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Joint Evaluation Report

ESR-1262

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 17 33—Wood I-joists

REPORT HOLDER:

EACOM TIMBER CORPORATION

ADDITIONAL LISTEE:

BLUELINX CORPORATION

EVALUATION SUBJECT:

P3 JOIST PJI-40, PJI-60, PJI-65, PJI-80 AND PJI-90 I-JOISTS

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015, 2012 and 2009 *International Building Code®* (IBC)
- 2021, 2018, 2015, 2012 and 2009 *International Residential Code®* (IRC)

Properties evaluated:

- Structural
- Fire resistance

2.0 USES

P3 JOIST by EACOM Timber Corporation I-joists are used as joists, roof rafters, rim joists and blocking panels in floor/ceiling and roof assemblies for single and multiple-span conditions in buildings of Type V construction.

3.0 DESCRIPTION

3.1 General:

P3 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 P3 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 EACOM Timber Corporation quality control manual. The company names and associated product trade names for the P3 JOIST and private-label I-joists are as follows:

COMPANY OR LISTEE	PRODUCT TRADE NAME AND SERIES
EACOM Timber Corporation	PJI 40, 60, 65, 80 and 90
BlueLinx Corporation	BLI 40, 60, 65, 80 and 90

All PJI 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: P3 JOIST I-joists are fabricated from solid-sawn SPF, Grade 1650 MSR for PJI-40 and PJI-65, Grade 2100 MSR for PJI-60 and PJI-80 flanges, and Grade 2400 MSR for PJI-90 flanges [nominal size of 2 inches by 3 inches (51 by 76 mm) for PJI-40 and PJI-60, and 2 inches by 4 inches (51 by 102 mm) for PJI-65, PJI-80 and PJI-90].

The P3 JOIST I-joists are produced with constant depths as noted in the table in Figure 1 and lengths from 12 to 64 feet (3.6 to 19.5 m).

3.2.2 Web: Webs consist of $^{3}/_{8}$-inch-thick or $^{7}/_{16}$-inch-thick (9.5 mm or 11.1 mm), 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 D2559 and as specified in the quality control manual that contains P3 JOIST manufacturing standards. The adhesives have also been tested in accordance with ASTM D7247.

4.0 DESIGN AND INSTALLATION

4.1 General:

Installation of P3 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 P3 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 equilibrium 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 P3 JOIST I-joists. See Figure 1 of this report for a typical cross section of a P3 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 P3 JOIST I-joists must be adjusted using the appropriate adjustment factors as specified in the American Wood Council *National Design Specification® for Wood Construction* (NDS) with the Supplement *Design Values for Wood Construction*. Reference design reactions, corresponding to various load duration factors, are given in Table 1B.

4.3 Deflection:

Maximum allowable deflection of P3 JOIST I-joists under design loads must not exceed the maximum allowable deflections specified in Section 1604.3 of the IBC, and Section R301.7 of the IRC. The method to calculate the deflection is as follows:

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

$\Delta = 5w\ell^4/(384\ EI) + w\ell^2/K$ for uniformly distributed loads

$\Delta = P\ell^3/(48\ EI) + 2P\ell\ /K$ 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 P3 JOIST I-joists between the faces of the supports.

4.5 Lateral Support:

The compression flange of P3 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 P3 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 1 3/4 inches (44 mm) for simple spans; for multiple span joists, intermediate bearing length must be a minimum 3 1/2 inches (89 mm). P3 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.

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. When P3 JOIST I-joists are used as wood diaphragm framing, refer to Table 4 for minimum nail spacing in 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 Horizontal Diaphragms: P3 JOIST I-joists used in the construction of horizontal wood diaphragms are subject to the allowable load values and requirements of Table 4.

4.14 Blocking Panels and Rim Boards:

Bearing walls perpendicular to and supported by I-joists require full-depth blocking or rim joists at supports. I-joists used as blocking panels must be installed between I-joists and have the maximum applicable vertical load capacities shown in Table 1A. When used as rim boards, P3 JOIST I-joists must be designed in accordance with the uniform vertical load transfer capacities shown in Tables 1A and the lateral load transfer capacities equal to the allowable shear values shown in Table 4.

4.15 Fire-resistance-rated Construction:

The P3 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 P3 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 P3 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 P3 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 AWC NDS.
- Required design capacities of the I-joists under design loads.
- Allowable design capacities of the P3 JOIST I-joists.
- Allowable deflection of the P3 JOIST I-joists consistent with this report.

5.3 Cutting and notching of P3 JOIST I-joist flanges is not permitted, except for cutting to proper length for installation.

5.4 The use of pressure-treated P3 JOIST I-joists, or portions thereof, is outside the scope of this report.

5.5 Evaluation of the use of P3 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 P3 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 P3 JOIST I-joists are produced in Sault St. Marie, Ontario, Canada, under a quality control program with inspections by ICC Evaluation Service, LLC and APA – The Engineered Wood Association.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Prefabricated Wood I-joists (AC14), dated June 2019 (Editorially revised February 2021).

Data in accordance with the ICC-ES Acceptance Criteria for Rim Board Products (AC124), dated June 2019 (editorially revised February 2021).

7.0 IDENTIFICATION

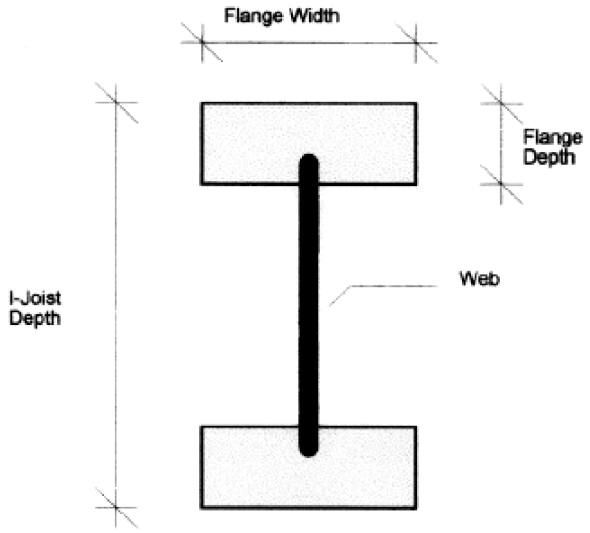
7.1 Each I-Joist must be marked with the product trade name; the joist series; the production date; the evaluation report number (ESR-1262); and the name or trademark of the inspection agency (APA – The Engineered Wood Association).

7.2 The report holder's contact information is the following:

EACOM TIMBER CORPORATION
1195 PEOPLES ROAD
SAULT STE. MARIE, ONTARIO P6C 3W7
CANADA
(705) 254-7597
www.eacom.ca

7.3 The additional listee's contact information is the following:

BLUELINX CORPORATION
1950 SPECTRUM CIRCLE
MARIETTA, GEORGIA 30067
(770) 953-7000



I-Joist Series	Flange Grade	Flange Size (depth x width) (inches)	Flange Specific Gravity	Web Thickness (inches)	Range of I-Joist Depths (inches)
PJI-40	1.5E Proprietary	1.5 × 2.5	0.42	$^{3}/_{8}$	$9^{1}/_{4}$ to 16
PJI-60	1.8E	1.5 × 2.5	0.46	$^{3}/_{8}$	$9^{1}/_{2}$ to 16
PJI-65	1.5E Proprietary	1.5 × 3.5	0.42	$^{3}/_{8}$	$11^{7}/_{8}$ to 16
PJI-80	1.8E	1.5 × 3.5	0.46	$^{7}/_{16}$	$9^{1}/_{2}$ to 24
PJI-90	2.0E	1.5 x 3.5	0.50	$^{7}/_{16}$	$11^{7}/_{8}$ to 24

For **SI:** 1 inch = 25.4 mm.

FIGURE 1—P3 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)	VERTICAL LOAD CAPACITY, VLC[4,5] (lbf/ft)	SHEAR DEFL. COEFFICIENT, K (x10^6 lbf)
PJI-40	9 1/4	181	2,690	1,080	2,000	4.81
	9 1/2	193	2,735	1,400	2,000	4.94
	11 1/4	289	3,380	1,345	2,000	5.85
	11 7/8	330	3,545	1,620	2,000	6.18
	14	482	4,270	1,815	2,000	7.28
	16	657	4,950	2,000	2,000	8.32
PJI-60	9 1/2	231	3,780	1,400	2,000	4.94
	11 7/8	396	4,900	1,620	2,000	6.18
	14	584	5,895	1,815	2,000	7.28
	16	799	6,835	2,000	2,000	8.32
PJI-65	11 7/8	454	5,085	1,620	2,000	6.18
	14	664	6,125	1,815	2,000	7.28
	16	901	7,105	2,000	2,000	8.32
PJI-80	9 1/2	321	5,375	1,405	2,000	4.94
	11 7/8	547	6,970	1,650	2,000	6.18
	14	802	8,390	1,865	2,000	7.28
	16	1,092	9,730	2,070	2,000	8.32
	18	1,413	11,000	2,450	2,000	9.36
	20	1,790	12,180	2,550	1,720	10.40
	22	2,214	13,340	2,650	1,440	11.44
	24	2,687	14,490	2,750	1,390	12.48
PJI-90	11 7/8	601	8,515	1,650	2,000	6.18
	14	877	10,255	1,865	2,000	7.28
	16	1,187	11,895	2,070	2,000	8.32
	18	1,546	13,445	2,450	2,000	9.36
	20	1,957	14,885	2,550	1,720	10.40
	22	2,419	16,305	2,650	1,440	11.44
	24	2,934	17,710	2,750	1,390	12.48

For **SI:** 1 inch = 25.4 mm; 1 lbf = 4.45 N; 1 lbf-ft = 1.356 N-m; 1lbf-in^2 = 0.00287 N-m^2.

[1]Values 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.
[2]Reference design moment capacity (M) of I-joists must not be increased by any repetitive member use factor.
[3]For calculating uniform load and center-point load deflections of the P3 JOIST in a simple-span application:

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

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

Where:

Δ = Deflection (in.)
w = Uniform load (lbf/in.)
ℓ = Span length (in.)
P = Concentrated load (lbf)
EI = Bending stiffness of the I-joist (lbf-in.^{2})
K = Coefficient of shear deflection (lbf)

[4]Allowable vertical-load capacity for I-joists used as blocking panels or rim boards.
[5]Use of I-joists with allowable vertical-load capacities less than 2000 lbf/ft is limited to engineered construction.

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	
PJI-40	9 1/4	1,080	1,080	1,080	1,080	2,700	2,880	2,795	3,230	955
	9 1/2	1,195	1,275	1,260	1,400	2,755	2,900	3,245	3,245	
	11 1/4	1,200	1,310	1,345	1,345	2,755	3,010	3,245	3,340	
	11 7/8	1,200	1,460	1,430	1,620	2,755	3,045	3,245	3,375	
	14	1,200	1,620	1,580	1,815	2,755	3,175	3,245	3,485	
	16	1,200	1,750	1,720	2,000	2,755	3,300	3,245	3,595	
PJI-60	9 1/2	1,195	1,275	1,260	1,400	2,755	2,900	3,245	3,245	1,180
	11 7/8	1,200	1,460	1,430	1,620	2,755	3,045	3,245	3,375	
	14	1,200	1,620	1,580	1,815	2,755	3,175	3,245	3,485	
	16	1,200	1,750	1,720	2,000	2,755	3,300	3,245	3,595	
PJI-65	11 7/8	1,200	1,460	1,430	1,620	2,810	3,300	3,255	3,585	1,380
	14	1,200	1,620	1,580	1,815	3,020	3,455	3,435	3,745	
	16	1,200	1,750	1,720	2,000	3,265	3,600	3,600	3,900	
PJI-80	9 1/2	1,305	1,405	1,405	1,405	2,760	3,125	3,245	3,400	1,705
	11 7/8	1,315	1,590	1,590	1,650	2,810	3,300	3,255	3,585	
	14	1,325	1,760	1,615	1,865	3,020	3,455	3,435	3,745	
	16	1,330	1,915	1,630	2,070	3,265	3,600	3,600	3,900	
	18	1,340	1,925	1,650	2,450	3,200	3,950	3,650	4,350	
	20	1,350	2,170	1,665	2,550	3,200	3,950	3,650	4,350	
	22	1,355	2,415	1,685	2,650	3,200	3,950	3,650	4,350	
	24	1,365	2,660	1,700	2,750	3,200	3,950	3,650	4,350	
PJI-90	11 7/8	1,315	1,590	1,590	1,650	2,810	3,300	3,255	3,585	2,000
	14	1,325	1,760	1,615	1,865	3,020	3,455	3,435	3,745	
	16	1,330	1,915	1,630	2,070	3,265	3,600	3,600	3,900	
	18	1,340	1,925	1,650	2,450	3,200	3,950	3,650	4,350	
	20	1,350	2,170	1,665	2,550	3,200	3,950	3,650	4,350	
	22	1,355	2,415	1,685	2,650	3,200	3,950	3,650	4,350	
	24	1,365	2,660	1,700	2,750	3,200	3,950	3,650	4,350	

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 (in.)	JOIST DESIGN	ON-CENTER SPACING (in.)			
		12	16	19.2	24
SIMPLE SPANS					
9 1/4	PJI-40	17'-7"	16'-1"	15'-3"	14'-3"
9 1/2	PJI-40	18'-0"	16'-5"	15'-7"	14'-6"
	PJI-60	18'-11"	17'-3"	16'-3"	15'-2"
	PJI-80	20'-9"	18'-11"	17'-9"	16'-6"
11 1/4	PJI-40	20'-6"	18'-9"	17'-9"	16'-3"
11 7/8	PJI-40	21'-5"	19'-7"	18'-6"	16'-8"
	PJI-60	22'-7"	20'-7"	19'-5"	18'-1"
	PJI-65	23'-6"	21'-5"	20'-2"	18'-9"
	PJI-80	24'-9"	22'-6"	21'-3"	19'-9"
	PJI-90	25'-6"	23'-2"	21'-9"	20'-3"
14	PJI-40	24'-4"	22'-2"	20'-6"	18'-4"
	PJI -60	25'-8"	23'-5"	22'-1"	20'-7"
	PJI-65	26'-8"	24'-3"	22'-10"	21'-3"
	PJI-80	28'-2"	25'-7"	24'-1"	22'-5"
	PJI-90	28'-11"	26'-3"	24'-9"	22'-11"
16	PJI-40	26'-11"	24'-2"	22'-1"	19'-9"
	PJI-60	28'-6"	25'-11"	24'-6"	22'-9"
	PJI-65	29'-6"	26'-10"	25'-4"	23'-6"
	PJI-80	31'-2"	28'-4"	26'-8"	24'-10"
	PJI-90	32'-0"	29'-1"	27'-4"	25'-4"
18	PJI-80	34'-0"	30'-11"	29'-1"	27'-0"
	PJI-90	34'-11"	31'-9"	29'-10"	27'-9"
20	PJI-80	36'-10"	33'-6"	31'-6"	29'-3"
	PJI-90	37'-10"	34'-4"	32'-4"	30'-0"
22	PJI-80	39'-6"	35'-11"	33'-10"	31'-5"
	PJI-90	40'-7"	36'-11"	34'-8"	32'-2"
24	PJI-80	42'-2"	38'-4"	36'-1"	33'-6"
	PJI-90	43'-3"	39'-4"	37'-0"	34'-4"
MULTIPLE SPANS					
9 1/4	PJI-40	19'-1"	17'-6"	16'-1"	14'-4"
9 1/2	PJI-40	19'-6"	17'-9"	16'-2"	14'-6"
	PJI-60	20'-6"	18'-8"	17'-8"	16'-5"
	PJI-80	22'-7"	20'-6"	19'-3"	17'-11"
11 1/4	PJI-40	22'-4"	19'-10"	18'-1"	16'-1"
11 7/8	PJI-40	23'-4"	20'-4"	18'-6"	16'-6"
	PJI-60	24'-6"	22'-4"	21'-1"	19'-6"
	PJI-65	25'-6"	23'-2"	21'-10"	19'-10"
	PJI-80	26'-11"	24'-6"	23'-0"	21'-4"
	PJI-90	27'-8"	25'-2"	23'-7"	21'-11"
14	PJI-40	25'-10"	22'-4"	20'-4"	18'-2"
	PJI-60	27'-11"	25'-5"	23'-11"	21'-5"
	PJI-65	28'-11"	26'-4"	24'-5"	21'-10"
	PJI-80	30'-7"	27'-10"	26'-2"	23'-10"
	PJI-90	31'-5"	28'-6"	26'-10"	23'-10"
16	PJI-40	27'-10"	24'-0"	21'-11"	19'-7"
	PJI-60	31'-0"	28'-2"	25'-10"	21'-8"
	PJI-65	32'-1"	28'-10"	26'-4"	23'-6"
	PJI-80	33'-11"	30'-10"	29'-0"	25'-9"
	PJI-90	34'-9"	31'-7"	29'-8"	25'-9"
18	PJI-80	37'-0"	33'-7"	31'-8"	29'-4"
	PJI-90	38'-0"	34'-6"	32'-5"	30'-1"
20	PJI-80	40'-1"	36'-5"	34'-3"	30'-11"
	PJI-90	41'-2"	37'-4"	35'-2"	31'-3"

TABLE 2—ALLOWABLE SPAN LENGTHS (ft-in.) (CONTINUED)

JOIST DEPTH (in.)	JOIST DESIGN	ON-CENTER SPACING (in.)			
		12	16	19.2	24
MULTIPLE SPANS					
22	PJI-80	43'-0"	39'-1"	36'-2"	31'-3"
	PJI-90	44'-2"	40'-2"	37'-9"	31'-3"
24	PJI-80	45'-11"	41'-4"	37'-9"	31'-3"
	PJI-90	47'-2"	42'-10"	39'-2"	31'-3"

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

[1]Allowable 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.

[2]Spans 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 20o.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 D3498. Spans must be reduced when floor sheathing is nailed only; consult EACOM.

[3]Minimum bearing length must be $1^3/_4$ inches for the end bearings and $3^1/_2$ inches for the intermediate bearings.

[4]Bearing 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 PJI-80 and PJI-90 joists, and as required for use with hangers.

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[1,2,3,4,5]

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	$12^3/_4$
$9^1/_4$	PJI-40	14'-3"	0'-9"	2'-0"	3'-3"	4'-7"	6'-1"										
$9^1/_2$	PJI -40	14'-6"	0'-7"	0'-8"	1'-2"	2'-9"	4'-5"	4'-11"									
	PJI -60	15'-2"	0'-7"	1'-1"	2'-7"	4'-3"	6'-0"	6'-6"									
	PJI-80	16'-6"	0'-7"	2'-0"	3'-7"	5'-3"	7'-1"	7'-7"									
$11^1/_4$	PJI-40	16'-1"	0'-7"	0'-8"	1'-8"	2'-11"	4'-4"	4'-8"	5'-9"	7'-4"							
$11^7/_8$	PJI -40	16'-6"	0'-7"	0'-8"	0'-8"	1'-2"	2'-8"	3'-0"	4'-2"	5'-9"	6'-11"						
	PJI -60	18'-1"	0'-7"	0'-8"	1'-8"	3'-1"	4'-8"	5'-0"	6'-3"	8'-0"	9'-2"						
	PJI-65	18'-9"	0'-7"	0'-8"	1'-11"	3'-4"	4'-10"	5'-3"	6'-6"	8'-3"	9'-5"						
	PJI -80	19'-8"	0'-7"	1'-4"	2'-10"	4'-4"	5'-11"	6'-4"	7'-7"	9'-5"	10'-8"						
	PJI -90	20'-1"	0'-7"	1'-9"	3'-3"	4'-9"	6'-4"	6'-9"	8'-0"	9'-10"	11'-1"						
14	PJI -40	18'-2"	0'-7"	0'-8"	0'-8"	0'-9"	1'-2"	1'-6"	2'-7"	4'-0"	4'-11"	5'-6"	7'-1"	8'-5"			
	PJI -60	20'-6"	0'-7"	0'-8"	0'-8"	1'-11"	3'-4"	3'-8"	4'-9"	6'-3"	7'-3"	7'-10"	9'-7"				
	PJI-65	21'-3"	0'-7"	0'-8"	0'-11"	2'-3"	3'-7"	3'-11"	5'-1"	6'-7"	7'-7"	8'-2"	9'-11"				
	PJI -80	22'-4"	0'-7"	0'-8"	1'-10"	3'-2"	4'-8"	5'-0"	6'-2"	7'-9"	8'-9"	9'-5"	11'-3"				
	PJI -90	22'-11"	0'-7"	0'-8"	1'-10"	3'-2"	4'-8"	5'-0"	6'-2"	7'-9"	8'-9"	9'-5"	11'-3"				
16	PJI -40	19'-7"	0'-7"	0'-8"	0'-8"	0'-9"	0'-9"	0'-10"	1'-2"	2'-6"	3'-4"	3'-10"	5'-3"	6'-5"	6'-9"	8'-5"	9'-9"
	PJI -60	21'-9"	0'-7"	0'-8"	0'-8"	0'-9"	1'-4"	1'-8"	2'-7"	3'-11"	4'-10"	5'-4"	6'-10"	8'-0"	8'-5"	10'-1"	
	PJI-65	23'-6"	0'-7"	0'-8"	0'-8"	1'-2"	2'-6"	2'-10"	3'-10"	5'-2"	6'-1"	6'-8"	8'-2"	9'-4"	9'-9"	11'-6"	
	PJI -80	24'-9"	0'-7"	0'-8"	0'-10"	2'-2"	3'-6"	3'-10"	4'-11"	6'-4"	7'-4"	7'-11"	9'-6"	10'-9"	11'-2"	13'-0"	
	PJI -90	25'-4"	0'-7"	0'-8"	0'-10"	2'-2"	3'-6"	3'-10"	4'-11"	6'-4"	7'-4"	7'-11"	9'-6"	10'-9"	11'-2"	13'-0"	
18	PJI -80	27'-0"	0'-7"	0'-8"	0'-8"	0'-10"	2'-3"	2'-7"	3'-8"	5'-1"	6'-1"	6'-8"	8'-2"	9'-5"	9'-10"	11'-7"	12'-11"
	PJI -90	27'-8"	0'-7"	0'-8"	0'-8"	1'-6"	2'-11"	3'-3"	4'-4"	5'-10"	6'-10"	7'-5"	9'-0"	10'-3"	10'-8"	12'-5"	13'-9"
20	PJI -80	29'-3"	0'-7"	0'-8"	0'-8"	0'-9"	1'-8"	2'-0"	3'-0"	4'-4"	5'-3"	5'-9"	7'-2"	8'-3"	8'-8"	10'-2"	11'-4"
	PJI -90	30'-0"	0'-7"	0'-8"	0'-8"	0'-9"	1'-11"	2'-3"	3'-3"	4'-8"	5'-6"	6'-0"	7'-5"	8'-7"	8'-11"	10'-6"	11'-8"
22	PJI -80	31'-3"	0'-7"	0'-8"	0'-8"	0'-9"	0'-9"	0'-10"	1'-9"	3'-0"	3'-9"	4'-3"	5'-7"	6'-7"	6'-11"	8'-3"	9'-4"
	PJI -90	31'-3"	0'-7"	0'-8"	0'-8"	0'-9"	0'-9"	0'-10"	1'-9"	3'-0"	3'-9"	4'-3"	5'-7"	6'-7"	6'-11"	8'-3"	9'-4"
24	PJI -80	31'-3"	0'-7"	0'-8"	0'-8"	0'-9"	0'-9"	0'-10"	0'-10"	1'-6"	2'-2"	2'-8"	3'-10"	4'-9"	5'-1"	6'-4"	7'-4"
	PJI -90	31'-3"	0'-7"	0'-8"	0'-8"	0'-9"	0'-9"	0'-10"	0'-10"	1'-6"	2'-2"	2'-8"	3'-10"	4'-9"	5'-1"	6'-4"	7'-4"

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_{rh} = Published Shear Value x [(Joist Depth - Hole Diameter) / Joist Depth].

[6]SAF = Span Adjustment Factor, used as defined below.

OPTIONAL (next page):

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 1.0, use 1.0 in the above calculation for $\frac{L_{actual}}{SAF}$.

Rules for cutting holes in PJI 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 $^1/_4$ inch. A minimum of $^1/_8$ inch should always be maintained between the top or bottom of the hole and the adjacent I-joist flange.
5. The sides of square holes or longest sides of rectangular holes 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. $1^1/_2$-inch holes are permitted anywhere in a cantilevered section of an PJI Joist. Holes of greater size may be permitted subject to verification.
8. A $1^1/_2$-inch 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 must be cut in a workmanlike manner in accordance with the restrictions listed above and as illustrated in Figure 2.
11. Limit three maximum size holes per span.
12. 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.

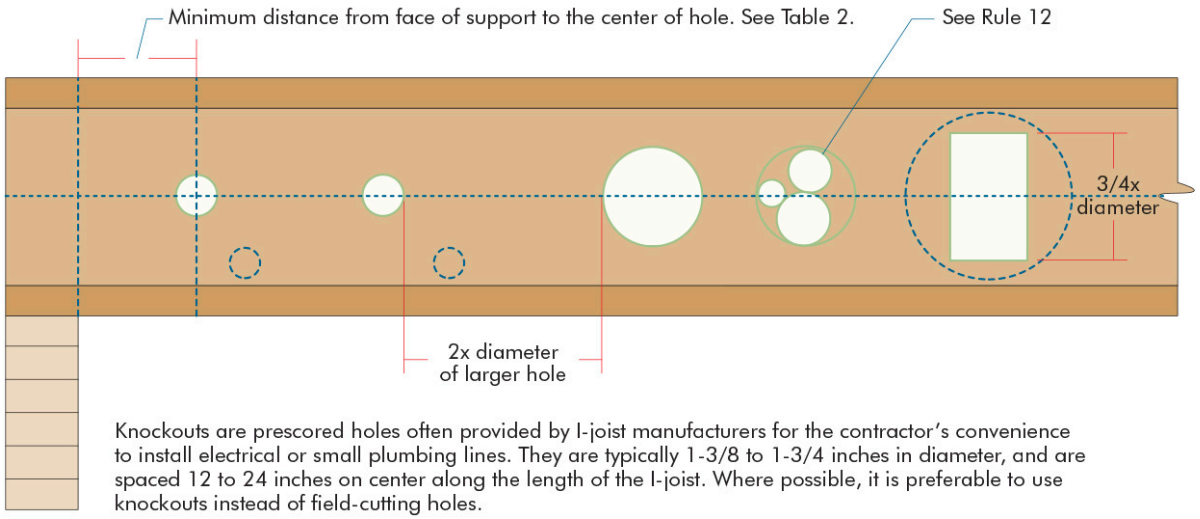


FIGURE 2—TYPICAL HOLES IN THE WEB

Requirements for Web Stiffeners:

1. Wood structural panel web stiffeners must be placed on each side of the I-joist web at:
   (a) Hangers with side nailing.
   (b) Hangers which do not laterally support the top flange of the I-joist.
   (c) Locations where concentrated loads in excess of 1580 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.
   (d) At exterior supports in engineered applications where concentrated loads cause exterior reaction loads to exceed 1580 pounds.
   (e) At reactions exceeding the tabulated values corresponding to installations without web stiffeners, as shown in Table 1B.
   (f) At all end reactions on 18-, 20-, 22- and 24-inch PJI-80 and PJI-90 joists.
2. 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).

Stiffener Size and Nailing Requirement

Joist Depth	2-1/2″ Wide Flange 8d (2-1/2″) nails	3-1/2″ Wide Flange 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)

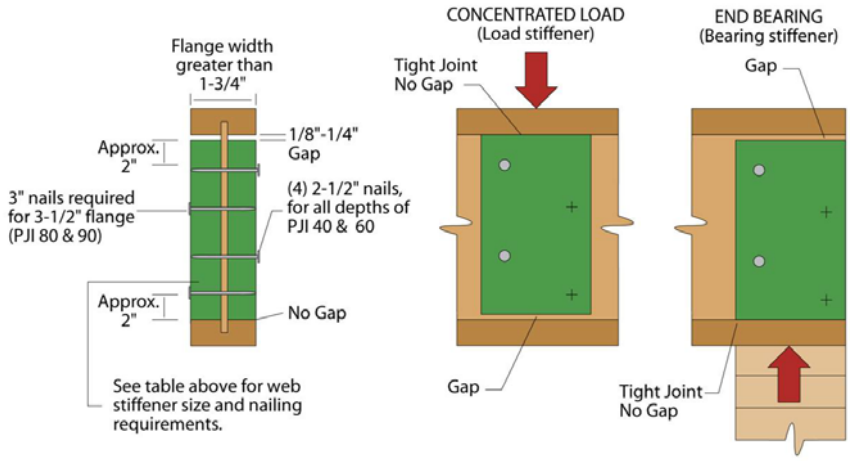


FIGURE 3—WEB STIFFENER REQUIREMENTS

TABLE 4—ALLOWABLE SHEAR (PLF) FOR HORIZONTAL WOOD STRUCTURAL PANEL DIAPHRAGMS FRAMED WITH P3 JOIST I-JOISTS FOR WIND[1] OR SEISMIC LOADING[2,3,9]

Sheathing Grade	Common Nail Size	Minimum Nominal Panel Thickness (in.)	Minimum Nominal Width of Framing Members at Adjoining Edges and Boundaries (in.)[4]	Blocked Diaphragms			Unblocked Diaphragms	
				Nail Spacing (in.) at Diaphragm Boundaries (All Cases), at Continuous Panel Edges Parallel to Load (Cases 3 & 4), and at All Panel Edges (Cases 5 & 6)[5,6]			Nails Spaced 6 in. Max at Supported Edges[5]	
				6	4	2-1/2[7]	Case 1 (No Unblocked Edges or Continuous Joints Parallel to Load)	All Other Configurations (Cases 2, 3 4, 5 & 6)
				Nail Spacing (in.) at Other Panel Edges (Cases 1, 2, 3 & 4)[5]				
				6	6	4		
Structural I	6d[8]	5/16	3	210	280	420	185	140
	8d	3/8	3	300	400	600	265	200
	10d	15/32	3	360	480	720	320	240
Sheathing and Single Floor	6d[8]	5/16	3	190	250	380	170	125
		3/8	3	210	280	420	185	140
	8d	3/8	3	270	360	540	240	180
		7/16	3	285	380	570	255	190
		15/32	3	300	400	600	265	200
	10d	15/32	3	325	430	650	290	215
		19/32	3	360	480	720	320	240

For **SI**: 1 inch = 25.4 mm; 1 plf = 14.59 N/m.

[1]For wind load applications, the values in the table above shall be permitted to be multiplied by 1.4.
[2]For shear loads of normal or permanent load duration as defined in the NDS, the values in the table above shall be multiplied by 0.63 or 0.56, respectively.
[3]The tabulated allowable shear capacities are for I-joist series with flanges having a specific gravity (G) of 0.50 or higher (see Figure 1). For G < 0.50 the allowable shear capacities shall be reduced by multiplying the allowable shear capacities by the Specific Gravity Adjustment Factor = [1-(0.5-G)]. The Specific Gravity Adjustment Factor shall not be greater than 1.
[4]Minimum flange widths of P3 JOIST I-joist framing members are 2-1/2 inches (3 inches nominal).
[5]Space nails maximum 12 inches o.c. along intermediate framing members (6 inches o.c. when supports are spaced 48 inches o.c. or greater). Fasteners shall be located 3/8 inch minimum from panel edges.
[6]When nail spacing is 4 inches on center at diaphragm boundaries, adjacent nails within a row must be offset (staggered) 1/2 inch.
[7]When nail spacing is 2-½ inches on center at adjoining panel edges, adjacent nails within a row must be offset (staggered) 1/2 inch.
[8]8d common nails minimum are recommended for roof panel attachments.
[9]See Table 4.2A of SDPWS for diaphragm configurations and minimum fastener penetration.

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES
Section: 06 17 33—Wood I-joists

REPORT HOLDER:

EACOM TIMBER CORPORATION

ADDITIONAL LISTEE:

BLUELINX CORPORATION

EVALUATION SUBJECT:

P3 JOIST PJI-40, PJI-60, PJI-65, PJI-80 AND PJI-90 I-JOISTS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that P3 JOIST I-joists, described in ICC-ES evaluation report ESR-1262, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2020 *Florida Building Code—Building*
- 2020 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The P3 JOIST I-joists described in Sections 2.0 through 7.0 of the evaluation report ESR-1262, comply with the *Florida Building Code—Building* and the *Florida Building Code—Residential*, provided the design requirements are determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in the evaluation report ESR-1262 for the 2018 *International Building Code®* (IBC) meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the P3 JOIST I-joists for compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential* has not been evaluated and is outside the scope of this evaluation report.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official, when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report ESR-1262, reissued January 2022.

APA PRODUCT REPORT®

www.apawood.org

Nordic Joist™ **PR-L274**
Nordic Structures Revised June 5, 2023

Products: Nordic Structures Prefabricated Wood I-Joists
Nordic Structures, 1100 Avenue des Canadiens-de-Montréal, Suite 100, Montreal, Québec
Canada H3B 2S2
(514) 871-8526
www.nordic.ca

1. Basis of the product report:
   - 2021, 2018, 2015, and 2012 International Building Code (IBC): Sections 104.11 Alternative materials and 2303.1.2 Prefabricated wood I-joists
   - 2021, 2018, and 2015 International Residential Code (IRC): Sections 104.11 Alternative materials, R502.1.2, and R802.1.8 (2021 and 2018 IRC only) Prefabricated wood I-joists
   - 2012 IRC: Sections R104.11 Alternative materials and R502.1.4 Prefabricated wood I-joists
   - ASTM D5055-16, D5055-13e1, D5055-13, and D5055-09 recognized in the 2021 IBC and IRC, 2018 IBC and IRC, 2015 IBC and IRC, and 2012 IBC and IRC, respectively
   - PRI-400 Performance Standard for Residential I-Joists
   - ANSI/AWC SDPWS-2021 Special Design Provisions for Wind and Seismic
   - APA Reports T2004P-3, T2004P-21, T2004P-74, T2004P-76, T2005P-30, T2005P-31, T2006P-12, T2006P-13, T2007P-14A, T2007P-76, T2007P-79A, T2007P-81, T2007P-91, T2008P-17, T2010P-20, T2013P-05, T2013P-37, T2015L-05B, T2017L-25, and T2019P-46, and other qualification data

2. Product description:
   Nordic Joist™ Series I-joists, as described in Table 1, are made with lumber flanges and OSB webs in accordance with the in-plant manufacturing standard approved by APA. The Nordic Joist Series are also qualified for PRI-400 and BLI Joist Series as shown in Tables 2 and 3.

3. Design properties:
   Tables 2 and 3 list the allowable design properties for Nordic Joist Series I-joists. Table 4 shows the allowable lateral shear capacities of Nordic Joist Series I-joists in diaphragm applications. Table 5 shows web stiffener information. The allowable spans shall be in accordance with the recommendations provided by the manufacturer (www.nordic.ca/en/documentation/technical-documents) and APA Design/Construction Guide, *Performance Rated I-Joists*, Form Z725 (www.apawood.org/resource-library) for products contained in the PRI Series.

   Design values for the Load and Resistance Factor Design (LRFD) used in the U.S. for Nordic Joist Series I-joists can be derived from the ASD values published in Tables 2 and 3 of this report in accordance with Tables 7.3.1, N1, N2, and N3 of the 2018 ANSI/AWC NDS.

4. Product installation:
   Nordic Joist Series I-joists shall be installed in accordance with the recommendations provided by the manufacturer (see link above) and APA Design/Construction Guide, *Performance Rated I-Joists*, Form Z725 (see link above). Permissible web holes, web stiffeners and cantilever reinforcements shall be in accordance with the recommendations provided by the manufacturer and APA Z725 for products contained in the PRI Series.

5. Fire-rated assemblies:
Fire-rated assemblies shall be constructed in accordance with the recommendations provided by the manufacturer (see link above), APA Product Report PR-S274 (see link above), or APA Design/Construction Guide, *Fire-Rated Systems*, Form W305 (see link above) for products contained in the PRI Series.

6. Limitations:
   a) Nordic Joist Series I-joists shall be designed in accordance with the code using the design properties specified in this report.
   b) Nordic Joist Series I-joists are limited to dry service conditions where the average equilibrium moisture content of sawn lumber is less than 16%.
   c) Nordic Joist Series I-joists are produced at the Nordic Structures facility in Chibougamau, Québec under a quality assurance program audited by APA.
   d) The design properties of BLI Series shall not exceed the design properties of the equivalent NI Series in accordance with Tables 2 and 3.
   e) This report is subject to re-examination in one year.

7. Identification:
The Nordic Joist Series I-joists described in this report are identified by a label bearing the manufacturer's name (Nordic Structures) and/or trademark, the APA assigned plant number (1052), the I-joist series, the APA logo, the report number PR-L274, and a means of identifying the date of manufacture. NI-40 and NI-40x, NI-60, and NI-80 are permitted to be labelled as onCenter® BLI 40, BLI 60, and BLI 80, respectively, as listed in Tables 2 and 3.

Table 1. Description of Nordic Joist Series I-Joists[a]

Joist Series	Joist Depths (in.)	Flanges				Web	
		Material	G[b]	Dimension		Material	Thick-ness (in.)
				Depth (in.)	Width (in.)		
NI-20	9-1/4 - 11-7/8	Proprietary SPF	0.42	1-1/2	2-1/2	OSB	3/8
NI-40	9-1/2 - 16	Proprietary SPF	0.42	1-1/2	2-1/2	OSB	3/8
NI-40x	7-7/8 - 16	Proprietary SPF	0.42	1-1/2	2-1/2	OSB	3/8
NI-60	7-7/8 - 18	MSR SPF	0.46	1-1/2	2-1/2	OSB	3/8
NI-70	9-1/2 - 16	MSR SPF	0.42	1-1/2	3-1/2	OSB	3/8
NI-80	7-7/8 - 16	MSR SPF	0.46	1-1/2	3-1/2	OSB	3/8
NI-80x	18 - 24	MSR SPF	0.46	1-1/2	3-1/2	OSB	7/16
NI-90	11-7/8 - 16	Proprietary SPF	0.50	1-1/2	3-1/2	OSB	7/16
NI-90x	11-7/8 - 16	Proprietary SPF	0.42	2	3-1/2	OSB	7/16

[a] Referenced dimensions are nominal. Tolerances are as specified in the in-plant quality manual.
[b] Specific gravity of flanges for use in diaphragm design (see Table 4) based on oven-dry weight and oven-dry volume.

Table 2. Design Properties (Allowable Stress Design) for Nordic Joist Series I-Joists[a]

Joist Depth (in.)	Joist Series	Permitted to Be Labelled as	EI[b] (10^6 lbf-in.^{2})	M[c] (lbf-ft)	V[d] (lbf)	VLC[e] (lbf/ft)	K[f] (10^6 lbf)
7-7/8	NI-40x		138	2,310	880	2,000	4.10
	NI-60		147	3,030	880	2,000	4.10
	NI-80		204	4,285	880	2,000	4.10
9-1/4	NI-20		138	2,510	1,080	2,000	4.81
	NI-40x		198	2,810	1,170	2,000	4.81
	NI-60		217	3,680	1,170	2,000	4.81
	NI-80		304	5,215	1,170	2,000	4.81
9-1/2	NI-20	PRI-20	145	2,590	1,120	2,000	4.94
	NI-40	PRI-40 or BLI 40	193	2,735	1,200	2,000	4.94
	NI-40x	PRI-40 or BLI 40	218	2,900	1,200	2,000	4.94
	NI-60	PRI-60	231	3,810	1,200	2,000	4.94
	NI-70		304	5,120	1,200	2,000	4.94
	NI-80		324	5,385	1,200	2,000	4.94
11-1/4	NI-20		222	3,155	1,340	2,000	5.85
	NI-40x		313	3,535	1,410	2,000	5.85
	NI-60		347	4,630	1,410	2,000	5.85
	NI-80		484	6,560	1,410	2,000	5.85
11-7/8	NI-20	PRI-20	253	3,355	1,420	2,000	6.18
	NI-40	PRI-40 or BLI 40	330	3,545	1,480	2,000	6.18
	NI-40x	PRI-40 or BLI 40	371	3,760	1,480	2,000	6.18
	NI-60	PRI-60 or BLI 60	396	4,935	1,570	2,000	6.18
	NI-70	PRI-70	515	6,635	1,590	2,000	6.18
	NI-80	PRI-80 or BLI 80	547	6,980	1,590	2,000	6.18
	NI-90	PRI-90	601	8,780	1,925	2,000	6.18
	NI-90x		615	9,465	2,055	2,000	6.18
14	NI-40	PRI-40 or BLI 40	482	4,270	1,750	2,000	7.28
	NI-40x	PRI-40 or BLI 40	540	4,530	1,750	2,000	7.28
	NI-60	PRI-60 or BLI 60	584	5,945	1,750	2,000	7.28
	NI-70	PRI-70	749	7,990	1,815	2,000	7.28
	NI-80	PRI-80 or BLI 80	802	8,405	1,835	2,000	7.28
	NI-90	PRI-90	877	10,570	2,125	2,000	7.28
	NI-90x		910	11,415	2,210	2,000	7.28
16	NI-40	PRI-40 or BLI 40	657	4,950	2,000	2,000	8.32
	NI-40x	PRI-40 or BLI 40	734	5,250	2,000	2,000	8.32
	NI-60	PRI-60 or BLI 60	799	6,895	2,000	2,000	8.32
	NI-70	PRI-70	1,015	9,265	2,000	2,000	8.32
	NI-80	PRI-80 or BLI 80	1,092	9,745	2,070	2,000	8.32
	NI-90	PRI-90	1,187	12,260	2,330	2,000	8.32
	NI-90x		1,245	13,100	2,330	2,000	8.32
18	NI-60		1,019	7,800	2,000	1,850	9.36
	NI-80x		1,399	10,990	2,360	1,275	9.36
20	NI-80x		1,771	12,315	2,450	1,275	10.40
22	NI-80x		2,191	13,645	2,530	1,275	11.44
24	NI-80x		2,660	14,975	2,600	1,275	12.48

For SI: 1 inch = 25.4 mm, 1 lbf = 4.448 N, 1 lbf-ft = 1.356 N-m, 1 lbf-in^2 = 0.000287 N-m^2

[a] The tabulated values are design values for normal duration of load. All values, except for EI, VLC, and K, shall be permitted to be adjusted for other load durations as permitted by the code.
[b] Bending stiffness (EI) of the I-joist.
[c] Moment capacity (M) of the I-joist.
[d] Shear capacity (V) of the I-joist.
[e] Uniform vertical load capacity of the I-joist.

(f) Coefficient of shear deflection (K). For calculating uniform load and center-point load deflections of the I-joist in a simple-span application, use Equations 1 and 2.

Uniform Load: $$\delta = \frac{5\,\omega L^4}{384\,EI} + \frac{\omega L^2}{K} \quad [1]$$

Center-Point Load: $$\delta = \frac{PL^3}{48\,EI} + \frac{2\,PL}{K} \quad [2]$$

where δ = calculated deflection (in.), ω = uniform load (lbf/in.),
P = concentrated load (lbf), L = design span (in.),
EI = bending stiffness of the I-joist (lbf-in.^{2}), and K = coefficient of shear deflection (lbf).

Table 3. Reaction Capacities (Allowable Stress Design) for Nordic Joist Series I-Joists[a,b,c,d]

Joist Depth (in.)	Joist Series	Permitted to Be Labelled as	Intermediate Reaction (lbf)				End Reaction (lbf)						Flange Bearing Capacity (lbf/in.)
			3-1/2 in. Brg. Length		5-1/2 in. Brg. Length		1-1/2 in. Brg. Length		1-3/4 in. Brg. Length		4 in. Brg. Length		
			Brg. Stiffeners		Brg. Stiffeners		Brg. Stiffeners		Brg. Stiffeners		Brg. Stiffeners		
			No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	
7-7/8	NI-40x		2,010	2,010	2,010	2,010	NA	NA	880	880	880	880	955
	NI-60		2,010	2,010	2,010	2,010	NA	NA	880	880	880	880	1,180
	NI-80		2,010	2,010	2,010	2,010	NA	NA	880	880	880	880	1,705
9-1/4	NI-20		2,350	2,360	2,510	2,510	NA	NA	1,015	1,015	1,080	1,080	955
	NI-40x		2,350	2,360	2,535	2,550	NA	NA	1,135	1,135	1,170	1,170	955
	NI-60		2,350	2,375	2,540	2,550	NA	NA	1,135	1,135	1,170	1,170	1,180
	NI-80		2,350	2,570	2,580	2,580	NA	NA	1,170	1,170	1,170	1,170	1,705
9-1/2	NI-20	PRI-20	2,410	2,425	2,575	2,575	1,035	1,035	1,035	1,035	1,120	1,120	955
	NI-40	PRI-40 or BLI 40	2,410	2,425	2,630	2,645	1,060	1,200	1,175	1,200	1,200	1,200	955
	NI-40x	PRI-40 or BLI 40	2,410	2,425	2,630	2,645	1,060	1,200	1,175	1,200	1,200	1,200	955
	NI-60	PRI-60	2,415	2,440	2,635	2,665	1,060	1,200	1,175	1,200	1,200	1,200	1,180
	NI-70		2,415	2,670	2,685	2,685	1,060	1,200	1,200	1,200	1,200	1,200	1,705
	NI-80		2,415	2,670	2,685	2,685	1,060	1,200	1,200	1,200	1,200	1,200	1,705
11-1/4	NI-20		2,845	2,870	3,045	3,045	1,050	1,050	1,190	1,190	1,340	1,340	955
	NI-40x		2,845	2,870	3,300	3,330	1,105	1,410	1,250	1,410	1,410	1,410	955
	NI-60		2,850	2,905	3,310	3,375	1,105	1,410	1,250	1,410	1,410	1,410	1,180
	NI-80		2,850	3,155	3,410	3,410	1,105	1,410	1,330	1,410	1,410	1,410	1,705
11-7/8	NI-20	PRI-20	3,000	3,030	3,215	3,215	1,055	1,055	1,245	1,245	1,420	1,420	955
	NI-40	PRI-40 or BLI 40	3,000	3,030	3,540	3,575	1,125	1,330	1,275	1,480	1,480	1,480	955
	NI-40x	PRI-40 or BLI 40	3,000	3,030	3,540	3,575	1,125	1,330	1,275	1,480	1,480	1,480	955
	NI-60	PRI-60 or BLI 60	3,005	3,070	3,550	3,625	1,125	1,330	1,275	1,480	1,550	1,570	1,180
	NI-70	PRI-70	3,005	3,330	3,670	3,670	1,125	1,330	1,350	1,480	1,550	1,590	1,705
	NI-80	PRI-80 or BLI 80	3,005	3,330	3,670	3,670	1,125	1,330	1,350	1,590	1,550	1,590	1,705
	NI-90	PRI-90	3,355	3,355	3,670	3,670	1,125	1,330	1,400	1,480	1,885	1,925	2,000
	NI-90x		4,170	4,170	4,170	4,170	1,125	1,330	1,765	2,055	1,885	2,055	1,380
14	NI-40	PRI-40 or BLI 40	3,130	3,160	3,530	3,565	1,180	1,665	1,325	1,690	1,550	1,750	955
	NI-40x	PRI-40 or BLI 40	3,130	3,160	3,530	3,565	1,180	1,665	1,325	1,690	1,550	1,750	955
	NI-60	PRI-60 or BLI 60	3,140	3,260	3,540	3,795	1,180	1,665	1,345	1,690	1,550	1,750	1,180
	NI-70	PRI-70	3,330	3,640	3,820	4,075	1,180	1,665	1,455	1,690	1,550	1,815	1,705
	NI-80	PRI-80 or BLI 80	3,330	3,640	3,820	4,075	1,180	1,665	1,455	1,760	1,600	1,835	1,705
	NI-90	PRI-90	3,355	3,640	3,820	4,075	1,180	1,665	1,455	1,690	1,885	2,125	2,000
	NI-90x		4,170	4,170	4,170	4,170	1,180	1,665	1,800	2,210	1,885	2,210	1,380

(Footnotes on following page)

Table 3. Reaction Capacities (Allowable Stress Design) for Nordic Joist Series I-Joists[a,b,c,d] (Continued)

Joist Depth (in.)	Joist Series	Permitted to Be Labelled as	Intermediate Reaction (lbf)				End Reaction (lbf)						Flange Bearing Capacity (lbf/in.)
			3-1/2 in. Brg. Length		5-1/2 in. Brg. Length		1-1/2 in. Brg. Length		1-3/4 in. Brg. Length		4 in. Brg. Length		
			Brg. Stiffeners		Brg. Stiffeners		Brg. Stiffeners		Brg. Stiffeners		Brg. Stiffeners		
			No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	
16	NI-40	PRI-40 or BLI 40	3,255	3,285	3,520	3,595	NA	NA	1,370	1,875	1,550	2,000	955
	NI-40x	PRI-40 or BLI 40	3,255	3,285	3,520	3,595	NA	NA	1,370	1,875	1,550	2,000	955
	NI-60	PRI-60 or BLI 60	3,265	3,440	3,530	3,955	NA	NA	1,410	1,875	1,550	2,000	1,180
	NI-70	PRI-70	3,640	3,930	3,960	4,455	NA	NA	1,550	1,875	1,550	2,000	1,705
	NI-80	PRI-80 or BLI 80	3,640	3,930	3,960	4,455	NA	NA	1,550	1,915	1,600	2,070	1,705
	NI-90	PRI-90	3,640	3,930	3,960	4,455	NA	NA	1,550	1,875	1,885	2,330	2,000
	NI-90x		4,170	4,170	4,170	4,170	NA	NA	1,830	2,325	1,885	2,330	1,380
18	NI-60		2,800	3,620	3,260	4,115	NA	NA	1,475	2,000	1,850	2,000	1,180
	NI-80x		3,115	3,820	3,280	4,420	NA	NA	1,300	1,900	1,850	2,360	1,705
20	NI-80x		3,190	4,120	3,410	4,575	NA	NA	1,320	2,045	1,900	2,450	1,705
22	NI-80x		3,265	4,425	3,535	4,730	NA	NA	1,340	2,195	1,950	2,530	1,705
24	NI-80x		3,340	4,725	3,665	4,885	NA	NA	1,360	2,340	2,000	2,600	1,705

For SI: 1 inch = 25.4 mm, 1 lbf = 4.448 N, 1 lbf/in. = 0.175 kN/m

(a) Reaction capacity shall be limited by the flange bearing capacity or the bearing capacity of the support material, whichever is less. The flange bearing capacity, per inch of bearing length, is based on the allowable compression perpendicular-to-grain of the I-joist flange, accounting for eased edges.

(b) Reaction capacity is for normal duration of load and shall be permitted to be adjusted for other load durations provided that the adjusted reaction capacity is not greater than the flange bearing capacity or the bearing capacity of the support material, which shall not be increased for any load durations.

(c) Reaction capacity shall be permitted to be increased over that tabulated for the minimum bearing length by linear interpolation of the reaction capacity between the minimum and maximum bearing lengths. Extrapolation beyond the minimum and maximum bearing lengths is beyond the scope of this table.

(d) Web stiffeners, when required, shall be installed in accordance with Table 5 and the recommendations provided by the manufacturer.

Table 4. Allowable Shear (Pounds Per Foot) for Horizontal Wood Structural Panel Diaphragms Framed With Nordic Joist Series I-Joists for Wind[a] or Seismic Loading[b,c]

Panel Grade	Common Nail Size	Minimum Nominal Panel Thickness (in.)	Minimum Nominal Width of Framing Members at Adjoining Panel Edges and Boundaries[e] (in.)	Blocked Diaphragms			Unblocked Diaphragms	
				Nail spacing (in.) at diaphragm boundaries (all cases), at continuous panel edges parallel to load (Cases 3 & 4), and at all panel edges (Cases 5 & 6)[f,g]			Nails Spaced 6 in. max. at supported edges[f,g]	
				6	4[h]	2-1/2[i]	Case 1 (No unblocked edges or continuous joints parallel to load	All other configurations (Cases 2, 3, 4, 5 &6)
				Nail spacing (in.) at other panel edges (Cases 1, 2, 3, & 4)[e]				
				6	6	4		
Structural I Grades	6d[d]	5/16	3	210	280	420	185	140
	8d	3/8		300	400	600	265	200
	10d	15/32		360	480	720	320	240
Sheathing, single floor and other grades covered in DOC PS 1 and PS 2	6d[d]	5/16		190	250	380	170	125
		3/8		210	280	420	185	140
	8d	3/8		270	360	540	240	180
		7/16		285	380	570	255	190
		15/32		300	400	600	265	200
	10d	15/32		325	430	650	290	215
		19/32		360	480	720	320	240

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 lbf = 4.448 N, 1 lbf/ft = 0.0146 N/mm.

(Footnotes on next page)

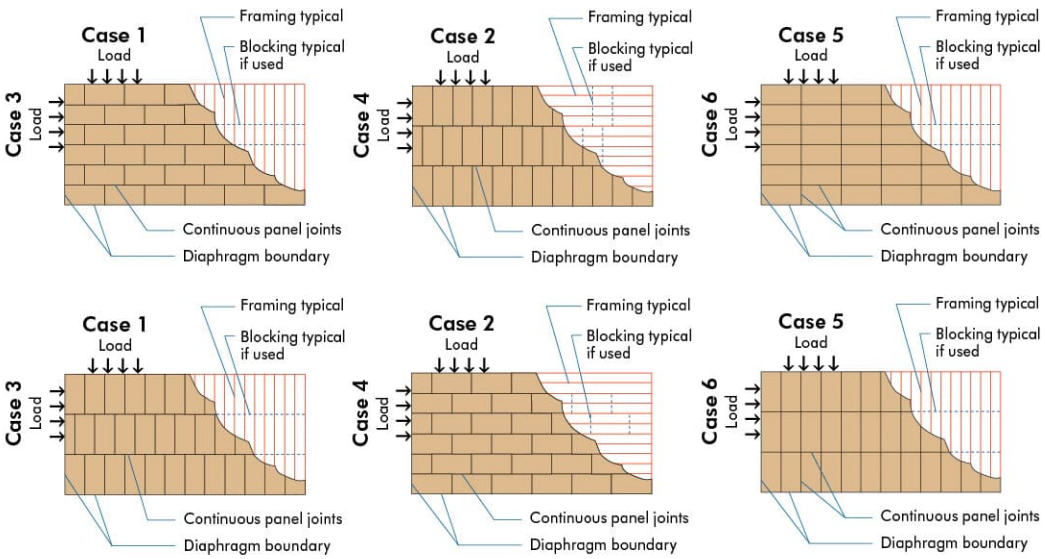


Figure 1. Diaphragm configurations

(a) For wind load applications, the values in the table above shall be permitted to be multiplied by 1.4.
(b) For shear loads of normal or permanent load duration as defined by the NDS, the values in the table above shall be multiplied by 0.63 or 0.56, respectively.
(c) The tabulated allowable shear capacities are for I-joist series with flanges having a specific gravity (G) of 0.50 or higher (see Table 1). For G < 0.50 the allowable shear capacities shall be reduced by multiplying the allowable shear capacities by the Specific Gravity Adjustment Factor = [1-(0.5-G)]. The Specific Gravity Adjustment Factor shall not be greater than 1.
(d) 8d common nails minimum are recommended for roofs due to negative pressures of high winds.
(e) The minimum nominal width of framing members not located at boundaries or adjoining panel edges shall be 2 inches.
(f) Space nails maximum 12 inches o.c. along intermediate framing members (6 inches o.c. when supports are spaced 48 inches o.c. or greater).
(g) Fasteners shall be located 3/8 inch from panel edges (see Figures 2, 3 and 4).
(h) Adjacent nails within a row must be staggered ½ inch when nail spacing is 4 inches or less (see Figure 3)
(i) Adjacent nails within a row must be staggered ½ inch at adjoining panel edges when nail spacing is 2-½ inches o.c. (see Figure 4).

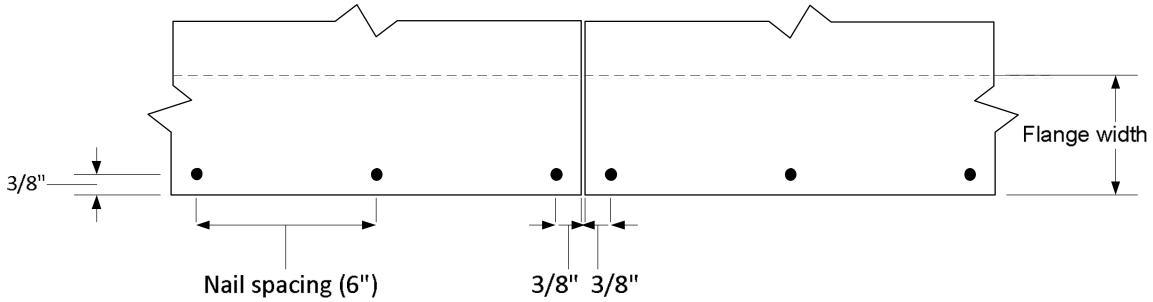


Figure 2. Non-staggered nails at diaphragm boundaries (see Footnote g), not to scale.

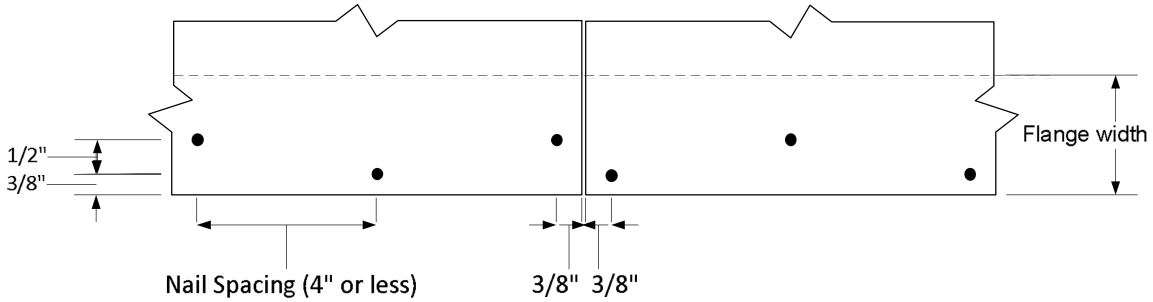


Figure 3. Staggered nails at diaphragm boundaries (see Footnote h), not to scale.

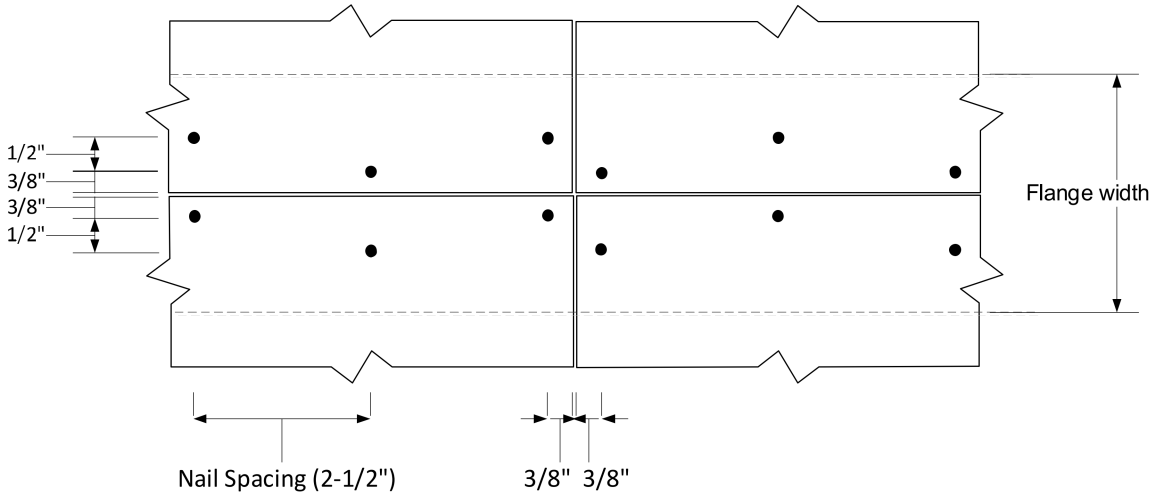


Figure 4. Staggered nails at adjoining panel edges (see Footnote i), not to scale.

Table 5. Minimum Dimensions for Web Stiffeners[(a)]

Joist Series	Web Stiffeners		Flange width, b_f (in.)
	Thickness (in.)	Width (in.)	
NI-20	1	2-5/16	2-1/2
NI-40	1	2-5/16	2-1/2
NI-40x	1	2-5/16	2-1/2
NI-60	1	2-5/16	2-1/2
NI-70	1-1/2	2-5/16	3-1/2
NI-80	1-1/2	2-5/16	3-1/2
NI-80x	1-1/2	2-5/16	3-1/2
NI-90	1-1/2	2-5/16	3-1/2
NI-90x	1-1/2	2-5/16	3-1/2

[(a)] Web stiffener length is 1/8 to 1/4 inch less than the clear distance between flanges. Stiffeners 1-inch thick are wood structural panels and stiffeners 1-1/2-inch thick are SPF lumber (specific gravity of 0.42) or denser lumber.

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