

ICC-ES Evaluation Report

ESR-1262

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This report is subject to re-examination in one year.

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Section: 06170—Prefabricated Structural Wood
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EVALUATION SUBJECT:
POWER JOIST® ADI-40, ADI-60, ADI-80 AND ADI-90 I-JOISTS
1.0 EVALUATION SCOPE
Compliance with the following codes:

- 2006 *International Building Code*® (IBC)
- 2006 *International Residential Code*® (IRC)

Properties evaluated:

- Structural
- Fire resistance

2.0 USES

Power Joist® I-joists are used as rim joists, roof rafters and joists in roof and floor/ceiling assemblies for single and multiple-span conditions in buildings of Type V construction.

3.0 DESCRIPTION
3.1 General:

Power Joist® I-joists are structural elements manufactured using finger-jointed, solid-sawn wood flanges and wood structural panel webs bonded together with an exterior-grade adhesive forming an "I" cross-sectional shape. The Power Joist I-joists are manufactured to meet the

performance standard entitled "PRI-400 Performance Standard for APA EWS I-joists," recognized in [ESR-1405](#), and the Anthony-Domtar quality control manual. The company names and associated product trade names for the Power Joist® and private-label I-joists are as follows:

COMPANY OR LISTEE	PRODUCT TRADE NAME AND SERIES
Anthony-Domtar, Inc.	ADI 40, 60, 80 and 90
Georgia-Pacific, LLC	WI 40, 60, 80 and 90
BlueLinx Corporation	BLI 40, 60, 80 and 90

All ADI I-Joists, regardless of the private-label mark, are identified as described in Section 7.0 of this report.

3.2 Material Specifications:

3.2.1 Flanges: Power Joist® I-joists are fabricated from solid-sawn SPF, Grade 1650 MSR for ADI-40, Grade 2100 MSR for ADI-60 and ADI-80 flanges, and Grade 2400 MSR for ADI-90 flanges [nominal size of 2 inches by 3 inches (51 by 76 mm) for ADI-40 and ADI-60, and 2 inches by 4 inches (51 by 102 mm) for ADI-80 and ADI-90].

Power Joist® I-joists have a constant depth that varies from 9¹/₂ to 16 inches (241 to 406 mm) for the ADI-40 and ADI-60, and from 11⁷/₈ to 24 inches (302 to 910 mm) for the ADI-80 and ADI-90. The I-joists are produced in lengths from 12 to 64 feet (3657 to 19 507 mm).

3.2.2 Web: Webs consist of ³/₈-inch-thick or ⁷/₁₆-inch-thick (9.5 mm or 11.1 mm), exterior-grade oriented strand board (OSB), which meets the requirements of the United States Department of Commerce Product Standard PS-2 for Structural 1, Exposure 1, rated panels.

3.2.3 Adhesive: Adhesives are exterior type complying with ASTM D 2559 and as specified in the quality control manual that contains Power Joist® manufacturing standards. The adhesives have also been tested in accordance with ASTM D 7247.

4.0 DESIGN AND INSTALLATION
4.1 General:

Installation of Power Joist® I-joists must comply with this report and the manufacturer's published installation instructions. The manufacturer's published installation instructions must be available at the jobsite at all times during installation.

4.2 Design Values:

Design values listed in this report for Power Joist® I-joists are limited to I-joists installed in covered, dry conditions of use. Dry conditions of use are environmental conditions represented by sawn lumber in which the moisture content is less than 16 percent.

See Tables 1A, 1B, and 2 of this report for allowable design values and span/load values of Power Joist® I-joists. See Figure 1 of this report for a typical cross section of a Power Joist® I-joist, showing flange and web dimensions. See Table 3 of this report for allowable web hole sizes and locations.

With the exception of reference design reactions, reference design values for Power Joist® I-joists must be adjusted using the appropriate adjustment factors as specified in *American Forest and Paper Association, National Design Standard for Wood Construction* with the Supplement *Design Values for Wood Construction (AF&PA NDS)*. Reference design reactions, corresponding to various load duration factors, are given in Table 1B.

4.3 Deflection:

Maximum allowable deflection of Power Joist® I-joists under design loads must not exceed the maximum allowable deflections specified in Section 1604.3 of the IBC, Section R301.7 of the IRC, and Sections 1604.5.4 and 1604.5.5 of the NBC. The method to calculate the deflection is as follows:

Calculated deflection of the joists under design load, utilizing the deflection formulas listed below:

$$\Delta = \frac{5w\ell^4}{384EI} + \frac{w\ell^2}{K} \text{ for uniformly distributed loads}$$

$$\Delta = \frac{P\ell^3}{48EI} + \frac{2P\ell}{K} \text{ for simple span with a concentrated load at mid-span}$$

where:

P = Concentrated load (lbf)

w = Uniform loads (lbf/in.)

EI = Bending stiffness (in.² - lbf)

ℓ = Span (inches) between centers of supports.

K = Coefficient of shear deflection (lbf) (see Table 1A of this report)

Δ = Calculated deflection (in.)

4.4 Shear Load:

Vertical shear load calculations must include all loads resisted by the Power Joist® I-joists between the faces of the supports.

4.5 Lateral Support:

The compression flange of Power Joist® I-joists must be provided with continuous lateral support. Sheathing fastened in accordance with the applicable code may be used to provide this lateral support at the top flange. Continuous bracing must also be provided to support the bottom flange in areas of negative moment over interior supports and at cantilevers. Additionally, the ends of Power Joist® I-joists must be provided with lateral support to resist rollover at bearing locations. This lateral support may be provided by either end blocking, rim joist, or cross bridging and must be installed consistent with the lateral stability presumed in the design calculations.

4.6 Bottom Flange Loads:

Concentrated loads imposed on the bottom flange of the joists have not been evaluated and are outside the scope of this report.

4.7 End Bearing:

End bearing length must be a minimum 1³/₄ inches (44 mm) for simple spans; for multiple span joists, intermediate bearing length must be a minimum 3¹/₂ inches (89 mm).

Power Joist® I-joist bearing lengths must be in accordance with Table 1B of this report.

4.8 Repetitive-member Use:

The repetitive-member use factors applicable to the moment capacities listed in Table 1A of this report are limited to 1.0.

4.9 Holes in I-joist Web:

Table 3 of this report specifies allowable sizes and locations of round holes in the I-joist webs.

4.10 Member Spans:

I-joist spans may be determined in accordance with Table 2 of this report. Vertical shear calculations must include all loads within the span from face to face of supports.

4.11 Fasteners:

Fastener design values must be in accordance with the applicable code. Fastener spacings must comply with the minimum spacing requirements prescribed by the code for nails installed in sawn lumber having a minimum specific gravity of 0.42 such as for spruce-pine-fir. Fastening must be accomplished in a manner that will not cause splitting in the I-joist flanges.

4.12 Web Stiffeners:

Web stiffener requirements for reactions and concentrated loads are as shown in Table 1B and Figure 3 of this report.

4.13 Fire-resistance-rated Construction:

The Power Joist I-joists described in this report may be used as described in Section 4.2.2 of [ESR-1405](#). Evaluation of the use of Power Joist I-joists as a component of other fire-resistance-rated roof or floor assemblies is outside the scope of this report.

5.0 CONDITIONS OF USE

The Power Joist® I-joists described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 Installation must comply with this report, the manufacturer's published installation instructions and the applicable code. If there is a conflict between the installation instructions and this report, this report governs.

5.2 Design calculations and details for specific applications demonstrating that Power Joist® I-joists comply with this report must be submitted to the code official. The design calculations and details for specific applications must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

Calculations must indicate the following:

- Load duration factor used in accordance with AF&PA NDS.
- Required design capacities of the I-joists under design loads.
- Allowable design capacities of the Power Joist® I-joists.
- Allowable deflection of the Power Joist® I-joists consistent with this report.

5.3 Cutting and notching of Power Joist® I-joist flanges is not permitted, except for cutting to proper length for installation.

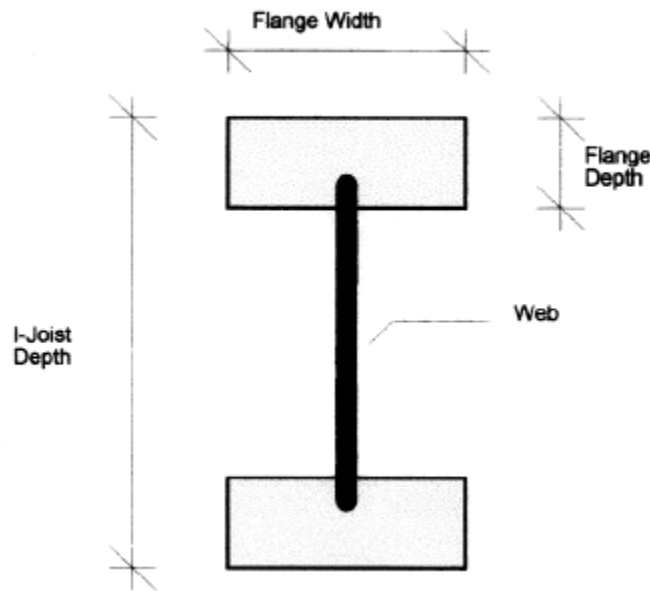
- 5.4 The use of pressure-treated Power Joist® I-joists, or portions thereof, is outside the scope of this report.
- 5.5 Evaluation of the use of Power Joist® I-joists as a component of fire-resistance-rated construction is as noted in Section 4.13 of this report.
- 5.6 Web opening sizes and locations within Power Joist® I-joists must be limited to the criteria in Table 3 of this report. Web opening conditions not covered in Table 3 of this report have not been evaluated and are outside the scope of this report.
- 5.7 Power Joist® I-joists are produced in Sault St. Marie, Ontario, Canada, under a quality control program with inspections by APA—The Engineered Wood Association (AA-649).

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Prefabricated Wood I-joists (AC14), dated October 2007 (editorially revised December 2008).

7.0 IDENTIFICATION

Each I-Joist must be marked with the product trade name; the joist series; the production date; the evaluation report number (1262); the name or trademark of the inspection agency (APA-EWS); and the Anthony-Domtar APA mill number (1058).



I-Joist Series	Flange Grade	Flange Size (depth x width) (inches)	Web Thickness (inches)	Range of I-Joist Depths (inches)
ADI-40	1.5E	1.5 x 2.5	3/8	9 1/2 to 16
ADI-60	1.8E	1.5 x 2.5	3/8	9 1/2 to 16
ADI-80	1.8E	1.5 x 3.5	3/8	11 7/8 to 16
			7/16	18 to 24
ADI-90	2.0E	1.5 x 3.5	7/16	11 7/8 to 24

For SI: 1 inch = 25.4 mm.

FIGURE 1—POWER JOIST® I-JOIST DIMENSIONS

TABLE 1A—REFERENCE DESIGN VALUES^{1,2,3}

JOIST SERIES	DEPTH (in)	BENDING STIFFNESS, EI (lb-in ²) x 10 ⁶	BENDING MOMENT, M (ft-lbf)	SHEAR, V (lbf)	SHEAR DEFL. COEFFICIENT, K (lbf)
ADI-40	9 ¹ / ₂	193	2735	1120	4.94
	11 ⁷ / ₈	330	3545	1420	6.18
	14	482	4270	1710	7.28
	16	657	4950	1970	8.32
ADI-60	9 ¹ / ₂	231	3780	1120	4.94
	11 ⁷ / ₈	396	4900	1420	6.18
	14	584	5895	1710	7.28
	16	799	6835	1970	8.32
ADI-80	11 ⁷ / ₈	547	6940	1420	6.18
	14	802	8360	1710	7.28
	16	1092	9690	1970	8.32
	18	1413	11000	2450	9.36
	20	1790	12180	2530	10.40
	22	2214	13340	2615	11.44
	24	2687	14490	2695	12.48
ADI-90	11 ⁷ / ₈	601	8515	1420	6.18
	14	877	10255	1710	7.28
	16	1187	11895	1970	8.32
	18	1546	13455	2450	9.36
	20	1957	14885	2530	10.40
	22	2419	16305	2615	11.44
	24	2934	17710	2695	12.48

For SI: 1 inch = 25.4 mm; 1 lbf = 4.45 N; 1 lbf-ft = 1.356 N-m; 1 lbf-in² = 0.00287 N-m².

¹Values are reference design values for normal duration of loads. All values except EI and K may be adjusted for other load durations as permitted by the applicable code for solid-sawn lumber.

²Reference design moment capacity (M_r) of I-joists must not be increased by any repetitive member use factor.

³For calculating uniform load and center-point load deflections of the Power Joist[®] in a simple-span application:

$$\text{For uniform loads: } \Delta = \frac{5w\ell^4}{384EI} + \frac{w\ell^2}{K}$$

$$\text{For center-point load: } \Delta = \frac{P\ell^3}{48EI} + \frac{2P\ell}{K}$$

where:

- Δ = Deflection (inch)
- w = Uniform load (lbf/inch)
- ℓ = Span length (inch)
- P = Concentrated load (lbf)
- EI = Bending stiffness on the I-joist (lbf-in²)
- K = Coefficient of shear deflection (lbf)

TABLE 1B—REFERENCE DESIGN REACTIONS AND FLANGE BEARING CAPACITIES^{1,2,3}

JOIST SERIES	DEPTH (in)	END REACTION (lbf)				INTERIOR REACTION (lbf)				FLANGE BEARING CAPACITY (per in. of brg. length) (lbf/in)
		1.75" Bearing		4" Bearing		3.5" Bearing		5.5" Bearing		
		Web Stiffeners		Web Stiffeners		Web Stiffeners		Web Stiffeners		
		No	Yes	No	Yes	No	Yes	No	Yes	
ADI-40	9 ¹ / ₂	1080	1120	1120	1120	2755	2900	3245	3245	955
	11 ⁷ / ₈	1200	1310	1420	1420	2755	3045	3245	3375	
	14	1200	1480	1550	1710	2755	3175	3245	3485	
	16	1200	1640	1550	1970	2755	3300	3245	3595	
ADI-60	9 ¹ / ₂	1080	1120	1120	1120	2755	2900	3245	3245	1180
	11 ⁷ / ₈	1200	1310	1420	1420	2755	3045	3245	3375	
	14	1200	1480	1550	1710	2755	3175	3245	3485	
	16	1200	1640	1550	1970	2755	3300	3245	3595	
ADI-80	11 ⁷ / ₈	1280	1420	1420	1420	2760	3300	3255	3585	1705
	14	1280	1710	1550	1710	3020	3455	3435	3745	
	16	1280	1845	1550	1970	3265	3600	3600	3900	
	18	N/A	2050	N/A	2450	3200	3950	3650	4350	
	20	N/A	2050	N/A	2530	3200	3950	3650	4350	
	22	N/A	2050	N/A	2615	3200	3950	3650	4350	
	24	N/A	2050	N/A	2695	3200	3950	3650	4350	
ADI-90	11 ⁷ / ₈	1280	1420	1420	1420	2760	3300	3255	3585	2000
	14	1280	1710	1550	1710	3020	3455	3435	3745	
	16	1280	1845	1550	1970	3265	3600	3600	3900	
	18	N/A	2050	N/A	2450	3200	3950	3650	4350	
	20	N/A	2050	N/A	2530	3200	3950	3650	4350	
	22	N/A	2050	N/A	2615	3200	3950	3650	4350	
	24	N/A	2050	N/A	2695	3200	3950	3650	4350	

For SI: 1 inch = 25.4 mm; 1 lbf = 4.45 N; 1 lbf/in = 0.175 N/mm.

¹ The tabulated reference design reaction values are for normal duration of load and are permitted to be adjusted for other load durations in accordance with the applicable code, provided the flange bearing capacity is not exceeded. Values limited by flange bearing capacity may not be further increased for duration of load. The flange bearing capacity, per inch of bearing length, is based on reference design compression perpendicular-to-grain of the I-joist flange, accounting for eased edges, and may be further limited by the bearing strength of the support material.

² Linear interpolation of the reaction capacity between the minimum and maximum bearing length is permitted. Bearing lengths longer than the maximum do not further increase reaction capacity.

³ See Figure 3 for required web stiffener details.

TABLE 2—ALLOWABLE SPAN LENGTHS (ft-in)

JOIST DEPTH (inches)	JOIST DESIGN	ON-CENTER SPACING (inches)			
		12	16	19.2	24
SIMPLE SPANS					
9 ¹ / ₂	ADI-40	18'-0"	16'-5"	15'-6"	14'-6"
	ADI-60	18'-11"	17'-4"	16'-4"	15'-3"
11 ⁷ / ₈	ADI-40	21'-5"	19'-7"	18'-6"	16'-8"
	ADI-60	22'-7"	20'-8"	19'-6"	18'-2"
	ADI-80	24'-11"	22'-8"	21'-4"	19'-10"
	ADI-90	25'-7"	23'-3"	21'-11"	20'-5"
14	ADI-40	24'-4"	22'-3"	20'-6"	18'-4"
	ADI-60	25'-9"	23'-6"	22'-2"	20'-8"
	ADI-80	28'-3"	25'-9"	24'-3"	22'-7"
	ADI-90	29'-0"	26'-5"	24'-11"	23'-2"
16	ADI-40	26'-11"	24'-3"	22'-1"	19'-9"
	ADI-60	28'-6"	26'-0"	24'-7"	22'-10"
	ADI-80	31'-4"	28'-6"	26'-10"	25'-0"
	ADI-90	32'-1"	29'-3"	27'-6"	25'-5"
18	ADI-80	34'-2"	31'-1"	29'-3"	27'-3"
	ADI-90	35'-1"	31'-11"	30'-1"	27'-11"
20	ADI-80	36'-11"	33'-8"	31'-8"	29'-6"
	ADI-90	37'-11"	34'-6"	32'-6"	30'-3"
22	ADI-80	39'-8"	36'-1"	34'-0"	31'-8"
	ADI-90	40'-9"	37'-1"	34'-11"	32'-6"
24	ADI-80	42'-4"	38'-6"	36'-4"	33'-9"
	ADI-90	43'-5"	39'-6"	37'-3"	34'-8"
MULTIPLE SPANS					
9 ¹ / ₂	ADI-40	19'-7"	17'-11"	16'-4"	14'-7"
	ADI-60	20'-8"	18'-10"	17'-9"	16'-6"
11 ⁷ / ₈	ADI-40	23'-5"	20'-5"	18'-7"	16'-7"
	ADI-60	24'-8"	22'-6"	21'-2"	19'-7"
	ADI-80	27'-1"	24'-8"	23'-3"	21'-7"
	ADI-90	27'-11"	25'-4"	23'-10"	21'-10"
14	ADI-40	25'-11"	22'-5"	20'-5"	18'-3"
	ADI-60	28'-0"	25'-7"	24'-1"	19'-9"
	ADI-80	30'-10"	28'-0"	26'-5"	23'-11"
	ADI-90	31'-8"	28'-9"	27'-1"	23'-11"
16	ADI-40	27'-11"	24'-2"	22'-0"	19'-8"
	ADI-60	31'-1"	28'-4"	24'-9"	19'-9"
	ADI-80	34'-2"	31'-1"	29'-3"	23'-11"
	ADI-90	35'-0"	31'-10"	29'-11"	25'-11"
18	ADI-80	37'-3"	33'-10"	31'-11"	29'-5"
	ADI-90	38'-3"	34'-9"	32'-9"	30'-5"
20	ADI-80	40'-3"	36'-8"	34'-6"	31'-0"
	ADI-90	41'-5"	37'-8"	35'-5"	31'-5"
22	ADI-80	43'-3"	39'-4"	36'-4"	31'-5"
	ADI-90	44'-5"	40'-5"	38'-0"	31'-5"
24	ADI-80	46'-2"	41'-6"	37'-10"	31'-5"
	ADI-90	47'-5"	43'-1"	39'-3"	31'-5"

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

¹Allowable clear span 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). This span chart is based on uniform loads. For applications other than uniformly distributed loads, an engineering analysis may be required based on the use of the design properties in Tables 1A and 1B.

²Spans are based on a composite floor with glue-nailed sheathing meeting the requirements for APA Rated Sheathing STURD-I-FLOOR, conforming to PS 2, with a minimum thickness of ¹⁹/₃₂ inch (40/20 or 20 o.c.) for a joist spacing of 19.2 inches or less, or ²³/₃₂ inch (48/24 or 24 o.c.) for a joist spacing of 24 inches. Adhesive must meet APA Specification AFG-01 or ASTM D 3498. Spans must be reduced by 12 inches when floor sheathing is nailed only.

³Minimum bearing length must be 1³/₄ inches for the end bearings and 3¹/₂ inches for the intermediate bearings.

⁴Bearing stiffeners are not required when I-joists are used with the spans and spacings given in the above table, except on 18-, 20-, 22- and 24-inch ADI-80 and ADI-90 joists, and as required for use with hangers.

TABLE 3—LOCATION OF CIRCULAR HOLES IN ADI JOIST WEBS, SIMPLE OR MULTIPLE SPAN FOR DEAD LOADS UP TO 10 psf AND LIVE LOADS UP TO 40 psf^{1,2,3,4,5}

JOIST DEPTH (in)	JOIST SERIES	SAF ⁶	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 "	ADI-40	14'-6"	0'-7"	1'-8"	3'-0"	4'-4"	5'-9"	6'-3"									
	ADI-60	15'-3"	1'-8"	3'-0"	4'-4"	5'-8"	7'-3"	7'-8"									
11 ⁷ / ₈ "	ADI-40	16'-7"	0'-7"	0'-8"	1'-2"	2'-5"	3'-9"	4'-1"	5'-1"	6'-8"	7'-11"						
	ADI-60	18'-2"	0'-8"	1'-10"	3'-2"	4'-5"	5'-10"	6'-2"	7'-4"	8'-11"	10'-0"						
	ADI-80	19'-10"	1'-11"	3'-2"	4'-6"	5'-10"	7'-3"	7'-8"	8'-10"	10'-6"	11'-7"						
	ADI-90	20'-5"	2'-1"	3'-4"	4'-8"	6'-0"	7'-6"	7'-10"	9'-0"	10'-8"	11'-11"						
14"	ADI-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"			
	ADI-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"			
	ADI-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"			
	ADI-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"	ADI-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"
	ADI-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"
	ADI-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"
	ADI-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"	ADI-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"
	ADI-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"	ADI-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"
	ADI-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"	ADI-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"
	ADI-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"	ADI-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"
	ADI-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"

For **SI**: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- ¹ Above tables may be used for I-joist spacing of 24 inches 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 a uniformly distributed design dead load of 10 psf (479 Pa), plus a uniformly distributed design live load of 40 psf (1915 Pa).
- ⁴ For continuous joists with more than one span, use the longest span to determine hole location in either span.
- ⁵ Joists with web hole sizes and/or locations that fall outside of the scope of this table must be analyzed based on the actual hole size, joist spacing, span, and loading conditions. The I-joist shear capacity at the location of a circular web hole is calculated using the following equation: $V_{th} = \text{Published Shear Value} \times [(\text{Joist Depth} - \text{Hole Diameter}) / \text{Joist Depth}]$.
- ⁶ SAF = Span Adjustment Factor, used as defined below.

OPTIONAL:

Table 3 is based on the I-joists being 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:

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

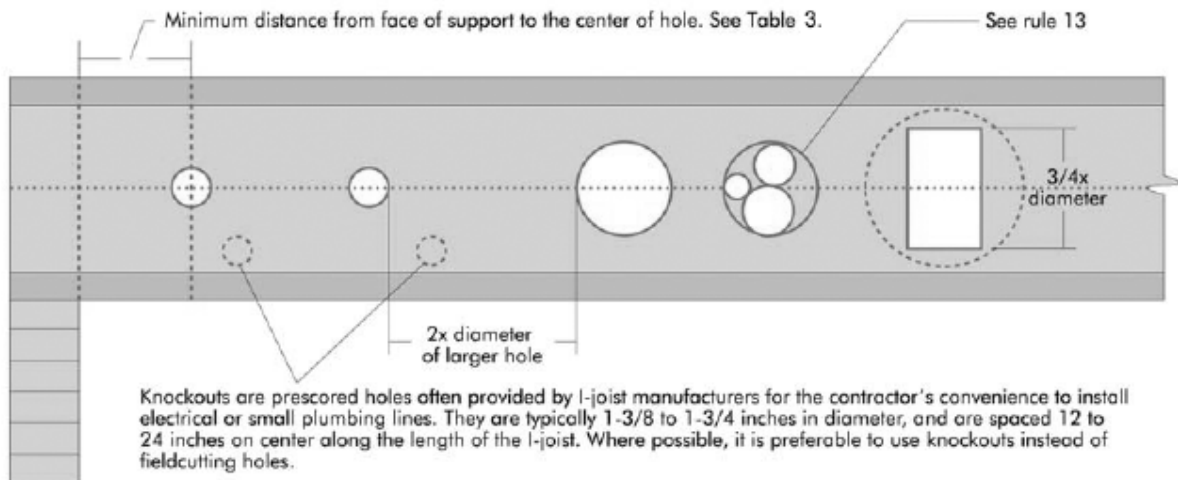
Where:

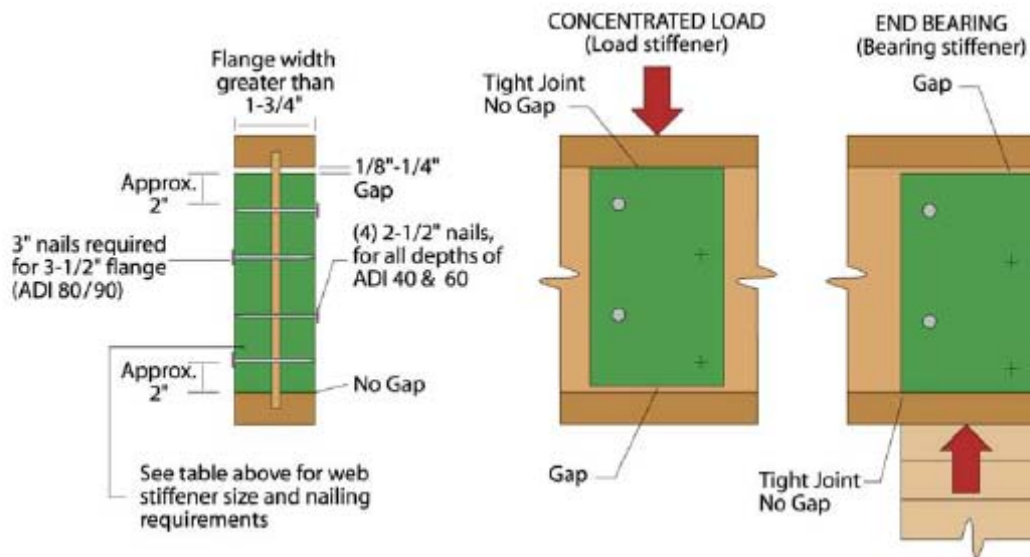
- D_{reduced}* = Distance from the inside face of any support to center of hole, reduced for less-than-maximum span applications (ft). The reduced distance must not be less than 6 inches from the face of the support to edge of the hole.
- L_{actual}* = The actual measured span distance between the inside faces of supports (ft).
- SAF* = Span Adjustment Factor given in Table 3.
- 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 $\frac{L_{actual}}{SAF}$.

Rules for cutting holes in ADI joists:

1. The distance between the inside edge of the support and the centerline of any hole must 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 must equal the clear distance between the flanges of the I-joist minus $\frac{1}{4}$ inch. A minimum of $\frac{1}{8}$ 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 must 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 must 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. $1\frac{1}{2}$ -inch holes are permitted anywhere in a cantilevered section of an ADI Joist. Holes of greater size may be permitted subject to verification.
9. A $1\frac{1}{2}$ -inch hole can be placed anywhere in the web provided that it meets the requirements of 6 above.
10. For joists with more than one span, use the longest span to determine hole location in either span.
11. All holes must be cut in a workmanlike manner in accordance with the restrictions listed above and as illustrated in Figure 2.
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 2—TYPICAL HOLES IN THE WEB**



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
9.5"	4	-
11.875"	4	4
14"	4	4
16"	4	4
18"	-	6
20"	-	6
22"	-	8
24"	-	8
Minimum Stiffener Size	1" x 2-5/16" (width)	1-1/2" x 2-5/16" (width)

Requirements for Web Stiffeners:

- Wood structural panel web stiffeners must be placed on each side of the I-joist web at:
 - Hangers with side nailing.
 - Hangers which do not laterally support the top flange of the I-joist.
 - Locations where concentrated loads in excess of 1,580 pounds are applied to the top flange of the I-joist between supports or, in the case of cantilever, anywhere between the cantilever tip and the support.
 - At exterior supports in engineered applications where concentrated loads cause exterior reaction loads to exceed 1,580 pounds.
 - At reactions exceeding the tabulated values corresponding to installations without web stiffeners, as shown in Table 1B.
 - At all end reactions on 18-, 20-, 22- and 24-inch ADI-80 and ADI-90 joists
- Web stiffeners must be made of Utility grade SPF (south) or better for lumber and/or sheathing grade or better for wood structural panels. When wood structural panels are used as web stiffeners, the strong axis of the panel must be oriented vertically (perpendicular to the long axis of the I-joist).

FIGURE 3—WEB STIFFENER REQUIREMENTS