4"	8'-8"	10'-3"	11'-5"
	PJI 90	30'-3"	0'-7"	0'-8"	0'-8"	0'-10"	2'-2"	2'-6"	3'-6"	4'-10"	5'-8"	6'-2"	7'-8"	8'-9"	9'-1"	10'-8"	11'-11"
22"	PJI 80	31'-5"	0'-7"	0'-8"	0'-8"	0'-9"	0'-9"	1'-1"	2'-0"	3'-3"	4'-0"	4'-6"	5'-9"	6'-9"	7'-1"	8'-6"	9'-9"
	PJI 90	31'-5"	0'-7"	0'-8"	0'-8"	0'-9"	0'-10"	1'-1"	2'-0"	3'-3"	4'-2"	4'-9"	6'-4"	7'-7"	8'-0"	9'-8"	11'-0
24"	PJI 80	31'-5"	0'-7"	0'-8"	0'-8"	0'-9"	0'-9"	0'-10"	0'-10"	1'-11"	2'-7"	3'-1"	4'-4"	5'-5"	5'-10"	7'-4"	8'-6"
	PJI 90	31'-5"	0'-7"	0'-8"	0'-8"	0'-9"	0'-9"	0'-10"	0'-10"	2'-4"	3'-2"	3'-9"	5'-3"	6'-4"	6'-9"	8'-4"	9'-6"

NOTES

(1) Above tables may be used for Power Joist spacing of 24" on center or less.

(2) Hole location distance is measured from inside face of supports to center of hole.

(3) Distances in this chart are based on uniformly loaded joists.

(4) Hole sizes and/or locations that fall outside of the scope of this table may be acceptable based on analysis of actual hole size, span, spacing, and loading conditions.

(5) SAF stands for Span Adjustment Factor. SAF is used as defined below:

OPTIONAL

Table 3 is based on the Power Joists being used at their maximum span. If the Power 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.

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

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

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

SAF = Span Adjustment Factor is given in the table above.

D = The minimum distance from the inside face of any support to center of hole from Table 3 above

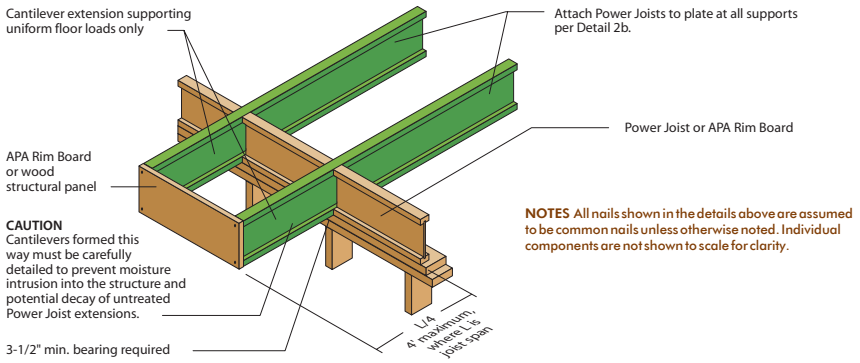
If $\frac{L_{actual}}{SAF}$ is greater than 1, use 1 in the above calculation for $\frac{L_{actual}}{SAF}$.

When calculating hole locations by this optional method, the following minimum distances between the center of the hole and the inside face of the support apply.

Hole Diameter																
in inches	2	3	4	5	6	6-1/4	7	8	8-5/8	9	10	10-3/4	11	12	12-3/4
(mm)	(51)	(76)	(101)	(127)	(152)	(159)	(178)	(202)	(219)	(228)	(254)	(273)	(279)	(305)	(324)
Minimum Distance															
in feet	0.5	0.5	1	1	1	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2
(mm)	(150)	(150)	(300)	(300)	(300)	(450)	(450)	(450)	(450)	(450)	(450)	(450)	(450)	(450)	(600)

Cantilever Details for Balconies (No Wall Load)

Figure 4



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

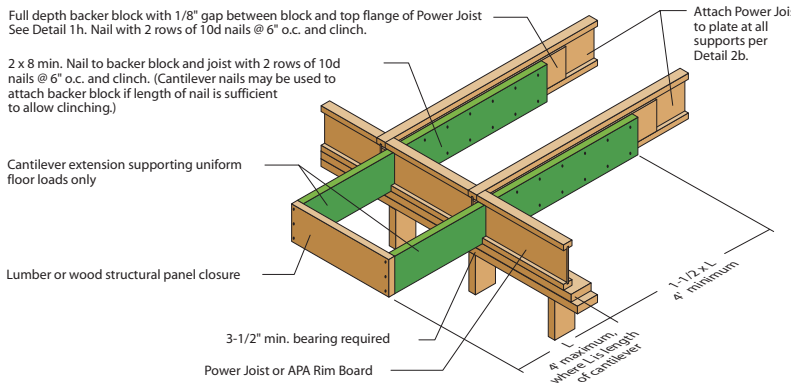
Balconies may be constructed by using either continuous Power Joists (Figure 4) or by adding lumber extensions (Figure 5) to the Power Joist. Continuous Power Joist cantilevers are limited to one-fourth the adjacent span when supporting uniform loads only. See Figure 6 for applications supporting concentrated loads at the end of the cantilever such as a wall.

Unless otherwise engineered, cantilevers are limited to a maximum of 4′ when supporting uniform loads only. Blocking is required at the cantilever support as shown.

Uniform floor load shall not exceed 40 psf live load and 10 psf dead load. The balcony load shall not exceed 60 psf live load and 10 psf dead load.

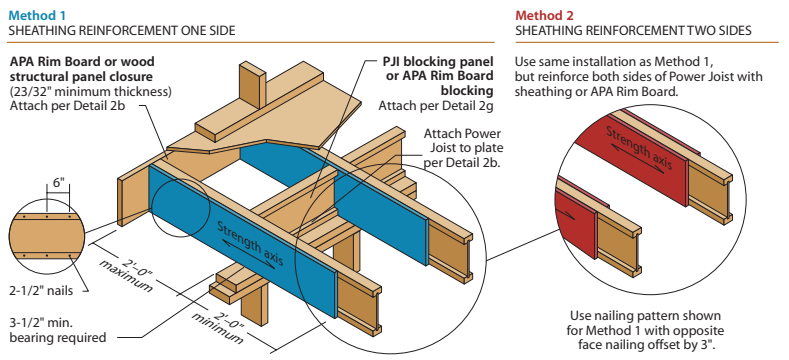
Figure 5

Lumber Cantilever Detail For Balconies (No Wall Load)



Cantilever Detail for Vertical Building Offset (Concentrated Wall Load)

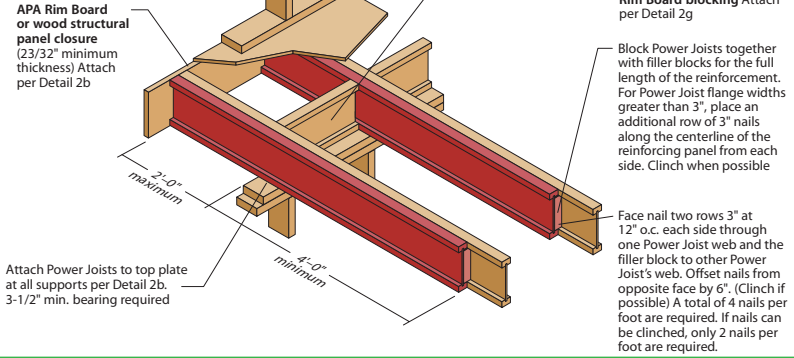
Figure 6



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 both top and bottom flange with 2-1/2" nails at 6" o.c. Install with face grain running horizontally. Attach Power Joist to plate at all supports per Detail 2b.

Power Joists may also be used in cantilever applications supporting a concentrated load applied to the end of the cantilever such as with a vertical building offset. For cantilever-end concentrated load applications that require reinforcing based on Table 2, the cantilever is limited to 2′ maximum. In addition, blocking is required along the cantilever support and is required for 4′ on each side of the cantilever area. Subject to the roof loads and layout (see Table 2), three methods of reinforcing are allowed in load bearing cantilever applications: reinforcing sheathing applied to one side of the Power Joist (Method 1), reinforcing sheathing applied to both sides of the Power Joist (Method 2), or double Power Joists (Alternate Method 2).

Alternate Method 2
DOUBLE POWER JOISTS



1. Wipe any mud, dirt, water, or ice from Power Joist flanges before gluing.
2. Snap a chalk line across the Power Joists four feet in from the wall for panel edge alignment and as a boundary for spreading glue.
3. Spread only enough glue to lay one or two panels at a time, or follow specific recommendations from the glue manufacturer.
4. Lay the first panel with tongue side to the wall, and nail in place. This protects the tongue of the next panel from damage when tapped into place with a block and sledgehammer.
5. Apply a continuous line of glue (about 1/4″ diameter) to the top flange of a single Power Joist. Apply glue in a winding pattern on wide areas such as with double Power Joists.
6. Apply two lines of glue on Power Joists where panel ends butt to assure proper gluing of each end.
7. After the first row of panels is in place, spread glue in the groove of one or two panels at a time before laying the next row. Glue line may be continuous or spaced, but avoid squeeze-out by applying a thinner line (1/8″) than used on Power Joist flanges.
8. Tap the second row of panels into place, using a block to protect groove edges.
9. Stagger end joints in each succeeding row of panels. A 1/8″ space between all end joints and 1/8″ at all edges, including T&G edges, is recommended. (Use a spacer tool or an 8d common nail to ensure accurate and consistent spacing.)
10. **Complete all nailing of each panel before glue sets.** Check the manufacturer's recommendations for allowable cure time. (Warm weather accelerates glue setting.) Use 6d ring- or screw-shank nails for panels 3/4″ thick or less and 8d ring- or screw-shank nails for thicker panels. Space nails per TableÀ4. Closer nail spacing may be required by some codes or for diaphragm construction. The finished deck can be walked on right away and will carry construction loads without damage to the glue bond.

Table 4

APA Rated Sturd-I-Floor Fastener Schedules for PJIs (1)

Maximum Joist Spacing (in.)	Panel Thickness (2) (in.)	Fastening: Glued-Nailed (3)		
		Nail Size and Type	Maximum Spacing (in.)	
			Supported Panel Edges	Intermediate Supports
16	23/32 (5)	6d ring- or screw-shank (4)	12	12
20	23/32 (5)	6d ring- or screw-shank (4)	12	12
24	23/32, 3/4	6d ring- or screw-shank (4)	12	12
	7/8	8d ring- or screw-shank (4)	6	12

(1) Special conditions may impose heavy traffic and concentrated loads that require construction in excess of the minimums shown.
(2) Panels in a given thickness may be manufactured in more than one allowable span. Panels with an allowable span greater than the actual joist spacing may be substituted for panels of the same thickness with an allowable span matching the actual joist spacing. For example, 19/32-inch-thick Sturd-I-Floor 20 o.c. may be substituted for 19/32-inch-thick Sturd-I-Floor 16 o.c. over joists 16Àinches on center.
(3) Use only adhesives conforming to APA Specification AFG-01 or ASTM D3498. Apply adhesives in accordance with the manufacturer's recommendations. If OSB panels with sealed surfaces and edges are to be used, use only solvent-based glues; check with panel manufacturer.
(4) 8d common nails may be substituted if ring- or screw-shank nails are not available.
(5) The recommended minimum thickness for use with Power Joists

IMPORTANT NOTE
Floor sheathing must be field glued to the Power Joist flanges in order to achieve the allowable spans stamped on the product. If sheathing is nailed only, reduce Power Joist spans in TablesÀ1 and 1a by 1′.

USP Hangers f

Table 5

Single Power Joi

USP Structural Connec

Width	Depth	Top Mount
2-1/2	9-1/2	TFL259
	11-7/8	TFL2511
	14	TFL251
	16	TFL251
3-1/2	11-7/8	THO351
	14	THO351
	16	THO351
	18	TFI418
	20	TFI420
	22	TFI422
	24	TFI424

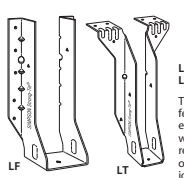
Table 6

Double Power Jo

USP Structural Connec

Width	Depth	Top Moun
5	9-1/2	THO2595
	11-7/8	THO2511
	14	THO2514
	16	THO2516
7	11-7/8	BPH711
	14	BPH711
	16	BPH711
	18	BPH711
	20	BPH712
	22	BPH712
	24	BPH712

NOTES
1. Hangers that are marked by sha
2. This table is for quick specifica
3. Hangers for Double Power Joi



LF – 18 gau
LT – 18 gau

The LF and feature fast easy install web stiffen required, a one screw joist in han

MIU – 16 gauge

The MIU series fea 16 gauge steel an extra nailing for h loads than the IU

rs for PJI 40, 60, 80, and 90 Series

Joist®
nnectors

Top Mount	Uplift 160%	Download DF/SP	Download SPF	Face Mount	Uplift 160%	Download DF/SP	Download SPF	Skewed	Uplift 160%	Download DF/SP	Download SPF
FL2595	140	1600	1230	THF25925	175	1370	1175	SKH2520L/R	1565	1625	1400
L25118	140	1600	1230	THF25112	360	1595	1370	SKH2520L/R	1565	1625	1400
FL2514	140	1600	1230	THF25140	360	2090	1800	SKH2524L/R	1565	1855	1600
FL2516	140	1600	1230	THF25160	360	2550	2200	SKH2524L/R	1565	1855	1600
O35118	265	2050	1720	THF35112	245	1825	1570	SKH410L/R	1565	2255	1935
O35140	265	2715	2280	THF35140	245	2320	2000	SKH414L/R	1565	3100	2660
O35160	265	2715	2280	THF35157	245	2550	2200	SKH414L/R	1565	3100	2660
FI418	360	2560	1660	THF35165	1295	2785	2400	SKH418L/R	1565	3950	3390
FI420	360	2560	1660	THF35165	1295	2785	2400	SKH418L/R	1565	3950	3390
FI422	360	3245	2345	THF35165	1295	2785	2400	SKH418L/R	1565	3950	3390
FI424	360	3245	2345	THF35165	1295	2785	2400	SKH418L/R	1565	3950	3390

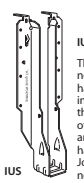
r Joist®
nnectors

Top Mount	Uplift 160%	Download DF/SP	Download SPF	Face Mount	Uplift 160%	Download DF/SP	Download SPF	Skewed	Uplift 160%	Download DF/SP	Download SPF
D25950-2	1175	3665	2710	THF25925-2	1115	1390	1200	SKH2520L/R-2	1905	1665	1440
D25118-2	1175	3665	3005	THF25112-2	1115	1855	1600	SKH2520L/R-2	1905	1665	1440
D25140-2	1175	4450	3265	THF25140-2	1220	2540	2200	SKH2524L/R-2	1905	1905	1650
D25160-2	1175	4450	3265	THF25160-2	1220	3050	2640	SKH2524L/R-2	1905	1905	1650
PH71118	1220	3455	3280	HD7120	1140	2255	1935	HD7120-SK45L/R[2]	855	2255	1935
PH7114	1220	3455	3280	HD7140	1525	2820	2420	HD7140-SK45L/R[2]	1145	2820	2420
PH7116	1220	3455	3280	HD7160	1525	3385	2905	HD7160-SK45L/R[2]	1145	3385	2905
PH7118	1220	3455	3280	HD7180	1525	3950	3390	HD7180-SK45L/R[2]	1145	3950	3390
PH7120	1220	3455	3280	HD7180	1525	3950	3390	HD7180-SK45L/R[2]	1145	3950	3390
PH7122	1220	3455	3280	HD7180	1525	3950	3390	HD7180-SK45L/R[2]	1145	3950	3390
PH7124	1220	3455	3280	HD7180	1525	3950	3390	HD7180-SK45L/R[2]	1145	3950	3390

by shading in tables require web stiffeners. Power Joist may require web stiffeners for hangers that are not marked by shading.
ecification for Power Joist hangers. Refer to hanger manufacturer for additional design information.
ver Joist are special order. Consult USP for pricing and lead times.

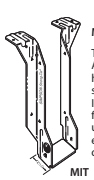
F – 18 gauge
T – 18 gauge
he LF and LT series
eature fast and
asy installation. No
eb stiffeners are
equired, and only
ne screw secures
oist in hanger.

6 gauge
U series features
ge steel and
iling for higher
an the IUT.



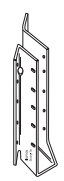
IUS – 18 gauge
The IUS is a new hybrid hanger that incorporates the advantages of face-mount and top-flange hangers. Joist nails are not required.

IUS



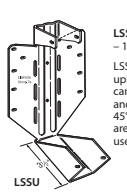
MIT – 16 gauge
The MIT's Positive Angle Nailing helps eliminate splitting of the I-Joists' bottom flange. Features uplift capacity and extended seat design

MIT



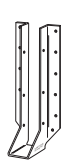
SUR/L – 16 gauge
SURI/LI – 16 gauge
All models are skewed 45°. The installation of these hangers does not require a beveled end cut. Web stiffeners are required when used with I-Joists.

SUL



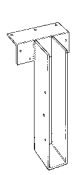
LSSUH310, LSSU410 – 16 gauge
LSSU models provide uplift capacity and can be field sloped and/or skewed to 45°. Web stiffeners are required when used with I-Joists.

LSSU



HU – 14 gauge
The HU series features uplift capacity and a large selection of sizes and load ranges. HU hangers have triangle holes that can be filled for increased loads. Web stiffeners are required when used with I-Joists.

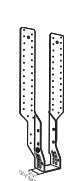
HU



W, WI: Top flange – 12 gauge
Stirrup – 12 gauge

WP, WPI, WPU: Top flange – 7 gauge
Stirrup – 12 gauge

WPU



THAI – 18 gauge
This hanger has extra long straps and can be field-formed to give height adjustability and top-flange hanger convenience. Positive angle nailing helps eliminate splitting of the I-Joist's bottom flange. Not all strap nail holes need to be filled for maximum nailing. Web stiffeners are required when used with I-Joists.

THAI

Simpson Hangers for PJI 40, 60, 80, and 90 Series

Table 7

Power Joist® Strong-Tie Hangers

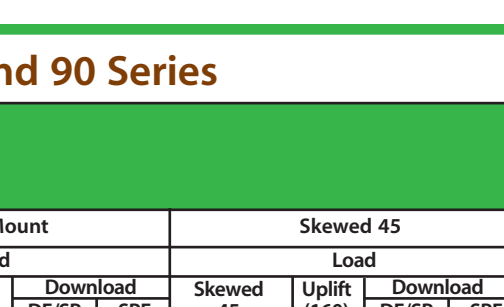
Power Joist		Top Mount				Face Mount				Skewed 45			
		Load				Load				Load			
Width	Depth	Top Mount	Uplift (160)	Download DF/SP	Download SPF	Face Mount	Uplift (160)	Download DF/SP	Download SPF	Skewed 45	Uplift (160)	Download DF/SP	Download SPF
2-1/2	9-1/2	ITS2.56/9.5	105	1520	1150	IUS2.56/9.5	75	935	810	SUR/L2.56/9	210	2015	1735
	11-7/8	ITS2.56/11.88	105	1520	1150	IUS2.56/11.88	75	1170	1010	SUR/L2.56/11	210	2305	1980
	14	ITS2.56/14	105	1520	1150	IUS2.56/14	75	1405	1210	SUR/L2.56/14	210	2590	2225
	16	ITS2.56/16	105	1520	1150	IUS2.56/16	75	1640	1415	SUR/L2.56/14	210	2590	2225
3-1/2	9-1/2	ITT49.5	105	1520	1150	IUS3.56/9.5	75	1170	1010	SUR/L410	720	1860	1610
	11-7/8	ITS3.56/11.88	105	1520	1150	US3.56/11.88	75	1405	1210	SUR/L410	720	1860	1610
	14	ITS3.56/14	105	1520	1150	IUS3.56/14	75	1405	1210	SUR/L414	960	2395	1795
	16	ITS3.56/16	105	1520	1150	IUS3.56/16	75	1640	1415	SUR/L414	960	2395	1795
	18	MIT418	215	2305	1665	MIU3.56/18	230	3690	3200	SUR/L414	960	2395	1795
	20	MIT420	215	2305	1665	MIU3.56/20	230	3975	3445	SUR/L414	960	2395	1795
	22	HIT422	315	2550	1950	MIU3.56/20	230	3975	3445	---------- not available ----------			
	24	HIT424	315	2550	1950	MIU3.56/20	230	3975	3445	---------- not available ----------			

NOTES

1. Hangers that are marked by green shading in tables require web stiffeners. ANTHONY EACOM may require web stiffeners for hangers that are not marked by shading.
2. This table is for quick specification for Power Joist hangers. Refer to hanger manufacturer for additional design information.

SIMPSON Strong-Tie® CONNECTORS®

Top Mount



Snap In | Face Mount | Skewed

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