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WEBSHIELD® PANELS

CSI Section:

06 17 33 Wood I-Joists

1.0 RECOGNITION

WEBshield® Panels recognized in this report have been evaluated for use as protective panels to enhance the fire performance of pre-fabricated wood I-joists. The fire-resistance properties of the WEBshield® Panels comply with the intent of the provisions of the following codes and regulations:

- 2018, 2015, and 2012 International Building Code® (IBC)
- 2018, 2015, and 2012 International Residential Code® (IRC)

2.0 LIMITATIONS

Use of the WEBshield® Panels recognized in this report is subject to the following limitations:

2.1 The panels shall be installed in accordance with the applicable code, the manufacturer’s published installation instructions, and this report. Where there is a conflict between these documents, the more restrictive requirements shall govern.

2.2 Except as prescribed in Section 3.5 of this report, cutting, drilling, or otherwise altering the panels is outside the scope of recognition. Partial panels are permitted as described in this report.

2.2.1 When installed as outlined in Figure 1 and Figure 2 of this report, WEBshield® panels do not alter the design properties of the joist.

2.3 The in-service moisture content of the WEBshield® Panels shall be 16 percent or less.

2.4 The WEBshield® Panels recognized in this report are produced under the authority of Pinkwood Ltd. in Calgary, Alberta, Canada.

3.0 PRODUCT USE

3.1 General: WEBshield® Panels are used to protect the webs of wood I-joists to provide equivalent fire performance to 2-inch by 10-inch nominal dimension lumber (38.1 mm by 235 mm) in residential floor applications. The patented FRI Assembly (consisting of I-joists and WEBshield® Panels) is recognized for installation without the prescribed minimum ½-inch-thick (12.7 mm) gypsum board or ⅝-inch-thick (15.9 mm) wood structural panel membrane in

accordance with Exception 4 to 2012 IRC Section R501.3 or 2015 and 2018 IRC Section R302.13. Recognition for this application is limited to designs in accordance with Sections 3.2 and 3.2.1 of this report and installation in accordance with Sections 3.3 and 3.3.1 of this report.

3.2 Design: FRI Assembly shall be used for applications having a maximum live load of 40 psf (1,915 N/m²) and a maximum dead load of 20 psf (958 N/m²). Loading conditions other than those described shall be reviewed by a registered design professional and approved by the code official. In conjunction with minimum WEBshield® coverage quantity in accordance with Table 2 of this report, the I-joist design values shall be adjusted as outlined in Note 1 of Table 1 of this report. Additional Panels may be added beyond the minimum WEBshield® coverage listed in Table 2 of this report. When additional panels are used, I-joist design values may be adjusted in accordance with Table 3 of this report.

3.3 Installation:

3.3.1 General: The WEBshield® Panels shall be installed in accordance with the applicable code, the manufacturer’s installation instructions, and this report. A copy of this evaluation report shall be available on the jobsite for quality control purposes during construction.

WEBshield® Panels shall be installed under the supervision of installers certified by Pinkwood Ltd. The certifications may be verified at www.webshieldpanels.com.

When WEBshield® panels are installed without the supervision of certified installers, special inspection by the jurisdiction having authority may be required.

3.3.2 Installation with Adhesives: The WEBshield® Panels may be pre-installed by the manufacturer utilizing wet-use type adhesives complying with ASTM D2559 and ASTM D7247 and are as described and specified in quality documentation.

3.3.3 Installation with Fasteners: The WEBshield® Panels may be installed with fasteners in accordance with Figure 1 and Figure 2 of this report.

3.4 Wood I-joists used in FRI Assembly: Wood I-joists used in FRI Assembly shall comply with ASTM D5055, shall be recognized in an evaluation report issued by an approved evaluation agency, shall be limited to 9½-inch (241 mm) through 16-inch (406 mm) depths, shall have solid sawn lumber or structural composite lumber flanges and wood structural panel oriented strand board (OSB) webs, and shall conform to the minimum size and strength property requirements specified in Table 1 of this report. All I-joist materials shall comply with Section 5 of ASTM D5055.

3.5 Web holes in FRI Assembly: Holes in the webs of wood I-joists used in FRI Assembly are subject to the maximum





size and location requirements specified in the code approved evaluation report for the wood I-joint complying with Section 3.4 of this report. Additionally, where the desired hole coincides with the location of a WEBshield® Panel, the following rules apply:

- a. A hole not exceeding 1½ inches (38.1 mm) in diameter may be located anywhere within a WEBshield® Panel. For adjacent 1½ inch (38.1 mm) maximum diameter holes, the spacing between holes shall be at least three times the largest hole diameter.
- b. When a 1½-inch-(38.1 mm) diameter hole is insufficient for the specific end-use application, a single 6-inch (152 mm) maximum diameter hole may be cut in a WEBshield® Panel section. When such a hole is cut, additional 6-inch-wide (152 mm) full-depth partial WEBshield® Panels shall be installed back-to-back adjacent to the penetrated panels and fastened to the web as described in Figure 1 and Figure 2 of this report, using fasteners at the top and bottom of each panel in accordance with the installation instructions.
- c. When multiple 1½-inch (38.1 mm) maximum diameter holes are closely grouped, inscribed area cannot exceed a 6-inch (152 mm) diameter.
- d. When hole locations, shapes and sizes differ from those listed in this section, analysis from a licensed design professional is required, which is subject to approval of the building official.

4.0 PRODUCT DESCRIPTION

WEBshield® Panels are Exposure 1 OSB panels, nominally 15/32 inch (11.9 mm) thick by 24 inches (610 mm) long and manufactured to fit between the top and bottom flanges of eligible I-joists to protect the webs in FRI Assembly. The panels are designated as ws-10 for use with 9½-inch-depth (241 mm) I-joists; ws-12 for use with 117/8-inch-depth (302 mm) I-joists; ws-14 for use with 14-inch-depth (356 mm) I-joists, and ws-16 for use with 16-inch-depth (406 mm) I-joists.. Six-inch (152 mm) and 12-inch (305 mm) nominal-width, full-depth WEBshield® partial panels may be cut from undamaged WEBshield® Panels.

5.0 IDENTIFICATION

WEBshield® Panels are identified by the product name (WEBshield®), and the evaluation report number (ER-653) printed on both ends. Pallets of WEBshield® Panels are identified with the designation corresponding to the I-joint depth (ws-10, ws-12, ws-14, or ws-16). The identification includes the IAPMO Uniform Evaluation Service Mark of Conformity. Either Mark of Conformity may be used as shown below:



IAPMO UES ER-653

6.0 SUBSTANTIATING DATA

- 6.1 Data and analysis in accordance with ASTM D5055, Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists.
- 6.2 Documentation describing the manufacturer’s quality management system.
- 6.3 I-joint floor installation details and product descriptive literature.
- 6.4 Reports of fire-resistance testing and analyses in accordance with AC14 Section A4.4 – Fire Protection of Floors, demonstrating equivalent fire performance to 2-inch by 10-inch nominal dimension lumber (38.1 mm by 235 mm).

7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research carried out by IAPMO Uniform Evaluation Service on Pinkwood Ltd.’s FRI Assembly to assess conformance to the codes shown in Section 1.0 of this report and serves as documentation of the product certification. WEBshield® Panels are manufactured at locations noted in Section 2.4 of this report under a quality control program with periodic inspection under the supervision of IAPMO UES.

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For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org



TABLE 1 – REQUIREMENTS FOR I-JOISTS USED IN FRI ASSEMBLY¹

Flange ³			Webstock
Min. Specific Gravity	Min. Size (inches)		Min. Thickness (inches)
	Depth	Width	
0.42	1½	2½	¾
0.42	2½	1½	¾

For S.I.: 1 inch = 25.4 mm; 1 lbf-ft = 1.4 N-m; 1 lbf-in² = 0.00284 N-m²
¹The allowable moment published in the code evaluation report described in Section 3.4 of this report shall be adjusted by a reduction factor of 0.82, provided 1) the minimum net flange area is 3.75 in.² (9073 mm²); and 2) the minimum WEBshield[®] quantities comply with Table 2 of this report. If neither condition is achieved, the I-joist is not suitable for the FRI assembly.
² The flanges shall be solid sawn or structural composite lumber, full length or finger-jointed using approved adhesives complying with the heat durability performance requirements for I-joists in accordance with ASTM D5055.

TABLE 2 - MINIMUM QUANTITY OF WEBSHIELD PANELS

Joist Span	WEBshield Length		Joist Span	WEBshield Length		Joist Span	WEBshield Length	
	24"	12"		24"	12"		24"	12"
≤	Min. Quantity		≤	Min. Quantity		≤	Min. Quantity	
26'	12		18'	8		10'	4	
25'	12		17'	8		9'	4	
24'	12		16'	8		8'	4	
23'	10	2	15'	6	2	7'	2	2
22'	10		14'	6		6'	2	
21'	10		13'	6		5'	2	
20'	10		12'	6		4'	2	
19'	8	2	11'	4	2	3'		2

For S.I.: 1 inch = 25.4 mm; 1 ft = 305 mm



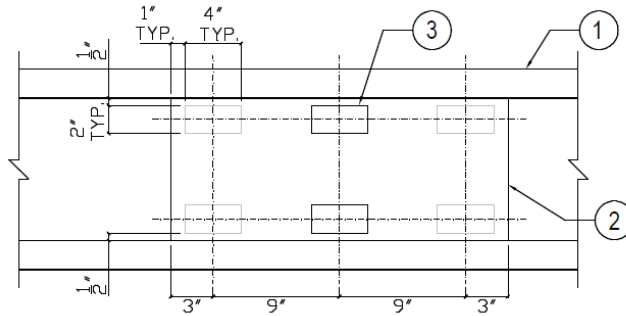
TABLE 3 - PERCENTAGE INCREASE IN MOMENT CAPACITY FOR ADDITIONAL WEBSHIELD PANELS

Span (ft)	Additional Webshield Panel Installed Symmetrically About Joist Center Line ¹ (in)	Percent Increase in Moment Capacity ² (%)	Span (ft)	Additional Webshield Panel Installed Symmetrically About Joist Center Line ¹ (in)	Percent Increase in Moment Capacity ² (%)	Span (ft)	Additional Webshield Panel Installed Symmetrically About Joist Center Line ¹ (in)	Percent Increase in Moment Capacity ² (%)	
8	0	7.1	15	0	3.8	20	0	7.1	
	6	11.6		6	6.0		6	8.9	
	12	16.1		12	8.3		12	10.7	
	18	18.0		18	10.5		18	12.5	
	24	18.0		24	12.8		24	14.3	
9	0	1.5	16	30	15.0	21	30	16.1	
	6	5.1		36	17.3		36	17.9	
	12	8.7		42	18.0		42	18.0	
	18	12.3		48	18.0		48	18.0	
	24	15.9		0	7.1		54	18.0	
10	30	18.0	17	6	9.4	22	60	18.0	
	0	0.0		12	11.6		66	18.0	
	6	3.0		18	13.9		0	4.7	
	12	6.0		24	16.1		6	6.4	
	18	9.0		30	18.0		12	8.0	
11	24	12.0	18	36	18.0	22	18	9.6	
	30	15.0		42	18.0		24	11.3	
	0	2.6		48	18.0		30	12.9	
	6	5.6		0	4.2		36	14.5	
	12	8.6		6	6.2		42	16.2	
12	18	11.6	19	12	8.2	22	48	17.8	
	24	14.6		18	10.2		54	18.0	
	30	17.6		24	12.2		60	18.0	
	0	7.1		30	14.2		66	18.0	
	6	10.1		36	16.2		0	2.6	
13	12	13.1	18	42	18.0	22	6	4.1	
	18	16.1		48	18.0		12	5.6	
	24	18.0		54	18.0		18	7.1	
	30	18.0		0	1.5		24	8.6	
	36	18.0		6	3.3		30	10.1	
14	0	3.3	18	12	5.1	22	36	11.6	
	6	5.8		18	6.9		42	13.1	
	12	8.4		24	8.7		48	14.6	
	18	11.0		30	10.5		54	16.1	
	24	13.5		36	12.3		60	17.6	
14	30	16.1	19	42	14.1	22	66	18.0	
	36	18.0		48	15.9		72	18.0	
	42	18.0		54	17.7				
	0	0.0		60	18.0				
	6	2.3		0	4.5				
14	12	4.5	19	6	6.3				
	18	6.8		12	8.1				
	24	9.0		18	9.9				
	30	11.3		24	11.7				
	36	13.5		30	13.5				
14	42	15.8	19	36	15.3				
	48	18.0		42	17.1				
				48	18.0				
				54	18.0				
				60	18.0				
		66	18.0						

Notes to Table 3:

1. Additional WEBshield panel refers to the WEBshield panel in addition to the typical WEBshield panel as specified in Figure 1 of this report. The total length of the additional WEBshield panel added to joist web shall be double length indicated in above table.
2. Percent increase refers to the percent increase of I-joist moment capacity of FRI Assembly.

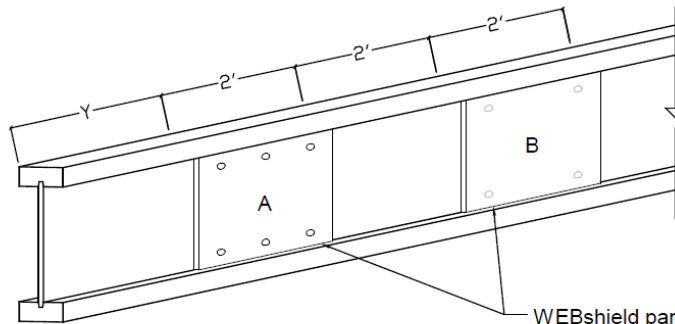
- 1) Wood I-joist per plan
- 2) WEBshield panels
- 3) Fastener zones - one fastener to be installed in each of the 6 zones



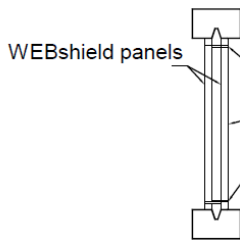
WEBshield panels shall be installed tightly against the I-joist web at prescribed intervals, back-to-back on each side, to protect the web against exposure to flame. Installed according to the following specifications.

- Use (6) 3/4-Inch-long, 7/16-Inch crown or larger staples, with a minimum 16-gauge to attach 15/32-Inch-thick WEBshield panels as shown.

- WEBshield panels shall be installed at 4-foot-on center spacing intervals with a 0.5" spacing tolerance. End panels shall begin within 2 feet from the ends of the I-joists (dimension y).

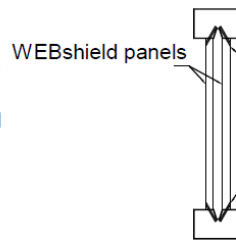


WEBshield panels - Fastening option A and B
See Table 2 - Minimum Quantity of WEBshield Panels



Six 3/4-Inch-long staples shall be installed at 90° in WEBshield panels on opposite sides of the web. Staples shall be staggered to avoid interference.

Section View Option A



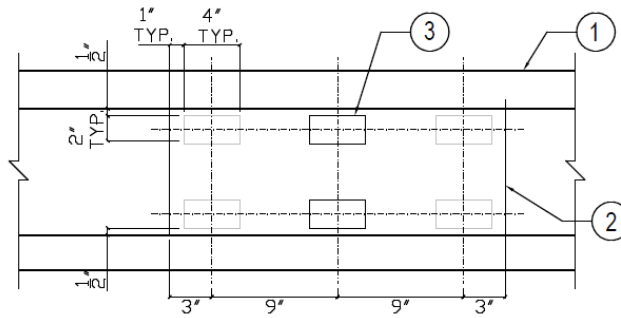
Four 1-1/4-inch long staples are permissible provided the fasteners are installed at an angle. Care must be taken to ensure the fasteners penetrate sufficiently into the I-joist to secure the panels, and also to avoid punching through and detaching the WEBshield panels on the opposite side of the web.

Section View Option B

FIGURE 1 – WEBSHIELD INSTALLATION DETAILS (2x3 Flange)



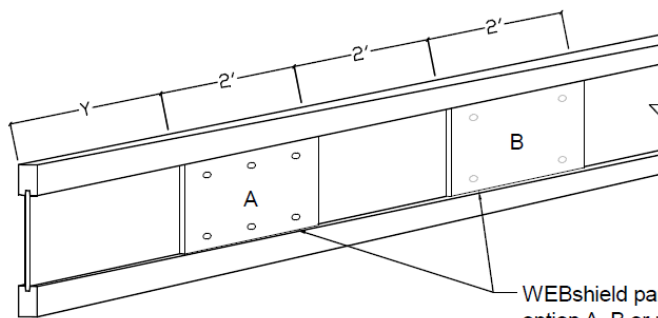
- 1) Wood I-joint per plan
- 2) WEBshield panels
- 3) Fastener zones - one fastener to be installed in each of the 6 zones



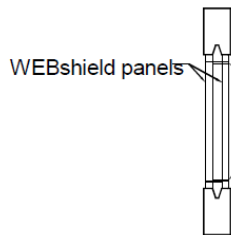
WEBshield panels shall be installed tightly against the I-joint web at prescribed intervals, back-to-back on each side, to protect the web against exposure to flame. Installed according to the following specifications.

- Use (6) 3/4-Inch-long, 7/16-Inch crown or larger staples, with a minimum 16-gauge to attach 15/32-Inch-thick WEBshield panels as shown.

- WEBshield panels shall be installed at 4-foot-on center spacing intervals with a 0.5" spacing tolerance. End panels shall begin within 2 feet from the ends of the I-joists (dimension y).

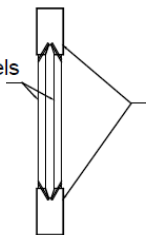


WEBshield panels - May be applied using stapling option A, B or using adhesive (factory applied)
See Table 2 - Minimum Quantity of WEBshield Panels



Six 3/4-Inch-long staples shall be installed at 90° in WEBshield panels on opposite sides of the web. Staples shall be staggered to avoid interference.

Section View Option A



Four 1-1/4-inch long staples are permissible provided the fasteners are installed at an angle. Care must be taken to ensure the fasteners penetrate sufficiently into the I-joint to secure the panels, and also to avoid punching through and detaching the WEBshield panels on the opposite side of the web.

Section View Option B

For SI: 1 inch = 25.4 mm

FIGURE 2 – WEBSHIELD INSTALLATION DETAILS (3x2 Flange)