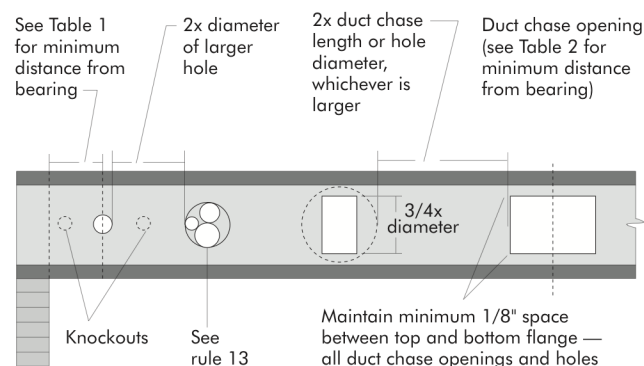


RULES FOR CUTTING HOLES AND DUCT CHASE OPENINGS:

- The distance between the inside edge of the support and the centerline of any hole or duct chase opening shall be in compliance with the requirements of Table 1 or 2, respectively.
- I-joist top and bottom flanges must NEVER be cut, notched, or otherwise modified.
- Whenever possible, field-cut holes should be centered on the middle of the web.
- The maximum size hole or the maximum depth of a duct chase opening that can be cut into an I-joist web shall equal the clear distance between the flanges of the I-joist minus 1/4 inch. A minimum of 1/8 inch should always be maintained between the top or bottom of the hole or opening and the adjacent I-joist flange.
- The sides of square holes or longest sides of rectangular holes should not exceed 3/4 of the diameter of the maximum round hole permitted at that location.
- Where more than one hole is necessary, the distance between adjacent hole edges shall exceed twice the diameter of the largest round hole or twice the size of the largest square hole (or twice the length of the longest side of the longest rectangular hole or duct chase opening) and each hole and duct chase opening shall be sized and located in compliance with the requirements of Tables 1 and 2, respectively.
- A knockout is **not** considered a hole, may be utilized anywhere it occurs, and may be ignored for purposes of calculating minimum distances between holes and/or duct chase openings.
- Holes measuring 1-1/2 inches or smaller shall be permitted anywhere in a cantilevered section of a joist. Holes of greater size may be permitted providing they have been verified.
- A 1-1/2 inch hole or smaller can be placed anywhere in the web provided that it meets the requirements of item 6 above.
- For continuous joists with more than one span, use the longest span to determine hole location in either span.
- All holes and duct chase openings shall be cut in a workman-like manner in accordance with the restrictions listed above and as illustrated in Figure 7.
- Limit three maximum size holes and one duct chase opening per span.
- 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.

FIGURE 7
FIELD-CUT HOLE LOCATOR

A knockout is **NOT** considered a hole, may be utilized wherever it occurs and may be ignored for purposes of calculating minimum distances between holes.

Knockouts are prescored holes provided for the contractor's convenience to install electrical or small plumbing lines. They are 1-1/2 inches in diameter, and are spaced 15 inches on center along the length of the I-joist. Where possible, it is preferable to use knockouts instead of field-cut holes.



Never drill, cut or notch the flange, or over-cut the web.

Holes in webs should be cut with a sharp saw.

For rectangular holes, avoid over-cutting the corners, as this can cause unnecessary stress concentrations. Slightly rounding the corners is recommended. Starting the rectangular hole by drilling a 1-inch diameter hole in each of the four corners and then making the cuts between the holes is another good method to minimize damage to the I-joist.

TABLE 1

HOLE SIZES AND LOCATIONS — Simple or Multiple Span

Joist Depth	Joist Series	Minimum Distance from Inside Face of Any Support to Center of Hole (ft - in.)															Span Adjustment Factor
		Round Hole Diameter (in.)															
		2	3	4	5	6	6-1/4	7	8	8-5/8	9	10	10-3/4	11	12	12-3/4	
9-1/2"	NI-20	0'-6"	1'-0"	2'-6"	3'-6"	5'-6"	6'-0"	---	---	---	---	---	---	---	---	13'-5"	
	NI-40x	0'-6"	1'-6"	3'-0"	4'-6"	5'-0"	6'-6"	---	---	---	---	---	---	---	---	15'-0"	
	NI-60	1'-6"	2'-6"	4'-0"	5'-6"	7'-0"	7'-6"	---	---	---	---	---	---	---	---	16'-7"	
	NI-70	2'-0"	3'-6"	5'-0"	6'-6"	8'-0"	8'-6"	---	---	---	---	---	---	---	---	17'-8"	
	NI-80	2'-6"	3'-6"	5'-0"	6'-6"	8'-6"	8'-6"	---	---	---	---	---	---	---	---	18'-2"	
11-7/8"	NI-20	0'-6"	0'-6"	0'-6"	1'-0"	3'-0"	3'-0"	4'-6"	6'-6"	7'-6"	---	---	---	---	---	14'-2"	
	NI-40x	0'-6"	0'-6"	1'-6"	2'-6"	4'-0"	4'-6"	5'-6"	7'-0"	8'-0"	---	---	---	---	---	17'-1"	
	NI-60	0'-6"	1'-6"	3'-0"	4'-6"	5'-6"	6'-0"	7'-6"	9'-0"	10'-0"	---	---	---	---	---	19'-8"	
	NI-70	1'-6"	2'-6"	4'-0"	5'-6"	7'-0"	7'-6"	8'-6"	10'-0"	11'-0"	---	---	---	---	---	21'-3"	
	NI-80	1'-6"	3'-0"	4'-0"	5'-6"	7'-0"	7'-6"	8'-6"	10'-6"	11'-6"	---	---	---	---	---	21'-7"	
NI-90x	0'-6"	0'-6"	0'-6"	2'-6"	4'-6"	5'-0"	6'-6"	---	---	---	---	---	---	---	---	22'-4"	
14"	NI-40x	0'-6"	0'-6"	0'-6"	1'-0"	2'-6"	2'-6"	3'-6"	5'-0"	6'-0"	6'-6"	8'-0"	10'-0"	---	---	18'-10"	
	NI-60	0'-6"	0'-6"	1'-6"	3'-0"	4'-0"	4'-6"	5'-6"	7'-0"	8'-0"	8'-6"	10'-6"	12'-0"	---	---	21'-7"	
	NI-70	0'-6"	0'-6"	1'-6"	3'-0"	4'-6"	4'-6"	6'-0"	8'-0"	9'-0"	9'-6"	12'-0"	13'-6"	---	---	21'-9"	
	NI-80	1'-0"	2'-0"	3'-6"	5'-0"	6'-0"	6'-6"	7'-6"	9'-0"	10'-0"	11'-0"	12'-6"	14'-0"	---	---	24'-6"	
	NI-90x	0'-6"	0'-6"	0'-6"	2'-0"	4'-0"	4'-0"	5'-6"	7'-6"	8'-6"	9'-0"	---	---	---	---	25'-5"	
16"	NI-60	0'-6"	0'-6"	0'-6"	0'-6"	1'-6"	2'-0"	3'-0"	4'-6"	5'-6"	6'-0"	8'-0"	9'-6"	10'-0"	12'-0"	14'-0"	21'-9"
	NI-70	0'-6"	0'-6"	0'-6"	0'-6"	2'-0"	2'-6"	3'-6"	5'-6"	6'-6"	7'-0"	9'-0"	10'-6"	11'-0"	13'-6"	15'-6"	21'-9"
	NI-80	0'-6"	1'-0"	2'-0"	3'-6"	4'-6"	5'-0"	6'-0"	7'-6"	8'-6"	9'-0"	10'-6"	12'-0"	12'-6"	14'-6"	16'-0"	26'-3"
	NI-90x	0'-6"	0'-6"	0'-6"	2'-0"	3'-6"	4'-0"	5'-0"	7'-0"	8'-0"	8'-6"	10'-6"	11'-6"	12'-0"	---	---	28'-3"

1. Above table may be used for I-joist spacing of 24 inches on center or less.

2. Hole location distance is measured from inside face of supports to center of hole.

3. For continuous joists with more than one span, use the **longest** span to determine hole location in either span.

4. Distances are based on uniformly loaded floor joists that meet the span requirements for a design live load of 40 psf and dead load of 10 psf, and a live load deflection limit of L/480. For other applications, contact your local distributor.

OPTIONAL HOLE CALCULATION:

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

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

Where:

D_{reduced} = Distance from the inside face of any support to center of hole, reduced for less-than-maximum span applications (ft).

L_{actual} = The actual measured span distance between the inside faces of supports (ft).

SAF = Span Adjustment Factor given in Table 1.

D = The minimum distance from the inside face of any support to center of hole from Table 1 above.

If $\frac{L_{\text{actual}}}{\text{SAF}}$ is greater than 1.0, use 1.0 in the above calculation for $\frac{L_{\text{actual}}}{\text{SAF}}$.

When calculating hole locations by this optional method, the minimum distance between the center of the hole and the inside face of the support shall be the lesser of two diameters or 12 inches plus 1/2 diameter, rounded up to the nearest 1/2 foot along the joist.

TABLE 2

DUCT CHASE OPENING SIZES AND LOCATIONS — Simple Span Only

Joist Depth	Joist Series	Minimum Distance from Inside Face of Supports to Center of Opening (ft - in.)									
		Duct Chase Length (in.)									
		8	10	12	14	16	18	20	22	24	
9-1/2"	NI-20	4'-6"	5'-0"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-0"
	NI-40x	5'-6"	6'-0"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-0"
	NI-60	5'-6"	6'-0"	6'-6"	7'-0"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-0"
	NI-70	5'-6"	6'-0"	6'-6"	6'-6"	7'-0"	7'-6"	7'-6"	8'-0"	8'-6"	8'-6"
	NI-80	5'-6"	6'-0"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-0"
11-7/8"	NI-20	6'-0"	6'-6"	7'-0"	7'-6"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	9'-6"
	NI-40x	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-0"
	NI-60	7'-6"	8'-0"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-6"	11'-6"
	NI-70	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	10'-6"	10'-6"
	NI-80	7'-6"	8'-0"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	10'-6"	11'-0"
14"	NI-90x	8'-0"	8'-6"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	11'-6"
	NI-40x	8'-0"	8'-6"	9'-0"	9'-6"	10'-6"	11'-0"	11'-6"	12'-6"	---	---
	NI-60	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	---	---
	NI-70	9'-0"	9'-6"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	12'-6"
	NI-80	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-0"
16"	NI-90x	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	13'-6"
	NI-60	10'-6"	11'-0"	11'-0"	12'-0"	12'-6"	13'-0"	13'-6"	14'-6"	---	---
	NI-70	10'-6"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-6"	14'-6"
	NI-80	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	15'-0"	15'-0"
	NI-90x	11'-6"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	15'-0"	15'-6"	15'-6"

1. Above table may be used for I-joist spacing of 24 inches on center or less.

2. Duct chase opening location distance is measured from inside face of supports to center of opening.

3. The above table is based on simple-span joists only. For other applications, contact your local distributor.

4. Distances are based on uniformly loaded floor joists that meet the span requirements for a design live load of 40 psf and dead load of 10 psf, and a live load deflection limit of L/480.