

# APA Performance-Rated PRI-405 Commercial I-Joists

PR-L405

Revised February 13, 2014

Products: APA PRI-405 Commercial I-Joists

# 1. Basis of the product report:

- 2012 and 2009 International Building Code (IBC): Sections 104.11 Alternative Materials and 2303.1.2 Prefabricated wood I-joists
- 2012 and 2009 International Residential Code (IRC): Sections R104.11 Alternative Materials and R502.1.4 Prefabricated wood I-joists
- ASTM D5055-09 and D5055-05 recognized by the 2012 IBC and IRC, and 2009 IBC and IRC, respectively
- APA PRI-405 Performance Standard for APA EWS Commercial I-Joists
- APA Product Reports, and qualification test reports and data

### Product description:

The prefabricated wood I-joists described herein comply with the APA PRI-405 *Performance Standard for APA EWS Commercial I-Joists*, and are commonly used in non-residential floor and roof construction. The standard complies with the requirements of the codes and ASTM D5055.

PRI-405 I-joists are manufactured with flanges of sawn lumber or structural composite lumber (SCL) in a net width of 3-1/2 inches and a minimum net thickness of 1-5/16 inches. The flange materials have a specific gravity of 0.46 or higher for C1, and 0.50 for C2 and C3 series of I-joists. The PRI-405 I-joist webs are manufactured with structural-use panels, including plywood and oriented strand board (OSB), meeting the requirements of PS 1, PS 2, CSA O325, or CSA O437. Adhesives conforming to ASTM D5055 are used for flange-to-flange, flange-to-web, and web-to-web joints.

## Design properties:

Table 1 lists the design properties for PRI-405 I-joists covered in this report. The allowable spans for the I-joists series covered in this report shall be in accordance with the recommendations provided by the manufacturer. Alternatively, the allowable spans shall be engineered using the design properties provided in this report.

## 4. Product installation:

PRI-405 I-joists covered in this report shall be installed in accordance with the recommendations provided by the manufacturer or the engineering drawing approved by the engineer of record. Permissible web holes and cantilever reinforcements shall be in accordance with the recommendations provided by the manufacturer or the engineering drawing.

## Fire-rated assemblies:

Fire-rated assemblies shall be constructed in accordance with the recommendations provided by the manufacturer or with APA *Fire-Rated Systems*, Form W305 (<a href="www.apawood.org/publications">www.apawood.org/publications</a>), as applicable. I-joists listed in this report may be used in the fire rated assemblies described in the 2012 IBC Table 721.1(3) and 2009 IBC Table 720.1(3), Items 21-1.1, and 23-1.1 through 28-1.1, provided the I-joists used meet the criteria described in the table's "Floor or Roof Construction" column.

## 6. Limitations:

a) PRI-405 I-joists shall be designed in accordance with the code using the design properties published in this report.

- b) PRI-405 I-joists are limited to dry service conditions where the average equilibrium moisture content of solid-sawn lumber is less than 16 percent.
- c) PRI-405 I-joists listed in this report are produced by manufacturing facilities shown in Table 2 under a quality assurance program audited by APA.
- d) This report is subject to re-examination in one year.

# 7. Identification:

PRI-405 I-joists described in this report are identified by a label bearing the manufacturer's name and/or trademark, the APA assigned plant number, the I-joist series designation and depth, the APA logo, the report number PR-L405, and a means of identifying the date of manufacture.

Table 1. Design Properties for APA PRI-405 I-Joist Series<sup>(a)</sup>

	T			IR <sup>(h,k)</sup> (lbf)				ER <sup>(e,k)</sup> (lbf)					gn Properties			
11-7/8" C1   518   6,940   1,420   1,280   1,390   1,390   1,390   4   2,760   2,840   2,810   2,840   4   2,000   14" C1   756   8,360   1,710   1,280   1,585   1,490   1,625   6   3,020   3,600   3,990   3,370   6   2,000   18" C1   1,024   9,690   1,970   1,280   1,770   1,490   1,925   6   3,020   3,600   3,090   3,865   8   2,000   18" C1   1,329   10,900   2,500   1,400   2,035   1,625   2,395   7   3,355   4,160   3,450   4,500   9   1,750   20" C1   1,682   12,065   2,685   NA   2,135   NA   2,565   8   NA   4,320   NA   4,715   11   1,450   22" C1   2,081   13,215   2,875   NA   2,240   NA   2,735   10   NA   4,480   NA   4,925   13   1,200   26" C1   3,017   15,480   3,245   NA   2,555   NA   3,240   14   NA   4,960   NA   5,355   17   850   30" C1   4,146   17,695   3,620   NA   2,655   NA   3,405   16   NA   4,960   NA   5,565   18   750   30" C1   4,146   17,695   3,620   NA   2,135   1,625   2,225   6   3,355   3,855   3,450   4,290   8   2,200   11" NA   4,640   NA   5,140   15   1,000   18" C2   1,126   11,785   2,310   1,400   1,825   1,625   2,225   6   3,355   3,995   3,450   4,290   8   2,100   18" C2   2,285   14,60   1,825   1,625   2,255   NA   3,450   14" NA   4,960   NA   5,780   20   650   18" C2   2,265   14,675   2,265   NA   2,100   1,825   1,625   2,255   6   3,355   3,855   3,450   4,290   8   2,100   18" C2   1,467   13,325   2,500   1,400   1,825   1,625   2,255   6   3,355   3,995   3,450   4,290   8   2,100   18" C2   1,467   13,325   2,500   1,400   2,035   1,625   2,255   6   3,355   3,995   3,450   4,290   8   2,100   18" C2   2,783   17,545   3,060   NA   2,345   NA   2,565   NA   3,070   13   NA   4,800   NA   4,715   11   1,450   22" C2   2,295   16,155   2,875   NA   2,240   NA   2,735   10   NA   4,480   NA   4,925   13   1,200   18" C2   1,866   14,750   2,685   NA   2,135   NA   2,565   NA   3,070   13   NA   4,800   NA   5,355   17   850   14,750   24" C2   2,783   17,545   3,060   NA   2,345   NA   2,565   NA   3,070   13   NA   4,800   NA   5,355   17   850   22	K <sup>(i)</sup>				3-1/2" 5-1/4"		3-1/2" No. of	3-1			-	M <sup>(c)</sup>		Joist Depth		
11-7/8" C1   518   6,940   1,420   1,280   1,390   1,390   1,390   4   2,760   2,840   2,810   2,840   4   2,000   14" C1   756   8,360   1,710   1,280   1,585   1,490   1,665   4   3,020   3,230   3,090   3,370   6   2,000   16" C1   1,024   9,690   1,970   1,280   1,770   1,490   1,925   6   3,020   3,600   3,090   3,865   8   2,000   18" C1   1,329   10,900   2,500   1,400   2,035   1,625   2,395   7   3,355   4,160   3,450   4,500   9   1,750   20" C1   1,682   12,065   2,685   NA   2,135   NA   2,565   8   NA   4,320   NA   4,715   11   1,450   22" C1   2,081   13,215   2,875   NA   2,240   NA   2,735   10   NA   4,800   NA   4,925   13   1,200   24" C1   2,526   14,355   3,060   NA   2,345   NA   2,900   11   NA   4,640   NA   5,140   15   1,000   28" C1   3,557   16,590   3,435   NA   2,655   NA   3,240   14   NA   4,660   NA   5,565   18   750   30" C1   4,146   17,695   3,620   NA   2,655   NA   3,405   16   NA   5,120   NA   5,780   20   650   11-7/8" C2   571   8,440   1,925   1,400   1,825   1,625   2,295   7   3,355   3,450   4,075   6   2,200   18" C2   1,126   11,785   2,310   1,400   1,825   1,625   2,255   6   3,355   3,955   3,450   4,075   6   2,200   18" C2   1,866   14,750   2,685   NA   2,135   NA   2,565   NA   3,240   14   NA   4,960   NA   5,780   20   650   11-76" C2   1,126   11,785   2,310   1,400   1,825   1,625   2,295   7   3,355   3,955   3,450   4,075   6   2,200   18" C2   1,866   14,750   2,685   NA   2,135   NA   2,565   NA   2,565   8   NA   4,320   NA   4,715   11   1,450   22" C2   2,295   16,155   2,875   NA   2,440   NA   2,565   8   NA   4,320   NA   4,715   11   1,450   22" C2   2,295   16,155   2,875   NA   2,440   NA   2,565   8   NA   4,320   NA   4,715   11   1,450   22" C2   2,295   16,155   2,875   NA   2,440   NA   2,565   8   NA   4,320   NA   4,715   11   1,450   22" C2   2,295   16,155   2,875   NA   2,440   NA   2,565   8   NA   4,320   NA   4,715   11   1,450   22" C2   2,295   16,155   2,875   NA   2,440   NA   2,565   NA   2,450   NA   2,565   NA   2,45	(10 <sup>6</sup> lbf)	\ , ,									(lbf)	(lbf-ft)	(10 <sup>6</sup> lbf-in. <sup>2</sup> )	and Series		
14"C1     756     8,360     1,710     1,280     1,585     1,490     1,665     4     3,020     3,230     3,090     3,370     6     2,000       16"C1     1,024     9,690     1,970     1,280     1,770     1,490     1,925     6     3,020     3,600     3,090     3,865     8     2,000       20"C1     1,682     12,065     2,685     NA     2,135     NA     2,565     8     NA     4,320     NA     4,715     11     1,450       20"C1     1,682     12,065     2,685     NA     2,135     NA     2,565     8     NA     4,320     NA     4,715     11     1,450       22"C1     2,081     13,215     2,875     NA     2,240     NA     2,735     10     NA     4,480     NA     4,925     13     1,200       24"C1     2,526     14,355     3,060     NA     2,450     NA     3,070     13     NA     4,800     NA     5,555		<del> </del>						•				<del> </del>				
16" C1     1,024     9,690     1,970     1,280     1,770     1,490     1,925     6     3,020     3,600     3,090     3,865     8     2,000       18" C1     1,329     10,900     2,500     1,400     2,035     1,625     2,395     7     3,355     4,160     3,450     4,500     9     1,750       20" C1     1,682     12,065     2,685     NA     2,135     NA     2,565     8     NA     4,320     NA     4,715     11     1,450       22" C1     2,081     13,215     2,875     NA     2,240     NA     2,900     11     NA     4,480     NA     4,925     13     1,200       24" C1     2,526     14,355     3,060     NA     2,450     NA     3,070     13     NA     4,800     NA     5,555     17     850       26" C1     3,017     15,480     3,245     NA     2,555     NA     3,240     14     NA     4,960     NA     5,56	6.18			,				4				′	,			
18" C1     1,329     10,900     2,500     1,400     2,035     1,625     2,395     7     3,355     4,160     3,450     4,500     9     1,750       20" C1     1,682     12,065     2,685     NA     2,135     NA     2,565     8     NA     4,320     NA     4,715     11     1,450       22" C1     2,081     13,215     2,875     NA     2,240     NA     2,735     10     NA     4,480     NA     4,925     13     1,200       26" C1     2,526     14,355     3,060     NA     2,345     NA     2,900     11     NA     4,640     NA     5,140     15     1,000       26" C1     3,017     15,480     3,245     NA     2,450     NA     3,240     14     NA     4,960     NA     5,565     18     750       30" C1     4,146     17,695     3,620     NA     2,655     NA     3,405     16     NA     5,120     NA     5,780	7.28	· ·		,	· ·	· ·			, ·	, , , , , , , , , , , , , , , , , , ,	,	l '	, -			
20" C1     1,682     12,065     2,685     NA     2,135     NA     2,565     8     NA     4,320     NA     4,715     11     1,450       22" C1     2,081     13,215     2,875     NA     2,240     NA     2,735     10     NA     4,480     NA     4,925     13     1,200       24" C1     2,526     14,355     3,060     NA     2,345     NA     2,900     11     NA     4,640     NA     5,140     15     1,000       26" C1     3,017     15,480     3,245     NA     2,450     NA     3,070     13     NA     4,800     NA     5,565     17     850       28" C1     3,557     16,590     3,435     NA     2,555     NA     3,405     16     NA     5,100     NA     5,565     18     750       30" C1     4,146     17,695     3,620     NA     2,655     NA     3,405     16     NA     5,120     NA     4,5780     2	8.32		8	,	-		-	6		1,490		′	1,970	,		
22" C1     2,081     13,215     2,875     NA     2,240     NA     2,735     10     NA     4,480     NA     4,925     13     1,200       24" C1     2,526     14,355     3,060     NA     2,345     NA     2,900     11     NA     4,640     NA     5,140     15     1,000       26" C1     3,017     15,480     3,245     NA     2,450     NA     3,070     13     NA     4,800     NA     5,365     17     850       28" C1     3,557     16,590     3,435     NA     2,555     NA     3,240     14     NA     4,960     NA     5,665     18     750       30" C1     4,146     17,695     3,620     NA     2,655     NA     3,405     16     NA     5,120     NA     5,665     18     750       11-78" C2     571     8,440     1,925     1,600     1,825     1,625     2,060     4     3,355     3,650     3,850     4	11.52	1,750	9	4,500	3,450	4,160	3,355	7	2,395	1,625	2,035	1,400	2,500	10,900	1,329	18" C1
24" C1     2,526     14,355     3,060     NA     2,345     NA     2,900     11     NA     4,640     NA     5,140     15     1,000       26" C1     3,017     15,480     3,245     NA     2,450     NA     3,070     13     NA     4,800     NA     5,355     17     850       28" C1     3,557     16,590     3,435     NA     2,555     NA     3,240     14     NA     4,960     NA     5,565     18     750       30" C1     4,146     17,695     3,620     NA     2,655     NA     3,405     16     NA     5,120     NA     5,780     20     650       11-7/8" C2     571     8,440     1,925     1,400     1,715     1,625     1,880     4     3,355     3,665     3,450     4,075     6     2,200       14" C2     832     10,165     2,125     1,400     1,825     1,625     2,225     6     3,355     3,835     3,450     4,290<	12.80	1,450	11	4,715	NA	4,320	NA	8	2,565	NA	2,135	NA	2,685	12,065	1,682	
26" C1     3,017     15,480     3,245     NA     2,450     NA     3,070     13     NA     4,800     NA     5,355     17     850       28" C1     3,557     16,590     3,435     NA     2,555     NA     3,240     14     NA     4,960     NA     5,565     18     750       30" C1     4,146     17,695     3,620     NA     2,655     NA     3,405     16     NA     5,120     NA     5,780     20     650       11-7/8" C2     571     8,440     1,925     1,400     1,715     1,625     1,880     4     3,355     3,450     3,850     4     2,200       14" C2     832     10,165     2,125     1,400     1,825     1,625     2,060     4     3,355     3,850     3,450     4,075     6     2,200       16" C2     1,126     11,785     2,310     1,400     1,930     1,625     2,225     6     3,355     3,995     3,450     4,500	14.08	1,200	13	4,925	NA	4,480	NA	10	2,735	NA	2,240	NA	2,875	13,215	2,081	22" C1
28" C1     3,557     16,590     3,435     NA     2,555     NA     3,240     14     NA     4,960     NA     5,565     18     750       30" C1     4,146     17,695     3,620     NA     2,655     NA     3,405     16     NA     5,120     NA     5,565     18     750       11-7/8" C2     571     8,440     1,925     1,400     1,715     1,625     1,880     4     3,355     3,655     3,450     4,075     6     2,200       16" C2     1,126     11,785     2,310     1,400     1,930     1,625     2,225     6     3,355     3,450     4,075     6     2,200       18" C2     1,467     13,325     2,500     1,400     2,035     1,625     2,225     6     3,355     3,450     4,500     9     1,750       20" C2     1,856     14,750     2,685     NA     2,135     NA     2,565     8     NA     4,320     NA     4,715     11     <	15.36	1,000	15	5,140	NA	4,640	NA	11	2,900	NA	2,345	NA	3,060	14,355	2,526	24" C1
30" C1     4,146     17,695     3,620     NA     2,655     NA     3,405     16     NA     5,120     NA     5,780     20     650       11-7/8" C2     571     8,440     1,925     1,400     1,715     1,625     1,880     4     3,355     3,665     3,450     3,850     4     2,200       14" C2     832     10,165     2,125     1,400     1,825     1,625     2,060     4     3,355     3,835     3,450     4,075     6     2,200       16" C2     1,126     11,785     2,310     1,400     1,930     1,625     2,225     6     3,355     3,995     3,450     4,290     8     2,100       18" C2     1,467     13,325     2,500     1,400     2,035     1,625     2,295     7     3,355     3,995     3,450     4,500     9     1,750       20" C2     1,856     14,750     2,685     NA     2,135     NA     2,565     8     NA     4,320     NA </td <td>16.64</td> <td>850</td> <td>17</td> <td>5,355</td> <td>NA</td> <td>4,800</td> <td>NA</td> <td>13</td> <td>3,070</td> <td>NA</td> <td>2,450</td> <td>NA</td> <td>3,245</td> <td>15,480</td> <td>3,017</td> <td>26" C1</td>	16.64	850	17	5,355	NA	4,800	NA	13	3,070	NA	2,450	NA	3,245	15,480	3,017	26" C1
11-7/8" C2     571     8,440     1,925     1,400     1,715     1,625     1,880     4     3,355     3,665     3,450     3,850     4     2,200       14" C2     832     10,165     2,125     1,400     1,825     1,625     2,060     4     3,355     3,835     3,450     4,075     6     2,200       16" C2     1,126     11,785     2,310     1,400     1,930     1,625     2,225     6     3,355     3,995     3,450     4,290     8     2,100       18" C2     1,467     13,325     2,500     1,400     2,035     1,625     2,295     7     3,355     3,995     3,450     4,500     9     1,750       20" C2     1,856     14,750     2,685     NA     2,135     NA     2,565     8     NA     4,320     NA     4,715     11     1,450       22" C2     2,295     16,155     2,875     NA     2,240     NA     2,735     10     NA     4,480     NA	17.92	750	18	5,565	NA	4,960	NA	14	3,240	NA	2,555	NA	3,435	16,590	3,557	28" C1
14" C2   832   10,165   2,125   1,400   1,825   1,625   2,060   4   3,355   3,835   3,450   4,075   6   2,200     16" C2   1,126   11,785   2,310   1,400   1,930   1,625   2,225   6   3,355   3,995   3,450   4,290   8   2,100     18" C2   1,467   13,325   2,500   1,400   2,035   1,625   2,395   7   3,355   4,160   3,450   4,500   9   1,750     20" C2   1,856   14,750   2,685   NA   2,135   NA   2,565   8   NA   4,320   NA   4,715   11   1,450     22" C2   2,295   16,155   2,875   NA   2,240   NA   2,735   10   NA   4,480   NA   4,925   13   1,200     24" C2   2,783   17,545   3,060   NA   2,345   NA   2,900   11   NA   4,640   NA   5,140   15   1,000     28" C2   3,913   20,280   3,435	19.20	650	20	5,780	NA	5,120	NA	16	3,405	NA	2,655	NA	3,620	17,695	4,146	30" C1
16" C2   1,126   11,785   2,310   1,400   1,930   1,625   2,225   6   3,355   3,995   3,450   4,290   8   2,100     18" C2   1,467   13,325   2,500   1,400   2,035   1,625   2,395   7   3,355   4,160   3,450   4,500   9   1,750     20" C2   1,856   14,750   2,685   NA   2,135   NA   2,565   8   NA   4,320   NA   4,715   11   1,450     22" C2   2,295   16,155   2,875   NA   2,240   NA   2,735   10   NA   4,480   NA   4,925   13   1,200     24" C2   2,783   17,545   3,060   NA   2,345   NA   2,900   11   NA   4,640   NA   5,140   15   1,000     26" C2   3,322   18,920   3,245   NA   2,450   NA   3,070   13   NA   4,800   NA   5,565   18   750     30" C2   4,558   21,630   3,620   NA </td <td>7.60</td> <td>2,200</td> <td>4</td> <td>3,850</td> <td>3,450</td> <td>3,665</td> <td>3,355</td> <td>4</td> <td>1,880</td> <td>1,625</td> <td>1,715</td> <td>1,400</td> <td>1,925</td> <td>8,440</td> <td>571</td> <td>11-7/8" C2</td>	7.60	2,200	4	3,850	3,450	3,665	3,355	4	1,880	1,625	1,715	1,400	1,925	8,440	571	11-7/8" C2
18" C2   1,467   13,325   2,500   1,400   2,035   1,625   2,395   7   3,355   4,160   3,450   4,500   9   1,750     20" C2   1,856   14,750   2,685   NA   2,135   NA   2,565   8   NA   4,320   NA   4,715   11   1,450     22" C2   2,295   16,155   2,875   NA   2,240   NA   2,735   10   NA   4,480   NA   4,925   13   1,200     24" C2   2,783   17,545   3,060   NA   2,345   NA   2,900   11   NA   4,640   NA   5,140   15   1,000     26" C2   3,322   18,920   3,245   NA   2,450   NA   3,070   13   NA   4,800   NA   5,355   17   850     28" C2   3,913   20,280   3,435   NA   2,555   NA   3,240   14   NA   4,960   NA   5,565   18   750     30" C2   4,558   21,630   3,620   NA <t< td=""><td>8.96</td><td>2,200</td><td>6</td><td>4,075</td><td>3,450</td><td>3,835</td><td>3,355</td><td>4</td><td>2,060</td><td>1,625</td><td>1,825</td><td>1,400</td><td>2,125</td><td>10,165</td><td>832</td><td>14" C2</td></t<>	8.96	2,200	6	4,075	3,450	3,835	3,355	4	2,060	1,625	1,825	1,400	2,125	10,165	832	14" C2
20" C2   1,856   14,750   2,685   NA   2,135   NA   2,565   8   NA   4,320   NA   4,715   11   1,450     22" C2   2,295   16,155   2,875   NA   2,240   NA   2,735   10   NA   4,480   NA   4,925   13   1,200     24" C2   2,783   17,545   3,060   NA   2,345   NA   2,900   11   NA   4,640   NA   5,140   15   1,000     26" C2   3,322   18,920   3,245   NA   2,450   NA   3,070   13   NA   4,800   NA   5,355   17   850     28" C2   3,913   20,280   3,435   NA   2,555   NA   3,240   14   NA   4,960   NA   5,565   18   750     30" C2   4,558   21,630   3,620   NA   2,655   NA   3,405   16   NA   5,120   NA   5,780   20   650     11-7/8" C3   713   11,260   1,925   1,400   1,715	10.24	2,100	8	4,290	3,450	3,995	3,355	6	2,225	1,625	1,930	1,400	2,310	11,785	1,126	16" C2
22" C2   2,295   16,155   2,875   NA   2,240   NA   2,735   10   NA   4,480   NA   4,925   13   1,200     24" C2   2,783   17,545   3,060   NA   2,345   NA   2,900   11   NA   4,640   NA   5,140   15   1,000     26" C2   3,322   18,920   3,245   NA   2,450   NA   3,070   13   NA   4,800   NA   5,355   17   850     28" C2   3,913   20,280   3,435   NA   2,555   NA   3,240   14   NA   4,960   NA   5,565   18   750     30" C2   4,558   21,630   3,620   NA   2,655   NA   3,405   16   NA   5,120   NA   5,780   20   650     11-7/8" C3   713   11,260   1,925   1,400   1,715   1,625   1,880   4   3,355   3,665   3,450   3,850   4   2,200     14" C3   1,057   13,700   2,125   1,400	11.52	1,750	9	4,500	3,450	4,160	3,355	7	2,395	1,625	2,035	1,400	2,500	13,325	1,467	18" C2
24" C2   2,783   17,545   3,060   NA   2,345   NA   2,900   11   NA   4,640   NA   5,140   15   1,000     26" C2   3,322   18,920   3,245   NA   2,450   NA   3,070   13   NA   4,800   NA   5,355   17   850     28" C2   3,913   20,280   3,435   NA   2,555   NA   3,240   14   NA   4,960   NA   5,565   18   750     30" C2   4,558   21,630   3,620   NA   2,655   NA   3,405   16   NA   5,120   NA   5,780   20   650     11-7/8" C3   713   11,260   1,925   1,400   1,715   1,625   1,880   4   3,355   3,665   3,450   3,850   4   2,200     14" C3   1,057   13,700   2,125   1,400   1,930   1,625   2,260   4   3,355   3,450   4,075   6   2,200     16" C3   1,444   16,000   2,310   1,400   1,930	12.80	1,450	11	4,715	NA	4,320	NA	8	2,565	NA	2,135	NA	2,685	14,750	1,856	20" C2
26" C2   3,322   18,920   3,245   NA   2,450   NA   3,070   13   NA   4,800   NA   5,355   17   850     28" C2   3,913   20,280   3,435   NA   2,555   NA   3,240   14   NA   4,960   NA   5,565   18   750     30" C2   4,558   21,630   3,620   NA   2,655   NA   3,405   16   NA   5,120   NA   5,780   20   650     11-7/8" C3   713   11,260   1,925   1,400   1,715   1,625   1,880   4   3,355   3,665   3,450   3,850   4   2,200     14" C3   1,057   13,700   2,125   1,400   1,825   1,625   2,060   4   3,355   3,835   3,450   4,075   6   2,200     16" C3   1,444   16,000   2,310   1,400   1,930   1,625   2,225   6   3,355   3,995   3,450   4,290   8   2,200	14.08	1,200	13	4,925	NA	4,480	NA	10	2,735	NA	2,240	NA	2,875	16,155	2,295	22" C2
28" C2   3,913   20,280   3,435   NA   2,555   NA   3,240   14   NA   4,960   NA   5,565   18   750     30" C2   4,558   21,630   3,620   NA   2,655   NA   3,405   16   NA   5,120   NA   5,780   20   650     11-7/8" C3   713   11,260   1,925   1,400   1,715   1,625   1,880   4   3,355   3,665   3,450   3,850   4   2,200     14" C3   1,057   13,700   2,125   1,400   1,825   1,625   2,060   4   3,355   3,835   3,450   4,075   6   2,200     16" C3   1,444   16,000   2,310   1,400   1,930   1,625   2,225   6   3,355   3,995   3,450   4,290   8   2,200	15.36	1,000	15	5,140	NA	4,640	NA	11	2,900	NA	2,345	NA	3,060	17,545	2,783	24" C2
30" C2     4,558     21,630     3,620     NA     2,655     NA     3,405     16     NA     5,120     NA     5,780     20     650       11-7/8" C3     713     11,260     1,925     1,400     1,715     1,625     1,880     4     3,355     3,665     3,450     3,850     4     2,200       14" C3     1,057     13,700     2,125     1,400     1,825     1,625     2,060     4     3,355     3,835     3,450     4,075     6     2,200       16" C3     1,444     16,000     2,310     1,400     1,930     1,625     2,225     6     3,355     3,995     3,450     4,290     8     2,200	16.64	850	17	5,355	NA	4,800	NA	13	3,070	NA	2,450	NA	3,245	18,920	3,322	26" C2
11-7/8" C3 713 11,260 1,925 1,400 1,715 1,625 1,880 4 3,355 3,665 3,450 3,850 4 2,200   14" C3 1,057 13,700 2,125 1,400 1,825 1,625 2,060 4 3,355 3,835 3,450 4,075 6 2,200   16" C3 1,444 16,000 2,310 1,400 1,930 1,625 2,225 6 3,355 3,995 3,450 4,290 8 2,200	17.92	750	18	5,565	NA	4,960	NA	14	3,240	NA	2,555	NA	3,435	20,280	3,913	28" C2
14" C3 1,057 13,700 2,125 1,400 1,825 1,625 2,060 4 3,355 3,835 3,450 4,075 6 2,200   16" C3 1,444 16,000 2,310 1,400 1,930 1,625 2,225 6 3,355 3,995 3,450 4,290 8 2,200	19.20	650	20	5,780	NA	5,120	NA	16	3,405	NA	2,655	NA	3,620	21,630	4,558	30" C2
16" C3	7.60	2,200	4	3,850	3,450	3,665	3,355	4	1,880	1,625	1,715	1,400	1,925	11,260	713	11-7/8" C3
	8.96	2,200	6	4,075	3,450	3,835	3,355	4	2,060	1,625	1,825	1,400	2,125	13,700	1,057	14" C3
18" C3	10.24	2,200	8	4,290	3,450	3,995	3,355	6	2,225	1,625	1,930	1,400	2,310	16,000	1,444	16" C3
	11.52	2,000	9	4,500	3,450	4,160	3,355	7	2,395	1,625	2,035	1,400	2,500	18,180	1,896	18" C3
20" C3   2,412   20,210   2,685   NA   2,135   NA   2,565   8   NA   4,320   NA   4,715   11   1,650	12.80	1,650	11	4,715	NA	4,320	NA	8	2,565	NA	2,135	NA	2,685	20,210	2,412	20" C3
22" C3 2,993 22,210 2,875 NA 2,240 NA 2,735 10 NA 4,480 NA 4,925 13 1,350	14.08	1,350	13	4,925	NA	4,480	NA	10	2,735	NA	2,240	NA	2,875	22,210	2,993	22" C3
24" C3 3,641 24,185 3,060 NA 2,345 NA 2,900 11 NA 4,640 NA 5,140 15 1,150	15.36		15	5,140	NA	4,640	NA	11	2,900	NA	2,345	NA	3,060			24" C3
26" C3 4,357 26,135 3,245 NA 2,450 NA 3,070 13 NA 4,800 NA 5,355 17 950	16.64	950	17	5,355	NA	4,800	NA	13	3,070	NA	2,450	NA	3,245	26,135	4,357	26" C3
28" C3 5,141 28,070 3,435 NA 2,555 NA 3,240 14 NA 4,960 NA 5,565 18 800	17.92	800	18	5,565	NA	4,960	NA	14	3,240	NA	2,555	NA	3,435	28,070	5,141	28" C3
30" C3 5,994 29,985 3,620 NA 2,655 NA 3,405 16 NA 5,120 NA 5,780 20 700	19.20	700	20	5,780	NA	5,120	NA	16	3,405	NA	2,655	NA	3,620			30" C3

See Footnotes on next page.

- (a) The tabulated values are design values for normal duration of load (10 years). All values, except for EI and K, shall be permitted to be adjusted for other load durations as permitted by the code, and the VLC values shall not be increased for shorter durations. The cell noted as "NA" indicates that the value is not available.
- (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 (ER) of the I-joist with a minimum bearing length as specified with or without bearing stiffeners. For a bearing length of 4 inches, the end reaction with bearing stiffeners may be set equal to the tabulated shear value. Interpolation of the end reaction with or without bearing stiffeners between 1-3/4 and 3-1/2-inch bearing is permitted. Interpolation of the end reaction with bearing stiffeners between 3-1/2 and 4-inch bearing (i.e., the tabulated shear value) is also permitted
- (f) The bearing stiffeners, when required, shall have a thickness of 1-1/2 in. and a width of 3-1/2 in. (e.g., 2x4) for a bearing length of 4 in. or less, or a width of 5-1/2 in. (e.g., 2x6) for a bearing length greater than 4 in.
- (g) The total number of 10d box (0.128 x 3 in.) nails required for a pair of bearing stiffeners.
- Intermediate reaction (IR) of the I-joist with a minimum bearing length as specified with or without bearing stiffeners. Interpolation of the intermediate reaction with or without bearing stiffeners between 3-1/2-inch and 5-1/4-inch bearing is permitted
- (i) Uniform vertical (bearing) load capacity (VLC).
- (I) 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: 
$$\delta = \frac{5\omega\ell^4}{384\text{EI}} + \frac{\omega\ell^2}{\text{K}}$$
 [1]

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

Where:

 $\delta$  = calculated deflection (in.),

 $\omega$  = uniform load (lbf/in.),

P = concentrated load (lbf),

= design span (in.).

EI = bending stiffness of the I-joist (lbf-in.2), and

< = coefficient of shear deflection (lbf).</p>

(k) The IR and ER design values after being adjusted for load duration shall meet the requirement given in Eq. 3.

ER x  $C_D$  or IR x  $C_D$  (lbf)  $\leq C_b$   $b_{bra}$   $L_{bra}$   $F_{C_1}$ , or the capacity of the bearing plate supporting the I-joist (lbf), whichever is smaller

Where:  $C_D$  = Load duration factor for ER and IR in accordance with the applicable code,

C<sub>b</sub> = Bearing area factor as defined in Section 3.10.4 of the NDS (= 1.0 for end reaction),

 $b_{bra}$  = Bearing width of the I-joist = typically the flange width ( $b_f$ ) minus 0.15 in. due to edge easing, (in.) = 3.35 in.,

-brg = Bearing length of the I-joist (in.), and

F<sub>c.1</sub> = Compressive stress perpendicular to grain of the I-joist flanges (lbf/in.<sup>2</sup>) = 425 psi (refer to the manufacturer for specific flange F<sub>c.1</sub> values as needed).

Table 2. Qualified Manufacturers of APA PRI-405 I-Joists

Manufacturer	Location	Mill Number	PRI-405 Series	Qualified Depths	Also Qualified As (Proprietary Series)	APA Product Report (Proprietary Series)
Pacific Woodtech Corporation	Burlington, WA	1048	C1	11-7/8 - 16	PWI-80	PR-L262
			C2	11-7/8 - 24	PWI-90	<u>PR-L202</u>

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 65 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 and Miami-Dade County.

# **APA – THE ENGINEERED WOOD ASSOCIATION**

#### **HEADQUARTERS**

7011 So. 19<sup>th</sup> St. • Tacoma, Washington 98466 Phone: (253) 565-6600 • Fax: (253) 565-7265 • Internet Address: <u>www.apawood.org</u>.

### 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 of product performance or designs as actually constructed.