USER'S GUIDE

ENGINEERED WOOD PRODUCTS

TECHNICAL DATA FOR

UTI AND UTLVL

UNIVERSAL TIMBER STRUCTURES

TABLE OF CONTENTS

I-JOISTS

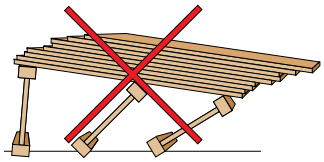
UTLVL HEADERS & BEAMS

WARRANTY

SAFETY & CONSTRUCTION PRECAUTIONS

INSTALLATION

- Walking on the joists should not be permitted until they are properly braced.
- All hangers, rim boards, rim joists and blocking at the end supports of the joists must be installed and nailed properly.
- During installation, a minimum of 1 x 4 temporary bracing is required.
- Bracing members should be spaced at 8′– 0″ o.c. and nailed to each joist with two 8d nails (10d box nails if bracing thickness exceeds 1″).
- Lap bracing ends and anchor them to temporary or permanent sheathing nailed to the first 4′ of joists at the end of the bay or a braced end wall.
- Do not cut, drill, or notch flanges.
- The ends of cantilevers must be temporarily braced on both the top and bottom flanges.
- Never overload sheathed joists with loads that exceed design loads.
- Only remove the bracing as the sheathing is attached.
- Engineered wood products should be used in dry conditions only.
- When stacking construction material, stack only over beams or walls, NOT on unsheathed joists.



These are general recommendations and in some cases, additional precautions may be required.

STORAGE & HANDLING GUIDELINES

STORAGE

- Installation guidelines from Pacific Woodtech will be included with every shipment of trademarked PWI joists to job sites.
- Store bundles upright on a smooth, level, well drained supportive surface.
- Always stack and handle I-joists in the upright position only.
- Bundles should not be in contact with the ground.
- Place 2x or LVL spacers (at a maximum of 10′ apart) between bundles and the ground and bundles stored on top of one another.
- Bundles should remain wrapped, strapped and protected from the weather until time of installation.

HANDLING

- All handling of joists with a forklift or crane should be done carefully.
- Joists should remain vertical during handling.
- Avoid excessive bowing during all phases of handling and installation (i.e. measuring, sawing or placement).
- Damage may result if the joist or beam is twisted or a load is applied to it while it's lying flat.
- NEVER USE OR FIELD REPAIR A DAMAGED I-JOIST.

SYSTEM PERFORMANCE

Traditionally, floor vibration has not been an issue with a well-designed and constructed floor. The model code-required serviceability deflection requirements of span/360 for live load and span/240 for total load have long served to keep code-conforming floors stiff enough to minimize vibration-related problems. These deflection requirements were based on the use of traditional lumber framing and prevailing architectural norms. Spans in traditional lumber-framed structures seldom exceeded 14 – 16 feet.

With engineered wood products, however, designers are no longer limited by the capacities and lengths of traditional lumber structural elements. Spans unheard of just a few years ago are now common with engineered wood products. The traditional deflection limits may no longer be appropriate for the longer spans made possible by engineered wood products. For this reason, APA has voluntarily adopted a live load deflection criteria that is 33% stiffer than that required in the current model building codes. This deflection criteria was selected for increase because vibration loads are caused by transient or live loads, most often by people moving about the floor itself.

By increasing the stiffness of the floor – using span/480 requirements instead of the more traditional span/360, the vibrations caused by a thundering herd of youngsters can be more easily tolerated. Designing the ideal floor is not, however, an exact science. Because one of the benefits of a wood floor is its ability to cushion footfalls, it is not desirable to make every floor overly stiff. As usual, a one-size solution does not fit all. The selection of span/480 as a serviceability requirement is a compromise. It provides a substantial decrease in floor vibration with a minimal cost penalty without making the floor so stiff that comfort is compromised.

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

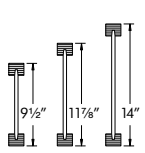
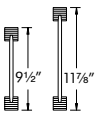
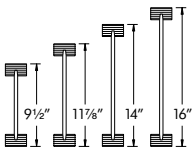
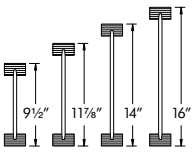
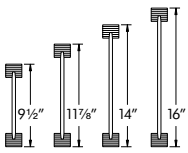
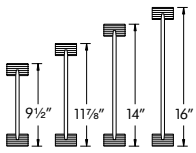
- Gluing the wood structural panel floor to the PWI joists
- Attaching wood structural panels or gypsum board to the bottom of the PWI floor joists
- Decreasing the PWI floor joist spacing by one increment based on allowable span
- Using full-depth blocking at regular intervals between all of the PWI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

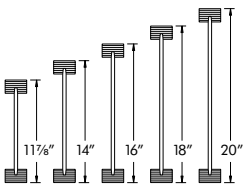
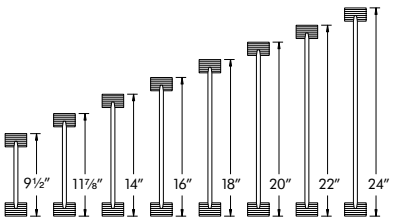
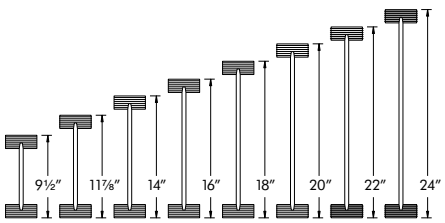
By far the most practical and most economical way to further increase the stiffness of your floor when using PWI joists is to select the most economical joist from our allowable span tables and then maintain the same joist designation but upgrade to the next net depth.

UNIVERSAL TIMBER STRUCTURES
UTI JOIST

ICC-ES ESR-1225 ▪ ICC-ES ESR-1405 ▪ APA PR-L262
HUD SEB 1132 ▪ LA CITY RR 25450 ▪ FL7428
WI 200258-W ▪ NYC MEA 233-98-M VOL IV

LVL FLANGE
JOIST DIMENSIONS

UTI 20	UTI 30	UTI 4 0	UTI 4 5	UTI 5 0	UTI 6 0
					
9½″ 11⅞″ 14″	9½″ 11⅞″	9½″ 11⅞″ 14″ 16″	9½″ 11⅞″ 14″ 16″	9½″ 11⅞″ 14″ 16″	9½″ 11⅞″ 14″ 16″
⅜″ OSB Web 1¾″ x 1⅜″ Flange	⅜″ OSB Web 1½″ x 1½″ Flange	⅜″ OSB Web 2⅝″ x 1⅜″ Flange	⅜″ OSB Web 2⅛″ x 1⅜″ Flange	⅜″ OSB Web 1¾″ x 1½″ Flange	⅜″ OSB Web 2⅝″ x 1⅜″ Flange

UTI 7 0	UTI 7 7	UTI 9 0
		
11⅞″ 14″ 16″ 18″ 20″	9½″ 11⅞″ 14″ 16″ 18″ 20″ 22″ 24″	9½″ 11⅞″ 14″ 16″ 18″ 20″ 22″ 24″
⅜″ OSB Web 2⅝″ x 1½″ Flange	7⁄16″ OSB Web 2⅝″ x 1½″ Flange	7⁄16″ OSB Web 3½″ x 1½″ Flange

LVL FLANGE UTI JOIST REFERENCE DESIGN VALUES

REFERENCE DESIGN VALUES[1]

Joist Series	Joist Depth	UTI Joist	EI[2] (x 10^6 lb-in^2)	k[3] (x 10^6 lb)	M[4] (ft-lb)	V[5] (lb)	ER[6] (lb)	IR[7] (lb)	Vertical Load[8] (plf)
UTI 20	9½″	UTI 2095	145	4.94	2520	1120	915	1990	2400
	11⅞″	UTI 2011	253	6.18	3265	1420	915	1990	2400
	14″	UTI 2014	373	7.28	3890	1710	915	1990	2400
UTI 30	9½″	UTI 3095	161	4.94	3225	1120	945	1905	2400
	11⅞″	UTI 3011	280	6.18	4170	1420	945	1905	2400
UTI 40	9½″	UTI 4095	193	4.94	2735	1120	1080	2160	2400
	11⅞″	UTI 4011	330	6.18	3545	1420	1200	2500	2400
	14″	UTI 4014	482	7.28	4270	1710	1200	2500	2400
	16″	UTI 4016	657	8.32	4950	1970	1200	2500	2400
UTI 45	9½″	UTI 4595	193	4.94	3345	1120	980	2240	2400
	11⅞″	UTI 4511	330	6.18	4315	1420	980	2250	2400
	14″	UTI 4514	486	7.28	5140	1710	980	2250	2400
	16″	UTI 4516	665	8.32	5880	1970	980	2250	2400
UTI 50	9½″	UTI 5095	186	4.94	3800	1120	1015	2040	2400
	11⅞″	UTI 5011	322	6.18	4915	1420	1015	2040	2400
	14″	UTI 5014	480	7.28	5860	1710	1015	2040	2400
	16″	UTI 5016	663	8.32	6715	1970	1015	2040	2400
UTI 60	9½″	UTI 6095	231	4.94	3780	1120	1080	2160	2400
	11⅞″	UTI 6011	396	6.18	4900	1420	1200	2500	2400
	14″	UTI 6014	584	7.28	5895	1710	1200	2500	2400
	16″	UTI 6016	799	8.32	6835	1970	1200	2500	2400
UTI 70	11⅞″	UTI 7011	440	6.19	6730	1420	1160	2335	2400
	14″	UTI 7014	644	7.33	8030	1710	1160	2335	2400
	16″	UTI 7016	873	8.42	9200	1970	1160	2335	2400
	18″	UTI 7018	1141	9.53	10355	2239	1160	2335	1850
	20″	UTI 7020	1447	10.63	11495	2506	1160	2335	1850
UTI 77	9½″	UTI 7795	261	5.57	5155	1430	1285	2695	2850
	11⅞″	UTI 7711	442	6.92	6675	1925	1285	2695	2850
	14″	UTI 7714	648	8.17	7960	2125	1285	2695	2850
	16″	UTI 7716	881	9.35	9120	2330	1285	2695	2850
	18″	UTI 7718	1152	10.55	10265	2535	1285	2695	2300
	20″	UTI 7720	1463	11.76	11395	2740	1285	2695	2300
	22″	UTI 7722	1815	12.97	12520	2935	2390[9]	4125[9]	1700
	24″	UTI 7724	2209	14.18	13630	3060	2390[9]	4125[9]	1700
UTI 90	9½″	UTI 9095	392	5.57	7915	1430	1400	2860	2850
	11⅞″	UTI 9011	661	6.92	10255	1925	1400	3355	2850
	14″	UTI 9014	965	8.17	12235	2125	1400	3355	2850
	16″	UTI 9016	1306	9.35	14020	2330	1400	3355	2850
	18″	UTI 9018	1703	10.55	15780	2535	1400	3355	2300
	20″	UTI 9020	2155	11.76	17520	2740	1400	3355	2300
	22″	UTI 9022	2664	12.97	19245	2935	2400[9]	4605[9]	1700
	24″	UTI 9024	3232	14.18	20955	3060	2400[9]	4605[9]	1700

1. Values apply to normal load duration. All values except EI, k and Vertical Load may be adjusted for other load durations as permitted by the code.
2. Bending stiffness (EI).
3. Coefficient of shear deflection (k). Use Equations 1 or 2 to calculate uniform load or center point load deflections in a simple-span application.

Uniform Load:

$$[1]\ \delta = \frac{5wl^4}{384EI} + \frac{wl^2}{k}$$

Center-Point Load:

$$[2]\ \delta = \frac{Pl^3}{48EI} + \frac{2Pl}{k}$$

where:

δ = calculated deflection (in.)
w = uniform load (lb/in.)
l = design span (in.)
P = concentrated load (lb)
EI = bending stiffness of the joist (lb-in^2)
k = coefficient of shear deflection (lb)

4. Moment capacity (M). The tabulated values shall not be increased by any code-allowed repetitive member factor.
5. Shear capacity (V).
6. End reaction capacity (ER) of the I-joist without web stiffeners and a minimum bearing length of 1¾ inches.
7. Intermediate reaction capacity (IR) of the I-joist without web stiffeners and a minimum bearing length of 3½ inches.
8. Blocking panel and rim joist vertical load capacity.
9. Web stiffeners required. See *Web Stiffener Requirements* on page 20.

For additional information, please visit our website at www.utsdesign.com

FLOOR SPANS

ALLOWABLE SPANS FOR UTI JOISTS – 40 PSF LIVE LOAD AND 10 PSF DEAD LOAD

Joist Series	Joist Depth	Simple Span				Multiple Span			
		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.
UTI 20	9½″	16′– 8″	15′– 3″	14′– 5″	13′– 6″	18′– 6″	17′– 0″	15′– 7″	13′– 11″
	11⅞″	19′– 11″	18′– 3″	17′– 3″	16′– 0″	22′– 3″	19′– 6″	17′– 10″	15′– 8″
	14″	22′– 8″	20′– 9″	19′– 6″	17′– 5″	24′– 8″	21′– 4″	19′– 6″	15′– 8″
UTI 30	9½″	17′– 1″	15′– 8″	14′– 10″	13′– 10″	19′– 0″	17′– 5″	16′– 5″	15′– 0″
	11⅞″	20′– 6″	18′– 9″	17′– 9″	16′– 7″	22′– 10″	20′– 10″	18′– 9″	15′– 0″
UTI 40	9½″	18′– 0″	16′– 5″	15′– 6″	14′– 6″	20′– 0″	17′– 10″	16′– 3″	14′– 6″
	11⅞″	21′– 5″	19′– 7″	18′– 6″	16′– 8″	23′– 7″	20′– 4″	18′– 7″	16′– 7″
	14″	24′– 4″	22′– 3″	20′– 6″	18′– 4″	25′– 11″	22′– 5″	20′– 5″	18′– 3″
	16″	26′– 11″	24′– 2″	22′– 1″	19′– 9″	27′– 11″	24′– 1″	22′– 0″	19′– 8″
UTI 45	9½″	18′– 0″	16′– 5″	15′– 6″	14′– 6″	20′– 0″	18′– 3″	17′– 3″	16′– 1″
	11⅞″	21′– 5″	19′– 7″	18′– 6″	17′– 3″	23′– 11″	21′– 10″	20′– 6″	17′– 9″
	14″	24′– 4″	22′– 3″	21′– 0″	19′– 5″	27′– 2″	24′– 7″	22′– 3″	17′– 9″
	16″	27′– 0″	24′– 8″	23′– 4″	19′– 5″	30′– 2″	26′– 4″	22′– 3″	17′– 9″
UTI 50	9½″	17′– 10″	16′– 3″	15′– 5″	14′– 5″	19′– 10″	18′– 1″	17′– 1″	15′– 11″
	11⅞″	21′– 4″	19′– 6″	18′– 5″	17′– 2″	23′– 9″	21′– 8″	20′– 2″	16′– 1″
	14″	24′– 4″	22′– 2″	21′– 0″	19′– 7″	27′– 1″	24′– 3″	20′– 2″	16′– 1″
	16″	27′– 0″	24′– 8″	23′– 4″	20′– 1″	30′– 2″	24′– 3″	20′– 2″	16′– 1″
UTI 60	9½″	18′– 11″	17′– 3″	16′– 4″	15′– 3″	21′– 1″	19′– 2″	18′– 1″	16′– 10″
	11⅞″	22′– 7″	20′– 8″	19′– 6″	18′– 2″	25′– 2″	22′– 11″	21′– 8″	19′– 6″
	14″	25′– 8″	23′– 5″	22′– 2″	20′– 8″	28′– 8″	26′– 1″	24′– 0″	19′– 9″
	16″	28′– 6″	26′– 0″	24′– 7″	22′– 11″	31′– 10″	28′– 5″	24′– 9″	19′– 9″
UTI 70	11⅞″	23′– 4″	21′– 3″	20′– 1″	18′– 8″	26′– 0″	23′– 8″	22′– 3″	18′– 5″
	14″	26′– 5″	24′– 2″	22′– 9″	21′– 3″	29′– 6″	26′– 10″	23′– 1″	18′– 5″
	16″	29′– 3″	26′– 9″	25′– 2″	23′– 0″	32′– 8″	27′– 9″	23′– 1″	18′– 5″
	18″	32′– 0″	29′– 3″	27′– 7″	23′– 0″	35′– 9″	27′– 9″	23′– 1″	18′– 5″
	20″	34′– 8″	31′– 7″	28′– 10″	23′– 0″	37′– 1″	27′– 9″	23′– 1″	18′– 5″
UTI 77	9½″	19′– 8″	17′– 11″	16′– 11″	15′– 10″	21′– 11″	20′– 0″	18′– 10″	17′– 7″
	11⅞″	23′– 5″	21′– 4″	20′– 2″	18′– 10″	26′– 1″	23′– 9″	22′– 5″	20′– 11″
	14″	26′– 7″	24′– 3″	22′– 11″	21′– 4″	29′– 8″	27′– 0″	25′– 6″	21′– 4″
	16″	29′– 5″	26′– 10″	25′– 4″	23′– 8″	32′– 10″	29′– 11″	26′– 8″	21′– 4″
	18″	32′– 2″	29′– 4″	27′– 9″	25′– 6″	35′– 11″	32′– 1″	26′– 8″	21′– 4″
	20″	34′– 10″	31′– 10″	30′– 0″	25′– 6″	38′– 11″	32′– 1″	26′– 8″	21′– 4″
	22″	37′– 5″	34′– 2″	32′– 3″	30′– 1″	41′– 10″	38′– 2″	35′– 1″	31′– 5″
	24″	40′– 0″	36′– 6″	34′– 5″	32′– 2″	44′– 8″	40′– 2″	36′– 8″	32′– 9″
UTI 90	9½″	22′– 2″	20′– 2″	19′– 0″	17′– 8″	24′– 8″	22′– 5″	21′– 1″	19′– 8″
	11⅞″	26′– 5″	24′– 0″	22′– 7″	21′– 1″	29′– 5″	26′– 9″	25′– 2″	23′– 4″
	14″	29′– 11″	27′– 3″	25′– 8″	23′– 11″	33′– 4″	30′– 4″	28′– 6″	26′– 6″
	16″	33′– 1″	30′– 2″	28′– 5″	26′– 5″	36′– 11″	33′– 7″	31′– 7″	26′– 7″
	18″	36′– 2″	32′– 11″	31′– 0″	27′– 10″	40′– 4″	36′– 8″	33′– 3″	26′– 7″
	20″	39′– 2″	35′– 8″	33′– 7″	27′– 10″	43′– 8″	39′– 9″	33′– 3″	26′– 7″
	22″	42′– 0″	38′– 3″	36′– 1″	33′– 7″	46′– 11″	42′– 8″	40′– 2″	36′– 7″
	24″	44′– 10″	40′– 10″	38′– 6″	35′– 10″	50′– 1″	45′– 6″	42′– 10″	36′– 7″

Notes:

1. Table values apply to uniformly loaded, residential floor joists.
2. Span is measured from face to face of supports.
3. Deflection is limited to L/240 at total load and L/480 at live load.
4. Table values are based on sheathing that is glued and nailed to the joists (23/32″ panels for joists at 24″ o.c. and 19/32″ panels for joists at 19.2″ o.c. and less). Reduce spans by 12″ if sheathing is nailed only.
5. Provide at least 1¾″ of bearing length at end supports and 3½″ at intermediate supports.
6. Provide lateral restraint at supports (e.g. blocking panels, rim board) and along the compression flange of each joist (e.g. floor sheathing, gypsum board ceiling).
7. Use sizing software or consult a professional engineer to analyze conditions outside the scope of this table (e.g. commercial floors, different bearing conditions, concentrated loads) or for multiple span joists if the length of any span is less than half the length of an adjacent span.

HOW TO USE FLOOR SPAN TABLES

1. Choose the appropriate live and dead load combination as well as a joist spacing.
2. Scan down the spacing column to find a span that exceeds the design span.
3. Scan to the left from that span to determine the joist size required.
4. Web stiffeners are required at all supports for 22″ and 24″ joists. See *Web Stiffener Requirements* on page 20 for more details.

FLOOR SPANS

ALLOWABLE SPANS FOR UTI JOISTS – 40 PSF LIVE LOAD AND 20 PSF DEAD LOAD

Joist Series	Joist Depth	Simple Span				Multiple Span			
		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.
UTI 20	9½″	16′– 8″	15′– 3″	14′– 4″	12′– 9″	18′– 1″	15′– 7″	14′– 3″	12′– 8″
	11⅞″	19′– 11″	17′– 11″	16′– 4″	14′– 7″	20′– 7″	17′– 10″	16′– 3″	13′– 0″
	14″	22′– 7″	19′– 6″	17′– 10″	15′– 1″	22′– 6″	19′– 6″	16′– 4″	13′– 0″
UTI 30	9½″	17′– 1″	15′– 8″	14′– 10″	13′– 10″	19′– 0″	17′– 5″	15′– 7″	12′– 5″
	11⅞″	20′– 6″	18′– 9″	17′– 9″	15′– 7″	22′– 10″	18′– 9″	15′– 7″	12′– 5″
UTI 40	9½″	18′– 0″	16′– 4″	14′– 11″	13′– 4″	18′– 10″	16′– 3″	14′– 10″	13′– 3″
	11⅞″	21′– 5″	18′– 8″	17′– 0″	15′– 2″	21′– 6″	18′– 7″	16′– 11″	15′– 1″
	14″	23′– 8″	20′– 6″	18′– 8″	16′– 8″	23′– 7″	20′– 5″	18′– 7″	16′– 5″
	16″	25′– 6″	22′– 1″	20′– 1″	18′– 0″	25′– 5″	22′– 0″	20′– 1″	16′– 5″
UTI 45	9½″	18′– 0″	16′– 5″	15′– 6″	14′– 6″	20′– 0″	18′– 0″	16′– 5″	14′– 8″
	11⅞″	21′– 5″	19′– 7″	18′– 6″	16′– 2″	23′– 9″	20′– 6″	18′– 6″	14′– 9″
	14″	24′– 4″	22′– 3″	20′– 3″	16′– 2″	25′– 11″	22′– 3″	18′– 6″	14′– 9″
	16″	27′– 0″	24′– 1″	20′– 3″	16′– 2″	27′– 9″	22′– 3″	18′– 6″	14′– 9″
UTI 50	9½″	17′– 10″	16′– 3″	15′– 5″	14′– 5″	19′– 10″	18′– 1″	16′– 9″	13′– 4″
	11⅞″	21′– 4″	19′– 6″	18′– 5″	16′– 9″	23′– 9″	20′– 2″	16′– 9″	13′– 4″
	14″	24′– 4″	22′– 2″	21′– 0″	16′– 9″	26′– 11″	20′– 2″	16′– 9″	13′– 4″
	16″	27′– 0″	24′– 8″	21′– 0″	16′– 9″	26′– 11″	20′– 2″	16′– 9″	13′– 4″
UTI 60	9½″	18′– 11″	17′– 3″	16′– 4″	15′– 3″	21′– 1″	19′– 2″	17′– 6″	14′– 2″
	11⅞″	22′– 7″	20′– 8″	19′– 6″	17′– 11″	25′– 2″	21′– 11″	19′– 11″	16′– 5″
	14″	25′– 8″	23′– 5″	22′– 0″	19′– 8″	27′– 9″	24′– 0″	20′– 7″	16′– 5″
	16″	28′– 6″	25′– 11″	23′– 8″	19′– 10″	29′– 11″	24′– 9″	20′– 7″	16′– 5″
UTI 70	11⅞″	23′– 4″	21′– 3″	20′– 1″	18′– 8″	26′– 0″	23′– 1″	19′– 2″	15′– 4″
	14″	26′– 5″	24′– 2″	22′– 9″	19′– 2″	29′– 6″	23′– 1″	19′– 2″	15′– 4″
	16″	29′– 3″	26′– 9″	24′– 0″	19′– 2″	30′– 10″	23′– 1″	19′– 2″	15′– 4″
	18″	32′– 0″	28′– 10″	24′– 0″	19′– 2″	30′– 10″	23′– 1″	19′– 2″	15′– 4″
	20″	34′– 8″	28′– 10″	24′– 0″	19′– 2″	30′– 10″	23′– 1″	19′– 2″	15′– 4″
UTI 77	9½″	19′– 8″	17′– 11″	16′– 11″	15′– 10″	21′– 11″	20′– 0″	18′– 10″	17′– 7″
	11⅞″	23′– 5″	21′– 4″	20′– 2″	18′– 10″	26′– 1″	23′– 9″	22′– 2″	17′– 8″
	14″	26′– 7″	24′– 3″	22′– 11″	21′– 3″	29′– 8″	26′– 8″	22′– 2″	17′– 8″
	16″	29′– 5″	26′– 10″	25′– 4″	21′– 3″	32′– 10″	26′– 8″	22′– 2″	17′– 8″
	18″	32′– 2″	29′– 4″	26′– 7″	21′– 3″	35′– 8″	26′– 8″	22′– 2″	17′– 8″
	20″	34′– 10″	31′– 10″	26′– 7″	21′– 3″	35′– 8″	26′– 8″	22′– 2″	17′– 8″
	22″	37′– 5″	34′– 2″	32′– 1″	28′– 8″	40′– 7″	35′– 1″	32′– 0″	27′– 3″
	24″	40′– 0″	36′– 6″	33′– 6″	29′– 11″	42′– 4″	36′– 8″	33′– 5″	27′– 3″
UTI 90	9½″	22′– 2″	20′– 2″	19′– 0″	17′– 8″	24′– 8″	22′– 5″	21′– 1″	18′– 10″
	11⅞″	26′– 5″	24′– 0″	22′– 7″	21′– 1″	29′– 5″	26′– 9″	25′– 2″	22′– 1″
	14″	29′– 11″	27′– 3″	25′– 8″	23′– 2″	33′– 4″	30′– 4″	27′– 8″	22′– 1″
	16″	33′– 1″	30′– 2″	28′– 5″	23′– 2″	36′– 11″	33′– 3″	27′– 8″	22′– 1″
	18″	36′– 2″	32′– 11″	29′– 0″	23′– 2″	40′– 4″	33′– 3″	27′– 8″	22′– 1″
	20″	39′– 2″	34′– 10″	29′– 0″	23′– 2″	43′– 8″	33′– 3″	27′– 8″	22′– 1″
	22″	42′– 0″	38′– 3″	36′– 1″	33′– 7″	46′– 11″	42′– 8″	38′– 1″	30′– 5″
	24″	44′– 10″	40′– 10″	38′– 6″	35′– 10″	50′– 1″	45′– 6″	38′– 1″	30′– 5″

See notes on page 6

FLOOR LOADS

SIMPLE-SPAN JOIST—ALLOWABLE LOADS FOR UTI JOISTS (PLF)

Joist Span (ft)	UTI 20						UTI 30				UTI 40								UTI 45							
	9½″		11⅞″		14″		9½″		11⅞″		9½″		11⅞″		14″		16″		9½″		11⅞″		14″		16″	
	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%
6	-	305	-	305	-	305	-	315	-	315	-	360	-	400	-	400	-	400	-	327	-	327	-	327	-	327
7	-	261	-	261	-	261	-	270	-	270	-	309	-	343	-	343	-	343	-	280	-	280	-	280	-	280
8	-	229	-	229	-	229	-	236	-	236	-	270	-	300	-	300	-	300	-	245	-	245	-	245	-	245
9	185	203	-	203	-	203	202	210	-	210	234	240	-	267	-	267	-	267	-	218	-	218	-	218	-	218
10	139	183	-	183	-	183	152	189	-	189	177	216	-	240	-	240	-	240	177	196	-	196	-	196	-	196
11	107	166	-	166	-	166	118	172	-	172	137	181	-	218	-	218	-	218	137	178	-	178	-	178	-	178
12	84	140	141	153	-	153	92	158	154	158	108	152	177	197	-	200	-	200	108	163	-	163	-	163	-	163
13	67	119	113	141	-	141	74	145	124	145	87	129	143	168	-	185	-	185	87	151	143	151	-	151	-	151
14	54	103	92	131	-	131	60	120	101	135	71	112	117	145	165	171	-	171	71	137	117	140	-	140	-	140
15	45	89	76	116	109	122	49	98	83	126	58	97	96	126	137	152	-	160	58	116	96	131	-	131	-	131
16	37	74	63	102	91	114	41	82	69	118	48	85	81	111	115	133	-	150	48	97	81	123	116	123	-	123
17			53	90	77	108			58	111			68	98	97	118	130	137			68	115	98	115	-	115
18			45	81	66	96			50	99			58	88	83	105	111	122			58	107	83	109	-	109
19			39	72	56	86			43	85			50	79	71	95	95	110			50	96	72	103	96	103
20			33	65	48	78			37	73			43	71	62	85	83	99			43	86	62	98	83	98
21					42	71									54	77	72	90					54	93	73	93
22					37	64									47	71	63	82					47	85	64	89
23					32	59									41	65	56	75					42	78	56	85
24					29	54									37	59	49	69					37	71	50	82
25																	44	63							44	75
26																	39	59							40	70
27																	35	54							35	65
28																	32	51							32	60
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Notes:

1. Table values apply to uniformly loaded floor joists.
2. Span is measured to the center of each support.
3. The values in the Total columns are based on an L/240 total load deflection limit. Building codes typically require L/360 for live load. Experience has shown that a live load deflection limit of L/480 at 40 psf for residential floors does a better job than L/360 of meeting most performance expectations.
4. Table values do not account for stiffness added by glued or nailed sheathing.
5. Provide at least 1¾″ of bearing length at end supports and 3½″ at intermediate supports.
6. Provide lateral restraint at supports (e.g. blocking panels, rim board) and along the compression flange of each joist (e.g. floor sheathing, gypsum board ceiling).
7. Use sizing software or consult a professional engineer to analyze conditions outside the scope of this table (e.g. different bearing lengths, concentrated loads) or for multiple span joists if the length of any span is less than half the length of an adjacent span.

HOW TO USE FLOOR LOAD TABLES

1. Choose a joist spacing and convert the live and total design loads specified in pounds per square foot (psf) to joist loads in pounds per lineal foot (plf). Joist Spacing (ft) x Design Load (psf) = Joist Load (plf).

JOIST LOAD (PLF)

Joist Spacing		Design Load (psf)								
Inches	Feet	20	30	40	50	60	70	80	90	100
12	1	20	30	40	50	60	70	80	90	100
16	1.33	27	40	53	67	80	93	106	120	133
19.2	1.6	32	48	64	80	96	112	128	144	160
24	2	40	60	80	100	120	140	160	180	200

2. Choose a span and scan across the Span row to find a joist size with sufficient Live and Total load capacities. Both requirements must be satisfied. When no value is shown in a Live column, Total load governs.
3. Web stiffeners are required at all supports for 22″ and 24″ joists. See *Web Stiffener Requirements* on page 20 for more details.

FLOOR LOADS

SIMPLE-SPAN JOIST—ALLOWABLE LOADS FOR UTI JOISTS (PLF)

Joist Span (ft)	UTI 50								UTI 60								UTI 70									
	9½″		11⅞″		14″		16″		9½″		11⅞″		14″		16″		11⅞″		14″		16″		18″		20″	
	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%
6	-	338	-	338	-	338	-	338	-	360	-	400	-	400	-	400	-	387	-	387	-	387	-	387	-	387
7	-	290	-	290	-	290	-	290	-	309	-	343	-	343	-	343	-	331	-	331	-	331	-	331	-	331
8	-	254	-	254	-	254	-	254	-	270	-	300	-	300	-	300	-	290	-	290	-	290	-	290	-	290
9	-	226	-	226	-	226	-	226	-	240	-	267	-	267	-	267	-	258	-	258	-	258	-	258	-	258
10	172	203	-	203	-	203	-	203	205	216	-	240	-	240	-	240	-	232	-	232	-	232	-	232	-	232
11	133	185	-	185	-	185	-	185	160	196	-	218	-	218	-	218	-	211	-	211	-	211	-	211	-	211
12	105	169	-	169	-	169	-	169	127	180	-	200	-	200	-	200	-	193	-	193	-	193	-	193	-	193
13	84	156	140	156	-	156	-	156	102	166	167	185	-	185	-	185	-	178	-	178	-	178	-	178	-	178
14	68	137	114	145	-	145	-	145	83	154	137	171	-	171	-	171	149	166	-	166	-	166	-	166	-	166
15	56	112	94	135	-	135	-	135	68	134	113	160	-	160	-	160	124	155	-	155	-	155	-	155	-	155
16	47	94	79	127	114	127	-	127	57	114	95	150	136	150	-	150	104	145	-	145	-	145	-	145	-	145
17			66	119	97	119	-	119			80	136	115	141	-	141	88	136	125	136	-	136	-	136	-	136
18			57	113	82	113	112	113			68	121	98	133	131	133	75	129	107	129	-	129	-	129	-	129
19			48	97	71	107	96	107			59	109	85	126	113	126	65	122	92	122	-	122	-	122	-	122
20			42	84	61	102	83	102			51	98	73	118	98	120	56	112	80	116	107	116	-	116	-	116
21					53	97	73	97					64	107	86	114			70	110	93	110	-	110	-	110
22					47	92	64	92					56	97	75	109			61	105	82	105	105	105	-	105
23					41	82	56	88					49	89	67	103			54	101	72	101	93	101	-	101
24					36	73	50	85					44	82	59	95			48	96	64	97	83	97	-	97
25							44	81							53	87					57	93	74	93	92	93
26							39	78							47	81					51	89	66	89	83	89
27							35	71							42	75					46	86	59	86	74	86
28							32	64							38	70					41	83	53	83	67	83
29																							48	80	61	80
30																							44	77	55	77
31																							40	75	50	75
32																									46	73
33																									42	70
34																									38	68
35																									35	66
36																										
37																										
38																										
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41																										
42																										
43																										
44																										

See notes on page 8

PSF TO PLF CONVERSION – LOAD IN POUNDS PER LINEAL FOOT (PLF)

O.C. Spacing		Load in Pounds per Square Foot (psf)											
(inches)	(feet)	20	25	30	35	40	45	50	55	60	65	70	75
12	1.00	20	25	30	35	40	45	50	55	60	65	70	75
16	1.33	27	33	40	47	53	60	67	73	80	87	93	100
19.2	1.60	32	40	48	56	64	72	80	88	96	104	112	120
24	2.00	40	50	60	70	80	90	100	110	120	130	140	150

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

FLOOR LOADS

SIMPLE-SPAN JOIST—ALLOWABLE LOADS FOR UTI JOISTS (PLF)

Joist Span (ft)	UTI 77																UTI 90															
	9½″		11⅞″		14″		16″		18″		20″		22″		24″		9½″		11⅞″		14″		16″		18″		20″		22″		24″			
	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%		
6	-	428	-	428	-	428	-	428	-	428	-	428	-	797	-	797	-	467	-	467	-	467	-	467	-	467	-	467	-	800	-	800
7	-	367	-	367	-	367	-	367	-	367	-	367	-	683	-	683	-	400	-	400	-	400	-	400	-	400	-	400	-	686	-	686
8	-	321	-	321	-	321	-	321	-	321	-	321	-	598	-	598	-	350	-	350	-	350	-	350	-	350	-	350	-	600	-	600
9	-	286	-	286	-	286	-	286	-	286	-	286	-	531	-	531	-	311	-	311	-	311	-	311	-	311	-	311	-	533	-	533
10	232	257	-	257	-	257	-	257	-	257	-	257	-	478	-	478	-	280	-	280	-	280	-	280	-	280	-	280	-	480	-	480
11	181	234	-	234	-	234	-	234	-	234	-	234	-	435	-	435	250	255	-	255	-	255	-	255	-	255	-	255	-	436	-	436
12	143	214	-	214	-	214	-	214	-	214	-	214	-	398	-	398	200	233	-	233	-	233	-	233	-	233	-	233	-	400	-	400
13	115	198	186	198	-	198	-	198	-	198	-	198	-	368	-	368	162	215	-	215	-	215	-	215	-	215	-	215	-	369	-	369
14	94	184	152	184	-	184	-	184	-	184	-	184	-	341	-	341	133	200	-	200	-	200	-	200	-	200	-	200	-	343	-	343
15	77	155	126	171	-	171	-	171	-	171	-	171	-	319	-	319	111	187	177	187	-	187	-	187	-	187	-	187	-	320	-	320
16	65	129	106	161	151	161	-	161	-	161	-	161	-	299	-	299	93	175	150	175	-	175	-	175	-	175	-	175	-	300	-	300
17			89	151	128	151	-	151	-	151	-	151	-	281	-	281			127	165	-	165	-	165	-	165	-	165	-	282	-	282
18			76	143	109	143	-	143	-	143	-	143	-	266	-	266			109	156	154	156	-	156	-	156	-	156	-	267	-	267
19			65	131	94	135	125	135	-	135	-	135	244	252	-	252			94	147	133	147	-	147	-	147	-	147	-	253	-	253
20			57	113	81	129	109	129	-	129	-	129	212	239	-	239			81	140	116	140	-	140	-	140	-	140	-	240	-	240
21					71	122	95	122	122	122	-	122	186	227	223	228					101	133	-	133	-	133	-	133	-	229	-	229
22					62	117	83	117	107	117	-	117	164	207	197	217					89	127	118	127	-	127	-	127	-	218	-	218
23					55	110	73	112	95	112	-	112	145	189	174	206					79	122	105	122	-	122	-	122	202	209	-	209
24					49	97	65	107	84	107	105	107	129	174	155	189					70	117	93	117	-	117	-	117	180	200	-	200
25							58	103	75	103	94	103	115	160	139	174							83	112	106	112	-	112	161	192	-	192
26							52	99	67	99	84	99	103	148	124	161							74	108	95	108	-	108	145	185	173	185
27							47	93	60	95	76	95	93	137	112	150							67	104	86	104	-	104	131	178	156	178
28							42	84	54	92	68	92	84	128	101	139							60	100	78	100	97	100	118	171	142	171
29									49	89	62	89	76	119	92	130									70	97	88	97	107	166	129	166
30									45	86	56	86	69	111	83	121									64	93	80	93	98	160	117	160
31									41	81	51	83	63	104	76	113									58	90	73	90	89	155	107	155
32											47	80	57	98	69	106											67	88	82	150	98	150
33											43	78	53	92	63	100											61	85	75	141	90	145
34											39	76	48	87	58	94											56	82	69	133	83	141
35											36	72	44	82	54	89											52	80	63	126	76	137
36													41	77	49	84													58	117	70	129
37													38	73	46	80													54	108	65	122
38													35	69	42	76													50	100	60	116
39															39	72															56	110
40															36	68															52	104
41															34	65															49	97
42															32	62															45	91
43																																
44																																

Notes:

1. Table values apply to uniformly loaded floor joists.
2. Span is measured to the center of each support.
3. The values in the Total columns are based on an L/240 total load deflection limit. Building codes typically require L/360 for live load. Experience has shown that a live load deflection limit of L/480 at 40 psf for residential floors does a better job than L/360 of meeting most performance expectations.
4. Table values do not account for stiffness added by glued or nailed sheathing.
5. Provide at least 1¾″ of bearing length at end supports and 3½″ at intermediate supports.
6. Provide lateral restraint at supports (e.g. blocking panels, rim board) and along the compression flange of each joist (e.g. floor sheathing, gypsum board ceiling).
7. Use sizing software or consult a professional engineer to analyze conditions outside the scope of this table (e.g. different bearing lengths, concentrated loads) or for multiple span joists if the length of any span is less than half the length of an adjacent span.

FLOOR LOADS

MULTIPLE-SPAN JOIST—ALLOWABLE LOADS FOR UTI JOISTS (PLF)

Joist Span (ft)	UTI 20						UTI 30				UTI 40								UTI 45							
	9½″		11⅞″		14″		9½″		11⅞″		9½″		11⅞″		14″		16″		9½″		11⅞″		14″		16″	
	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%
6	-	265	-	265	-	265	-	254	-	254	-	288	-	333	-	333	-	333	-	299	-	300	-	300	-	300
7	-	227	-	227	-	227	-	218	-	218	-	247	-	286	-	286	-	286	-	256	-	257	-	257	-	257
8	-	199	-	199	-	199	-	191	-	191	-	216	-	250	-	250	-	250	-	224	-	225	-	225	-	225
9	-	177	-	177	-	177	-	169	-	169	-	192	-	222	-	222	-	222	-	199	-	200	-	200	-	200
10	-	159	-	159	-	159	-	152	-	152	-	173	-	200	-	200	-	200	-	179	-	180	-	180	-	180
11	143	145	-	145	-	145	-	139	-	139	-	157	-	182	-	182	-	182	-	163	-	164	-	164	-	164
12	113	133	-	133	-	133	124	127	-	127	144	144	-	167	-	167	-	167	144	149	-	150	-	150	-	150
13	91	119	-	122	-	122	99	117	-	117	116	129	-	154	-	154	-	154	116	138	-	138	-	138	-	138
14	74	103	-	114	-	114	81	109	-	109	95	112	-	143	-	143	-	143	95	128	-	129	-	129	-	129
15	61	90	103	106	-	106	67	102	-	102	79	97	-	126	-	133	-	133	79	119	-	120	-	120	-	120
16	51	79	86	100	-	100	56	95	94	95	66	85	108	111	-	125	-	125	66	105	108	113	-	113	-	113
17			73	90	-	94			79	90			92	98	-	118	-	118			92	106	-	106	-	106
18			62	81	-	88			68	85			78	88	-	105	-	111			78	100	-	100	-	100
19			53	72	77	84			58	80			67	79	-	95	-	105			67	95	-	95	-	95
20			46	65	66	78			50	76			58	71	83	85	-	99			58	86	84	90	-	90
21					58	71									73	77	-	90					73	86	-	86
22					51	64									64	71	-	82					64	82	-	82
23					45	59									56	65	-	75					57	78	76	78
24					40	54									50	59	67	69					50	71	68	75
25																	60	63							61	72
26																	54	59							54	69
27																	48	54							49	65
28																	43	51							44	60
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See notes on page 10

FLOOR LOADS

MULTIPLE-SPAN JOIST—ALLOWABLE LOADS FOR UTI JOISTS (PLF)

Joist Span (ft)	UTI 50								UTI 60								UTI 70									
	9½″		11⅞″		14″		16″		9½″		11⅞″		14″		16″		11⅞″		14″		16″		18″		20″	
	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%
6	-	272	-	272	-	272	-	272	-	288	-	333	-	333	-	333	-	311	-	311	-	311	-	311	-	311
7	-	233	-	233	-	233	-	233	-	247	-	286	-	286	-	286	-	267	-	267	-	267	-	267	-	267
8	-	204	-	204	-	204	-	204	-	216	-	250	-	250	-	250	-	234	-	234	-	234	-	234	-	234
9	-	181	-	181	-	181	-	181	-	192	-	222	-	222	-	222	-	208	-	208	-	208	-	208	-	208
10	-	163	-	163	-	163	-	163	-	173	-	200	-	200	-	200	-	187	-	187	-	187	-	187	-	187
11	-	148	-	148	-	148	-	148	-	157	-	182	-	182	-	182	-	170	-	170	-	170	-	170	-	170
12	-	136	-	136	-	136	-	136	-	144	-	167	-	167	-	167	-	156	-	156	-	156	-	156	-	156
13	113	126	-	126	-	126	-	126	-	133	-	154	-	154	-	154	-	144	-	144	-	144	-	144	-	144
14	92	117	-	117	-	117	-	117	111	123	-	143	-	143	-	143	-	133	-	133	-	133	-	133	-	133
15	76	109	-	109	-	109	-	109	92	115	-	133	-	133	-	133	-	125	-	125	-	125	-	125	-	125
16	64	102	-	102	-	102	-	102	77	108	-	125	-	125	-	125	-	117	-	117	-	117	-	117	-	117
17			90	96	-	96	-	96			107	118	-	118	-	118	-	110	-	110	-	110	-	110	-	110
18			77	91	-	91	-	91			92	111	-	111	-	111	101	104	-	104	-	104	-	104	-	104
19			66	86	-	86	-	86			79	105	-	105	-	105	87	98	-	98	-	98	-	98	-	98
20			57	82	-	82	-	82			69	98	99	100	-	100	75	93	-	93	-	93	-	93	-	93
21					73	78	-	78					86	95	-	95			-	89	-	89	-	89	-	89
22					64	74	-	74					76	91	-	91			83	85	-	85	-	85	-	85
23					56	71	-	71					67	87	-	87			73	81	-	81	-	81	-	81
24					50	68	68	68					60	82	80	83			65	78	-	78	-	78	-	78
25							60	65							71	80					-	75	-	75	-	75
26							54	63							64	77					69	72	-	72	-	72
27							49	60							58	74					62	69	-	69	-	69
28							44	58							52	70					56	67	-	67	-	67
29																							-	64	-	64
30																							60	62	-	62
31																							55	60	-	60
32																									-	58
33																									-	57
34																									53	55
35																									49	53
36																										
37																										
38																										
39																										
40																										
41																										
42																										
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44																										

Notes:

1. Table values apply to uniformly loaded floor joists.
2. Span is measured to the center of each support.
3. The values in the Total columns are based on an L/240 total load deflection limit. Building codes typically require L/360 for live load. Experience has shown that a live load deflection limit of L/480 at 40 psf for residential floors does a better job than L/360 of meeting most performance expectations.
4. Table values do not account for stiffness added by glued or nailed sheathing.
5. Provide at least 1¾″ of bearing length at end supports and 3½″ at intermediate supports.
6. Provide lateral restraint at supports (e.g. blocking panels, rim board) and along the compression flange of each joist (e.g. floor sheathing, gypsum board ceiling).
7. Use sizing software or consult a professional engineer to analyze conditions outside the scope of this table (e.g. different bearing lengths, concentrated loads) or for multiple span joists if the length of any span is less than half the length of an adjacent span.

FLOOR LOADS

MULTIPLE-SPAN JOIST—ALLOWABLE LOADS FOR UTI JOISTS (PLF)

Joist Span (ft)	UTI 77																UTI 90															
	9½″		11⅞″		14″		16″		18″		20″		22″		24″		9½″		11⅞″		14″		16″		18″		20″		22″		24″	
	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%	Live L/480	Total 100%
6	-	359	-	359	-	359	-	359	-	359	-	359	-	550	-	550	-	381	-	447	-	447	-	447	-	447	-	447	-	614	-	614
7	-	308	-	308	-	308	-	308	-	308	-	308	-	471	-	471	-	327	-	383	-	383	-	383	-	383	-	383	-	526	-	526
8	-	270	-	270	-	270	-	270	-	270	-	270	-	413	-	413	-	286	-	336	-	336	-	336	-	336	-	336	-	461	-	461
9	-	240	-	240	-	240	-	240	-	240	-	240	-	367	-	367	-	254	-	298	-	298	-	298	-	298	-	298	-	409	-	409
10	-	216	-	216	-	216	-	216	-	216	-	216	-	330	-	330	-	229	-	268	-	268	-	268	-	268	-	268	-	368	-	368
11	-	196	-	196	-	196	-	196	-	196	-	196	-	300	-	300	-	208	-	244	-	244	-	244	-	244	-	244	-	335	-	335
12	-	180	-	180	-	180	-	180	-	180	-	180	-	275	-	275	-	191	-	224	-	224	-	224	-	224	-	224	-	307	-	307
13	152	166	-	166	-	166	-	166	-	166	-	166	-	254	-	254	-	176	-	206	-	206	-	206	-	206	-	206	-	283	-	283
14	125	154	-	154	-	154	-	154	-	154	-	154	-	236	-	236	-	163	-	192	-	192	-	192	-	192	-	192	-	263	-	263
15	104	144	-	144	-	144	-	144	-	144	-	144	-	220	-	220	145	153	-	179	-	179	-	179	-	179	-	179	-	246	-	246
16	87	135	-	135	-	135	-	135	-	135	-	135	-	206	-	206	123	143	-	168	-	168	-	168	-	168	-	168	-	230	-	230
17			120	127	-	127	-	127	-	127	-	127	-	194	-	194			-	158	-	158	-	158	-	158	-	158	-	217	-	217
18			103	120	-	120	-	120	-	120	-	120	-	183	-	183			143	149	-	149	-	149	-	149	-	149	-	205	-	205
19			88	113	-	113	-	113	-	113	-	113	-	174	-	174			124	141	-	141	-	141	-	141	-	141	-	194	-	194
20			77	108	-	108	-	108	-	108	-	108	-	165	-	165			109	134	-	134	-	134	-	134	-	134	-	184	-	184
21					96	103	-	103	-	103	-	103	-	157	-	157					-	128	-	128	-	128	-	128	-	175	-	175
22					84	98	-	98	-	98	-	98	-	150	-	150					119	122	-	122	-	122	-	122	-	167	-	167
23					75	94	-	94	-	94	-	94	-	143	-	143					105	117	-	117	-	117	-	117	-	160	-	160
24					66	90	88	90	-	90	-	90	-	138	-	138					94	112	-	112	-	112	-	112	-	154	-	154
25							79	86	-	86	-	86	-	132	-	132							-	107	-	107	-	107	-	147	-	147
26							71	83	-	83	-	83	-	127	-	127							100	103	-	103	-	103	-	142	-	142
27							64	80	-	80	-	80	-	122	-	122							90	99	-	99	-	99	-	136	-	136
28							57	77	74	77	-	77	113	118	-	118							82	96	-	96	-	96	-	132	-	132
29									67	74	-	74	103	114	-	114									-	93	-	93	-	127	-	127
30									61	72	-	72	94	110	-	110									86	89	-	89	-	123	-	123
31									56	70	-	70	86	104	103	106									79	87	-	87	-	119	-	119
32											64	67	78	98	94	103											-	84	110	115	-	115
33											59	65	72	92	86	100											-	81	101	112	-	112
34											54	63	66	87	80	94											76	79	93	108	-	108
35											50	62	61	82	73	89											70	77	86	105	103	105
36													56	77	68	84													79	102	95	102
37													52	73	63	80													74	100	88	100
38													48	69	58	76													68	97	82	97
39															54	72															76	94
40															50	68															71	92
41															47	65															66	90
42															44	62															62	88
43																																
44																																

See notes on page 12

WEB STIFFENER REQUIREMENTS

Web stiffeners are pairs of small blocks, cut from panels or 2x4s, that are nailed to the joist web to stiffen a deep web, increase reaction capacity or accommodate a special connector. Web stiffeners are not required when joists are sized by means of the tables in this guide, with the following exceptions:

1. Web stiffeners are required at the ends of joists set in hangers that are not deep enough to laterally support the top flanges of the joists. Refer to the hanger manufacturer's installation instructions.
2. Web stiffeners are required to accommodate special connector nailing requirements. Refer to the connector manufacturer's installation instructions.
3. Web stiffeners are required at birdsmouth cuts at the low end supports of sloped joists.
4. Web stiffeners are required at all supports on 22- and 24-inch joists.

When joists are sized by means of sizing software, or otherwise engineered for an application, web stiffeners are required as follows:

1. Web stiffeners are required for high reactions at supports. Refer to ESR-1225.
2. Web stiffeners are required under concentrated loads applied to the tops of joists between supports, or along cantilevers beyond the support, when the concentrated load exceeds 1500 pounds.

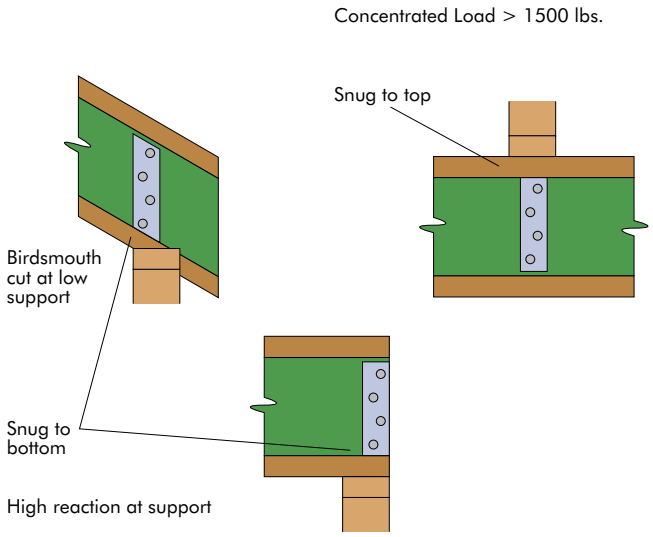
NUMBER OF WEB STIFFENER NAILS REQUIRED

Joist Depth	24″ & 22″	20″ & 18″	16″ & Less
Intermediate Support	10	8	4
All Other Conditions	8	6	4

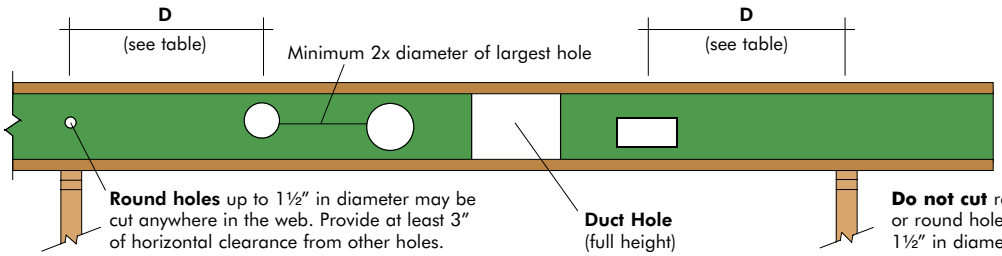
WEB STIFFENER SIZE REQUIRED

Flange Width	Minimum Dimensions		
	Web Stiffeners		Nails
	Thickness	Width	
1½″	15/32″	2 5/16″	2½″ x 0.131″
1¾″	19/32″	2 5/16″	2½″ x 0.131″
2 1/16″	23/32″	2 5/16″	2½″ x 0.131″
2 5/16″	⅞″	2 5/16″	2½″ x 0.131″
2½″	⅞″	2 5/16″	2½″ x 0.131″
3½″	1½″	3½″	3½″ x 0.131″

Web stiffener length is approximately ⅛″ less than the clear distance between flanges.



WEB HOLE SPECIFICATIONS



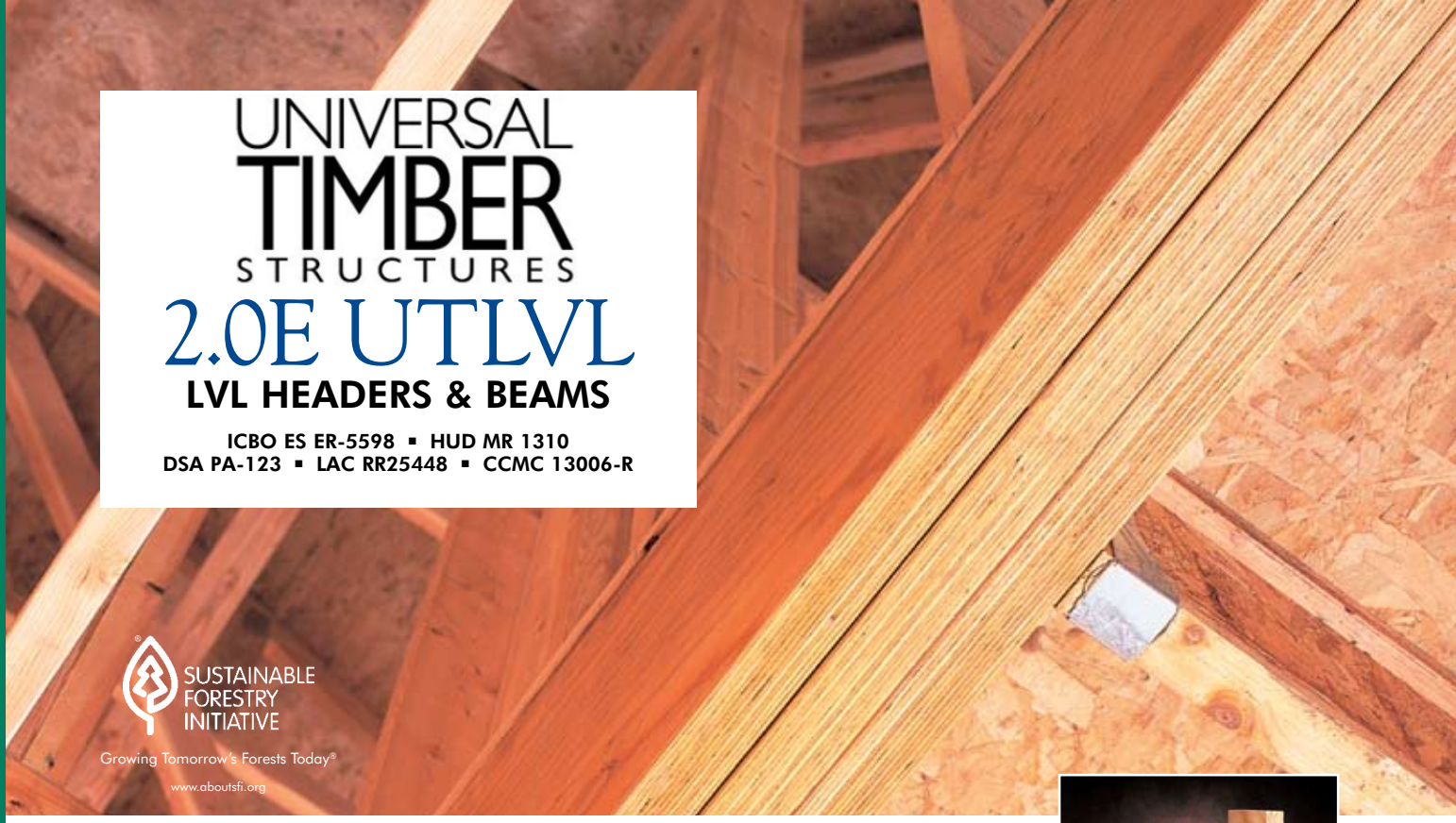
ROUND AND RECTANGULAR HOLES

Minimum Distance 'D' From Any Support to the Centerline of the Hole

Round Hole Diameter			2"	3"	4"	5"	6"	6¼"	8⅝"	10"	10¾"	12"	12¾"	14¾"	16¾"
Rectangular Hole Side			1½"	2¼"	3"	3¾"	4½"	4⅝"	6⅜"	7½"	8"	9"	9½"	11"	12½"
9¼" Joist	Span (ft)	8	1'– 1"	1'– 8"	2'– 2"	2'– 9"	3'– 3"								
		12	1'– 8"	2'– 6"	3'– 3"	4'– 1"	4'– 11"								
		16	2'– 2"	3'– 3"	4'– 4"	5'– 5"	6'– 6"								
9½" Joist	Span (ft)	8	1'– 1"	1'– 7"	2'– 1"	2'– 8"	3'– 2"	3'– 3"							
		12	1'– 7"	2'– 4"	3'– 2"	3'– 11"	4'– 9"	4'– 11"							
		16	2'– 1"	3'– 2"	4'– 3"	5'– 3"	6'– 4"	6'– 7"							
11⅞" Joist	Span (ft)	8	1'– 1"	1'– 2"	1'– 7"	2'– 0"	2'– 5"	2'– 7"	3'– 7"						
		12	1'– 1"	1'– 9"	2'– 5"	3'– 0"	3'– 8"	3'– 10"	5'– 5"						
		16	1'– 5"	2'– 4"	3'– 2"	4'– 1"	4'– 11"	5'– 2"	7'– 2"						
		20	1'– 10"	2'– 11"	4'– 0"	5'– 1"	6'– 2"	6'– 5"	9'– 0"						
14" Joist	Span (ft)	12	1'– 1"	1'– 2"	1'– 5"	2'– 0"	2'– 8"	2'– 10"	4'– 3"	5'– 1"	5'– 6"				
		16	1'– 1"	1'– 2"	1'– 11"	2'– 9"	3'– 6"	3'– 9"	5'– 8"	6'– 9"	7'– 4"				
		20	1'– 1"	1'– 5"	2'– 5"	3'– 5"	4'– 5"	4'– 8"	7'– 1"	8'– 5"	9'– 3"				
		24	1'– 1"	1'– 8"	2'– 10"	4'– 1"	5'– 4"	5'– 7"	8'– 6"	10'– 2"	11'– 1"				
16" Joist	Span (ft)	12	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 5"	1'– 6"	3'– 0"	3'– 10"	4'– 3"	5'– 1"	5'– 6"		
		16	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 10"	2'– 1"	4'– 0"	5'– 1"	5'– 9"	6'– 9"	7'– 4"		
		20	1'– 1"	1'– 2"	1'– 2"	1'– 3"	2'– 4"	2'– 7"	5'– 0"	6'– 5"	7'– 2"	8'– 5"	9'– 2"		
		24	1'– 1"	1'– 2"	1'– 2"	1'– 7"	2'– 9"	3'– 1"	6'– 0"	7'– 8"	8'– 7"	10'– 1"	11'– 0"		
		28	1'– 1"	1'– 2"	1'– 2"	1'– 10"	3'– 3"	3'– 7"	7'– 0"	8'– 11"	10'– 0"	11'– 10"	12'– 10"		
18" Joist	Span (ft)	12	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 3"	1'– 3"	1'– 7"	2'– 6"	2'– 11"	3'– 9"	4'– 2"	5'– 5"	
		16	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 3"	1'– 3"	2'– 2"	3'– 3"	3'– 11"	5'– 0"	5'– 7"	7'– 3"	
		20	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 3"	1'– 3"	2'– 8"	4'– 1"	4'– 11"	6'– 2"	7'– 0"	9'– 1"	
		24	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 3"	1'– 3"	3'– 2"	4'– 11"	5'– 10"	7'– 5"	8'– 5"	10'– 11"	
		28	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 3"	1'– 3"	3'– 9"	5'– 9"	6'– 10"	8'– 8"	9'– 9"	12'– 9"	
20" Joist	Span (ft)	16	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 3"	1'– 3"	1'– 4"	1'– 10"	2'– 5"	3'– 6"	4'– 1"	5'– 9"	7'– 4"
		20	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 3"	1'– 3"	1'– 4"	2'– 3"	3'– 1"	4'– 4"	5'– 1"	7'– 2"	9'– 2"
		24	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 3"	1'– 3"	1'– 4"	2'– 9"	3'– 8"	5'– 2"	6'– 1"	8'– 7"	11'– 0"
		28	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 3"	1'– 3"	1'– 4"	3'– 2"	4'– 3"	6'– 1"	7'– 2"	10'– 0"	12'– 10"
		32	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 3"	1'– 3"	1'– 5"	3'– 8"	4'– 11"	6'– 11"	8'– 2"	11'– 5"	14'– 8"
22" Joist	Span (ft)	16	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 3"	1'– 3"	2'– 7"	3'– 4"	3'– 9"	4'– 5"	4'– 10"	6'– 0"	7'– 1"
		20	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 5"	1'– 7"	3'– 2"	4'– 2"	4'– 8"	5'– 7"	6'– 1"	7'– 6"	8'– 10"
		24	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 8"	1'– 10"	3'– 10"	5'– 0"	5'– 7"	6'– 8"	7'– 3"	8'– 11"	10'– 7"
		28	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 11"	2'– 2"	4'– 6"	5'– 10"	6'– 7"	7'– 9"	8'– 6"	10'– 5"	12'– 5"
		32	1'– 1"	1'– 2"	1'– 2"	1'– 3"	2'– 3"	2'– 6"	5'– 2"	6'– 8"	7'– 6"	8'– 11"	9'– 9"	11'– 11"	14'– 2"
24" Joist	Span (ft)	16	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 3"	1'– 3"	1'– 10"	2'– 7"	3'– 0"	3'– 8"	4'– 0"	5'– 1"	6'– 2"
		20	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 3"	1'– 3"	2'– 3"	3'– 2"	3'– 8"	4'– 6"	5'– 0"	6'– 4"	7'– 8"
		24	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 3"	1'– 3"	2'– 9"	3'– 10"	4'– 5"	5'– 5"	6'– 0"	7'– 8"	9'– 3"
		28	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 3"	1'– 3"	3'– 2"	4'– 6"	5'– 2"	6'– 4"	7'– 0"	8'– 11"	10'– 9"
		32	1'– 1"	1'– 2"	1'– 2"	1'– 3"	1'– 3"	1'– 3"	3'– 8"	5'– 2"	5'– 11"	7'– 3"	8'– 1"	10'– 2"	12'– 4"

GENERAL NOTES:

1. Table values apply to joists sized by means of the load or span tables in this publication. Use beam sizing software for a more precise analysis or to analyze conditions outside of the scope of these tables.
2. Web holes may be located anywhere between the joist flanges. Leave at least ⅛ inch clearance between the edges of holes and the flanges.
3. Do not cut rectangular holes, or round holes larger than 1½ inch diameter, in cantilevers.
4. The horizontal clearance between the edges of adjacent holes must be at least twice the diameter (or longest side) of the larger hole. Exception: A 1½ inch diameter hole may be drilled anywhere in the web. Provide at least 3 inches of horizontal clearance from adjacent holes of any size.
5. 1½ inch diameter holes are factory-scored in the web at 16 inches on center.



UNIVERSAL TIMBER STRUCTURES

2.0E UTLVL

LVL HEADERS & BEAMS

ICBO ES ER-5598 ▪ HUD MR 1310
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2.0E UTLVL REFERENCE
DESIGN VALUES

1¾" x 2.0E UT LVL REFERENCE DESIGN VALUES

Depth	Maximum Vertical Shear (lb)			Maximum Bending Moment (ft-lb)			EI (x 10^6 lbs-in^2)	Weight (plf)
	100%	115%	125%	100%	115%	125%		
3½"	1164	1338	1455	1181	1358	1476	13	1.6
5½"	1829	2103	2286	2664	3064	3330	49	2.5
7¼"	2411	2772	3013	4380	5037	5475	111	3.3
9¼"	3076	3537	3845	6791	7810	8489	231	4.2
9½"	3159	3633	3948	7125	8194	8907	250	4.3
11¼"	3741	4302	4676	9660	11109	12075	415	5.1
11⅞"	3948	4541	4936	10647	12245	13309	488	5.4
14"	4655	5353	5819	14320	16468	17900	800	6.4
16"	5320	6118	6650	18210	20942	22763	1195	7.3
18"	5985	6883	7481	22511	25888	28139	1701	8.2
20"	6650	7648	8313	27212	31294	34015	2333	9.1
22"	7315	8412	9144	32305	37150	40381	3106	10.0
23⅞"	7938	9129	9923	37428	43043	46786	3969	10.9

3½" x 2.0E UT LVL REFERENCE DESIGN VALUES

Depth	Maximum Vertical Shear (lb)			Maximum Bending Moment (ft-lb)			EI (x 10^6 lbs-in^2)	Weight (plf)
	100%	115%	125%	100%	115%	125%		
3½"	2328	2677	2909	2362	2716	2952	25	3.2
5½"	3658	4206	4572	5328	6128	6660	97	5.0
7¼"	4821	5544	6027	8761	10075	10951	222	6.6
9¼"	6151	7074	7689	13583	15620	16978	462	8.4
9½"	6318	7265	7897	14251	16388	17813	500	8.6
11¼"	7481	8603	9352	19320	22218	24150	831	10.2
11⅞"	7897	9081	9871	21295	24489	26619	977	10.8
14"	9310	10707	11638	28639	32935	35799	1601	12.7
16"	10640	12236	13300	36421	41884	45526	2389	14.5
18"	11970	13766	14963	45022	51775	56277	3402	16.4
20"	13300	15295	16625	54424	62587	68030	4667	18.2
22"	14630	16825	18288	64609	74301	80761	6211	20.0
23⅞"	15877	18258	19846	74857	86085	93571	7939	21.7

2.0E UTLVL Reference Design Values[1]

Modulus of Elasticity E = 2,000,000 psi[2]
Bending (beam) F_b = 3,100 psi[3][4]
Horizontal Shear (beam) F_v = 285 psi
Compression Perpendicular to Grain (beam) $F_{c\perp}$ = 850 psi[2]

(1) Values apply to dry service conditions
(2) Do not adjust for load duration
(3) May be adjusted by $(12/d)^{1/5}$, where d is the depth of the member (inches)
(4) May be adjusted by 1.04 for repetitive members as defined in *ANSI/AF&PA NDS*

For additional grades and sizes, please visit our Web site at www.utsdesign.com

EQUIVALENT SPECIFIC GRAVITY FOR FASTENER DESIGN

Nails & Wood Screws	Face	Lateral	0.50
		Withdrawal	0.50
	Edge	Lateral	0.50
		Withdrawal	0.47
Bolts & Lag Screws	Face	Lateral	0.50

AVAILABLE SIZES (INCHES)

1¾" 2.0E UTLVL

3½ 5½ 7¼ 9¼ 9½ 11¼ 11⅞ 14 16 18 20 22 23⅞

3½" 2.0E UTLVL

3½ 5½ 7¼ 9¼ 9½ 11¼ 11⅞ 14 16 18 20 22 23⅞

2.0E ALLOWABLE UNIFORM LOADS FLOOR 100%

ALLOWABLE UNIFORM LOADS* – POUNDS PER LINEAL FOOT – 1¾" 2.0E UTLVL

Span (ft)	Key	One 1¾" 2.0E UTLVL							
		3½"	5½"	7¼"	9¼"	9½"	11¼"	11⅞"	14"
6	LL	86	333	762	-	-	-	-	-
	TL	127	497	763	1028	1063	1325	1425	1796
	BRG	1.5 / 3	1.5 / 3	1.5 / 3.9	2.1 / 5.2	2.2 / 5.4	2.7 / 6.7	2.9 / 7.2	3.6 / 9.1
7	LL	54	210	480	-	-	-	-	-
	TL	71	278	636	849	877	1083	1161	1445
	BRG	1.5 / 3	1.5 / 3	1.5 / 3.8	2 / 5	2.1 / 5.2	2.6 / 6.4	2.7 / 6.9	3.4 / 8.5
8	LL		140	322	668	724	-	-	-
	TL		162	374	723	746	916	979	1208
	BRG		1.5 / 3	1.5 / 3	2 / 4.9	2 / 5	2.5 / 6.2	2.6 / 6.6	3.3 / 8.2
9	LL		99	226	469	508	-	-	-
	TL		100	232	629	649	793	846	1038
	BRG		1.5 / 3	1.5 / 3	1.9 / 4.8	2 / 4.9	2.4 / 6	2.6 / 6.4	3.2 / 7.9
10	LL		-	-	342	370	615	724	-
	TL		65	151	509	551	699	745	909
	BRG		1.5 / 3	1.5 / 3	1.7 / 4.3	1.9 / 4.7	2.4 / 5.9	2.5 / 6.3	3.1 / 7.7
11	LL		-	-	257	278	462	544	-
	TL		44	102	381	413	625	665	809
	BRG		1.5 / 3	1.5 / 3	1.5 / 3.6	1.5 / 3.9	2.3 / 5.8	2.5 / 6.2	3 / 7.5
12	LL			-	198	214	356	419	686
	TL			71	293	317	529	586	729
	BRG			1.5 / 3	1.5 / 3	1.5 / 3.2	2.2 / 5.4	2.4 / 6	3 / 7.4
13	LL			-	156	169	280	329	540
	TL			51	229	249	415	489	663
	BRG			1.5 / 3	1.5 / 3	1.5 / 3	1.8 / 4.6	2.2 / 5.4	2.9 / 7.3
14	LL			-	125	135	224	264	432
	TL			37	183	198	331	390	578
	BRG			1.5 / 3	1.5 / 3	1.5 / 3	1.6 / 4	1.9 / 4.7	2.8 / 6.9
15	LL				101	110	182	214	351
	TL				148	160	268	316	503
	BRG				1.5 / 3	1.5 / 3	1.5 / 3.4	1.6 / 4.1	2.6 / 6.4
16	LL				83	90	150	177	289
	TL				121	131	220	260	428
	BRG				1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.6	2.3 / 5.8
17	LL				70	75	125	147	241
	TL				100	109	183	216	356
	BRG				1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.2	2.1 / 5.2
18	LL				59	64	105	124	203
	TL				84	91	153	181	299
	BRG				1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3	1.8 / 4.6
19	LL					54	90	105	173
	TL					77	129	153	253
	BRG					1.5 / 3	1.5 / 3	1.5 / 3	1.7 / 4.1
20	LL						77	90	148
	TL						110	130	216
	BRG						1.5 / 3	1.5 / 3	1.5 / 3.7
21	LL						66	78	128
	TL						95	112	186
	BRG						1.5 / 3	1.5 / 3	1.5 / 3.4
22	LL						58	68	111
	TL						82	97	161
	BRG						1.5 / 3	1.5 / 3	1.5 / 3.1
23	LL							59	97
	TL							84	140
	BRG							1.5 / 3	1.5 / 3
24	LL								86
	TL								122
	BRG								1.5 / 3
25	LL								76
	TL								107
	BRG								1.5 / 3
26	LL								67
	TL								95
	BRG								1.5 / 3
27	LL								60
	TL								84
	BRG								1.5 / 3
28	LL								54
	TL								75
	BRG								1.5 / 3
29	LL								
	TL								
	BRG								
30	LL								
	TL								
	BRG								

*** Can be applied to the beam in addition to its own weight. Simple or multiple beam spans**

Key to Table:

LL = Maximum live load – limits deflection to L/360
TL = Maximum total load – limits deflections to L/240 (or a maximum of 0.3125" for beams 7¼" deep or less)
BRG = Required end / intermediate bearing length (inches), based on bearing stress of 850 psi.

2.0E ALLOWABLE UNIFORM LOADS FLOOR 100%

ALLOWABLE UNIFORM LOADS* – POUNDS PER LINEAL FOOT – 1¾" 2.0E UTLVL

Span (ft)	Key	Two 1¾" 2.0E UTLVL												
		3½"	5½"	7¼"	9¼"	9½"	11¼"	11⅞"	14"	16"	18"	20"	22"	23⅞"
6	LL	172	666	1525	-	-	-	-	-	-	-	-	-	-
	TL	254	993	1526	2056	2127	2650	2850	3591	4388	5304	6366	7613	8997
	BRG	1.5 / 3	1.5 / 3	1.5 / 3.9	2.1 / 5.2	2.2 / 5.4	2.7 / 6.7	2.9 / 7.2	3.6 / 9.1	4.4 / 11.1	5.4 / 13.4	6.4 / 16.1	7.7 / 19.2	9.1 / 22.7
7	LL	108	419	960	-	-	-	-	-	-	-	-	-	-
	TL	141	556	1272	1698	1754	2166	2322	2889	3484	4147	4893	5736	6634
	BRG	1.5 / 3	1.5 / 3	1.5 / 3.8	2 / 5	2.1 / 5.2	2.6 / 6.4	2.7 / 6.9	3.4 / 8.5	4.1 / 10.3	4.9 / 12.2	5.8 / 14.4	6.8 / 16.9	7.8 / 19.6
8	LL		281	643	1336	1447	-	-	-	-	-	-	-	-
	TL		324	747	1446	1493	1831	1958	2416	2887	3404	3972	4600	5252
	BRG		1.5 / 3	1.5 / 3	2 / 4.9	2 / 5	2.5 / 6.2	2.6 / 6.6	3.3 / 8.2	3.9 / 9.8	4.6 / 11.5	5.4 / 13.4	6.2 / 15.5	7.1 / 17.7
9	LL		197	452	938	1016	-	-	-	-	-	-	-	-
	TL		200	464	1259	1298	1586	1693	2075	2465	2885	3342	3838	4346
	BRG		1.5 / 3	1.5 / 3	1.9 / 4.8	2 / 4.9	2.4 / 6	2.6 / 6.4	3.2 / 7.9	3.8 / 9.4	4.4 / 11	5.1 / 12.7	5.8 / 14.6	6.6 / 16.5
10	LL		-	-	684	741	1230	1447	-	-	-	-	-	-
	TL		130	302	1018	1103	1398	1490	1819	2150	2504	2884	3292	3705
	BRG		1.5 / 3	1.5 / 3	1.7 / 4.3	1.9 / 4.7	2.4 / 5.9	2.5 / 6.3	3.1 / 7.7	3.6 / 9.1	4.2 / 10.6	4.9 / 12.2	5.6 / 13.9	6.3 / 15.7
11	LL		-	-	514	557	924	1087	-	-	-	-	-	-
	TL		87	204	762	826	1250	1331	1618	1905	2211	2535	2882	3228
	BRG		1.5 / 3	1.5 / 3	1.5 / 3.6	1.5 / 3.9	2.3 / 5.8	2.5 / 6.2	3 / 7.5	3.5 / 8.9	4.1 / 10.3	4.7 / 11.8	5.4 / 13.4	6 / 15
12	LL			-	396	429	712	837	1372	-	-	-	-	-
	TL			142	585	635	1058	1172	1457	1711	1979	2262	2562	2860
	BRG			1.5 / 3	1.5 / 3	1.5 / 3.2	2.2 / 5.4	2.4 / 6	3 / 7.4	3.5 / 8.7	4 / 10.1	4.6 / 11.5	5.2 / 13	5.8 / 14.5
13	LL			-	311	337	560	659	1079	-	-	-	-	-
	TL			102	459	497	830	977	1325	1552	1790	2041	2305	2566
	BRG			1.5 / 3	1.5 / 3	1.5 / 3	1.8 / 4.6	2.2 / 5.4	2.9 / 7.3	3.4 / 8.6	3.9 / 9.9	4.5 / 11.2	5.1 / 12.7	5.7 / 14.1
14	LL			-	249	270	448	527	864	1290	-	-	-	-
	TL			74	365	396	662	780	1156	1420	1635	1859	2095	2327
	BRG			1.5 / 3	1.5 / 3	1.5 / 3	1.6 / 4	1.9 / 4.7	2.8 / 6.9	3.4 / 8.4	3.9 / 9.7	4.4 / 11	5 / 12.4	5.5 / 13.8
15	LL				203	220	365	429	703	1049	1493	-	-	-
	TL				296	321	537	632	1006	1280	1504	1707	1920	2128
	BRG				1.5 / 3	1.5 / 3	1.5 / 3.4	1.6 / 4.1	2.6 / 6.4	3.3 / 8.2	3.8 / 9.6	4.3 / 10.9	4.9 / 12.2	5.4 / 13.5
16	LL				167	181	300	353	579	864	1230	-	-	-
	TL				242	263	440	519	856	1124	1391	1578	1771	1960
	BRG				1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.6	2.3 / 5.8	3.1 / 7.7	3.8 / 9.5	4.3 / 10.7	4.8 / 12	5.3 / 13.3
17	LL				139	151	250	295	483	720	1026	1407	-	-
	TL				200	218	365	431	711	994	1230	1466	1644	1817
	BRG				1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.2	2.1 / 5.2	2.9 / 7.2	3.6 / 8.9	4.2 / 10.6	4.8 / 11.9	5.3 / 13.1
18	LL				117	127	211	248	407	607	864	1185	-	-
	TL				168	182	306	361	597	885	1095	1326	1534	1693
	BRG				1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3	1.8 / 4.6	2.7 / 6.8	3.4 / 8.4	4.1 / 10.2	4.7 / 11.8	5.2 / 13
19	LL					108	179	211	346	516	735	1008	1342	-
	TL					153	259	306	506	760	981	1188	1412	1584
	BRG					1.5 / 3	1.5 / 3	1.5 / 3	1.7 / 4.1	2.5 / 6.2	3.2 / 8	3.9 / 9.6	4.6 / 11.4	5.1 / 12.8
20	LL						154	181	296	442	630	864	1150	1470
	TL						220	261	432	649	884	1070	1272	1475
	BRG						1.5 / 3	1.5 / 3	1.5 / 3.7	2.2 / 5.6	3 / 7.6	3.7 / 9.1	4.3 / 10.9	5 / 12.6
21	LL						133	156	256	382	544	747	994	1270
	TL						189	224	371	559	800	969	1152	1336
	BRG						1.5 / 3	1.5 / 3	1.5 / 3.4	2 / 5.1	2.9 / 7.2	3.5 / 8.7	4.1 / 10.3	4.8 / 12
22	LL						116	136	223	332	473	649	864	1105
	TL						163	193	321	484	694	881	1048	1216
	BRG						1.5 / 3	1.5 / 3	1.5 / 3.1	1.8 / 4.6	2.6 / 6.6	3.3 / 8.3	3.9 / 9.9	4.6 / 11.4
23	LL							119	195	291	414	568	756	967
	TL							168	280	422	605	805	957	1110
	BRG							1.5 / 3	1.5 / 3	1.7 / 4.2	2.4 / 6	3.2 / 8	3.8 / 9.4	4.4 / 10.9
24	LL								172	256	365	500	666	851
	TL								245	370	530	732	877	1018
	BRG								1.5 / 3	1.5 / 3.9	2.2 / 5.5	3 / 7.6	3.6 / 9	4.2 / 10.5
25	LL								152	227	323	442	589	753
	TL								215	325	467	646	807	936
	BRG								1.5 / 3	1.5 / 3.6	2 / 5.1	2.8 / 7	3.5 / 8.7	4 / 10.1
26	LL								135	201	287	393	524	669
	TL								190	288	414	572	745	864
	BRG								1.5 / 3	1.5 / 3.3	1.9 / 4.7	2.6 / 6.4	3.3 / 8.4	3.9 / 9.7
27	LL								120	180	256	351	468	598
	TL								168	255	368	509	681	800
	BRG								1.5 / 3	1.5 / 3.1	1.7 / 4.4	2.4 / 6	3.2 / 8	3.7 / 9.3
28	LL								108	161	230	315	419	536
	TL								149	227	328	454	609	742
	BRG								1.5 / 3	1.5 / 3	1.6 / 4.1	2.2 / 5.6	3 / 7.4	3.6 / 9
29	LL									145	207	283	377	482
	TL									203	294	407	546	690
	BRG									1.5 / 3	1.5 / 3.8	2.1 / 5.2	2.8 / 6.9	3.5 / 8.7
30	LL									131	187	256	341	436
	TL									182	264	366	491	632
	BRG									1.5 / 3	1.5 / 3.5	1.9 / 4.8	2.6 / 6.4	3.3 / 8.2

*** Can be applied to the beam in addition to its own weight. Simple or multiple beam spans**

Key to Table:

LL = Maximum live load – limits deflection to L/360
TL = Maximum total load – limits deflections to L/240 (or a maximum of 0.3125" for beams 7¼" deep or less)
BRG = Required end / intermediate bearing length (inches), based on bearing stress of 850 psi.

2.0E ALLOWABLE UNIFORM LOADS FLOOR 100%

ALLOWABLE UNIFORM LOADS* – POUNDS PER LINEAL FOOT – 1¾" 2.0E UTLVL

Span (ft)	Key	Three 1¾" 2.0E UTLVL												
		3½"	5½"	7¼"	9¼"	9½"	11¼"	11⅞"	14"	16"	18"	20"	22"	23⅞"
6	LL	257	998	2287	-	-	-	-	-	-	-	-	-	-
	TL	381	1490	2289	3085	3190	3975	4275	5387	6582	7955	9549	11420	13496
	BRG	1.5 / 3	1.5 / 3	1.5 / 3.9	2.1 / 5.2	2.2 / 5.4	2.7 / 6.7	2.9 / 7.2	3.6 / 9.1	4.4 / 11.1	5.4 / 13.4	6.4 / 16.1	7.7 / 19.2	9.1 / 22.7
7	LL	162	629	1440	-	-	-	-	-	-	-	-	-	-
	TL	212	835	1908	2547	2632	3249	3483	4334	5225	6221	7339	8604	9951
	BRG	1.5 / 3	1.5 / 3	1.5 / 3.8	2 / 5	2.1 / 5.2	2.6 / 6.4	2.7 / 6.9	3.4 / 8.5	4.1 / 10.3	4.9 / 12.2	5.8 / 14.4	6.8 / 16.9	7.8 / 19.6
8	LL		421	965	2004	2171	-	-	-	-	-	-	-	-
	TL		486	1121	2169	2239	2747	2937	3624	4331	5105	5958	6900	7878
	BRG		1.5 / 3	1.5 / 3	2 / 4.9	2 / 5	2.5 / 6.2	2.6 / 6.6	3.3 / 8.2	3.9 / 9.8	4.6 / 11.5	5.4 / 13.4	6.2 / 15.5	7.1 / 17.7
9	LL		296	678	1407	1525	-	-	-	-	-	-	-	-
	TL		301	696	1888	1948	2379	2539	3113	3697	4328	5013	5758	6518
	BRG		1.5 / 3	1.5 / 3	1.9 / 4.8	2 / 4.9	2.4 / 6	2.6 / 6.4	3.2 / 7.9	3.8 / 9.4	4.4 / 11	5.1 / 12.7	5.8 / 14.6	6.6 / 16.5
10	LL		-	-	1026	1111	1846	2171	-	-	-	-	-	-
	TL		195	453	1526	1654	2097	2236	2728	3224	3755	4325	4939	5557
	BRG		1.5 / 3	1.5 / 3	1.7 / 4.3	1.9 / 4.7	2.4 / 5.9	2.5 / 6.3	3.1 / 7.7	3.6 / 9.1	4.2 / 10.6	4.9 / 12.2	5.6 / 13.9	6.3 / 15.7
11	LL		-	-	771	835	1387	1631	-	-	-	-	-	-
	TL		131	306	1144	1240	1875	1996	2427	2858	3316	3803	4323	4842
	BRG		1.5 / 3	1.5 / 3	1.5 / 3.6	1.5 / 3.9	2.3 / 5.8	2.5 / 6.2	3 / 7.5	3.5 / 8.9	4.1 / 10.3	4.7 / 11.8	5.4 / 13.4	6 / 15
12	LL			-	594	643	1068	1256	2058	-	-	-	-	-
	TL			213	878	952	1587	1758	2186	2566	2968	3393	3843	4289
	BRG			1.5 / 3	1.5 / 3	1.5 / 3.2	2.2 / 5.4	2.4 / 6	3 / 7.4	3.5 / 8.7	4 / 10.1	4.6 / 11.5	5.2 / 13	5.8 / 14.5
13	LL			-	467	506	840	988	1619	-	-	-	-	-
	TL			152	688	746	1245	1466	1988	2328	2686	3062	3458	3849
	BRG			1.5 / 3	1.5 / 3	1.5 / 3	1.8 / 4.6	2.2 / 5.4	2.9 / 7.3	3.4 / 8.6	3.9 / 9.9	4.5 / 11.2	5.1 / 12.7	5.7 / 14.1
14	LL			-	374	405	673	791	1296	1935	-	-	-	-
	TL			111	548	595	994	1170	1734	2130	2452	2789	3143	3490
	BRG			1.5 / 3	1.5 / 3	1.5 / 3	1.6 / 4	1.9 / 4.7	2.8 / 6.9	3.4 / 8.4	3.9 / 9.7	4.4 / 11	5 / 12.4	5.5 / 13.8
15	LL				304	329	547	643	1054	1573	2240	-	-	-
	TL				443	481	805	949	1508	1921	2255	2561	2880	3192
	BRG				1.5 / 3	1.5 / 3	1.5 / 3.4	1.6 / 4.1	2.6 / 6.4	3.3 / 8.2	3.8 / 9.6	4.3 / 10.9	4.9 / 12.2	5.4 / 13.5
16	LL				250	271	451	530	868	1296	1846	-	-	-
	TL				363	394	661	779	1284	1685	2086	2367	2657	2940
	BRG				1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.6	2.3 / 5.8	3.1 / 7.7	3.8 / 9.5	4.3 / 10.7	4.8 / 12	5.3 / 13.3
17	LL				209	226	376	442	724	1081	1539	2111	-	-
	TL				301	326	548	647	1067	1490	1845	2200	2466	2725
	BRG				1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3.2	2.1 / 5.2	2.9 / 7.2	3.6 / 8.9	4.2 / 10.6	4.8 / 11.9	5.3 / 13.1
18	LL				176	191	316	372	610	910	1296	1778	-	-
	TL				251	273	459	542	896	1327	1643	1988	2300	2539
	BRG				1.5 / 3	1.5 / 3	1.5 / 3	1.5 / 3	1.8 / 4.6	2.7 / 6.8	3.4 / 8.4	4.1 / 10.2	4.7 / 11.8	5.2 / 13
19	LL					162	269	316	519	774	1102	1512	2012	-
	TL					230	388	459	759	1139	1472	1782	2118	2377
	BRG					1.5 / 3	1.5 / 3	1.5 / 3	1.7 / 4.1	2.5 / 6.2	3.2 / 8	3.9 / 9.6	4.6 / 11.4	5.1 / 12.8
20	LL						231	271	445	664	945	1296	1725	2205
	TL						331	391	648	974	1326	1605	1908	2213
	BRG						1.5 / 3	1.5 / 3	1.5 / 3.7	2.2 / 5.6	3 / 7.6	3.7 / 9.1	4.3 / 10.9	5 / 12.6
21	LL						199	234	384	573	816	1120	1490	1905
	TL						284	335	557	838	1200	1454	1728	2004
	BRG						1.5 / 3	1.5 / 3	1.5 / 3.4	2 / 5.1	2.9 / 7.2	3.5 / 8.7	4.1 / 10.3	4.8 / 12
22	LL						173	204	334	499	710	974	1296	1657
	TL						245	290	482	726	1040	1322	1572	1823
	BRG						1.5 / 3	1.5 / 3	1.5 / 3.1	1.8 / 4.6	2.6 / 6.6	3.3 / 8.3	3.9 / 9.9	4.6 / 11.4
23	LL							178	292	436	621	852	1134	1450
	TL							251	419	633	907	1207	1436	1665
	BRG							1.5 / 3	1.5 / 3	1.7 / 4.2	2.4 / 6	3.2 / 8	3.8 / 9.4	4.4 / 10.9
24	LL								257	384	547	750	998	1276
	TL								367	554	796	1098	1316	1527
	BRG								1.5 / 3	1.5 / 3.9	2.2 / 5.5	3 / 7.6	3.6 / 9	4.2 / 10.5
25	LL								228	340	484	664	883	1129
	TL								322	488	701	968	1210	1405
	BRG								1.5 / 3	1.5 / 3.6	2 / 5.1	2.8 / 7	3.5 / 8.7	4 / 10.1
26	LL								202	302	430	590	785	1004
	TL								284	431	621	858	1117	1296
	BRG								1.5 / 3	1.5 / 3.3	1.9 / 4.7	2.6 / 6.4	3.3 / 8.4	3.9 / 9.7
27	LL								181	270	384	527	701	896
	TL								252	383	552	763	1022	1200
	BRG								1.5 / 3	1.5 / 3.1	1.7 / 4.4	2.4 / 6	3.2 / 8	3.7 / 9.3
28	LL								162	242	344	472	629	804
	TL								224	341	492	681	913	1113
	BRG								1.5 / 3	1.5 / 3	1.6 / 4.1	2.2 / 5.6	3 / 7.4	3.6 / 9
29	LL									218	310	425	566	723
	TL									305	440	611	819	1036
	BRG									1.5 / 3	1.5 / 3.8	2.1 / 5.2	2.8 / 6.9	3.5 / 8.7
30	LL									197	280	384	511	653
	TL									273	395	549	737	947
	BRG									1.5 / 3	1.5 / 3.5	1.9 / 4.8	2.6 / 6.4	3.3 / 8.2

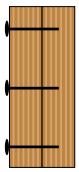
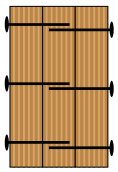
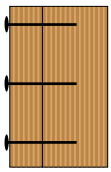
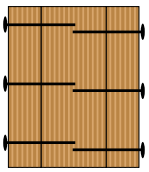
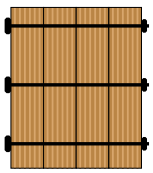
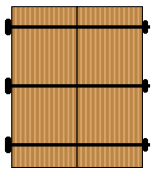
*** Can be applied to the beam in addition to its own weight. Simple or multiple beam spans**

Key to Table:

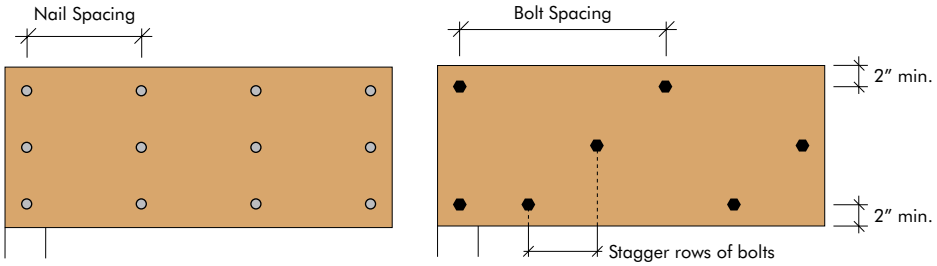
LL = Maximum live load – limits deflection to L/360
TL = Maximum total load – limits deflections to L/240 (or a maximum of 0.3125" for beams 7¼" deep or less)
BRG = Required end / intermediate bearing length (inches), based on bearing stress of 850 psi.

MULTIPLE-PLY UTLVL BEAM ASSEMBLY

COMBINATIONS OF 1¾" AND 3½" PLIES

CONDITION A	CONDITION B		CONDITION C	CONDITION D	CONDITION E
					
2 pieces 1¾"	3 pieces 1¾"	1 piece 1¾" 1 piece 3½"	2 pieces 1¾" 1 piece 3½"	4 pieces 1¾"	2 pieces 3½"

OR



1¾" AND 3½" PLIES—MAXIMUM UNIFORM SIDE LOAD (PLF)

Condition	3½" x 0.131" Nails		16d Common Nails		½" Bolts		
	2 Rows at 12" o.c.	3 Rows at 12" o.c.	2 Rows at 12" o.c.	3 Rows at 12" o.c.	2 Rows at 24" o.c.	2 Rows at 12" o.c.	3 Rows at 12" o.c.
Condition A (2–1¾")	390	585	565	845	510	1015	1520
Condition B (3–1¾" OR 1–1¾" + 1–3½")	290	435	425	635	380	765	1145
Condition C (2–1¾" + 1–3½")	260	390	375	565	465	930	1395
Condition D (4–1¾")	use bolts for this condition				340	680	1015
Condition E (2–3½")	use bolts for this condition				860	1720	2580

Notes:

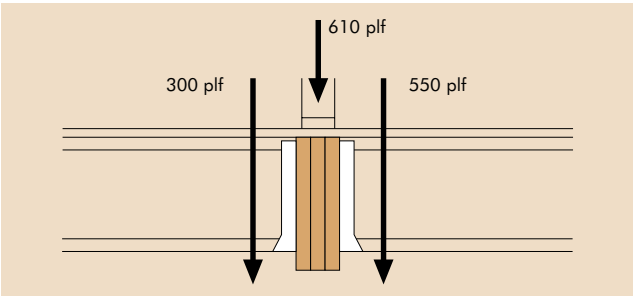
1. Minimum fastener schedule for smaller side loads and top-loaded beams:
   Conditions A, B & C, beams 12" deep or less:
   2 rows 3½" x 0.131" at 12" o.c.
   Conditions A, B & C, beams deeper than 12":
   3 rows 3½" x 0.131" at 12" o.c.
   Conditions D & E, all beam depths:
   2 rows 1½" bolts at 24" o.c.
2. The table values for nails may be doubled for 6" o.c. and tripled for 4" o.c. nail spacings.
3. The nail schedules shown apply to both sides of a three-ply beam.
4. The table values apply to common bolts that conform to ANSI/ASME Standard B18.2.1-1981. A washer not less than a standard cut washer shall be between the wood and the bolt head and between the wood and the nut. The distance from the edge of the beam to the bolt holes must be at least 2" for ½" bolts. Bolt holes shall be the same diameter as the bolt.
5. 7" wide beams must be loaded from both sides and/or top loaded.
6. Beams wider than 7" must be designed by the engineer of record.
7. Load duration factors may be applied to the table values.

HOW TO USE THE MAXIMUM UNIFORM SIDE-LOAD TABLE

EXAMPLE:

THREE 1¾" PLIES LOADED FROM BOTH SIDES AND ABOVE (CONDITION B)

1. Use allowable load tables or sizing software to size the beam to carry a total load of (300 + 610 + 550) = 1460 plf.
2. Refer to the Condition B row in the table. Scan across the row from left to right for a table value greater than 550 plf, which is the greatest side load carried by the beam. The fourth value in the row indicates that 3 rows of 16d common nails at 12" o.c. will accommodate a side load of 635 plf which is greater than the 550 plf required. Use 3 rows of 16d common nails at 12" o.c., from both sides, to assemble the beam.



OUR PRODUCT WARRANTY

Universal Timber Structures warrants that its products will be free from manufacturing errors or defects in workmanship and material.

In addition, provided the product is correctly installed and used, Universal Timber Structures warrants the adequacy of its design for the normal and expected life of the structure.

This warranty is backed by the full resources of Universal Timber Structures and by underwritten product liability insurance.

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UNIVERSAL TIMBER STRUCTURES

Universal Timber Structures
PO Box 157
Auburndale FL 33823

Western States
6553 Old Salem Rd NE
Albany, OR 97321
Tel. (541) 248-2139
Fax (541) 926-4681

Eastern States
623 W Bridgers Av
Auburndale, FL 33823
Tel. (863) 965-0213
Fax (863) 967-1082

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