

IB Series I-Joists  
International Beams, Inc.

PR-L252  
Revised August 10, 2011

Products: IB-400, 600, 800 and 900 Prefabricated Wood I-Joists  
International Beams, Inc., 480, rue Jocelyn-Bastille, CP 10, Pohénégamook, Quebec, Canada.  
[www.internationalbeams.com](http://www.internationalbeams.com)

1. Basis of the product report:
  - 2006 and 2009 International Building Code (IBC): Sections 104.11 Alternative Materials and 2303.1.2 Prefabricated wood I-joists
  - 2006 and 2009 International Residential Code (IRC): Sections R104.11 Alternative Materials and R502.1.4 Prefabricated wood I-joists
  - ASTM D 5055-05 recognized by the 2009 IBC and IRC
  - Performance Standard for APA EWS I-Joists, PRI-400
  - APA Reports T2000P-42A, T2001P-53, T2001P-63, T2001P-78, T2002P-65, T2003P-17, T2003P-18A, T2003P-52, T2005P-01A, T2005P-40B, T2005P-99A, T2006P-36, T2006P-43, T2006P-53, T2008P-37, T2009P-34A, T2010P-06, T2010P-49A, and other qualification data
2. Product description:

IB Series I-joists are made with lumber flanges and OSB web in accordance with the in-plant manufacturing standard approved by APA.
3. Design properties:

Tables 1 through 3 list the design properties for IB Series I-joists. The allowable spans for IB Series I-joists shall be in accordance with the recommendations provided by the manufacturer ([www.internationalbeams.com](http://www.internationalbeams.com)), and with APA Design & Construction Guide, *Performance Rated I-Joists*, Form Z725 ([www.apawood.org/publications](http://www.apawood.org/publications)) for products contained in the PRI Series.
4. Product installation:

IB Series I-joists shall be installed in accordance with the recommendations provided by the manufacturer (see link above) and APA Design & Construction Guide, *I-Joist Construction Details*, Form D710 (see link above). Permissible web holes and cantilever reinforcements shall be in accordance with the recommendations provided by the manufacturer, and with APA D710 for products contained in the PRI Series.
5. Fire-rated assemblies:

Fire-rated assemblies shall be constructed in accordance with the recommendations provided by the manufacturer (see link above), and with APA Design & Construction Guide, *Fire-Rated Systems*, Form W305 (see link above) for products contained in the PRI Series.
6. Limitations:
  - a) IB Series I-joists shall be designed in accordance with the code using the design properties specified in this report.
  - b) IB Series I-joists are limited to dry service conditions where the average moisture content of lumber is less than 16 percent.
  - c) IB Series I-joists are produced at International Beams' facility in Pohénégamook, Quebec, under a quality assurance program audited by APA.
  - d) This report is subject to re-examination in one year.
7. Identification:

The IB prefabricated wood I-joists described in this report are identified by a label bearing the manufacturer's name (International Beams) and/or trademark, the APA assigned plant

number of 1033 for the Pohénégamook plant, the I-joist depth and series, the APA logo, the report number PR-L252, and a means of identifying the date of manufacture.

Table 1. Design Properties (Allowable Stress Design) for IB Series I-Joists<sup>(a)</sup>

Joist Designation	Joist Depth (in.)	Also Qualified for	EI <sup>(b)</sup> (10 <sup>6</sup> lbf-in. <sup>2</sup> )	M <sup>(c)</sup> (lbf-ft)	V <sup>(d)</sup> (lbf)		Vertical load (plf)	K <sup>(e)</sup> (10 <sup>6</sup> lbf)
					Without bearing stiffeners	With bearing stiffeners		
IB-400	9-1/4	NA	185	2,715				
	9-1/2	PRI-40	198	2,800	1,155	1,155	2,000	4.81
	11-1/4	NA	296	3,410	1,185	1,185	2,000	4.94
	11-7/8	PRI-40	336	3,630	1,405	1,405	2,000	5.85
	14	PRI-40	494	4,370	1,480	1,480	2,000	6.18
	16	PRI-40	673	5,065	1,550	1,750	2,000	7.28
IB-600	9-1/4	NA	220	3,740	1,550	2,000	2,000	8.32
	9-1/2	PRI-60	235	3,860	1,155	1,350	2,000	4.81
	11-1/4	NA	356	4,700	1,185	1,370	2,000	4.94
	11-7/8	PRI-60	399	5,000	1,405	1,515	2,000	5.85
	14	PRI-60	585	6,020	1,480	1,570	2,000	6.18
	16	PRI-60	799	6,980	1,550	1,750	2,000	7.28
	18	NA	1,046	7,895	1,550	2,000	2,000	8.32
	20	NA	1,304	8,735	1,550	2,250	1,750	9.36
IB-800	9-1/4	NA	307	5,295	1,550	2,500	1,500	10.40
	9-1/2	PRI-80	326	5,465	1,155	1,390	2,000	4.81
	11-1/4	NA	493	6,655	1,185	1,405	2,000	4.94
	11-7/8	PRI-80	552	7,080	1,405	1,540	2,000	5.85
	14	PRI-80	807	8,530	1,480	1,585	2,000	6.18
	16	PRI-80	1,094	9,890	1,550	1,750	2,000	7.28
	18	NA	1,445	11,135	1,550	2,000	2,000	8.32
	20	NA	1,799	12,380	1,600	2,300	1,810	9.36
IB-900	11-7/8	PRI-90	604	8,825	1,650	2,600	1,625	10.40
	14	PRI-90	884	10,630	1,885	1,925	2,000	6.18
	16	PRI-90	1,199	12,635	1,885	2,125	2,000	7.28
	18	NA	1,565	14,285	1,885	2,330	2,000	8.32
	20	NA	1,984	15,810	1,885	2,510	1,810	11.52
	22	NA	2,457	17,320	1,885	2,695	1,625	12.80
	24	NA	2,985	18,810	1,885	2,875	1,250	14.08

(a) The tabulated values are design values for normal duration of load. All values, except for EI and K, shall be permitted to be adjusted for other load durations as permitted by the code. Values for Limit States Design in Canada are available from the manufacturer.

(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 with a minimum end bearing length of 4".

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

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

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

Where:  $\delta$  = calculated deflection (in.),  $\omega$  = uniform load (lbf/in.),  
 P = concentrated load (lbf),  $\ell$  = design span (in.),  
 EI = bending stiffness of the I-joist (lbf-in.<sup>2</sup>), and  
 K = coefficient of shear deflection (lbf).

Table 2. Intermediate Reaction Design Properties (Allowable Stress Design) for IB Series I-Joists<sup>(a)</sup>

Joist Designation	Joist Depth (in.)	Also Qualified for	IR (lb <sub>f</sub> )			
			3-1/2-in. Bearing		5-1/2-in. Bearing	
			w/o BS	w/ BS	w/o BS	w/ BS
IB-400	9-1/4	NA	2,160	2,310	2,310	2,310
	9-1/2	PRI-40	2,160	2,370	2,370	2,370
	11-1/4	NA	2,500	2,795	2,810	2,810
	11-7/8	PRI-40	2,500	2,795	2,810	2,960
	14	PRI-40	2,500	2,795	3,100	3,455
	16	PRI-40	2,500	2,795	3,100	3,650
IB-600	9-1/4	NA	2,160	2,700	2,310	2,700
	9-1/2	PRI-60	2,160	2,740	2,370	2,740
	11-1/4	NA	2,500	3,030	2,810	3,030
	11-7/8	PRI-60	2,500	3,075	2,810	3,140
	14	60	2,500	3,215	3,100	3,455
	16	PRI-60	2,500	3,350	3,100	3,650
	18	NA	2,500	3,425	3,100	3,735
20	NA	2,500	3,450	3,100	3,820	
IB-800	9-1/4	NA	2,310	2,700	2,310	2,700
	9-1/2	NA	2,370	2,740	2,370	2,740
	11-1/4	NA	2,810	3,030	2,810	3,030
	11-7/8	PRI-80	2,810	3,140	2,810	3,140
	14	PRI-80	3,020	3,500	3,100	3,500
	16	PRI-80	3,100	4,000	3,100	4,000
	18	NA	3,100	4,225	3,100	4,225
20	NA	3,100	4,350	3,100	4,350	
IB-900	11-7/8	PRI-90	3,355	3,355	3,355	3,355
	14	PRI-90	3,355	3,530	3,355	3,660
	16	PRI-90	3,355	3,920	3,355	4,090
	18	NA	3,355	4,270	3,355	4,640
	20	NA	3,355	4,600	3,355	5,000
	22	NA	3,355	4,950	3,355	5,075
	24	NA	3,355	5,150	3,355	5,150

<sup>(a)</sup> Interpolation between 3-1/2- and 5-1/2-inch IR shall be permitted.

Table 3. End Reaction Design Properties (Allowable Stress Design) for IB Series I-Joists<sup>(a)</sup>

Joist Designation	Joist Depth	Also Qualified for	ER (lbf)									
			1-1/2 in. Bearing		1-3/4 in. Bearing		2-3/4 in. Bearing		3-1/2 in. Bearing		4 in. Bearing	
			w/o BS	w/ BS	w/o BS	w/ BS	w/o BS	w/ BS	w/o BS	w/ BS	w/o BS	w/ BS
IB-400	9-1/4"	NA	1,110	1,155	1,115	1,155	1,155	1,155	1,155	1,155	1,155	1,155
	9-1/2"	PRI-40	1,120	1,185	1,130	1,185	1,185	1,185	1,185	1,185	1,185	1,185
	11-1/4"	NA	1,175	1,355	1,205	1,360	1,340	1,405	1,405	1,405	1,405	1,405
	11-7/8"	PRI-40	1,195	1,420	1,230	1,430	1,370	1,480	1,465	1,480	1,480	1,480
	14"	PRI-40	1,260	1,630	1,295	1,645	1,455	1,750	1,550	1,750	1,550	1,750
	16"	PRI-40	1,325	1,825	1,355	1,845	1,455	2,000	1,550	2,000	1,550	2,000
IB-600	9-1/4"	NA	1,110	1,155	1,130	1,350	1,155	1,350	1,155	1,350	1,155	1,350
	9-1/2"	PRI-60	1,120	1,185	1,140	1,370	1,185	1,370	1,185	1,370	1,185	1,370
	11-1/4"	NA	1,175	1,355	1,215	1,515	1,340	1,515	1,405	1,515	1,405	1,515
	11-7/8"	PRI-60	1,195	1,420	1,240	1,570	1,370	1,570	1,465	1,570	1,480	1,570
	14"	PRI-60	1,260	1,630	1,335	1,750	1,460	1,750	1,550	1,750	1,550	1,750
	16"	PRI-60	1,325	1,825	1,420	1,925	1,495	1,970	1,550	2,000	1,550	2,000
	18"	NA	NA	NA	1,505	2,095	1,530	2,185	1,550	2,250	1,550	2,250
20"	NA	NA	NA	1,550	2,260	1,550	2,395	1,550	2,500	1,550	2,500	
IB-800	9-1/4"	NA	1,110	1,155	1,130	1,380	1,155	1,350	1,155	1,380	1,155	1,390
	9-1/2"	NA	1,120	1,185	1,140	1,405	1,185	1,370	1,185	1,405	1,185	1,405
	11-1/4"	NA	1,175	1,355	1,215	1,540	1,340	1,515	1,405	1,540	1,405	1,540
	11-7/8"	PRI-80	1,195	1,420	1,280	1,585	1,370	1,570	1,465	1,585	1,480	1,585
	14"	PRI-80	1,260	1,630	1,335	1,750	1,460	1,750	1,550	1,750	1,550	1,750
	16"	PRI-80	1,325	1,825	1,420	2,000	1,495	1,970	1,550	2,000	1,550	2,000
	18"	NA	NA	NA	1,505	2,270	1,530	2,185	1,550	2,300	1,600	2,300
20"	NA	NA	NA	1,550	2,460	1,550	2,395	1,550	2,600	1,650	2,600	
IB-900	11-7/8"	PRI-90	1,195	1,420	1,400	1,585	1,630	1,710	1,805	1,805	1,885	1,925
	14"	PRI-90	1,260	1,630	1,400	1,750	1,630	1,870	1,805	1,960	1,885	2,125
	16"	PRI-90	1,325	1,825	1,420	2,000	1,640	2,190	1,805	2,330	1,885	2,330
	18"	NA	NA	NA	1,505	2,270	1,600	2,405	1,675	2,510	1,885	2,510
	20"	NA	NA	NA	1,550	2,470	1,620	2,590	1,675	2,680	1,885	2,695
	22"	NA	NA	NA	1,470	2,595	1,585	2,725	1,675	2,820	1,885	2,875
24"	NA	NA	NA	1,470	2,880	1,585	2,925	1,675	2,960	1,885	3,060	

(a) Interpolation of the end reaction between tabulated bearing lengths shall be permitted. For bearing lengths greater or equal to 4 inches the "4 in. Bearing" values shall be used.

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