



ENGINEERED WOOD DATA FILE



APA PERFORMANCE RATED I-JOISTS FOR UNITED KINGDOM

APA PERFORMANCE RATED™ I-JOISTS SAY WHAT THEY DO AND DO WHAT THEY SAY

APA – The Engineered Wood Association has made it easy to make the right choice for I-joist products.

APA Performance Rated™ I-Joists (PRI™) provide a high performance alternative to dimension lumber joists for floor and roof applications. This guide will help you efficiently use APA PRIs by walking you through the simple steps of product selection, specification, and installation.

The APA trademark signifies that the I-joists are manufactured to strict quality standards by a member of Engineered Wood Systems (EWS), a related corporation of APA. PRIs are

manufactured in conformance with PRI-400, *Performance Standard for APA EWS I-Joists*. PRI-400 I-joists bearing the approval of APA and the British Board of Agrément (BBA) are readily available in the United Kingdom. APA member manufacturers are committed to a rigorous programme of quality verification and testing, which ensures predictable product performance. In other words, APA PRIs are I-joists that say what they do and do what they say.

PRI-400 brings product standardisation while providing for a multitude of design and construction situations. The standard provides design information for numerous types and sizes of I-joists. Now specifiers and builders can select and use I-joists from various APA EWS member manufacturers,

using just one set of design and installation criteria. Because PRIs can be selected based on their allowable span for uniformly loaded floors, it is easy to incorporate them into your design. The allowable spans for PRI-400 are based on a deflection limit of 1/480 of the span, so the result is a stiffer floor than required by code.

This guide emphasises residential floor systems. However, much of the basic design information can be used for other construction applications, such as flat roofs. Review by a design professional is required for applications beyond the scope of this document. (See Table 4 for design properties.)

Simple to specify. Easy to install. Less confusion. APA Performance Rated I-Joists are the right choice for floor and flat roof construction.

SAMPLE TRADEMARK – Position of trademark on I-joist may vary by manufacturer

The I-joist alternative to 2 x 10 (47 x 250 mm) lumber with a net depth of 9-1/2" (241 mm). Also available in depths of 11-7/8" (302 mm), 14" (356 mm), and 16" (406 mm).

Joist designation.

Plant number

BBA Mark indicates PRI-400 I-joist recognition by British Board of Agrément (BBA Assessment Report No. 1718)



Identifies I-joists as being manufactured in conformance with APA Standard PRI-400, *Performance Standard for APA EWS I-Joists*.

Conforms with APA Standard PRI-400, *Performance Standard for APA EWS I-Joists*.

NOTICE:

The technical data contained in this guide applies **only** to I-joists that bear the APA Performance Rated I-Joist (PRI™) trademark. These trademarked products, manufactured by APA EWS member mills, adhere to our quality assurance programme and conform to PRI-400, "Performance Standard for APA EWS I-Joists."

SELECTING APA PERFORMANCE RATED I-JOISTS

Product Description

The APA Performance Rated I-Joist (PRI) is an “I”-shaped engineered wood structural member designed for use in residential floor construction. The product is prefabricated using sawn or structural composite lumber flanges and wood structural panel webs, bonded together with exterior-type adhesives. In order to be classified as an APA PRI, the joist is limited to a live load deflection limit of 1/480 of the span, a criteria which provides superior floor performance.

APA Performance Rated I-joists are identified by their depth in inches followed by a designation such as PRI-30 which relates to the joist strength and stiffness.

APA PRIs are manufactured to strict tolerances with the following characteristics:

TABLE 1

TYPICAL DIMENSIONS FOR APA PERFORMANCE RATED I-JOISTS

Net Depth	Joist Designation
9-1/2" (241 mm)	PRI-20
	PRI-30
	PRI-40
	PRI-50
	PRI-60
11-7/8" (302 mm)	PRI-20
	PRI-30
	PRI-40
	PRI-50
	PRI-60
14" (356 mm)	PRI-40
	PRI-50
	PRI-60
	PRI-70
16" (406 mm)	PRI-40
	PRI-50
	PRI-60
	PRI-70
	PRI-80

- **Flanges** are either sawn lumber or structural composite lumber, such as LVL. The top flange is of the same type and grade of material as the bottom flange. The minimum flange width is 38 mm. The net flange size depends on the material used.

- **Webs** consist of wood structural panels, which can be plywood or OSB. All panels are classified as Exposure 1 or Exterior for use in service class

environments one and two as defined in BS 5268-2:1996. Webs are 9.5 mm in thickness or greater.

- All PRIs are assembled using exterior-type **adhesives** that have met both the American Society of Testing and Materials Standard (ASTM) D 2559 and acceptance by the BBA.

- APA PRIs are available in four depths as shown in Table 1.

TABLE 2

SPANS IN METERS FOR APA PRI-400 I-JOISTS FOR USE WITH 0.345 kN/m² DEAD LOAD AND 1.5 kN/m² LIVE LOAD

	Depth (mm)	Single Span Dead Load Up to 0.345 kN/m ² Joist centres (mm)			Multiple Span Dead Load Up to 0.345 kN/m ² Joist centres (mm)		
		300	400	600	300	400	600
		9-1/2" PRI-20	241	4.95	4.47	3.85	5.50
9-1/2" PRI-30	241	5.13	4.62	3.99	5.64	5.20	4.50
9-1/2" PRI-40	241	5.34	4.82	4.15	5.82	5.40	4.43
9-1/2" PRI-50	241	5.36	4.84	4.17	5.84	5.42	4.71
9-1/2" PRI-60	241	5.57	5.11	4.40	6.08	5.63	4.96
11-7/8" PRI-20	302	5.80	5.38	4.66	6.32	5.87	5.11
11-7/8" PRI-30	302	5.95	5.51	4.81	6.48	6.01	5.40
11-7/8" PRI-40	302	6.10	5.66	4.98	6.66	6.17	5.12
11-7/8" PRI-50	302	6.15	5.70	5.03	6.70	6.21	5.58
11-7/8" PRI-60	302	6.38	5.91	5.28	6.95	6.45	5.79
11-7/8" PRI-70	302	6.55	6.07	5.44	7.15	6.62	5.94
11-7/8" PRI-80	302	6.88	6.37	5.71	7.51	6.96	6.24
14" PRI-40	356	6.71	6.22	5.58	7.32	6.78	5.68
14" PRI-50	356	6.79	6.29	5.64	7.41	6.87	6.16
14" PRI-60	356	7.03	6.51	5.83	7.66	7.10	6.37
14" PRI-70	356	7.20	6.67	5.97	7.85	7.28	6.53
14" PRI-80	356	7.57	7.01	6.27	8.27	7.66	6.86
16" PRI-40	406	7.25	6.72	6.03	7.91	7.33	6.16
16" PRI-50	406	7.36	6.82	6.11	8.03	7.44	6.68
16" PRI-60	406	7.60	7.04	6.31	8.29	7.68	6.89
16" PRI-70	406	7.79	7.21	6.46	8.50	7.87	7.06
16" PRI-80	406	8.18	7.57	6.78	8.93	8.27	7.41

Notes

1. For non load bearing partitions where the self weight of the partition is less than 0.8 kN/m & the partitions span perpendicular to the span then reduce the spans presented by 9%.
2. For non load bearing partitions (0.8 kN/m) that span parallel to the span add an extra joist directly under partition.
3. Minimum bearings are 45 mm for end spans and 89 mm for intermediate bearing.
4. Self weight is included in the span tables.
5. For multiple span, the shortest span must be at least 50% of the longer span.

■ PRIs of the same depth may be manufactured with various flange widths. Hanger manufacturers have products readily available for PRI-400 I-joists.

■ Most mills supply I-joists to distributors and dealers in lengths up to 14 meters. These are then cut to frequently used lengths for jobsite delivery. Check local supplier for availability.

Residential Floor Allowable Spans

The allowable span for uniformly loaded residential floor construction has been pre-engineered for each joist designation at various I-joist spacings. Therefore, the specific PRI needed for your application is easily determined by selecting the span needed and then choosing the PRI that meets your span, spacing, and loading criteria.

Tables 2 and 3 provide span applications for 1.5 kN/m² live loads with 0.345 kN/m² dead load and 0.900 kN/m² dead load respectively. The use of these tables will provide maximum spans for the indicated spacings and span conditions.

To illustrate the selection of an APA PRI product, assume a design for a 0.9 kN/m² dead load and a single span of 4.7 m. Further assume the joist depth is limited to 302 mm or less and joist spacing to 400 mm on centre or less. From the entries in Table 3, look down the 400 mm on centre spacing column. For depths of 241 mm (9-1/2 inch), select **9-1/2" PRI-60**. As an alternate, from the 302 mm (11-7/8 inch) depths notice that **any** joist designation will work. The allowable spans in the tables in this design guide indicate the allowable clear span for various joist spacings under typical residential floor loads.

TABLE 3

SPANS IN METERS FOR APA PRI-400 I-JOISTS FOR USE WITH 0.9 kN/m² DEAD LOAD AND 1.5 kN/m² LIVE LOAD

	Depth (mm)	Single Span Dead Load Up to 0.9 kN/m ² Joist centres (mm)				Double Span Dead Load Up to 0.9 kN/m ² Joist centres (mm)			
		300	400	450	600	300	400	450	600
9-1/2" PRI-20	241	4.72	4.28	4.10	3.69	5.14	4.75	4.48	3.87
9-1/2" PRI-30	241	4.84	4.43	4.24	3.81	5.27	4.89	4.74	4.31
9-1/2" PRI-40	241	4.98	4.61	4.42	3.89	5.44	4.77	4.49	3.89
9-1/2" PRI-50	241	5.01	4.64	4.44	3.99	5.46	5.06	4.90	4.51
9-1/2" PRI-60	241	5.20	4.82	4.67	4.21	5.68	5.26	5.10	4.57
11-7/8" PRI-20	302	5.42	5.02	4.86	4.46	5.91	5.48	5.18	4.48
11-7/8" PRI-30	302	5.55	5.14	4.98	4.61	6.06	5.61	5.44	5.04
11-7/8" PRI-40	302	5.70	5.28	5.11	4.50	6.22	5.52	5.20	4.50
11-7/8" PRI-50	302	5.74	5.31	5.15	4.76	6.26	5.80	5.62	5.21
11-7/8" PRI-60	302	5.95	5.51	5.34	4.93	6.50	6.02	5.83	5.29
11-7/8" PRI-70	302	6.11	5.66	5.48	5.06	6.67	6.18	5.99	5.54
11-7/8" PRI-80	302	6.42	5.94	5.75	5.31	7.01	6.49	6.29	5.82
14" PRI-40	356	6.27	5.80	5.62	4.99	6.84	6.12	5.77	4.99
14" PRI-50	356	6.34	5.87	5.69	5.26	6.92	6.41	6.21	5.75
14" PRI-60	356	6.56	6.07	5.88	5.43	7.16	6.63	6.42	5.86
14" PRI-70	356	6.72	6.22	6.02	5.56	7.33	6.79	6.58	6.09
14" PRI-80	356	7.06	6.53	6.32	5.84	7.71	7.14	6.92	6.40
16" PRI-40	406	6.77	6.27	6.07	5.41	7.39	6.63	6.25	5.41
16" PRI-50	406	6.87	6.36	6.16	5.70	7.50	6.95	6.73	6.23
16" PRI-60	406	7.09	6.56	6.36	5.87	7.74	7.17	6.94	6.36
16" PRI-70	406	7.27	6.72	6.51	6.02	7.93	7.35	7.12	6.58
16" PRI-80	406	7.63	7.05	6.83	6.31	8.33	7.71	7.47	6.91

Notes

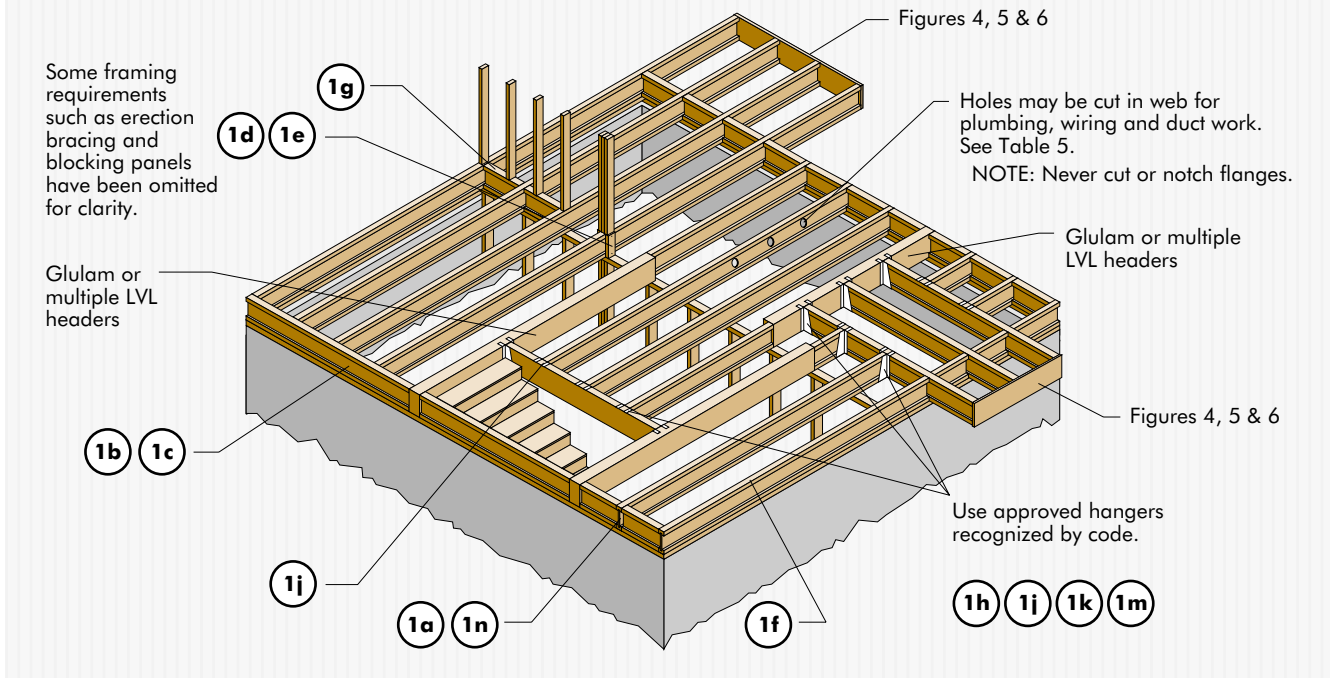
1. For non load bearing partitions where the self weight of the partition is less than 0.8kN/m & the partitions span perpendicular to the span then reduce the spans presented by 12%.
2. For non load bearing partitions (0.8kN/m) that span parallel to the span add an extra joist directly under partition.
3. Minimum bearings are 45mm for end spans and 89mm for intermediate bearing.
4. Self weight is included in the span tables.
5. For double span, the shortest span must be at least 50% of the longer span.

The spans shown in Tables 2 and 3 are based on repetitive member usage which is typical for all wood products. Use of these span tables is limited to uniform load conditions with a deflection limit of 1/480 of the span. APA PRIs can be used for other applications when properly engineered using the appropriate design properties in Table 4.

While any of the PRIs shown in Tables 2 and 3 may be available in a specific market area, availability of any specific PRI product should be verified. Contact the APA office in Bournemouth (see back page) for a list of APA PRI-400 manufacturers and distributors.

FIGURE 1

TYPICAL APA PERFORMANCE RATED I-JOIST FLOOR FRAMING AND CONSTRUCTION DETAILS



Typical Floor Framing and Construction Details

Installation Notes:

1. Installation of APA PRIs shall be as shown in Figure 1.
2. Except for cutting to length, I-joist flanges should **never** be cut, drilled, or notched.
3. Concentrated loads should only be applied to the top surface of the top flange. At no time should concentrated loads be suspended from the bottom flange with the exception of light loads.
4. I-joists must be protected from the weather prior to installation.
5. I-joists must not be used in places where they will be permanently exposed to weather, or will reach a moisture content greater than 16% such as in swimming pool or sauna areas. They must not be installed where they will remain in direct contact with concrete or masonry.
6. End bearing length must be at least 45 mm. For multiple span joists,

intermediate bearing length must be at least 89 mm.

7. Ends of floor joists shall be restrained to prevent rollover. Use APA Performance Rated™ Rim Board or I-joist blocking panels. Use of lumber as rim joists or blocking for PRI-400 I-joists is not recommended due to potential height incompatibility as a result of lumber shrinkage.
8. I-joists installed beneath bearing walls perpendicular to the joists shall have equal depth blocking panels, APA Performance Rated Rim Board, or squash blocks (cripple blocks) to transfer gravity loads from above the floor system to the wall or foundation below.
9. For I-joists installed beneath bearing walls parallel to the joists, the maximum allowable vertical load using a single I-joist is 29.2 kN/meter or 58.4 kN/meter if double I-joists are used.
10. Continuous lateral support of the I-joist's compression flange is required to prevent rotation and buckling. In single span uses, lateral support of the top flange is normally supplied by the

floor sheathing. In multiple span or cantilever applications, bracing of the I-joist's bottom flange is also required at interior supports of multiple-span joists, and at the end support next to the cantilever extension.

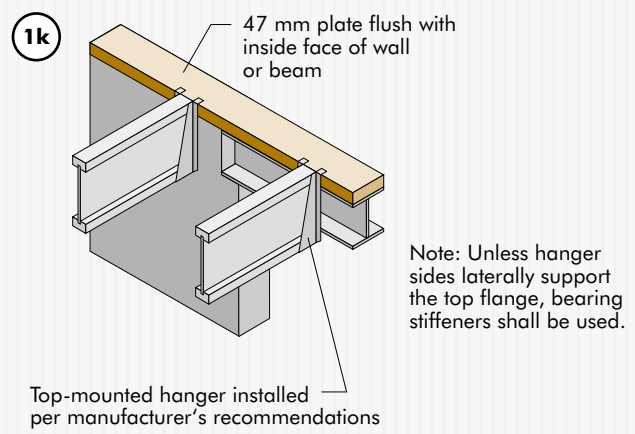
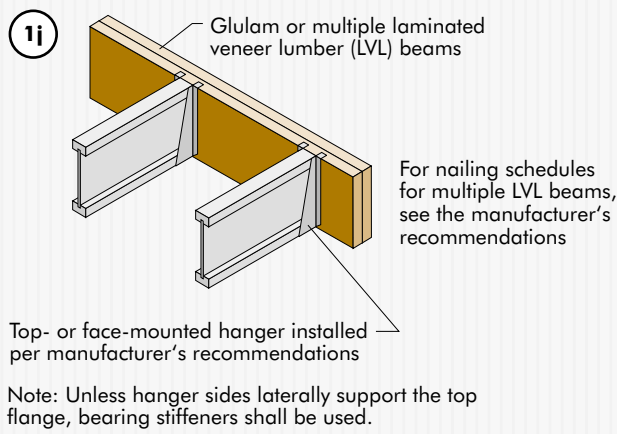
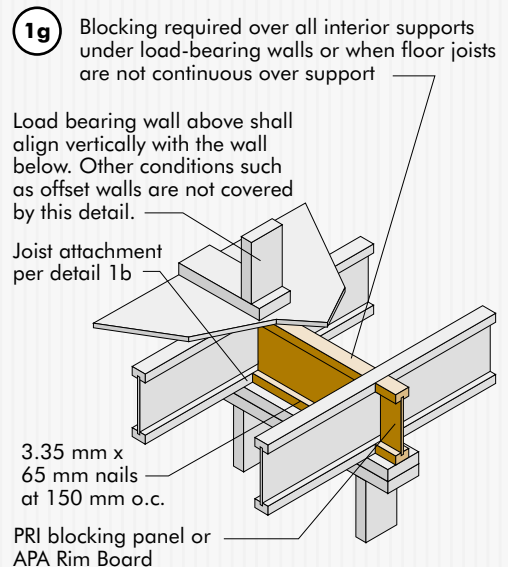
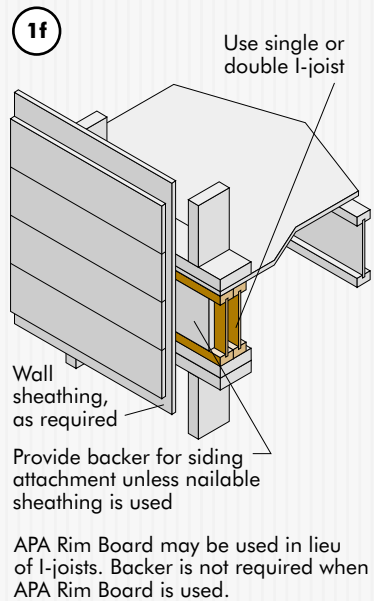
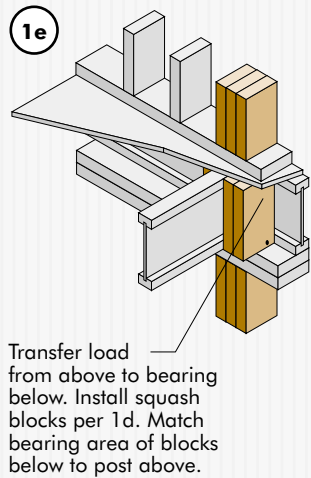
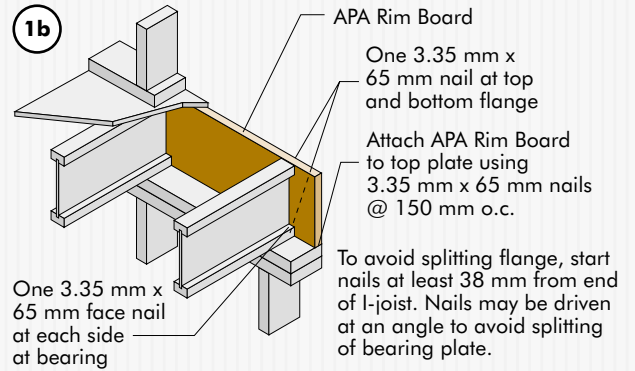
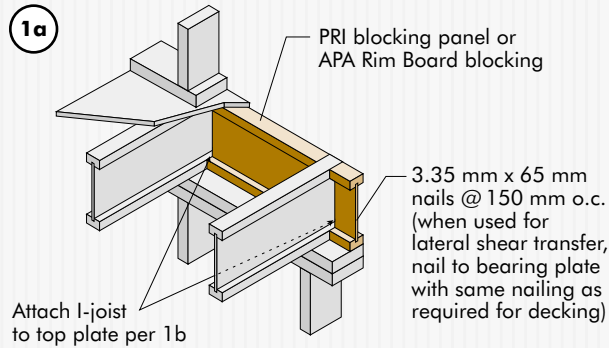
11. Nails installed perpendicular to the wide face of the flange shall be spaced not closer than 50 mm o.c. per row (75 mm o.c. for I-joists with composite flanges 38 mm wide) for nails with a diameter of 3.35 mm or less. If more than one row of nails is used (not permitted for I-joists with composite flanges 38 mm wide) the rows must be offset at least 13 mm. Nails installed parallel to the wide face of the veneers in LVL flanges shall not be spaced closer than 75 mm o.c. for 3.35 x 65 mm long nails, and 100 mm o.c. for 3.75 x 75 mm long nails.

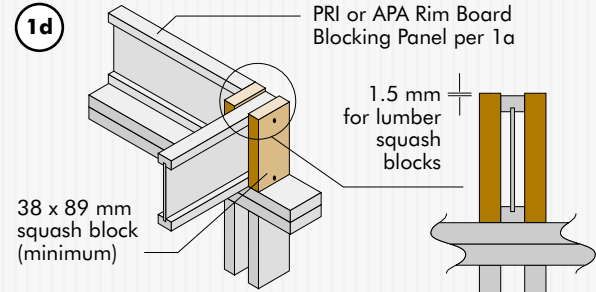
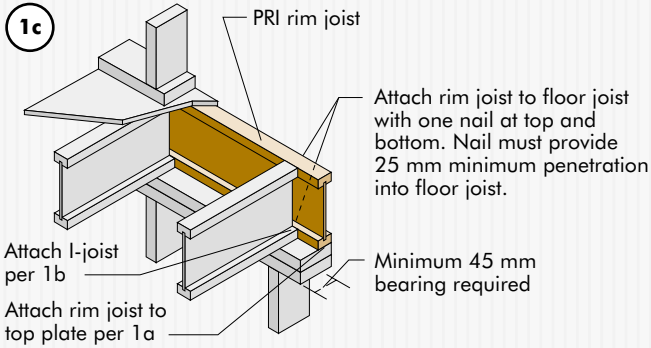
12. Figure 1 details on the following pages show only I-joist-specific fastener requirements. For other fastener requirements, see the applicable building code.

FIGURE 1 CONTINUED

TYPICAL APA PERFORMANCE RATED I-JOIST FLOOR FRAMING AND CONSTRUCTION DETAILS (TIMBER FRAME CONSTRUCTION)

Individual components not shown to scale for clarity.





Provide lateral bracing per 1a, 1b, or 1c
Vertical load transfer capacity per pair of squash blocks as shown:

Pair of Squash Blocks	Vertical Load, kN
47 x 100 mm	17.8
28.5 mm Rim Board	13.3
25 mm Rim Board	12.0

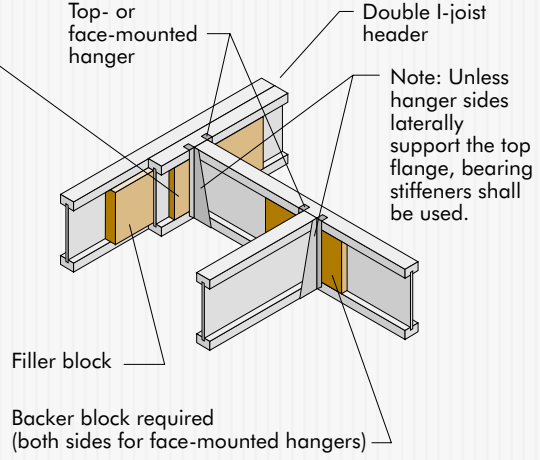
1h

Backer block (use if hanger load exceeds 1.1 kN) Before installing a backer block to a double I-joist, drive 3 additional 3.75 mm x 75 mm nails through the webs and filler block where the backer block will fit. Clinch. Install backer tight to top flange. Use twelve 3.75 mm x 75 mm nails, clinched when possible. Maximum capacity for hanger for this detail = 5.7 kN.

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

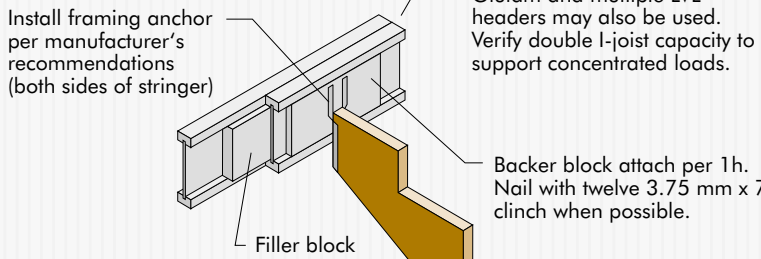
Flange Width	Material Thickness Required*	Minimum Depth**
38 mm	15 mm	140 mm
45 mm	18 mm	140 mm
58 mm	25 mm	184 mm
64 mm	25 mm	140 mm
89 mm	38 mm	184 mm

* Backer block material shall be lumber or wood structural panels.
** For face-mount hangers use net joist depth minus 83 mm for joists with 38 mm thick flanges. For 33.3 mm thick flanges use net depth minus 73 mm.



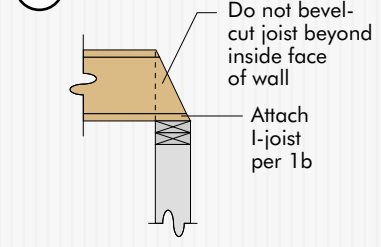
For hanger capacity see hanger manufacturer's recommendations. Verify double I-joist capacity to support concentrated loads.

1m



Maximum support capacity = 5.7 kN

1n



Note: Blocking required at bearing for lateral support, not shown for clarity.

FIGURE 1 CONTINUED

TYPICAL APA PERFORMANCE RATED I-JOIST FLOOR FRAMING AND CONSTRUCTION DETAILS (BRICK AND BLOCK CONSTRUCTION) Individual components not shown to scale for clarity.

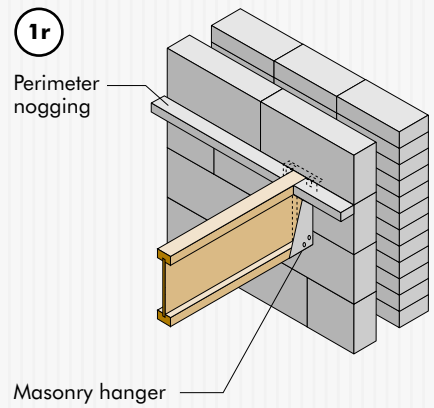
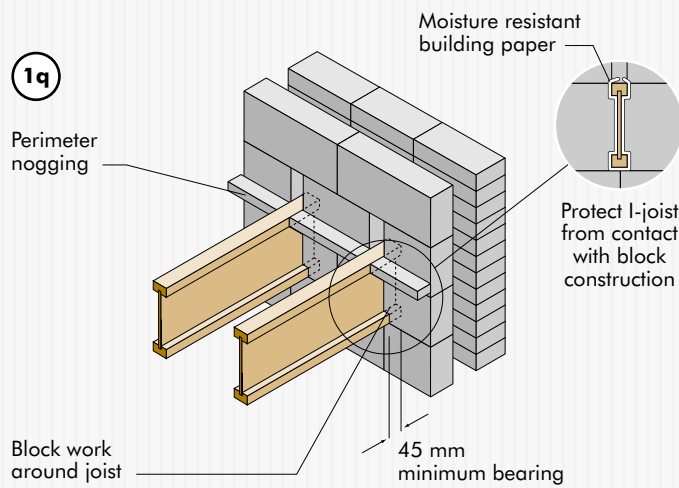
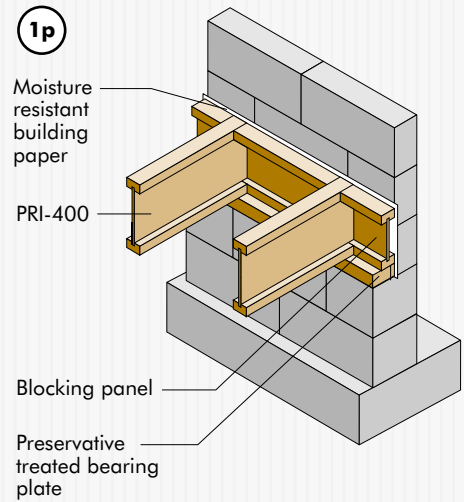
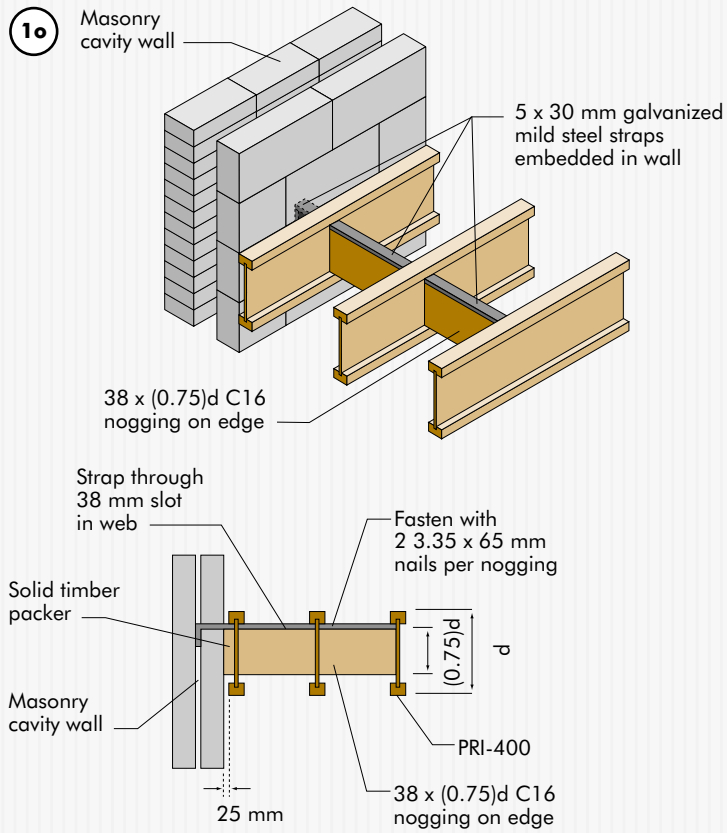


TABLE 4

LONG TERM DESIGN VALUES FOR APA PRI-400 I-JOISTS¹

Joist Type	Joist Depth mm	Moment Capacity		Bending Stiffness EI x 10 ⁹ Nmm ²	Shear Rigidity GA x 10 ⁶ N	Shear Capacity kN	Weight of joist kN/m	Bearing lengths		
		non load sharing kNm	load sharing kNm					End reaction ^{2,3}		Int. Reaction kN
								45 mm kN	100 mm kN	
9-1/2" PRI-20	241	2.69	2.80	383	1.62	3.83	0.032	2.84	3.83	5.81
9-1/2" PRI-30	241	3.46	3.60	426	1.62	3.83	0.032	3.23	3.83	6.51
9-1/2" PRI-40	241	2.63	2.82	484	1.62	3.83	0.035	3.69	3.83	7.39
9-1/2" PRI-50	241	4.06	4.23	492	1.62	3.83	0.035	3.48	3.83	6.98
9-1/2" PRI-60	241	3.63	3.88	579	1.62	3.83	0.035	3.69	3.83	7.39
11-7/8" PRI-20	302	3.60	3.74	669	2.02	4.86	0.035	2.84	4.86	5.81
11-7/8" PRI-30	302	4.59	4.77	741	2.02	4.86	0.035	3.23	4.86	6.51
11-7/8" PRI-40	302	3.52	3.76	827	2.02	4.86	0.038	4.10	4.86	8.55
11-7/8" PRI-50	302	5.40	5.62	852	2.02	4.86	0.038	3.48	4.86	6.98
11-7/8" PRI-60	302	4.85	5.18	992	2.02	4.86	0.038	4.10	4.86	8.55
11-7/8" PRI-70	302	6.92	7.19	1111	2.02	4.86	0.045	3.97	4.86	6.98
11-7/8" PRI-80	302	6.85	7.33	1371	2.02	4.86	0.045	4.38	4.86	8.55
14" PRI-40	356	4.32	4.62	1208	2.38	5.85	0.042	4.10	5.85	8.55
14" PRI-50	356	6.61	6.87	1269	2.38	5.85	0.042	3.48	4)	6.98
14" PRI-60	356	5.95	6.36	1463	2.38	5.85	0.042	4.10	5.85	9.44
14" PRI-70	356	8.79	9.15	1621	2.38	5.85	0.049	3.97	5.85	7.99
14" PRI-80	356	8.41	9.00	2009	2.38	5.85	0.031	4.38	5.85	8.55
16" PRI-40	406	5.07	5.42	1646	2.72	6.74	0.044	4.10	6.74	8.55
16" PRI-50	406	7.74	8.05	1753	2.72	6.74	0.044	3.48	5)	6.98
16" PRI-60	406	6.99	7.47	2002	2.72	6.74	0.044	4.10	6.74	10.33
16" PRI-70	406	10.31	10.72	2224	2.72	6.74	0.051	3.97	6.74	7.99
16" PRI-80	406	9.89	10.58	2736	2.72	6.74	0.051	4.38	6.74	8.55

¹⁾ Valid for service class 1 and 2 conditions and long term loading. See table of Modification Factors below for other loading conditions.

²⁾ End reactions may be interpolated for bearing lengths in between those tabulated.

³⁾ Web stiffeners required if value of end reaction is over 5.3 kN.

⁴⁾ 14" PRI-50 has an end reaction of 5.85 kN with 125 mm bearing.

⁵⁾ 16" PRI-50 has an end reaction of 6.74 kN with 125 mm bearing.

The flexural stiffness and shear rigidity required for the purpose of evaluating deflection is given above for use in accordance with BS 5268: Part 2: 1996. The maximum deflection of a uniformly loaded I-joist is given by:

$$Y = \frac{5wL^4}{384EI} + \frac{wL^2}{8GA}$$

where:

w = uniform load per unit length
L = effective span
EI = bending stiffness
GA = shear rigidity

	Modification factors		
	Long Term	Medium Term	Short Term
Moment Capacity	1.00	1.25	1.5
Shear Strength	1.00	1.75	2.25
Bearing Capacity	1.00	1.75	2.25

Web Hole Specifications

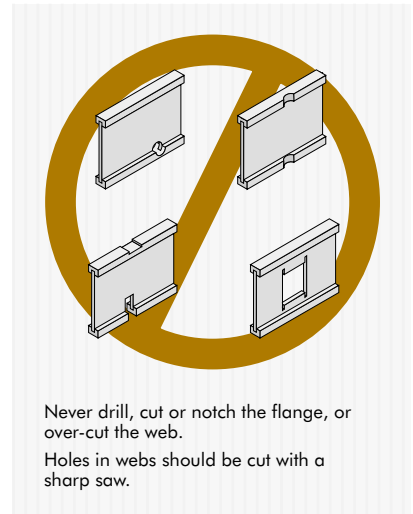
One of the benefits of using I-joists in residential floor construction is that holes may be cut in the joist webs to accommodate electrical wiring, plumbing lines and other mechanical systems, therefore minimizing the depth of the floor system.

Rules for cutting holes in PRI Joists

1. The distance between the inside edge of the support and the face of any hole shall not be less than that shown in Table 5.
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 6 mm. A minimum of 3 mm 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 and/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 5.
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. A 38 mm hole can be placed anywhere in the web provided that it meets the requirements of 6 above.
9. For joists with more than one span, use the longest span to determine hole location in either span.
10. All holes shall be cut in a workman-like manner in accordance with the restrictions listed above and as illustrated in Figure 2.

FIGURE 2

APA PRI JOIST TYPICAL HOLES

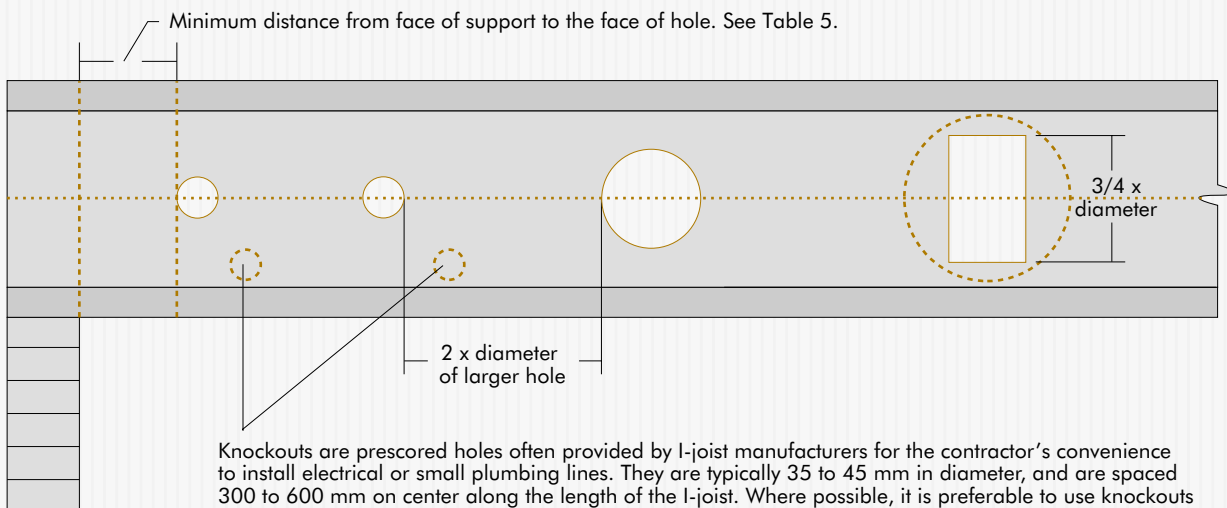


TABLE 5*

MINIMUM DISTANCE FROM FACE OF ALL JOIST SUPPORTS TO FACE OF HOLE – Single or Multi-Span

Joist Depth	Joist Designation	Minimum Distance from Inside Face of Any Support to Face of Hole (meter)											
		Round Hole Diameter (mm)											
		50	75	100	125	160	170	200	215	250	270	300	320
9-1/2" (241mm)	PRI-20	0.30	0.55	0.85	1.15	1.60							
	PRI-30	0.60	0.90	1.00	1.30	1.75							
	PRI-40	0.30	0.55	0.85	1.15	1.75							
	PRI-50	0.75	1.05	1.15	1.45	1.90							
	PRI-60	0.75	1.05	1.30	1.45	2.05							
11-7/8" (302 mm)	PRI-20	0.30	0.30	0.40	0.70	1.15	1.30	1.75	2.05				
	PRI-30	0.30	0.55	0.85	1.15	1.45	1.60	1.90	2.20				
	PRI-40	0.30	0.30	0.40	0.70	1.15	1.30	1.90	2.05				
	PRI-50	0.45	0.70	0.85	1.15	1.60	1.75	2.05	2.20				
	PRI-60	0.45	0.70	1.00	1.30	1.60	1.75	2.20	2.35				
	PRI-70	0.60	0.90	1.15	1.45	1.75	1.90	2.35	2.50				
	PRI-80	0.75	1.05	1.30	1.60	2.05	2.05	2.50	2.65				
14" (356 mm)	PRI-40	0.30	0.40	0.55	0.85	1.15	1.45	1.75	2.05	2.45	2.75		
	PRI-50	0.30	0.25	0.55	0.85	1.30	1.45	1.75	1.85	2.30	2.60		
	PRI-60	0.30	0.40	0.55	0.85	1.30	1.45	1.75	2.05	2.45	2.75		
	PRI-70	0.30	0.55	0.70	1.00	1.45	1.60	1.90	2.20	2.45	2.75		
	PRI-80	0.45	0.70	1.00	1.30	1.60	1.75	2.20	2.35	2.75	3.05		
16" (406 mm)	PRI-40	0.30	0.30	0.30	0.40	0.85	1.00	1.25	1.40	1.85	2.30	2.60	3.05
	PRI-50	0.30	0.30	0.30	0.55	1.00	1.00	1.40	1.55	2.00	2.15	2.60	2.90
	PRI-60	0.30	0.30	0.30	0.55	1.00	1.15	1.40	1.70	2.00	2.30	2.75	3.05
	PRI-70	0.30	0.30	0.40	0.70	1.15	1.30	1.60	1.70	2.15	2.45	2.75	3.05
	PRI-80	0.30	0.30	0.70	1.00	1.30	1.45	1.90	2.05	2.45	2.60	3.05	3.35

Notes:

- Above table may be used for I-joist spacing of 600 mm or less.
- Hole location distance is measured from inside face of the closest support to the closest edge of hole.
- Distances in this chart are based on uniformly loaded joists that meet the span requirements in Tables 2 and 3. Because of the partition load requirement (0.8 kN/m run), the floor self-weight is limited to a maximum of 0.50 kN/m².

Blocking Panels

Blocking panels prevent floor joists from overturning and transfer loads through the floor system into the structure below.

Due to difference in depth and possible shrinkage, common framing lumber set on edge is **NOT** acceptable as blocking. Blocking panels must be cut to the proper length to fit between the I-joists, and their depth must match the depth of the I-joists.

Blocking panels may be used:

1. To stabilize I-joists laterally at supports, as shown in Figures 1a and 1g. Lateral support is required during installation and is necessary to obtain design carrying capacity.
2. To transmit vertical loads as shown in Figures 1a, 1c, 1f, and 1g.
3. For closures such as that shown in Figures 1a and 1e.
4. To transmit lateral forces to shear walls. Shear transfer nailing into the flanges must be specified by the building designer.
5. To provide lateral stability to walls.

APA Performance Rated Rim Board

A rim board is the wood component that fills the space between the sill plate and bottom plate of a wall or, in second floor construction, between the top plate and bottom plate of two wall sections. The rim board must match the depth of the framing members between floors or between the

Storage and Handling Guidelines

1. Store I-joists vertically, level, and in bundles.
2. Always stack and handle I-joists in the upright position only.
3. Do not store I-joists in direct contact with the ground.
4. Protect I-joists from weather, and use stickers to separate bundles.
5. Bundled units should be kept intact until time of installation.
6. Take care not to damage I-joists with forklifts or cranes.
7. Do not handle I-joists in a horizontal orientation.
8. **NEVER USE OR FIELD REPAIR A DAMAGED I-JOIST.**

floor and foundation to function properly. In addition to supporting the wall loads, the rim board ties the floor joists together. It is an integral component in an engineered wood system because it transfers both lateral and vertical bearing forces.

While lumber has been the traditional product used for rim boards, it is not compatible with the new generation of wood I-joists used in floor construction. With the increasing use of wood I-joists, a demand for compatible engineered wood rim boards has resulted.

APA Performance Rated Rim Boards can be manufactured using plywood, oriented strand board (OSB), glued laminated timber (glulam), or laminated veneer lumber (LVL). These engineered wood rim boards have less shrinkage than lumber and match the depth of wood I-joists and other engineered wood framing products. They are available in lengths up to 8 meters, depending on the product used.

Most APA Performance Rated Rim Boards are wood structural panels that are manufactured in accordance with the *Performance Standard for APA EWS Rim Boards* and *Voluntary Product Standards PS 1 or PS 2*, or *APA Standard PRP-108*. Glulam rim boards are a resawn grade of glued laminated timber manufactured in accordance with the *Performance Standard for APA EWS Rim Boards* and *ANSI A190.1*.

As glued engineered wood products, APA Rim Boards have greater dimensional stability, higher strength, increased structural reliability, more consistent quality and a lower tendency to check or split than sawn lumber.

For more information, refer to the APA Data File: *APA Performance Rated Rim Board*, Form W345.

Web Stiffener Requirements

A web stiffener is a block of plywood, OSB or lumber that is added to stiffen the I-joist's web, increase the nailing surface, and provide additional support for a hanger or other connector. Web stiffeners are common with certain types of joist hanger installations, and might also be necessary in some longer span applications requiring deeper joists with higher shear capacities. They are typically placed at the end of the I-joist, between the flanges and against both sides of the web. When used at end bearings, web stiffeners are often called **bearing stiffeners** and should be installed tight against the bottom or "bearing" flange of the I-joist, but with a minimum 3 mm gap between the top of the stiffener and the bottom of the top flange.

When used to stiffen the web under a concentrated load they are also known as **load stiffeners**. Load stiffeners are installed tight against the top or "load" flange, again with a minimum 3 mm

gap between the bottom of the stiffener and the top of the bottom flange.

APA PRIs, designed in accordance with the load/span conditions set forth in Tables 2 and 3, do not require stiffeners, with the following exceptions:

- When sides of the hangers do not laterally brace the top flange of each I-joist, as shown in Figures 1h, 1j and 1k.
- For all engineered applications with design end reactions greater than 5.3 kN, as noted in footnote 3 of Table 4.

- When I-joists are designed to support concentrated loads greater than 450 kg applied to the I-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. (See Figure 3.)

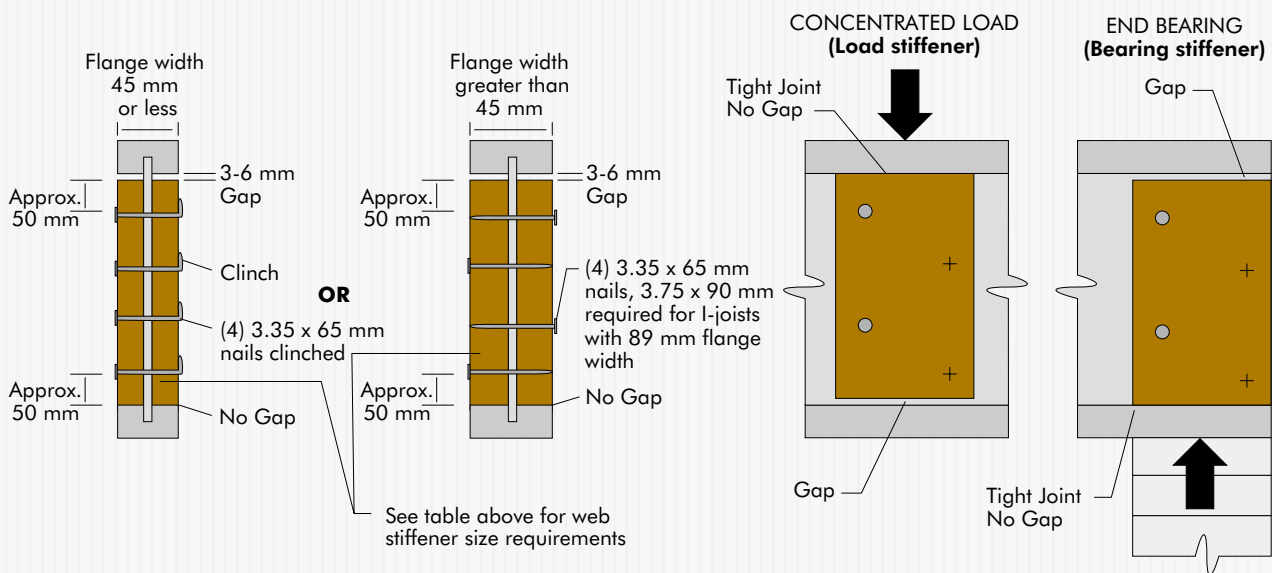
Stiffeners may be supplied by the manufacturer for field installation, or may be cut in the field as required for the application.

STIFFENER SIZE REQUIRED

APA PRI Flange Width	Web Stiffener Size Each Side of Web
38 mm	12 mm x 58 mm minimum width
45 mm	15 mm x 58 mm minimum width
58 mm	25 mm x 58 mm minimum width
63 mm	25 mm x 58 mm minimum width
89 mm	38 mm x 58 mm minimum width

FIGURE 3

APA PERFORMANCE RATED I-JOIST WEB STIFFENER REQUIREMENTS



Cantilever Details for Balconies (No Wall Load)

Balconies may be constructed using either continuous APA PRIs (Figure 4) or by adding lumber extensions (Figure 5) to the I-joist. Continuous I-joist cantilevers are limited to one-fourth the adjacent span when supporting uniform loads only. For applications supporting concentrated loads at the end of the cantilever, such as a wall, see Figure 6.

Unless otherwise engineered, cantilevers are limited to a maximum of 1.2 m when supporting uniform loads only. Blocking is required at the cantilever support as shown.

FIGURE 4

I-JOIST CANTILEVER DETAIL FOR BALCONIES

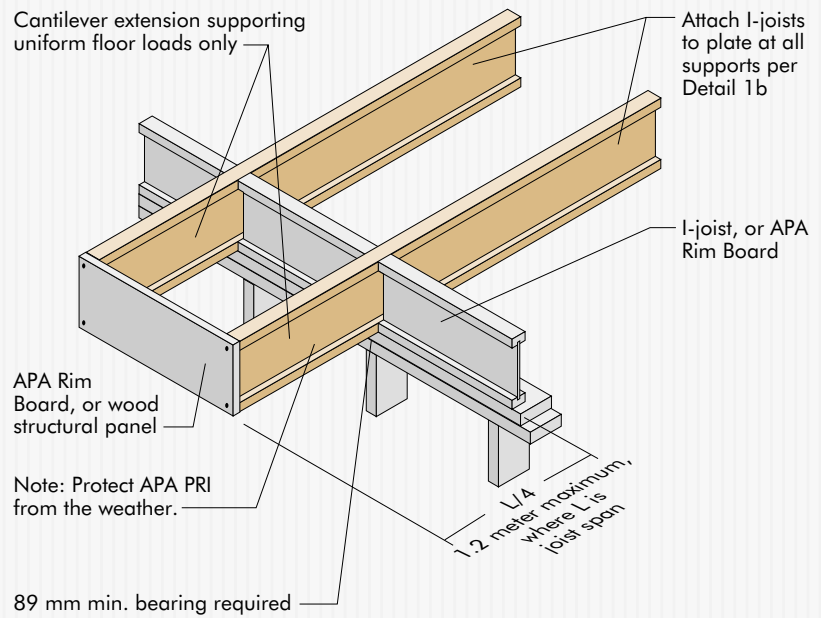
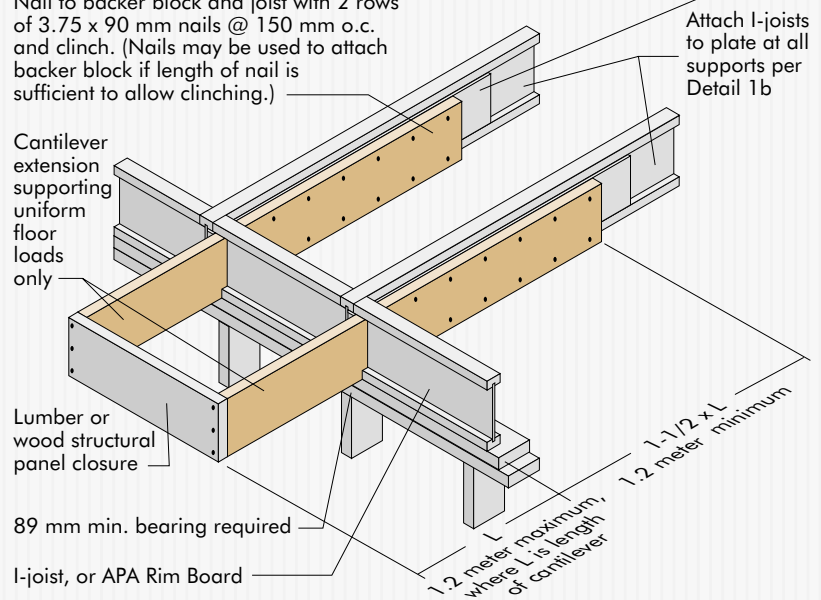


FIGURE 5

LUMBER CANTILEVER DETAIL FOR BALCONIES

Full depth backer block with 3 mm gap between block and top flange of I-joist. See Detail 1h. Nail with 2 rows of 3.75 x 90 mm nails @ 150 mm o.c. and clinch.

Nail to backer block and joist with 2 rows of 3.75 x 90 mm nails @ 150 mm o.c. and clinch. (Nails may be used to attach backer block if length of nail is sufficient to allow clinching.)



Cantilever Options for Vertical Building Offset (Concentrated Wall Load)

I-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. This application **requires engineering** and is not recommended for supporting brick walls. Blocking is required along the cantilever support and for 1.2 meters on each side of the cantilever area. Three methods of reinforcing may be used for engineering

for load bearing cantilever applications: reinforcing sheathing (typically 19 mm or thicker) or APA Rim Board applied to one side of the I-joist, reinforcing sheathing or APA Rim Board applied to both sides of the joist or double I-joists.

FIGURE 6

TYPICAL CANTILEVER OPTIONS FOR VERTICAL BUILDING OFFSET (Application requires engineering design)

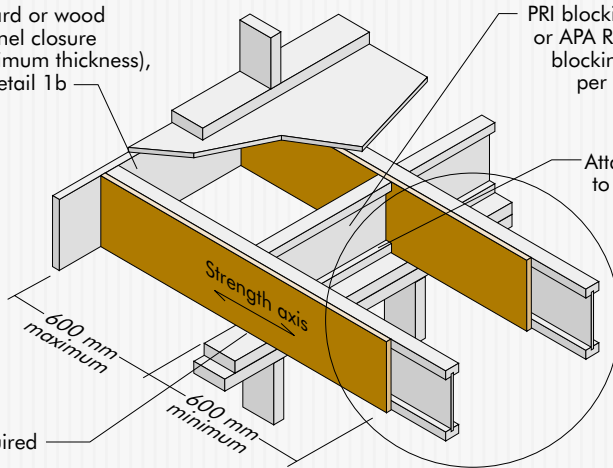
**Method 1
SHEATHING REINFORCEMENT ONE SIDE**

APA Rim Board or wood structural panel closure (19 mm minimum thickness), attach per Detail 1b

PRI blocking panel or APA Rim Board blocking, attach per Detail 1g

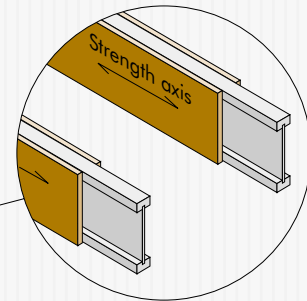
Attach I-joist to plate per Detail 1b

89 mm min. bearing required



**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.



Offset nail pattern on opposite side of joist by one-half of nail spacing

Note: Depth shall match the full height of the joist. Install with face grain horizontal. Attach I-joist to plate at all supports per Detail 1b.

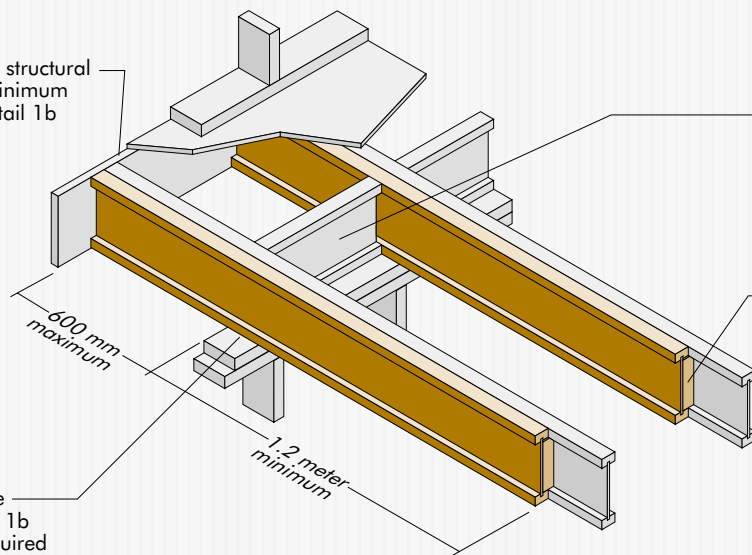
**Method 3
DOUBLE I-JOIST**

APA Rim Board, or wood structural panel closure (19 mm minimum thickness), attach per Detail 1b

PRI blocking panel or APA Rim Board blocking, attach per Detail 1g

Block I-joists together with filler blocks for the full length of the reinforcement

Attach I-joists to top plate at all supports per Detail 1b
89 mm min. bearing required



APA PERFORMANCE RATED I-JOISTS FOR UNITED KINGDOM

ENGINEERED WOOD DATA FILE

We have field representatives who can help answer questions involving APA PRI-400 I-joists. For additional assistance in specifying engineered wood products. Call or write:

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