

ROOF DETAILS

FRAMING AND CONSTRUCTION GUIDE

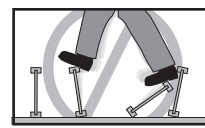


Bringing Nature's Resources Home

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SAFETY AND CONSTRUCTION PRECAUTIONS



WARNING

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

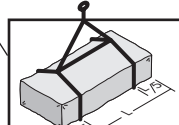
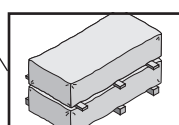
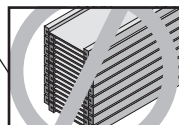
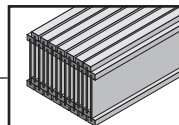
Avoid Accidents by Following these Important Guidelines:

- Brace and nail each I-joist 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-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.
- 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-joist before placing loads on the floor system. Then, stack building materials over beams or walls only.
- 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 use 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

- Bundle wrap can be slippery when wet. Avoid walking on wrapped bundles.
- Store I-joists vertically, level, and in bundles.
- Always stack and handle I-joists in the upright position only.
- Do not store I-joists in direct contact with the ground.
- Protect I-joists from weather, and use spacers to separate bundles.
- Bundled units should be kept intact until time of installation.
- When lifting 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.
- Do not handle I-joists in a horizontal orientation.
- NEVER USE OR FIELD REPAIR A DAMAGED I-JOIST.



ALLOWABLE ROOF SPANS

ALLOWABLE ROOF SPANS FOR NORDIC I-JOISTS

Snow Load = 20 psf, Dead Load = 15 psf

Joist Depth	Joist Series	Slope of 1/4:12 to 4:12			Slope of >4:12 to 8:12			Slope of >8:12 to 12:12		
		On Center Spacing			On Center Spacing			On Center Spacing		
		12"	16"	24"	12"	16"	24"	12"	16"	24"
9'-1/2"	NI-20	22'-0"	19'-11"	17'-4"	20'-8"	18'-9"	16'-3"	19'-1"	17'-3"	15'-0"
	NI-40x	25'-3"	22'-10"	19'-1"	23'-8"	21'-6"	18'-6"	21'-0"	19'-10"	17'-3"
	NI-60	25'-9"	23'-4"	20'-3"	24'-2"	21'-11"	19'-0"	22'-4"	20'-2"	17'-7"
	NI-70	28'-2"	25'-6"	22'-2"	26'-6"	24'-0"	20'-10"	24'-5"	22'-2"	19'-3"
11'-7/8"	NI-20	26'-7"	24'-1"	20'-6"	25'-0"	22'-7"	19'-8"	23'-0"	20'-10"	18'-2"
	NI-40x	30'-2"	26'-8"	21'-9"	28'-4"	25'-8"	21'-1"	26'-2"	23'-9"	20'-3"
	NI-60	30'-10"	27'-11"	24'-4"	29'-0"	26'-3"	22'-10"	26'-9"	24'-3"	21'-11"
	NI-70	33'-8"	30'-6"	26'-6"	31'-8"	28'-8"	24'-11"	29'-2"	26'-5"	23'-0"
14'	NI-20	34'-4"	31'-1"	27'-0"	32'-3"	29'-3"	25'-5"	29'-9"	27'-0"	23'-6"
	NI-40x	35'-9"	32'-4"	28'-1"	33'-7"	30'-5"	26'-5"	31'-0"	28'-1"	24'-5"
	NI-60	33'-10"	29'-4"	23'-10"	32'-2"	28'-5"	23'-2"	29'-8"	26'-11"	22'-3"
	NI-70	35'-2"	31'-10"	27'-5"	33'-0"	29'-11"	26'-0"	30'-6"	27'-8"	24'-0"
16'	NI-20	38'-3"	34'-7"	30'-1"	35'-11"	32'-6"	28'-3"	33'-1"	30'-0"	26'-1"
	NI-40x	39'-1"	35'-5"	29'-6"	36'-9"	33'-3"	28'-8"	33'-11"	30'-8"	26'-9"
	NI-60	42'-4"	38'-4"	33'-4"	39'-9"	36'-0"	31'-4"	36'-8"	33'-3"	28'-11"
	NI-70	43'-4"	39'-3"	34'-2"	40'-9"	36'-11"	32'-1"	37'-7"	34'-1"	29'-8"
18'	NI-20	40'-9"	36'-11"	32'-1"	38'-3"	34'-8"	30'-2"	35'-4"	32'-0"	27'-10"
	NI-40x	39'-1"	35'-5"	29'-6"	36'-9"	33'-3"	28'-8"	33'-11"	30'-8"	26'-9"
	NI-60	42'-4"	38'-4"	33'-4"	39'-9"	36'-0"	31'-4"	36'-8"	33'-3"	28'-11"
	NI-70	43'-4"	39'-3"	34'-2"	40'-9"	36'-11"	32'-1"	37'-7"	34'-1"	29'-8"
20'	NI-20	45'-3"	41'-0"	35'-8"	42'-6"	38'-7"	33'-6"	39'-3"	35'-7"	31'-0"
	NI-40x	45'-3"	41'-0"	35'-8"	42'-6"	38'-7"	33'-6"	39'-3"	35'-7"	31'-0"
	NI-60	45'-3"	41'-0"	35'-8"	42'-6"	38'-7"	33'-6"	39'-3"	35'-7"	31'-0"
	NI-70	45'-3"	41'-0"	35'-8"	42'-6"	38'-7"	33'-6"	39'-3"	35'-7"	31'-0"

ALLOWABLE ROOF SPANS FOR NORDIC I-JOISTS

Snow Load = 30 psf, Dead Load = 15 psf

Joist Depth	Joist Series	Slope of 1/4:12 to 4:12			Slope of >4:12 to 8:12			Slope of >8:12 to 12:12		
		On Center Spacing			On Center Spacing			On Center Spacing		
		12"	16"	24"	12"	16"	24"	12"	16"	24"
9'-1/2"	NI-20	20'-3"	18'-4"	15'-11"	19'-1"	17'-3"	15'-0"	17'-8"	16'-0"	13'-11"
	NI-40x	23'-2"	20'-8"	16'-10"	21'-10"	19'-10"	16'-5"	20'-4"	18'-5"	15'-11"
	NI-60	23'-8"	21'-5"	18'-7"	22'-4"	20'-2"	17'-6"	20'-8"	18'-9"	16'-3"
	NI-70	25'-11"	23'-5"	20'-4"	24'-5"	22'-1"	19'-2"	22'-8"	20'-6"	17'-10"
11'-7/8"	NI-20	26'-5"	23'-11"	20'-9"	25'-0"	22'-7"	19'-7"	23'-2"	21'-0"	18'-3"
	NI-40x	24'-5"	22'-2"	18'-1"	23'-0"	20'-10"	17'-8"	21'-5"	19'-4"	16'-10"
	NI-60	27'-3"	23'-7"	19'-2"	26'-2"	23'-0"	18'-9"	24'-4"	22'-6"	18'-2"
	NI-70	28'-4"	25'-8"	22'-0"	26'-9"	24'-3"	21'-11"	24'-10"	22'-6"	19'-7"
14'	NI-20	30'-11"	28'-0"	24'-4"	29'-2"	26'-5"	23'-0"	27'-1"	24'-7"	21'-4"
	NI-40x	31'-7"	28'-7"	24'-10"	29'-9"	27'-0"	23'-5"	27'-8"	25'-1"	21'-9"
	NI-60	32'-10"	29'-8"	25'-9"	31'-0"	28'-0"	24'-4"	28'-9"	26'-0"	22'-8"
	NI-70	29'-11"	25'-10"	21'-11"	29'-2"	25'-3"	20'-7"	27'-7"	24'-5"	19'-11"
16'	NI-20	32'-4"	29'-3"	24'-2"	30'-6"	27'-7"	23'-7"	28'-4"	25'-8"	22'-4"
	NI-40x	35'-1"	31'-9"	27'-7"	33'-2"	30'-0"	26'-1"	30'-9"	27'-10"	24'-3"
	NI-60	35'-11"	32'-6"	28'-3"	33'-11"	30'-8"	26'-8"	31'-5"	28'-6"	24'-8"
	NI-70	38'-11"	35'-3"	30'-3"	36'-8"	33'-3"	28'-11"	34'-1"	30'-10"	26'-10"
18'	NI-20	39'-10"	36'-1"	31'-0"	37'-7"	34'-1"	29'-7"	34'-11"	31'-8"	27'-6"
	NI-40x	41'-7"	37'-8"	32'-9"	39'-3"	35'-7"	30'-11"	36'-6"	33'-0"	28'-9"
	NI-60	35'-11"	32'-0"	26'-11"	33'-11"	30'-8"	25'-5"	31'-5"	28'-6"	24'-8"
	NI-70	38'-11"	35'-3"	30'-3"	36'-8"	33'-3"	28'-11"	34'-1"	30'-10"	26'-10"
20'	NI-20	39'-10"	36'-1"	31'-0"	37'-7"	34'-1"	29'-7"	34'-11"	31'-8"	27'-6"
	NI-40x	41'-7"	37'-8"	32'-9"	39'-3"	35'-7"	30'-11"	36'-6"	33'-0"	28'-9"
	NI-60	35'-11"	32'-0"	26'-11"	33'-11"	30'-8"	25'-5"	31'-5"	28'-6"	24'-8"
	NI-70	38'-11"	35'-3"	30'-3"	36'-8"	33'-3"	28'-11"	34'-1"	30'-10"	26'-10"

- Allowable clear span applicable to simple-span roof construction with a design roof snow load as shown and dead load of 15 psf. The allowable span is based on the horizontal distance between inside face of supports. The snow load deflection is limited to L/240 and the total load deflection to L/180. Spans are based on a duration of load (DOL) factor of 1.15.
 - Spans include a cantilever of up to 2 feet on one end of the I-joist.
 - Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches on end bearing adjacent to cantilever.
 - Bearing stiffeners are **not** required when I-joists are used with the spans and spacing given in these tables, except as required for hangers.
 - These span charts are based on uniform loads. For applications with other than uniformly distributed loads, an engineering analysis may be required based on the use of the design properties.
- SI units conversion: 1 inch = 25.4 mm, 1 foot = 0.305 m

INSTALLING NORDIC I-JOISTS

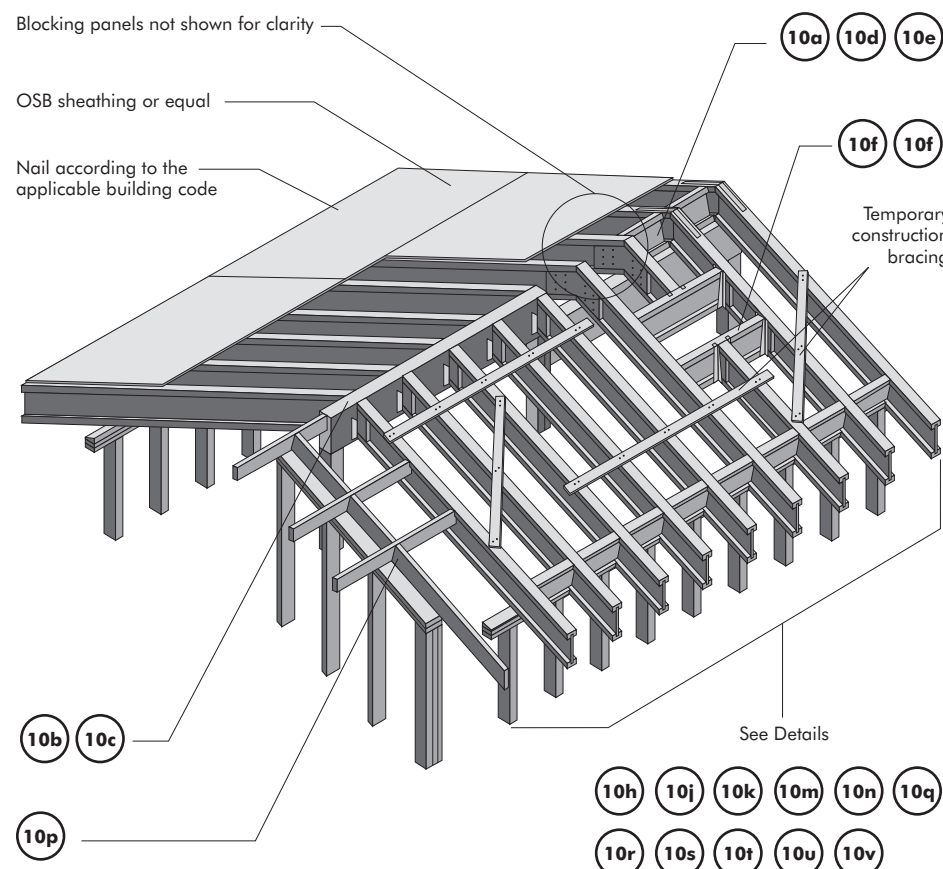
TYPICAL I-JOIST ROOF FRAMING CONSTRUCTION DETAILS AND INSTALLATION NOTES

- Installation of Nordic I-joists shall be as shown in Figure 10.
- Except for cutting to length, or for providing birdsmouth bearings, I-joist flanges must **not** be cut, drilled or notched.
- I-joists are permitted to be birdsmouth cut at the lower end of the joist only. The birdsmouth cut must have full bearing and not overhang the inside face of the plate. Bearing / web stiffeners are required at the birdsmouth cut on both sides of the web.
- When beveled bearing plates are used at I-joist supports, I-joist attachment to the bevel plate must be designed to transfer lateral thrust.
- Concentrated loads should only be applied to the top surface of the top flange. At no time should concentrated loads be suspended from the bottom flange, with the exception of light loads such as ceiling fans or light fixtures.
- I-joists must be protected from the weather prior to installation.
- I-joists must not be used in applications where they will be permanently exposed to weather, or will reach a moisture content greater than 16 percent, such as in swimming pool or hot tub areas. They must not be installed where they will remain in direct contact with concrete or masonry.
- End bearing length must be at least 1-3/4 inches. For continuous framing and roof framing with cantilevers, the intermediate support and end bearing adjacent to the cantilever both must be at least 3-1/2 inches. For multiple-span joists, intermediate bearing length must be at least 3-1/2 inches.
- Ends of roof joists must be restrained at the bearing to prevent rollover. Rim board or I-joist blocking panels are preferred. Cantilever-end blocking must be placed at the support adjacent to the cantilever, and ends of all cantilever extensions must be laterally braced by a fascia board or others similar methods.
- Rim board, I-joist blocking panels, or other means of providing lateral support must be provided at all I-joist bearing points.
- Continuous lateral support of the I-joist's compression flange is required to prevent rotation and buckling. In simple span roof applications, lateral support of the top flange is normally supplied by the roof sheathing. Bracing of the I-joist's bottom flange is also required at interior supports of multiple-span joists and at the end support next to an overhang. Lateral support of the entire bottom flange may be required in cases of load reversal such as those caused by high wind.
- Nails installed perpendicular to the wide face of the flange shall be spaced in accordance with the applicable building code requirements or approved building plans, but should not be closer than 3 inches on center for 8d common nails or 6 inches on center for 10d common nails. If more than one row of nails is used, the rows must be offset at least 1/2 inch.
- Details in Figure 10 show only I-joist-specific fastener requirements. For other fastener requirements, such as wind uplift requirements or other member attachment details, see the applicable building code. The knockouts may be removed to aid ventilation.
- The top and bottom flanges of the I-joist must be kept within 1/2 in. of true alignment. The use of I-joist blocking panels or engineered wood rim board greatly simplifies this requirement.
- All roof details are valid up to a 12:12 slope unless otherwise noted.
- Refer to *Nordic Installation Guide for Residential Floors* for more details.
- Roof spans shall be in accordance with Nordic Joist Allowable Roof Span Tables, or designed based on the use of the design properties.
- Web holes shall be verified, please contact your local representative.

TYPICAL I-JOIST ROOF FRAMING TEMPORARY BRACING NOTES

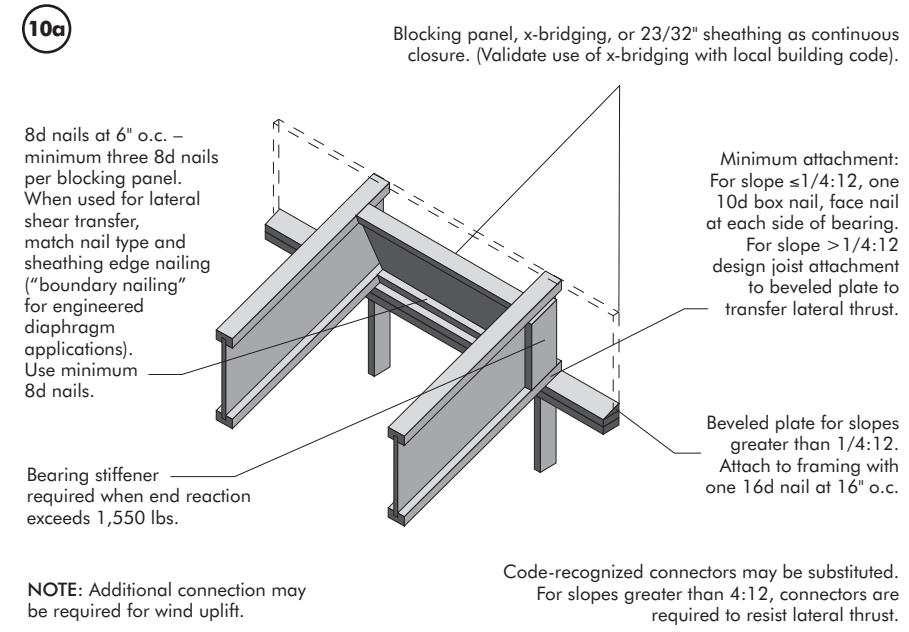
- All engineered wood rim boards, blocking, connections, and temporary bracing must be installed before workers are allowed on the structure.
- For temporary bracing, use lines of 1 x 4 nailed to each I-joist with two 8d nails. The lines should be parallel, about 8 ft apart, and should have ends overlapped.
- To prevent rollover of the entire roof system, brace each end and every 25 ft at roof with blocking at ends or diagonal bracing. *Please note that in a roof system framed with parallel-chord rafters such as I-joists, the panel roof sheathing alone does not provide bracing for the roof framing! The blocking or bridging at the bearing points must be provided.*
- The continuous 1 x 4 bracing must be attached to the braced bays.

FIGURE 10
TYPICAL NORDIC I-JOIST FLOOR FRAMING AND CONSTRUCTION DETAILS

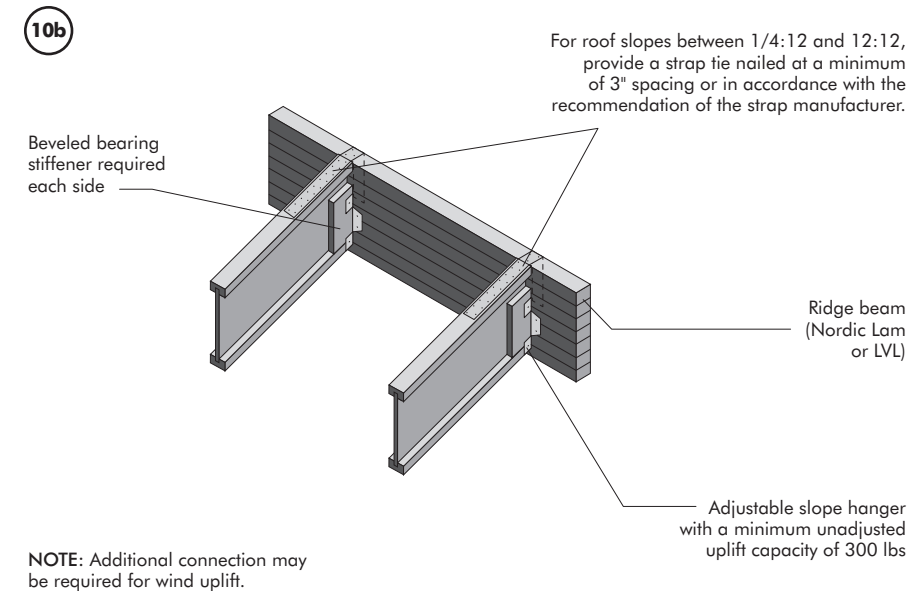


All nails shown in the above details are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common nails (0.131 x 2-1/2 in.) shown in details. Framing lumber assumed to be Utility grade S-P-F (south) or stronger species. Individual components not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

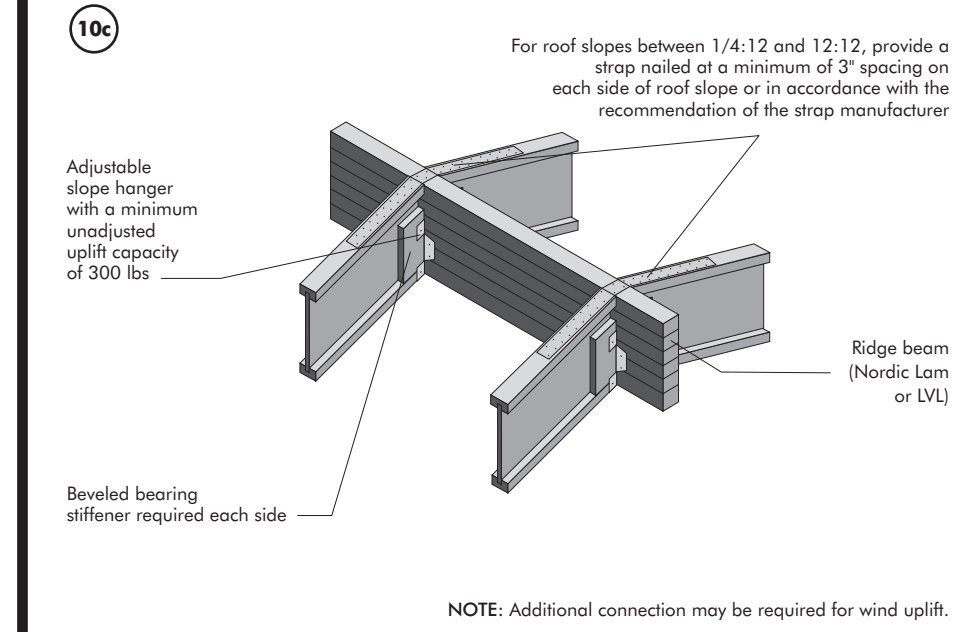
UPPER END, BEARING ON WALL



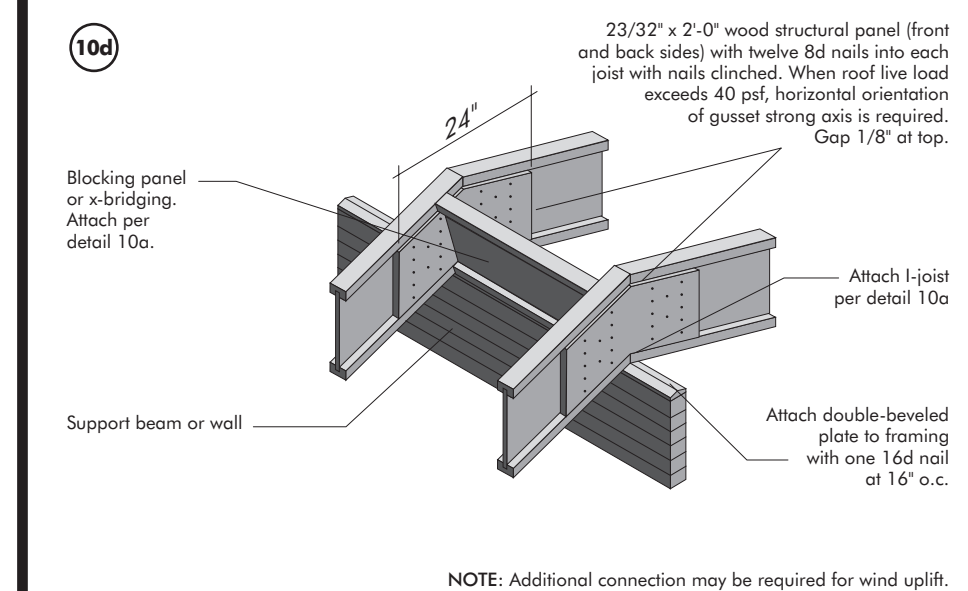
RIDGE CONNECTION



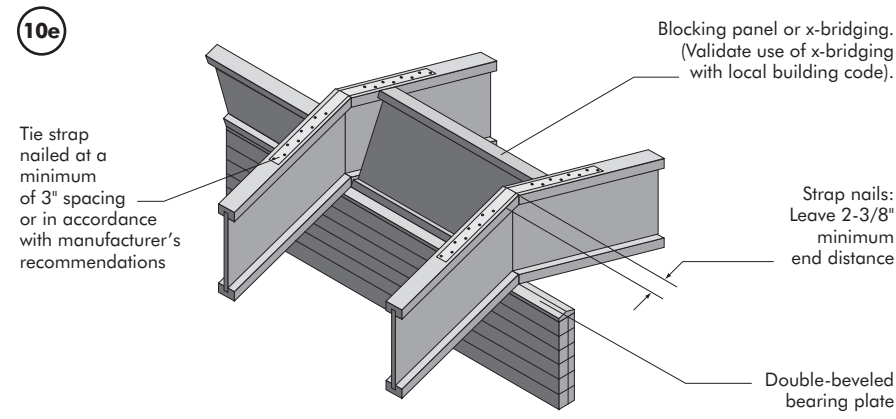
I-JOIST TO RIDGE BEAM CONNECTION



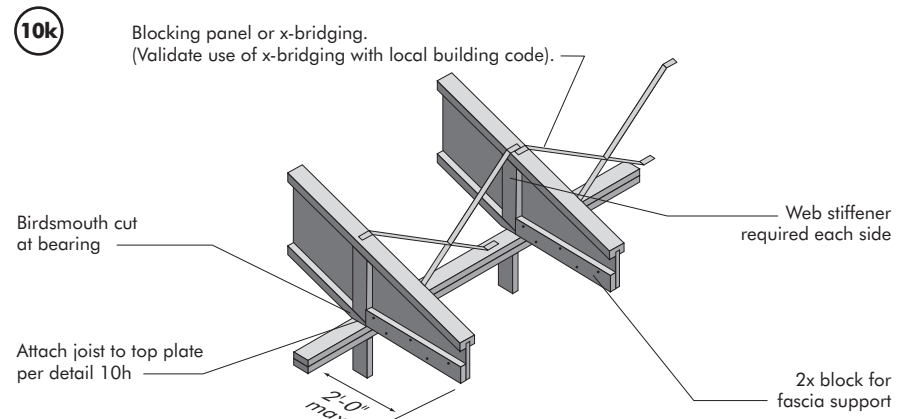
I-JOIST CONNECTION WITH WOOD STRUCTURAL PANEL GUSSETS



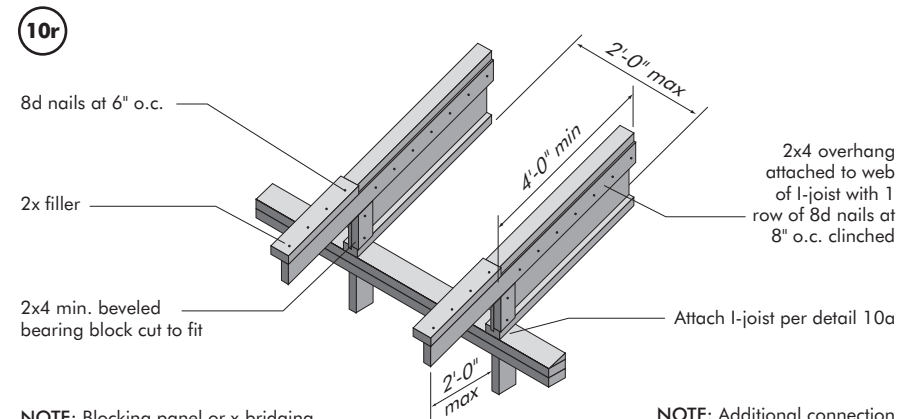
I-JOIST CONNECTION WITH TIE STRAP



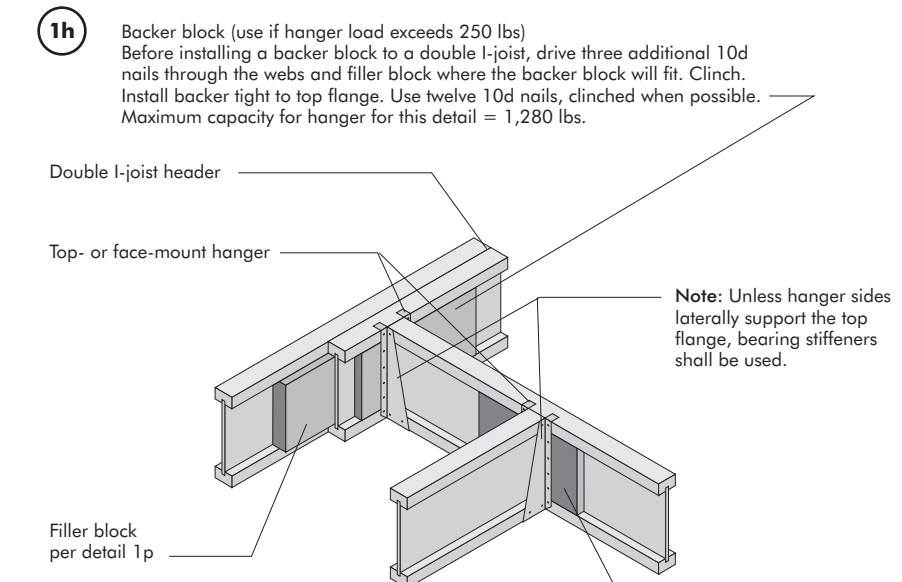
I-JOIST OVERHANG FOR FASCIA SUPPORT WITH BIRDSMOUTH CUT



LUMBER OVERHANG WITH BEVELED PLATE



BACKER BLOCK



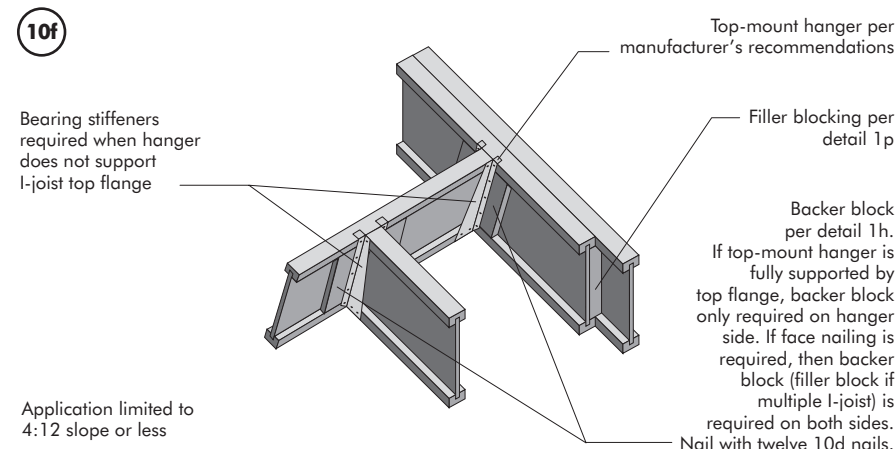
For hanger capacity see hanger manufacturer's recommendations. Verify double I-joist capacity to support concentrated loads.

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

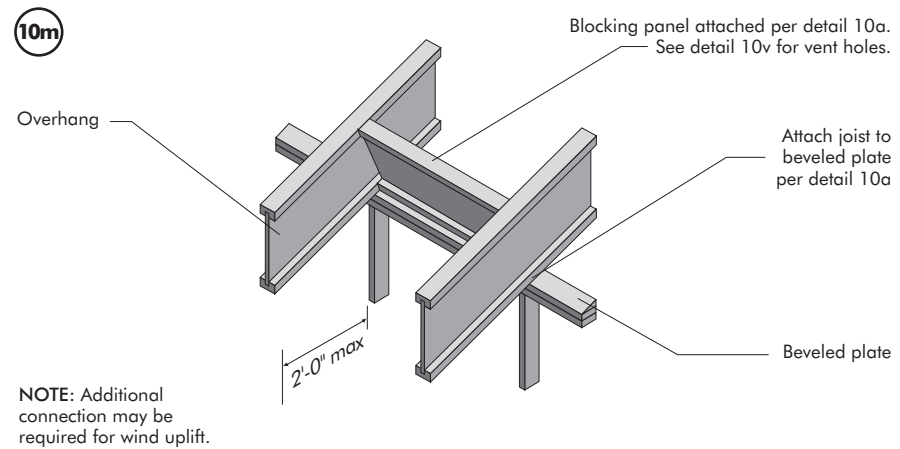
Flange Width	Material Thickness Required*	Minimum Depth**
2-1/2"	1"	5-1/2"
3-1/2"	1-1/2"	7-1/4"

* 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".

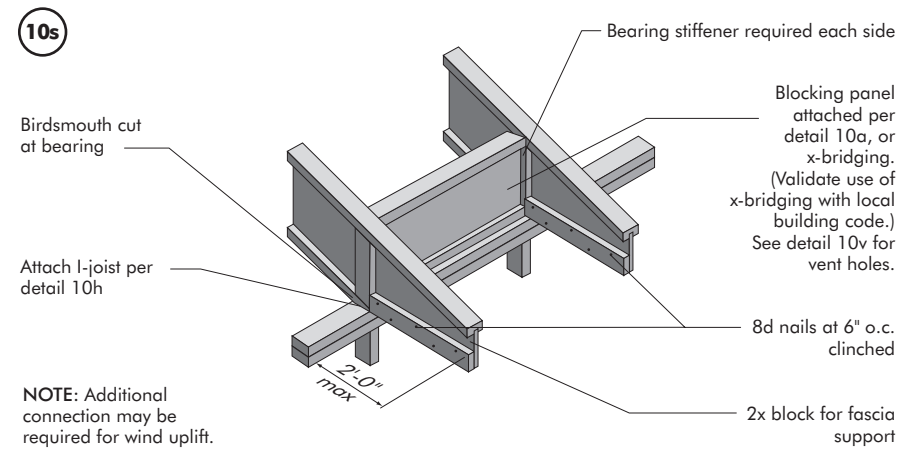
ROOF OPENING TOP-MOUNT HANGERS



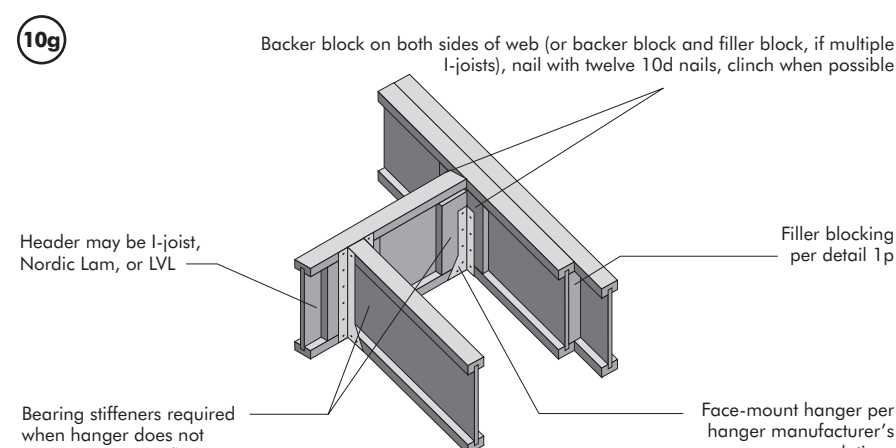
BLOCKING PANEL AT BEVELED PLATE



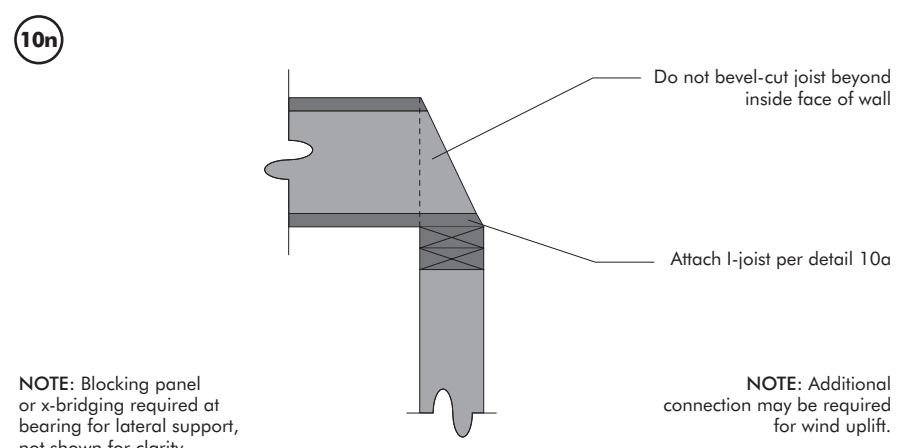
I-JOIST OVERHANG FOR FASCIA SUPPORT WITH BIRDSMOUTH CUT



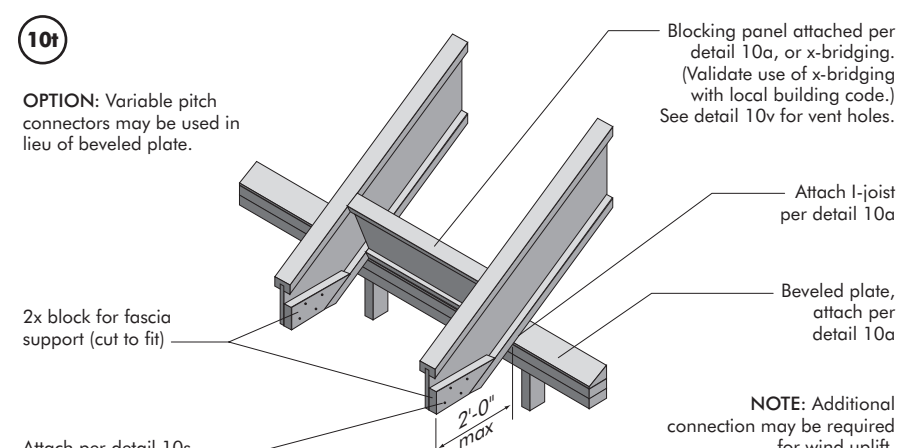
ROOF OPENING FACE-MOUNT HANGERS



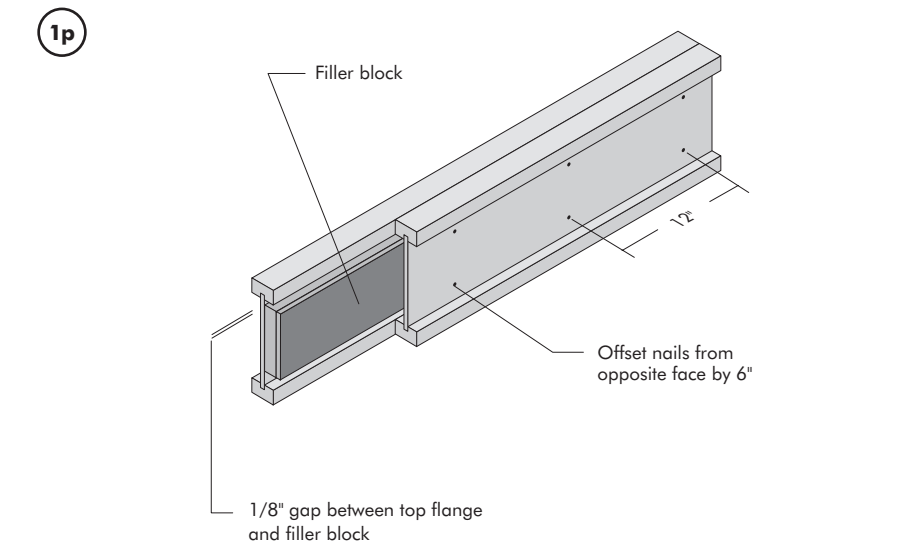
I-JOIST WITH BEVEL-CUT END



I-JOIST OVERHANG FOR FASCIA SUPPORT WITH BEVELED PLATE



FILLER BLOCK

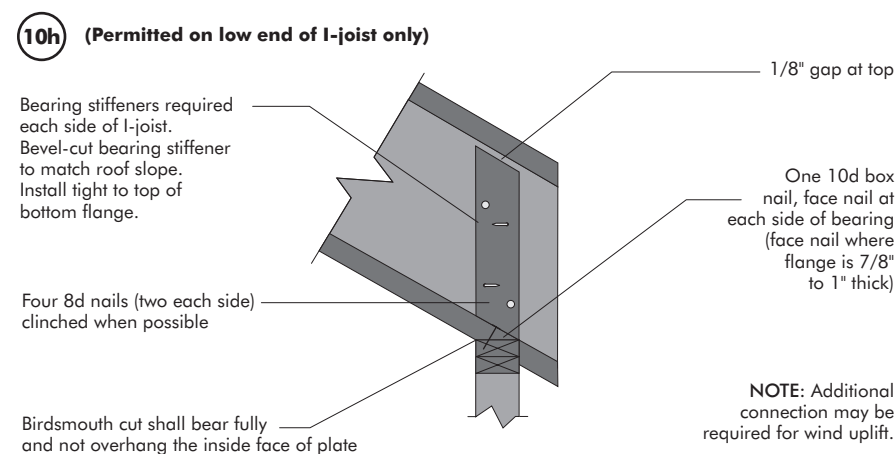


FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION

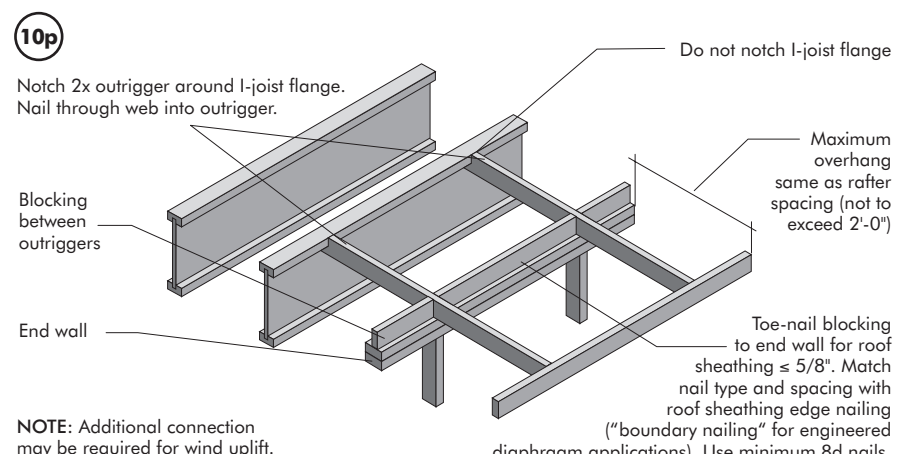
Flange Size	Net Depth	Filler Block Size
2-1/2" x 1-1/2"	9-1/2" 11-7/8" 14" 16"	2-1/8" x 6" 2-1/8" x 8" 2-1/8" x 10" 2-1/8" x 12"
3-1/2" x 1-1/2"	9-1/2" 11-7/8" 14" 16"	3" x 6" 3" x 8" 3" x 10" 3" x 12"
3-1/2" x 2"	11-7/8" 14" 16"	3" x 7" 3" x 9" 3" x 11"

- NOTES:**
- Support back of I-joist web during nailing to prevent damage to web/flange connection.
 - Leave a 1/8-inch gap between top of filler block and bottom of top I-joist flange.
 - Filler block is required between joists for full length of span.
 - 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.
 - The maximum load that may be applied to one side of the double joist using this detail is 620 lb/ft. Verify double I-joist capacity.

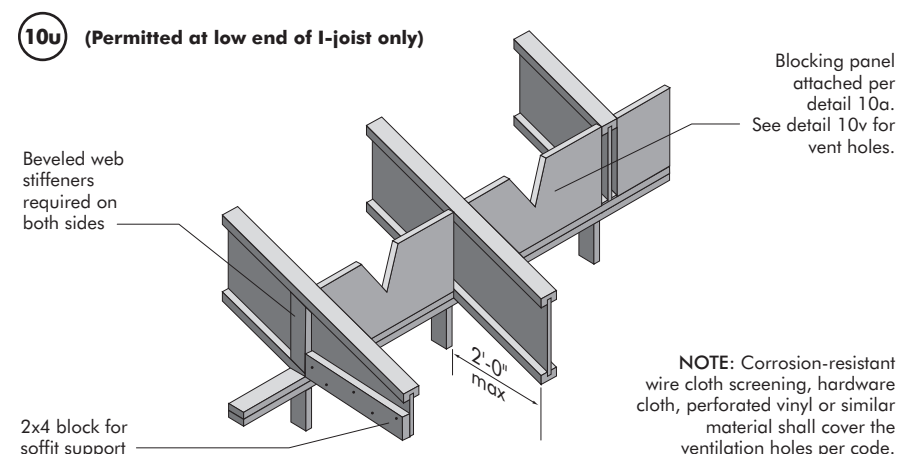
BIRDSMOUTH CUT & BEVEL CUT BEARING STIFFENER



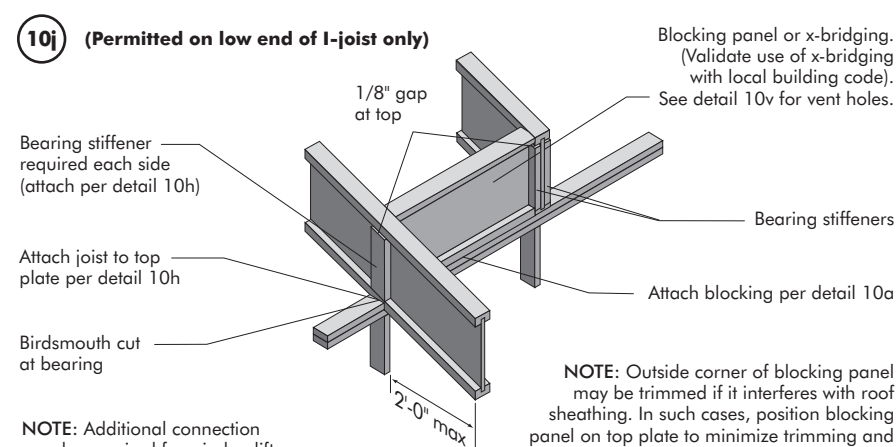
OUTRIGGER



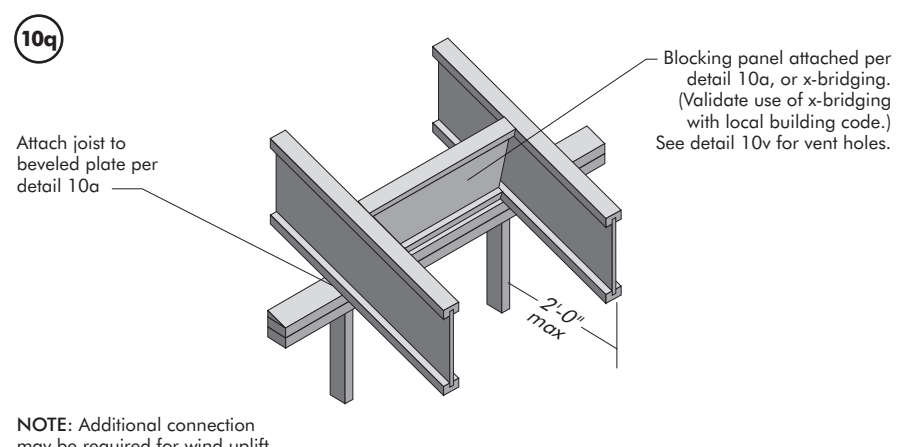
BIRDSMOUTH CUT



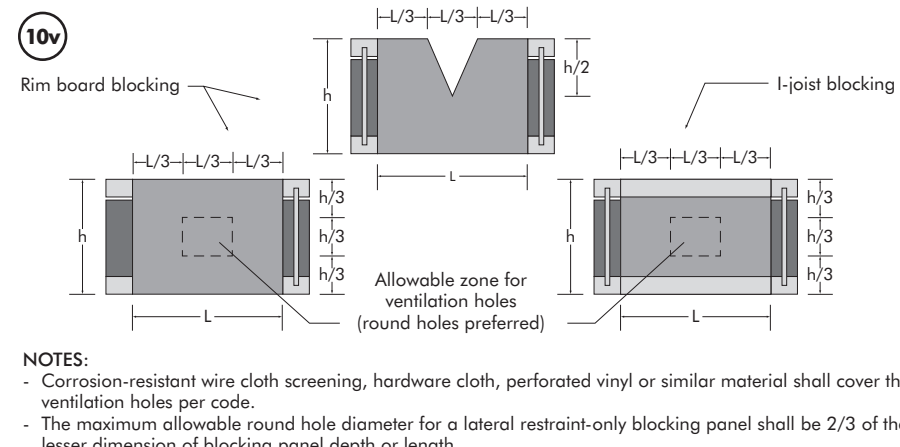
BIRDSMOUTH CUT WITH OVERHANG




I-JOIST OVERHANG WITH BEVELED PLATE



VENTILATION HOLES IN BLOCKING PANELS





PRODUCT WARRANTY

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

Furthermore, Chantiers Chibougamaou 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.