APA PRODUCT REPORT®

www.apawood.org

PKI Series I-Joists
PinkWood Ltd.

PR-L315

Revised February 3, 2020

Products: PKI Series I-Joists
PinkWood Ltd., 5929 6th St. NE, Calgary, Alberta, Canada T2K 5R5
(403) 279-3700
www.pinkwood.ca

1. Basis of the product report:
   - 2018, 2015, and 2012 International Building Code (IBC): Sections 104.11 Alternative materials and 2303.1.2 Prefabricated wood I-joists
   - 2018 and 2015 International Residential Code (IRC): Sections R104.11 Alternative materials, R502.1.2, and R802.1.8 (2018 IRC only) Prefabricated wood I-joists
   - 2012 IRC: Sections R104.11 Alternative materials and R502.1.4 Prefabricated wood I-joists
   - ASTM D5055-13e1, D5055-13, and D5055-09 recognized by the 2018 IBC and IRC, 2015 IBC and IRC, and 2012 IBC and IRC, respectively
   - APA Reports T2014M-11, T2014M-19, T2015M-01A, T2015M-09, T2016M-09, T2016M-14, T2016M-17, T2016M-38, T2016M-45, T2016M-48, T2016M-51, T2017M-34, T2019M-24, T2019M-32, and T2019M-54, and other qualification data

2. Product description:
   PKI10, PKI20, PKI23, PKI35Plus, PKI40, and PKI50 Series I-joists, as described in Table 1, are made with lumber flanges and an OSB web in accordance with the in-plant manufacturing standard approved by APA.

3. Design properties:
   Tables 2 and 3 list the design properties for PKI10, PKI20, PKI23, PKI35Plus, PKI40, and PKI50 Series I-joists. The allowable spans for PKI Series I-joists covered by this report shall be in accordance with the recommendations provided by the manufacturer (www.pinkwood.ca).

4. Product installation:
   PKI10, PKI20, PKI23, PKI35Plus, PKI40, and PKI50 Series I-joists shall be installed in accordance with the recommendations provided by the manufacturer (see link above). Permissible web holes and cantilever reinforcements shall be in accordance with the recommendations provided by the manufacturer.

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-S315, or APA *Fire-Rated Systems*, Form W305 (www.apawood.org/resource-library).

6. Limitations:
   a) PKI10, PKI20, PKI23, PKI35Plus, PKI40, and PKI50 Series I-joists shall be designed in accordance with the code using the design properties specified in this report.
   b) PKI10, PKI20, PKI23, PKI35Plus, PKI40, and PKI50 Series I-joists are limited to dry service conditions where the average equilibrium moisture content of sawn lumber is less than 16 percent.
   c) PKI10, PKI20, PKI23, PKI35Plus, PKI40, and PKI50 Series I-joists are produced at the PinkWood Ltd. facility in Calgary, Alberta, Canada under a quality assurance program audited by APA.

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

7. Identification:
The PKI Series prefabricated wood I-joists described in this report are identified by a label bearing the manufacturer's name (PinkWood Ltd.) and/or trademark, the APA assigned plant number (1113), the I-joist depth and series, the APA logo, the report number PR-L315, and a means of identifying the date of manufacture.

Table 1. Description of PKI Series I-Joists[(a)]

Joist Series	Joist Depths (in.)	Flanges			Web	
		Material	Dimension		Material	Thickness (in.)
			Depth (in.)	Width (in.)		
PKI10	9-1/2 - 14	Proprietary SPF	1-1/2	2-1/2	OSB	3/8
PKI20	9-1/2 - 16	Proprietary SPF	1-1/2	2-1/2	OSB	3/8
PKI23	9-1/2 - 16	Proprietary SPF	1-1/2	2-1/2	OSB	7/16
PKI35Plus	9-1/2 - 16	Proprietary SPF and proprietary Douglas Fir-Larch (North)	1-1/2	3-1/2	OSB	3/8
PKI40	9-1/2 - 16	Proprietary SPF	1-1/2	3-1/2	OSB	3/8
	18 - 24	Proprietary SPF	1-1/2	3-1/2	OSB	7/16
PKI50	11-7/8 - 24	Proprietary SPF	1-1/2	3-1/2	OSB	7/16

[(a)] Referenced dimensions are nominal. Tolerances are as specified in the plant quality manual.

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

Joist Depth (in.)	Joist Series	EI [b] (10^6lbf-in.^{2})	M [c] (lbf-ft)	V [d] (lbf)	VLC [e] (lbf/ft)	K [f] (10^6lbf)
9-1/2	PKI10	168	2,365	1,260	2,000	4.94
11-7/8		286	3,100	1,485	2,000	6.18
14		420	3,720	1,680	2,000	7.28
9-1/2	PKI20	193	2,810	1,260	2,000	4.94
11-7/8		327	3,755	1,485	2,000	6.18
14		479	4,405	1,680	2,000	7.28
16		652	5,060	1,870	2,000	8.32
9-1/2	PKI23	208	3,330	1,585	2,000	4.94
11-7/8		352	4,320	1,805	2,000	6.18
14		515	5,200	2,005	2,000	7.28
16		700	6,030	2,190	2,000	8.32
9-1/2	PKI35Plus	234	3,395	1,260	2,000	4.94
11-7/8		396	4,395	1,485	2,000	6.18
14		580	5,270	1,680	2,000	7.28
16		787	5,990	1,870	2,000	8.32
9-1/2	PKI40	328	5,390	1,340	2,000	4.94
11-7/8		553	6,970	1,625	2,000	6.18
14		807	8,395	1,875	2,000	7.28
16		1,092	9,730	2,115	2,000	8.32
18		1,421	11,005	2,535	1,800	9.36
20		1,799	12,175	2,680	1,600	10.40
22		2,224	13,335	2,815	1,300	11.44
24		2,698	14,480	2,945	1,100	12.48
11-7/8	PKI50	565	7,955	2,135	2,000	6.18
14		824	9,200	2,280	2,000	7.28
16		1,115	10,655	2,415	2,000	8.32
18		1,453	12,770	2,535	1,800	9.36
20		1,839	14,175	2,680	1,600	10.40
22		2,273	14,590	2,815	1,300	11.44
24		2,757	15,845	2,945	1,100	12.48

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

[a] The tabulated values are allowable design values for normal duration of load. All values, except for EI, K, and VLC 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, which shall not be increased by any repetitive member use factor.

[d] Shear capacity (V) of the I-joist.

[e] Uniform vertical load capacity (VLC) of the I-joist.

[f] Coefficient of shear deflection (K). For calculating uniform load and center point load deflections of an 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 PKI Series I-Joists[a,b,c,d]

Joist Depth (in.)	Joist Series	End Reaction(lbf)				Intermediate Reaction (lbf)				Flange Bearing Capacity (lbf/in.)
		1-1/2 in. or 2-1/2 in.[e] Brg. Length		3-1/2 in. or 4 in.[f] Brg. Length		3-1/2 in. Brg. Length		5-1/2 in. Brg. Length		
		w/o Brg. Stiffeners	w/Brg. Stiffeners	w/o Brg. Stiffeners	w/Brg. Stiffeners	w/o Brg. Stiffeners	w/Brg. Stiffeners	w/o Brg. Stiffeners	w/Brg. Stiffeners	
9-1/2	PKI10	900	1,140	1,110	1,260	2,195	2,280	2,450	2,520	955
11-7/8		900	1,275	1,160	1,485	2,195	2,485	2,525	2,810	
14		900	1,395	1,200	1,680	2,195	2,665	2,585	2,960	
9-1/2	PKI20	970	1,140	1,110	1,260	2,195	2,375	2,450	2,635	955
11-7/8		970	1,275	1,160	1,485	2,330	2,525	2,595	2,830	
14		970	1,395	1,200	1,680	2,455	2,665	2,725	3,005	
16		970	1,510	1,240	1,870	2,570	2,795	2,850	3,175	
9-1/2	PKI23	1,050	1,430	1,350	1,500	2,410	2,770	2,850	3,210	1,180
11-7/8		1,050	1,470	1,435	1,680	2,410	2,770	2,850	3,280	
14		1,050	1,505	1,485	1,845	2,410	2,770	2,850	3,340	
16		1,050	1,540	1,500	2,000	2,410	2,770	2,850	3,400	
9-1/2	PKI35Plus	900	1,140	1,110	1,260	2,195	2,280	2,450	2,520	1,380
11-7/8		900	1,275	1,160	1,485	2,195	2,485	2,525	2,810	
14		900	1,395	1,200	1,680	2,195	2,665	2,585	2,960	
16		900	1,510	1,240	1,865	2,195	2,880	2,645	3,105	
9-1/2	PKI40	1,185	1,340	1,305	1,340	2,900	3,095	2,940	3,195	1,705
11-7/8		1,245	1,510	1,595	1,625	3,025	3,340	3,120	3,515	
14		1,280	1,660	1,595	1,875	3,085	3,565	3,280	3,805	
16		1,295	1,800	1,595	2,115	3,145	3,775	3,435	4,080	
18		1,310	2,060	1,680	2,550	2,850	4,285	3,435	4,970	
20		1,310	2,185	1,680	2,640	2,850	4,410	3,435	4,970	
22		1,310	2,310	1,680	2,735	2,850	4,530	3,435	4,970	
24		1,310	2,440	1,680	2,830	2,850	4,640	3,435	4,970	
11-7/8	PKI50	1,245	1,510	1,595	1,625	3,025	3,340	3,120	3,515	1,995
14		1,280	1,660	1,595	1,875	3,085	3,565	3,280	3,805	
16		1,295	1,800	1,595	2,115	3,145	3,775	3,435	4,080	
18		1,310	2,060	1,680	2,550	2,850	4,285	3,435	4,970	
20		1,310	2,185	1,680	2,640	2,850	4,410	3,435	4,970	
22		1,310	2,310	1,680	2,735	2,850	4,530	3,435	4,970	
24		1,310	2,440	1,680	2,830	2,850	4,640	3,435	4,970	

See footnotes on the next page.

Footnotes to Table 3:

For SI: 1 inch = 25.4 mm, 1 lbf = 4.448 N, 1 lbf/in. = 0.175kN/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) Bearing stiffeners shall be installed in accordance with the recommendations provided by the manufacturer.

(e) Bearing length = 2-1/2 in. for 18-in. to 24-in. deep PKI40 and PKI50 I-joist series. Bearing length = 1-1/2 in. for all other cases.

(f) Bearing length = 3-1/2 in. for PKI23 I-joist series. Bearing length = 4 in. for all other cases.

APA –The Engineered Wood Association is an approved national standards developer accredited by American National Standards Institute (ANSI). APA publishes ANSI standards and Voluntary Product Standards for wood structural panels and engineered wood products. APA is an accredited certification body under ISO/IEC 17065 by Standards Council of Canada (SCC), an accredited inspection agency under ISO/IEC 17020 by International Code Council (ICC) International Accreditation Service (IAS), and an accredited testing organization under ISO/IEC 17025 by IAS. APA is also an approved Product Certification Agency, Testing Laboratory, Quality Assurance Entity, and Validation Entity by the State of Florida, and an approved testing laboratory by City of Los Angeles.

APA – THE ENGINEERED WOOD ASSOCIATION
HEADQUARTERS
7011 So. 19th St. ▪ Tacoma, Washington 98466
Phone: (253) 565-6600 ▪ Fax: (253) 565-7265 ▪ Internet Address: www.apawood.org

PRODUCT SUPPORT HELP DESK
(253) 620-7400 ▪ *E-mail Address*: help@apawood.org

DISCLAIMER