



NORDIC ENGINEERED WOOD RESIDENTIAL DESIGN

CONSTRUCTION GUIDE

NORDIC JOIST™



FSC-CERTIFIED PRODUCTS AVAILABLE



Responsible Forest Management
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BRINGING NATURE'S RESOURCES HOME

Nordic Engineered Wood was founded in the year 2000 to develop and promote high quality wood products for use in residential and light commercial construction.

Our vision is built on the founding principles of reliable service, consistent quality, and responsible forestry practices. Chantiers Chibougamau has achieved ISO 14001 accreditation, the international standard for environmentally responsible harvesting and reforestation, to ensure the long term viability of our precious natural resources.

CCL's manufacturing plant is the largest of its kind in North America, with an annual production capacity in excess of 100 million linear feet.

Nordic Engineered Wood's goal is to provide the most consistent, high quality finished products available. Utilizing state-of-the-art technology from forest to finish, Nordic Joist™ is the benchmark against which other I-joists are compared.



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What makes Nordic I-joist better than other I's

Harvesting

The raw material used in Nordic I-joists is high density black spruce harvested on 2.0 million acres of land under the stewardship of Chantiers Chibougamau (CCL). Black spruce is known for its extreme density, fiber strength, and narrow growth rings. CCL utilizes state-of-the-art harvesting and reforestation techniques that ensure the highest quality flange stock, and guarantees that quality for generations to come.

MSR Lumber Flanges

The computerized manufacturing process scans lumber for moisture, wane, warp, splits, and other defects; and machine stress-rates each piece to determine its flexural stress value prior to flange assembly. Nordic I-joists use only lumber that *exceeds* 1650f MSR rating.

Straighter Flanges

Detection of defects in the raw material is one of the most critical components in establishing strong, straight, and consistent flanges. More joints guarantee more consistency. Nordic flanges are made of short length lumber blocks, minimizing inherent deviations and ensuring that your joists stay straight and lay flat.

Tension Testing


After the flanges are manufactured and cured, *every single flange* is tension tested to ensure the integrity of the joints prior to assembly as an I-joist. If the flange doesn't pass the tension-test, it doesn't make it into production.

Quality Control

Rigorous manufacturing and product inspections occur on a strict schedule, ensuring the most consistent product available. Adherence to quality control practices is more than a formality. In the spirit of continuous improvement, CCL is breaking new ground, bringing ISO 9001 Quality Management Systems to the engineered wood industry.

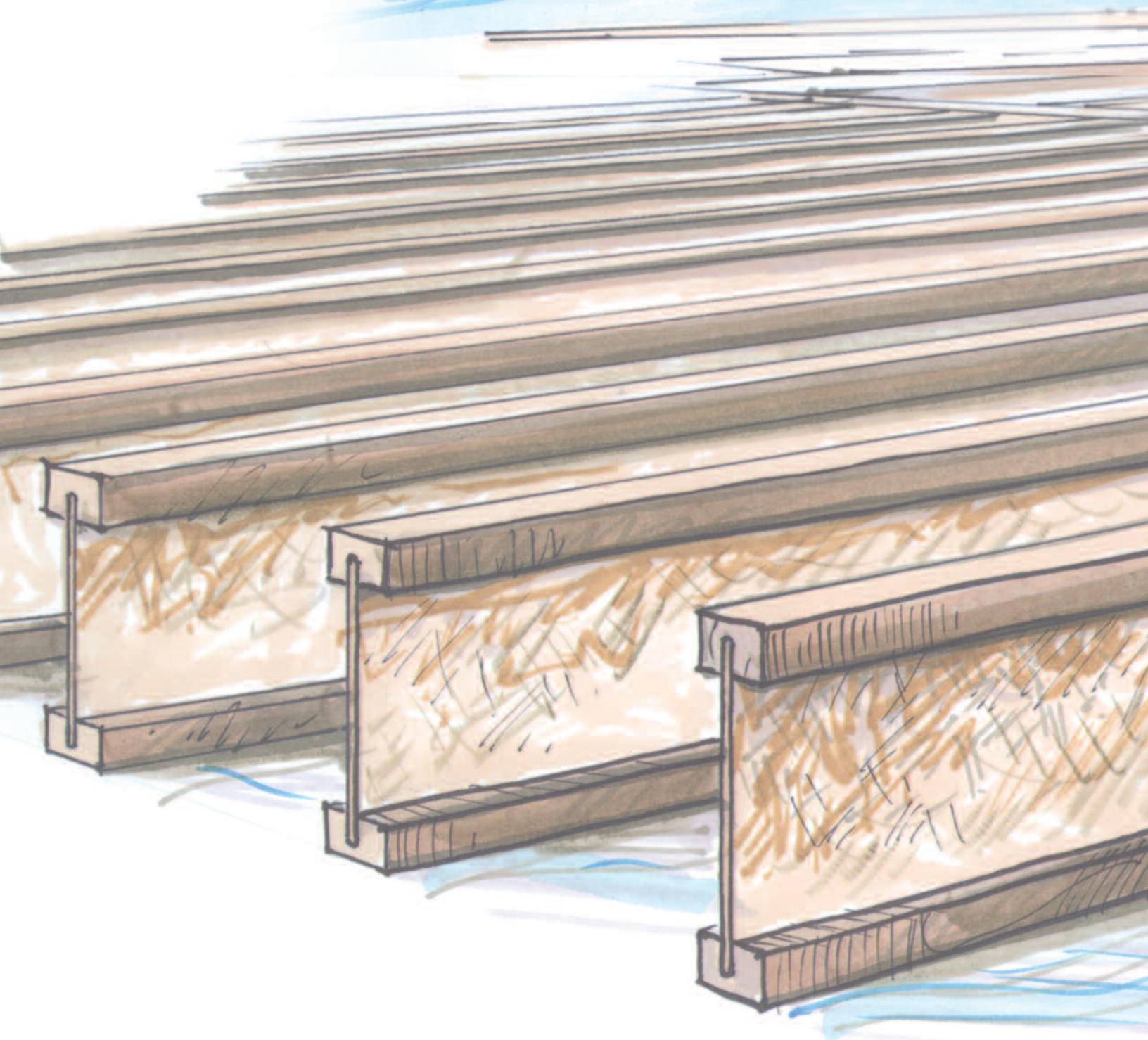
Third-Party Inspection Services

I-joists produced at the CCL plant have been tested and approved by the following agencies: APA, PFS, and Warnock Hersey. Code approvals include CCMC, ICC-ES, and CE Marking.



I-JOISTS FOR RESIDENTIAL FLOORS AND ROOFS

NORDIC JOIST™



NORDIC JOIST™

FLEXIBILITY, STABILITY, QUALITY

Simple to Install – I-joists save builders time, and therefore money. I-joists are typically pre-cut in two-foot increments in length and shipped to the job site ready to install. This minimizes job site cutting and material waste. I-joists can be cut and fastened with traditional framing tools and fasteners – no special tools are required. Since I-joists can typically be used at greater joist spacing than conventional lumber joists, fewer pieces must be cut and handled on the job site, making I-joist installation less costly and less wasteful for the builder.

Allows Design Flexibility – The availability of long lengths allows for multiple span installations, thus speeding construction by eliminating the need to lap joists over bearing walls or support beams. This also means fewer pieces to handle, resulting in lower labor costs.

Dimensionally Stable – I-joists will not warp, twist, or shrink, and are more uniform and dimensionally stable than conventional lumber joists.

Lightweight – Because I-joists typically weigh less than half as much as comparable conventional lumber joists, they can be installed quickly and efficiently.

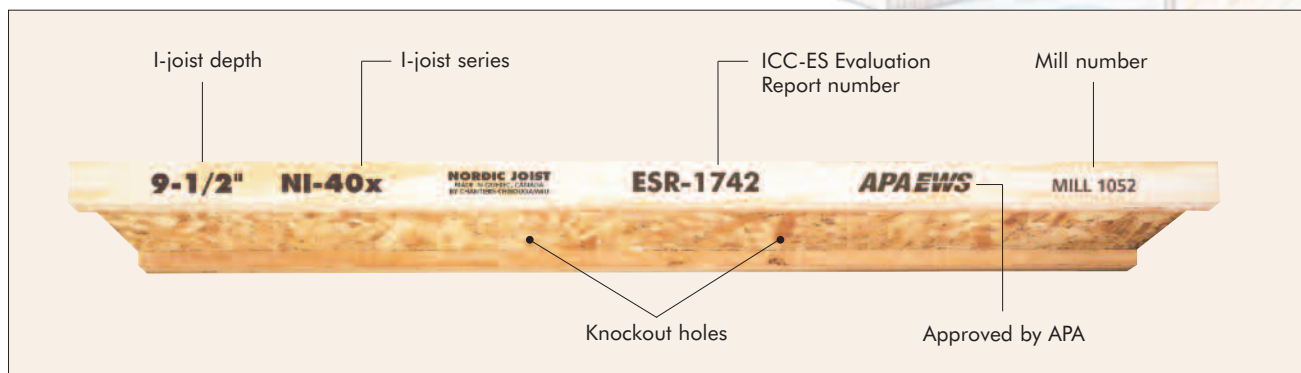
Web Holes – The wood structural panel webs in I-joists permit holes to be easily cut on site to permit the passage of electrical wiring, plumbing and ductwork. Nordic I-joists provide **knockout holes** along the length of the joists to facilitate the installation of electrical wiring or light plumbing lines. These knockouts can easily be removed with a hammer as needed.

APA Quality Assured – The APA trademark ensures superior I-joist quality and consistent performance. All products are subject to proven quality assurance programs.

Resource Friendly – Wood I-joists use up to 50% less wood fiber in their production than conventional lumber joists, allowing more efficient use of our natural resources.



NORDIC JOIST™

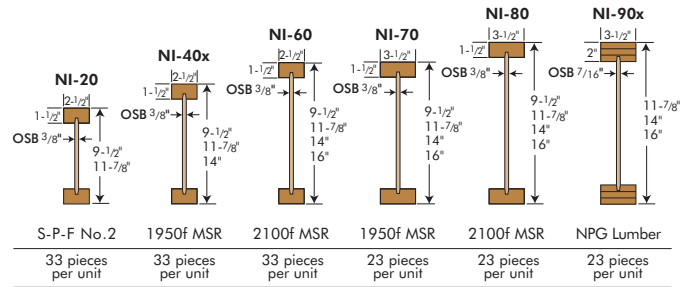




DESIGN PROPERTIES

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.



DESIGN PROPERTIES FOR NORDIC I-JOISTS ^{(a) (b)}

JOIST DEPTH	JOIST SERIES	EI ^(c) (10 ⁶ lbf-in. ²)	M ^(d) (lbf-ft)	V ^(e) (lbf)	IR ^(f) (lbf)	IR w/WS ^(g) (lbf)	ER ^(h) (lbf)	K ⁽ⁱ⁾ (10 ⁶ lbf)	WEIGHT (lbf/ft)
9-1/2"	NI-20	145	2,590	1,120	1,700	1,700	900	4.94	2.55
	NI-40x	218	2,900	1,200	2,240	2,620	1,120	4.94	2.65
	NI-60	231	3,810	1,200	2,240	2,620	1,120	4.94	2.78
	NI-70	304	5,120	1,200	2,240	2,620	1,120	4.94	3.27
	NI-80	324	5,385	1,200	2,380	2,790	1,190	4.94	3.27
11-7/8"	NI-20	253	3,355	1,420	1,800	1,800	900	6.18	2.85
	NI-40x	371	3,760	1,480	2,750	2,930	1,250	6.18	2.85
	NI-60	396	4,935	1,480	2,750	2,930	1,250	6.18	2.99
	NI-70	515	6,635	1,480	2,750	2,930	1,250	6.18	3.45
	NI-80	547	6,980	1,480	2,900	3,120	1,330	6.18	3.45
14"	NI-90x	615	9,465	2,055	4,170	4,170	1,765	6.18	4.43
	NI-40x	540	4,530	1,730	2,750	3,240	1,250	7.28	3.00
	NI-60	584	5,945	1,730	2,750	3,240	1,250	7.28	3.15
	NI-70	749	7,990	1,730	2,750	3,240	1,250	7.28	3.75
	NI-80	802	8,405	1,730	3,310	3,840	1,330	7.28	3.75
16"	NI-90x	910	11,415	2,210	4,170	4,170	1,765	7.28	4.73
	NI-60	799	6,895	1,970	2,750	3,240	1,250	8.32	3.46
	NI-70	1,015	9,265	1,970	2,750	3,240	1,250	8.32	3.95
	NI-80	1,092	9,745	1,970	3,310	3,840	1,330	8.32	3.95
	NI-90x	1,245	13,100	2,325	4,170	4,170	1,765	8.32	4.93

For SI: 1 lbf = 4.448 N, 1 lbf-ft = 1.356 N-m, 1 lbf-in² = 0.00287 N-m², 1 inch = 25.4 mm.

- The tabulated values are design values for normal duration of load. All values, except for EI and K, are permitted to be adjusted for other load durations as permitted by the code for solid sawn lumber.
- The vertical (bearing) load capacity is 2,000 lbf/ft without bearing stiffeners.
- Bending stiffness (EI) of the I-joist.
- Moment capacity (M) of the I-joist, which shall **not** be increased by any code allowed repetitive member use factor.
- Shear capacity (V) of the I-joist.
- Intermediate reaction (IR) of the I-joist with a minimum bearing length of 3-1/2 inches without bearing stiffeners.
- Intermediate reaction (IR w/WS) of the I-joist with a minimum bearing length of 3-1/2 inches with bearing stiffeners.
- End reaction (ER) of the I-joist with a minimum bearing length of 1-3/4 inches without bearing stiffeners. Higher end reactions are permitted. For a bearing length of 4 inches, the end reaction may be set equal to the tabulated shear value. Interpolation of the end reaction between 1-3/4 and 4-inch bearing is permitted. For end reaction values over 1,550 lbf, bearing stiffeners are required.
- Coefficient of shear deflection (K). For calculating uniform load and center-point load deflections of the I-joist in a simple-span application, use Eqs. 1 and 2.

$$\text{Uniform Load: } \delta = \frac{5\omega\ell^4}{384 EI} + \frac{\omega\ell^2}{K} \quad (1)$$

$$\text{Center-Point Load: } \delta = \frac{P\ell^3}{48 EI} + \frac{2P\ell}{K} \quad (2)$$

Where:

- δ = calculated deflection (in.)
- ω = uniform load (lbf/in.)
- ℓ = design span (in.)
- P = concentrated load (lbf)
- EI = bending stiffness of the I-joist (lbf-in.²)
- K = coefficient of shear deflection (lbf)

ALLOWABLE FLOOR SPANS

ALLOWABLE FLOOR SPANS — Live Load = 40 psf, Dead Load = 10 psf

Live Load Deflection Limit of L/480

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"	13'-5"
	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'-8"
	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"	14'-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"
14"	NI-90x	25'-9"	23'-6"	22'-1"	20'-7"	28'-1"	25'-6"	24'-1"	22'-4"
	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"	21'-9"
	NI-80	28'-3"	25'-9"	24'-3"	22'-7"	30'-10"	28'-0"	26'-5"	24'-6"
16"	NI-90x	29'-4"	26'-9"	25'-2"	23'-5"	32'-0"	29'-1"	27'-5"	25'-5"
	NI-60	28'-6"	26'-0"	24'-7"	22'-10"	31'-1"	28'-4"	26'-0"	21'-9"
	NI-70	30'-8"	27'-11"	26'-4"	24'-6"	33'-5"	30'-5"	27'-3"	21'-9"
	NI-80	31'-4"	28'-6"	26'-10"	25'-0"	34'-2"	31'-1"	29'-3"	26'-3"
	NI-90x	32'-7"	29'-8"	27'-11"	26'-0"	35'-6"	32'-3"	30'-5"	28'-3"

ALLOWABLE FLOOR SPANS — Live Load = 40 psf, Dead Load = 10 psf

Live Load Deflection Limit of L/360

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	18'-5"	16'-10"	15'-11"	14'-3"	20'-0"	17'-5"	15'-10"	13'-5"
	NI-40x	20'-7"	18'-6"	16'-11"	15'-1"	21'-4"	18'-5"	16'-10"	15'-0"
	NI-60	21'-0"	19'-2"	18'-1"	16'-11"	22'-10"	20'-10"	19'-4"	17'-3"
	NI-70	22'-9"	20'-9"	19'-7"	18'-3"	24'-9"	22'-7"	21'-3"	17'-8"
	NI-80	23'-2"	21'-1"	19'-11"	18'-7"	25'-3"	23'-0"	21'-8"	18'-10"
11-7/8"	NI-20	22'-0"	19'-11"	18'-2"	16'-3"	22'-11"	19'-10"	17'-9"	14'-2"
	NI-40x	24'-5"	21'-1"	19'-3"	17'-2"	24'-4"	21'-0"	19'-2"	17'-1"
	NI-60	25'-0"	22'-10"	21'-7"	19'-9"	27'-3"	24'-1"	22'-0"	19'-8"
	NI-70	27'-1"	24'-8"	23'-3"	21'-8"	29'-6"	26'-11"	25'-4"	21'-9"
	NI-80	27'-6"	25'-1"	23'-8"	22'-1"	30'-0"	27'-4"	25'-9"	23'-0"
14"	NI-90x	28'-6"	26'-0"	24'-6"	22'-10"	31'-1"	28'-4"	26'-8"	24'-10"
	NI-40x	26'-9"	23'-2"	21'-2"	18'-11"	26'-8"	23'-1"	21'-1"	18'-10"
	NI-60	28'-5"	26'-0"	24'-3"	21'-8"	30'-7"	26'-6"	24'-2"	21'-7"
	NI-70	30'-7"	27'-11"	26'-4"	24'-7"	33'-5"	30'-5"	27'-3"	21'-9"
	NI-80	31'-3"	28'-6"	26'-10"	25'-0"	34'-1"	31'-1"	28'-9"	25'-9"
16"	NI-90x	32'-6"	29'-7"	27'-11"	26'-0"	35'-5"	32'-3"	30'-5"	28'-3"
	NI-60	31'-6"	28'-7"	26'-1"	23'-4"	33'-0"	28'-7"	26'-0"	21'-9"
	NI-70	33'-11"	30'-11"	29'-2"	24'-10"	37'-0"	32'-9"	27'-3"	21'-9"
	NI-80	34'-8"	31'-7"	29'-9"	26'-5"	37'-9"	34'-0"	31'-0"	26'-3"
	NI-90x	36'-0"	32'-10"	30'-11"	28'-10"	39'-4"	35'-9"	33'-9"	31'-4"

NOTES:

1. Allowable **clear** span applicable to residential floor construction with a design live load of 40 psf and dead load of 10 psf. The live load deflection is limited to L/480 or L/360 as shown, and the total load deflection to L/240. For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
2. 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.
3. Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches for the intermediate bearings.
4. Bearing stiffeners are **not** required when I-joists are used with the spans and spacing given in these tables, except as required for hangers.
5. 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



ALLOWABLE FLOOR SPANS — Live Load = 40 psf, Dead Load = 20 psf

Live Load Deflection Limit of L/600

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	15'-4"	14'-1"	13'-3"	12'-5"	16'-9"	15'-3"	13'-11"	11'-1"
	NI-40x	17'-3"	15'-9"	14'-10"	13'-9"	18'-9"	16'-10"	15'-4"	13'-8"
	NI-60	17'-6"	16'-0"	15'-1"	14'-0"	19'-1"	17'-4"	16'-4"	14'-9"
	NI-70	19'-0"	17'-3"	16'-3"	15'-2"	20'-8"	18'-9"	17'-8"	14'-9"
	NI-80	19'-4"	17'-7"	16'-7"	15'-5"	21'-0"	19'-1"	18'-0"	15'-8"
11-7/8"	NI-20	18'-5"	16'-10"	15'-11"	14'-10"	20'-0"	17'-9"	14'-9"	11'-9"
	NI-40x	20'-6"	18'-9"	17'-7"	15'-8"	22'-2"	19'-2"	17'-6"	15'-7"
	NI-60	20'-11"	19'-1"	18'-0"	16'-9"	22'-9"	20'-9"	19'-6"	17'-11"
	NI-70	22'-7"	20'-7"	19'-4"	18'-0"	24'-7"	22'-4"	21'-0"	18'-1"
	NI-80	23'-0"	20'-11"	19'-8"	18'-4"	25'-0"	22'-9"	21'-5"	19'-1"
14"	NI-40x	23'-3"	21'-2"	19'-3"	17'-3"	24'-4"	21'-1"	19'-3"	17'-2"
	NI-60	23'-9"	21'-8"	20'-5"	19'-0"	25'-11"	23'-7"	22'-0"	18'-1"
	NI-70	25'-7"	23'-3"	21'-11"	20'-5"	27'-10"	25'-4"	22'-8"	18'-1"
	NI-80	26'-1"	23'-9"	22'-4"	20'-9"	28'-5"	25'-10"	24'-4"	21'-10"
	NI-90x	27'-1"	24'-8"	23'-3"	21'-7"	29'-6"	26'-10"	25'-3"	23'-5"
16"	NI-60	26'-4"	24'-0"	22'-8"	20'-8"	28'-9"	26'-0"	22'-8"	18'-1"
	NI-70	28'-4"	25'-9"	24'-3"	20'-8"	30'-10"	27'-3"	22'-8"	18'-1"
	NI-80	28'-11"	26'-4"	24'-9"	22'-0"	31'-6"	28'-8"	26'-11"	21'-10"
	NI-90x	30'-1"	27'-4"	25'-9"	23'-11"	32'-10"	29'-9"	28'-0"	26'-0"

ALLOWABLE FLOOR SPANS — Live Load = 40 psf, Dead Load = 20 psf

Live Load Deflection Limit of L/480

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	15'-11"	14'-7"	13'-10"	12'-11"	17'-4"	15'-10"	13'-11"	11'-1"
	NI-40x	17'-11"	16'-4"	15'-5"	13'-9"	19'-5"	16'-10"	15'-4"	13'-8"
	NI-60	18'-2"	16'-7"	15'-8"	14'-7"	19'-9"	18'-0"	17'-0"	14'-9"
	NI-70	19'-8"	17'-11"	16'-11"	15'-9"	21'-5"	19'-6"	18'-4"	14'-9"
	NI-80	20'-1"	18'-3"	17'-2"	16'-0"	21'-10"	19'-10"	18'-8"	15'-8"
11-7/8"	NI-20	19'-1"	17'-6"	16'-6"	14'-10"	20'-10"	17'-9"	14'-9"	11'-9"
	NI-40x	21'-4"	19'-3"	17'-7"	15'-8"	22'-2"	19'-2"	17'-6"	15'-7"
	NI-60	21'-8"	19'-10"	18'-8"	17'-5"	23'-8"	21'-7"	20'-1"	17'-11"
	NI-70	23'-5"	21'-4"	20'-1"	18'-9"	25'-6"	23'-3"	21'-10"	18'-1"
	NI-80	23'-10"	21'-9"	20'-6"	19'-0"	26'-0"	23'-8"	22'-3"	19'-1"
14"	NI-40x	24'-9"	22'-6"	21'-2"	19'-8"	26'-11"	24'-6"	23'-0"	21'-5"
	NI-60	24'-1"	21'-2"	19'-3"	17'-3"	24'-4"	21'-1"	19'-3"	17'-2"
	NI-70	26'-7"	24'-2"	22'-9"	20'-8"	28'-11"	26'-4"	22'-8"	18'-1"
	NI-80	27'-1"	24'-8"	23'-3"	21'-7"	29'-6"	26'-10"	25'-3"	21'-10"
	NI-90x	28'-2"	25'-7"	24'-1"	22'-5"	30'-8"	27'-10"	26'-3"	24'-4"
16"	NI-60	27'-4"	24'-11"	23'-6"	20'-8"	29'-10"	26'-0"	22'-8"	18'-1"
	NI-70	29'-5"	26'-9"	25'-3"	20'-8"	32'-0"	27'-3"	22'-8"	18'-1"
	NI-80	30'-0"	27'-4"	25'-9"	22'-0"	32'-9"	29'-9"	27'-4"	21'-10"
	NI-90x	31'-3"	28'-5"	26'-9"	24'-10"	34'-1"	30'-11"	29'-1"	27'-0"

NOTES:

1. Allowable **clear** span applicable to residential floor construction with a design live load of 40 psf and dead load of 20 psf. The live load deflection is limited to L/600 or L/480 as shown, and the total load deflection to L/360. For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
2. 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.
3. Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches for the intermediate bearings.
4. Bearing stiffeners are **not** required when I-joists are used with the spans and spacing given in these tables, except as required for hangers.
5. 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.
6. For ceramic tile applications, spacings greater than 16" o.c. are typically not recommended.

SI units conversion: 1 inch = 25.4 mm, 1 foot = 0.305 m

ALLOWABLE ROOF SPANS

ALLOWABLE ROOF SPANS

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'-10"	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"
	NI-80	28'-10"	26'-1"	22'-8"	27'-1"	24'-6"	21'-3"	25'-0"	22'-7"	19'-8"
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'-1"
	NI-70	33'-8"	30'-6"	26'-6"	31'-8"	28'-8"	24'-11"	29'-2"	26'-5"	23'-0"
	NI-80	34'-4"	31'-1"	27'-0"	32'-3"	29'-3"	25'-5"	29'-9"	27'-0"	23'-6"
14"	NI-40x	33'-10"	29'-4"	23'-10"	32'-2"	28'-5"	23'-2"	29'-8"	26'-11"	22'-3"
	NI-60	35'-2"	31'-10"	27'-5"	33'-0"	29'-11"	26'-0"	30'-6"	27'-8"	24'-0"
	NI-70	38'-3"	34'-7"	30'-1"	35'-11"	32'-6"	28'-3"	33'-1"	30'-0"	26'-1"
	NI-80	39'-1"	35'-5"	30'-9"	36'-9"	33'-3"	28'-11"	33'-11"	30'-8"	26'-9"
	NI-90x	40'-9"	36'-11"	32'-1"	38'-3"	34'-8"	30'-2"	35'-4"	32'-0"	27'-10"
16"	NI-60	39'-1"	35'-5"	29'-6"	36'-9"	33'-3"	28'-8"	33'-11"	30'-8"	26'-9"
	NI-70	42'-4"	38'-4"	33'-4"	39'-9"	36'-0"	31'-4"	36'-8"	33'-3"	28'-11"
	NI-80	43'-4"	39'-3"	34'-2"	40'-9"	36'-11"	32'-1"	37'-7"	34'-1"	29'-8"
	NI-90x	45'-3"	41'-0"	35'-8"	42'-6"	38'-7"	33'-6"	39'-3"	35'-7"	31'-0"

ALLOWABLE ROOF SPANS

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"
	NI-80	26'-5"	23'-11"	20'-9"	25'-0"	22'-7"	19'-7"	23'-2"	21'-0"	18'-3"
11-7/8"	NI-20	24'-5"	22'-2"	18'-1"	23'-0"	20'-10"	17'-8"	21'-5"	19'-4"	16'-10"
	NI-40x	27'-3"	23'-7"	19'-2"	26'-2"	23'-0"	18'-9"	24'-4"	22'-0"	18'-2"
	NI-60	28'-4"	25'-8"	22'-0"	26'-9"	24'-3"	21'-1"	24'-10"	22'-6"	19'-7"
	NI-70	30'-11"	28'-0"	24'-4"	29'-2"	26'-5"	23'-0"	27'-1"	24'-7"	21'-4"
	NI-80	31'-7"	28'-7"	24'-10"	29'-9"	27'-0"	23'-5"	27'-8"	25'-1"	21'-9"
14"	NI-90x	32'-10"	29'-8"	25'-9"	31'-0"	28'-0"	24'-4"	28'-9"	26'-0"	22'-8"
	NI-40x	29'-11"	25'-10"	21'-1"	29'-2"	25'-3"	20'-7"	27'-7"	24'-5"	19'-11"
	NI-60	32'-4"	29'-3"	24'-2"	30'-6"	27'-7"	23'-7"	28'-4"	25'-8"	22'-4"
	NI-70	35'-1"	31'-9"	27'-7"	33'-2"	30'-0"	26'-1"	30'-9"	27'-10"	24'-3"
	NI-80	35'-11"	32'-6"	28'-3"	33'-11"	30'-8"	26'-8"	31'-5"	28'-6"	24'-9"
16"	NI-90x	37'-5"	33'-11"	29'-5"	35'-4"	32'-0"	27'-10"	32'-10"	29'-9"	25'-10"
	NI-60	35'-11"	32'-0"	26'-1"	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"
	NI-80	39'-10"	36'-1"	31'-0"	37'-7"	34'-1"	29'-7"	34'-11"	31'-8"	27'-6"
16"	NI-90x	41'-7"	37'-8"	32'-9"	39'-3"	35'-7"	30'-11"	36'-6"	33'-0"	28'-9"

NOTES:

1. 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.
2. Spans include a cantilever of up to 2 feet on one end of the I-joist.
3. Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches on end bearing adjacent to cantilever.
4. Bearing stiffeners are **not** required when I-joists are used with the spans and spacing given in these tables, except as required for hangers.
5. 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



ALLOWABLE ROOF SPANS

Snow Load = 40 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	18'-11"	17'-1"	14'-4"	17'-11"	16'-2"	14'-1"	16'-8"	15'-1"	13'-1"
	NI-40x	21'-7"	18'-8"	15'-3"	20'-6"	18'-4"	14'-11"	19'-1"	17'-3"	14'-6"
	NI-60	22'-1"	20'-0"	17'-4"	20'-11"	18'-11"	16'-5"	19'-6"	17'-7"	15'-4"
	NI-70	24'-2"	21'-10"	19'-0"	22'-11"	20'-9"	18'-0"	21'-4"	19'-4"	16'-9"
	NI-80	24'-8"	22'-4"	19'-4"	23'-5"	21'-2"	18'-4"	21'-9"	19'-9"	17'-1"
11-7/8"	NI-20	22'-10"	20'-1"	16'-5"	21'-7"	19'-7"	16'-1"	20'-1"	18'-3"	15'-8"
	NI-40x	24'-8"	21'-4"	17'-4"	24'-2"	20'-11"	17'-0"	22'-10"	20'-4"	16'-7"
	NI-60	26'-6"	24'-0"	19'-11"	25'-1"	22'-8"	19'-6"	23'-4"	21'-2"	18'-4"
	NI-70	28'-11"	26'-2"	22'-8"	27'-4"	24'-9"	21'-6"	25'-6"	23'-1"	20'-1"
	NI-80	29'-6"	26'-8"	23'-2"	27'-11"	25'-3"	21'-11"	26'-0"	23'-7"	20'-5"
	NI-90x	30'-8"	27'-9"	24'-0"	29'-0"	26'-3"	22'-9"	27'-0"	24'-6"	21'-3"
14"	NI-40x	27'-1"	23'-5"	19'-1"	26'-7"	23'-0"	18'-8"	25'-10"	22'-4"	18'-2"
	NI-60	30'-2"	26'-10"	21'-11"	28'-7"	25'-11"	21'-6"	26'-8"	24'-1"	20'-11"
	NI-70	32'-10"	29'-8"	25'-5"	31'-0"	28'-1"	24'-5"	28'-11"	26'-2"	22'-9"
	NI-80	33'-7"	30'-4"	26'-1"	31'-9"	28'-9"	24'-11"	29'-7"	26'-10"	23'-3"
	NI-90x	35'-0"	31'-8"	27'-5"	33'-1"	30'-0"	26'-0"	30'-10"	27'-11"	24'-3"
16"	NI-60	33'-6"	28'-11"	23'-7"	31'-9"	28'-5"	23'-2"	29'-7"	26'-10"	22'-6"
	NI-70	36'-4"	32'-11"	26'-11"	34'-5"	31'-2"	26'-10"	32'-1"	29'-0"	25'-3"
	NI-80	37'-3"	33'-8"	28'-1"	35'-3"	31'-11"	27'-7"	32'-10"	29'-9"	25'-10"
	NI-90x	38'-11"	35'-2"	30'-6"	36'-10"	33'-4"	28'-11"	34'-4"	31'-1"	27'-0"

ALLOWABLE ROOF SPANS

Snow Load = 50 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	17'-9"	16'-1"	13'-2"	16'-11"	15'-4"	13'-0"	15'-10"	14'-4"	12'-5"
	NI-40x	19'-11"	17'-2"	14'-0"	19'-5"	16'-11"	13'-9"	18'-1"	16'-5"	13'-5"
	NI-60	20'-9"	18'-9"	16'-1"	19'-9"	17'-11"	15'-6"	18'-6"	16'-9"	14'-6"
	NI-70	22'-9"	20'-7"	17'-4"	21'-8"	19'-7"	17'-0"	20'-3"	18'-4"	15'-11"
	NI-80	23'-3"	21'-0"	17'-7"	22'-1"	20'-0"	17'-4"	20'-8"	18'-9"	16'-3"
11-7/8"	NI-20	21'-5"	18'-6"	15'-1"	20'-5"	18'-2"	14'-10"	19'-1"	17'-3"	14'-6"
	NI-40x	22'-8"	19'-7"	16'-0"	22'-4"	19'-3"	15'-8"	21'-8"	18'-10"	15'-4"
	NI-60	24'-11"	22'-6"	18'-4"	23'-9"	21'-6"	18'-0"	22'-2"	20'-1"	17'-5"
	NI-70	27'-2"	24'-7"	21'-3"	25'-11"	23'-5"	20'-4"	24'-2"	21'-11"	19'-0"
	NI-80	27'-9"	25'-1"	21'-9"	26'-5"	23'-11"	20'-9"	24'-8"	22'-4"	19'-5"
	NI-90x	28'-10"	26'-1"	22'-7"	27'-5"	24'-10"	21'-6"	25'-8"	23'-3"	20'-2"
14"	NI-40x	24'-11"	21'-7"	17'-7"	24'-6"	21'-2"	17'-3"	23'-11"	20'-8"	16'-10"
	NI-60	28'-5"	24'-9"	20'-2"	27'-1"	24'-4"	19'-10"	25'-3"	22'-11"	19'-4"
	NI-70	30'-10"	27'-11"	22'-9"	29'-5"	26'-7"	23'-0"	27'-6"	24'-10"	21'-7"
	NI-80	31'-6"	28'-6"	24'-0"	30'-1"	27'-2"	23'-7"	28'-1"	25'-5"	22'-1"
	NI-90x	32'-11"	29'-9"	25'-9"	31'-4"	28'-4"	24'-7"	29'-4"	26'-6"	23'-0"
16"	NI-60	30'-10"	26'-8"	21'-8"	30'-1"	26'-2"	21'-4"	28'-1"	25'-5"	20'-10"
	NI-70	34'-2"	30'-11"	22'-9"	32'-7"	29'-6"	24'-9"	30'-5"	27'-7"	23'-11"
	NI-80	35'-0"	31'-8"	24'-3"	33'-4"	30'-2"	25'-5"	31'-2"	28'-3"	24'-6"
	NI-90x	36'-7"	33'-1"	28'-8"	34'-10"	31'-6"	27'-4"	32'-7"	29'-6"	25'-7"

NOTES:

1. 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.
2. Spans include a cantilever of up to 2 feet on one end of the I-joist.
3. Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches on end bearing adjacent to cantilever.
4. Bearing stiffeners are **not** required when I-joists are used with the spans and spacing given in these tables, except as required for hangers.
5. 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

ALLOWABLE UNIFORM LOADS

ALLOWABLE UNIFORM FLOOR LOADS (plf) — 100%

JOIST DEPTH	JOIST SERIES	CRITERIA	CLEAR SPAN (ft)											
			8	10	12	14	16	18	20	22	24	26	28	30
9-1/2"	NI-20	L/480 LL L/240 TL	165	133	81 111	52 95	36 72	25 51	18 37	14 28	11 22	-- --	-- --	-- --
	NI-40x	L/480 LL L/240 TL	218	175	116 146	76 114	52 88	37 69	28 56	21 42	16 33	13 26	10 21	-- --
	NI-60	L/480 LL L/240 TL	218	175	122 146	80 126	55 110	39 79	29 59	22 44	17 34	13 27	11 22	-- --
	NI-70	L/480 LL L/240 TL	218	175	146	102 126	71 110	51 98	38 76	29 58	22 45	18 36	14 29	11 23
	NI-80	L/480 LL L/240 TL	231	186	155	108 133	75 117	54 104	40 81	30 61	24 48	19 38	15 30	12 25
11-7/8"	NI-20	L/480 LL L/240 TL	175	140	117	89 101	61 88	44 79	32 65	24 49	19 38	15 30	12 24	10 20
	NI-40x	L/480 LL L/240 TL	267	215	180	125 148	87 114	62 90	46 73	35 60	27 51	22 43	17 35	14 29
	NI-60	L/480 LL L/240 TL	267	215	180	132 154	92 135	66 118	49 96	37 75	29 59	23 46	18 37	15 30
	NI-70	L/480 LL L/240 TL	267	215	180	154	116 135	84 120	63 108	48 96	37 75	30 60	24 48	19 39
	NI-80	L/480 LL L/240 TL	282	227	189	163	122 143	88 127	66 114	51 102	39 79	31 63	25 51	21 42
	NI-90x	L/480 LL L/240 TL	400	321	269	190 231	134 202	98 180	73 147	56 113	44 88	35 70	28 57	23 47
14"	NI-40x	L/480 LL L/240 TL	267	215	180	154	123 135	89 109	66 88	51 73	39 61	31 52	25 45	20 39
	NI-60	L/480 LL L/240 TL	267	215	180	154	132 135	96 120	71 108	54 96	42 81	34 68	27 55	22 45
	NI-70	L/480 LL L/240 TL	267	215	180	154	135	119 120	89 108	68 99	54 90	43 83	34 69	28 57
	NI-80	L/480 LL L/240 TL	322	259	216	186	163	126 145	95 130	73 119	57 109	45 91	37 74	30 61
	NI-90x	L/480 LL L/240 TL	405	326	273	234	191 205	140 183	106 164	81 150	64 128	51 103	41 83	34 68
16"	NI-60	L/480 LL L/240 TL	267	215	180	154	135	120	96 108	74 99	57 90	46 80	37 69	30 60
	NI-70	L/480 LL L/240 TL	267	215	180	154	135	120	91 99	72 90	57 90	46 83	37 77	30 72
	NI-80	L/480 LL L/240 TL	322	259	216	186	163	145	126 130	97 119	76 109	61 100	49 93	41 82
	NI-90x	L/480 LL L/240 TL	405	326	273	234	205	183	141 164	109 150	86 137	69 127	56 112	46 92

NOTES:

- Table values are based on **clear** distance between supports and may be used for simple or multiple spans. For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
- Tabulated loads are based on uniform loads only, and assume continuous lateral bracing of the compression flange. Table values do not include additional stiffness from composite action with glue-nailed or nailed decking.
- Both live and total loads must be checked. Where no value is shown in the live load row (LL), the total load governs the design. For floor applications with L/360 live load deflection, multiply L/480 value times 1.33. Total load deflection is limited to L/240.
- Verify that the deflection criteria herein are accepted by local codes and authorities.
- The I-joist weight has not been taken into account.
- Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches for the intermediate bearings.
- Bearing stiffeners are **not** required, except as required for hangers.
- Refer to appropriate sections for proper installation.
- For double joists, double the table values and connect joist per detail 1p on page 19.

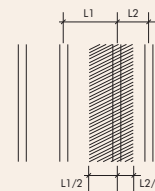
PSF TO PLF CONVERSION TABLE

Load in pounds per linear foot (plf)

ON CENTER SPACING		LOAD IN POUNDS PER SQUARE FOOT (psf)									
in.	ft	20	25	30	35	40	45	50	55	60	
12	1.00	20	25	30	35	40	45	50	55	60	
16	1.33	27	34	40	47	54	60	67	74	80	
19.2	1.60	32	40	48	56	64	72	80	88	96	
24	2.00	40	50	60	70	80	90	100	110	120	

o.c. spacing (ft) x load (psf) = load (plf)

JOIST SPACING



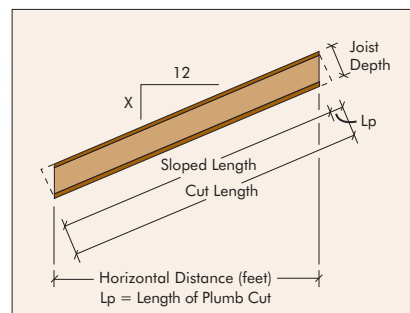


ALLOWABLE UNIFORM ROOF LOADS (plf) — 115%

JOIST DEPTH	JOIST SERIES	CRITERIA	CLEAR SPAN (ft)											
			8	10	12	14	16	18	20	22	24	26	28	30
9-1/2"	NI-20	L/240 LL L/180 TL	190	153	128	105 109	72 90	51 68	37 50	28 38	22 29	17 23	14 18	11 15
	NI-40x	L/240 LL L/180 TL	250	201	168	131	101	75 80	56 65	42 54	33 44	26 34	21 28	17 22
	NI-60	L/240 LL L/180 TL	250	201	168	144	127	111 105	79 78	59 59	44 46	34 36	27 29	18 24
	NI-70	L/240 LL L/180 TL	250	201	168	144	127	102 113	76 101	58 77	45 60	36 48	29 38	23 31
	NI-80	L/240 LL L/180 TL	266	214	179	153	135	108 120	81 108	61 82	48 64	38 51	30 41	25 33
11-7/8"	NI-20	L/240 LL L/180 TL	201	162	135	116	102	88 90	65 75	49 62	38 51	30 40	24 32	20 26
	NI-40x	L/240 LL L/180 TL	307	247	207	171	131	104	84	70	55 58	44 50	35 43	29 37
	NI-60	L/240 LL L/180 TL	307	247	207	177	155	133 136	99 111	75 91	59 77	46 62	37 50	30 41
	NI-70	L/240 LL L/180 TL	307	247	207	177	155	138	125	96 113	75 100	60 80	48 64	39 53
	NI-80	L/240 LL L/180 TL	324	261	218	187	164	146 196	131 147	120 113	106 88	84 70	68 57	56 47
	NI-90x	L/240 LL L/180 TL	460	370	309	265	233	207	187	151	118	94	76	62
14"	NI-40x	L/240 LL L/180 TL	307	247	207	177	155	125	101	84	71	60	51 52	41 45
	NI-60	L/240 LL L/180 TL	307	247	207	177	155	138	125	109 110	85 93	68 79	55 68	45 59
	NI-70	L/240 LL L/180 TL	307	247	207	177	155	138	125	113	104	86 96	69 89	57 76
	NI-80	L/240 LL L/180 TL	370	298	249	214	187	167	150	137	125	112	97	81
	NI-90x	L/240 LL L/180 TL	466	375	313	269	236	210	189	163 172	128 158	103 137	83 111	68 91
16"	NI-60	L/240 LL L/180 TL	307	247	207	177	155	138	125	113	104	92	74 79	61 69
	NI-70	L/240 LL L/180 TL	307	247	207	177	155	138	125	113	104	96	89	76 83
	NI-80	L/240 LL L/180 TL	370	298	249	214	187	167	150	137	125	116	107	98
	NI-90x	L/240 LL L/180 TL	466	375	313	269	236	210	189	172	158	138 146	112 135	92 123

NOTES:

- Table values are based on **clear** distance between supports and may be used for simple or multiple spans. For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
- Tabulated loads are based on uniform loads only, and assume continuous lateral bracing of the compression flange. Tables values are based on a duration of load (DOL) factor of 1.15. Table values do not include additional stiffness from composite action with glue-nailed or nailed decking.
- Both live and total loads must be checked. Where no value is shown in the live load row (LL), the total load governs the design. For roof applications with L/360 live load deflection, multiply L/240 value times 0.67. Total load deflection is limited to L/180.
- Verify that the deflection criteria herein are accepted by local codes and authorities.
- The I-joist weight has not been taken into account.
- Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches for the intermediate bearings.
- Bearing stiffeners are **not** required, except as required for hangers.
- Refer to appropriate sections for proper installation.
- For double joists, double the table values and connect joist per detail 1p on page 19.



ROOF SLOPE ADJUSTMENT FACTORS

SLOPE IN 12	3	4	5	6	7	8	9	10	11	12
SLOPE FACTOR	1.031	1.054	1.083	1.118	1.158	1.202	1.250	1.302	1.357	1.414

CUTTING LENGTH FOR SLOPED ROOFS

Cut Length (ft) = [Horizontal Distance (ft) x Slope Factor] + [Joist Depth (in.) x Slope in 12 / 144]

TYPICAL FLOOR FRAMING AND CONSTRUCTION DETAILS

INSTALLATION NOTES:

1. Installation of Nordic I-joists shall be as shown in Figure 1.
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. 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.
5. I-joists must be protected from the weather prior to installation.
6. 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.
7. End bearing length must be at least 1-3/4 inches. For multiple-span joists, intermediate bearing length must be at least 3-1/2 inches.
8. Ends of floor joists shall be restrained to prevent rollover. Use rim board or I-joist blocking panels.
9. I-joists installed beneath bearing walls perpendicular to the joists shall have full-depth blocking panels, rim board, or squash blocks (cripple blocks) to transfer gravity loads from above the floor system to the wall or foundation below.
10. For I-joists installed directly beneath bearing walls parallel to the joists or used as rim board or blocking panels, the maximum allowable vertical load using a single I-joist is 2,000 plf, and 4,000 plf if double I-joists are used.
11. Continuous lateral support of the I-joist's compression flange is required to prevent rotation and buckling. In simple span uses, lateral support of the top flange is normally supplied by the floor sheathing. In multiple span or cantilever applications, 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 the cantilever extension. The ends of all cantilever extensions must be laterally braced as shown in Figure 3, 4, or 5.
12. 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.
13. Figure 1 details on the following pages show only I-joist-specific fastener requirements. For other fastener requirements, see the applicable building code.
14. For proper temporary bracing of wood I-joists and placement of temporary construction loads, see *Safety and Construction Precautions*, on page 42.



FLOOR PERFORMANCE

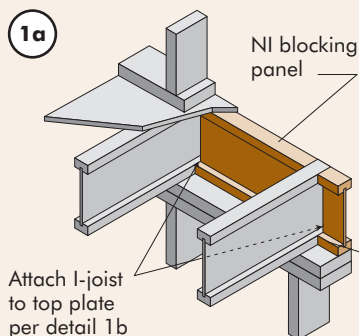
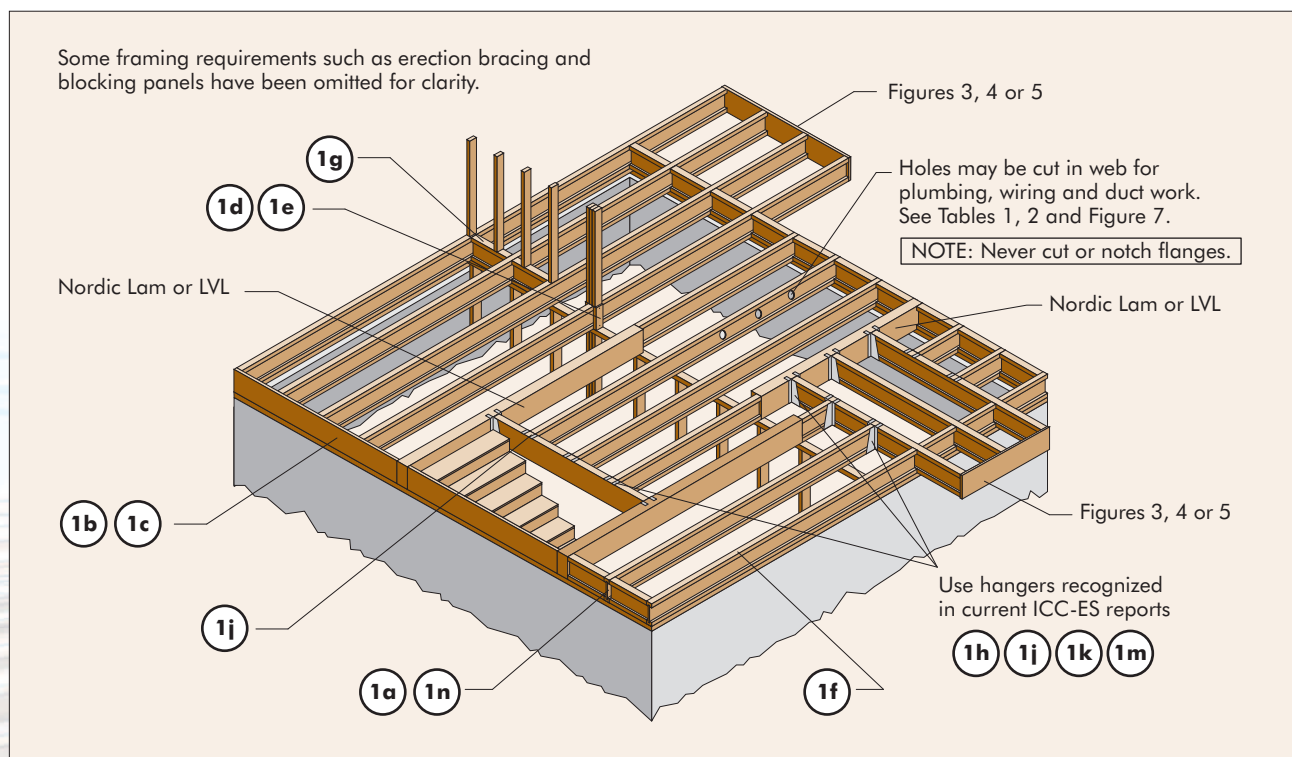
Researchers have proposed a number of methods that can be used to reduce floor vibration. These methods include:

- ▶ Gluing the wood structural panel floor to the joists
- ▶ Attaching wood structural panels or gypsum board to the bottom of the floor joists
- ▶ Decreasing the floor-joist spacing by one increment based on allowable span
- ▶ Using full-depth blocking at regular intervals between all of the floor joists over the entire floor (Detail 1r)

By far the most practical and most economical way to further increase the stiffness of your floor when using Nordic joists is to select the most economical I-joist from our maximum span tables and then maintain the same joist designation but upgrade to the next net depth. For example: If a 9-1/2" NI-40x is selected for a given application, specifying an 11-7/8" NI-40x will provide an increase in stiffness of over 70% for just a few cents per linear foot.



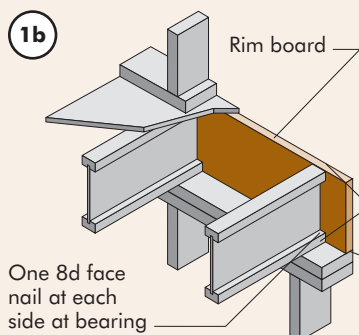
FIGURE 1
TYPICAL NORDIC I-JOIST FLOOR FRAMING AND CONSTRUCTION DETAILS



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 is based on 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.

8d nails at 6" o.c. to top plate (when used for lateral shear transfer, nail to bearing plate with same nailing as required for decking)



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

*The uniform vertical load capacity is limited to a rim board depth of 16 inches or less and is based on 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.

One 8d common or box nail at top and bottom flange

Attach rim board to top plate using 8d common or box toe-nails at 6" o.c.

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.

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.

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

1c

Diagram 1c illustrates the connection between a rim joist, a floor joist, and a top plate. The rim joist is shown being attached to the floor joist with one nail at the top and bottom. It is also attached to the top plate. A label indicates that a minimum bearing of 1-3/4 inches is required.

NI rim joist per detail 1a

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.

Attach rim joist to top plate per detail 1a

Minimum 1-3/4" bearing required

Attach I-joist per detail 1b

1d

Diagram 1d shows a cross-section of a blocking panel (NI or rim board) with a squash block installed between it and a post. The squash block is shown with a height of + 1/16 inch. A label indicates that a minimum bearing of 1-3/4 inches is required.

NI or rim board blocking panel per detail 1a

+ 1/16" for squash blocks

Squash block

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, 1b, or 1c

1e

Diagram 1e shows a cross-section of a blocking panel with a squash block installed between it and a post. The squash block is shown with a height of + 1/16 inch. A label indicates that a minimum bearing of 1-3/4 inches is required.

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

1f

Diagram 1f shows a cross-section of a wall sheathing attachment to a rim board. The wall sheathing is attached to the rim board using a backer. A label indicates that a minimum bearing of 1-3/4 inches is required.

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.

Provide backer for siding attachment unless nailable sheathing is used.

Wall sheathing, as required

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.

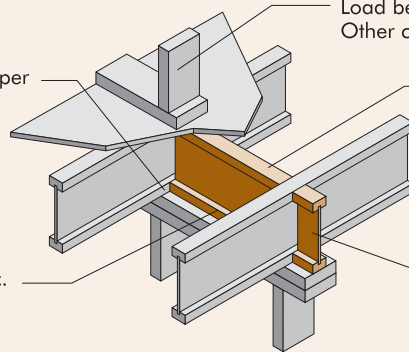
All nails shown in the above details are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common nails (0.131 x 2-1/2 in.) shown in details. Framing lumber assumed to be Utility grade S-P-F (south) or stronger species. Individual components not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



1g

Joist attachment per detail 1b

8d nails at 6" o.c. to top plate



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

Blocking required over all interior supports under load-bearing walls or when floor joists are not continuous over support

NI blocking panel per detail 1a

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.

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".

Top- or face-mount hanger

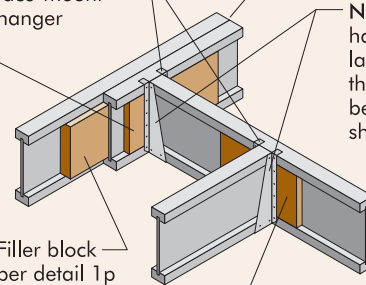
Double I-joist header

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

Filler block per detail 1p

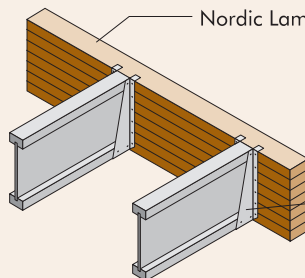
Backer block required (both sides for face-mount hangers)

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



1j

Nordic Lam or LVL



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

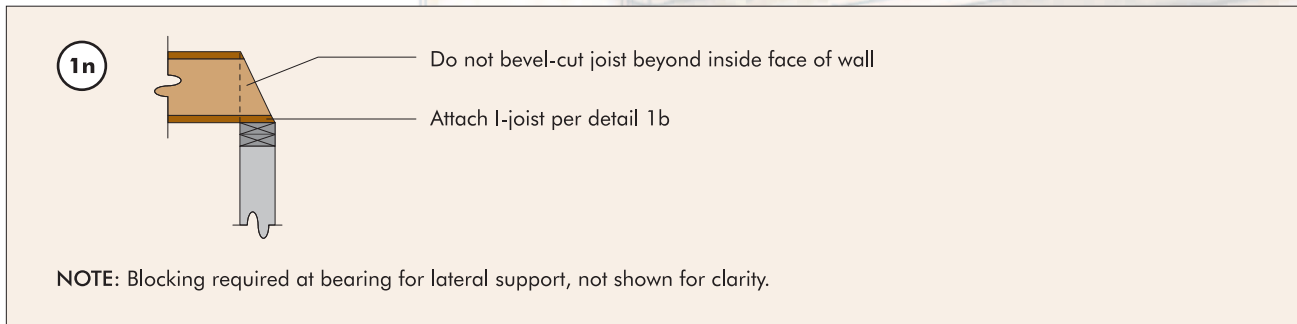
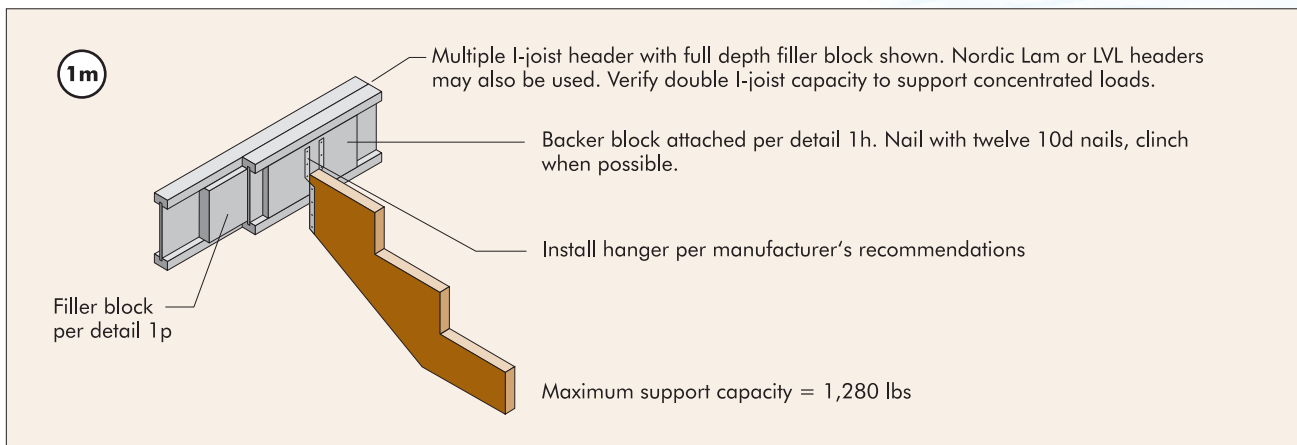
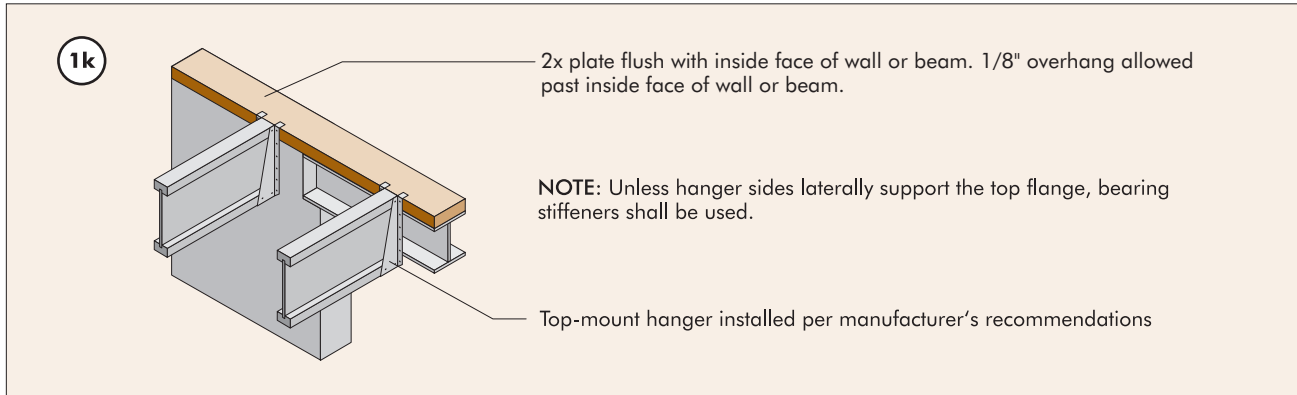
Top- or face-mount hanger installed per manufacturer's recommendations

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

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.

FIGURE 1 continued

TYPICAL NORDIC I-JOIST FLOOR FRAMING AND CONSTRUCTION DETAILS

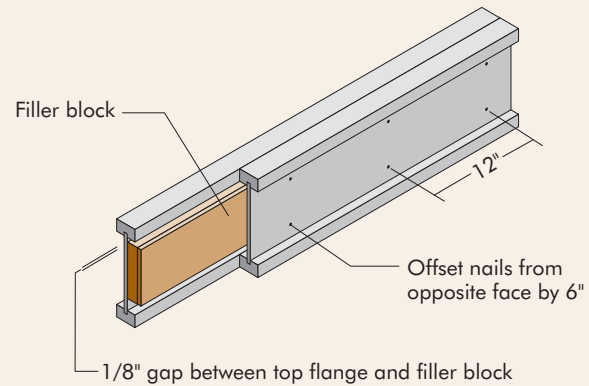


All nails shown in the above details are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common nails (0.131 x 2-1/2 in.) shown in details. Framing lumber assumed to be Utility grade S-P-F (south) or stronger species. Individual components not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

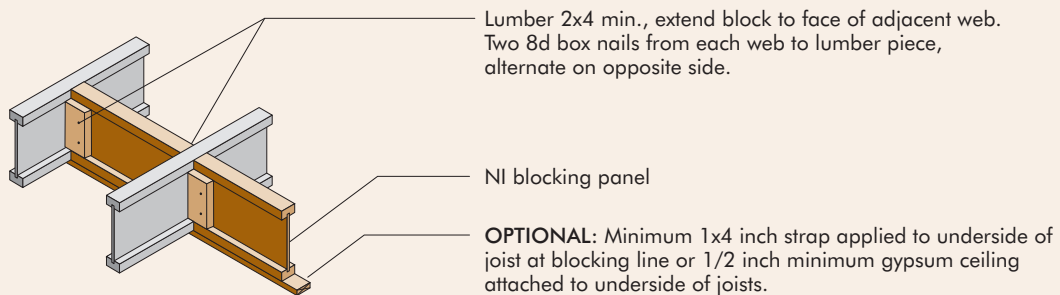
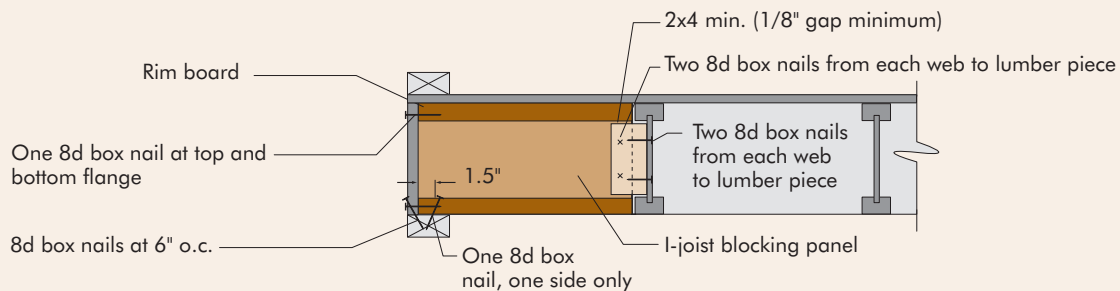


**1p****FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION**

Flange Width	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"

**NOTES:**

1. Support back of I-joist web during nailing to prevent damage to web/flange connection.
2. Leave a 1/8-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. (clined 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.

1r**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.

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.

WEB STIFFENER REQUIREMENTS

A web stiffener is a wood block that is used to reinforce the web of an I-joist at locations where:

- The webs of the I-joist are in jeopardy of buckling out of plane. This usually occurs in deeper I-joists.
- The webs of the I-joist are in jeopardy of “knifing” through the I-joist flanges. This can occur at any I-joist depth when the design reaction loads exceed a specific level.
- The I-joist is supported in a hanger and the sides of the hanger do not extend up to the top flange. The web stiffener supports the I-joist along a vertical axis as designed.

There are two kinds of web stiffeners: **bearing stiffeners** and **load stiffeners**. They are differentiated by the applied load and the location of the gap between the slightly undersized stiffener and the top or bottom flange. See Figure 2.

Bearing stiffeners are located at the supports, both interior and exterior, when required. Nordic I-joists **do not** need bearing stiffeners at any support when subjected to the normal residential uniform loads and installed in accordance with the allowable spans printed in this document.

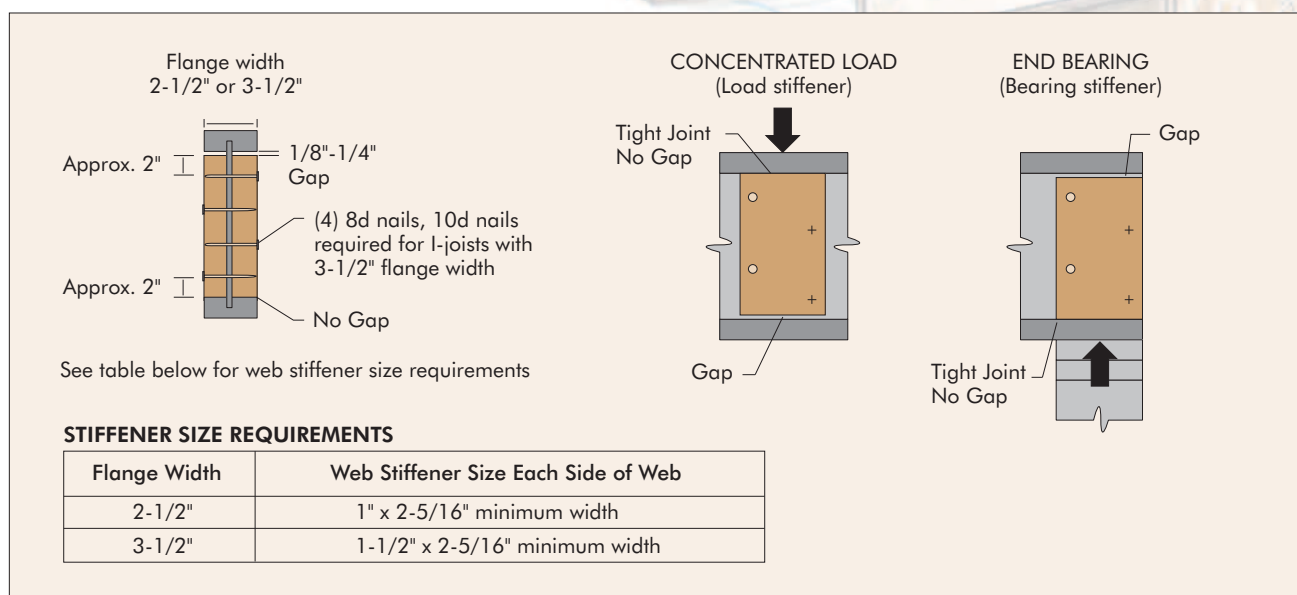
Load stiffeners are located between supports where significant point loads are applied to the top flange of an I-joist.

Web stiffener blocks may be comprised of lumber, rim board, or wood structural panels. The minimum grade of wood structural panels is Rated Sheathing; minimum lumber grade is Utility grade S-P-F (south) or better. The depth of the web stiffener should equal the distance between the flanges of the joist minus 1/8 inch – 1/4 inch.

Recommendations:

1. A **bearing stiffener** is required in all engineered applications with design end reactions greater than 1,550 lbs, with the exception of NI-90x, which requires bearing stiffeners when end reaction values exceed 1,885 lbs. The gap between the stiffener and the flange is at the top.
2. 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.
3. 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.

FIGURE 2
WEB STIFFENER INSTALLATION DETAILS





CANTILEVER DETAILS

FOR BALCONIES (No Wall Load)

Balconies may be constructed using either continuous Nordic I-joists (Detail 3a) or by adding lumber extensions to the I-joist (Detail 3b). Continuous I-joist cantilevers are limited to one-fourth the adjacent span when supporting uniform loads only.

For applications supporting concentrated loads at the end of the cantilever, such as a wall, see Figures 4 and 5.

Unless otherwise engineered, cantilevers are limited to a maximum of 4 feet when supporting uniform loads only. Blocking is required at the cantilever support as shown. Uniform floor load shall not exceed 40 psf live load and 10 psf dead load. The balcony uniform load shall not exceed 60 psf live load and 10 psf dead load.

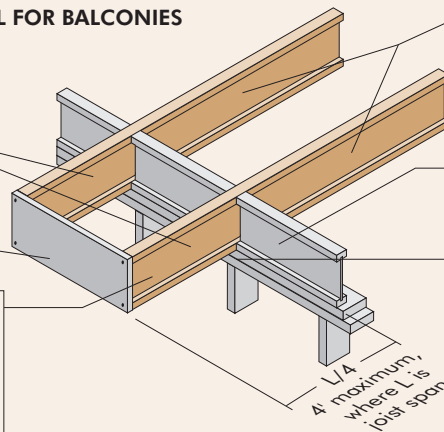
FIGURE 3
CANTILEVER DETAILS FOR BALCONIES

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

Cantilever extension supporting uniform floor loads only

Rim board, or wood structural panel

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



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

I-joist, or rim board

3-1/2" min. bearing required

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)

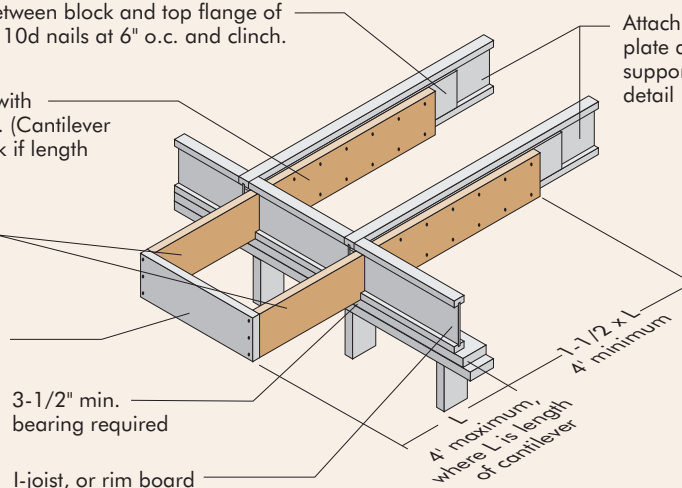
Full depth backer block with 1/8" gap between block and top flange of I-joist. See detail 1h. Nail with 2 rows of 10d nails at 6" o.c. and clinch.

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

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



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

3-1/2" min. bearing required

I-joist, or rim board

CANTILEVER DETAILS

FOR VERTICAL BUILDING OFFSET (Concentrated Wall Load)

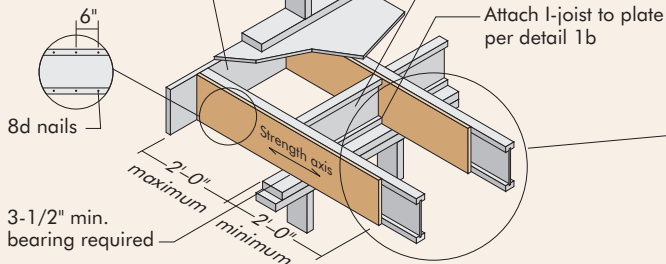
Nordic I-joists may also be used in cantilever applications supporting a concentrated load applied to the end of the cantilever, such as with a vertical building offset. For cantilever-end concentrated load applications that require reinforcing based on the following table, the cantilever is limited to 2 feet maximum. In addition, blocking is required along the cantilever support and for 4 feet on each side of the cantilever

area. Subject to the roof loads and layout (see the following table), three methods of reinforcing are allowed in load bearing cantilever applications: reinforcing sheathing applied to one side of the I-joist (Method 1), reinforcing sheathing applied to both sides of the joist (Method 2), or double I-joists (Alternate Method 2).

FIGURE 4
CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET

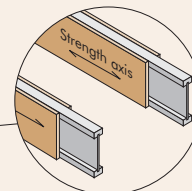
4a Method 1 – SHEATHING REINFORCEMENT ONE SIDE

Rim board or wood structural panel closure (23/32" minimum thickness), attach per detail 1b



Method 2 – SHEATHING REINFORCEMENT TWO SIDES

Use same installation as Method 1 but reinforce both sides of I-joist with sheathing.

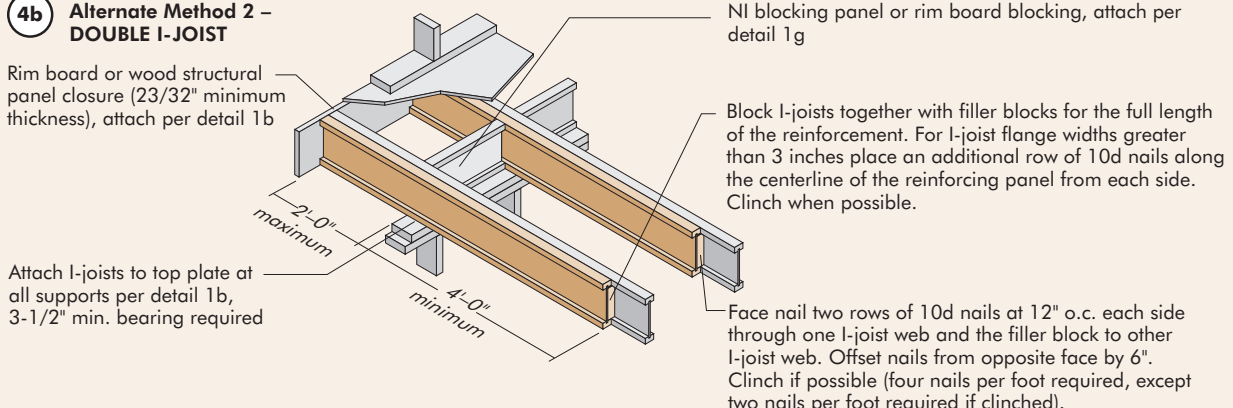


Use nailing pattern shown for Method 1 with opposite face nailing offset by 3"

NOTE: APA RATED SHEATHING 48/24 (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

Rim board or wood structural panel closure (23/32" minimum thickness), attach per detail 1b



NI blocking panel or rim board blocking, attach per detail 1g

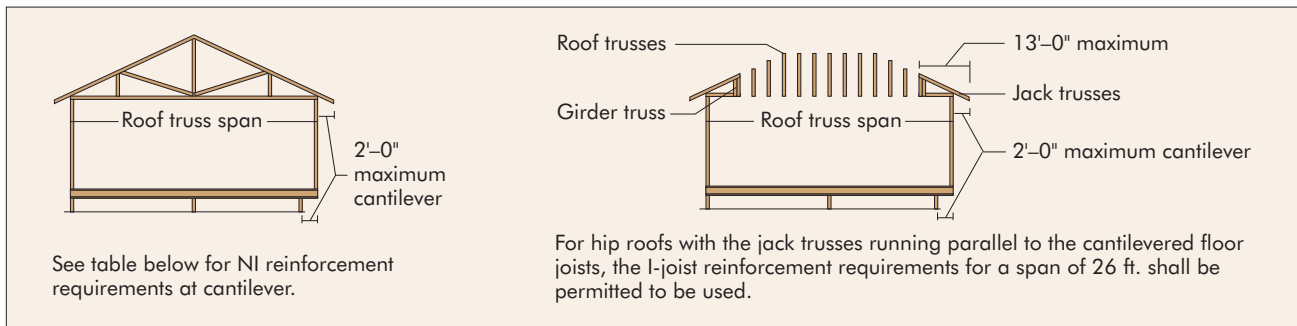
Block I-joists together with filler blocks for the full length of the reinforcement. For I-joist flange widths greater than 3 inches place an additional row of 10d nails along the centerline of the reinforcing panel from each side. Clinch when possible.

Attach I-joists to top plate at all supports per detail 1b, 3-1/2" min. bearing required

Face nail two rows of 10d nails at 12" o.c. each side through one I-joist web and the filler block to other I-joist web. Offset nails from opposite face by 6". Clinch if possible (four nails per foot required, except two nails per foot required if clinched).



FIGURE 4 (continued)



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	1	X
	28	N	N	1	1	N	N	1	2	N	1	2	X
	30	N	N	1	1	N	1	1	2	N	1	2	X
	32	N	N	1	2	N	1	1	2	N	1	2	X
	34	N	N	1	2	N	1	2	X	N	1	2	X
	36	N	N	1	2	N	1	2	X	N	2	X	X
11-7/8	26	N	N	N	1	N	N	1	2	N	1	1	2
	28	N	N	N	1	N	N	1	2	N	1	1	2
	30	N	N	1	1	N	N	1	2	N	1	2	X
	32	N	N	1	1	N	1	1	2	N	1	2	X
	34	N	N	1	2	N	1	1	2	N	1	2	X
	36	N	N	1	2	N	1	2	X	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	1	N	N	N	1
	32	N	N	N	N	N	N	N	1	N	N	N	1
	34	N	N	N	N	N	N	N	1	N	N	N	2
	36	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	1
	28	N	N	N	N	N	N	N	1	N	N	N	1
	30	N	N	N	N	N	N	N	1	N	N	N	1
	32	N	N	N	N	N	N	N	1	N	N	N	1
	34	N	N	N	N	N	N	N	1	N	N	1	2
	36	N	N	N	N	N	N	N	1	N	N	1	2
16	38	N	N	N	1	N	N	N	1	N	N	1	2
	40	N	N	N	1	N	N	N	1	N	N	1	2
	42	N	N	N	1	N	N	1	2	N	N	1	2

NOTES:

- 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.
- 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.
- 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.
- 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.
- Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

BRICK CANTILEVER DETAILS

FOR VERTICAL BUILDING OFFSET (Concentrated Wall Load)

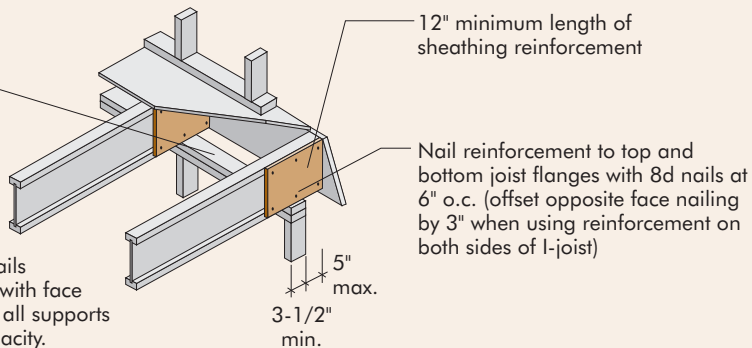
FIGURE 5

BRICK CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET

5a SHEATHING REINFORCEMENT

Provide full depth blocking between joists over support (not shown)

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.

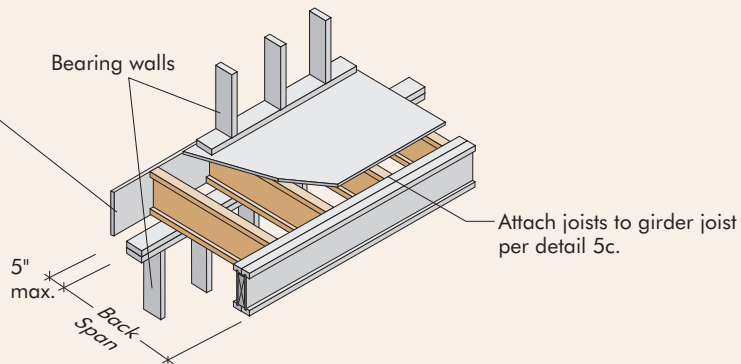


5b SET-BACK DETAIL

Rim board or wood structural panel closure (23/32" minimum thickness), attach per detail 1b.

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" min. I-joist bearing required.



5c SET-BACK CONNECTION

Vertical solid sawn blocks (2x6 Utility grade S-P-F (south)) nailed through joist web and web of girder using 8d nails. Alternate for opposite side.

NOTES:

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

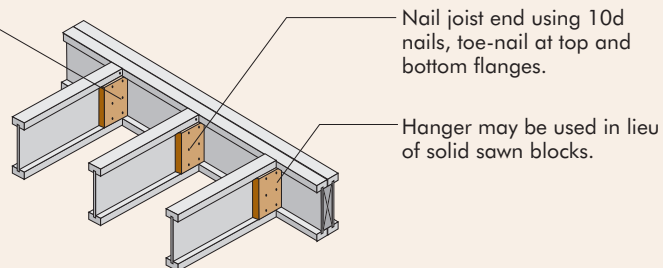
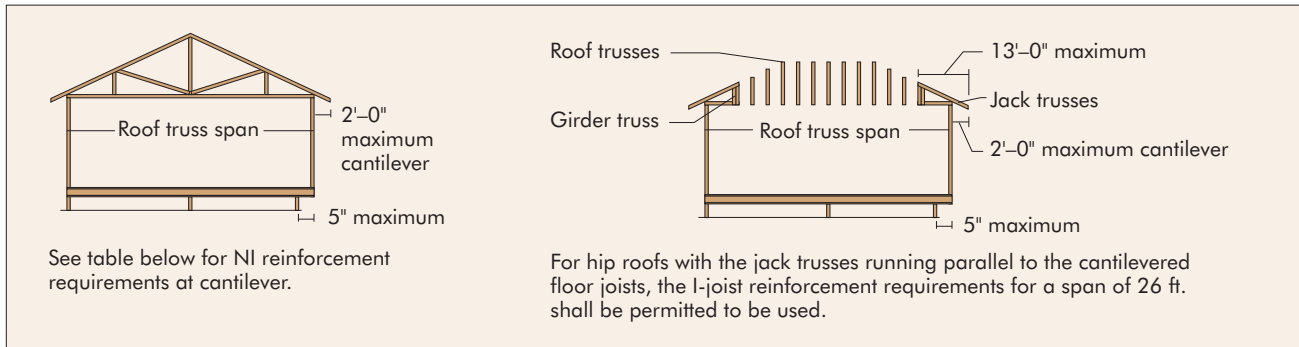




FIGURE 5 (continued)



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	N	N	1	N	N	N	2	N	N	1	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	N	1	N	N	1	X	N	1	2	X
	34	N	N	N	2	N	N	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	1	N	N	N	1	N	N	1	2
	28	N	N	N	1	N	N	1	1	N	N	1	2
	30	N	N	N	1	N	N	1	1	N	1	1	2
	32	N	N	N	1	N	N	1	2	N	1	1	X
	34	N	N	N	1	N	N	1	2	N	1	1	X
	36	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	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	1
	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	2
	36	N	N	N	N	N	N	N	1	N	N	N	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	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	N	1
18	26	N	N	N	N	N	N	N	N	N	N	N	2
	28	N	N	N	N	N	N	N	1	N	N	N	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	N	N	N	N	1	N	N	1	2
	36	N	N	N	N	N	N	N	1	N	N	1	2

NOTES:

- 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.
- 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.
- 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.
- 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.
- Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

STAIRWELL OPENINGS

IN I-JOIST FLOOR FRAMING

When designing a floor for a residential structure, the designer is often faced with detailing an unsupported stairwell opening in the floor. The following information simplifies the selection of trimmers and headers, provides guidance on the appropriate detailing for their use, and quantifies hanger capacity requirements for I-joist-to-header and header-to-trimmer intersections.

These recommendations are based on the use of Nordic I-joists used in either simple or multiple maximum allowable spans for residential applications, and on a **total load of 50 psf** for the floor and stair areas. The information provided is appropriate for stairwell openings from **10.5 ft to 12 ft in length and 48 inches in width**, whose long dimension is either running parallel **or** perpendicular to the joist span, as shown in Figure 6 below. *When these recommendations are followed, it is unnecessary to support the stairwell opening from below with vertical framing members.* For stairwells parallel to the I-joist span, it is also assumed that there is a **non-load-bearing partition load of 64 plf** along one header and one trimmer. For stairwells perpendicular to the I-joist span, there is assumed to be a non-load-bearing partition load of 64 plf along both headers and on the trimmer.

The stair stringers may be attached to the header/trimmer at either end of the stairwell opening. For stairwells parallel or perpendicular to the I-joist spans, the opening may be placed anywhere in the floor without regard to the support of the floor framing.

Stairwells Parallel to I-Joist Span

The most common method for placing a stairwell in a wood-framed floor is to run the long axis of the opening parallel to the span of the I-joist. This generally requires smaller headers and trimmers than the perpendicular orientation.

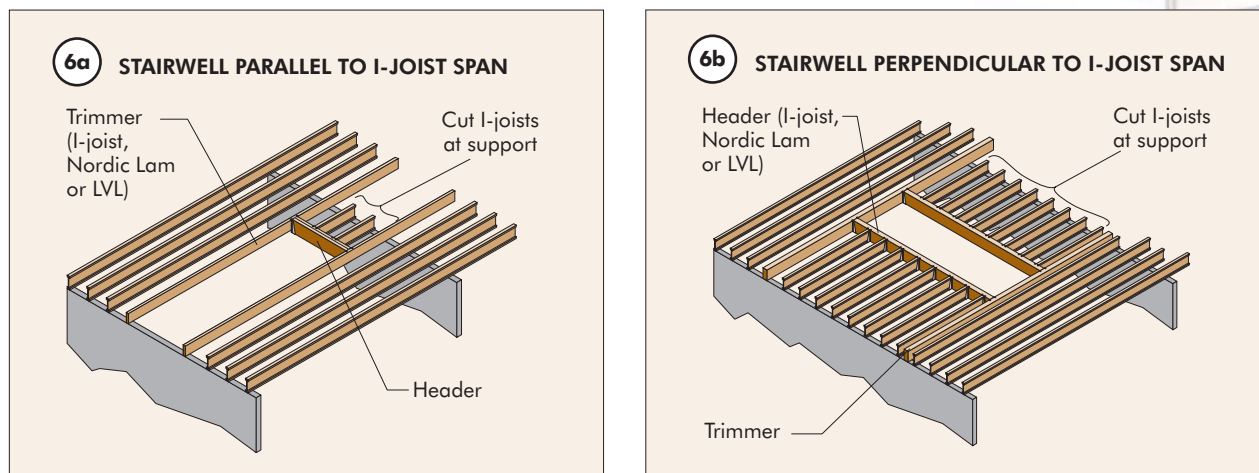
Table shown on the following page is a guide for determining the I-joist requirement or the minimum sections of other engineered wood members required to frame the headers and trimmers seen in Detail 6a.

Caution: *In situations where the stairwell runs parallel to the floor joists and the floor joists are installed over two or more spans, the header supporting the continuous floor joists may be subjected to uplift loads caused by the floor joists it supports. Cutting the interrupted joists at the center support will eliminate this uplift load. If this method is selected, the designer will have to insure that the maximum allowable **simple** span for the I-joist is not exceeded. An alternative method would be to leave the floor joists continuous over the interior support and design the header and hangers for the resulting uplift loads.*

Stairwells Perpendicular to I-Joist Span

Often the floor plan or architectural details of the building are such that it is not possible to orient the stairwell axis parallel to the I-joist span. In such cases, the trimmers are placed parallel to the I-joist span and support the headers by way of metal hangers. The headers, in turn, support the cut ends of the floor joists also via metal hangers. This relationship

FIGURE 6
STAIRWELL OPENINGS IN I-JOIST FLOORS





can be seen in Detail 6b. In addition to the header load, the trimmers are designed to carry the concentrated loads of the stair stringers.

Caution: Because the headers intersect the span of the floor joists over a large length (up to 12 ft), in cases where the floor joists are used continuous over multiple spans, special design consideration must be given to the adjacent clear span to insure adequate floor performance. To eliminate design problems and allow maximum flexibility in locating the stairwell, consider limiting the

maximum allowable spans for continuous floors containing stairwells perpendicular to I-joist spans to those given for simple span floors.

Upward thrust acting on the header adjacent to a center support can be eliminated by cutting the I-joists at the center of the support, thus providing two simple spans where the I-joists are interrupted by the headers. An alternative method would be to leave the floor joists continuous over the interior support and design the header and hangers for the resulting uplift loads.

STAIRWELL OPENINGS PARALLEL TO I-JOIST FLOOR

MAX. I-JOIST CLEAR SPAN (ft)	HEADER REQUIREMENTS			
	SUGGESTED I-JOIST	ALTERNATIVE IJC		JOIST TO HEADER HANGER REQUIREMENT
		LVL	GLULAM	
14	(1 ea.) 9-1/2" NI-20	1-3/4" x 9-1/2"	1-3/4" x 9-1/2"	Type A
16	(1 ea.) 9-1/2" NI-40x	1-3/4" x 9-1/2"	1-3/4" x 9-1/2"	Type A
18	(1 ea.) 11-7/8" NI-20	1-3/4" x 11-7/8"	1-3/4" x 11-7/8"	Type A
20	(1 ea.) 11-7/8" NI-40x	1-3/4" x 11-7/8"	1-3/4" x 11-7/8"	Type A
22	(1 ea.) 11-7/8" NI-80	1-3/4" x 11-7/8"	1-3/4" x 11-7/8"	Type A
MAX. I-JOIST CLEAR SPAN (ft)	TRIMMER REQUIREMENTS			
	SUGGESTED I-JOIST	ALTERNATIVE IJC		JOIST TO HEADER HANGER REQUIREMENT
		LVL	GLULAM	
14	(2 ea.) 9-1/2" NI-60	3-1/2" x 9-1/2"	2-1/2" x 9-1/2"	Type A
16	(2 ea.) 9-1/2" NI-60	3-1/2" x 9-1/2"	3-1/2" x 9-1/2"	Type A
18	(2 ea.) 11-7/8" NI-60	3-1/2" x 11-7/8"	2-1/2" x 11-7/8"	Type A
20	(2 ea.) 11-7/8" NI-70	3-1/2" x 11-7/8"	3-1/2" x 11-7/8"	Type A
22	(2 ea.) 11-7/8" NI-70	3-1/2" x 11-7/8"	5-1/2" x 11-7/8"	Type A

STAIRWELL OPENINGS PERPENDICULAR TO I-JOIST FLOOR

MAX. I-JOIST CLEAR SPAN (ft)	HEADER REQUIREMENTS			
	SUGGESTED I-JOIST	ALTERNATIVE IJC		JOIST TO HEADER HANGER REQUIREMENT
		LVL	GLULAM	
14	(1 ea.) 9-1/2" NI-20	1-3/4" x 9-1/2"	2-1/2" x 9-1/2"	Type A
16	(1 ea.) 9-1/2" NI-60	3-1/2" x 9-1/2"	2-1/2" x 9-1/2"	Type A
18	(1 ea.) 11-7/8" NI-40x	1-3/4" x 11-7/8"	1-3/4" x 11-7/8"	Type A
20	(1 ea.) 11-7/8" NI-60	1-3/4" x 11-7/8"	1-3/4" x 11-7/8"	Type A
22	(1 ea.) 14" NI-40x	1-3/4" x 11-7/8"	1-3/4" x 14"	Type A
MAX. I-JOIST CLEAR SPAN (ft)	TRIMMER REQUIREMENTS			
	SUGGESTED I-JOIST	ALTERNATIVE IJC		JOIST TO HEADER HANGER REQUIREMENT
		LVL	GLULAM	
14	Use Alternative IJC	5-1/4" x 9-1/2"	5-1/4" x 9-1/2"	Type B
16		7" x 9-1/2"	7" x 9-1/2"	Type B
18		5-1/4" x 11-7/8"	5-1/4" x 11-7/8"	Type B
20		7" x 11-7/8"	7" x 11-7/8"	2,700 lbf
22		5-1/4" x 14"	5-1/2" x 14"	3,000 lbf

NOTES:

1. Stairwell openings not to exceed 12 ft in length and 48 inches in width (header length).
2. Minimum grade LVL based on E = 2,000,000 psi (apparent), Fb = 2,900 psi, and Fv = 285 psi.
3. Minimum grade Glulam based on E = 1,800,000 psi (apparent), Fb = 2,400 psi, and Fv = 250 psi.
4. Type A face- or top-mount hanger: 1,450 lbf. Type B face- or top-mount hanger: 2,500 lbf.
5. Minimum bearing length shall be 1-3/4 inches for the end bearings, except for *italic* characters, which shall be 3-1/2 inches.
6. Refer to Detail 1p for double I-joist construction.

WEB HOLE SPECIFICATIONS

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 are permitted anywhere in a cantilevered section of a joist. Holes of greater size may be permitted providing they have been verified.
9. 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.
10. For continuous joists with more than one span, use the longest span to determine hole location in either span.
11. 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.
12. Limit three maximum size holes and one duct chase opening per span.
13. 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

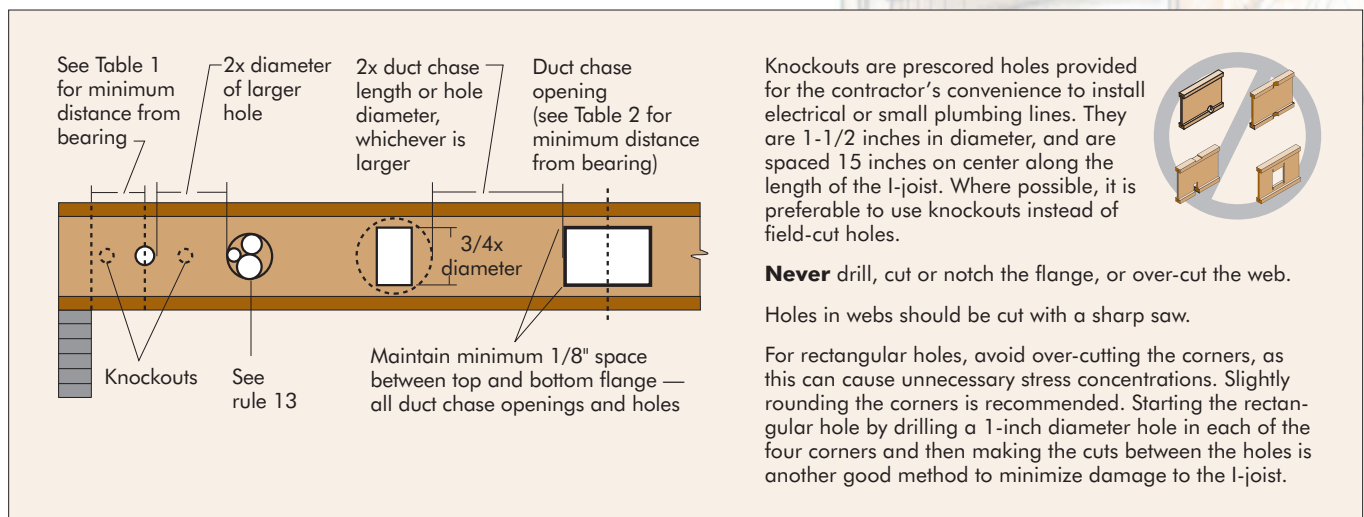




TABLE 1

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 ADJ. 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"	6'-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"

NOTES:

- Above table may be used for I-joist 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.

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:

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

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.

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 $\frac{L_{\text{actual}}}{\text{SAF}}$.

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'-6"	5'-0"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	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"	8'-0"	8'-6"	9'-0"	9'-0"	
	NI-70	5'-6"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	
	NI-80	5'-6"	6'-0"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	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"	
	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"	
	NI-70	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-0"	10'-6"	
	NI-80	7'-6"	8'-0"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-0"	10'-6"	
14"	NI-90x	8'-0"	8'-6"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	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'-6"	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-90x	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	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"	
	NI-80	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-6"	15'-0"	
	NI-90x	11'-6"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	15'-0"	15'-6"	

NOTES:

- Above table may be used for I-joist 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. For other applications, contact your local distributor.

RIM BOARD

As an integral part of the Nordic Engineered Wood family of products, high quality rim board provides a compatible, economical, and structural solution for today's higher vertical and lateral loading conditions.

Rim Board Performance

Manufactured in accordance with ICC-ES AC124, *Acceptance Criteria for Rim Board Products*.

Helps Improve Energy Efficiency

- Using 16' rim board means fewer joints and when correctly installed, reduced air leakage.
- This helps to maximize the overall energy efficiency of the home.

Multiple Applications

While Nordic rim board has been specifically designed and engineered for use as a perimeter framing product for floors, it is also very effective when used as non-structural framing at stairwell openings.

Features and Benefits

- Resists twisting, cupping, cracking and warping.
- Available in 4 depths: 9-1/2", 11-7/8", 14", and 16"
- 16' lengths reduce the number of joints and offer easy handling and installation.
- Each board is edge coated and the units are paper wrapped for protection against the elements.
- Engineered to have the structural strength to transfer both vertical and lateral loads.
- Designed and manufactured for use as a fully supported perimeter board for floor and roof joists in residential and light commercial construction.
- Smooth, stable nailing surface.

Handling and Storage

Handle with the same care as all EWPs.

- Store indoors or undercover.
- Keep rim board up off the ground.
- Cover panels loosely when outdoors to protect from the elements.

Environmentally Responsible Technology

Like all Nordic Engineered Wood products, there is optimum usage of wood fibers with virtually no waste.

Installation

A full 1-1/8" edge surface allows for quick installation with virtually no risk of splitting. Proper installation of the rim board is essential to the overall structural integrity of the building. Refer to *Rim Board Installation and Construction Details* on next page.

Holes in Rim Board

- The maximum allowable round or rectangular hole size shall be 2/3 of the rim board depth. The length of the rim board segment containing a hole shall be at least eight times the hole size. These hole provisions do not apply to rim board installed over openings, such as doors or windows.
- Field-cut holes should be vertically centered in the rim board and at least one hole diameter or 6 inches, whichever is less, clear distance away from the end of the wall line. Holes should never be placed such that they interfere with the attachment of the rim board to the ends of the floor joist, or any other code-required nailing.
- When concentrated loads are present on the rim board (loads not supported by any other vertical-load-carrying members such as squash blocks), holes should not be placed in the rim board within a distance equal to the depth of the rim board from the area of loading.
- For multiple holes, the clear spacing between holes shall be at least two times the diameter of the larger hole, or twice the length of the longest side of the longest rectangular hole.

DESIGN PROPERTIES FOR RIM BOARDS ^(a)

PRODUCT	H ^(b) (lbf/ft)	V ^(c) (lbf/ft)	Z ^(d) (lbf)	P ^(e) (lbf)	WEIGHT (pcf)
1-1/8" Rim Board	200	4,850	350	3,500	35.6

(a) These design values are applicable only to rim board applications in compliance with the connection requirements given in this document and should not be used in the design of a bending member, such as joist, header, rafter, or ledger. The design values are applicable to the normal load duration (10 years) for wood products, except for the horizontal load transfer capacity which is based on the short-term load duration (10 minutes). All values may be adjusted for other load durations in accordance with the applicable code.

(b) The horizontal (shear) load transfer capacity (H).

(c) The bearing (vertical) load capacity (V).

(d) The lateral resistance of a 1/2-inch-diameter lag screw (Z).

(e) The concentrated load capacity (P). The maximum concentrated load acting along any area of the floor sheathing above the rim board from 3" to 12" in length. The bearing load must be simultaneously satisfied along with the concentrated load capacity.

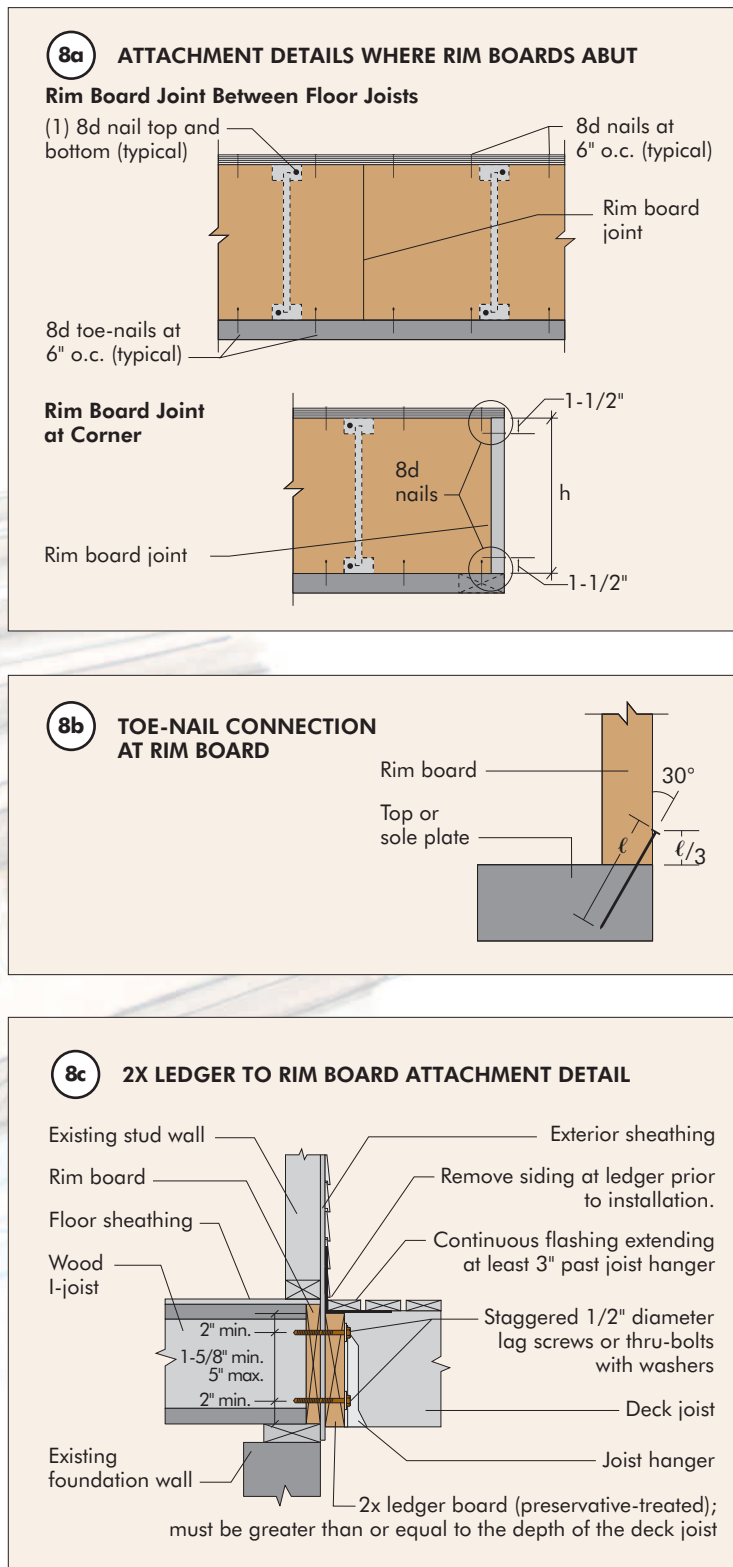


Rim Board Installation and Connection Details

INSTALLATION AND CONNECTION REQUIREMENTS:

1. Floor sheathing to rim board – Use 8d nails (box or common) at 6 inches o.c. **Caution:** The horizontal load capacity is not necessarily increased with decreased nail spacing. Under no circumstances should the nail spacing be less than 3 inches. The 16d (box or common) nails used to connect the bottom plate of a wall to the rim board through the sheathing do not reduce the horizontal load capacity of the rim board provided that the 8d nail spacing (sheathing–rim board) is 6 inches o.c. and the 16d nail spacing (bottom plate–sheathing–rim board) is in accordance with the prescriptive requirements of the applicable code.
2. Rim board to I-joist – Use two 8d nails (box or common), one each into the top and bottom flanges.
3. Rim board to rim board – Attach rim board to rim board in accordance with Detail 8a. Rim board-to-rim board butt joints should be made between floor joists to minimize damage to joists caused by excessive end nailing.
4. Rim board to sill plate – Toe-nail using 8d (box or common) nails at 6 inches o.c. as shown in Detail 8b.
5. Starter joist – When rim boards are used as starter joists to transfer vertical loads, there are several installation options, such as blocking panels (Detail 1s), doubling up the rim boards, or placing an I-joist adjacent to the rim board. Please consult your designer for the appropriate option and details for your application.
6. Attachment of 2x lumber ledgers to rim board – Use 1/2-inch diameter lag screws with a minimum nominal length of 4 inches or 1/2-inch diameter through-bolts with washers and nuts. In both cases, use a design value of 350 lbf per fastener (see Detail 8c). Fasteners should be staggered in 2 rows with a minimum of 2 inches from any edge to the center of holes. For fastener spacing, consult your local distributor. **Caution:** The lag screw should be inserted in a lead hole by turning with a wrench, not by driving with a hammer. Over-torquing can significantly reduce the lateral resistance of the lag screw and should therefore be avoided. See the NDS 2005 for the appropriate size of clearance and lead holes.
7. Lateral resistance of nails applied to the faces of rim board – Calculate the lateral nail resistance based on the procedures given in the NDS 2005 using the bearing strength equivalent to Douglas fir-Larch.

FIGURE 8
RIM BOARD INSTALLATION DETAILS



BONUS ROOM FLOOR

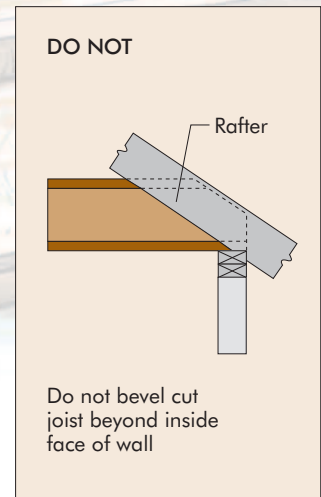
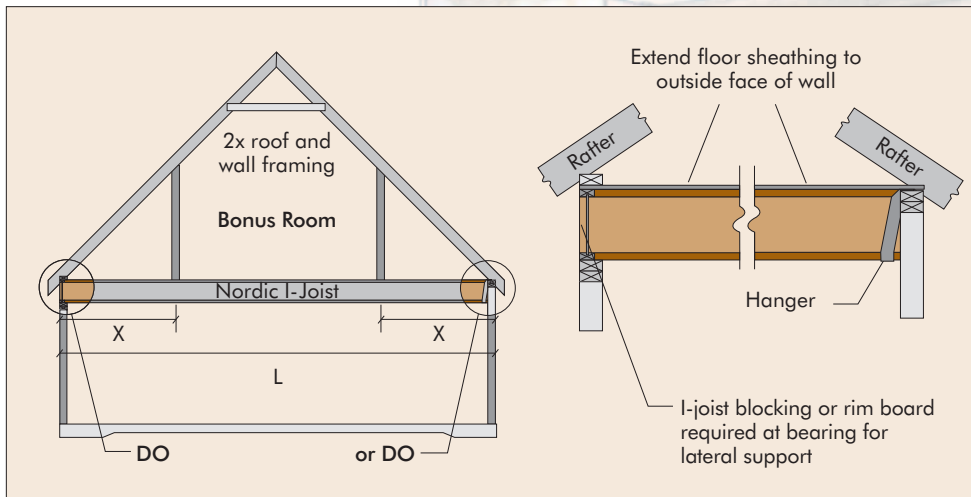
JOIST SELECTION GUIDE

JOIST SELECTION FOR BONUS ROOM

I-JOIST SPAN L (ft)	KNEEWALL LOCATION X (ft)	ROOF LOADING							
		SNOW LOAD = 30 psf, DEAD LOAD = 15 psf				SNOW LOAD = 40 psf, DEAD LOAD = 15 psf			
		ON CENTER SPACING				ON CENTER SPACING			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
20	4	14" NI-40x	16" NI-60	16" NI-60	—	14" NI-60	16" NI-60	16" NI-80	—
	5	14" NI-40x	16" NI-60	16" NI-60	16" NI-80	14" NI-60	16" NI-60	16" NI-80	16" NI-80
	6	14" NI-40x	14" NI-60	16" NI-60	16" NI-80	14" NI-60	16" NI-60	14" NI-80	16" NI-80
22	4	16" NI-60	16" NI-80	16" NI-80*	—	16" NI-60	16" NI-80	—	—
	5	16" NI-60	16" NI-80	16" NI-80*	—	16" NI-60	16" NI-80	—	—
	6	16" NI-60	16" NI-80	16" NI-80	—	16" NI-60	16" NI-80	—	—
24	4	16" NI-80	—	—	—	16" NI-80*	—	—	—
	5	16" NI-80	—	—	—	16" NI-80*	—	—	—
	6	16" NI-80	—	—	—	16" NI-80*	—	—	—

NOTES:

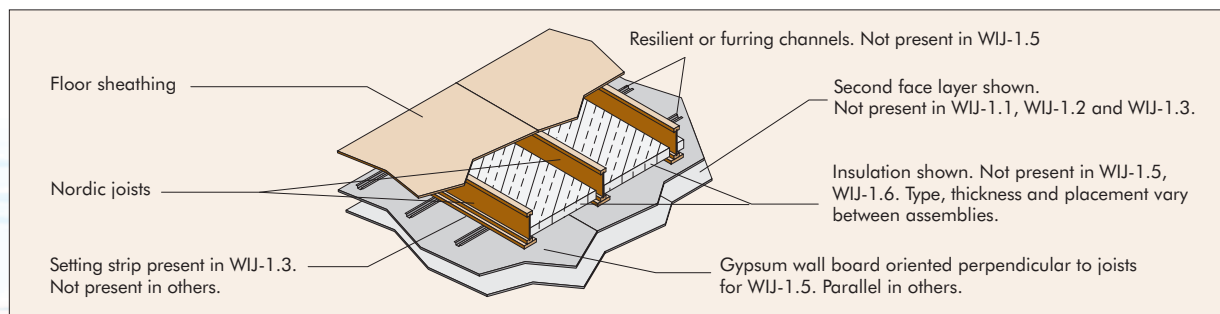
1. Floor joist selection for a design roof snow load as shown and dead load of 15 psf. The design is based on a duration of load (DOL) factor of 1.15.
2. The roof rafter slope has been assumed to be between 8/12 and 12/12.
3. Maximum load shall be: 50 psf floor total load (between the kneewalls), 30 psf attic total load (outside the kneewalls), and 40 plf kneewall load.
4. The live load deflection is limited to L/480, and the total load deflection to L/240 or 3/4 inch, whichever is worst.
* Under these conditions, total load deflection exceeds 3/4 inch, but do meet L/240.
5. Minimum bearing length shall be 3-1/2 inches for the end bearings. Web stiffeners are required for *italic* characters.
6. Straight gable roof framing. No hip framing is permitted.
7. For other applications, contact your local distributor.





FIRE AND SOUND RATED SYSTEMS

FIGURE 9
ONE-HOUR FIRE-RESISTIVE FLOOR-CEILING ASSEMBLY



ASSEMBLY NUMBER IBC / DCA3	ONE HOUR FIRE-RESISTIVE CEILING ASSEMBLIES ^{1,2,3}							
	WITHOUT CONCRETE TOPPING				WITH CONCRETE TOPPING			
	CUSHIONED VINYL		CARPET & PAD		CUSHIONED VINYL		CARPET & PAD	
	STC	IIC	STC	IIC	STC	IIC	STC	IIC
PRESENT IN ALL ASSEMBLIES								
Structural Members:	All assemblies shall be composed of wood I-joists spaced at a maximum 24 o.c. with a minimum 9-1/4 inch depth, with the exception of WIJ-1.6 and WIJ-1.7 which require a minimum of 9-1/2 inch depth. Assemblies WIJ-1.1 and WIJ-1.2 require an NI-70, NI-80, or NI-90x.							
Floor Sheathing:	The floor must be composed of a minimum 23/32" thick tongue-and-groove wood sheathing installed per code requirements. A minimum of 8d common nails must be used in all assemblies except WIJ-1.3. Assemblies WIJ-1.1 and WIJ-1.2 require to be glued to the joist's top flange with an AFG-01 construction adhesive.							
Finish:	All face layer joints are to be covered with tape and coated with joint compound. Screw heads are to be covered with joint compound.							
23-1.1 / WIJ-1.3	51	46	52	66	60	48	60	60
Insulation:	Minimum 2 inch thick mineral wool insulation batts (3.5 pcf, nominal). Place between I-joists on furring strip ledge.							
Setting Strips:	Minimum 1x4 (nominal) wood setting strips attached along the bottom flange of I-joist flanges.							
Resilient channels:	Minimum 0.019 inch thick (or 1/2" single leg) galvanized steel resilient channels. Resilient channels are installed perpendicular to joists and are to be spaced at a minimum 16 inches o.c. and doubled at wallboard end joints.							
Gypsum Wallboard:	Single Sheet of minimum 5/8" Type C Gypsum wallboard. Install with long dimension perpendicular to resilient channel and stagger end joints.							
24-1.1 / WIJ-1.1	51	46	51	64	60	50	60	65
Insulation:	Minimum 1-1/2 inch thick mineral wool insulation batts (2.5 pcf, nominal). Place between I-joists on furring channels.							
Furring channels:	Minimum 0.026 inch thick galvanized steel hat-shaped furring channels. Furring channels are installed perpendicular to joists and are to be spaced at a minimum 16 inches o.c. and doubled at wallboard end joints.							
Gypsum Wallboard:	Single Sheet of minimum 5/8" Type C Gypsum wallboard. Install with long dimension perpendicular to furring channel and stagger end joints.							
25-1.1 / WIJ-1.2	--	--	--	--	--	--	49	59
Insulation:	Minimum 1-1/2 inch thick mineral wool insulation batts (2.5 pcf, nominal). Place between I-joists on resilient channels.							
Resilient channels:	Minimum 0.019 inch thick galvanized steel resilient channels. Resilient channels are installed perpendicular to joists and are to be spaced at a minimum 16 inches o.c. and doubled at wallboard end joints.							
Gypsum Wallboard:	Single Sheet of minimum 5/8" Type C Gypsum wallboard. Install with long dimension perpendicular to resilient channel and stagger end joints.							
26-1.1 / WIJ-1.5	--	--	--	--	--	--	49	55
Insulation:	None							
Gypsum Wallboard:	Two layers of minimum 1/2 inch thick Type X gypsum wallboard. Attach long dimension of wallboard perpendicular to the I-joists as follows: <i>Base Layer:</i> Fasten base layer of wallboard to the bottom flange, center end joints of wallboard on bottom flange of the I-joist and stagger. <i>Face Layer:</i> Attach face layer to bottom flange of I-joist through the base layer. Offset edge joints of wallboard face layer 24 inches from those of base layer. Center end joints on bottom flange of I-joists and offset at a minimum of 48 inches from those of the base layer. Fasten face layer to base layer as described in Table 720.1(3) of the IBC 2009.							
27-1.1 / WIJ-1.6	--	--	54	68	--	--	58	55
Insulation:	None							
Resilient channels:	Minimum 0.019 inch thick galvanized steel resilient channels. Resilient channels are installed perpendicular to joists and are to be spaced at a minimum 24 inches o.c. and doubled at wallboard end joints. If joists spacing is greater than 16 inches o.c. maximum spacing of resilient channels are reduced to 16 inches o.c..							
Gypsum Wallboard:	Two layers of minimum 1/2 inch thick Type X gypsum wallboard. Attach long dimension of wallboard perpendicular to the resilient channels as follows: <i>Base Layer:</i> Fasten base layer of wallboard to the resilient channels with the end joints staggered. <i>Face Layer:</i> Attach face layer to the resilient channel through the base layer. Offset edge joints of wallboard face layer 24 inches from those of base layer, center end joints on bottom flange of I-joists and offset at a minimum of 48 inches from those of the base layer. Fasten face layer to base layer as described in Table 720.1(3) of the IBC 2009.							
-- / WIJ-1.7	59	50	55	68	65	51	63	65
Insulation:	Fiberglass insulation.							
Furring Channels:	Same as WIJ-1.6.							
Gypsum Wallboard:	Same as WIJ-1.6.							

NOTES:

1. This page serves only as a brief overview of a few assemblies. Consult IBC 2009 Table 720.1(3) for additional floor and roof systems, specific fastener requirements and installation details. Consult the *DCA3 Design for Code Acceptance, Fire Rated Floor Assemblies* by the American Wood Council for sound rating information.
2. All assemblies may also be used in a fire-rated roof/ceiling application, but only when constructed exactly as described.
3. STC and IIC values estimated by David L. Adams Associates, Inc.

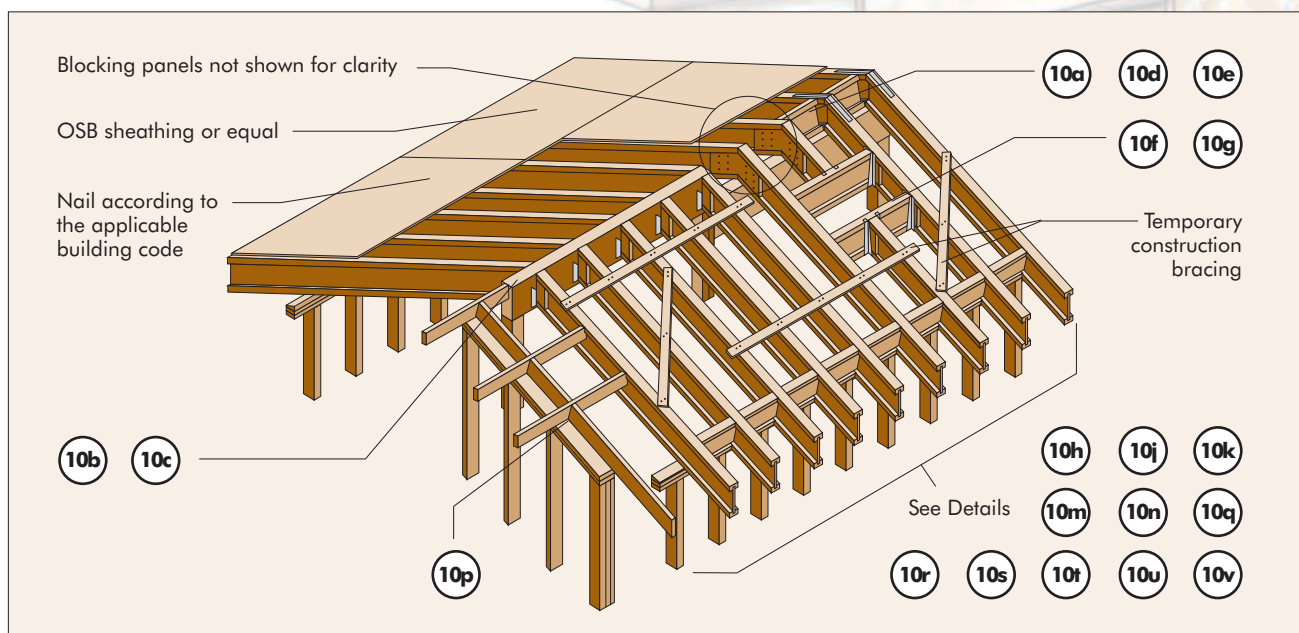
TYPICAL ROOF FRAMING AND CONSTRUCTION DETAILS

INSTALLATION NOTES:

1. Installation of Nordic I-joists shall be as shown in Figure 10.
2. Except for cutting to length, or for providing birdsmouth bearings, I-joist flanges must **not** be cut, drilled, or notched.
3. 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 stiffeners are required at the birdsmouth cut on both sides of the web.
4. When beveled bearing plates are used at I-joist supports, I-joist attachment to the bevel plate must be designed to transfer lateral thrust.
5. 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 must be at least 3-1/2 inches.
6. 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 other similar methods.
7. 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.
8. Figure 10 details on the following pages 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.
9. All roof details are valid up to a 12:12 slope unless otherwise noted.
10. Verify roof ventilation and insulation requirements with applicable building code.
11. Refer to *Typical Floor Framing Installation Notes* and *Safety and Construction Precautions* for additional information.

FIGURE 10

TYPICAL NORDIC I-JOIST ROOF FRAMING AND CONSTRUCTION DETAILS



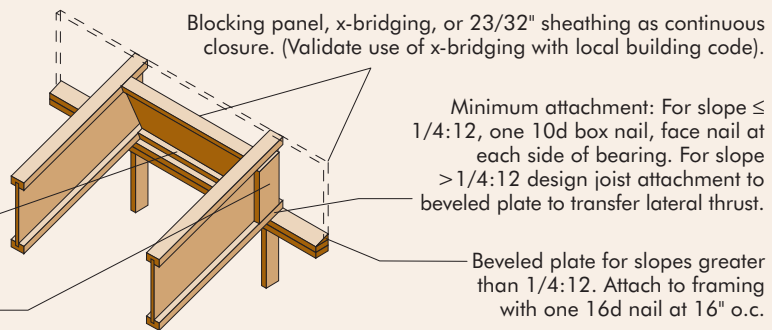


10a UPPER END, BEARING ON WALL

8d nails at 6" o.c. – minimum three 8d nails per blocking panel.
When used for lateral shear transfer, match nail type and sheathing edge nailing ("boundary nailing" for engineered diaphragm applications). Use minimum 8d nails.

Bearing stiffener required when end reaction exceeds 1,550 lbs.

NOTE: Additional connection may be required for wind uplift.

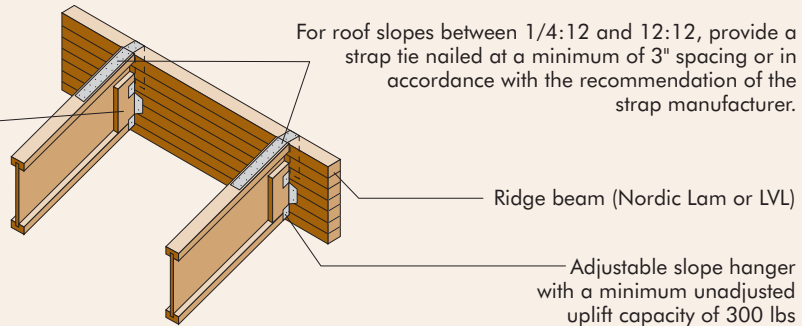


Code-recognized connectors may be substituted. For slopes greater than 4:12, connectors are required to resist lateral thrust.

10b RIDGE CONNECTION

Beveled bearing stiffener required each side

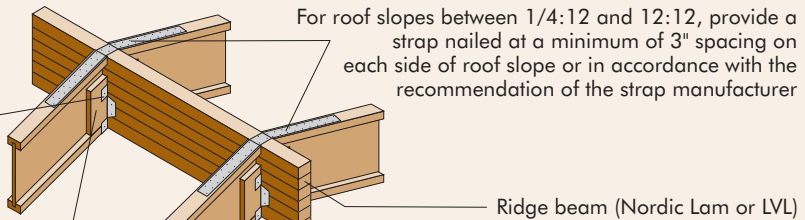
NOTE: Additional connection may be required for wind uplift.



10c I-JOIST TO RIDGE BEAM CONNECTION

Adjustable slope hanger with a minimum unadjusted uplift capacity of 300 lbs

Beveled bearing stiffener required each side

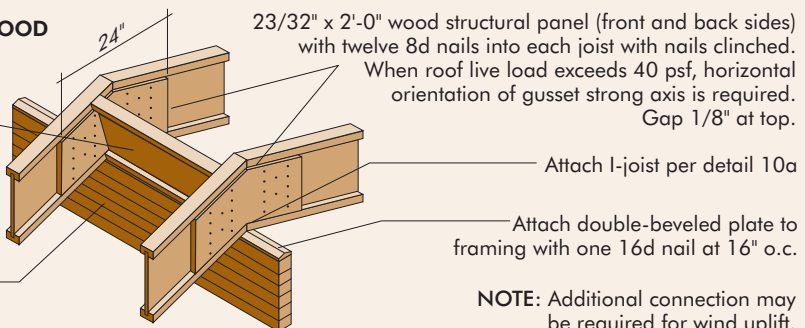


NOTE: Additional connection may be required for wind uplift.

10d I-JOIST CONNECTION WITH WOOD STRUCTURAL PANEL GUSSETS

Blocking panel or x-bridging. Attach per detail 10a.

Support beam or wall



NOTE: Additional connection may be required for wind uplift.

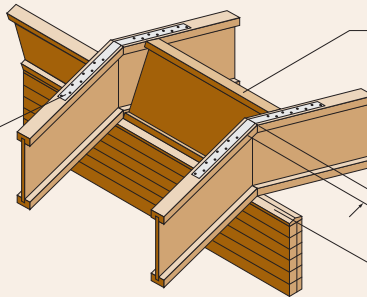
All nails shown in the above details are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common nails (0.131 x 2-1/2 in.) shown in details. Framing lumber assumed to be Utility grade S-P-F (south) or stronger species. Individual components not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

FIGURE 10 continued

TYPICAL NORDIC I-JOIST ROOF FRAMING AND CONSTRUCTION DETAILS

10e I-JOIST CONNECTION WITH TIE STRAP

Tie strap nailed at a minimum of 3" spacing or in accordance with manufacturer's recommendations



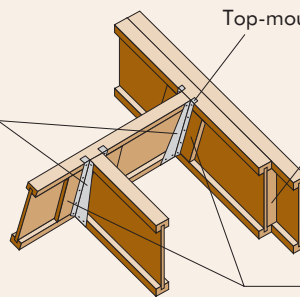
Blocking panel or x-bracing. (Validate use of x-bracing with local building code).

Strap nails: Leave 2-3/8" minimum end distance

Double-beveled bearing plate

10f ROOF OPENING TOP-MOUNT HANGERS

Bearing stiffeners required when hanger does not support I-joist top flange



Top-mount hanger per manufacturer's recommendations

Filler blocking per detail 1p

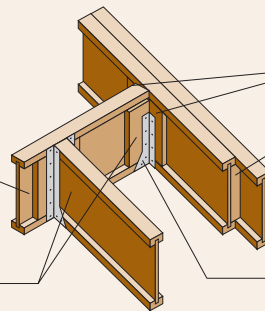
Backer block per detail 1h. If top-mount hanger is fully supported by top flange, backer block only required on hanger side. If face nailing is required, then backer block (filler block if multiple I-joist) is required on both sides.

Nail with twelve 10d nails.

Application limited to 4:12 slope or less

10g ROOF OPENING FACE-MOUNT HANGERS

Header may be I-joist, Nordic Lam, or LVL



Backer block on both sides of web (or backer block and filler block, if multiple I-joists), nail with twelve 10d nails, clinch when possible

Filler blocking per detail 1p

Bearing stiffeners required when hanger does not support I-joist top flange

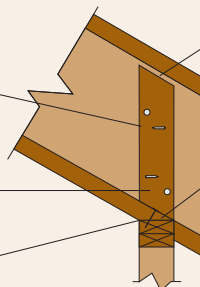
Face-mount hanger per hanger manufacturer's recommendations

10h BIRDSMOUTH CUT & BEVEL CUT BEARING STIFFENER (Permitted on low end of I-joist only)

Bearing stiffeners required each side of I-joist. Bevel-cut bearing stiffener to match roof slope. Install tight to top of bottom flange.

Four 8d nails (two each side) clinched when possible

Birdsmouth cut shall bear fully and not overhang the inside face of plate



1/8" gap at top

One 10d box nail, face nail at each side of bearing (face nail where flange is 7/8" to 1" thick)

NOTE: Additional connection may be required for wind uplift.

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.



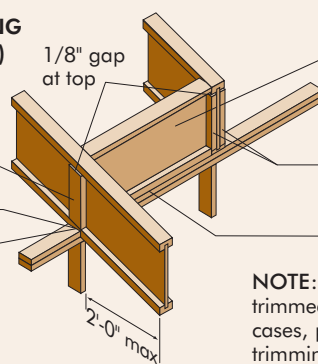
**10j BIRDSMOUTH CUT WITH OVERHANG
(Permitted on low end of I-joist only)**

Bearing stiffener required each side (attach per detail 10h)

Attach joist to top plate per detail 10h

Birdsmouth cut at bearing

NOTE: Additional connection may be required for wind uplift.



Blocking panel or x-briding. (Validate use of x-briding with local building code). See detail 10v for vent holes.

Bearing stiffeners

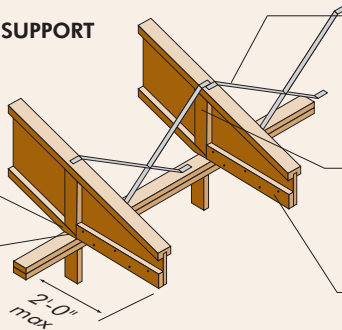
Attach blocking per detail 10a

NOTE: Outside corner of blocking panel may be trimmed if it interferes with roof sheathing. In such cases, position blocking panel on top plate to minimize trimming and still allow required nailing into top plate.

10k I-JOIST OVERHANG FOR FASCIA SUPPORT WITH BIRDSMOUTH CUT

Birdsmouth cut at bearing

Attach joist to top plate per detail 10h



Blocking panel or x-briding. (Validate use of x-briding with local building code).

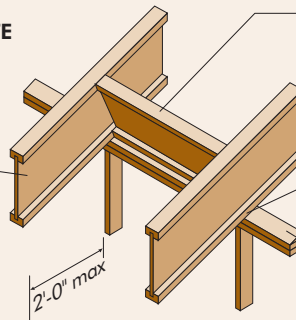
Web stiffener required each side

2x block for fascia support

10m BLOCKING PANEL AT BEVELED PLATE

Overhang

NOTE: Additional connection may be required for wind uplift.



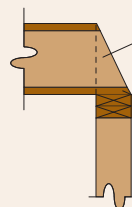
Blocking panel attached per detail 10a. See detail 10v for vent holes.

Attach joist to beveled plate per detail 10a

Beveled plate

10n I-JOIST WITH BEVEL-CUT END

NOTE: Blocking panel or x-briding required at bearing for lateral support, not shown for clarity.



Do not bevel-cut joist beyond inside face of wall

Attach I-joist per detail 10a

NOTE: Additional connection may be required for wind uplift.

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.

FIGURE 10 continued

TYPICAL NORDIC I-JOIST ROOF FRAMING AND CONSTRUCTION DETAILS

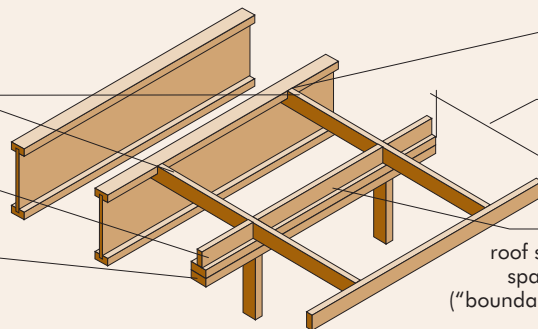
10p OUTRIGGER

Notch 2x outrigger around I-joist flange. Nail through web into outrigger.

Blocking between outriggers

End wall

NOTE: Additional connection may be required for wind uplift.



Do not notch I-joist flange

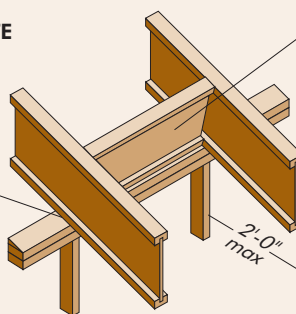
Maximum overhang same as rafter spacing (not to exceed 2'-0")

Toe-nail blocking to end wall for roof sheathing $\leq 5/8"$. Match nail type and spacing with roof sheathing edge nailing ("boundary nailing" for engineered diaphragm applications). Use minimum 8d nails.

10q I-JOIST OVERHANG WITH BEVELED PLATE

Attach joist to beveled plate per detail 10a

NOTE: Additional connection may be required for wind uplift.



Blocking panel attached per detail 10a, or x-bridging. (Validate use of x-bridging with local building code.) See detail 10v for vent holes.

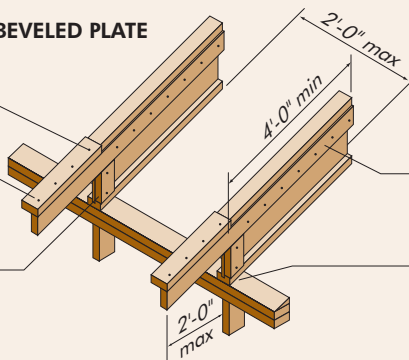
10r LUMBER OVERHANG WITH BEVELED PLATE

8d nails at 6" o.c.

2x filler

2x4 min. beveled bearing block cut to fit

NOTE: Blocking panel or x-bridging not shown for clarity.



2x4 overhang attached to web of I-joist with 1 row of 8d nails at 8" o.c. clinched

Attach I-joist per detail 10a

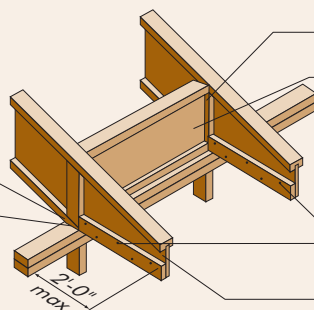
NOTE: Additional connection may be required for wind uplift.

10s I-JOIST OVERHANG FOR FASCIA SUPPORT WITH BIRDSMOUTH CUT

Birdsmouth cut at bearing

Attach I-joist per detail 10h

NOTE: Additional connection may be required for wind uplift.



Bearing stiffener required each side

Blocking panel attached per detail 10a, or x-bridging. (Validate use of x-bridging with local building code.) See detail 10v for vent holes.

8d nails at 6" o.c. clinched

2x block for fascia support

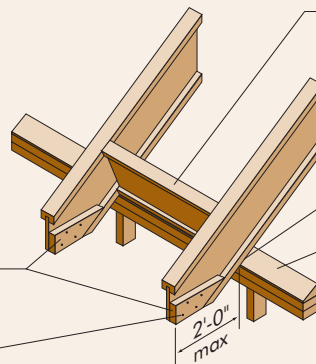
All nails shown in the above details are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common nails (0.131 x 2-1/2 in.) shown in details. Framing lumber assumed to be Utility grade S-P-F (south) or stronger species. Individual components not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

**10i****I-JOIST OVERHANG FOR FASCIA SUPPORT WITH BEVELED PLATE**

OPTION: Variable pitch connectors may be used in lieu of beveled plate.

2x block for fascia support (cut to fit)

Attach per detail 10s



Blocking panel attached per detail 10a, or x-bridging. (Validate use of x-bridging with local building code.) See detail 10v for vent holes.

Attach I-joist per detail 10a

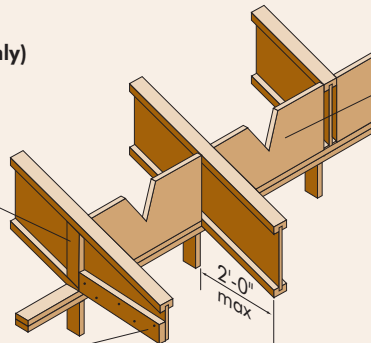
Beveled plate, attach per detail 10a

NOTE: Additional connection may be required for wind uplift.

10u**BIRDSMOUTH CUT (Permitted on low end of I-joist only)**

Beveled web stiffeners required on both sides

2x4 block for soffit support



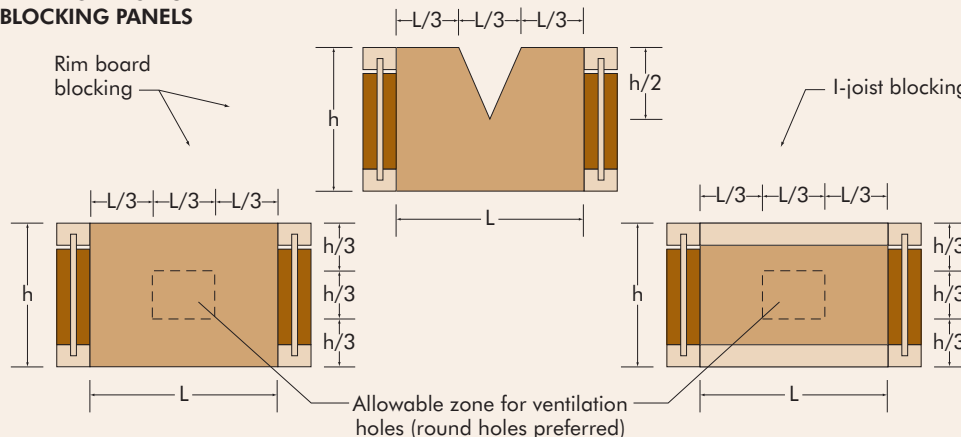
Blocking panel attached per detail 10a. See detail 10v for vent holes.

NOTE: Corrosion-resistant wire cloth screening, hardware cloth, perforated vinyl or similar material shall cover the ventilation holes per code.

10v**VENTILATION HOLES IN BLOCKING PANELS**

Rim board blocking

I-joist blocking

**NOTES:**

- Corrosion-resistant wire cloth screening, hardware cloth, perforated vinyl or similar material shall cover the ventilation holes per code.
- The maximum allowable round hole diameter for a lateral restraint-only blocking panel shall be 2/3 of the lesser dimension of blocking panel depth or length.
- Whenever possible, field-cut holes should be centered in the blocking panel both vertically and horizontally.

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.

FRAMING CONNECTORS

SIMPSON STRONG-TIE CONNECTORS

	JOIST SERIES	JOIST DEPTH	FACE MOUNT					TOP MOUNT				
			Model	Fasteners		Allowable Loads (lbs)		Model	Fasteners		Allowable Loads (lbs)	
				Header	Joist	Uplift (160)	Floor (100)		Header	Joist	Uplift (160)	Floor (100)
SINGLE JOISTS	NI-20	9-1/2"	IUS2.56/9.5	8-10d	-	60	810	ITS2.56/9.5	6-10d	-	90	1150
	NI-40x	11-7/8"	IUS2.56/11.88	10-10d	-	60	1010	ITS2.56/11.88	6-10d	-	90	1150
	NI-60	14"	IUS2.56/14	12-10d	-	60	1210	ITS2.56/14	6-10d	-	90	1150
		16"	IUS2.56/16	14-10d	-	60	1415	ITS2.56/16	6-10d	-	90	1150
	NI-70	9-1/2"	IUS3.56/9.5	8-10d	-	60	1010	ITS3.56/9.5	6-10d	-	90	1150
	NI-80	11-7/8"	IUS3.56/11.88	10-10d	-	60	1210	ITS3.56/11.88	6-10d	-	90	1150
DOUBLE JOISTS	NI-20	9-1/2"	MIU5.12/9	16-16d	2-10d x 1-1/2	195	1970	MIT39.5-2	8-16d	2-10d x 1-1/2	185	1665
	NI-40x	11-7/8"	MIU5.12/11	20-16d	2-10d x 1-1/2	195	2460	MIT311.88-2	8-16d	2-10d x 1-1/2	185	1665
	NI-60	14"	MIU5.12/14	22-16d	2-10d x 1-1/2	195	2705	MIT314-2	8-16d	2-10d x 1-1/2	185	1665
		16"	MIU5.12/16	24-16d	2-10d x 1-1/2	195	2950	MIT5.12/16	8-16d	2-10d x 1-1/2	185	1665
	NI-70	9-1/2"	HU410-2	14-16d	6-16d	1105	1625	B7.12/9.5	14-16d	6-16d	865	2650
	NI-80	11-7/8"	HU412-2	16-16d	6-16d	1105	1855	B7.12/11.88	14-16d	6-16d	865	2650
DOUBLE JOISTS	NI-20	9-1/2"	MIU5.12/9	16-16d	2-10d x 1-1/2	195	1970	MIT39.5-2	8-16d	2-10d x 1-1/2	185	1665
	NI-40x	11-7/8"	MIU5.12/11	20-16d	2-10d x 1-1/2	195	2460	MIT311.88-2	8-16d	2-10d x 1-1/2	185	1665
	NI-60	14"	MIU5.12/14	22-16d	2-10d x 1-1/2	195	2705	MIT314-2	8-16d	2-10d x 1-1/2	185	1665
		16"	MIU5.12/16	24-16d	2-10d x 1-1/2	195	2950	MIT5.12/16	8-16d	2-10d x 1-1/2	185	1665
	NI-70	9-1/2"	HU410-2	14-16d	6-16d	1105	1625	B7.12/9.5	14-16d	6-16d	865	2650
	NI-80	11-7/8"	HU412-2	16-16d	6-16d	1105	1855	B7.12/11.88	14-16d	6-16d	865	2650

	JOIST SERIES	JOIST DEPTH	FIELD SLOPE & SKEW					45° SKEW				
			Model	Fasteners		Allowable Loads (lbs)		Model	Fasteners		Allowable Loads (lbs)	
				Header	Joist	Uplift (160)	Floor (100)		Header	Joist	Uplift (160)	Floor (100)
SINGLE JOISTS	NI-20	9-1/2"	LSSUH310	18-16d	12-10d x 1-1/2	990	1930	SUR/L2.56/9	14-16d	2-10d x 1-1/2	180	1735
	NI-40x	11-7/8"	LSSUH310	18-16d	12-10d x 1-1/2	990	1930	SUR/L2.56/11	16-16d	2-10d x 1-1/2	180	1980
	NI-60	14"	LSSUH310	18-16d	12-10d x 1-1/2	990	1930	SUR/L2.56/14	18-16d	2-10d x 1-1/2	180	2225
		16"	LSSUH310	18-16d	12-10d x 1-1/2	990	1930	SUR/L2.56/16	18-16d	2-10d x 1-1/2	180	2225
	NI-70	9-1/2"	LSSUH410	18-16d	12-10d x 1-1/2	990	2160	SUR/L410	14-16d	6-16d	920	1610
	NI-80	11-7/8"	LSSUH410	18-16d	12-10d x 1-1/2	990	2160	SUR/L410	14-16d	6-16d	920	1610
DOUBLE JOISTS	NI-20	9-1/2"	Refer to Wood Construction Connectors catalog for hanger selection					HSUR/L5.12/9	12-16d	2-10d x 1-1/2	120	1440
	NI-40x	11-7/8"	LSU5.12	24-16d	16-10d x1-1/2	760	1550	HSUR/L5.12/11	16-16d	2-10d x 1-1/2	120	1920
	NI-60	14"	LSU5.12	24-16d	16-10d x1-1/2	760	1550	HSUR/L5.12/14	20-16d	2-10d x 1-1/2	120	2400
		16"	LSU5.12	24-16d	16-10d x1-1/2	760	1550	HSUR/L5.12/16	24-16d	2-10d x 1-1/2	120	2410
	NI-70	9-1/2"	Refer to Wood Construction Connectors catalog for hanger selection									
	NI-80	11-7/8"	Refer to Wood Construction Connectors catalog for hanger selection									

NOTES:

- Support material assumed to be Nordic Lam or sawn lumber (Douglas Fir-Larch, Southern Pine or Spruce-Pine-Fir species).
- Loads may not be increased for short-term loading. Uplift loads have been increased 60% for wind loading with no further increase allowed. Divide by 1.6 for normal loading applications such as cantilever construction.
- Shaded hangers require web stiffeners. Web stiffeners may be required by others for non-shaded hangers.
- Leave 1/16" (1/8" maximum) clearance between the end of the supported joist and the header or hanger.
- When I-joist is used as header, all nails must be 10d x 1-1/2. Refer to *Wood Construction Connectors* catalog for allowable loads.
- To verify connector suitability for a specific application, refer to *Wood Construction Connectors* catalog, or visit www.strongtie.com.



IUS



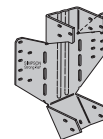
MIU



ITS



MIT



LSSU



SUL



USP STRUCTURAL CONNECTORS

	JOIST SERIES	JOIST DEPTH	FACE MOUNT					TOP MOUNT				
			Model	Fasteners		Allowable Loads (lbs)		Model	Fasteners		Allowable Loads (lbs)	
				Header	Joist	Uplift (160)	Floor (100)		Header	Joist	Uplift (160)	Floor (100)
SINGLE JOISTS	NI-20	9-1/2"	THF25925	12-10d	2-10d x 1-1/2	175	1175	TFL2595	6-10d	2-10d x 1-1/2	360	1230
	NI-40x	11-7/8"	THF25112	14-10d	2-10d x 1-1/2	360	1370	TFL25118	6-10d	2-10d x 1-1/2	360	1230
	NI-60	14"	THF25140	18-10d	2-10d x 1-1/2	360	1800	TFL2514	6-10d	2-10d x 1-1/2	360	1230
	NI-60	16"	THF25160	22-10d	2-10d x 1-1/2	360	2200	TFL2516	6-10d	2-10d x 1-1/2	360	1230
	NI-70	9-1/2"	THF35925	12-10d	2-10d x 1-1/2	245	1175	THO35950	10-10d	2-10d x 1-1/2	360	2050
	NI-80	11-7/8"	THF35112	16-10d	2-10d x 1-1/2	245	1570	THO35118	10-10d	2-10d x 1-1/2	360	2050
DOUBLE JOISTS	NI-40x	14"	THF35140	20-10d	2-10d x 1-1/2	245	2000	THO35140	12-10d	2-10d x 1-1/2	360	2100
	NI-90x	16"	THF35157	22-10d	2-10d x 1-1/2	245	2200	THO35610	12-10d	2-10d x 1-1/2	360	2100
	NI-20	9-1/2"	THF25925-2	12-10d	6-10d	1115	1200	THO25950-2	10-16d	6-10d	1175	3000
	NI-40x	11-7/8"	THF25112-2	16-10d	6-10d	1115	1600	THO25118-2	10-16d	6-10d	1175	3000
	NI-60	14"	THF25140-2	20-10d	6-10d	1200	2180	THO25140-2	12-16d	6-10d	1175	3300
	NI-60	16"	THF25160-2	24-10d	6-10d	1200	2615	THO25160-2	12-16d	6-10d	1175	3300
DOUBLE JOISTS	NI-70	9-1/2"	HD7100	12-16d	6-10d	1130	1450	BPH7195	10-16d	6-10d	1200	3280
	NI-80	11-7/8"	HD7120	16-16d	6-10d	1130	1935	BPH71118	10-16d	6-10d	1200	3280
	NI-80	14"	HD7140	20-16d	8-10d	1510	2420	BPH7114	10-16d	6-10d	1200	3280
	NI-90x	16"	HD7160	24-16d	8-10d	1510	2905	BPH7116	10-16d	6-10d	1200	3280

	JOIST SERIES	JOIST DEPTH	FIELD SLOPE & SKEW					45° SKEW				
			Model	Fasteners		Allowable Loads (lbs)		Model	Fasteners		Allowable Loads (lbs)	
				Header	Joist	Uplift (160)	Floor (100)		Header	Joist	Uplift (160)	Floor (100)
SINGLE JOISTS	NI-20	9-1/2"	LSSH25	14-16d	12-10d x 1-1/2	1195	1665	SKH2520L/R	14-10d	10-10d x 1-1/2	1550	1400
	NI-40x	11-7/8"	LSSH25	14-16d	12-10d x 1-1/2	1195	1665	SKH2520L/R	14-10d	10-10d x 1-1/2	1550	1400
	NI-60	14"	LSSH25	14-16d	12-10d x 1-1/2	1195	1665	SKH2524L/R	16-10d	10-10d x 1-1/2	1550	1600
	NI-60	16"	LSSH25	14-16d	12-10d x 1-1/2	1195	1665	SKH2524L/R	16-10d	10-10d x 1-1/2	1550	1600
	NI-70	9-1/2"	LSSH35	14-16d	12-10d x 1-1/2	1585	1665	*SKH410L/R	16-16d	10-16d	1565	1935
	NI-80	11-7/8"	LSSH35	14-16d	12-10d x 1-1/2	1585	1665	*SKH410L/R	16-16d	10-16d	1565	1935
DOUBLE JOISTS	NI-40x	14"	LSSH35	14-16d	12-10d x 1-1/2	1585	1665	*SKH414L/R	22-16d	10-16d	1565	2660
	NI-90x	16"	LSSH35	14-16d	12-10d x 1-1/2	1585	1665	*SKH414L/R	22-16d	10-16d	1565	2660
	NI-20	9-1/2"	Refer to EWP Product Guide for hanger selection					*SKH2520L/R-2	14-10d	10-10d	1630	1430
	NI-40x	11-7/8"						*SKH2520L/R-2	14-10d	10-10d	1630	1430
	NI-60	14"						*SKH2524L/R-2	16-10d	10-10d	1630	1630
	NI-60	16"						*SKH2524L/R-2	16-10d	10-10d	1630	1630
DOUBLE JOISTS	NI-70	9-1/2"	Refer to EWP Product Guide for hanger selection					Refer to EWP Product Guide for hanger selection				
	NI-80	11-7/8"										
	NI-80	14"										
	NI-90x	16"										

NOTES:

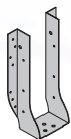
- Support material assumed to be Nordic Lam or sawn lumber (Douglas Fir-Larch, Southern Pine or Spruce-Pine-Fir species).
- Loads may not be increased for short-term loading. Uplift loads have been increased 60% for wind loading with no further increase allowed. Divide by 1.6 for normal loading applications such as in cantilever construction.
- Shaded hangers require web stiffeners. Web stiffeners may be required by others for non-shaded hangers.
- Leave 1/16" (1/8" maximum) clearance between the end of the supported joist and the header or hanger.
- When I-joist is used as header, all nails must be 10d x 1-1/2. Refer to EWP Product Guide for allowable loads.
- To verify connector suitability for a specific application, refer to the EWP Product Guide, or visit www.USPconnectors.com.

* Miter cut required on end of joist to achieve design loads.

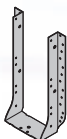
USP
Structural
Connectors™
A GIBALTAR COMPANY



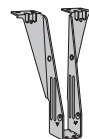
THF



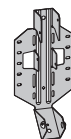
THF-Double



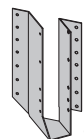
HD



THO



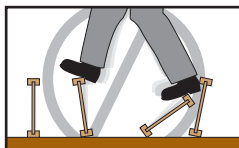
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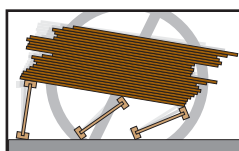
SKH_R

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.

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

Avoid Accidents by Following these Important Guidelines:

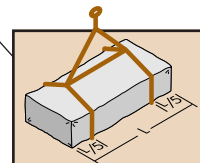
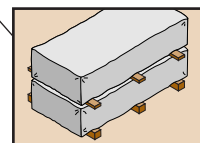
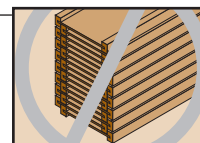
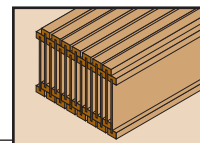
1. Brace and nail each I-joist as it is installed, using hangers, blocking panels, rim board, and/or cross-bridging at joist ends.
2. When the building is completed, the floor sheathing will provide lateral support for the top flanges of the I-joists. Until this sheathing is applied, temporary bracing, 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 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 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

1. Bundle wrap can be slippery when wet. Avoid walking on wrapped bundles.
2. Store I-joists vertically, level, and in bundles.
3. Always stack and handle I-joists in the upright position only.
4. Do not store I-joists in direct contact with the ground.
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 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.
8. Do not handle I-joists in a horizontal orientation.
9. NEVER USE OR FIELD REPAIR A DAMAGED I-JOIST.





SOFTWARE

Nordic I-PLAN™

Reduce design time, save money and decrease jobsite waste with an integrated, user-friendly software program from Nordic.

Nordic I-Plan™ is an analysis and design tool that provides detailed structural framing layouts with high precision and expediency. As a valued Nordic customer, your focus is on profitability. Nordic's single interface design software provides accurate take-offs while minimizing input time.

Nordic I-Plan™ will help you achieve residential and commercial projects on time and on budget with real cost estimates and pricing levels. From component sizing to multi-level framing systems, Nordic I-Plan™ can help builders manage and control expenses through improved construction efficiency. For example, material waste can be reduced by accounting for all building components required for specific structures.

Nordic I-Plan™ will deliver reliable design solutions with the quality and speed that today's competitive market demands.

Characteristics and Features:

- Full EWP/Hangers/Sheathing Database
- Member Sizing and Optimization
- DXF Files Import and Export
- Detailed Layout Drawings
- Material List and Quotation
- Easy to Use Menu-Driven Program

Woodworks® Sizer

WoodWorks® Sizer is a software program that can be used to design entire structures or single members (joists, beams, columns and studs) using the full range of engineered wood products: glulam, prefabricated wood I-joists, and structural composite lumber.

For sizing wood beams:

- Automatically patterns live loads for multiple span beams
- Beams may be horizontal, sloped or have an oblique angle
- Specify deflection limits, lateral bracing, and notch dimensions
- A suggested list of sections can be generated if section properties are unknown
- Analyzes and designs columns and studs in load-bearing applications

Nordic Inventory/Management Software

Nordic Inventory Management Software is a full featured inventory management and cut optimization program that enables users to keep track of their inventory and increase productivity and profitability by reducing wasted material.

- Inventory Management
- Order Process Management
- Reports for Inventory, Purchase Orders, Job Processing, Cutting, etc.
- Import material lists from KeyPlan™
- Cut Optimization with User Preferences
- Multi-User Interface

DEAD LOAD

MATERIAL WEIGHTS

DEAD LOAD MATERIAL WEIGHTS (psf)

MATERIAL (psf)	MATERIAL (psf)	MATERIAL (psf)
SHEATHING AND DECKING	COVERINGS (continued)	FRAME PARTITIONS
OSB, 3/8-in. 1.4	Gypsum sheathing, 1/2-in. 2.0	Wood or steel studs, 1/2-in. gypsum board each side 8
OSB, 7/16-in. 1.6	Skylight, metal frame, 3/8-in. glass 8.0	Wood studs, 2 x 4, unplastered 4
OSB, 1/2-in. 1.9	Waterproofing membranes:	plastered one side 12
OSB, 19/32-in. 2.2	Bituminous, gravel-covered 5.5	plastered two sides 20
OSB, 23/32-in. 2.7	Bituminous, smooth surface 1.5	
Plywood, 11/32-in. 1.1	Liquid applied 1.0	
Plywood, 15/32-in. 1.5	Single-ply, sheet 0.7	
Plywood, 19/32-in. 1.9		FRAME WALLS
Plywood, 23/32-in. 2.3	FLOOR FILL	Exterior stud walls:
Plywood, 1-1/8-in. 3.6	Gyp-crete, 3/4" 6.3	2 x 4 at 16-in., 5/8-in. gypsum, insulated, 3/8-in. siding 11
Metal deck, 20 gage 2.5	Lightweight concrete, 1-1/2" 12	2 x 6 at 16-in., 5/8-in. gypsum, insulated, 3/8-in. siding 12
Metal deck, 18 gage 3.0	Stone concrete, 1-1/2" 18	Exterior stud walls with brick veneer 48
Wood decking, 1-in. 3.0		Windows, glass, frame and sash 8
Wood decking, 2-in. 5.0	FLOOR FINISHES	
Wood decking, 3-in. 8.0	Carpet and pad 2.0	NOTE: Wall weights in pounds per square foot of wall. Multiply weight times wall height for pounds per linear foot (plf).
CEILINGS	Ceramic or quarry tile (3/4-in.) on 1/2-in. mortar bed 16 on 1-in. mortar bed 23	INSULATION (per inch thickness)
Gypsum board, 1/2-in. 2.2	Hardwood, nominal 1-in. 4.0	Cellular glass 0.7
Gypsum board, 5/8-in. 2.8	Linoleum or asphalt tile, 1/4-in. 1.0	Fibrous glass 1.1
Mechanical duct allowance 4.0	Marble and mortar on stone-concrete fill 33	Fiberboard 1.5
Plaster on wood lath 8.0	Slate (per inch thickness) 15	Perlite 0.8
Suspended steel channel system 2.0	Subflooring, 3/4-in. 3.0	Polystyrene foam 0.2
Wood furring suspension system 2.5		Rigid insulation 1.5
COVERINGS	FLOORS (12-in. spacing)	Urethane foam with skin 0.5
Asbestos-cement shingles 4.0	2 x 4 1.4	
Asphalt shingles 2.0	2 x 6 2.1	
Wood shingles 3.0	2 x 8 2.8	
Cement tile 16	2 x 10 3.6	
Clay tile (for mortar add 10 psf)	2 x 12 4.3	
Minimum 10	NI joist 2.20 - 3.95	
Spanish 19		
Composition:	NOTES:	
3-ply ready roofing 1.0	- See page 7 for I-joist weight/linear foot	
4-ply felt and gravel 5.5	- For 16-in. spacing, divide by 1.33	
5-ply felt and gravel 6.0	- For 19.2-in. spacing, divide by 1.6	
	- For 24-in. spacing, divide by 2	

NOTES:

1. Estimated material weights in pounds per square foot (psf).
2. Wood decking and 2x lumber weight based on Douglas Fir.
3. Adding 1.0 to 2.0 psf is recommended for miscellaneous dead loads.
4. For additional information, refer to *Minimum Design Loads for Buildings and Other Structures*, ASCE Standard 7-05, Tables C3-1 and C3-2.



CONVERSION FACTORS

CONVERSION FACTORS

ITEM	IMPERIAL – SI	SI – IMPERIAL
LENGTH	1 in. = 25.4 mm = 0.0254 m 1 ft = 0.3048 m 1 yd = 0.9144 m 1 mile = 1.60934 km	1 mm = 0.0393701 in. 1 m = 39.3701 in. = 3.28084 ft = 1.09361 yd 1 km = 0.621371 mile
LENGTH / TIME	1 ft/s = 0.3048 m/s 1 mph = 1.60934 km/h	1 m/s = 3.28084 ft/s 1 km/h = 0.621371 mph
AREA	1 in. ² = 645.16 mm ² 1 ft ² = 0.0929030 m ² 1 acre = 0.404686 ha 1 mi ² = 2.58999 km ²	1 mm ² = 0.001550 in. ² 1 m ² = 10.7639 ft ² 1 ha = 2.47105 acres 1 km ² = 0.386102 mi ²
VOLUME	1 in. ³ = 16387.1 mm ³ 1 ft ³ = 0.0283168 m ³ 1 yd ³ = 0.764555 m ³ 1 fl oz = 28.4131 ml 1 gal = 4.54609 l	1 mm ³ = 0.0000610237 in. ³ 1 m ³ = 35.3147 ft ³ = 1.30795 yd ³ 1 ml = 0.0351951 fl oz 1 l = 0.219969 gal
MASS	1 oz = 28.3495 g 1 lb = 0.453592 kg 1 ton = 0.907185 Mg 1 lb = 0.00045391 Mg	1 g = 0.0352740 oz 1 kg = 2.20462 lb 1 Mg = 1.10231 ton = 2204.62 lb
MASS / VOLUME	1 lb/ft ³ = 16.1085 kg/m ³	1 kg/m ³ = 0.0622480 lb/ft ³
FORCE	1 lb = 4.44822 N	1 N = 0.224809 lb
STRESS	1 lb/in. ² = 0.00689476 MPa	1 MPa = 145.038 lb/in. ²
LOADING	1 lb/ft ² = 0.0478803 kN/m ² 1 lb/ft = 0.0145939 kN/m	1 kN/m ² = 20.8854 lb/ft ² 1 kN/m = 68.5218 lb/ft
MOMENT	1 lb-ft = 0.00135582 kN-m	1 kN-m = 737.562 lb-ft
TEMPERATURE	1 °F = (°F-32) / 1.8 °C	1 °C = 32 + 1.8 (°C) °F

NOTES:

1. 9.80665 Newtons = 1.0 kilogram x 9.80665 m/s²
2. 1.0 Pascal = 1.0 Newton per square meter

PRODUCT WARRANTY

PRODUCT WARRANTY



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.

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Only FSC

- prohibits conversion of natural forests or other habitat around the world
- prohibits the use of highly hazardous pesticides around the world
- respects human rights with particular attention to indigenous peoples
- is the only forest *certification system* that is supported by all major environmental groups.
- identifies areas that need special protection (e.g. cultural or sacred sites, habitats of endangered animals or plants).

But most importantly only FSC reviews each certified operation *at least* once a year – and if they are found not to comply, the certificate is withdrawn.

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