APA PRODUCT REPORT®

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Resolute RSI I-Joists — PR-L340
Resolute Engineered Wood Larouche Inc. — Revised April 11, 2024

Products: Resolute RSI I-Joists
Resolute Engineered Wood Larouche Inc., 900 chemin du Lac-Hippolyte, Larouche, Quebec G0W 1Z0, Canada
(418) 547-2828
www.pfresolu.com

1. Basis of the product report:
   - 2021, 2018, 2015, and 2012 International Building Code (IBC): Sections 104.11 Alternative materials and 2303.1.2 Prefabricated wood I-joists
   - 2021, 2018, and 2015 International Residential Code (IRC): Sections 104.11 Alternative materials, and R502.1.2 and R802.1.8 (2021 and 2018 IRC only) Prefabricated wood I-joists
   - 2012 IRC: Sections R104.11 Alternative materials and R502.1.4 Prefabricated wood I-joists
   - ASTM D5055-16, D5055-13e1, ASTM D5055-13, and D5055-09 recognized in the 2021 IBC and IRC, 2018 IBC and IRC, 2015 IBC and IRC, and 2012 IBC and IRC, respectively
   - APA PRI-400 Performance Standard for Residential I-Joists
   - 2021, 2015, and 2008 ANSI/AWC Special Design Provisions for Wind and Seismic (SPDWS) recognized in the 2021, 2018 and 2015, and 2012 IBC, respectively
   - 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-69, T2008P-97, T2008P-111, T2009P-03, T2009P-14, T2009P-60, T2009P-61, T2009P-82, T2010P-36, T2010P-39, T2010P-52B, T2010P-58, T2011P-08, T2013P-35, T2013P-36, T2014P-03, T2014P-29, T2014P-36, T2015L-05B, T2015P-20, T2016P-01, T2016P-27, T2017L-25, and T2017P-32, and other qualification data

2. Product description:
   Resolute RSI I-joists are described in Table 1 in accordance with the in-plant manufacturing standard approved by APA.

3. Design properties:
   Tables 2 and 3 lists the design properties for the Resolute RSI I-joists covered by this report. Table 4 shows the allowable lateral shear capacities of Resolute RSI I-joists in diaphragm applications. The allowable spans for Resolute RSI I-joists shall be in accordance with the recommendations provided by the manufacturer (www.pfresolu.com). The allowable spans for Resolute PRI I-joists shall be permitted in accordance with the APA *Performance Rated I-Joists*, Form Z725 (www.apawood.org/resource-library).

4. Product installation:
   Resolute RSI I-joists covered by this report shall be installed in accordance with the recommendations provided by the manufacturer (see link above) or the APA *Performance Rated I-Joists*, Form Z725 (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 Z725 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 or APA *Fire-Rated Systems*, Form W305 (see link above).

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6. Limitations:
   a) Resolute RSI I-joists shall be designed in accordance with the code using the design properties specified in this report.
   b) Resolute RSI I-joists are limited to dry service conditions where the average equilibrium moisture content of solid-sawn lumber is less than 16%.
   c) Resolute RSI I-joists are produced at the Resolute Engineered Wood Larouche Inc. facility in Larouche, Quebec under a quality assurance program audited by APA.
   d) This report is subject to re-examination in one year.

7. Identification:
   Resolute RSI I-joists described in this report are identified by a label bearing the manufacturer's name (Resolute Engineered Wood Larouche Inc.) and/or trademark, the APA assigned plant number (1068), the I-joist series designation and depth, the APA logo, the report number PR-L340, and a means of identifying the date of manufacture.

Table 1. Description of Resolute RSI I-Joists[a]

Joist Series	Joist Depths (in.)	Flanges				Web	
		Material	G[b]	Dimension		Material	Thickness[c] (in.)
				Depth (in.)	Width (in.)		
RSI 15	8-7/8 - 16	Proprietary SPF	0.42	1-1/2	2-1/2	OSB	3/8
RSI 25	8-7/8 – 16	Proprietary SPF	0.42	1-1/2	2-1/2	OSB	3/8
RSI 25x4	9-1/2 - 16	MSR SPF	0.42	1-1/2	3-1/2	OSB	3/8
RSI 35	8-7/8 – 16	MSR SPF	0.46	1-1/2	2-1/2	OSB	3/8
RSI 45	8-7/8 - 24	Proprietary SPF	0.46	1-1/2	3-1/2	OSB	3/8[d]
RSI 55	9-1/4 - 24	MSR SPF	0.50	1-1/2	3-1/2	OSB	7/16
RSI 65	11-7/8 - 24	LVL	0.50	1-1/2	3-1/2	OSB	7/16

[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] 7/16-inch webs shall be permitted to substitute for 3/8-inch webs.
[d] 7/16 inch webs for joist depths exceeding 16 inches.

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Table 2. Design Properties (Allowable Stress Design) for Resolute RSI 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.)
RSI 15	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[g]	142	2,365	1,130	1,900	0.355
	11-1/4	228	2,915	1,280	1,760	0.414
	11-7/8[g]	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
RSI 25	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[h]	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[h]	318	3,755	1,485	1,760	0.438
	14[h]	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[h]	652	5,050	1,870	1,500	0.582
RSI 25x4	9-1/2[h]	185	2,810	1,260	1,900	0.358
	11-7/8[h]	318	3,755	1,485	1,760	0.438
	14[h]	474	4,400	1,680	1,600	0.512
	16[h]	652	5,050	1,870	1,500	0.582
RSI 35	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[i]	243	3,620	1,260	2,200	0.213
	11-1/4	359	4,410	1,425	2,200	0.252
	11-7/8[i]	406	4,690	1,485	2,200	0.267
	14[i]	589	5,645	1,680	1,600	0.313
	16[i]	791	6,545	1,870	1,500	0.358
RSI 45	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[j]	547	6,965	1,625	2,200	0.515
	14[j]	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[j]	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 4)

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Table 2. Design Properties (Allowable Stress Design) for Resolute RSI 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.)
RSI 55	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
	22	2,408	16,220	3,360	1,300	1.173
	24	2,919	17,615	3,620	1,100	1.280
RSI 65	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
	22	2,597	19,575	3,360	1,300	0.993
	24	3,127	21,340	3,620	1,100	1.081

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 (10 years). All values, except for EI and K, shall be adjusted for other load durations in accordance with the code., and the VLC values shall not be increased for shorter durations.
[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 factor.
[d] Shear capacity (V) of the I-joist.
[e] Uniform vertical load capacity of the I-joist.
[f] 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.

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

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

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

[g] The 9-1/2, and 11-7/8-inch RSI 15 shall be permitted to be designed as PRI-20 I-joists.
[h] The 9-1/2, 11-7/8, 14, and 16-inch RSI 25 and RSI-25x4 shall be permitted to be designed as PRI-40 I-joists.
[i] The 9-1/2, 11-7/8, 14, and 16-inch RSI 35 shall be permitted to be designed as PRI-60 I-joists.
[j] The 11-7/8, 14, and 16-inch RSI 45 are recognized as PRI-80 I-joists.

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Table 3. Reaction Capacities (Allowable Stress Design) for Resolute RSI 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 ($F_{c\perp}$), 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	
RSI 15	8-7/8	1,940	2,095	2,165	2,320	870	990	975	1,055	425
	9-1/4	1,960	2,115	2,190	2,350	870	1,010	990	1,100	
	9-1/2[f]	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[f]	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	
RSI 25	8-7/8	2,160	2,330	2,410	2,580	970	1,100	1,085	1,175	425
	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[g]	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[g]	2,330	2,525	2,595	2,830	970	1,275	1,160	1,485	
	14[g]	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[g]	2,570	2,795	2,850	3,175	970	1,510	1,240	1,870	
RSI 25x4	9-1/2[g]	2,195	2,375	2,450	2,635	970	1,140	1,110	1,260	425
	11-7/8[g]	2,330	2,525	2,595	2,830	970	1,275	1,160	1,485	
	14[g]	2,455	2,665	2,725	3,005	970	1,395	1,200	1,680	
	16[g]	2,570	2,795	2,850	3,175	970	1,510	1,240	1,870	
RSI 35	8-7/8	2,160	2,330	2,410	2,580	970	1,100	1,085	1,175	525
	9-1/4	2,180	2,355	2,435	2,615	970	1,125	1,100	1,225	
	9-1/2[h]	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[h]	2,330	2,525	2,595	2,830	970	1,275	1,160	1,485	
	14[h]	2,455	2,665	2,725	3,005	970	1,395	1,200	1,680	
	16[h]	2,570	2,795	2,850	3,175	970	1,510	1,240	1,870	

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Table 3. Reaction Capacities (Allowable Stress Design) for Resolute RSI I-Joists[a,b,c] (Continued)

Joist Series Designation	Joist Depth (inches, unless otherwise noted)	Intermediate Reaction[d] (lbf)				End Reaction[l] (lbf)				Compressive Stress Perpendicular to Grain ($F_{c\perp}$), 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	
RSI 45	8-7/8	2,870	3,025	2,890	3,105	1,170	1,265	1,240	1,265	525
	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[i]	3,025	3,340	3,120	3,515	1,245	1,510	1,595	1,625	
	14[i]	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[i]	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[j]	2,305[j]	1,690	2,555	
	20	3,450	4,410	3,850	4,835	1,500[j]	2,450[j]	1,690	2,795	
	22	3,450	4,530	3,850	5,030	1,500[j]	2,595[j]	1,690	3,030	
	24	3,450	4,640	3,850	5,210	1,500[j]	2,705[j]	1,690	3,270	
RSI 55	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[j]	2,490[j]	2,130	2,845	
	20	3,450	4,990	3,850	5,475	1,700[j]	2,675[j]	2,130	3,105	
	22	3,450	5,235	3,850	5,790	1,700[j]	2,865[j]	2,130	3,360	
	24	3,450	5,480	3,850	6,100	1,700[j]	3,055[j]	2,130	3,620	
RSI 65	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[j]	2,300[j]	1,575	2,845	
	20	3,130	4,620	3,670	4,975	1,325[j]	2,455[j]	1,595	3,105	
	22	3,130	4,810	3,670	5,200	1,335[j]	2,610[j]	1,615	3,360	
	24	3,130	5,000	3,670	5,430	1,340[j]	2,770[j]	1,635	3,620	

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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 RSI 15, RSI 25, RSI 25x4, RSI 35, RSI 45, and RSI 55 I-joists, or subtract 0.10 inch from the flange width (see Table 1) of the RSI 65 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 and 11-7/8-inch RSI 15 shall be permitted to be designed as PRI-20 I-joists.

(g) The 9-1/2, 11-7/8, 14, and 16-inch RSI 25 and RSI 25x4 shall be permitted to be designed as PRI-40 I-joists.

(h) The 9-1/2, 11-7/8, 14, and 16-inch RSI 35 shall be permitted to be designed as PRI-60 I-joists.

(i) The 11-7/8, 14, and 16-inch RSI 45 are recognized as PRI-80 I-joists.

(j) Minimum bearing length is 2-1/2 inches.

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Table 4. Allowable Shear (Pounds Per Foot) for Horizontal Wood Structural Panel Diaphragms Framed With Resolute RSI 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[e] (in.)	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)[f,g]			Nails Spaced 6 in. max. at supported edges[f,g]	
				6	4[h]	2-1/2[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)				
				6	6	4		
Structural 1 Grades	6d[d]	5/16	3	210	280	420	185	140
	8d	3/8		300	400	600	265	200
	10d	15/32		360	480	720	320	240
Sheathing, single floor and other grades covered in DOC PS 1 and PS 2	6d[d]	5/16		190	250	380	170	125
		3/8		210	280	420	185	140
	8d	3/8		270	360	540	240	180
		7/16		285	380	570	255	190
		15/32		300	400	600	265	200
	10d	15/32		325	430	650	290	215
		19/32		360	480	720	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 the following pages)

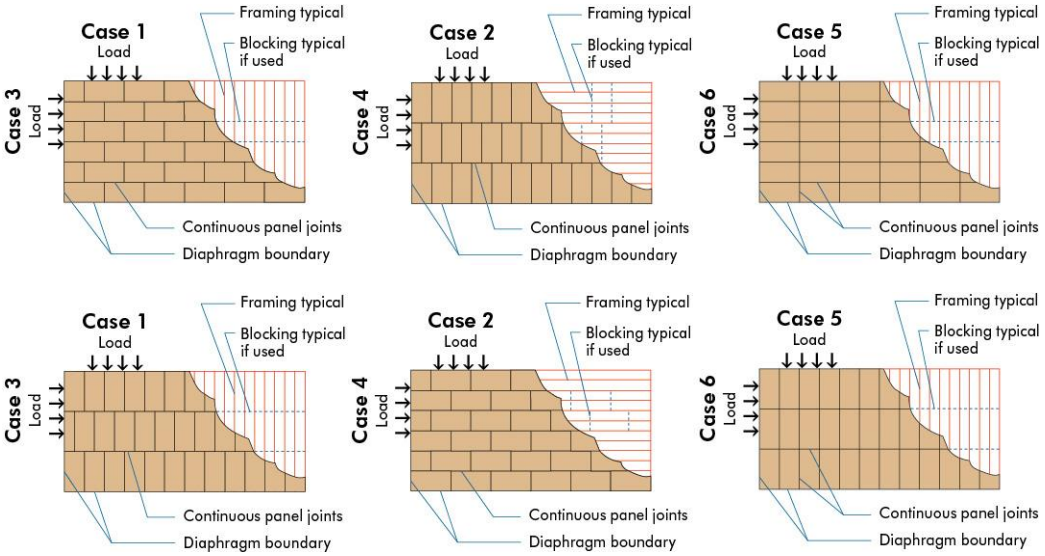

Figure 1. Diaphragm configurations

(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) 8d common nails minimum are recommended for roofs due to negative pressures of high winds.
(e) The minimum nominal width of framing members not located at boundaries or adjoining panel edges shall be 2 inches.
(f) 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).
(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 ½ inch when nail spacing is 4 inches or less (see Figure 3).
(i) Adjacent nails within a row must be staggered ½ inch at adjoining panel edges when nail spacing is 2-½ inches o.c. (see Figure 4).

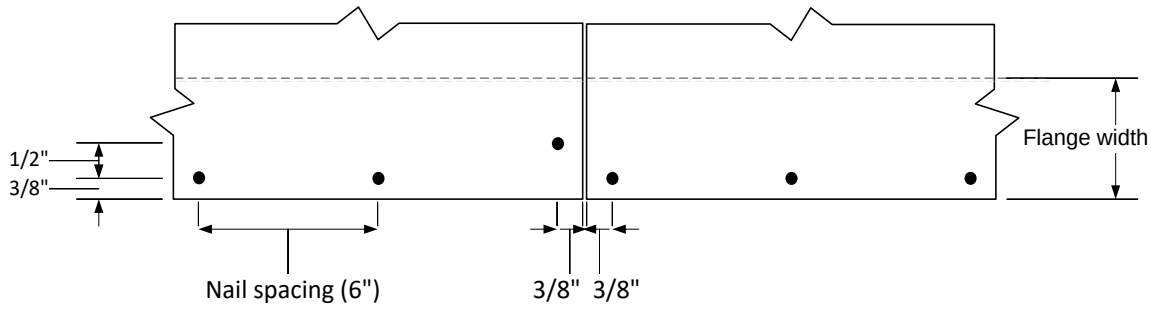

Figure 2. Boundary nails for nail spacing of 6 inches o.c. (not to scale)

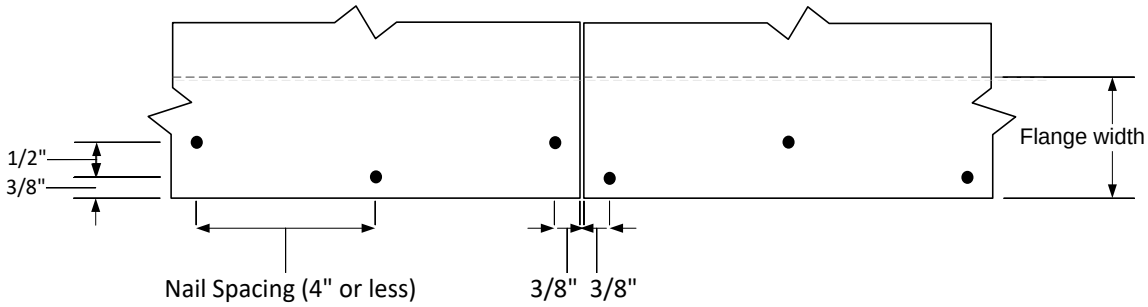

Figure 3. Staggered nails when the nail spacing is 4 inches o.c. or less at diaphragm boundaries (not to scale)

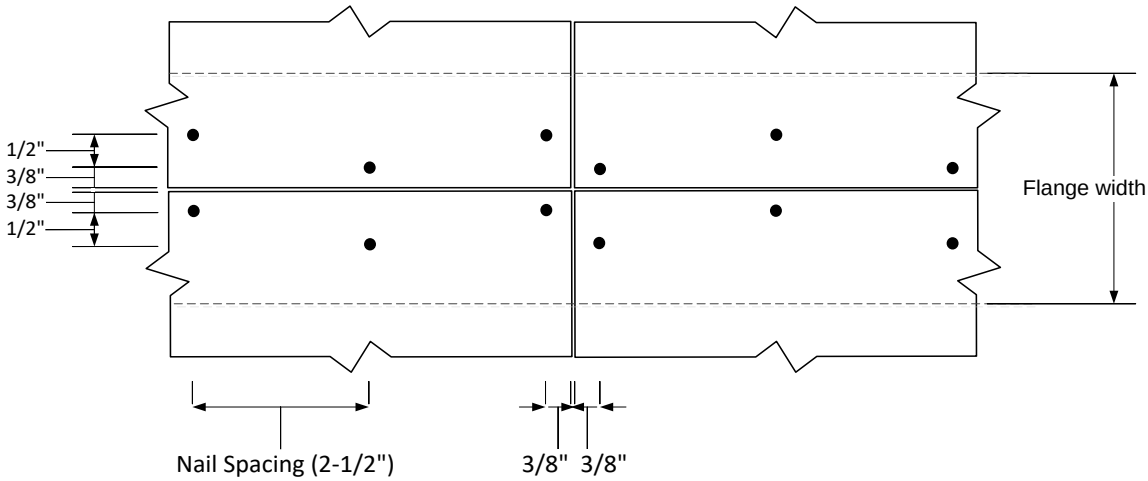

Figure 4. Staggered nails when the nail spacing is 2-1/2 inches o.c. at adjoining panel edges (not to scale)

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