

LP[®] SolidStart[®] I-Joists
Louisiana-Pacific Corporation

PR-L238

Revised June 10, 2020

Products: LP[®] SolidStart[®] and LP FlameBlock[®] I-Joists
LP Building Products, Louisiana-Pacific Corporation, 414 Union Street, Suite 2000, Nashville,
Tennessee 37219
(615) 986-5600
www.lpcorp.com

1. Basis of the product report:
 - 2018, 2015, 2012, and 2009 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 104.11 Alternative materials and R502.1.2 and R802.1.8 (2018 IRC only) Prefabricated wood I-joists
 - 2012 and 2009: Sections R104.11 Alternative materials and R502.1.4 Prefabricated wood I-joists
 - ASTM D5055-13e1, ASTM D5055-13, D5055-09, and D5055-05 recognized by the 2018 IBC and IRC, 2015 IBC and IRC, 2012 IBC and IRC, and 2009 IBC and IRC, respectively
 - Performance Standard for APA EWS I-Joists PRI-400
 - AWC SDPWS-2015 Special Design Provisions for Wind and Seismic
 - Intertek LPI 20, LPI 20X1.7 and LPI 32 Test Report, Intertek LPI 20X1.5 Test Report, PFS LPI 23 (a.k.a. LPI 32) Test Report, APA Reports T2005M-21, T2005M-52, T2006M-03, T2006M-07, T2008P-42, T2008P-45, T2008P-69, T2008P-97, T2008P-111, T2009P-03, T2009P-14, T2009P-21, T2009P-38, T2009P-47, T2009P-60, T2009P-61, T2009P-82, T2010P-36, T2010P-39, T2010P-52A, T2010P-58, T2010P-59, T2011P-08, T2011P-53A, T2011P-61, T2012P-25A, T2013P-30, T2013P-38, T2014P-03, T2014P-18, T2014P-29, T2014P-36, T2015L-05B, T2015P-10A, T2015P-11A, T2015P-30A, T2016P-01, T2016P-10, T2016P-19, T2016P-27, T2016P-39, T2017L-25, and T2017P-32, and other qualification data
2. Product description:

LP[®] SolidStart[®] and LP FlameBlock[®] I-joists are described in Table 1 in accordance with the in-plant manufacturing standard approved by APA. LP FlameBlock I-joists (LPI 18FB, LPI 20FB, and LPI 42FB) are made of OSB webs with a factory-applied Pyrotite[®] coating on both faces in accordance with the in-plant manufacturing standard.
3. Design properties:

Tables 2 and 3 list the design properties for the LP SolidStart and LP FlameBlock I-joists covered by this report. Table 4 shows the allowable lateral shear capacities of LP I-Joists in diaphragm applications. The allowable spans for LP SolidStart and LP FlameBlock I-joists shall be in accordance with the recommendations provided by the manufacturer (contact the manufacturer for information or refer to the *Technical Guide for Residential Construction*, Lit. Item LPEW0357, *Technical Guide for Light-Frame Commercial and Multifamily Construction*, Lit. Item LPEW0325, *LPI 450 Technical Guide*, Lit Item LPEW0421, or *LPI 530 Technical Guide*, Lit Item LPEW0416 (www.lpcorp.com/resources/literature). The allowable spans for LP SolidStart I-joists qualified as the PRI series shall be permitted in accordance with the *APA Performance Rated I-Joists*, Form Z725 (www.apawood.org/resource-library).
4. Product installation:

LP SolidStart and LP FlameBlock I-joists covered by this report shall be installed in accordance with the recommendations provided by the manufacturer (see link above) or the *APA I-Joist Construction Details*, Form D710 (see link above) for products qualified as the

PRI Series. Permissible web holes and cantilever reinforcements shall be in accordance with the recommendations provided by the manufacturer or with the APA D710 for products qualified as the PRI Series.

5. Fire-rated assemblies:
Fire-rated assemblies shall be constructed in accordance with the recommendations provided by the manufacturer, APA Product Report PR-S238, or APA *Fire-Rated Systems*, Form W305 (see link above) for products qualified as the PRI Series. LPI 18FB, LPI 20FB, and LPI 42FB series I-joists have demonstrated equivalent fire performance through fire tests in accordance with ICC-ES AC14 and are in compliance with Exception 4 to Section R302.13 of the 2018 and 2015 IRC, and Section R501.3 of the 2012 IRC.
6. Limitations:
 - a) LP SolidStart and LP FlameBlock I-joists shall be designed in accordance with the code using the design properties specified in this report.
 - b) LP SolidStart and LP FlameBlock I-joists are limited to dry service conditions where the average equilibrium moisture content of solid-sawn lumber is less than 16 percent.
 - c) LP SolidStart I-joists are produced at Red Bluff, California, Larouche, Quebec, and St. Prime, Quebec under a quality assurance program audited by APA. A list of I-joists manufactured at different LP facilities is documented and audited by APA.
 - d) LP FlameBlock I-joists are produced at Resolute – LP Engineered Wood Larouche Inc., Larouche, Quebec, under a quality assurance program audited by APA except that the Pyrotite coated webs are certified by the coating company and third-party inspection by the Underwriter Laboratories and Intertek Testing Services NA, Inc.
 - e) This report is subject to re-examination in one year.
7. Identification:
The LP I-joists described in this report are identified by a label bearing the manufacturer's name (Louisiana-Pacific Corporation, Resolute – LP Larouche, or Resolute – LP St Prime) and/or trademark, the APA assigned plant number (1069 for the Red Bluff plant, 1068 for the Larouche plant, and 1077 for the St. Prime plant), the I-joist series designation and depth, the APA logo, the report number PR-L238, and a means of identifying the date of manufacture.

Table 1. Description of LP SolidStart and LP FlameBlock I-Joists^(a)

Joist Series	Joist Depths (in.)	Flanges				Web	
		Material	G ^(b)	Dimension		Material	Thickness ^(d) (in.)
				Depth (in.)	Width (in.)		
LPI 18	7-7/8 - 16	Proprietary SPF	0.42	1-1/2	2-1/2	OSB	3/8
LPI 18FB	9-1/2 - 16	Proprietary SPF	0.42	1-1/2	2-1/2	OSB	23/32
LPI 20Plus	7-7/8 - 16	Proprietary SPF	0.42	1-1/2	2-1/2	OSB	3/8
LPI 20FB	9-1/2 - 16	MSR SPF	0.42	1-1/2	2-1/2	OSB	23/32
LPI 32Plus	7-7/8 - 16	MSR SPF	0.46	1-1/2	2-1/2	OSB	3/8
LPI 42Plus	7-7/8 - 24	Proprietary SPF	0.46 ^(c)	1-1/2	3-1/2	OSB	3/8 ^(e)
LPI 42FB	11-7/8 - 16	MSR SPF	0.46	1-1/2	3-1/2	OSB	23/32
LPI 52Plus	9-1/4 - 24	MSR SPF	0.50	1-1/2	3-1/2	OSB	7/16
LPI 36	11-7/8 - 24	LVL	0.50	1-1/2	2-1/4	OSB	3/8
LPI 56	11-7/8 - 24	LVL	0.50	1-1/2	3-1/2	OSB	7/16
LPI 450	9-1/2 - 16	LVL	0.50	1-5/16	1-3/4	OSB	3/8
LPI 530	9-1/2 - 16	LVL	0.50	1-5/16	2-1/16	OSB	3/8
LPI 53	7-7/8 - 16	LVL	0.50	1-5/16	2-1/16	OSB	3/8
LPI 70	7-7/8 - 16	LVL	0.50	1-5/16	2-3/4	OSB	3/8

- ^(a) Referenced dimensions are nominal. Tolerances are as specified in the in-plant quality manual.
- ^(b) Specific gravity of flanges for use in diaphragm design (see Table 4) based on oven-dry weight and oven-dry volume for lumber flanges or equivalent specific gravity for LVL flanges.
- ^(c) Specific gravity of flanges for LPI 42Plus SolidStart I-joists trademarked with mill number 1069 (Red Bluff, CA) is 0.50.
- ^(d) 7/16 inch webs shall be permitted to substitute for 3/8 inch webs.
- ^(e) 7/16 inch webs for joist depths exceeding 16 inches.

Table 2. Design Properties (Allowable Stress Design) for LP SolidStart and LP FlameBlock I-Joists^(a)

Joist Series Designation	Joist Depth (inches, unless otherwise noted)	EI ^(b) (10 ⁶ lbf-in. ²)	M ^(c) (lbf-ft)	V ^(d) (lbf)	VLC ^(e) (lbf/ft)	K ^(f) (10 ⁶ lbf-ft/in.)
LPI 18	7-7/8	69	1,910	940	1,900	0.302
	8-7/8	92	2,205	1,055	1,900	0.334
	9-1/4	114	2,315	1,100	1,900	0.347
	9-1/2	142	2,365	1,130	1,900	0.355
	11-1/4	228	2,915	1,280	1,760	0.414
	11-7/8	248	3,100	1,335	1,760	0.435
	14	371	3,720	1,510	1,600	0.508
	16	514	4,230	1,680	1,200	0.577
LPI 18FB	9-1/2	142	2,365	1,130	1,900	0.355
	11-7/8	248	3,100	1,335	1,760	0.435
	14	371	3,720	1,510	1,600	0.508
	16	514	4,230	1,680	1,200	0.577
LPI 20Plus	7-7/8	117	2,235	1,045	1,900	0.305
	8-7/8	157	2,580	1,175	1,900	0.337
	9-1/4	173	2,710	1,225	1,900	0.350
	240 mm	183	2,795	1,250	1,900	0.356
	9-1/2 ^(g)	185	2,810	1,260	1,900	0.358
	11-1/4	280	3,410	1,425	1,760	0.417
	300 mm	314	3,735	1,475	1,760	0.436
	11-7/8 ^(g)	318	3,755	1,485	1,760	0.438
	14 ^(g)	474	4,400	1,680	1,600	0.512
	360 mm	488	4,460	1,700	1,500	0.518
	400 mm	629	4,965	1,845	1,500	0.573
	16 ^(g)	652	5,050	1,870	1,500	0.582
LPI 20FB	9-1/2	185	2,810	1,260	1,900	0.358
	11-7/8	318	3,755	1,485	1,760	0.438
	14	474	4,400	1,680	1,600	0.512
	16	652	5,050	1,870	1,500	0.582
LPI 32Plus	7-7/8	152	2,890	1,045	2,200	0.200
	8-7/8	203	3,340	1,175	2,200	0.201
	9-1/4	228	3,510	1,225	2,200	0.208
	9-1/2 ^(g)	243	3,620	1,260	2,200	0.213
	11-1/4	359	4,410	1,425	2,200	0.252
	11-7/8 ^(g)	406	4,690	1,485	2,200	0.267
	14 ^(g)	589	5,645	1,680	1,600	0.313
	16 ^(g)	791	6,545	1,870	1,500	0.358
LPI 42Plus	7-7/8	204	4,290	1,145	2,200	0.341
	8-7/8	272	4,955	1,265	2,200	0.385
	9-1/4	301	5,210	1,310	2,200	0.401
	240 mm	317	5,340	1,335	2,200	0.410
	9-1/2	321	5,375	1,340	2,200	0.412
	11-1/4	480	6,550	1,550	2,200	0.488
	300 mm	535	6,920	1,615	2,200	0.513
	11-7/8 ^(h)	547	6,965	1,625	2,200	0.515
	14 ^(h)	802	8,390	1,875	2,000	0.607
	360 mm	825	8,505	1,895	2,000	0.614
	400 mm	1,054	9,560	2,085	2,000	0.682
	16 ^(h)	1,092	9,725	2,115	2,000	0.693
	18	1,333	11,000	2,555	1,700	0.960
	20	1,688	12,170	2,795	1,580	1.067
22	2,088	13,335	3,030	1,300	1.173	
24	2,534	14,480	3,270	1,100	1.280	

(Footnotes on Page 6)

Table 2. Design Properties (Allowable Stress Design) for LP SolidStart and LP FlameBlock I-Joists^(a)
 (Continued)

Joist Series Designation	Joist Depth (inches, unless otherwise noted)	EI ^(b) (10 ⁶ lbf-in. ²)	M ^(c) (lbf-ft)	V ^(d) (lbf)	VLC ^(e) (lbf/ft)	K ^(f) (10 ⁶ lbf-ft/in.)
LPI 42FB	11-7/8	547	6,965	1,625	2,200	0.515
	14	802	8,390	1,875	2,000	0.607
	16	1,092	9,725	2,115	2,000	0.693
LPI 52Plus	9-1/4	334	6,340	1,715	2,400	0.493
	9-1/2	356	6,540	1,745	2,400	0.507
	11-1/4	529	7,965	1,975	2,400	0.600
	11-7/8	600	8,475	2,055	2,400	0.633
	14	874	10,205	2,330	2,200	0.747
	16	1,183	11,835	2,585	2,000	0.853
	18	1,540	13,380	2,845	1,700	0.960
	20	1,948	14,810	3,105	1,580	1.067
	24	2,919	17,615	3,620	1,100	1.280
LPI 36	11-7/8	429	6,445	1,615	1,800	0.468
	14	622	7,755	1,830	1,800	0.550
	16	836	8,995	2,020	1,800	0.625
	18	1,082	10,135	2,185	1,300	0.700
	20	1,360	11,270	2,320	1,300	0.774
	24	2,010	13,505	2,525	1,100	0.922
LPI 56	11-7/8	668	10,170	2,055	2,400	0.549
	14	968	12,250	2,330	2,200	0.641
	16	1,301	14,205	2,585	1,900	0.729
	18	1,684	16,010	2,845	1,700	0.817
	20	2,115	17,800	3,105	1,580	0.905
	24	2,597	19,575	3,360	1,300	0.993
LPI 450	9-1/2	170	3,350	1,230	2,000	0.473
	11-7/8	286	4,320	1,430	2,000	0.585
	14	419	5,120	1,605	1,100	0.686
	16	569	5,860	1,775	1,100	0.782
LPI 530	9-1/2	200	4,000	1,340	2,000	0.478
	11-7/8	337	5,150	1,565	2,000	0.591
	16	666	6,990	1,955	1,100	0.789
LPI 53	7-7/8	128	3,210	1,045	2,000	0.402
	8-7/8	170	3,690	1,175	2,000	0.448
	9-1/4	188	3,880	1,225	2,000	0.466
	9-1/2	200	4,000	1,260	2,000	0.478
	11-1/4	297	4,850	1,425	2,000	0.561
	11-7/8	337	5,150	1,485	2,000	0.591
	16	666	6,990	1,870	1,100	0.789
LPI 70	7-7/8	172	4,340	1,045	2,000	0.410
	8-7/8	227	4,990	1,175	2,000	0.455
	9-1/4	251	5,250	1,225	2,000	0.474
	9-1/2	268	5,410	1,260	2,000	0.486
	11-1/4	396	6,560	1,425	2,000	0.569
	11-7/8	448	6,980	1,485	2,000	0.599
	16	881	9,480	1,870	1,100	0.800

(Footnotes on Page 6)

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, VLC, and K, shall be adjusted for other load durations in accordance with the code.
- (b) Bending stiffness (EI) of the I-joint.
- (c) Moment capacity (M) of the I-joint, which shall not be increased by any repetitive member factor.
- (d) Shear capacity (V) of the I-joint.
- (e) Uniform vertical load capacity of the I-joint.
- (f) Coefficient of shear deflection (K). For calculating uniform load and center-point load deflections of the I-joint in a simple-span application, use Eqs. 1 and 2.

$$\text{Uniform Load:} \quad \delta = \frac{5 \omega L^4}{384 EI} + \frac{\omega L^2}{12 K} \quad [1]$$

$$\text{Center-Point Load:} \quad \delta = \frac{PL^3}{48 EI} + \frac{PL}{6 K} \quad [2]$$

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

- (g) The 9-1/2, 11-7/8, 14, and 16-inch LPI 20Plus and LPI 32Plus trademarked with mill number 1068 (Larouche, QC) shall be permitted to be designed as PRI-40 and PRI-60 I-joists, respectively. The 9-1/2, 11-7/8, and 14-inch LPI 20Plus and LPI 32Plus trademarked with mill number 1077 (St. Prime, QC) shall be permitted to be designed as PRI-40 and PRI-60 I-joists, respectively
- (h) The 11-7/8, 14, and 16-inch LPI 42Plus I-joists trademarked with mill numbers 1068 (Larouche, QC) and 1069 (Red Bluff, CA) are recognized as PRI-80 I-joists. The 11-7/8 and 14-inch LPI 42Plus trademarked with mill number 1077 (St. Prime, QC) are recognized as PRI-80 I-joists.

Table 3. Reaction Capacities (Allowable Stress Design) for LP SolidStart and LP FlameBlock I-Joists^(a,b,c)

Joist Series Designation	Joist Depth (inches, unless otherwise noted)	Intermediate Reaction ^(d) (lbf)				End Reaction ^(e) (lbf)				Compressive Stress Perpendicular to Grain (F _{c⊥}), psi
		3-1/2 in. Brg. Length		5-1/2 in. Brg. Length		1-1/2 in. Brg. Length		4 in. Brg. Length		
		With Brg. Stiffeners		With Brg. Stiffeners		With Brg. Stiffeners		With Brg. Stiffeners		
		No	Yes	No	Yes	No	Yes	No	Yes	
LPI 18	7-7/8	1,890	2,035	2,115	2,250	870	940	940	940	425
	8-7/8	1,940	2,095	2,165	2,320	870	990	975	1,055	
	9-1/4	1,960	2,115	2,190	2,350	870	1,010	990	1,100	
	9-1/2	1,975	2,135	2,205	2,370	870	1,025	995	1,130	
	11-1/4	2,065	2,235	2,300	2,500	870	1,110	1,030	1,280	
	11-7/8	2,095	2,270	2,335	2,545	870	1,145	1,040	1,335	
	14	2,205	2,395	2,450	2,700	870	1,255	1,080	1,510	
16	2,310	2,515	2,565	2,855	870	1,355	1,115	1,680		
LPI 18FB	9-1/2	2,135	2,135	2,370	2,370	1,025	1,025	1,130	1,130	425
	11-7/8	2,270	2,270	2,545	2,545	1,145	1,145	1,335	1,335	
	14	2,395	2,395	2,700	2,700	1,255	1,255	1,510	1,510	
	16	2,515	2,515	2,855	2,855	1,355	1,355	1,680	1,680	
LPI 20Plus	7-7/8	2,100	2,265	2,350	2,500	970	1,045	1,045	1,045	425
	8-7/8	2,160	2,330	2,410	2,580	970	1,100	1,085	1,175	
	9-1/4	2,180	2,355	2,435	2,615	970	1,125	1,100	1,225	
	240 mm	2,190	2,370	2,445	2,630	970	1,135	1,105	1,250	
	9-1/2 ^(f)	2,195	2,375	2,450	2,635	970	1,140	1,110	1,260	
	11-1/4	2,295	2,485	2,560	2,780	970	1,235	1,145	1,425	
	300 mm	2,325	2,520	2,590	2,825	970	1,270	1,155	1,475	
	11-7/8 ^(f)	2,330	2,525	2,595	2,830	970	1,275	1,160	1,485	
	14 ^(f)	2,455	2,665	2,725	3,005	970	1,395	1,200	1,680	
	360 mm	2,465	2,675	2,740	3,020	970	1,405	1,205	1,700	
400 mm	2,555	2,780	2,835	3,150	970	1,495	1,235	1,845		
16 ^(f)	2,570	2,795	2,850	3,175	970	1,510	1,240	1,870		
LPI 20FB	9-1/2	2,375	2,375	2,635	2,635	1,140	1,140	1,260	1,260	425
	11-7/8	2,525	2,525	2,830	2,830	1,275	1,275	1,485	1,485	
	14	2,665	2,665	3,005	3,005	1,395	1,395	1,680	1,680	
	16	2,795	2,795	3,175	3,175	1,510	1,510	1,870	1,870	
LPI 32Plus	7-7/8	2,100	2,265	2,350	2,500	970	1,045	1,045	1,045	525
	8-7/8	2,160	2,330	2,410	2,580	970	1,100	1,085	1,175	
	9-1/4	2,180	2,355	2,435	2,615	970	1,125	1,100	1,225	
	9-1/2 ^(f)	2,195	2,375	2,450	2,635	970	1,140	1,110	1,260	
	11-1/4	2,295	2,485	2,560	2,780	970	1,235	1,145	1,425	
	11-7/8 ^(f)	2,330	2,525	2,595	2,830	970	1,275	1,160	1,485	
	14 ^(f)	2,455	2,665	2,725	3,005	970	1,395	1,200	1,680	
16 ^(f)	2,570	2,795	2,850	3,175	970	1,510	1,240	1,870		

(Footnotes on Page 10)

Table 3. Reaction Capacities (Allowable Stress Design) for LP SolidStart and LP FlameBlock I-Joists^(a,b,c) (Continued)

Joist Series Designation	Joist Depth (inches, unless otherwise noted)	Intermediate Reaction ^(d) (lbf)				End Reaction ^(e) (lbf)				Compressive Stress Perpendicular to Grain (F _{cL}), psi
		3-1/2 in. Brg. Length		5-1/2 in. Brg. Length		1-1/2 in. Brg. Length		4 in. Brg. Length		
		With Brg. Stiffeners		With Brg. Stiffeners		With Brg. Stiffeners		With Brg. Stiffeners		
		No	Yes	No	Yes	No	Yes	No	Yes	
LPI 42Plus	7-7/8	2,815	2,920	2,815	2,970	1,145	1,145	1,145	1,145	525 ⁽ⁱ⁾
	8-7/8	2,870	3,025	2,890	3,105	1,170	1,265	1,240	1,265	
	9-1/4	2,890	3,065	2,920	3,160	1,180	1,310	1,280	1,310	
	240 mm	2,895	3,085	2,935	3,185	1,185	1,335	1,295	1,335	
	9-1/2	2,900	3,095	2,940	3,195	1,185	1,340	1,305	1,340	
	11-1/4	2,995	3,270	3,075	3,430	1,230	1,465	1,515	1,550	
	300 mm	3,020	3,335	3,115	3,505	1,245	1,505	1,585	1,615	
	11-7/8 ^(g)	3,025	3,340	3,120	3,515	1,245	1,510	1,595	1,625	
	14 ^(g)	3,140	3,565	3,280	3,805	1,300	1,660	1,595	1,875	
	360 mm	3,150	3,580	3,295	3,830	1,305	1,670	1,595	1,895	
	400 mm	3,230	3,750	3,415	4,045	1,345	1,780	1,595	2,085	
	16 ^(g)	3,245	3,775	3,435	4,080	1,350	1,800	1,595	2,115	
	18	3,450	4,285	3,850	4,625	1,500 ^(h)	2,305 ^(h)	1,690	2,555	
	20	3,450	4,410	3,850	4,835	1,500 ^(h)	2,450 ^(h)	1,690	2,795	
22	3,450	4,530	3,850	5,030	1,500 ^(h)	2,595 ^(h)	1,690	3,030		
24	3,450	4,640	3,850	5,210	1,500 ^(h)	2,705 ^(h)	1,690	3,270		
LPI 42FB	11-7/8	3,340	3,340	3,515	3,515	1,510	1,510	1,625	1,625	525
	14	3,565	3,565	3,805	3,805	1,660	1,660	1,875	1,875	
	16	3,775	3,775	4,080	4,080	1,800	1,800	2,115	2,115	
LPI 52Plus	9-1/4	3,400	3,680	3,500	3,800	1,330	1,630	1,590	1,715	615
	9-1/2	3,400	3,710	3,515	3,840	1,335	1,650	1,600	1,745	
	11-1/4	3,415	3,925	3,605	4,110	1,360	1,775	1,665	1,975	
	11-7/8	3,420	4,000	3,635	4,210	1,370	1,820	1,690	2,055	
	14	3,435	4,260	3,745	4,540	1,385	1,970	1,845	2,330	
	16	3,450	4,505	3,850	4,855	1,400	2,110	1,985	2,585	
	18	3,450	4,750	3,850	5,165	1,700 ^(h)	2,490 ^(h)	2,130	2,845	
	20	3,450	4,990	3,850	5,475	1,700 ^(h)	2,675 ^(h)	2,130	3,105	
	22	3,450	5,235	3,850	5,790	1,700 ^(h)	2,865 ^(h)	2,130	3,360	
24	3,450	5,480	3,850	6,100	1,700 ^(h)	3,055 ^(h)	2,130	3,620		
LPI 36	11-7/8	2,500	3,105	2,835	3,470	1,025	1,500	1,290	1,615	550
	14	2,500	3,205	2,835	3,565	1,025	1,515	1,325	1,830	
	16	2,500	3,305	2,835	3,655	1,025	1,525	1,360	2,020	
	18	2,500	3,405	2,835	3,750	1,175 ^(h)	1,800 ^(h)	1,395	2,185	
	20	2,500	3,500	2,835	3,840	1,185 ^(h)	1,860 ^(h)	1,430	2,320	
	22	2,500	3,600	2,835	3,930	1,200 ^(h)	1,915 ^(h)	1,465	2,435	
24	2,500	3,700	2,835	4,025	1,215 ^(h)	1,960 ^(h)	1,500	2,525		

(Footnotes on Page 10)

Table 3. Reaction Capacities (Allowable Stress Design) for LP SolidStart and LP FlameBlock I-Joists^(a,b,c) (Continued)

Joist Series Designation	Joist Depth (inches, unless otherwise noted)	Intermediate Reaction ^(e) (lbf)				End Reaction ^(e) (lbf)				Compressive Stress Perpendicular to Grain (F _{c⊥}), psi
		3-1/2 in. Brg. Length		5-1/2 in. Brg. Length		1-1/2 in. Brg. Length		4 in. Brg. Length		
		With Brg. Stiffeners		With Brg. Stiffeners		With Brg. Stiffeners		With Brg. Stiffeners		
		No	Yes	No	Yes	No	Yes	No	Yes	
LPI 56	11-7/8	3,130	3,860	3,670	4,060	1,145	1,660	1,515	2,055	550
	14	3,130	4,055	3,670	4,300	1,145	1,755	1,535	2,330	
	16	3,130	4,245	3,670	4,525	1,145	1,845	1,555	2,585	
	18	3,130	4,435	3,670	4,750	1,315 ^(h)	2,300 ^(h)	1,575	2,845	
	20	3,130	4,620	3,670	4,975	1,325 ^(h)	2,455 ^(h)	1,595	3,105	
	22	3,130	4,810	3,670	5,200	1,335 ^(h)	2,610 ^(h)	1,615	3,360	
	24	3,130	5,000	3,670	5,430	1,340 ^(h)	2,770 ^(h)	1,635	3,620	
LPI 450	9-1/2	1,855	2,085	2,195	2,415	840	1,100	1,040	1,230	550
	11-7/8	1,920	2,230	2,255	2,510	840	1,210	1,070	1,430	
	14	1,985	2,360	2,305	2,595	840	1,305	1,100	1,605	
	16	2,045	2,485	2,360	2,680	840	1,395	1,125	1,775	
LPI 530	9-1/2	2,065	2,300	2,265	2,500	880	1,125	1,095	1,340	550
	11-7/8	2,120	2,485	2,400	2,735	880	1,245	1,120	1,565	
	14	2,165	2,655	2,525	2,945	880	1,350	1,145	1,765	
	16	2,210	2,810	2,640	3,140	880	1,450	1,165	1,955	
LPI 53	7-7/8	2,030	2,170	2,170	2,340	880	1,045	1,045	1,045	550
	8-7/8	2,050	2,240	2,230	2,425	880	1,095	1,060	1,175	
	9-1/4	2,060	2,265	2,250	2,460	880	1,115	1,065	1,225	
	9-1/2	2,065	2,280	2,265	2,480	880	1,125	1,070	1,260	
	11-1/4	2,105	2,405	2,365	2,635	880	1,215	1,095	1,425	
	11-7/8	2,120	2,445	2,400	2,690	880	1,245	1,100	1,485	
	14	2,165	2,590	2,525	2,875	880	1,350	1,130	1,680	
16	2,210	2,730	2,640	3,050	880	1,450	1,160	1,870		
LPI 70	7-7/8	2,100	2,300	2,250	2,420	900	1,045	1,045	1,045	550
	8-7/8	2,150	2,360	2,325	2,515	900	1,100	1,070	1,175	
	9-1/4	2,170	2,385	2,350	2,550	900	1,125	1,080	1,225	
	9-1/2	2,180	2,400	2,370	2,570	900	1,140	1,085	1,260	
	11-1/4	2,265	2,510	2,500	2,735	900	1,240	1,125	1,425	
	11-7/8	2,295	2,545	2,545	2,790	900	1,275	1,140	1,485	
	14	2,400	2,675	2,700	2,990	900	1,395	1,190	1,680	
	16	2,500	2,800	2,850	3,175	900	1,510	1,240	1,870	

(Footnotes on Page 10)

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 lbf = 4.448 N, 1 psi = 6.895 kPa.

- (a) Reaction capacity shall be limited by the tabulated I-joist reaction capacity, flange bearing capacity, or the bearing capacity of the support material, whichever is less. The flange bearing capacity is based on the allowable compressive stress perpendicular to grain of the I-joist flange, the net flange width, and the bearing length, and may be further limited by the bearing capacity of the support material. To calculate the net flange width, subtract 0.25 inch from the flange width (see Table 1) of the LPI 18, LPI 18FB, LPI 20Plus, LPI 20FB, LPI 32Plus, LPI 42Plus, and LPI 52Plus SolidStart I-joists, or subtract 0.10 inch from the flange width (see Table 1) of the LPI 36, LPI 56, LPI 450, LPI 530, LPI 53, and LPI 70 SolidStart I-joists.
- (b) Reaction capacity is for normal duration of load and shall be adjusted for other load durations provided that the adjusted reaction design value is not greater than the flange bearing capacity or the bearing capacity of the support material. Flange bearing capacity and the bearing capacity of any wood support shall not be adjusted for load duration.
- (c) Reaction capacity and flange bearing capacity shall be permitted to be increased over that tabulated for the minimum bearing length. Linear interpolation of the reaction capacity between the minimum and maximum bearing length is permitted. Bearing lengths longer than the maximum do not further increase the reaction capacity. Flange bearing capacity and that of a wood support will increase with additional bearing length.
- (d) For depths of 9-1/2 inches and greater, the intermediate reaction with a minimum bearing length of 3 inches shall be permitted to be determined based on the intermediate reaction values with a bearing length of 3-1/2 inches and 5-1/2 inches.
- (e) The minimum bearing length for end reactions is 1-1/2 inches, unless otherwise noted.
- (f) The 9-1/2, 11-7/8, 14, and 16-inch LPI 20Plus and LPI 32Plus trademarked with mill number 1068 (Larouche, QC) shall be permitted to be designed as PRI-40 and PRI-60 I-joists, respectively. The 9-1/2, 11-7/8, and 14-inch LPI 20Plus and LPI 32Plus trademarked with mill number 1077 (St. Prime, QC) shall be permitted to be designed as PRI-40 and PRI-60 I-joists, respectively.
- (g) The 11-7/8, 14, and 16-inch LPI 42Plus I-joists trademarked with mill numbers 1068 (Larouche, QC) and 1069 (Red Bluff, CA) are recognized as PRI-80 I-joists. The 11-7/8 and 14-inch LPI 42Plus trademarked with mill number 1077 (St. Prime, QC) are recognized as PRI-80 I-joists.
- (h) Minimum bearing length is 2-1/2 inches.
- (i) Compressive stress perpendicular to grain ($F_{c\perp}$) of flanges for LPI 42Plus SolidStart I-joists trademarked with mill number 1069 (Red Bluff, CA) is 615 psi.

Table 4. Allowable Shear (Pounds Per Foot) for Horizontal Wood Structural Panel Diaphragms Framed With LP SolidStart and LP FlameBlock I-Joists for Wind^(a) or Seismic Loading^(b,c)

Panel Grade	Common Nail Size	Minimum Nominal Panel Thickness (in.)	Minimum Nominal Width of Framing Members at Adjoining Panel Edges and Boundaries ^(d) (in.)	I-Joist series approved for diaphragm construction as indicated.	Blocked Diaphragms			Unblocked Diaphragms	
					Nail spacing (in.) at diaphragm boundaries (all cases), at continuous panel edges parallel to load (Cases 3 & 4), and at all panel edges (Cases 5 & 6) ^(e,g)			Nails Spaced 6 in. max. at supported edges ^(e)	
					6	4 ^(h)	2-1/2 ^(h,i)	Case 1 (No unblocked edges or continuous joints parallel to load)	All other configurations (Cases 2, 3, 4, 5 & 6)
					Nail spacing (in.) at other panel edges (Cases 1, 2, 3, & 4) ^(e)				
					6	6	4		
Structural 1 Grades	6d ^(f)	5/16	2	LPI 450, 530 & 53	185	250	NP ^(k)	165	125
			3	LPI 18, 18FB, 20Plus, 20FB, 32Plus, 42Plus, 42FB & 52Plus LPI 36 ^(j) , 56 & 70	210	280	420 ^(l)	185	140
	8d	3/8	2	LPI 450, 530 & 53	270	360	NP ^(k)	240	180
			3	LPI 18, 18FB, 20Plus, 20FB, 32Plus, 42Plus, 42FB & 52Plus LPI 36 ^(j) , 56 & 70	300	400	600 ^(l)	265	200
	10d	15/32	2	LPI 450, 530 & 53	320	425	NP ^(k)	285	215
			3	LPI 18, 18FB, 20Plus, 20FB, 32Plus, 42Plus, 42FB & 52Plus LPI 36 ^(j) , 56 & 70	360	480	720 ^(l)	320	240
Sheathing, single floor and other grades covered in DOC PS 1 and PS 2	6d ^(f)	5/16	2	LPI 450, 530 & 53	170	225	NP ^(k)	150	110
			3	LPI 18, 18FB, 20Plus, 20FB, 32Plus, 42Plus, 42FB & 52Plus LPI 36 ^(j) , 56 & 70	190	250	380 ^(l)	170	125
		3/8	2	LPI 450, 530 & 53	185	250	NP ^(k)	165	125
			3	LPI 18, 18FB, 20Plus, 20FB, 32Plus, 42Plus, 42FB & 52Plus LPI 36 ^(j) , 56 & 70	210	280	420 ^(l)	185	140
	8d	3/8	2	LPI 450, 530 & 53	240	320	NP ^(k)	215	160
			3	LPI 18, 18FB, 20Plus, 20FB, 32Plus, 42Plus, 42FB & 52Plus LPI 36 ^(j) , 56 & 70	270	360	540 ^(l)	240	180
		7/16	2	LPI 450, 530 & 53	255	340	NP ^(k)	230	170
			3	LPI 18, 18FB, 20Plus, 20FB, 32Plus, 42Plus, 42FB & 52Plus LPI 36 ^(j) , 56 & 70	285	380	570 ^(l)	255	190
		15/32	2	LPI 450, 530 & 53	270	360	NP ^(k)	240	180
			3	LPI 18, 18FB, 20Plus, 20FB, 32Plus, 42Plus, 42FB & 52Plus LPI 36 ^(j) , 56 & 70	300	400	600 ^(l)	265	200
	10d	15/32	2	LPI 450, 530 & 53	290	385	NP ^(k)	255	190
			3	LPI 18, 18FB, 20Plus, 20FB, 32Plus, 42Plus, 42FB & 52Plus LPI 36 ^(j) , 56 & 70	325	430	650 ^(l)	290	215
		19/32	2	LPI 450, 530 & 53	320	425	NP ^(k)	285	215
			3	LPI 18, 18FB, 20Plus, 20FB, 32Plus, 42Plus, 42FB & 52Plus LPI 36 ^(j) , 56 & 70	360	480	720 ^(l)	320	240

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 lbf = 4.448 N, 1 lbf/ft = 0.0146 N/mm.

(Footnotes on following page)

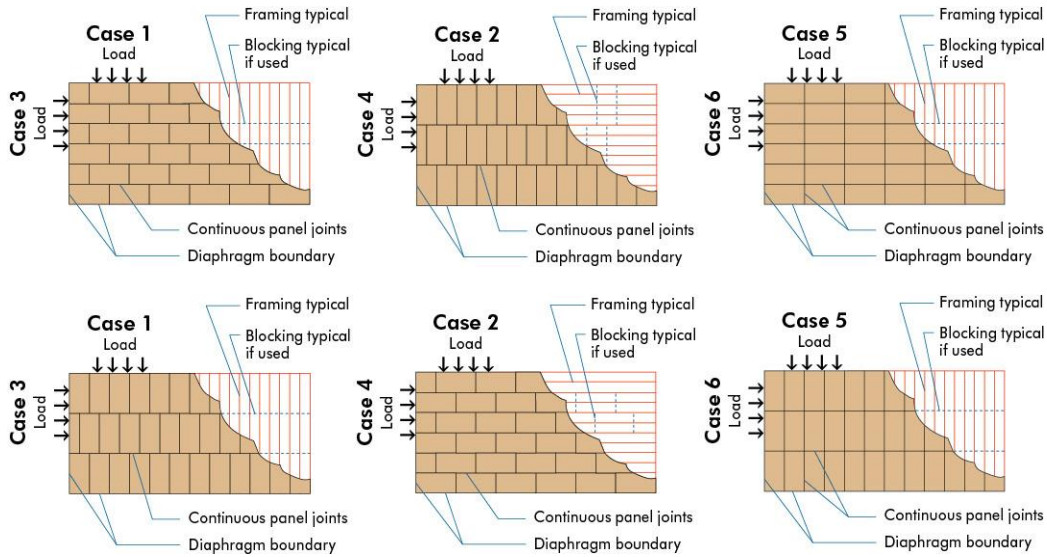


Figure 1. Diaphragm configurations

- (a) For wind load applications, the values in the table above shall be permitted to be multiplied by 1.4.
- (b) For shear loads of normal or permanent load duration as defined by the NDS, the values in the table above shall be multiplied by 0.63 or 0.56, respectively.
- (c) The tabulated allowable shear capacities are for I-joist series with flanges having a specific gravity (G) of 0.50 or higher (see Table 1). For $G < 0.50$ the allowable shear capacities shall be reduced by multiplying the allowable shear capacities by the Specific Gravity Adjustment Factor = $[1 - (0.5 - G)]$. The Specific Gravity Adjustment Factor shall not be greater than 1.
- (d) The minimum nominal width of framing members not located at boundaries or adjoining panel edges shall be 2 inches.
- (e) Space nails maximum 12 inches o.c. along intermediate framing members (6 inches o.c. when supports are spaced 48 inches o.c. or greater). Fasteners shall be located 3/8 inch minimum from panel edges (see figure below).
- (f) 8d common nails minimum are recommended for roofs due to negative pressures of high winds.
- (g) Fasteners shall be located 3/8 inch minimum from panel edges (see Figures 2, 3, and 4).
- (h) Adjacent nails within a row must be staggered 1/2 inch at diaphragm boundaries when nail spacing is 4 inches o.c. or less (see Figure 3).
- (i) Adjacent nails within a row must be staggered 1/2 inch at adjoining panel edges when nail spacing is 2-1/2 inches o.c. (see Figure 4).
- (j) LPI 36 is not permitted with the nail spacing of 2-1/2 inches o.c.
- (k) Not permitted.

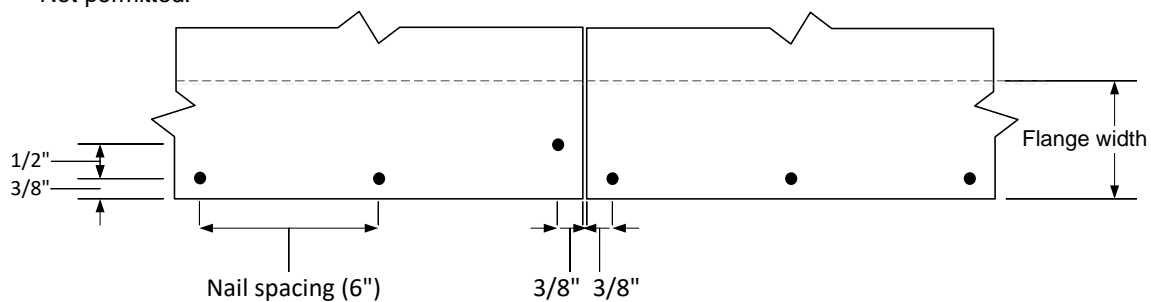


Figure 2. Boundary nails for nail spacing of 6 inches o.c. (not to scale)

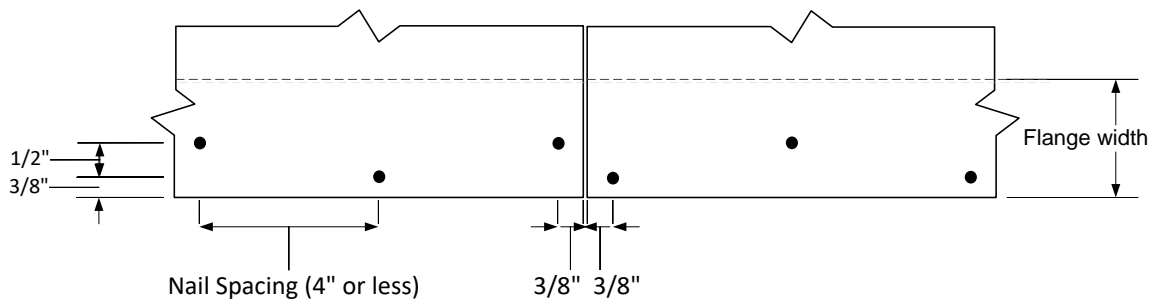


Figure 3. Staggered nails when the nail spacing is 4 inches o.c. or less at diaphragm boundaries (not to scale)

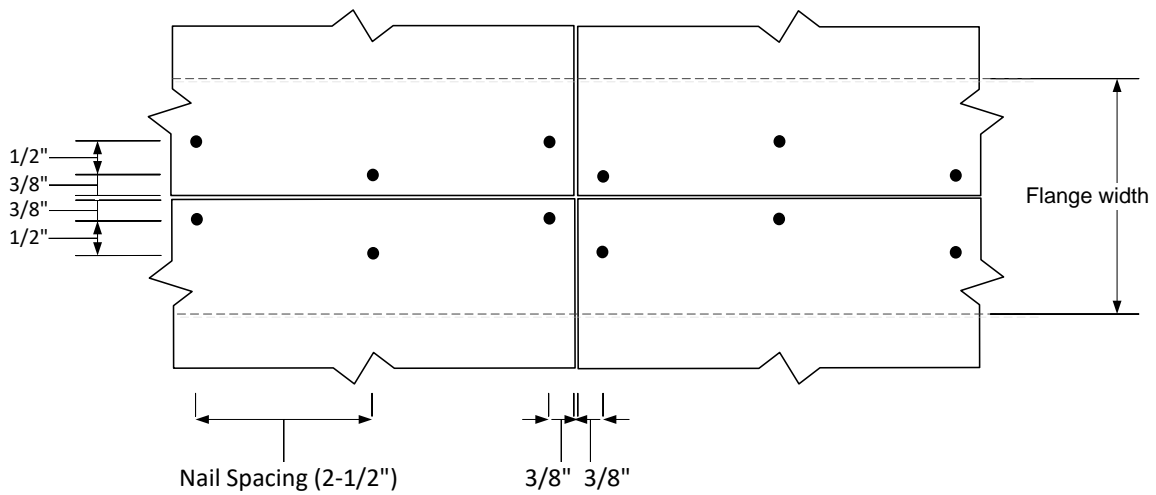


Figure 4. Staggered nails when the nail spacing is 2-1/2 inches o.c. at adjoining panel edges (not to scale)

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

APA Product Report® is a trademark of *APA – The Engineered Wood Association*, Tacoma, Washington. The information contained herein is based on the product evaluation in accordance with the references noted in this report. Neither APA, nor its members make any warranty, expressed or implied, or assume any legal liability or responsibility for the use, application of, and/or reference to opinions, findings, conclusions, or recommendations included in this report. Consult your local jurisdiction or design professional to assure compliance with code, construction, and performance requirements. Because APA has no control over quality of workmanship or the conditions under which engineered wood products are used, it cannot accept responsibility for product performance or designs as actually constructed.