NORDIC ENGINEERED WOOD

RESIDENTIAL DESIGN

CONSTRUCTION GUIDE

NORDIC JOIST™

NORDIC ENGINEERED WOOD

FSC-CERTIFIED PRODUCTS AVAILABLE

FSC www.fsc.org

The mark of responsible forestry

FSC® C011517

NORDIC
ENGINEERED WOOD

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 (CCL) has achieved FSC certification, 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. 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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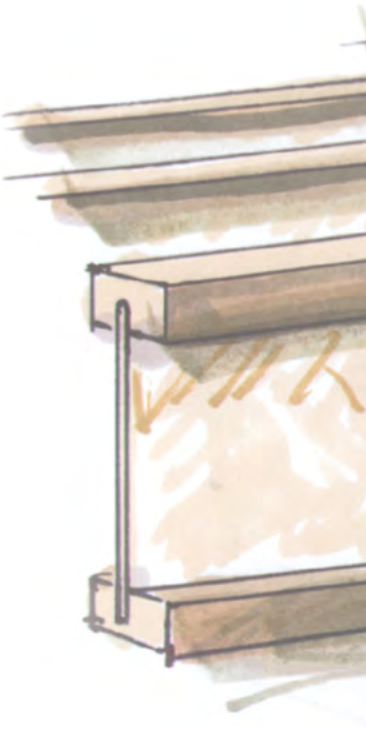
What makes Nordic I-joist better than other I's

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.



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

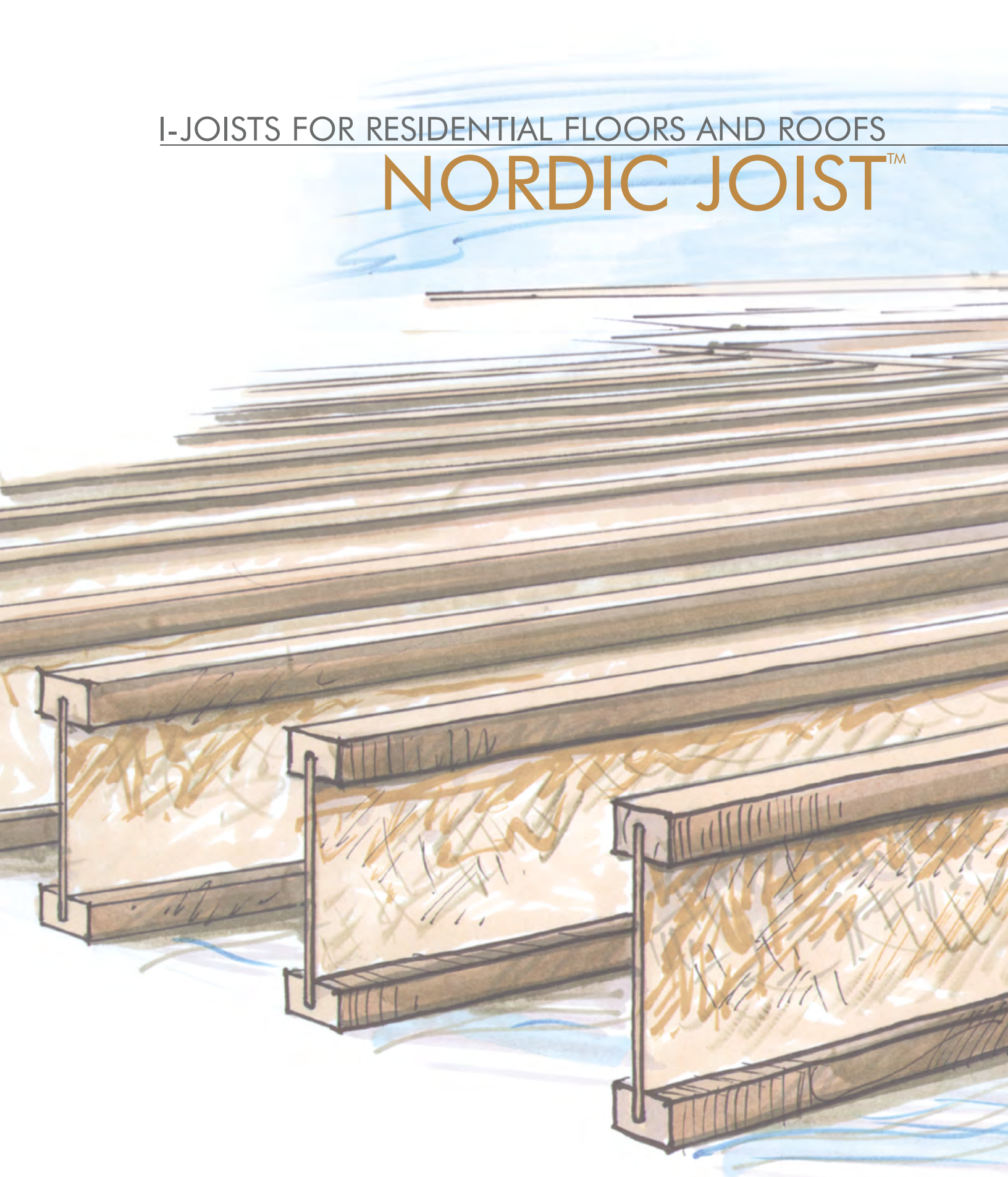
Rigorous manufacturing and product inspections occur on a strict schedule, ensuring the most consistent product available. Adherence to quality control practices is more than a formality.

Third-Party Inspection Services

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

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.

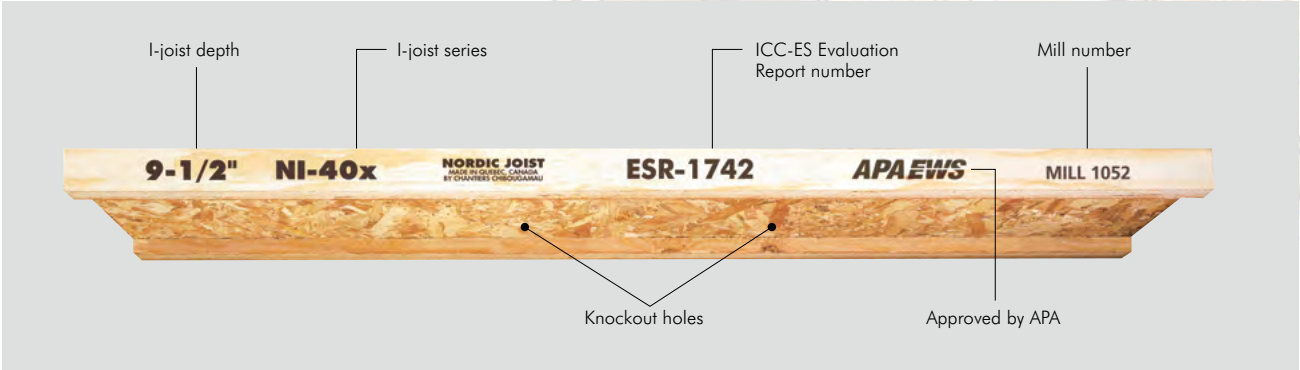
Lightweight – Because I-joists typically weigh less than half as much as comparable conventional lumber joists, they can be installed quickly and efficiently.

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.

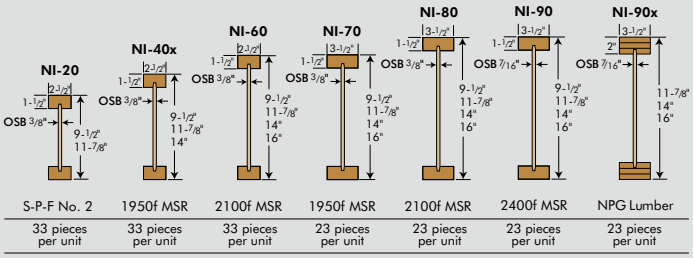
NORDIC JOIST™



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_r[d] (lbf-ft)	V_r[e] (lbf)	IR_r[f] (lbf)	IR_r[f] w/ BS (lbf)	IR_r[f] (lbf)	IR_r[f] w/ BS (lbf)	ER_r[g] (lbf)	ER_r[g] w/ BS (lbf)	ER_r[g] (lbf)	ER_r[g] w/ BS (lbf)	K[h] (10^6 lbf)	WEIGHT (plf)
					3-1/2-in BEARING		5-1/2-in BEARING		1-3/4-in BEARING		4-in BEARING			
9-1/2"	NI-20	145	2590	1120	2410	2425	2575	2575	1035	1035	1120	1120	4.94	2.55
	NI-40x	218	2900	1200	2410	2425	2630	2645	1175	1200	1200	1200	4.94	2.65
	NI-60	231	3810	1200	2415	2440	2635	2665	1175	1200	1200	1200	4.94	2.78
	NI-70	304	5120	1200	2415	2670	2685	2685	1200	1200	1200	1200	4.94	3.27
	NI-80	324	5385	1200	2415	2670	2685	2685	1200	1200	1200	1200	4.94	3.27
11-7/8"	NI-20	253	3355	1420	3000	3030	3215	3215	1245	1245	1420	1420	6.18	2.85
	NI-40x	371	3760	1480	3000	3030	3540	3575	1275	1480	1480	1480	6.18	2.85
	NI-60	396	4935	1480	3005	3070	3550	3625	1275	1480	1480	1480	6.18	2.99
	NI-70	515	6635	1480	3005	3330	3670	3670	1350	1480	1480	1480	6.18	3.45
	NI-80	547	6980	1480	3005	3330	3670	3670	1350	1480	1480	1480	6.18	3.45
	NI-90	601	8780	1925	3355	3355	3670	3670	1400	1480	1885	1925	6.18	3.45
	NI-90x	615	9465	2055	4170	4170	4170	4170	1765	2055	1885	2055	6.18	4.43
14"	NI-40x	540	4530	1730	3130	3160	3530	3565	1325	1690	1550	1730	7.28	3.00
	NI-60	584	5945	1730	3140	3260	3540	3795	1345	1690	1550	1730	7.28	3.15
	NI-70	749	7990	1730	3330	3640	3820	4075	1455	1690	1550	1730	7.28	3.75
	NI-80	802	8405	1730	3330	3640	3820	4075	1455	1690	1550	1730	7.28	3.75
	NI-90	877	10570	2125	3355	3640	3820	4075	1455	1690	1885	2125	7.28	3.75
	NI-90x	910	11415	2210	4170	4170	4170	4170	1800	2210	1885	2210	7.28	4.73
16"	NI-40x	734	5250	1970	3255	3285	3520	3555	1370	1875	1550	1970	8.32	3.30
	NI-60	799	6895	1970	3265	3440	3530	3955	1410	1875	1550	1970	8.32	3.46
	NI-70	1015	9265	1970	3640	3930	3960	4455	1550	1875	1550	1970	8.32	3.95
	NI-80	1092	9745	1970	3640	3930	3960	4455	1550	1875	1550	1970	8.32	3.95
	NI-90	1187	12260	2330	3640	3930	3960	4455	1550	1875	1885	2330	8.32	3.95
	NI-90x	1245	13100	2325	4170	4170	4170	4170	1830	2325	1885	2325	8.32	4.93

For SI: 1 lbf = 4.448 N, 1 lbf-ft = 1.356 N-m, 1 lbf-in^2 = 0.00287 N-m^2, 1 inch = 25.4 mm.

(a) The tabulated values are design values for normal duration of load. All values, except for EI and K, may be adjusted for other load durations as permitted by the code.

(b) The maximum vertical linear load capacity for the I-joist without load or bearing stiffeners is 2,000 lbf/ft.

(c) Bending stiffness (EI) of the I-joist.

(d) Moment capacity (M_r) of the I-joist, which shall not be increased by any code repetitive member use factor.

(e) Shear capacity (V_r) of the I-joist.

(f) Intermediate reaction (IR_r) of the I-joist with and without bearing stiffeners (BS). Minimum required bearing lengths as indicated. Interpolation of the end reaction between 3-1/2 and 5-1/2-inch bearing is permitted.

(g) End reaction (ER_r) of the I-joist with and without bearing stiffeners (BS). Minimum required bearing lengths as indicated. Interpolation of the end reaction between 1-3/4 and 4-inch bearing is permitted.

(h) 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.

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

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 ON CENTER SPACING				MULTIPLE SPANS ON CENTER SPACING			
		12"	16"	19.2	24"	12"	16"	19.2"	24"
9-1/2"	NI-20	16'-7"	15'-3"	14'-5"	13'-6"	18'-1"	16'-7"	15'-8"	14'-2"
	NI-40x	18'-8"	17'-0"	16'-1"	15'-0"	20'-4"	18'-5"	16'-10"	15'-0"
	NI-60	18'-11"	17'-4"	16'-4"	15'-3"	20'-8"	18'-10"	17'-9"	16'-7"
	NI-70	20'-6"	18'-9"	17'-8"	16'-5"	22'-4"	20'-4"	19'-2"	17'-10"
	NI-80	20'-11"	19'-1"	18'-0"	16'-9"	22'-9"	20'-9"	19'-6"	18'-2"
11-7/8"	NI-20	19'-11"	18'-3"	17'-3"	16'-1"	21'-8"	19'-10"	17'-9"	16'-2"
	NI-40x	22'-2"	20'-3"	19'-2"	17'-2"	24'-2"	21'-0"	19'-2"	17'-1"
	NI-60	22'-8"	20'-8"	19'-6"	18'-2"	24'-8"	22'-6"	21'-2"	19'-8"
	NI-70	24'-5"	22'-3"	21'-0"	19'-7"	26'-8"	24'-3"	22'-10"	21'-3"
	NI-80	24'-11"	22'-8"	21'-4"	19'-11"	27'-1"	24'-8"	23'-3"	21'-7"
	NI-90	25'-7"	23'-3"	21'-11"	20'-5"	27'-10"	25'-4"	23'-10"	22'-2"
	NI-90x	25'-9"	23'-6"	22'-1"	20'-7"	28'-1"	25'-6"	24'-1"	22'-4"
14"	NI-40x	25'-2"	22'-11"	21'-2"	18'-11"	26'-8"	23'-1"	21'-1"	18'-10"
	NI-60	25'-9"	23'-6"	22'-2"	20'-8"	28'-0"	25'-7"	24'-1"	21'-7"
	NI-70	27'-8"	25'-3"	23'-9"	22'-2"	30'-2"	27'-6"	25'-10"	24'-1"
	NI-80	28'-3"	25'-9"	24'-3"	22'-7"	30'-10"	28'-0"	26'-5"	24'-6"
	NI-90	29'-0"	26'-5"	24'-10"	23'-1"	31'-7"	28'-9"	27'-1"	25'-2"
	NI-90x	29'-4"	26'-9"	25'-2"	23'-5"	32'-0"	29'-1"	27'-5"	25'-5"
16"	NI-60	28'-6"	26'-0"	24'-7"	22'-10"	31'-1"	28'-4"	26'-0"	23'-3"
	NI-70	30'-8"	27'-11"	26'-4"	24'-6"	33'-5"	30'-5"	27'-3"	26'-7"
	NI-80	31'-4"	28'-6"	26'-10"	25'-0"	34'-2"	31'-1"	29'-3"	27'-2"
	NI-90	32'-1"	29'-2"	27'-6"	25'-7"	35'-0"	31'-10"	29'-11"	27'-10"
	NI-90x	32'-7"	29'-8"	27'-11"	26'-0"	35'-6"	32'-3"	30'-5"	28'-3"

ALLOWABLE FLOOR SPANS — Live Load = 40 psf, Dead Load = 10 psf
LIVE LOAD DEFLECTION LIMIT OF L/360

JOIST DEPTH	JOIST SERIES	SIMPLE SPANS ON CENTER SPACING				MULTIPLE SPANS 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"	14'-2"
	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"	19'-0"
	NI-80	23'-2"	21'-1"	19'-11"	18'-7"	25'-3"	23'-0"	21'-8"	19'-0"
11-7/8"	NI-20	22'-0"	19'-11"	18'-2"	16'-3"	22'-11"	19'-10"	18'-1"	16'-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"	22'-10"
	NI-80	27'-6"	25'-1"	23'-8"	22'-1"	30'-0"	27'-4"	25'-9"	23'-5"
	NI-90	28'-4"	25'-10"	24'-4"	22'-8"	30'-10"	28'-1"	26'-6"	24'-8"
	NI-90x	28'-6"	26'-0"	24'-6"	22'-10"	31'-1"	28'-4"	26'-8"	24'-10"
14"	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"	28'-1"	25'-1"
	NI-80	31'-3"	28'-6"	26'-10"	25'-0"	34'-1"	31'-1"	28'-9"	25'-9"
	NI-90	32'-1"	29'-3"	27'-7"	25'-8"	35'-0"	31'-10"	30'-0"	26'-7"
	NI-90x	32'-6"	29'-7"	27'-11"	26'-0"	35'-5"	32'-3"	30'-5"	28'-3"
16"	NI-60	31'-6"	28'-7"	26'-1"	23'-4"	33'-0"	28'-7"	26'-0"	23'-3"
	NI-70	33'-11"	30'-11"	29'-2"	27'-1"	37'-0"	33'-1"	30'-3"	27'-0"
	NI-80	34'-8"	31'-7"	29'-9"	27'-9"	37'-9"	34'-0"	31'-0"	27'-8"
	NI-90	35'-6"	32'-4"	30'-6"	28'-5"	38'-9"	35'-3"	33'-3"	28'-11"
	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 ON CENTER SPACING				MULTIPLE SPANS 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"	14'-5"	12'-11"
	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"	15'-3"
	NI-70	19'-0"	17'-3"	16'-3"	15'-2"	20'-8"	18'-9"	17'-8"	15'-9"
	NI-80	19'-4"	17'-7"	16'-7"	15'-5"	21'-0"	19'-1"	18'-0"	15'-9"
11-7/8"	NI-20	18'-5"	16'-10"	15'-11"	14'-10"	20'-0"	18'-1"	16'-6"	14'-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"	19'-6"
	NI-80	23'-0"	20'-11"	19'-8"	18'-4"	25'-0"	22'-9"	21'-5"	19'-6"
	NI-90	23'-8"	21'-6"	20'-3"	18'-9"	25'-9"	23'-4"	22'-0"	20'-5"
	NI-90x	23'-10"	21'-8"	20'-5"	18'-11"	25'-11"	23'-7"	22'-2"	20'-7"
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"	19'-8"
	NI-70	25'-7"	23'-3"	21'-11"	20'-5"	27'-10"	25'-4"	23'-10"	22'-0"
	NI-80	26'-1"	23'-9"	22'-4"	20'-9"	28'-5"	25'-10"	24'-4"	22'-0"
	NI-90	26'-10"	24'-4"	22'-11"	21'-4"	29'-2"	26'-6"	24'-11"	22'-2"
	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"	21'-1"	28'-9"	26'-0"	23'-9"	21'-3"
	NI-70	28'-4"	25'-9"	24'-3"	22'-7"	30'-10"	28'-1"	26'-5"	24'-1"
	NI-80	28'-11"	26'-4"	24'-9"	23'-0"	31'-6"	28'-8"	26'-11"	24'-1"
	NI-90	29'-8"	27'-0"	25'-5"	23'-7"	32'-4"	29'-4"	27'-7"	24'-1"
	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 ON CENTER SPACING				MULTIPLE SPANS 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"	14'-6"	12'-11"
	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"	15'-9"
	NI-70	19'-8"	17'-11"	16'-11"	15'-9"	21'-5"	19'-6"	18'-4"	15'-9"
	NI-80	20'-1"	18'-3"	17'-2"	16'-0"	21'-10"	19'-10"	18'-8"	15'-9"
11-7/8"	NI-20	19'-1"	17'-6"	16'-6"	14'-10"	20'-10"	18'-1"	16'-6"	14'-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"	19'-6"
	NI-80	23'-10"	21'-9"	20'-6"	19'-0"	26'-0"	23'-8"	22'-3"	19'-6"
	NI-90	25'-7"	23'-3"	21'-11"	20'-5"	27'-10"	25'-4"	23'-10"	22'-2"
	NI-90x	24'-9"	22'-6"	21'-2"	19'-8"	26'-11"	24'-6"	23'-0"	21'-5"
14"	NI-40x	24'-1"	21'-2"	19'-3"	17'-3"	24'-4"	21'-1"	19'-3"	17'-2"
	NI-60	24'-8"	22'-6"	21'-3"	19'-9"	26'-11"	24'-2"	22'-0"	19'-8"
	NI-70	26'-7"	24'-2"	22'-9"	21'-2"	28'-11"	26'-4"	24'-9"	22'-0"
	NI-80	27'-1"	24'-8"	23'-3"	21'-7"	29'-6"	26'-10"	25'-3"	22'-0"
	NI-90	29'-0"	26'-5"	24'-10"	23'-1"	31'-7"	28'-9"	27'-1"	22'-2"
	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"	21'-4"	29'-10"	26'-0"	23'-9"	21'-3"
	NI-70	29'-5"	26'-9"	25'-3"	23'-5"	32'-0"	29'-2"	27'-5"	24'-1"
	NI-80	30'-0"	27'-4"	25'-9"	23'-11"	32'-9"	29'-9"	28'-0"	24'-1"
	NI-90	32'-1"	29'-2"	27'-6"	25'-7"	35'-0"	31'-10"	29'-11"	24'-1"
	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 ON CENTER SPACING			SLOPE OF >4:12 TO 8:12 ON CENTER SPACING			SLOPE OF >8:12 TO 12:12 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"
	NI-90	35'-5"	32'-1"	27'-11"	33'-4"	30'-2"	26'-3"	30'-9"	27'-10"	24'-3"
	NI-90x	35'-9"	32'-4"	28'-1"	33'-7"	30'-5"	26'-5"	31'-0"	28'-1"	24'-5"
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-90	40'-3"	36'-6"	31'-8"	37'-10"	34'-3"	29'-9"	34'-11"	31'-8"	27'-6"
	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-90	44'-7"	40'-5"	35'-1"	41'-10"	37'-11"	33'-0"	38'-8"	35'-0"	30'-6"
	NI-90x	45'-3"	41'-0"	35'-8"	42'-6"	38'-7"	33'-6"	39'-3"	35'-7"	31'-0"

ALLOWABLE ROOF SPANS

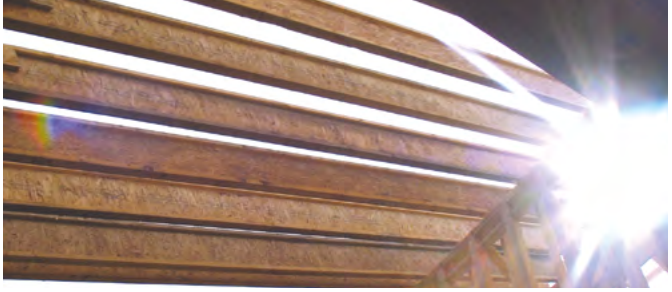
SNOW LOAD = 30 PSF, DEAD LOAD = 15 PSF

JOIST DEPTH	JOIST SERIES	SLOPE OF 1/4:12 TO 4:12 ON CENTER SPACING			SLOPE OF >4:12 TO 8:12 ON CENTER SPACING			SLOPE OF >8:12 TO 12:12 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"
	NI-90	32'-7"	29'-6"	25'-7"	30'-9"	27'-10"	24'-2"	28'-6"	25'-10"	22'-5"
	NI-90x	32'-10"	29'-8"	25'-9"	31'-0"	28'-0"	24'-4"	28'-9"	26'-0"	22'-8"
14"	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"
	NI-90	37'-0"	33'-6"	29'-1"	34'-11"	31'-7"	27'-6"	32'-5"	29'-4"	25'-6"
	NI-90x	37'-5"	33'-11"	29'-5"	35'-4"	32'-0"	27'-10"	32'-10"	29'-9"	25'-10"
16"	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"
	NI-90	41'-0"	37'-1"	32'-2"	38'-8"	35'-0"	30'-5"	35'-11"	32'-6"	28'-3"
	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 ON CENTER SPACING			SLOPE OF >4:12 TO 8:12 ON CENTER SPACING			SLOPE OF >8:12 TO 12:12 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-90	30'-5"	27'-6"	23'-10"	28'-9"	26'-1"	22'-7"	26'-10"	24'-4"	21'-1"
	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-90	34'-7"	31'-3"	27'-1"	32'-8"	29'-7"	25'-8"	30'-6"	27'-7"	24'-0"
	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-90	38'-3"	34'-8"	30'-1"	36'-3"	32'-10"	28'-6"	33'-9"	30'-7"	26'-7"
	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 ON CENTER SPACING			SLOPE OF >4:12 TO 8:12 ON CENTER SPACING			SLOPE OF >8:12 TO 12:12 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'-8"	21'-8"	19'-7"	17'-0"	20'-3"	18'-4"	15'-11"
	NI-80	23'-3"	21'-0"	17'-8"	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-90	28'-7"	25'-10"	22'-5"	27'-3"	24'-8"	21'-5"	25'-6"	23'-1"	20'-0"
	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"	23'-5"	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-90	32'-6"	29'-5"	25'-6"	30'-11"	28'-0"	24'-4"	28'-11"	26'-2"	22'-9"
	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"	25'-2"	32'-7"	29'-6"	24'-9"	30'-5"	27'-7"	23'-11"
	NI-80	35'-0"	31'-8"	25'-10"	33'-4"	30'-2"	25'-5"	31'-2"	28'-3"	24'-6"
	NI-90	36'-0"	32'-7"	28'-3"	34'-3"	31'-0"	26'-11"	32'-1"	29'-0"	25'-2"
	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		133	81	52	36	25	18	14	11	--	--	--
		L/240 TL	218	175	138	102	72	51	37	28	22	17	14	11
	NI-40x	L/480 LL			116	76	52	37	28	21	16	13	10	--
		L/240 TL	233	187	155	114	88	69	56	42	33	26	21	17
	NI-60	L/480 LL			122	80	55	39	29	22	17	13	11	--
		L/240 TL	233	187	157	135	111	79	59	44	34	27	22	18
	NI-70	L/480 LL			154	102	71	51	38	29	22	18	14	11
		L/240 TL	233	187	157	135	118	102	76	58	45	36	29	23
	NI-80	L/480 LL				108	75	54	40	30	24	19	15	12
		L/240 TL	233	187	157	135	118	105	81	61	48	38	30	25
11-7/8"	NI-20	L/480 LL			136	89	61	44	32	24	19	15	12	10
		L/240 TL	276	222	179	132	102	80	65	49	38	30	24	20
	NI-40x	L/480 LL			189	125	87	62	46	35	27	22	17	14
		L/240 TL	288	231	193	148	114	90	73	60	51	43	35	29
	NI-60	L/480 LL				132	92	66	49	37	29	23	18	15
		L/240 TL	288	231	193	166	146	118	96	75	59	46	37	30
	NI-70	L/480 LL				165	116	84	63	48	37	30	24	19
		L/240 TL	288	231	193	166	146	129	117	96	75	60	48	39
	NI-80	L/480 LL					122	88	66	51	39	31	25	21
		L/240 TL	288	231	193	166	146	129	117	102	79	63	51	42
	NI-90	L/480 LL				187	132	96	72	55	43	34	28	23
		L/240 TL	326	262	219	188	165	147	132	111	87	69	56	46
	NI-90x	L/480 LL				190	134	98	73	56	44	35	28	23
		L/240 TL	400	321	269	231	202	180	147	113	88	70	57	47
14"	NI-40x	L/480 LL					123	89	66	51	39	31	25	20
		L/240 TL	304	245	204	176	137	109	88	73	61	52	45	39
	NI-60	L/480 LL					132	96	71	54	42	34	27	22
		L/240 TL	305	245	205	176	154	137	116	96	81	68	55	45
	NI-70	L/480 LL					163	119	89	68	54	43	34	28
		L/240 TL	324	260	218	187	164	146	131	119	108	86	69	57
	NI-80	L/480 LL						126	95	73	57	45	37	30
		L/240 TL	324	260	218	187	164	146	131	119	109	91	74	61
	NI-90	L/480 LL						136	102	79	62	49	40	33
		L/240 TL	326	262	219	188	165	147	132	120	110	99	80	66
	NI-90x	L/480 LL					191	140	106	81	64	51	41	34
		L/240 TL	405	326	273	234	205	183	164	150	128	103	83	68
16"	NI-60	L/480 LL						128	96	74	57	46	37	30
		L/240 TL	317	255	213	183	161	143	129	111	94	80	69	60
	NI-70	L/480 LL						157	118	91	72	57	46	38
		L/240 TL	354	284	238	204	179	159	144	131	120	107	93	76
	NI-80	L/480 LL							126	97	76	61	49	41
		L/240 TL	354	284	238	204	179	159	144	131	120	111	97	82
	NI-90	L/480 LL							135	105	82	66	53	44
		L/240 TL	354	284	238	204	179	159	144	131	120	111	103	88
	NI-90x	L/480 LL							141	109	86	69	56	46
		L/240 TL	405	326	273	234	205	183	164	150	137	127	112	92

NOTES:

1. 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.
2. 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.
3. 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.
4. Verify that the deflection criteria herein are accepted by local codes and authorities.
5. The I-joist weight has not been taken into account.
6. Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches for the intermediate bearings.
7. Bearing stiffeners are not required, except as required for hangers.
8. Refer to appropriate sections for proper installation.
9. For double joists, double the table values and connect joist per detail 1p on page 19.

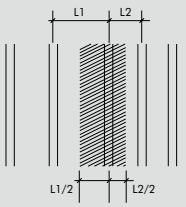
PSF TO PLF CONVERSION TABLE

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



Calculating Uniformly Distributed Load (plf):

$$\left(\frac{L1\ (ft)}{2}+\frac{L2\ (ft)}{2}\right) \times LL\ (psf) = LL\ (plf)$$

$$\left(\frac{L1\ (ft)}{2}+\frac{L2\ (ft)}{2}\right) \times TL\ (psf) = TL\ (plf)$$

Check resulting loads against those in the appropriate chart.

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				105	72	51	37	28	22	17	14	11
		L/180 TL	250	201	159	117	90	68	50	38	29	23	18	15
	NI-40x	L/240 LL						75	56	42	33	26	21	17
		L/180 TL	268	216	178	131	101	80	65	54	44	34	28	22
	NI-60	L/240 LL					111	79	59	44	34	27	22	18
		L/180 TL	268	216	180	155	133	105	78	59	46	36	29	24
	NI-70	L/240 LL						102	76	58	45	36	29	23
		L/180 TL	268	216	180	155	136	121	101	77	60	48	38	31
	NI-80	L/240 LL						108	81	61	48	38	30	25
		L/180 TL	268	216	180	155	136	121	108	82	64	51	41	33
11-7/8"	NI-20	L/240 LL						88	65	49	38	30	24	20
		L/180 TL	317	255	206	152	117	92	75	62	51	40	32	26
	NI-40x	L/240 LL									55	44	35	29
		L/180 TL	331	266	222	171	131	104	84	70	58	50	43	37
	NI-60	L/240 LL						133	99	75	59	46	37	30
		L/180 TL	331	266	222	191	167	136	111	91	77	62	50	41
	NI-70	L/240 LL							126	96	75	60	48	39
		L/180 TL	331	266	222	191	167	149	134	122	100	80	64	53
	NI-80	L/240 LL							133	102	79	63	51	42
		L/180 TL	331	266	222	191	167	149	134	122	106	84	68	56
	NI-90	L/240 LL							144	111	87	69	56	46
		L/180 TL	375	302	252	217	190	169	152	138	116	92	74	61
	NI-90x	L/240 LL						196	147	113	88	70	57	47
		L/180 TL	460	370	309	265	233	207	187	151	118	94	76	62
14"	NI-40x	L/240 LL											51	41
		L/180 TL	350	281	235	202	158	125	101	84	71	60	52	45
	NI-60	L/240 LL								109	85	68	55	45
		L/180 TL	351	282	236	203	178	158	133	110	93	79	68	59
	NI-70	L/240 LL									108	86	69	57
		L/180 TL	372	299	250	215	188	168	151	137	125	106	92	76
	NI-80	L/240 LL									115	91	74	61
		L/180 TL	372	299	250	215	188	168	151	137	126	112	97	81
	NI-90	L/240 LL									124	99	80	66
		L/180 TL	375	302	252	217	190	169	152	138	127	117	107	88
	NI-90x	L/240 LL								163	128	103	83	68
		L/180 TL	466	375	313	269	236	210	189	172	158	137	111	91
16"	NI-60	L/240 LL											74	61
		L/180 TL	365	293	245	211	185	164	148	128	108	92	79	69
	NI-70	L/240 LL										115	93	76
		L/180 TL	407	327	274	235	206	183	165	150	138	123	107	93
	NI-80	L/240 LL										123	99	82
		L/180 TL	407	327	274	235	206	183	165	150	138	127	112	98
	NI-90	L/240 LL											107	88
		L/180 TL	407	327	274	235	206	183	165	150	138	127	118	110
	NI-90x	L/240 LL										138	112	92
		L/180 TL	466	375	313	269	236	210	189	172	158	146	135	123

NOTES:

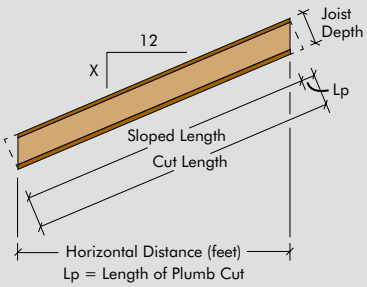
1. Table values are based on clear distance between supports and may be used for simple or multiple spans. For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
2. Tabulated loads are based on uniform loads only, and assume continuous lateral bracing of the compression 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.
3. 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.
4. Verify that the deflection criteria herein are accepted by local codes and authorities.
5. The I-joist weight has not been taken into account.
6. Minimum bearing length shall be 1-3/4 inches for the end bearings, and 3-1/2 inches for the intermediate bearings.
7. Bearing stiffeners are not required, except as required for hangers.
8. Refer to appropriate sections for proper installation.
9. 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. Concentrated loads should not 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 of 16 percent or greater, 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 (0.131 x 2-1/2 in.) nails or 6 inches on center for 10d common (0.148 x 3 in.) 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

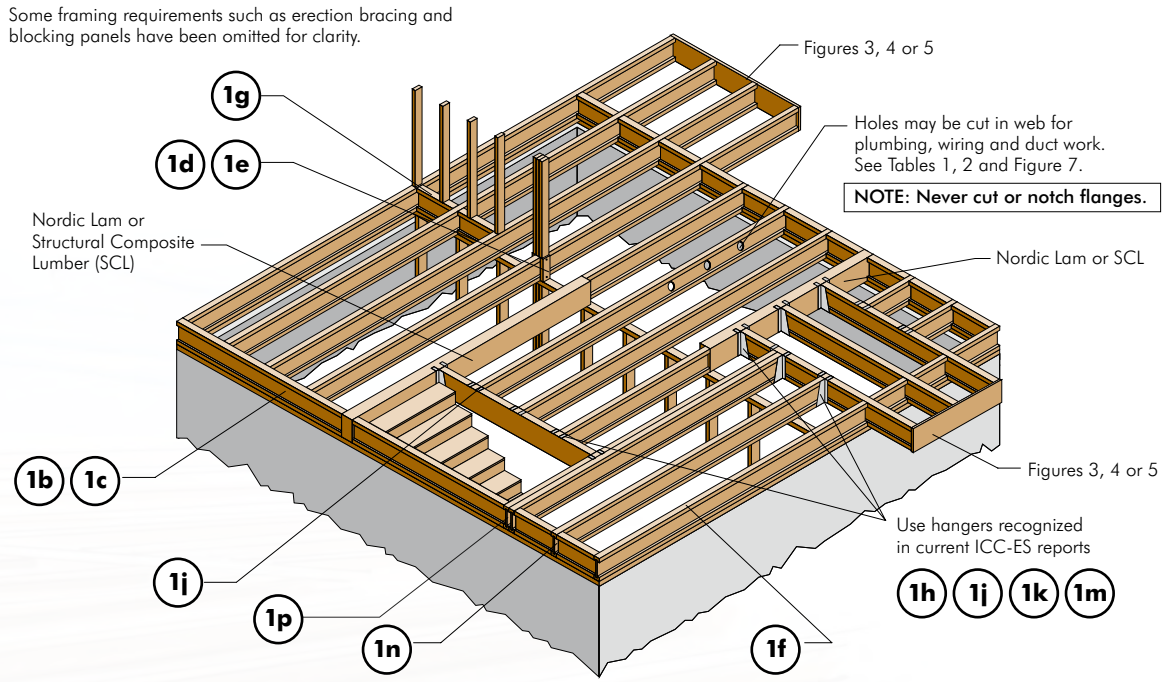
Researchers have proposed a number of methods that can be used to reduce floor vibration. These methods include:

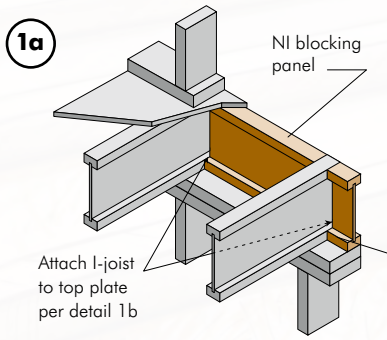
- Gluing the wood structural panel floor to the joists
- Attaching wood structural panels or gypsum board to the bottom of the floor joists
- Decreasing the floor-joist spacing by one increment based on allowable span
- Using full-depth blocking at regular intervals between all of the floor joists over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

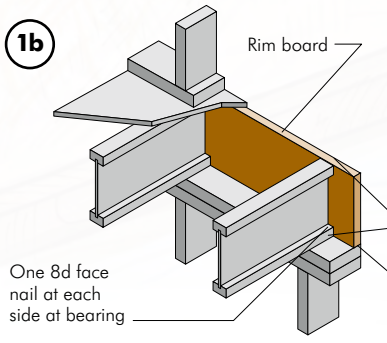




Blocking Panel or Rim Joist	Uniform Vertical Load Transfer Capacity* (plf)
NI Joists	2,000

*The uniform vertical load capacity is limited to a joist depth of 16 inches or less and shall not be increase for any load duration shorter than the normal (10-yr) load duration. It shall. 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" APA Rim Board Plus**	4,400

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

** See ANSI/APA PRR410: *Standard for Performance-Rated Engineered Wood Rim Boards,* Form PRR-410.

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.

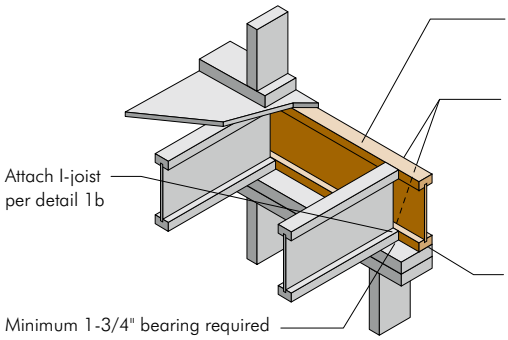
Minimum bearing length shall be 1-3/4" for the end bearings, and 3-1/2" for the intermediate bearings when applicable.

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.

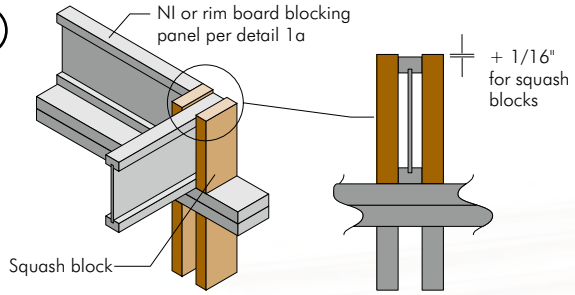
FIGURE 1 (continued)

TYPICAL NORDIC I-JOIST FLOOR FRAMING AND CONSTRUCTION DETAILS

1c



1d

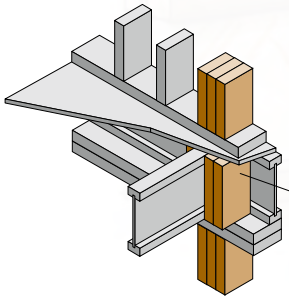


Pair of Squash Blocks	Vertical Load Transfer Capacity per Pair of Squash Blocks (lbf)	
	3-1/2" wide	5-1/2" wide
2x Lumber	3,800	5,900
1-1/8" APA Rim Board Plus **	2,600	4,000

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

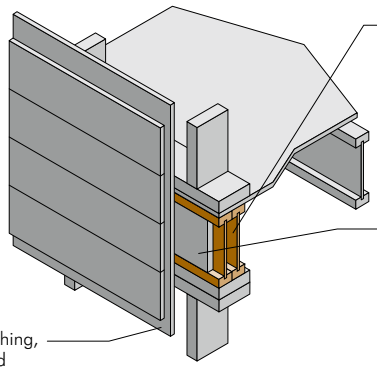
** See ANSI/APA PRR410: *Standard for Performance-Rated Engineered Wood Rim Boards,* Form PRR-410.

1e



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

1f

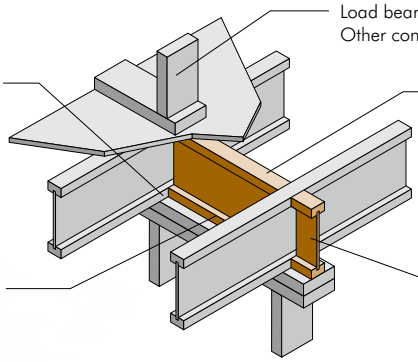


All nails shown in the above details are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common nails (0.131 x 2-1/2 in.) shown in details. Framing lumber assumed to be Utility grade S-P-F (south) or stronger species. Individual components not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

FIGURE 1 (continued)

TYPICAL NORDIC I-JOIST FLOOR FRAMING AND CONSTRUCTION DETAILS

1g



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

Joist attachment per detail 1b

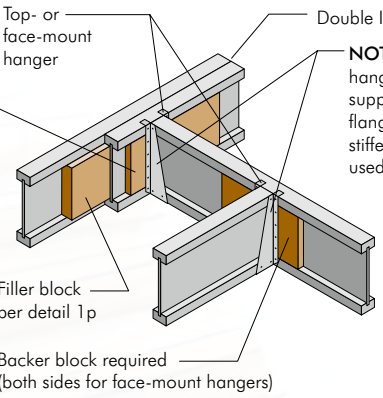
Blocking required over all interior supports under load-bearing walls or when floor joists are not continuous over support. In high seismic areas (SDC D_0, D_1, and D_2) the IRC requires blocking at all intermediate supports. The IBC requires blocking at all supports for all Seismic Design Categories.

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

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 (0.148" x3") nails through the webs and filler block where the backer block will fit. Clinch. Install backer tight to top flange.
Use twelve 10d (0.148" x3") nails, clinched when possible. Maximum capacity for hanger for this detail = 1,280 lbs.



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)

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

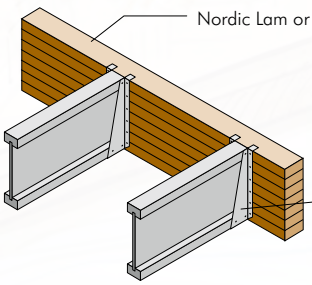
Flange Width	Material Thickness Required*	Minimum Depth**
2-1/2"	1"	5-1/2"
3-1/2"	1-1/2"	7-1/4"

* 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".

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

1j



Nordic Lam or SCL

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

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

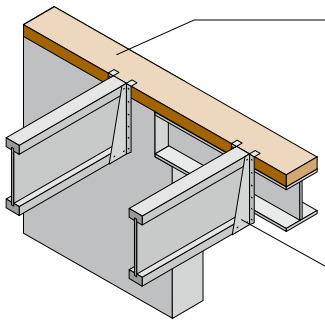
NOTE: Unless hanger sides laterally support the top flange, bearing stiffeners shall be used.

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

1k

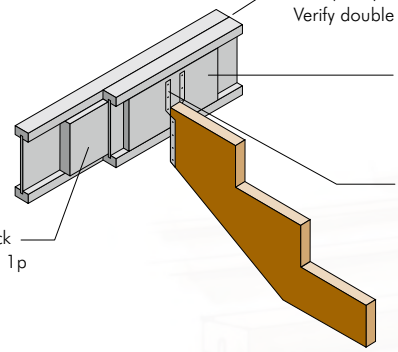


2x plate flush with inside face of wall or beam. 1/8" overhang allowed past inside face of wall or beam.

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

Top-mount hanger installed per manufacturer's recommendations

1m



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

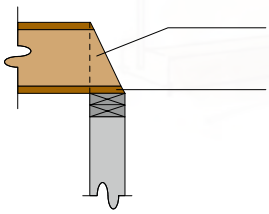
Backer block attached per detail 1h. Nail with twelve 10d nails, clinch when possible.

Install hanger per manufacturer's recommendations

Filler block per detail 1p

Maximum support capacity = 1,280 lbs

1n



Do not bevel-cut joist beyond inside face of wall

Attach I-joist per detail 1b

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

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.

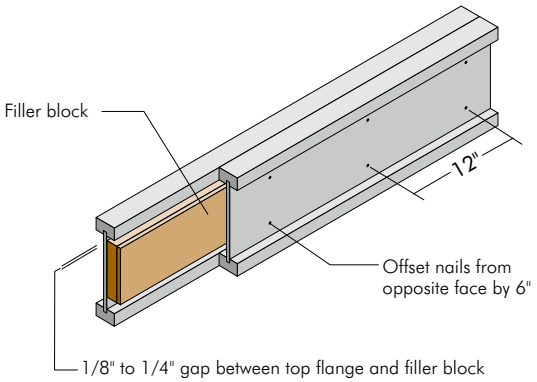
FIGURE 1 (continued)

TYPICAL NORDIC I-JOIST FLOOR FRAMING AND CONSTRUCTION DETAILS

1p

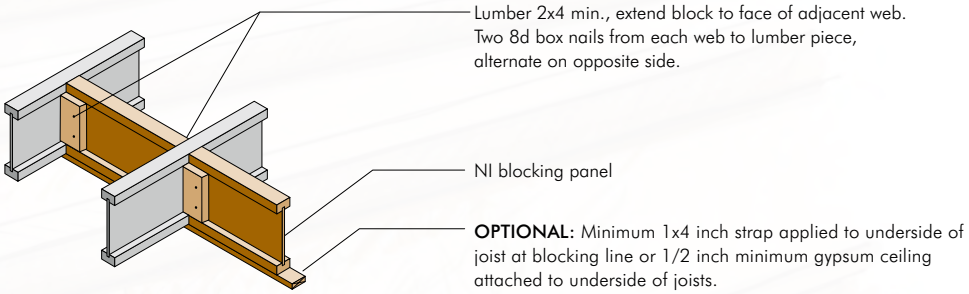
FILLER BLOCK REQUIREMENTS FOR DOUBLE I-JOIST CONSTRUCTION

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

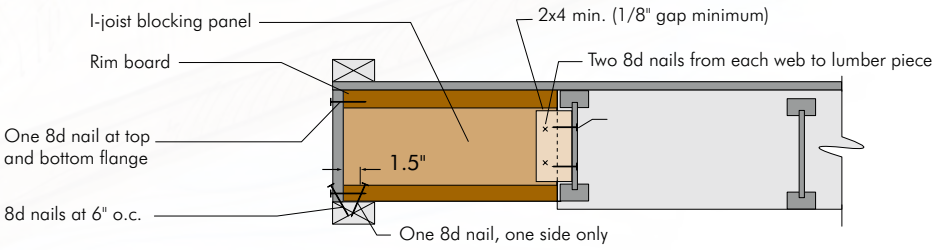


NOTES:
1. Support back of I-joist web during nailing to prevent damage to web/flange connection.
2. Leave a 1/8-inch to 1/4-inch gap between top of filler block and bottom of top I-joist flange.
3. Filler block is required between joists for full length of span.
4. Nail joists together with two rows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

1r



1s



NOTES:
- 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.

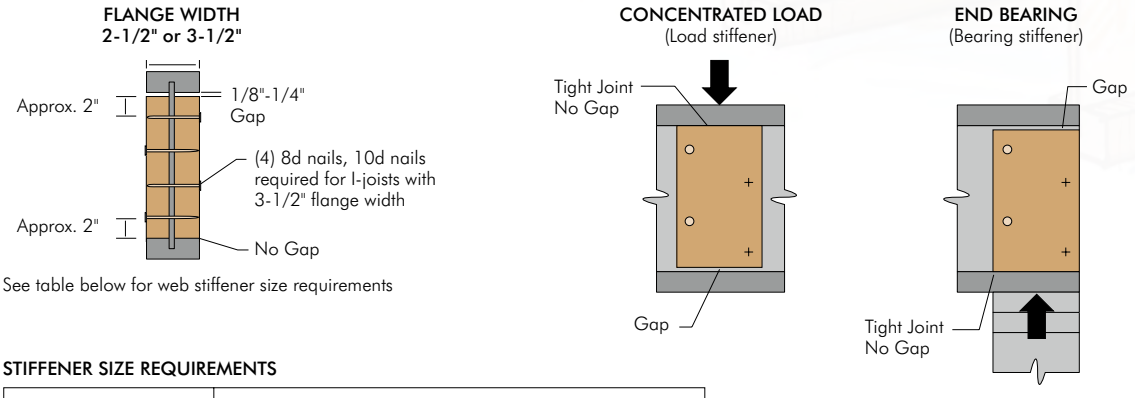
Recommendations:

1. A ***bearing stiffener*** is required in all engineered applications with reactions greater than shown in the I-joist design properties table on page 7.

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



See table below for web stiffener size requirements

STIFFENER SIZE REQUIREMENTS

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

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.

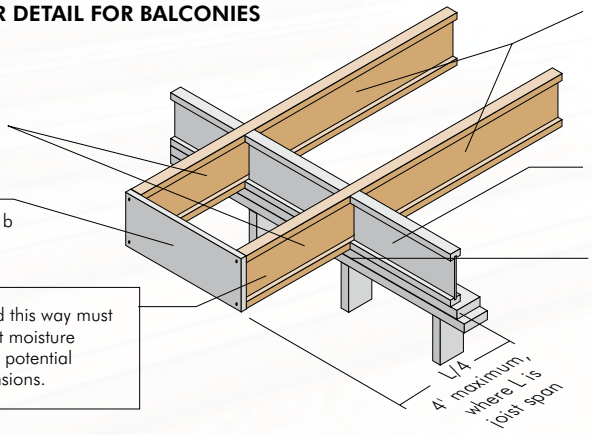
For applications supporting concentrated loads at the end of the cantilever, such as a wall, see Figures 4 and 5.

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 loads 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.

Caution : *Cantilevered balcony details address structural considerations only. Cantilevered balcony details for moisture control, weathering and durability are beyond the scope of this publication.*

FIGURE 3
CANTILEVER DETAILS FOR BALCONIES

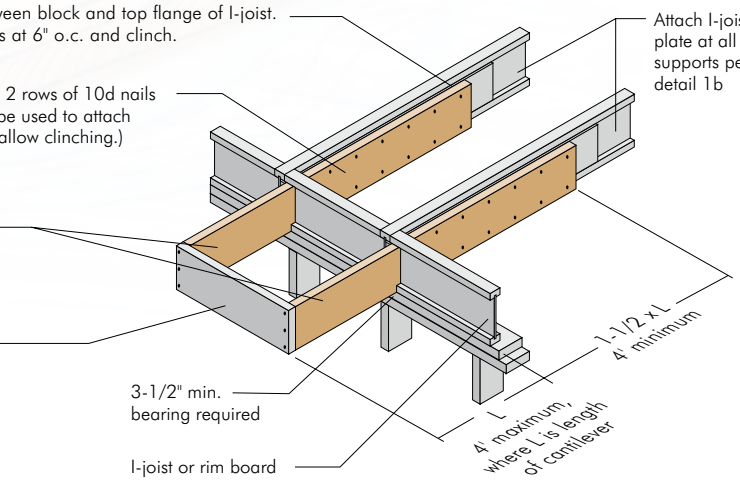
3a **I-JOIST CANTILEVER DETAIL FOR BALCONIES (No Wall Load)**



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

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

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



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

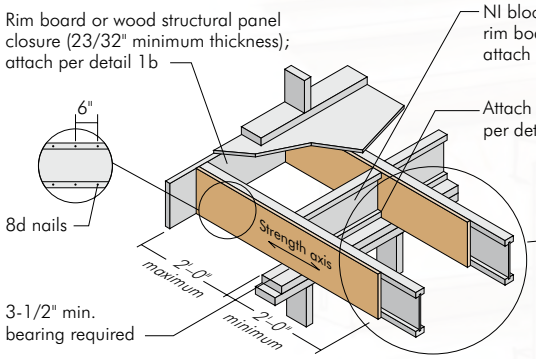
CANTILEVER DETAILS
FOR VERTICAL BUILDING OFFSET (Concentrated Wall Load)

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).

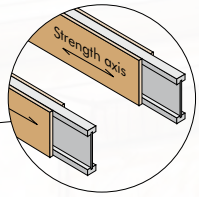
FIGURE 4
CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET

4a **Method 1 – SHEATHING REINFORCEMENT ONE SIDE**



Method 2 – SHEATHING REINFORCEMENT TWO SIDES

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



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

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

4b **Alternate Method 2 – DOUBLE I-JOIST**

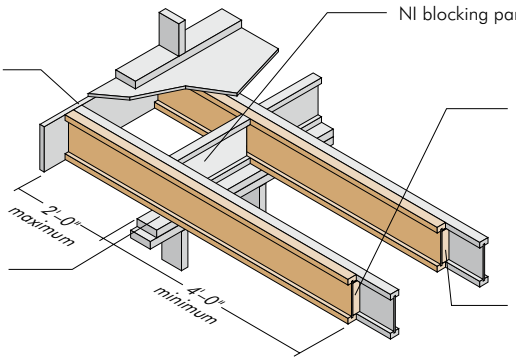
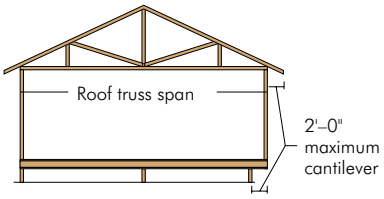
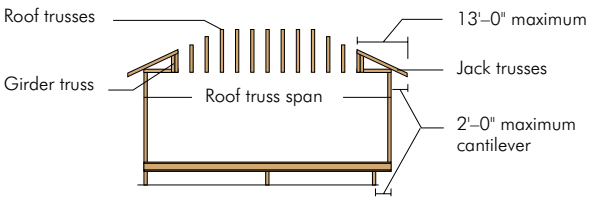


FIGURE 4 (continued)



See table below for NI reinforcement requirements at cantilever.



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

CANTILEVER REINFORCEMENT METHODS ALLOWED

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

NOTES:

1. N = No reinforcement required.
   1 = NI reinforced with 23/32" wood structural panel on one side only.
   2 = NI reinforced with 23/32" wood structural panel on both sides, or double I-joist.
   X = Try a deeper joist or closer spacing.
2. Maximum load shall be: 15 psf roof dead load, 50 psf floor total load, and 80 plf wall load. Wall load is based on 3'-0" maximum width window or door openings. For larger openings, or multiple 3'-0" width openings spaced less than 6'-0" o.c., additional joists beneath the opening's cripple studs may be required.
3. Table applies to joists 12" to 24" o.c. that meet the floor span requirements for a design live load of 40 psf and dead load of 10 psf, and a live load deflection limit of L/480. Use 12" o.c. requirements for lesser spacing.
4. For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge board, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.
5. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

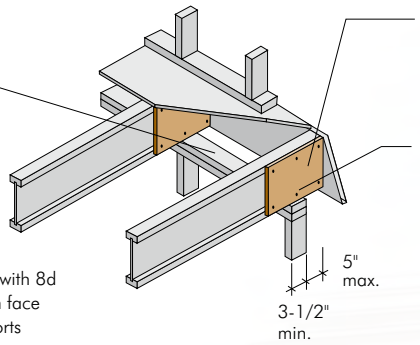
BRICK CANTILEVER DETAILS
FOR VERTICAL BUILDING OFFSET (Concentrated Wall Load)

FIGURE 5
BRICK CANTILEVER DETAILS FOR VERTICAL BUILDING OFFSET

5a SHEATHING REINFORCEMENT

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

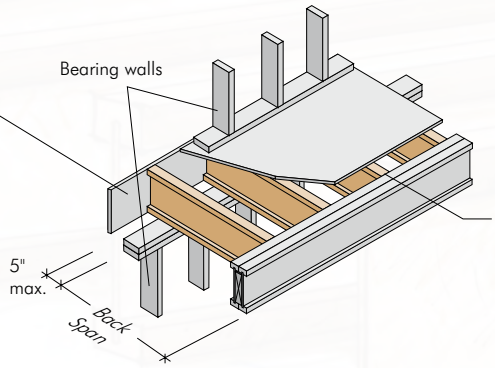
NOTE: APA RATED SHEATHING 48/24 or APA Rated Sturd-I-Floor 24 oc (minimum thickness 23/32") required on sides of joist. Depth shall match the full height of the joist. Nail with 8d nails at 6" o.c., top and bottom flange. Install with face grain horizontal. Attach I-joist to plate at all supports per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



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.

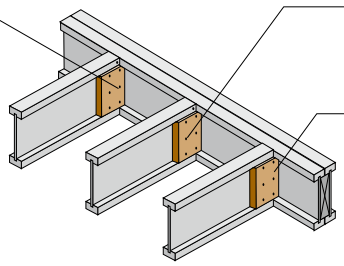
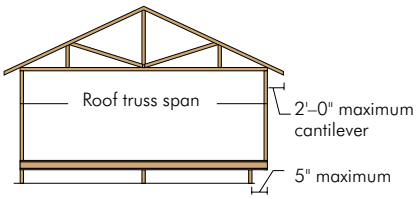
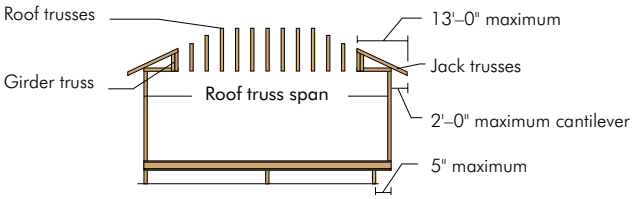


FIGURE 5 (continued)



See table below for NI reinforcement requirements at cantilever.



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

BRICK CANTILEVER REINFORCEMENT METHODS ALLOWED

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

NOTES:

1. N = No reinforcement required.
   1 = NI reinforced with 23/32" wood structural panel on one side only.
   2 = NI reinforced with 23/32" wood structural panel on both sides, or double I-joist.
   X = Try a deeper joist or closer spacing.
2. Maximum load shall be: 15 psf roof dead load, 50 psf floor total load, and 80 plf wall load. Wall load is based on 3'-0" maximum width window or door openings. For larger openings, or multiple 3'-0" width openings spaced less than 6'-0" o.c., additional joists beneath the opening's cripple studs may be required.
3. Table applies to joists 12" to 24" o.c. that meet the floor span requirements for a design live load of 40 psf and dead load of 10 psf, and a live load deflection limit of L/480. Use 12" o.c. requirements for lesser spacing.
4. For conventional roof construction using a ridge beam, the Roof Truss Span column above is equivalent to the distance between the supporting wall and the ridge beam. When the roof is framed using a ridge board, the Roof Truss Span is equivalent to the distance between the supporting walls as if a truss is used.
5. Cantilevered joists supporting girder trusses or roof beams may require additional reinforcing.

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.

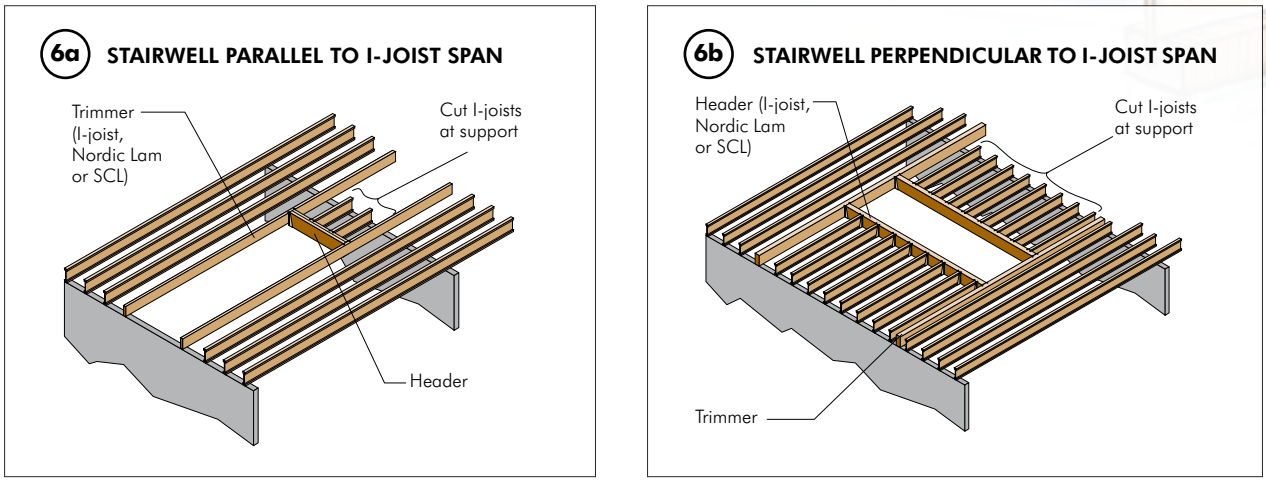
Table shown on the following page is a guide for determining the I-joist requirement or the minimum sections of other engineered wood members required to frame the headers and trimmers seen in Detail 6a.

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

FIGURE 6
STAIRWELL OPENINGS IN I-JOIST FLOORS



joists also via metal hangers. This relationship 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
		SCL	NORDIC LAM 24F-1.9E	
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
		SCL	NORDIC LAM 24F-1.9E	
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
		SCL	NORDIC LAM 24F-1.9E	
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
		SCL	NORDIC LAM 24F-1.9E	
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:

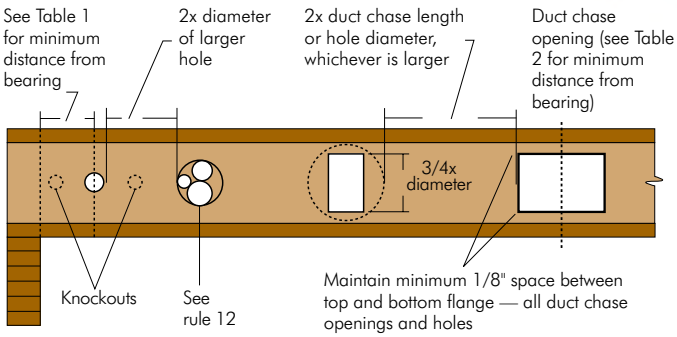
1. Stairwell openings not to exceed 12 ft in length and 48 inches in width (header length).
2. Minimum grade SCL based on E = 2,000,000 psi (apparent), F_b = 2,900 psi, and F_v = 285 psi.
3. Properties of Nordic Lam 24F-1.9E are based on E = 1,800,000 psi (apparent), F_b = 2,400 psi, and F_v = 250 psi.
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

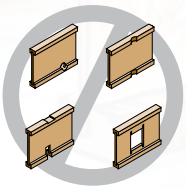
RULES FOR CUTTING HOLES AND DUCT CHASE OPENINGS:

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. All holes and duct chase openings shall be cut in a workman-like manner in accordance with the restrictions listed above and as illustrated in Figure 7.
11. Limit three maximum size holes per span, of which one may be a duct chase opening.
12. A group of round holes at approximately the same location shall be permitted if they meet the requirements for a single round hole circumscribed around them.

FIGURE 7
FIELD-CUT HOLE LOCATOR



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



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

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

Holes in webs should be cut with a sharp saw.

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

TABLE 1

LOCATION OF CIRCULAR HOLE IN JOIST WEBS
Simple or Multiple Span for Dead Loads up to 15 psf and Live Loads up to 40 psf

JOIST DEPTH	JOIST SERIES	MINIMUM DISTANCE FROM INSIDE FACE OF ANY SUPPORT TO CENTER OF HOLE (ft-in.) ROUND HOLE DIAMETER (in.)															SPAN ADJ. FACTOR
		2	3	4	5	6	6-1/4	7	8	8-5/8	9	10	10-3/4	11	12	12-3/4	
9-1/2"	NI-20	0'-7"	1'-4"	2'-8"	4'-0"	5'-5"	5'-9"	---	---	---	---	---	---	---	---	---	13'-6"
	NI-40x	0'-7"	1'-4"	2'-8"	4'-2"	5'-8"	6'-2"	---	---	---	---	---	---	---	---	---	15'-0"
	NI-60	1'-0"	2'-4"	3'-9"	5'-3"	6'-10"	7'-3"	---	---	---	---	---	---	---	---	---	15'-3"
	NI-70	1'-10"	3'-3"	4'-8"	6'-2"	7'-9"	8'-3"	---	---	---	---	---	---	---	---	---	16'-5"
	NI-80	2'-0"	3'-5"	4'-10"	6'-4"	8'-0"	8'-5"	---	---	---	---	---	---	---	---	---	16'-9"
11-7/8"	NI-20	0'-7"	0'-8"	0'-10"	2'-0"	3'-4"	3'-9"	4'-9"	6'-3"	7'-5"	---	---	---	---	---	---	16'-1"
	NI-40x	0'-7"	0'-8"	1'-0"	2'-4"	3'-8"	4'-0"	5'-2"	6'-8"	8'-0"	---	---	---	---	---	---	17'-2"
	NI-60	0'-7"	1'-4"	2'-8"	4'-0"	5'-5"	5'-10"	7'-0"	8'-8"	9'-9"	---	---	---	---	---	---	18'-2"
	NI-70	1'-2"	2'-5"	3'-9"	5'-2"	6'-8"	7'-0"	8'-2"	9'-10"	11'-0"	---	---	---	---	---	---	19'-7"
	NI-80	1'-4"	2'-8"	4'-0"	5'-4"	6'-10"	7'-3"	8'-5"	10'-2"	11'-3"	---	---	---	---	---	---	19'-11"
	NI-90	0'-7"	0'-8"	1'-3"	2'-11"	4'-8"	5'-2"	6'-6"	8'-6"	9'-11"	---	---	---	---	---	---	20-5"
	NI-90x	0'-7"	0'-8"	0'-8"	2'-3"	4'-2"	4'-6"	6'-0"	---	---	---	---	---	---	---	---	20'-7"
14"	NI-40x	0'-7"	0'-8"	0'-8"	0'-9"	2'-0"	2'-4"	3'-4"	4'-9"	5'-9"	6'-3"	8'-0"	9'-9"	---	---	---	18'-11"
	NI-60	0'-7"	0'-8"	1'-3"	2'-6"	4'-0"	4'-3"	5'-3"	6'-9"	7'-9"	8'-3"	10'-2"	11'-10"	---	---	---	20'-8"
	NI-70	0'-7"	1'-8"	3'-0"	4'-3"	5'-8"	6'-0"	7'-0"	8'-6"	9'-6"	10'-2"	12'-0"	13'-4"	---	---	---	22'-2"
	NI-80	0'-8"	1'-10"	3'-2"	4'-6"	6'-0"	6'-3"	7'-4"	8'-10"	9'-10"	10'-6"	12'-3"	13'-8"	---	---	---	22'-7"
	NI-90	0'-7"	0'-8"	0'-9"	2'-3"	3'-10"	4'-3"	5'-6"	7'-3"	8'-5"	9'-2"	11'-2"	12'-9"	---	---	---	23'-1"
	NI-90x	0'-7"	0'-8"	0'-8"	1'-10"	3'-6"	4'-0"	5'-3"	7'-0"	8'-3"	9'-0"	---	---	---	---	---	23'-5"
16"	NI-60	0'-7"	0'-8"	0'-8"	1'-2"	2'-5"	2'-9"	3'-9"	5'-0"	6'-0"	6'-6"	8'-0"	9'-2"	9'-8"	11'-9"	13'-9"	22'-10"
	NI-70	0'-7"	0'-9"	2'-0"	3'-3"	4'-8"	5'-0"	6'-0"	7'-5"	8'-4"	9'-0"	10'-5"	11'-9"	12'-2"	14'-0"	15'-5"	24'-6"
	NI-80	0'-7"	1'-2"	2'-4"	3'-8"	5'-0"	5'-4"	6'-4"	7'-10"	8'-9"	9'-4"	11'-0"	12'-2"	12'-6"	14'-4"	16'-0"	25'-0"
	NI-90	0'-7"	0'-8"	0'-8"	1'-6"	3'-0"	3'-5"	4'-6"	6'-3"	7'-3"	7'-10"	9'-8"	11'-0"	11'-6"	13'-6"	15'-3"	25'-7"
	NI-90x	0'-7"	0'-8"	0'-8"	1'-10"	3'-4"	3'-9"	5'-0"	6'-6"	7'-6"	8'-3"	10'-0"	11'-5"	11'-10"	---	---	26'-0"

NOTES:

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

OPTIONAL 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:

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

Where:

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

TABLE 2

DUCT CHASE OPENING SIZES AND LOCATIONS — Simple Span Only

JOIST DEPTH	JOIST SERIES	MINIMUM DISTANCE FROM INSIDE FACE OF ANY SUPPORT TO CENTER OF OPENING (ft-in.) DUCT CHASE LENGTH (in.)								
		8	10	12	14	16	18	20	22	24
9-1/2"	NI-20	4'-2"	4'-7"	5'-0"	5'-5"	5'-10"	6'-2"	6'-8"	7'-1"	7'-6"
	NI-40x	5'-2"	5'-7"	6'-0"	6'-4"	6'-8"	7'-2"	7'-7"	8'-1"	8'-8"
	NI-60	5'-3"	5'-8"	6'-0"	6'-6"	7'-0"	7'-3"	7'-9"	8'-3"	8'-10"
	NI-70	5'-1"	5'-4"	5'-9"	6'-1"	6'-6"	7'-1"	7'-4"	8'-0"	8'-3"
	NI-80	5'-2"	5'-7"	6'-0"	6'-4"	6'-8"	7'-2"	7'-7"	8'-1"	8'-6"
11-7/8"	NI-20	5'-9"	6'-2"	6'-8"	7'-1"	7'-5"	8'-0"	8'-4"	9'-0"	9'-5"
	NI-40x	6'-7"	7'-1"	7'-6"	8'-1"	8'-6"	9'-1"	9'-7"	10'-2"	10'-9"
	NI-60	7'-1"	7'-7"	8'-0"	8'-4"	8'-10"	9'-3"	9'-9"	12'-4"	11'-2"
	NI-70	7'-0"	7'-3"	7'-9"	8'-1"	8'-6"	9'-1"	9'-6"	10'-0"	10'-5"
	NI-80	7'-1"	7'-5"	8'-0"	8'-4"	8'-10"	9'-2"	9'-8"	10'-2"	10'-8"
	NI-90	4'-3"	4'-10"	5'-4"	5'-11"	6'-6"	7'-1"	7'-8"	8'-3"	8'-11"
	NI-90x	7'-6"	8'-1"	8'-4"	8'-9"	9'-2"	9'-8"	10'-1"	10'-7"	11'-2"
14"	NI-40x	7'-9"	8'-3"	8'-10"	9'-5"	10'-1"	10'-7"	11'-3"	12'-1"	12'-9"
	NI-60	8'-8"	9'-2"	9'-6"	10'-1"	10'-6"	11'-1"	11'-7"	12'-4"	13'-2"
	NI-70	8'-6"	9'-1"	9'-4"	9'-10"	10'-2"	10'-8"	11'-2"	11'-8"	12'-4"
	NI-80	8'-9"	9'-2"	9'-8"	10'-1"	10'-6"	11'-1"	11'-6"	12'-1"	12'-8"
	NI-90	5'-10"	6'-5"	7'-0"	7'-6"	8'-2"	8'-9"	9'-4"	9'-11"	10'-8"
	NI-90x	9'-3"	9'-8"	10'-2"	10'-7"	11'-1"	11'-6"	12'-1"	12'-8"	13'-3"
16"	NI-60	10'-1"	10'-7"	11'-0"	11'-6"	12'-1"	12'-7"	13'-4"	14'-2"	15'-0"
	NI-70	10'-1"	10'-4"	10'-10"	11'-4"	11'-8"	12'-2"	12'-9"	13'-4"	14'-0"
	NI-80	10'-3"	10'-9"	11'-2"	11'-7"	12'-1"	12'-7"	13'-2"	13'-9"	14'-6"
	NI-90	7'-4"	7'-11"	8'-6"	9'-1"	9'-8"	10'-3"	13'-0"	11'-7"	12'-3"
	NI-90x	11'-1"	11'-4"	11'-10"	12'-3"	12'-8"	13'-3"	14'-0"	14'-7"	15'-4"

NOTES:

1. Above table may be used for I-joist spacing of 24 inches on center or less.
2. Duct chase opening location distance is measured from inside face of supports to center of opening.
3. The above table is based on simple-span joists only. For other applications, contact your local distributor.
4. Distances are based on uniformly loaded floor joists that meet the span requirements for a design live load of 40 psf and dead load of 10 psf, and a live load deflection limit of L/480. For other applications, contact your local distributor.

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 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" APA Rim Board Plus	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

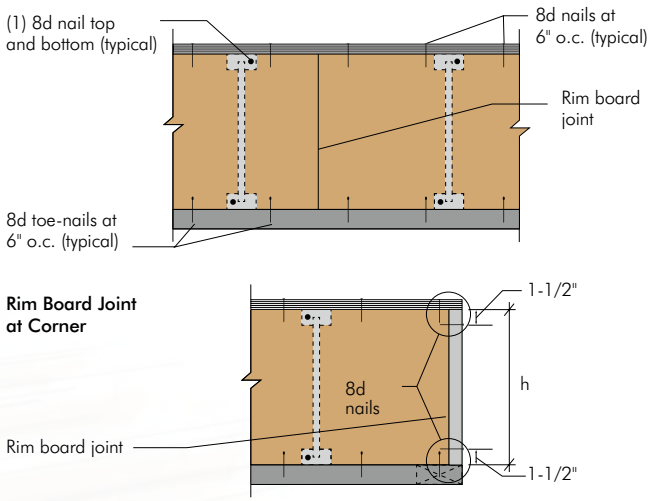
INSTALLATION AND CONNECTION REQUIREMENTS:

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.

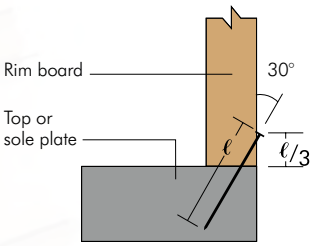
FIGURE 8

RIM BOARD INSTALLATION DETAILS

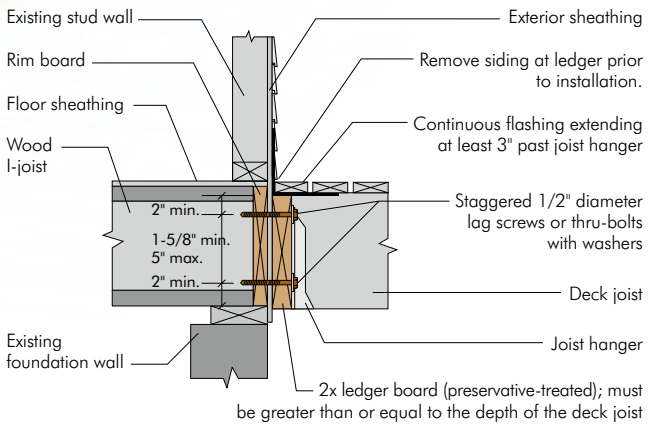
8a ATTACHMENT DETAILS WHERE RIM BOARDS ABUT



8b TOE-NAIL CONNECTION AT RIM BOARD



8c 2X LEDGER TO RIM BOARD ATTACHMENT DETAIL



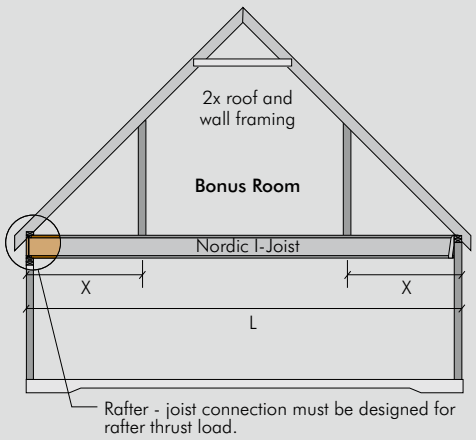
BONUS ROOM FLOOR
JOIST SELECTION GUIDE

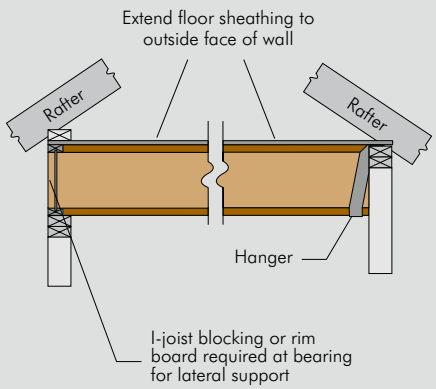
JOIST SELECTION FOR BONUS ROOM

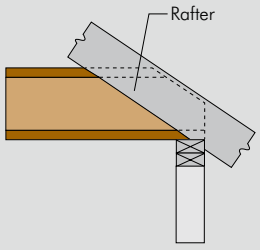
KNEEWALL LOCATION X (ft)	I-JOIST SPAN L (ft)	ROOF LOADING							
		SNOW LOAD = 30 psf, DEAD LOAD = 15 psf				SNOW LOAD = 40 psf, DEAD LOAD = 15 psf			
		ON CENTER SPACING				ON CENTER SPACING			
		12	16	19.2	24	12	16	19.2	24
4 or less	20	11-7/8" NI-40x 9-1/2" NI-70	14" NI-40x 11-7/8" NI-60	14" NI-60 11-7/8" NI-70	16" NI-60 14" NI-70 11-7/8" NI-90x	11-7/8" NI-40x 9-1/2" NI-80	14" NI-40x 11-7/8" NI-70	14" NI-60 11-7/8" NI-70	16" NI-60 14" NI-70
	22	11-7/8" NI-40x	11-7/8" NI-70	14" NI-60 11-7/8" NI-90x	14" NI-70	14" NI-40x 11-7/8" NI-70	14" NI-60 11-7/8" NI-90x	16" NI-60 14" NI-70	16" NI-70 14" NI-90x
	24	14" NI-40x 11-7/8" NI-70	14" NI-70	16" NI-60 14" NI-80	16" NI-70	14" NI-40x 11-7/8" NI-80	16" NI-60 14" NI-70	16" NI-70 14" NI-90x	***16" NI-80***
	26	14" NI-70	16" NI-60 14" NI-90x	16" NI-70	16" NI-90x	16" NI-60 14" NI-70	16" NI-70	16" NI-80	-
6 or less	20	11-7/8" NI-40x 9-1/2" NI-70	14" NI-40x 11-7/8" NI-60	14" NI-60 11-7/8" NI-70	16" NI-60 14" NI-70 11-7/8" NI-90x	11-7/8" NI-40x	11-7/8" NI-70	14" NI-60 11-7/8" NI-80	16" NI-60 14" NI-70
	22	14" NI-40x 11-7/8" NI-60	14" NI-60 11-7/8" NI-70	16" NI-60 14" NI-70	16" NI-70 14" NI-80	14" NI-40x 11-7/8" NI-70	14" NI-60 11-7/8" NI-90x	16" NI-60 14" NI-70	16" NI-70
	24	14" NI-40x 11-7/8" NI-70	16" NI-60 14" NI-70	14" NI-90x	16" NI-70	14" NI-60 11-7/8" NI-90x	16" NI-60 14" NI-80	16" NI-70	16" NI-90x
	26	16" NI-60 14" NI-70	16" NI-70 14" NI-90x	16" NI-80	-	16" NI-60 14" NI-70	16" NI-70	16" NI-90x	-

NOTES:

1. Roof design loads: Snow load as shown; roof dead load 15 psf. The design is based on a duration of load (DOL) factor of 1.15.
2. Floor design loads: Dead load of floor 10 psf; dead load of kneewall 40 plf; live load between kneewalls 40 psf; attic load behind kneewalls 20 psf.
3. Roof slope assumed to be between 8/12 and 12/12.
4. The live load deflection is limited to L/480 and the total load deflection to L/240.
5. Minimum bearing length shall be 3-1/2 inches for the end bearings. Bearing web stiffeners are required for I-joists noted in ***italic bold***.
6. Straight gable roof framing. Hip roofs are outside the scope of this table.
7. For sizing with other dimensions and loads contact your local distributor.

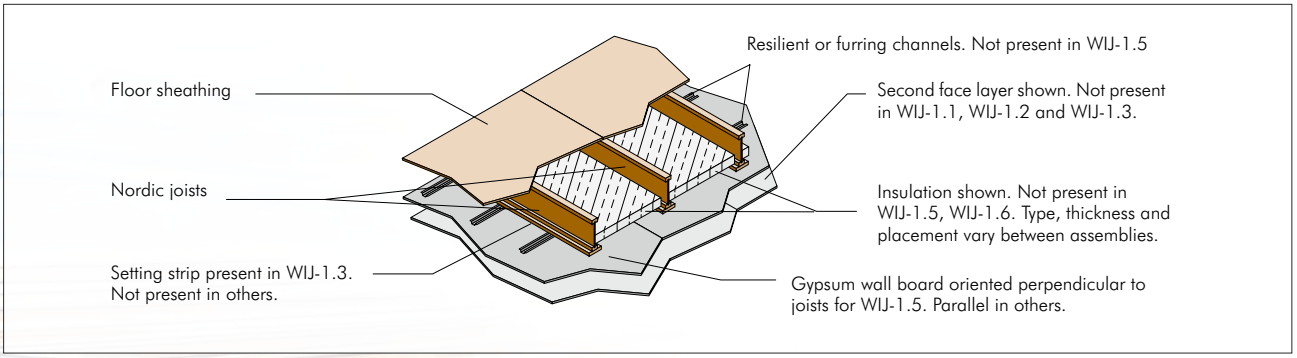






Do not bevel cut joist beyond inside face of wall, except if required as part of a reinforced joist - rafter connection.

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



ASSEMBLY NUMBER IBC/DCA3	ONE HOUR FIRE-RESISITVE 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 floor sheathing 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.							
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 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:	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: *Base Layer:* Fasten base layer of wallboard to the bottom flange, center end joints of wallboard on bottom flange of the I-joist and stagger. *Face Layer:* 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 721.1(3) of the IBC 2012.							
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: *Base Layer:* Fasten base layer of wallboard to the resilient channels with the end joints staggered. *Face Layer:* 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 721.1(3) of the IBC 2012.							
-- / 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 2012, Table 721.1(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 should **never** 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

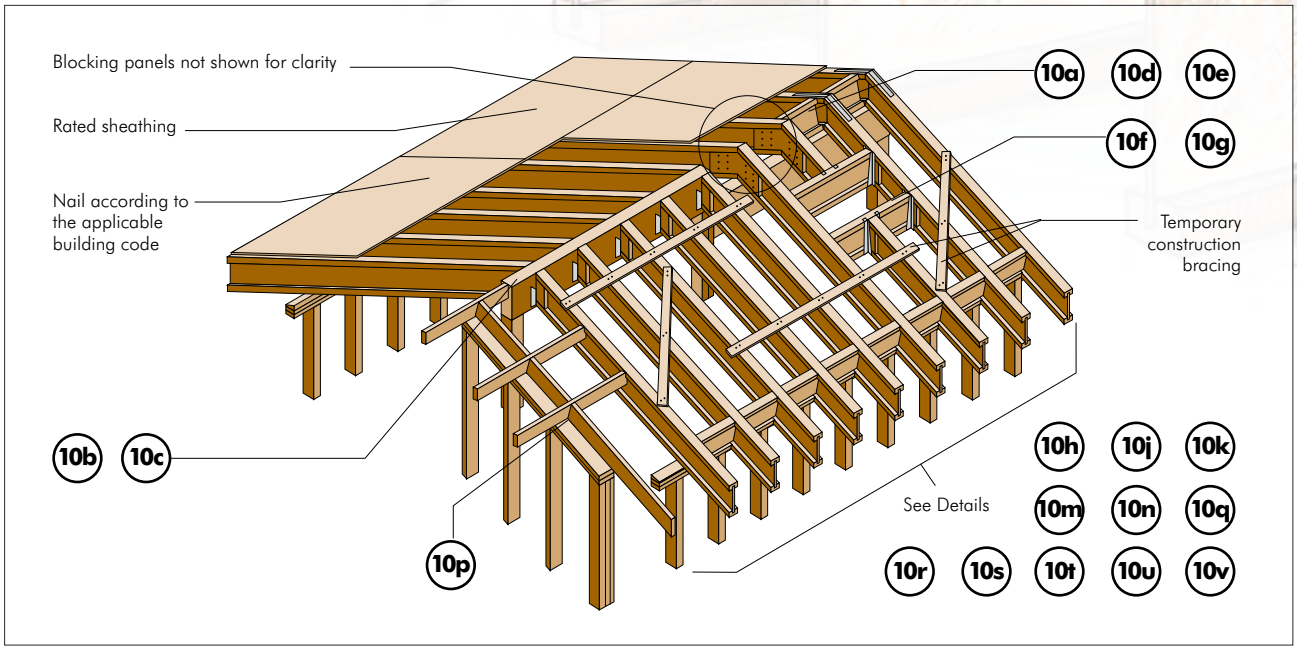
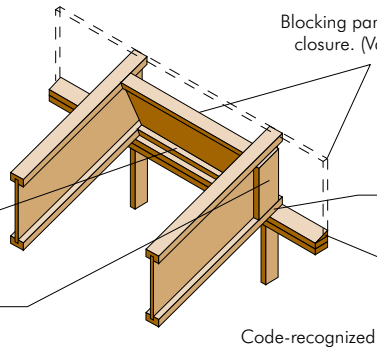


FIGURE 10 (continued)

TYPICAL NORDIC I-JOIST ROOF FRAMING AND CONSTRUCTION DETAILS

10a UPPER END, BEARING ON WALL



Blocking panel, x-bridging, or 23/32" sheathing as continuous closure. (Validate use of x-bridging with local building code).

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.

Minimum attachment: For slope ≤1/4:12, one 10d box nail, face nail at each side of bearing. For slope >1/4:12 design joist attachment to beveled plate to transfer lateral thrust.

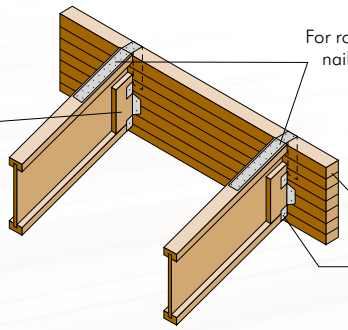
Beveled plate for slopes greater than 1/4:12. Attach to framing with one 16d nail at 16" o.c.

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

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

NOTE: Additional connection may be required for wind uplift.

10b RIDGE CONNECTION



For roof slopes between 1/4:12 and 12:12, provide a strap tie nailed at a minimum of 3" spacing or in accordance with the recommendation of thestrap manufacturer.

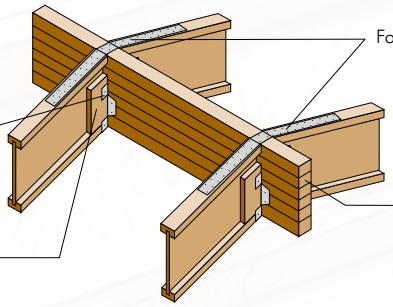
Beveled bearing stiffener required each side

Ridge beam (Nordic Lam or SCL)

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

NOTE: Additional connection may be required for wind uplift.

10c I-JOIST TO RIDGE BEAM CONNECTION



For roof slopes between 1/4:12 and 12:12, provide a strap nailed at a minimum of 3" spacing on each side of roof slope or in accordance with the recommendation of the strap manufacturer

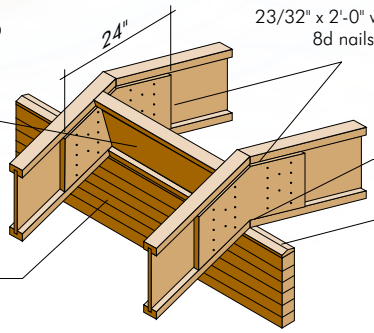
Adjustable slope hanger with a minimum unadjusted uplift capacity of 300 lbs

Ridge beam (Nordic Lam or SCL)

Beveled bearing stiffener required each side

NOTE: Additional connection may be required for wind uplift.

10d I-JOIST CONNECTION WITH WOOD STRUCTURAL PANEL GUSSETS



23/32" x 2'-0" wood structural panel (front and back sides) with twelve 8d nails into each joist with nails clinched. When roof live load exceeds 40 psf, horizontal orientation of gusset strong axis is required. Gap 1/8" at top.

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

Attach I-joist per detail 10a

Attach double-beveled plate to framing with one 16d nail at 16" o.c.

Support beam or wall

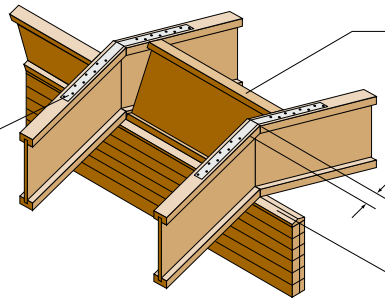
NOTE: Additional connection may be required for wind uplift.

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



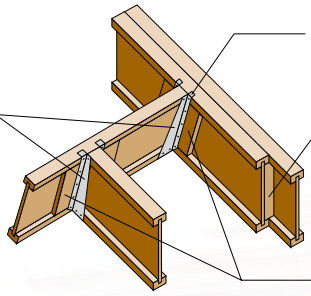
Blocking panel or x-bridging. (Validate use of x-bridging with local building code).

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

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

Double-beveled bearing plate

10f ROOF OPENING TOP-MOUNT HANGERS



Top-mount hanger per manufacturer's recommendations

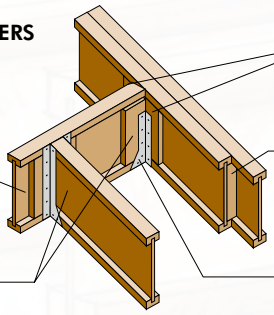
Filler blocking per detail 1p

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

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



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

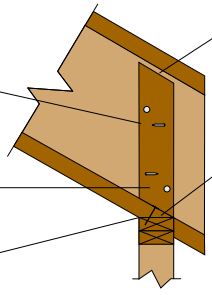
Header may be I-joist, Nordic Lam, or SCL

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 STIFFENERS (Permitted on low end of I-joist only)



1/8" gap at top

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

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

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

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

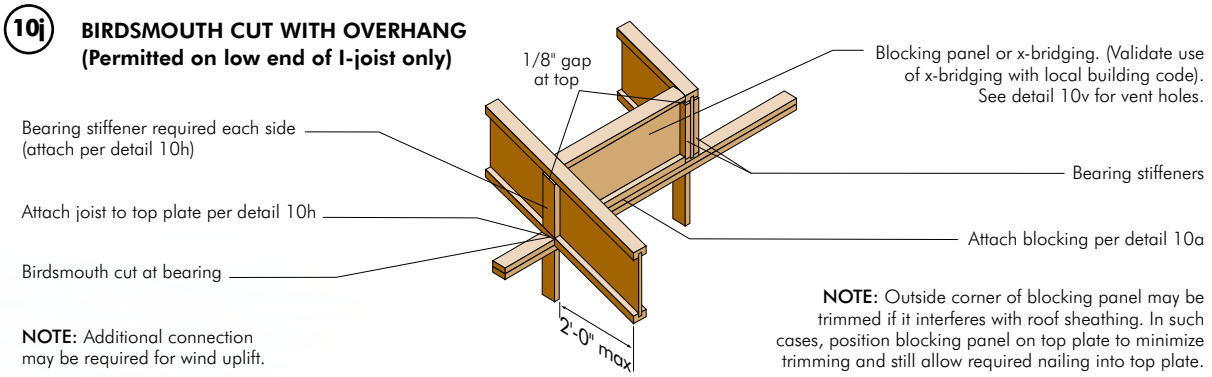
NOTE: Additional connection may be required for wind uplift.

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

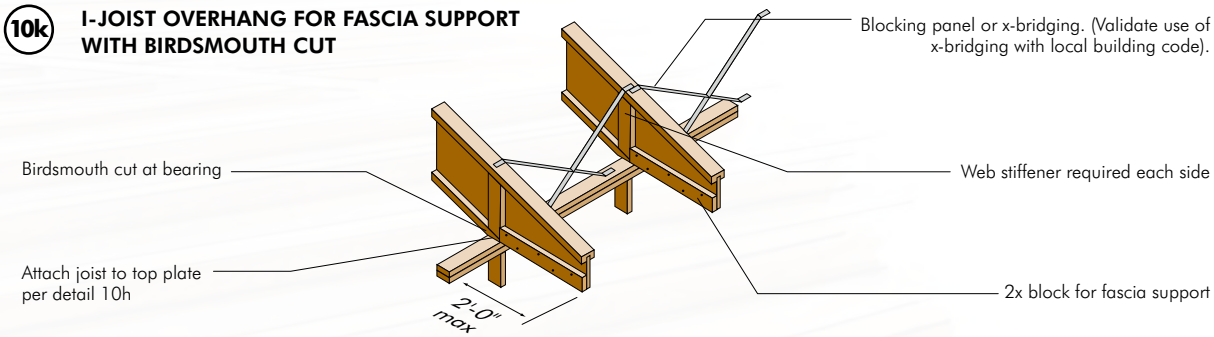
10j BIRDSMOUTH CUT WITH OVERHANG (Permitted on low end of I-joist only)



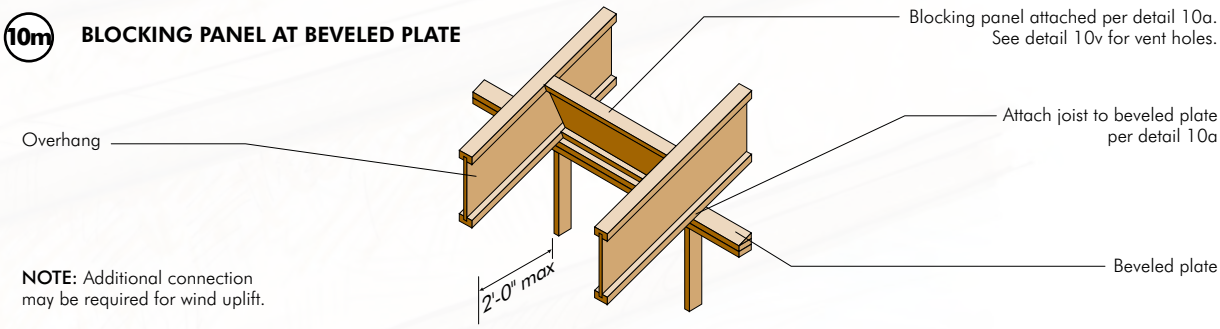
NOTE: Additional connection may be required for wind uplift.

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

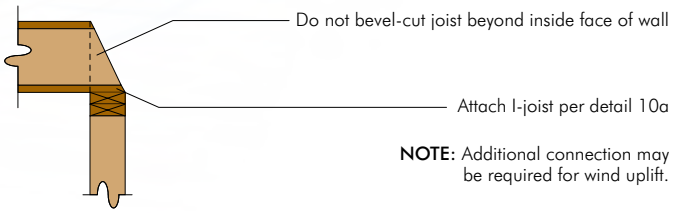


10m BLOCKING PANEL AT BEVELED PLATE



NOTE: Additional connection may be required for wind uplift.

10n I-JOIST WITH BEVEL-CUT END



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

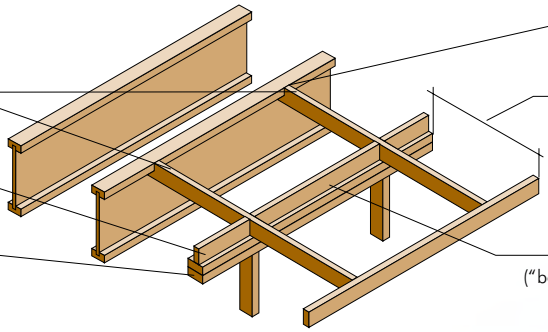
NOTE: Additional connection may be required for wind uplift.

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.

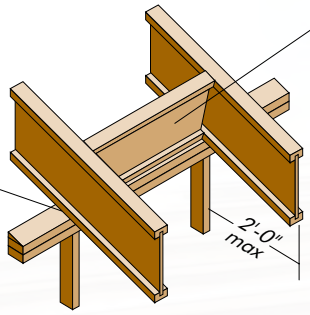
FIGURE 10 (continued)

TYPICAL NORDIC I-JOIST ROOF FRAMING AND CONSTRUCTION DETAILS

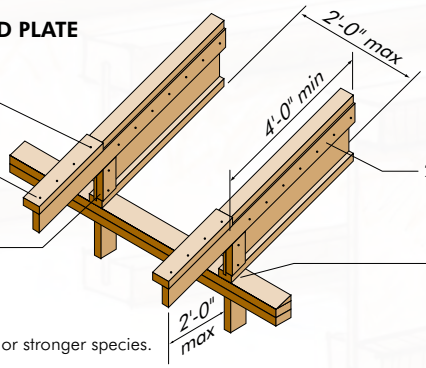
10p OUTRIGGER



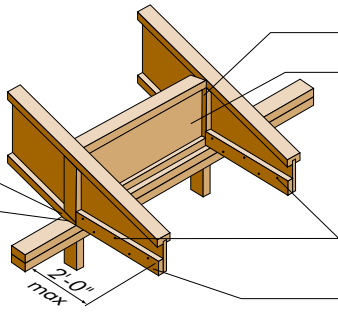
10q I-JOIST OVERHANG WITH BEVELED PLATE



10r LUMBER OVERHANG WITH BEVELED PLATE



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

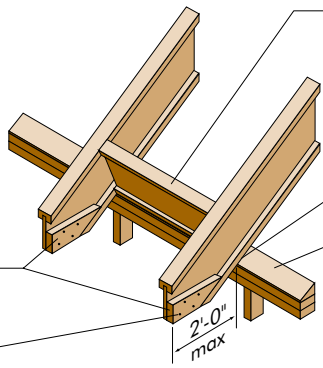


All nails shown in the above details are assumed to be common nails unless otherwise noted. 10d box nails (0.128 x 3 in.) may be substituted for 8d common nails (0.131 x 2-1/2 in.) shown in details. Framing lumber assumed to be Utility grade S-P-F (south) or stronger species. Individual components not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

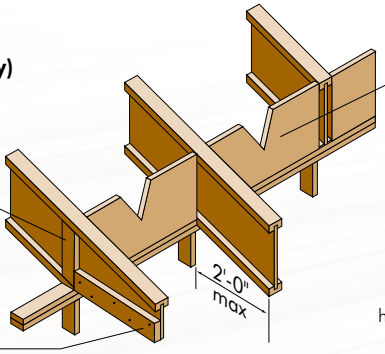
FIGURE 10 (continued)

TYPICAL NORDIC I-JOIST ROOF FRAMING AND CONSTRUCTION DETAILS

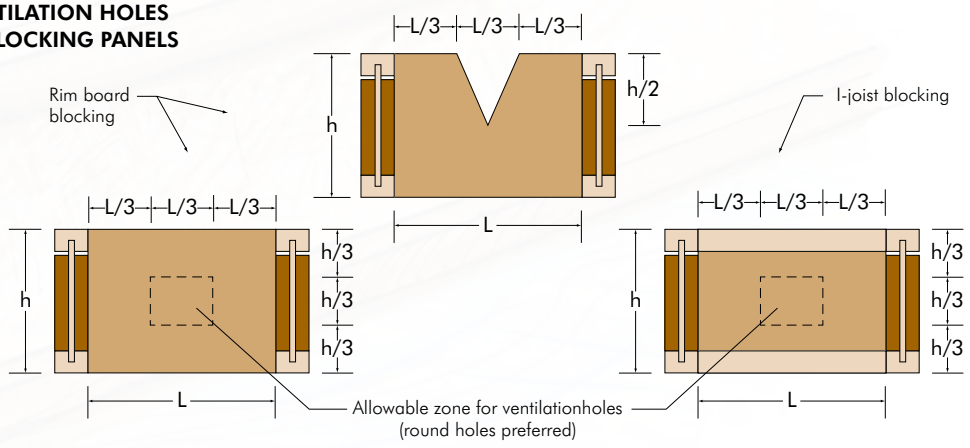
10t I-JOIST OVERHANG FOR FASCIA SUPPORT WITH BEVELED PLATE



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



10v VENTILATION HOLES IN BLOCKING PANELS



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

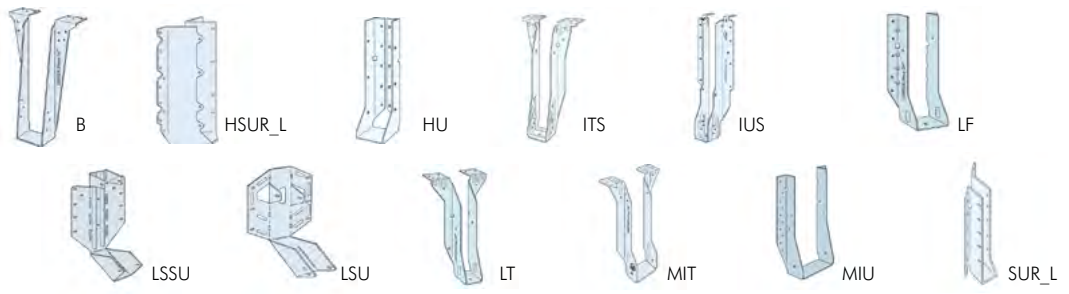
	JOIST SERIES	JOIST DEPTH	FACE MOUNT					TOP MOUNT				
			MODEL	Fastener Type		Allowable Loads (lbs)		MODEL	Fastener Type		Allowable Loads (lbs)	
				Header	Joist	Uplift (160)	Floor (100)		Header	Joist	Uplift (160)	Floor (100)
SINGLE JOISTS	NI-20 NI-40x NI-60	9-1/2	IUS2.56/9.5	8-10d	-	75	810	ITS2.56/9.5	6-10d	-	105	1150
		11-7/8	IUS2.56/11.88	10-10d	-	75	1010	ITS2.56/11.88	6-10d	-	105	1150
		14	IUS2.56/14	12-10d	-	75	1210	ITS2.56/14	6-10d	-	105	1150
		16	IUS2.56/16	14-10d	-	75	1415	ITS2.56/16	6-10d	-	105	1150
	NI-70 NI-80 NI-90x	9-1/2	IUS3.56/9.5	10-10d	-	75	1010	ITS3.56/9.5	6-10d	-	105	1150
		11-7/8	IUS3.56/11.88	12-10d	-	75	1210	ITS3.56/11.88	6-10d	-	105	1150
		14	IUS3.56/14	12-10d	-	75	1210	ITS3.56/14	6-10d	-	105	1150
		16	IUS3.56/16	14-10d	-	75	1415	ITS3.56/16	6-10d	-	105	1150
DOUBLE JOISTS	NI-20 NI-40x NI-60	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
		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
		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 NI-80 NI-90x	9-1/2	HU410-2	18-16d	8-16d	1475	2090	B7.12/9.5	14-16d	6-16d	870	2650
		11-7/8	HU412-2	22-16d	8-16d	1475	2550	B7.12/11.88	14-16d	6-16d	870	2650
		14	HU414-2	26-16d	8-16d	2215	3015	B7.12/14	14-16d	6-16d	870	2650
		16	HU414-2	26-16d	8-16d	2215	3015	B7.12/16	14-16d	6-16d	870	2650

	JOIST SERIES	JOIST DEPTH	FIELD SLOPE & SKEW					45° SKEW				
			MODEL	Fastener Type		Allowable Loads (lbs)		MODEL	Fastener Type		Allowable Loads (lbs)	
				Header	Joist	Uplift (160)	Floor (100)		Header	Joist	Uplift (160)	Floor (100)
SINGLE JOISTS	NI-20 NI-40x NI-60	9-1/2	LSSUH310	14-16d	12-10d x 1-1/2	990	1385	SUR/L2.56/9	14-16d	2-10d x 1-1/2	180	1735
		11-7/8	LSSUH310	14-16d	12-10d x 1-1/2	990	1385	SUR/L2.56/11	16-16d	2-10d x 1-1/2	180	1980
		14	LSSUH310	14-16d	12-10d x 1-1/2	990	1385	SUR/L2.56/14	18-16d	2-10d x 1-1/2	180	2225
		16	LSSUH310	14-16d	12-10d x 1-1/2	990	1385	SUR/L2.56/14	18-16d	2-10d x 1-1/2	180	2225
	NI-70 NI-80 NI-90x	9-1/2	LSSUH410	14-16d	12-10d x 1-1/2	990	1365	SUR/L410	14-16d	6-16d	920	1610
		11-7/8	LSSUH410	14-16d	12-10d x 1-1/2	990	1365	SUR/L410	14-16d	6-16d	920	1610
		14	LSSUH410	14-16d	12-10d x 1-1/2	990	1365	SUR/L414	18-16d	8-16d	1225	1795
		16	LSSUH410	14-16d	12-10d x 1-1/2	990	1365	SUR/L414	18-16d	8-16d	1225	1795
DOUBLE JOISTS	NI-20 NI-40x NI-60	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
		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
		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 NI-80 NI-90x	9-1/2 11-7/8 14 16	*Refer to Wood Construction Connectors catalog for hanger selection*					*Refer to Wood Construction Connectors catalog for hanger selection*				

NOTES:

1. Support material assumed to be Nordic Lam or sawn lumber (Douglas Fir-Larch, Southern Pine or Spruce-Pine-Fir species).
2. 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.
3. Shaded hangers require web stiffeners. Web stiffeners may be required by others for non-shaded hangers.
4. Leave 1/16" (1/8" maximum) clearance between the end of the supported joist and the header or hanger.
5. 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.
6. To verify connector suitability for a specific application, refer to *Wood Construction Connectors* catalog, or visit www.strongtie.com.

SIMPSON Strong-Tie™



USP STRUCTURAL CONNECTORS

	JOIST SERIES	JOIST DEPTH	FACE MOUNT MODEL	FACE MOUNT Fastener Type Header	FACE MOUNT Fastener Type Joist	FACE MOUNT Allowable Loads (lbs) Uplift (160)	FACE MOUNT Allowable Loads (lbs) Floor (100)	TOP MOUNT MODEL	TOP MOUNT Fastener Type Header	TOP MOUNT Fastener Type Joist	TOP MOUNT Allowable Loads (lbs) Uplift (160)	TOP MOUNT Allowable Loads (lbs) Floor (100)
SINGLE JOISTS	NI-20 NI-40x NI-60	9-1/2	THF25925	12-10d	2-10d x 1-1/2	150	1175	TFL2595	6-10d	2-10d x 1-1/2	120	1230
		11-7/8	THF25112	14-10d	2-10d x 1-1/2	310	1370	TFL25118	6-10d	2-10d x 1-1/2	120	1230
		14	THF25140	18-10d	2-10d x 1-1/2	310	1800	TFL2514	6-10d	2-10d x 1-1/2	120	1230
		16	THF25160	22-10d	2-10d x 1-1/2	310	2200	TFL2516	6-10d	2-10d x 1-1/2	120	1230
	NI-70 NI-80 NI-90x	9-1/2	THF35925	12-10d	2-10d x 1-1/2	205	1175	THO35950	10-10d	2-10d x 1-1/2	225	1720
		11-7/8	THF35112	16-10d	2-10d x 1-1/2	205	1570	THO35118	10-10d	2-10d x 1-1/2	225	1720
		14	THF35140	20-10d	2-10d x 1-1/2	205	2000	THO35140	12-10d	2-10d x 1-1/2	225	2280
		16	THF35157	22-10d	2-10d x 1-1/2	205	2200	THO35610	12-10d	2-10d x 1-1/2	225	2280
DOUBLE JOISTS	NI-20 NI-40x NI-60	9-1/2	THF25925-2	12-10d	6-10d	960	1200	THO25950-2	10-16d	6-10d	985	2710
		11-7/8	THF25112-2	16-10d	6-10d	960	1600	THO25118-2	10-16d	6-10d	985	3005
		14	THF25140-2	20-10d	6-10d	1055	2200	THO25140-2	12-16d	6-10d	985	3005
		16	THF25160-2	24-10d	6-10d	1055	2640	THO25160-2	12-16d	6-10d	985	3265
	NI-70 NI-80 NI-90x	9-1/2	HD7100	12-16d	6-10d	990	1450	BPH7195	10-16d	6-10d	1055	3280
		11-7/8	HD7120	16-16d	6-10d	990	1935	BPH71118	10-16d	6-10d	1055	3280
		14	HD7140	20-16d	8-10d	1320	2420	BPH7114	10-16d	6-10d	1055	3280
		16	HD7160	24-16d	8-10d	1320	2905	BPH7116	10-16d	6-10d	1055	3280

	JOIST SERIES	JOIST DEPTH	FIELD SLOPE & SKEW MODEL	FIELD SLOPE & SKEW Fastener Type Header	FIELD SLOPE & SKEW Fastener Type Joist	FIELD SLOPE & SKEW Allowable Loads (lbs) Uplift (160)	FIELD SLOPE & SKEW Allowable Loads (lbs) Floor (100)	45° SKEW MODEL	45° SKEW Fastener Type Header	45° SKEW Fastener Type Joist	45° SKEW Allowable Loads (lbs) Uplift (160)	45° SKEW Allowable Loads (lbs) Floor (100)
SINGLE JOISTS	NI-20 NI-40x NI-60	9-1/2	LSSH25	14-16d	12-10d x 1-1/2	1005	1530	SKH2520L/R	14-10d	10-10d x 1-1/2	1315	1400
		11-7/8	LSSH25	14-16d	12-10d x 1-1/2	1005	1530	SKH2520L/R	14-10d	10-10d x 1-1/2	1315	1400
		14	LSSH25	14-16d	12-10d x 1-1/2	1005	1530	SKH2524L/R	16-10d	10-10d x 1-1/2	1315	1600
		16	LSSH25	14-16d	12-10d x 1-1/2	1005	1530	SKH2524L/R	16-10d	10-10d x 1-1/2	1315	1600
	NI-70 NI-80 NI-90x	9-1/2	LSSH35	14-16d	12-10d x 1-1/2	1330	1615	*SKH410L/R	16-16d	10-16d	1315	1935
		11-7/8	LSSH35	14-16d	12-10d x 1-1/2	1330	1615	*SKH410L/R	16-16d	10-16d	1315	1935
		14	LSSH35	14-16d	12-10d x 1-1/2	1330	1615	*SKH414L/R	22-16d	10-16d	1315	2604
		16	LSSH35	14-16d	12-10d x 1-1/2	1330	1615	*SKH414L/R	22-16d	10-16d	1315	2604
DOUBLE JOISTS	NI-20 NI-40x NI-60	9-1/2	Refer to *EWP Product Guide for hanger selection*					*SKH2520L/R-2	14-10d	10-10d	1635	1440
		11-7/8						*SKH2520L/R-2	14-10d	10-10d	1635	1440
		14						*SKH2524L/R-2	16-10d	10-10d	1635	1650
		16						*SKH2524L/R-2	16-10d	10-10d	1635	1650
	NI-70 NI-80 NI-90x	9-1/2	Refer to *EWP Product Guide for hanger selection*					HD7100-SK45L/R	(20)16d	(8)10d	745	1450
		11-7/8						HD7120-SK45L/R	(16)16d	(6)10d	745	1935
		14						HD7140-SK45L/R	(20)16d	(8)10d	745	2420
		16						HD7160-SK45L/R	(20)16d	(8)10d	745	2905

NOTES:

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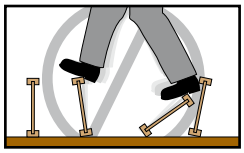
2. Loads may not be increased for short-term loading. Uplift loads have been increased 60% for wind loading with no further increase allowed. Divide by 1.6 for normal loading applications such as in cantilever construction.
3. Shaded hangers require web stiffeners. Web stiffeners may be required by others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

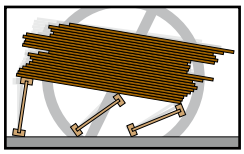
** Miter cut required on end of joist to achieve design loads.*

USP STRUCTURAL CONNECTORS® A MiTek® Company

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 not stable until completely installed, and will not carry any load until fully braced and sheathed.

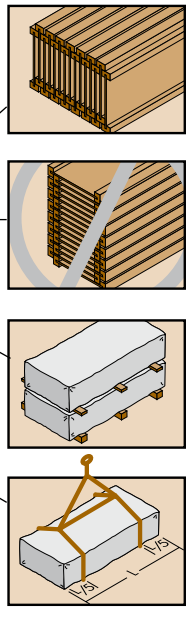
Avoid Accidents by Following these Important Guidelines:

1. Brace and nail each I-joist as it is installed, using hangers, blocking panels, rim board, and/or cross-bridging at joist ends. When I-joists are applied continuous over interior supports and a load-bearing wall is planned at that location, blocking will be required at the interior support.
2. When the building is completed, the floor sheathing will provide lateral support for the top flanges of the I-joists. Until this sheathing is applied, temporary bracing, often called struts, or temporary sheathing must be applied to prevent I-joist rollover or buckling.
   - Temporary bracing or struts must be 1x4 inch minimum, at least 8 feet long and spaced no more than 8 feet on center, and must be secured with a minimum of two 2-1/2" nails fastened to the top surface of each I-joist. Nail the bracing to a lateral restraint at the end of each bay. Lap ends of adjoining bracing over at least two I-joists.
   - Or, sheathing (temporary or permanent) can be nailed to the top flange of the first 4 feet of I-joists at the end of the bay.
3. For cantilevered I-joists, brace top and bottom flanges, and brace ends with closure panels, rim board, or cross-bridging.
4. Install and fully nail permanent sheathing to each I-joist before placing loads on the floor system. Then, stack building materials over beams or walls only.
5. *Never* install a damaged I-joist.

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

STORAGE
AND HANDLING GUIDELINES

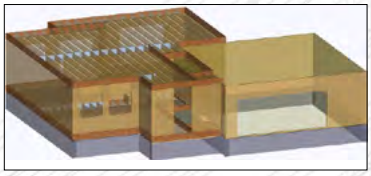
1. Bundle wrap can be slippery when wet. Avoid walking on wrapped bundles.
2. Store, stack and handle I-joists vertically and level only.
3. Always stack and handle I-joists in the upright position only.
4. Do not store I-joists in direct contact with the ground and/or flatwise.
5. Protect I-joists from weather, and use spacers to separate bundles.
6. Bundled units should be kept intact until time of installation.
7. When 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 TRY TO REPAIR A DAMAGED I-JOIST.

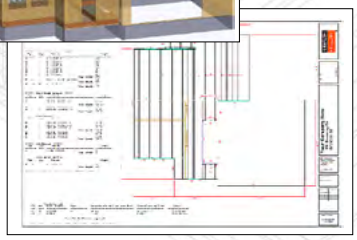


SOFTWARE

Component Solutions EWP Edition®

ISTRUCT™



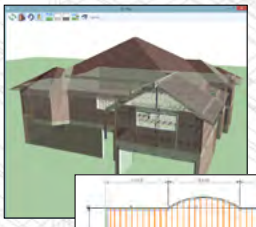


Component Solutions EWP Edition by Simpson Strong-tie and iStruct by CSD (Calculated Structured Designs) are software that integrate and automate all of the major functions that take place in specifying and engineering building components and materials for wood frame structures.

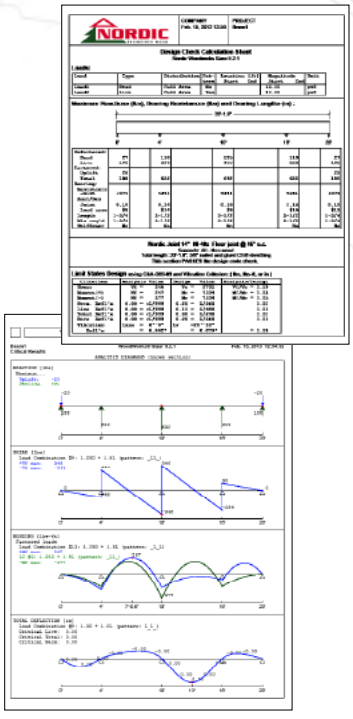
Design, analyze, engineer, calculate, plan, report, generate takeoffs, and finalize the sale all with one software solution. Generate a full house design including all engineered wood floor and roof systems, taking into account all live and gravity loads as they are transferred down through the structure, and complete with all individual component calculations.

In addition, any Nordic glulam and joist may be sized separately and independent from any structure.

Component Solutions EWP Edition and iStruct are available to distributors.



Nordic Sizer



Nordic Sizer by WOODWORKS® is a software program that can be used to design individual members (joists, beams, floor/roof slabs, columns, wall panels) using the full range of Nordic's engineered wood products: glued laminated timber beams and columns, prefabricated wood I-joists, glulam decking, and cross-laminated timber (CLT).

Nordic Sizer analyzes and designs simple and multiple span members for factored dead, live, snow, and wind loads as per CSA O86-09, automatically patterns loads and checks all load combinations as per NBC 2010. Joists and beams may be set horizontally, sloped, or axially rotated (purlins). Columns, studs, and wall panels may be analyzed under combinations of axial and bending loads, and in consideration of load excentricities.

The user may also specify deflection limits, lateral bracing, end notches, web holes, built-up members, service conditions, and floor composition for vibration calculation. Fire design according to NBC 2010, Division B, D-2.11 and D-2.4, but also according to an alternative char-rate method is available for all solid timber products. Material, grade and series, width and thickness may all be specified as 'unknown' - a list of acceptable sections with all the combinations for a given span and loading situation will be generated.

Nordic Sizer is available to engineers, architects, and specifiers working with Nordic products.

DEAD LOAD
MATERIAL WEIGHTS

MATERIAL	(psf)
SHEATHING AND DECKING	
OSB, 3/8-in.	1.4
OSB, 7/16-in.	1.6
OSB, 1/2-in.	1.9
OSB, 19/32-in.	2.2
OSB, 23/32-in.	2.7
Plywood, 11/32-in.	1.1
Plywood, 15/32-in.	1.5
Plywood, 19/32-in.	1.9
Plywood, 23/32-in.	2.3
Plywood, 1-1/8-in.	3.6
Metal deck, 20 gage	2.5
Metal deck, 18 gage	3.0
Wood decking, 1-in.	3.0
Wood decking, 2-in.	5.0
Wood decking, 3-in.	8.0
CEILINGS	
Gypsum board, 1/2-in.	2.2
Gypsum board, 5/8-in.	2.8
Mechanical duct allowance	4.0
Plaster on wood lath	8.0
Suspended steel channel system	2.0
Wood furring suspension system	2.5
COVERINGS	
Asbestos-cement shingles	4.0
Asphalt shingles	2.0
Wood shingles	3.0
Cement tile	16
Clay tile (for mortar add 10 psf)	1.9
Minimum	10
Spanish	19
Composition:	1.9
3-ply ready roofing	1.0
4-ply felt and gravel	5.5
5-ply felt and gravel	6.0

MATERIAL	(psf)
COVERINGS (continued)	
Gypsum sheathing, 1/2-in.	2.0
Skylight, metal frame, 3/8-in. glass	8.0
Waterproofing membranes:	1.9
Bituminous, gravel-covered	5.5
Bituminous, smooth surface	1.5
Liquid applied	1.0
Single-ply, sheet	0.7
FLOOR FILL	
Gyp-crete, 3/4"	6.3
Lightweight concrete, 1-1/2"	12
Stone concrete, 1-1/2"	18
FLOOR FINISHES	
Carpet and pad	2.0
Ceramic or quarry tile (3/4-in.)	5.0
on 1/2-in. mortar bed	16
on 1-in. mortar bed	23
Hardwood, nominal 1-in.	4.0
Linoleum or asphalt tile, 1/4-in.	1.0
Marble and mortar	4.0
on stone-concrete fill	33
Slate (per inch thickness)	15
Subflooring, 3/4-in.	3.0
FLOORS (12-in. spacing)	
2 x 4	1.4
2 x 6	2.1
2 x 8	2.8
2 x 10	3.6
2 x 12	4.3
NI joist	2.20 - 3.95

NOTES:
- See page 7 for I-joist weight/linear foot
- For 16-in. spacing, divide by 1.33
- For 19.2-in. spacing, divide by 1.6
- For 24-in. spacing, divide by 2

MATERIAL	(psf)
FRAME PARTITIONS	
Wood or steel studs,	1.4
1/2-in. gypsum board each side	8
Wood studs, 2 x 4,	1.9
unplastered	4
plastered one side	12
plastered two sides	20
FRAME WALLS	
Exterior stud walls:	1.9
2 x 4 at 16-in., 5/8-in. gypsum,	2.3
insulated, 3/8-in. siding	11
2 x 6 at 16-in., 5/8-in. gypsum,	2.5
insulated, 3/8-in. siding	12
Exterior stud walls with brick veneer	48
Windows, glass, frame and sash	8

NOTE: Wall weights in pounds per square foot of wall. Multiply weight times wall height for pounds per linear foot (plf).

INSULATION (per inch thickness)	
Cellular glass	0.7
Fibrous glass	1.1
Fibreboard	1.5
Perlite	0.8
Polystyrene foam	0.2
Rigid insulation	1.5
Urethane foam with skin	0.5

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 7-10, Tables C3-1 and C3-2.

CONVERSION FACTORS

CONVERSION FACTORS

ITEM	IMPERIAL – METRIC			METRIC – IMPERIAL		
LENGTH	1 in.	=	25.4 mm	1 mm	=	0.0393701 in.
		=	0.0254 m	1 m	=	39.3701 in.
	1 ft	=	0.3048 m		=	3.28084 ft
	1 yd	=	0.9144 m		=	1.09361 yd
	1 mile	=	1.60934 km	1 km	=	0.621371 mile
LENGTH / TIME	1 ft/s	=	0.3048 m/s	1 m/s	=	3.28084 ft/s
	1 mph	=	1.60934 km/h	1 km/h	=	0.621371 mph
AREA	1 $in.^2$	=	645.16 mm^2	1 mm^2	=	0.001550 $in.^2$
	1 ft^2	=	0.0929030 m^2	1 m^2	=	10.7639 ft^2
	1 acre	=	0.404686 ha	1 ha	=	2.47105 acres
	1 mi^2	=	2.58999 km^2	1 km^2	=	0.386102 mi^2
VOLUME	1 $in.^3$	=	16387.1 mm^3	1 mm^3	=	0.0000610237 $in.^3$
	1 ft^3	=	0.0283168 m^3	1 m^3	=	35.3147 ft^3
	1 yd^3	=	0.764555 m^3		=	1.30795 yd^3
	1 fl oz (US)	=	29.5735 ml	1 ml	=	0.0338141 fl oz (US)
	1 gal (US)	=	3.78541 l	1 l	=	0.264172 gal (US)
MASS	1 oz	=	28.3495 g	1 g	=	0.0352740 oz
	1 lb	=	0.453592 kg	1 kg	=	2.20462 lb
	1 short ton (2,000 lbs)	=	0.907185 tons	1 ton	=	1.10231 short tons
MASS / VOLUME	1 lb/ft^3	=	16.1085 kg/m^3	1 kg/m^3	=	0.062079 lb/ft^3
FORCE	1 lb	=	4.44822 N	1 N	=	0.224809 lb
STRESS	1 $lb/in.^2$ (psi)	=	0.00689476 N/mm^2 (MPa)	1 N/mm^2 (MPa)	=	145.038 $lb/in.^2$ (psi)
LOADING	1 lb/ft^2 (psf)	=	0.0478803 kN/m^2 (KPa)	1 kN/m^2 (KPa)	=	20.8854 lb/ft^2 (psf)
	1 lb/ft (plf)	=	0.0145939 kN/m	1 kN/m	=	68.5218 lb/ft (plf)
MOMENT	1 lb-ft	=	0.00135582 kN-m	1 kN-m	=	737.561 lb-ft
TEMPERATURE	1 °F	=	(°F-32) / 1.8 °C	1 °C	=	32 + 1.8 (°C) °F

NOTES:

1. 9.80665 Newtons (N) = 1.0 kilogram (kg) x 9.80665 m/s^2
2. 1.0 Pascal (Pa) = 1.0 Newtons per square meter (N/m^2)

PRODUCT WARRANTY

CHANTIERS CHIBOUGAMAU

PRODUCT WARRANTY

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

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

ONE SMALL STEP FOR NORDIC ENGINEERED WOOD

ONE GIANT STEP
FOR INDUSTRY

From its inception Nordic Engineered Wood has strived to provide the most efficient wood products with the least environmental impacts. That's why Nordic Engineered Wood, in its exclusive partnership with Chantiers Chibougamau Ltd., has become a leader in demanding well-managed forestry practices.

Back in 2000, Nordic was one of the first in North America to demand that the wood used in its products meet or exceed the ISO 14001 Standard. Continuing its ongoing commitment to responsible wood solutions, Nordic Engineered Wood is proud to offer products that are certified by the Forest Stewardship Council, the international benchmark of well-managed forests.

What's in a logo?

With all the certification bodies out there, trying to do the right thing and buying responsibly produced products can be confusing. The FSC label makes it easy to make the right choice when buying wood products. This is what sets FSC apart:

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.

"FSC has the highest environmental standard for forest management of any certification system in the world."

Monte Hummel
World Wildlife Fund, Canada

Protecting nature's resources is everyone's responsibility; at Nordic Engineered Wood we are doing our part.

Do yours.

FSC-Certified wood products are available. Consult your local distributor for details.

FSC
www.fsc.org

The mark of responsible forestry

FSC® C011517

www.nordicewp.com

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