

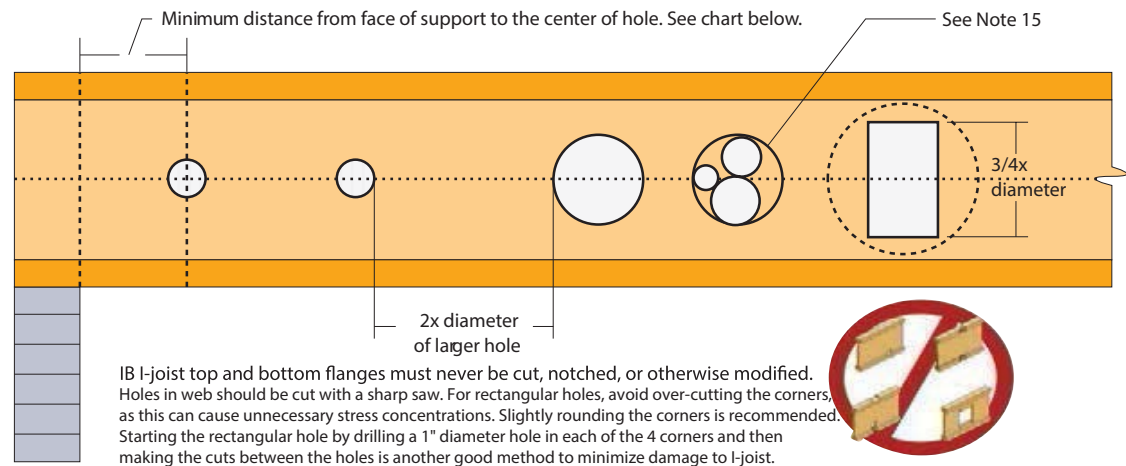
Technical Bulletin (TB-IJ-13)

Subject: Web Hole Guidelines for Residential IB I-joists

March 2015 (Updated June 2017)

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Typical Holes



Allowable Webhole Sizes and Locations U.S. ASD (Allowable Stress Design)

40 psf Live Load , 15 psf Dead Load (1 3/4" end bearings, 3 1/2" interior bearings, without bearing stiffeners)



Minimum Distance from Inside Face of Any Support to Center of Web Hole (Simple or Multi-span)

Round Hole Diameter (inches)

I-Joist Depth	I-Joist Series	SAF	2	3	4	5	6	6 1/4	7	8	8 5/8	9	10	10 3/4	11
9 1/2"	IB400	14'-1"	0'-7"	1'-9"	2'-11"	4'-3"	5'-7"	6'-0"							
	IB600	15'-4"	1'-5"	2'-8"	3'-11"	5'-4"	7'-1"	7'-7"							
	IB800	16'-9"	2'-5"	3'-8"	5'-0"	6'-7"	8'-5"								
11 7/8"	IB400	16'-1"	0'-7"	0'-8"	1'-4"	2'-6"	3'-9"	4'-1"	5'-1"	6'-6"	7'-9"				
	IB600	18'-1"	0'-7"	1'-6"	2'-8"	3'-11"	5'-5"	5'-10"	7'-1"	8'-10"					
	IB800	19'-11"	1'-9"	2'-11"	4'-2"	5'-5"	7'-0"	7'-5"	8'-8"						
14"	IB900	20'-5"	0'-7"	1'-4"	2'-10"	4'-4"	6'-0"	6'-5"	7'-8"	9'-6"					
	IB400	17'-8"	0'-7"	0'-8"	1'-2"	2'-3"	3'-4"	3'-7"	4'-5"	5'-7"	6'-4"	6'-10"	8'-6"		
	IB600	18'-1"	0'-7"	0'-8"	1'-9"	3'-1"	4'-5"	4'-9"	5'-10"	7'-7"	8'-8"				
16"	IB800	21'-10"	1'-9"	3'-0"	4'-4"	5'-8"	7'-1"	7'-6"	8'-7"	10'-2"					
	IB900	23'-2"	0'-8"	1'-11"	3'-2"	4'-6"	5'-10"	6'-3"	7'-3"	8'-9"	9'-10"	10'-7"			
	IB400	18'-1"	0'-7"	0'-8"	0'-11"	1'-10"	2'-9"	3'-0"	3'-9"	5'-0"	5'-9"	6'-3"	7'-7"	8'-7"	9'-0"
16"	IB600	18'-1"	0'-7"	0'-8"	1'-4"	2'-8"	4'-1"	4'-5"	5'-6"	7'-0"	7'-11"	8'-6"			
	IB800	22'-5"	2'-4"	3'-6"	4'-8"	5'-11"	7'-2"	7'-5"	8'-5"	9'-10"	10'-10"				
	IB900	24'-3"	0'-7"	1'-8"	3'-0"	4'-5"	5'-11"	6'-3"	7'-5"	8'-11"	9'-11"	10'-6"			

See page 3 of 3 for notes pertaining to this web hole table

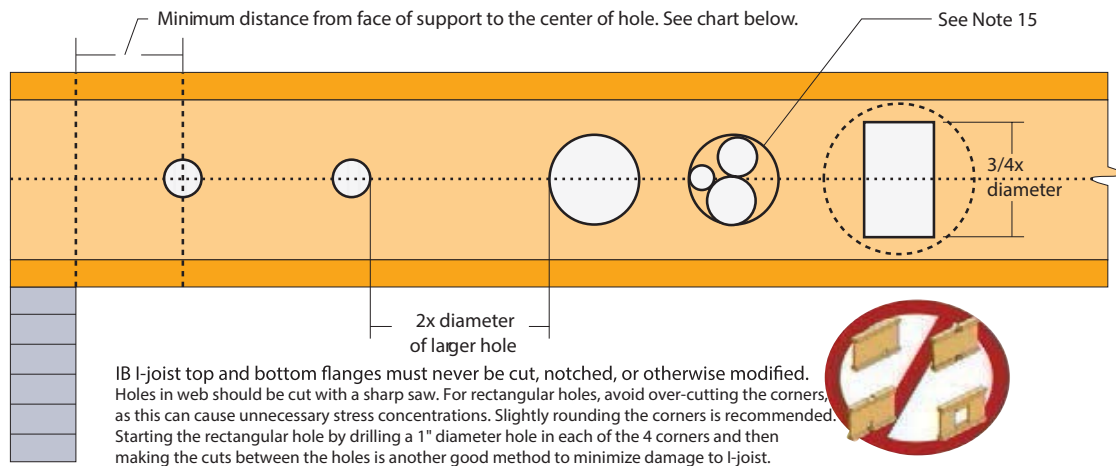
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Typical Holes



Allowable Web Hole Sizes and Locations Canadian LSD (Limit States Design)

40 psf unfactored Live Load, 15 psf unfactored Dead Load (1 3/4" end bearings, 3 1/2" interior bearings, without bearing stiffeners).
 Minimum Distance from Inside Face of Any Support to Center of Web Hole (Simple or Multi-span)



I-Joist Depth	I-Joist Series	SAF	Round Hole Diameter (in.)											
			2	3	4	5	6	6¼	7	8	8⅝	9	10	10¾
9½"	IB400	14'-1"	0'-7"	1'-9"	2'-11"	4'-3"	5'-7"	6'-0"						
	IB600	15'-4"	1'-5"	2'-8"	3'-11"	5'-4"	7'-1"	7'-7"						
	IB800	16'-9"	2'-5"	3'-8"	5'-0"	6'-7"	8'-5"							
11⅞"	IB400	16'-1"	0'-7"	0'-8"	1'-4"	2'-6"	3'-9"	4'-1"	5'-1"	6'-6"	7'-9"			
	IB600	18'-1"	0'-7"	1'-6"	2'-8"	3'-11"	5'-5"	5'-10"	7'-1"	8'-10"				
	IB800	19'-11"	1'-9"	2'-11"	4'-2"	5'-5"	7'-0"	7'-5"	8'-8"					
	IB900	20'-5"	0'-7"	1'-4"	2'-10"	4'-4"	6'-0"	6'-5"	7'-8"	9'-6"				
14"	IB400	17'-8"	0'-7"	0'-8"	1'-2"	2'-3"	3'-4"	3'-7"	4'-5"	5'-7"	6'-4"	6'-10"	8'-6"	
	IB600	18'-1"	0'-7"	0'-8"	1'-9"	3'-1"	4'-5"	4'-9"	5'-10"	7'-7"	8'-8"			
	IB800	21'-10"	1'-9"	3'-0"	4'-4"	5'-8"	7'-1"	7'-6"	8'-7"	10'-2"				
	IB900	23'-2"	0'-8"	1'-11"	3'-2"	4'-6"	5'-10"	6'-3"	7'-3"	8'-9"	9'-10"	10'-7"		
16"	IB400	18'-1"	0'-7"	0'-8"	0'-11"	1'-10"	2'-9"	3'-0"	3'-9"	5'-0"	5'-9"	6'-3"	7'-7"	8'-7"
	IB600	18'-1"	0'-7"	0'-8"	1'-4"	2'-8"	4'-1"	4'-5"	5'-6"	7'-0"	7'-11"	8'-6"		
	IB800	22'-5"	2'-4"	3'-6"	4'-8"	5'-11"	7'-2"	7'-5"	8'-5"	9'-10"	10'-10"			
	IB900	24'-3"	0'-7"	1'-8"	3'-0"	4'-5"	5'-11"	6'-3"	7'-5"	8'-11"	9'-11"	10'-6"		

See page 3 of 3 for notes pertaining to this web hole table



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Notes:

- 1) Table may be used for I-joist spacing 24 inches on center or less.
- 2) Hole location distance is measured from inside face of supports to center of hole.
- 3) Distances in this chart are based on uniformly loaded joists.
- 4) Joists with web hole location and/or sizes that fall outside of the scope of this table must be analyzed based on the actual hole size, joist spacing, span and loading condition. The I-joist shear capacity at the location of the circular web hole is calculated using the following equation: $V_{\text{(round hole)}} = \text{Published Shear Value} \times [(\text{Joist Depth} - \text{Hole Diameter}) / \text{Joist Depth}]$.
SAF = Span adjustment factor, used as defined below

OPTIONAL:

This table is based on I-joists being used at their maximum span. If the I-joists are placed at less than their full allowable span, the maximum distance from the centerline of the hole to the face of any support (D), as given above may be reduced as follows:

$$D_{\text{reduced}} = L_{\text{actual}} / \text{SAF} \times D$$

Where:

- D_{reduced} = Distance from the inside face of any support to center of hole, reduced for less than maximum span applications (ft). The reduced distance must not be less than 6-inches from the face of support to edge of hole
 L_{actual} = The actual measured span distance between the inside faces of supports (ft)
SAF = Span Adjustment Factor given above
D = The minimum distance from the inside face of any support to center of hole given above.
If $L_{\text{actual}} / \text{SAF}$ is greater than 1, use 1 in the above calculation for $L_{\text{actual}} / \text{SAF}$
- 5) I-joist top and bottom flanges must NEVER be cut, notched, or otherwise modified
 - 6) Whenever possible, field-cut holes should be centered on the middle of the web.
 - 7) The maximum size hole that can be cut into an I-joist web shall equal the clear distance between flanges of the I-joist minus 1/4 inch.
 - 8) The sides of square holes or longest sides of rectangular holes should not exceed three fourths of the diameter of the maximum round hole permitted at that location.
 - 9) Where more than one hole is necessary, the horizontal distance between adjacent hole edges shall exceed twice the diameter of the largest round or square hole (or twice the length of the longest side of the longest rectangular hole) and each hole must be sized and located in compliance with the requirements of the table above.
 - 10) A 1 1/2" diameter knockout is not considered a hole, and may be utilized anywhere it occurs and may be ignored for purposes of calculating minimum distances between holes.
 - 11) A single 1 1/2" maximum diameter hole shall be permitted anywhere in a cantilevered section of an IB I-joist. Holes of greater size may be permitted subject to verification.
 - 12) A single 1 1/2" maximum diameter hole can be located anywhere in the web, including directly adjacent to a larger hole. Multiple 1 1/2" diameter holes in a horizontal row shall be permitted if they meet the requirements of notes 9 or 15 and cover a length of 24 inches or less. Multiple 1 1/2" diameter holes covering a length greater than 24 inches may be permitted subject to verification.
 - 13) For I-joists with more than one span, use the longest span to determine hole locations in either span.
 - 14) All holes shall be cut in a workman-like manner in accordance with the restrictions listed above, and as illustrated in the figure above.
 - 15) A group of round holes at approximately the same location shall be permitted if they meet the requirements for a single round hole circumscribed around them.
 - 16) Refer to International Beams Design Software for other hole sizes, locations, and joist span conditions.

For figure and web hole tables pertaining to these notes, see pages 1 of 3 (U.S.-ASD) and 2 of 3 (CND-LSD)