

Joint Evaluation Report

ESR-1225

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DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES

Section: 06 17 33—Wood I-joists

REPORT HOLDER:

PACIFIC WOODTECH CORPORATION

EVALUATION SUBJECT:

PWI JOISTS

ADDITIONAL LISTEES:

ALLIANCE LUMBER

BLUELINX CORPORATION

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2018, 2015, 2012, 2009 and 2006 *International Building Code*® (IBC)
- 2018, 2015, 2012, 2009 and 2006 *International Residential Code*® (IRC)

For evaluation for compliance with codes adopted by Los Angeles Department of Building and Safety (LADBS), see [ESR-1225 LABC and LARC Supplement](#).

Properties evaluated:

- Structural
- Fire-resistance-rated assemblies

2.0 USES

PWI joists are used as joists, rafters, headers and blocking panels.

3.0 DESCRIPTION

3.1 General:

PWI joists comply with IBC Section 2303.1.2, 2018 and 2015 IRC Section R502.1.2 and 2012, 2009 and 2006 IRC Section R502.1.4 for allowable stress design, and are manufactured in accordance with the approved Pacific Woodtech Corporation *I-Joist Quality Control Manual*. Joist descriptions are provided in Table 1. Pacific Woodtech Corporation private-labels PWI joists. The company names and associated product trade names for the PWI joists and private label I-joists are as follows:

COMPANY OR LISTEE	PRODUCT TRADE NAME
Pacific Woodtech Corporation	PWI Joist
Alliance Lumber	Integri-Joist™
BlueLinx Corporation	onCENTER®

All PWI joists, regardless of the private label, are identified as described in Section 7.0 of this report.

3.2 Materials:

3.2.1 Flanges: Structural composite as specified in the approved quality control manual. See Table 1.

3.2.2 Webs: Wood structural panel sections as specified in the approved quality control manual. See Table 1.

3.2.3 Adhesives: Exterior-type, heat-durable adhesives complying with ASTM D5055 as specified by the approved quality control manual.

4.0 DESIGN AND INSTALLATION

4.1 General:

The information provided in this report applies to the Allowable Stress Design method.

4.2 Web Stiffeners:

Web stiffeners are not required, with the following exceptions:

- a. Web stiffeners are required at the ends of the I-joist in joist hangers that are not deep enough to laterally support the top flange of the joist. Refer to the hanger installation instructions.
- b. Web stiffeners are required to accommodate special hanger nailing requirements. Refer to the hanger installation instructions.
- c. Web stiffeners are required under concentrated loads applied to the top of the I-joist between supports, or along cantilevers beyond the support, when the concentrated load exceeds 1500 pounds (6672 N).
- d. Web stiffeners are required at birdsmouth cuts at the low end support of sloped joists.
- e. Web stiffeners are required for high reactions at supports.

See Table 2B for allowable reaction and web stiffener use requirements. See Figure 1 for illustrations as well as web stiffener dimensions and nail sizes.

4.3 Web Holes:

Tables 4 and 5 provide allowable locations for round, rectangular and duct holes in joists sized by means of Table 3. For engineered designs, refer to the notes in Tables 4 and 5 and use the following allowable hole shear values:

$$\text{Round holes: } V_{\text{hole}} = \left(\frac{d - \text{Hole Diameter (inches)}}{d} - C \right) \times V_{\text{joist}}$$

where:

V_{hole} = allowable joist shear at web hole (lbs).

d = joist depth (inches).

C = adjustment variable, 0.06 for $3/8$ -inch-thick webs and 0.00 for $7/16$ -inch-thick webs, see Table 1.

V_{joist} = allowable joist shear (lbs).

Rectangular holes: If the longest side dimension is less than or equal to $0.75(d - 2d_f)$, analyze as a round hole with a diameter equal to the longest side dimension divided by 0.75, otherwise analyze as a duct hole with a width equal to the width of the desired rectangular hole.

where:

d = joist depth (in.)

d_f = flange depth (in.), see Table 1.

Duct holes (full height of web removed):

PWI 20/30 $V_{\text{hole}} = 300 - 8.5 \times \text{width}$
maximum width = 12 inches

PWI 47/50 $V_{\text{hole}} = 360 - 11 \times \text{width}$
maximum width = 14 inches

PWI 40/45/60/70/77/77w $V_{\text{hole}} = 430 - 11.5 \times \text{width}$
maximum width = 20 inches

PWI 90 $V_{\text{hole}} = 515 - 12 \times \text{width}$
maximum width = 24 inches

where:

V_{hole} = allowable joist shear at web hole (lbs).

Width = duct hole width (inches).

4.4 Fasteners:

Allowable capacities and spacing for nails into the top of flanges of PWI joists with LVL flanges are in accordance with the NDS for solid-sawn lumber with a specific gravity of 0.50. Allowable capacities and spacing for nails into the side of flanges of PWI joists with LVL flanges are in accordance with the NDS for solid-sawn lumber with a specific gravity of 0.50 for lateral values and 0.47 for withdrawal values.

PWI-47 joists used in diaphragm applications, when designed in accordance with Tables 4.2A and 4.2C of the American Wood Council *Special Design Provisions for Wind and Seismic* with following limitations: nailing spacing must be 4 or 6 inches only; reference shear capacity values must be as provided for 2-inch (51 mm) nominal width framing only; and nails spaced at 4 inches (102 mm) on center at diaphragm boundaries must be staggered $1/2$ inch (12.7 mm).

4.5 Bridging:

Bridging is not required in the joist span unless specified by the building designer.

4.6 Lateral Support:

Provide lateral restraint at supports (e.g., blocking panels, rim board) and along the compression flange of each joist (e.g., wood structural panel sheathing, gypsum board ceiling, wood structural panel soffit).

4.7 Fire-resistive Construction for Roof-ceiling and Floor-ceiling Assemblies:

4.7.1 Assembly 1, One-hour:

4.7.1.1 Finish Flooring (Optional): Hardwood or softwood flooring on building paper; or resilient flooring, parquet floor, synthetic-fiber-felt floor coverings, carpeting, or ceramic tile on $3/8$ -inch-thick (10 mm) panel-type underlayment; or ceramic tile on $1/4$ -inch (32 mm) mortar bed.

4.7.1.2 Subfloor: Wood structural sheathing in compliance with the provisions of PS1 or PS2 and the applicable building code.

4.7.1.3 Wood Structural Members: Minimum $9 1/2$ -inch-deep (241 mm) wood I-joists spaced a maximum of 24 inches (610 mm) on center. Minimum flange size is $1 1/2$ inches thick by $1 1/2$ inches wide (38 by 38 mm). Minimum web thickness is $3/8$ inch (10 mm).

4.7.1.4 Insulation (Optional): $3 1/2$ -inch (89 mm) glass fiber batts, or $3 1/2$ -inch (89 mm) mineral wool batts.

4.7.1.5 Resilient Channels: Minimum 0.018-inch-thick (0.5 mm) resilient channels are installed in continuous rows at a maximum spacing of 24 inches (610 mm) on center, and are perpendicular to the joists. The channels are attached to the bottom of each joist with a $1 1/4$ -inch-long (32 mm) screw. Additional channels may be installed between continuous rows at the locations of end joints in the first layer of ceiling. The additional channel may be extended a minimum of 2 inches (51 mm) beyond the joists adjacent to each side of the gypsum board panels in the first layer of ceiling.

4.7.1.6 Ceiling: Two layers of $1/2$ -inch-thick (13 mm), Type X gypsum board in compliance with ASTM C1396. The long edge of each layer must be perpendicular to the channels (parallel to the joists). End and side joints must be staggered at least 16 inches (406 mm) from layer to layer. The first layer must be fastened to the resilient channels with $1 1/4$ -inch (32 mm), Type S screws at 12 inches (305 mm) on center. Screws must be installed a minimum of $3/8$ inch (10 mm) from end joints and a minimum of $1 1/2$ inches (38 mm) from side joints. The second layer must be fastened to the resilient channels with $1 5/8$ -inch (41 mm), Type S screws at 12 inches (305 mm) on center. Screws must be installed a minimum of $1/2$ inch (13 mm) from end and side joints. One-and-one-half-inch (38 mm), Type G screws may be substituted at end joints in the second layer when end joints fall between channels.

4.7.2 Assembly 2, One-hour:

4.7.2.1 Finish Flooring (Optional): Hardwood or softwood flooring on building paper; or resilient flooring, parquet flooring, synthetic-fiber-felt floor covering, carpeting, or ceramic tile on $3/8$ -inch-thick (10 mm) panel-type underlayment; or ceramic tile on $1 1/4$ -inch-thick (32 mm) mortar bed.

4.7.2.2 Subfloor: Minimum $23/32$ -inch-thick (19 mm) wood structural sheathing in compliance with the provisions of PS 1 or PS 2 and the applicable building code.

4.7.2.3 Wood Structural Members: Minimum $9 1/2$ -inch-deep (241 mm) wood I-joists spaced a maximum of 24 inches (610 mm) on center. Minimum flange size $1 1/8$ -inch-thick-by- $2 5/16$ -inch-wide (29 mm by 59 mm). Minimum web thickness is $3/8$ inch (10 mm).

4.7.2.4 Insulation (Optional): $3 1/2$ -inch-thick (89 mm) glass fiber batts.

4.7.2.5 Resilient Channels: Minimum 0.019-inch-thick (0.5 mm) resilient channels installed perpendicular to the

I-joists at 16 inches (406 mm) on center. Attach to each I-joist with one 1 $\frac{1}{4}$ -inch-long (32 mm) Type S drywall screw.

4.7.2.6 Ceiling: Two layers of $\frac{1}{2}$ -inch-thick (13 mm) USG SHEETROCK Brand FIRECODE® C Core Type X gypsum boards installed with long dimension perpendicular to resilient channels:

Base Layer: Butt ends on resilient channels and stagger end joints. Attach to the resilient channels with #6 x 1 $\frac{1}{4}$ -inch-long (32 mm) Type S drywall screws at 12 inches (305 mm) on center. Minimum 1 $\frac{1}{2}$ -inch (38 mm) edge distance and minimum $\frac{3}{8}$ -inch (10 mm) end distance.

Face Layer: Stagger edge joints from base layer by 24 inches (610 mm). Stagger end joints from base layer by minimum 1 $\frac{1}{2}$ channel spaces. Attach to resilient channels through base layer with #6 x 1 $\frac{5}{8}$ -inch-long (41 mm) Type S drywall screws at 12 inches (305 mm) on center. Attach ends to base layer with #10 x 1 $\frac{1}{2}$ -inch (38 mm) Type G drywall screws at 8 inches (203 mm) on center. Minimum 1 $\frac{1}{2}$ -inch (38 mm) edge distance and end distance. Finish joints with tape and joint compound. Finish screw heads with joint compound.

4.7.3 Other Assemblies: PWI joists may be used in the assemblies described in 2018, 2015 and 2012 IBC Table 721.1(3) and 2009 IBC Table 720.1(3), Item Numbers 21-1.1, and 23-1.1 through 28-1.1; and 2006 IBC Table 720.1(3), Item Numbers 21-1.1, 23-1.1, 25-1.1 through 29-1.1, provided the joists meet the criteria listed in the "Floor or Roof Construction" column. PWI joists with 1 $\frac{1}{2}$ -by-1 $\frac{1}{2}$ -inch flanges (38 mm by 38 mm) satisfy the minimum 2.3-square-inch (14.4 cm²), flange-cross-sectional area criterion of 2018, 2015 and 2012 IBC Table 721.1(3), Item Number 23-1.1 and 2009 IBC Table 720.1(3), Item Number 23-1.1. PWI joists may also be used in wood I-joist assemblies that are qualified under the Footnote q of the IBC tables referenced in this Section 4.7.3.

4.8 Fire Protection of Floors:

PWI joists may be used in the fire protection assemblies described in Section 4.3 of ICC-ES evaluation report [ESR-1405](#) to meet the Exception 4 to 2018 and 2015 IRC Section R302.13 and 2012 IRC Section R501.3.

5.0 CONDITIONS OF USE

The Pacific Woodtech Corporation and private label 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 I-joists are manufactured at the Pacific Woodtech facility in Burlington, Washington, under a quality control program with inspections by ICC-ES and APA.

5.2 Design and installation must comply with the applicable building code, this report and the manufacturer's published installation instructions. In the event of a conflict, the code and this report must govern.

5.3 For applications based on Tables 2A and 2B, design calculations and details for specific applications must be furnished to the code official, when requested, when the permit is applied for. Calculations and drawings shall be prepared, signed and sealed by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

6.0 EVIDENCE SUBMITTED

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

7.0 IDENTIFICATION

7.1 Each I-joist must be marked with the product trade name or trademark; the joist series; the production date; the evaluation report number (ESR-1225); the name of the manufacturer (Pacific Woodtech); and the manufacturer's APA mill number (1048).

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

PACIFIC WOODTECH CORPORATION
1850 PARK LANE
BURLINGTON, WASHINGTON 98233
(360) 707-2200
www.pacificwoodtech.com

7.3 The Additional Listees' contact information is the following:

ALLIANCE LUMBER
1800 W BROADWAY ROAD, SUITE 1
TEMPE, ARIZONA 85282
BLUELINX CORPORATION
1950 SPECTRUM CIRCLE
MARIETTA, GEORGIA 30067

TABLE 1—JOIST DESCRIPTION

Joist Series	Joist Depths [in]		Flange			Web	
	Minimum	Maximum	Material	Width [in]	Depth [in]	Material	Thick. [in]
PWI-20	9 $\frac{1}{2}$	14	LVL	1 $\frac{3}{4}$	1 $\frac{3}{8}$	OSB	$\frac{3}{8}$
PWI-30	9 $\frac{1}{2}$	11 $\frac{7}{8}$	LVL	1 $\frac{1}{2}$	1 $\frac{1}{2}$	OSB	$\frac{3}{8}$
PWI-40	9 $\frac{1}{4}$	16	LVL	2 $\frac{5}{16}$	1 $\frac{3}{8}$	OSB	$\frac{3}{8}$
PWI-45	9 $\frac{1}{2}$	16	LVL	2 $\frac{1}{16}$	1 $\frac{3}{8}$	OSB	$\frac{3}{8}$
PWI-47	7 $\frac{7}{8}$	20	LVL	2 $\frac{5}{16}$	1 $\frac{1}{8}$	OSB	$\frac{3}{8}$
PWI-50	9 $\frac{1}{2}$	16	LVL	1 $\frac{3}{4}$	1 $\frac{1}{2}$	OSB	$\frac{3}{8}$
PWI-60	9 $\frac{1}{4}$	16	LVL	2 $\frac{5}{16}$	1 $\frac{3}{8}$	OSB	$\frac{3}{8}$
PWI-70	11 $\frac{7}{8}$	20	LVL	2 $\frac{5}{16}$	1 $\frac{1}{2}$	OSB	$\frac{3}{8}$
PWI-77	9 $\frac{1}{2}$	24	LVL	2 $\frac{5}{16}$	1 $\frac{1}{2}$	OSB	$\frac{7}{16}$
PWI-77w	9 $\frac{1}{2}$	24	LVL	2 $\frac{1}{2}$	1 $\frac{1}{2}$	OSB	$\frac{7}{16}$
PWI-90	9 $\frac{1}{2}$	24	LVL	3 $\frac{1}{2}$	1 $\frac{1}{2}$	OSB	$\frac{7}{16}$

For SI: 1 inch = 25.4 mm.

TABLE 2A—REFERENCE ALLOWABLE STRESS DESIGN VALUES FOR PWI JOISTS ^(1, 2)

Joist Series	Joist Depth	EI ^(3, 8)	k ^(4, 8)	M ⁽⁵⁾	V ⁽⁶⁾	Vert. Load ⁽⁷⁾
PWI-20	9 1/2"	145	4.94	2520	1330	2000
	11 7/8"	253	6.18	3265	1705	2000
	14"	373	7.28	3890	1955	2000
PWI-30	9 1/2"	161	4.94	3225	1330	2000
	11 7/8"	280	6.18	4170	1705	2000
PWI-40	9 1/4"	181	4.81	2650	1280	2000
	9 1/2"	193	4.94	2735	1330	2000
	11 7/8"	330	6.18	3545	1705	2000
	14"	482	7.28	4270	1955	2000
	16"	657	8.32	4950	2190	2000
PWI-45	9 1/2"	193	4.94	3345	1330	2000
	11 7/8"	330	6.18	4315	1705	2000
	14"	486	7.28	5140	1955	2000
	16"	665	8.32	5880	2190	2000
PWI-47	7 7/8"	133	4.10	2690	1000	2000
	9 1/2"	206	4.94	3335	1330	2000
	11 7/8"	344	6.18	4280	1705	2000
	14"	499	7.28	5075	1955	2000
	16"	674	8.32	5790	2190	2000
	18"	878	9.36	6500	2425	1450
	20"	1112	10.40	7200	2660	1450
PWI-50	9 1/2"	186	4.94	3800	1330	2000
	11 7/8"	322	6.18	4915	1705	2000
	14"	480	7.28	5860	1955	2000
	16"	663	8.32	6715	2190	2000
PWI-60	9 1/4"	218	4.81	3665	1280	2000
	9 1/2"	231	4.94	3780	1330	2000
	11 7/8"	396	6.18	4900	1705	2000
	14"	584	7.28	5895	1955	2000
	16"	799	8.32	6835	2190	2000
PWI-70	11 7/8"	440	6.18	6730	1705	2000
	14"	644	7.28	8030	1955	2000
	16"	873	8.32	9200	2190	2000
	18"	1141	9.36	10355	2425	1450
	20"	1447	10.40	11495	2660	1450
PWI-77/77w	9 1/2"	261	6.08	5155	1430	2400
	11 7/8"	442	7.60	6675	1925	2400
	14"	648	8.96	7960	2125	2400
	16"	881	10.24	9120	2330	2400
	18"	1152	11.52	10265	2535	1800
	20"	1463	12.80	11395	2740	1800
	22"	1815	14.08	12520	2935	1300
	24"	2209	15.36	13630	3060	1300
PWI-90	9 1/2"	392	6.08	7915	1430	2400
	11 7/8"	661	7.60	10255	1925	2400
	14"	965	8.96	12235	2125	2400
	16"	1306	10.24	14020	2330	2400
	18"	1703	11.52	15780	2535	1800
	20"	2155	12.80	17520	2740	1800
	22"	2664	14.08	19245	2935	1300
	24"	3232	15.36	20955	3060	1300

For **SI**: 1 inch = 25.4 mm, 1 lb = 4.448 N, 1 ft-lb = 1.35 N-m, 1 lb-in² = 179 N-mm².

- Applicable adjustment factors must be applied to reference design values in accordance with Section 7.3 of the NDS.
- Reference design values reflect dry service conditions, where the moisture content in service is less than 16%, as in most covered structures.
- Bending stiffness [10⁶ lb-in²]
- Coefficient of shear deflection [10⁶ lb]
- Moment capacity [ft-lb]. Reference moment values must be multiplied by the repetitive member factor, C_r = 1.0.
- Shear capacity [lb]
- Blocking panel vertical load capacity [plf]
- Use Equations 1 and 2 to calculate uniform and center point load deflections in a simple-span application.

$$\text{Uniform Load: } \delta = \frac{5w\ell^4}{384EI} + \frac{w\ell^2}{k} \quad [1]$$

$$\text{Center-Point Load: } \delta = \frac{P\ell^3}{48EI} + \frac{2P\ell}{k} \quad [2]$$

Where: δ = calculated deflection in inches
 w = uniform load in pounds per inch
 P = concentrated load in pounds
 ℓ = design span in inches
 EI = I-joist bending stiffness in pounds-inches squared
 k = coefficient of shear deflection in pounds

TABLE 2B—REFERENCE ALLOWABLE STRESS REACTION VALUES FOR PWI JOISTS ^(1, 2)

Joist Series	Joist Depth	ER ($1\frac{3}{4}" \leq \ell_b \leq 3\frac{1}{2}"$) ⁽³⁾		IR ($3\frac{1}{2}" \leq \ell_b \leq 5\frac{1}{4}"$) ⁽⁴⁾		WS ⁽⁵⁾ Nails	b _{EFF} ⁽⁶⁾
		No Web Stiffeners	With Web Stiffeners	No Web Stiffeners	With Web Stiffeners		
PWI-20	9½"	117.1 × ℓ _b + 710	0.0 × ℓ _b + 1120	142.9 × ℓ _b + 1490	0.0 × ℓ _b + 2240	4	1.62
	11⅞"	222.9 × ℓ _b + 525	0.0 × ℓ _b + 1420	245.7 × ℓ _b + 1130	211.4 × ℓ _b + 1535	4	
	14"	222.9 × ℓ _b + 525	97.1 × ℓ _b + 1370	245.7 × ℓ _b + 1130	211.4 × ℓ _b + 1535	4	
PWI-30	9½"	77.7 × ℓ _b + 809	77.7 × ℓ _b + 809	0.0 × ℓ _b + 1905	0.0 × ℓ _b + 1905	4	1.37
	11⅞"	210.9 × ℓ _b + 576	210.9 × ℓ _b + 576	0.0 × ℓ _b + 1905	0.0 × ℓ _b + 1905	4	
PWI-40	9¼"	0.0 × ℓ _b + 1080	0.0 × ℓ _b + 1080	0.0 × ℓ _b + 2160	0.0 × ℓ _b + 2160	4	2.18
	9½"	22.9 × ℓ _b + 1040	0.0 × ℓ _b + 1120	0.0 × ℓ _b + 2240	0.0 × ℓ _b + 2240	4	
	11⅞"	194.3 × ℓ _b + 740	0.0 × ℓ _b + 1420	291.4 × ℓ _b + 1310	0.0 × ℓ _b + 2840	4	
	14"	200.0 × ℓ _b + 730	0.0 × ℓ _b + 1710	291.4 × ℓ _b + 1310	205.7 × ℓ _b + 2120	4	
	16"	200.0 × ℓ _b + 730	0.0 × ℓ _b + 1970	291.4 × ℓ _b + 1310	257.1 × ℓ _b + 2250	8	
PWI-45	9½"	80.0 × ℓ _b + 840	0.0 × ℓ _b + 1120	0.0 × ℓ _b + 2240	0.0 × ℓ _b + 2240	4	1.93
	11⅞"	245.7 × ℓ _b + 550	0.0 × ℓ _b + 1420	180.0 × ℓ _b + 1620	137.1 × ℓ _b + 2120	4	
	14"	245.7 × ℓ _b + 550	80.0 × ℓ _b + 1430	180.0 × ℓ _b + 1620	240.0 × ℓ _b + 1760	4	
	16"	245.7 × ℓ _b + 550	228.6 × ℓ _b + 1170	180.0 × ℓ _b + 1620	240.0 × ℓ _b + 1760	8	
PWI-47	7⅞"	171.4 × ℓ _b + 565	14.3 × ℓ _b + 1085	222.9 × ℓ _b + 1030	168.6 × ℓ _b + 1535	4	2.18
	9½"	180.0 × ℓ _b + 560	14.3 × ℓ _b + 1220	217.1 × ℓ _b + 1100	162.9 × ℓ _b + 1730	4	
	11⅞"	197.1 × ℓ _b + 540	17.1 × ℓ _b + 1410	208.6 × ℓ _b + 1200	157.1 × ℓ _b + 2005	4	
	14"	208.6 × ℓ _b + 535	20.0 × ℓ _b + 1580	200.0 × ℓ _b + 1295	151.4 × ℓ _b + 2250	4	
	16"	222.9 × ℓ _b + 520	22.9 × ℓ _b + 1740	191.4 × ℓ _b + 1390	145.7 × ℓ _b + 2485	8	
	18"	234.3 × ℓ _b + 510	22.9 × ℓ _b + 1905	182.9 × ℓ _b + 1480	140.0 × ℓ _b + 2720	8	
	20"	248.6 × ℓ _b + 495	25.7 × ℓ _b + 2065	177.1 × ℓ _b + 1560	134.3 × ℓ _b + 2955	10	
PWI-50	9½"	46.9 × ℓ _b + 933	46.9 × ℓ _b + 933	0.0 × ℓ _b + 2040	0.0 × ℓ _b + 2040	4	1.62
	11⅞"	180.0 × ℓ _b + 700	180.0 × ℓ _b + 700	0.0 × ℓ _b + 2040	0.0 × ℓ _b + 2040	4	
	14"	164.6 × ℓ _b + 727	213.7 × ℓ _b + 641	0.0 × ℓ _b + 2040	0.0 × ℓ _b + 2040	4	
	16"	164.6 × ℓ _b + 727	293.7 × ℓ _b + 501	0.0 × ℓ _b + 2040	0.0 × ℓ _b + 2040	8	
PWI-60	9¼"	0.0 × ℓ _b + 1080	0.0 × ℓ _b + 1080	0.0 × ℓ _b + 2160	0.0 × ℓ _b + 2160	4	2.18
	9½"	2.9 × ℓ _b + 1040	0.0 × ℓ _b + 1120	0.0 × ℓ _b + 2240	0.0 × ℓ _b + 2240	4	
	11⅞"	194.3 × ℓ _b + 740	0.0 × ℓ _b + 1420	291.4 × ℓ _b + 1310	0.0 × ℓ _b + 2840	4	
	14"	200.0 × ℓ _b + 730	0.0 × ℓ _b + 1710	291.4 × ℓ _b + 1310	205.7 × ℓ _b + 2120	4	
	16"	200.0 × ℓ _b + 730	0.0 × ℓ _b + 1970	291.4 × ℓ _b + 1310	257.1 × ℓ _b + 2250	8	
PWI-70	11⅞"	148.6 × ℓ _b + 900	0.0 × ℓ _b + 1420	217.1 × ℓ _b + 1700	0.0 × ℓ _b + 2840	4	2.18
	14"	260.0 × ℓ _b + 705	67.4 × ℓ _b + 1474	308.6 × ℓ _b + 1380	154.3 × ℓ _b + 2610	4	
	16"	260.0 × ℓ _b + 705	216.0 × ℓ _b + 1214	308.6 × ℓ _b + 1380	257.1 × ℓ _b + 2250	8	
	18"	260.0 × ℓ _b + 705	246.3 × ℓ _b + 1377	308.6 × ℓ _b + 1380	342.9 × ℓ _b + 2300	8	
	20"	260.0 × ℓ _b + 705	260.0 × ℓ _b + 1353	308.6 × ℓ _b + 1380	342.9 × ℓ _b + 2300	10	
PWI-77 PWI-77w	9½"	82.9 × ℓ _b + 1140	0.0 × ℓ _b + 1430	94.3 × ℓ _b + 2365	0.0 × ℓ _b + 2860	4	2.18
	11⅞"	271.4 × ℓ _b + 810	20.0 × ℓ _b + 1855	260.0 × ℓ _b + 1785	345.7 × ℓ _b + 1820	4	
	14"	271.4 × ℓ _b + 810	134.3 × ℓ _b + 1655	260.0 × ℓ _b + 1785	345.7 × ℓ _b + 1820	4	
	16"	271.4 × ℓ _b + 810	251.4 × ℓ _b + 1450	260.0 × ℓ _b + 1785	345.7 × ℓ _b + 1820	8	
	18"	271.4 × ℓ _b + 810	225.7 × ℓ _b + 1745	260.0 × ℓ _b + 1785	194.3 × ℓ _b + 3090	8	
	20"	271.4 × ℓ _b + 810	291.4 × ℓ _b + 1630	260.0 × ℓ _b + 1785	194.3 × ℓ _b + 3090	10	
	22"	NA	291.4 × ℓ _b + 1880	NA	171.4 × ℓ _b + 3525	10	
PWI-90	24"	NA	291.4 × ℓ _b + 1880	NA	171.4 × ℓ _b + 3525	10	3.37
	9½"	17.1 × ℓ _b + 1370	0.0 × ℓ _b + 1430	0.0 × ℓ _b + 2860	0.0 × ℓ _b + 2860	4	
	11⅞"	285.7 × ℓ _b + 900	14.3 × ℓ _b + 1875	282.9 × ℓ _b + 2365	0.0 × ℓ _b + 3850	4	
	14"	285.7 × ℓ _b + 900	128.6 × ℓ _b + 1675	351.4 × ℓ _b + 2125	225.7 × ℓ _b + 3065	4	
	16"	285.7 × ℓ _b + 900	245.7 × ℓ _b + 1470	351.4 × ℓ _b + 2125	351.4 × ℓ _b + 2625	8	
	18"	285.7 × ℓ _b + 900	220.0 × ℓ _b + 1765	351.4 × ℓ _b + 2125	351.4 × ℓ _b + 3125	8	
	20"	285.7 × ℓ _b + 900	285.7 × ℓ _b + 1650	351.4 × ℓ _b + 2125	351.4 × ℓ _b + 3125	10	
	22"	NA	285.7 × ℓ _b + 1900	NA	351.4 × ℓ _b + 3375	10	
	24"	NA	285.7 × ℓ _b + 1900	NA	351.4 × ℓ _b + 3375	10	

For SI: 1 inch = 25.4 mm, 1 lb = 4.448 N.

- Reaction values are permitted to be adjusted for load duration in accordance with Section 7.3.2 of the NDS, provided the adjusted value is less than or equal to the limiting value calculated in footnote 6 to this table.
- Reference design values reflect dry service conditions, where the moisture content in service is less than 16%, as in most covered structures.
- End reaction capacity [lb]. For $1\frac{3}{4}" \leq \ell_b \leq 3\frac{1}{2}"$, where ℓ_b is the bearing length in inches. See Note 6.
- Intermediate reaction capacity [lb]. For $3\frac{1}{2}" \leq \ell_b \leq 5\frac{1}{4}"$, where ℓ_b is the bearing length in inches. See Note 6.
- Number of web stiffener nails. Refer to Figure 1 for web stiffener and nail dimensions.
- Effective flange width [in]. ER shall not exceed $b_{EFF} \times \ell_b \times F_{c\perp}$ and IR shall not exceed $b_{EFF} \times \ell_b \times F_{c\perp} \times C_b$, where ℓ_b is the bearing length in inches, $F_{c\perp}$ is the reference compression design value perpendicular to grain in pounds per square inch and $C_b = (\ell_b + 0.375) \div \ell_b$. For LVL flanges, $F_{c\perp} = 650$ psi. Do not adjust $F_{c\perp}$ for load duration. Compression of the support surface must also be checked.

TABLE 3—ALLOWABLE RESIDENTIAL FLOOR SPANS – 40 PSF LIVE LOAD AND 10 PSF DEAD LOAD ^(1–7)

Joist Series	Joist Depth	Simple Span				Two or More Continuous Spans			
		12" o.c.	16" o.c.	19.2" o.c.	24" o.c.	12" o.c.	16" o.c.	19.2" o.c.	24" o.c.
PWI-20	9 1/2"	16'-8"	15'-3"	14'-5"	13'-6"	18'-6"	17'-0"	15'-7"	13'-11"
	11 7/8"	19'-11"	18'-3"	17'-3"	16'-0"	22'-3"	19'-6"	17'-10"	15'-8"
	14"	22'-8"	20'-9"	19'-6"	17'-5"	24'-8"	21'-4"	19'-6"	15'-8"
PWI-30	9 1/2"	17'-1"	15'-8"	14'-10"	13'-10"	19'-0"	17'-5"	16'-5"	15'-0"
	11 7/8"	20'-6"	18'-9"	17'-9"	16'-7"	22'-10"	20'-10"	18'-9"	15'-0"
PWI-40	9 1/4"	17'-7"	16'-1"	15'-2"	14'-2"	19'-7"	17'-7"	16'-0"	14'-4"
	9 1/2"	18'-0"	16'-5"	15'-6"	14'-6"	20'-0"	17'-10"	16'-3"	14'-6"
	11 7/8"	21'-5"	19'-7"	18'-6"	16'-8"	23'-7"	20'-4"	18'-7"	16'-7"
	14"	24'-4"	22'-3"	20'-6"	18'-4"	25'-11"	22'-5"	20'-5"	18'-3"
PWI-45	16"	26'-11"	24'-2"	22'-1"	19'-9"	27'-11"	24'-1"	22'-0"	18'-5"
	9 1/2"	18'-0"	16'-5"	15'-6"	14'-6"	20'-0"	18'-3"	17'-3"	16'-1"
	11 7/8"	21'-5"	19'-7"	18'-6"	17'-3"	23'-11"	21'-10"	20'-6"	17'-9"
	14"	24'-4"	22'-3"	21'-0"	19'-5"	27'-2"	24'-7"	22'-3"	17'-9"
PWI-47	16"	27'-0"	24'-8"	23'-4"	19'-5"	30'-2"	26'-4"	22'-3"	17'-9"
	7 7/8"	15'-10"	14'-6"	13'-8"	12'-9"	17'-7"	16'-1"	15'-2"	14'-1"
	9 1/2"	18'-4"	16'-9"	15'-9"	14'-9"	20'-5"	18'-7"	17'-6"	14'-7"
	11 7/8"	21'-8"	19'-10"	18'-8"	17'-5"	24'-2"	22'-0"	19'-0"	15'-2"
PWI-50	14"	24'-6"	22'-5"	21'-2"	17'-10"	27'-4"	23'-8"	19'-8"	15'-8"
	16"	27'-2"	24'-9"	22'-7"	18'-0"	30'-2"	24'-6"	20'-4"	16'-3"
	18"	29'-7"	27'-1"	22'-10"	18'-3"	32'-0"	25'-2"	20'-11"	16'-8"
	20"	32'-1"	27'-9"	23'-1"	18'-5"	33'-8"	25'-11"	21'-6"	17'-2"
PWI-60	9 1/2"	17'-10"	16'-3"	15'-5"	14'-5"	19'-10"	18'-1"	17'-1"	15'-11"
	11 7/8"	21'-4"	19'-6"	18'-5"	17'-2"	23'-9"	21'-8"	20'-2"	16'-1"
	14"	24'-4"	22'-2"	21'-0"	19'-7"	27'-1"	24'-3"	20'-2"	16'-1"
	16"	27'-0"	24'-8"	23'-4"	20'-11"	30'-2"	24'-3"	20'-2"	16'-1"
PWI-70	9 1/4"	18'-7"	16'-11"	16'-0"	14'-11"	20'-8"	18'-10"	17'-9"	16'-6"
	9 1/2"	18'-11"	17'-3"	16'-4"	15'-3"	21'-1"	19'-2"	18'-1"	16'-10"
	11 7/8"	22'-7"	20'-8"	19'-6"	18'-2"	25'-2"	22'-11"	21'-8"	18'-5"
	14"	25'-8"	23'-5"	22'-2"	20'-8"	28'-8"	26'-1"	23'-0"	18'-5"
PWI-77 PWI-77w	16"	28'-6"	26'-0"	24'-7"	21'-5"	31'-10"	27'-8"	23'-0"	18'-5"
	11 7/8"	23'-4"	21'-3"	20'-1"	18'-8"	26'-0"	23'-8"	22'-3"	19'-5"
	14"	26'-5"	24'-2"	22'-4"	21'-3"	29'-6"	26'-10"	24'-4"	19'-5"
	16"	29'-3"	26'-9"	25'-2"	23'-0"	32'-8"	29'-3"	24'-4"	19'-5"
PWI-90	18"	32'-0"	29'-3"	27'-7"	23'-0"	35'-9"	29'-3"	24'-4"	19'-5"
	20"	34'-8"	31'-7"	28'-10"	23'-0"	38'-8"	29'-3"	24'-4"	19'-5"
	9 1/2"	19'-8"	17'-11"	16'-11"	15'-10"	21'-11"	20'-0"	18'-10"	17'-7"
	11 7/8"	23'-5"	21'-4"	20'-2"	18'-10"	26'-1"	23'-9"	22'-5"	20'-11"
PWI-90	14"	26'-7"	24'-3"	22'-11"	21'-4"	29'-8"	27'-0"	25'-6"	21'-4"
	16"	29'-5"	26'-10"	25'-4"	23'-8"	32'-10"	29'-11"	26'-8"	21'-4"
	18"	32'-2"	29'-4"	27'-9"	25'-6"	35'-11"	32'-1"	26'-8"	21'-4"
	20"	34'-10"	31'-10"	30'-0"	25'-6"	38'-11"	32'-1"	26'-8"	21'-4"
PWI-90	22"	37'-5"	34'-2"	32'-3"	30'-1"	41'-10"	38'-2"	35'-1"	31'-5"
	24"	40'-0"	36'-6"	34'-5"	32'-2"	44'-8"	40'-2"	36'-8"	32'-9"
	9 1/2"	22'-2"	20'-2"	19'-0"	17'-8"	24'-8"	22'-5"	21'-1"	19'-8"
	11 7/8"	26'-5"	24'-0"	22'-7"	21'-1"	29'-5"	26'-9"	25'-2"	23'-4"
PWI-90	14"	29'-11"	27'-3"	25'-8"	23'-11"	33'-4"	30'-4"	28'-6"	26'-6"
	16"	33'-1"	30'-2"	28'-5"	26'-5"	36'-11"	33'-7"	31'-7"	26'-7"
	18"	36'-2"	32'-11"	31'-0"	27'-10"	40'-4"	36'-8"	33'-3"	26'-7"
	20"	39'-2"	35'-8"	33'-7"	27'-10"	43'-8"	39'-9"	33'-3"	26'-7"
PWI-90	22"	42'-0"	38'-3"	36'-1"	33'-7"	46'-11"	42'-8"	40'-2"	36'-7"
	24"	44'-10"	40'-10"	38'-6"	35'-10"	50'-1"	45'-6"	42'-10"	36'-7"

For SI: 1 inch = 25.4 mm.

- Table values apply to uniformly loaded, residential floor joists.
- Span is measured from face to face of supports.
- Deflection is limited to L/240 at total load and L/480 at live load.
- Table values are based on sheathing that is glued and nailed to the joists (²³/₃₂" panels for joists at 24" o.c. and ¹⁹/₃₂" panels for joists at 19.2" o.c. and less). Reduce spans by 12" if sheathing is nailed only.
- Provide at least 1 3/4" of bearing length at end supports and 3 1/2" at intermediate supports. Web stiffeners are not required when joists are used at these spans and spacings, except as might be required by joist hanger manufacturers.
- Provide lateral restraint at supports (e.g., blocking panels, rim board) and along the compression flange of each joist (e.g. wood structural panel sheathing, gypsum board ceiling, wood structural panel soffit).
- Use other means to analyze conditions outside the scope of this table (e.g. commercial floors, different bearing conditions, concentrated loads) or for multiple span joists if the length of any span is less than half the length of an adjacent span.

TABLE 4—DUCT HOLES^{1,2,3,4}

Minimum Distance 'D' From Any Support to the Centerline of the Hole (See Figure 2)

Joist Series	Joist Span	Duct Hole Width				
		8"	10"	12"	14"	16"
PWI-20	8 ft.	3'-10"	3'-11"	3'-11"		
	12 ft.	5'-9"	5'-10"	5'-11"		
	16 ft.	7'-8"	7'-10"	7'-11"		
	20 ft.	9'-7"	9'-9"	9'-11"		
	24 ft.	11'-6"	11'-9"	11'-11"		
PWI-30	8 ft.	3'-9"	3'-10"	3'-11"		
	12 ft.	5'-8"	5'-9"	5'-11"		
	16 ft.	7'-7"	7'-8"	7'-10"		
	20 ft.	9'-5"	9'-8"	9'-10"		
	24 ft.	11'-4"	11'-7"	11'-10"		
PWI-40/60	8 ft.	3'-6"	3'-7"	3'-9"	3'-10"	3'-11"
	12 ft.	5'-3"	5'-5"	5'-7"	5'-9"	5'-11"
	16 ft.	7'-0"	7'-3"	7'-6"	7'-8"	7'-10"
	20 ft.	8'-10"	9'-1"	9'-4"	9'-7"	9'-10"
	24 ft.	10'-7"	10'-11"	11'-3"	11'-6"	11'-10"
PWI-45	8 ft.	3'-5"	3'-7"	3'-8"	3'-9"	3'-10"
	12 ft.	5'-2"	5'-4"	5'-6"	5'-8"	5'-10"
	16 ft.	6'-11"	7'-2"	7'-5"	7'-7"	7'-9"
	20 ft.	8'-8"	9'-0"	9'-3"	9'-6"	9'-9"
	24 ft.	10'-5"	10'-9"	11'-1"	11'-4"	11'-8"
PWI-47	8 ft.	3'-9"	3'-10"	3'-11"	(6)	
	12 ft.	5'-7"	5'-9"	5'-11"	(6)	
	16 ft.	7'-6"	7'-8"	7'-10"	(6)	
	20 ft.	9'-4"	9'-7"	9'-10"	(6)	
	24 ft.	11'-3"	11'-6"	11'-10"	(6)	
PWI-50	8 ft.	3'-8"	3'-9"	3'-10"	3'-11"	
	12 ft.	5'-6"	5'-7"	5'-9"	5'-11"	
	16 ft.	7'-4"	7'-6"	7'-9"	7'-11"	
	20 ft.	9'-2"	9'-5"	9'-8"	9'-11"	
	24 ft.	11'-0"	11'-3"	11'-7"	11'-11"	
PWI-70	8 ft.	3'-7"	3'-8"	3'-9"	3'-10"	(6)
	12 ft.	5'-5"	5'-6"	5'-8"	5'-10"	(6)
	16 ft.	7'-2"	7'-5"	7'-7"	7'-9"	(6)
	20 ft.	9'-0"	9'-3"	9'-6"	9'-9"	(6)
	24 ft.	10'-10"	11'-1"	11'-5"	11'-8"	(6)
PWI-77/77w depth ≤ 20" ⁽⁵⁾	8 ft.	3'-8"	3'-9"	3'-11"	3'-11"	(6)
	12 ft.	5'-7"	5'-8"	5'-10"	5'-11"	(6)
	16 ft.	7'-5"	7'-7"	7'-10"	7'-11"	(6)
	20 ft.	9'-4"	9'-6"	9'-9"	9'-11"	(6)
	24 ft.	11'-2"	11'-5"	11'-9"	11'-11"	(6)
PWI-90 depth ≤ 20" ⁽⁵⁾	8 ft.	3'-8"	3'-9"	3'-10"	3'-11"	(6)
	12 ft.	5'-7"	5'-8"	5'-10"	5'-11"	(6)
	16 ft.	7'-5"	7'-7"	7'-9"	7'-11"	(6)
	20 ft.	9'-4"	9'-6"	9'-8"	9'-11"	(6)
	24 ft.	11'-2"	11'-5"	11'-8"	11'-10"	(6)

For SI: 1 inch = 25.4 mm.

- Table values apply to joists sized by means of Table 3.
- Web holes may be located anywhere between the joist flanges. Leave at least $\frac{1}{8}$ inch clearance between the edges of holes and the flanges.
- Do not cut rectangular holes, or round holes larger than $1\frac{1}{2}$ inches in diameter, in cantilevers.
- The horizontal clearance between the edges of adjacent holes must be at least twice the diameter (or longest side) of the larger hole. Exception: A $1\frac{1}{2}$ -inch diameter hole may be drilled anywhere in the web. Provide at least 3 inches of horizontal clearance from adjacent holes of any size.
- For depths $\geq 22"$, refer to the engineered design recommendations in Section 4.3.
- Refer to the engineered design recommendations in Section 4.3

TABLE 5—ROUND AND RECTANGULAR HOLES⁽¹⁻⁴⁾

Minimum Distance 'D' From Any Support to the Centerline of the Hole (See Figure 2)

Round Hole Diameter			2"	3"	4"	5"	6"	6 1/4"	8 5/8"	10"	10 3/4"	12"	12 3/4"	14 3/4"	16 3/4"
Rectangular Hole Side			1 1/2"	2 1/4"	3"	3 3/4"	4 1/2"	4 1/2"	6 1/4"	7 1/2"	8"	9"	9 1/2"	11"	12 1/2"
7 7/8" Joist	Span	8 ft.	1'-3"	1'-11"	2'-7"										
		12 ft.	1'-10"	2'-10"	3'-11"										
		16 ft.	2'-5"	3'-10"	5'-3"										
9 1/4" Joist	Span	8 ft.	1'-1"	1'-4"	2'-0"	2'-8"	3'-3"								
		12 ft.	1'-1"	2'-0"	3'-0"	3'-11"	4'-11"								
		16 ft.	1'-5"	2'-8"	4'-0"	5'-3"	6'-7"								
9 1/2" Joist	Span	8 ft.	1'-1"	1'-7"	2'-1"	2'-8"	3'-2"	3'-4"							
		12 ft.	1'-7"	2'-4"	3'-2"	3'-11"	4'-9"	5'-0"							
		16 ft.	2'-1"	3'-2"	4'-3"	5'-3"	6'-4"	6'-8"							
11 7/8" Joist	Span	8 ft.	1'-1"	1'-2"	1'-2"	1'-8"	2'-2"	2'-3"	3'-6"						
		12 ft.	1'-1"	1'-2"	1'-10"	2'-6"	3'-3"	3'-5"	5'-3"						
		16 ft.	1'-1"	1'-5"	2'-5"	3'-4"	4'-4"	4'-7"	7'-0"						
		20 ft.	1'-1"	1'-9"	3'-0"	4'-2"	5'-5"	5'-8"	8'-10"						
14" Joist	Span	8 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-5"	1'-6"	2'-7"	3'-2"	3'-8"				
		12 ft.	1'-1"	1'-2"	1'-2"	1'-5"	2'-1"	2'-3"	3'-10"	4'-10"	5'-5"				
		16 ft.	1'-1"	1'-2"	1'-2"	1'-10"	2'-9"	3'-0"	5'-2"	6'-5"	7'-3"				
		20 ft.	1'-1"	1'-2"	1'-2"	2'-4"	3'-5"	3'-9"	6'-5"	8'-0"	9'-1"				
16" Joist	Span	8 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	1'-10"	2'-5"	2'-9"	3'-4"	3'-9"		
		12 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	2'-8"	3'-7"	4'-1"	5'-0"	5'-7"		
		16 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-4"	1'-6"	3'-7"	4'-9"	5'-5"	6'-7"	7'-5"		
		20 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-8"	1'-11"	4'-6"	6'-0"	6'-10"	8'-3"	9'-4"		
		24 ft.	1'-1"	1'-2"	1'-2"	1'-3"	2'-0"	2'-4"	5'-5"	7'-2"	8'-2"	9'-11"	11'-2"		
18" Joist	Span	8 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	1'-4"	1'-8"	1'-11"	2'-6"	2'-10"	3'-10"	
		12 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	1'-7"	2'-6"	2'-11"	3'-9"	4'-2"	5'-9"	
		16 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	2'-2"	3'-3"	3'-11"	5'-0"	5'-7"	7'-7"	
		20 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	2'-8"	4'-1"	4'-11"	6'-2"	7'-0"	9'-6"	
		24 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	3'-2"	4'-11"	5'-10"	7'-5"	8'-5"	11'-5"	
20" Joist	Span	8 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	1'-4"	1'-5"	1'-5"	1'-9"	2'-0"	2'-10"	3'-11"
		12 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	1'-4"	1'-5"	1'-10"	2'-7"	3'-1"	4'-3"	5'-10"
		16 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	1'-4"	1'-10"	2'-5"	3'-6"	4'-1"	5'-9"	7'-9"
		20 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	1'-4"	2'-3"	3'-1"	4'-4"	5'-1"	7'-2"	9'-9"
		24 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	1'-4"	2'-9"	3'-8"	5'-2"	6'-1"	8'-7"	11'-8"
22" Joist	Span	8 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	1'-4"	1'-8"	1'-10"	2'-3"	2'-5"	3'-0"	3'-6"
		12 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	1'-11"	2'-6"	2'-10"	3'-4"	3'-8"	4'-6"	5'-4"
		16 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	2'-7"	3'-4"	3'-9"	4'-5"	4'-10"	6'-0"	7'-1"
		20 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-5"	1'-7"	3'-2"	4'-2"	4'-8"	5'-7"	6'-1"	7'-6"	8'-10"
		24 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-8"	1'-10"	3'-10"	5'-0"	5'-7"	6'-8"	7'-3"	8'-11"	10'-7"
24" Joist	Span	8 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	1'-4"	1'-5"	1'-6"	1'-10"	2'-0"	2'-7"	3'-1"
		12 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	1'-4"	1'-11"	2'-3"	2'-9"	3'-0"	3'-10"	4'-7"
		16 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	1'-10"	2'-7"	3'-0"	3'-8"	4'-0"	5'-1"	6'-2"
		20 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	2'-3"	3'-2"	3'-8"	4'-6"	5'-0"	6'-4"	7'-8"
		24 ft.	1'-1"	1'-2"	1'-2"	1'-3"	1'-3"	1'-3"	2'-9"	3'-10"	4'-5"	5'-5"	6'-0"	7'-8"	9'-3"

For SI: 1 inch = 25.4 mm.

- Table values apply to joists sized by means of Table 3.
- Web holes may be located anywhere between the joist flanges. Leave at least 1/8 inch clearance between the edges of holes and the flanges.
- Do not cut rectangular holes, or round holes larger than 1 1/2 inches in diameter, in cantilevers.
- The horizontal clearance between the edges of adjacent holes must be at least twice the diameter (or longest side) of the larger hole. Exception: A 1 1/2-inch diameter hole may be drilled anywhere in the web. Provide at least 3 inches of horizontal clearance from adjacent holes of any size.

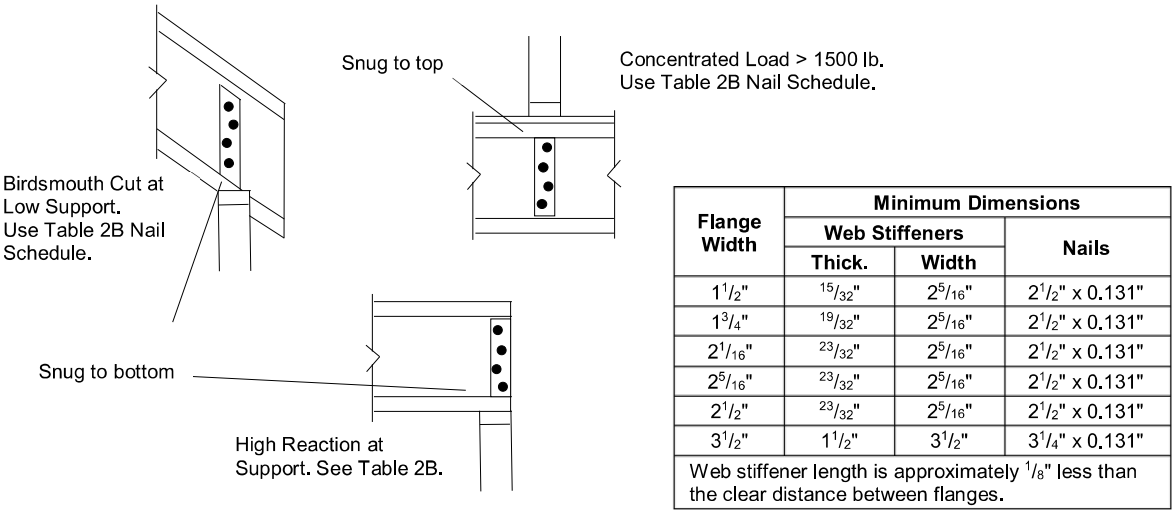


FIGURE 1

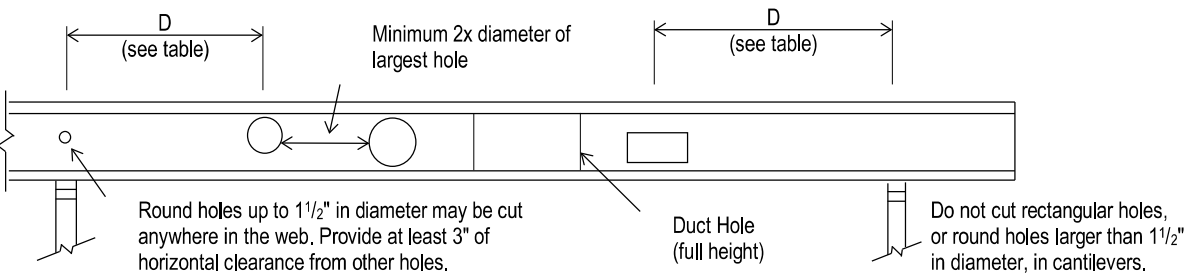


FIGURE 2

DISCLAIMER

APA Product Report® is a trademark of APA – The Engineered Wood Association, Tacoma, Washington. ICC-ES Evaluation Report is a trademark of ICC Evaluation Service, LLC (ICC-ES). The information contained herein is based on the product evaluation in accordance with the references noted in this report. Neither ICC-ES, nor APA or its members make any warranty, expressed or implied, or assume any legal liability or responsibility for the use, application of, and/or reference to opinions, findings, conclusions, or recommendations included in this report. The joint ICC-ES/APA Evaluation Reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. Consult the local jurisdiction or design professional to assure compliance with code, construction, and performance requirements. Because neither APA, nor ICC-ES, has any control over quality of workmanship or the conditions under which engineered wood products are used, it cannot accept responsibility for product performance or designs as actually constructed.

ICC-ES Evaluation Report

ESR-1225 LABC and LARC Supplement

Issued September 2020

Revised May 2021

This report is subject to renewal October 2021.

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A Subsidiary of the International Code Council®

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

REPORT HOLDER:

PACIFIC WOODTECH CORPORATION

EVALUATION SUBJECT:

PWI JOISTS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that PWI joists, described in ICC-ES evaluation report [ESR-1225](#), have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2020 *City of Los Angeles Building Code* (LABC)
- 2020 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The PWI joists, described in Sections 2.0 through 7.0 of the evaluation report [ESR-1225](#), comply with the LABC Chapter 23, and the LARC, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The PWI joists described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-1225](#).
- The design, installation, conditions of use and identification are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-1225](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- Flanges must not be subjected to dynamic or static outward forces which may tend to separate the flanges from the web. Bottom flanges must not support load exceeding 250 pounds on each side of flange at 5 feet on center or 100 pounds per linear foot.

This evaluation report supplement expires concurrently with the evaluation report ESR-1225, reissued October 2019 and revised May 2021.

Joint Evaluation Report

ESR-1251

Reissued April 2021

This report is subject to renewal April 2023.

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A Subsidiary of the International Code Council®

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES

Section: 06 17 33—Wood I-joists

REPORT HOLDER:

ROSEBURG FOREST PRODUCTS CO.

EVALUATION SUBJECT:

RFPI® PREFABRICATED WOOD I-JOISTS: RFPI® 20 SERIES, RFPI® 25 SERIES, RFPI® 30 SERIES, RFPI® 40 SERIES, RFPI® 400 SERIES, RFPI® 45 SERIES, RFPI® 50 SERIES, RFPI® 70 SERIES, RFPI® 90 SERIES, RFPI® 40S SERIES, RFPI® 60S SERIES, RFPI® 80S SERIES, RFPI® 700 SERIES AND RFPI® 900 SERIES

ADDITIONAL LISTEE:

BLUELINX CORPORATION

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2018, 2015, 2012, 2009 and 2006 *International Building Code®* (IBC)
- 2018, 2015, 2012, 2009 and 2006 *International Residential Code®* (IRC)

For evaluation for compliance with codes adopted by the California Office of Statewide Health Planning and Development (OSHPD) and Division of the State Architect (DSA), see [ESR-1251 CBC and CRC Supplement](#).

For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see [ESR-1251 LABC and LARC Supplement](#).

Property evaluated:

Structural

1.2 Evaluation to the following green code(s) and/or standards:

- 2019 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2020, 2015, 2012 and 2008 ICC 700 *National Green Building Standard™* (ICC 700-2020, ICC 700-2015, ICC 700-2012 and ICC 700-2008)

Attributes verified:

See Section 3.1

2.0 USES

RFPI® Prefabricated Wood I-Joists are used as floor joists, roof rafters, rim joists and blocking panels to support code-required loads.

3.0 DESCRIPTION

3.1 General:

The pre-fabricated wood I-joists described in this report comply with the requirements of the codes specifically referenced in Section 1.0 of this report, and are manufactured in accordance with the requirements of ASTM D5055.

RFPI® Prefabricated Wood I-Joists consist of laminated veneer lumber (LVL) flanges or solid sawn lumber flanges and oriented strand board (OSB) webs fabricated to form an I-shaped cross section. Top and bottom flanges are placed to create a constant-depth joist. For all RFPI®-joists, the web sections are installed with the face grain (strong axis) perpendicular to the long axis of the I-joist. The web-to-flange joint is made by inserting the web into a groove in the center of the face of the flange member.

The attributes of the wood joists have been verified as conforming to the provisions of (i) CALGreen Sections A4.404.3 for efficient framing techniques; (ii) ICC 700-2020 Sections 608.1(2), 11.608.1(2) and 13.104.1(4); (iii) ICC 700-2015 and ICC 700-2012 Sections 608.1(2), 11.608.1(2) and 12(A).608.1 for resource-efficient materials; and (iv) ICC 700-2008 Section 607.1(2) for resource-efficient materials. Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance.

3.2 Material:

3.2.1 LVL Flanges: Laminated veneer lumber (LVL) flange material is manufactured by Roseburg Forest Products in accordance with the Roseburg Forest Products I-Joist Quality Control Manual. Flange dimensions are as shown in Table 3.

3.2.2 Solid Sawn Lumber Flanges: Solid sawn lumber flange material for the RFPI® 40S, RFPI® 60S, and RFPI® 80S is manufactured from lumber that meets the requirements noted in the Roseburg Forest Products quality control manual. The lumber is finger jointed and re-graded to the required specifications documented in the quality control manual. Flange dimensions are as shown in Table 3.

3.2.3 Webs: Webs are $\frac{3}{8}$ - or $\frac{7}{16}$ -inch-thick (9.5 or 11.1 mm) OSB Exposure 1 with a span rating of 24/0, conforming to U.S. Product Standard PS 2.

3.2.4 Adhesives: Adhesives used in the I-joist manufacturing process conform to the requirements of

ASTM D2559, are tested in accordance with ASTM D7247 and meet the heat durability requirements of ASTM D5055.

4.0 DESIGN AND INSTALLATION

Installation of RFPI® Prefabricated Wood 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.

4.1 General:

Reference design values are as indicated in Tables 1 and 2 of this report. Available joist dimensions are as indicated in Table 3 of this report. Allowable floor spans are as indicated in Table 4 of this report. Joist webs contain prefabricated 1½-inch-diameter (38 mm) knockouts, 16 inches (406 mm) on center, located approximately 2 inches (51 mm) from one flange. Round holes are permitted in the webs of the I-joist in accordance with Table 5 of this report. When web stiffeners are required, installation details must comply with Table 6 and Figure 1 of this report. Minimum bearing length for simple spans of joists must be 1¾ inches (44mm). Minimum bearing length at intermediate support points for multiple-span I-joists must be 3½ inches (89 mm) When I-joists are used as simple-span members, the design shear must be equal to the end reaction.

4.2 Repetitive Member Factor:

Moment capacity of the I-joist must not be increased by any repetitive member factor ($C_r = 1.0$).

4.3 Lateral Support:

The compression flange of the I-joist must be laterally supported throughout its length to prevent lateral displacement (e.g. through attachment to wood structural panel sheathing, gypsum board sheathing, wood structural panel soffit). Joist ends must be restrained to prevent rollover, as by diaphragm sheathing attached to the top flange and to an end wall or shear transfer panel, or blocking or cross-bracing capable of transferring the larger of 50 pounds per foot (730 N/m) or the required shear force due to wind, seismic or soil conditions. Code-recognized methods specified for solid-sawn lumber are acceptable. Bridging is not required in RFPI® floor and roof joist applications.

4.4 Duration of Load:

Adjustments for duration of load provided for wood members and their connections must be in accordance with the applicable code.

4.5 In-service Moisture Conditions:

RFPI® I-joist properties and allowable loads in this report are limited to covered installations with dry conditions of use. Dry conditions of use are those environmental conditions represented by sawn lumber in which the moisture content is less than 16 percent.

4.6 Deflection:

Deflection of the joists under design load based on deflection due to bending and shear stresses related to strength-of-material principles must be calculated using the following formulas:

For simple span with concentrated load at mid-span:

$$D = PL^3/48EI + 2PL/K$$

For simple span with uniformly distributed load:

$$D = 5WL^4/384EI + WL^2/K$$

where:

D = Deflection (inch) at mid-span

W = Uniform load (lbf/inch)

L = On-center span (inch)

K = Shear deflection coefficient from Table 1 of this report (inch-lbf/inch)

EI = Value from Table 1 of this report (lbf-in.²)

P = Concentrated load (lbf)

4.7 Fasteners:

The allowable withdrawal and lateral loads for nails installed perpendicular or parallel to the wide face of the LVL flange are the same as those provided in the applicable code for sawn lumber having a minimum specific gravity of 0.50, such as Douglas fir-larch.

The allowable withdrawal and lateral loads for nails installed perpendicular or parallel to the wide face of the solid sawn flange are to be based on values provided in the applicable code for lumber with a minimum specific gravity of 0.42 for the RFPI® 40S series and 0.46 for RFPI® 60S and 80S series. See Table 7 for adjustments to and limitations on the allowable lateral design values of RFPI®-Joists when used as framing members in horizontal wood diaphragms.

When used in the horizontal wood diaphragm design, fasteners shall be spaced in accordance with Table 7 for each joist series.

4.8 Diaphragms: Roseburg RFPI® Prefabricated Wood I-Joists may be used in the construction of horizontal wood diaphragms to resist wind and seismic loads in accordance with the allowable shear loads of Table 7 and applicable footnotes.

4.9 Rim Joists and Blocking Panels: Roseburg RFPI®-Joists may be used as the boundary members (rim joists) for diaphragm applications provided in Table 7 and as rim joists to transfer the uniform vertical and lateral loads provided in Table 7 for each joist series. The vertical load capacity values for each series are applicable to Roseburg RFPI®-Joists used as blocking panels.

4.10 One-hour Fire-resistance-rated Floor-ceiling Assemblies:

4.10.1 Assembly 1: The I-joists described in this report, with minimum flange size of 1½ by 2½ inches (38 by 64 mm), may be used in the assembly as described in Section 4.2.2.1 of [ESR-1405](#).

4.10.2 Assembly 2: The I-joists described in this report may be used in the appropriate assembly as described in Section 4.2.2.3 of [ESR-1405](#).

4.10.3 Assembly 3: The I-joists described in this report may be used in the appropriate assembly as described in Section 4.2.2.4 of [ESR-1405](#).

4.10.4 Other Assemblies: The I-joists described in this report may be used in the assemblies described in 2018, 2015 and 2012 IBC Table 721.1(3) and 2009 IBC Table 720.1(3), Item Numbers 21-1.1, 23-1.1 through 28-1.1 and Item Number 30-1.1 (2018 and 2015 IBC only); and in 2006 IBC Table 720.1(3), Item Numbers 21-1.1, 23-1.1 and 25-1.1 through 29-1.1; provided the I-joists used meet the required criteria as described in the tabulated "Floor or Roof Construction" column. For the purposes of the minimum flange area requirement of 2.3 square inches (1480 mm²) in Item Number 23-1.1, a 1½-by-1½ flange having a cross sectional area of 2.25 square inches (1450 mm²) may be considered sufficient.

4.11 Fire Protection of Floors:

Roseburg RFPI®-Joists may be used in the fire protection assemblies described in Section 4.3 of ICC-ES evaluation report [ESR-1405](#), to meet the provisions of 2018 and 2015 IRC Section R302.13, and 2012 IRC Section R501.3.

5.0 CONDITIONS OF USE

The RFPI® Prefabricated Wood 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. Allowable design properties, loads and spans for the I-joists must not exceed the values shown in Tables 1, 2 and 4 of this report.
- 5.2 Design calculations and details for specific applications, demonstrating that RFPI® Prefabricated Wood 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. Where applicable, Table 4 of this report is intended to provide alternatives to the design calculations for member size, span, spacing and deflection.
- 5.3 Flanges must not be cut and round holes in the webs must conform to the requirements as stated in this report. (See Table 5 of this report.)
- 5.4 RFPI® Prefabricated Wood I-Joists are produced in Riddle, Oregon, under a quality-control program with inspections by ICC-ES and 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 June 2019.

Data in accordance with ICC-ES Acceptance Criteria for Rim Board Products (AC124), dated June 2019 (editorially revised February 2020)

7.0 IDENTIFICATION

7.1 The RFPI® Prefabricated Wood I-Joists described in this report are identified by a label bearing the manufacturer's name (Roseburg Forest Products Co.) and/or trademark (see Figure 2), the plant location, the product type, the name of the inspection agency (APA—The Engineered Wood Association) and the evaluation report number (ESR-1251).

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

ROSEBURG FOREST PRODUCTS CO.
3660 GATEWAY STREET
SPRINGFIELD, OREGON 97477
(800) 245-1115
www.roseburg.com

7.3 The Additional Listee's contact information is the following:

BLUELINX CORPORATION
1950 SPECTRUM CIRCLE
MARIETTA, GEORGIA 30067

TABLE 1—REFERENCE DESIGN VALUES FOR RFPI JOISTS^{1,2}

LVL FLANGE JOIST SERIES [depth (in.) - series]	I-JOIST WEIGHT (plf)	STIFFNESS, EI (10 ⁶ lbf-in. ²)	MOMENT, M _r ³ (lbf-ft)	SHEAR, V _r (lbf)	SHEAR DEFL. COEFF., K (10 ⁶ lbf)	VERTICAL LOAD CAPACITY ^{4,5} (plf)
9½ RFPI® - 20	2.0	165	2820	1220	4.94	2000
9½ RFPI® - 25	1.7	156	2980	1120	4.94	2000
9½ RFPI® - 30	1.7	161	3225	1120	4.94	2000
9½ RFPI® - 400	2.3	193	3345	1220	4.94	2000
9½ RFPI® - 40	2.4	215	3760	1330	4.94	2000
9½ RFPI® - 45	2.3	235	4690	1120	4.94	2000
9½ RFPI® - 50	1.9	186	3800	1120	4.94	2000
9½ RFPI® - 70	2.6	266	5130	1330	4.94	2000
9½ RFPI® - 90	3.7	398	7830	1890	4.94	2000
11⅞ RFPI® - 20	2.3	283	3640	1420	6.18	2000
11⅞ RFPI® - 25	2.0	270	3860	1420	6.18	2000
11⅞ RFPI® - 30	2.0	280	4170	1420	6.18	2000
11⅞ RFPI® - 400	2.6	330	4315	1480	6.18	2000
11⅞ RFPI® - 40	2.7	366	4855	1550	6.18	2000
11⅞ RFPI® - 45	2.6	400	6075	1420	6.18	2000
11⅞ RFPI® - 50	2.2	322	4915	1420	6.18	2000
11⅞ RFPI® - 70	2.9	455	6645	1550	6.18	2000
11⅞ RFPI® - 90	3.8	676	10145	2050	6.18	2000
14 RFPI® - 20	2.5	420	4330	1610	7.28	2000
14 RFPI® - 400	2.8	486	5140	1710	7.28	2000
14 RFPI® - 40	3.0	540	5785	1770	7.28	2000
14 RFPI® - 45	2.8	592	7245	1710	7.28	2000
14 RFPI® - 50	2.4	480	5860	1710	7.28	2000
14 RFPI® - 70	3.1	672	7925	1770	7.28	2000
14 RFPI® - 90	4.2	992	12100	2195	7.28	2000
16 RFPI® - 400	3.0	665	5880	1970	8.32	2000
16 RFPI® - 40	3.1	737	6615	1970	8.32	2000
16 RFPI® - 45	3.0	810	8300	1970	8.32	2000
16 RFPI® - 50	2.6	663	6715	1970	8.32	2000
16 RFPI® - 70	3.4	918	9080	1970	8.32	2000
16 RFPI® - 90	4.4	1350	13865	2330	8.32	2000
18 RFPI®-700	3.9	1245	10450	2575	11.34	2200
18 RFPI®-900	4.8	1849	16080	2885	11.34	2200
20 RFPI®-700	4.1	1579	11600	2740	12.60	2200
20 RFPI®-900	5.2	2337	17855	2945	12.60	2200
22 RFPI®-700	4.4	1955	12740	2935	13.86	1800
22 RFPI®-900	5.5	2886	19615	3010	13.86	1800
24 RFPI®-700	4.6	2375	13870	3060	15.12	1750
24 RFPI®-900	5.7	3496	21355	3060	15.12	1750
SOLID SAWN FLANGE JOIST SERIES [depth (in.) - series]	I-JOIST WEIGHT (plf)	STIFFNESS, EI (10 ⁶ lbf-in. ²)	MOMENT, M_r³ (lbf-ft)	SHEAR, V_r (lbf)	SHEAR DEFL. COEFF., K (10 ⁶ lbf)	VERTICAL LOAD CAPACITY⁴ (plf)
9½ RFPI® - 40S	2.6	193	2735	1120	4.94	2000
9½ RFPI® - 60S	2.6	231	3780	1120	4.94	2000
11⅞ RFPI® - 40S	2.8	330	3545	1420	6.18	2000
11⅞ RFPI® - 60S	2.8	396	4900	1420	6.18	2000
11⅞ RFPI® - 80S	3.8	547	6970	1590	6.18	2000
14 RFPI® - 40S	3.1	482	4270	1710	7.28	2000
14 RFPI® - 60S	3.1	584	5895	1710	7.28	2000
14 RFPI® - 80S	4.0	802	8390	1835	7.28	2000
16 RFPI® - 40S	3.3	657	4950	1970	8.32	2000
16 RFPI® - 60S	3.3	799	6835	1970	8.32	2000
16 RFPI® - 80S	4.3	1092	9730	2070	8.32	2000

For SI: 1 in. = 25.4 mm; 1 ft = 304.8 mm; 1 lbf = 4.4 N.

¹ Reference design values must be adjusted in accordance with Section 7.3 of the NDS.² Refer to Table 2a for reference design reactions and required use of web stiffeners. Adjusted design reactions must not exceed the flange bearing capacities given in Table 2b.³ Moment capacity of the I-joist must not be increased by any repetitive member use factor.⁴ Vertical load capacity of I-joist rim joist or I-joist blocking panel when continuously supported.⁵ Use of RFPI I-Joists for which vertical load capacity is less than 2000 plf is limited to engineered construction.

TABLE 2A—REFERENCE DESIGN REACTION VALUES, R_n , FOR RFPI JOISTS^{1,2}

LVL FLANGE JOIST SERIES [depth (in.) – series]	END REACTION (lb _f)						INTERMEDIATE REACTION (lb _f)				Web Stiff. Nails ⁴
	1¾ in. Brg. Length		3½ in. Brg. Length		4 in. Brg. Length ³		3½ in. Brg. Length		5¼ in. Brg. Length		
	Web Stiffeners		Web Stiffeners		Web Stiffeners		Web Stiffeners		Web Stiffeners		
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	
9½ RFPI®-20	910	1150	1150	1200	1220	1220	1775	1875	2000	2300	4-8d
9½ RFPI®-25	830	-	1055	-	1120	-	1700	-	-	-	-
9½ RFPI®-30	945	-	1080	-	1120	-	1905	-	-	-	-
9½ RFPI®-400	1025	1220	1175	1220	1220	1220	2150	2250	2300	2440	4-8d
9½ RFPI®-40	1080	1220	1270	1305	1330	1330	2250	2500	2550	2650	4-8d
9½ RFPI®-45	1080	-	1110	-	1120	-	2160	-	-	-	-
9½ RFPI®-50	1015	-	1070	-	1120	-	2040	-	-	-	-
9½ RFPI®-70	1120	1330	1280	1330	1330	1330	2335	2500	2550	2650	4-8d
9½ RFPI®-90	1330	1585	1615	1820	1700	1890	3020	3445	3445	3475	4-10d
11⅞ RFPI®-20	950	1225	1315	1375	1420	1420	1935	2035	2135	2435	4-8d
11⅞ RFPI®-25	830	-	1290	-	1420	-	1700	-	-	-	-
11⅞RFPI®-30	945	-	1310	-	1420	-	1905	-	-	-	-
11⅞ RFPI®-400	1050	1265	1380	1430	1480	1480	2250	2350	2350	2650	4-8d
11⅞ RFPI®-40	1200	1400	1470	1515	1550	1550	2500	2625	2660	2870	4-8d
11⅞ RFPI®-45	1200	-	1370	-	1420	-	2500	-	-	-	-
11⅞ RFPI®-50	1015	-	1230	-	1420	-	2040	-	-	-	-
11⅞RFPI®-70	1200	1470	1470	1530	1550	1550	2500	2625	2660	2870	4-8d
11⅞RFPI®-90	1400	1745	1775	1980	1885	2050	3355	3475	3475	3675	4-10d
14 RFPI®-20	950	1290	1415	1535	1550	1610	1935	2035	2135	2435	4-8d
14 RFPI®-400	1050	1305	1435	1620	1550	1710	2250	2350	2350	2650	4-8d
14 RFPI®-40	1200	1560	1470	1720	1550	1770	2500	2740	2755	3065	4-8d
14 RFPI®-45	1200	-	1550	1,595	1550	1710	2500	-	-	-	-
14 RFPI®-50	1015	-	1390	1390	1550 ³	1710 ³	2040	-	-	-	-
14 RFPI®-70	1200	1590	1470	1730	1550	1770	2500	2740	2755	3065	4-8d
14 RFPI®-90	1400	1885	1775	2125	1885	2195	3355	3500	3500	3850	4-10d
16 RFPI®-400	1050	1340	1435	1830	1550	1970	2250	2350	2350	2650	4-8d
16 RFPI®-40	1200	1710	1470	1910	1550	1970	2500	2850	2850	3250	4-8d
16 RFPI®-45	1200	-	1550	1800	1550	1970	2500	-	-	-	-
16 RFPI®-50	1015	-	1530	1530	1550 ³	1970 ³	2040	-	-	-	-
16 RFPI®-70	1200	1710	1470	1910	1550	1970	2500	2850	2850	3250	4-8d
16 RFPI®-90	1400	2025	1775	2260	1885	2330	3355	3525	3525	4025	4-10d
18 RFPI®-700	1125	2200	1650	2575	1800	2575	2745	4050	3025	4475	8-8d
18 RFPI®-900	1475	2570	1765	2885	1850	2885	3000	5110	3475	5710	8-16d
20 RFPI®-700	1090	2300	1585	2740	1725	2740	2745	4050	3025	4475	8-8d
20 RFPI®-900	1350	2665	1700	2945	1800	2945	3000	5110	3475	5710	8-16d
22 RFPI®-700	N.A.	2400	N.A.	2935	N.A.	2935	N.A.	4150	N.A.	4605	10-8d
22 RFPI®-900	N.A.	2755	N.A.	3010	N.A.	3010	N.A.	5405	N.A.	6020	10-16d
24 RFPI®-700	N.A.	2500	N.A.	3060	N.A.	3060	N.A.	4150	N.A.	4605	10-8d
24 RFPI®-900	N.A.	2850	N.A.	3060	N.A.	3060	N.A.	5405	N.A.	6020	10-16d

SOLID SAWN FLANGE JOIST SERIES [depth (in.) – series]	END REACTION (lb _f)						INTERMEDIATE REACTION (lb _f)				Web Stiff. Nails ⁴
	1¾ in. Brg. Length		3½ in. Brg. Length		4 in. Brg. Length		3½ in. Brg. Length		5¼ in. Brg. Length		
	Web Stiffeners		Web Stiffeners		Web Stiffeners		Web Stiffeners		Web Stiffeners		
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	
9½ RFPI®-40S	1080	1120	1110	1120	1120	1120	2160	2240	2240	2240	4-8d
9½ RFPI®-60S	1080	1120	1110	1120	1120	1120	2160	2240	2240	2240	4-8d
11⅞ RFPI®-40S	1200	1340	1370	1400	1420	1420	2500	2625	2660	2840	4-8d
11⅞ RFPI®-60S	1200	1340	1370	1400	1420	1420	2500	2625	2660	2840	4-8d
11⅞ RFPI®-80S	1280	1590	1490	1590	1550	1590	2810	3180	3100	3180	4-10d
14 RFPI®-40S	1200	1530	1470	1670	1550	1710	2500	2740	2755	3050	4-8d
14 RFPI®-60S	1200	1530	1470	1670	1550	1710	2500	2740	2755	3050	4-8d
14 RFPI®-80S	1280	1750	1490	1815	1550	1835	3020	3360	3210	3600	4-10d
16 RFPI®-40S	1200	1710	1470	1910	1550	1970	2500	2850	2850	3250	4-8d
16 RFPI®-60S	1200	1710	1470	1910	1550	1970	2500	2850	2850	3250	4-8d
16 RFP®-80S	1280	1900	1490	2030	1550	2070	3020	3525	3310	4000	4-10d

For SI: 1 in. = 25.4 mm; 1 lb_f = 4.4 N.¹Reference design reaction values must be adjusted in accordance with Section 7.3 of the NDS; however, adjusted design values must not exceed the allowable flange bearing capacities based on compression perpendicular-to-grain, as given in Table 2b.²Tabulated values may be interpolated for bearing lengths between those given.³The values in these columns require a minimum bearing length of 5 inches for the 14- and 16-inch-deep RFPI® 50.⁴Number of nails required for web stiffeners (where web stiffeners are required). Web stiffeners must be installed in accordance with Table 6, Figure 1, and the recommendations provided by the manufacturer.

TABLE 2B—ALLOWABLE FLANGE BEARING CAPACITIES BASED ON COMPRESSION PERPENDICULAR-TO-GRAIN^{1,2,3}

Depth	Joist Designation	END REACTION (lbf)			INTERMEDIATE REACTION (lbf)	
		1 ³ / ₄ in. Brg. Length	3 ¹ / ₂ in. Brg. Length	4 in. Brg. Length	3 ¹ / ₂ in. Brg. Length	5 ¹ / ₄ in. Brg. Length
All Depths in each Series	RFPI®-20	1,835	3,675	4,205	4,070	5,910
	RFPI®-25	1,555	3,110	3,555	3,440	4,995
	RFPI®-30	1,555	3,110	5,015	3,440	4,995
	RFPI®-400	2,195	4,390	5,665	4,860	7,055
	RFPI®-40	2,475	4,955	5,665	5,490	7,970
	RFPI®-45	2,475	4,955	4,205	5,490	7,970
	RFPI®-50	1,835	3,675	5,665	4,070	5,910
	RFPI®-70	2,475	4,955	8,755	5,490	7,970
	RFPI®-90	3,830	7,660	4,020	8,480	12,310
	RFPI®-40S	1,760	3,520	4,970	3,895	5,655
	RFPI®-60S	2,175	4,350	7,070	4,815	6,990
	RFPI®-80S	3,090	6,185	7,070	6,850	9,940
	RFPI®-700	2,475	4,955	5,665	5,490	7,970
	RFPI®-900	3,830	7,660	8,755	8,480	12,310

For **SI**: 1 in. = 25.4 mm; 1 lbf = 4.4 N.

¹Adjusted design reaction values for RFPI I-joists must be determined in accordance with Table 2a (previous page), but must not exceed the allowable flange bearing capacities given in Table 2b (above).

²Allowable flange bearing capacities given in Table 2b must not be adjusted by any load duration factor.

³Tabulated values may be interpolated for bearing lengths between those given.

TABLE 3—JOIST DIMENSIONS

JOIST SERIES	JOIST DEPTHS (IN)		FLANGE			WEB	
	MINIMUM	MAXIMUM	MATERIAL	WIDTH (in)	Thick. (in)	MATERIAL	THICK. (in)
RFPI-20	9 ¹ / ₂	14	LVL	1 ³ / ₄	1 ³ / ₈	OSB	3 ³ / ₈
RFPI-25	9 ¹ / ₂	11 ⁷ / ₈	LVL	1 ¹ / ₂	1 ¹ / ₂	OSB	3 ³ / ₈
RFPI-30	9 ¹ / ₂	11 ⁷ / ₈	LVL	1 ¹ / ₂	1 ¹ / ₂	OSB	3 ³ / ₈
RFPI-400	9 ¹ / ₂	16	LVL	2 ¹ / ₁₆	1 ³ / ₈	OSB	3 ³ / ₈
RFPI-40	9 ¹ / ₂	16	LVL	2 ⁵ / ₁₆	1 ³ / ₈	OSB	3 ³ / ₈
RFPI-45	9 ¹ / ₂	16	LVL	2 ⁵ / ₁₆	1 ¹ / ₂	OSB	3 ³ / ₈
RFPI-50	9 ¹ / ₂	16	LVL	1 ³ / ₄	1 ¹ / ₂	OSB	3 ³ / ₈
RFPI-70	9 ¹ / ₂	16	LVL	2 ⁵ / ₁₆	1 ¹ / ₂	OSB	3 ³ / ₈
RFPI-90	9 ¹ / ₂	16	LVL	3 ¹ / ₂	1 ¹ / ₂	OSB	7 ¹ / ₁₆
RFPI-700	18	24	LVL	2 ⁵ / ₁₆	1 ¹ / ₂	OSB	7 ¹ / ₁₆
RFPI-900	18	24	LVL	3 ¹ / ₂	1 ¹ / ₂	OSB	7 ¹ / ₁₆
RFPI-40S	9 ¹ / ₂	16	Solid sawn	2 ¹ / ₂	1 ¹ / ₂	OSB	3 ³ / ₈
RFPI-60S	9 ¹ / ₂	16	Solid sawn	2 ¹ / ₂	1 ¹ / ₂	OSB	3 ³ / ₈
RFPI-80S	11 ⁷ / ₈	16	Solid sawn	3 ¹ / ₂	1 ¹ / ₂	OSB	3 ³ / ₈

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

TABLE 4—ALLOWABLE SPAN LENGTH—SIMPLE AND MULTIPLE SPANS^{1,2,3,4,5,6}

LVL FLANGE JOIST SERIES [depth (in.) - series]	SIMPLE SPAN ON-CENTER SPACING (in.)				MULTIPLE SPAN ON-CENTER SPACING (in.)			
	12	16	19.2	24	12	16	19.2	24
9 1/2 RFPI® - 20	17'-2"	15'-9"	14'-10"	13'-10"	18'-9"	17'-1"	16'-2"	14'-0"
9 1/2 RFPI® - 25	17'-0"	15'-6"	14'-8"	13'-9"	18'-6"	16'-11"	15'-11"	13'-5"
9 1/2 RFPI® - 30	17'-1"	15'-8"	14'-10"	13'-10"	18'-7"	17'-0"	16'-1"	15'-0"
9 1/2 RFPI® - 400	18'-0"	16'-5"	15'-6"	14'-6"	19'-7"	17'-10"	16'-10"	15'-9"
9 1/2 RFPI® - 40	18'-7"	16'-11"	16'-0"	14'-11"	20'-2"	18'-5"	17'-5"	16'-2"
9 1/2 RFPI® - 45	19'-1"	17'-5"	16'-5"	15'-4"	20'-9"	18'-11"	17'-10"	16'-8"
9 1/2 RFPI® - 50	17'-10"	16'-4"	15'-5"	14'-5"	19'-5"	17'-9"	16'-9"	15'-7"
9 1/2 RFPI® - 70	19'-9"	18'-0"	17'-0"	15'-10"	21'-6"	19'-7"	18'-5"	17'-2"
9 1/2 RFPI® - 90	22'-3"	20'-3"	19'-0"	17'-9"	24'-2"	22'-0"	20'-8"	19'-3"
11 7/8 RFPI® - 20	20'-6"	18'-9"	17'-9"	16'-6"	22'-4"	20'-5"	18'-10"	15'-3"
11 7/8 RFPI® - 25	20'-3"	18'-7"	17'-6"	16'-5"	22'-1"	20'-2"	16'-9"	13'-5"
11 7/8 RFPI® - 30	20'-6"	18'-9"	17'-8"	16'-6"	22'-4"	20'-5"	18'-10"	15'-0"
11 7/8 RFPI® - 400	21'-5"	19'-7"	18'-6"	17'-3"	23'-4"	21'-4"	20'-1"	17'-9"
11 7/8 RFPI® - 40	22'-1"	20'-2"	19'-0"	17'-9"	24'-1"	22'-0"	20'-8"	19'-3"
11 7/8 RFPI® - 45	22'-8"	20'-9"	19'-7"	18'-3"	24'-9"	22'-7"	21'-3"	19'-9"
11 7/8 RFPI® - 50	21'-4"	19'-6"	18'-5"	17'-2"	23'-3"	21'-2"	20'-0"	16'-1"
11 7/8 RFPI® - 70	23'-7"	21'-6"	20'-3"	18'-10"	25'-8"	23'-5"	22'-0"	19'-9"
11 7/8 RFPI® - 90	26'-6"	24'-1"	22'-8"	21'-1"	28'-10"	26'-3"	24'-8"	22'-11"
14 RFPI® - 20	23'-4"	21'-4"	20'-2"	18'-6"	25'-5"	22'-7"	19'-2"	15'-3"
14 RFPI® - 400	24'-4"	22'-3"	21'-0"	19'-7"	26'-7"	24'-3"	22'-3"	17'-9"
14 RFPI® - 40	25'-2"	22'-11"	21'-8"	20'-2"	27'-5"	25'-0"	23'-7"	19'-9"
14 RFPI® - 45	25'-10"	23'-7"	22'-3"	20'-9"	28'-2"	25'-8"	24'-3"	19'-9"
14 RFPI® - 50	24'-4"	22'-2"	21'-0"	19'-7"	26'-6"	24'-2"	20'-2"	16'-1"
14 RFPI® - 70	26'-10"	24'-5"	23'-0"	21'-5"	29'-3"	26'-7"	24'-9"	19'-9"
14 RFPI® - 90	30'-1"	27'-5"	25'-9"	23'-11"	32'-10"	29'-10"	28'-1"	26'-0"
16 RFPI® - 400	27'-0"	24'-8"	23'-4"	20'-10"	29'-6"	26'-4"	22'-3"	17'-9"
16 RFPI® - 40	27'-10"	25'-5"	24'-0"	22'-4"	30'-4"	27'-8"	24'-9"	19'-9"
16 RFPI® - 45	28'-8"	26'-2"	24'-8"	23'-0"	31'-3"	28'-6"	24'-9"	19'-9"
16 RFPI® - 50	27'-0"	24'-8"	23'-4"	20'-2"	29'-6"	24'-3"	20'-2"	16'-1"
16 RFPI® - 70	29'-9"	27'-1"	25'-6"	23'-9"	32'-5"	29'-6"	24'-9"	19'-9"
16 RFPI® - 90	33'-4"	30'-4"	28'-7"	26'-7"	36'-5"	33'-1"	31'-1"	26'-7"
SOLID SAWN FLANGE JOIST SERIES [depth (in.) - series]	SIMPLE SPAN ON-CENTER SPACING (in.)				MULTIPLE SPAN ON-CENTER SPACING (in.)			
	12	16	19.2	24	12	16	19.2	24
9 1/2 RFPI® - 40S	18'-0"	16'-5"	15'-6"	14'-6"	19'-7"	17'-11"	16'-4"	14'-7"
9 1/2 RFPI® - 60S	18'-11"	17'-4"	16'-4"	15'-3"	20'-8"	18'-10"	17'-9"	16'-6"
11 7/8 RFPI® - 40S	21'-5"	19'-7"	18'-6"	16'-8"	23'-5"	20'-5"	18'-7"	16'-7"
11 7/8 RFPI® - 60S	22'-7"	20'-8"	19'-6"	18'-2"	24'-8"	22'-6"	21'-2"	19'-7"
11 7/8 RFPI® - 80S	24'-11"	22'-8"	21'-4"	19'-11"	27'-1"	24'-8"	23'-3"	21'-7"
14 RFPI® - 40S	24'-4"	22'-3"	20'-6"	18'-4"	25'-11"	22'-5"	20'-5"	18'-3"
14 RFPI® - 60S	25'-9"	23'-6"	22'-2"	20'-8"	28'-0"	25'-7"	24'-1"	19'-9"
14 RFPI® - 80S	28'-3"	25'-9"	24'-3"	22'-7"	30'-9"	28'-0"	26'-4"	23'-11"
16 RFPI® - 40S	26'-11"	24'-3"	22'-1"	19'-9"	27'-11"	24'-2"	22'-0"	19'-8"
16 RFPI® - 60S	28'-6"	26'-0"	24'-7"	22'-11"	31'-1"	28'-4"	24'-9"	19'-9"
16 RFPI® - 80S	31'-4"	28'-6"	26'-10"	25'-0"	34'-2"	31'-1"	29'-3"	23'-11"

For SI: 1 in. = 25.4 mm; 1 ft = 304.8 mm; 1 lbf = 4.4 N.

¹Allowable clear span applicable to simple-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 $L/480$.²Spans are based on a composite floor with glue-nailed sheathing meeting the requirements for APA Rated Sheathing or APA Rated STURD-I-FLOOR conforming to PS 1 or PS 2, with a minimum thickness of $19/32$ inch for a joist spacing of 19.2 inches or less, or $23/32$ inch for a joist spacing of 24 inches. Spans must be reduced 12 inches when the floor sheathing is nailed only.³Minimum bearing length must be $1 3/4$ inches for the end bearings.⁴Span lengths are based on uniform loads.⁵Web stiffeners are not required for the spans shown.⁶Allowable spans for the RFPI® 700 and RFPI® 900 series I-joists are outside the scope of this evaluation report. Contact the report holder (Roseburg Forest Products Company) regarding allowable spans for these two series.

TABLE 5—CIRCULAR HOLE PLACEMENT^{1,2,3,4,5,6}

JOIST SERIES [depth (in.) – series]	MINIMUM DISTANCE FROM INSIDE FACE OF ANY SUPPORT TO CENTER OF HOLE (feet - inches)														
	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 RFPI-20	0-7	0-8	1-11	3-4	5-1	5-7									
9 ¹ / ₂ RFPI-25	0-7	0-11	2-2	3-9	5-6	5-11									
9 ¹ / ₂ RFPI-30	0-9	2-0	3-3	4-7	6-1	6-6									
9 ¹ / ₂ RFPI-400	0-7	1-9	3-1	4-7	6-2	6-7									
9 ¹ / ₂ RFPI-40	0-7	1-3	2-8	4-3	6-0	6-5									
9 ¹ / ₂ RFPI-40S	0-7	1-8	3-0	4-4	5-9	6-3									
9 ¹ / ₂ RFPI-45	1-10	3-1	4-5	5-10	7-4	7-9									
9 ¹ / ₂ RFPI-50	1-1	2-4	3-8	5-0	6-6	6-11									
9 ¹ / ₂ RFPI-60S	1-8	3-0	4-4	5-8	7-3	7-8									
9 ¹ / ₂ RFPI-70	0-7	1-10	3-5	5-0	6-9	7-2									
9 ¹ / ₂ RFPI-90	1-9	3-3	4-10	6-6	8-3	8-9									
11 ⁷ / ₈ RFPI-20	0-7	0-8	0-8	1-9	3-4	3-9	5-0	6-10	8-0						
11 ⁷ / ₈ RFPI-25	0-7	0-8	0-8	0-9	2-4	2-10	4-3	6-4	7-9						
11 ⁷ / ₈ RFPI-30	0-7	0-8	0-8	1-9	3-4	3-9	5-0	6-10	8-0						
11 ⁷ / ₈ RFPI-400	0-7	0-8	1-6	2-10	4-2	4-7	5-8	7-5	8-8						
11 ⁷ / ₈ RFPI-40	0-7	0-8	2-0	3-5	4-10	5-3	6-5	8-1	9-2						
11 ⁷ / ₈ RFPI-40S	0-7	0-8	1-2	2-5	3-9	4-1	5-1	6-8	7-11						
11 ⁷ / ₈ RFPI-45	0-9	2-0	3-3	4-7	6-0	6-4	7-5	9-0	10-1						
11 ⁷ / ₈ RFPI-50	0-7	0-8	0-11	2-6	4-1	4-6	5-10	7-8	8-11						
11 ⁷ / ₈ RFPI-60S	0-8	1-10	3-2	4-5	5-10	6-2	7-4	8-11	10-0						
11 ⁷ / ₈ RFPI-70	0-7	1-0	2-4	3-9	5-2	5-7	6-9	8-6	9-10						
11 ⁷ / ₈ RFPI-80S	0-7	1-10	3-3	4-9	6-3	6-8	7-11	9-8	10-11						
11 ⁷ / ₈ RFPI-90	0-7	0-8	0-11	2-9	4-7	5-1	6-7	8-8	10-2						
14 RFPI-20	0-7	0-8	0-8	0-9	0-9	1-1	2-3	4-2	5-4	6-1	8-2	9-11			
14 RFPI-400	0-7	0-8	0-8	0-9	1-11	2-4	3-7	5-3	6-4	7-0	8-11	10-8			
14 RFPI-40	0-7	0-8	0-8	1-2	2-6	2-10	4-0	5-10	6-11	7-8	9-8	11-4			
14 RFPI-40S	0-7	0-8	0-8	0-9	1-10	2-2	3-2	4-7	5-5	6-0	7-7	9-4			
14 RFPI-45	0-7	0-8	0-8	1-8	3-3	3-8	4-11	6-8	7-9	8-6	10-6	12-1			
14 RFPI-50	0-7	0-8	0-8	0-9	0-9	1-1	2-6	4-6	5-9	6-7	8-10	10-7			
14 RFPI-60S	0-7	0-8	0-8	1-7	3-2	3-6	4-9	6-6	7-8	8-4	10-4	11-11			
14 RFPI-70	0-7	0-8	0-8	1-6	3-1	3-6	4-10	6-7	7-9	8-6	10-7	12-3			
14 RFPI-80S	0-7	0-9	2-1	3-6	4-11	5-3	6-5	7-11	9-0	9-7	11-5	13-2			
14 RFPI-90	0-7	0-8	0-9	2-4	4-1	4-6	5-9	7-7	8-9	9-6	11-7	13-3			
16 RFPI-400	0-7	0-8	0-8	0-9	0-9	0-10	0-10	1-11	3-1	3-10	5-11	7-6	8-0	10-4	12-3
16 RFPI-40	0-7	0-8	0-8	0-9	0-9	0-10	1-10	3-6	4-6	5-2	6-11	8-5	9-0	11-4	13-3
16 RFPI-40S	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
16 RFPI-45	0-7	0-8	0-8	0-9	0-9	0-10	1-10	3-6	4-7	5-4	7-5	9-0	9-7	12-0	13-11
16 RFPI-50	0-7	0-8	0-8	0-9	0-9	0-10	0-10	0-10	1-9	2-6	4-6	6-0	6-8	9-7	11-11
16 RFPI-60S	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
16 RFPI-70	0-7	0-8	0-8	0-9	0-9	0-10	2-1	4-0	5-3	6-0	8-1	9-9	10-4	12-9	14-8
16 RFPI-80S	0-7	0-8	0-8	0-11	2-4	2-9	4-1	5-10	6-11	7-8	9-7	11-1	11-7	13-10	15-7
16 RFPI-90	0-7	0-8	0-8	0-10	2-3	2-8	3-10	5-5	6-6	7-4	9-5	11-1	11-8	14-1	16-1

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

¹Tabulated values are for simple or multiple spans, based on 40 psf live load and 10 psf dead load, and I-joist spacing of 24 inches on center or less with the full shear design values given in Table 1 of this report.

²The top and bottom of each hole must be at least ¹/₈ inch away from the top and bottom flanges, respectively; and wherever practical, the web hole should be approximately centered vertically on the depth of the web.

³Distances are based on uniformly loaded joists that meet the span requirements in Table 4 of this report.

⁴Some of the minimum distances given in Table 5 are not achievable for certain maximum spans given in Table 4. For such cases, a smaller hole size or tighter joist spacing should be used in order to satisfy both the minimum hole distance and the maximum span requirements.

⁵For webs with multiple holes, the minimum allowable center-to-center hole spacing is 3D, where D is the diameter of the larger hole.

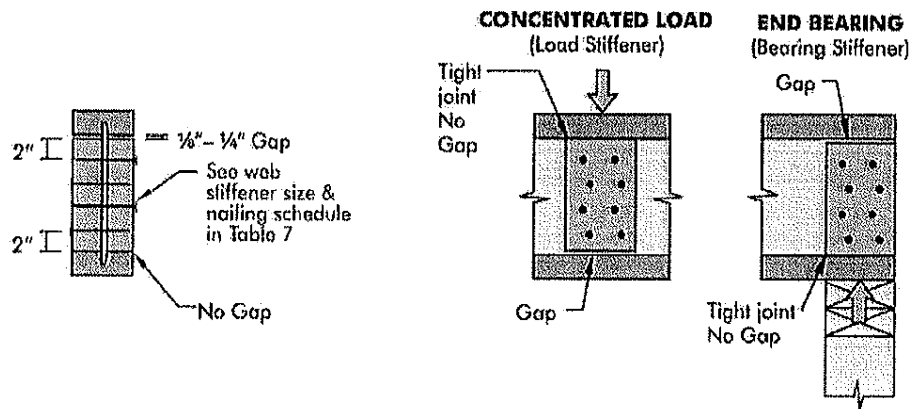
⁶The allowable location of round holes for the RFPI® 700 and RFPI® 900 series of I-joists may be determined by utilizing the following equation to calculate the allowable shear capacity of the I-joist with a given hole size: $V_{hole} = V_r \times \{(joist\ depth - hole\ diameter) / joist\ depth\}$

Where: V_{hole} is the allowable shear at the centerline of the hole (lbf)
 V_r is the allowable shear value for the I-joist as given in Table 1 (lbf)
 Joist depth is the out-to-out depth of the I-joist (in)
 Hole diameter is in inches.

TABLE 6—MINIMUM WEB STIFFENER DIMENSIONS AND NAILING REQUIREMENTS

LVL FLANGE JOIST SERIES	FLANGE WIDTH (in.)	MINIMUM DIMENSIONS AND NAILING REQUIREMENTS		
		Web Stiffener Dimensions (in.)		Nails
		Thickness	Width	
RFPI® - 20	1 ³ / ₄	1 ⁹ / ₃₂	2 ⁵ / ₁₆	8d box – 2 ¹ / ₂ x 0.113 inch
RFPI® - 25	1 ¹ / ₂	1 ⁵ / ₃₂	2 ⁵ / ₁₆	8d box – 2 ¹ / ₂ x 0.113 inch
RFPI® - 30	1 ¹ / ₂	1 ⁵ / ₃₂	2 ⁵ / ₁₆	8d box – 2 ¹ / ₂ x 0.113 inch
RFPI® - 400	2 ¹ / ₁₆	7/ ₈	2 ⁵ / ₁₆	8d box – 2 ¹ / ₂ x 0.113 inch
RFPI® - 40	2 ⁵ / ₁₆	1	2 ⁵ / ₁₆	8d box – 2 ¹ / ₂ x 0.113 inch
RFPI® - 45	2 ⁵ / ₁₆	1	2 ⁵ / ₁₆	8d box – 2 ¹ / ₂ x 0.113 inch
RFPI® - 50	1 ³ / ₄	1 ⁹ / ₃₂	2 ⁵ / ₁₆	8d box – 2 ¹ / ₂ x 0.113 inch
RFPI® - 70	2 ⁵ / ₁₆	1	2 ⁵ / ₁₆	8d box – 2 ¹ / ₂ x 0.113 inch
RFPI® - 90	3 ¹ / ₂	1 ¹ / ₂	2 ⁵ / ₁₆	10d box – 3 x 0.128 inch
RFPI® - 700	2 ⁵ / ₁₆	7/ ₈	3 ¹ / ₂	8d box – 2 ¹ / ₂ x 0.113 inch
RFPI® - 900	3 ¹ / ₂	1 ¹ / ₂	3 ¹ / ₂	16d box – 3 ¹ / ₂ x 0.135 inch
SOLID SAWN FLANGE JOIST SERIES	FLANGE WIDTH (in.)	MINIMUM DIMENSIONS AND NAILING REQUIREMENTS		
		Web Stiffener Dimensions (in.)		Nails
		Thickness (in)	Width (in)	
RFPI® - 40S	2 ¹ / ₂	1	2 ⁵ / ₁₆	8d box – 2 ¹ / ₂ x 0.113 inch
RFPI® - 60S	2 ¹ / ₂	1	2 ⁵ / ₁₆	8d box – 2 ¹ / ₂ x 0.113 inch
RFPI® - 80S	3 ¹ / ₂	1 ¹ / ₂	2 ⁵ / ₁₆	10d box – 3 x 0.128 inch

For SI: 1 in. = 25.4 mm.



For SI: 1 in. = 25.4 mm.

FIGURE 1—WEB STIFFENER DIAGRAM
 (See Table 6 for stiffener size and nailing requirements.)

TABLE 7—ALLOWABLE SHEAR (POUNDS PER FOOT) FOR HORIZONTAL WOOD STRUCTURAL PANEL DIAPHRAGMS FRAMED WITH ROSEBURG RFPI-JOISTS FOR WIND¹ OR SEISMIC LOADING^{2,3}

Panel Grade	Common Nail Size	Minimum Nominal Panel Thickness (in.)	Minimum Nominal Width of Framing Members at Adjoining Panel Edges and Boundaries ⁴ (in.)	RFPI-Joist series approved for diaphragm construction as indicated.	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	2-½ ⁸	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 1 Grades	6d ⁷	5/16	2	RFPI 20 & 400	185	250	--	165	125
			3	RFPI 40, 40S, 60S, 70, 80S, 90, 700 & 900	210	280	420 ⁹	185	140
	8d	3/8	2	RFPI 20 & 400	270	360	--	240	180
			3	RFPI 40, 40S, 60S, 70, 80S, 90, 700 & 900	300	400	600 ⁹	265	200
	10d	15/32	2	RFPI 20 & 400	320	425	--	285	215
			3	RFPI 40, 40S, 60S, 70, 80S, 90, 700 & 900	360	480	720 ⁹	320	240
Sheathing, single floor and other grades covered in DOC PS 1 and PS 2	6d ⁷	5/16	2	RFPI 20 & 400	170	225	--	150	110
			3	RFPI 40, 40S, 60S, 70, 80S, 90, 700 & 900	190	250	380 ⁹	170	125
		3/8	2	RFPI 20 & 400	185	250	--	165	125
			3	RFPI 40, 40S, 60S, 70, 80S, 90, 700 & 900	210	280	420 ⁹	185	140
	8d	3/8	2	RFPI 20 & 400	240	320	--	215	160
			3	RFPI 40, 40S, 60S, 70, 80S, 90, 700 & 900	270	360	540 ⁹	240	180
		7/16	2	RFPI 20 & 400	255	340	--	230	170
			3	RFPI 40, 40S, 60S, 70, 80S, 90, 700 & 900	285	380	570 ⁹	255	190
		15/32	2	RFPI 20 & 400	270	360	--	240	180
			3	RFPI 40, 40S, 60S, 70, 80S, 90, 700 & 900	300	400	600 ⁹	265	200
	10d	15/32	2	RFPI 20 & 400	290	385	--	255	190
			3	RFPI 40, 40S, 60S, 70, 80S, 90, 700 & 900	325	430	650 ⁹	290	215
		19/32	2	RFPI 20 & 400	320	425	--	285	215
			3	RFPI 40, 40S, 60S, 70, 80S, 90, 700 & 900	360	480	720 ⁹	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.

- For wind load applications, the values in the table above shall be permitted to be multiplied by 1.4.
- 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.
- The tabulated allowable shear capacities are for I-joist series with flanges having a specific gravity (G) of 0.50 or higher. 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. See Section 4.7 for flange specific gravity information.
- The minimum nominal width of framing members not located at boundaries or adjoining panel edges shall be 2 inches.
- 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.
- When nail spacing is 4 inches on center at diaphragm boundaries, adjacent nails within a row must be offset (staggered) 1/2 inch for RFPI-40S, 60S and 80S series I-joists.
- 8d common nails minimum are recommended for roofs due to negative pressures of high winds.
- Adjacent nails within a row must be staggered 1/2 inch at adjoining panel edges when nail spacing is 2-1/2 inches o.c.
- Nail spacing of 2-1/2 inches at diaphragm boundaries is permitted only for lumber flange I-joists (RFPI-40S, RFPI- 60S, and RFPI-80S).

**FIGURE 2—PRODUCT LOGO****DISCLAIMER**

APA Product Report® is a trademark of APA – *The Engineered Wood Association*, Tacoma, Washington. ICC-ES Evaluation Report is a trademark of ICC Evaluation Service, LLC (ICC-ES). The information contained herein is based on the product evaluation in accordance with the references noted in this report. Neither ICC-ES, nor APA or its members make any warranty, expressed or implied, or assume any legal liability or responsibility for the use, application of, and/or reference to opinions, findings, conclusions, or recommendations included in this report. The joint ICC-ES/APA Evaluation Reports are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the report or a recommendation for its use. Consult the local jurisdiction or design professional to assure compliance with code, construction, and performance requirements. Because neither APA, nor ICC-ES, has any control over quality of workmanship or the conditions under which engineered wood products are used, it cannot accept responsibility for product performance or designs as actually constructed.

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES

Section: 06 17 33—Wood I-Joists

REPORT HOLDER:

ROSEBURG FOREST PRODUCTS CO.

EVALUATION SUBJECT:

RFPI® PREFABRICATED WOOD I-JOISTS: RFPI® 20 SERIES, RFPI® 30 SERIES, RFPI® 40 SERIES, RFPI® 400 SERIES, RFPI® 50 SERIES, RFPI® 70 SERIES, RFPI® 90 SERIES, RFPI® 40S SERIES, RFPI® 60S SERIES, RFPI® 80S SERIES, RFPI® 700 SERIES AND RFPI® 900 SERIES

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the RFPI® Prefabricated Wood I-Joists: RFPI® 20 Series, RFPI® 30 Series, RFPI® 40 Series, RFPI® 400 Series, RFPI® 50 Series, RFPI® 70 Series, RFPI® 90 Series, RFPI® 40S Series, RFPI® 60S Series, RFPI® 80S Series, RFPI® 700 Series and RFPI® 900 Series, described in the ICC-ES evaluation report [ESR-1251](#), have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2020 City of Los Angeles Building Code (LABC)
- 2020 City of Los Angeles Residential Code (LARC)

2.0 CONCLUSIONS

The RFPI® Prefabricated Wood I-Joists: RFPI® 20 Series, RFPI® 30 Series, RFPI® 40 Series, RFPI® 400 Series, RFPI® 50 Series, RFPI® 70 Series, RFPI® 90 Series, RFPI® 40S Series, RFPI® 60S Series, RFPI® 80S Series, RFPI® 700 Series and RFPI® 900 Series, described in Sections 2.0 through 7.0 of the ICC-ES evaluation report [ESR-1251](#), comply with LABC Chapter 23, and LARC, and are subjected to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The RFPI® Prefabricated Wood I-Joists: RFPI® 20 Series, RFPI® 30 Series, RFPI® 40 Series, RFPI® 400 Series, RFPI® 50 Series, RFPI® 70 Series, RFPI® 90 Series, RFPI® 40S Series, RFPI® 60S Series, RFPI® 80S Series, RFPI® 700 Series and RFPI® 900 Series, described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the ICC-ES evaluation report [ESR-1251](#).
- The design, installation, conditions of use and identification are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the ICC-ES evaluation report [ESR-1251](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16 and 17, as applicable.
- RFPI® 25 Series and RFPI® 45 Series in the ICC-ES evaluation report [ESR-1251](#) are excluded from this supplement.
- Flanges must not be subjected to dynamic or static outward forces which may tend to separate the flanges from the web. Bottom flanges must not support load exceeding 250 pounds on each side of flange at 5 feet on center or 100 pounds per linear foot.

This supplement expires concurrently with the evaluation report ESR-1251, reissued April 2021.

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES

Section: 06 17 33—Wood I-joists

REPORT HOLDER:

ROSEBURG FOREST PRODUCTS CO.

EVALUATION SUBJECT:

RFPI® PREFABRICATED WOOD I-JOISTS: RFPI® 20 SERIES, RFPI® 25 SERIES, RFPI® 30 SERIES, RFPI® 40 SERIES, RFPI® 400 SERIES, RFPI® 45 SERIES, RFPI® 50 SERIES, RFPI® 70 SERIES, RFPI® 90 SERIES, RFPI® 40S SERIES, RFPI® 60S SERIES, RFPI® 80S SERIES, RFPI® 700 SERIES AND RFPI® 900 SERIES

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that RFPI® Prefabricated Wood I-Joists, evaluated in ICC-ES evaluation report ESR-1251, have also been evaluated for compliance with the code(s) noted below.

Applicable code edition(s):

- 2019 California Building Code (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) and Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2019 California Residential Code (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The RFPI® Prefabricated Wood I-Joists, described in Sections 2.0 through 7.0 of the evaluation report ESR-1251, comply with CBC Chapter 23, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report ESR-1251, and the additional requirements of CBC Chapters 16 and 17, as applicable.

2.1.1 OSHPD: The RFPI® Prefabricated Wood I-Joists, described in Sections 2.0 through 7.0 of the evaluation report ESR-1251, comply with CBC amended Chapters 16, 17 and 23, and Chapters 16A and 17A provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report, and the additional requirements in Section 2.1.1.1 and 2.1.1.2 of this supplement:

2.1.1.1 Conditions of Use:

1. All loads applied shall be determined by the registered design professional and shall comply with applicable loads and load combinations from CBC Chapter 16 and amendments [OSHPD 1R, 2, 3 and 5] and 16A [OSHPD 1 and 4].
2. Seismic Design Category shall be in accordance with CBC amended Section 1613.1 Exception 6 [OSHPD 1R, 2 & 5].
3. Construction documents shall include detailing and limitations for notches and bored holes in accordance with CBC amended Section 2304.4.1 [OSHPD 1, 1R, 2, 4 and 5].
4. Conventional light-frame construction under Section 2308 is permitted in accordance with CBC Section 2308.2.7 [OSHPD 1R, 2 & 5].

2.1.1.2 Special Inspection Requirement: Special inspection of wood structural elements are required in accordance with CBC amended Section 1705A.5.3 [OSHPD 1 & 4].

2.1.2 DSA: The RFPI® Prefabricated Wood I-Joists, described in Sections 2.0 through 7.0 of the evaluation report ESR-1251, comply with CBC amended Chapters 16 and 23, and Chapters 16A and 17A provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report, and the additional requirements in Section 2.1.2.1 and 2.1.2.2 of this supplement:

2.1.2.1 Conditions of Use:

1. All loads applied shall be determined by the registered design professional and shall comply with applicable loads and load combinations from CBC amended sections in Chapter 16 [DSA-SS/CC] and 16A [DSA/SS].
2. Construction documents shall include detailing and limitations for notches and bored holes in accordance with CBC amended Section 2304.4.1 [DSA-SS and DSA-SS/CC].
3. Conventional light-frame construction under Section 2308, if applicable, shall comply with CBC Section 2308.2.7 [DSA-SS and DSA-SS/CC].

2.1.2.2 Special Inspection Requirement: Special inspection of wood structural elements are required in accordance with CBC amended Section 1705A.5.3 [DSA-SS and DSA-SS/CC].

2.2 CRC:

The RFPI® Prefabricated Wood I-Joists, described in Sections 2.0 through 7.0 of the evaluation report ESR-1210, comply with CRC Chapters 5 and 8, provided the design and installation are in accordance with the 2018 *International Residential Code*® (IRC) provisions noted in the evaluation report ESR-1251.

This supplement expires concurrently with the evaluation report ESR-1251, reissued April 2021.

DIVISION: 06 00 00—WOOD, PLASTICS AND COMPOSITES

Section: 06 17 33—Wood I-joists

REPORT HOLDER:

ROSEBURG FOREST PRODUCTS CO.

EVALUATION SUBJECT:

RFPI® PREFABRICATED WOOD I-JOISTS: RFPI® 20 SERIES, RFPI® 25 SERIES, RFPI® 30 SERIES, RFPI® 40 SERIES, RFPI® 400 SERIES, RFPI® 45 SERIES, RFPI® 50 SERIES, RFPI® 70 SERIES, RFPI® 90 SERIES, RFPI® 40S SERIES, RFPI® 60S SERIES, RFPI® 80S SERIES, RFPI® 700 SERIES AND RFPI® 900 SERIES

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that RFPI® Prefabricated Wood I-Joists, described in ICC-ES evaluation report ESR-1251, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2020 and 2017 *Florida Building Code—Building*
- 2020 and 2017 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The RFPI® Prefabricated Wood I-Joists, described in Sections 2.0 through 7.0 of the evaluation report ESR-1251, 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-1251 for the 2018 and 2015 *International Building Code*® (IBC) meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the RFPI® Prefabricated Wood 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-1251, reissued April 2021.