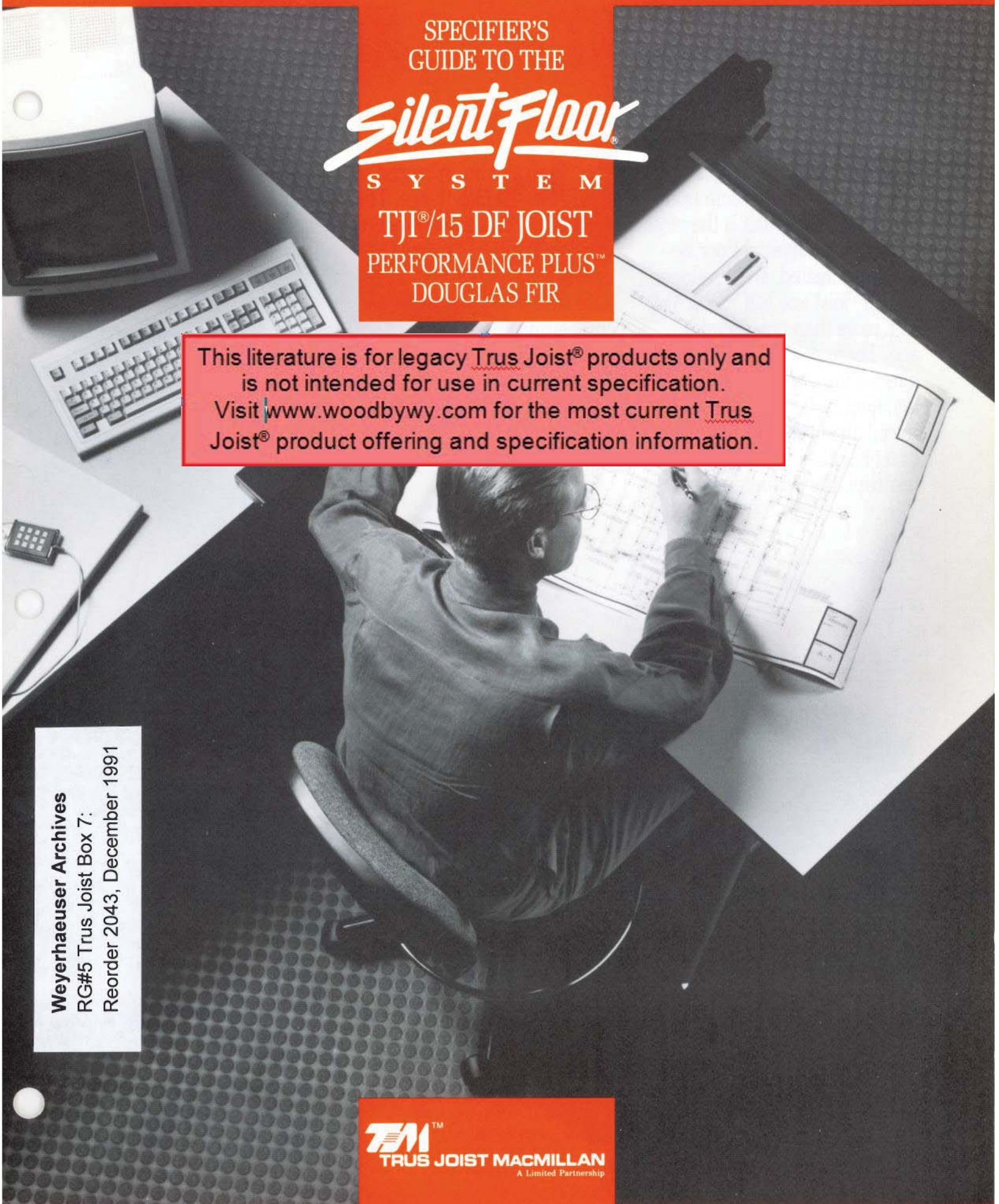
RESIDENTIAL APPLICATIONS

SPECIFIER'S GUIDE TO THE Silent Floor® SYSTEM

TJI®/15 DF JOIST

PERFORMANCE PLUS™ DOUGLAS FIR



This literature is for legacy Trus Joist® products only and is not intended for use in current specification. Visit www.woodbywy.com for the most current Trus Joist® product offering and specification information.

TRUS JOIST MACMILLAN™
A Limited Partnership

DESIGN SPECIFICATIONS

WE GO TO GREAT LENGTHS TO

To make a long story short, the Silent Floor® joist system from Trus Joist MacMillan is the most advanced residential floor system ever created. We developed the TJI® joist and MICRO=LAM® LVL more than two decades ago. These products established a new standard of performance and quality. In 1991, we introduced an entirely new generation of Silent Floor joists featuring the Performance Plus™ web and an enhanced MICRO=LAM LVL flange. This high-performance combination produced a joist unequalled in moisture resistance and structural strength at an even more competitive cost.

Each of these developments demonstrates that we have the resolve and the resources to remain the leader in wood fiber engineering. So when you specify TJI joists and MICRO=LAM LVL beams, you can base your recommendation *and* reputation on a tradition of technological leadership.

The Silent Floor system also offers tremendous design flexibility because TJI joists and MICRO=LAM LVL beams

The complete Silent Floor system. TJI joists and MICRO=LAM LVL beams are available in lengths up to 60 feet.

*See our Residential Products Reference Guide for design information on MICRO=LAM LVL.

SUPPORT YOUR REPUTATION.

CONTENTS

are engineered to stay exceptionally strong and straight. With this complete system you're able to do things that would not be possible with lesser materials.

And unlike ordinary dimension lumber, Silent Floor joists will not shrink, warp, twist, cup or crown. Which eliminates the major cause of squeaky floors. Customer complaints. And costly call-backs.

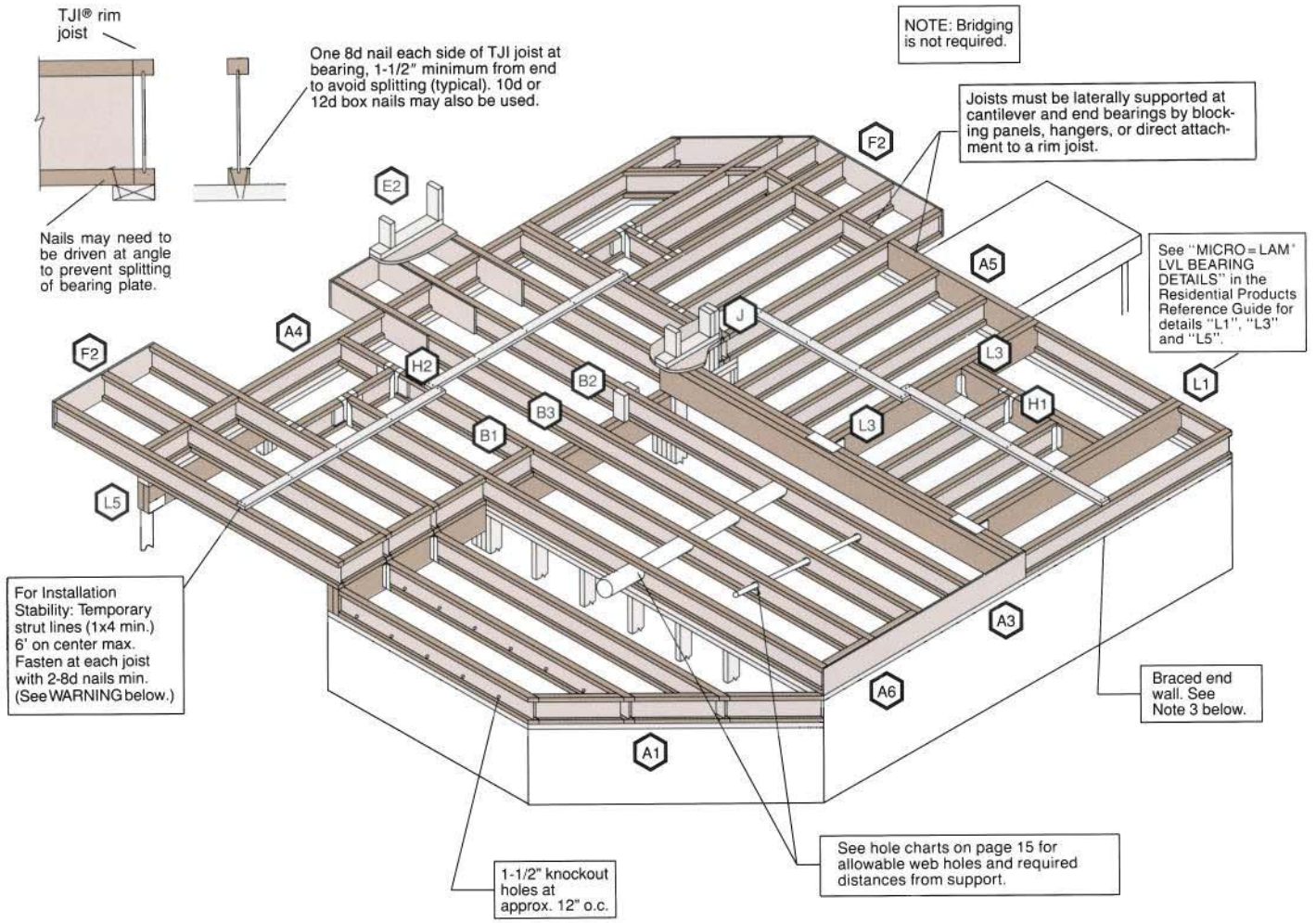
This specifier's guide contains specifications and details for residential applications. We hope you find it useful. If you have questions, are planning an unusual installation, or need information on a multi-family or commercial application, feel free to call the Trus Joist MacMillan representative nearest you. After all, now that you've decided to specify the one and only Silent Floor system, you can expect superior support on every level.

QUALITY GUARANTEE

We guarantee that the Trus Joist MacMillan products used in your home were manufactured to precise tolerances and are free from defects. In the unlikely event that your floor or roof system develops squeaks or any other problem due to a defect in our products, we will promptly remedy that problem at no cost to you.

This guarantee is effective for the life of your home.
1-800-628-3997

TYPICAL Silent Floor® SYSTEM FRAMING



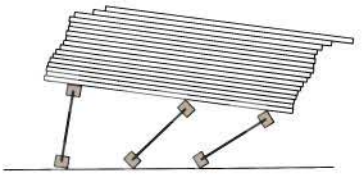
WARNING

JOISTS ARE UNSTABLE UNTIL BRACED LATERALLY

DO NOT allow workers to walk on joists until braced. INJURY MAY RESULT. See Notes 1, 2 & 3 below.

BRACING INCLUDES:

- BLOCKING
- HANGERS
- STRUT LINES
- SHEATHING



DO NOT stack building materials on unsheathed joists. Stack only over beams or walls. See Note 4 below.

WARNING NOTES:

Lack of concern for proper bracing during construction can result in serious accidents. Under normal conditions if the following guidelines are observed, accidents will be avoided.

1. All blocking, hangers and rim joists at the end supports of the TJI® joists must be completely installed and properly nailed.
2. Lateral strength, like a braced end wall or an existing deck, must be established at the ends of the bay. This can also be accomplished by a temporary or permanent deck (sheathing) nailed to the first 4 feet of joists at the end of the bay.
3. Temporary strut lines of 1 x 4 (min.) must be nailed to a braced end wall or sheathed area as in note 2 and to each joist. Without this bracing, buckling sideways or roll over is highly probable under light construction loads — like a worker and one layer of unnailed sheathing.
4. Sheathing must be totally attached to each TJI® joist before additional loads can be placed on the system.
5. Ends of cantilevers require strut lines on both the top and bottom flanges.
6. The flanges must remain straight within a tolerance of 1/2" from the true alignment.

TJI®/15 DF JOIST RESIDENTIAL FLOOR SPAN CHARTS

SEE THE "PRODUCT DISTRIBUTION MAP" (BACK COVER) FOR GENERAL DISTRIBUTION OF DOUGLAS FIR AND SOUTHERN PINE PRODUCTS. BE SURE THE PRODUCT YOU SPECIFY IS AVAILABLE IN YOUR PROJECT'S LOCATION. CONTACT YOUR LOCAL TRUS JOIST MACMILLAN OFFICE FOR ASSISTANCE OR ADDITIONAL PRODUCT INFORMATION.

40 PSF LIVE LOAD, 10 PSF DEAD LOAD (Example: Single layer glue-nailed wood sheathing and direct applied ceiling)

L/360 LIVE LOAD DEFLECTION

	TJI®/15 DF JOIST DEPTH	
o.c. spacing	9½"	11⅞"
12"	18'-9"	22'-4"
16"	17'-2"	20'-5"
19.2"	16'-3"	18'-10"
24"	15'-1"	15'-1"

L/480 LIVE LOAD DEFLECTION

	TJI®/15 DF JOIST DEPTH	
o.c. spacing	9½"	11⅞"
12"	17'-0"	20'-3"
16"	15'-6"	18'-5"
19.2"	14'-8"	17'-5"
24"	13'-7"	15'-1"

40 PSF LIVE LOAD, 20 PSF DEAD LOAD (Example: Single layer glue-nailed wood sheathing with ¾" poured gypsum concrete and direct applied ceiling)

L/360 LIVE LOAD DEFLECTION

	TJI®/15 DF JOIST DEPTH	
o.c. spacing	9½"	11⅞"
12"	18'-9"	22'-4"
16"	16'-11"	18'-10"
19.2"	15'-5"	15'-8"
24"	12'-6"	12'-6"

L/480 LIVE LOAD DEFLECTION

	TJI®/15 DF JOIST DEPTH	
o.c. spacing	9½"	11⅞"
12"	17'-0"	20'-3"
16"	15'-6"	18'-5"
19.2"	14'-8"	15'-8"
24"	12'-6"	12'-6"

NOTE: Installing TJI® joists at closer on center spacings or at shorter spans than shown may improve floor performance. See below for "A WORD ABOUT FLOOR PERFORMANCE," or contact your Trus Joist MacMillan representative for assistance.

GENERAL NOTES:

1. Span charts assume composite action with single layer of the appropriate span rated glue-nailed wood decking for deflection only. **Spans shall be reduced 5" where sheathing panels are nailed only.**
2. Spans are based on clear distance between supports, uniformly loaded joists, and include allowable increases for repetitive use members.
3. For loading conditions not shown, refer to allowable uniform load tables on page 14.
4. Spans shown reflect the most restrictive of simple span or multiple span applications.
5. Web stiffeners are required for lateral support of the joist if the sides of the hanger do not laterally support the TJI® joist top flange. Otherwise, web stiffeners do not enhance bearing capacity and are not required for TJI®/15 DF floor joists.

A WORD ABOUT FLOOR PERFORMANCE

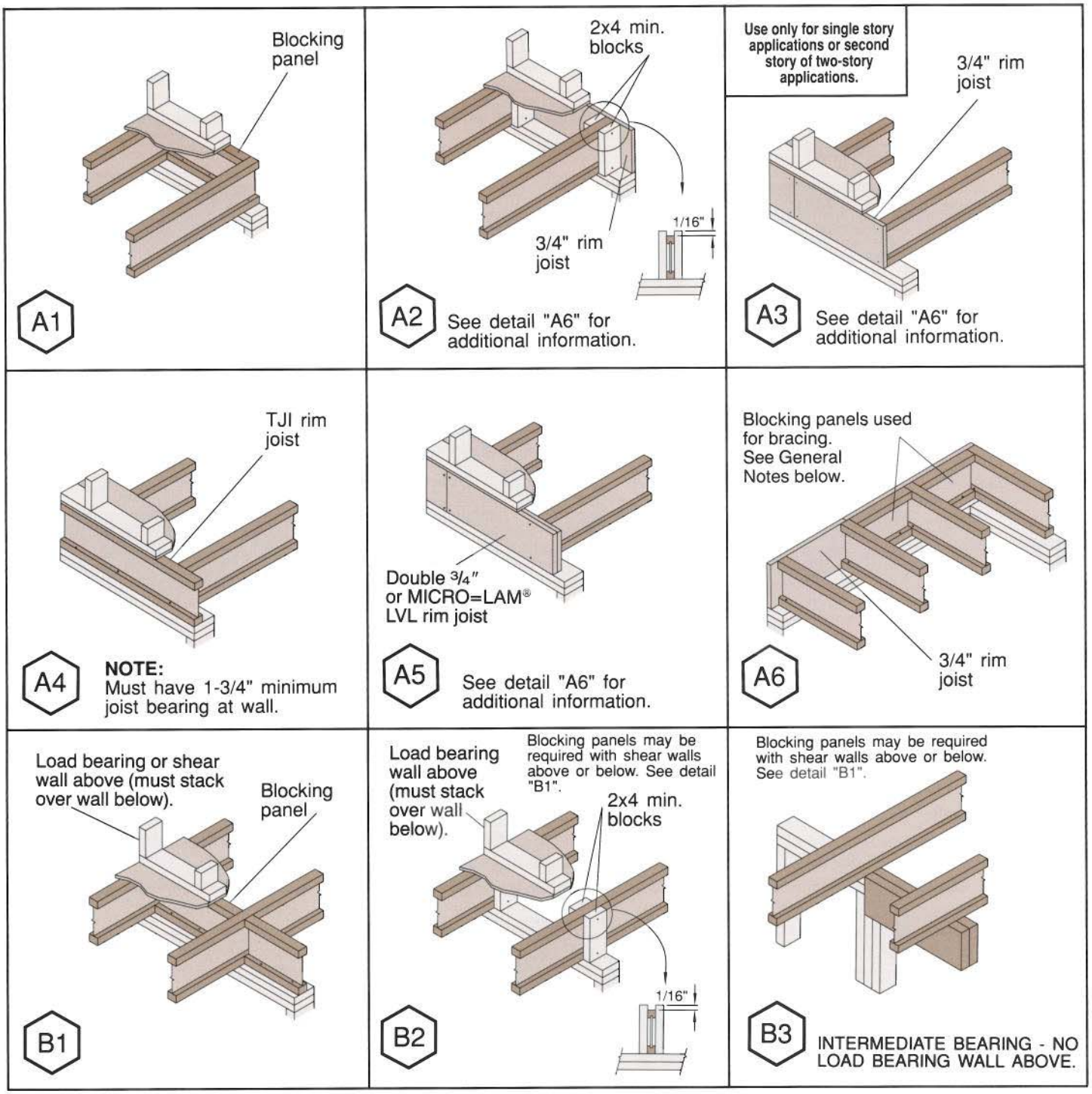
The spans indicated in the "L/360 Live Load Deflection" charts above meet or exceed all code requirements and may provide acceptable performance to the user. But, in addition to safely supporting the loads to be imposed on it, a floor system must perform to the satisfaction of the end user. Since expectancy levels may vary from one user to another, designing a floor system becomes a subjective issue requiring judgement as to the sensitivity of the occupant.

The second span charts above entitled "L/480 Live Load Deflection" have been developed as a guide to help builders construct higher quality floors. Spans in these charts were developed using stricter live load deflection criteria to limit deflection over longer spans.

In addition to the joist deflection, several other factors may affect the performance of the floor system. A glue-nailed floor system will perform better than a nailed floor. Deflection of the sheathing material between the joists can be reduced by increasing the thickness of sheathing or decreasing the spacing of the joist. Proper installation, including adequate and level support for the joists, and care in fastening of the joists and sheathing are essential to the system performance.

In some cases where the system is stiff and very little dead load (i.e. partition walls, ceilings, furniture, etc.) exists, vibrations may occur. Vibrations are generally sufficiently dampened when a ceiling is directly attached to the bottom flange of the joists. When the joists occur in a crawl space or over an unfinished basement, the vibration can be minimized by nailing a continuous 2x4 (flat) perpendicular to the joists' bottom flanges at midspan and tying off to the end walls.

TJI®/15 DF JOIST FLOOR DETAILS



GENERAL NOTES

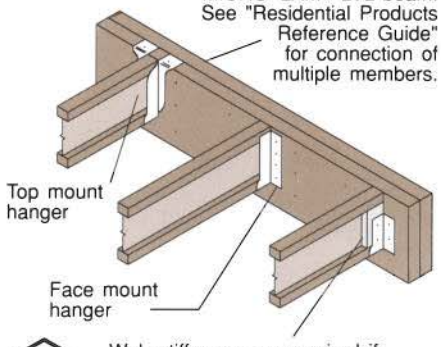
MINIMUM BEARING LENGTH

- 1 3/4" minimum bearing is required at joist ends.
- 3 1/2" minimum bearing is required when joists are continuous over the support.

3/4" RIM JOIST, REINFORCEMENT OR CLOSURE

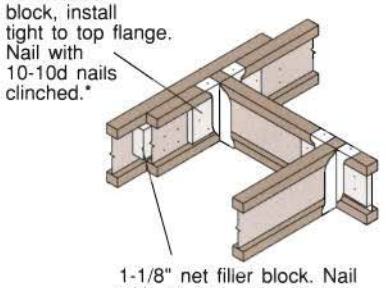
- 3/4" for rim joist, reinforcement or closure refers to 3/4" CDX plywood or other 3/4" exterior grade 48/24 span rated sheathing that is cut to match the full depth of the joist. Install with face grain horizontal.
- Rim joist and cantilever reinforcement must bear fully on the wall plate.
- Bracing complying with the code shall be carried to the foundation. When 3/4" rim joist is used blocking panels cut from TJI® joists or MICRO=LAM® LVL may be installed for a minimum of 4' at each end and at least 4' every 25' of bearing wall length to carry wall bracing as required to the foundation. See detail "A6."
- Check local codes for acceptance of details "A2," "A3,", "A5" and "A6."

TJI®/15 DF JOIST FLOOR DETAILS



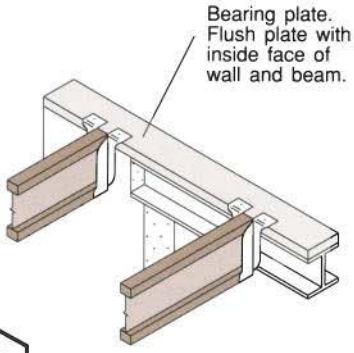
H1

Web stiffeners are required if the sides of the hanger do not laterally support the TJI® joist top flange. See detail "K".



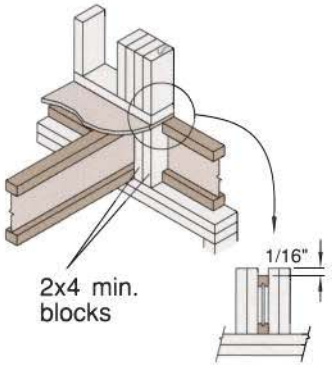
H2

* Backer block required where hanger load exceeds 250 pounds.

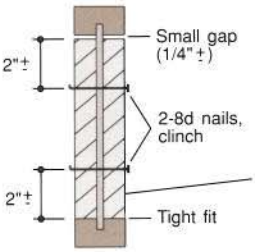


H3

Solid block post loads from above to bearing plate below.



J

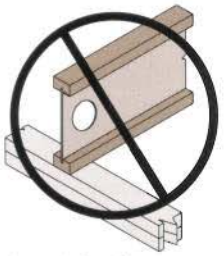


K

TJI®/15 DF JOIST
WEB STIFFENER ATTACHMENT

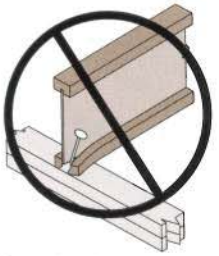
THESE CONDITIONS ARE NOT PERMITTED

DO NOT put holes too close to supports



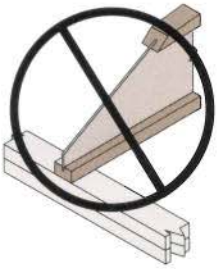
Refer to hole charts on page 15 for minimum distance from bearing wall.

DO NOT split the flange

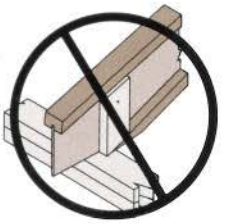


Use 8d nails, 1½" minimum from end of flange. 10d or 12d box nails may also be used.

DO NOT bevel cut joist beyond inside face of wall.



Birdsmouth cut must not overhang inside face of plate.



TJI® joist flange must bear fully on the plate. See detail "R12" on page 13.

BLOCKING PANELS OR RIM JOISTS

- For single-story applications and second floor of two-story applications, use details "A1," "A2," "A3," "A4," or "A5."
- For main floor rim of two-story applications, use details "A1," "A2," "A4," or "A5."
- Assumes 1000 plf vertical load transfer for each layer of ¾" rim joist.
- Assumes 2000 plf vertical load transfer for each TJI® blocking panel or rim joist.
- Assumes 5145 plf vertical load transfer for each 1¾" MICRO=LAM® LVL used as rim joist or blocking.

NAILING REQUIREMENTS

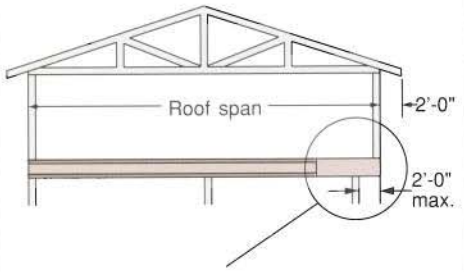
- Nail joists at bearings with 2-8d (or 10d or 12d box) nails (1 each side), 1½" minimum from end to avoid splitting.
- Nail TJI® joist blocking panels or TJI® rim joist to bearing plate with 8d nails at 6" on center. When used for shear transfer, nail to bearing plate with same nailing as the decking.
- Nail TJI® rim joist, MICRO=LAM® LVL rim joist, ¾" rim joist or closure to TJI® joist with 2-8d nails, one each at top and bottom flange.
- Attach 2x4 min. blocks at details "A2," "B2" and "J" to TJI® joist top and bottom flanges with 1-8d nail.

WEB STIFFENER REQUIREMENTS

- Web stiffeners are required for lateral support of the joist if the sides of the hanger do not laterally support the TJI® joist top flange. Otherwise, web stiffeners do not enhance bearing capacity and are not required for TJI®/15 DF floor joists.

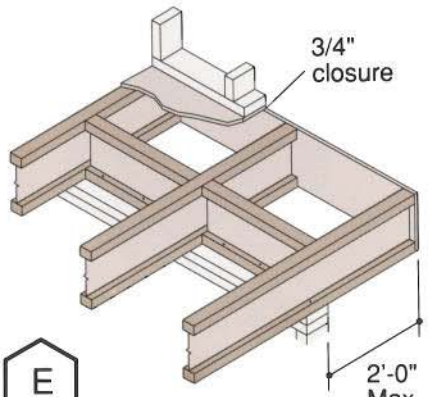
TJI®/15 DF JOIST FLOOR DETAILS

LOAD BEARING CANTILEVER DETAILS

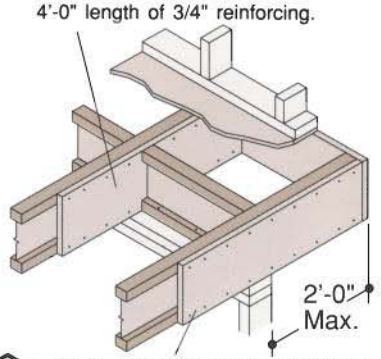


TJI® joists may be cantilevered up to a maximum of 2'-0" when supporting roof load, but may require reinforcement. **Consult tables on page 9 to determine required reinforcement** and details at right for methods of reinforcement.

NOTE:
3/4" CDX plywood reinforcement or other 3/4" exterior grade 48/24 span rated sheathing must match the full depth of the TJI® joist. Install with face grain horizontal. Reinforcing member must bear fully on the wall plate.

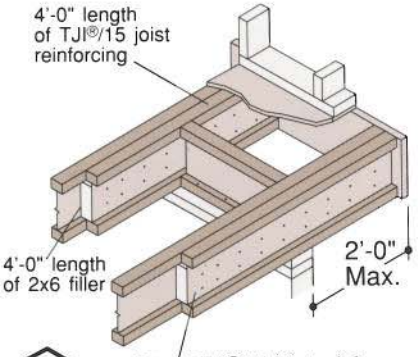


E



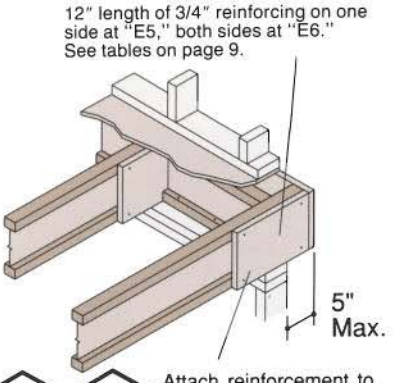
E2

Attach reinforcement to joist top and bottom flanges with 8d nails at 6" o.c.



E4

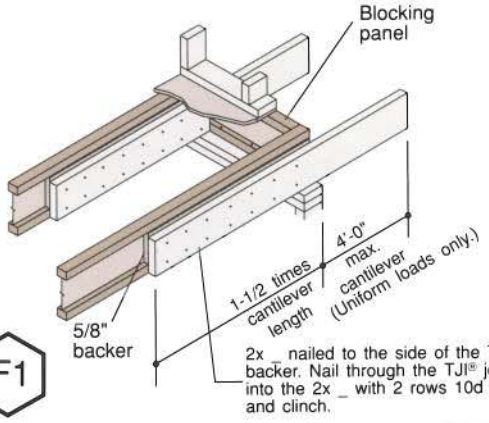
Attach TJI®/15 joist reinforcement to joist web with 2 rows 10d nails at 6" o.c. clinched.



E5 E6

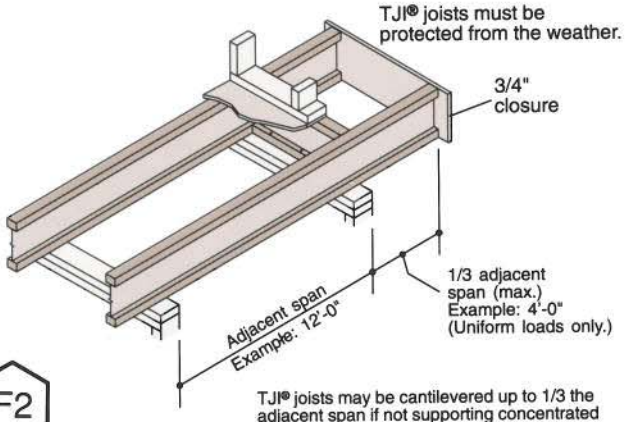
Attach reinforcement to joist top and bottom flanges with one 8d nail at each corner.

NON-LOAD BEARING CANTILEVER DETAILS



F1

2x _ nailed to the side of the TJI® joist with wood backer. Nail through the TJI® joist and backer into the 2x _ with 2 rows 10d nails at 6" o.c. and clinch.



F2

TJI® joists may be cantilevered up to 1/3 the adjacent span if not supporting concentrated loads on the cantilever.

REFER TO PAGES 6 AND 7 FOR GENERAL NOTES FOR DETAILS.

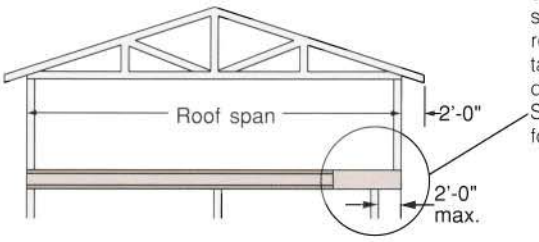
NAILING OF SHEATHING TO TOP FLANGE

Nail Size	Closest o.c. spacing per row
8d box	2-1/2"
8d common	3-1/2"
10d, 12d box	3"

- Maximum spacing of nails is 18" o.c.
- 14 ga. staples may be substituted for 8d nails if minimum penetration of 1" into the TJI® joist is achieved.

Joist Layout for 19.2" On Center Spacing	
	1 — 19 3/16"
	2 — 38 3/8"
	3 — 57 5/8"
	4 — 76 13/16"
8'	5 — 96"
	6 — 115 3/16"
	7 — 134 3/8"
	8 — 153 5/8"
	9 — 172 13/16"
16'	10 — 192"
	11 — 211 3/16"
	12 — 230 3/8"
	13 — 249 5/8"
	14 — 268 13/16"
24'	15 — 288"

TJI®/15 DF LOAD BEARING CANTILEVER TABLE



TJI® joists may be cantilevered up to a maximum of 2'-0" when supporting roof load, but may require reinforcement. Consult table and refer to footnotes to determine required reinforcement. See details E2 and E4 on page 8 for methods of reinforcement.

	Roof Total Load		30 PSF			40 PSF			50 PSF		
	Joist Spcg.		16" o.c.	19.2" o.c.	24" o.c.	16" o.c.	19.2" o.c.	24" o.c.	16" o.c.	19.2" o.c.	24" o.c.
9½" TJI®/15 DF	Roof Truss Span w/24" Soffit Assumed	24'	0	0	0	0	0	1	0	1	X
		26'	0	0	0	0	0	1	1	1	X
		28'	0	0	1	0	1	1	1	1	X
		30'	0	0	1	0	1	1	1	1	X
		32'	0	0	1	0	1	X	1	X	X
		34'	0	0	1	1	1	X	1	X	X
		36'	0	0	1	1	1	X	1	X	X
11⅞" TJI®/15 DF	Roof Truss Span w/24" Soffit Assumed	26'	0	0	1	0	1	1	1	1	1
		28'	0	0	1	0	1	1	1	1	1
		30'	0	0	1	1	1	1	1	1	1
		32'	0	0	1	1	1	1	1	1	1
		34'	0	1	1	1	1	1	1	1	X
		36'	0	1	1	1	1	1	1	1	X
		38'	0	1	1	1	1	1	1	1	X

Numbers in charts refer to footnotes below.

0. No reinforcement required.

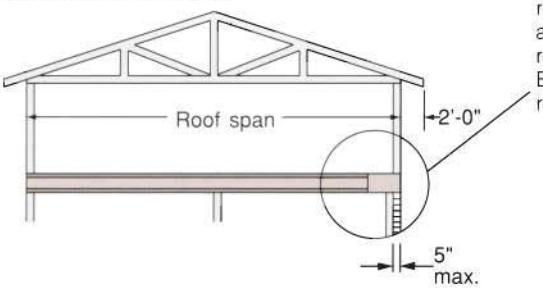
1. ¾" x 48" reinforcement required on one side of joist as shown in detail E2 on page 8 or, double the joists as shown in detail E4 on page 8.

X. Will not work. Reduce spacing of joists.

NOTE:

- Assumes a 10 psf roof dead load and 60 plf wall load. Additional support may be required for other loadings.
- ¾" reinforcement refers to ¾" CDX plywood or other ¾" exterior grade 48/24 span rated sheathing that is cut to match the full depth of the joist. Install with face grain horizontal. Reinforcing member must bear fully on the wall plate. Minimum wall plate width is 3½ inches.
- Calculations assume a bearing stress of 480 psi.

TJI®/15 DF LOAD BEARING CANTILEVER TABLE – BRICK LEDGE



TJI® joists for brick ledge cantilevers may be cantilevered up to 5" when supporting roof load, but may require reinforcement. Consult table and refer to footnotes to determine required reinforcement. See details E5 and E6 on page 8 for method of reinforcement.

	Roof Total Load		30 PSF			40 PSF			50 PSF		
	Joist Spcg.		16" o.c.	19.2" o.c.	24" o.c.	16" o.c.	19.2" o.c.	24" o.c.	16" o.c.	19.2" o.c.	24" o.c.
9½" TJI®/15 DF	Roof Truss Span w/24" Soffit Assumed	24'	0	0	0	0	0	1	1	1	1
		26'	0	0	1	0	0	1	1	1	1
		28'	0	0	1	0	0	1	1	1	1
		30'	0	0	1	0	0	1	1	1	1
		32'	0	1	1	0	1	1	1	1	2
		34'	0	1	1	0	1	1	1	1	2
		36'	0	1	1	0	1	1	1	1	2
11⅞" TJI®/15 DF	Roof Truss Span w/24" Soffit Assumed	24'	0	0	0	0	0	1	1	1	1
		26'	0	0	1	0	0	1	1	1	1
		28'	0	0	1	0	0	1	1	1	1
		30'	0	0	1	0	0	1	1	1	1
		32'	0	1	1	0	1	1	1	1	2
		34'	0	1	1	0	1	1	1	1	2
		36'	0	1	1	0	1	1	1	1	2

Numbers in charts refer to footnotes below.

0. No reinforcement required.

1. ¾" x 12" reinforcement required on one side of joist. Attach per detail E5 on page 8.

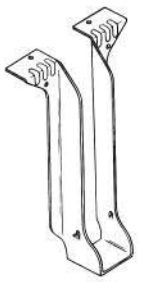
2. ¾" x 12" reinforcement required on both sides of joist. Attach per detail E6 on page 8.

NOTE:

- Assumes a 10 psf roof dead load and 60 plf wall load. Additional support may be required for other loadings.
- ¾" reinforcement refers to ¾" CDX plywood or other ¾" exterior grade 48/24 span rated sheathing that is cut to match the full depth of the joist. Install with face grain horizontal. Reinforcing member must bear fully on the wall plate. Minimum wall plate width is 3½ inches.
- Calculations assume a bearing stress of 480 psi.

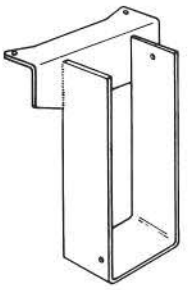
TJI®/15 DF JOIST FRAMING CONNECTORS

C1
TOP MOUNT
SINGLE JOIST HANGER



JOIST	HANGER
9½" TJI®/15 DF	IT29.5 or ITT29.5
11⅞" TJI®/15 DF	IT211.88 or ITT211.88

C2
TOP MOUNT
DOUBLE JOIST HANGER



JOIST	HANGER	MAXIMUM LOAD (LBS.)
9½" TJI®/15 DF	WP29.5-2	2525
11⅞" TJI®/15 DF	WP211.88-2	2525

C3
FACE MOUNT
SINGLE JOIST HANGER

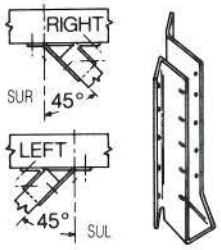
JOIST	HANGER
9½" TJI®/15 DF	IU29 or IUT29
11⅞" TJI®/15 DF	IU211 or IUT211

C4
FACE MOUNT
DOUBLE JOIST HANGER

JOIST	HANGER	MAXIMUM LOAD (LBS.)
9½" TJI®/15 DF	U210-2*	1875 (100%) – 2350 (125%)
11⅞" TJI®/15 DF	HU212-2*	2160 (100%) – 2700 (125%)

*Requires use of web stiffeners.

C5
FACE MOUNT SKEWED
45° JOIST HANGER



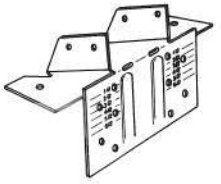
TOP VIEW

JOIST	45° SKEWED HANGER
9½" TJI®/15 DF	SUR 210/SUL 210*
11⅞" TJI®/15 DF	SUR 210/SUL 210*

*Requires use of web stiffeners.

C6
VARIABLE SLOPE
SEAT CONNECTOR

NOTE:
- Requires 3½" width bearing surface.
- May be used only on slopes of 1"/12" through 6"/12."

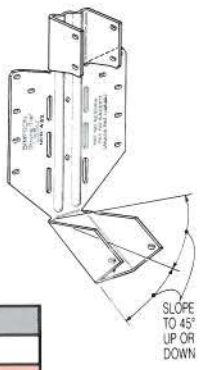


JOIST	CONNECTOR	MAXIMUM LOAD (LBS.)
9½" TJI®/15 DF	VP 2	1150
11⅞" TJI®/15 DF	VP 2	1150

Note: Requires 3½" width bearing surface.

C7
VARIABLE SLOPE
SEAT JOIST
HANGER

NOTE:
Hanger can be field adjusted for slopes and skews of up to 45 degrees.



JOIST	HANGER
9½" TJI®/15 DF	LSSU 210*
11⅞" TJI®/15 DF	LSSU 210*

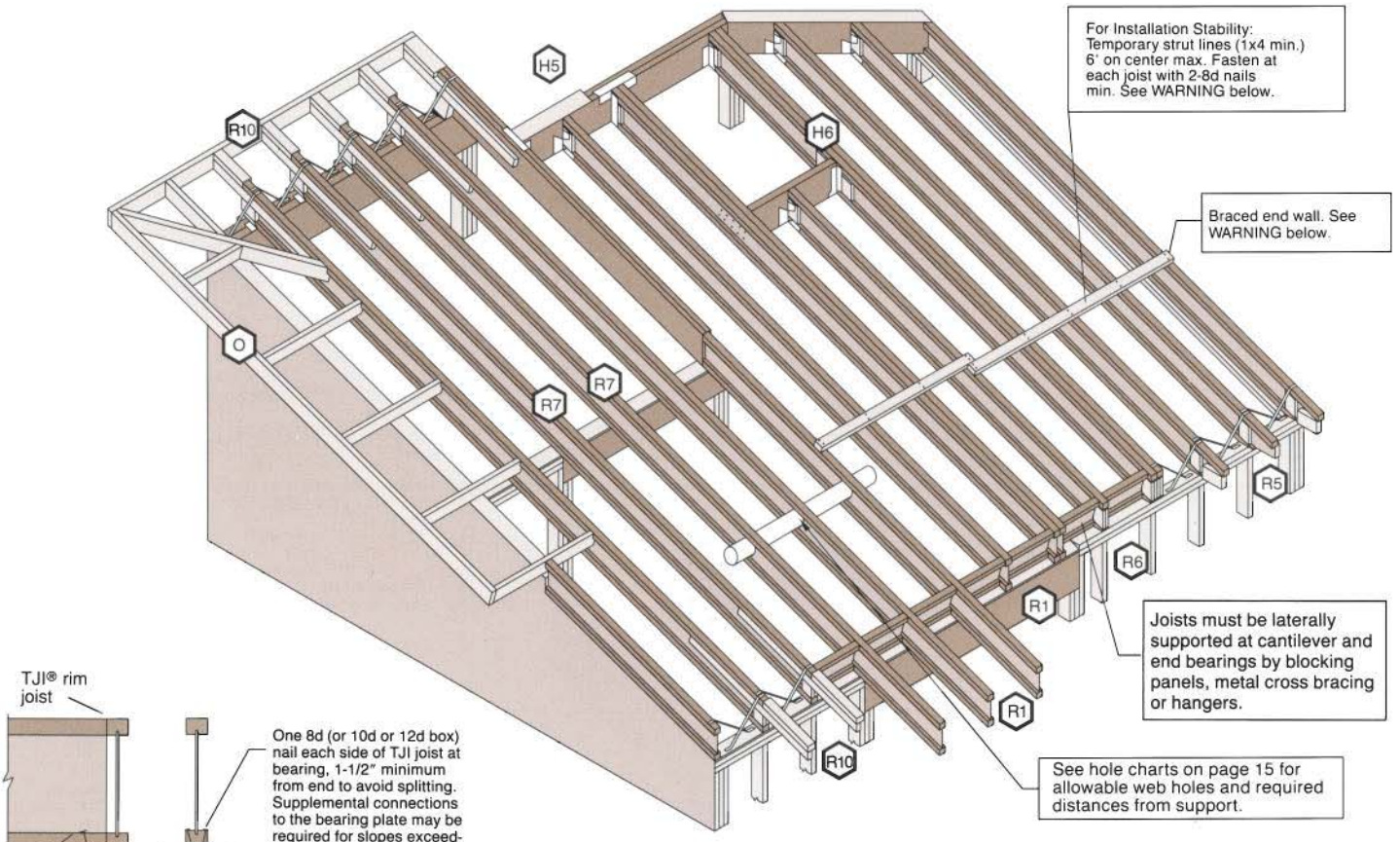
*Requires use of web stiffeners.

NOTES:

Some hangers shown have less capacity than the capacity of the TJI® joists. For single joist applications beyond those shown in the span tables and all double joist applications, these hangers will need to be checked to assure adequate capacity.

- Hangers can only achieve maximum capacity if all nail holes are filled with the proper nails.
- In some cases, the hangers shown may have greater capacity when used in conjunction with certain supporting member categories or support member criteria.
- The hangers listed above are manufactured by Simpson Strong-Tie® Company, Inc. For additional hanger information, please refer to the appropriate Simpson Strong-Tie® Company, Inc. evaluation report.

RESIDENTIAL TJI®/15 DF JOIST ROOF DETAILS & SPAN CHART



WARNING
Unbraced joists are unstable. See complete warning on page 4.

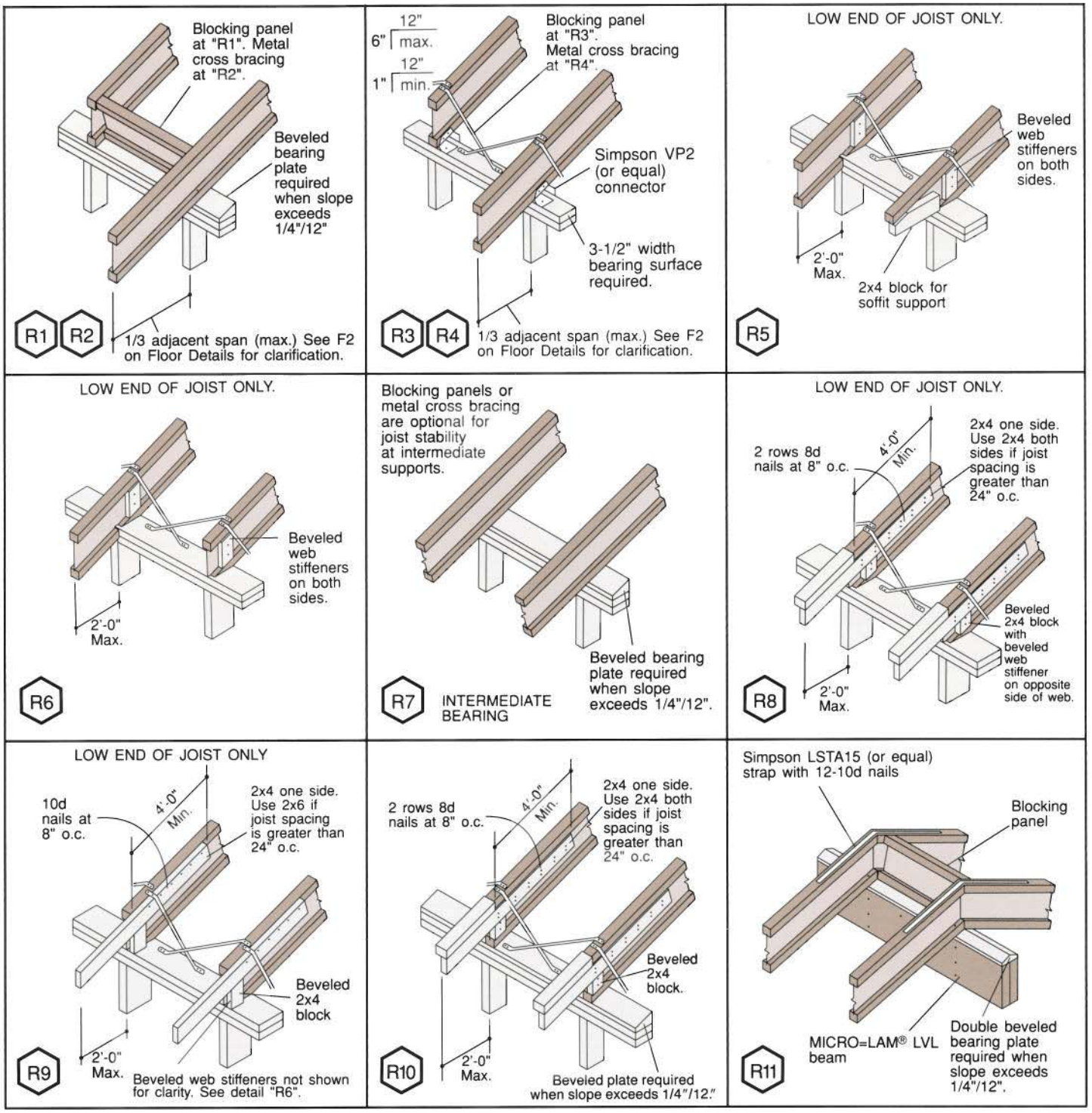
TJI®/15 DF JOIST – RESIDENTIAL ROOF SPAN CHARTS

Low Slope: 6″/12″ or less.
High Slope: Over 6″/12″ through 12″/12.″

TJI®/15 DF			DESIGN LIVE LOAD (LL) AND DEAD LOAD (DL) IN PSF													
			NON-SNOW (125%)				SNOW LOAD AREA (115%)									
O.C. SPACING	DEPTH	SLOPE	16 LL 15 DL	16 LL 20 DL	20 LL 15 DL	20 LL 20 DL	20 LL 15 DL	20 LL 20 DL	25 LL 15 DL	25 LL 20 DL	30 LL 15 DL	30 LL 20 DL	40 LL 15 DL	40 LL 20 DL	50 LL 15 DL	50 LL 20 DL
12″ o.c.	9½″	LOW	N.A.	N.A.	22′-3″	21′-2″	22′-3″	21′-2″	21′-4″	20′-5″	20′-6″	19′-9″	19′-2″	18′-7″	18′-1″	17′-8″
		HIGH	20′-7″	19′-4″	19′-10″	18′-10″	19′-10″	18′-10″	19′-1″	18′-2″	18′-5″	17′-7″	17′-4″	16′-8″	16′-5″	15′-11″
	11⅞″	LOW	N.A.	N.A.	26′-10″	25′-6″	26′-10″	25′-6″	25′-8″	24′-7″	24′-8″	23′-9″	23′-1″	22′-4″	21′-10″	21′-3″
		HIGH	24′-9″	23′-4″	23′-11″	22′-8″	23′-11″	22′-8″	23′-0″	21′-11″	22′-2″	21′-3″	20′-11″	20′-1″	19′-10″	19′-2″
16″ o.c.	9½″	LOW	N.A.	N.A.	20′-2″	19′-2″	20′-2″	19′-2″	19′-4″	18′-6″	18′-7″	17′-10″	17′-4″	16′-10″	16′-5″	15′-11″
		HIGH	18′-7″	17′-7″	18′-0″	17′-0″	18′-0″	17′-0″	17′-3″	16′-6″	16′-8″	16′-0″	15′-8″	15′-1″	14′-11″	14′-5″
	11⅞″	LOW	N.A.	N.A.	24′-4″	23′-2″	24′-4″	23′-2″	23′-3″	22′-3″	22′-4″	21′-6″	20′-11″	20′-3″	19′-9″	19′-1″
		HIGH	22′-5″	21′-2″	21′-8″	20′-6″	21′-8″	20′-6″	20′-10″	19′-10″	20′-1″	19′-3″	18′-11″	18′-3″	17′-11″	17′-4″
19.2″ o.c.	9½″	LOW	N.A.	N.A.	18′-11″	18′-0″	18′-11″	18′-0″	18′-1″	17′-4″	17′-5″	16′-9″	16′-3″	15′-9″	15′-5″	14′-11″
		HIGH	17′-6″	16′-6″	16′-11″	16′-0″	16′-11″	16′-0″	16′-3″	15′-6″	15′-8″	15′-0″	14′-9″	14′-2″	14′-0″	13′-6″
	11⅞″	LOW	N.A.	N.A.	22′-10″	21′-9″	22′-10″	21′-9″	21′-10″	20′-11″	21′-0″	20′-2″	19′-8″	18′-9″	18′-1″	16′-9″
		HIGH	21′-1″	19′-10″	20′-4″	19′-3″	20′-4″	19′-3″	19′-7″	18′-8″	18′-11″	18′-1″	17′-9″	17′-1″	16′-10″	16′-4″
24″ o.c.	9½″	LOW	N.A.	N.A.	17′-6″	16′-8″	17′-6″	16′-8″	16′-9″	16′-1″	16′-1″	15′-6″	15′-1″	14′-6″	14′-0″	13′-4″
		HIGH	16′-2″	15′-3″	15′-8″	14′-10″	15′-8″	14′-10″	15′-0″	14′-4″	14′-6″	13′-10″	13′-8″	13′-2″	12′-11″	12′-6″
	11⅞″	LOW	N.A.	N.A.	21′-1″	20′-1″	21′-1″	20′-1″	20′-2″	19′-3″	19′-4″	18′-3″	17′-1″	15′-6″	14′-6″	13′-4″
		HIGH	19′-6″	18′-5″	18′-10″	17′-10″	18′-10″	17′-10″	18′-1″	17′-3″	17′-6″	16′-9″	16′-5″	15′-8″	15′-0″	13′-8″

1. Roof joists to be sloped ¼″ in 12″ minimum. No camber provided.
2. Maximum deflection is limited to L/180 at total load, and L/240 at live load.
3. For loads not shown, refer to allowable uniform load table on page 14.
4. Charts are based on a support beam or wall at the high end. Applications utilizing ridge boards are not covered by these charts.
5. Spans are based on the horizontal clear distance between supports, uniformly loaded joists, and include allowable increases for repetitive use members.
6. Spans shown are based on the most restrictive of simple span or multiple span applications.
7. Web stiffeners are required for lateral support of the joist if the sides of the hanger do not laterally support the TJI® joist top flange. Web stiffeners are also required at all sloped hanger locations and all birdsmouth cut locations. Otherwise, web stiffeners do not enhance bearing capacity and are not required for TJI®/15 DF roof joists.

TJI®/15 DF JOIST ROOF DETAILS



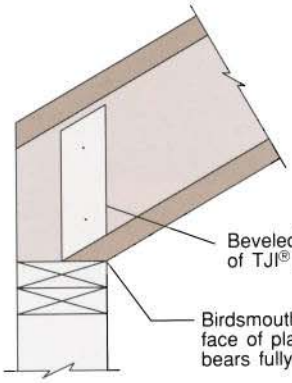
GENERAL NOTES

MINIMUM BEARING LENGTH

- 1¾" minimum bearing is required at joist ends.
- 3½" minimum bearing is required when joists are continuous over the support.

SLOPE/BEVEL PLATE CRITERIA

- Unless otherwise noted, all details are valid to maximum 12"/12" slope.
- A sloped bearing surface is required for all slopes exceeding ¼" per foot for wood bearing surfaces. At the low end of joists a birdsmouth cut may be used without a beveled bearing surface. See detail R12.
- Slope seats for hangers are required when the roof slope exceeds ½" per foot. Beveled web stiffeners are required at sloped seat hangers. See detail R13.
- Supplemental connections to the bearing plate may be required for sloped conditions beyond 4" per foot to resist sliding forces.

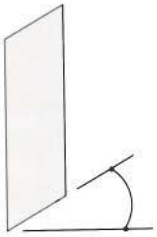


Birdsmouth cut is allowed only on low end of joist.

Beveled web stiffener each side of TJI® joist web. See detail "R13".

Birdsmouth cut must not overhang inside face of plate, so that TJI® joist flange bears fully on plate.

R12 BIRDSMOUTH CUT

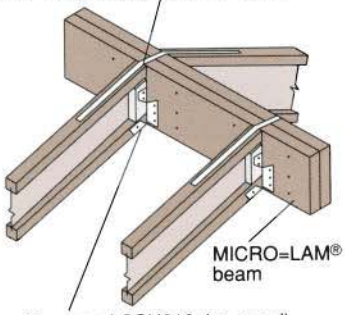


See detail "K" on Floor Details for attachment.

Bevel cut web stiffener to match roof slope.

R13 BEVELED WEB STIFFENER

Simpson LSTA 15 (or equal) strap with 12-10d nails may be required with hangers other than LSSU210 when slope exceeds 7"/12"

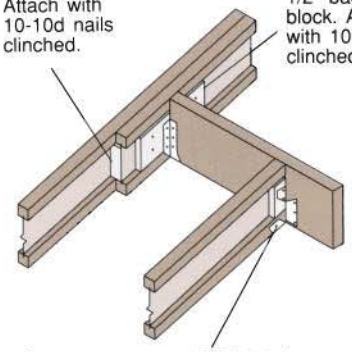


MICRO=LAM® LVL beam

H5 Simpson LSSU210 (or equal) hanger with beveled web stiffeners

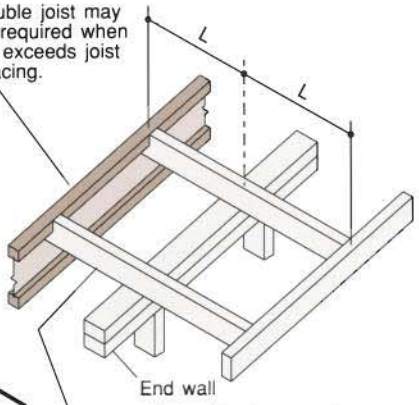
1-1/8" net filler block. Attach with 10-10d nails clinched.

1/2" backer block. Attach with 10-10d nails clinched.



H6 Simpson LSSU210 (or equal) hanger with beveled web stiffeners

Double joist may be required when "L" exceeds joist spacing.

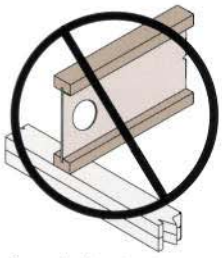


End wall

O 2x overhang. Notch around TJI® joist top flange.

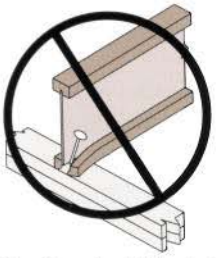
THESE CONDITIONS ARE NOT PERMITTED

DO NOT put holes too close to supports



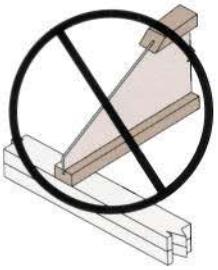
Refer to hole charts on page 15 for minimum distance from bearing wall.

DO NOT split the flange

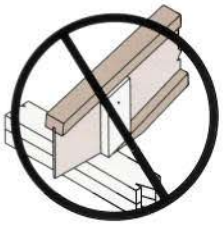


Use 8d nails, 1½" minimum from end of flange. 10d or 12d box nails may also be used.

DO NOT bevel cut joist beyond inside face of wall.



Birdsmouth cut must not overhang inside face of plate.



TJI® joist flange must bear fully on the plate. See detail "R12" above.

LATERAL SUPPORT TO PREVENT JOIST ROLLOVER

- All roof joists must be laterally supported at cantilever and end bearings to prevent joist rollover. Use TJI® joist blocking panels or metal cross bracing. Attach metal cross bracing with 2-10d nails at each end.

WEB STIFFENER REQUIREMENTS

- Web stiffeners are required for lateral support of the joist if the sides of the hanger do not laterally support the TJI® joist top flange. Web stiffeners are also required at all sloped hanger locations and at all birdsmouth cut locations. Otherwise, web stiffeners do not enhance bearing capacity and are not required for TJI®/15 DF roof joists.

TJI®/15 DF ALLOWABLE UNIFORM LOAD TABLE

Values shown are in pounds per lineal foot (PLF)

JOIST SPAN	9½" TJI®/15 DF					11⅞" TJI®/15 DF					JOIST SPAN
	Floor		Roof			Floor		Roof			
	LIVE LOAD	TOTAL LOAD	TOTAL LOAD		DEFL.	LIVE LOAD	TOTAL LOAD	TOTAL LOAD		DEFL.	
	L/480	100%	115%	125%	L/240	L/480	100%	115%	125%	L/240	
6		247	284	308			247	284	308		6
8		187	215	233			187	215	233		8
10	143	150	172	187			150	172	187		10
12	88	125	143	156			125	143	156		12
14	57	107	123	133	115	96	107	123	133		14
16	39	79	98	105	79	67	94	108	117		16
18	28	56	75	75	56	48	84	96	105	96	18
20	21	42	56	56	42	36	71	83	91	71	20
22	16	32	42	42	32	27	54	70	72	54	22
24	12	25	33	33	25	21	42	56	56	42	24
26			26	26	20	17	34	45	45	34	26
28			21	21	16	14	27	36	36	27	28
30								29	29	22	30
32								24	24	18	32

1. Load capacity assumes no composite action provided by sheathing.
2. The values above reflect the most restrictive of simple span or multiple span applications.
3. Web stiffeners are required for lateral support of the joist if the sides of the hanger do not laterally support the TJI® joist top flange. Web stiffeners are also required at all sloped hanger locations and all birdsmouth cut locations. Otherwise, web stiffeners do not enhance bearing capacity and are not required for TJI®/15 DF joists.

FLOOR JOISTS:

4. To size a joist for use in a floor, it is necessary to check both live load and total load. When live load is not shown, total load will control.
5. Total load column limits joist deflection to L/240.
6. Live load column limits joist deflection to L/480. For live load deflection limit of L/360 (minimum code criteria) multiply values in live load column by 1.33.

ROOF JOISTS:

7. Roof joists to be sloped ¼" in 12" minimum. No camber provided.
8. Total load column limits joist deflection to L/180. For stiffer total load deflection criteria, check L/240 column at total load.

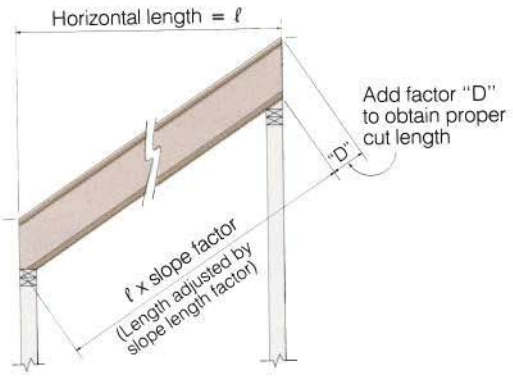
   Note: Some codes may require a L/240 live load deflection limit; check L/240 column at live load. Check your local code for roof deflection criteria.

9. For roof slopes greater than 2"/12", consideration must be given to the increased dead load and deflection caused by actual sloped length. Multiply the horizontal clear span by the slope factor from the "Slope Factor Table" to determine the joist span.

SLOPE FACTOR TABLE

SLOPE	FACTOR
2½ in 12	1.022
3 in 12	1.031
3½ in 12	1.042
4 in 12	1.054
4½ in 12	1.068
5 in 12	1.083
6 in 12	1.118
7 in 12	1.158
8 in 12	1.202
9 in 12	1.250
10 in 12	1.302
11 in 12	1.357
12 in 12	1.414

TJI® JOIST CUT LENGTH CALCULATION



Actual cut length can be approximated by multiplying the horizontal length by the slope factor and adding the "D" factor.

SLOPE	"D" FACTOR	
	9½"	11⅞"
2½ in 12	2"	2½"
3 in 12	2⅜"	3"
3½ in 12	2⅞"	3½"
4 in 12	3¼"	4"
4½ in 12	3⅝"	4½"
5 in 12	4"	5"
6 in 12	4¾"	6"
7 in 12	5⅝"	7"
8 in 12	6⅜"	8"
9 in 12	7⅛"	9"
10 in 12	8"	10"
11 in 12	8¾"	11"
12 in 12	9½"	11⅞"

TJI®/15 DF JOIST HOLE CHARTS – ROUND, SQUARE AND RECTANGULAR HOLES

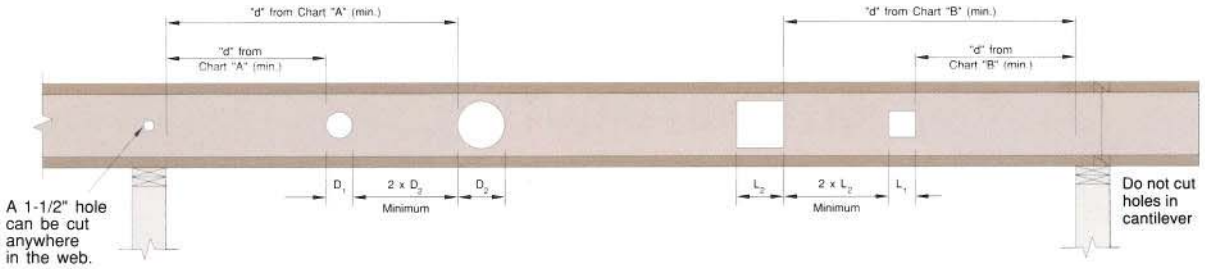


CHART A — ROUND HOLES

MINIMUM DISTANCE (d) FROM INSIDE FACE OF ANY SUPPORT TO NEAREST EDGE OF HOLE

	MAXIMUM ROUND HOLE SIZE								
	2"	3"	4"	5"	6"	6¼"	7"	8"	8⅝"
9½" TJI®/15 DF	1'-0"	2'-6"	3'-6"	6'-0"	8'-0"	8'-6"	—	—	—
11⅞" TJI®/15 DF	1'-0"	1'-0"	1'-0"	2'-0"	4'-0"	4'-0"	6'-6"	8'-0"	9'-6"

CHART B — SQUARE OR RECTANGULAR HOLES

MINIMUM DISTANCE (d) FROM INSIDE FACE OF ANY SUPPORT TO NEAREST EDGE OF HOLE

	MAXIMUM SQUARE OR RECTANGULAR HOLE SIZE*								
	2"	3"	4"	5"	6"	6¼"	7"	8"	8⅝"
9½" TJI®/15 DF	2'-6"	5'-0"	6'-0"	6'-6"	—	—	—	—	—
11⅞" TJI®/15 DF	1'-0"	2'-0"	4'-0"	6'-0"	7'-0"	7'-0"	8'-0"	9'-0"	—

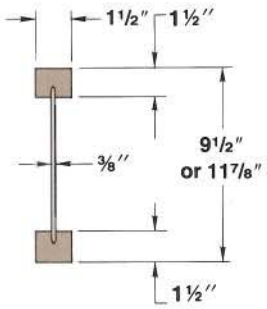
***NOTE:** Rectangular holes based on measurement of longest side.

NOTES:

1. If more than one hole is to be cut in the web, the length of the uncut web between holes must be twice the length of the longest dimension of the largest adjacent hole. Holes may be located vertically anywhere within the web.
2. TJI® joists are manufactured with 1½" perforated "knockouts" in the web at approximately 12" on center along the length of the joist.
3. The distances in the hole charts are based on uniformly loaded joists using maximum loads shown for any of the tables listed within this Specifier's Guide. For other load conditions, contact your Trus Joist MacMillan Representative.

FULL DEPTH RECTANGULAR HOLES ARE ALSO ALLOWED. CONTACT YOUR TRUS JOIST MACMILLAN REPRESENTATIVE FOR ASSISTANCE.

TJI®/15 DF DESIGN PROPERTIES (100% Load Duration)



TJI®/15 DF	Joist Depth (in.)	Weight (lbs./foot)	EI 10⁶ In² lbs.	Max. Vertical Shear (lbs.)	Maximum Reaction (lbs.)		Max. Resistive Moment (ft.-lbs.)
					End Bearing	Intermediate Bearing	
	9½"	1.9	161	1120	940	1900	2800
	11⅞"	2.2	280	1420	940	1900	3715

NOTE:

- Design reaction includes all loads on the joist. Design shear is computed at the face of supports including all loads on the span(s). Allowable shear may sometimes be increased at interior supports in accordance with NER-200 and these increases are reflected in span tables.
- The reaction values above are based on an assumed minimum bearing length of 1¾" at ends, 3½" at intermediate supports.

The following formula approximates the uniform load deflection of Δ:

$$\Delta = \frac{22.5w\ell^4}{EI} + \frac{2.67w\ell^2}{d \times 10^5}$$

w = uniform load in pounds per lineal foot
ℓ = clear span in feet
d = out to out depth of the joist in inches
EI = value from table

MATERIAL WEIGHTS

TJI®/15 DF
9½" 1.9 PLF
11⅞" 2.2 PLF

Fir Sheathing*
(Based on 36 pcf)

½" plywood	1.5 psf
⅝" plywood	1.8 psf
¾" plywood	2.3 psf
1⅛" plywood	3.4 psf
½" OSB	1.7 psf
⅝" OSB	2.0 psf
¾" OSB	2.5 psf
1⅛" OSB	3.7 psf

*For Southern Pine weights, increase fir weights by 10%.

Roofing Materials

Asphalt shingles	2.5 psf
Wood shingles	2.0 psf
Clay tile	9.0 to 14.0 psf
Slate (⅜" thick)	15 psf

Roll or Batt Insulation

Rock Wool	(1" thick) 0.2 psf
Glass Wool	(1" thick) 0.1 psf

Floors

Hardwood (Nominal 1")	4.0 psf
Concrete (1" thick)	
Regular	12.0 psf
Lightweight	6.0 to 10.0 psf
Sheet vinyl	0.2 psf
Carpet and pad	0.6 psf
¾" ceramic or quarry tile	10.0 psf
Gypsum concrete (¾")	6.5 psf

Ceilings

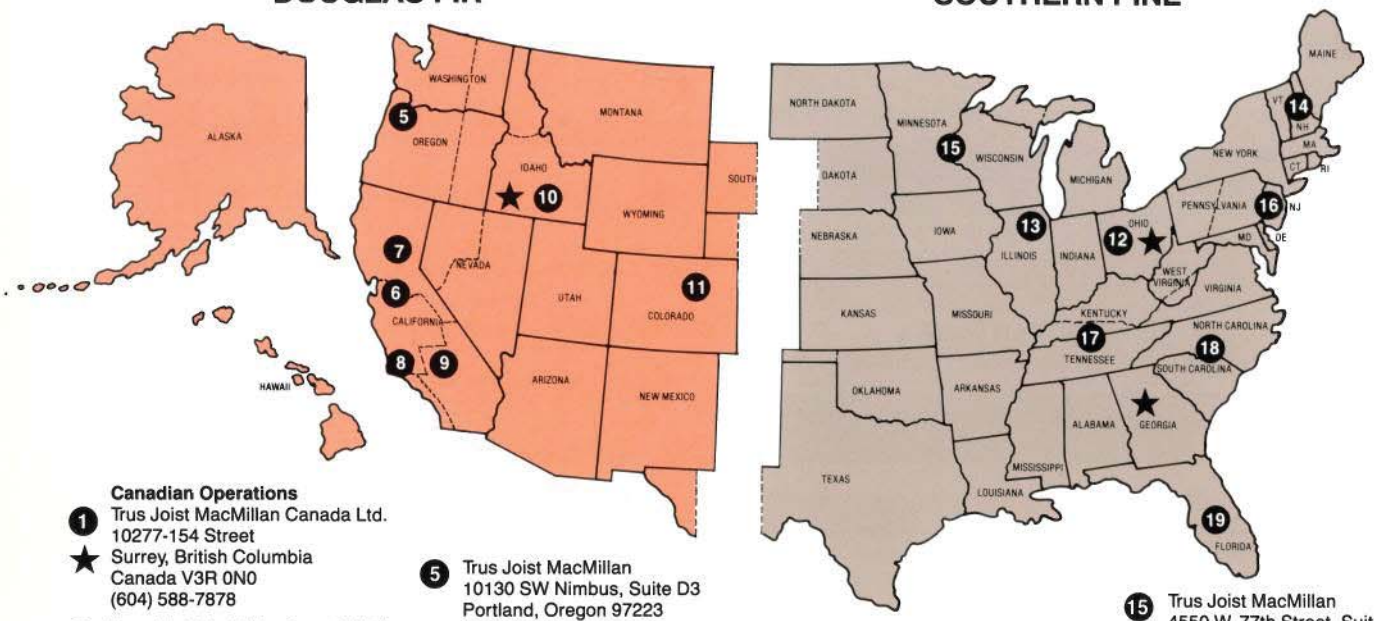
Acoustical fiber tile	1.0 psf
½" gypsum board	2.2 psf
⅝" gypsum board	2.8 psf
Plaster (1" thick)	8.0 psf

Trus Joist MacMillan now offers a product line that includes both Douglas Fir and Southern Pine species. Some of these products have different properties and capacities. The map below indicates the general distribution of each species, although some overlap may occur. To be sure the product you specify is readily available in your project's location, contact your local Trus Joist MacMillan representative, or call 1-800-338-0515 for the representative near you. The regional offices listed below represent over 175 technical representatives throughout North America.

PRODUCT DISTRIBUTION

DOUGLAS FIR

SOUTHERN PINE



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Call for the dealer nearest you:
1-800-338-0515

CODE EVALUATIONS: FHA 689, FHA 925, NER 119, NER 126.
NOTE: NER Evaluation includes BOCA, ICBO and SBCCI.

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Legacy Literature
See Note on Front Cover