

Broadspan<sup>®</sup> I-Joists  
Georgia-Pacific Wood Products LLC

PR-L273  
Revised June 29, 2009

Products: BSI 200, 400, 700 and 900 Series I-Joists  
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1. Basis of the product report:
  - 2006 International Building Code (IBC): Sections 104.11 Alternative Materials and 2303.1.2 Prefabricated wood I-joists
  - 2006 International Residential Code (IRC): Sections R104.11 Alternative Materials and R502.1.4 Prefabricated wood I-joists
  - ASTM D 5055-04 recognized by the 2006 IBC and IRC
  - APA Reports T98Q-11, T99P-01, T99P-28, T2000P-03A, T2001M-1, T2001P-16, T2001P-19, T2001P-21, T2001P-59, T2001P-61, T2001P-62, T2001P-84, T2002P-40, T2002M-60A, T2003M-43, T2003M-44A, T2003M-55, T2003P-62, T2003P-70, T2003M-78, T2004M-44, T2005M-53, T2006M-71, T2007M-29, T2007P-54, T2007M-65, T2007P-83, T2007M-108, and other qualification data.
2. Product description:

Broadspan I-Joist Series BSI 200, 400, 700 and 900 are made with laminated veneer lumber (LVL) flanges and OSB webs in accordance with the in-plant manufacturing standards and quality manuals approved by APA. The minimum flange thicknesses are: 1-3/8 inches for BSI 200 and 400 Series I-joists, and 1-1/2 inches for BSI 700 and 900 Series I-joists.
3. Design properties:

Table 1 lists the design properties for BSI Series I-joists. The allowable spans for BSI Series I-joists shall be in accordance with the recommendations provided by the manufacturer ([www.broadspanewp.com](http://www.broadspanewp.com)).
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 moisture content of lumber is less than 16 percent.
  - c) BSI 200 Series I-joists are produced at the Georgia-Pacific Wood Products LLC facility in Roxboro, North Carolina under a quality assurance program audited by APA.

- d) BSI 400 Series I-joists are produced at the Georgia-Pacific Wood Products LLC facility in Roxboro, North Carolina or Georgia-Pacific Wood Products South LLC facility in Thorsby, Alabama under a quality assurance program audited by APA.
- e) BSI 700 and 900 Series I-joists are produced at the Georgia-Pacific Wood Products South LLC, facility in Thorsby, Alabama under a quality assurance program audited by APA.
- f) This report is subject to re-examination in one year.

7. Identification:

The BSI Series I-joists described in this report are identified by a label bearing the manufacturer's name (Georgia-Pacific Wood Products LLC or Georgia-Pacific Wood Products South LLC) and/or trademark (Broadspan®), the APA assigned plant number (1027 for the Roxboro plant and 1085 for the Thorsby plant), the I-joist depth and series, the APA-EWS logo, the report number PR-L273, and a means of identifying the date of manufacture.

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

Joist Depth (in.)	Joist Series	EI <sup>(c)</sup> (x10 <sup>6</sup> lbf-in. <sup>2</sup> )	M <sup>(d)</sup> (lbf-ft)	V <sup>(e)</sup> (lbf)	End Reaction with 1-3/4-in. bearing <sup>(f)</sup> (lbf)	Intermediate Reaction with 3-1/2-in. bearing <sup>(g)</sup> (lbf)	K <sup>(h)</sup> (x10 <sup>6</sup> lbf)
9-1/2	BSI 200	159	3,000	1,135	1,050	2,340	4.94
	BSI 400	204	3,250	1,200	1,120	2,600	4.94
11-7/8	BSI 200	274	3,870	1,435	1,100	2,340	6.18
	BSI 400	346	4,200	1,460	1,225	2,600	6.18
	BSI 700	435	6,825	1,600	1,275	3,000	6.18
	BSI 900	663	10,480	1,950	1,500	3,800	6.18
14	BSI 200	409	4,640	1,710	1,150	2,340	7.28
	BSI 400	505	5,050	1,715	1,250	2,600	7.28
	BSI 700	638	8,135	1,800	1,300	3,000	7.28
	BSI 900	968	12,500	2,240	1,500	3,800	7.28
16	BSI 400	694	5,850	1,990	1,235	2,600	8.32
	BSI 700	868	9,320	2,050	1,350	3,000	8.32
	BSI 900	1,317	14,325	2,330	1,650	3,950	8.32

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> The maximum vertical load transfer of BSI Series I-joists is 2,000 plf.
- <sup>(c)</sup> Bending stiffness (EI) of the I-joist.
- <sup>(d)</sup> Moment capacity (M) of the I-joist, which shall not be increased by any repetitive member use factor.
- <sup>(e)</sup> Shear capacity (V) of the I-joist.
- <sup>(f)</sup> End reaction (ER) of the I-joist with a minimum bearing length of 1-3/4 inches without web stiffeners. Higher end reactions are permitted. For a bearing length of 4 inches, the end reaction may be set equal to the tabulated shear value. Interpolation of the end reaction between 1-3/4 inches and 4 inches bearing is permitted. For end reaction values greater than 1,550 pounds (1,900 pounds for BSI 900), web stiffeners are required.
- <sup>(g)</sup> Intermediate reaction (IR) of the I-joist with a minimum bearing length of 3-1/2 inches without web stiffeners.
- <sup>(h)</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.

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

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

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**APA – THE ENGINEERED WOOD ASSOCIATION  
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