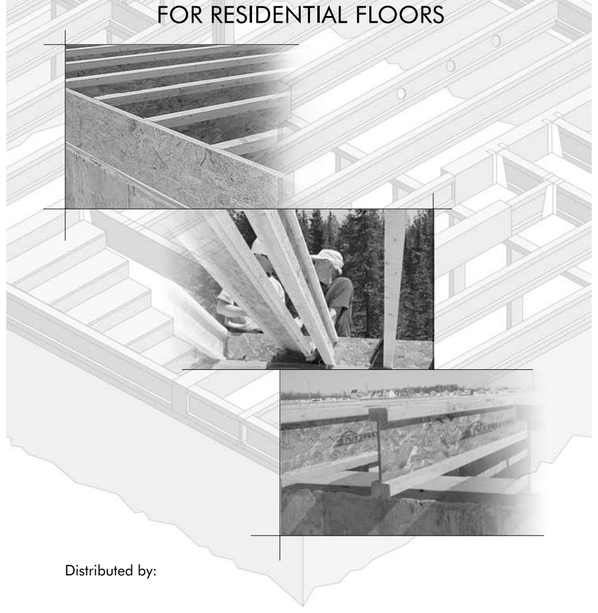
NORDIC ENGINEERED WOOD

INSTALLATION GUIDE

FOR RESIDENTIAL FLOORS



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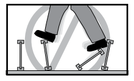
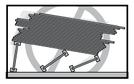
N-U301 / November 2014

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-joist with concentrated loads from building materials.

WARNING

I-joists are not stable until completely installed, and will not carry any load until fully braced and sheathed.

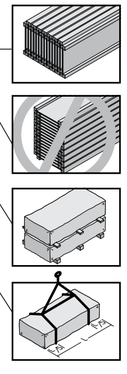
Avoid Accidents by Following these Important Guidelines:

1. Brace and nail each I-joist as it is installed, using hangers, blocking panels, rim board, and/or cross-bridging at joist ends. When I-joists are applied continuous over interior supports and a load-bearing wall is planned at that location, blocking will be required at the interior support.
2. 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-joist 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-joist. 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.
3. For cantilevered I-joists, brace top and bottom flanges, and brace ends with closure panels, rim board, or cross-bridging.
4. Install and fully nail permanent sheathing to each I-joist before placing loads on the floor system. Then, stack building materials over beams or walls only.
5. *Never* install a damaged I-joist.

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

STORAGE AND HANDLING GUIDELINES

1. Bundle wrap can be slippery when wet. Avoid walking on wrapped bundles.
2. Store, stack, and handle I-joists vertically and level only.
3. Always stack and handle I-joists in the upright position only.
4. Do not store I-joists in direct contact with the ground and/or flatwise.
5. Protect I-joists from weather, and use spacers to separate bundles.
6. Bundled units should be kept intact until time of installation.
7. When handling I-joists with a crane on the job site, take a few simple precautions to prevent damage to the I-joists and injury to your work crew.
   - Pick I-joists in bundles as shipped by the supplier.
   - Orient the bundles so that the webs of the I-joists are vertical.
   - Pick the bundles at the 5th points, using a spreader bar if necessary.
8. Do not handle I-joists in a horizontal orientation.
9. NEVER USE OR TRY TO REPAIR A DAMAGED I-JOIST.



ALLOWABLE SPANS

1. Allowable spans are based on uniform loads. For applications with non-uniform loads, an engineering analysis may be required using the design properties found in the *Nordic Joist Design/Construction Guide.*
2. The allowable spans in the table indicate the allowable **clear** span for various joist spacings under typical residential uniform floor loads (40 psf live load and 10 psf dead load) for glued-nailed systems.
3. The live load deflection is limited to L/480.
4. Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches for the intermediate bearings.
5. For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
6. Spans are based on a composite floor with glued-nailed sheathing meeting the requirements for APA Rated Sheathing or APA Rated STURD-I-FLOOR conforming to PRP-108, PS 1, or PS 2 with a minimum thickness of 19/32 inch (40/20 or 20 oc) for a joist spacing of 19.2 inches or less, or 23/32 inch (48/24 or 24 oc) for a joist spacing of 24 inches. Adhesive shall meet APA Specification AFG-01 or ASTM D3498.
7. Bearing stiffeners are **not** required when I-joists are used with the spans and spacing given in this table, except as required for hangers.
8. SI units conversion: 1 inch = 25.4 mm
   1 foot = 0.305 m

ALLOWABLE SPANS FOR NORDIC I-JOISTS
SIMPLE AND MULTIPLE SPANS

Joist Depth	Joist Series	Simple spans				Multiple spans			
		On center spacing				On center spacing			
		12"	16"	19.2	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	16'-7"	15'-3"	14'-5"	13'-6"	18'-1"	16'-7"	15'-8"	14'-2"
	NI-40x	18'-8"	17'-0"	16'-1"	15'-0"	20'-4"	18'-5"	16'-10"	15'-0"
	NI-60	18'-11"	17'-4"	16'-4"	15'-3"	20'-8"	18'-10"	17'-9"	16'-7"
	NI-70	20'-6"	18'-9"	17'-8"	16'-5"	22'-4"	20'-4"	19'-2"	17'-10"
	NI-80	20'-11"	19'-1"	18'-0"	16'-9"	22'-9"	20'-9"	19'-6"	18'-2"
11-7/8"	NI-20	19'-11"	18'-3"	17'-3"	16'-1"	21'-8"	19'-10"	17'-9"	16'-2"
	NI-40x	22'-2"	20'-3"	19'-2"	17'-2"	24'-2"	21'-0"	19'-2"	17'-1"
	NI-60	22'-8"	20'-8"	19'-6"	18'-2"	24'-8"	22'-6"	21'-2"	19'-8"
	NI-70	24'-5"	22'-3"	21'-0"	19'-7"	26'-8"	24'-3"	22'-10"	21'-3"
	NI-80	24'-11"	22'-8"	21'-4"	19'-11"	27'-1"	24'-8"	23'-3"	21'-7"
	NI-90	25'-7"	23'-3"	21'-11"	20'-5"	27'-10"	25'-4"	23'-10"	22'-2"
	NI-90x	25'-9"	23'-6"	22'-1"	20'-7"	28'-1"	25'-6"	24'-1"	22'-4"
14"	NI-40x	25'-2"	22'-11"	21'-2"	18'-11"	26'-8"	23'-1"	21'-1"	18'-10"
	NI-60	25'-9"	23'-6"	22'-2"	20'-8"	28'-0"	25'-7"	24'-1"	21'-7"
	NI-70	27'-8"	25'-3"	23'-9"	22'-2"	30'-2"	27'-6"	25'-10"	24'-1"
	NI-80	28'-3"	25'-9"	24'-3"	22'-7"	30'-10"	28'-0"	26'-5"	24'-6"
	NI-90	29'-0"	26'-5"	24'-10"	23'-1"	31'-7"	28'-9"	27'-1"	25'-2"
	NI-90x	29'-4"	26'-9"	25'-2"	23'-5"	32'-0"	29'-1"	27'-5"	25'-5"
16"	NI-60	28'-6"	26'-0"	24'-7"	22'-10"	31'-1"	28'-4"	26'-0"	23'-3"
	NI-70	30'-8"	27'-11"	26'-4"	24'-6"	33'-5"	30'-5"	27'-3"	26'-7"
	NI-80	31'-4"	28'-6"	26'-10"	25'-0"	34'-2"	31'-1"	29'-3"	27'-2"
	NI-90	32'-1"	29'-2"	27'-6"	25'-7"	35'-0"	31'-10"	29'-11"	27'-10"
	NI-90x	32'-7"	29'-8"	27'-11"	26'-0"	35'-6"	32'-3"	30'-5"	28'-3"

ICC-ES EVALUATION REPORT ESR-1742

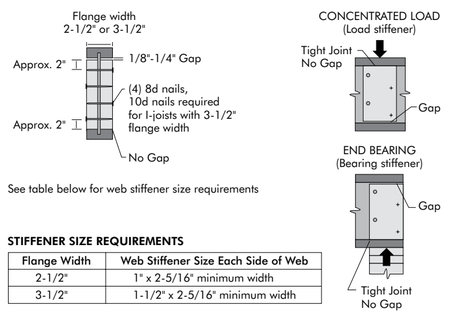
WEB STIFFENERS

RECOMMENDATIONS:

- A ***bearing stiffener*** is required in all engineered applications with reactions greater than shown in the I-joist properties table found of the *I-joist Construction Guide* (U101).The gap between the stiffener and the flange is at the top.
- A ***bearing stiffener*** is required when the I-joist is supported in a hanger and the sides of the hanger do not extend up to, and support, the top flange. The gap between the stiffener and flange is at the top.
- A ***load stiffener*** is required at locations where a concentrated load greater than 1,500 lbs is applied to the top flange between supports, or in the case of a cantilever, anywhere between the cantilever tip and the support. These values are for normal duration of load, and may be adjusted for other load durations as permitted by the code. The gap between the stiffener and the flange is at the bottom.

SI units conversion: 1 inch = 25.4 mm

FIGURE 2
WEB STIFFENER INSTALLATION DETAILS



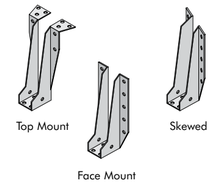
See table below for web stiffener size requirements

STIFFENER SIZE REQUIREMENTS

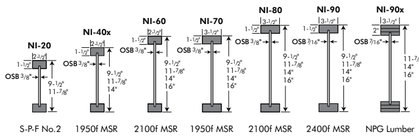
Flange Width	Web Stiffener Size Each Side of Web
2-1/2"	1" x 2-5/16" minimum width
3-1/2"	1-1/2" x 2-5/16" minimum width

I-JOIST HANGERS

1. Hangers shown illustrate the three most commonly used metal hangers to support I-joists.
2. All nailing must meet the hanger manufacturer's recommendations.
3. Hangers should be selected based on the joist depth, flange width and load capacity based on the allowable spans.
4. Web stiffeners are required when the sides of the hangers do not laterally brace the top flange of the I-joist.



NORDIC I-JOIST SERIES



S-P-F No.2	1950f MSR	2100f MSR	1950f MSR	2100f MSR	2400f MSR	NPG Lumber
33 pieces per unit	33 pieces per unit	33 pieces per unit	23 pieces per unit	23 pieces per unit	23 pieces per unit	23 pieces per unit

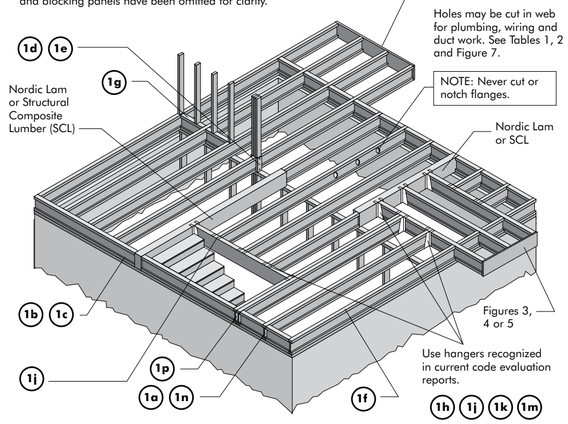
Chantiers Chibougamau Ltd. harvests its own trees, which enables Nordic products to adhere to strict quality control procedures throughout the manufacturing process. Every phase of the operation, from forest to the finished product, reflects our commitment to quality.

Nordic Engineered Wood I-joists use only finger-jointed black spruce lumber in their flanges, ensuring consistent quality, superior strength, and longer span carrying capacity.

INSTALLING NORDIC I-JOISTS

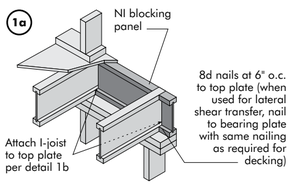
1. Before laying out floor system components, verify that I-joist flange widths match hanger widths. If not, contact your supplier.
2. Except for cutting to length, I-joist flanges should **never** be cut, drilled, or notched.
3. Install I-joists so that top and bottom flanges are within 1/2 inch of true vertical alignment.
4. I-joists must be anchored securely to supports before floor sheathing is attached, and supports for multiple-span joists must be level.
5. Minimum bearing lengths: 1-3/4 inches for end bearings and 3-1/2 inches for intermediate bearings.
6. When using hangers, seat I-joists firmly in hanger bottoms to minimize settlement.
7. Leave a 1/16-inch gap between the I-joist end and a header.
8. Concentrated loads greater than those that can normally be expected in residential construction should *only* be applied to the top surface of the top flange. Normal concentrated loads include track lighting fixtures, audio equipment and security cameras. Never suspend unusual or heavy loads from the I-joist's bottom flange. Whenever possible, suspend *all* concentrated loads from the top of the I-joist. Or, attach the load to blocking that has been securely fastened to the I-joist webs.
9. Never install I-joists where they will be permanently exposed to weather, or where they will remain in direct contact with concrete or masonry.
10. Restrain ends of floor joists to prevent rollover. Use rim board, rim joists or I-joist blocking panels.
11. For I-joists installed over and beneath bearing walls, use full depth blocking panels, rim board, or squash blocks (cripple members) to transfer gravity loads through the floor system to the wall or foundation below.
12. Due to shrinkage, common framing lumber set on edge **may never** be used as blocking or rim boards. I-joist blocking panels or other engineered wood products – such as rim board – must be cut to fit between the I-joists, and an I-joist-compatible depth selected.
13. Provide permanent lateral support of the bottom flange of all I-joists at interior supports of multiple-span joists. Similarly, support the bottom flange of all cantilevered I-joists at the end support next to the cantilever extension. In the completed structure, the gypsum wallboard ceiling provides this lateral support. Until the final finished ceiling is applied, temporary bracing or struts must be used.
14. If square-edge panels are used, edges must be supported between I-joists with 2x4 blocking. Glue panels to blocking to minimize squeaks. Blocking is not required under structural finish flooring, such as wood strip flooring, or if a separate underlayment layer is installed.
15. Nail spacing: Space nails installed to the flange's top face in accordance with the applicable building code requirements or approved building plans.

FIGURE 1
TYPICAL NORDIC I-JOIST FLOOR FRAMING AND CONSTRUCTION DETAILS



All nails shown in the above details are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common nails (0.131 x 2-1/2 in.) shown in details. Framing lumber assumed to be Utility grade S-P-F (south) or stronger species. Individual components not shown to scale for clarity.

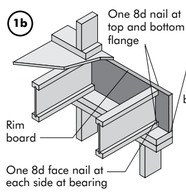
1a



Blocking Panel or Rim Joist	Uniform Vertical Load Transfer Capacity* (plf)
NI Joists	2,000

*The uniform vertical load capacity is limited to a joist depth of 16 inches or less and shall not be increased for any load duration shorter than the normal (10-yr) load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer capacity, see detail 1d.

1b



To avoid splitting flange, start nails at least 1-1/2" from end of I-joist. Nails may be driven at an angle to avoid splitting of bearing plate.

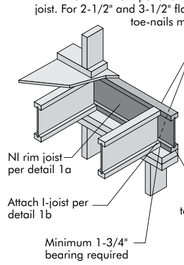
Minimum bearing length shall be 1-3/4" for the end bearings, and 3-1/2" for the intermediate bearings when applicable.

Blocking Panel or Rim Joist	Uniform Vertical Load Transfer Capacity* (plf)
1-1/8" Rim Board Plus	4,850

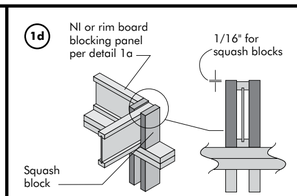
*The uniform vertical load capacity is limited to a rim board depth of 16 inches or less and shall not be increased for any load duration shorter than the normal (10-yr) load duration. It shall not be used in the design of a bending member, such as joist, header, or rafter. For concentrated vertical load transfer capacity, see detail 1d.

1c

Attach rim joist to floor joist with one nail at top and bottom. Nail must provide 1 inch minimum penetration into floor joist. For 2-1/2" and 3-1/2" flange widths, toe-nails may be used.



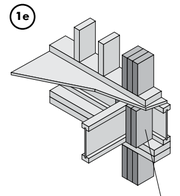
1d



Pair of Squash Blocks	Vertical Load Transfer Capacity per Pair of Squash Blocks (lbs)	
	3-1/2" wide	5-1/2" wide
2x Lumber	3,800	5,900
1-1/8" Rim Board Plus	2,600	4,000

Provide lateral bracing per detail 1a, 1b, or 1c

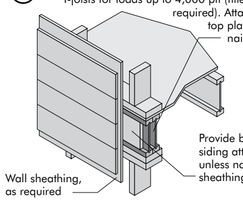
1e



Transfer load from above to bearing below. Install squash blocks per detail 1d. Match bearing area of blocks below to post above.

1f

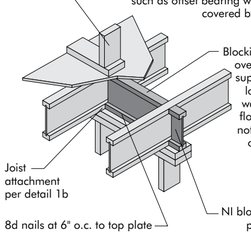
Use single I-joist for loads up to 2,000 plf, double I-joists for loads up to 4,000 plf (filler block not required). Attach I-joist to top plate using 8d nails at 6" o.c.



Rim board may be used in lieu of I-joists. Backer is not required when rim board is used. Bracing per code shall be carried to the foundation.

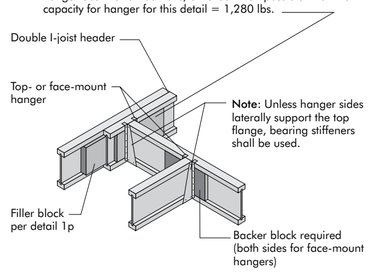
1g

Load bearing wall above shall align vertically with the bearing below. Other conditions, such as offset bearing walls, are not covered by this detail.



1h

Backer block (use if hanger load exceeds 250 lbs)
Before installing a backer block to a double I-joist, drive three additional 10d nails through the webs and filler block where the backer block will fit. Clinch. Install backer tight to top flange. Use twelve 10d nails, clinched when possible. Maximum capacity for hanger for this detail = 1,280 lbs.



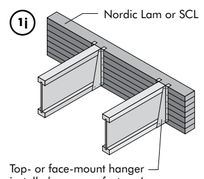
For hanger capacity see hanger manufacturer's recommendations. Verify double I-joist capacity to support concentrated loads.

BACKER BLOCKS (Blocks must be long enough to permit required nailing without splitting)

Flange Width	Material Thickness Required*	Minimum Depth**
2-1/2"	1"	5-1/2"
3-1/2"	1-1/2"	7-1/4"

* Minimum grade for backer block material shall be Utility grade S-P-F (south) or better for solid sawn lumber and Rated Sheathing grade for wood structural panels.
** For face-mount hangers use net joist depth minus 3-1/4" for joists with 1-1/2" thick flanges. For 2" thick flanges use net depth minus 4-1/4".

1i

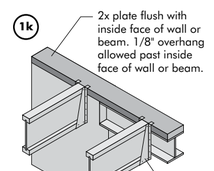


For nailing schedules for multiple beams, see the manufacturer's recommendations.

Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

1k

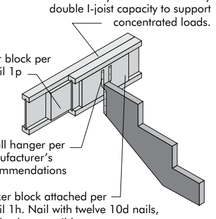
2x plate flush with inside face of wall or beam. 1/8" overhang allowed past inside face of wall or beam.



Note: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

1m

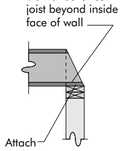
Multiple I-joist header with full depth filler block shown. Nordic Lam or SCL headers may also be used. Verify double I-joist capacity to support concentrated loads.



Maximum support capacity = 1,280 lbs.

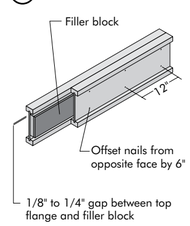
1n

Do not bevel-cut joist beyond inside face of wall



Note: Blocking required at bearing for lateral support, not shown for clarity.

1p



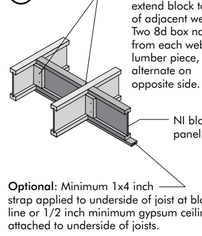
Notes:

1. Support back of I-joist web during nailing to prevent damage to web/flange connection.
2. Leave a 1/8 to 1/4-inch gap between top of filler block and bottom of top I-joist flange.
3. Filler block is required between joists for full length of span.
4. Nail joists together with two rows of 10d nails at 12 inches o.c. (clinched when possible) on each side of the double I-joist. Total of four nails per foot required. If nails can be clinched, only two nails per foot are required.
5. The maximum load that may be applied to one side of the double joist using this detail is 620 lbf/ft. Verify double I-joist capacity.

FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION

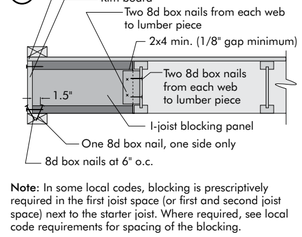
Flange Size	Net Depth	Filler Block Size
2-1/2" x 1-1/2"	9-1/2"	2-1/8" x 6"
	11-7/8"	2-1/8" x 8"
	14"	2-1/8" x 10"
	16"	2-1/8" x 12"
3-1/2" x 1-1/2"	9-1/2"	3" x 6"
	11-7/8"	3" x 8"
	14"	3" x 10"
	16"	3" x 12"
3-1/2" x 2"	11-7/8"	3" x 7"
	14"	3" x 9"
	16"	3" x 11"

1r



Optional: Minimum 1x4 inch strap applied to underside of joist at blocking line or 1/2 inch minimum gypsum ceiling attached to underside of joists.

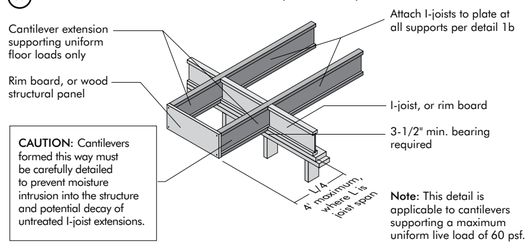
1s



Note: In some local codes, blocking is prescriptively required in the first joist space (or first and second joist space) next to the starter joist. Where required, see local code requirements for spacing of the blocking.

CANTILEVER DETAILS FOR BALCONIES (NO WALL LOAD)

3a I-JOIST CANTILEVER DETAIL FOR BALCONIES (No Wall Load)



CAUTION: Cantilevers formed this way must be carefully detailed to prevent moisture intrusion into the structure and potential decay of untreated I-joist extensions.

Note: This detail is applicable to cantilevers supporting a maximum uniform live load of 60 psf.

3b LUMBER CANTILEVER DETAIL FOR BALCONIES (No Wall Load)

Full depth backer block with 1/8" gap between block and top flange of I-joist. See detail 1h. Nail with 2 rows of 10d nails at 6" o.c. and clinch.

2x8 min. Nail to backer block and joist with 2 rows of 10d nails at 6" o.c. and clinch. (Cantilever nails may be used to attach backer block if length of nail is sufficient to allow clinching.)

Cantilever extension supporting uniform floor loads only

Lumber or wood structural panel closure

3-1/2" min. bearing required

I-joist, or rim board

Attach I-joists to plate at all supports per detail 1b

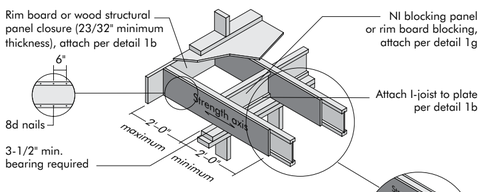
1-1/2 x L 4 minimum

4 maximum, where L= length of cantilever

Note: This detail is applicable to cantilevers supporting a maximum uniform live load of 60 psf.

CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET (CONCENTRATED WALL LOAD)

4a Method 1 — SHEATHING REINFORCEMENT ONE SIDE

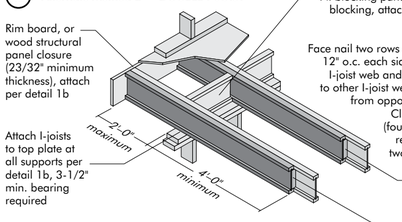


Method 2 — SHEATHING REINFORCEMENT TWO SIDES

- Use same installation as Method 1 but reinforce both sides of I-joist with sheathing.
- Use nailing pattern shown for Method 1 with opposite face nailing offset by 3".

Note: APA RATED SHEATHING 48/24 or APA RATED STURD-I-FLOOR 24 oc (minimum thickness 23/32") required on sides of joist. Depth shall match the full height of the joist. Nail with 8d nails at 6" o.c., top and bottom flange. Install with face grain horizontal. Attach I-joist to plate at all supports per detail 1b. Verify reinforced I-joist capacity.

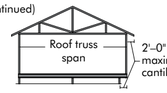
4b Alternate Method 2 — DOUBLE I-JOIST

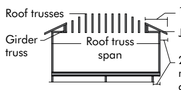


Block I-joists together with filler blocks for the full length of the reinforcement. For I-joist flange widths greater than 3 inches place an additional row of 10d nails along the centerline of the reinforcing panel from each side. Clinch when possible.

FIGURE 4 (continued)

See table below for NI reinforcement requirements at cantilever.





For hip roofs with the jack trusses running parallel to the cantilevered floor joists, the I-joist reinforcement requirements for a span of 26 ft. shall be permitted to be used.

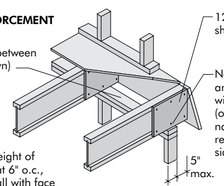
CANTILEVER REINFORCEMENT METHODS ALLOWED

JOIST DEPTH (in.)	ROOF TRUSS SPAN (ft)	ROOF LOADING											
		LL = 20 psf, DL = 15 psf				LL = 30 psf, DL = 15 psf				LL = 40 psf, DL = 15 psf			
		JOIST SPACING (in.)				JOIST SPACING (in.)				JOIST SPACING (in.)			
		12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
9-1/2"	26	N	N	N	1	N	N	1	2	N	1	2	X
	28	N	N	N	1	N	N	1	2	N	1	2	X
	30	N	N	N	1	N	N	1	2	N	1	2	X
	32	N	N	1	2	N	1	1	X	N	1	2	X
	34	N	N	1	2	N	1	2	X	N	2	X	X
	36	N	N	1	2	N	1	2	X	N	2	X	X
11-7/8"	26	N	N	N	N	N	N	N	1	N	N	N	1
	28	N	N	N	N	N	N	N	1	N	N	1	2
	30	N	N	N	N	N	N	N	1	N	N	1	2
	32	N	N	N	N	N	N	N	1	N	N	1	2
	34	N	N	N	1	N	N	1	2	N	1	1	2
	36	N	N	N	1	N	N	1	2	N	1	1	X
	38	N	N	N	1	N	N	1	2	N	1	2	X
14"	26	N	N	N	N	N	N	N	N	N	N	N	1
	28	N	N	N	N	N	N	N	N	N	N	N	1
	30	N	N	N	N	N	N	N	N	N	N	N	1
	32	N	N	N	N	N	N	N	N	N	N	N	1
	34	N	N	N	N	N	N	N	1	N	N	N	1
	36	N	N	N	N	N	N	N	1	N	N	1	1
	38	N	N	N	N	N	N	N	1	N	N	1	2
	40	N	N	N	N	N	N	N	1	N	N	1	2
16"	26	N	N	N	N	N	N	N	N	N	N	N	N
	28	N	N	N	N	N	N	N	N	N	N	N	N
	30	N	N	N	N	N	N	N	N	N	N	N	N
	32	N	N	N	N	N	N	N	N	N	N	N	1
	34	N	N	N	N	N	N	N	N	N	N	N	1
	36	N	N	N	N	N	N	N	N	N	N	N	1
	38	N	N	N	N	N	N	N	N	N	N	N	1
	40	N	N	N	N	N	N	N	1	N	N	1	1
	42	N	N	N	N	N	N	N	1	N	N	1	1

1. N = No reinforcement required.
   1 = NI reinforced with 23/32" wood structural panel on one side only.
   2 = NI reinforced with 23/32" wood structural panel on both sides, or double I-joist.
   X = Try a deeper joist or closer spacing.
2. Maximum load shall be: 15 psf roof dead load, 50 psf floor total load, and 80 plf wall load. Wall load is based on 3'-0" maximum width window or door openings. For larger openings, or multiple 3'-0" width openings spaced less than 6'-0" o.c., additional joists beneath the opening's cripple studs may be required.
3. Table applies to joists 12" to 24" o.c. that meet the floor 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. Use 12" o.c. requirements for lesser spacing.
4. For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge board, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.
5. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

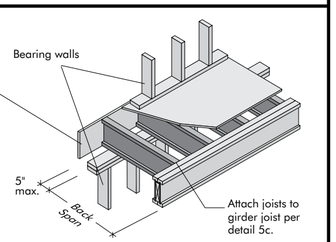
BRICK CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET (CONCENTRATED WALL LOAD)

5a SHEATHING REINFORCEMENT



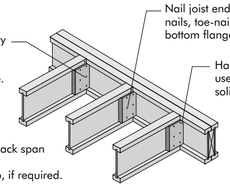
Note: APA RATED SHEATHING 48/24 (minimum thickness 23/32") required on sides of joist. Depth shall match the full height of the joist. Nail with 8d nails at 6" o.c., top and bottom flange. Install with face grain horizontal. Attach I-joist to plate at all supports per detail 1b. Verify reinforced I-joist capacity.

5b SET-BACK DETAIL



Notes:
- Provide full depth blocking between joists over support (not shown for clarity)
- Attach I-joist to plate at all supports per detail 1b.
- 3-1/2" minimum I-joist bearing required.

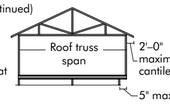
5c SET-BACK CONNECTION

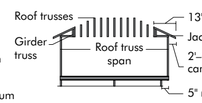


Notes:
- Verify girder joist capacity if the back span exceeds the joist spacing.
- Attach double I-joist per detail 1p, if required.

FIGURE 5 (continued)

See table below for NI reinforcement requirements at cantilever.





For hip roofs with the jack trusses running parallel to the cantilevered floor joists, the I-joist reinforcement requirements for a span of 26 ft. shall be permitted to be used.

BRICK CANTILEVER REINFORCEMENT METHODS ALLOWED

JOIST DEPTH (in.)	ROOF TRUSS SPAN (ft)	ROOF LOADING											
		LL = 20 psf, DL = 15 psf				LL = 30 psf, DL = 15 psf				LL = 40 psf, DL = 15 psf			
		JOIST SPACING (in.)				JOIST SPACING (in.)				JOIST SPACING (in.)			
		12	16	19.2	24	12	16	19.2	24	12	16	19.2	24
9-1/2"	26	N	1	2	X	N	2	X	X	1	X	X	X
	28	N	1	2	X	1	2	X	X	1	X	X	X
	30	N	2	X	X	1	2	X	X	1	X	X	X
	32	N	2	X	X	1	X	X	X	2	X	X	X
	34	N	2	X	X	1	X	X	X	2	X	X	X
	36	1	2	X	X	1	X	X	X	2	X	X	X
11-7/8"	26	N	1	1	X	N	1	2	X	N	2	X	X
	28	N	1	2	X	N	1	2	X	1	2	X	X
	30	N	1	2	X	N	2	X	X	1	2	X	X
	32	N	1	2	X	N	2	X	X	1	X	X	X
	34	N	1	2	X	N	2	X	X	1	X	X	X
	36	N	1	2	X	1	2	X	X	1	X	X	X
	38	N	1	2	X	1	2	X	X	1	X	X	X
14"	26	N	N	1	2	N	1	2	X	N	1	2	X
	28	N	N	1	2	N	1	2	X	N	1	X	X
	30	N	N	1	X	N	1	2	X	N	2	X	X
	32	N	1	1	X	N	1	2	X	N	2	X	X
	34	N	1	2	X	N	1	2	X	1	2	X	X
	36	N	1	2	X	N	2	X	X	1	2	X	X
	38	N	1	2	X	N	2	X	X	1	2	X	X
	40	N	1	2	X	N	2	X	X	1	X	X	X
16"	26	N	N	1	2	N	N	1	2	N	1	2	X
	28	N	N	1	2	N	1	1	X	N	1	2	X
	30	N	N	1	2	N	1	2	X	N	1	2	X
	32	N	N	1	2	N	1	2	X	N	1	2	X
	34	N	N	1	2	N	1	2	X	N	2	X	X
	36	N	N	1	X	N	1	2	X	N	2	X	X
	38	N	1	1	X	N	1	2	X	N	2	X	X
	40	N	1	2	X	N	1	2	X	1	2	X	X
	42	N	1	2	X	N	2	X	X	1	2	X	X

1. N = No reinforcement required.
   1 = NI reinforced with 23/32" wood structural panel on one side only.
   2 = NI reinforced with 23/32" wood structural panel on both sides, or double I-joist.
   X = Try a deeper joist or closer spacing.
2. Maximum load shall be: 15 psf roof dead load, 50 psf floor total load, and 80 plf wall load. Wall load is based on 3'-0" maximum width window or door openings. For larger openings, or multiple 3'-0" width openings spaced less than 6'-0" o.c., additional joists beneath the opening's cripple studs may be required.
3. Table applies to joists 12" to 24" o.c. that meet the floor 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. Use 12" o.c. requirements for lesser spacing.
4. For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge board, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.
5. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

WEB HOLES

RULES FOR CUTTING HOLES AND DUCT CHASE OPENINGS:

1. 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.
2. I-joist top and bottom flanges must NEVER be cut, notched, or otherwise modified.
3. Whenever possible, field-cut holes should be centered on the middle of the web.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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 subject to verification.
9. A 1-1/2 inch hole or smaller can be placed anywhere in the web provided that it meets the requirements of rule number 6 above.
10. 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.
11. Limit three maximum size holes per span, of which one may be a duct chase opening.
12. 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
LOCATION OF CIRCULAR HOLES IN JOIST WEBS
Simple or Multiple Span for Dead Loads up to 10 psf and Live Loads up to 40psf

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'-7"	1'-4"	2'-8"	4'-0"	5'-5"	5'-9"	---	---	---	---	---	---	---	---	---	13'-6"
	NI-40x	0'-7"	1'-4"	2'-8"	4'-2"	5'-8"	6'-2"	---	---	---	---	---	---	---	---	---	15'-0"
	NI-60	1'-0"	2'-4"	3'-9"	5'-3"	6'-10"	7'-3"	---	---	---	---	---	---	---	---	---	15'-3"
	NI-70	1'-10"	3'-3"	4'-8"	6'-2"	7'-9"	8'-3"	---	---	---	---	---	---	---	---	---	16'-5"
	NI-80	2'-0"	3'-5"	4'-10"	6'-4"	8'-0"	8'-5"	---	---	---	---	---	---	---	---	---	16'-9"
11-7/8"	NI-20	0'-7"	0'-8"	0'-10"	2'-0"	3'-4"	3'-9"	4'-9"	6'-3"	7'-5"	---	---	---	---	---	---	16'-1"
	NI-40x	0'-7"	0'-8"	1'-0"	2'-4"	3'-8"	4'-0"	5'-2"	6'-8"	8'-0"	---	---	---	---	---	---	17'-2"
	NI-60	0'-7"	1'-4"	2'-8"	4'-0"	5'-5"	5'-10"	7'-0"	8'-8"	9'-9"	---	---	---	---	---	---	18'-2"
	NI-70	1'-2"	2'-5"	3'-9"	5'-2"	6'-8"	7'-0"	8'-2"	9'-10"	11'-0"	---	---	---	---	---	---	19'-7"
	NI-80	1'-4"	2'-8"	4'-0"	5'-4"	6'-10"	7'-3"	8'-5"	10'-2"	11'-3"	---	---	---	---	---	---	19'-11"
	NI-90	0'-7"	0'-8"	1'-3"	2'-11"	4'-8"	5'-2"	6'-6"	8'-6"	9'-11"	---	---	---	---	---	---	20'-5"
	NI-90x	0'-7"	0'-8"	0'-8"	2'-3"	4'-2"	4'-6"	6'-0"	---	---	---	---	---	---	---	---	20'-7"
14"	NI-40x	0'-7"	0'-8"	0'-8"	0'-9"	2'-0"	2'-4"	3'-4"	4'-9"	5'-9"	6'-3"	8'-0"	9'-9"	---	---	---	18'-11"
	NI-60	0'-7"	0'-8"	1'-3"	2'-6"	4'-0"	4'-3"	5'-3"	6'-9"	7'-9"	8'-3"	10'-2"	11'-10"	---	---	---	20'-8"
	NI-70	0'-7"	1'-8"	3'-0"	4'-3"	5'-8"	6'-0"	7'-0"	8'-6"	9'-6"	10'-2"	12'-0"	13'-4"	---	---	---	22'-2"
	NI-80	0'-8"	1'-10"	3'-2"	4'-6"	6'-0"	6'-3"	7'-4"	8'-10"	9'-10"	10'-6"	12'-3"	13'-8"	---	---	---	22'-7"
	NI-90	0'-7"	0'-8"	0'-9"	2'-3"	3'-10"	4'-3"	5'-6"	7'-3"	8'-5"	9'-2"	11'-2"	12'-9"	---	---	---	23'-1"
	NI-90x	0'-7"	0'-8"	0'-8"	1'-10"	3'-6"	4'-0"	5'-3"	7'-0"	8'-3"	9'-0"	---	---	---	---	---	23'-5"
16"	NI-60	0'-7"	0'-8"	0'-8"	1'-2"	2'-5"	2'-9"	3'-9"	5'-0"	6'-0"	6'-6"	8'-0"	9'-2"	9'-8"	11'-9"	13'-9"	22'-10"
	NI-70	0'-7"	0'-9"	2'-0"	3'-3"	4'-8"	5'-0"	6'-0"	7'-5"	8'-4"	9'-0"	10'-5"	11'-9"	12'-2"	14'-0"	15'-5"	24'-6"
	NI-80	0'-7"	1'-2"	2'-4"	3'-8"	5'-0"	5'-4"	6'-4"	7'-10"	8'-9"	9'-4"	11'-0"	12'-2"	12'-6"	14'-4"	16'-0"	25'-0"
	NI-90	0'-7"	0'-8"	0'-8"	1'-6"	3'-0"	3'-5"	4'-6"	6'-3"	7'-3"	7'-10"	9'-8"	11'-0"	11'-6"	13'-6"	15'-3"	25'-7"
	NI-90x	0'-7"	0'-8"	0'-8"	1'-10"	3'-4"	3'-9"	5'-0"	6'-6"	7'-6"	8'-3"	10'-0"	11'-5"	11'-10"	---	---	26'-0"

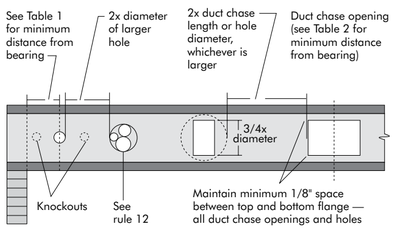
1. Above table may be used for I-joist spacing of 24 inches on center or less.
2. Hole location distance is measured from inside face of supports to center of hole.
3. Distances in this chart are based on uniformly loaded joists.

OPTIONAL:
The above table is based on the I-joists 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:

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

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 shall not be less than 6 inches from the face of the support to edge of the hole.
- L_{actual} = The actual measured span distance between the inside faces of supports (ft).
- SAF = Span Adjustment Factor given in this table.
- D = The minimum distance from the inside face of any support to center of hole from this table. If $\frac{L_{actual}}{SAF}$ is greater than 1, use 1 in the above calculation for $\frac{L_{actual}}{SAF}$.

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 2
DUCT CHASE OPENING SIZES AND LOCATIONS — Simple Span Only

Joist Depth	Joist Series	Minimum distance from inside face of any support 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'-2"	4'-7"	5'-0"	5'-5"	5'-10"	6'-2"	6'-8"	7'-1"	7'-6"
	NI-40x	5'-2"	5'-7"	6'-0"	6'-4"	6'-8"	7'-2"	7'-7"	8'-1"	8'-11"
	NI-60	5'-3"	5'-8"	6'-0"	6'-6"	7'-0"	7'-3"	7'-9"	8'-3"	8'-10"
	NI-70	5'-1"	5'-4"	5'-9"	6'-1"	6'-6"	7'-1"	7'-4"	8'-0"	8'-3"
	NI-80	5'-2"	5'-7"	6'-0"	6'-4"	6'-8"	7'-2"	7'-7"	8'-1"	8'-6"
11-7/8"	NI-20	5'-9"	6'-2"	6'-8"	7'-1"	7'-5"	8'-0"	8'-4"	9'-0"	9'-5"
	NI-40x	6'-7"	7'-1"	7'-6"	8'-1"	8'-6"	9'-1"	9'-7"	10'-2"	10'-9"
	NI-60	7'-1"	7'-7"	8'-0"	8'-4"	8'-10"	9'-3"	9'-9"	10'-4"	11'-2"
	NI-70	7'-0"	7'-3"	7'-9"	8'-1"	8'-6"	9'-1"	9'-6"	10'-0"	10'-5"
	NI-80	7'-1"	7'-5"	8'-0"	8'-4"	8'-10"	9'-2"	9'-8"	10'-2"	10'-8"
	NI-90	4'-3"	4'-10"	5'-4"	5'-11"	6'-6"	7'-11"	7'-8"	8'-3"	8'-11"
	NI-90x	7'-6"	8'-1"	8'-4"	8'-9"	9'-2"	9'-8"	10'-1"	10'-7"	11'-2"
14"	NI-40x	7'-9"	8'-3"	8'-10"	9'-5"	10'-1"	10'-7"	11'-3"	12'-1"	12'-9"
	NI-60	8'-8"	9'-2"	9'-6"	10'-1"	10'-6"	11'-1"	11'-7"	12'-4"	13'-2"
	NI-70	8'-6"	9'-1"	9'-4"	9'-10"	10'-2"	10'-8"	11'-2"	11'-8"	12'-4"
	NI-80	8'-9"	9'-2"	9'-8"	10'-1"	10'-6"	11'-1"	11'-6"	12'-1"	12'-8"
	NI-90	5'-10"	6'-5"	7'-0"	7'-6"	8'-2"	8'-9"	9'-4"	9'-11"	10'-8"
	NI-90x	9'-3"	9'-8"	10'-2"	10'-7"	11'-1"	11'-6"	12'-1"	12'-8"	13'-3"
16"	NI-60	10'-1"	10'-7"	11'-0"	11'-6"	12'-1"	12'-7"	13'-4"	14'-2"	15'-0"
	NI-70	10'-1"	10'-4"	10'-10"	11'-4"	11'-8"	12'-2"	12'-9"	13'-4"	14'-0"
	NI-80	10'-3"	10'-9"	11'-2"	11'-7"	12'-1"	12'-7"	13'-2"	13'-9"	14'-6"
	NI-90	7'-4"	7'-11"	8'-6"	9'-1"	9'-8"	10'-3"	13'-0"	11'-7"	12'-3"
	NI-90x	11'-1"	11'-4"	11'-10"	12'-3"	12'-8"	13'-3"	14'-0"	14'-7"	15'-4"

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. For other applications, contact your local distributor.

INSTALLING THE GLUED FLOOR SYSTEM

1. Wipe any mud, dirt, water, or ice from I-joist flanges before gluing.
2. Snap a chalk line across the I-joists four feet in from the wall for panel edge alignment and as a boundary for spreading glue.
3. Spread only enough glue to lay one or two panels at a time, or follow specific recommendations from the glue manufacturer.
4. Lay the first panel with tongue side to the wall, and nail in place. This protects the tongue of the next panel from damage when tapped into place with a block and sledgehammer.
5. Apply a continuous line of glue (about 1/4-inch diameter) to the top flange of a single I-joist. Apply glue in a winding pattern on wide areas, such as with double I-joists.
6. Apply two lines of glue on I-joists where panel ends butt to assure proper gluing of each end.
7. After the first row of panels is in place, spread glue in the groove of one or two panels at a time before laying the next row. Glue line may be continuous or spaced, but avoid squeeze-out by applying a thinner line (1/8 inch) than used on I-joist flanges.
8. Tap the second row of panels into place, using a block to protect groove edges.
9. Stagger end joints in each succeeding row of panels. A 1/8-inch space between all end joints and 1/8-inch at all edges, including T&G edges, is recommended. (Use a spacer tool or an 8d common nail to assure accurate and consistent spacing.)
10. **Complete all nailing of each panel before glue sets.** Check the manufacturer's recommendations for cure time. (Warm weather accelerates glue setting.) Use 6d ring- or screw-shank nails for panels 3/4-inch thick or less, and 8d ring- or screw-shank nails for thicker panels. Space nails per the table below. Closer nail spacing may be required by some codes, or for diaphragm construction. The finished deck can be walked on right away and will carry construction loads without damage to the glue bond.

APA RATED STURD-I-FLOOR FASTENER SCHEDULES FOR NI's(1)

Maximum Joist Spacing (in.)	Panel Thickness(2) (in.)	Nail Size and Type	Fastening: Glued-Nailed(3)	
			Maximum Spacing (in.)	
			Supported Panel Edges	Intermediate Supports
16	23/32(5)	6d ring-or screw-shank(4)	12	12
20	23/32(5)	6d ring-or screw-shank(4)	12	12
24	23/32, 3/4	6d ring-or screw-shank(4)	12	12
	7/8	8d ring-or screw-shank(4)	6	12

(1) Special conditions may impose heavy traffic and concentrated loads that require construction in excess of the minimums shown.

(2) Panels in a given thickness may be manufactured in more than one allowable span. Panels with an allowable span greater than the actual joist spacing may be substituted for panels of the same thickness with an allowable span matching the actual joist spacing. For example, 19/32-inch-thick Sturd-I-Floor 20 oc may be substituted for 19/32-inch-thick Sturd-I-Floor 16 oc over joists 16 inches on center.

(3) Use only adhesives conforming to APA Specification AFG-01, or ASTM D3498 applied in accordance with the manufacturer's recommendations. If OSB panels with sealed surfaces and edges are to be used, use only solvent-based glues; check with panel manufacturer.

(4) 8d common nails may be substituted if ring- or screw-shank nails are not available.

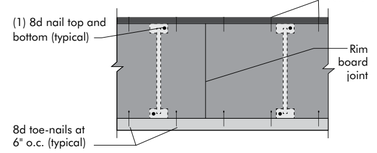
(5) Recommended minimum thickness for use with I-joists.

IMPORTANT NOTE:
Floor sheathing must be field glued to the I-joist flanges in order to achieve the allowable spans shown in this document. If sheathing is nailed only, reduce I-joist spans in the Allowable Spans Table by 1 foot.

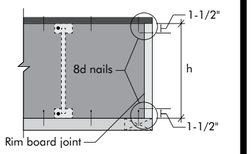
RIM BOARD INSTALLATION DETAILS

8a ATTACHMENT DETAILS WHERE RIM BOARDS ABUT

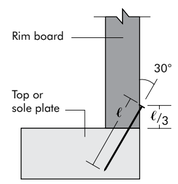
Rim board Joint Between Floor Joists



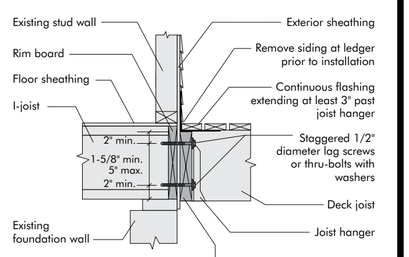
Rim board Joint at Corner



8b TOE-NAIL CONNECTION AT RIM BOARD



8c 2X LEDGER TO RIM BOARD ATTACHMENT DETAIL



CHANTIERS CHIBOUGAMAU

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.