Trus Joist® TJI® Ceiling Joist Supporting Attic Load and Roof Thrust Load

The following information is intended to assist designers in the specification of TJI® for ceiling joist applications supporting both attic load and roof thrust load, as prescribed in 2018/2021/2024 IRC Chapter 8. It is the responsibility of the designer of record to confirm the conditions of the ceiling joist to be within the limitations of the tables provided in this document. For additional design information regarding TJI® joists, reference *Trus Joist® TJI® Joist Specifier's Guide* (TJ-4000).

Ceiling Joists Supporting Attic Load and Roof Thrust Load

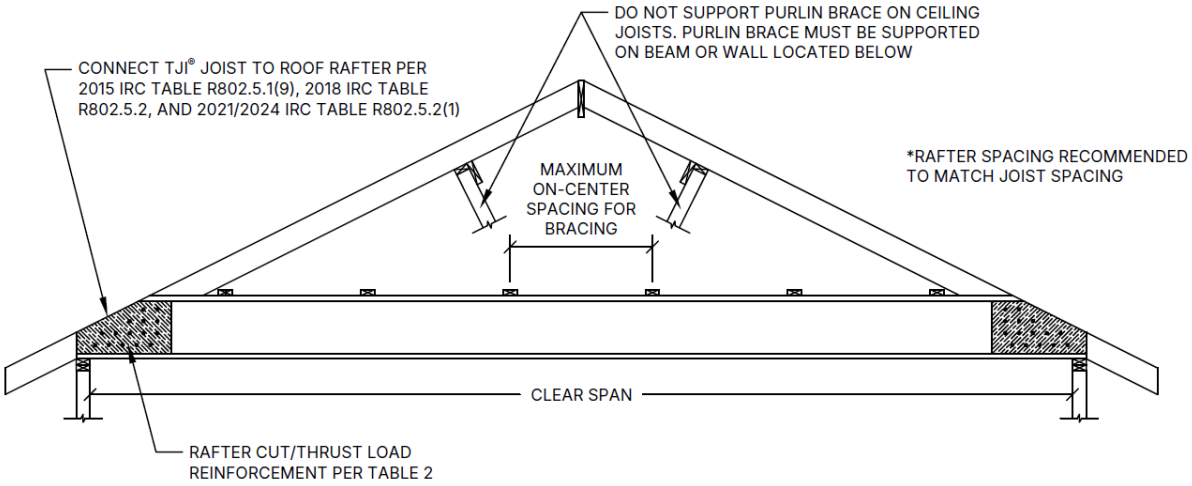
Table 1 provides maximum clear spans for TJI® ceiling joists supporting "uninhabitable attics with limited storage" or "areas other than sleeping areas" as defined by 2018/2021/2024 IRC Table R301.5 and a roof thrust load based on IRC prescribed connections between roof rafters and ceiling joists. The nailing requirements for the rafter-to-ceiling joist connection are given by 2018 IRC Table R802.5.2, and 2021/2024 IRC Table R802.5.2(1). Prior to fastening the rafter-to-ceiling joist connection, the TJI® joist must be reinforced to accommodate both the thrust load and tapered end cut (see Trus Joist® TJI® Rafter Cut/Thrust Load Reinforcement Detail). For ceiling joists supporting only attic load, reference *Trus Joist® TJI® Ceiling Joist Supporting Attic Load* (TB-805).

TABLE 1: TJI® CEILING JOIST SUPPORTING ATTIC LOAD AND ROOF THRUST LOAD[1][2][3][4]

Depth	TJI®	Maximum Clear Span[5][6][7][8]							
		20 PSF Live Load / 10 PSF Dead Load				40 PSF Live Load / 10 PSF Dead Load			
		12″ o.c.	16″ o.c.	19.2″ o.c.	24″ o.c.	12″ o.c.	16″ o.c.	19.2″ o.c.	24″ o.c.
9½″	110	22′-3″	20′-1″	18′-11″	17′-6″	17′-6″	15′-10″	14′-10″	13′-8″
	210	23′-6″	21′-3″	20′-0″	18′-6″	18′-6″	16′-8″	15′-8″	14′-5″
	230	24′-4″	22′-0″	20′-8″	19′-1″	19′-1″	17′-3″	16′-2″	14′-11″
11⅞″	110	26′-7″	24′-1″	22′-6″	20′-1″	20′-11″	18′-11″	17′-5″	15′-6″
	210	28′-1″	25′-5″	23′-10″	22′-0″	22′-1″	19′-11″	18′-8″	17′-0″
	230	29′-0″	26′-3″	24′-8″	22′-9″	22′-9″	20′-7″	19′-4″	17′-10″
	360	30′-10″	27′-11″	26′-2″	24′-3″	24′-3″	21′-11″	20′-6″	18′-11″
	560	35′-6″	32′-1″	30′-2″	27′-11″	27′-11″	25′-2″	23′-7″	21′-10″
14″	110	30′-3″	26′-10″	24′-5″	21′-9″	23′-10″	20′-9″	18′-11″	16′-10″
	210	31′-11″	28′-11″	26′-10″	23′-11″	25′-1″	22′-9″	20′-9″	18′-6″
	230	32′-11″	29′-10″	28′-0″	25′-3″	25′-11″	23′-5″	21′-11″	19′-6″
	360	35′-0″	31′-9″	29′-9″	27′-7″	27′-7″	24′-11″	23′-4″	21′-5″
	560	36′-0″[9]	36′-0″[9]	34′-3″	31′-8″	31′-8″	28′-7″	26′-10″	24′-9″
16″	110	33′-2″	28′-8″	26′-1″	23′-3″	25′-8″	22′-2″	20′-2″	18′-0″
	210	35′-5″	31′-5″	28′-8″	25′-7″	27′-10″	24′-4″	22′-2″	19′-9″
	230	36′-0″[9]	33′-1″	30′-3″	27′-0″	28′-9″	25′-8″	23′-5″	20′-10″
	360	36′-0″[9]	35′-2″	33′-0″	30′-6″	30′-6″	27′-7″	25′-10″	21′-5″
	560	36′-0″[9]	36′-0″[9]	36′-0″[9]	35′-1″	35′-1″	31′-8″	29′-9″	25′-2″

[1] Uniform loads only.
[2] Roof thrust load calculated based on 30 PSF roof live/snow load and 10 PSF dead load.
[3] Roof pitch 6:12 to 12:12. Maximum roof overhang is 24″.
[4] Struts or posts supporting roof framing or purlin lines must not be braced to joists.
[5] Simple span only.
[6] Minimum bearing length of 2¼″ end.
[7] Total load deflection limited to L/240 and live load deflection limited to L/360; assumed no composite action.
[8] For TJI® 110, maximum on-center spacing of bracing is 32″ o.c.; for all other TJI® joists, use 36″ o.c.
[9] Maximum clear span limited by scope of IRC table.

Trus Joist® TJI® Rafter Cut/Thrust Load Reinforcement Detail



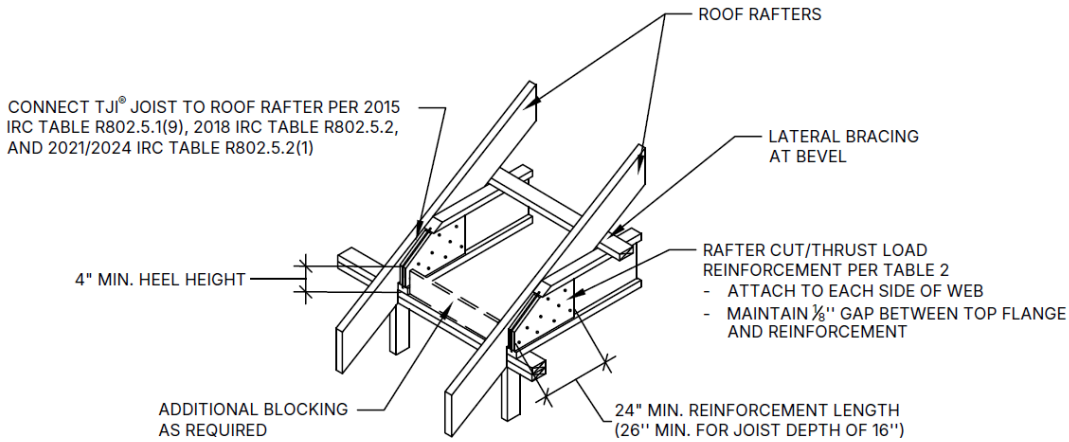


TABLE 2: RAFTER CUT/THRUST LOAD REINFORCEMENT

TJI®	Material	Nail
110	¾'' CDX or OSB	20 (0.131'' x 2¼'') or larger, clinched
210	⅞'' CDX or OSB	
230	⅞'' or 1'' net CDX or OSB	
360		
560	1½'' thick TimberStrand® LSL[1]	22 (0.131'' x 3½'') or larger, clinched

[1] TimberStrand® LSL may be re-sawn per TB-305.

The maximum clear spans in Table 1 consider an axial tension load due to the thrust force resulting from the roof rafter being fastened to the ceiling joist. Reference 2018 IRC Table R802.5.2, or 2021/2024 IRC Table R802.5.2(1) for additional design requirements of rafter-to-ceiling joist connections.

If you have any questions, please contact your Weyerhaeuser representative.

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