

Broadspan™ “S” Series I-Joists  
Georgia-Pacific Wood Products LLC

PR-L288  
Revised October 22, 2010

Products: BSI 40S, BSI 60S, BSI 80S, and BSI 85S Series I-Joists  
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[www.gp.com/build/productgroup.aspx?pid=6708](http://www.gp.com/build/productgroup.aspx?pid=6708)

1. Basis of the product report:
  - 2009 and 2006 International Building Code (IBC): Sections 104.11 Alternative Materials and 2303.1.2 Prefabricated wood I-joists
  - 2009 and 2006 International Residential Code (IRC): Sections R104.11 Alternative Materials and R502.1.4 Prefabricated wood I-joists
  - ASTM D 5055-05 and D5055-04 recognized by the 2009 IBC and IRC, and 2006 IBC and IRC, respectively
  - APA Reports T98Q-20, T98P-21, T2000P-12A, T2001M-2, T2001M-20, T2003M-79, T2004M-27, T2004M-29, T2007M-23, T2007M-56, T2008M-104, T2009M-31, T2009M-51, T2009M-52, T2010M-45, T2010M-47, and other qualification data
2. Product description:

The BSI Series I-joists covered by this report are made with lumber flanges and OSB webs in accordance with the in-plant manufacturing standards approved by APA.
3. Design properties:

Table 1 lists the design properties for BSI Series I-joists covered by this report. The allowable spans for BSI Series I-joists covered in this report shall be in accordance with the recommendations provided by the manufacturer ([www.gp.com/build/product.aspx?pid=6708](http://www.gp.com/build/product.aspx?pid=6708)). For connection design, the specific gravity for the BSI flanges shall be limited to 0.42 for BSI 40S; 0.46 for BSI 60S and BSI 80S (up to 16”), and 0.55 for BSI 80S (greater than 16”) and BSI 85S.
4. Product installation:

BSI 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), and with APA Design/Construction Guide: *Fire-Rated Systems*, Form W305 ([www.apawood.org/publications](http://www.apawood.org/publications)).
6. Limitations:
  - a) BSI Series I-joists shall be designed in accordance with the code using the design properties specified in this report.
  - b) BSI Series I-joists are limited to dry service conditions where the average equilibrium moisture content of sawn lumber is less than 16 percent.
  - c) BSI 40S (except for 9-1/4 inches), BSI 60S (except for 9-1/4 inches), BSI 80S (except for 9-1/4, 9-1/2, and 11-1/4 inches), and BSI 85S Series I-joists are produced at the Georgia-Pacific Wood Products LLC, Ocala, Florida facilities, and BSI 40S, BSI 60S, and BSI 80S Series I-joists are produced at the Roxboro, North Carolina facilities under a quality assurance program audited by APA.

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

7. Identification:

The BSI Series prefabricated wood I-joists described in this report are identified by a label bearing the manufacturer's name (Georgia-Pacific Wood Products LLC) and/or trademark (Broadspan), the APA assigned plant number (1021 for the Ocala plant or 1027 for the Roxboro plant), the I-joist depth and series, the APA logo, the report number PR-L288, and a means of identifying the date of manufacture.

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

Joist Depth (in.)	Joist Series	EI <sup>(b)</sup> (x10 <sup>6</sup> lbf-in. <sup>2</sup> )	M <sup>(c)</sup> (lbf-ft)	V <sup>(d)</sup> (lbf)	End Reaction <sup>(e)</sup> (lbf)				Intermediate Reaction (lbf)				K <sup>(f)</sup> (x10 <sup>6</sup> lb)	Uniform Vertical Load (lbf/ft)
					1-3/4 in. Brg. Length		4 in. Brg. Length		3-1/2 in. Brg. Length		5-1/4 in. Brg. Length			
					w/o Brg. Stiff	w/Brg. Stiff	w/o Brg. Stiff	w/Brg. Stiff	w/o Brg. Stiff	w/Brg. Stiff	w/o Brg. Stiff	w/Brg. Stiff		
9-1/4	BSI 40S	182	2,680	1,080	1,030	---	1,080	---	2,160	2,485	2,560	3,145	4.81	2,000
	BSI 60S	219	3,700	1,200	1,100	---	1,200	---	2,300	2,600	2,575	3,160	4.81	2,000
	BSI 80S	304	5,230	1,325	1,250	---	1,325	---	2,750	3,535	3,345	3,695	4.81	2,000
9-1/2	BSI 40S	193	2,765	1,200	1,110	---	1,200	---	2,350	2,500	2,575	3,150	4.94	2,000
	BSI 60S	231	3,805	1,210	1,110	---	1,210	---	2,375	2,645	2,600	3,175	4.94	2,000
	BSI 80S	324	5,395	1,365	1,255	---	1,365	---	2,755	3,625	3,360	3,735	4.94	2,000
11-1/4	BSI 60S	352	4,640	1,420	1,195	---	1,420	---	2,455	2,720	2,700	3,195	5.85	2,000
	BSI 80S	485	6,570	1,530	1,280	---	1,530	---	2,865	3,850	3,445	4,005	5.85	2,000
11-7/8	BSI 40S	330	3,585	1,460	1,225	---	1,460	---	2,575	2,645	2,720	3,175	6.18	2,000
	BSI 60S	396	4,930	1,495	1,230	---	1,495	---	2,590	2,745	2,740	3,200	6.18	2,000
	BSI 80S	547	6,975	1,555	1,290	---	1,555	---	2,880	4,025	3,475	4,085	6.18	2,000
14	BSI 40S	482	4,315	1,715	1,250	---	1,715	---	2,610	2,790	2,830	3,200	7.28	2,000
	BSI 60S	584	5,935	1,740	1,335	---	1,740	---	2,625	2,845	2,860	3,225	7.28	2,000
	BSI 80S	802	8,400	1,800	1,335	---	1,800	---	3,040	4,225	3,575	4,475	7.28	2,000
16	BSI 40S	657	5,005	1,990	1,235	1,500	1,675	1,990	2,650	2,935	2,950	3,225	8.32	2,000
	BSI 60S	799	6,885	2,000	1,345	1,575	1,675	2,000	2,675	2,945	2,980	3,250	8.32	2,000
	BSI 80S	1,092	9,740	2,060	1,345	1,770	1,710	2,060	3,200	4,420	3,675	4,725	8.32	2,000
18	BSI 80S	1,507	11,610	2,200	1,420	2,000	1,635	2,200	---	4,875	---	5,000	9.36	1,750
20	BSI 80S	1,920	13,015	2,280	1,335	2,225	1,560	2,280	---	5,075	---	5,400	10.40	1,750
22	BSI 85S	2,419	14,230	2,640	---	2,300	---	2,640	---	5,395	---	5,495	14.83	3,350
24	BSI 85S	2,962	15,615	2,825	---	2,375	---	2,825	---	5,640	---	5,750	16.15	3,350

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

- <sup>(a)</sup> 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.
- <sup>(b)</sup> Bending stiffness (EI) of the I-joist.
- <sup>(c)</sup> Moment capacity (M) of the I-joist, which shall not be increased by any repetitive member use factor.
- <sup>(d)</sup> Shear capacity (V) of the I-joist.
- <sup>(e)</sup> Interpolation of the end reaction between 1-3/4" and 4" bearing is permitted.
- <sup>(f)</sup> 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.),
- P = concentrated load (lbf),
- EI = bending stiffness of the I-joist (lbf-in.<sup>2</sup>),
- K = coefficient of shear deflection (lbf),
- $\omega$  = uniform load (lbf/in.), and
- $\ell$  = design span (in.).

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**APA – THE ENGINEERED WOOD ASSOCIATION**

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