Wood Structural Panel Edge Clips (H-clips)

A panel edge clip (often called an “H-clip” or “plywood clip”) is typically a small piece of galvanized metal that is placed between adjacent wood structural sheathing panels at a location between supporting joists or trusses and/or rafters to provide support to panel edges. The common thickness of the H-clip sheet metal is between 18 and 20 gauge (0.052 inch [1.31 mm] and 0.040 inch [1.01 mm]).

In general, H-clips are used to reduce the effective spacing of the framing members by improving load distribution and increasing the effective stiffness of the roof and/or floor deck. In addition, H-clips provide the recommended spacing between adjoining panel edges, allowing room for panel expansion if the panels get wet during construction (see two different kinds of H-clips and their installation in Figure 1).

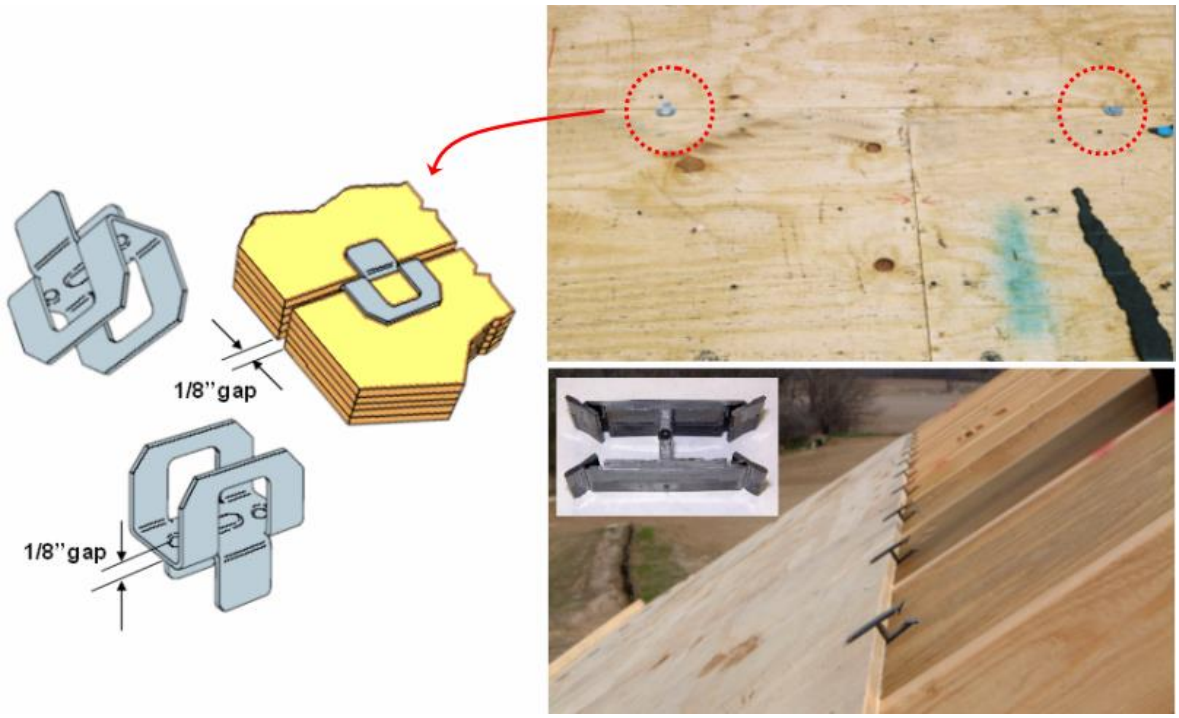

Figure 1. Panel edge clip (H-clip) installation

Left: Galvanized steel H-clip.

Top right: H-clip installed between adjacent roof sheathing panels and in between supporting trusses.

Bottom right: Installed nylon (plastic) H-clip and ready for next row of plywood sheathing panels.

Because H-clips are not load rated, code approval is not required. Based on gravity loading requirements, building codes often require that H-clips or other means, such as tongue-and-groove edges or lumber blocking, be used to support panel edges. H-clips can be an alternative to solid lumber blocking and tongue-and-groove panel edges in many applications.

Panel edge support requirements under uniform gravity loads are provided in the building codes (e.g., 2015 IBC Tables 2304.8(3), 2304.8(5), and 2015 IRC Table R503.2.1.1(1)). Table 1 provides allowable roof live loads for Sheathing Span®[1] panels installed with the strength axis perpendicular to supports. Allowable roof live loads for each span rating are provided with the maximum span with or without panel edge support.

For example, 24/16 span-rated OSB or plywood roof sheathing panels may be installed perpendicular to trusses and/or rafters spaced 24 inches on center (o.c.) with or without H-clips (please refer to the yellow shaded row in Table 1 below). The 24/16 span-rated panels are performance tested for roof applications at their maximum roof span of 24 inches o.c. without edge clips, so the building code allows the tabulated live load at that maximum span without edge clips. However, panel edge clips are readily available for 24/16 span-rated panels, and many structural panel manufacturers recommend their use to assure proper edge spacing.

The effectiveness and load distribution attributes of the H-clip can be illustrated with an example of 32/16 span-rated panels that can span up to 32 inches with edge support (i.e., if panel edge clips or other edge support is used) but only 28 inches when no edge support is provided (please refer to the green shaded row in Table 1). As shown in the table, a 32/16 span-rated panel used for roof sheathing over supports spaced at 24 inches o.c. can support a uniform live load of 70 psf without panel clips or other edge support, since edge support is not required with roof supports spaced 28 inches o.c. or less.

[1] Sheathing Span is a registered trademark of PFS Corporation.

Table 1.

Allowable uniform roof live loads for SHEATHING SPAN® panels (strength axis perpendicular to supports)[1]

Span Rating	Performance Category[4]	Maximum Span (inches)		Allowable Live Loads[2] (psf)								
		With edge support[3]	Without edge support	Spacing of supports center-to-center (inches)								
				12	16	19.2	24	32	40	48	54	60
20/0	5/16, 11/32	20	20	120	50	30						
24/0	3/8	24	20	190	100	60	30					
24/16	**7/16**	**24**	**24**	**190**	**100**	**65**	**40**					
32/16	**15/32, 1/2**	**32**	**28**		**180**	**120**	**70**	**30**				
40/20	19/32, 5/8	40	32			205	130	60	30			
48/24	23/32, 3/4	48	36				175	95	45	35		
54/32	7/8, 1	54	40					130	75	50	35	
60/32	7/8, 1	60	40					165	100	70	50	35
60/48	7/8, 1, 1-1/8	60	48					165	100	70	50	35

SI units: 1 inch = 25.4 mm; 1 psf = 47.9 Pa

1. Panels shall be a minimum of 24 inches wide.
2. The allowable spans were determined using a dead load of 10 psf. If the dead load exceeds 10 psf then the live load shall be reduced accordingly.
3. Tongue-and-groove edges, panel edge clips (one between each support, except two between supports 48 inches on center), lumber blocking or other. Only lumber blocking will satisfy blocked diaphragm requirements of IBC 2006 and 2009 Tables 2306.3.1 and 2306.3.2.
4. Performance Category is a fractional designation of the allowable panel thickness range for each specific span rating. Note that the building code (IBC, IRC) may reference the nominal panel thickness for each specific span rating.

Where required by code or recommended by manufacturer, H-clips should be installed as follows:

- One H-clip shall be placed between abutting panels at a location midway between each pair of trusses, rafters, or joists. However, two (2) equally spaced H-clips are required between supports when spaced 48 inches on center.
- Use the same size panel edge clip as the panel thickness. H-clips must fit snugly.
- Abutting wood structural panels shall be fitted as closely as clips permit. Occasional misfit of abutting sheets may be tolerated if gaps do not exceed maximum opening of 1/4 inch (6 mm).

Misspaced, embedded and/or damaged H-clips may reduce their effectiveness to transfer and resist load. Panel bowing and/or buckling is often observed at locations where clips are damaged and/or where they are misplaced (see Figure 2).

Figure 2. Panel edge clip (H-clip) installation errors – misplaced and/or missing edge clips

Top: Buckling of plywood roof sheathing due to misplaced panel H-clip.

Bottom: Buckling and/or bowing of the overlaid OSB roof sheathing due to misplaced and missing panel H-clip.