

# CONSTRUCTION DETAILS FOR RESIDENTIAL FLOORS

N-U303 / January 2006



Refer to the *Installation Guide for Residential Floors* for additional information.  
ICC-ES EVALUATION REPORT ESR-1742

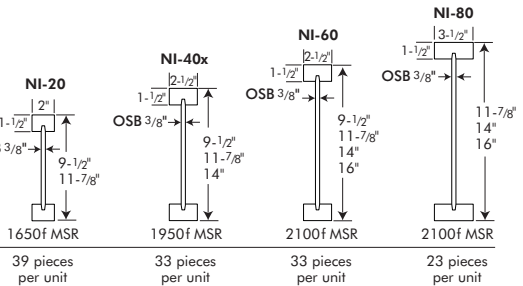
## WEB HOLE SPECIFICATIONS

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-joint 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-joint web shall equal the clear distance between the flanges of the I-joint 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-joint 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.



- One and one-half inch holes shall be permitted anywhere in a cantilevered section of a joist. Holes of greater size may be permitted subject to verification.
- A 1-1/2 inch hole 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 3 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.

## 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.)															
		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"										
	NI-40x	0'-6"	1'-6"	3'-0"	4'-6"	6'-0"	6'-6"										
	NI-60	1'-6"	2'-6"	4'-0"	5'-6"	7'-0"	7'-6"										
11-7/8"	NI-20	0'-6"	0'-6"	0'-6"	1'-0"	3'-0"	3'-0"	4'-6"	6'-6"	7'-6"							
	NI-40x	0'-6"	0'-6"	1'-6"	2'-6"	4'-0"	4'-6"	5'-6"	7'-0"	8'-0"							
	NI-60	0'-6"	1'-6"	3'-0"	4'-6"	5'-6"	6'-0"	7'-6"	9'-0"	10'-0"							
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"				
	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"				
	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"				
16"	NI-60	0'-6"	0'-6"	0'-6"	1'-6"	2'-0"	3'-0"	4'-6"	5'-6"	6'-0"	8'-0"	9'-6"	10'-0"	10'-6"	12'-0"	14'-0"	16'-0"
	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"	
	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"	

- Above table may be used for I-joint spacing of 24 inches on center or less.
- Hole location distance is measured from inside face of supports to center of hole.
- For continuous joists with more than one span, use the longest span to determine hole location in either span.
- 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.
- The above table is based on the I-joists being used at their maximum spans. The minimum distance as given above may be reduced for shorter spans; contact your local distributor.

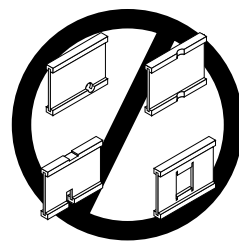
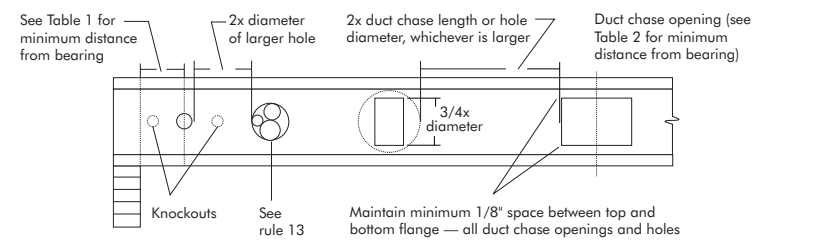
## TABLE 2 DUCT CHASE OPENING SIZES AND LOCATIONS

Simple Span Only

Joist Depth	Joist Series	Minimum Distance From Inside Face of Any 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	6'-0"	6'-6"	6'-6"	7'-0"	7'-6"	7'-6"	8'-0"									
	NI-40x	5'-6"	6'-0"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"							
	NI-60	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	7'-6"	8'-0"	8'-6"	9'-0"							
11-7/8"	NI-20	7'-6"	8'-0"	8'-6"	8'-6"	9'-0"	9'-6"	10'-0"									
	NI-40x	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"							
	NI-60	7'-6"	8'-0"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-6"							
14"	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-80	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"							
16"	NI-60	10'-6"	11'-0"	11'-0"	12'-0"	12'-6"	13'-0"	13'-6"	14'-6"								
	NI-80	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	15'-0"							
	NI-80	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	15'-0"							

- Above table may be used for I-joint spacing of 24 inches on center or less.
- Duct chase opening location distance is measured from inside face of supports to center of opening.
- The above table is based on simple-span joists only. For other applications, contact your local distributor.
- 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.
- The above table is based on the I-joists being used at their maximum spans. The minimum distance as given above may be reduced for shorter spans; contact your local distributor.

## FIGURE 7 FIELD-CUT HOLE LOCATOR



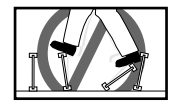
Knockouts are prescored holes provided for the contractor's convenience to install electrical or small plumbing lines. They are 1-1/2 inches in diameter, and are spaced 15 inches on center along the length of the I-joint. Where possible, it is preferable to use knockouts instead of field-cut holes.

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

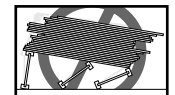
Holes in webs should be cut with a sharp saw.

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 4 corners and then making the cuts between the holes is another good method to minimize damage to I-joint.

## SAFETY AND CONSTRUCTION PRECAUTIONS



Do not walk on I-joists until fully fastened and braced, or serious injuries can result.



Never stack building materials over unsheathed I-joists. Once sheathed, do not over-stress I-joists with concentrated loads from building materials.

WARNING: I-joists are unstable until completely installed with panels fully fastened to the top flanges.

AVOID ACCIDENTS BY FOLLOWING THESE IMPORTANT GUIDELINES:

- Brace and nail each I-joint as it is installed, using hangers, blocking panels, rim board, and/or cross-bridging at joist ends.
- When the building is completed, the floor sheathing will provide lateral support for the top flanges of the I-joists. Until this sheathing is applied, temporary bracing, often called struts, or temporary sheathing must be applied to prevent I-joint rollover or buckling.
  - Temporary bracing or struts must be 1x4 inch minimum, at least 8 feet long and spaced no more than 8 feet on center, and must be secured with a minimum of two 8d nails fastened to the top surface of each I-joint. Nail the bracing to a lateral restraint at the end of each bay. Lap ends of adjoining bracing over at least two I-joists.
  - Or, sheathing (temporary or permanent) can be nailed to the top flange of the first 4 feet of I-joists at the end of the bay.
- For cantilevered I-joists, brace top and bottom flanges, and brace ends with closure panels, rim board, or cross-bridging.
- Install and nail permanent sheathing to each I-joint before placing loads on the floor system. Then, stack building materials over beams or walls only.
- Never install a damaged I-joint.

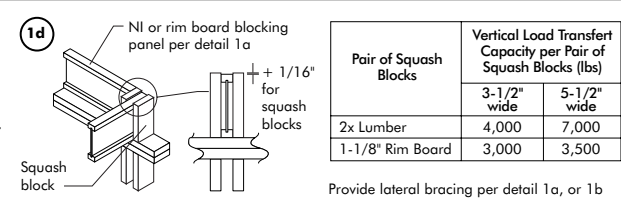
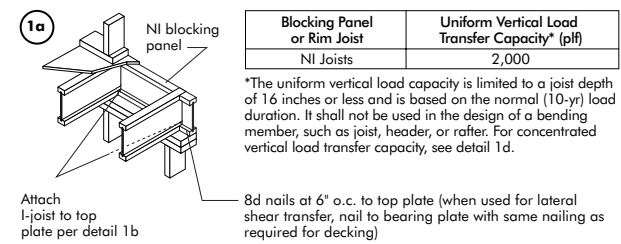
Improper storage or installation, failure to follow applicable building codes, failure to follow span ratings for Nordic I-joists, failure to use allowable hole sizes and locations, or failure to use web stiffeners when required can result in serious accidents. Follow these installation guidelines carefully.



## PRODUCT WARRANTY

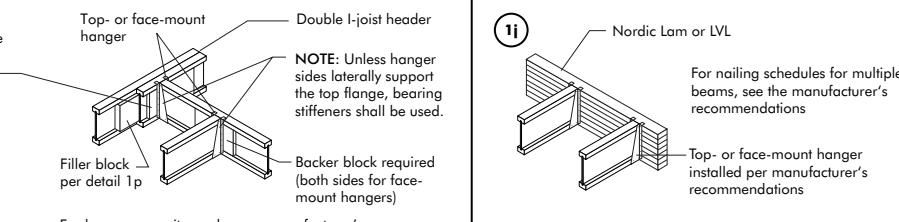
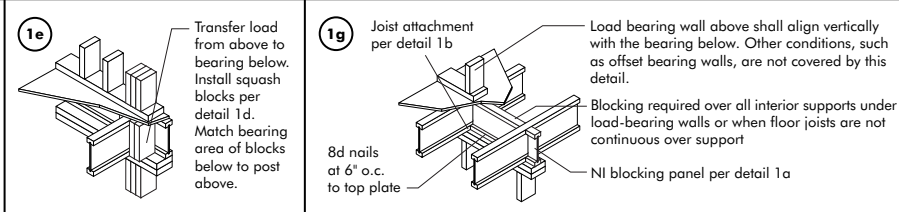
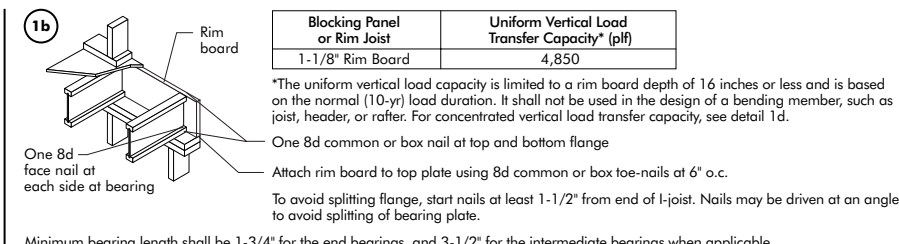
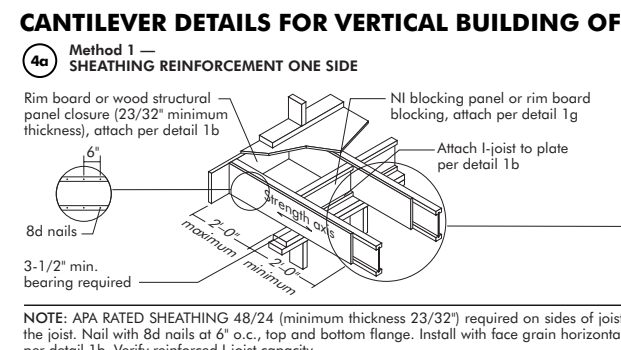
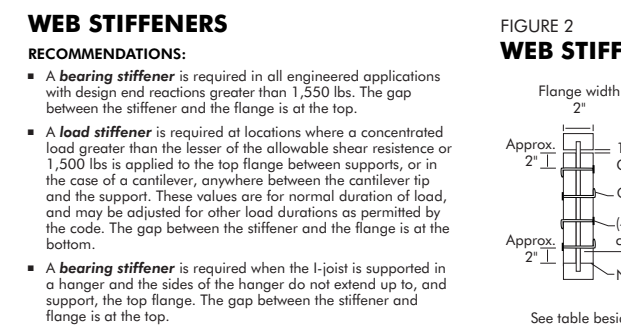
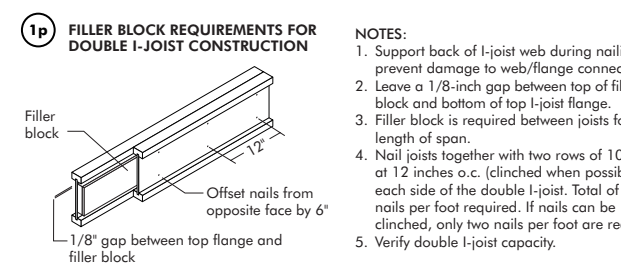
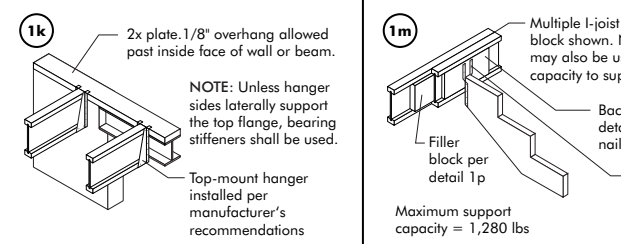
Chantiers Chibougamau guarantees that, in accordance with our specifications, Nordic products are free from manufacturing defects in material and workmanship.

Furthermore, Chantiers Chibougamau warrants that our products, when utilized in accordance with our handling and installation instructions, will meet or exceed our specifications for the lifetime of the structure.



Pair of Squash Blocks	Vertical Load Transfer Capacity per Pair of Squash Blocks (lbs)	
	3-1/2" wide	5-1/2" wide
2x Lumber	4,000	7,000
1-1/8" Rim Board	3,000	3,500

Provide lateral bracing per detail 1a, or 1b



For nailing schedules for multiple beams, see the manufacturer's recommendations

