

Wood I Beam[™]: WI Series I-Joists
Georgia-Pacific Wood Products LLC

PR-L256(F)
Revised January 25, 2012

Products: WI 40, WI 60, and WI 80 Series I-Joists
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1. Basis of the product report:
 - 2012 and 2009 International Building Code (IBC): Section 2303.1.2 Prefabricated wood I-joists
 - 2012 and 2009 International Residential Code (IRC): Section R502.1.4 Prefabricated wood I-joists
 - 2010 and 2007 Florida Building Code (FBC), Building: Section 2303.1.2 Prefabricated wood I-joists
 - 2010 and 2007 Florida Building Code (FBC), Residential: Section R502.1.1.4 Prefabricated wood I-joists
 - ASTM D5055-09 recognized by the 2012 IBC and IRC, ASTM D5055-05, recognized by the 2009 IBC, 2009 IRC and 2010 FBC, and ASTM D5055-04 recognized by the 2007 FBC
 - Performance Standard for APA EWS I-Joists, PRI-400
 - APA Reports T1998Q-20, T1998P-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, T2011P-65 and other qualification data
2. Product description:

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

Table 1 lists the design properties for WI Series I-joists. For connection design, the specific gravity of the WI flanges shall be limited to 0.42 for WI 40, and 0.46 for WI 60 and WI 80.
4. Product installation:

WI Series I-joists shall be installed 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, and with APA *Fire-Rated Systems*, Form W305Y, dated June 2005.
6. Limitations:
 - a) WI Series I-joists shall be designed in accordance with the code using the design properties specified in this report.
 - b) WI Series I-joists are limited to dry service conditions where the average equilibrium moisture content of sawn lumber is less than 16 percent.
 - c) WI 40, WI 60, and WI 80 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 WI 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, the APA assigned plant number (1027), the I-joist depth and series, the APA logo, the report number PR-L256, and a means of identifying the date of manufacture.

Table 1. Design Properties (Allowable Stress Design) for WI Series I-Joists ^(a)

Joist Depth (in.)	Joist Series	Also Qualified for	EI ^(b) (x10 ⁶ lbf-in. ²)	M ^(c) (lbf-ft)	V ^(d) (lbf)	End Reaction ^(e) (lbf)	Intermediate Reaction ^(f) (lbf)	C ^(g) (x10 ⁶ ft-lbf/in.)	Uniform Vertical Load (lbf/ft)
9-1/4	WI 40	---	181	2,650	1,080	1,030	2,160	0.401	2,000
	WI 60	---	217	3,665	1,080	1,030	2,160	0.401	2,000
	WI 80	---	301	5,210	1,120	1,080	2,240	0.401	2,000
9-1/2	WI 40	PRI-40	193	2,735	1,120	1,080	2,160	0.412	2,000
	WI 60	PRI-60	231	3,780	1,120	1,080	2,160	0.412	2,000
	WI 80	---	320	5,355	1,120	1,080	2,240	0.412	2,000
11-1/4	WI 40	---	289	3,370	1,345	1,200	2,500	0.488	2,000
	WI 60	---	347	4,630	1,345	1,200	2,500	0.488	2,000
	WI 80	---	480	6,550	1,390	1,215	2,750	0.488	2,000
11-7/8	WI 40	PRI-40	330	3,545	1,420	1,200	2,500	0.515	2,000
	WI 60	PRI-60	396	4,900	1,420	1,200	2,500	0.515	2,000
	WI 80	PRI-80	547	6,940	1,420	1,280	2,760	0.515	2,000
14	WI 40	PRI-40	482	4,270	1,710	1,200	2,500	0.607	2,000
	WI 60	PRI-60	584	5,895	1,710	1,200	2,500	0.607	2,000
	WI 80	PRI-80	802	8,360	1,710	1,280	3,020	0.607	2,000
16	WI 40	PRI-40	657	4,950	1,970	1,200	2,500	0.693	2,000
	WI 60	PRI-60	799	6,835	1,970	1,200	2,500	0.693	2,000
	WI 80	PRI-80	1,092	9,690	1,970	1,280	3,020	0.693	2,000

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

- (a) The tabulated values are design values for normal duration of load. All values, except for EI, C, and Uniform Vertical Load, shall be permitted to be adjusted for other load durations in accordance with the code.
- (b) Bending stiffness (EI) of the I-joist.
- (c) Moment capacity (M) of the I-joist.
- (d) Shear capacity (V) of the I-joist.
- (e) End reaction of the I-joist with a minimum bearing length of 1-3/4 inches without bearing 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 and 4-inch bearing is permitted. For end reaction values over 1,550 lbf, bearing stiffeners are required.
- (f) Intermediate reaction of the I-joist with a minimum bearing length of 3-1/2 inches without bearing stiffeners.
- (g) Coefficient of shear deflection (C). For calculating uniform load and center-point load deflections of the I-joist in a simple-span application, use Eqs. 1 and 2.

$$\text{Uniform Load: } \delta = \frac{22.5 \omega \ell^4}{EI} + \frac{\omega \ell^2}{C} \quad [1]$$

$$\text{Center-Point Load: } \delta = \frac{36 P \ell^3}{EI} + \frac{2 P \ell}{C} \quad [2]$$

Where:

- δ = calculated deflection (in.),
- P = concentrated load (lbf),
- EI = bending stiffness of the I-joist (lbf-in.²),
- C = coefficient of shear deflection (lbf-ft/in.),
- ω = uniform load (lbf/ft), and
- ℓ = design span (ft).

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**APA – THE ENGINEERED WOOD ASSOCIATION
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