



VULCRAFT

SEE
IMPORTANT
NOTICE
REGARDING
BRIDGING
ON PAGE 1.

STEEL JOISTS AND JOIST GIRDERS

A Division of Nucor Corporation



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VULCRAFT
2001



5

STEEL JOISTS
JOIST GIRDERS

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****IMPORTANT NOTICE****

BASED UPON FINDINGS OF INDUSTRY SPONSORED RESEARCH, THE STEEL JOIST INSTITUTE HAS DEVELOPED NEW REQUIREMENTS FOR THE USE OF ERECTION STABILITY BRIDGING. THE NEW SJI SPECIFICATIONS REQUIRE BOLTED DIAGONAL BRIDGING TO BE INSTALLED FOR SOME K-SERIES AND LH-SERIES JOISTS BEFORE SLACKENING THE HOISTING LINES. THE JOIST SPANS REQUIRING THIS STABILITY BRIDGING ARE SHADED IN THE LOAD TABLES.

IT IS VERY IMPORTANT FOR JOIST SPECIFIERS AND ERECTORS TO KNOW THAT OSHA IS INTERPRETING 29CFR-1926.751 (c)2 TO MEAN ALL JOIST FORTY (40) FEET (12192MM) AND LONGER TO REQUIRE A ROW OF BOLTED BRIDGING TO BE IN PLACE BEFORE SLACKENING OF HOISTING LINES.

*FRONT COVER PICTURE:
Brown & Root Employee Center
Houston, Texas
General Contractor: Brown & Root
Steel Fabricator: Palmer Steel Supplies, Inc.*

1995 REVISIONS

PAGE	SECTION	CHANGE
1		Added notice regarding bridging.
6	Vibration	Revised.
7	Concentrated Loads	Revised.
8	LRFD	Added.
9	K-Series	New bridging tables.
10-13	K-Series	Added shading and OSHA note for erection stability requirement.
14-17	KCS-Series	Change from CS-Series, added metric.
18-21	K-Series	Added metric load tables.
22-29	K-Series	Revised specifications to include metric and new bridging criteria.
31	Accessories & Details	Revised VS-Series.
35-36	Accessories & Details	New bridging requirements.
39	Accessories & Details	New top chord extension load table-metric.
40	Accessories & Details	Revised camber tables to include metric.
43	LH-DLH Series	New bridging tables.
44-46	LH-Series	Added shading and OSHA note for erection stability requirement.
47-48	DLH-Series	Added shading for erection stability requirement.
49-52	LH-Series	New metric tables.
53-54	DLH-Series	New metric tables.
55-62	LH-DLH Series	Revised specifications to include metric and new bridging criteria.
77	Joist Girders	Re-worded.
78	Joist Girders	Added detail "F".
80-88	Joist Girders	Enhanced weight tables and added stepped line to indicate when a 10 inch deep bearing should be used.
89-95	Joist Girders	New metric design example and metric weight tables.
96-102	Joist Girders	Revised specifications to include metric.
103-106	Fire Resistance Ratings	Revised stress limitations and revised some fire resistance ratings.
107-118	Economical Joist Guide	Added shading for erection stability requirements. Method of listing joists in order of economies has been revised.
119-126	Recommended Code of Standard Practice	Revised to include metric and new bridging criteria.

A WORD ABOUT QUALITY

In manufacturing steel joists, there can be no compromise on quality. Your business depends on it. Our reputation and success depends on it. As the largest manufacturer of steel joists in the United States, a lot of buildings and a lot of people depend on Vulcraft for consistently high standards of quality that are demonstrated in reliable performance.

In the manufacturing of steel joists and joist girders, Vulcraft uses high quality steel. Welding to exact specifications is the key to making structurally sound joists—and the most critical step in the entire process. This being the case, all Vulcraft welders are certified to American Welding Society standards. All welds are in accordance with the Steel Joist Institute's welding criteria and all Vulcraft joists are manufactured to meet the required design loads of the specifying professional.

To further insure the precision and quality of every weld, every Vulcraft quality assurance inspector is also certified to these same high standards. Furthermore Vulcraft's quality assurance supervisors report directly to the engineering manager. Vulcraft also employs an ongoing program of mechanical testing that includes full scale load tests at every facility.

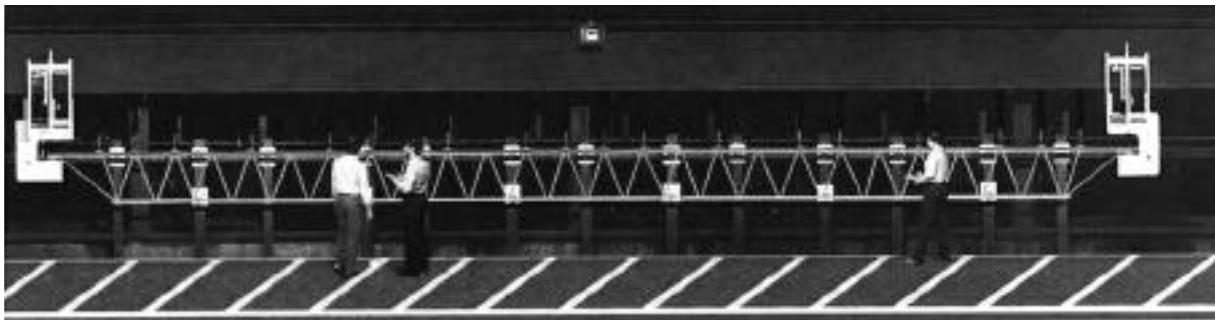
As the leading manufacturer of steel joists and joist girders in the United States, Vulcraft's reputation depends on successfully managed quality control programs. That's why quality is important at Vulcraft. You have our word on it.

NOTICE

Vulcraft, a Division of Nucor Corporation, has provided this catalog for use by engineers and architects in designing and using Vulcraft open web joists and open web girders. It includes all products available at the time of printing. Vulcraft reserves the right to change, revise or withdraw any Products or procedures without notice.

The information presented in this catalog has been prepared in accordance with recognized engineering principles and is for general information only. While it is believed to be accurate, this information should not be used or relied upon for any specific application without competent professional examination and verification of its accuracy, suitability and applicability by an engineer, architect or other licensed professional.

Vulcraft is a manufacturer of open web steel joists, joist girders, floor deck and roof deck. Vulcraft employs a staff of engineers for the design, manufacture and marketing of its products. Vulcraft does not accept the responsibility as the design professional of record for any structure. Vulcraft accepts the delegation of the engineering responsibility only for the products it manufactures, provided the application and applicable loading for these products are specified by the design professional of record. Vulcraft provides engineering for the design of its products and does not displace the need on any project for a design professional of record.



VULCRAFT

STEEL JOISTS AND JOIST GIRDERS, STEEL ROOF AND FLOOR DECK, COMPOSITE JOISTS

VULCRAFT OFFERS A WIDE RANGE OF
JOISTS, JOIST GIRDERS AND DECK PRODUCTS.
FOR MORE INFORMATION,
CONTACT A VULCRAFT SALES OFFICE

VULCRAFT MANUFACTURING LOCATIONS:

P.O. Box 637	Brigham City, UT 84302*	(435) 734-9433	Fax: (435) 732-5423
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*STEEL JOISTS, JOIST GRIDERS AND COMPOSITE JOISTS ONLY.

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312 Elm Building, Cincinnati, Ohio

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Structural Engineer: Stanley D. Lindsey and Associates
Developer: Duke Construction Management
Steel Fabricators: Ferguson Steel
Steel Erector: Ben Hur Construction*



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FLOOR VIBRATION

Floor vibration occurs, in varying degrees, in all types of building construction. Unlike steady state vibration, which can be isolated, vibration due to human impact is inconsistent in amplitude and frequency and therefore, more difficult to control.

The Steel Joist Institute has studied this phenomenon for many years. Laboratory research has been performed and numerous buildings, exhibiting both good and bad characteristics, were tested using seismic recording instruments. The findings have been published by the SJI in Technical Digest #5.

The vast majority of structures, including those utilizing steel joists, do not exhibit floor vibrations severe enough to be considered objectionable. However, human sensitivity to vibratory motion varies, and a satisfactory framing solution is dependent upon the sound judgement of qualified structural engineers.

The following observations are in keeping with the research data for vibrational characteristics not objectionable to normal human response, and are recommended only as a guide.

DEFINITIONS

Floor vibration is measured in terms of amplitude and frequency. These two factors are not objectionable to all people at the same level since human sensitivity varies.

Amplitude is defined as the magnitude or total distance traveled by each oscillation of the vibration.

Frequency is the term used to describe the speed of the oscillations and is expressed in cycles per second or Hz.

Acceleration results from combining amplitude and frequency and is the only vibration factor which humans can sense.

Damping is defined as the rate of decay of amplitude.

OPEN FLOOR AREAS are most subject to vibrational problems. Objections occur most often when a 2 1/2" thick slab of lightweight concrete is used on spans in the range of 28 feet. As the spans both increase and decrease from this length, the likelihood of objectionable vibration tends to taper off. Partitions, file cabinets, book stacks, heavy furnishings and even crowds of people provide additional damping and minimize complaints.

THICKER FLOOR SLABS are an economical solution to floor vibration, when open floor areas are required. Additional thickness increases floor system stiffness transverse to the joists, thus reducing the amplitude. A slight increase in frequency will be offset by the additional mass of the system, producing a reduction of objectionable vibration.

WIDER JOIST SPACINGS improve vibrational characteristics only when combined with thicker floor slabs. The resulting increase in joist size does not contribute

significantly to the composite section. When used with a thicker slab, greater resistance to vibration can be achieved, and, since fewer pieces must be installed, may be more economical.

PARTITIONS introduce damping and usually eliminate vibration problems. They will be effective either above or below a floor. Partitions below provide damping even though only attached to suspended ceilings and not in direct contact with joists.

SUPPORT FRAMING BEAMS sometimes greatly magnify floor vibration. If a floor vibration problem is judged to be imminent, one needs to calculate the natural frequency and amplitude for both the joist and supporting joist girders or beams. In this manner the resulting system amplitude and frequency can be determined from which the required system damping can be calculated. The damping provided in the system should be greater than the calculated required damping.

INCREASING JOIST STIFFNESS above that which is required by live load deflection is not a good solution. Increasing the stiffness of the steel joists themselves results in increasing the frequency and slightly decreasing the amplitude of the floor vibration.

BRIDGING of all standard types provide equal floor vibrational characteristics.

LONGER FLOOR SPANS have many advantages over shorter spans, both in construction cost and in vibrational response. Floor spans over 40 feet with a 2-1/2" thick concrete slab give a vibrational frequency in the 3-5 cycles per second range. A human can tolerate a larger amplitude at this reduced frequency without sensing it. Thus, there is minimal sensation of motion and the floor feels extremely stable.

ASSISTANCE can be given to architects and engineers on the subject of vibration and steel joist construction. Call the engineering manager at the nearest Vulcraft manufacturing facility.

PC based software to evaluate vibration of joist supported floor systems is available from the STEEL JOIST INSTITUTE, 3127 10th Ave. North Ext., Myrtle Beach, SC 29577, phone (843) 626-1995 and STRUCTURAL ENGINEERS, INC., 537 Wisteria Drive, Radford, VA 24141, Fax no. (703) 731-3330.

CONCLUSIONS:

Partitions eliminate vibration problems. When a floor area cannot have partitions, increasing the slab thickness is the most economical and effective way to prevent vibration objections. Steel joist and concrete slab open floor areas have generally not given objectionable vibration at spans less than 20 feet or greater than 40 feet even with only 2 1/2" slab. Due consideration should also be given to support framing beams as outlined above.

For more information refer to Steel Joist Institute Technical Digest No. 5 "Vibration of Steel Joist-Concrete Slab Floors."

DEFLECTION OF STEEL JOISTS

The deflection of a steel joist when loaded with a uniformly-distributed load depends upon the following factors:

w= uniformly-distributed load carried by the joist (plf)

L= (span of the joist - .33)(ft.)

E= modulus of elasticity of steel (29,000,000 psi)

I= 26.767 WLL (L3) (10⁻⁶) where WLL=red figure in load table

Tests have shown that deflection at mid-span may be determined with reasonable accuracy using the following formula:

Deflection (inches)=

$$\frac{1.15 \times 5wL^4 (12^3)}{384EI}$$

$$\frac{25.88wL^4}{EI}$$

Example: Determine the approximate total load deflection of a 24K8 for the following conditions:

W=280 plf L=40.0 ft

W_{LL}= 161 plf E=29,000,000 psi

I=26.767(161) (40-.33)³ (10⁻⁶)= 269.0 in.⁴

Deflection=

$$\frac{25.88(280)(40-.33)^4}{29,000,000(269)} = 2.30 \text{ in.}$$

HOW TO SPECIFY CONCENTRATED AND OTHER NON-UNIFORM LOADS ON STEEL JOISTS

K-SERIES

When working with K-series joists, the specifying professional has two means by which to handle concentrated loads. First, KCS joists may be chosen (see page 14). These new SJI joists are specifically designed to address the problems created by non-uniform loading and using KCS joists is the best alternative for a loading condition that cannot be located during the design phase.

Second, the design loads can be shown on the contract drawings. If this method is used all concentrated loads must be located and the magnitude of the loads must be given and any other non-uniform loading must include the location and magnitude. The best way to handle this is through a load diagram. The specifying professional must specifically instruct the joist manufacturer to provide special joists for these situations.

These joists are to be labeled "SP" on the plan. **NOTE OF CAUTION IS DUE HERE.** In no case should the required resisting moment or end reaction exceed the highest values tabulated for the KCS joists of the specified depth. Those values represent the practical upper limits for the respective joist depths.

The Steel Joist Institute has an example for each of these choices. They are reprinted in this catalog on page 14 for the KCS example and on page 124 for the special (SP) design example.

Whatever option is chosen, it is still possible the required shear and/or moment exceeds that which can be developed with a K-series joist. In the event this happens, the specifying professional can do one of two things:

- 1) Use double joists. Both joists would be KCS joists or "specials" (SP), but carrying half of the required loads.
- 2) Specifying a special (SP) LH-series joist. (NOTE: LH joists require deeper bearing seats.)

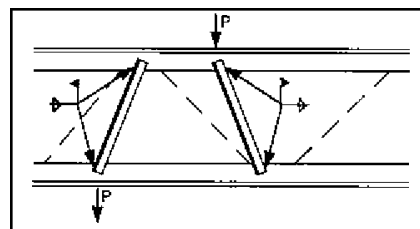
LH-SERIES

When it is necessary for LH-series joists to be specified to support concentrated loads, the specifying professional should provide the design requirements for these joists on the structural drawings. This must be done by giving both the uniform load and any non-uniform loads. If the non-uniform loads are concentrated the location and magnitude of each load must be provided. A load diagram of each joist should be provided. A specific note instructing the joist manufacturer to design a special (SP) joist should be given.

Regardless of whether K-series, KCS-series or LH-series joists are specified, it is important to note that even though sufficient shear and moment capacity are provided within the special joist, the localized bending of the chord members due to concentrated loading between panel points is not considered. The joist design generally presumes that all concentrated loads are to be applied at panel points. When this is not the case, the specifying professional must specify on the structural drawings of the contract documents one of the following methods:

- 1) A field installed member be located at all concentrated loads not occurring at panel points (see detail C1).
- 2) The magnitude and locations of all loads can be provided on the structural drawings and Vulcraft can shop install an additional web, thus eliminating the field labor.

The second alternative is the most economical.



DETAIL C1

VARYING UNIFORM LOADS ON STEEL JOISTS

The selection process of a joist for varying uniform loads such as drift loads or stepped uniform loads is essentially the same as that for concentrated loads. For K-series joists where the uniform load exceeds 550 pounds per lineal foot, the only options are: double joists or the use of special (SP) joists. Again a load diagram should be shown on the structural drawings.

LOAD AND RESISTANCE FACTOR DESIGN

The following method may be used to convert the Steel Joist Institute's Specifications for use in Load and Resistance Factor Design (LRFD)

Method:

$$WU = 1.65 W_{sji}, \text{ or } W_{sji} = WU / 1.65$$

Where, WU = ultimate joist capacity
 W_{sji} = SJI Load Table Load (black figure)

Load tables for LRFD can be obtained directly from the current SJI Load Tables by using the formula:

$$W_n = W_{sji} \times 0.9 \times 1.65$$

Where, W_n = nominal joist capacity
0.9 = Resistance Factor (ϕ)

"K" Series Example:

Given: $WU = 1.2 WD + 1.6 WL$

Problem: Select a joist from the current load tables for $W_{sji} \geq WU/1.65$ (ϕ)

$L = 40$ ft.
 $WD = 50$ plf
 $WL = 150$ plf
Use Roof Live load deflection $\leq L/240$

$$WU = 1.2 \times 50 + 1.6 \times 150 = 300 \text{ plf}$$

$$W_{sji} \geq 300 / (1.65 \times 0.9) = 202 \text{ plf}$$

Select 22K6: W_{sji} @ 40 ft. span = 207 plf > 202 plf. O.K'

Deflection Live Load $\leq L/240$

$$W_{sjiLL} = 1.5 \times 111 = 166 \text{ plf} > 150 \text{ plf O.K'}$$

The above procedure outlines the specification of a "K" Series Joist to support a uniform gravity load utilizing LRFD. When loads other than uniform gravity loads (such as wind uplift loads, concentrated loads, end moments or non-uniform loads) are a design consideration, the Specifying Professional shall clearly indicate on the structural drawings whether these loads are factored or unfactored. To remain consistent with established LRFD design procedures it is recommended that factored loads be specified.

The above procedure is also applicable to the LH/DLH Series Joists and Joist Girders.



ECONOMICAL

HIGH STRENGTH

DESIGN - Vulcraft K Series open web steel joists are designed in accordance with specifications of the Steel Joist Institute.

ACCESSORIES see page 32.

FOR TOP CHORD EXTENSIONS AND EXTENDED ENDS see page 37.

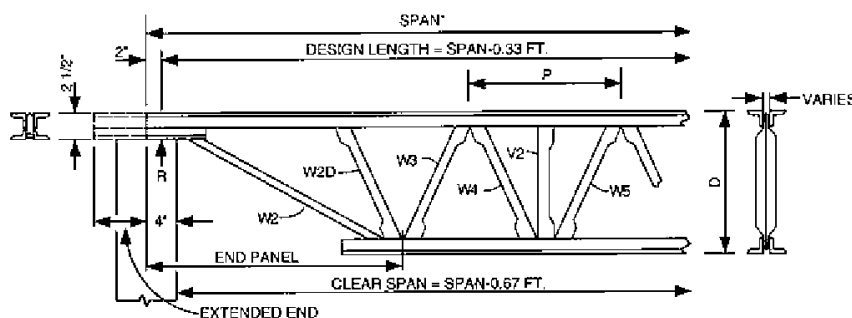
SJI SPANS TO 60'-0"

PAINT - Vulcraft joists receive a shop-coat of rust inhibitive primer whose performance characteristics conform to those of the Steel Joist Institute specifications 3.3.

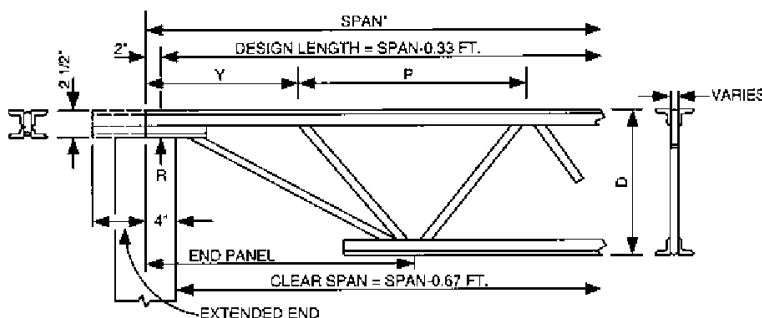
SPECIFICATIONS see page 22.

KCS SERIES JOIST see page 14.

ANGLE WEB



ROD WEB



* For Definition of Span, see page 30.

NOTE: Actual layout may vary from that shown.

MAXIMUM JOIST SPACING FOR HORIZONTAL BRIDGING							
SECTION NUMBER**	BRIDGING MATERIAL SIZE						
	Round Rod	Equal Leg Angles					
	1/2" DIA (13mm) r = .13"	1 x 7/64 (25mm x 3mm) r = .25"	1-1/4 x 7/64 (32mm x 3mm) r = .25"	1-1/2 x 7/64 (38mm x 3mm) r = .30"	1-3/4 x 7/64 (45mm x 3mm) r = .35"	2 x 1/8 (51mm x 3mm) r = .40"	2-1/2 x 5/32 (64mm x 4mm) r = .50"
1 thru 9	3'-3" (991mm)	5'-0" (1524mm)	6'-3" (1905mm)	7'-6" (2286mm)	8'-7" (2616mm)	10'-0" (3048mm)	12'-6" (3810mm)
10	3'-0" (914mm)	4'-8" (1422mm)	6'-3" (1905mm)	7'-6" (2286mm)	8'-7" (2616mm)	10'-0" (3048mm)	12'-6" (3810mm)
11 and 12	2'-7" (787mm)	4'-0" (1219mm)	5'-8" (1727mm)	7'-6" (2286mm)	8'-7" (2616mm)	10'-0" (3048mm)	12'-6" (3810mm)

*SECTION NUMBER REFERS TO THE LAST DIGITS OF JOIST DESIGNATION, CONNECTION TO JOIST MUST RESIST 700 POUNDS (3114 N)

MAXIMUM JOIST SPACING FOR DIAGONAL BRIDGING				
JOIST DEPTH	BRIDGING ANGLE SIZE-EQUAL LEG ANGLES			
	1 x 7/64 (25mm x 3mm) r = .20"	1 1/4 x 7/64 (32mm x 3mm) r = .25"	1 1/2 x 7/64 (38mm x 3mm) r = .30"	1 3/4 x 7/64 (45mm x 3mm) r = .35"
12	6'-6" (1981mm)	8'-3" (2514mm)	9'-11" (3022mm)	11'-7" (3530mm)
14	6'-6" (1981mm)	8'-3" (2514mm)	9'-11" (3022mm)	11'-7" (3530mm)
16	6'-6" (1981mm)	8'-2" (2489mm)	9'-10" (2997mm)	11'-6" (3505mm)
18	6'-6" (1981mm)	8'-2" (2489mm)	9'-10" (2997mm)	11'-6" (3505mm)
20	6'-5" (1955mm)	8'-2" (2489mm)	9'-10" (2997mm)	11'-6" (3505mm)
22	6'-4" (1930mm)	8'-1" (2463mm)	9'-10" (2997mm)	11'-6" (3505mm)
24	6'-4" (1930mm)	8'-1" (2463mm)	9'-9" (2971mm)	11'-5" (3479mm)
26	6'-3" (1905mm)	8'-0" (2438mm)	9'-9" (2971mm)	11'-5" (3479mm)
28	6'-2" (1879mm)	8'-0" (2438mm)	9'-8" (2946mm)	11'-5" (3479mm)
30	6'-2" (1879mm)	7'-11" (2413mm)	9'-8" (2946mm)	11'-4" (3454mm)

K-series--all sections numbers use A307 bolt 3/8" (9mm) diameter.

See page 27 for number of rows of bridging required.

BRIDGING FOR STANDING SEAM ROOF SYSTEMS:

Generally, standing seam roof systems will not adequately brace the top chords of the joists with standard SJI bridging. We therefore, recommend that when a standing seam roof system is specified, the design professional specifically state that the joist manufacturer is to check the bridging requirements and provide bridging as required to adequately brace the top chord against lateral movement under full loading conditions.

UPLIFT BRIDGING:

Where uplift forces due to wind are a design requirement, these forces must be indicated on the structural drawings in terms of **net** uplift in pounds per square foot or pounds per linear foot. When these loads are specified, they must be considered in the design of joists and bridging. As a minimum, a single line of bottom chord bridging must be provided near the first bottom chord panel point, at each end of the joist, whenever uplift is a design consideration.*

*See Section 5.11 of the specifications.

IT IS VERY IMPORTANT FOR JOIST SPECIFIERS AND ERECTORS TO KNOW THAT OSHA IS INTERPRETING 29CFR-1926.751(c)2 TO MEAN ALL JOIST FORTY (40) FEET (12192MM) AND LONGER TO REQUIRE A ROW OF BOLTED BRIDGING TO BE IN PLACE BEFORE SLACKENING OF HOISTING LINES.

STANDARD LOAD TABLE OPEN WEB STEEL JOISTS, K-SERIES

Based on a Maximum Allowable Tensile Stress of 30,000 psi

Adopted by the Steel Joist Institute November 4, 1985; Revised to May 2, 1994 - Effective September 1, 1994

The black figures in the following table give the TOTAL safe uniformly distributed load-carrying capacities, in pounds per linear foot, of K-Series Steel Joists. The weight of DEAD loads, including the joists, must be deducted to determine the LIVE load-carrying capacities of the joists. The load table may be used for parallel chord joists installed to a maximum slope of 1/2 inch per foot.

The figures shown in RED in this load table are the LIVE loads per linear foot of joist which will produce an approximate deflection of 1/360 of the span. LIVE loads which will produce a deflection of 1/240 of the span may be obtained by multiplying the figures in RED by 1.5. In no case shall the TOTAL load capacity of the joists be exceeded.

The approximate joist weights per linear foot shown in these tables do not include accessories.

The approximate moment of inertia of the joist, in 4 inches is: $I_j = 26.767(W_{LL})(L^3)(10^{-6})$, where W_{LL} = RED figure in the Load Table and L = (Span - .33) in feet.

For the proper handling of concentrated and/or varying loads, see Section 5.5 in the Recommended Code of Standard Practice.

Where the joist span is equal to or greater than the span corresponding to the RED shaded area shown in the load table, the row of bridging nearest the mid span of the joist shall be installed as bolted diagonal bridging. Hoisting cables shall not be released until this bolted diagonal bridging is completed installed.

JOIST DESIGNATION	8K1	10K1	12K1	12K3	12K5	14K1	14K3	14K4	14K6	16K2	16K3	16K4	16K5	16K6	16K7	16K9
DEPTH (IN.)	8	10	12	12	12	14	14	14	14	16	16	16	16	16	16	16
APPROX. WT. (lbs./ft.)	5.1	5.0	5.0	5.7	7.1	5.2	6.0	6.7	7.7	5.5	6.3	7.0	7.5	8.1	8.6	10.0
SPAN (ft.)																
Ø																
8	550															
9	550															
10	550															
	480	550														
11	532	550														
	377	542														
12	444	550	550	550	550											
	288	455	550	550	550											
13	377	479	550	550	550											
	225	363	510	510	510											
14	324	412	500	550	550	550	550	550	550							
	179	289	425	463	463	550	550	550	550							
15	281	358	434	543	550	511	550	550	550							
	145	234	344	428	434	475	507	507	507							
16	246	313	380	476	550	448	550	550	550	550	550	550	550	550	550	550
	119	192	282	351	396	390	467	467	467	550	550	550	550	550	550	550
17		277	336	420	550	395	495	550	550	512	550	550	550	550	550	550
	159	234	291	366	324	404	443	443	443	488	526	526	526	526	526	526
18	246	299	374	507	352	441	530	550	550	456	508	550	550	550	550	550
	134	197	245	317	272	339	397	408	408	409	456	490	490	490	490	490
19	221	268	335	454	315	395	475	550	550	408	455	547	550	550	550	550
	113	167	207	269	230	287	336	383	347	347	386	452	455	455	455	455
20	199	241	302	409	284	356	428	525	368	410	493	550	550	550	550	550
	97	142	177	230	197	246	287	347	297	297	330	386	426	426	426	426
21			218	273	370	257	322	388	475	333	371	447	503	548	550	550
			123	153	198	170	212	248	299	255	285	333	373	405	406	406
22			199	249	337	234	293	353	432	303	337	406	458	498	550	550
			106	132	172	147	184	215	259	222	247	289	323	351	385	385
23			181	227	308	214	268	322	395	277	308	371	418	455	507	550
			93	116	150	128	160	188	226	194	216	252	282	307	339	363
24			166	208	282	196	245	295	362	254	283	340	384	418	465	550
			81	101	132	113	141	165	199	170	189	221	248	269	298	346
25						180	226	272	334	234	260	313	353	384	428	514
						100	124	145	175	150	167	195	219	238	263	311
26						166	209	251	308	216	240	289	326	355	395	474
						88	110	129	156	133	148	173	194	211	233	276
27						154	193	233	285	200	223	268	302	329	366	439
						79	98	115	139	119	132	155	173	188	208	246
28						143	180	216	265	186	207	249	281	306	340	408
						70	88	103	124	106	118	138	155	168	186	220
29										173	193	232	261	285	317	380
										95	106	124	139	151	167	198
30										161	180	216	244	266	296	355
										86	96	112	126	137	151	178
31										151	168	203	228	249	277	332
										78	87	101	114	124	137	161
32										142	158	190	214	233	259	311
										71	79	92	103	112	124	147



STANDARD LOAD TABLE / OPEN WEB STEEL JOISTS, K-SERIES

Based on a Maximum Allowable Tensile Stress of 30,000 psi

JOIST DESIGNATION	18K3	18K4	18K5	18K6	18K7	18K9	18K10	20K3	20K4	20K5	20K6	20K7	20K9	20K10	22K4	22K5	22K6	22K7	22K9	22K10	22K11
DEPTH (IN.)	18	18	18	18	18	18	18	20	20	20	20	20	20	20	22	22	22	22	22	22	22
APPROX. WT. (lbs./ft.)	6.6	7.2	7.7	8.5	9.0	10.2	11.7	6.7	7.6	8.2	8.9	9.3	10.8	12.2	8.0	8.8	9.2	9.7	11.3	12.6	13.8
SPAN (ft.)																					
18	550	550	550	550	550	550	550														
19	550	550	550	550	550	550	550														
20	463	550	550	550	550	550	550	517	550	550	550	550	550	550							
21	420	506	550	550	550	550	550	468	550	550	550	550	550	550							
22	382	460	518	550	550	550	550	426	514	550	550	550	550	550	550	550	550	550	550	550	550
23	349	420	473	516	550	550	550	389	469	529	550	550	550	550	518	550	550	550	550	550	550
24	320	385	434	473	526	550	550	357	430	485	528	550	550	550	475	536	550	550	550	550	550
25	294	355	400	435	485	550	550	329	396	446	486	541	550	550	438	493	537	550	550	550	550
26	272	328	369	402	448	538	550	304	366	412	449	500	550	550	404	455	496	550	550	550	550
27	252	303	342	372	415	498	550	281	339	382	416	463	550	550	374	422	459	512	550	550	550
28	234	282	318	346	385	463	548	261	315	355	386	430	517	550	348	392	427	475	550	550	550
29	218	263	296	322	359	431	511	243	293	330	360	401	482	550	324	365	398	443	532	550	550
30	203	245	276	301	335	402	477	227	274	308	336	374	450	533	302	341	371	413	497	550	550
31	190	222	249	271	299	354	361	236	277	310	337	373	405	405	338	379	411	454	454	454	454
32	178	215	242	264	294	353	418	199	240	271	295	328	395	468	265	299	326	363	436	517	549
33	168	202	228	248	276	332	393	187	226	254	277	309	371	440	249	281	306	341	410	486	532
34	158	190	214	233	260	312	370	176	212	239	261	290	349	414	235	265	288	321	386	458	516
35	149	179	202	220	245	294	349	166	200	226	246	274	329	390	221	249	272	303	364	432	494
36	141	169	191	208	232	278	330	157	189	213	232	259	311	369	209	236	257	286	344	408	467
37	131	155	175	191	211	254	304	148	179	202	220	245	294	349	198	223	243	271	325	386	442
38	121	143	161	176	194	234	284	138	166	187	204	228	275	329	187	211	230	256	308	366	419
39	111	131	147	161	176	212	259	128	153	171	187	204	228	275	177	199	216	241	292	347	397
40	101	118	132	144	159	188	221	118	141	156	171	187	204	228	167	187	203	228	278	327	377
41	91	108	121	131	145	171	201	108	128	141	156	171	187	204	157	177	192	217	267	317	367
42	81	98	110	120	132	156	184	98	118	131	146	161	176	191	147	167	182	202	242	282	322
43	71	88	100	109	119	141	168	88	103	115	125	139	164	193	137	153	167	185	219	257	292
44	61	77	89	97	105	125	151	77	93	104	114	128	151	178	127	143	157	175	209	247	285
45	51	66	77	85	93	111	135	66	81	91	101	111	125	140	117	133	147	165	199	237	275
46	41	55	65	73	81	97	117	55	69	79	89	99	113	128	107	123	137	155	189	227	265
47	31	44	53	61	69	83	101	44	57	66	76	86	96	110	97	111	125	143	177	215	253
48	21	33	41	49	57	69	85	33	45	53	61	69	77	85	87	101	115	133	167	205	243
49	11	22	29	35	41	50	61	22	31	37	44	51	58	65	77	89	101	113	137	171	205
50	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

*IT IS VERY IMPORTANT FOR JOIST SPECIFIERS AND ERECTORS TO KNOW THAT OSHA IS INTERPRETING 29CFR-1926.751(c)2 TO MEAN ALL JOIST FORTY (40) FEET (12192MM) AND LONGER TO REQUIRE A ROW OF BOLTED BRIDGING TO BE IN PLACE BEFORE SLACKENING OF HOIST LINES.



STANDARD LOAD TABLE / OPEN WEB STEEL JOISTS, K-SERIES

Based on a Maximum Allowable Tensile Stress of 30,000 psi

JOIST DESIGNATION	24K4	24K5	24K6	24K7	24K8	24K9	24K10	24K12	26K5	26K6	26K7	26K8	26K9	26K10	26K12
DEPTH (IN.)	24	24	24	24	24	24	24	24	26	26	26	26	26	26	26
APPROX. WT. (lbs./ft.)	8.4	9.3	9.7	10.1	11.5	12.0	13.1	16.0	9.8	10.6	10.9	12.1	12.2	13.8	16.6
SPAN (ft.) Ø															
24	520	550	550	550	550	550	550	550							
	516	544	544	544	544	544	544	544							
25	479	540	550	550	550	550	550	550							
	456	511	520	520	520	520	520	520							
26	442	499	543	550	550	550	550	550	542	550	550	550	550	550	550
	405	453	493	499	499	499	499	499	535	541	541	541	541	541	541
27	410	462	503	550	550	550	550	550	502	547	550	550	550	550	550
	361	404	439	479	479	479	479	479	477	519	522	522	522	522	522
28	381	429	467	521	550	550	550	550	466	508	550	550	550	550	550
	323	362	393	436	456	456	456	456	427	464	501	501	501	501	501
29	354	400	435	485	536	550	550	550	434	473	527	550	550	550	550
	290	325	354	392	429	436	436	436	384	417	463	479	479	479	479
30	331	373	406	453	500	544	550	550	405	441	492	544	550	550	550
	262	293	319	353	387	419	422	422	346	377	417	457	459	459	459
31	310	349	380	424	468	510	550	550	379	413	460	509	550	550	550
	237	266	289	320	350	379	410	410	314	341	378	413	444	444	444
32	290	327	357	397	439	478	549	549	356	387	432	477	519	549	549
	215	241	262	290	318	344	393	393	285	309	343	375	407	431	431
33	273	308	335	373	413	449	532	532	334	364	406	448	488	532	532
	196	220	239	265	289	313	368	368	259	282	312	342	370	404	404
34	257	290	315	351	388	423	502	516	315	343	382	422	459	516	516
	179	201	218	242	264	286	337	344	237	257	285	312	338	378	378
35	242	273	297	331	366	399	473	501	297	323	360	398	433	501	501
	164	184	200	221	242	262	308	324	217	236	261	286	310	356	356
36	229	258	281	313	346	377	447	487	280	305	340	376	409	486	487
	150	169	183	203	222	241	283	306	199	216	240	263	284	334	334
37	216	244	266	296	327	356	423	474	265	289	322	356	387	460	474
	138	155	169	187	205	222	260	290	183	199	221	242	262	308	315
38	205	231	252	281	310	338	401	461	251	274	305	337	367	436	461
	128	143	156	172	189	204	240	275	169	184	204	223	241	284	299
39	195	219	239	266	294	320	380	449	238	260	289	320	348	413	449
	118	132	144	159	174	189	222	261	156	170	188	206	223	262	283
* 40	185	208	227	253	280	304	361	438	227	247	275	304	331	393	438
	109	122	133	148	161	175	206	247	145	157	174	191	207	243	269
41	176	198	216	241	266	290	344	427	215	235	262	289	315	374	427
	101	114	124	137	150	162	191	235	134	146	162	177	192	225	256
42	168	189	206	229	253	276	327	417	205	224	249	275	300	356	417
	94	106	115	127	139	151	177	224	125	136	150	164	178	210	244
43	160	180	196	219	242	263	312	406	196	213	238	263	286	339	407
	88	98	107	118	130	140	165	213	116	126	140	153	166	195	232
44	153	172	187	209	231	251	298	387	187	204	227	251	273	324	398
	82	92	100	110	121	131	154	199	108	118	131	143	155	182	222
45	146	164	179	199	220	240	285	370	179	194	217	240	261	310	389
	76	86	93	103	113	122	144	185	101	110	122	133	145	170	212
46	139	157	171	191	211	230	272	354	171	186	207	229	250	296	380
	71	80	87	97	106	114	135	174	95	103	114	125	135	159	203
47	133	150	164	183	202	220	261	339	164	178	199	219	239	284	369
	67	75	82	90	99	107	126	163	89	96	107	117	127	149	192
48	128	144	157	175	194	211	250	325	157	171	190	210	229	272	353
	63	70	77	85	93	101	118	153	83	90	100	110	119	140	180
49									150	164	183	202	220	261	339
									78	85	94	103	112	131	169
50									144	157	175	194	211	250	325
									73	80	89	97	105	124	159
51	*IT IS VERY IMPORTANT FOR JOIST SPECIFIERS AND ERECTORS TO KNOW THAT OSHA IS INTERPRETING 29CFR-1926.751(c)2 TO MEAN ALL JOIST FORTY (40) FEET (12192MM) AND LONGER TO REQUIRE A ROW OF BOLTED BRIDGING TO BE IN PLACE BEFORE SLACKENING OF HOIST LINES.								139	151	168	186	203	241	313
									69	75	83	91	99	116	150
52									133	145	162	179	195	231	301
									65	71	79	86	93	110	142



STANDARD LOAD TABLE / OPEN WEB STEEL JOISTS, K-SERIES

Based on a Maximum Allowable Tensile Stress of 30,000 psi

JOIST DESIGNATION		28K6	28K7	28K8	28K9	28K10	28K12	30K7	30K8	30K9	30K10	30K11	30K12
DEPTH (IN.)		28	28	28	28	28	28	30	30	30	30	30	30
APPROX. WT. (lbs./ft.)		11.4	11.8	12.7	13.0	14.3	17.1	12.3	13.2	13.4	15.0	16.4	17.6
SPAN (ft.) Ø													
28		548	550	550	550	550	550						
		541	543	543	543	543	543						
29		511	550	550	550	550	550						
		486	522	522	522	522	522						
30		477	531	550	550	550	550	550	550	550	550	550	550
		439	486	500	500	500	500	543	543	543	543	543	543
31		446	497	550	550	550	550	534	550	550	550	550	550
		397	440	480	480	480	480	508	520	520	520	520	520
32		418	466	515	549	549	549	501	549	549	549	549	549
		397	440	438	463	463	463	461	500	500	500	500	500
33		393	438	484	527	532	532	471	520	532	532	532	532
		329	364	399	432	435	435	420	460	468	468	468	468
34		370	412	456	496	516	516	443	490	516	516	516	516
		300	333	364	395	410	410	384	420	441	441	441	441
35		349	389	430	468	501	501	418	462	501	501	501	501
		275	305	333	361	389	389	351	384	415	415	415	415
36		330	367	406	442	487	487	395	436	475	487	487	487
		352	280	306	332	366	366	323	353	383	392	392	392
37		312	348	384	418	474	474	373	413	449	474	474	474
		232	257	282	305	344	344	297	325	352	374	374	374
38		296	329	364	396	461	461	354	391	426	461	461	461
		214	237	260	282	325	325	274	300	325	353	353	353
39		280	313	346	376	447	449	336	371	404	449	449	449
		198	219	240	260	306	308	253	277	300	333	333	333
* 40		266	297	328	357	424	438	319	353	384	438	438	438
		183	203	222	241	284	291	234	256	278	315	315	315
41		253	283	312	340	404	427	303	335	365	427	427	427
		170	189	206	224	263	277	217	238	258	300	300	300
42		241	269	297	324	384	417	289	320	348	413	417	417
		158	175	192	208	245	264	202	221	240	282	284	284
43		230	257	284	309	367	407	276	305	332	394	407	407
		147	163	179	194	228	252	188	206	223	263	270	270
44		220	245	271	295	350	398	263	291	317	376	398	398
		137	152	167	181	212	240	176	192	208	245	258	258
45		210	234	259	282	334	389	251	278	303	359	389	389
		128	142	156	169	198	229	164	179	195	229	246	246
46		201	224	248	270	320	380	241	266	290	344	380	380
		120	133	146	158	186	219	153	168	182	214	236	236
47		192	214	237	258	306	372	230	255	277	329	372	372
		112	125	136	148	174	210	144	157	171	201	226	226
48		184	206	227	247	294	365	221	244	266	315	362	365
		105	117	128	139	163	201	135	148	160	188	215	216
49		177	197	218	237	282	357	212	234	255	303	347	357
		99	110	120	130	153	193	127	139	150	177	202	207
50		170	189	209	228	270	350	203	225	245	291	333	350
		93	103	113	123	144	185	119	130	141	166	190	199
51		163	182	201	219	260	338	195	216	235	279	320	343
		88	97	106	115	136	175	112	123	133	157	179	192
52		157	175	193	210	250	325	188	208	226	268	308	336
		83	92	100	109	128	165	106	116	126	148	169	184
53		151	168	186	203	240	313	181	200	218	258	296	330
		78	87	95	103	121	156	100	109	119	140	159	177
54		145	162	179	195	232	301	174	192	209	249	285	324
		74	82	89	97	114	147	94	103	112	132	150	170
55		140	156	173	188	223	290	168	185	202	240	275	312
		70	77	85	92	108	139	89	98	106	125	142	161
56		135	151	166	181	215	280	162	179	195	231	265	301
		66	73	80	87	102	132	84	92	100	118	135	153
57								156	173	188	223	256	290
								80	88	95	112	128	145
58								151	167	181	215	247	280
								76	83	90	106	121	137
59								146	161	175	208	239	271
								72	79	86	101	115	130
60								141	156	169	201	231	262
								69	75	81	96	109	124

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OPEN WEB STEEL JOISTS, K-SERIES

KCS JOISTS

The KCS Joists:

1. Provide a versatile K-Series Joist that can be easily specified to support uniform loads plus concentrated and non-uniform loads.
2. Eliminate many repetitive load diagrams required on contract documents and allow some flexibility of load locations.

KCS Joists are designed in accordance with the Standard Specifications for K-Series Joists.

Standard K-Series Joists are designed for simple span uniform load which results in a parabolic moment diagram for chord forces and a linearly sloped shear diagram for web forces. When non-uniform and/or concentrated loads are encountered the shear and moment diagrams required may be shaped quite differently and may not be covered by the shear and moment design envelopes of a standard K-Series Joist.

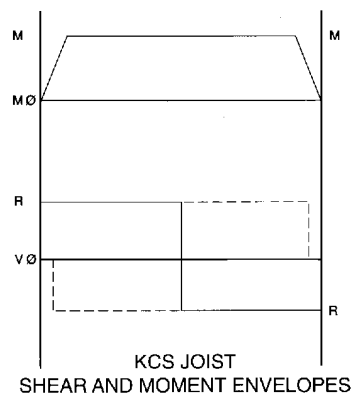
KCS Joist chords are designed for a flat positive moment envelope. The moment capacity is constant at all interior panels. The top chord end panel is designed for axial load based on the force in the first tension web, which is based on the specified shear. A uniform load of 550 plf (8020 N/m) is used to check end panel bending.

The web forces are determined based on a flat shear envelope. All webs are designed for a vertical shear equal to the specified shear capacity. Furthermore, all webs (except the first tension web which remains in tension under all simple span gravity loads) will be designed for 100% stress reversal.

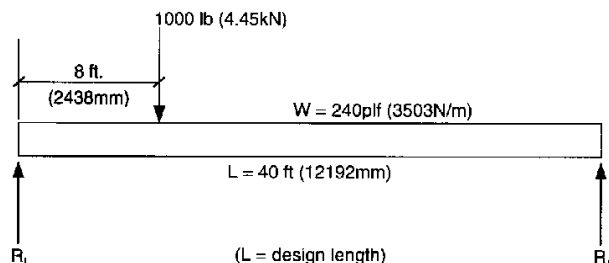
The KCS Joist load tables list the shear and moment capacity of each joist. The selection of a KCS Joist requires the specifying professional to calculate the maximum moment and shear imposed and select the appropriate KCS Joist. If a KCS Joist cannot be selected from the load table or if any uniform load exceeds 550 plf (8020 N/m) or if the maximum concentrated load exceeds the shear capacity of the joist, use double KCS Joists or select an LH-SERIES joist. For the LH-SERIES joist, supply a load diagram. When net uplift loads, end moments

or other external horizontal loads are a design consideration, these loads shall be provided to the joist manufacturer by the specifying professional.

As is the case with standard **K**, **LH** and **DLH**-SERIES Joists, chord bending due to concentrated loads must be addressed. In the case of concentrated loads, the specifying professional shall handle them in one of two ways: 1) specify on the structural drawings that an extra web must be field applied at all concentrated loads not occurring at joist panel points, or 2) provide exact locations of all concentrated loads for which the joist manufacturer shall provide necessary reinforcement. Please reference Chapter VI of SJI Technical Digest No. 9 HANDLING AND ERECTION of steel joists and joist girders (July, 1987).



EXAMPLE 1

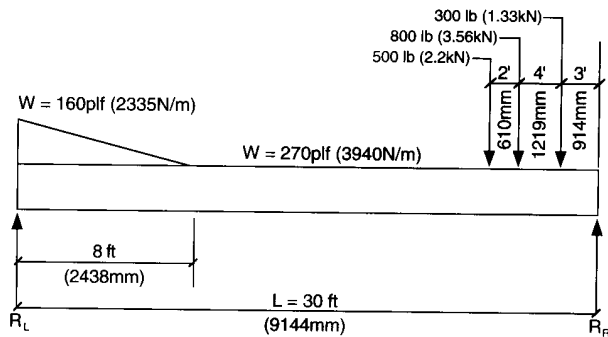


$M = 625 \text{ in-kip (70.6 kN}\cdot\text{m)}$
 $R_L = 5600 \text{ lbs. (24.9 kN)}$, $R_R = 5000 \text{ lbs. (22.2 kN)}$
Select A 22KCS3, $M = 658 \text{ in-kip (74.3 kN}\cdot\text{m)}$
 $R = 6600 \text{ lbs. (29.3 kN)}$
Bridging section no. 9 for $L = 40 \text{ ft. (12192 mm)}$
Use 22K9 to determine bridging and stability requirements.
Since a standard KCS Joist can be selected from the load table a load diagram is not required.



KCS JOISTS

EXAMPLE 2



$$M = 443 \text{ in-kip (50.1 kN}\cdot\text{m)}$$

$$R_L = 5000 \text{ lbs. (22.2 kN)}, R_R = 5340 \text{ lbs. (23.7 kN)}$$

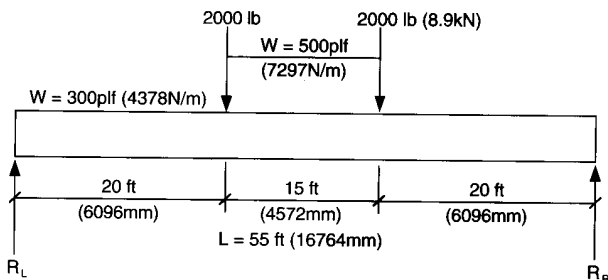
Select a 22KCS2, $M = 488 \text{ in-kip (55.1 kN}\cdot\text{m)}$

$$R = 5900 \text{ lbs. (26.2 kN)}$$

Bridging section no. 6 for $L = 30 \text{ ft. (9144 mm)}$

Use 22K6 to determine bridging and stability requirements. Since the maximum uniform load of 430 plf (6275 N/m) (270 plf (3940 N/m) + 160 plf (2335 N/m)) does not exceed the maximum KCS Joist uniform load of 550 plf (8020 N/m) and a standard KCS Joist can be selected from the load table, a load diagram is not required.

EXAMPLE 3



$$M = 2910 \text{ in-kip (328.8 kN}\cdot\text{m)}$$

$$R_L = R_R = 14000 \text{ lbs. (62.3 kN)}$$

EXCEEDS CAPACITY OF 30KCS5 (MAXIMUM KCS JOIST) AND EXCEEDS MAX. UNIF. LOAD OF 550 plf (8020 N/m).

OPTION A: Use double joists each having a min. $M = 1455 \text{ in-kip (164.4 kN}\cdot\text{m)}$ and $R = 7000 \text{ lbs. (31.1 kN)}$ and a uniform load of 400 plf (5838 N/m).

Select two 28KCS5, $M = 1704 \text{ in-kip (192.5 kN}\cdot\text{m)}$, $R = 9200 \text{ lbs. (40.9 kN)}$.

Bridging section no. 12 for $L = 55 \text{ ft. (16764 mm)}$

Use 28K12 to determine bridging and stability requirements.

OPTION B: Select an LH-Series Joist. Calculate an equivalent uniform load based on the maximum moment or shear.

$$W_M = \frac{8M}{L^2} = 641 \text{ plf (9.35 kN/m)}$$

$$W_V = \frac{2R}{L} = 509 \text{ plf (7.43 kN/m)}$$

Use 641 plf (9.35 kN/m)

From the LH-Series Load Table select a 32LH13 - $W=690 \text{ plf (10.06 kN/m)}$ for a 55 ft. (16764 mm) span. Specify a 32LH13SP and present a load diagram on the structural drawings with the following note:

JOIST MANUFACTURER SHALL DESIGN FOR THE LOADING SHOWN IN THE LOAD DIAGRAM.



KCS JOIST LOAD TABLE

(U.S. CUSTOMARY)

JOIST DESIGNATION	DEPTH (inches)	MOMENT CAPACITY* (inch-kips)	SHEAR CAPACITY* (lbs)	APPROX. WEIGHT** (lbs/ft)	GROSS MOMENT OF INERTIA (in ⁴)	BRIDG. TABLE SECT. NO.
10KCS1	10	172	2000	6.0	29	1
10KCS2	10	225	2500	7.5	37	1
10KCS3	10	296	3000	10.0	47	1
12KCS1	12	209	2400	6.0	43	3
12KCS2	12	274	3000	8.0	55	5
12KCS3	12	362	3500	10.0	71	5
14KCS1	14	247	2900	6.5	59	4
14KCS2	14	324	3400	8.0	77	6
14KCS3	14	428	3900	10.0	99	6
16KCS2	16	349	4000	8.5	99	6
16KCS3	16	470	4800	10.5	128	9
16KCS4	16	720	5300	14.5	192	9
16KCS5	16	934	5800	18.0	245	9
18KCS2	18	395	4700	9.0	127	6
18KCS3	18	532	5200	11.0	164	9
18KCS4	18	817	5700	15.0	247	10
18KCS5	18	1062	6200	18.5	316	10
20KCS2	20	442	5200	9.5	159	6
20KCS3	20	595	6000	11.5	205	9
20KCS4	20	914	7900	16.5	308	10
20KCS5	20	1191	8400	20.0	396	10
22KCS2	22	488	5900	10.0	194	6
22KCS3	22	658	6600	12.5	251	9
22KCS4	22	1012	7900	16.5	377	11
22KCS5	22	1319	8600	20.5	485	11
24KCS2	24	534	6300	10.0	232	6
24KCS3	24	720	7200	12.5	301	9
24KCS4	24	1108	8400	16.5	453	12
24KCS5	24	1448	8900	20.5	584	12
26KCS2	26	580	6600	10.0	274	6
26KCS3	26	783	7800	12.5	355	9
26KCS4	26	1206	8500	16.5	536	12
26KCS5	26	1576	9200	20.5	691	12
28KCS2	28	626	6900	10.5	320	6
28KCS3	28	846	8000	12.5	414	9
28KCS4	28	1303	8500	16.5	626	12
28KCS5	28	1704	9200	20.5	808	12
30KCS3	30	908	8000	13.0	478	9
30KCS4	30	1400	8500	16.5	722	12
30KCS5	30	1833	9200	21.0	934	12

*MAXIMUM UNIFORMLY DISTRIBUTED LOAD CAPACITY IS 550 PLF AND SINGLE CONCENTRATED LOAD CANNOT EXCEED SHEAR CAPACITY.

**DOES NOT INCLUDE ACCESSORIES

IMPORTANT NOTICE

BASED UPON FINDINGS OF INDUSTRY SPONSORED RESEARCH, THE STEEL JOIST INSTITUTE HAS DEVELOPED NEW REQUIREMENTS FOR THE USE OF ERECTION STABILITY BRIDGING. THE NEW SJI SPECIFICATIONS REQUIRE BOLTED DIAGONAL BRIDGING TO BE INSTALLED FOR SOME K-SERIES AND LH-SERIES JOISTS BEFORE SLACKENING THE HOISTING LINES. THE JOIST SPANS REQUIRING THIS STABILITY BRIDGING ARE SHADED IN THE LOAD TABLES.

IT IS VERY IMPORTANT FOR JOIST SPECIFIERS AND ERECTORS TO KNOW THAT OSHA IS INTERPRETING 29CFR-1926.751(c)2 TO MEAN ALL JOIST FORTY (40) FEET (12192MM) AND LONGER TO REQUIRE A ROW OF BOLTED BRIDGING TO BE IN PLACE BEFORE SLACKENING OF HOISTING LINES.



KCS JOIST LOAD TABLE

(SYSTEME INTERNATIONAL)

JOIST DESIGNATION	DEPTH (mm)	MOMENT CAPACITY* (kN-m)	SHEAR CAPACITY* (kN)	APPROXIMATE WEIGHT**		GROSS MOMENT OF INERTIA (cm ⁴)	BRDG. TABLE SECT. NO.
				(kg/m)	(N/m)		
10KCS1	254	19.4	8.8	9	90	1200	1
10KCS2	254	25.4	11.1	11	110	1540	1
10KCS3	254	33.4	13.3	15	150	1950	1
12KCS1	304	23.6	10.6	9	90	1780	3
12KCS2	304	31.0	13.3	12	120	2280	5
12KCS3	304	40.9	15.5	15	150	2950	5
14KCS1	355	27.9	12.8	9	90	2450	4
14KCS2	355	36.6	15.1	12	120	3200	6
14KCS3	355	48.4	17.3	15	150	4120	6
16KCS2	406	39.4	17.7	12	120	4120	6
16KCS3	406	53.1	21.3	15	150	5320	9
16KCS4	406	81.3	23.5	21	210	7990	9
16KCS5	406	105.5	25.7	27	260	10190	9
18KCS2	457	44.6	20.9	13	130	5280	6
18KCS3	457	60.1	23.1	16	160	6820	9
18KCS4	457	92.3	25.3	22	220	10280	10
18KCS5	457	120.0	27.5	28	270	13150	10
20KCS2	508	49.9	23.1	14	140	6610	6
20KCS3	508	67.2	26.6	17	170	8530	9
20KCS4	508	103.3	35.1	24	240	12810	10
20KCS5	508	134.6	37.3	30	290	16480	10
22KCS2	558	55.1	26.2	15	150	8070	6
22KCS3	558	74.3	29.3	18	180	10440	9
22KCS4	558	114.3	35.1	24	240	15690	11
22KCS5	558	149.0	38.2	31	300	20180	11
24KCS2	609	60.3	28.0	15	150	9650	6
24KCS3	609	81.3	32.0	18	180	12520	9
24KCS4	609	125.2	37.3	24	240	18850	12
24KCS5	609	163.6	39.5	31	300	24300	12
26KCS2	660	65.5	29.3	15	150	11400	6
26KCS3	660	88.5	34.6	18	180	14770	9
26KCS4	660	136.3	37.8	24	240	22310	12
26KCS5	660	178.1	40.9	31	300	28760	12
28KCS2	711	70.7	30.6	15	150	13310	6
28KCS3	711	95.6	35.5	18	180	17230	9
28KCS4	711	147.2	37.8	24	240	26050	12
28KCS5	711	192.5	40.9	31	300	33630	12
30KCS3	762	102.6	35.5	19	190	19890	9
30KCS4	762	158.2	37.8	24	240	30050	12
30KCS5	762	207.1	40.9	32	310	38870	12

*MAXIMUM UNIFORMLY DISTRIBUTED LOAD CAPACITY IS 8020 NEWTONS/METER AND SINGLE CONCENTRATED LOAD CANNOT EXCEED SHEAR CAPACITY.

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METRIC LOAD TABLE OPEN WEB STEEL JOISTS, K-SERIES

Based on a Maximum Allowable Tensile Stress of 207 MPa

Adopted by the Steel Joist Institute May 2, 1994 - Effective September 1, 1994

The black figures in the following table give the TOTAL safe uniformly distributed load-carrying capacities, in kiloNewtons per meter (kN/m) of K-Series Steel Joists. The weight (kN/m) of the DEAD loads, including the joists, must be deducted to determine the LIVE load-carrying capacities of the joists. The load table may be used for parallel chord joists installed to a maximum slope of 1:24.

The figures shown **RED** in this load table are the LIVE loads per linear meter of joist which will produce an approximate deflection of L/360 of the span. LIVE loads which produce a deflection of L/240 of the span may be obtained by multiplying the figures in **RED** by 1.5. In no case shall the TOTAL load capacity of the joists be exceeded.

The approximate weight of the joists, in kiloNewtons per meter (kN/m) shown in these tables do not include accessories.

The approximate moment of inertia of the joist, in mm⁴ is:

$$I_x = 2.6953 (W_{LL})(L^3)(10^{-5}), \text{ where } W_{LL} = \text{RED figure in the Load Table; } L = (\text{span}-102) \text{ in millimeters.}$$

For the proper handling of concentrated and/or varying loads, see Section 5.5 in the Recommended Code of Standard Practice.

Where the joist span is equal to or greater than the span corresponding to the **RED** shaded area shown in the load table, the row of bridging nearest the mid span of the joist shall be installed as bolted diagonal bridging. Hoisting cables shall not be released until this bolted diagonal bridging is completely installed.

SAFE UNIFORMLY DISTRIBUTED LOAD IN KILONEWTONS/METER

Joist Designation	8K1	10K1	12K1	12K3	12K5	14K1	14K3	14K4	14K6	16K2	16K3	16K4	16K5	16K6	16K7	16K9
Depth (mm)	203	254	305	305	305	356	356	356	356	406	406	406	406	406	406	406
Approx. Mass (kg/m)	7.6	7.4	7.4	8.5	10.6	7.7	8.9	10.0	11.5	8.2	9.4	10.4	11.2	12.1	12.8	14.9
Approx. Mass (kN/m)	0.07	0.07	0.07	0.08	0.10	0.08	0.09	0.10	0.11	0.08	0.09	0.10	0.11	0.12	0.13	0.15
Span (mm) Ø																
2438	8.02 8.02															
2743	8.02 8.02															
3048	8.02 7.00	8.02 8.02														
3352	7.76 5.50	8.02 7.90														
3657	6.47 4.20	8.02 6.64	8.02 8.02	8.02 8.02	8.02 8.02											
3962	5.50 3.28	6.99 5.29	8.02 7.44	8.02 7.44	8.02 7.44											
4267	4.72 2.61	6.01 4.21	7.29 6.20	8.02 6.75	8.02 6.75	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02							
4572	4.10 2.11	5.22 3.41	6.33 5.02	7.92 6.24	8.02 6.33	7.45 6.93	8.02 7.39	8.02 7.39	8.02 7.39							
4876	3.59 1.73	4.56 2.80	5.54 4.11	6.94 5.12	8.02 5.77	6.53 5.69	8.02 6.81	8.02 6.81	8.02 6.81	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02
5181		4.04 2.32	4.90 3.41	6.12 4.24	8.02 5.34	5.76 4.72	8.02 5.89	8.02 6.46	8.02 6.46	7.47 7.12	8.02 7.67	8.02 7.67	8.02 7.67	8.02 7.67	8.02 7.67	8.02 7.67
5486		3.59 1.95	4.36 2.87	5.45 3.57	7.39 4.62	5.13 3.96	6.43 4.94	7.73 5.79	8.02 5.95	6.65 5.96	7.41 6.65	8.02 7.15	8.02 7.15	8.02 7.15	8.02 7.15	8.02 7.15
5791		3.22 1.64	3.91 2.43	4.88 3.02	6.62 3.92	4.59 3.35	5.76 4.18	6.93 4.90	8.02 5.58	5.95 5.06	6.64 5.63	7.98 6.59	8.02 6.64	8.02 6.64	8.02 6.64	8.02 6.64
6096		2.90 1.41	3.51 2.07	4.40 2.58	5.96 3.35	4.14 2.87	5.19 3.59	6.24 4.18	7.66 5.06	5.37 4.33	5.98 4.81	7.19 5.63	8.02 6.21	8.02 6.21	8.02 6.21	8.02 6.21
6400			3.18 1.79	3.98 2.23	5.39 2.88	3.75 2.48	4.69 3.09	5.66 3.61	6.93 4.36	4.85 3.72	5.41 4.15	6.52 4.85	7.34 5.44	7.99 5.91	8.02 5.92	8.02 5.92
6705			2.90 1.54	3.63 1.92	4.91 2.51	3.41 2.14	4.27 2.68	5.15 3.13	6.30 3.77	4.42 3.23	4.91 3.60	5.92 4.21	6.68 4.71	7.26 5.12	8.02 5.61	8.02 5.61
7010			2.64 1.35	3.31 1.69	4.49 2.18	3.12 1.86	3.91 2.33	4.69 2.74	5.76 3.29	4.04 2.83	4.49 3.15	5.41 3.67	6.10 4.11	6.64 4.48	7.39 4.94	8.02 5.29
7315			2.42 1.18	3.03 1.47	4.11 1.92	2.86 1.64	3.57 2.05	4.30 2.40	5.28 2.90	3.70 2.48	4.13 2.75	4.96 3.22	5.60 3.61	6.10 3.92	6.78 4.34	8.02 5.04
7619						2.62 1.45	3.29 1.80	3.96 2.11	4.87 2.55	3.41 2.18	3.79 2.43	4.56 2.84	5.15 3.19	5.60 3.47	6.24 3.83	7.50 4.53
7924						2.42 1.28	3.05 1.60	3.66 1.88	4.49 2.27	3.15 1.94	3.50 2.15	4.21 2.52	4.75 2.83	5.18 3.07	5.76 3.40	6.91 4.02
8229						2.24 1.15	2.81 1.43	3.40 1.67	4.15 2.02	2.91 1.73	3.25 1.92	3.91 2.26	4.40 2.52	4.80 2.74	5.34 3.03	6.40 3.59
8534						2.08 1.02	2.62 1.28	3.15 1.50	3.86 1.80	2.71 1.54	3.02 1.72	3.63 2.01	4.10 2.26	4.46 2.45	4.96 2.71	5.95 3.21
8839										2.52 1.38	2.81 1.54	3.38 1.80	3.80 2.02	4.15 2.20	4.62 2.43	5.54 2.88
9144										2.34 1.25	2.62 1.40	3.15 1.63	3.56 1.83	3.88 1.99	4.31 2.20	5.18 2.59
9448										2.20 1.13	2.45 1.26	2.96 1.47	3.32 1.66	3.63 1.80	4.04 1.99	4.84 2.34
9753										2.07 1.03	2.30 1.15	2.77 1.34	3.12 1.50	3.40 1.63	3.77 1.80	4.53 2.14



STANDARD LOAD TABLE IN METRIC UNITS/OPEN WEB STEEL JOISTS, K-SERIES

SAFE UNIFORMLY DISTRIBUTED LOAD IN KILONEWTONS/METER

Joist Designation	18K3	18K4	18K5	18K6	18K7	18K9	18K10		20K3	20K4	20K5	20K6	20K7	20K9	20K10		22K4	22K5	22K6	22K7	22K9	22K10	22K11
Depth (mm)	457	457	457	457	457	457	457		508	508	508	508	508	508	508		559	559	559	559	559	559	559
Approx Mass (kg/m)	9.8	10.7	11.5	12.6	13.4	15.2	17.4		10.0	11.3	12.2	13.2	13.8	16.1	18.2		11.9	13.1	13.7	14.4	16.8	18.8	20.5
Approx Mass (kN/m)	0.10	0.11	0.11	0.12	0.13	0.15	0.17		0.10	0.11	0.12	0.13	0.14	0.16	0.18		0.12	0.13	0.13	0.14	0.16	0.18	0.20
Span (mm)																							
Ø																							
5486	8.02	8.02	8.02	8.02	8.02	8.02	8.02																
	8.02	8.02	8.02	8.02	8.02	8.02	8.02																
5791	7.50	8.02	8.02	8.02	8.02	8.02	8.02																
	7.20	7.63	7.63	7.63	7.63	7.63	7.63																
6096	6.75	8.02	8.02	8.02	8.02	8.02	8.02		7.54	8.02	8.02	8.02	8.02	8.02	8.02								
	6.17	7.15	7.15	7.15	7.15	7.15	7.15		7.54	8.02	8.02	8.02	8.02	8.02	8.02								
6400	6.12	7.38	8.02	8.02	8.02	8.02	8.02		6.82	8.02	8.02	8.02	8.02	8.02	8.02								
	5.31	6.21	6.71	6.71	6.71	6.71	6.71		6.61	7.58	7.58	7.58	7.58	7.58	7.58								
6705	5.57	6.71	7.55	8.02	8.02	8.02	8.02		6.21	7.50	8.02	8.02	8.02	8.02	8.02		8.02	8.02	8.02	8.02	8.02	8.02	8.02
	4.61	5.39	6.04	6.39	6.39	6.39	6.39		5.73	6.72	7.15	7.15	7.15	7.15	7.15		7.99	7.99	7.99	7.99	7.99	7.99	7.99
7010	5.09	6.12	6.90	7.53	8.02	8.02	8.02		5.67	6.84	7.72	8.02	8.02	8.02	8.02		7.55	8.02	8.02	8.02	8.02	8.02	8.02
	4.02	4.71	5.28	5.73	6.10	6.10	6.10		5.02	5.86	6.58	6.82	6.82	6.82	6.82		7.16	7.55	7.55	7.55	7.55	7.55	7.55
7315	4.67	5.61	6.33	6.90	7.67	8.02	8.02		5.21	6.27	7.07	7.70	8.02	8.02	8.02		6.93	7.82	8.02	8.02	8.02	8.02	8.02
	3.53	4.14	4.64	5.03	5.57	5.77	5.77		4.40	5.15	5.77	6.27	6.53	6.53	6.53		6.28	7.04	7.22	7.22	7.22	7.22	7.22
7619	4.29	5.18	5.83	6.34	7.07	8.02	8.02		4.80	5.77	6.50	7.09	7.89	8.02	8.02		6.39	7.19	7.83	8.02	8.02	8.02	8.02
	3.12	3.64	4.10	4.45	4.91	5.50	5.50		3.88	4.55	5.10	5.54	6.14	6.21	6.21		5.56	6.23	6.77	6.91	6.91	6.91	6.91
7924	3.96	4.78	5.38	5.86	6.53	7.85	8.02		4.43	5.34	6.01	6.55	7.29	8.02	8.02		5.89	6.64	7.23	8.02	8.02	8.02	8.02
	2.77	3.23	3.63	3.95	4.36	5.16	5.26		3.44	4.04	4.52	4.91	5.44	5.91	5.91		4.93	5.53	5.99	6.62	6.62	6.62	6.62
8229	3.67	4.42	4.99	5.42	6.05	7.26	8.02		4.10	4.94	5.57	6.07	6.75	8.02	8.02		5.45	6.15	6.69	7.47	8.02	8.02	8.02
	2.46	2.88	3.23	3.51	3.89	4.59	5.06		3.07	3.60	4.04	4.39	4.85	5.67	5.67		4.39	4.91	5.35	5.92	6.30	6.30	6.30
8534	3.41	4.11	4.64	5.04	5.61	6.75	7.99		3.80	4.59	5.18	5.63	6.27	7.54	8.02		5.07	5.72	6.23	6.93	8.02	8.02	8.02
	2.20	2.58	2.90	3.15	3.48	4.11	4.83		2.75	3.22	3.61	3.92	4.34	5.15	5.47		3.94	4.40	4.78	5.31	6.02	6.02	6.02
8839	3.18	3.83	4.31	4.69	5.23	6.28	7.45		3.54	4.27	4.81	5.25	5.85	7.03	8.02		4.72	5.32	5.80	6.46	7.76	8.02	8.02
	1.98	2.32	2.61	2.83	3.13	3.70	4.34		2.48	2.90	3.25	3.53	3.91	4.62	5.23		3.53	3.96	4.30	4.77	5.64	5.82	5.82
9144	2.96	3.57	4.02	4.39	4.88	5.86	6.96		3.31	3.99	4.49	4.90	5.45	6.56	7.77		4.40	4.97	5.41	6.02	7.25	8.02	8.02
	1.79	2.10	2.34	2.55	2.83	3.34	3.92		2.23	2.61	2.93	3.18	3.53	4.17	4.90		3.19	3.57	3.88	4.30	5.09	5.61	5.61
9448	2.77	3.34	3.76	4.10	4.56	5.48	6.50		3.09	3.73	4.21	4.58	5.10	6.14	7.28		4.13	4.65	5.06	5.64	6.78	8.02	8.02
	1.61	1.89	2.13	2.30	2.55	3.02	3.54		2.01	2.36	2.65	2.88	3.19	3.77	4.43		2.88	3.23	3.51	3.89	4.61	5.38	5.38
9753	2.59	3.13	3.53	3.85	4.29	5.15	6.10		2.90	3.50	3.95	4.30	4.78	5.76	6.82		3.86	4.36	4.75	5.29	6.36	7.54	8.01
	1.47	1.72	1.92	2.10	2.32	2.74	3.22		1.83	2.14	2.40	2.61	2.90	3.42	4.02		2.62	2.93	3.19	3.53	4.18	4.91	5.18
10058	2.45	2.94	3.32	3.61	4.02	4.84	5.73		2.72	3.29	3.70	4.04	4.50	5.41	6.42		3.63	4.10	4.46	4.97	5.98	7.09	7.76
	1.34	1.57	1.76	1.91	2.11	2.49	2.93		1.66	1.95	2.18	2.37	2.64	3.12	3.66		2.39	2.67	2.90	3.22	3.80	4.48	4.87
10363	2.30	2.77	3.12	3.40	3.79	4.55	5.39		2.56	3.09	3.48	3.80	4.23	5.09	6.04		3.42	3.86	4.20	4.68	5.63	6.68	7.53
	1.22	1.43	1.60	1.75	1.92	2.27	2.68		1.53	1.78	1.99	2.17	2.40	2.84	3.34		2.17	2.43	2.65	2.94	3.48	4.08	4.58
10668	2.17	2.61	2.94	3.21	3.57	4.29	5.09		2.42	2.91	3.29	3.59	3.99	4.80	5.69		3.22	3.63	3.96	4.42	5.31	6.30	7.20
	1.12	1.31	1.47	1.60	1.76	2.08	2.45		1.40	1.63	1.83	1.99	2.20	2.61	3.06		1.99	2.23	2.43	2.69	3.19	3.75	4.26
10972	2.05	2.46	2.78	3.03	3.38	4.05	4.81		2.29	2.75	3.10	3.38	3.77	4.53	5.38		3.05	3.44	3.75	4.17	5.02	5.95	6.81
	1.02	1.19	1.34	1.47	1.61	1.92	2.24		1.28	1.50	1.67	1.82	2.02	2.39	2.81		1.83	2.05	2.23	2.46	2.93	3.44	3.92
11277									2.15	2.61	2.94	3.21	3.57	4.29	5.09		2.88	3.25	3.54	3.95	4.74	5.63	6.45
									1.18	1.38	1.54	1.67	1.86	2.20	2.59		1.69	1.89	2.05	2.27	2.69	3.16	3.60
11582									2.05	2.48	2.78	3.03	3.38	4.07	4.83		2.72	3.07	3.35	3.73	4.49	5.34	6.11
									1.07	1.26	1.43	1.54	1.72	2.02	2.39		1.56	1.73	1.89	2.10	2.48	2.91	3.32
11887									1.94	2.34	2.64	2.88	3.21	3.86	4.58		2.59	2.91	3.18	3.54	4.26	5.06	5.79
									1.00	1.18	1.31	1.43	1.59	1.88	2.20		1.43	1.60	1.75	1.94	2.29	2.69	3.07
* 12192									1.85	2.23	2.51	2.74	3.05	3.66	4.34		2.46	2.77	3.02	3.37	4.05	4.81	5.50
									0.93	1.09	1.22	1.32	1.47	1.73	2.04		1.32	1.48	1.61	1.79	2.13	2.49	2.84
12496																	2.34	2.64	2.87	3.21	3.85	4.58	5.23
																	1.24	1.38	1.50	1.66	1.97	2.32	2.64
12801																	2.23	2.52	2.74	3.05	3.67	4.36	4.99
																	1.15	1.28	1.40	1.54	1.83	2.15	2.45
13106																	2.13	2.40	2.61	2.91	3.50	4.15	4.75
																	1.06	1.19	1.29	1.44	1.70	2.01	2.29
13411																	2.02	2.29	2.49	2.78	3.34	3.96	4.53
																	0.99	1.10	1.21	1.34	1.59	1.86	2.13

* IT IS VERY IMPORTANT FOR JOIST SPECIFIERS AND ERECTORS TO KNOW THAT OSHA IS INTERPRETING 29CFR-1926.751(c)2 TO MEAN ALL JOIST FORTY (40) FEET (12192MM) AND LONGER TO REQUIRE A ROW OF BOLTED BRIDGING TO BE IN PLACE BEFORE SLACKENING OF HOIST LINES.



STANDARD LOAD TABLE IN METRIC UNITS/OPEN WEB STEEL JOISTS, K-SERIES SAFE UNIFORMLY DISTRIBUTED LOAD IN KILONEWTONS/METER

Joist Designation	24K4	24K5	24K6	24K7	24K8	24K9	24K10	24K12	26K5	26K6	26K7	26K8	26K9	26K10	26K12	28K6	28K7	28K8	28K9	28K10	28K12
Depth (mm)	610	610	610	610	610	610	610	610	660	660	660	660	660	660	660	711	711	711	711	711	711
Approx Mass (kg/m)	12.5	13.8	14.4	15.0	17.1	17.9	19.5	23.8	14.6	15.8	16.2	18.0	18.2	20.5	24.7	17.0	17.6	18.9	19.3	21.3	25.5
Approx Mass (kN/m)	0.12	0.14	0.14	0.15	0.17	0.18	0.19	0.23	0.14	0.15	0.16	0.18	0.18	0.20	0.24	0.17	0.17	0.19	0.19	0.21	0.25
Span (mm) Ø																					
7315	7.58 7.53	8.02 7.93	8.02 7.93	8.02 7.93	8.02 7.93	8.02 7.93	8.02 7.93	8.02 7.93													
7619	6.99 6.65	7.88 7.45	8.02 7.58	8.02 7.58	8.02 7.58	8.02 7.58	8.02 7.58	8.02 7.58													
7924	6.45 5.91	7.28 6.61	7.92 7.19	8.02 7.28	8.02 7.28	8.02 7.28	8.02 7.28	8.02 7.28	7.90 7.80	8.02 7.89	8.02 7.89	8.02 7.89	8.02 7.89	8.02 7.89	8.02 7.89						
8229	5.98 5.26	6.74 5.89	7.34 6.40	8.02 6.99	8.02 6.99	8.02 6.99	8.02 6.99	8.02 6.99	7.32 6.96	7.98 7.57	8.02 7.61	8.02 7.61	8.02 7.61	8.02 7.61	8.02 7.61						
8534	5.56 4.71	6.26 5.28	6.81 5.73	7.60 6.36	8.02 6.65	8.02 6.65	8.02 6.65	8.02 6.65	6.80 6.23	7.41 6.77	8.02 7.31	8.02 7.31	8.02 7.31	8.02 7.31	8.02 7.31	7.99 7.89	8.02 7.92	8.02 7.92	8.02 7.92	8.02 7.92	8.02 7.92
8839	5.16 4.23	5.83 4.74	6.34 5.16	7.07 5.72	7.82 6.26	8.02 6.36	8.02 6.36	8.02 6.36	6.33 5.60	6.90 6.08	7.69 6.75	8.02 6.99	8.02 6.99	8.02 6.99	8.02 6.99	7.45 7.09	8.02 7.61	8.02 7.61	8.02 7.61	8.02 7.61	8.02 7.61
9144	4.83 3.82	5.44 4.27	5.92 4.65	6.61 5.15	7.29 5.64	7.93 6.11	8.02 6.15	8.02 6.15	5.91 5.04	6.43 5.50	7.18 6.08	7.93 6.66	8.02 6.69	8.02 6.69	8.02 6.69	6.96 6.40	7.74 7.09	8.02 7.29	8.02 7.29	8.02 7.29	8.02 7.29
9448	4.52 3.45	5.09 3.88	5.54 4.21	6.18 4.67	6.82 5.10	7.44 5.53	8.02 5.98	8.02 5.98	5.53 4.58	6.02 4.97	6.71 5.51	7.42 6.02	8.02 6.47	8.02 6.47	8.02 6.47	6.50 5.79	7.25 6.42	8.02 7.00	8.02 7.00	8.02 7.00	8.02 7.00
9753	4.23 3.13	4.77 3.51	5.21 3.82	5.79 4.23	6.40 4.64	6.97 5.02	8.01 5.73	8.01 5.73	5.19 4.15	5.64 4.50	6.3 5.00	6.96 5.47	7.57 5.93	8.01 6.28	8.01 6.28	6.10 5.26	6.80 5.83	7.51 6.39	8.01 6.75	8.01 6.75	8.01 6.75
10058	3.98 2.86	4.49 3.21	4.88 3.48	5.44 3.86	6.02 4.21	6.55 4.56	7.76 5.37	7.76 5.37	4.87 3.77	5.31 4.11	5.92 4.55	6.53 4.99	7.12 5.39	7.76 5.89	7.76 5.89	5.73 4.80	6.39 5.31	7.06 5.82	7.69 6.30	7.76 6.34	7.76 6.34
10363	3.75 2.61	4.23 2.93	4.59 3.18	5.12 3.53	5.66 3.85	6.17 4.17	7.32 4.91	7.53 5.02	4.59 3.45	5.00 3.75	5.57 4.15	6.15 4.55	6.69 4.93	7.53 5.51	7.53 5.51	5.39 4.37	6.01 4.85	6.65 5.31	7.23 5.76	7.53 5.98	7.53 5.98
10668	3.53 2.39	3.98 2.68	4.33 2.91	4.83 3.22	5.34 3.53	5.82 3.82	6.90 4.49	7.31 4.72	4.33 3.16	4.71 3.44	5.25 3.80	5.80 4.17	6.31 4.52	7.31 5.19	7.31 5.19	5.09 4.01	5.67 4.45	6.27 4.85	6.82 5.26	7.31 5.67	7.31 5.67
10972	3.34 2.18	3.76 2.46	4.10 2.67	4.56 2.96	5.04 3.23	5.50 3.51	6.52 4.13	7.10 4.46	4.08 2.90	4.45 3.15	4.96 3.50	5.48 3.83	5.96 4.14	7.09 4.87	7.10 4.87	4.81 3.67	5.35 4.08	5.92 4.46	6.45 4.84	7.10 5.34	7.10 5.34
11277	3.15 2.01	3.56 2.26	3.88 2.46	4.31 2.72	4.77 2.99	5.19 3.23	6.17 3.79	6.91 4.23	3.86 2.67	4.21 2.90	4.69 3.22	5.19 3.53	5.64 3.82	6.71 4.49	6.91 4.59	4.55 3.38	5.07 3.75	5.60 4.11	6.10 4.45	6.91 5.02	6.91 5.02
11582	2.99 1.86	3.37 2.08	3.67 2.27	4.10 2.51	4.52 2.75	4.93 2.97	5.85 3.50	6.72 4.01	3.66 2.46	3.99 2.68	4.45 2.97	4.91 3.25	5.35 3.51	6.36 4.14	6.72 4.36	4.31 3.12	4.80 3.45	5.31 3.79	5.77 4.11	6.72 4.74	6.72 4.74
11887	2.84 1.72	3.19 1.92	3.48 2.10	3.88 2.32	4.29 2.53	4.67 2.75	5.54 3.23	6.55 3.80	3.47 2.27	3.79 2.48	4.21 2.74	4.67 3.00	5.07 3.25	6.02 3.82	6.55 4.13	4.08 2.88	4.56 3.19	5.04 3.50	5.48 3.79	6.52 4.46	6.55 4.49
* 12192	2.69 1.59	3.03 1.78	3.31 1.94	3.69 2.15	4.08 2.34	4.43 2.55	5.26 3.00	6.39 3.60	3.31 2.11	3.60 2.29	4.01 2.53	4.43 2.78	4.83 3.02	5.73 3.54	6.39 3.92	3.88 2.67	4.33 2.96	4.78 3.23	5.21 3.51	6.18 4.14	6.39 4.24
12496	2.56 1.47	2.88 1.66	3.15 1.80	3.51 1.99	3.88 2.18	4.23 2.36	5.02 2.78	6.23 3.42	3.13 1.95	3.42 2.13	3.82 2.36	4.21 2.58	4.59 2.80	5.45 3.28	6.23 3.73	3.69 2.48	4.13 2.75	4.55 3.00	4.96 3.26	5.89 3.83	6.23 4.04
12801	2.45 1.37	2.75 1.54	3.00 1.67	3.34 1.85	3.69 2.02	4.02 2.20	4.77 2.58	6.08 3.26	2.99 1.82	3.26 1.98	3.63 2.18	4.01 2.39	4.37 2.59	5.19 3.06	6.08 3.56	3.51 2.30	3.92 2.55	4.33 2.80	4.72 3.03	5.60 3.57	6.08 3.85
13106	2.33 1.28	2.62 1.43	2.86 1.56	3.19 1.72	3.53 1.89	3.83 2.04	4.55 2.40	5.92 3.10	2.86 1.69	3.10 1.83	3.47 2.04	3.83 2.23	4.17 2.42	4.94 2.84	5.93 3.38	3.35 2.14	3.75 2.37	4.14 2.61	4.50 2.83	5.35 3.32	5.93 3.67
13411	6.61 1.19	2.51 1.34	2.72 1.45	3.05 1.60	3.37 1.76	3.66 1.91	4.34 2.24	5.64 2.90	2.72 1.57	2.97 1.72	3.31 1.91	3.66 2.08	3.98 2.26	4.72 2.65	5.80 3.23	3.21 1.99	3.57 2.21	3.95 2.43	4.30 2.64	5.10 3.09	5.80 3.50
13716	2.13 1.10	2.39 1.25	2.61 1.35	2.90 1.50	3.21 1.64	3.50 1.78	4.15 2.10	5.39 2.69	2.61 1.47	2.83 1.60	3.16 1.78	3.50 1.94	3.80 2.11	4.52 2.48	5.67 3.09	3.06 1.86	3.41 2.07	3.77 2.27	4.11 2.46	4.87 2.88	5.67 3.34
14020	2.02 1.03	2.29 1.16	2.49 1.26	2.78 1.41	3.07 1.54	3.35 1.66	3.96 1.97	5.16 2.53	2.49 1.38	2.71 1.50	3.02 1.66	3.34 1.82	3.64 1.97	4.31 2.32	5.54 2.96	2.93 1.75	3.26 1.94	3.61 2.13	3.94 2.30	4.67 2.71	5.54 3.19
14325	1.94 0.97	2.18 1.09	2.39 1.19	2.67 1.31	2.94 1.44	3.21 1.56	3.80 1.83	4.94 2.37	2.39 1.29	2.59 1.40	2.90 1.56	3.19 1.70	3.48 1.85	4.14 2.17	5.38 2.80	2.80 1.63	3.12 1.82	3.45 1.98	3.76 2.15	4.46 2.53	5.42 3.06
14630	1.86 0.91	2.10 1.02	2.29 1.12	2.55 1.24	2.83 1.35	3.07 1.47	3.64 1.72	4.74 2.23	2.29 1.21	2.49 1.31	2.77 1.45	3.06 1.60	3.34 1.73	3.96 2.04	5.15 2.62	2.68 1.53	3.00 1.70	3.31 1.86	3.60 2.02	4.29 2.37	5.32 2.93
14935									2.18 1.13	2.39 1.24	2.67 1.37	2.94 1.50	3.21 1.63	3.80 1.91	4.94 2.46	2.58 1.44	2.87 1.60	3.18 1.75	3.45 1.89	4.11 2.23	5.21 2.81
15240									2.10 1.06	2.29 1.16	2.55 1.29	2.83 1.41	3.07 1.53	3.64 1.80	4.74 2.32	2.48 1.35	2.75 1.50	3.05 1.64	3.32 1.79	3.94 2.10	5.10 2.69
15544									2.02 1.00	2.20 1.09	2.45 1.21	2.71 1.32	2.96 1.44	3.51 1.69	4.56 2.18	2.37 1.28	2.65 1.41	2.93 1.54	3.19 1.67	3.79 1.98	4.93 2.55
15849									1.94 0.94	2.11 1.03	2.36 1.15	2.61 1.25	2.84 1.35	3.37 1.60	4.39 2.07	2.29 1.21	2.55 1.34	2.81 1.45	3.06 1.59	3.64 1.86	4.74 2.40
16154																2.20 1.13	2.45 1.26	2.71 1.38	2.96 1.50	3.50 1.76	4.56 2.27
16459																2.11 1.07	2.36 1.19	2.61 1.29	2.84 1.41	3.38 1.66	4.39 2.14
16764																2.04 1.02	2.27 1.12	2.52 1.24	2.74 1.34	3.25 1.57	4.23 2.02
17068																1.97 0.96	2.20 1.06	2.42 1.16	2.64 1.26	3.13 1.48	4.08 1.92

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STANDARD LOAD TABLE IN METRIC UNITS/OPEN WEB STEEL JOISTS, K-SERIES SAFE UNIFORMLY DISTRIBUTED LOAD IN KILONEWTONS/METER

Joist Designation	30K7	30K8	30K9	30K10	30K11	30K12
Depth (mm)	762	762	762	762	762	762
Approx Mass (kg/m)	18.3	19.6	19.9	22.3	24.4	26.2
Approx Mass (kN/m)	0.18	0.19	0.20	0.22	0.24	0.26
Span (mm) Ø						
9144	8.02 7.92	8.02 7.92	8.02 7.92	8.02 7.92	8.02 7.92	8.02 7.92
9448	7.79 7.41	8.02 7.58	8.02 7.58	8.02 7.58	8.02 7.58	8.02 7.58
9753	7.31 6.72	8.01 7.29	8.01 7.29	8.01 7.29	8.01 7.29	8.01 7.29
10058	6.87 6.12	7.58 6.71	7.76 6.82	7.76 6.82	7.76 6.82	7.76 6.82
10363	6.46 5.60	7.15 6.12	7.53 6.43	7.53 6.43	7.53 6.43	7.53 6.43
10668	6.10 5.12	6.74 5.60	7.31 6.05	7.31 6.05	7.31 6.05	7.31 6.05
10972	5.76 4.71	6.36 5.15	6.93 5.58	7.10 5.72	7.10 5.72	7.10 5.72
11277	5.44 4.33	6.02 4.74	6.55 5.13	6.91 5.45	6.91 5.45	6.91 5.45
11582	5.16 3.99	5.70 4.37	6.21 4.74	6.72 5.15	6.72 5.15	6.72 5.15
11887	4.90 3.69	5.41 4.04	5.89 4.37	6.55 4.85	6.55 4.85	6.55 4.85
* 12192	4.65 3.41	5.15 3.73	5.60 4.05	6.39 4.59	6.39 4.59	6.39 4.59
12496	4.42 3.16	4.88 3.47	5.32 3.76	6.23 4.37	6.23 4.37	6.23 4.37
12801	4.21 2.94	4.67 3.22	5.07 3.50	6.02 4.11	6.08 4.14	6.08 4.14
13106	4.02 2.74	4.45 3.00	4.84 3.25	5.74 3.83	5.93 3.94	5.93 3.94
13411	3.83 2.56	4.24 2.80	4.62 3.03	5.48 3.57	5.80 3.76	5.80 3.76
13716	3.66 2.39	4.05 2.61	4.42 2.84	5.23 3.34	5.67 3.59	5.67 3.59
14020	3.51 2.23	3.88 2.45	4.23 2.65	5.02 3.12	5.54 3.44	5.54 3.44
14325	3.35 2.10	3.72 2.29	4.04 2.49	4.80 2.93	5.42 3.29	5.42 3.29
14630	3.22 1.97	3.56 2.15	3.88 2.33	4.59 2.74	5.28 3.13	5.32 3.15
14935	3.09 1.85	3.41 2.02	3.72 2.18	4.42 2.58	5.06 2.94	5.21 3.02
15240	2.96 1.73	3.28 1.89	3.57 2.05	4.24 2.42	4.85 2.77	5.12 2.90
15544	2.84 1.63	3.15 1.79	3.42 1.94	4.07 2.29	4.67 2.61	5.00 2.80
15849	2.74 1.54	3.03 1.69	3.29 1.83	3.91 2.15	4.49 2.46	4.90 2.68
16154	2.64 1.45	2.91 1.59	3.18 1.73	3.76 2.04	4.31 2.32	4.81 2.58
16459	2.53 1.37	2.80 1.50	3.05 1.63	3.63 1.92	4.15 2.18	4.72 2.48
16764	2.45 1.29	2.69 1.43	2.94 1.54	3.50 1.82	4.01 2.07	4.55 2.34
17068	2.36 1.22	2.61 1.34	2.84 1.45	3.37 1.72	3.86 1.97	4.39 2.23
17373	2.27 1.16	2.52 1.28	2.74 1.38	3.25 1.63	3.73 1.86	4.23 2.11
17678	2.20 1.10	2.43 1.21	2.64 1.31	3.13 1.54	3.60 1.76	4.08 1.99
17983	2.13 1.05	2.34 1.15	2.55 1.25	3.03 1.47	3.48 1.67	3.95 1.89
18288	2.05 1.00	2.27 1.09	2.46 1.18	2.93 1.40	3.37 1.59	3.82 1.80



STANDARD SPECIFICATIONS FOR OPEN WEB STEEL JOISTS, **K-SERIES**

Adopted by the Steel Joist Institute November 4, 1985 - Revised to May 2, 1994 - Effective September 1, 1994

SECTION 1. SCOPE

These specifications cover the design, manufacture and use of Open Web Steel Joists, **K-Series**.

SECTION 2. DEFINITION

The term "Open Web Steel Joists **K-Series**," as used herein, refers to open web, parallel chord, load-carrying members suitable for the direct support of floors and roof decks in buildings, utilizing hot-rolled or cold-formed steel, including cold-formed steel whose yield strength* has been attained by cold working. **K-Series** Joists shall be designed in accordance with these specifications to support the uniformly distributed loads given in the Standard Load Tables for Open Web Steel Joists, **K-Series**, attached hereto.

The KCS Joist is a **K-Series** Joist which is provided to address the problem faced by specifying professionals when trying to select joists to support uniform plus concentrated loads or other non uniform loads.

The design of chord sections for **K-Series** Joists shall be based on a yield strength of 50 ksi (345 MPa). The design of web sections for **K-Series** Joists shall be based on a yield strength of either 36 ksi (250 MPa) or 50 ksi (345 MPa). Steel used for **K-Series** Joists chord or web sections shall have a minimum yield strength determined in accordance with one of the procedures specified in Section 3.2 which is equal to the yield strength assumed in the design.

* The term "Yield Strength" as used herein shall designate the yield level of a material as determined by the applicable method outlined in paragraph 13 - "Yield Strength," or paragraph 12 - "Yield Point," of ASTM Standard A370, "Mechanical Testing of Steel Products," or as specified in Section 3.2 of this Specification.

Standard Specifications and Load Tables. Open Web Steel Joists, **K-Series**. Copyright 1994.

Steel Joist Institute.

SECTION 3. MATERIALS

3.1 STEEL

The steel used in the manufacture of chord and web sections shall conform to one of the following ASTM Specifications of latest adoption:

Structural Steel, ASTM A36/A36M.

High-Strength, Low-Alloy Structural Steel, ASTM A242/A242M.

High-Strength Carbon-Manganese Steel of Structural Quality ASTM A529/A529M, Grade 50.

Hot-Rolled Carbon Steel Sheet and Strip, Structural Quality, ASTM A570/A570M.

High-Strength, Low-Alloy Columbium-Vanadium Steels of Structural Quality, ASTM A572/A572M, Grade 50.

High-Strength, Low-Alloy Structural Steel with 50 ksi (345 MPa) Minimum Yield Point to 4 inches (102mm) thick, ASTM A588/A588M.

Steel Sheet and Strip, Hot-Rolled and Cold-Rolled, High-Strength Low-Alloy, with Improved Corrosion Resistance, ASTM A606.

Steel Sheet and Strip, Hot-Rolled and Cold-Rolled, High-Strength, Low-Alloy, Columbium and/or Vanadium, ASTM A607, Grade 50.

Steel, Cold-Rolled Sheet, Carbon Structural, ASTM A611, Grade D.

or shall be of suitable quality ordered or produced to other than the listed specifications, provided that such material in the state used for final assembly and manufacture is weldable and is proved by tests performed by the producer or manufacturer to have the properties specified in Section 3.2.

3.2 MECHANICAL PROPERTIES

The yield strength used as a basis for the design stresses prescribed in Section 4 shall be either 36 ksi (250 MPa) or 50 ksi (345 MPa). Evidence that the steel furnished meets or exceeds the design yield strength shall, if requested, be provided in the form of an affidavit or by witnessed or certified test reports.

For material used without consideration of increase in yield strength resulting from cold forming, the specimens shall be taken from as-rolled material. In the case of material, the mechanical properties of which conform to the requirements of one of the listed specifications, test specimens and procedure shall conform to those of such specifications and to ASTM A370.

In the case of material, the mechanical properties of which do not conform to the requirements of one of the listed specifications, the test specimens and procedures shall conform to the applicable requirements of ASTM A370, and the specimens shall exhibit a yield strength equal to or exceeding the design yield strength and an elongation of not less than (a) 20 percent in 2 inches (51 mm) for sheet and strip, or (b) 18 percent in 8 inches (203 mm) for plates, shapes and bars with adjustments for thickness for plates, shapes



and bars as prescribed in ASTM A36/A36M, A242/A242M, A529/A529M, A572/A572M, A588/A588M, whichever specification is applicable on the basis of design yield strength.

The number of tests shall be as prescribed in ASTM A6 for plates, shapes, and bars; and ASTM A570, A570M, A606, A607, and A611 for sheet and strip.

If as-formed strength is utilized, the test reports shall show the results of tests performed on full section specimens in accordance with the provisions of Section 3.1.1 and 6.3 of the AISI Specifications for the Design of Cold Formed Steel Structural Members and shall indicate compliance with these provisions and with the following additional requirements:

- The yield strength measured in the tests shall equal or exceed the design yield strength.
- Where tension tests are made for acceptance and control purposes, the tensile strength shall be at least 6 percent greater than the yield strength of the section.
- Where compression tests are used for acceptance and control purposes, the specimen shall withstand a gross shortening of 2 percent of its original length without cracking. The length of the specimen shall be not greater than 20 times the least radius of gyration.
- If any test specimen fails to pass the requirements of the subparagraphs (a), (b), or (c) above, as applicable, two retests shall be made of specimens from the same lot. Failure of one of the retest specimens to meet such requirements shall be the cause for rejection of the lot represented by the specimens.

3.3 PAINT

The standard shop paint is a primer coat intended to protect the steel for only a short period of exposure in ordinary atmospheric conditions and shall be considered an impermanent and provisional coating.

When specified, the standard shop paint shall conform to one of the following:

- Steel Structures Painting Council Specification 15-68T, Type 1 (red oxide).
- Federal Specification TT-P-636 (red oxide).
- Or, shall be a shop paint which meets the minimum performance requirements of one of the above listed specifications.

SECTION 4. DESIGN AND MANUFACTURE

4.1 METHOD

Joists shall be designed in accordance with these specifications as simply supported, uniformly loaded

trusses supporting a floor or roof deck so constructed as to brace the top chord of the joists against lateral buckling. Where any applicable design feature is not specifically covered herein, the design shall be in accordance with the following specifications of latest adoption:

- American Institute of Steel Construction Specification for Design, Fabrication and Erection of Structural Steel for Buildings (Allowable Stress Design), where the material used consists of plates, shapes or bars.
- American Iron and Steel Institute Specification for the Design of Cold-Formed Steel Structural Members, for members which are formed from sheet or strip material.

4.2 UNIT STRESSES

Joists shall have their components so proportioned that the unit stresses in kips per square inch (Mega Pascal) shall not exceed the following, where F_y is the yield strength defined in Section 3.2:

(a) Tension:

$$\text{Chords} \\ F_y = 50 \text{ ksi (345 MPa)} \dots F_t = 30 \text{ ksi (207 MPa)}$$

$$\text{Webs} \\ F_y = 50 \text{ ksi (345 MPa)} \dots F_t = 30 \text{ ksi (207 MPa)} \\ F_y = 36 \text{ ksi (250 MPa)} \dots F_t = 22 \text{ ksi (152 MPa)}$$

(b) Compression

For members with l/r less than C_c :

$$F_a = \frac{\left[1 - \frac{(l/r)^2}{2C_c^2}\right] QF_y}{5 + \frac{3}{8} \left(\frac{l/r}{C_c}\right) - \frac{1}{8} \left(\frac{l/r}{C_c}\right)^3}$$

$$\text{where } C_c = \sqrt{\frac{2\pi^2 E}{QF_y}} \text{ and}$$

where Q is a form factor equal to unity except when the width-thickness ratio of one or more elements of the profile exceeds the limits specified in the AISI Specifications, Section B5 (Allowable Stress Design) for hot-rolled sections, and in the AISI Specifications, Section 3, for cold formed sections.

For members with l/r greater than C_c :

$$F_a = \frac{12p^2 E}{23(l/r)^2}$$

In the above formulas, l is taken as the distance between panel points for the chord members and the unbraced length clear of attachments for web members, and r is the corresponding least radius of gyration of the member or any component thereof. E is equal to 29,000 ksi (200,000 MPa).



STANDARD SPECIFICATIONS / FOR OPEN WEB STEEL JOISTS, K-SERIES

(c) Bending:

For chords

$$F_y = 50 \text{ ksi (345 MPa)} \dots F_b = 30 \text{ ksi (207 MPa)}$$

For web members other than solid rounds

$$F_y = 50 \text{ ksi (345 MPa)} \dots F_b = 30 \text{ ksi (207 MPa)}$$

$$F_y = 36 \text{ ksi (250 MPa)} \dots F_b = 22 \text{ ksi (152 MPa)}$$

For web members of solid round cross-section

$$F_y = 50 \text{ ksi (345 MPa)} \dots F_b = 45 \text{ ksi (310 MPa)}$$

$$F_y = 36 \text{ ksi (250 MPa)} \dots F_b = 32 \text{ ksi (221 MPa)}$$

For bearing plates

$$F_y = 50 \text{ ksi (345 MPa)} \dots F_b = 37 \text{ ksi (255 MPa)}$$

$$F_y = 36 \text{ ksi (250 MPa)} \dots F_b = 27 \text{ ksi (186 MPa)}$$

F_y = Specified minimum yield strength

$$F'_e = \frac{12\pi^2 E}{23 (l/r_x)^2}$$

where l is the panel length as defined in Section 4.2 (b) and r_x is the radius of gyration about the axis of bending.

Q = Form factor as defined in Section 4.2(b).

In order to insure lateral stability during erection, the radius of gyration of the top chord about its vertical axis shall be not less than $l/145$ where l is the spacing in inches (millimeters) between lines of bridging as specified in Section 5.4(c).

The top chord shall be considered as stayed laterally by the floor slab or roof deck when attachments are in accordance with the requirements of Section 5.8(e) of these specifications.

4.3 MAXIMUM SLENDERNESS RATIOS

The slenderness ratio, l/r , where l is as used in Section 4.2 (b) and r is the corresponding least radius of gyration, shall not exceed the following:

Top chord interior panels	90
Top chord end panels	120
Compression members other than top chord	200
Tension members	240

If moment-resistant weld groups are not used at the ends of a crimped, first primary compression web member, then $1.2 l/r_x$ must be used. Where r_x = member radius of gyration in the plane of the joist.

4.4 MEMBERS

(a) Chords

The bottom chord shall be designed as an axially loaded tension member.

The top chord shall be designed for only axial compressive stress when the panel length, l , does not exceed 24 inches (609 mm). When the panel length exceeds 24 inches (609 mm), the top chord shall be designed as a continuous member subject to combined axial and bending stresses and shall be so proportioned that

$$f_a + f_b \leq 0.6 F_y, \text{ at the panel point; and}$$

$$\frac{f_a}{F_a} + \left(1 - \frac{f_a}{F'_e}\right) \frac{C_m f_b}{Q F_b} < 1.0, \text{ at mid-panel;}$$

in which

$$C_m = 1 - 0.3 f_a / F'_e \text{ for end panels}$$

$$C_m = 1 - 0.4 f_a / F'_e \text{ for interior panels}$$

f_a = Computed axial unit compressive stress

f_b = Computed bending unit compressive stress at the point under consideration

F_a = Permissible axial unit compressive stress based on l/r as defined in Section 4.2 (b).

f_b = Permissible bending unit stress

(b) Web

The vertical shears to be used in the design of the web members shall be determined from full uniform loading, but such vertical shears shall be not less than 25% of the end reaction. Due consideration shall be given to the effect of eccentricity. The effect of combined axial compression and bending may be investigated using the provisions of Section 4.4(a), letting $C_m = 0.4$ when bending due to eccentricity produces reversed curvature.

Interior vertical web members used in modified Warren type web systems shall be designed to resist the gravity loads supported by the member plus 1/2 of 1.0 percent of the top chord axial force.

(c) Extended Ends

Extended top chords or full depth cantilever ends require the special attention of the specifying professional.

The magnitude and location of the design loads to be supported, the deflection requirements, and the proper bracing shall be clearly indicated on the structural drawings.

4.5 CONNECTIONS

(a) Methods

Joist connections and splices shall be made by attaching the members to one another by arc or resistance welding or other approved method.

1) Welded Connections

- Selected welds shall be inspected visually by the manufacturer. Prior to this inspection, weld slag shall be removed.
- Cracks are not acceptable and shall be repaired.
- Thorough fusion shall exist between weld and base metal for the required design length of the weld; such fusion shall be verified by visual inspection.



- d) Unfilled weld craters shall not be included in the design length of the weld.
- e) Undercut shall not exceed $\frac{1}{16}$ inch (2mm) for welds oriented parallel to the principal stress.
- f) The sum of surface (piping) porosity diameters shall not exceed $\frac{1}{16}$ inch (2 mm) in any 1 inch (25mm) of design weld length.
- g) Weld spatter that does not interfere with paint coverage is acceptable.

- 2) **Welding Program**
Manufacturers shall have a program for establishing weld procedures and operator qualification, and for weld sampling & testing. (See Technical Digest #8 - Welding of Open Web Steel Joists).
- 3) **Weld Inspection by Outside Agencies**
(See Section 5.12 of these specifications) The agency shall arrange for visual inspection to determine that welds meet the acceptance standards of Section 4.5 (a) 1) above. Ultrasonic, X-Ray, and magnetic particle testing are inappropriate for joists due to the configurations of the components and welds.

(b) Strength

Joint connections shall be capable of withstanding forces due to an ultimate load equal to at least two times the design load shown in the applicable Standard Load Table.

(c) Splices

Splices may occur at any point in chord or web members. Members containing a butt weld splice shall develop an ultimate tensile force of at least 57 ksi (393 MPa) times the full design area of the chord or web. The term "member" shall be defined as all component parts comprising the chord or web, at the point of splice.

(d) Eccentricity

Members connected at a joint shall have their centroidal axes meet at a point if practical. Otherwise, due consideration shall be given to the effect of eccentricity. In no case shall eccentricity of any web member at a joint exceed $\frac{3}{4}$ of the over-all dimension, measured in the plane of the web, of the largest member connected. The eccentricity of any web member shall be the perpendicular distance from the centroidal axis of that web member to the point on the centroidal axis of the chord which is vertically above or below the intersection of the centroidal axes of the web members forming the joint. Ends of joists shall be proportioned to resist bending produced by eccentricity at the support.

4.6 VERIFICATION OF DESIGN AND MANUFACTURE**(a) Design Calculations**

Companies manufacturing **K-Series Joists** shall submit design data to the Steel Joist Institute (or an independent agency approved by the Steel Joist Institute) for verification of compliance with the SJI Specifications. Design Data shall be submitted in detail and in the format specified by the Institute.

(b) Tests of Chord and Web Members

Each manufacturer shall, at the time of design review by the Steel Joist Institute or other independent agency, verify by tests that his design, in accordance with Sections 4.1 through 4.5 of this specification, will provide a minimum factor of safety of 1.65 on the theoretical design capacity of critical members. Such tests shall be evaluated considering the actual yield strength of the members of the test joists.

Material tests for determining mechanical properties of component members shall be conducted on full sections.

(c) Tests of Joints and Connections

Each manufacturer shall verify by shear tests on representative joints of typical joists that connections will meet the provision of Section 4.5(b). Chord and web members may be reinforced for such tests.

(d) In-Plant Inspections

Each manufacturer shall verify his ability to manufacture **K-Series Joists** through periodic In-Plant Inspections. Inspections shall be performed by an independent agency approved by the Steel Joist Institute. The frequency, manner of inspection, and manner of reporting shall be determined by the Steel Joist Institute. The plant inspections are not a guaranty of the quality of any specific joists or Joist Girders; this responsibility lies fully and solely with the individual manufacturer.

4.7 CAMBER

Camber is optional with the manufacturer but, when provided, recommended approximate camber is as follows:

<u>Top Chord Length</u>	<u>Approximate Camber</u>
20 feet (6096 mm)	$\frac{1}{4}$ inch (6 mm)
30 feet (9144 mm)	$\frac{3}{8}$ inch (10 mm)
40 feet (12192 mm)	$\frac{5}{8}$ inch (16 mm)
50 feet (15240 mm)	1 inch (25 mm)
60 feet (18288 mm)	$1\frac{1}{2}$ inches (38 mm)

In no case will joists be manufactured with negative camber.



SECTION 5. APPLICATION

5.1 USAGE

These specifications shall apply to any type of structure where floors and roofs are to be supported directly by steel joists installed as hereinafter specified. Where joists are used other than on simple spans under uniformly distributed loading as prescribed in Section 4.1, they shall be investigated and modified if necessary to limit the unit stresses to those listed in Section 4.2.

CAUTION: If a rigid connection of the bottom chord is to be made to the column or other support, it shall be made only after the application of the dead loads. The joist is then no longer simply supported, and the system must be investigated for continuous frame action by the specifying engineer or architect.

The designed detail of a rigid type connection and moment plates shall be shown on the structural drawings by the specifying professional. The moment plates shall be furnished by other than the joist manufacturer.

5.2 SPAN

The span of a joist shall not exceed 24 times its depth.

5.3 END SUPPORTS

(a) Masonry and Concrete

K-Series Joists supported by masonry or concrete are to bear on steel bearing plates and shall be designed as steel bearing. Due consideration of the end reactions and all other vertical or lateral forces shall be taken by the specifying professional in the design of the steel bearing plate and the masonry or concrete. The ends of K-Series Joists shall extend a distance of not less than 4 inches (102 mm) over the masonry or concrete support and be anchored to the steel bearing plate. The plate shall be located not more than $\frac{1}{2}$ inch (13 mm) from the face of the wall and shall be not less than 6 inches (153 mm) wide perpendicular to the length of the joist. It is to be designed by the specifying professional in compliance with the allowable unit stresses in Section A5.1 (Allowable Stress Design) of the A.I.S.C. Specifications of latest adoption. The steel bearing plate shall be furnished by other than the joist manufacturer.

Where it is deemed necessary to bear less than 4 inches (102 mm) over the masonry or concrete support, special consideration is to be given to the design of the steel bearing plate and the masonry or concrete by the specifying engineer or architect. The joists must bear a minimum of 2 $\frac{1}{2}$ inches (64 mm) on the steel bearing plate.

(b) Steel

Due consideration of the end reactions and all other vertical and lateral forces shall be taken by the specifying professional in the design of the steel support. The ends of K-Series Joists shall extend a distance of not less than 2 $\frac{1}{2}$ inches (64 mm) over the steel supports.

5.4 BRIDGING

Bridging is required and shall consist of one of the following types.

(a) Horizontal

Horizontal bridging shall consist of two continuous horizontal steel members, one attached to the top chord and the other attached to the bottom chord. Each attachment to the joists shall be made by welding or mechanical means and shall be capable of resisting a horizontal force of not less than 700 pounds (3114 N).

The ratio of unbraced length to least radius of gyration (l/r) of the bridging member shall not exceed 300, where l is the distance in inches (millimeters) between attachments and r is the least radius of gyration of the bridging member. If the bridging member is a round bar, the diameter shall be at least $\frac{1}{2}$ inch (13 mm). The bridging member shall be designed for a compressive force of 0.24 times the joist top chord area.

(b) Diagonal

Diagonal bridging shall consist of cross-bracing with l/r ratio of not more than 200, where l is the distance in inches (millimeters) between connections and r is the least radius of gyration of the bracing member. Where cross-bracing members are connected at their point of intersection, the l distance shall be taken as the distance in inches (millimeters) between connections at the point of intersection of the bracing members and the connections to the chord of the joists. Connections to the chords of steel joists shall be made by positive mechanical means or by welding.

(c) Quantity

In no case shall the number of rows of bridging be less than shown in the bridging table. Spaces between rows shall be approximately uniform. See Section 5.11 for bridging required for uplift forces.



NUMBER OF ROWS OF BRIDGING** Refer to the K-Series Load Table and Specification Section 6. for required bolted diagonal bridging. Distances are Joist Span lengths - See "Definition of Span" page 30.					
Section No.*	1 Row	2 Rows	3 Rows	4 Rows	5 Rows
#1	Up thru 16'	Over 16' thru 24'	Over 24' thru 28'		
#2	Up thru 17'	Over 17' thru 25'	Over 25' thru 32'		
#3	Up thru 18'	Over 18' thru 28'	Over 28' thru 38'	Over 38' thru 40'	
#4	Up thru 19'	Over 19' thru 28'	Over 28' thru 38'	Over 38' thru 48'	
#5	Up thru 19'	Over 19' thru 29'	Over 29' thru 39'	Over 39' thru 50'	Over 50' thru 52'
#6	Up thru 19'	Over 19' thru 29'	Over 29' thru 39'	Over 39' thru 51'	Over 51' thru 56'
#7	Up thru 20'	Over 20' thru 33'	Over 33' thru 45'	Over 45' thru 58'	Over 58' thru 60'
#8	Up thru 20'	Over 20' thru 33'	Over 33' thru 45'	Over 45' thru 58'	Over 58' thru 60'
#9	Up thru 20'	Over 20' thru 33'	Over 33' thru 46'	Over 46' thru 59'	Over 59' thru 60'
#10	Up thru 20'	Over 20' thru 37'	Over 37' thru 51'	Over 51' thru 60'	
#11	Up thru 20'	Over 20' thru 38'	Over 38' thru 53'	Over 53' thru 60'	
#12	Up thru 20'	Over 20' thru 39'	Over 39' thru 53'	Over 53' thru 60'	

* Last digit(s) of joist designation shown in Load Table.

** See Section 5.11 for additional bridging required for uplift design.

NUMBER OF ROWS OF BRIDGING** METRIC Refer to the K-Series Metric Load Table and Specification Section 6. for required bolted diagonal bridging. Distances are Joist Span lengths – See “Definition of Span” page 30.					
Section No.*	One Row	Two Rows	Three Rows	Four Rows	Five Rows
#1	Thru 4877mm	Over 4877mm thru 7315mm	Over 7315mm thru 8534mm		
#2	Thru 5182mm	Over 5182mm thru 7620mm	Over 7620mm thru 9754mm		
#3	Thru 5486mm	Over 5486mm thru 8534mm	Over 8534mm thru 11582mm	Over 11582mm thru 12192mm	
#4	Thru 5791mm	Over 5791mm thru 8534mm	Over 8534mm thru 11582mm	Over 11582mm thru 14630mm	
#5	Thru 5791mm	Over 5791mm thru 8839mm	Over 8839mm thru 11887mm	Over 11887mm thru 15240mm	Over 15240mm thru 15850mm
#6	Thru 5791mm	Over 5791mm thru 8839mm	Over 8839mm thru 11887mm	Over 11887mm thru 15545mm	Over 15545mm thru 17069mm
#7	Thru 6096mm	Over 6096mm thru 10058mm	Over 10058mm thru 13716mm	Over 13716mm thru 17678mm	Over 17678mm thru 18288mm
#8	Thru 6096mm	Over 6096mm thru 10058mm	Over 10058mm thru 13716mm	Over 13716mm thru 17678mm	Over 17678mm thru 18288mm
#9	Thru 6096mm	Over 6096mm thru 10058mm	Over 10058mm thru 14021mm	Over 14021mm thru 17983mm	Over 17983mm thru 18288mm
#10	Thru 6096mm	Over 6096mm thru 11278mm	Over 11278mm thru 15545mm	Over 15545mm thru 18288mm	
#11	Thru 6096mm	Over 6096mm thru 11582mm	Over 11582mm thru 16154mm	Over 16154mm thru 18288mm	
#12	Thru 6096mm	Over 6096mm thru 11887mm	Over 11887mm thru 16154mm	Over 16154mm thru 18288mm	

* Last digit(s) of joist designation shown in Load Table

** See Section 5.11 for additional bridging required for uplift design.

(d) Bottom Chord Bearing Joists

Where bottom chord bearing joists are utilized, there shall be a row of diagonal bridging near the support to provide lateral stability. This bridging shall be installed as the joists are set in place.

5.5 INSTALLATION OF BRIDGING

All bridging and bridging anchors shall be completely installed before construction loads are placed on the joists.



Bridging shall support the top chords against lateral movement during the construction period and shall hold the steel joists in the approximate position as shown on the plans.

The ends of all bridging lines terminating at walls or beams shall be anchored thereto.

5.6 END ANCHORAGE

(a) Masonry and Concrete

Ends of K-Series Joists resting on steel bearing plates on masonry or structural concrete shall be attached thereto with a minimum of two $\frac{1}{8}$ inch (3 mm) fillet welds 1 inch (25 mm) long, or with two $\frac{1}{2}$ inch (13 mm) bolts, or with the combination of one $\frac{1}{2}$ inch (13 mm) bolt and one $\frac{1}{8}$ inch (3 mm) fillet weld 1 inch (25 mm) long.

(b) Steel

Ends of K-Series Joists resting on steel supports shall be attached thereto with a minimum of two $\frac{1}{8}$ inch (3 mm) fillet welds 1 inch (25 mm) long, or with two $\frac{1}{2}$ inch (13 mm) bolts, or with the combination of one $\frac{1}{2}$ inch (13 mm) bolt and one $\frac{1}{8}$ inch (3 mm) fillet weld 1 inch (25 mm) long. In steel frames, where columns are not framed in at least two directions with structural steel members, joists at column lines shall be field bolted at the columns to provide lateral stability during construction.

(c) Uplift

Where uplift forces are a design consideration, roof joists shall be anchored to resist such forces.

5.7 JOIST SPACING

Joists shall be spaced so that the loading on each joist does not exceed the allowable load for the particular joist designation.

5.8 FLOOR AND ROOF DECKS

(a) Material

Floors and roof decks may consist of cast-in-place or pre-cast concrete or gypsum, formed steel, wood, or other suitable material capable of supporting the required load at the specified joist spacing.

(b) Thickness

Cast-in-place slabs shall be not less than 2 inches (51 mm) thick.

(c) Centering

Centering for cast-in-place slabs may be ribbed metal lath, corrugated steel sheets, paper-backed welded wire fabric, removable centering or any other suitable material capable of supporting the slab at the designated joist spacing.

Centering shall not cause lateral displacement or damage to the top chord of joists during installation or removal of the centering or placing of the concrete.

(d) Bearing

Slabs or decks shall bear uniformly along the top chords of the joists.

(e) Attachments

Each attachment for slab or deck to top chords of joists shall be capable of resisting a lateral force of not less than 300 pounds (1335 N). The spacing shall not exceed 36 inches (914 mm) along the top chord.

(f) Wood Nailers

Where wood nailers are used, such nailers in conjunction with deck or slab shall be attached to the top chords of the joists in conformance with Section 5.8(e).

5.9 DEFLECTION

The deflection due to the design **live** load shall not exceed the following:

Floors: $\frac{1}{360}$ of span.

Roofs: $\frac{1}{360}$ of span where a plaster ceiling is attached or suspended.
 $\frac{1}{240}$ of span for all other cases.

The specifying professional shall give due consideration to the effects of deflection and vibration* in the selection of Joists.

* For further reference, refer to Steel Joist Institute Technical Digest #5, "Vibration of Steel Joist-Concrete Slab Floors" and the Institute's Computer Vibration Program.

5.10 PONDING

Unless a roof surface is provided with sufficient slope towards points of free drainage, or adequate individual drains to prevent the accumulation of rain water, the roof system shall be investigated to assure stability under ponding conditions in accordance with Section K2 of the AISC Specifications (Allowable Stress Design) of latest adoption.*

The ponding investigation shall be performed by the specifying professional.

* For further reference, refer to Steel Joist Institute Technical Digest #3, "Structural Design of Steel Joist Roofs to Resist Ponding Loads".



5.11 UPLIFT

Where uplift forces due to wind are a design requirement, these forces must be indicated on the contract drawings in terms of net uplift in pounds per square foot (Pascals). When these forces are specified, they must be considered in the design of joists and/or bridging. A single line of **bottom chord** bridging must be provided near the first bottom chord panel points whenever uplift due to wind forces is a design consideration.*

* For further reference, refer to Steel Joist Institute Technical Digest #6, "Structural Design of Steel Joist Roofs to Resist Uplift Loads."

5.12 INSPECTION

Joists shall be inspected by the manufacturer before shipment to insure compliance of materials and workmanship with the requirements of these specifications. If the purchaser wishes an inspection of the steel joists by someone other than the manufacturer's own inspectors, he may reserve the right to do so in his "Invitation to Bid" or the accompanying "Job Specifications".

Arrangements shall be made with the manufacturer for such inspection of the joists at the manufacturing shop by the purchaser's inspectors at purchaser's expense.

SECTION 6.* ERECTION STABILITY AND HANDLING

When it is necessary for the erector to climb on the joists, extreme caution must be exercised since unbridged joists may exhibit some degree of instability under the erector's weight.

During the construction period, the contractor shall provide means for adequate distribution of concentrated loads so that the carrying capacity of any joist is not exceeded.

a) Stability Requirements

- 1) One end of all joists shall be attached to its support in accordance with Section 5.6 - End Anchorage, ***before allowing the weight of an erector on the joists.***

When bolted connections are used, the bolts must be snug tightened.

- 2) Where the joist span is equal to or greater than the span corresponding to the RED shaded area shown in the load table, the row of bridging nearest the mid span of the joist shall be installed as bolted diagonal bridging.

Hoisting cables shall not be released until this bolted diagonal bridging is completely installed.

- 3) No loads other than the weight of one erector are allowed on the joist until **all** bridging is completely installed and **all** joist ends are attached.
- 4) In the case of bottom chord bearing joists, the ends of the joist must be restrained laterally per Section 5.4(d) before releasing the hoisting cables.
- 5) After the joist is straightened and plumbed, and all bridging is completely installed and anchored, the ends of the joists shall be fully connected to the supports in accordance with Section 5.6 End Anchorage.

b) Field Welding

- 1) All field welding shall be performed in a workman-like manner to insure that the joists are not damaged by such welding.
- 2) On cold-formed members whose yield strength has been attained by cold working, and whose as-formed strength is used in the design, the total length of weld at any one point shall not exceed 50 percent of the overall developed width of the cold-formed section.

c) Handling

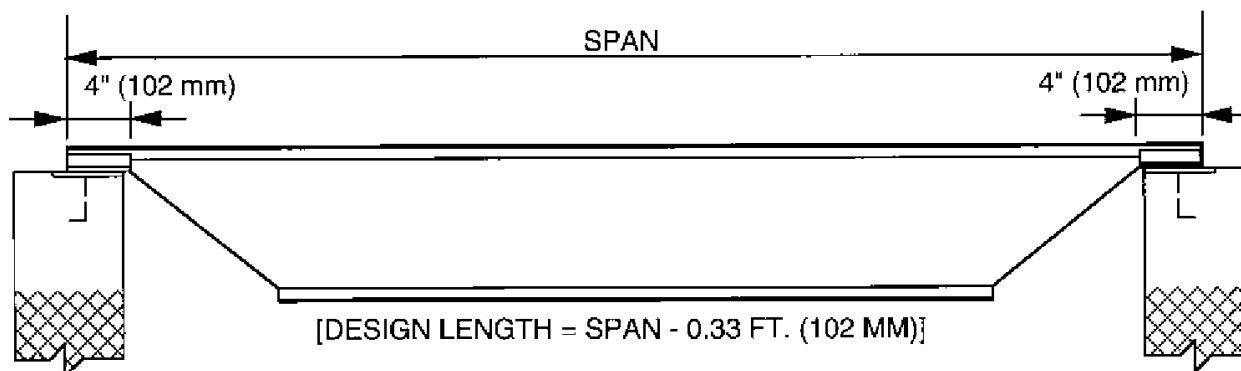
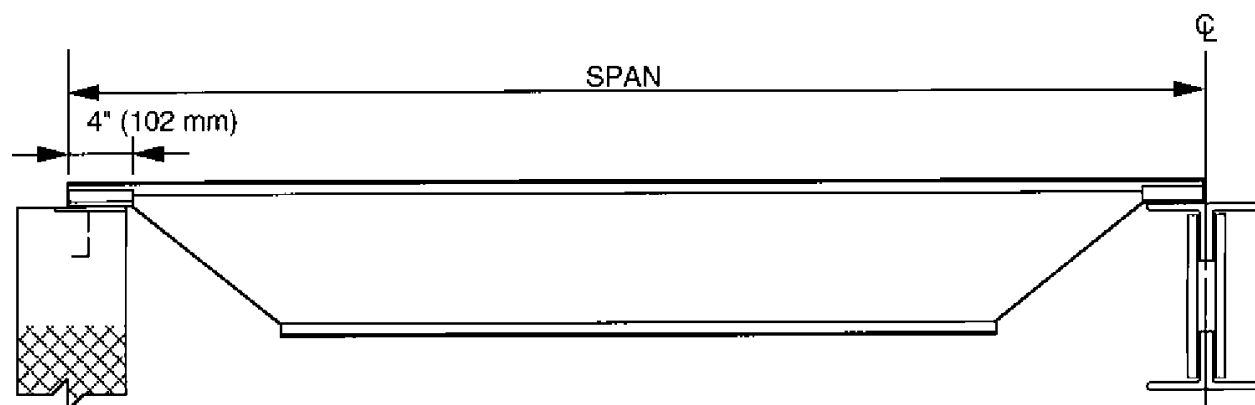
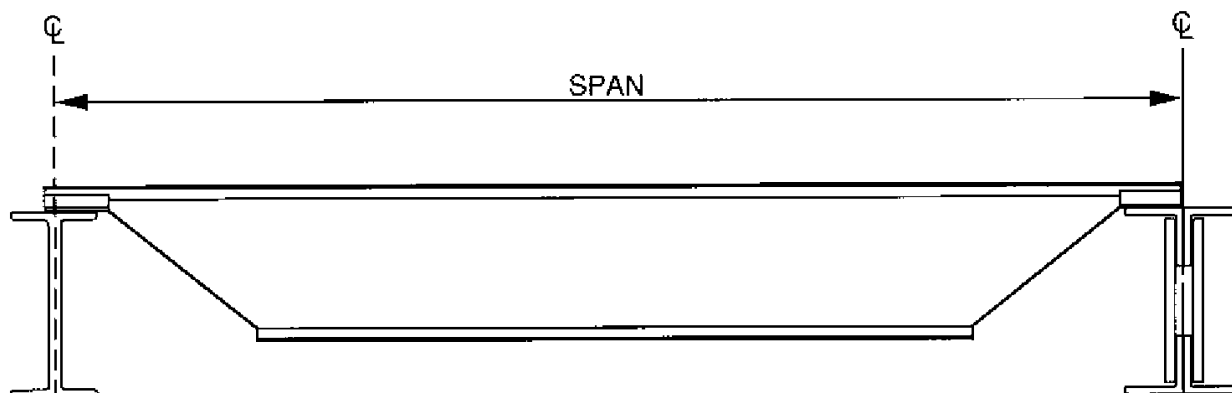
Care shall be exercised at all times to avoid damage to the joists and accessories through careless handling during unloading, storing and erecting.

* For a thorough coverage of this topic, refer to SJI Technical Digest #9, "Handling and Erection of Steel Joists and Joist Girders."



DEFINITION OF SPAN

U.S. CUSTOMARY UNITS
SYSTEME INTERNATIONAL



VS SERIES

VS SERIES are joist substitutes which are intended for use in very short spans (10ft or less) where open web steel joists are impractical. They are commonly specified to span over hallways and short spans in skewed bays.

FABRICATION

- Depth 2.5 in
- Maximum Length 10 ft
- Minimum Length 3 ft
- Contact your local Vulcraft Plant for sloped or pitched seat information.

STANDARD CONFIGURATION**

2.5VS1 Thru 2.5VS2	
2.5VS3 Thru 2.5VS5	
2.5VS6 Thru 2.5VS7	

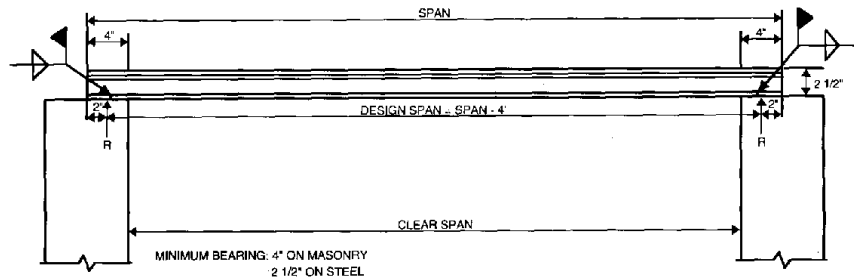
**Configuration may vary from that shown.

LOAD TABLE SPECIFICATIONS

Joist substitutes are fabricated from material conforming to the SJI specifications. $F_y = 50$ ksi; $F_b = 30$ ksi. Full lateral support to the compression flange is assumed to be provided by metal deck.

ERECTION STABILITY

Caution must be exercised since joist substitutes exhibit some degree of instability. After erection and before loads of any description are placed on the joist substitutes the ends must be welded to the supports per SJI specs and the metal deck installed and attached to the top flange.

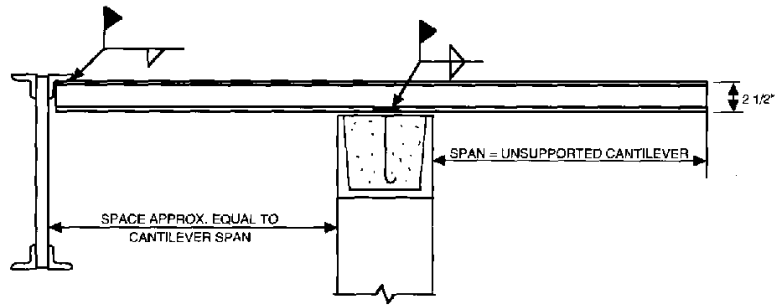


NOTE: VS SERIES NOT U.L. APPROVED.

VS SERIES SIMPLE SPAN LOAD TABLE

VS TYPE	2.5VS1	2.5VS2	2.5VS3	2.5VS4	2.5VS5	2.5VS6	2.5VS7
S IN ^3	0.52	0.62	0.72	0.84	0.97	1.2	1.7
I IN^4	0.65	0.78	.089	1.1	1.2	1.5	2.1
WTlbs/ft	2.5	3.0	3.6	4.2	4.9	6.4	8.2
SPAN ft	ALLOWABLE UNIFORM LOAD (TOTAL/LIVE) PLF						
4	550						
5	459/296	550/338	550/380	550/465	550	550	550
6	311/165	374/189	436/212	519/260	550/283	550/354	550/496
7	225/102	270/116	315/131	375/160	435/174	540/218	550/305
8	170/67	204/76	238/86	284/105	329/114	408/143	550/200
9				222/73	257/79	320/99	435/139
10				178/52	207/57	257/71	350/100

The figures shown in red in this load table are the live loads per linear foot which will produce an approximate deflection of 1/360 of the span. Live loads which will produce a deflection of 1/240 of the span may be obtained by multiplying the figures in red by 1.5. In no case shall the total load capacity of the joist substitute be exceeded.



OUTRIGGER DETAIL

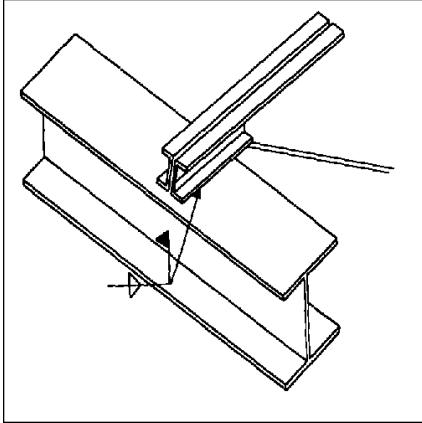
NOTE: VS SERIES NOT U.I. APPROVED.

LOAD TABLE FOR LOOSE OUTRIGGERS

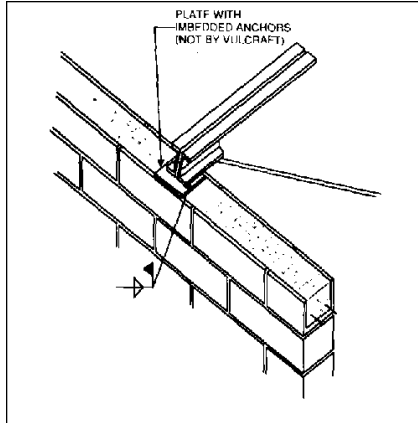
OUTRIGGER	TOTAL ALLOWABLE LOAD FOR UNSUPPORTED CANTILEVER										
	PLF*										
	SPAN ft-in										
TYPE	2'-0	2'-6	3'-0	3'-6	4'-0	4'-6	5'-0	5'-6	6'-0	6'-6	
2.5VS1	550	416	289	212	163	128					
2.5VS2	550	499	346	254	195	154	125	103			
2.5VS3	550	550	402	295	226	179	145	120	100		
2.5VS4	550	550	465	341	261	207	167	138	116		
2.5VS5	550	550	537	395	302	239	193	160	134	114	
2.5VS6	550	550	550	493	377	298	241	199	168	143	
2.5VS7	550	550	550	550	517	409	331	274	230	196	

**Serviceability requirements must be checked by the specifying professional.

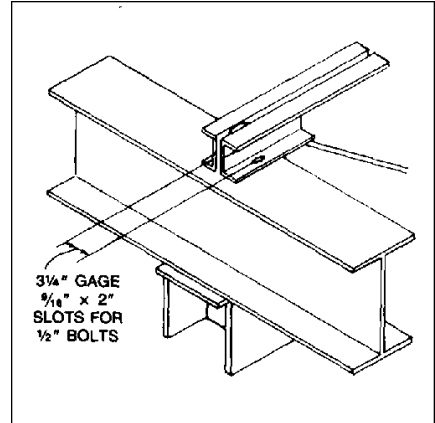
K SERIES OPEN WEB STEEL JOISTS



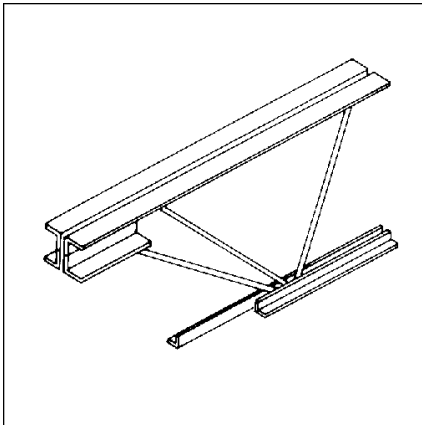
ANCHORAGE TO STEEL
SEE SJI SPECIFICATION 5.3 (b) AND 5.6



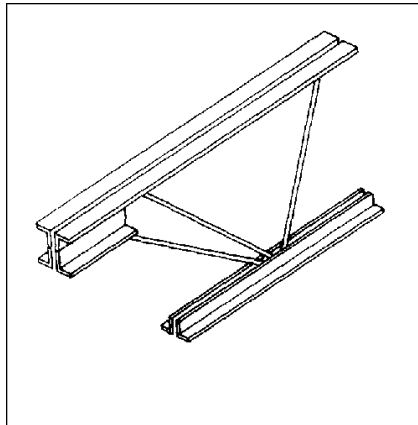
ANCHORAGE TO MASONRY
SEE SJI SPECIFICATION 5.3 (a) AND 5.6



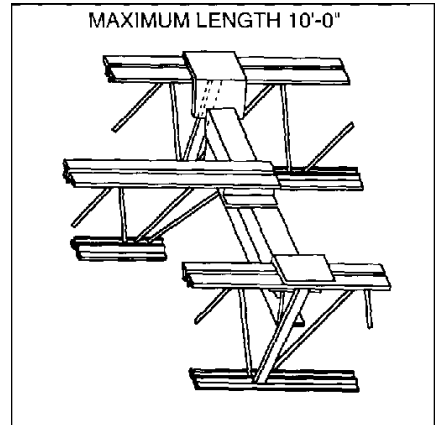
BOLTED CONNECTION*
TYPICALLY REQUIRED AT COLUMNS



CEILING EXTENSION



BOTTOM CHORD STRUT



HEADERS

Note: If header does not bear at a Joist Panel Point add extra web in field as shown.

MAXIMUM DUCT OPENING SIZES (K SERIES)*

JOIST DEPTH	ROUND	SQUARE	RECTANGLE
8 inches	5 inches	4x4 inches	3x8 inches
10 inches	6 inches	5x5 inches	3x8 inches
12 inches	7 inches	6x6 inches	4x9 inches
14 inches	8 inches	6x6 inches	5x9 inches
16 inches	9 inches	7 1/2 x 7 1/2 inches	6x10 inches
18 inches	11 inches	8x8 inches	7x11 inches
20 inches	11 inches	9x9 inches	7x12 inches
22 inches	12 inches	9 1/2 x 9 1/2 inches	8x12 inches
24 inches	13 inches	10x10 inches	8x13 inches
26 inches	15 1/2 inches	12x12 inches	9x18 inches
28 inches	16 inches	13x13 inches	9x18 inches
30 inches	17 inches	14x14 inches	10x18 inches
*FOR LH SERIES CONSULT WITH VULCRAFT			

SPECIFYING PROFESSIONAL MUST INDICATE ON STRUCTURAL DRAWINGS SIZE AND LOCATION OF ANY DUCT THAT IS TO PASS THRU JOIST.

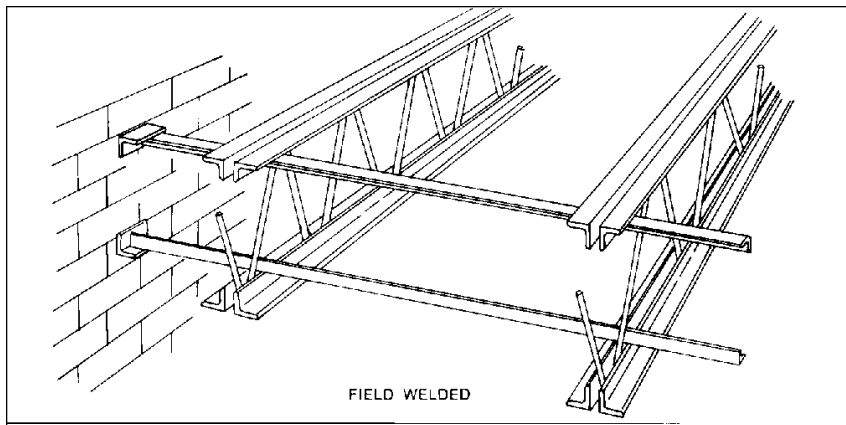
NOTE:

*The Occupational Safety and Health Administration Standards (OSHA), Paragraph 1910. 12 refers to Paragraph 1518.751 of "Construction Standards" which states:

"In steel, where bar joists are utilized, and columns are not framed in at least two directions with structural steel members, a bar joist shall be field-bolted at columns to provide lateral stability during construction."

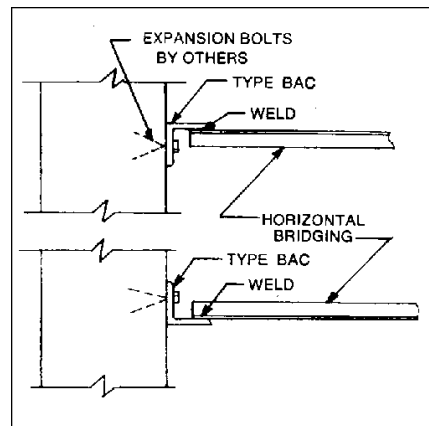
SEE SJI SPECIFICATION - SECTION 6. FOR HANDLING AND ERECTION OF K-SERIES OPEN WEB STEEL JOISTS AND SJI TECHNICAL DIGEST NO. 9.

K SERIES OPEN WEB STEEL JOISTS

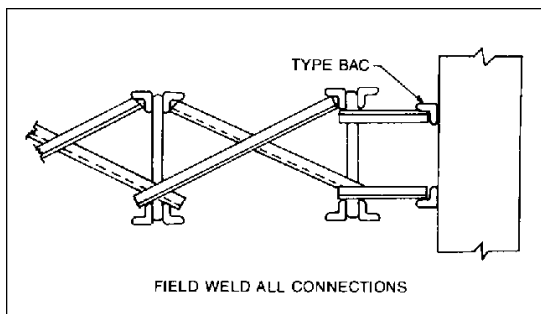


HORIZONTAL BRIDGING
SEE SJI SPECIFICATION 5.5 AND 6.

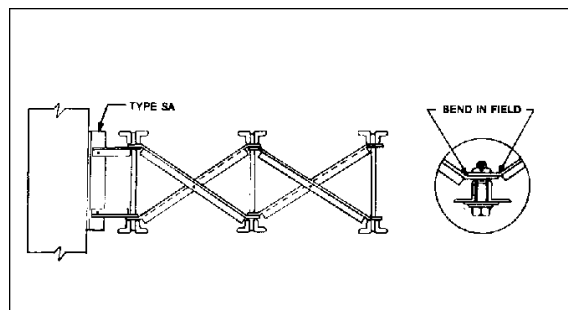
NOTE: DO NOT WELD BRIDGING TO JOIST WEB MEMBERS.
DO NOT HANG ANY MECHANICAL, ELECTRICAL, ETC. FROM BRIDGING.



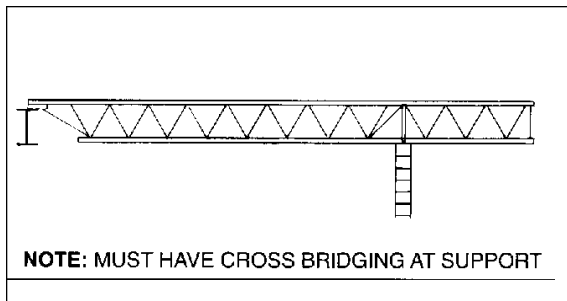
BRIDGING ANCHORS
SEE SJI SPECIFICATION 5.5 AND 6.



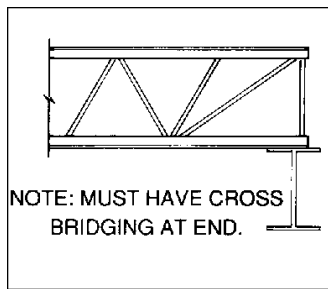
WELDED CROSS BRIDGING
SEE SJI SPECIFICATION 5.5 AND 6.
HORIZONTAL BRIDGING SHALL BE USED IN
SPACE ADJACENT TO THE WALL TO ALLOW FOR
PROPER DEFLECTION OF THE JOIST NEAREST
THE WALL.



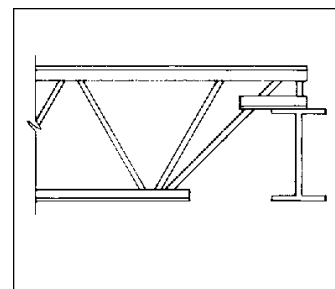
BOLTED CROSS BRIDGING
SEE SJI SPECIFICATION 5.5 AND 6.
USE ONLY FOR ROW NEAREST THE MIDSPAN OF THE JOIST WHEN
FOUR OR FIVE ROWS OF BRIDGING ARE REQUIRED. SEE K SERIES
SPECIFICATIONS SECTION 5.4 9 (c) AND SECTION 6.0. CROSS BRIDGING
IS MORE EXPENSIVE TO INSTALL AND HAS NO ADVANTAGE OVER
HORIZONTAL BRIDGING IN TRANSFERRING LOADS OR REDUCING
VIBRATION.
NOTE: IN LIEU OF ABOVE BOLTED CONNECTION JOISTS MAY BE
SUPPLIED WITH A CLIP ANGLE FOR BOLTING BRIDGING.



FULL DEPTH CANTILEVER END
SEE SJI SPECIFICATION 5.4 (d) AND 5.5 FOR BRIDGING
REQUIREMENTS.



SQUARE END
SEE SJI SPECIFICATION 5.4 (d)
AND 5.5 FOR BRIDGING
REQUIREMENTS.



DEEP BEARINGS
CONFIGURATION MAY VARY

ACCESSORIES AND DETAILS

K SERIES OPEN WEB STEEL JOISTS

SLOPED SEAT REQUIREMENTS FOR SLOPES 3/8:12 AND GREATER

LOW END

HIGH END

NO TCX	NO TCX	Slope Rate	High End Recommended Seat Depth
WITH TCX	WITH TCX		
		3/8:12 1/2:12 1:12 1 1/2:12 2:12 2 1/2:12 3:12 3 1/2:12 4:12 4 1/2:12 5 1/2:12 6:12 6:12 & OVER	3" 3 1/4" 3 1/2" 3 3/4" 3 7/8" 4" 4 1/4" 4 3/8" 4 5/8" 5" 5 1/4" 5 1/2" CONTACT VULCRAFT

NOTES:

- (1) Depths shown are the minimums required for fabrication of sloped bearing seats. Depths may vary depending on actual bearing conditions.
- (2) Contact Vulcraft when required seat slope is greater than 6" in 12".
- (3) Clearance must be checked at outer edge of support as shown in detail B. Increase bearing depth as required to permit passage of 2 1/2" deep extension.
- (4) If extension depth greater than 2 1/2" is required (see details B and D) increase bearing depths accordingly.
- (5) If slope is 1/4:12 or less sloped seats are not required.



BARTLE HALL CONVENTION CENTER

Kansas City, Missouri

Architect-Engineer: HNTB Corp.
 General Contractor: Watson General Contractors, Inc.
 Steel Fabricator: Havens Steel, Inc.
 Steel Erector: Danny's Construction Co., Inc.

ACCESSORIES AND DETAILS

BRIDGING REQUIREMENTS FOR K-SERIES JOISTS

Number of Rows of Bridging***
Distances are Span Lengths
(see "Definition of Span" on page 30.)

**IT IS VERY IMPORTANT FOR JOIST SPECIFIERS AND ERECTORS TO KNOW THAT OSHA IS
INTERPRETING 29CFR-1926.751(c)2 TO MEAN ALL JOIST FORTY (40) FEET (12192MM) AND LONGER
TO REQUIRE A ROW OF BOLTED BRIDGING TO BE IN A PLACE BEFORE SLACKENING OF HOISTING LINES.**

Section Numbers*	ERECTION STABILITY SPANS (SJI Spec. Section 6)		1 Row	2 Rows	3 Rows	4 Rows	5 Rows
	Depth	Span Less Than**					
1	8	17'	Up thru 16'	Over 16' thru 24'	Over 24' thru 28'		
	10	21'					
	12	23'					
	14	27'					
2	16	29'	Up thru 17'	Over 17' thru 25'	Over 25' thru 32'		
3	12	25'	Up thru 18'	Over 18' thru 28'	Over 28' thru 38'	Over 38' thru 40'	
	14	29'					
	16	30'					
	18	31'					
4	20	32'	Up thru 19'	Over 19' thru 28'	Over 28' thru 38'	Over 38' thru 48'	
	22	34'					
	24	36'					
	26	38'					
5	12	25'	Up thru 19'	Over 19' thru 29'	Over 29' thru 39'	Over 39' thru 50'	Over 50' thru 52'
	16	32'					
	18	33'					
	20	34'					
6	22	35'	Up thru 19'	Over 19' thru 29'	Over 29' thru 39'	Over 39' thru 51'	Over 51' thru 56'
	24	36'					
	26	39'					
	28	40'					
7	16	33'	Up thru 20'	Over 20' thru 33'	Over 33' thru 45'	Over 45' thru 58'	Over 58' thru 60'
	18	37'					
	20	39'					
	22	40'					
8	24	43'	Up thru 20'	Over 20' thru 33'	Over 33' thru 45'	Over 45' thru 58'	Over 58' thru 60'
	26	44'					
	28	44'					
	30	45'					
9	16	33'	Up thru 20'	Over 20' thru 33'	Over 33' thru 46'	Over 46' thru 59'	Over 59' thru 60'
	18	37'					
	20	39'					
	22	40'					
10	24	44'	Up thru 20'	Over 20' thru 33'	Over 33' thru 46'	Over 46' thru 59'	Over 59' thru 60'
	26	44'					
	28	45'					
	30	45'					
11	18	37'	Up thru 20'	Over 20' thru 37'	Over 37' thru 51'	Over 51' thru 60'	
	20	41'					
	22	45'					
	24	49'					
12	26	49'	Up thru 20'	Over 20' thru 39'	Over 39' thru 53'	Over 53' thru 60'	
	28	53'					
	30	53'					
	32	54'					

* Last digit(s) of joist designation.

** For spans **EQUAL TO OR EXCEEDING** that shown above, one of the required rows, nearest mid-span, must be bolted diagonal type. Bolted diagonal bridging shall be installed and connected BEFORE releasing the hoisting lines. Refer to Specification Section 6 for handling and erection requirements.

*** See SJI Specifications 5.11 for uplift requirement, page 29.

K-Series Joist Maximum Joist Spacing for Horizontal Bridging						
*Bridging Material Size						
Equal Leg Angles						
Section Numbers**	1x7/64 r = .20"	1-1/4x7/64 r = .25"	1-1/2x7/64 r = .30"	1-3/4x7/64 r = .35"	2x1/8 r = .40"	2-1/2x5/32 r = .50"
1 thru 9	5"-0"	6"-3"	7"-6"	8"-7"	10"-0"	12"-6"
10	4"-8"	6"-3"	7"-6"	8"-7"	10"-0"	12"-6"
11 & 12	4"-0"	5"-8"	7"-6"	8"-7"	10"-0"	12"-6"

* Connection to Joist must resist 700 pounds.
** Refer to last digit(s) of Joist Designation.

K, LH & DLH Series Joist Maximum Joist Spacing for Diagonal Bridging					
Bridging Angle Size					
Joist Depth	1x7/64 r = .20"	1-1/4x7/64 r = .25"	1-1/2x7/64 r = .30"	1-3/4x7/64 r = .35"	2x1/8 r = .40"
12	6"-6"	8"-3"	9"-11"	11"-7"	
14	6"-6"	8"-3"	9"-11"	11"-7"	
16	6"-6"	8"-2"	9"-10"	11"-6"	
18	6"-6"	8"-2"	9"-10"	11"-6"	
20	6"-5"	8"-2"	9"-10"	11"-6"	
22	6"-4"	8"-1"	9"-10"	11"-6"	
24	6"-4"	8"-1"	9"-9"	11"-5"	
26	6"-3"	8"-0"	9"-9"	11"-5"	
28	6"-2"	8"-0"	9"-8"	11"-5"	
30	6"-2"	7"-11"	9"-8"	11"-4"	
32	6"-1"	7"-10"	9"-7"	11"-4"	13"-0"
36		7"-9"	9"-6"	11"-3"	12"-11"
40		7"-7"	9"-5"	11"-2"	12"-10"
44		7"-5"	9"-3"	11"-0"	12"-9"
48		7"-3"	9"-2"	10"-11"	12"-8"
52			9"-0"	10"-9"	12"-7"
56			8"-10"	10"-8"	12"-5"
60			8"-7"	10"-6"	12"-4"
64			8"-5"	10"-4"	12"-2"
68			8"-2"	10"-2"	12"-0"
72			8"-0"	10"-0"	11"-10"

LH-Series Joist* Maximum Joist Spacing for Horizontal Bridging						
Bridging Angle Size						
Section Numbers**	1x7/64 r = .20"	1-1/4x7/64 r = .25"	1-1/2x7/64 r = .30"	1-3/4x7/64 r = .35"	2x1/8 r = .40"	2-1/2x5/32 r = .50"
02,03,04	4"-7"	6"-3"	7"-6"	8"-9"	10"-0"	12"-4"
05,06	4"-1"	5"-9"	7"-6"	8"-9"	10"-0"	12"-4"
07,08	3"-9"	5"-1"	6"-8"	8"-6"	10"-0"	12"-4"
09,10		4"-6"	6"-0"	7"-8"	10"-0"	12"-4"
11,12		4"-1"	5"-5"	6"-10"	8"-11"	12"-4"
13,14		3"-9"	4"-11"	6"-3"	8"-2"	12"-4"
15,16			4"-3"	5"-5"	7"-1"	11"-0"
17			4"-0"	5"-1"	6"-8"	10"-5"

* Connection to Joist must resist 700 pounds.
** Refer to last digit(s) of Joist Designation.

IT IS VERY IMPORTANT FOR JOIST SPECIFIERS AND ERECTORS TO KNOW THAT OSHA IS INTERPRETING 29CFR-1926.751(c)2 TO MEAN ALL JOIST FORTY (40) FEET (12192MM) AND LONGER TO REQUIRE A ROW OF BOLTED BRIDGING TO BE IN A PLACE BEFORE SLACKENING OF HOISTING LINES.

Bridging Requirements for LH-Series and DLH-Series Joists***		
Erection Stability Spans (SJI Spec. Section 105)		
Depth	Section Number	Spans less than **
18	02	33"
	03 thru 09	37"
20	02	33"
	03	38"
	04 thru 10	41"
24	03	35"
	04	39"
	05	40"
	06	45"
	07 thru 11	49"
28	05	42"
	06	46"
	07 thru 08	54"
	09 thru 13	57"
32	06 thru 07	47"
	08	55"
	09 thru 15	60"
36	07 thru 08	47"
	09	57"
	10 thru 15	60"
40	08 thru 16	47"
44	09 thru 17	52"
48	10 thru 17	56"

* Last two digits of joist designation.
** NOTE: Erection Stability Span = Clear span + 8". (See SJI Specifications Section 104.2) For spans EQUAL TO OR EXCEEDING that shown, one of the required rows, nearest mid-span, must be bolted diagonal type. For spans through 60 feet, the bolted diagonal bridging must be installed 60 BEFORE releasing the hoisting lines. FOR SPANS OVER 60 FEET, ALL BRIDGING ROWS MUST BE BOLTED DIAGONAL TYPE. Spans over 60 feet through 100 feet require two rows of bolted diagonal bridging to be installed, at one-third points, BEFORE releasing the hoisting lines. Spans over 100 feet require ALL rows of bolted diagonal bridging to be installed BEFORE releasing the hoisting lines.
*** All DLH-Series JOISTS REQUIRE ALL BRIDGING ROWS TO BE BOLTED DIAGONAL TYPE.

Bridging Spacing		
LH-DLH Sect. Number*	Minimum Bolt Diameter**	Max. Spacing of Bridging Lines
02,03,04	3/8"	11"-0"
05,06	3/8"	12"-0"
07,08	3/8"	13"-0"
09,10	3/8"	14"-0"
11,12	3/8"	16"-0"
13,14	1/2"	16"-0"
15,16,17	1/2"	21"-0"
18,19	5/8"	26"-0"

* Last two digits of joist designation.
** Size required due to requirements as indicated for bolted diagonal bridging connections per SJI Specifications Section 104.5(e). Minimum A307 Bolt required for connection.

K SERIES OPEN WEB STEEL JOISTS
TOP CHORD EXTENSIONS AND EXTENDED ENDS

Joint extensions are commonly furnished to support a variety of overhang conditions. The two types are pictured below. The first is the **TOP CHORD EXTENSION** or **"S" TYPE**, which has only the top chord angles extended. The second is the **EXTENDED END** or **"R" TYPE** in which the standard 2 1/2" (64 mm) end bearing depth is maintained over the entire length of the extension. The "S" TYPE extension is so designated because of its **Simple** nature whereas the "R" TYPE involves **Reinforcing** the top chord angles. The specifying professional should be aware that an "S" TYPE is more economical and should be specified whenever possible.

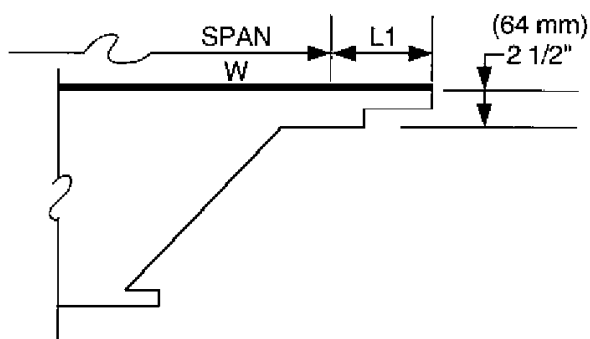
The following load tables for K-Series TOP CHORD EXTENSIONS and EXTENDED ENDS have been developed as an aid to the specifying professional. The black number in the tables is the maximum allowable uniform load in pounds per linear foot (Newton/Meter). The red number is the uniform load which will produce an approximate deflection of $L^1/240$, where L^1 is the length of the extension. The load tables are applicable for uniform loads only. If there

are concentrated loads and/or non-uniform loads, a loading diagram must be provided by the specifying professional on the structural drawings. In cases where it is not possible to meet specific job requirements with a 2-1/2" (64 mm) deep "R" type extension (refer to "S" and "I" values in the Extended End Load Table), the depth of the extension must be increased to provide greater load-carrying capacity. If the loading diagram for any condition is not shown, the joist manufacturer will design the extension to support the uniform load indicated in the K-Series Joist Load Table for the span of the joist.

When TOP CHORD EXTENSIONS or EXTENDED ENDS are specified, the allowable deflection and the bracing requirements must be considered by the specifying professional.

It should be noted that an "R" TYPE extension must be specified when building details dictate a 2-1/2" (64 mm) depth at the end of the extension. In the absence of specific instructions, the joist manufacturer may provide either type.

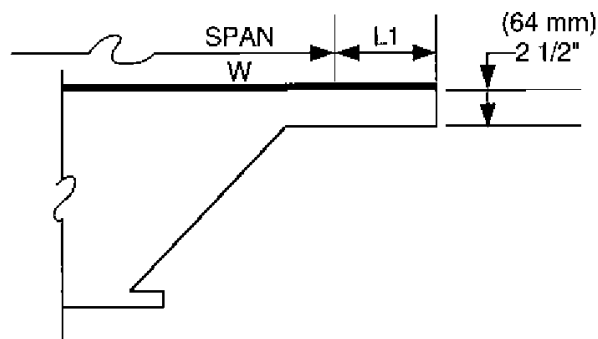
TOP CHORD EXTENSION



TOP CHORD EXTENSION - "S" TYPE
 (only top chord angles extended)

W = Uniform Load
 L1 = Length of Extension beyond standard bearing
 SPAN = See page 30 for definition of Span

EXTENDED ROD



EXTENDED END - "R" TYPE
 (standard 2 1/2" (64 mm) end depth extended)

K SERIES OPEN WEB STEEL JOISTS

TOP CHORD EXTENSION LOAD TABLE (S TYPE)											
TYPE	S in3	I in4	LENGTH (L1)								
			0'6	1'0	1'6	2'0	2'6	3'0	3'6	4'0	4'6
S1	0.099	0.088	550 550	363 363	178 127	105 58					
S2	0.115	0.138	550 550	422 422	207 200	122 91					
S3	0.139	0.159	550 550	510 510	250 230	148 104					
S4	0.160	0.172	550 550	550 550	288 249	170 113	112 60				
S5	0.176	0.188	550 550	550 550	316 272	187 124	123 66				
S6	0.192	0.204	550 550	550 550	345 295	204 134	135 72				
S7	0.241	0.306	550 550	550 550	433 433	256 201	169 108	120 64			
S8	0.266	0.332	550 550	550 550	478 478	283 219	187 117	132 70			
S9	0.288	0.358	550 550	550 550	518 518	306 236	202 126	143 75	107 48		
S10	0.380	0.544	550 550	550 550	550 550	404 359	267 192	189 115	141 74	109 50	
S11	0.438	0.622	550 550	550 550	550 550	466 410	307 220	218 131	162 84	126 57	100 41
S12	0.494	0.696	550 550	550 550	550 550	526 459	347 246	246 147	183 94	142 64	113 45

TOP CHORD EXTENSION LOAD TABLE (R TYPE)														
TYPE	S (in3)	I (in4)	LENGTH (L1)											
			0'6	1'0	1'6	2'0	2'6	3'0	3'6	4'0	4'6	5'0	5'6	6'0
R1	0.895	1.119	550 550	550 550	550 550	550 550	550 396	446 236	332 152	257 103	205 73	167 54	139 41	17 32
R2	0.839	1.157	550 550	550 550	550 550	550 550	550 409	418 244	312 157	241 107	192 76	157 56	130 42	110 33
R3	0.998	1.299	550 550	550 550	550 550	550 550	550 459	497 271	371 176	287 120	229 85	186 63	155 47	131 37
R4	1.147	1.433	550 550	550 550	550 550	550 550	550 507	550 302	426 195	330 132	263 94	214 69	178 52	150 41
R5	1.249	1.561	550 550	550 550	550 550	550 550	550 329	550 212	464 144	359 103	286 75	233 57	194 57	164 44
R6	1.352	1.690	550 550	550 550	550 550	550 550	550 357	550 230	502 156	389 111	310 82	253 62	210 48	177 48
R7	1.422	1.802	550 550	550 550	550 550	550 550	550 380	550 245	528 167	409 119	326 87	266 66	221 66	186 51
R8	1.558	1.948	550 550	550 550	550 550	550 550	550 411	550 265	550 180	448 128	357 94	291 71	242 71	204 55
R9	1.673	2.091	550 550	550 550	550 550	550 550	550 442	550 284	550 194	481 138	384 101	313 77	260 77	219 59
R10	1.931	2.414	550 550	550 550	550 550	550 550	550 510	550 328	550 224	550 159	443 117	361 89	300 89	253 69
R11	2.183	2.729	550 550	550 550	550 550	550 550	550 550	550 371	550 253	550 180	501 132	408 100	339 100	287 78
R12	2.413	3.016	550 550	550 550	550 550	550 550	550 550	550 410	550 279	550 199	550 146	451 111	375 111	317 86



ACCESSORIES AND DETAILS

TOP CHORD EXTENSION LOAD TABLE (S TYPE)											
kiloNewtons per Meter (kN/m)											
TYPE	S	I	LENGTH (L1) In Millimeters								
			152	305	457	610	762	914	1067	1219	1372
S1	1622	36628	8.02 8.02	5.29 5.42	2.59 1.85	1.53 .84					
S2	1884	57340	8.02 8.02	6.15 8.02	3.02 2.91	1.78 1.32					
S3	2278	66181	8.02 8.02	7.44 8.02	3.64 3.35	2.15 1.51					
S4	2622	71592	8.02 8.02	8.02 8.02	4.20 3.63	2.48 1.64	1.63 .87				
S5	2884	78251	8.02 8.02	8.02 8.02	4.61 3.96	2.72 1.80	1.79 .96				
S6	3146	84911	8.02 8.02	8.02 8.02	5.03 4.30	2.97 1.95	1.97 1.05				
S7	3949	127367	8.02 8.02	8.02 8.02	6.31 6.46	3.73 2.93	2.46 1.57	1.75 .93			
S8	4359	138188	8.02 8.02	8.02 8.02	6.97 7.01	4.13 3.19	2.72 1.70	1.92 1.02			
S9	4719	149010	8.02 8.02	8.02 8.02	7.55 7.57	4.46 3.44	2.94 1.83	2.08 1.09	1.56 .70		
S10	6227	226430	8.02 8.02	8.02 8.02	8.02 8.02	5.89 5.23	3.89 2.80	2.75 1.67	2.05 1.07	1.59 .72	
S11	7177	258895	8.02 8.02	8.02 8.02	8.02 8.02	6.80 5.98	4.48 3.21	3.18 1.91	2.36 1.22	1.83 .83	1.45 .59
S12	8095	289697	8.02 8.02	8.02 8.02	8.02 8.02	7.67 6.69	5.06 3.59	3.59 2.14	2.67 1.37	2.07 .93	1.64 .65

TOP CHORD EXTENSION LOAD TABLE (R TYPE)														
kiloNewtons per Meter (kN/m)														
TYPE	S	I	LENGTH (L1) IN MILLIMETERS											
			152	305	457	610	762	914	1,067	1,219	1,372	1,524	1,676	1,829
R1	14666	465762	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 5.77	6.50 3.44	4.84 2.21	3.75 1.50	2.99 1.06	2.43 0.78	2.02 0.59	1.70 0.46
R2	13748	481579	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 5.96	6.10 3.56	4.55 2.29	3.51 1.56	2.80 1.10	2.29 0.81	1.89 0.61	1.60 0.48
R3	16354	540684	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 6.69	7.23 3.99	5.41 2.56	4.18 1.75	3.34 1.24	2.71 0.91	2.26 0.68	1.91 0.53
R4	18796	596459	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 7.39	8.02 4.40	6.24 2.84	4.81 1.92	3.83 1.37	3.12 1.00	2.59 0.75	2.18 0.59
R5	20467	649763	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 4.80	6.77 3.09	5.23 2.10	4.17 1.50	3.40 1.09	2.83 0.83	2.39 0.64
R6	22155	703430	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 5.21	7.32 3.35	5.67 2.27	4.52 1.61	3.69 1.19	3.06 0.90	2.58 0.70
R7	23300	750048	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 5.54	7.70 3.57	5.96 2.43	4.75 1.73	3.88 1.26	3.22 0.96	2.71 0.74
R8	25531	810818	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 5.99	8.02 3.86	6.53 2.62	5.21 1.86	4.24 1.37	3.53 1.03	2.97 0.80
R9	27415	870339	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 6.45	8.02 4.14	7.01 2.83	5.60 2.01	4.56 1.47	3.79 1.12	3.19 0.86
R10	31643	1004782	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 7.44	8.02 4.78	8.02 3.26	6.46 2.32	5.26 1.70	4.37 1.29	3.69 1.00
R11	35773	1135894	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 5.41	8.02 3.69	7.31 2.62	5.95 1.92	4.94 1.45	4.18 1.13
R12	39542	1255353	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 5.98	8.02 4.07	8.02 2.90	6.58 2.13	5.47 1.61	4.62 1.25



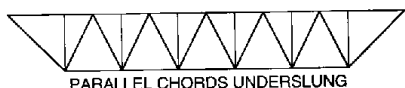
LH & DLH SERIES LONGSPAN STEEL JOISTS

STANDARD TYPES

Longspan steel joists can be furnished with either underslung or square ends, with parallel chords or with single or double pitched top chords to provide sufficient slope for roof drainage.

The Longspan joist designation is determined by its nominal depth at the center of the span, except for offset double pitched joists, where the depth should be given at the ridge. A part of the designation should be either the section number or the total design load over the design live load (TL/LL given in plf).

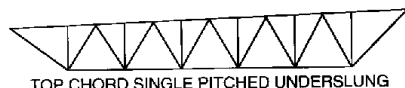
All pitched joists will be cambered in addition to the pitch unless specified otherwise.



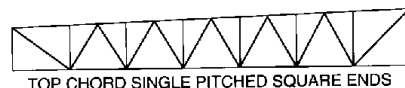
PARALLEL CHORDS UNDERSLUNG



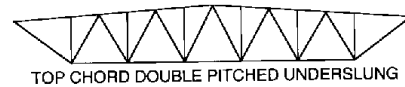
PARALLEL CHORDS SQUARE ENDS



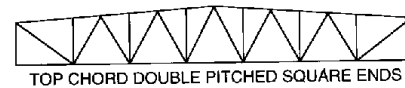
TOP CHORD SINGLE PITCHED UNDERSLUNG



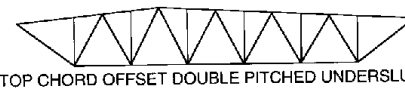
TOP CHORD SINGLE PITCHED SQUARE ENDS



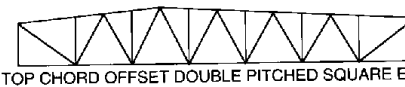
TOP CHORD DOUBLE PITCHED UNDERSLUNG



TOP CHORD DOUBLE PITCHED SQUARE ENDS



TOP CHORD OFFSET DOUBLE PITCHED UNDERSLUNG



TOP CHORD OFFSET DOUBLE PITCHED SQUARE ENDS

CAMBER

Non-Standard Types: The design professional shall provide on the structural drawings the amount of camber desired as a percent of live load and as a percent of dead load.

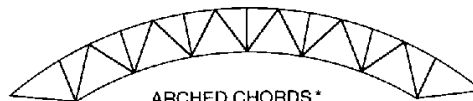
Standard Types: The camber listed in the table will be fabricated into the joists unless the design professional specifically states otherwise on the structural drawings.

NON-STANDARD TYPES

The following joists can also be supplied by Vulcraft, however, **THE DISTRICT SALES OFFICE OR MANUFACTURING FACILITY NEAREST YOU SHOULD BE CONTACTED FOR ANY LIMITATIONS IN DEPTH OR LENGTH.**

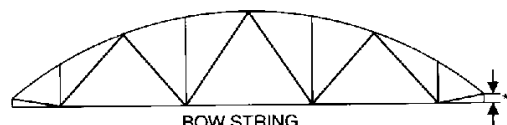


SCISSOR*

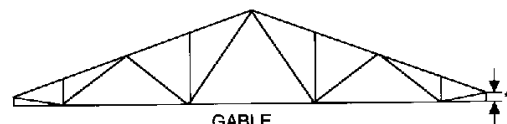


ARCHED CHORDS*

*Horizontal forces due to deflections of these types need to be considered by the design professional.



BOW STRING



GABLE

**Contact Vulcraft for minimum depth at ends.

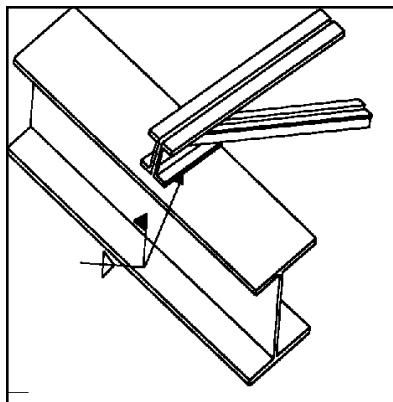
CAMBER FOR STANDARD TYPES

LH & DLH series joists shall have camber in accordance with the following table:***

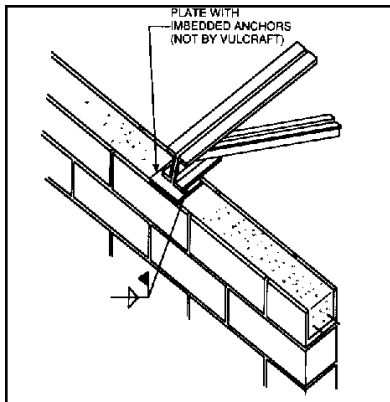
Top Chord Length	Approx. Camber
20'-0" (6096 mm)	1/4" (6 mm)
30'-0" (9144 mm)	3/8" (10 mm)
40'-0" (12192 mm)	5/8" (16 mm)
50'-0" (15240 mm)	1" (25 mm)
60'-0" (18288 mm)	1 1/2" (38 mm)
70'-0" (21336 mm)	2" (51 mm)
80'-0" (24384 mm)	2 3/4" (70 mm)
90'-0" (27432 mm)	3 1/2" (89 mm)
100'-0" (30480 mm)	4 1/4" (108 mm)
110'-0" (33528 mm)	5" (127 mm)
120'-0" (36576 mm)	6" (152 mm)
130'-0" (39621 mm)	7" (178 mm)
140'-0" (42672 mm)	8" (203 mm)
144'-0" (43890 mm)	8 1/2" (216 mm)

*** NOTE: If full camber is not desired near walls or other structural members please note on the structural drawings.

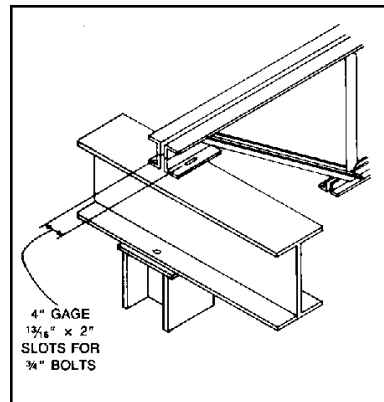
LH & DLH SERIES LONGSPAN STEEL JOISTS



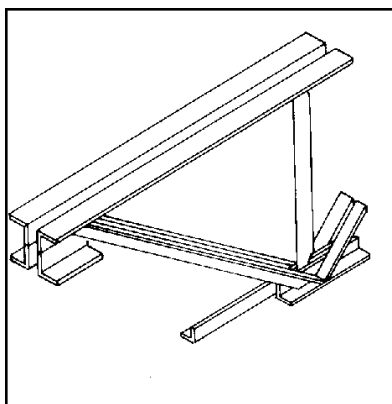
ANCHORAGE TO STEEL
SEE SJI SPECIFICATION
104.4 (b) AND 104.7 (b)



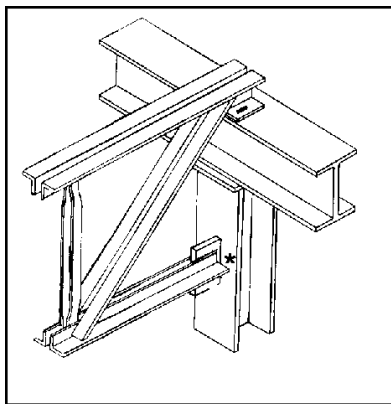
ANCHORAGE TO MASONRY
SEE SJI SPECIFICATION
104.4 (a) AND 104.7 (a)



BOLTED CONNECTION
See Note (c)
Typically required at columns

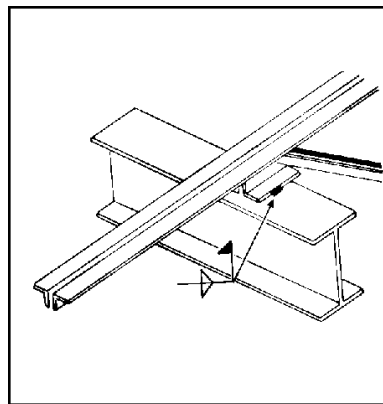


CEILING EXTENSION



BOTTOM CHORD EXTENSION

*If bottom chord extension is to be bolted or welded the specifying professional must provide axial loads on structural drawings.



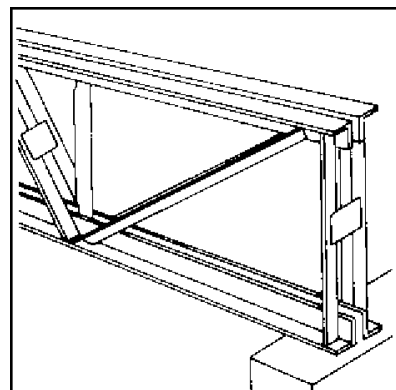
TOP CHORD EXTENSION
See Note (a)

- (a) Extended top chords or full depth cantilever ends require the special attention of the specifying professional.

The magnitude and location of the design loads to be supported, the deflection requirements, and the proper bracing shall be clearly indicated on the structural drawings.

- (b) See SJI Specification - Section 105 for Handling and Erection of LH and DLH joists.
- (c) The Occupational Safety and Health Administration Standards (OSHA), Paragraph 1910.12 refers to Paragraph 1518.751 of "Construction Standards" which states:
"In steel framing, where bar joists are utilized, and columns are not framed in at least two directions with structural steel members, a bar joist shall be field-bolted at columns to provide lateral stability during construction."

NOTE: Configurations may vary from that shown.



SQUARE END
See SJI Specification 104.5 (f).
Cross bridging required at end of bottom bearing joist.

LH & DLH SERIES LONGSPAN STEEL JOISTS



NOTE: Do not weld bridging to web members. Do not hang any mechanical, electrical, etc. from bridging.



(b) For required bolt size refer to bridging spacing table on page 121.

LH & DLH SERIES OPEN WEB STEEL JOISTS SLOPED SEAT REQUIREMENTS

LOW END		HIGH END		SLOPE RATE	HIGH END MINIMUM **SEAT DEPTH
	A		C		
	B		D	1/4:12 3/8:12 1/2:12 1:12 1 1/2:12 2:12 2 1/2:12 3:12 3 1/2:12 4:12 4 1/2:12 5:12 6:12 & OVER	5 1/2" 5 1/2" 5 3/4" 6" 6 1/4" 6 1/2" 6 3/4" 7" 7 1/4" 7 1/2" 7 3/4" 8" CONTACT VULCRAFT

** Add 2 1/2 to seat depths at 18 and 19 chord section numbers.

- (1) Depths shown are the minimums required for fabrication of sloped bearing seats.
- (2) Contact Vulcraft when required seat slope is greater than 6" in 12".
- (3) Clearance must be checked at outer edge of support as shown in detail B. Increase bearing depth as required to permit passage of 5" deep extension.
- (4) If extension depth greater than 5" is required (see detail B and D) increase bearing depths accordingly.

VULCRAFT LH & DLH SERIES / GENERAL INFORMATION

HIGH STRENGTH

ECONOMICAL

DESIGN – Vulcraft LH & DLH Series long span steel joists are designed in accordance with the specifications of the Steel Joist Institute.

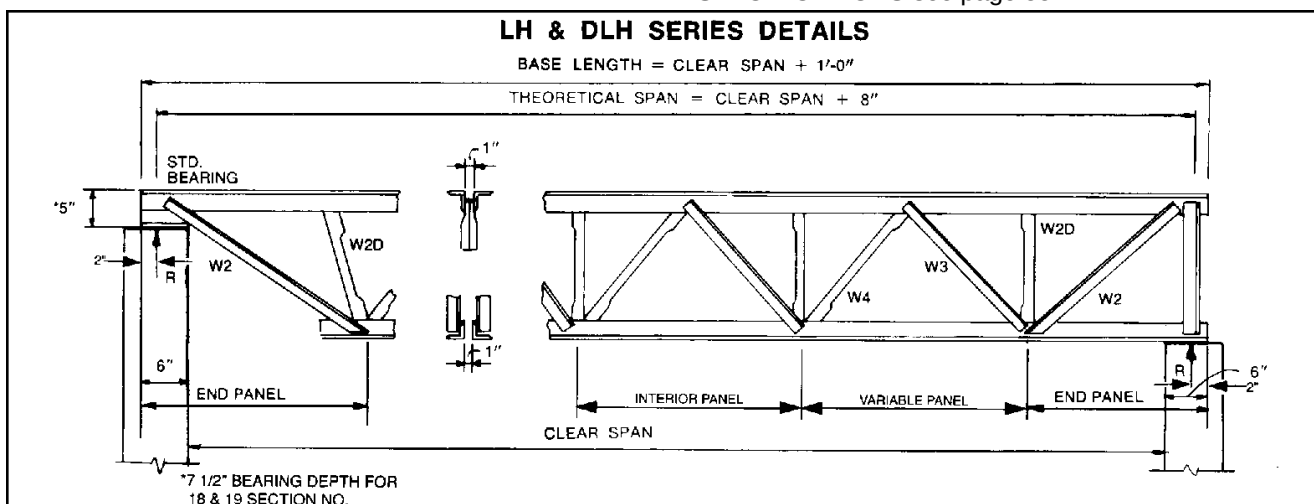
ACCESSORIES see page 41.

ROOF SPANS TO 144'-0"

FLOOR SPANS TO 120'-0"

PAINT – Vulcraft joists receive a shop-coat of rust inhibitive primer whose performance characteristics conform to those of the Steel Joist Institute specification 102.4.

SPECIFICATIONS see page 55.



MAXIMUM JOIST SPACING FOR DIAGONAL BRIDGING					
BRIDGING ANGLE SIZE-EQUAL LEG ANGLES					
JOIST DEPTH	1x7/64 (25mm x 3mm) r = .20"	1-1/4x7/64 (32mm x 3mm) r = .25"	1-1/2x7/64 (38mm x 3mm) r = .30"	1-3/4x7/64 (45mm x 3mm) r = .35"	2x1/8 (51mm x 3mm) r = .40"
32	6'-1"(1854mm)	7'-10"(2387mm)	9'-7"(2921mm)	11'-4"(3454mm)	13'-0"(3962mm)
36		7'-9"(2362mm)	9'-6"(2895 mm)	11'-3"(3429mm)	12'-11"(3973mm)
40		7'-7"(2311mm)	9'-5"(2870 mm)	11'-2"(3403mm)	12'-10"(3911mm)
44		7'-5"(2260mm)	9'-3"(2819 mm)	11'-0"(3352mm)	12'-9"(3886mm)
48		7'-3"(2209mm)	9'-2"(2794 mm)	10'-11"(3327mm)	12'-8"(3860mm)
52			9'-0"(2743 mm)	10'-9"(3276mm)	12'-7"(3835mm)
56			8'-10"(2692 mm)	10'-8"(3251mm)	12'-5"(3784mm)
60			8'-7"(2616 mm)	10'-6"(3200mm)	12'-4"(3759mm)
64			8'-5"(2565 mm)	10'-4"(3149mm)	12'-2"(3708mm)
68			8'-2"(2489 mm)	10'-2"(3098mm)	12'-0"(3657mm)
72			8'-0"(2438 mm)	10'-0"(3048mm)	11'-10"(3606mm)

SECTION NUMBER*	MAX. SPACING OF LINES OF BRIDGING	HORIZONTAL BRACING FORCE	
		lbs.	(N)
02, 03, 04	11'-0" (3352mm)	400	(1779)
05 - 06	12'-0" (3657mm)	500	(2224)
07 - 08	13'-0" (3962mm)	650	(2891)
09 - 10	14'-0" (4267mm)	800	(3558)
11 - 12	16'-0" (4876mm)	1000	(4448)
13 - 14	16'-0" (4876mm)	1200	(5337)
15 - 16	21'-0" (6400mm)	1600	(7117)
17	21'-0" (6400mm)	1800	(8006)
18 - 19	26'-0" (7924mm)	2000	(8896)

NUMBER OF LINES OF BRIDGING BASED ON CLEAR SPAN.
*LAST TWO DIGITS OF JOIST DESIGNATION.

MIN. A307 BOLTREQ'D FOR CONNECTION		
SERIES	SECTION NUMBER*	A307 BOLT DIAMETER
LH/DLH	2 - 12	3/8"(9mm)
LH/DLH	13 - 17	1/2" (12mm)
DLH	18 & 19	5/8" (15mm)

*LAST TWO DIGITS OF JOIST DESIGNATION.

MAXIMUM JOIST SPACING FOR HORIZONTAL BRIDGING						
SPANS OVER 60' REQUIRE BOLTED DIAGONAL BRIDGING						
BRIDGING ANGLE SIZE-EQUAL LEG ANGLES						
SECTION NUMBER*	1x7/64 (25mm x 3mm) r = .20"	1-1/4x7/64 (32mm x 3mm) r = .25"	1-1/2x7/64 (38mm x 3mm) r = .30"	1-3/4x7/64 (45mm x 3mm) r = .35"	2x1/8 (51mm x 3mm) r = .40"	2-1/2x5/32 (64mm x 4mm) r = .50"
02, 03, 04	4'-7"(1397mm)	6'-3"(1905mm)	7'-6"(2286mm)	8'-9"(2667mm)	10'-0"(3048mm)	12'-4"(3759mm)
05 - 06	4'-1"(1245mm)	5'-9"(1753mm)	7'-6"(2286mm)	8'-9"(2667mm)	10'-0"(3048mm)	12'-4"(3759mm)
07 - 08	3'-9"(1143mm)	5'-1"(1549mm)	6'-8"(2032mm)	8'-6"(2590mm)	10'-0"(3048mm)	12'-4"(3759mm)
09 - 10		4'-6"(1372mm)	6'-0"(1829mm)	7'-8"(2337mm)	10'-0"(3048mm)	12'-4"(3759mm)
11 - 12		4'-1"(1245mm)	5'-5"(1651mm)	6'-10"(2083mm)	8'-11"(2118mm)	12'-4"(3759mm)
13 - 14		3'-9"(1143mm)	4'-11"(1499mm)	6'-3"(1905mm)	8'-2"(2489mm)	12'-4"(3759mm)
15 - 16			4'-3"(1295mm)	5'-5"(1651mm)	7'-1"(2159mm)	11'-0"(3353mm)
17			4'-0"(1219mm)	5'-1"(1549mm)	6'-8"(2032mm)	10'-5"(3175mm)

*REFER TO THE LASTDIGITS OF JOIST DESIGNATION CONNECTION TO JOIST MUSTRESIST FORCES LISTED IN TABLE 104.5.1.

IT IS VERY IMPORTANT FOR JOIST SPECIFIERS AND ERECTORS TO KNOW THAT OSHA IS INTERPRETING 29CFR-1926.751(c)2 TO MEAN ALL JOIST FORTY (40) FEET (12192MM) AND LONGER TO REQUIRE A ROW OF BOLTED BRIDGING TO BE IN PLACE BEFORE SLACKENING OF HOISTING LINES.

- NOTES:**
1. Special designed LH and DLH can be supplied in longer lengths. See SLH Series Page 63.
 2. Additional bridging may be required when joists support standing seam roof decks. The specifying professional should require that the joist manufacturer check the system and provide bridging as required to adequately brace the joists against lateral movement. For bridging requirements due to uplift pressures refer to sect. 104.12.

STANDARD LOAD TABLE LONGSPAN STEEL JOISTS, LH-SERIES

Based on a Maximum Allowable Tensile Stress of 30 ksi

Adopted by the Steel Joist Institute May 25, 1983; Revised to May 2, 1994 - Effective September 1, 1994

The black figures in the following table give the TOTAL safe uniformly-distributed load-carrying capacities in pounds per linear foot, of LH Series joists. The weight of DEAD loads, including the joists, must in all cases be deducted to determine the LIVE load-carrying capacities of the joists. The approximate DEAD load of the joists may be determined from the weights per linear foot shown in the tables.

The RED figures in this load table are the LIVE loads per linear foot of joist which will produce an approximate deflection of 1/360 of the span. LIVE loads which will produce a deflection of 1/240 of the span may be obtained by multiplying the RED figures by 1.5. In no case shall the TOTAL load capacity of the joists be exceeded.

This load table applies to joists with either parallel chords or standard pitched top chords. When top chords are pitched, the carrying capacities are determined by the nominal depth of the joists at the center of the span. Standard top chord pitch is 1/8 inch per foot. If pitch exceeds this standard, the load table does not apply. This load table may be used for parallel chord joists installed to a maximum slope of 1/2 inch per foot.

Where the joist span is equal to or greater than the span corresponding to the RED SHADED area of the load table, the row of bridging nearest the mid span shall be diagonal bridging with bolted connections at chords and intersection. Hoisting cables shall not be released until this row of bolted diagonal bridging is completely installed.

Where the joist span is equal to or greater than the span corresponding to the BLUE SHADED area of the load table, all rows of bridging shall be diagonal bridging with bolted connections at chords and intersection. Hoisting cables shall not be released until the two rows of bridging nearest the third points are completely installed.

The approximate moment of inertia of the joist, in inches⁴ is: $I_j = 26.767(W_{LL})(L^3)(10^{-6})$, where W_{LL} = RED figure in the Load Table, and L = (clear span + .67) in feet.

When holes are required in top or bottom chords, the carrying capacities must be reduced in proportion to the reduction of chord areas.

The top chords are considered as being stayed laterally by floor slab or roof deck.

The approximate joist weights per linear foot shown in these tables do not include accessories.

Joist Designation	Approx. Wt. in Lbs. per Linear Ft. (Joists Only)	Depth in Inches	SAFELOAD* in Lbs. Between	CLEAR SPAN IN FEET															
				21-24	25	26	27	28	29	30	31	32	33	34	35	36			
18LH02	10	18	12000	468	442	418	391	367	345	324	306	289	273	259	245				
				313	284	259	234	212	193	175	160	147	135	124	114				
18LH03	11	18	13300	521	493	467	438	409	382	359	337	317	299	283	267				
				348	317	289	262	236	213	194	177	161	148	136	124				
18LH04	12	18	15500	604	571	535	500	469	440	413	388	365	344	325	308				
				403	367	329	296	266	242	219	200	182	167	153	141				
18LH05	15	18	17500	684	648	614	581	543	508	476	448	421	397	375	355				
				454	414	378	345	311	282	256	233	212	195	179	164				
18LH06	15	18	20700	809	749	696	648	605	566	531	499	470	443	418	396				
				526	469	419	377	340	307	280	254	233	212	195	180				
18LH07	17	18	21500	840	809	780	726	678	635	595	559	526	496	469	444				
				553	513	476	428	386	349	317	288	264	241	222	204				
18LH08	19	18	22400	876	843	812	784	758	717	680	641	604	571	540	512				
				577	534	496	462	427	387	351	320	292	267	246	226				
18LH09	21	18	24000	936	901	868	838	810	783	759	713	671	633	598	566				
				616	571	527	491	458	418	380	346	316	289	266	245				
			22-24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
20LH02	10	20	11300	442	437	431	410	388	365	344	325	307	291	275	262	249	237	225	215
				306	303	298	274	250	228	208	190	174	160	147	136	126	117	108	101
20LH03	11	20	12000	469	463	458	452	434	414	395	372	352	333	316	299	283	269	255	243
				337	333	317	302	280	258	238	218	200	184	169	156	143	133	123	114
20LH04	12	20	14700	574	566	558	528	496	467	440	416	393	372	353	335	318	303	289	275
				428	406	386	352	320	291	265	243	223	205	189	174	161	149	139	129
20LH05	14	20	15800	616	609	602	595	571	544	513	484	458	434	411	390	371	353	336	321
				459	437	416	395	366	337	308	281	258	238	219	202	187	173	161	150
20LH06	15	20	21100	822	791	763	723	679	635	596	560	527	497	469	444	421	399	379	361
				606	561	521	477	427	386	351	320	292	267	246	226	209	192	178	165
20LH07	17	20	22500	878	845	814	786	760	711	667	627	590	556	526	497	471	447	425	404
				647	599	556	518	484	438	398	362	331	303	278	256	236	218	202	187
20LH08	19	20	23200	908	873	842	813	785	760	722	687	654	621	588	558	530	503	479	457
				669	619	575	536	500	468	428	395	365	336	309	285	262	242	225	209
20LH09	21	20	25400	990	953	918	886	856	828	802	778	755	712	673	636	603	572	544	517
				729	675	626	581	542	507	475	437	399	366	336	309	285	264	244	227
20LH10	23	20	27400	1068	1028	991	956	924	894	865	839	814	791	748	707	670	636	604	575
				786	724	673	626	585	545	510	479	448	411	377	346	320	296	274	254



STANDARD LOAD TABLE/LONGSPAN STEEL JOISTS, LH-SERIES

Based on a Maximum Allowable Tensile Stress of 30 ksi

Joist Designation	Approx. Wt. in Lbs. per Linear Ft. (Joists Only)	Depth in Inches	SAFELOAD* in Lbs. Between		CLEAR SPAN IN FEET															
			28-32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	
24LH03	11	24	11500	342 235	339 226	336 218	323 204	307 188	293 175	279 162	267 152	255 141	244 132	234 124	224 116	215 109	207 102	199 96	191 90	
24LH04	12	24	14100	419 288	398 265	379 246	360 227	343 210	327 195	312 182	298 169	285 158	273 148	262 138	251 130	241 122	231 114	222 107	214 101	
24LH05	13	24	15100	449 308	446 297	440 285	419 264	399 244	380 226	363 210	347 196	331 182	317 171	304 160	291 150	280 141	269 132	258 124	248 117	
24LH06	16	24	20300	604 411	579 382	555 356	530 331	504 306	480 284	457 263	437 245	417 228	399 211	381 197	364 184	348 172	334 161	320 152	307 142	
24LH07	17	24	22300	665 452	638 421	613 393	588 367	565 343	541 320	516 297	491 276	468 257	446 239	426 223	407 208	389 195	373 182	357 171	343 161	
24LH08	18	24	23800	707 480	677 447	649 416	622 388	597 362	572 338	545 314	520 292	497 272	475 254	455 238	435 222	417 208	400 196	384 184	369 173	
24LH09	21	24	28000	832 562	808 530	785 501	764 460	731 424	696 393	663 363	632 337	602 313	574 292	548 272	524 254	501 238	480 223	460 209	441 196	
24LH10	23	24	29600	882 596	856 559	832 528	809 500	788 474	768 439	737 406	702 378	668 351	637 326	608 304	582 285	556 266	533 249	511 234	490 220	
24LH11	25	24	31200	927 624	900 588	875 555	851 525	829 498	807 472	787 449	768 418	734 388	701 361	671 337	642 315	616 294	590 276	567 259	544 243	
			**																	
			33-40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	
28LH05	13	28	14000	337 219	323 205	310 192	297 180	286 169	275 159	265 150	255 142	245 133	237 126	228 119	220 113	213 107	206 102	199 97	193 92	
28LH06	16	28	18600	448 289	429 270	412 253	395 238	379 223	364 209	350 197	337 186	324 175	313 166	301 156	291 148	281 140	271 133	262 126	25	
28LH07	17	28	21000	505 326	484 305	464 285	445 267	427 251	410 236	394 222	379 209	365 197	352 186	339 176	327 166	319 158	305 150	295 142	285 135	
28LH08	18	28	22500	540 348	517 325	496 305	475 285	456 268	438 252	420 236	403 222	387 209	371 196	357 185	344 175	331 165	319 156	308 148	297 140	
28LH09	21	28	27700	667 428	639 400	612 375	586 351	563 329	540 309	519 291	499 274	481 258	463 243	446 228	430 216	415 204	401 193	387 183	374 173	
28LH10	23	28	30300	729 466	704 439	679 414	651 388	625 364	600 342	576 322	554 303	533 285	513 269	495 255	477 241	460 228	444 215	429 204	415 193	
28LH11	25	28	32500	780 498	762 475	736 448	711 423	682 397	655 373	629 351	605 331	582 312	561 294	540 278	521 263	502 249	485 236	468 223	453 212	
28LH12	27	28	35700	857 545	837 520	818 496	800 476	782 454	766 435	737 408	709 383	682 361	656 340	632 321	609 303	587 285	566 270	546 256	527 243	
28LH13	30	28	37200	895 569	874 543	854 518	835 495	816 472	799 452	782 433	766 415	751 396	722 373	694 352	668 332	643 314	620 297	598 281	577 266	
			**																	
			38-46	47-48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
32LH06	14	32	16700	338 211	326 199	315 189	304 179	294 169	284 161	275 153	266 145	257 138	249 131	242 125	234 119	227 114	220 108	214 104	208 99	
32LH07	16	32	18800	379 235	366 223	353 211	341 200	329 189	318 179	308 170	298 162	288 154	279 146	271 140	262 133	254 127	247 121	240 116	233 111	
32LH08	17	32	20400	411 255	397 242	383 229	369 216	357 205	345 194	333 184	322 175	312 167	302 159	293 151	284 144	275 137	267 131	259 125	252 120	
32LH09	21	32	25600	516 319	498 302	480 285	463 270	447 256	432 243	418 230	404 219	391 208	379 198	367 189	356 180	345 172	335 164	325 157	315 149	
32LH10	21	32	28300	571 352	550 332	531 315	512 297	495 282	478 267	462 254	445 240	430 228	416 217	402 206	389 196	376 189	364 178	353 169	342 162	
32LH11	24	32	31000	625 385	602 363	580 343	560 325	541 308	522 292	505 277	488 263	473 251	458 239	443 227	429 216	416 206	403 196	390 187	378 179	
32LH12	27	32	36400	734 450	712 428	688 406	664 384	641 364	619 345	598 327	578 311	559 295	541 281	524 267	508 255	492 243	477 232	463 221	449 211	
32LH13	30	32	40600	817 500	801 480	785 461	771 444	742 420	715 397	690 376	666 354	643 336	621 319	600 304	581 288	562 275	544 262	527 249	511 238	
32LH14	33	32	41800	843 515	826 495	810 476	795 458	780 440	766 417	738 395	713 374	688 355	665 337	643 321	622 304	602 290	583 276	564 264	547 251	
32LH15	35	32	43200	870 532	853 511	837 492	821 473	805 454	791 438	776 422	763 407	750 393	725 374	701 355	678 338	656 322	635 306	616 292	597 279	
			**																	
			42-46	47-56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
36LH07	16	36	16800	292 177	283 168	274 160	266 153	258 146	251 140	244 134	237 128	230 122	224 117	218 112	212 107	207 103	201 99	196 95	191 91	
36LH08	18	36	18500	321 194	311 185	302 176	293 168	284 160	276 153	268 146	260 140	253 134	246 128	239 123	233 118	227 113	221 109	215 104	209 100	
36LH09	21	36	23700	411 247	398 235	386 224	374 214	363 204	352 195	342 186	333 179	323 171	314 163	306 157	297 150	289 144	282 138	275 133	267 127	
36LH10	21	36	26100	454 273	440 260	426 248	413 236	401 225	389 215	378 206	367 197	357 188	347 180	338 173	328 165	320 159	311 152	303 146	295 140	
36LH11	23	36	28500	495 297	480 283	465 269	451 257	438 246	425 234	412 224	401 214	389 205	378 196	368 188	358 180	348 173	339 166	330 159	322 153	
36LH12	25	36	34100	593 354	575 338	557 322	540 307	523 292	508 279	493 267	478 255	464 243	450 232	437 222	424 213	412 204	400 195	389 187	378 179	
36LH13	30	36	40100	697 415	675 395	654 376	634 359	615 342	596 327	579 312	562 298	546 285	531 273	516 262	502 251	488 240	475 231	463 221	451 213	
36LH14	36	36	44200	768 456	755 434	729 412	706 392	683 373	661 356	641 339	621 323	602 309	584 295	567 283	551 270	535 259	520 247	505 237	492 228	
36LH15	36	36	46600	809 480	795 464	781 448	769 434	744 413	721 394	698 375	677 358	656 342	637 327	618 312	600 299	583 286	567 274	551 263	536 252	

STANDARD LOAD TABLE/LONGSPAN STEEL JOISTS, LH-SERIES

Based on a Maximum Allowable Tensile Stress of 30 ksi

Joist Designation	Approx. Wt. in Lbs. per Linear Ft. (Joists Only)	Depth in Inches	SAFELOAD* in Lbs. Between		CLEAR SPAN IN FEET															
			47-59	60-64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
40LH08	16	40	16600	16600	254	247	241	234	228	222	217	211	206	201	196	192	187	183	178	174
40LH09	21	40	21800	21800	332	323	315	306	298	291	283	276	269	263	256	250	244	239	233	228
40LH10	21	40	24000	24000	367	357	347	338	329	321	313	305	297	290	283	276	269	262	255	249
40LH11	22	40	26200	26200	399	388	378	368	358	349	340	332	323	315	308	300	293	286	279	273
40LH12	25	40	31900	31900	486	472	459	447	435	424	413	402	392	382	373	364	355	346	338	330
40LH13	30	40	37600	37600	573	557	542	528	514	500	487	475	463	451	440	429	419	409	399	390
40LH14	35	40	43000	43000	656	638	620	603	587	571	556	542	528	515	502	490	478	466	455	444
40LH15	36	40	48100	48100	734	712	691	671	652	633	616	599	583	567	552	538	524	511	498	486
40LH16	42	40	53000	53000	808	796	784	772	761	751	730	710	691	673	655	638	622	606	591	576
			52-59	60-72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88
44LH09	19	44	20000	20000	272	265	259	253	247	242	236	231	226	221	216	211	207	202	198	194
44LH10	21	44	22100	22100	300	293	286	279	272	266	260	254	249	243	238	233	228	223	218	214
44LH11	22	44	23900	23900	325	317	310	302	295	289	282	276	269	264	258	252	247	242	236	232
44LH12	25	44	29600	29600	402	393	383	374	365	356	347	339	331	323	315	308	300	293	287	280
44LH13	30	44	35100	35100	477	466	454	444	433	423	413	404	395	386	377	369	361	353	346	338
44LH14	31	44	40400	40400	549	534	520	506	493	481	469	457	446	436	425	415	406	396	387	379
44LH15	36	44	47000	47000	639	623	608	593	579	565	551	537	524	512	500	488	476	466	455	445
44LH16	42	44	54200	54200	737	719	701	684	668	652	637	622	608	594	580	568	555	543	531	520
44LH17	47	44	58200	58200	790	780	769	759	750	732	715	699	683	667	652	638	624	610	597	584
			56-59	60-80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
48LH10	21	48	20000	20000	246	241	236	231	226	221	217	212	208	204	200	196	192	188	185	181
48LH11	22	48	21700	21700	266	260	255	249	244	239	234	229	225	220	216	212	208	204	200	196
48LH12	25	48	27400	27400	336	329	322	315	308	301	295	289	283	277	272	266	261	256	251	246
48LH13	29	48	32800	32800	402	393	384	376	368	360	353	345	338	332	325	318	312	306	300	294
48LH14	32	48	38700	38700	475	464	454	444	434	425	416	407	399	390	383	375	367	360	353	346
48LH15	36	48	44500	44500	545	533	521	510	499	488	478	468	458	448	439	430	422	413	405	397
48LH16	42	48	51300	51300	629	615	601	588	576	563	551	540	528	518	507	497	487	477	468	459
48LH17	47	48	57600	57600	706	690	675	660	646	632	619	606	593	581	569	558	547	536	525	515

* The safe uniform load for the clear spans shown in the Safe Load Column is equal to (Safe Load)/(Clear span + 0.67). (The added 0.67 feet (8 inches) is required to obtain the proper length on which the Load Tables were developed).

In no case shall the safe uniform load, for clear spans less than the minimum clear span shown in the Safe Load Column, exceed the uniform load calculated for the minimum clear span listed in the Safe Load Column.

To solve for live loads for clear spans shown in the Safe Load Column (or lesser clear spans), multiply the live

load of the shortest clear span shown in the Load Table by (the shortest clear span shown in the Load Table + 0.67 feet)² and divide by (the actual clear span + 0.67 feet)². The live load shall not exceed the safe uniform load.

****IT IS VERY IMPORTANT FOR JOIST SPECIFIERS AND ERECTORS TO KNOW THAT OSHA IS INTERPRETING 29CFR-1926.75(c)2 TO MEAN ALL JOIST FORTY (40) FEET (12192MM) AND LONGER TO REQUIRE A ROW OF BOLTED BRIDGING TO BE IN PLACE BEFORE SLACKENING OF HOISTING LINES.**



STANDARD LOAD TABLE DEEP LONGSPAN STEEL JOISTS, DLH-SERIES

Based on a Maximum Allowable Tensile Stress of 30,000 psi

Adopted by the Steel Joist Institute May 25, 1983; Revised to May 2, 1994 - Effective September 1, 1994

The black figures in the following table give the TOTAL safe uniformly-distributed load-carrying capacities in pounds per linear foot, of **DLH-Series** joists. The weight of DEAD loads, including the joists, must in all cases be deducted to determine the LIVE load-carrying capacities of the joists. The approximate DEAD load of the joists may be determined from the weights per linear foot shown in the tables. All loads shown are for roof construction only.

The **RED** figures in this load table are the LIVE loads per linear foot of joist which will produce an approximate deflection of 1/360 of the span. LIVE loads which will produce a deflection of 1/240 of the span may be obtained by multiplying the **RED** figures by 1.5. In no case shall the TOTAL load capacity of the joist be exceeded.

This load table applies to joists with either parallel chords or standard pitched top chords. When top chords are pitched, the carrying capacities are determined by the nominal depth of the joists at center of the span. Standard top chord pitch is 1/8 inch per foot. If pitch exceeds this standard, the load table does not apply. This load table may be used for parallel chord joists installed to a maximum slope of 1/2 inch per foot.

All rows of bridging shall be diagonal bridging with bolted connections at the chords and intersections.

Where the span of the joist is equal to or greater than the span corresponding to the BLUE SHADED area of the load table hoisting cables shall not be released until the two rows of bridging nearest the third points are completely installed.

Where the span of the joist is equal to or greater than the span corresponding to the GRAY SHADED area of the load table hoisting cables shall not be released until all rows of bridging are completely installed.

The approximate moment of inertia of the joist, in inches⁴ $I_j = 26.767(W_{LL}(L^3)(10^{-6})$, where W_{LL} = **RED** figure in the Load Table, and L = (clear span + .67) in feet.

When holes are required in top or bottom chords, the carrying capacities must be reduced in proportion to the reduction of chord areas.

The top chords are considered as being stayed laterally by the roof deck.

The approximate joist weights per linear foot shown in these tables do not include accessories.

Joist Designation	Approx. Wt. in Lbs. per Linear Ft. (Joists Only)	Depth in Inches	SAFELOAD* in Lbs. Between	CLEAR SPAN IN FEET													
				61-88	89	90	91	92	93	94	95	96	97	98	99	100	101
52DLH10	25	52	26700	298	291	285	279	273	267	261	256	251	246	241	236	231	227
				171	165	159	154	150	1475	140	136	132	128	124	120	116	114
52DLH11	26	52	29300	327	320	313	306	299	293	287	281	275	270	264	259	254	249
				187	181	174	169	164	158	153	149	144	140	135	132	128	124
52DLH12	29	52	32700	365	357	349	342	334	327	320	314	307	301	295	289	284	278
				204	197	191	185	179	173	168	163	158	153	149	144	140	135
52DLH13	34	52	39700	443	433	424	414	406	397	389	381	373	366	358	351	344	338
				247	239	231	224	216	209	203	197	191	185	180	174	170	164
52DLH14	39	52	45400	507	497	486	476	466	457	447	438	430	421	413	405	397	390
				276	266	258	249	242	234	227	220	213	207	201	194	189	184
52DLH15	42	52	51000	569	557	545	533	522	511	500	490	480	470	461	451	443	434
				311	301	291	282	272	264	256	247	240	233	226	219	213	207
52DLH16	45	52	55000	614	601	588	575	563	551	540	528	518	507	497	487	478	468
				346	335	324	314	304	294	285	276	267	260	252	245	237	230
52DLH17	52	52	63300	706	691	676	661	647	634	620	608	595	583	572	560	549	539
				395	381	369	357	346	335	324	315	304	296	286	279	270	263
				66-96	97	98	99	100	101	102	103	104	105	106	107	108	109
56DLH11	26	56	28100	288	283	277	272	267	262	257	253	248	244	239	235	231	227
				169	163	158	153	149	145	140	136	133	129	125	122	118	115
56DLH12	30	56	32300	331	324	318	312	306	300	295	289	284	278	273	268	263	259
				184	178	173	168	163	158	153	150	145	141	137	133	130	126
56DLH13	34	56	39100	401	394	386	379	372	365	358	351	344	338	331	325	319	314
				223	216	209	204	197	191	186	181	175	171	166	161	157	152
56DLH14	39	56	44200	453	444	435	427	419	411	403	396	388	381	375	368	361	355
				249	242	234	228	221	214	209	202	196	190	186	181	175	171
56DLH15	42	56	50500	518	508	498	488	478	469	460	451	443	434	426	419	411	403
				281	272	264	256	248	242	234	228	221	215	209	204	198	192
56DLH16	46	56	54500	559	548	537	526	516	506	496	487	478	469	460	452	444	436
				313	304	294	285	277	269	262	254	247	240	233	227	221	214
56DLH17	51	56	62800	643	630	618	605	594	582	571	560	549	539	529	520	510	501
				356	345	335	325	316	306	298	289	281	273	266	258	251	245



STANDARD LOAD TABLE/DEEP LONGSPAN STEEL JOISTS, DLH SERIES

Based on a Maximum Allowable Tensile Stress of 30 ksi

Joist Designation	Approx. Wt. in Lbs. per Linear Ft. (Joists Only)	Depth in Inches	SAFELOAD* in Lbs. Between		CLEAR SPAN IN FEET																	
			70-99	100-104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120		
60DLH12	29	60	31100	31100	295	289	284	279	274	270	265	261	256	252	248	244	240	236	232	228		
					168	163	158	154	150	146	142	138	134	131	128	124	121	118	115	113		
60DLH13	35	60	37800	37800	358	351	345	339	333	327	322	316	311	306	301	296	291	286	282	277		
					203	197	191	187	181	176	171	167	163	158	154	151	147	143	139	135		
60DLH14	40	60	42000	42000	398	391	383	376	370	363	356	350	344	338	332	327	321	316	310	305		
					216	210	205	199	193	189	183	178	173	170	165	161	156	152	149	145		
60DLH15	43	60	49300	49300	467	458	450	442	434	427	419	412	405	398	392	385	379	373	367	361		
					255	248	242	235	228	223	216	210	205	200	194	190	185	180	175	171		
60DLH16	46	60	54200	54200	513	504	494	485	476	468	460	451	444	436	428	421	414	407	400	393		
					285	277	269	262	255	247	241	235	228	223	217	211	206	201	196	190		
60DLH17	52	60	62300	62300	590	579	569	558	548	538	529	519	510	501	493	484	476	468	460	453		
					324	315	306	298	290	283	275	267	261	254	247	241	235	228	223	217		
60DLH18	59	60	71900	71900	681	668	656	644	632	621	610	599	589	578	568	559	549	540	531	522		
					366	357	346	337	327	319	310	303	294	286	279	272	266	259	252	246		
			75-99	100-112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128		
64DLH12	31	64	30000	30000	264	259	255	251	247	243	239	235	231	228	224	221	218	214	211	208		
					153	150	146	142	138	135	132	129	125	122	119	116	114	111	109	106		
64DLH13	34	64	36400	36400	321	315	310	305	300	295	291	286	281	277	273	269	264	260	257	253		
					186	181	176	171	168	163	159	155	152	148	144	141	137	134	131	128		
64DLH14	40	64	41700	41700	367	360	354	349	343	337	332	326	321	316	311	306	301	296	292	287		
					199	193	189	184	179	174	171	166	162	158	154	151	147	143	140	136		
64DLH15	43	64	47800	47800	421	414	407	400	394	387	381	375	369	363	358	352	347	341	336	331		
					234	228	223	217	211	206	201	196	191	187	182	177	173	170	165	161		
64DLH16	46	64	53800	53800	474	466	458	450	443	435	428	421	414	407	401	394	388	382	376	370		
					262	254	248	242	235	229	224	218	213	208	203	198	193	189	184	180		
64DLH17	52	64	62000	62000	546	536	527	518	509	501	492	484	476	468	461	454	446	439	432	426		
					298	290	283	275	268	262	255	248	243	237	231	226	220	215	210	205		
64DLH18	59	64	71600	71600	630	619	608	598	587	578	568	559	549	540	532	523	515	507	499	491		
					337	328	320	311	304	296	288	282	274	267	261	255	249	243	237	232		
			80-99	100-120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136		
68DLH13	37	68	35000	35000	288	284	279	275	271	267	263	259	255	252	248	244	241	237	234	231		
					171	168	164	159	155	152	149	145	142	138	135	133	130	127	124	121		
68DLH14	40	68	40300	40300	332	327	322	317	312	308	303	299	294	290	286	281	277	273	269	266		
					184	179	175	171	167	163	159	155	152	148	145	141	138	135	133	130		
68DLH15	40	68	45200	45200	372	365	360	354	348	343	337	332	327	322	317	312	308	303	299	294		
					206	201	196	191	187	182	178	174	170	166	162	158	155	152	148	145		
68DLH16	49	68	53600	53600	441	433	427	420	413	407	400	394	388	382	376	371	365	360	354	349		
					242	236	230	225	219	214	209	204	199	195	190	186	182	178	174	171		
68DLH17	55	68	60400	60400	497	489	481	474	467	460	453	446	439	433	427	420	414	408	403	397		
					275	268	262	256	249	244	238	232	228	222	217	212	208	203	198	194		
68DLH18	61	68	69900	69900	575	566	557	549	540	532	524	516	508	501	493	486	479	472	465	459		
					311	304	297	289	283	276	269	263	257	251	246	240	234	230	225	219		
68DLH19	67	68	80500	80500	662	651	641	631	621	611	601	592	583	574	565	557	548	540	532	525		
					353	344	336	328	320	313	305	298	291	285	278	272	266	260	254	248		
			84-99	100-128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144		
72DLH14	41	72	39200	39200	303	298	294	290	285	281	277	274	270	266	262	259	255	252	248	245		
					171	167	163	159	155	152	149	146	143	139	136	133	131	128	128	129		
72DLH15	44	72	44900	44900	347	342	336	331	326	322	317	312	308	303	299	295	291	286	282	279		
					191	187	183	178	174	171	167	163	160	156	152	150	147	143	140	137		
72DLH16	50	72	51900	51900	401	395	390	384	378	373	368	363	358	353	348	343	338	334	329	325		
					225	219	214	209	205	200	196	191	188	183	179	175	171	169	165	161		
72DLH17	56	72	58400	58400	451	445	438	432	426	420	414	408	402	397	391	386	381	376	371	366		
					256	250	245	239	233	228	224	218	213	209	205	200	196	191	188	184		
72DLH18	59	72	68400	68400	528	520	512	505	497	490	483	479	470	463	457	450	444	438	432	426		
					289	283	276	270	265	258	252	247	242	236	231	227	222	217	212	209		
72DLH19	70	72	80200	80200	619	609	600	591	582	573	565	557	549	541	533	526	518	511	504	497		
					328	321	313	306	300	293	286	280	274	268	263	257	251	247	241	236		

*The safe uniform load for the clear spans shown in the Safe Load Column is equal to (Safe Load)/(Clear span + 0.67). (The added 0.67 feet (8 inches) is required to obtain the proper length on which the Load Tables were developed).

In no case shall the safe uniform load, for clear spans less than the minimum clear span shown in the Safe Load Column, exceed the uniform load calculated for the minimum clear span listed in the Safe Load Column.

To solve for live loads for clear spans shown in the Safe Load Column (or lesser clear spans), multiply the live load of the shortest clear span shown in the Load Table by (the shortest clear span shown in the Load Table + 0.67 feet)² and divide by (the actual clear span + 0.67 feet)². The live load shall not exceed the safe uniform load.



METRIC LOAD TABLE LONGSPAN STEEL JOISTS, LH-SERIES

Based on a Maximum Allowable Tensile Stress of 207 MPa

Adopted by the Steel Joist Institute May 2, 1994 - Effective September 1, 1994

The black figures in the following table give the TOTAL safe uniformly-distributed load-carrying capacities, in kilonewton per meter, of LH-Series Joists. The weight (kn/m) of DEAD loads, including the joists, must in all cases be deducted to determine the LIVE load-carrying capacities of the joists. The approximate DEAD load of the joists may be determined from the weights per linear foot shown in the tables.

The RED figures in this load table are the LIVE loads (kiloNewtons per meter) of joist which will produce an approximate deflection of 1/360 of the span. LIVE loads which will produce a deflection of 1/240 of the span may be obtained by multiplying the RED figures by 1.5. In no case shall the TOTAL load capacity of the joists be exceeded.

This load table applies to joists with either parallel chords or standard pitched top chords. When top chords are pitched, the carrying capacities are determined by the nominal depth of the joists at the center of the span. Standard top chord pitch is 1:96. If pitch exceeds this standard, the load table does not apply. This load table may be used for parallel chord joists installed to a maximum slope of 1:24.

Where the joist span is equal to or greater than the span corresponding to the RED SHADED area of the load table, the row of bridging nearest the mid span shall be diagonal bridging with bolted connections at chords and intersection. Hoisting cables shall not be released until this row of bolted diagonal bridging is completely installed.

Where the joist span is equal to or greater than the span corresponding to the BLUE SHADED area of the load table, all rows of bridging shall be diagonal bridging with bolted connections at chords and intersection. Hoisting cables shall not be released until the two rows of bridging nearest the third points are completely installed.

When holes are required in top or bottom chords, the carrying capacities must be reduced in proportion to reduction of chord areas.

The top chords are considered as being stayed laterally by floor slab or roof deck.

The approximate joist weights (kg/m) and mass (kN/m) shown in these tables do **not** include accessories.

The approximate moment of inertia of the joist, in(mm⁴) is:

$I_j = 2.6953 (W_{LL})(L^3)(10^{-5})$, where W_{LL} = RED figure in the Load Table; L = (Span + 204) in millimeters.

** IMPORTANT NOTICE**

BASED UPON FINDINGS OF INDUSTRY SPONSORED RESEARCH, THE STEEL JOIST INSTITUTE HAS DEVELOPED NEW REQUIREMENTS FOR THE USE OF ERECTION STABILITY BRIDGING. THE NEW SJI SPECIFICATIONS REQUIRE BOLTED DIAGONAL BRIDGING TO BE INSTALLED FOR SOME K-SERIES AND LH-SERIES JOISTS BEFORE SLACKENING THE HOISTING LINES. THE JOIST SPANS REQUIRING THIS STABILITY BRIDGING ARE SHADED IN THE LOAD TABLES.

IT IS VERY IMPORTANT FOR JOIST SPECIFIERS AND ERECTORS TO KNOW THAT OSHA IS INTERPRETING 29CFR-1926 (c)2 TO MEAN ALL FORTY (40) FEET (12192MM) AND LONGER TO REQUIRE A ROW OF BOLTED BRIDGING TO BE IN PLACE BEFORE SLACKENING OF HOISTING LINES.



STANDARD LOAD TABLE IN METRIC UNITS/OPEN WEB STEEL JOISTS, LH-SERIES SAFE UNIFORMLY DISTRIBUTED LOAD IN KILONEWTONS/METER

Joist Designation	Approx. Mass (kN / m)	Approx. Mass (kg / m)	Depth (mm)	SAFE LOAD* In kN Between	CLEAR SPAN (mm)															
				6400-7315	7619	7924	8229	8534	8839	9144	9448	9753	10058	10363	10668	10972				
18LH02	0.15	15	457	53.3	6.82 4.56	6.45 4.14	6.10 3.77	5.70 3.41	5.35 3.09	5.03 2.81	4.72 2.55	4.46 2.33	4.21 2.14	3.98 1.97	3.77 1.80	3.57 1.66				
18LH03	0.16	16	457	59.1	7.60 5.07	7.19 4.62	6.81 4.21	6.39 3.82	5.96 3.44	5.57 3.10	5.23 2.83	4.91 2.58	4.62 2.34	4.36 2.15	4.13 1.98	3.89 1.80				
18LH04	0.18	18	457	68.9	8.81 5.88	8.33 5.35	7.80 4.80	7.29 4.31	6.84 3.88	6.42 3.53	6.02 3.19	5.66 2.91	5.32 2.65	5.02 2.43	4.74 2.23	4.49 2.05				
18LH05	0.22	22	457	77.8	9.98 6.62	9.45 6.04	8.96 5.51	8.47 5.03	7.92 4.53	7.41 4.11	6.94 3.73	6.53 3.40	6.14 3.09	5.79 2.84	5.47 2.61	5.18 2.39				
18LH06	0.22	22	457	92.0	11.80 7.67	10.93 6.84	10.15 6.11	9.45 6.11	8.82 4.96	8.26 4.48	7.74 4.08	7.28 3.70	6.85 3.38	6.46 3.09	6.10 2.84	5.77 2.62				
18LH07	0.25	25	457	95.6	12.25 8.07	11.8 7.48	11.38 6.94	10.59 6.24	9.89 5.63	9.26 5.09	8.68 4.62	8.15 4.20	7.67 3.85	7.23 3.51	6.84 3.23	6.47 2.97				
18LH08	0.28	28	457	99.6	12.78 8.42	12.3 7.79	11.85 7.23	11.44 6.74	11.06 6.23	10.46 5.64	9.92 5.12	9.35 4.67	8.81 4.26	8.33 3.89	7.88 3.59	7.47 3.29				
18LH09	0.31	31	457	106.7	13.65 8.98	13.14 8.33	12.66 7.69	12.22 7.16	11.82 6.68	11.42 6.10	11.07 5.54	10.4 5.04	9.79 4.61	9.23 4.21	8.72 3.88	8.26 3.57				
				6705-7315	7619	7924	8229	8534	8839	9144	9448	9753	10058	10363	10668	10972	11277	11582	11887	12192
20LH02	0.15	15	508	50.2	6.45 4.46	6.37 4.42	6.28 4.34	5.98 3.99	5.66 3.64	5.32 3.32	5.02 3.03	4.74 2.77	4.48 2.53	4.24 2.33	4.01 2.14	3.82 1.98	3.63 1.83	3.45 1.70	3.28 1.57	3.13 1.47
20LH03	0.16	16	508	53.3	6.84 4.91	6.75 4.85	6.68 4.62	6.59 4.40	6.33 4.08	6.04 3.76	5.76 3.47	5.42 3.18	5.13 2.91	4.85 2.68	4.61 2.46	4.36 2.27	4.13 2.08	3.92 1.94	3.72 1.79	3.54 1.66
20LH04	0.18	18	508	65.3	8.37 6.24	8.26 5.92	8.14 5.63	7.70 5.13	7.23 4.67	6.81 4.24	6.42 3.86	6.07 3.54	5.73 3.25	5.42 2.99	5.15 2.75	4.88 2.53	4.64 2.34	4.42 2.17	4.21 2.02	4.01 1.88
20LH05	0.20	21	508	70.2	8.98 6.69	8.88 6.37	8.78 6.07	8.68 5.76	8.33 5.34	7.93 4.91	7.48 4.49	7.06 4.10	6.68 3.76	6.33 3.47	5.99 3.19	5.69 2.94	5.41 2.72	5.15 2.52	4.90 2.34	4.68 2.18
20LH06	0.22	22	508	93.8	11.99 8.84	11.54 8.18	11.13 7.60	10.55 6.96	9.90 6.23	9.26 5.63	8.69 5.12	8.17 4.67	7.69 4.26	7.25 3.89	6.84 3.59	6.47 3.29	6.14 3.05	5.82 2.80	5.53 2.59	5.26 2.40
20LH07	0.25	25	508	100.0	12.81 9.44	12.33 8.74	11.87 8.11	11.47 7.55	11.09 7.06	10.37 6.39	9.73 5.80	9.15 5.28	8.61 4.83	8.11 4.42	7.67 4.05	7.25 3.73	6.87 3.44	6.52 3.18	6.20 2.94	5.89 2.72
20LH08	0.28	28	508	103.1	13.25 9.76	12.74 9.03	12.28 8.39	11.86 7.82	11.45 7.29	11.09 6.82	10.53 6.24	10.02 5.76	9.54 5.32	9.06 4.90	8.58 4.50	8.14 4.15	7.73 3.82	7.34 3.53	6.99 3.28	6.66 3.05
20LH09	0.31	31	508	112.9	14.44 10.63	13.9 9.85	13.39 9.13	12.93 8.47	12.49 7.90	12.08 7.39	11.7 6.37	11.35 5.82	11.01 5.34	10.39 4.90	9.82 4.50	9.28 4.15	8.80 3.85	8.34 3.56	7.93 3.31	7.54 3.31
20LH10	0.34	34	508	121.8	15.58 11.47	15.00 10.56	14.46 9.82	13.95 9.13	13.48 8.53	13.04 7.95	12.62 7.44	12.24 6.99	11.87 6.53	11.54 5.99	10.91 5.50	10.31 5.04	9.77 4.67	9.28 4.31	8.81 3.99	8.39 3.70
				8534-9753	10058	10363	10668	10972	11277	11582	11887	12192	12496	12801	13106	13411	13715	14020	14325	14630
24LH03	0.16	16	610	51.1	4.99 3.42	4.94 3.29	4.90 3.18	4.71 2.97	4.48 2.74	4.27 2.55	4.07 2.36	3.89 2.21	3.72 2.05	3.56 1.92	3.41 1.80	3.26 1.69	3.13 1.59	3.02 1.48	2.90 1.40	2.78 1.31
24LH04	0.18	18	610	62.7	6.11 4.20	5.80 3.86	5.53 3.59	5.25 3.31	5.00 3.06	4.77 2.84	4.55 2.65	4.34 2.46	4.15 2.30	3.98 2.15	3.82 2.01	3.66 1.89	3.51 1.78	3.37 1.66	3.23 1.56	3.12 1.47
24LH05	0.19	19	610	67.1	6.55 4.49	6.50 4.33	6.42 4.15	6.11 3.85	5.82 3.56	5.54 3.29	5.29 3.06	5.06 2.86	4.83 2.65	4.62 2.49	4.43 2.33	4.24 2.18	4.08 2.05	3.92 1.92	3.76 1.80	3.61 1.70
24LH06	0.23	24	610	90.2	8.81 5.99	8.44 5.57	8.09 5.19	7.73 4.83	7.35 4.46	7.00 4.14	6.66 3.83	6.37 3.57	6.08 3.32	5.82 3.07	5.56 2.87	5.31 2.68	5.07 2.51	4.87 2.34	4.67 2.21	4.48 2.07
24LH07	0.25	25	610	99.1	9.70 6.59	9.31 6.14	8.94 5.73	8.58 5.35	8.24 5.00	7.89 4.67	7.53 4.33	7.16 4.02	6.82 3.75	6.50 3.48	6.21 3.25	5.93 3.03	5.67 2.84	5.44 2.65	5.21 2.49	5.00 2.34
24LH08	0.26	27	610	105.8	10.31 7.00	9.88 6.52	9.47 6.07	9.07 5.66	8.71 5.28	8.34 4.93	7.95 4.58	7.58 4.26	7.25 3.96	6.93 3.70	6.64 3.47	6.34 3.23	6.08 3.03	5.83 2.86	5.60 2.68	5.38 2.52
24LH09	0.31	31	610	124.5	12.14 8.20	11.79 7.73	11.45 7.31	11.14 6.71	10.66 6.18	10.15 5.73	9.67 5.29	9.22 4.91	8.78 4.56	8.37 4.26	7.99 3.96	7.64 3.70	7.31 3.47	7.00 3.25	6.71 3.05	6.43 2.86
24LH10	0.34	34	610	131.6	12.87 8.69	12.49 8.15	12.14 7.70	11.80 7.29	11.49 6.91	11.2 6.40	10.75 5.92	10.24 5.51	9.74 5.12	9.29 4.75	8.87 4.43	8.49 4.15	8.11 3.88	7.77 3.63	7.45 3.41	7.15 3.21
24LH11	0.36	37	610	138.7	13.52 9.10	13.13 8.58	12.76 8.09	12.41 7.66	12.09 7.26	11.77 6.88	11.48 6.55	11.20 6.10	10.71 5.66	10.23 5.26	9.79 4.91	9.36 4.59	8.98 4.29	8.61 4.02	8.27 3.77	7.93 3.54

**** IT IS VERY IMPORTANT FOR JOIST SPECIFIERS AND ERECTORS TO KNOW THAT OSHA IS INTERPRETING 29CFR-1926.751(c)2 TO MEAN ALL FORTY (40) FEET (12192MM) AND LONGER TO REQUIRE A ROW OF BOLTED BRIDGING TO BE IN PLACE BEFORE SLACKENING OF HOISTING LINES.**



STANDARD LOAD TABLE IN METRIC UNITS/OPEN WEB STEEL JOISTS, LH-SERIES SAFE UNIFORMLY DISTRIBUTED LOAD IN KILONEWTONS/METER

Joist Designation	Approx. Mass (kN / m)	Approx. Mass (kg / m)	Depth (mm)	SAFE LOAD*	CLEAR SPAN (mm)																	
				In kN Between **																		
				10058-12192	12496	12801	13106	13411	13715	14020	14325	14630	14935	15239	15544	15849	16154	16459	16764	17068		
28LH05	0.19	19	711	62.2	4.91 3.19	4.71 2.99	4.52 2.80	4.33 2.62	4.17 2.46	4.01 2.32	3.86 2.18	3.72 2.07	3.57 1.94	3.45 1.83	3.32 1.73	3.21 1.64	3.10 1.56	3.00 1.48	2.90 1.41	2.81 1.34		
28LH06	0.23	24	711	82.7	6.53 4.21	6.26 3.94	6.01 3.69	5.76 3.47	5.53 3.25	5.31 3.05	5.10 2.87	4.91 2.71	4.72 2.55	4.56 2.42	4.39 2.27	4.24 2.15	4.10 2.04	3.95 1.94	3.82 1.83	3.69 1.75		
28LH07	0.25	25	711	93.4	7.36 4.75	7.06 4.45	6.77 4.15	6.49 3.89	6.23 3.66	5.98 3.44	5.74 3.23	5.53 3.05	5.32 2.87	5.13 2.71	4.94 2.56	4.77 2.42	4.61 2.30	4.45 2.18	4.30 2.07	4.15 1.97		
28LH08	0.26	27	711	100.0	7.88 5.07	7.54 4.74	7.23 4.45	6.93 4.15	6.65 3.91	6.39 3.67	6.12 3.44	5.88 3.23	5.64 3.05	5.41 2.86	5.21 2.69	5.02 2.55	4.83 2.40	4.65 2.27	4.49 2.15	4.33 2.04		
28LH09	0.31	31	711	123.2	9.73 6.24	9.32 5.83	8.93 5.47	8.55 5.12	8.21 4.80	7.88 4.50	7.57 4.24	7.28 3.99	7.01 3.76	6.75 3.54	6.50 3.32	6.27 3.15	6.05 2.97	5.85 2.81	5.64 2.67	5.45 2.52		
28LH10	0.34	34	711	134.7	10.63 6.80	10.27 6.40	9.90 6.04	9.50 5.66	9.12 5.31	8.75 4.99	8.40 4.69	8.08 4.42	7.77 4.15	7.48 3.92	7.22 3.72	6.96 3.51	6.71 3.32	6.47 3.13	6.26 2.97	6.05 2.81		
28LH11	0.36	37	711	144.5	11.38 7.26	11.12 6.93	10.74 6.53	10.37 6.17	9.95 5.79	9.55 5.44	9.17 5.12	8.82 4.83	8.49 4.55	8.18 4.29	7.88 4.05	7.60 3.83	7.32 3.63	7.07 3.44	6.82 3.25	6.61 3.09		
28LH12	0.39	40	711	158.8	12.50 7.95	12.21 7.58	11.93 7.23	11.67 6.94	11.41 6.62	11.17 6.34	10.75 5.95	10.34 5.58	9.95 5.26	9.57 4.96	9.22 4.68	8.88 4.42	8.56 4.15	8.26 3.94	7.96 3.73	7.69 3.54		
28LH13	0.44	45	711	165.4	13.06 8.30	12.75 7.92	12.46 7.55	12.18 7.22	11.90 6.88	11.66 6.59	11.41 6.31	11.17 6.05	10.96 5.77	10.53 5.44	10.12 5.13	9.74 4.84	9.38 4.58	9.04 4.33	8.72 4.10	8.42 3.88		
				**	11582-14021	14326-14630	14935	15239	15544	15849	16154	16459	16768	17068	17373	17678	17983	18288	18592	18897	19202	19507
32LH06	0.20	21	813	74.2	4.93 3.07	4.75 2.9	4.59 2.75	4.43 2.61	4.29 2.46	4.14 2.34	4.01 2.23	3.88 2.11	3.75 2.01	3.63 1.91	3.53 1.82	3.41 1.73	3.31 1.66	3.21 1.57	3.12 1.51	3.03 1.44		
32LH07	0.23	24	813	83.6	5.53 3.42	5.34 3.25	5.15 3.07	4.97 2.91	4.8 2.75	4.64 2.61	4.49 2.48	4.34 2.36	4.2 2.24	4.07 2.13	3.95 2.04	3.82 1.94	3.7 1.85	3.6 1.76	3.50 1.69	3.40 1.61		
32LH08	0.25	25	813	90.7	5.99 3.72	5.79 3.53	5.58 3.34	5.38 3.15	5.21 2.99	5.03 2.83	4.85 2.68	4.69 2.55	4.55 2.43	4.40 2.32	4.27 2.20	4.14 2.10	4.01 1.99	3.89 1.91	3.77 1.82	3.67 1.75		
32LH09	0.31	31	813	113.8	7.53 4.65	7.26 4.40	7.00 4.15	6.75 3.94	6.52 3.73	6.30 3.54	6.10 3.35	5.89 3.19	5.70 3.03	5.53 2.88	5.35 2.75	5.19 2.62	5.03 2.51	4.88 2.39	4.74 2.29	4.59 2.17		
32LH10	0.31	31	813	125.8	8.33 5.13	8.02 4.84	7.74 4.59	7.47 4.33	7.22 4.11	6.97 3.89	6.74 3.70	6.49 3.50	6.27 3.32	6.07 3.16	5.86 3.00	5.67 2.86	5.48 2.71	5.31 2.59	5.15 2.46	4.99 2.36		
32LH11	0.35	36	813	137.8	9.12 5.61	8.78 5.29	8.46 5.00	8.17 4.74	7.89 4.49	7.61 4.26	7.36 4.04	7.12 3.83	6.90 3.66	6.68 3.48	6.46 3.31	6.26 3.15	6.07 3.00	5.88 2.86	5.69 2.72	5.51 2.61		
32LH12	0.39	40	813	161.9	10.71 6.56	10.39 6.24	10.04 5.92	9.69 5.60	9.35 5.31	9.03 5.03	8.72 4.77	8.43 4.53	8.15 4.30	7.89 4.10	7.64 3.89	7.41 3.72	7.18 3.54	6.96 3.38	6.75 3.22	6.55 3.07		
32LH13	0.44	45	813	180.5	11.92 7.29	11.68 7.00	11.45 6.72	11.25 6.47	10.82 6.12	10.43 5.79	10.06 5.48	9.71 5.16	9.38 4.90	9.06 4.65	8.75 4.43	8.47 4.20	8.20 4.01	7.93 3.82	7.69 3.63	7.45 3.47		
32LH14	0.48	49	813	185.9	12.30 7.51	12.05 7.22	11.82 6.94	11.60 6.68	11.38 6.42	11.17 6.08	10.77 5.76	10.4 5.45	10.04 5.18	9.70 4.91	9.38 4.68	9.07 4.43	8.78 4.23	8.50 4.02	8.23 3.85	7.98 3.66		
32LH15	0.51	52	813	192.1	12.69 7.76	12.44 7.45	12.21 7.18	11.98 6.90	11.74 6.62	11.54 6.39	11.32 6.15	11.13 5.93	10.94 5.73	10.58 5.45	10.23 5.18	9.89 4.93	9.57 4.69	9.26 4.46	8.98 4.26	8.71 4.07		
				12802-14021	14326-17069	17373	17678	17983	18288	18592	18897	19202	19507	19812	20116	20421	20726	21031	21336	21640	21945	
36LH07	0.23	24	914	74.7	4.26 2.58	4.13 2.45	3.99 2.33	3.88 2.23	3.76 2.13	3.66 2.04	3.56 1.95	3.45 1.86	3.35 1.78	3.26 1.70	3.18 1.63	3.09 1.56	3.02 1.50	2.93 1.44	2.86 1.38	2.78 1.32		
36LH08	0.26	27	914	82.2	4.68 2.83	4.53 2.69	4.40 2.56	4.27 2.45	4.14 2.33	4.02 2.23	3.91 2.13	3.79 2.04	3.69 1.95	3.59 1.86	3.48 1.79	3.40 1.72	3.31 1.64	3.22 1.59	3.13 1.51	3.05 1.45		
36LH09	0.31	31	914	105.4	5.99 3.60	5.80 3.42	5.63 3.26	5.45 3.12	5.29 2.97	5.13 2.84	4.99 2.71	4.85 2.61	4.71 2.49	4.58 2.37	4.46 2.29	4.33 2.18	4.21 2.10	4.11 2.01	4.01 1.94	3.89 1.85		
36LH10	0.31	31	914	116.0	6.62 3.98	6.42 3.79	6.21 3.61	6.02 3.44	5.85 3.28	5.67 3.13	5.51 3.00	5.35 2.87	5.21 2.74	5.06 2.62	4.93 2.52	4.78 2.40	4.67 2.32	4.53 2.21	4.42 2.13	4.30 2.04		
36LH11	0.34	34	914	126.7	7.22 4.33	7.00 4.13	6.78 3.92	6.58 3.75	6.39 3.59	6.20 3.41	6.01 3.26	5.85 3.12	5.67 2.99	5.51 2.86	5.37 2.74	5.22 2.62	5.07 2.52	4.94 2.42	4.81 2.32	4.69 2.23		
36LH12	0.36	37	914	151.6	8.65 5.16	8.39 4.93	8.12 4.69	7.88 4.48	7.63 4.26	7.41 4.07	7.19 3.89	6.97 3.72	6.77 3.54	6.56 3.38	6.37 3.23	6.18 3.10	6.01 2.97	5.83 2.84	5.67 2.72	5.51 2.61		
36LH13	0.44	45	914	178.3	10.17 6.05	9.85 5.76	9.54 5.48	9.25 5.23	8.97 4.99	8.69 4.77	8.44 4.55	8.20 4.34	7.96 4.15	7.74 3.98	7.53 3.82	7.32 3.66	7.12 3.50	6.93 3.37	6.75 3.23	6.58 3.10		
36LH14	0.53	54	914	196.6	11.20 6.65	11.01 6.33	10.63 6.01	10.3 5.72	9.96 5.44	9.64 5.19	9.35 4.94	9.06 4.71	8.78 4.50	8.52 4.30	8.27 4.13	8.04 3.94	7.80 3.77	7.58 3.60	7.36 3.45	7.18 3.32		
36LH15	0.53	54	914	207.2	11.80 7.00	11.6 6.77	11.39 6.53	11.22 6.33	10.85 6.02	10.52 5.74	10.18 5.47	9.88 5.22	9.57 4.99	9.29 4.77	9.01 4.55	8.75 4.36	8.50 4.17	8.27 3.99	8.04 3.83	7.82 3.67		

**** IT IS VERY IMPORTANT FOR JOIST SPECIFIERS AND ERECTORS TO KNOW THAT OSHA IS INTERPRETING 29CFR-1926.751(c)2 TO MEAN ALL FORTY (40) FEET (12192MM) AND LONGER TO REQUIRE A ROW OF BOLTED BRIDGING TO BE IN PLACE BEFORE SLACKENING OF HOISTING LINES.**



STANDARD LOAD TABLE IN METRIC UNITS/OPEN WEB STEEL JOISTS, LH-SERIES SAFE UNIFORMLY DISTRIBUTED LOAD IN KILONEWTONS/METER

Joist Designation	Approx. Mass (kN / m)	Approx. Mass (kg / m)	Depth (mm)	SAFE LOAD* In kN Between		CLEAR SPAN (mm)																
				14326-17983	18288-19507	19812	20116	20421	20726	21031	21336	21640	21945	22250	22555	22860	23164	23469	23774	24079	24384	
40LH08	0.23	24	1016	73.8	73.8	3.70 2.18	3.60 2.10	3.51 2.01	3.41 1.92	3.32 1.85	3.23 1.78	3.16 1.70	3.07 1.63	3.00 1.57	2.93 1.51	2.86 1.45	2.80 1.41	2.72 1.35	2.67 1.31	2.59 1.25	2.53 1.21	
40LH09	0.31	31	1016	96.9	96.9	4.84 2.86	4.71 2.74	4.59 2.62	4.46 2.52	4.34 2.42	4.24 2.33	4.13 2.23	4.02 2.14	3.92 2.05	3.83 1.98	3.73 1.91	3.64 1.83	3.56 1.78	3.48 1.72	3.40 1.64	3.32 1.59	
40LH10	0.31	31	1016	106.7	106.7	5.35 3.15	5.21 3.02	5.06 2.88	4.93 2.77	4.80 2.67	4.68 2.56	4.56 2.46	4.45 2.36	4.33 2.27	4.23 2.18	4.13 2.10	4.02 2.02	3.92 1.95	3.82 1.88	3.72 1.80	3.63 1.73	
40LH11	0.32	33	1016	116.5	116.5	5.82 3.41	5.66 3.26	5.51 3.13	5.37 3.02	5.22 2.88	5.09 2.77	4.96 2.67	4.84 2.56	4.71 2.46	4.59 2.37	4.49 2.29	4.37 2.20	4.27 2.11	4.17 2.04	4.07 1.97	3.98 1.89	
40LH12	0.36	37	1016	141.8	141.8	7.09 4.15	6.88 3.98	6.69 3.80	6.52 3.66	6.34 3.51	6.18 3.37	6.02 3.23	5.86 3.10	5.72 2.99	5.57 2.87	5.44 2.75	5.31 2.65	5.18 2.56	5.04 2.46	4.93 2.37	4.81 2.29	
40LH13	0.44	45	1016	167.2	167.2	8.36 4.87	8.12 4.67	7.90 4.48	7.70 4.30	7.50 4.13	7.29 3.95	7.10 3.79	6.93 3.64	6.75 3.51	6.58 3.37	6.42 3.25	6.26 3.12	6.11 3.02	5.96 2.90	5.82 2.80	5.69 2.69	
40LH14	0.51	52	1016	191.2	191.2	9.57 5.58	9.31 5.35	9.04 5.12	8.80 4.90	8.56 4.71	8.33 4.50	8.11 4.33	7.90 4.15	7.70 3.98	7.51 3.83	7.32 3.67	7.15 3.54	6.97 3.40	6.80 3.28	6.64 3.15	6.47 3.05	
40LH15	0.53	54	1016	213.9	213.9	10.71 6.23	10.39 5.95	10.08 5.69	9.79 5.44	9.51 5.21	9.23 4.99	8.98 4.78	8.74 4.59	8.50 4.40	8.27 4.23	8.05 4.07	7.85 3.91	7.64 3.76	7.45 3.61	7.26 3.48	7.09 3.35	
40LH16	0.61	63	1016	235.7	235.7	11.79 6.84	11.61 6.64	11.44 6.43	11.26 6.24	11.10 6.07	10.96 5.89	10.65 5.64	10.36 5.41	10.08 5.19	9.82 4.99	9.55 4.80	9.31 4.61	9.07 4.43	8.84 4.26	8.62 4.11	8.40 3.95	
				15849-17983	18288-21945	22250	22555	22860	23164	23469	23774	24079	24384	24688	24993	25298	25603	25907	26212	26517	26822	
44LH09	0.28	28	1118	88.9	88.9	3.96 2.30	3.86 2.21	3.77 2.13	3.69 2.05	3.60 1.98	3.53 1.91	3.44 1.85	3.37 1.78	3.29 1.72	3.22 1.66	3.15 1.60	3.07 1.54	3.02 1.50	2.94 1.44	2.88 1.40	2.83 1.35	
44LH10	0.31	31	1118	98.3	98.3	4.37 2.53	4.27 2.45	4.17 2.36	4.07 2.26	3.96 2.18	3.88 2.10	3.79 2.02	3.7 1.95	3.63 1.89	3.54 1.82	3.47 1.76	3.40 1.70	3.32 1.64	3.25 1.60	3.18 1.54	3.12 1.50	
44LH11	0.32	33	1118	106.3	106.3	4.74 2.74	4.62 2.64	4.52 2.55	4.40 2.45	4.30 2.36	4.21 2.29	4.11 2.20	4.02 2.13	3.92 2.04	3.85 1.98	3.76 1.91	3.67 1.85	3.60 1.79	3.53 1.73	3.44 1.67	3.38 1.61	
44LH12	0.36	37	1118	131.6	131.6	5.86 3.38	5.73 3.26	5.58 3.13	5.45 3.02	5.32 2.91	5.19 2.80	5.06 2.69	4.94 2.61	4.83 2.51	4.71 2.42	4.59 2.33	4.49 2.26	4.37 2.17	4.27 2.10	4.18 2.02	4.08 1.95	
44LH13	0.44	45	1118	156.1	156.1	6.96 4.01	6.80 3.86	6.62 3.70	6.47 3.59	6.31 3.44	6.17 3.32	6.02 3.21	5.89 3.09	5.76 2.99	5.63 2.88	5.50 2.78	5.38 2.69	5.26 2.61	5.15 2.52	5.04 2.43	4.93 2.34	
44LH14	0.45	46	1118	179.7	179.7	8.01 4.59	7.79 4.40	7.58 4.24	7.38 4.07	7.19 3.91	7.01 3.77	6.84 3.63	6.66 3.50	6.50 3.37	6.36 3.25	6.20 3.13	6.05 3.02	5.92 2.91	5.77 2.81	5.64 2.72	5.53 2.64	
44LH15	0.53	54	1118	209.0	209.0	9.32 5.34	9.09 5.13	8.87 4.94	8.65 4.75	8.44 4.58	8.24 4.42	8.04 4.26	7.83 4.10	7.64 3.95	7.47 3.80	7.29 3.67	7.12 3.54	6.94 3.41	6.80 3.31	6.64 3.19	6.49 3.07	
44LH16	0.61	63	1118	241.0	241.0	10.75 6.14	10.49 5.91	10.23 5.69	9.98 5.47	9.74 5.28	9.51 5.07	9.29 4.90	9.07 4.72	8.87 4.56	8.66 4.40	8.46 4.24	8.28 4.11	8.09 3.96	7.92 3.83	7.74 3.72	7.58 3.59	
44LH17	0.69	70	1118	258.8	258.8	11.52 6.56	11.38 6.39	11.22 6.21	11.07 6.05	10.94 5.91	10.68 5.69	10.43 5.48	10.20 5.29	9.96 5.12	9.73 4.93	9.51 4.77	9.31 4.61	9.10 4.45	8.90 4.30	8.71 4.15	8.52 4.02	
				17068-17983	18288-24384	24688	24993	25298	25603	25907	26212	26517	26822	27127	27431	27736	28041	28346	28651	28955	29260	
48LH10	0.31	31	1219	88.9	88.9	3.59 2.05	3.51 1.98	3.44 1.92	3.37 1.85	3.29 1.79	3.22 1.73	3.16 1.69	3.09 1.63	3.03 1.57	2.97 1.53	2.91 1.48	2.86 1.44	2.80 1.40	2.74 1.35	2.69 1.31	2.64 1.26	
48LH11	0.32	33	1219	96.5	96.5	3.88 2.21	3.79 2.14	3.72 2.07	3.63 1.99	3.56 1.94	3.48 1.88	3.41 1.82	3.34 1.75	3.28 1.70	3.21 1.64	3.15 1.60	3.09 1.54	3.03 1.50	2.97 1.45	2.91 1.41	2.86 1.37	
48LH12	0.36	37	1219	121.8	121.8	4.90 2.78	4.80 2.69	4.69 2.61	4.59 2.52	4.49 2.43	4.39 2.34	4.30 2.27	4.21 2.20	4.13 2.14	4.04 2.07	3.96 2.01	3.88 1.94	3.80 1.88	3.73 1.83	3.66 1.78	3.59 1.72	
48LH13	0.42	43	1219	145.9	145.9	5.86 3.32	5.73 3.22	5.60 3.10	5.48 3.00	5.37 2.90	5.25 2.81	5.15 2.72	5.03 2.62	4.93 2.55	4.84 2.48	4.74 2.39	4.64 2.32	4.55 2.24	4.46 2.18	4.37 2.11	4.29 2.05	
48LH14	0.47	48	1219	172.1	172.1	6.93 3.92	6.77 3.79	6.62 3.66	6.47 3.54	6.33 3.41	6.20 3.31	6.07 3.21	5.93 3.09	5.82 3.00	5.69 2.90	5.58 2.81	5.47 2.72	5.35 2.64	5.25 2.56	5.15 2.49	5.04 2.40	
48LH15	0.53	54	1219	197.9	197.9	7.95 4.49	7.77 4.34	7.60 4.18	7.44 4.05	7.28 3.92	7.12 3.79	6.97 3.67	6.82 3.56	6.68 3.44	6.53 3.32	6.40 3.22	6.27 3.12	6.15 3.03	6.02 2.93	5.91 2.84	5.79 2.75	
48LH16	0.61	63	1219	228.1	228.1	9.17 5.18	8.97 5.00	8.77 4.83	8.58 4.67	8.40 4.52	8.21 4.36	8.04 4.21	7.88 4.08	7.75 3.95	7.55 3.83	7.39 3.72	7.25 3.60	7.10 3.48	6.96 3.38	6.82 3.28	6.69 3.18	
48LH17	0.69	70	1219	256.2	256.2	10.30 5.79	10.06 5.58	9.85 5.41	9.63 5.22	9.42 5.04	9.22 4.88	9.03 4.72	8.84 4.58	8.65 4.43	8.47 4.29	8.30 4.15	8.14 4.02	7.98 3.91	7.82 3.79	7.66 3.67	7.51 3.57	

*The safe uniform load for the clear spans shown in the Safe Load column is equal to (Safe Load)/(Clear span + 204). (The added 0.67 feet (204 millimeters) is required to obtain the proper length on which the Load Tables were developed).

In no case shall the safe uniform load, for clear spans less than the minimum clear span shown in the Safe Load column, exceed the uniform load calculated for the minimum clear span listed in the Safe Load column.

To solve for live loads for clear spans shown in the Safe Load column (or lesser clear spans), multiply the live load of the shortest clear span shown in the Load Table by (the shortest clear span shown in the Load Table + 204 mm)² and divide by (the actual clear span + 204mm)². The live load shall not exceed the safe uniform load.



METRIC LOAD TABLE LONGSPAN STEEL JOISTS, DLH-SERIES

Based on a Maximum Allowable Tensile Stress of 207 MPa

Adopted by the Steel Joist Institute May 2, 1994 - Effective September 1, 1994

The black figures in the following table give the TOTAL safe uniformly-distributed load-carrying capacities, in kiloNewtons per meter, of DLH-Series Joists. The weight (kN/m) of DEAD loads, including the joists, must in all cases be deducted to determine the LIVE load-carrying capacities of the joists. The approximate DEAD load of the joists may be determined from the weights shown in the tables. All loads shown are for roof construction only.

The **RED** figures in this load table are the LIVE loads (kiloNewtons per meter) of joist which will produce an approximate deflection of $l/360$ of the span. LIVE loads which will produce a deflection of $1/240$ of the span may be obtained by multiplying the **RED** figures by 1.5. In no case shall the TOTAL load capacity of the joists be exceeded.

This load table applies to joists with either parallel chords or standard pitched top chords. When top chords are pitched, the carrying capacities are determined by the nominal depth of the joists at center of the span. Standard top chord pitch is 1:96. If pitch exceeds this standard, the load table does not apply. This load table may be used for parallel chord joists installed to a maximum slope of 1:24. All rows of bridging shall be diagonal bridging with bolted connections at the chords and intersections.

Where the span of the joist is equal to or greater than the span corresponding to the **BLUE SHADED** area of the load table hoisting cables shall not be released until the two rows of bridging nearest the third points are completely installed.

Where the span of the joists is equal to or greater than the span corresponding to the **GRAY SHADED** area of the load table hoisting cables shall not be released until all rows of bridging are completely installed.

When holes are required in top or bottom chords, the carrying capacities must be reduced in proportion to reduction of chord areas.

The top chords are considered as being stayed laterally by the roof deck.

The approximate joist weights (kN/m) and mass (kg/m) shown in these tables do not include accessories.

The approximate moment of inertia of the joist, in (mm^4) is:

$I_j = 2.6953 (W_{LL})(L^3)(10^{-5})$, where W_{LL} = **RED** figure in the Load Table; L = (Span + 204) in millimeters.

Joist Designation	Approx. Mass (kN / m)	Approx. Mass (kg / m)	Depth (mm)	SAFE LOAD* In kN Between	CLEAR SPAN (mm)															
					27127	27431	27736	28041	28346	28651	28955	29260	29565	29870	30175	30479	30784	31089	31394	31699
				18592-26822																
52DLH10	0.36	37	1321	118.7	4.34	4.24	4.15	4.07	3.98	3.89	3.80	3.73	3.66	3.59	3.51	3.44	3.37	3.31	3.25	3.18
					2.49	2.40	2.32	2.24	2.18	2.11	2.04	1.98	1.92	1.86	1.80	1.75	1.69	1.66	1.60	1.56
52DLH11	0.38	39	1321	130.3	4.77	4.67	4.56	4.46	4.36	4.27	4.18	4.10	4.01	3.94	3.85	3.77	3.70	3.63	3.56	3.50
					2.72	2.64	2.53	2.46	2.39	2.30	2.23	2.17	2.10	2.04	1.97	1.92	1.86	1.80	1.75	1.70
52DLH12	0.42	43	1321	145.4	5.32	5.21	5.09	4.99	4.87	4.77	4.67	4.58	4.48	4.39	4.30	4.21	4.14	4.05	3.98	3.91
					2.97	2.87	2.78	2.69	2.61	2.52	2.45	2.37	2.30	2.23	2.17	2.10	2.04	1.97	1.92	1.86
52DLH13	0.50	51	1321	176.5	6.46	6.31	6.18	6.04	5.92	5.79	5.67	5.56	5.44	5.34	5.22	5.12	5.02	4.93	4.83	4.74
					3.60	3.48	3.37	3.26	3.15	3.05	2.96	2.87	2.78	2.69	2.62	2.53	2.48	2.39	2.32	2.26
52DLH14	0.57	58	1321	201.9	7.39	7.25	7.09	6.94	6.8	6.66	6.52	6.39	6.27	6.14	6.02	5.91	5.79	5.69	5.57	5.47
					4.02	3.88	3.76	3.63	3.53	3.41	3.31	3.21	3.10	3.02	2.93	2.83	2.75	2.68	2.59	2.52
52DLH15	0.61	63	1321	226.8	8.30	8.12	7.95	7.77	7.61	7.45	7.29	7.15	7.00	6.85	6.72	6.58	6.46	6.33	6.21	6.10
					4.53	4.39	4.24	4.11	3.96	3.85	3.73	3.60	3.50	3.40	3.29	3.19	3.10	3.02	2.93	2.84
52DLH16	0.66	67	1321	244.6	8.96	8.77	8.58	8.39	8.21	8.04	7.88	7.70	7.55	7.39	7.25	7.10	6.97	6.82	6.69	6.58
					5.04	4.88	4.72	4.58	4.43	4.29	4.15	4.02	3.89	3.79	3.67	3.57	3.45	3.35	3.26	3.16
52DLH17	0.76	77	1321	281.5	10.3	10.08	9.86	9.64	9.44	9.25	9.04	8.87	8.68	8.50	8.34	8.17	8.01	7.86	7.70	7.55
					5.76	5.56	5.38	5.21	5.04	4.88	4.72	4.59	4.43	4.31	4.17	4.07	3.94	3.83	3.72	3.60
				20116-29260	29565	29870	30175	30479	30784	31089	31394	31699	32003	32308	32613	32918	33223	33528	33832	34137
56DLH11	0.38	39	1422	124.9	4.20	4.13	4.04	3.96	3.89	3.82	3.75	3.69	3.61	3.56	3.48	3.42	3.37	3.31	3.25	3.19
					2.46	2.37	2.30	2.23	2.17	2.11	2.04	1.98	1.94	1.88	1.82	1.78	1.72	1.67	1.64	1.60
56DLH12	0.44	45	1422	143.6	4.83	4.72	4.64	4.55	4.46	4.37	4.30	4.21	4.14	4.05	3.98	3.91	3.83	3.77	3.70	3.63
					2.68	2.59	2.52	2.45	2.37	2.30	2.23	2.18	2.11	2.05	1.99	1.94	1.89	1.83	1.79	1.73
56DLH13	0.50	51	1422	173.9	5.85	5.74	5.63	5.53	5.42	5.32	5.22	5.12	5.02	4.93	4.83	4.74	4.65	4.58	4.49	4.42
					3.25	3.15	3.05	2.97	2.87	2.78	2.71	2.64	2.55	2.49	2.42	2.34	2.29	2.21	2.17	2.11
56DLH14	0.57	58	1422	196.6	6.61	6.47	6.34	6.23	6.11	5.99	5.88	5.77	5.66	5.56	5.47	5.37	5.26	5.18	5.09	5.00
					3.63	3.53	3.41	3.32	3.22	3.12	3.05	2.94	2.86	2.77	2.71	2.64	2.55	2.49	2.43	2.36
56DLH15	0.61	63	1422	224.6	7.55	7.41	7.26	7.12	6.97	6.84	6.71	6.58	6.46	6.33	6.21	6.11	5.99	5.88	5.77	5.67
					4.10	3.96	3.85	3.73	3.61	3.53	3.41	3.32	3.22	3.13	3.05	2.97	2.88	2.80	2.74	2.65
56DLH16	0.67	68	1422	242.4	8.15	7.99	7.83	7.67	7.53	7.38	7.23	7.10	6.97	6.84	6.71	6.59	6.47	6.36	6.24	6.12
					4.56	4.43	4.29	4.15	4.04	3.92	3.82	3.70	3.60	3.50	3.40	3.31	3.22	3.12	3.05	2.97
56DLH17	0.74	76	1422	279.3	9.38	9.19	9.01	8.82	8.66	8.49	8.33	8.17	8.01	7.86	7.72	7.58	7.44	7.31	7.18	7.04
					5.19	5.03	4.88	4.74	4.61	4.46	4.34	4.21	4.10	3.98	3.88	3.76	3.66	3.57	3.47	3.37



STANDARD LOAD TABLES IN METRIC UNITS/LONGSPAN STEEL JOISTS, DLH-SERIES
SAFE UNIFORM DISTRIBUTED LOAD IN KILONEWTONS/METER

Joist Designation	Approx. Mass (kN / m)	Approx. Mass (kg / m)	Depth (mm)	SAFE LOAD* In kN Between		CLEAR SPAN (mm)																	
				21336-30175	30480-31699	32003	32308	32613	32918	33223	33528	33832	34137	34442	34747	35052	35356	35661	35966	36271	36576		
60DLH12	0.42	43	1524	138.3	138.3	4.30 2.45	4.21 2.37	4.14 2.30	4.07 2.24	3.99 2.18	3.94 2.13	3.86 2.07	3.80 2.01	3.73 1.95	3.67 1.91	3.61 1.86	3.56 1.80	3.50 1.76	3.44 1.72	3.38 1.67	3.32 1.64		
60DLH13	0.51	52	1524	168.1	168.1	5.22 2.96	5.12 2.87	5.03 2.78	4.94 2.72	4.85 2.64	4.77 2.56	4.69 2.49	4.61 2.43	4.53 2.37	4.46 2.30	4.39 2.24	4.31 2.20	4.24 2.14	4.17 2.08	4.11 2.02	4.04 1.97		
60DLH14	0.58	60	1524	186.8	186.8	5.80 3.15	5.70 3.06	5.58 2.99	5.48 2.90	5.39 2.81	5.29 2.75	5.19 2.67	5.10 2.59	5.02 2.52	4.93 2.48	4.84 2.40	4.77 2.34	4.68 2.27	4.61 2.21	4.52 2.17	4.45 2.11		
60DLH15	0.63	64	1524	219.2	219.2	6.81 3.72	6.68 3.61	6.56 3.53	6.45 3.42	6.33 3.32	6.23 3.25	6.11 3.15	6.01 3.06	5.91 2.99	5.80 2.91	5.72 2.83	5.61 2.77	5.53 2.69	5.44 2.62	5.35 2.55	5.26 2.49		
60DLH16	0.67	68	1524	241.0	241.0	7.48 4.15	7.35 4.04	7.20 3.92	7.07 3.82	6.94 3.72	6.82 3.60	6.71 3.51	6.58 3.42	6.47 3.32	6.36 3.25	6.24 3.16	6.14 3.07	6.04 3.00	5.93 2.93	5.83 2.86	5.73 2.77		
60DLH17	0.76	77	1524	277.1	277.1	8.61 4.72	8.44 4.59	8.3 4.46	8.14 4.34	7.99 4.23	7.85 4.13	7.72 4.01	7.57 3.89	7.44 3.8	7.31 3.70	7.19 3.60	7.06 3.51	6.94 3.42	6.82 3.32	6.71 3.25	6.61 3.16		
60DLH18	0.86	88	1524	319.8	319.8	9.93 5.34	9.74 5.21	9.57 5.04	9.39 4.91	9.22 4.77	9.06 4.65	8.9 4.52	8.74 4.42	8.59 4.29	8.43 4.17	8.28 4.07	8.15 3.96	8.01 3.88	7.88 3.77	7.74 3.67	7.61 3.59		
				22860-30175	30480-34137	34442	34747	35052	35356	35661	35966	36271	36576	36880	37185	37490	37795	38100	38404	38709	39014		
64DLH12	0.45	46	1626	133.4	133.4	3.85 2.23	3.77 2.18	3.72 2.13	3.66 2.07	3.6 2.01	3.54 1.97	3.48 1.92	3.42 1.88	3.37 1.82	3.32 1.78	3.26 1.73	3.22 1.69	3.18 1.66	3.12 1.61	3.07 1.59	3.03 1.54		
64DLH13	0.50	51	1626	161.9	161.9	4.68 2.71	4.59 2.64	4.52 2.56	4.45 2.49	4.37 2.45	4.3 2.37	4.24 2.32	4.17 2.26	4.10 2.21	4.04 2.15	3.98 2.10	3.92 2.05	3.85 1.99	3.79 1.95	3.75 1.91	3.69 1.86		
64DLH14	0.58	60	1626	185.4	185.4	5.35 2.90	5.25 2.81	5.16 2.75	5.09 2.68	5.00 2.61	4.91 2.53	4.84 2.49	4.75 2.42	4.68 2.36	4.61 2.30	4.53 2.24	4.46 2.20	4.39 2.14	4.31 2.08	4.26 2.04	4.18 1.98		
64DLH15	0.63	64	1626	212.6	212.6	6.14 3.41	6.04 3.32	5.93 3.25	5.83 3.16	5.74 3.07	5.64 3.00	5.56 2.93	5.47 2.86	5.38 2.78	5.29 2.72	5.22 2.65	5.13 2.58	5.06 2.52	4.97 2.48	4.90 2.40	4.83 2.34		
64DLH16	0.67	68	1626	239.3	239.3	6.91 3.82	6.8 3.7	6.68 3.61	6.56 3.53	6.46 3.42	6.34 3.34	6.24 3.26	6.14 3.18	6.04 3.10	5.93 3.03	5.85 2.96	5.74 2.88	5.66 2.81	5.57 2.75	5.48 2.68	5.39 2.62		
64DLH17	0.76	77	1626	275.7	275.7	7.96 4.34	7.82 4.23	7.69 4.13	7.55 4.01	7.42 3.91	7.31 3.82	7.18 3.72	7.06 3.61	6.94 3.54	6.82 3.45	6.72 3.37	6.62 3.29	6.50 3.21	6.40 3.13	6.30 3.06	6.21 2.99		
64DLH18	0.86	88	1626	318.4	318.4	9.19 4.91	9.03 4.78	8.87 4.67	8.72 4.53	8.56 4.43	8.43 4.310	8.28 4.20	8.15 4.11	8.01 3.99	7.88 3.89	7.76 3.80	7.63 3.72	7.51 3.63	7.39 3.54	7.28 3.45	7.16 3.38		
				24384-30175	30480-36576	36880	37185	37490	37795	38100	38404	38709	39014	39319	39624	39928	40233	40538	40843	41148	41452		
68DLH13	0.54	55	1727	155.6	155.6	4.20 2.49	4.14 2.45	4.07 2.39	4.01 2.32	3.95 2.26	3.89 2.21	3.83 2.17	3.77 2.11	3.72 2.07	3.67 2.01	3.61 1.97	3.56 1.94	3.51 1.89	3.45 1.85	3.41 1.80	3.37 1.76		
68DLH14	0.58	60	1727	179.2	179.2	4.84 2.68	4.77 2.61	4.69 2.55	4.62 2.49	4.55 2.43	4.49 2.37	4.42 2.32	4.36 2.26	4.29 2.21	4.23 2.15	4.17 2.11	4.10 2.05	4.04 2.01	3.98 1.97	3.92 1.94	3.88 1.89		
68DLH15	0.64	65	1727	201.0	201.0	5.42 3.00	5.32 2.93	5.25 2.86	5.16 2.78	5.07 2.72	5.00 2.65	4.91 2.59	4.84 2.53	4.77 2.48	4.69 2.42	4.62 2.36	4.55 2.30	4.49 2.26	4.42 2.21	4.36 2.15	4.29 2.11		
68DLH16	0.72	73	1727	238.4	238.4	6.43 3.53	6.31 3.44	6.23 3.35	6.12 3.28	6.02 3.19	5.93 3.12	5.83 3.05	5.74 2.97	5.66 2.90	5.57 2.84	5.48 2.77	5.41 2.71	5.32 2.65	5.25 2.59	5.16 2.53	5.09 2.49		
68DLH17	0.80	82	1727	268.6	268.6	7.25 4.01	7.13 3.91	7.01 3.82	6.91 3.73	6.81 3.63	6.71 3.56	6.61 3.47	6.50 3.38	6.40 3.32	6.31 3.23	6.23 3.16	6.12 3.09	6.04 3.03	5.95 2.96	5.88 2.88	5.79 2.83		
68DLH18	0.89	91	1727	310.9	310.9	8.39 4.53	8.26 4.43	8.12 4.33	8.01 4.21	7.88 4.13	7.76 4.02	7.64 3.92	7.53 3.83	7.41 3.75	7.31 3.66	7.19 3.59	7.09 3.50	6.99 3.41	6.88 3.35	6.78 3.28	6.69 3.19		
68DLH19	0.98	100	1727	358.0	358.0	9.66 5.15	9.50 5.02	9.35 4.90	9.20 4.78	9.06 4.67	8.91 4.56	8.77 4.45	8.63 4.34	8.50 4.24	8.37 4.15	8.24 4.05	8.12 3.96	7.99 3.88	7.88 3.79	7.76 3.70	7.66 3.61		
				25603-30175	30480-39014	39319	39624	39928	40233	40538	40843	41148	41452	41757	42062	42367	42672	42976	43281	43586	43891		
72DLH14	0.60	61	1829	174.3	174.3	4.42 2.49	4.34 2.43	4.29 2.37	4.23 2.32	4.15 2.26	4.10 2.21	4.04 2.17	3.99 2.13	3.94 2.08	3.88 2.02	3.82 1.98	3.77 1.94	3.72 1.91	3.67 1.86	3.61 1.82	3.57 1.79		
72DLH15	0.64	65	1829	199.7	199.7	5.06 2.78	4.99 2.72	4.90 2.67	4.83 2.59	4.75 2.53	4.69 2.49	4.62 2.43	4.55 2.37	4.49 2.33	4.42 2.27	4.36 2.21	4.30 2.18	4.24 2.14	4.17 2.08	4.11 2.04	4.07 1.99		
72DLH16	0.73	74	1829	230.8	230.8	5.85 3.28	5.76 3.19	5.69 3.12	5.60 3.05	5.51 2.99	5.44 2.91	5.37 2.86	5.29 2.78	5.22 2.74	5.15 2.67	5.07 2.61	5.00 2.55	4.93 2.49	4.87 2.46	4.80 2.40	4.74 2.34		
72DLH17	0.82	83	1829	259.7	259.7	6.58 3.73	6.49 3.64	6.39 3.57	6.30 3.48	6.21 3.40	6.12 3.32	6.04 3.26	5.95 3.18	5.86 3.10	5.79 3.05	5.70 2.99	5.63 2.91	5.56 2.86	5.48 2.78	5.41 2.74	5.34 2.68		
72DLH18	0.86	88	1829	304.2	304.2	7.70 4.21	7.58 4.13	7.47 4.02	7.36 3.94	7.25 3.86	7.15 3.76	7.04 3.67	6.99 3.60	6.85 3.53	6.75 3.44	6.66 3.37	6.56 3.31	6.47 3.23	6.39 3.16	6.30 3.09	6.21 3.05		
72DLH19	1.02	104	1829	356.7	356.7	9.03 4.78	8.88 4.68	8.75 4.56	8.62 4.46	8.49 4.37	8.36 4.27	8.24 4.17	8.12 4.08	8.01 3.99	7.89 3.91	7.77 3.83	7.67 3.75	7.55 3.66	7.45 3.60	7.35 3.51	7.25 3.44		

The safe uniform load for the clear spans shown in the Safe Load column is equal to (Safe Load)/(Clear span + 204) (The added 0.67 feet (204 millimeters) is required to obtain the proper length on which the Load Tables were developed).

In no case shall the safe uniform load, for clear spans less than the minimum clear span shown in the Safe Load column, exceed the uniform load calculated for the minimum clear span listed in the Safe Load column.

To solve for live loads for clear spans shown in the Safe Load column (or lesser clear spans), multiply the live load of the shortest clear span shown in the Load Table by (the shortest clear span shown in the Load Table + 204 mm)² and divide by (the actual clear span + 204mm)². The live load shall not exceed the safe uniform load.



STANDARD SPECIFICATIONS

FOR LONGSPAN STEEL JOISTS, **LH-SERIES** AND DEEP LONGSPAN STEEL JOISTS, **DLH-SERIES**

Adopted by the Steel Joist Institute February 15, 1978 - Revised to May 2, 1994 - Effective September 1, 1994

SECTION 100. SCOPE

These specifications cover the design, manufacture and use of Longspan Steel Joists **LH-Series**, and Deep Longspan Steel Joists, **DLH-Series**.

SECTION 101. DEFINITION

The term "Longspan Steel Joists **LH-Series** and Deep Longspan Joists **DLH-Series**," as used herein, refers to open web, load-carrying members utilizing hotrolled or cold-formed steel, including cold-formed steel whose yield strength* has been attained by cold working. **LH-Series** are suitable for the direct support of floors and roof decks in buildings, and **DLH-Series** are suitable for the direct support of roof decks in buildings.

The design of **LH-** and **DLH-Series** joist chord or web sections shall be based on a yield strength of at least 36 ksi (250 MPa), but not greater than 50 ksi (345 MPa). Steel used for **LH-** and **DLH-Series** joist chord or web sections shall have a minimum yield strength determined in accordance with one of the procedures specified in Section 102.2, which is equal to the yield strength assumed in the design. **LH-** and **DLH-Series** joists shall be designed in accordance with these specifications to support the loads given in the attached Standard Load Tables for **LH-** and **DLH Series** joists.

*The term "yield strength" as used herein shall designate the yield level of a material as determined by the applicable method outlined in paragraph 13 - "Yield Strength," or paragraph 12 - "Yield Point," of ASTM Standard A370, "Mechanical Testing of Steel Products," or as specified in Section 102.2 of this Specification.

Standard Specifications and Load Tables. Longspan Steel Joists **LH-Series** and Deep Longspan Steel Joists **DLH-Series**. Copyright 1994. Steel Joist Institute.

SECTION 102. MATERIALS

102.1 STEEL

The steel used in the manufacture of chord and web sections shall conform to one of the following ASTM Specifications of latest adoption:

- Structural Steel, ASTM A36/A36M.
- High-Strength Low-Alloy Structural Steel, ASTM A242/A242M.
- High-Strength Carbon-Manganese Steel of Structural Quality ASTM A529/A529M, Grade 50.

- Hot-Rolled Carbon Steel Sheet and Strip, Structural Quality ASTM A570/A570M.
- High-Strength Low-Alloy Columbium-Vanadium Steel of Structural Quality ASTM A572/A572M, Grades 42, 45, and 50.
- High-Strength Low-Alloy Structural Steel with 50 ksi (345 MPa) Minimum Yield Point to 4 inches (102 mm) thick, ASTM A588/A588M.
- Steel Sheet and Strip, Hot-Rolled and Cold-Rolled, High-Strength, Low-Alloy, with Improved Corrosion Resistance, ASTM A606.
- Steel Sheet and Strip, Hot-Rolled and Cold-Rolled, High-Strength, Low-Alloy, Columbium and/or Vanadium, ASTM A607. Grades 45 and 50.
- Steel, Cold-Rolled Sheet, Carbon Structural, ASTM A611. Grade D.

or shall be of suitable quality ordered or produced to other than the listed specifications, provided that such material in the state used for final assembly and manufacture is weldable and is proved by tests performed by the producer or manufacturer to have the properties specified in Section 102.2.

102.2 MECHANICAL PROPERTIES

The yield strength used as a basis for the design stresses prescribed in Section 103 shall be at least 36 ksi (250 MPa), but shall not be greater than 50 ksi (345 MPa). Evidence that the steel furnished meets or exceeds the design yield strength shall, if requested, be provided in the form of an affidavit or by witnessed or certified test reports.

For material used without consideration of increase in yield strength resulting from cold forming, the specimens shall be taken from as-rolled material. In the case of material the mechanical properties of which conform to the requirements of one of the listed specifications, test specimens and procedure shall conform to those of such specifications and to ASTM A370.

In the case of material the mechanical properties of which do not conform to the requirements of one of the listed specifications, the test specimens and procedure shall conform to the applicable requirements of ASTM A370 and the specimens shall exhibit a yield strength equal to or exceeding the design yield strength and an elongation of not less than (a) 20 percent in 2 inches (51 mm) for sheet and strip or (b) 18 percent in 8 inches (203 mm) for plates, shapes and bars with adjustments for thickness for plates, shapes and bars as prescribed in ASTM A36/A36M, A242/A242M, A529/A529M, A572/A572M,



and A588/A588M, whichever specification is applicable on the basis of design yield strength.

The number of tests shall be as prescribed in ASTM A6 for plates, shapes, and bars; and ASTM A570/A570M, A606, A607, and A611 for sheet and strip.

If as-formed strength is utilized, the test reports shall show the results of tests performed on full section specimens in accordance with the provisions of Section 3.1.1 and 6.3 of the AISI Specification for the Design of Cold-Formed Steel Structural Members, and shall indicate compliance with these provisions and with the following additional requirements:

1. The yield strength measured in the tests equal or exceed the design yield strength.
2. Where tension tests are made for acceptance and control purposes the tensile strength shall be at least 6 percent greater than the yield strength of the section.
3. Where compression tests are used for acceptance and control purposes the specimen shall withstand a gross shortening of 2 percent of its original length without cracking. The length of specimen shall be not greater than 20 times its least radius
4. If any test specimen fails to pass the requirements of subparagraphs 1, 2 or 3 above, as applicable, two retests shall be made of specimens from the same lot. Failure of one of the retest specimens to meet such requirements shall be cause for rejection of the lot represented by the specimens.

102.3 WELDING ELECTRODES

The following electrodes shall be used for arc welding:

- (a) For connected members both having a specified minimum yield strength greater than 36 ksi (250 MPa).
AWS A5.1 or A5.5, E70XX
AWS A5.17, F7X, EXXX flux electrode combination
AWS A5.18, E70S-X or E70U-1
AWS A5.20, E70T-X
- (b) For connected members both having a specified minimum yield strength of 36 ksi (250 MPa) or one having a specified minimum yield strength of 36 ksi (250 MPa) and the other having a specified minimum yield strength greater than 36 ksi (250 MPa).
AWS A5. 1, E60XX
AWS A5.17, F6X-EXXX flux electrode combination
AWS A5.20, E60T-X

or any of those listed in Section 102.3(a)

Other welding methods, providing equivalent strength as demonstrated by tests, may be used.

102.4 PAINT

The standard shop paint is a primer coat intended to protect the steel for only a short period of exposure in ordinary atmospheric conditions and shall be considered an impermanent and provisional coating.

When specified, the Standard shop paint shall conform to one of the following:

- (a) Steel Structures Painting Council Specification 15-68T, Type I (red oxide)
- (b) Federal Specification TT-P-636 (red oxide)
- (c) Or, shall be a shop paint which meets the minimum performance requirements of one of the above listed specifications.

SECTION 103. DESIGN AND MANUFACTURE

103.1 METHOD

Joists shall be designed in accordance with these specifications as simply supported uniformly loaded trusses supporting a floor or roof deck so constructed as to brace the top chord of the joists against lateral buckling. Where any applicable design feature is not specifically covered herein, the design shall be in accordance with the following specifications of latest adoption:

- (a) American Institute of Steel Construction Specification for the Design, Fabrication and Erection of Structural Steel, for Buildings (Allowable Stress Design), where the material used consists of plates, shapes or bars.
- (b) American Iron and Steel Institute Specification for the Design of Cold-Formed Steel Structural Members, for members which are cold-formed from sheet or strip material.

103.2 UNIT STRESSES

Joists shall have their components so proportioned that the unit stresses in kips per square inch (Mega Pascals) shall not exceed the following where F_y is the yield strength defined in Section 102.2:

(a) Tension:

All members $F_t = 0.6F_y$

(b) Compression:

For all members with Kl/r less than C_c :

$$F_a = \frac{\left[1 - \frac{(Kl/r)^2}{2C_c^2}\right] QF_y}{\frac{5}{3} + \frac{3}{8} \left[\frac{Kl/r}{C_c}\right] - \frac{1}{8} \left[\frac{Kl/r}{C_c}\right]^3}$$

$$\text{where } C_c = \sqrt{\frac{2\pi^2 E}{QF_y}} \text{ and}$$



where Q is a form factor equal to unity except when the width-thickness ratio of one or more elements of the profile exceeds the limits specified in the AISC Specification, Section B5 (Allowable Stress Design) for hot-rolled sections and in the AISI Specification, Section 3., for cold-formed sections; and where K is a length factor used to determine the effective slenderness ratio as shown in Table 103.3.1.

For members with Kl/r greater than C_c :

$$F_a = \frac{12p^2E}{23(Kl/r)^2}$$

In the above formulas Kl/r is the appropriate effective slenderness ratio as determined from Section 103.3, and "E" is equal to 29,000 ksi (200,000 MPa).

(c) Bending:

For chords, and for web members other than solid rounds $F_b = 0.6 F_y$
 For web members of solid round cross section $F_b = 0.9 F_y$
 For bearing plates $F_b = 0.75 F_y$

(d) Weld Stresses:

Shear at throat of fillet welds:
 Made with E70 series electrodes or F7X-EXXX flux-electrode combinations . . . 21 ksi (145 MPa)
 Made with E60 series electrodes or F6X-EXXX flux-electrode combinations . . . 18 ksi (124 MPa)

Tension or compression on groove or butt welds shall be the same as those specified for the connected material.

TABLE 103.3.1 MAXIMUM AND EFFECTIVE SLENDERNESS RATIOS

I TOP CHORD INTERIOR PANEL

- A. The slenderness ratios, $1.0l/r$ and $1.0l_s/r$, of members as a whole or any component part shall not exceed 90.
- B. *The effective slenderness ratio to determine "F_a"*
- | | | | | |
|-----------------------------|-------------|------------|-------------|--------------|
| 1. With fillers or ties | $0.75l/r_x$ | $1.0l/r_y$ | | $1.0l_s/r_z$ |
| 2. Without fillers or ties | | | $0.75l/r_z$ | |
| 3. Single component members | $0.75l/r_x$ | $1.0l/r_y$ | | |
- C. *The effective slenderness ratio to determine "F'_e"*
- | | | | | |
|-----------------------------|-------------|--|--|--|
| 1. With fillers or ties | $0.75l/r_x$ | | | |
| 2. Without fillers or ties | $0.75l/r_x$ | | | |
| 3. Single component members | $0.75l/r_x$ | | | |

II TOP CHORD END PANEL

- A. The slenderness ratios, $1.0l/r$ and $1.0l_s/r$, of members as a whole or any component part shall not exceed 120.
- B. *The effective slenderness ratio to determine "F_a"*
- | | | | | |
|-----------------------------|------------|------------|------------|--------------|
| 1. With fillers or ties | $1.0l/r_x$ | $1.0l/r_y$ | | $1.0l_s/r_z$ |
| 2. Without fillers or ties | | | $1.0l/r_z$ | |
| 3. Single component members | $1.0l/r_x$ | $1.0l/r_y$ | | |
- C. *The effective slenderness ratio to determine "F'_e"*
- | | | | | |
|-----------------------------|------------|--|--|--|
| 1. With fillers or ties | $1.0l/r_x$ | | | |
| 2. Without fillers or ties | $1.0l/r_x$ | | | |
| 3. Single component members | $1.0l/r_x$ | | | |

III TENSION MEMBERS - CHORDS AND WEBS

- A. The slenderness ratios, $1.0l/r$ and $1.0l_s/r$, of members as a whole or any component part shall not exceed 240.

IV COMPRESSION WEB MEMBERS

- A. The slenderness ratios, $1.0l/r$ and $1.0l_s/r$, of members as a whole or any component part shall not exceed 200.
- B. *The effective slenderness ratio to determine "F_a"*
- | | | | | |
|-----------------------------|---------------|------------|------------|--------------|
| 1. With fillers or ties | $0.75l/r_x$ | $1.0l/r_y$ | | $1.0l_s/r_z$ |
| 2. Without fillers or ties | | | $1.0l/r_z$ | |
| 3. Single component members | $0.75l/r_x^*$ | $1.0l/r_y$ | | |

*If moment-resistant weld groups are not used at the ends of a crimped, first primary compression web member, then $1.2l/r_x$ must be used.



103.3 MAXIMUM SLENDERNESS RATIOS

The slenderness ratios, $1.0l/r$ and $1.0l/r$, of members as a whole or any component part shall not exceed the values given in Table 103.3.1, Parts A.

The effective slenderness ratio, Kl/r^* , to be used in calculating the allowable stresses F_a and F'_e , is the largest value as determined from Table 103.3.1, Parts B and C.

In compression members when fillers or ties are used, they shall be spaced so that the l_s/r_z , ratio of each component does not exceed the governing l/r ratio of the member as a whole. The terms are defined as follows:

l = length center-to-center of panel points, except $l=36"$ for

calculating l/r_y of top chord member.

l_s = maximum length center-to-center between panel point and tiller (tie), or between adjacent fillers (ties).

r_x = member radius of gyration in the plane of the joist.

r_y = member radius of gyration out of the plane of the joist.

r_z = least radius of gyration of a member component.

*See AISC Specification Section C2.1 and P.N. Chod and T.V. Galambos, Compression Chords Without Fillers in Longspan Steel Joists, Research Report No. 36, June 1975 Structural Division, Civil Engineering Department, Washington University, St. Louis, Mo.

103.4 MEMBERS

(a) Chords

The bottom chord shall be designed as an axially loaded tension member.

The top chord shall be designed as a continuous member subject to combined axial and bending stresses and shall be so proportioned that

$f_a + f_b \leq 0.6 F_y$, at the panel point; and

$$\frac{f_a}{F_a} + \left(1 - \frac{f_a}{F'_e}\right) Q F_b \leq 1.0, \text{ at mid-panel;}$$

in which

$C_m = 1 - 0.3 f_b/F'_e$ for end panels

$C_m = 1 - 0.4 f_b/F'_e$ for interior panels

f_a = Computed axial unit compressive stress

f_b = Computed bending unit compressive stress at the point under consideration

F_a = Permissible axial unit compressive stress based on Kl/r .

F_b = Permissible bending unit stress; $0.6F_y$

$$F'_e = \frac{12\pi^2 E}{23(Kl/r_x)^2}$$

r_x = Radius of gyration about the axis of bending

Q = Form factor as defined in Section 103.2(b).

The radius of gyration of the top chord about its vertical axis shall be not less than $l/170$ where l is the spacing in inches (millimeters) between lines of bridging as specified in section 104.5 (d).

The top chord shall be considered as stayed laterally by the floor or roof deck provided the requirements of Section 104.9 (e) of these specifications are met.

(b) Web

The vertical shears to be used in the design of the web members shall be determined from full uniform loading but such vertical shear shall be not less than 25 percent of the end reaction.

Interior vertical web members used in modified Warren type web systems shall be designed to resist the gravity loads supported by the member plus 1/2 of 1.0 percent of the top chord axial force.

(c) Depth

Joists may have either parallel chords or a top chord slope of 1/8 inch per foot (1:96). The depth, for the purpose of design, in all cases shall be the depth at mid-span.

(d) Eccentricity

Members connected at a joint shall have their center of gravity lines meet at a point, if practical. Eccentricity on either side of the neutral axis of chord members may be neglected when it does not exceed the distance between the neutral axis and the back of the chord. Otherwise, provision shall be made for the stresses due to eccentricity. Ends of joists shall be proportioned to resist bending produced by eccentricity at the support.

In those cases where a single angle compression member is attached to the outside of the stem of a tee or double angle chord, due consideration shall be given to eccentricity.

(e) Extended Ends

Extended top chords or full depth cantilever ends require the special attention of the specifying professional. The magnitude and location of the design loads to be supported, the deflection requirements, and the proper bracing shall be clearly indicated on the structural drawings.

103.5 CONNECTIONS

(a) Methods

Joint connections and splices shall be made by attaching the members to one another by arc or resistance welding or other approved method.

(1) Welded Connections

- a) Selected welds shall be inspected visually by the manufacturer. Prior to this inspection, weld slag shall be removed.



- b) Cracks are not acceptable and shall be repaired.
- c) Thorough fusion shall exist between layers of weld metal and between weld metal and base metal for the required design length of the weld; such fusion shall be verified by visual inspection.
- d) Unfilled weld craters shall not be included in the design length of the weld.
- e) Undercut shall not exceed 1/16 inch (2 mm) for welds oriented parallel to the principal stress.
- f) The sum of surface (piping) porosity diameters shall not exceed 1/16 inch (2 mm) in any 1 inch (25 mm) of design weld length.
- g) Weld spatter that does not interfere with paint coverage is acceptable.

2) Welding Program.

Manufacturers shall have a program for establishing weld procedures and operator qualification and for weld sampling and testing.

3) Weld inspection by Outside Agencies (See Section 104.13 of these specifications).

The agency shall arrange for visual inspection to determine that welds meet the acceptance standards of Section 103.5 a.1) above. Ultrasonic, X-Ray and magnetic particle testing are inappropriate for joists due to the configurations of the components and welds.

(b) Strength

Joint connections shall develop the maximum force due to any of the design loads, but not less than 50 percent of the allowable strength of the member in tension or compression, whichever force is the controlling factor in the selection of the member.

(c) Shop Splices

Shop splices may occur at any point in chord or web members. Splices shall be designed for the member force but not less than 50 percent of the allowable member strength. Members containing a butt weld splice shall develop an ultimate tensile force of at least 57 ksi (393 MPa) times the full design area of the chord or web. The term "member" shall be defined as all component parts, comprising the chord or web, at the point of splice.

(d) Field Splices

Field splices shall be designed by the manufacturer and may be either bolted or welded. Splices shall be designed for the member force but not less than 50 percent of the allowable member strength.

103.6 CAMBER

Joists shall have approximate cambers in accordance with the following:

Top Chord Length

20'-0" (6096 mm)
30'-0" (9144 mm)
40'-0" (12192 mm)
50'-0" (15240 mm)
60'-0" (18288 mm)
70'-0" (21336 mm)
80'-0" (24384 mm)
90'-0" (27432 mm)
100'-0" (30480 mm)
110'-0" (33528 mm)
120'-0" (36576 mm)
130'-0" (39621 mm)
140'-0" (42672 mm)
144'-0" (43890 mm)

Approximate Camber

1/4" (6 mm)
3/8" (10 mm)
5/8" (16 mm)
1" (25 mm)
1 1/2" (38 mm)
2" (51 mm)
2 3/4" (70 mm)
3 1/2" (89 mm)
4 1/4" (108 mm)
5" (127 mm)
6" (152 mm)
7" (178 mm)
8" (203 mm)
8 1/2" (216 mm)

103.7 VERIFICATION OF DESIGN AND MANUFACTURE

(a) Design Calculations

Companies manufacturing any **LH-** or **DLH-Series** Joists shall submit design data to the Steel Joist Institute (or an independent agency approved by the Steel Joist Institute) for verification of compliance with the SJI Specifications.

(b) In-Plant Inspections

Each manufacturer shall verify his ability to manufacture **LH-Series** and **DLH-Series** Joists through periodic In-Plant Inspections. Inspections shall be performed by an independent agency approved by the Steel Joist Institute. The frequency, manner of inspection, and manner of reporting shall be determined by the Steel Joist Institute. The Plant inspections are not a guaranty of the quality of any specific joists; this responsibility lies fully and solely with the individual manufacturer.

SECTION 104. APPLICATION

104.1 USAGE

These specifications shall apply to any type of structure where floor and roof decks are to be supported directly by steel joists installed as hereinafter specified. Where joists are used other than on simple spans under uniformly distributed loading, as prescribed in Section 103.1, they shall be investigated and modified if necessary to limit the unit stresses to those listed in Section 103.2.

CAUTION: If a rigid connection of the bottom chord is to be made to the column or other support, it shall be made only after the application of the dead loads. The joist is then no longer simply supported and the system must be investigated for continuous frame action by the specifying professional.

The designed detail of a rigid type connection and moment plates shall be shown on the structural drawings by the specifying professional. The moment plates shall be furnished by other than the joist manufacturer.



104.2 SPAN

The clear span of a joist shall not exceed 24 times its depth. The term "Span" as used herein is defined as the clearspan plus 8 inches (203 mm).

104.3 DEPTH

The nominal depth of sloping chord joists shall be the depth at mid-span. The standard slope of the top chord shall be 1/8 inch per foot (1:96).

104.4 END SUPPORTS**(a) Masonry and Concrete**

LH- & DLH-Series Joists supported by masonry or concrete are to bear on steel bearing plates and shall be designed as steel bearing. Due consideration of the end reactions and all other vertical and lateral forces shall be taken by the specifying professional in the design of the steel bearing plate and the masonry or concrete. The ends of **LH- & DLH-Series** Joists shall extend a distance of not less than 6 inches (152 mm) over the masonry or concrete support and be anchored to the steel bearing plate. The plate shall be located not more than 1/2 inch (13 mm) from the face of the wall and shall be not less than 9 inches (229 mm) wide perpendicular to the length of the joist. It is to be designed by the specifying professional in compliance with the allowable unit stresses in Section A5.1 (Allowable Stress Design) of the A.I.S.C. Specifications of latest adoption. The steel bearing plate shall be furnished by other than the joist manufacturer.

Where it is deemed necessary to bear less than 6 inches (152 mm) over the masonry or concrete support, special consideration is to be given to the design of the steel bearing plate and the masonry or concrete by the specifying professional. The joists must bear a minimum of 4 inches (102 mm) on the steel bearing plate.

(b) Steel

Due consideration of the end reactions and all other vertical and lateral forces shall be taken by the specifying engineer or architect in the design of the steel support.

The ends of **LH- or DLH-Series** joists shall extend a distance of not less than 4 inches (102 mm) over the steel supports. Where it is deemed necessary to butt opposite joists over a narrow steel support with bearing less than that noted above, special ends must be specified, and such ends shall have positive attachments to the support, either by bolting or welding.

104.5 BRIDGING**(a) Horizontal**

Horizontal bridging lines shall consist of two continuous horizontal steel members, one attached to the top chord and the other attached

to the bottom chord. The l/r ratio of the bridging member shall not exceed 300, where l is the distance in inches (millimeters) between attachments and r is the least radius of gyration of the bridging member. The bridging member shall be designed for a compressive force of 0.24 times the joist top chord area.

(b) Diagonal

Diagonal bridging lines shall consist of crossbracing with l/r ratio of not more than 200, where l is the distance in inches (millimeters) between connections and r is the least radius of gyration of the bracing member. Where cross-bracing members are connected at their point of intersection, the l distance shall be taken as the distance in inches (millimeters) between connections at the point of intersection of the bracing members and the connections to the chords of the joists.

(c) Bridging Lines

For spans up through 60 feet (18288 mm), welded horizontal bridging may be used except where the row of bridging nearest the center is required to be bolted diagonal bridging as indicated by the **Red shaded area** in the load table.

For spans over 60 feet (18288 mm) bolted diagonal bridging shall be used as indicated by the **Blue and Gray shaded areas** of the load table.

(d) Spacing

The maximum spacing of lines of bridging shall not exceed the values in Table 104.5.1. See Section 104.12 for bridging required for uplift forces.

TABLE 104.5.1

LH-DLH *Section Number	Max. Spac. of Lines of Bridging	Horizontal Bracing Force	
		lbs	(N)
02, 03, 04	11'-0" (3352 mm)	400	(1779)
05, 06	12'-0" (3657 mm)	500	(2224)
07, 08	13'-0" (3962 mm)	650	(2891)
09, 10	14'-0" (4267 mm)	800	(3558)
11, 12	16'-0" (4876 mm)	1000	(4448)
13, 14	16'-0" (4876 mm)	1200	(5337)
15, 16	21'-0" (6400 mm)	1600	(7117)
17	21'-0" (6400 mm)	1800	(8006)
18, 19	26'-0" (7924 mm)	2000	(8896)

Number of lines of bridging is based on joist clear span dimensions. *Last two digits of joist designation shown in load table.

(e) Connections:

Connections to the chords of the steel joists shall be made by positive mechanical means or by welding, and capable of resisting a horizontal force not less than that specified in Table 104.5.1.

(f) Bottom Chord Bearing Joists

Where bottom chord bearing joists are utilized, there shall be a row of diagonal bridging near the



support to provide lateral stability. This bridging shall be installed as the joists are set in place.

104.6 INSTALLATION OF BRIDGING

All bridging and bridging anchors shall be completely installed before construction loads are placed on the joists. Bridging shall support the top and bottom chords against lateral movement during the construction period and shall hold the steel joists in the approximate position as shown on the plans.

The ends of all bridging lines terminating at walls or beams shall be anchored to resist the force shown in Table 104.5.1.

104.7 END ANCHORAGE

(a) Masonry and Concrete

Ends of LH- or DLH-Series Joists resting on steel bearing plates on masonry or structural concrete shall be attached thereto with a minimum of two 1/4 inch (6 mm) fillet welds 2 inches (51 mm) long, or with two 3/4 inch (19 mm) bolts.

(b) Steel

Ends of LH- or DLH-Series Joists resting on steel supports shall be attached thereto with a minimum of two 1/4 inch (6 mm) fillet welds 2 inches (51 mm) long, or with two 3/4 inch (19 mm) bolts. In steel frames, where columns are not framed in at least two directions with structural steel members, joists at column lines shall be field bolted at the columns to provide lateral stability during construction.

(c) Uplift

Where uplift forces are a design consideration, roof joists shall be anchored to resist such forces.

104.8 JOIST SPACING

Joists shall be spaced so that the loading on each joist does not exceed the allowable load given for the particular designation and clearspan in the Load Table.

104.9 FLOOR AND ROOF DECKS

(a) Material

Floors and roof decks may consist of cast-in-place or precast concrete or gypsum, formed steel, wood or other suitable material capable of supporting the required load at the specified joist spacing.

(b) Thickness

Cast-in-place slabs shall be not less than 2 inches (51 mm) thick.

(c) Centering

Centering for structural slabs may be ribbed metal lath, corrugated steel sheets, paper-back welded wire fabric, removable centering or any other suitable material capable of supporting the slab at the designated joist spacing. Centering shall not

cause lateral displacement or damage to the top chord of joists during installation or removal of the centering or placing of the concrete.

(d) Bearing

Slabs or decks shall bear uniformly along the top chords of the joists.

(e) Attachments

The spacing of attachments along the top chord shall not exceed 36 inches (914 mm). Such attachments of the slab or deck to the top chords of joists shall be capable of resisting the following forces:

TABLE 104.9.1	
*Section Number	Equivalent Force Required
02 to 04 incl.	120 lbs./ft. (1.75 kN/m)
05 to 09 incl.	150 lbs./ft. (2.19 kN/m)
10 to 17 incl.	200 lbs./ft. (2.92 kN/m)
18 and 19	250 lbs./ft. (3.65 kN/m)

*Last two digits of joist designation shown in Load Table.

(f) Wood Nailers

Where wood nailers are used, such nailers in conjunction with the deck or slab shall be firmly attached to the top chords of the joists in conformance with Section 104.9(e).

104.10 DEFLECTION

The deflection due to the design live load shall not exceed the following:

Floors: 1/360 of span

Roofs: 1/360 of span where a plaster ceiling is attached or suspended.
1/240 of span for all other cases.

The specifying professional shall give due consideration to the effects of deflection and vibration* in the selection of joists.

* For further reference, refer to Steel Joist Institute Technical Digest #5, "Vibration of Steel Joist - Concrete Slab Floors" and the Institute's Computer Vibration Program.

104.11 PONDING

Unless a roof surface is provided with sufficient slope toward points of free drainage or adequate individual drains to prevent the accumulation of rain water, the roof system shall be investigated to assure stability under ponding conditions in accordance with Section K2 (Allowable Stress Design) of the AISC Specifications.* The ponding investigation shall be performed by the specifying professional.

* For further reference, refer to Steel Joist Institute Technical Digest #3 "Structural Design of Steel Joist Roofs to Resist Ponding Loads."

104.12 UPLIFT

Where uplift forces due to wind are a design



requirement, these forces must be indicated on the contract drawings in terms of net uplift in pounds per square foot (Pascals). When these forces are specified, they must be considered in the design of joists and/or bridging. A single line of bottom chord bridging must be provided near the first bottom chord panel points whenever uplift due to wind forces is a design consideration.*

* For further reference, refer to Steel Joist Institute Technical Digest #6, "Structural design of Steel Joist Roofs to Resist Uplift Loads."

104.13 INSPECTION

Joists shall be inspected by the manufacturer before shipment to insure compliance of materials and workmanship with the requirements of these specifications. If the purchaser wishes an inspection of the steel joists by someone other than the manufacturer's own inspectors, he may reserve the right to do so in his "Invitation to Bid" or the accompanying "Job Specifications." Arrangements shall be made with the manufacturing shop by the purchaser's inspectors at purchaser's expense.

SECTION 105.* ERECTION STABILITY AND HANDLING

When it is necessary for the erector to climb on the joists, extreme caution must be exercised since unbridged joists may exhibit some degree of instability under the erector's weight.

During the construction period, the contractor shall provide means for adequate distribution of concentrated loads so that the carrying capacity of any joist is not exceeded.

A. Stability Requirements

- Where the joist span does not exceed the erection stability span (as indicated by the shaded areas of the load table) one end of all joists shall be attached to its support in accordance with Section 104.7 - End Anchorage, or the joist shall be stabilized by the hoisting cable(s) ***before allowing the weight of an erector on the joists.***

When bolted connections are used the bolts must be snug tightened.

- A maximum weight of two erectors shall be allowed on any unbridged joist if: 1) the joist is stabilized by the hoisting cable(s), or 2) one end of the joist is attached to its support in the manner prescribed in Section 104.7 - End Anchorage and the bolted diagonal bridging required for erection stability is completely installed.

Where the span of the joist exceeds the erection stability span as indicated by the shaded area of the load table, hoisting cables shall not be released until the following conditions are met.

- One line of bolted diagonal bridging** is completely installed near the mid span for joist spans included in the **RED shaded area** of the load table.
 - Two lines of bolted diagonal bridging** nearest the third points of the span are completely installed for spans of over 60 feet (18288 mm) through 100 feet (30480 mm) as indicated by the **BLUE shaded area** in the LH and DLH Series Joist Load Tables.
 - All lines of bolted diagonal bridging** are completely installed for spans over 100 feet (30480 mm) as indicated by the **Gray shaded area** in the DLH Load Table.
- No loads other than the weight of the erector are allowed on the joist until all bridging is completely installed and all joist ends are attached.
 - In the case of bottom chord bearing joists, the ends of the joist must be restrained laterally per Section 104.5 (f) before releasing the hoisting cables.
 - After the joist is straightened and plumbed, and all bridging is completely installed and anchored, the ends of the joist shall be fully connected to the supports in accordance with Section 104.7 - End Anchorage.

B. Field Welding

- All field welding shall be performed in a workman-like manner to insure that the joists are not damaged by such welding.
- On cold-formed members whose yield strength has been attained by cold working, and whose as-formed strength is used in the design, the total length of weld at any one point shall not exceed 50 percent of the overall developed width of the cold-formed section.

C. Handling

Particular attention should be paid to the erection of Longspan and Deep Longspan Steel Joists. Care shall be exercised at all times to avoid damage to the joists and accessories through careless handling during unloading, storing and erecting.

Each joist shall be adequately braced laterally before any loads are applied. If lateral support is provided by bridging, the bridging lines as defined in Section 105, 2(a), (b), or (c) must be anchored to prevent lateral movement.

* For a thorough coverage of this topic, refer to SJI Technical Digest #9, "Handling and Erection of Steel Joists and Joist Girders".



HIGH STRENGTH STEEL

ECONOMICAL

DESIGN - Vulcraft SLH Series long span steel joists are designed in accordance with the specifications included in this section.

ACCESSORIES see page 64.

PAINT - Vulcraft SLH Series joists receive a shop-coat of rust inhibitive primer that conforms to specification 202.4.

SPECIFICATIONS - see page 68.

TABLE 1

SLH- SERIES BRIDGING SPACING		
JOIST SECTION NUMBER*	MINIMUM BOLT DIAMETER	MAXIMUM SPACING OF BRIDGING LINES
SLH 15-18	5/8" dia A325	21'-0
SLH 19-20	5/8" dia A325	26'-0
SLH 21-22	5/8" dia A325	30'-0
SLH 23-25	3/4" dia A325	30'-0

*LAST TWO DIGITS OF JOIST DESIGNATION SHOWN IN LOAD TABLE.

TABLE 2

SLH-SERIES BEARING DATA				
JOIST SECTION NUMBER*	BEARING DEPTH	MINIMUM BEARING LENGTH	BEARING SEAT FILLET WELD (1)	BEARING SEAT BOLTS FOR ERECTION (1)
SLH 15-18	5"	4"	2-1/4" x 2"	2-3/4" dia A325
SLH 19-25	7 1/2"	6"	2-1/4" x 4"	2-3/4" dia A325

(1) BEARING SEATS MUST BE WELDED IN ADDITION TO BEING BOLTED.

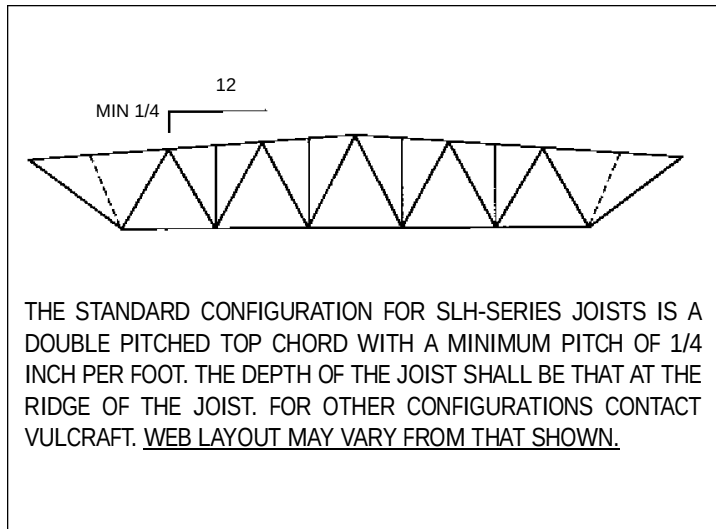
TABLE 3

JOIST DEPTH	HORIZONTAL PLUS DIAGONAL BRIDGING*		MIN. JOIST SPACE FOR DIAGONAL ONLY BRIDGING	DIAGONAL ONLY BRIDGING			
	.66 X DEPTH*	HORIZONTAL AND DIAGONAL ANGLE SIZE		MAXIMUM JOIST SPACING FOR DIAGONAL BRIDGING SIZE			
				2" x 2" x 1/8"	2 1/2" x 2 1/2" x 3/16"	3" x 3" x 3/16"	3 1/2" x 3 1/2" x 1/4"
80"	4'-4"	1 3/4" x 1 3/4" x 1/8"	4'-5"	9'-11"	15'-1"	18'-8"	22'-1"
88"	4'-9"	1 3/4" x 1 3/4" x 1/8"	4'-10"	7'-3"	14'-9"	18'-5"	21'-11"
96"	5'-3"	2" x 2" x 1/8"	5'-4"		14'-5"	18'-2"	21'-8"
104"	5'-8"	2 1/2" x 2 1/2" x 3/16"	5'-9"		14'-0"	17'-10"	21'-5"
112"	6'-1"	2 1/2" x 2 1/2" x 3/16"	6'-2"		11'-11"	17'-6"	21'-1"
120"	6'-7"	2 1/2" x 2 1/2" x 3/16"	6'-8"			17'-0"	20'-10"
*NOTE: WHEN THE JOIST SPACING IS LESS THAN 0.66 x JOIST DEPTH, BOLTED HORIZONTAL BRIDGING SHALL BE USED IN ADDITION TO THE DIAGONAL BRIDGING.							

NOTES: 1. For lengths and depths greater than those shown in the load tables contact Vulcraft.

2. Additional bridging may be required when joists support a standing seam roof. The specifying professional should require the joist manufacturer to check the system and provide bridging as required to adequately brace the joists against lateral movement. For bridging requirements due to uplift loading refer to specification section 204.13.

ACCESSORIES AND DETAILS SLH SERIES LONGSPAN STEEL JOISTS.

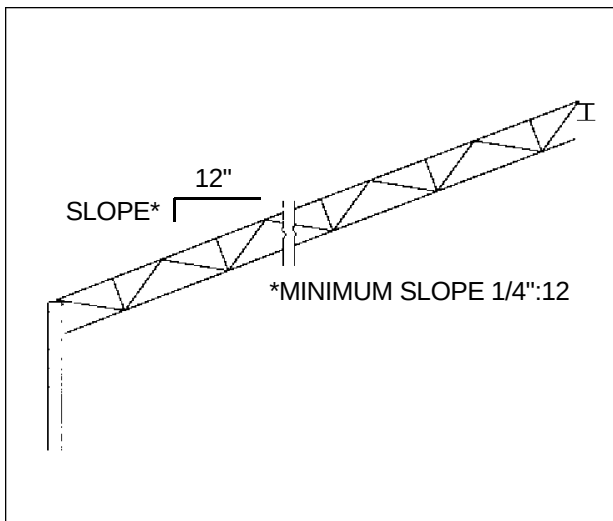


SLH-SERIES CAMBER*		
TOP CHORD LENGTH	DOUBLE PITCH JOISTS**	PARALLEL CHORD JOISTS
111'-0"	3 1/4"	5 1/4"
120'-0"	3 1/2"	6"
130'-0"	3 7/8"	7"
140'-0"	4 1/8"	8"
150'-0"	4 3/8"	8 3/4"
160'-0"	4 3/4"	9 1/2"
180'-0"	5 1/4"	10 1/2"
200'-0"	5 7/8"	11 3/4"
220'-0"	6 1/2"	13"
240'-0"	7"	14"

**JOISTS WITH TOP CHORD PITCH OF 1/4" PER FOOT OR GREATER.

*For walls or other structural members near SLH-Series Joists provisions need to be made to match top chord elevation.

Specifying professional must provide camber requirements as a percentage of live load and dead load if camber is different from that shown.

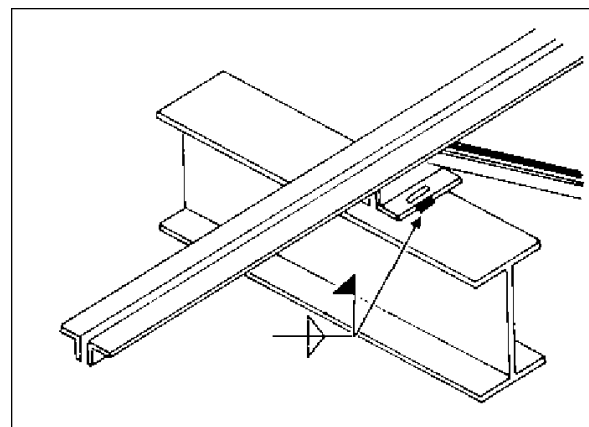


PARALLEL CHORD JOISTS
SEE SPECIFICATION 203.4 (c)

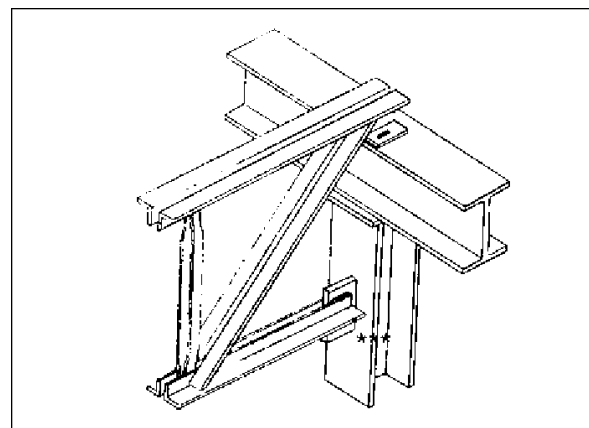
- (a) Extend top chords require the special attention of the specifying engineer.

The magnitude and location of the design loads to be supported, the deflection requirements, and the proper bracing shall be clearly indicated on the structural drawings.

NOTE:
FOR ANY CONCENTRATED LOADS SUCH AS BASKETBALL GOALS, CURTAINS, SCORE BOARDS, HVAC UNITS, ETC. IT IS ESSENTIAL THAT THE SPECIFYING ENGINEER PROVIDE THE MAGNITUDE AND LOCATION OF ALL LOADS ON THE STRUCTURAL DRAWINGS.



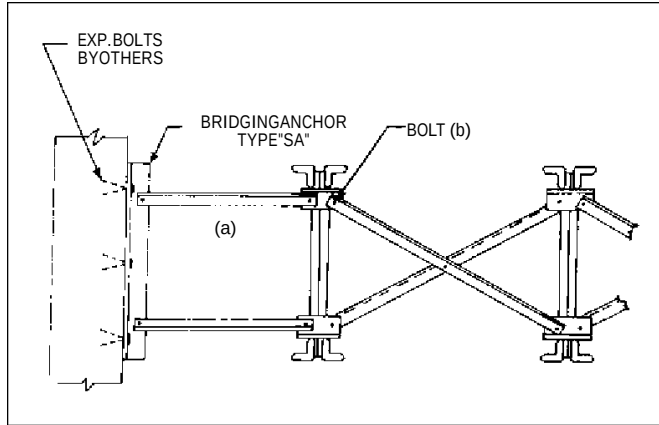
TOP CHORD EXTENSION (a)
SEE TABLE 204.8.1



BOTTOM CHORD STRUT
(SEE SPECIFICATION 204.1)

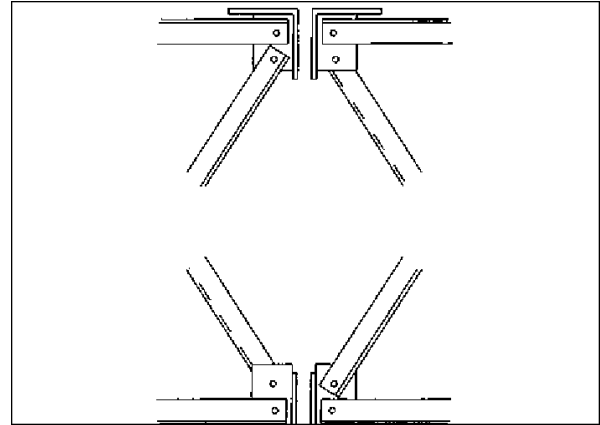
*** If bottom chord is to be bolted or welded the specifying professional must provide axial loads on structural drawings.

ACCESSORIES AND DETAILS SLH SERIES LONGSPAN STEEL JOISTS



CROSS BRIDGING

HORIZONTAL BRIDGING IS TO BE USED IN THE SPACE ADJACENT TO THE WALL TO ALLOW FOR PROPER DEFLECTION OF THE JOIST NEAREST THE WALL. SEE TABLES 1 AND 3 PAGE 63.

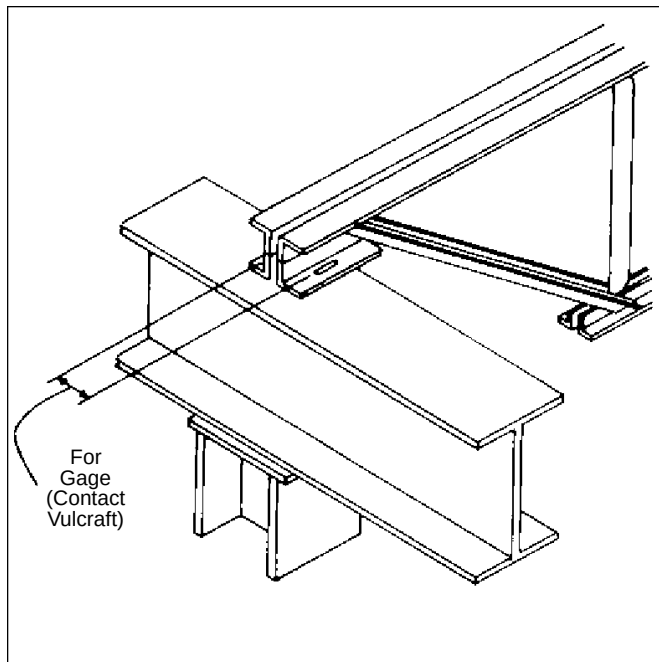


BOLTED, HORIZONTAL PLUS DIAGONAL, BRIDGING

SEE TABLE 3, PAGE 63 AND SPECIFICATION 204.6.

NOTE: CLIP CONFIGURATION MAY VARY FROM THAT SHOWN.

NOTE: DO NOT HANG ANY MECHANICAL, ELECTRICAL, ETC. FROM BRIDGING.



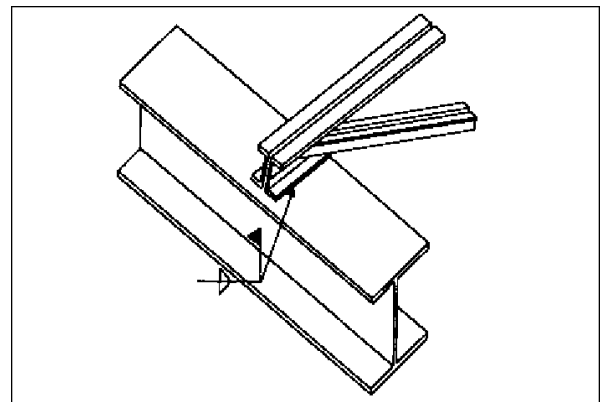
BOLTED CONNECTION (b)

SEE TABLE 2, PAGE 63.

TYPICALLY USED AT COLUMNS

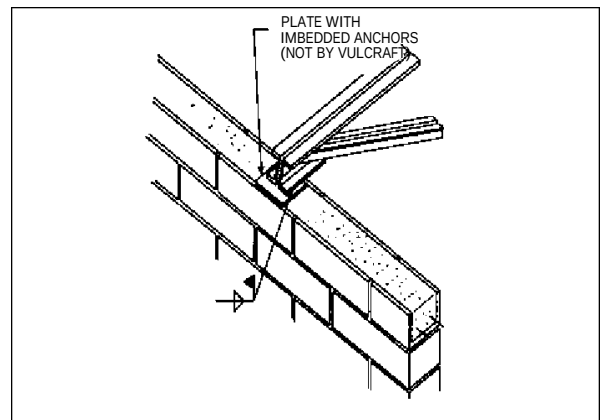
The Occupation Safety and Health Administration Standards (OSHA), Paragraph 1910.12 refers to Paragraph 1518.751 of "Construction Standards" which states:

"In steel framing, where bar joists are utilized, and columns are not framed in at least two directions with structural steel members, a bar joist shall be field-bolted at columns to provide lateral stability during construction."



ANCHORAGE TO STEEL

SEE TABLE 2, PAGE 63.



ANCHORAGE TO MASONRY

SEE SPECIFICATION 204.5 (a)

SEE TABLE 2, PAGE 63.

VULCRAFT LOAD TABLE SUPER LONGSPAN STEEL JOISTS, SLH-SERIES

JANUARY 1, 1991

Based on a Maximum Allowable Tensile Stress of 30,000 psi

The black figures in the following table give the TOTAL safe uniformly-distributed load-carrying capacities, in pounds per linear foot, of SLH-Series Joists. The weight of DEAD loads, including the joists, must in all cases be deducted to determine the LIVE load-carrying capacities of the joists. The approximate DEAD load of the joists may be determined from the weights per linear foot shown in the tables. All loads shown are for roof construction only.

The red figures in this table are the LIVE loads per linear foot of joist which will produce an approximate deflection of 1/360 of the span. LIVE loads which will produce a deflection of 1/240 of the span may be obtained by multiplying the red figures by 1.5. In no case shall the TOTAL load capacity of the joists be exceeded.

This load table applies to joists with either parallel chords or standard pitched top chords. When top chords are pitched, the design capacities are determined by the nominal depth of the joists at the center of the span. Standard top chord pitch is 1/4 inch per foot. If pitch exceeds this standard, the load table does not apply. This load table may be used for parallel chord joists installed to a maximum slope of 1/2 inch per foot.

When holes are required in top or bottom chords, the carrying capacities must be reduced in proportion to reduction of chord areas.

The top chords are considered as being stayed laterally by the roof deck.

The approximate joist weights per linear foot shown in these table do not include accessories.

When erecting SLH joists, hoisting cables shall not be released until all rows of bridging are completely installed.

*The safe load for the clear spans shown in the shaded section is equal to (Safe Load) / (Clear Span + 0.67). [The added 0.67 feet (8 inches) is required to obtain the proper length on which the Load Tables were developed.]
In no case shall the safe uniform load, for clear spans less than the minimum clear span shown in the shaded area, exceed the uniform load calculated for the minimum clear span listed in the shaded area.

To solve for live loads for clear spans shown in the shaded area (or lesser clear spans), multiply the live load of the shortest clear span shown in the Load tables by (the shortest clear span shown in the Load table + 0.67 feet)² and divide by (the actual clear span + 0.67 feet)². The live load shall not exceed the safe uniform load.

**For spans between those listed use a linear interpolation.

Joist Designation	Approx. Wt. In Lbs. per Linear Ft. (Joists Only)	Depth In Inches	Safe Load In Lbs. Between	CLEAR SPAN IN FEET**															
				80-110	111	114	117	120	123	126	129	132	135	138	141	144	147	150	155
80SLH15	40	80	52,000	466	442	421	401	383	366	350	335	321	307	295	283	272	261	244	228
80SLH16	46	80	62,500	321	296	275	255	236	220	205	192	179	167	157	147	139	130	118	107
				375	347	321	297	276	257	240	224	209	196	184	172	162	162	138	126
80SLH17	53	80	72,200	647	617	587	559	533	510	487	466	446	427	410	393	378	363	340	319
80SLH18	60	80	81,600	451	416	386	358	332	309	288	269	252	235	221	207	195	183	166	151
				516	477	441	409	380	354	330	308	288	270	253	237	223	210	190	173
80SLH19	67	80	95,200	853	812	773	736	701	670	640	612	585	560	537	516	495	476	445	418
80SLH20	75	80	107,000	578	533	493	458	425	396	369	344	322	301	283	266	250	235	213	193
				964	921	882	845	807	771	736	704	674	645	618	594	570	547	513	481
				646	596	552	512	475	443	412	385	360	337	316	297	279	263	238	216
			88-119	120	123	126	129	132	135	138	141	144	147	150	155	160	165	170	175
88SLH16	46	88	62,000	514	490	467	447	428	410	394	378	363	349	335	314	295	278	262	248
88SLH17	51	88	70,100	361	336	313	291	272	254	238	223	210	197	186	168	153	140	127	117
				404	375	349	325	304	284	266	249	234	220	207	187	170	156	143	130
88SLH18	58	88	80,400	667	635	605	577	551	527	504	483	463	444	426	399	374	352	331	312
88SLH19	65	88	93,000	460	427	397	370	346	323	303	284	267	250	236	214	195	177	162	149
				771	734	699	666	636	608	582	557	534	513	492	461	432	406	382	360
88SLH20	76	88	107,000	521	484	450	420	392	367	343	322	302	284	267	243	221	201	184	169
				889	854	821	789	755	723	694	665	639	614	590	553	520	489	461	435
88SLH21	89	88	132,000	623	579	539	502	469	438	410	385	361	340	320	290	264	241	220	202
				1099	1045	996	950	907	867	829	794	762	731	702	657	616	579	544	513
				724	673	626	584	545	509	477	447	420	395	372	337	307	280	256	235

VULCRAFT LOAD TABLE SUPER LONGSPAN STEEL JOISTS, SLH-SERIES

Based on a Maximum Allowable Tensile Stress of 30,000 psi

Joist Designation	Approx. Wt. In Lbs. per Linear Ft. (Joists Only)	Depth In Inches	Safe Load† In Lbs. Between	CLEAR SPAN IN FEET**															
				96-128	129	132	135	138	141	144	147	150	155	160	165	170	175	180	185
96SLH17	52	96	70,000	540	517	496	474	456	438	421	405	380	357	335	316	298	281	266	252
96SLH18	58	96	78,800	389	363	339	318	298	280	263	247	224	204	186	170	156	143	132	122
				443	413	386	362	340	319	300	282	256	232	212	194	178	163	150	139
96SLH19	66	96	94,200	727	697	667	638	611	585	561	539	505	474	445	419	396	373	353	334
				502	469	438	410	385	361	340	320	290	264	241	220	202	186	171	158
96SLH20	74	96	106,000	824	789	754	722	691	662	635	610	571	536	504	475	448	423	400	378
96SLH21	90	96	133,000	569	531	496	465	436	409	385	362	329	299	272	249	229	210	193	178
				1027	982	940	900	864	829	797	766	719	675	635	598	564	533	504	477
96SLH22	102	96	149,000	698	652	610	571	535	503	473	445	404	367	335	306	281	258	238	220
				1150	1108	1067	1028	991	957	921	886	832	782	736	694	656	620	587	556
				811	757	708	663	622	584	549	517	469	426	389	355	326	300	276	255
			104-137	138	141	144	147	150	155	160	165	170	175	180	185	190	195	200	205
104SLH18	59	104	76,800	554	532	512	489	472	444	418	396	374	354	335	318	302	287	273	260
104SLH19	67	104	93,400	426	400	375	353	332	301	274	250	229	209	192	177	164	152	140	130
				674	647	622	598	574	539	507	479	452	427	404	383	364	346	325	312
104SLH20	75	104	105,000	484	453	426	401	377	342	311	284	260	238	218	201	186	172	160	148
				764	738	714	688	661	621	583	548	516	487	460	435	413	391	371	353
104SLH21	90	104	132,000	548	513	483	453	427	387	352	321	293	269	247	228	210	195	181	167
				956	917	881	847	813	763	718	677	639	604	571	541	514	488	464	441
104SLH22	104	104	148,000	673	632	593	558	525	476	433	395	361	331	301	280	259	240	222	206
				1071	1034	999	966	934	883	830	783	738	698	660	626	594	564	536	511
104SLH23	109	104	163,000	783	734	689	648	610	553	503	459	420	385	353	326	301	278	258	240
				1181	1141	1096	1052	1009	945	887	834	785	741	700	662	628	595	565	537
				819	768	721	678	638	578	526	480	439	403	370	341	315	291	270	250
			112-146	147	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220
112LSH19	67	112	91,900	623	600	564	530	500	472	446	424	402	382	362	345	329	314	300	286
112SLH20	76	112	104,000	466	439	398	362	330	302	276	255	234	216	200	186	172	160	149	140
				710	688	649	610	575	543	514	488	463	440	417	398	379	361	345	330
112SLH21	91	112	131,000	528	497	450	410	374	342	313	288	266	245	227	210	195	181	169	158
				891	858	805	757	713	673	637	603	572	543	516	491	468	446	426	407
112SLH22	104	112	147,000	650	612	555	504	460	421	386	355	327	301	279	259	240	224	208	195
				999	967	918	871	824	778	736	697	661	628	596	568	541	516	492	470
112SLH23	110	112	162,000	755	711	644	586	535	489	449	412	380	350	324	301	279	260	242	226
				1102	1067	1012	959	901	848	800	756	716	679	644	612	582	554	528	504
112SLH24	131	112	192,000	790	744	674	613	560	512	469	431	397	367	340	315	292	272	253	236
				1304	1263	1199	1139	1074	1014	959	909	862	819	778	741	706	673	642	613
				957	901	817	743	678	620	569	523	481	444	411	381	354	329	307	287
			102-164	165	170	175	180	185	190	195	200	205	210	215	220	230	235	240	
120SLH20	77	120	98,900	597	564	532	505	479	456	434	414	395	376	359	344	329	315	302	290
120SLH21	92	120	123,000	430	393	361	332	306	282	261	242	225	209	195	182	170	159	149	140
				748	706	667	632	599	570	542	516	492	469	448	428	410	392	376	360
120SLH22	104	120	141,000	530	485	444	409	376	347	321	298	277	258	240	224	209	196	184	173
				855	815	770	729	692	658	626	596	568	542	517	495	473	453	434	416
120SLH23	111	120	156,000	616	564	516	475	438	404	374	347	322	300	279	261	244	228	214	201
				943	898	848	804	763	725	690	657	626	596	569	543	519	496	475	455
120SLH24	132	120	185,000	644	590	541	497	458	423	391	363	336	313	292	272	255	238	224	210
				1117	1062	1003	950	902	858	816	777	741	706	675	645	617	591	566	543
120SLH25	152	120	212,000	781	715	655	603	555	512	474	440	408	380	354	330	309	289	271	255
				1284	1218	1152	1092	1036	984	936	891	850	811	775	741	709	678	650	623
				915	837	768	706	650	600	555	515	478	445	415	387	362	339	318	298

**SECTION 200.
SCOPE**

These specifications cover the design, manufacture and use of Super Longspan Steel Joists SLH Series.

**SECTION 201.
DEFINITION**

The term "Super Longspan Steel Joists SLH Series" as used herein, refers to open web, load-carrying members utilizing hot-rolled steel. SLH series are suitable for the direct support of roof decks in buildings.

The design for SLH Series joist chord or web sections shall be based on a yield strength of at least 36,000 psi, but not greater than 50,000 psi. Steel used for SLH Series joist chord or web sections shall have a minimum yield strength determined in accordance with one of the procedures specified in Section 202.2, which is equal to the yield strength assumed in the design. SLH Series joists shall be designed in accordance with these specifications to support the loads given in the attached Standard Load Tables for SLH Series joists.

**SECTION 202.
MATERIALS**

202.1 STEEL

The steel used in the manufacture of chord and web sections shall conform to one of the following ASTM Specifications of latest adoption:

- Structural Steel, ASTM A36/A36M.
- High-Strength Low-Alloy Structural Steel, ASTM A242/A242M.
- High-Strength Carbon-Manganese Steel of Structural Quality ASTM A529/A529M. Grade 50.
- Hot-Rolled Carbon Steel Sheets and Strip, Structural Quality ASTM A570/A570M.
- High-Strength Low-Alloy Columbium-Vanadium Steel of Structural Quality ASTM A572/A572M. Grades 42, 45, and 50.
- High-Strength Low-Alloy Structural Steel with 50,000 psi Minimum Yield Point to 4 inches thick, ASTM A588/A588M.
- Steel Sheet and Strip, Hot-Rolled and Cold-Rolled, High-Strength, Low-Alloy, with Improved Corrosion Resistance, ASTM A606.
- Steel Sheet and Strip, Hot-Rolled and Cold-Rolled, High-Strength, Low-Alloy, Columbium and/or Vanadium, ASTM A607. Grades 45 and 50.
- Steel, Cold-Rolled Sheet, Carbon Structural ASTM A611, Grade.

*The term "yield strength" as used herein shall designate the yield level of a material as determined by the applicable method outlined in paragraph 13 "Yield Strength," or paragraph 12 "Yield Point," or ASTM A370, "Mechanical Testing of Steel Products," or as specified in Section 202.2 of this Specification, or shall be of suitable quality ordered or produced to other than the listed specifications, provided that such material in the state used for final assembly and fabrication is weldable and is proved by tests performed by the producer or fabricator to have the properties specified in Section 202.2.

202.2 MECHANICAL PROPERTIES

The yield strength used as a basis for the design stresses prescribed in Section 203 shall be at least 36,000 psi, but shall not be greater than 50,000 psi. Evidence that the steel furnished meets or exceeds the design yield

strength shall, if requested, be provided in the form of an affidavit or by witnessed or certified test reports.

In the case of material, the mechanical properties of which conform to the requirements of one of the listed specifications, test specimens and procedure shall conform to those of such specifications and to ASTM A370.

In the case of material, the mechanical properties of which do not conform to the requirements of one of the listed specifications, the test specimens and procedure shall conform to the applicable requirements of ASTM A370 and the specimens shall exhibit a yield strength equal to or exceeding the design yield strength and an elongation of not less than (a) 20 percent in 2 inches for sheet and strip or (b) 18 percent in 8 inches for plates, shapes and bars with adjustments for thickness for plates, shapes, and bars as prescribed in ASTM A36/A36M, A242/A242M, A529/A529M, A572/A572M, and A588/A588M whichever specification is applicable on the basis of design yield strength. The number of tests shall be as prescribed in ASTM A6 for plates, shapes, and bars; and ASTM A570/A570M, A606, AND A607 for the sheet and strip.

202.3 WELDING ELECTRODES

The following electrodes shall be used for arc welding:

(a) For connected members both having a specified minimum yield strength greater than 36,000 psi

AWS A5.1 or A5.5, E70XX

AWS A5.17, F7X, EXXX flux electrode combination

AWS A5.18, E70S-X or E70U-1

AWS A5.20, E70T-X

(b) For connected members both having a specified minimum yield strength of 36,000 psi or one having a specified minimum yield strength of 36,000 psi and the other having a specified minimum yield strength greater than 36,000 psi

AWS A5.1, E60XX

AWS A5.17, F6X-EXXX flux electrode combination

AWS A5.20, E60T-X

or any of those listed in Section 202.3 (a)

Other welding methods, providing equivalent strength as demonstrated by tests, may be used.

202.4 PAINT

The Standard shop paint is a **primer coat** intended to protect the steel for only a short period of exposure in ordinary atmospheric conditions and shall be considered an impermanent and provisional coating. The Standard shop paint shall conform to one of the following:

(a) Steel Structures Painting Council Specification 15-68T, Type 1 (red oxide).

(b) Federal Specification TT-P-636 (red oxide).

(c) Or, shall be a shop paint which meets the minimum performance requirements of one of the above listed specifications.

**SECTION 203.
DESIGN AND MANUFACTURE**

203.1 METHOD

Joists shall be designed in accordance with these

SPECIFICATIONS FOR VULCRAFT SUPER LONGSPAN STEEL JOISTS SLH-SERIES

specifications as simply supported uniformly loaded trusses supporting a roof deck so constructed as to brace the top chord of the joists against lateral buckling. Where any applicable design feature is not specifically covered herein, the design shall be in accordance with the American Institute of Steel Construction Specification for the Design, Fabrication and Erection of Structural Steel for Buildings, latest adoption, where the material used consists of plates, shapes or bars.

203.2 UNIT STRESSES

Joists shall have their components so proportioned that the unit stresses in pounds per square inch shall not exceed the following, where F_y is the yield strength defined in Section 202.2:

- (a) Tension: All members $F_t = 0.6 F_y$
 (b) Compression: For all members with Kl/r less than C_c :

$$F_a = \frac{\left[1 - \frac{(Kl/r)^2}{2C_c^2}\right] QF_y}{\frac{5}{3} + \frac{3}{8} \left(\frac{Kl/r}{C_c}\right) - \frac{1}{8} \left(\frac{Kl/r}{C_c}\right)^3}$$

$$\text{where } C_c = \sqrt{\frac{2\pi^2 E}{Q F_y}} \quad \text{and}$$

where Q is a form factor equal to unity except when the width-thickness ratio of one or more elements of the profile exceeds the limits specified in the AISC Specifications, Section B5 (Allowable Stress Design), and where K is a length factor used to determine the effective slenderness ratio as shown in Table 203.3.1.

For members with Kl/r greater than C_c :

$$F_a = \frac{12p^2 E}{23 (Kl/r)^2}$$

l = Length center-to-center of panel points, except $l = 36"$ for calculating l/r_y of top chord member
 l_c = Maximum length center-to-center between panel point and filler (tie), or between adjacent fillers (ties).

In the previous formulas Kl/r is the appropriate effective slenderness ratio as determined from Section 203.3, and "E" is equal to 29,000,000 psi.

- c) Bending:
 For chords, and for web members
 other than solid rounds $F_b = 0.6 F_y$
 For web members of solid round
 cross section $F_b = 0.9 F_y$
 For bearing plates $F_b = 0.75 F_y$
 d) Weld Stresses:
 Shear at throat of fillet welds:
 Made with E70 series electrodes or F7X-EXXX flux-electrode combinations 21,000 psi
 Made with E60 series electrodes or F6X-XXX flux-electrode combination 18,000 psi
 Tension or compression on groove or butt welds shall be the same as those specified for the connected material.

203.3 MAXIMUM SLENDERNESS RATIOS

The slenderness ratios, l_0/r and l_c/r , of members as a whole or any component part shall not exceed the values given in Table 203.3.1, Parts A.

The effective slenderness ratio, Kl/r^* , to be used in calculating the allowable stresses F_a and F_e , is the largest value as determined from Table 203.3.1, Parts B and C.

In compression members when fillers or ties are used, they shall be spaced so that the l_s/r_z ratio of each component does not exceed the governing l/r ratio of the members as a whole. The terms are defined as follows.

*See AISC Specification Section C2.1 and P.N. Chod and T.V. Galambos, Compression Chords Without Fillers in Longspan Steel Joists, Research Report No. 36, June 1975 Structural Division, Civil Engineering Department, Washington University, St. Louis, MO.

r_x = Member radius of gyration in the plane of the joist.
 r_y = Member radius of gyration out of plane of the joist.
 r_z = Least radius of gyration of a member component.

TABLE 203.3.1 MAXIMUM AND EFFECTIVE SLENDERNESS RATIOS

I. TOP CHORD INTERIOR PANEL				
A. The slenderness ratios, $1.0 l/r$ and $1.0 l_s/r$, of members as a whole or any component part shall not exceed 90.				
B. The effective slenderness ratio to determine "F _a "				
1. With fillers or ties	$0.75 l/r_x$	$1.0 l/r_y$	$1.0 l_s/r_z$	
2. Without fillers or ties	$0.75 l/r_z$			
3. Single component members	$0.75 l/r_x$	$1.0 l/r_y$		
C. The effective slenderness ratio to determine "F _e "				
1. With fillers or ties	$0.75 l/r_x$			
2. Without fillers or ties	$0.75 l/r_x$			
3. Single component members	$0.75 l/r_x$			
II. TOP CHORD END PANEL				
A. The slenderness ratios, $1.0 l/r$ and $1.0 l_s/r$, of members as a whole or any component part shall not exceed 120.				
B. The effective slenderness ratio to determine "F _a "				
1. With fillers or ties	$1.0 l/r_x$	$1.0 l/r_y$	$1.0 l_s/r_z$	
2. Without fillers or ties	$1.0 l/r_z$			
3. Single component members	$1.0 l/r_x$	$1.0 l/r_y$		
C. The effective slenderness ratio to determine "F _e "				
1. With fillers or ties	$1.0 l/r_x$			
2. Without fillers or ties	$1.0 l/r_x$			
3. Single component members	$1.0 l/r_x$			
III. TENSION MEMBERS - CHORDS AND WEBS				
A. The slenderness ratios, $1.0 l/r$ and $1.0 l_s/r$, of members as a whole or any component part shall not exceed 240.				
IV. COMPRESSION WEB MEMBERS				
A. The slenderness ratios, $1.0 l/r$ and $1.0 l_s/r$, of members as a whole or any component part shall not exceed 200.				
B. The effective slenderness ratio to determine "F _a "				
1. With fillers or ties	$0.75 l/r_x$	$1.0 l/r_y$	$1.0 l_s/r_z$	
2. Without fillers or ties	$1.0 l/r_z$			
3. Single component members	$0.75 l/r_x$	$1.0 l/r_y$		

203.4 MEMBERS

(a) Chords

The bottom chord shall be designed as an axially loaded tension member.

The top chord shall be designed as a continuous member subject to combined axial and bending stresses and shall be so proportioned that

$f_a + f_b \leq 0.6F_y$, at the panel point; and

$$\frac{f_a}{F_a} + \frac{C_m f_b}{\left(1 - \frac{f_a}{F'_e}\right) Q F_b} \leq 1.0, \text{ at mid-panel;}$$

$C_m = 1 - 0.3f_a/F'_e$ for end panels

$C_m = 1 - 0.4f_a/F'_e$ for interior panels

f_a = Computed axial unit compressive stress

f_b = Computed bending unit compressive stress at point under consideration

F_a = Permissible axial unit compressive stress based on $K l/r$

F_b = Permissible bending unit stress; $0.6F_y$

$$F'_e = \frac{12\pi^2 E}{23 (K l/r_x)^2}$$

r_x = Radius of gyration about the axis of bending

Q = Form factor as defined in Section 203.2 (b)

The radius of gyration of the top chord about its vertical axis shall be not less than $l/170$ where l is the spacing in inches between lines of bridging as specified in Section 204.6.

The top chord shall be considered as stayed laterally by the roof deck provided the requirements of Section 204.10 (d) of these specifications are met.

(b) Web

The vertical shears to be used in the design of the web members shall be determined from full uniform loading, but such vertical shear shall not be less than 25 percent of the end reaction.

Interior vertical web members used in modified Warren type web systems shall be designed to resist the gravity loads supported by the member plus 1 1/2 percent of the top chord axial force.

(c) Depth

Joists can have either a top chord pitch of 1/4 inch per foot or parallel chords. The depth, for the purpose of design, in all cases shall be the depth at mid-span. Parallel chord joists must be installed with a minimum slope of 1/4 inch per foot.

(d) Eccentricity

Members connected at a joint shall have their center of gravity lines meet at a point, if practical. Eccentricity on either side of the neutral axis of chord members may be neglected when it does not exceed the distance between the neutral axis and the back of the chord. Otherwise, provision shall be made for the stresses due to eccentricity. Ends of joists shall be proportioned to resist bending produced by eccentricity at the support.

(e) Extended Ends

Extended top chords or full depth cantilever ends require the special attention of the specifying engineer or architect.

The magnitude and location of the design loads to be supported, the deflection requirements, and the proper bracing shall be clearly indicated on the structural drawings.

203.5 CONNECTIONS

(a) Method

Joint connections and splices shall be made by attaching the members to one another by arc or resistance welding or other approved method.

1) Welded Connections

- Selected welds shall be inspected visually by the manufacturer. Prior to this inspection, weld slag shall be removed.
- Cracks are not acceptable and shall be repaired.
- Thorough fusion shall exist between layers of weld metal and between weld metal and base metal for the required design length of the weld; such fusion shall be verified by visual inspection.
- Unfilled weld craters shall not be included in the design length of the weld.
- Undercut shall not exceed $l/16$ inch for welds oriented parallel to the principal stress.
- The sum of surface (piping) porosity diameters shall not exceed $l/16$ inch in any 1 inch of design weld length.
- Weld spatter that does not interfere with paint coverage is acceptable.

2) Welding Program

Manufacturers shall have a program for establishing weld procedures and operator qualification and for weld sampling and testing.

3) Weld inspection by Outside Agencies (See Section 204.14 of these specifications).

The agency shall arrange for visual inspection to determine that welds meet the acceptance standards of Section 203.5 a. 1) above. Ultrasonic X-Ray, and magnetic particle testing are inappropriate for joists due to the configurations of the components and welds.

(b) Strength

Joint connections shall develop the maximum force due to any of the design loads, but not less than 50 percent of the allowable strength of the member in tension or compression, whichever force is the controlling factor in the selection of the member.

(c) Shop Splices

Shop splices may occur at any point in chord or web members. Splices shall be designed for the member force, but not less than 50 percent of the allowable member strength. Members containing a butt weld splice shall develop an ultimate tensile force of at least 57,000 psi times the full design area of the

chord or web. The term "member" shall be defined as all component parts, comprising the chord or web, at the point of splice.

- (d) **Field Splices**
Field splices shall be bolted connections designed by the manufacturer. Splices shall be designed for the member shear and moment forces, but not less than 50 percent of the allowable member strength.
- (e) **Bridging Clips**
Where double angles, separated by a nominal gap, are used as chord members, the two angles must be tied together with a filler or tie at all bridging clip locations. These fillers and their connections must be capable of developing the bridging forces indicated by Section 204.6 (d).

203.6 CAMBER

Joists shall have approximate cambers in accordance with the following:

TABLE 203.6.1

Top Chord Length	Double Pitch Joists*	Parallel Chord Joists
111'-0"	3 1/4"	5 1/4"
120'-0"	3 1/2"	6"
130'-0"	3 7/8"	7"
140'-0"	4 1/8"	8"
150'-0"	4 3/8"	8 3/4"
160'-0"	4 3/4"	9 1/2"
180'-0"	5 1/4"	10 1/2"
200'-0"	5 7/8"	11 3/4"
220'-0"	6 1/2"	13"
240'-0"	7"	14"

* Pitched 1 1/4 in 12" or greater

203.7 SHOP PAINTING

Joists and accessories shall receive one shop coat of protective paint as specified in Section 202.4.

203.8 VERIFICATION OF DESIGN

Design data on SLH series joists will be supplied to the specifying engineer upon request.

SECTION 204. APPLICATION

204.1 USAGE

These specifications shall apply to any type of structure where roof decks are to be supported directly by steel joists installed as herein specified. Where joists are used other than on simple spans under uniformly distributed loading, as prescribed in Section 203.1, they shall be investigated and modified if necessary to limit the unit stresses to those listed in Section 203.2.

CAUTION: If a rigid connection of the bottom chord is to be made to the column or other support, it shall be made only after the application of the dead loads. The joist is

then no longer simply supported and the system must be investigated for continuous frame action by the specifying professional.

204.2 SPAN

The clear span of joists shall not exceed 24 times their nominal depth.

204.3 DEPTH

The nominal depth of pitched chord joists shall be the depth at mid-span. The standard pitch of the top chord shall be 1/4 inch per foot.

204.4 PITCH

The standard configuration for SLH Series Joists is a double pitched top chord with a pitch of 1/4 inch per foot. The double pitched design was selected for economy and positive roof drainage.

204.5 END SUPPORTS

- (a) **Masonry and Concrete**

SLH Series Joists supported by masonry or concrete are to bear on steel bearing plates, and shall be designed as steel bearing. Due consideration of the end reactions and all other vertical and lateral forces shall be taken by the specifying engineer or architect in the design of the steel bearing plate and the masonry or concrete. The ends of SLH Series Joists shall extend over the masonry or concrete support not less than the distance shown in Table 204.5.1. The plate shall be located not more than 1/2 inch from the face of the wall and shall be not less than 9 inches wide perpendicular to the length of the joist. It is to be designed by the specifying engineer or architect in compliance with the allowable unit stresses in Section A5.1 (Allowable Stress Design) of the AISC Specifications, of latest adoption. The steel bearing plate shall be furnished by other than the joist manufacturer.

- (b) **Steel**

Due consideration of the end reactions and all other vertical and lateral forces shall be taken by the specifying engineer or architect in the design of the steel support. The end of SLH Series Joists shall extend over the steel support a distance not less than that shown in Table 204.5.1.

TABLE 204.5.1

Joist Section Number	Minimum Bearing Length*
SLH 15-18	4"
SLH 19-25	6"

*Excluding extension

204.6 BRIDGING

- (a) **Horizontal**

Horizontal bridging lines shall consist of two continuous horizontal steel members, one attached to the top chord and the other attached to the bottom chord. The l/r ratio of the bridging member shall not

exceed 300, where l is the distance in inches between attachments and r is the least radius of gyration of the bridging member.

(b) Diagonal

Diagonal bridging lines shall consist of cross-bracing with l/r ratio of not more than 200, where l is the distance in inches between connections and r is the least radius of gyration of the bracing member. Where cross-bracing members are connected at their point of intersection, the l distance shall be taken as the distance in inches between connections at the point of intersection of the bracing members and the connections to the chords of the joists.

(c) Bridging Lines

Bolted diagonal bridging shall be used except when the joist spacing is less than .66 x joist depth, then bolted horizontal bridging shall be used in addition to diagonal bridging.

(d) Spacing

The maximum spacing of lines of bridging shall not exceed the values in Table 204.6.1. Bridging shall be installed near a bottom chord panel point or an extra web member shall be furnished to brace the bottom chord for the vertical component of the bridging force equal to the horizontal bracing force. See Section 204.13 for bridging required for uplift forces.

TABLE 204.6.1

Joist-Section Number*	Max. Spac. Of Lines Of Bridging	Horizontal Bracing Force**
15 to 17	21'-0"	2,700 lbs
18	21'-0"	3,400 lbs
19	26'-0"	3,400 lbs
20	26'-0"	3,700 lbs
21	30'-0"	4,200 lbs
22	30'-0"	5,000 lbs
23	30'-0"	5,500 lbs
24	30'-0"	6,300 lbs
25	30'-0"	7,100 lbs

The number of lines of bridging is based on the joists clear span dimensions.

* Last two digits of designation shown in load table.

** Each connection to the chord shall resist one-half of this force.

(e) Connections

Connections to the chords of the steel joists and bridging anchors shall be made by positive mechanical means and capable of resisting a horizontal force not less than that specified in Table 204.6.1.

(f) Bottom Chord Bearing Joists

It is not recommended that SLH-Series joists be used in bottom chord bearing configuration.

204.7 INSTALLATION OF BRIDGING

All bridging and bridging anchors shall be completely installed before construction loads are placed on the joists. Bridging shall support the top and bottom chords against lateral movement during the construction period and shall hold the steel joists in the approximate position as shown on the plans.

The ends of all bridging lines terminating at walls or beams shall be anchored thereto.

204.8 END ANCHORAGE

(a) Masonry and Concrete

Ends of SLH Series Joists resting on steel bearing plates on masonry or structural concrete shall be attached thereto as shown Table 204.8.1.

(b) Steel

Ends of SLH Series Joists resting on steel supports shall be attached thereto as shown in Table 204.8.1. In steel frames, where columns are not framed in at least two directions with structural steel members, joists at column lines shall be field bolted at the columns to provide lateral stability during construction.

TABLE 204.8.1 END ANCHORAGE

Joist Section No.*	Fillet Weld	Bearing Seat Bolts For Erection
SLH 15-18	2 - 1/4" x 2"	2 - 3/4" A325
SLH 19-25	2 - 1/4" x 4"	2 - 3/4" A325

*Last two digits of designation shown in load table.

(c) Uplift

Where uplift forces are a design consideration, roof joists shall be anchored to resist such forces.

204.9 JOIST SPACING

Joists shall be spaced so that the loading on each joist does not exceed the allowable load given for the particular designation and span in the Load Table.

204.10 ROOF DECKS

(a) Material

Decks may consist of cast-in-place or precast concrete or gypsum, formed steel, wood or other suitable material capable of supporting the required load at the specified joist spacing.

(b) Thickness

Cast-in-place slabs shall not be less than 2 inches thick.

(c) Bearing

Slabs or decks shall bear uniformly along the top chords of the joist.

(d) Attachments

The spacing of attachments along the top chord shall not exceed 36 inches. Such attachments of the slab or deck to the top chords of joists shall be capable of resisting the following forces:

TABLE 204.10.1

Joist Section Number*	Equivalent Force Required
15 - 16 incl.	300 lbs./ft.
17 - 19 incl.	300 lbs./ft.
20 - 21 incl.	300 lbs./ft.
22 - 24 incl.	420 lbs./ft.
25	520 lbs./ft.

*Last two digits of designation shown in load table.

(e) Wood Nailers

It is not recommended that SLH-Series joists be used in conjunction with wood nailers.

204.11 DEFLECTION

The deflection due to the design live load shall not exceed the following:

Roofs

$l/360$ of span where plaster ceiling is attached or suspended.

$l/240$ of span for all other cases.

The specifying engineer or architect shall give due consideration to the effects of deflection in selection of joists.

204.12 PONDING

Unless a roof surface is provided with sufficient slope toward points of free drainage or adequate individual drains to prevent the accumulation of rain water, the roof system shall be investigated to assure stability under ponding conditions in accordance with Section K2 (Allowable Stress Design) of the AISC Specifications.*

A top chord pitch of $1/4"$ or more per foot is recommended to minimize ponding.

The ponding investigation shall be performed by the specifying engineer or architect.

* For further information, refer to Steel Joist Institute Technical Digest #3, "Structural Design of Steel Joist Roofs to Resist Ponding Loads".

204.13 UPLIFT

Where uplift forces due to wind are a design requirement, these forces must be indicated on the structural drawings in terms of net uplift in pounds per square foot. When these forces are specified, they must be considered in the design of joists and bridging. A single line of bottom chord bridging must be provided near the first bottom chord panel points, whenever uplift due to wind forces is a design consideration.**

** For further information, refer to Steel Joist Institute Technical Digest #6, "Structural Design of Steel Joist Roofs to Resist Uplift Loads".

204.14 INSPECTION

Joists shall be inspected by the manufacturer before shipment to insure compliance of materials and workmanship with the requirements of these specifications. If the purchaser wishes an inspection of the steel joists by someone other than the manufacturer's own inspectors, he may reserve the right to do so in the "Invitation to Bid" or the accompanying "Job Specifications". Arrangements shall be made with the manufacturer for such inspection of the joists at the manufacturing facility by the purchaser's inspectors at purchaser's expense.

SECTION 205.

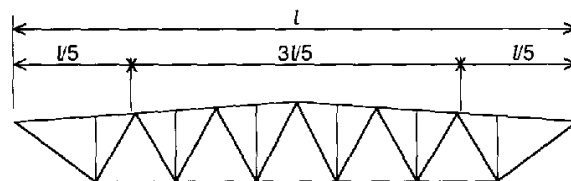
HANDLING AND ERECTION*

Particular attention should be paid to the erection of Super Longspan Steel Joists.

Care shall be exercised at all times to avoid damage through careless handling during unloading, storing, and erecting. Dropping of joists shall not be permitted.

Each joist shall be adequately braced laterally before any loads are applied. If lateral support is provided by bridging, the bridging lines must be anchored to prevent lateral movement.

Hoisting cables attached at a panel point approximately $1/5$ of the span from each end will minimize erection stresses in the steel joist. **The angle of the hoisting cables from the vertical shall not exceed 30 degrees.** Two cranes are recommended for spans greater than 150 feet.



Hoisting cables shall not be released until all bridging lines are installed. For ease of alignment, anchorage of joist ends in accordance with Section 204.8 should follow the installation of bridging. During the construction period, the contractor shall provide means for the adequate distribution of concentrated loads so the carrying capacity of any joist is not exceeded.

* For thorough coverage of this topic, refer to the Steel Joist Institute Technical Digest #9, "Handling and Erection of Steel Joists and Girders".

WHAT ARE JOIST GIRDERS?

Joist girders are primary framing members. The design is simple span, supporting equally spaced concentrated loads from open web steel joists. These concentrated loads are considered to act at the panel points of the joist girder.

Joist girders are designed to allow for the efficient use of steel in longer spans for primary framing members.

The following weight tables list joist girders from 20" to 96" deep and spans up to 100 feet. (For depths and lengths not listed contact Vulcraft.) The depth designation is determined by the nominal depth at the center of the span, except for offset double pitched girders, where the depth is determined at the ridge.

The standard configuration of a joist girder is parallel chord with underslung ends and bottom chord extensions. (Joist girders can be furnished in other configurations, see below.) The standard depth of bearing for joist girders is $7\frac{1}{2}$ inches at the end of the bearing seat.

The standard method of connecting girders to columns is two $\frac{3}{4}$ " diameter A325 bolts. A loose connection of the lower chord to the column or other support is required during erection in order to stabilize the lower chord laterally and to help brace the joist girder against overturning. **CAUTION: IF A RIGID CONNECTION OF THE BOTTOM CHORD IS TO BE MADE TO COLUMN OR OTHER SUPPORT, IT IS TO BE MADE ONLY**

AFTER THE APPLICATION OF THE DEAD LOADS. THE JOIST GIRDER IS THEN NO LONGER SIMPLY SUPPORTED AND THE SYSTEM MUST BE INVESTIGATED FOR CONTINUOUS FRAME ACTION BY THE SPECIFYING PROFESSIONAL.

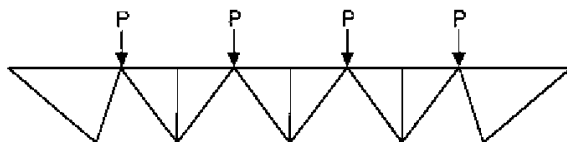
Joist girders along the perimeter, with joists coming in from one side only, and those with unbalanced loads must be designed such that the reactions pass through the center of the joist girder.

The weight tables list the approximate weight per linear foot for a joist girder supporting the panel point loads given by the specifying engineer. **NOTE: THE WEIGHT OF THE JOIST GIRDER MUST BE INCLUDED IN THE PANEL POINT LOAD. (SEE THE EXAMPLE ON PAGE 79).**

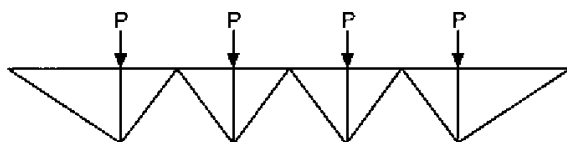
For calculating the approximate deflection or checking ponding the following formula may be used in determining the approximate moment of inertia of the joist girder. $I_{JG} = 0.027 \text{ NPLd}$

Where N = number of joist spaces, P = panel point load in kips, L = joist girder length in feet and d = effective depth of the joist girder in inches. Contact Vulcraft if a more exact joist girder moment of inertia must be known.

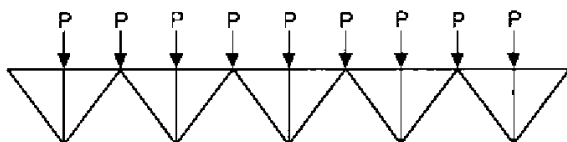
*Increase seat depth to 10" if weight of joist girder appears to the right of the stepped blue lines in the weight tables.



G TYPE



VG TYPE



BG TYPE

OTHER CONFIGURATIONS

AVAILABLE ARE:

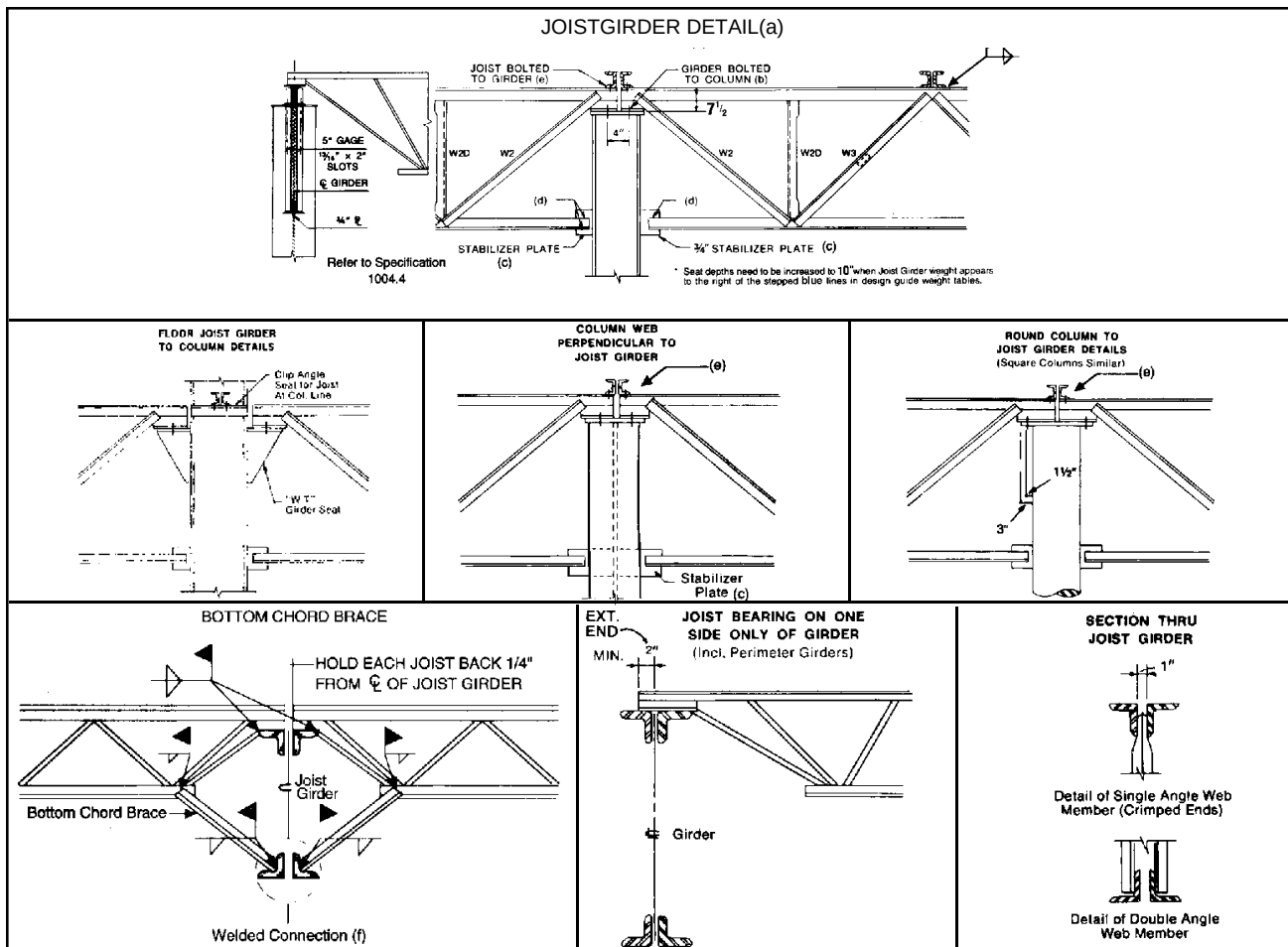
DOUBLE PITCH TC, UNDERSLUNG

SINGLE PITCH TC, UNDERSLUNG

OFFSET DOUBLE PITCH TC, UNDERSLUNG

SEE PAGE 79
FOR DESIGN EXAMPLE

NOTE: JOIST GIRDER WEB CONFIGURATION MAY VARY FROM THAT SHOWN. IF EXACT CONFIGURATION IS REQUIRED CONTACT VULCRAFT.



JOIST GIRDER NOTES

- (a) All Joist Girder dimensions shown are subject to change when required by the physical size of large Joist Girders. If changes are necessary Vulcraft will so note on the placing plans,
- (b) The standard connection for Joist Girders to columns is 13/16 inch slots for 3/4 inch bolts in girder bearings. **The girder erection bolts are by others.** If the specifying professional wishes to use the Joist Girder bearing to transmit horizontal loads, the required amount of weld to connect the Joist Girder seat to the column should be specified. For additional information see the section of this catalog "JOIST GIRDERS IN MOMENT RESISTIVE FRAMES." (page 78)
- (c) Stabilizer plates between bottom chord angles stabilize the bottom chord laterally and brace the Joist Girder against overturning during erection. (Refer to 1004.4)
- (d) Joist Girder bottom chord struts do not require welding to the stabilizer plate unless required by design to transmit horizontal forces. When welding is required, the amount of weld should be specified by the specifying professional. **UNLESS OTHERWISE SPECIFIED, BOTTOM CHORD STRUTS SHOULD NOT BE WELDED.**
- (e) Joists are connected to the girder by welding except that the joists at (or nearest) the column shall be bolted (O.S.H.A. Sec. 1910.12 Construction Standards Sec 1518.751).
- (f) The l/ry of the bottom chord of the Joist Girder cannot exceed 240. For STANDARD Joist Girders, the specifying engineer can use the "Joist Girder Bottom Chord Brace Chart" in conjunction with the "Design Guide Weight Table/Joist Girders, G Series" to select the correct number of bottom chord braces. Joist Girders which must resist uplift, end moments, or axial bottom chord forces may require additional braces.

JOIST GIRDER NOTES

If fixed end moments or uplift are present, the specifying professional should also specify bottom chord braces to be designed and furnished by the joist girder manufacturer. If any additional braces are required due to

the compression load in the bottom chord, Vulcraft will indicate their location on the erection drawings. Bottom chord braces may be either welded or bolted to the girder, but are typically welded to the joist.

JOIST GIRDER BOTTOM CHORD BRACE CHART*			
SPAN IN FEET			
JOIST GIRDER WEIGHT/FT	NO BC BRACES	ONE BC BRACE @ CENTERLINE	TWO BC BRACES @ 1/3 POINTS
0-22	0' to 24'	>24' to 49'	>49' to 73'
23-31	0' to 28'	>28' to 57'	>57' to 85'
31-45	0' to 32'	>32' to 65'	>65' to 97'
46-66	0' to 36'	>36' to 73'	>73' to 110'
67-87	0' to 41'	>41' to 82'	>82' to 123'
88-135	0' to 49'	>49' to 98'	>98' to 147'
136-173	0' to 57'	>57' to 114'	>114' to 171'

* The bottom chords must be restrained in accordance with Section 1004.5 of The SJI Specifications.

ECONOMY TIPS

- Designate Joist Girder with exact load required, such as 60G8N11.2K.
- If Joist Girder depth is limited below the optimum depth as shown in the weight tables, use the maximum depth permitted by the building system: such as 53G8N12K (odd depths can be designed and furnished).
- The Joist Girder designations shown in the weight guide are typical types included only as a guide. The specifying professional is encouraged to specify the exact depth, span and loading that best suits the building.
- A Joist Girder depth in inches approximately equal to the span in feet is often a good combination for economy.
- The specifying professional is urged to investigate several combinations of bay sizes and joist spaces to find the most economical combination.
- The following table illustrates the economy possible using this system.

Table G-1 ROOF SYSTEM WEIGHT FOR RECOMMENDED BAY SIZES							
BAY SIZE		Weight of joists* + Girders** = Total (PSF)***					
Joist Span	Girder Span	Design Load (PSF)				Joist Space (Ft.)	Girder Depth (In.)
		35 (PSF)	40 (PSF)	45 (PSF)	50 (PSF)		
40'	40'	1.69 + .75 = 2.44	1.78 + .83 = 2.61	1.90 + .90 = 2.80	2.07 + 1.03 = 3.10	6.67	48
40'	50'	1.73 + .95 = 2.68	1.90 + 1.08 = 2.98	2.02 + 1.18 = 3.20	2.13 + 1.28 = 3.41	6.25	60
40'	60'	1.69 + 1.13 = 2.82	1.78 + 1.30 = 3.08	1.90 + 1.40 = 3.30	2.07 + 1.53 = 3.60	6.67	72
45'	40'	1.89 + .71 = 2.60	2.04 + .80 = 2.84	2.14 + .89 = 3.03	2.41 + .96 = 3.37	6.67	48
45'	50'	1.98 + .96 = 2.94	2.11 + 1.09 = 3.20	2.22 + 1.16 = 3.38	2.40 + 1.29 = 3.69	6.25	60
45'	60'	1.89 + 1.16 = 3.05	2.04 + 1.24 = 3.28	2.14 + 1.38 = 3.52	2.41 + 1.49 = 3.90	6.67	72
50'	40'	2.19 + .72 = 2.91	2.28 + .80 = 3.08	2.53 + .86 = 3.39	2.80 + 1.06 = 3.86	6.67	48
50'	50'	2.21 + .92 = 3.13	2.43 + 1.00 = 3.43	2.61 + 1.12 = 3.73	2.70 + 1.20 = 3.90	6.25	60
50'	60'	2.19 + 1.12 = 3.31	2.28 + 1.22 = 3.50	2.53 + 1.34 = 3.87	2.80 + 1.50 = 4.30	6.67	72

* Weight of joists in pounds per square foot.

** Weight of the joist girders in pounds per square foot.

*** Total weight of joists and joist girders in pounds per square foot.

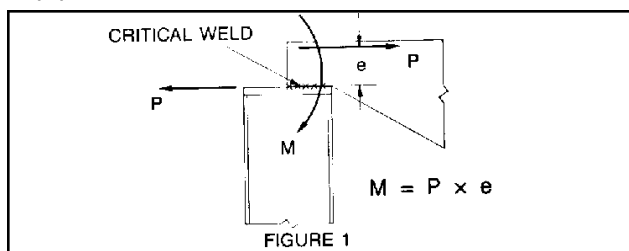
The larger bay sizes become more economical as the column heights increase and in localities with high erection labor costs. Larger bays speed construction by reducing the number of pieces and therefore the number of crane lifts. Encasing the columns for fire proofing or decoration also makes the larger bays more attractive.

JOIST GIRDERS IN MOMENT RESISTANT FRAMES

When a Joist Girder is used as a component of a moment resistive frame, both the design wind moment and any continuity (usually live load) moment must be specified for each end of each affected Joist Girder. Provided this information, Vulcraft will design the Joist Girder as a simply supported truss for full gravity loading. The "fixed end" moments are then applied to the Joist Girder. Using the appropriate combinations of the gravity loads, the wind moments, and/or the continuity moments, the critical member stresses are identified and the Joist Girder members are sized accordingly.

A one-third increase in allowable stresses is permitted in all load combinations involving wind. **(Vulcraft does not design the Joist Girder for any dead load moments unless specifically instructed to do so on the structural drawings.)** For this reason it is very important that on the structural drawings the specifying professional specify that all dead loads be applied to the Joist Girders before the bottom chord struts are welded to the stabilizer plates.

One of the most important considerations of using a Joist Girder in a moment resistive frame is the connection of the Joist Girder to the column. As with a beam connection, special provisions must be made to develop the required moment capacity. As can be readily seen in Figure 1, the use of a standard Joist Girder seat results in an eccentric moment due to the depth of the seat. This moment must be resisted by the weld group connecting the Joist Girder seat to the cap plate of the column.



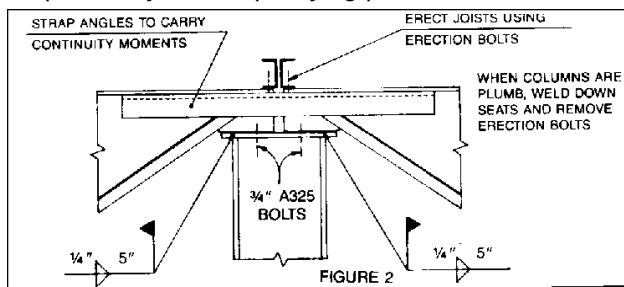
Vulcraft has conducted an extensive testing program to determine the maximum capacity of this connection. Table 1 gives the maximum capacity of a Joist Girder with a six inch deep bearing seat sitting atop the support. To achieve these strengths, both A325 erection bolts must be installed and tightened "snug tight" (ref. AISC for definition) in the Joist Girder seat. In addition, the Joist Girder seats must be welded to the support with a minimum of two 1/4" fillet welds 5 inches long. The bottom chord extensions of the Joist Girder must be welded to the column stabilizer plate as required.

Table 1

MAXIMUM AXIAL LOAD CAPACITY FOR 6" DEEP JOIST GIRDER SEATS	
JOIST GIRDER WGHT PER FOOT	
0-30	8 Kips
30.1 * Up	16 Kips

The capacities in Table 1 can be increased by one-third for all load cases involving wind.

If the axial load due only to the wind moment does not exceed the values in Table 1 (after increasing them by one-third), a strap angle connecting the Joist Girders together as shown in Figure 2 can be used to resist the continuity moments. By tying the Joist Girder ends together, the Joist Girder-to-cap plate connection need only resist the wind loads, **the strap angles do not transfer wind moments**. The design of such a strap angle to resist the continuity moments is the responsibility of the specifying professional.



When the end moments on the Joist Girders are too large for the seat to resist, it is necessary to utilize a moment plate as shown in Details A-F. The use of this simple moment plate virtually eliminates all eccentricity problems.

By using the equations and Table 2 below, the specifying professional can determine the minimum Joist Girder top chord width for most Joist Girders. If the end moments are very large, the Joist Girder loads and/or spacings vary, or other special conditions exist, a more exact analysis is required. Once the Joist Girder top chord width is known, the specifying professional can easily size the moment plate and its weld requirements to complete the connection detail.

EQUATION 1 (ODD NO. OF JOIST SPACES)

$$A = \frac{.028P}{D} (N^2S - .67N + .67 - S)$$

EQUATION 2 (EVEN NO. OF JOIST SPACES)

$$A = \frac{.028P}{D} (N^2S - .67N + .67)$$

Where:

P = Panel point load (kips)

N = No. of joist spaces

S = Joist spacing (ft.)

D = Joist Girder depth (in.)

Table 2*

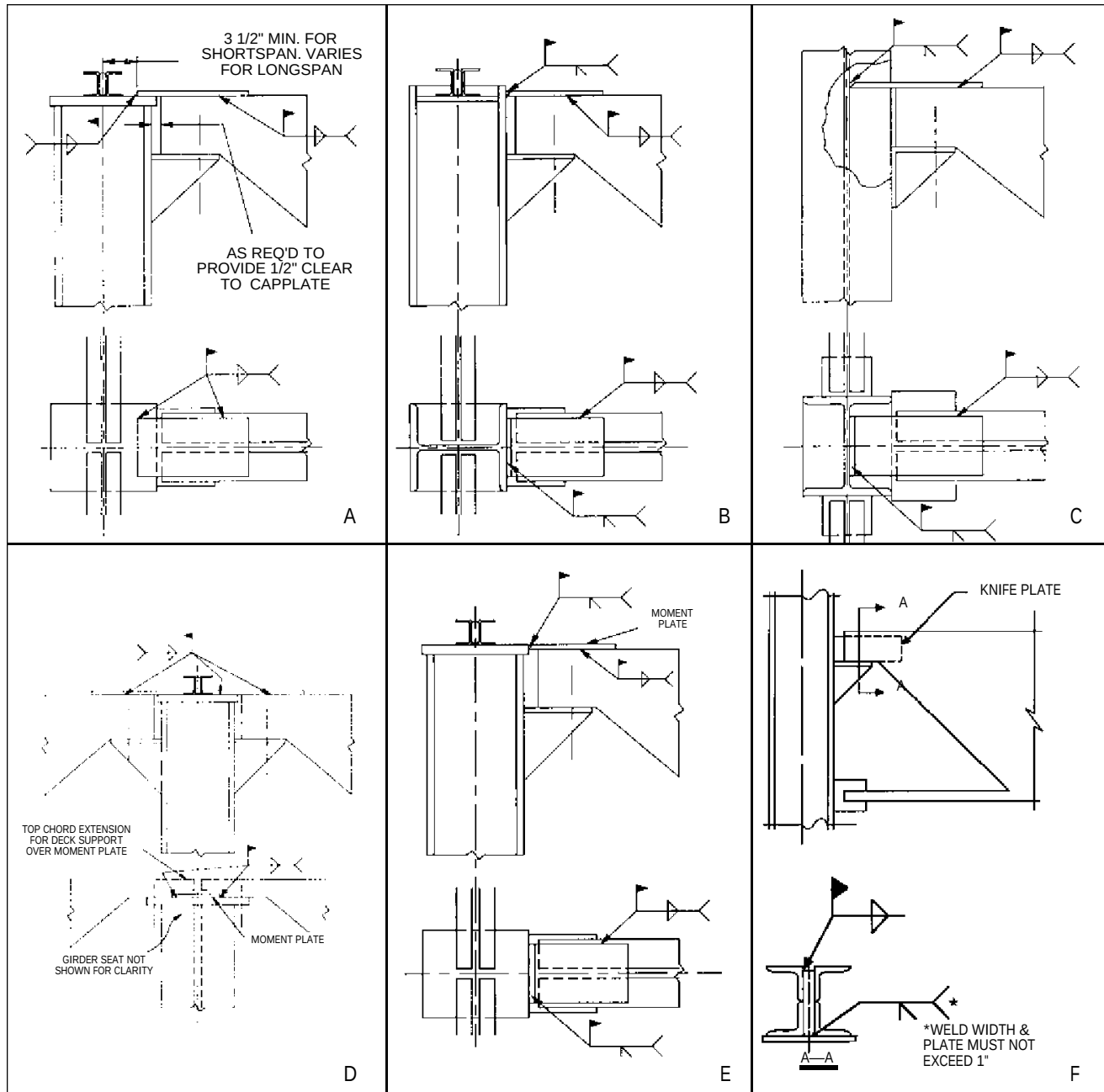
A	Minimum Top Chord Width
0.95 - 1.19	6"
1.20 - 1.78	7"
1.79 - 2.48	8"
2.49 - 3.75	9"
3.76 - 4.76	11"
4.78 - 8.44	13"
Greater than 8.44	Consult Vulcraft

Please note that this chart is to be used only for designing moment plates. It is not intended for use as a general detailing aid.

*The bearing seat width may be larger than the top chord width. Contact Vulcraft if seat width is needed for determining column plate sizes.

MOMENT CONNECTION DETAILS

Presented below are six suggested detailed for a moment resistive connection involving roof Joist Girders. Similar details should be utilized for longspan joists with end moments. In all cases, the bottom chord is to be connected to the column with a vertical stabilizer plate which is to be sized to carry the required load and obtain required weld (use 6 x 6 x 3/4 plate minimum for Joist Girders).

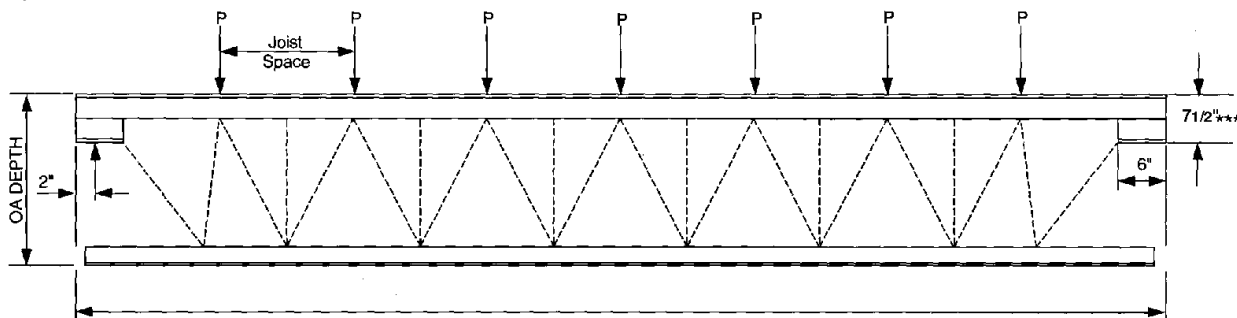


NOTES :

- (1) Connections type B & C would also be recommended for floor girder details.
- (2) Where a backer bar is required for groove welds, additional clearance must be provided when determining girder hold back dimension.
- (3) Similar details would apply at other types of columns.
- (4) Additional stiffener plates as required not shown for clarity.
- (5) In all details, moment plate design and material is not by Vulcraft.

HOW TO SPECIFY VULCRAFT JOIST GIRDERS

For a given joist girder span, the designer first determines the number of joist spaces, Then the panel point loads are calculated and a depth is selected. The following tables gives the Joist Girder weight per linear foot for various depths and loads.



JOIST GIRDER SPAN (C/C COLUMN TO C/C COLUMN)

STANDARD DESIGNATION

48G**	8N	8.8K
Depth in Inches	Number of Joist Spaces	Kip Load on Each Panel Point (One Kip = 1000 lbs.)

Example: Given : 50'-0 x 40'-0 bay Joists spaced on 6'-3 centers

Live Load = 20 psf
Dead Load = 15 psf *
Total Load = 35 psf

Note: Web configuration may vary from that shown. Contact Vulcraft if exact layout must be known.

- * Includes the approximate Joist Girder weight in panel point loads.
** See page 74 for other Girder Types.
*** Increase to 10" if to the right of the stepped blue lines in the weight tables.

1. Determine number of actual joist spaces (N).

In this example, N = 8

2. Joist Selection

- Span = 40'-0
- T.L. = $6.25 \times 35 = 219$ plf
- from K-Series load tables select a 22K7 (T.L. = 231 > 219; L.L. = 185 > 125)
 $123 \times 1.5 = 185$ (l/240 limit applies since ceiling is not plastered)

3. Joist Girder Selection

- compute the concentrated load at top chord panel points $P = 219 \times 40 = 8,760$ lbs. = 8.8 kips (use 9K for depth selection) Live load deflection rarely governs in Joist Girder selection because of their depth.
- Select girder depth
The 50'-0 span 8 panel Joist Girder table on page 85 indicates that the rule of about one

inch of depth for each foot of span is a good compromise of limited depth and economy. Therefore select depth of 48 inches.

- the Joist Girder will then be designated 48G8N8.8K
- the Joist Girder table shows the weight for a 48G8N9K is 40 pounds per lineal foot
- total weight of this Joist Girder system per square foot is:

Joists 9.7 plf/6.25	= 1.55
Girder 40 plf/40	= <u>1.00</u>
	2.55 psf

4. For rectangular bays check economy with joists and girders spanning the opposite way

Joists (26K10) $13.8 \text{ plf}/6.67 = 2.07$
Girder (40G6N12K) $47 \text{ plf}/50 = \underline{.94}$
3.01 psf

NOTES:

- When it is required to have joists bear only at vertical web members to gain space for duct work, the Joist Girder should be labeled as a "VG" in lieu of a "G".
- The following tables serve as a design guide only. Odd size joist girder lengths, depths, kip loadings, and panel lengths are available.

DESIGN GUIDE WEIGHT TABLE FOR JOIST GIRDERS U. S. CUSTOMARY

Based on an allowable tensile stress of 30ksi

Girder Span (ft)	Joist Spaces (ft)	Girder Depth (in)	Joist Girder Weight – Pounds Per Linear Foot																	
			Load on Each Panel Point																	
			4K	5K	6K	7K	8K	9K	10K	11K	12K	14K	16K	18K	20K	25K	30K	35K	40K	50K
20	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	2N@	20	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	10.00	24	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	3N@	20	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	6.67	24	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	4N@	20	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	5.00	24	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
22	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	2N@	20	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	11	24	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	3N@	20	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	7.33	24	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	4N@	20	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	5.5	24	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
24	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	2N@	20	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	12.00	24	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	3N@	20	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	8.00	24	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	4N@	20	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	6.00	24	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
26	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	2N@	20	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	13.00	24	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	3N@	20	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	8.67	24	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	4N@	20	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	6.5	24	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16

Joist Girder weights to the right of the heavy blue line have 10 inch bearing depths. Check with Vulcraft for material availability.

DESIGN GUIDE WEIGHT TABLE FOR JOIST GIRDERS

U. S. CUSTOMARY

Based on an allowable tensile stress of 30ksi

Girder Span (ft)	Joist Spaces (ft)	Girder Depth (in)	Joist Girder Weight - Pounds Per Linear Foot																					
			Load on Each Panel Point																					
			4K	5K	6K	7K	8K	9K	10K	11K	12K	14K	16K	18K	20K	25K	30K	35K	40K	50K	60K	70K	80K	100K
28	2N@ 14.00	24	29	29	29	29	29	29	29	30	31	31	33	34	37	39	42	49	57	65	77	91	103	129
		28	29	29	30	30	30	30	30	30	30	31	32	34	34	38	40	43	46	58	66	78	93	106
		32	30	30	30	30	30	30	30	30	30	31	32	33	34	37	39	40	44	52	60	68	76	95
	3N@ 9.33	24	16	16	16	16	16	18	21	22	23	26	29	33	36	44	54	61	70	91	105	124	133	174
		28	16	16	16	16	16	16	18	19	21	23	26	29	31	39	47	52	61	77	94	107	115	156
		32	16	16	16	16	17	17	18	19	24	24	27	29	36	42	47	54	70	80	97	110	131	
	4N@ 7.00	24	16	16	17	19	21	24	27	28	31	35	39	45	50	62	74	91	101	121	143	165	190	244
		28	17	17	17	18	20	23	24	25	28	32	36	39	44	57	64	76	85	109	124	151	170	206
		32	16	16	16	18	19	20	21	22	24	27	31	37	39	46	54	62	74	88	108	126	149	185
	5N@ 5.6	24	16	17	19	22	24	28	31	33	35	41	47	55	62	78	92	105	114	152	176	215	244	
28		16	16	17	20	21	26	28	29	32	35	40	47	52	64	80	94	104	134	156	186	213	260	
32		16	16	17	19	20	22	26	27	29	32	38	42	46	58	66	82	97	111	136	162	190	232	
6N@ 4.67	24	17	19	21	25	29	32	36	39	43	50	59	66	73	100	109	121	142	191	219	254	314		
	28	16	19	21	22	26	29	32	34	37	44	52	57	60	76	103	105	123	149	194	223	253		
	32	17	17	20	22	24	27	30	31	34	38	45	51	54	71	87	105	108	148	177	201	230	301	
7N@ 4.00	24	18	22	26	31	33	37	43	48	51	59	67	79	84	103	131	144	166	219	261				
	28	17	20	24	26	29	32	36	41	45	53	61	65	74	95	109	125	147	184	224	272	312		
	32	17	20	23	25	27	30	33	37	40	47	55	60	67	83	106	115	127	169	202	240	277		
14N@ 2.00	24	33	43	51	59	66	79	84	102	103	121	143	155	173	221	281								
	28	30	38	45	53	61	70	75	82	88	106	114	137	149	198	235	274	332						
	32	28	33	40	47	54	63	72	76	79	100	113	118	132	172	206	244	284						
30	2N@ 15.00	24	29	29	29	29	29	29	30	30	31	32	33	35	37	40	46	53	60	72	85	102	130	139
		28	29	29	29	29	29	29	30	30	30	32	32	34	36	38	41	44	49	65	74	86	92	115
		36	30	30	30	30	30	30	30	30	30	31	32	32	33	36	38	41	42	51	60	68	76	95
	3N@ 10.00	24	15	16	16	16	18	19	22	24	25	29	31	34	38	48	57	65	74	91	109	130	151	176
		28	16	16	16	16	16	17	20	21	24	25	28	31	33	43	50	58	67	79	94	108	126	156
		36	16	16	16	16	16	17	18	19	21	25	26	29	30	38	45	51	60	69	89	96	110	136
	4N@ 7.5	24	16	16	17	20	24	26	27	30	32	37	42	47	54	66	78	99	104	140	161	183	210	265
		28	16	16	17	18	21	23	25	27	28	33	37	42	46	56	71	79	93	110	143	156	179	223
		36	16	16	16	18	19	20	21	23	27	29	32	36	41	50	60	69	76	104	112	146	149	202
	5N@ 6.00	24	16	17	20	23	26	29	32	34	38	45	53	58	62	78	100	108	131	162	193	231	262	
		28	16	16	19	21	24	27	28	31	34	38	46	49	56	71	79	102	107	143	166	195	224	285
		36	16	17	17	19	21	22	25	27	29	31	38	40	44	58	66	76	88	108	127	151	179	220
	6N@ 5.00	24	17	19	24	28	31	34	39	42	47	54	62	69	78	100	109	140	161	190	237	288		
		28	16	19	20	26	28	31	34	37	40	46	52	60	67	84	102	111	143	167	195	222	289	
		36	16	17	20	22	26	28	31	32	35	41	47	53	60	74	87	106	113	148	175	200	237	304
8N@ 3.75	24	21	25	31	36	41	47	50	58	62	73	83	100	102	131	162	188	216	255					
	28	20	23	29	32	37	40	44	49	53	61	72	81	86	111	144	147	175	224	281				
	36	19	22	26	30	32	36	41	45	50	57	65	75	82	105	114	147	159	204	242	308	343		
15N@ 2.00	24	40	50	58	66	78	92	101	106	115	142	165	181	196	257	326								
	28	34	41	52	60	68	76	85	103	105	113	137	152	176	216	265	329							
	36	30	39	47	54	62	73	77	83	91	111	117	133	159	195	242	275	325						
32	3N@ 10.67	24	15	15	15	17	19	21	23	25	26	31	34	37	42	50	63	72	86	102	123	130	150	197
		28	16	16	16	16	17	19	21	22	24	27	29	32	35	44	51	64	67	87	105	114	132	173
		36	16	16	16	16	16	17	19	21	22	25	27	30	32	39	45	52	60	77	93	107	115	156
	4N@ 8.00	24	16	16	18	22	24	26	29	31	34	40	45	53	58	69	89	99	107	139	161	187	222	273
		28	16	16	17	19	22	24	26	27	30	35	38	46	48	62	70	83	101	115	143	165	187	243
		36	16	16	18	18	19	20	22	23	26	28	34	37	39	50	57	66	75	88	107	125	149	184
	5N@ 6.4	24	16	19	22	26	29	31	34	38	41	47	54	61	68	91	103	113	140	172	200	237	275	
		28	16	17	19	22	24	27	29	32	35	41	47	54	62	71	92	102	114	143	175	209	233	305
		36	16	16	18	20	22	26	27	30	33	36	42	47	55	64	80	94	103	133	156	187	203	258
	6N@ 5.33	24	18	21	25	29	33	36	40	46	49	57	65	73	82	100	119	141	161	214	242	307		
		28	17	19	21	26	28	31	36	39	43	50	59	62	70	92	102	121	142	171	219	249	290	
		36	16	19	20	24	26	28	32	34	37	44	52	57	60	76	103	105	123	149	194	223	253	321
	8N@ 4.00	24	23	28	33	39	42	50	57	58	65	77	91	100	108	140	162	188	216	282				
		28	21	26	28	33	37	42	48	51	59	67	75	85	101	111	143	167	192	241	292	304		
		36	19	22	26	29	32	36	42	46	52	61	69	76	86	109	125	149	176	207	258	277	316	
Bearing Depth			7 1/2 in.														10 in.							

Joist Girder weights to the right of the heavy blue line have 10 inch bearing depths. Check with Vulcraft for material availability.

DESIGN GUIDE WEIGHT TABLE FOR JOIST GIRDERS

U. S. CUSTOMARY

Based on an allowable tensile stress of 30ksi

Girder Span (ft)	Joist Spaces (ft)	Girder Depth (in)	Joist Girder Weight – Pounds Per Linear Foot																									
			Load on Each Panel Point																									
			4K	5K	6K	7K	8K	9K	10K	11K	12K	14K	16K	18K	20K	25K	30K	35K	40K	50K	60K	70K	80K	100K				
34	3N@ 11.33	28	18	18	18	18	19	19	20	22	23	25	28	31	34	40	48	57	65	73	91	109	124	150	173			
		32	18	18	18	19	19	19	20	22	23	26	28	32	35	42	49	58	66	87	91	112	126	156				
		36	18	19	19	19	19	19	20	20	22	26	27	29	31	39	45	51	60	73	89	99	115	136				
		40	19	19	19	19	19	19	20	20	21	25	27	28	32	37	44	46	54	70	79	92	110	132				
	4N@ 8.50	28	16	16	18	20	23	26	27	29	32	36	40	47	54	62	78	91	100	130	152	174	199	243				
		32	16	16	17	19	20	24	24	27	30	32	37	42	47	56	71	79	92	108	134	155	177	223				
		36	16	17	18	18	19	21	23	26	27	29	33	38	41	50	61	69	76	104	113	146	149	200				
		40	16	18	18	18	19	20	21	23	26	28	33	35	39	45	54	62	74	87	106	115	148	182				
	5N@ 6.80	28	16	17	21	23	26	29	32	35	38	45	47	54	62	77	99	106	120	153	185	212	248					
		32	16	17	18	21	24	27	30	32	34	39	46	48	55	70	79	101	107	133	156	197	214	267				
		36	16	16	17	20	21	25	28	28	33	36	39	47	50	64	73	85	104	119	146	170	198	241				
		40	17	17	18	19	21	23	26	29	29	35	38	40	48	58	66	80	96	111	137	151	181	227				
6N@ 5.67	28	17	20	24	28	30	33	36	41	44	54	58	65	73	100	108	130	142	190	220	248	307						
	32	17	19	21	25	28	31	34	37	40	48	52	59	67	83	102	110	123	167	193	224	252						
	36	17	18	20	22	26	28	31	32	36	41	50	53	60	74	86	105	113	148	177	199	228	298					
	40	17	18	19	22	24	27	29	30	33	39	42	51	54	67	83	97	108	128	153	187	216	269					
36	7N@ 4.86	28	19	23	27	31	34	39	43	47	54	62	70	78	91	105	131	152	175	219	255							
		32	18	20	26	27	31	35	38	42	47	56	64	71	79	102	111	134	155	193	223	268						
		36	17	20	22	27	29	32	36	38	42	50	57	65	69	86	105	118	136	176	203	241	285					
		40	17	20	23	25	28	30	33	36	39	45	53	59	63	79	99	109	122	154	196	225	258	332				
	9N@ 3.78	28	25	28	34	39	43	51	58	63	67	78	92	101	109	142	164	194	220	284								
		32	21	26	30	35	40	44	49	56	60	70	80	95	103	124	148	175	198	265								
		36	20	25	28	32	36	41	45	50	53	62	72	81	88	113	127	150	178	227	275	330						
		40	19	23	28	30	34	38	43	46	51	59	68	76	84	107	116	142	159	206	250	299						
	3N@ 12.00	28	18	18	18	18	19	21	23	25	27	30	33	40	41	48	60	69	81	94	109	130	151	186				
		32	18	18	18	18	18	19	21	23	25	27	30	33	36	44	54	61	71	87	104	112	132	164				
		36	18	18	19	19	19	19	20	21	22	26	28	31	34	43	48	55	63	76	93	107	115	156				
		40	19	19	19	19	19	19	20	20	22	26	28	32	32	40	44	51	57	69	89	97	110	131				
4N@ 9.00	28	16	16	19	21	23	27	29	31	34	39	45	50	54	69	81	99	104	140	161	183	211	265					
	32	16	16	17	20	23	24	26	28	31	35	40	46	48	62	70	83	101	115	143	165	188	230					
	36	17	17	17	18	21	24	25	27	28	33	37	40	46	57	65	73	85	109	125	150	172	212					
	40	16	18	18	18	19	21	23	23	26	28	32	38	40	50	58	66	76	96	111	126	149	183					
5N@ 7.20	28	16	18	21	25	26	31	34	36	40	45	54	61	68	81	100	114	130	162	196	231	262						
	32	16	17	20	22	24	27	30	34	35	41	46	54	59	70	91	101	112	143	177	199	233	300					
	36	16	16	18	21	23	26	28	30	33	37	42	47	55	63	79	93	104	133	156	186	200	258					
	40	17	17	17	20	21	24	26	28	31	36	39	43	49	57	73	81	95	111	137	162	188	230					
6N@ 6.00	28	18	20	25	27	33	36	39	42	47	57	62	69	77	99	113	140	160	191	236	282							
	32	17	20	23	25	28	31	35	39	42	48	55	62	70	83	102	121	142	167	199	241	285						
	36	16	18	21	24	26	29	32	36	37	44	52	56	63	80	102	106	123	147	193	214	252	317					
	40	17	18	20	22	26	27	30	33	35	41	46	53	58	71	86	105	111	148	177	200	228	296					
7N@ 5.14	28	19	24	28	33	37	40	47	50	54	62	77	82	99	113	140	162	188	225	291								
	32	18	21	26	28	32	37	40	43	49	56	64	71	80	102	116	143	166	196	246	297							
	36	18	20	25	28	31	33	36	41	44	53	57	65	73	94	109	125	147	183	213	256	306						
	40	17	20	24	26	29	31	34	37	41	49	55	62	66	82	106	113	127	167	200	231	274						
9N@ 4.00	28	24	31	36	41	46	54	57	65	69	82	99	104	113	141	173	205	236	293									
	32	23	27	31	37	40	48	52	59	63	73	84	102	103	133	157	185	215	268									
	36	21	26	29	33	37	41	50	52	56	65	74	85	95	113	146	160	187	236	298								
	40	20	24	27	30	35	39	43	46	51	62	68	76	87	107	121	151	178	207	270	307							
38	3N@ 12.67	32	22	23	23	23	23	24	25	26	26	29	33	36	40	47	57	65	74	91	109	124	142	173				
		36	23	23	23	23	23	24	25	26	26	27	28	32	36	43	50	61	67	85	97	112	126	156				
		40	23	23	23	23	24	24	24	25	26	29	28	31	33	43	48	55	63	73	89	99	115	145				
		44	23	24	24	24	24	24	24	25	26	28	29	29	33	39	44	50	58	70	88	96	110	131				
	4N@ 9.50	32	16	16	18	21	23	26	28	30	32	36	41	46	54	62	78	91	100	120	152	175	190	244				
		36	16	17	17	19	23	24	26	26	29	34	38	42	47	56	71	79	93	108	134	155	177	223				
		40	17	17	18	18	20	23	24	26	28	31	35	38	41	51	61	72	80	104	113	146	149	199				
		44	18	18	18	18	19	21	23	24	27	29	34	36	39	48	58	66	74	88	106	121	148	182				
	5N@ 7.60	32	16	17	20	23	26	29	32	35	37	44	47	55	62	77	91	105	115	152	177	207	233					
		36	16	17	18	22	24	27	29	31	34	38	46	49	56	71	79	93	107	134	158	184	213	274				
		40	16	16	17	20	22	25	28	30	33	37	41	47	50	63	74	93	104	118	147	171	197	239				
		44	17	17	18	20	21	23	26	28	30	35	39	42	49	57	69	81	96	111	137	161	188	221				
6N@ 6.33	32	17	20	23	27	31	34	36	39	43	51	58	65	73	99	106	121	142	189	218	251	305						
	36	17	19	21	26	28	32	34	37	40	48	52	59	64	83	102	110	123	167	192	222	260						
	40	17	18	20	23	26	29	32	33	36	42	50	56	61	73	86	105	113	148	176	199	228	298					
	44	17	18	20	22	26	28	30	33	34	39	46	51	58	70	82	97	108	127	163	189	210	272					
8N@ 4.75	32	20	26	30	35	39	43	49	55	59	67	79	92	101	121	143	167	191	239	309								
	36	20	24	28	32	36	41	44	50	53	61	69	81	86	106	125	147	175	224	258	325							
	40	20	25	28	31	34	37	43	48	51	58	66	74	82	106	115	139	168	202	240	292	333						
	44	19	23	27	29	32	36	39	43	49	54	60	72	76	98	111	123	153	184	222	272	309						
10N@ 3.80	32	27	32	38	45	48	55	62	70	78	91	102	107	121	155	191	212	260										
	36	25	30	35	39	47	49	56	64	71	79	93	103	108	145	173	196	214	282									
	40	23																										

DESIGN GUIDE WEIGHT TABLE FOR JOIST GIRDERS

U. S. CUSTOMARY

Based on an allowable tensile stress of 30ksi

Girder Span (ft)	Joist Spaces (ft)	Girder Depth (in)	Joist Girder Weight - Pounds Per Linear Foot																							
			Load on Each Panel Point																							
			4K	5K	6K	7K	8K	9K	10K	11K	12K	14K	16K	18K	20K	25K	30K	35K	40K	50K	60K	70K	80K	100K		
40	3N@ 13.33	32	22	23	23	23	24	24	25	26	27	30	34	38	40	51	60	69	81	94	108	124	150	185		
		36	23	23	23	23	23	24	25	25	27	27	32	34	39	46	54	61	70	87	104	111	126	164		
		40	23	23	23	23	23	24	25	27	27	28	32	35	43	49	55	62	84	93	107	125	156			
		44	23	23	23	24	24	24	24	26	26	28	32	33	42	47	55	63	73	89	99	115	131			
	48	23	24	24	24	24	24	24	26	26	29	29	29	32	38	44	51	57	70	80	92	102	131			
	4N@ 10.00	32	16	16	19	22	25	26	28	30	33	39	45	50	53	68	77	90	104	129	152	173	202	252		
		36	16	17	18	21	25	25	26	29	31	34	40	44	48	62	71	79	93	115	143	166	179	230		
		40	17	17	17	19	23	25	26	27	29	32	38	41	46	56	68	77	93	109	119	150	172	212		
		44	16	16	18	18	20	21	23	24	28	30	34	37	40	51	57	66	76	104	111	126	150	189		
	48	17	17	18	18	19	20	23	25	26	28	32	34	37	49	58	66	74	87	108	116	139	178			
	5N@ 8.00	32	16	18	22	25	28	31	34	37	40	46	54	58	65	78	100	106	130	157	188	227	255			
		36	16	17	20	23	25	27	31	34	35	41	46	54	59	71	91	102	107	143	167	196	230	298		
		40	16	16	18	21	23	27	28	30	33	37	42	47	53	64	80	93	104	128	159	182	210	262		
		44	17	17	17	20	23	24	28	29	31	35	39	46	49	60	73	81	96	116	138	161	186	245		
	48	17	17	17	19	23	25	28	29	33	37	41	47	57	67	80	93	111	122	152	178	217				
	6N@ 6.67	32	17	20	24	28	32	35	39	42	47	54	62	69	77	99	108	140	151	189	220	266				
		36	17	20	23	26	28	31	35	38	41	48	55	62	70	83	102	115	142	167	197	232	275	313		
		40	17	18	21	25	28	29	32	36	38	44	49	56	64	79	94	105	118	147	185	215	245			
		44	17	18	21	22	27	29	30	33	36	42	49	53	58	74	86	105	111	148	177	199	227	294		
	48	17	18	20	24	25	28	29	31	33	40	44	52	55	72	79	98	108	130	156	180	204	271			
	7N@ 5.71	32	19	24	28	32	34	40	45	47	54	62	70	77	91	105	130	152	175	218	255					
		36	18	21	26	28	32	35	40	43	48	56	63	71	79	102	115	143	155	197	232	276				
		40	18	20	25	28	31	33	36	41	45	51	57	65	72	94	108	118	145	184	214	255	300			
		44	18	21	23	27	29	31	34	37	41	50	58	63	67	82	106	113	127	167	199	237	272			
	48	18	22	24	27	30	33	37	39	42	48	57	63	71	81	99	114	125	169	195	234	267				
	8N@ 5.00	32	21	27	31	36	39	47	50	58	62	70	83	100	101	121	152	175	197	241						
		36	21	25	29	32	37	40	48	51	56	64	72	84	93	111	144	156	182	222	277					
		40	20	23	27	30	35	38	41	46	51	61	69	76	86	105	119	148	171	203	257	294				
44		20	24	29	30	34	38	41	45	50	58	66	75	78	98	113	129	153	193	240	278	320				
48	19	24	26	29	32	35	40	43	46	55	60	72	76	90	111	118	144	183	218	261	295					
10N@ 4.00	32	27	33	40	43	51	58	63	70	78	92	103	110	122	168	190	218	246								
	36	27	30	35	41	48	55	62	64	72	79	94	107	116	145	181	199	240	306							
	40	25	28	33	39	43	50	56	57	65	74	86	95	109	134	160	186	212	277							
	44	23	28	31	37	40	48	51	57	59	74	81	88	98	120	150	175	190	255	302						
48	22	26	29	34	38	42	50	54	59	67	76	83	98	114	140	157	182	230	277	324						
42	3N@ 14.00	32	29	29	30	31	31	32	33	34	35	38	40	45	53	60	69	81	94	118	140	160	185			
		36	29	29	30	30	31	31	32	34	33	35	36	38	40	47	57	64	70	87	109	122	141	173		
		40	30	30	30	30	30	30	31	34	34	34	35	37	39	46	53	61	71	85	97	112	126	156		
		44	30	30	30	30	30	30	32	32	33	35	35	36	37	43	48	56	63	73	88	99	115	146		
	48	30	30	30	30	31	31	32	32	33	35	35	36	39	43	48	53	61	74	89	99	110	132			
	4N@ 10.50	32	16	17	20	23	25	28	30	33	35	42	45	50	57	68	89	99	104	140	161	186	214	274		
		36	16	16	18	21	23	25	28	30	33	37	44	46	52	66	75	91	101	115	143	175	191	240		
		40	17	17	18	21	22	24	26	28	30	34	38	45	47	59	68	79	94	109	134	159	177	214		
		44	17	17	18	19	21	25	25	27	29	32	36	42	46	54	65	74	82	106	120	138	164	202		
	48	18	18	18	18	20	25	27	25	28	31	35	39	43	50	63	71	81	98	114	139	153	192			
	5N@ 8.40	32	17	20	23	26	28	33	36	39	44	47	54	61	68	90	103	113	130	172	197	225	256			
		36	16	17	21	23	26	28	32	34	37	44	48	54	62	74	91	105	115	152	177	207	233			
		40	16	18	20	22	24	27	29	32	34	40	45	52	55	67	79	93	107	133	156	186	210	266		
		44	16	18	19	21	25	26	28	30	32	38	41	47	53	64	77	93	104	119	148	171	200	238		
	48	17	18	18	20	24	24	27	29	30	36	39	43	49	57	70	81	96	111	137	162	187	220			
	6N@ 7.00	32	18	21	26	29	33	37	40	45	47	57	65	73	81	99	119	140	160	190	236	289				
		36	17	20	24	27	30	34	36	39	43	51	58	62	70	91	106	121	142	177	209	240	293			
		40	17	19	21	26	28	32	34	36	40	47	55	59	64	79	103	109	123	167	192	222	253			
		44	17	18	21	24	26	29	32	34	36	43	50	57	60	76	95	105	113	148	176	202	227	303		
	48	17	18	21	24	26	29	30	33	35	41	46	52	58	70	83	106	108	139	163	188	208	270			
	7N@ 6.00	32	20	24	29	34	37	42	47	53	54	68	77	90	99	113	140	162	187	226	289					
		36	20	23	27	30	35	38	41	46	51	59	70	78	83	102	122	142	166	205	248	292				
		40	18	22	25	28	32	35	39	42	47	56	63	71	79	95	109	134	147	182	222	272	303			
		44	18	21	24	27	30	32	36	40	43	51	57	65	73	87	106	119	137	176	202	246	283			
	48	18	20	24	26	29	32	34	37	41	47	52	59	67	83	98	113	122	164	191	220	255				
	8N@ 5.25	32	22	28	33	38	43	47	54	58	65	77	83	100	105	140	163	188	216	268						
		36	20	26	29	34	40	43	49	55	59	67	79	84	101	116	143	167	190	231	290					
		40	20	24	28	33	36	41	45	50	53	61	69	81	86	107	126	151	175	215	264	326				
44		21	23	28	31	34	37	43	47	52	58	66	79	83	107	116	141	157	201	239	291	333				
48	21	25	28	29	32	35	39	44	48	56	64	69	78	100	111	130	156	182	214	278	315					
11N@ 3.82	32	31	37	45	53	61	69	77	82	91	104	114	130	151	189	218	267									
	36	27	35	41	48	55	62	70	72	79	92	106	115	132	166	197	232	270								
	40	27	32	37	42	49	56	64	65	73	84	103	108	117	149	182	209	243	310							
	44	25	31	35	40	48	51	58	65</																	

Joist Girder weights to the right of the heavy blue line have 10 inch bearing depths. Check with Vulcraft for material availability.

DESIGN GUIDE WEIGHT TABLE FOR JOIST GIRDERS

U. S. CUSTOMARY

Based on an allowable tensile stress of 30ksi

Girder Span (ft)	Joist Spaces (ft)	Girder Depth (in)	Joist Girder Weight – Pounds Per Linear Foot																																			
			Load on Each Panel Point																																			
			4K	5K	6K	7K	8K	9K	10K	11K	12K	14K	16K	18K	20K	25K	30K	35K	40K	50K	60K	70K	80K	100K														
45	3N@ 15.00	36	40	44	48	54	30	30	30	30	31	31	31	32	32	33	33	34	34	36	36	37	37	38	39	44	52	60	69	81	95	120	134	151	187			
		36	40	44	48	54	30	30	30	30	31	31	31	32	32	33	33	34	34	36	36	37	37	38	39	44	51	59	62	70	88	110	122	141	166			
		36	40	44	48	54	30	30	30	30	31	31	31	32	32	33	33	34	34	36	36	37	37	38	39	44	50	58	63	82	90	101	117	148				
		36	40	44	48	54	30	30	30	30	32	32	32	32	32	33	33	33	36	36	37	37	38	39	41	48	48	53	60	71	89	97	104	132				
	4N@ 11.25	36	40	44	48	54	18	19	19	20	20	21	21	23	23	24	24	25	25	26	26	28	28	30	32	37	43	46	51	65	75	87	101	115	143	165	178	230
		36	40	44	48	54	18	19	19	20	21	21	23	23	24	24	25	25	26	26	28	28	30	32	34	40	44	47	59	68	76	93	109	134	156	178	211	
		36	40	44	48	54	19	20	20	20	21	22	22	25	25	26	26	28	28	30	32	32	33	34	35	40	42	54	64	73	81	104	114	136	151	198		
		36	40	44	48	54	20	20	20	20	21	22	22	24	24	25	26	26	27	30	33	33	34	35	38	41	50	58	66	74	97	108	116	140	176			
	5N@ 9.00	36	40	44	48	54	16	16	16	17	17	18	18	21	21	23	23	24	24	27	27	29	29	32	34	39	45	48	56	67	79	94	107	133	156	182	209	265
		36	40	44	48	54	16	18	18	19	19	20	20	21	21	23	23	24	24	26	28	28	30	32	34	37	41	46	53	64	78	89	96	118	148	162	186	238
		36	40	44	48	54	17	18	18	18	18	19	19	20	20	21	21	22	22	24	26	26	29	31	33	40	43	47	58	70	79	92	112	131	153	166	217	
		36	40	44	48	54	17	18	18	18	18	19	19	20	20	21	21	22	22	24	26	26	29	31	33	37	41	46	53	64	78	89	96	118	148	162	186	238
	6N@ 7.50	36	40	44	48	54	17	22	22	24	24	25	25	29	29	32	32	35	35	39	39	43	43	47	47	54	62	69	78	99	109	140	151	189	217	261		
		36	40	44	48	54	17	20	20	24	24	27	27	30	30	33	33	35	35	38	42	42	49	49	55	55	62	71	92	102	116	142	168	196	246	281		
		36	40	44	48	54	17	19	19	23	23	26	26	28	28	31	31	33	33	36	39	39	47	47	52	52	56	64	80	103	109	123	159	192	222	250		
		36	40	44	48	54	17	19	19	22	22	24	24	27	27	29	29	31	31	34	37	37	43	43	50	50	57	61	74	87	105	113	148	175	199	227	295	
	7N@ 6.43	36	40	44	48	54	20	24	24	28	28	32	32	36	36	40	40	46	46	47	54	54	62	62	70	77	91	105	130	152	175	217	255					
		36	40	44	48	54	19	22	22	27	27	30	30	34	34	38	38	41	41	46	49	49	56	56	63	71	79	102	116	143	155	196	231	290				
		36	40	44	48	54	18	22	22	25	25	28	28	31	31	36	36	39	39	42	47	47	56	56	63	65	72	94	109	123	147	182	213	257	299			
		36	40	44	48	54	18	21	21	24	24	27	27	29	29	33	33	37	37	40	43	43	50	50	57	65	73	82	105	119	136	175	201	238	278			
	9N@ 5.00	36	40	44	48	54	24	24	26	30	30	32	35	39	41	45	49	57	63	72	83	100	114	125	165	195	231	263										
		36	40	44	48	54	25	30	35	39	47	54	58	63	70	78	92	101	109	141	164	194	226	282														
		36	40	44	48	54	22	28	32	37	42	48	52	56	64	72	84	93	103	123	156	179	197	250														
		36	40	44	48	54	23	28	31	36	39	45	50	53	57	66	76	86	130	113	146	175	187	244	295													
12N@ 3.75	36	40	44	48	54	22	26	29	34	37	41	46	51	54	63	74	81	88	109	129	152	177	226	269	313													
	36	40	44	48	54	21	24	28	31	35	39	43	46	51	60	69	76	84	108	116	144	159	193	243	280	321												
	36	40	44	48	54	32	39	48	55	62	70	78	83	100	106	121	142	155	191	225	272																	
	36	40	44	48	54	30	35	42	49	56	64	71	79	84	103	108	123	145	171	198	246	294																
48	4N@ 12.00	36	40	44	48	54	18	19	19	20	20	21	21	23	23	24	24	25	25	26	26	29	29	30	31	33	40	44	46	60	68	77	89	109	129	157	172	212
		36	40	44	48	54	19	19	20	20	21	21	23	23	24	24	25	25	26	26	29	29	30	31	33	40	45	50	63	75	87	93	113	134	155	177	231	
		36	40	44	48	54	19	20	20	20	21	21	23	23	24	24	25	25	26	26	29	29	30	31	33	40	44	46	60	68	77	89	109	129	157	172	212	
		36	40	44	48	54	20	20	21	21	21	24	24	25	26	26	29	29	30	32	32	37	37	41	43	49	61	70	79	97	112	128	149	188				
	5N@ 9.60	36	40	44	48	54	17	21	21	24	24	27	27	30	30	33	33	36	36	39	44	44	50	50	57	64	68	90	103	113	130	171	197	228	266			
		36	40	44	48	54	17	19	19	24	24	25	27	27	31	31	33	37	39	44	44	51	51	57	65	77	91	106	125	153	177	206	234					
		36	40	44	48	54	17	18	18	23	23	25	26	29	29	31	34	36	43	47	52	59	71	87	101	107	133	156	195	222	250	278						
		36	40	44	48	54	17	17	17	22	24	24	27	30	32	35	39	45	47	53	67	78	90	108	128	157	184	207	236	266								
	6N@ 8.00	36	40	44	48	54	18	23	23	26	26	30	34	37	40	45	50	61	68	76	81	99	119	140	160	201	236	288										
		36	40	44	48	54	17	22	22	24	27	32	35	38	41	46	54	62	69	77	92	106	130	143	176	218	250	292										
		36	40	44	48	54	17	20	20	24	27	30	33	36	39	42	48	55	63	71	84	103	111	132	168	195	231	265										
		36	40	44	48	54	17	20	24	25	28	31	34	36	39	47	50	57	64	80	94	108	118	148	182	213	251	313										
	8N@ 6.00	36	40	44	48	54	24	28	33	39	43	50	54	61	65	77	91	100	105	140	163	188	216	278														
		36	40	44	48	54	21	27	31	35	40	46	49	55	59	71	79	92	101	116	143	167	191	246	300													
		36	40	44	48	54	21	27	29	33	37	41	47	50	56	64	72	81	94	109	135	159	174	223	280													
		36	40	44	48	54	21	24	29	32	36	39	43	49	51	61	67	76	82	107	120	150	175	203	249	301												
	9N@ 5.33	36	40	44	48	54	23	26	28	33	37	40	43	49	51	59	67	75	81	98	114	130	154	191	229	268	314											
		36	40	44	48	54	27	31	37	42	47	54	61	69	70	91	99	105	114	151	174	206	237															
		36	40	44	48	54	24	29																														

DESIGN GUIDE WEIGHT TABLE FOR JOIST GIRDERS U. S. CUSTOMARY

Based on an allowable tensile stress of 30ksi

Girder Span (ft)	Joist Spaces (ft)	Girder Depth (in)	Joist Girder Weight - Pounds Per Linear Foot																							
			Load on Each Panel Point																							
			4K	5K	6K	7K	8K	9K	10K	11K	12K	14K	16K	18K	20K	25K	30K	35K	40K	50K	60K	70K	80K	100K		
50	4N@ 12.50	40	23	24	24	27	27	28	31	33	36	42	44	50	56	65	85	90	104	130	152	173	199	252		
		44	23	24	24	26	28	28	29	31	34	38	43	49	51	66	74	87	104	115	153	174	180	230		
		48	23	24	24	26	28	28	29	30	32	36	42	44	50	60	68	79	93	108	133	156	178	213		
		54	27	27	27	28	28	28	28	30	31	33	38	42	45	55	62	73	82	106	112	137	159	197		
	60	27	28	28	28	28	29	29	30	31	32	36	40	43	51	59	69	76	97	113	122	138	178			
	5N@ 10.00	40	17	21	24	25	29	32	35	38	42	46	54	58	65	86	100	110	125	152	184	219	253			
		44	16	19	23	24	28	30	33	36	39	44	50	54	58	75	91	105	113	152	177	205	230	294		
		48	17	19	22	25	25	29	31	33	36	40	46	53	59	68	88	94	107	134	159	183	209	269		
		54	18	18	21	24	26	27	30	31	33	38	42	46	52	61	78	90	96	117	138	162	184	238		
	60	18	20	20	22	25	27	28	31	31	35	41	46	48	62	70	79	93	112	133	163	166	217			
	6N@ 8.33	40	18	22	26	29	32	36	41	46	47	54	62	70	78	100	109	131	151	188	226	260				
		44	17	22	24	27	30	34	37	40	46	49	55	63	71	92	106	116	142	168	205	246	281			
		48	17	22	23	26	28	32	35	38	39	47	56	63	65	80	103	109	123	159	191	222	258			
		54	18	20	23	25	29	29	32	35	37	43	49	57	58	73	87	105	112	148	174	197	226	293		
	60	18	21	22	25	27	31	31	33	35	41	45	51	59	68	83	98	109	129	155	178	205	265			
	8N@ 6.25	40	23	27	31	37	41	48	54	55	62	71	83	92	102	122	153	176	195	248						
		44	22	27	31	34	39	44	49	52	56	65	75	84	102	111	144	167	182	222	288					
		48	22	25	29	33	37	40	45	50	53	61	73	81	86	107	126	149	175	214	263	310				
		54	25	26	31	34	37	41	46	48	51	58	70	76	83	106	114	141	163	193	239	283	315			
	60	24	25	28	32	35	39	42	47	49	57	64	72	77	99	115	125	146	178	215	258	291				
	10N@ 5.00	40	28	33	41	46	55	62	66	74	78	92	105	115	131	156	193	229	267							
		44	27	32	37	44	49	56	63	67	72	88	102	107	116	155	180	208	239	302						
		48	27	32	35	41	48	54	57	64	68	80	94	103	109	135	160	186	214	274						
		54	26	29	33	40	43	50	55	58	62	74	82	96	106	121	152	173	188	251	306					
60	25	28	32	38	41	45	51	54	58	68	77	84	98	114	142	167	180	225	275	317						
13N@ 3.85	40	35	41	51	59	67	74	83	92	102	111	132	144	169	196	252	303									
	44	32	39	48	56	61	69	75	85	95	105	117	134	148	194	228	260	313								
	48	30	36	44	51	57	66	74	77	87	105	111	120	138	174	200	248	288								
	54	29	34	40	48	53	60	68	74	78	90	108	114	125	157	191	216	256	326							
60	28	33	40	45	50	57	64	71	73	83	94	113	115	148	174	216	235	297								
55	5N@ 11.00	44	19	22	25	27	30	32	35	38	43	49	54	61	66	85	95	111	125	153	180	219	253			
		48	19	21	24	25	29	30	33	36	39	45	50	58	62	75	91	106	112	153	177	205	230			
		54	20	21	23	25	26	29	31	34	36	44	46	52	60	67	88	94	108	128	158	182	207	265		
		60	20	22	22	24	27	27	31	32	34	39	45	47	53	64	77	90	97	116	137	162	185	237		
	66	21	22	23	24	26	28	29	32	33	37	42	46	49	62	71	80	93	112	133	164	176	217			
	6N@ 9.17	44	18	23	26	29	33	37	40	46	47	54	62	70	77	100	114	131	151	188	226	261				
		48	18	23	24	29	31	34	37	42	46	52	59	66	71	92	106	116	143	177	205	246	279			
		54	19	22	24	27	30	33	35	39	41	47	56	60	65	80	95	109	119	160	181	211	251			
		60	19	20	23	25	30	31	34	37	40	44	50	58	61	77	96	105	112	149	174	197	226	279		
	66	20	20	23	26	29	32	32	35	37	41	49	52	59	72	84	99	110	130	156	187	205	269			
	7N@ 7.86	44	22	25	28	33	36	41	46	51	54	62	71	78	91	105	131	153	176	216	263					
		48	21	24	28	31	34	39	45	46	52	59	68	77	79	106	117	143	158	205	237	291				
		54	19	24	26	29	32	36	39	43	48	57	64	69	78	95	109	129	148	182	213	259	301			
		60	20	23	25	29	31	34	37	41	43	50	59	67	70	84	406	113	138	166	199	235	277			
	66	20	23	25	29	32	33	37	38	43	50	54	60	68	82	100	114	124	157	194	219	261	317			
	9N@ 6.11	44	25	30	35	41	46	54	58	63	70	78	92	101	110	143	166	195	228	282						
		48	25	28	33	39	43	49	55	60	64	72	84	102	108	134	157	182	205	266						
		54	25	28	33	38	42	46	51	57	58	69	79	87	97	114	148	164	187	243	282					
		60	24	28	33	37	40	43	48	50	58	67	79	83	89	108	124	154	174	202	264	309				
	66	24	27	31	35	39	42	45	50	52	61	70	77	85	101	117	145	159	194	242	286	319				
	11N@ 5.00	44	31	37	46	52	58	66	70	78	91	101	107	131	142	179	205	253	297							
		48	29	34	41	47	55	63	67	72	79	93	106	116	113	158	195	231	269							
		54	28	33	39	46	49	57	62	69	73	81	96	109	116	150	181	199	241	302						
		60	26	32	37	41	48	51	59	64	68	80	84	98	112	140	166	189	214	269						
66	27	31	36	39	46	50	55	62	65	74	84	100	102	124	147	170	194	261	293							
14N@ 3.93	44	39	46	55	63	71	79	92	102	107	121	144	157	179	218	269										
	48	36	43	50	63	71	77	80	94	104	112	134	148	172	206	254	302									
	54	34	41	49	57	66	71	75	83	97	107	120	138	152	187	215	263	307								
	60	31	39	46	52	61	68	77	78	85	101	114	123	142	168	202	241	284								
66	32	38	44	50	57	63	71	75	80	96	113	119	130	163	197	223	262	321								
Bearing Depth			7 1/2 in.												10 in.											

Joist Girder weights to the right of the

DESIGN GUIDE WEIGHT TABLE FOR JOIST GIRDERS

U. S. CUSTOMARY

Based on an allowable tensile stress of 30ksi

Girder Span (ft)	Joist Spaces (ft)	Girder Depth (in)	Joist Girder Weight – Pounds Per Linear Foot																							
			Load on Each Panel Point																							
			4K	5K	6K	7K	8K	9K	10K	11K	12K	14K	16K	18K	20K	25K	30K	35K	40K	50K	60K	70K	80K	100K		
60	5N@ 12.00	48	21	23	26	28	31	34	37	42	43	50	55	62	66	85	96	111	125	153	189	218	252			
		54	21	21	24	27	30	32	35	38	42	44	51	56	62	75	88	106	112	144	168	204	221	281		
		60	21	22	23	26	28	30	33	35	38	44	46	51	57	68	86	95	108	128	158	182	208	256		
		66	22	22	23	25	28	29	33	34	36	40	46	47	53	65	78	91	97	117	139	162	188	228		
		72	22	23	23	24	27	29	31	34	35	38	44	47	52	62	72	81	93	113	135	164	177	217		
	6N@ 10.00	48	21	23	26	31	34	38	40	46	47	58	66	70	77	100	114	131	152	188	227	262				
		54	19	23	25	29	32	35	38	41	45	53	59	67	71	92	106	117	119	169	204	229	269			
		60	19	22	26	28	31	34	36	39	42	48	55	61	68	81	95	110	134	160	181	209	242			
		66	20	22	25	27	30	32	34	67	41	47	50	58	62	77	96	106	112	140	175	198	216	278		
		72	20	21	24	27	29	32	33	35	38	43	50	52	60	72	84	99	114	142	166	188	206	266		
	8N@ 7.50	48	24	28	32	38	41	48	54	55	62	70	78	92	101	121	152	176	192	241						
		54	23	26	31	35	39	43	47	55	56	64	72	81	94	109	134	158	180	221	268					
		60	23	26	29	32	38	41	44	49	52	59	66	76	83	106	120	149	163	199	239	290				
		66	29	31	34	36	40	46	48	50	56	64	72	76	82	101	116	142	165	191	230	280	313			
		72	30	31	33	34	38	43	47	49	51	59	69	74	83	102	118	126	147	190	228	255	191			
	10N@ 6.00	48	30	36	43	50	58	65	66	75	78	92	106	116	132	157	193	229	265							
		54	29	34	40	46	51	59	60	68	76	88	95	107	144	147	180	205	232	296						
		60	27	33	38	41	47	53	61	61	70	79	90	97	110	136	162	183	210	272						
		66	27	32	36	40	46	49	55	62	64	75	81	97	99	120	143	165	190	254	296					
		72	27	32	35	39	43	48	53	58	61	73	77	86	100	116	137	169	191	225	283					
	12N@ 5.00	48	35	41	49	55	63	71	79	92	93	107	116	142	156	191	229	266								
		54	33	39	46	50	57	65	73	80	81	104	109	118	135	172	197	238	274							
		60	32	37	41	50	56	59	67	74	79	96	107	112	121	163	187	219	247	316						
		66	31	36	40	47	53	60	61	68	76	85	99	110	115	145	177	201	228	288						
		72	30	35	40	44	52	54	63	64	75	80	89	104	114	130	160	194	219	273	319					
	15N@ 4.00	48	39	49	62	70	78	92	101	106	110	132	155	167	189	228	289									
		54	37	47	56	64	73	81	94	95	105	118	135	158	171	208	254	298								
		60	35	42	51	59	68	76	83	88	98	112	122	141	164	197	229	276	307							
		66	36	44	54	57	65	73	80	88	94	113	118	130	158	193	221	261	294							
		72	36	43	49	57	67	75	77	84	91	107	121	126	143	178	219	240	283							
65	6N@ 10.83	54	22	25	28	31	34	38	43	45	47	55	66	69	75	92	107	132	152	177	207	250	288			
		60	22	24	26	31	32	36	38	42	46	53	60	67	71	92	107	116	133	169	195	231	262			
		66	22	24	26	29	31	34	36	40	43	49	54	61	68	80	96	110	119	159	184	209	236			
		72	23	24	26	29	30	33	35	39	43	47	50	56	63	75	92	107	113	141	166	196	218	276		
	8N@ 8.13	54	24	28	33	38	42	47	52	55	63	70	78	92	101	116	143	166	192	229	284					
		60	23	26	32	36	39	43	48	50	57	65	72	80	94	109	135	158	180	210	259					
		66	32	34	41	43	44	48	53	55	61	68	73	81	93	114	133	151	167	212	246	296				
		72	32	34	34	42	45	47	49	54	57	69	74	82	83	106	121	143	167	194	241	277				
	10N@ 6.50	54	31	37	44	50	56	63	67	75	76	92	107	113	127	156	182	220	243							
		60	30	35	41	46	52	58	64	68	77	88	95	109	115	136	180	196	222	283						
		66	28	34	39	44	47	54	61	65	70	82	91	98	112	132	163	184	210	263						
		72	28	34	37	41	47	50	56	63	63	72	81	94	100	120	143	168	193	247	295					
	11N@ 5.91	54	32	39	45	52	59	66	71	77	87	101	107	126	133	176	205	230	264							
		60	32	36	45	48	54	61	69	73	78	94	108	110	118	160	181	208	243							
		66	30	36	41	46	50	56	62	70	71	83	97	111	113	141	166	200	215	287						
		72	29	34	39	43	50	55	60	65	73	81	93	100	114	167	166	187	214	257						
	13N@ 5.00	54	36	42	50	57	65	72	80	92	102	108	123	144	158	192	229	269								
		60	34	40	49	57	61	70	74	81	94	105	111	125	148	182	209	252	286							
		66	33	38	45	52	60	67	72	75	83	99	109	116	129	167	199	234	263							
		72	32	38	43	51	55	62	70	77	78	88	110	116	120	158	182	210	253	309						
Bearing Depth			7 1/2 in.												10 in.											

Joist Girder weights to the right of the heavy blue line have 10 inch bearing depths. Check with Vulcraft for material availability.

DESIGN GUIDE WEIGHT TABLE FOR JOIST GIRDERS

U. S. CUSTOMARY

Based on an allowable tensile stress of 30ksi

Girder Span (ft)	Joist Spaces (ft)	Girder Depth (in)	Joist Girder Weight - Pounds Per Linear Foot																							
			Load on Each Panel Point																							
			4K	5K	6K	7K	8K	9K	10K	11K	12K	14K	16K	18K	20K	25K	30K	35K	40K	50K	60K	70K	80K	100K		
70	7N@ 10.00	54	24	28	32	36	40	44	50	54	58	65	73	86	91	111	131	153	175	226	263					
		60	23	26	31	33	38	44	46	51	53	63	67	75	87	106	126	153	165	204	242	284				
		66	23	27	31	32	36	39	45	47	52	59	67	71	78	94	114	135	156	184	222	260				
		72	23	26	29	33	35	39	42	47	48	55	62	70	78	96	111	121	140	183	211	145	286			
	84	26	28	30	32	35	37	40	44	47	51	59	66	71	83	102	117	125	170	192	220	254	313			
	9N@ 7.78	54	27	33	37	44	48	54	61	66	70	90	100	105	114	151	174	202	225	276						
		60	25	31	35	40	47	49	56	64	67	76	93	102	107	134	156	180	205	256						
		66	25	31	35	40	47	49	56	62	69	74	82	96	106	121	149	174	200	244	300					
		72	25	31	35	40	46	49	56	57	63	72	81	93	99	115	141	163	185	216	273					
	84	25	31	35	40	43	49	51	53	58	67	76	80	89	104	119	145	171	195	234	287	317				
	11N@ 6.36	54	33	43	50	58	66	67	75	86	92	106	115	132	153	177	217	250	258							
		60	32	40	46	51	59	67	68	76	87	94	108	118	134	167	205	231	236							
		66	32	38	44	47	55	61	68	40	78	91	97	110	120	160	183	207	221	290						
		72	31	36	41	47	54	57	63	72	73	83	98	112	114	142	166	191	196	256	300					
	84	31	35	39	45	50	53	58	68	68	76	87	99	106	126	149	172									
	12N@ 5.83	54	36	45	52	59	67	75	78	92	101	107	132	142	154	192	229	268	287							
		60	34	41	48	56	60	68	77	80	93	107	115	133	145	180	205	245	267							
		66	32	39	47	50	58	65	70	78	82	96	110	120	136	163	198	224	246	304						
		72	33	38	44	50	57	63	69	73	71	94	108	117	124	156	188	214								
	84	31	37	42	47	53	55	65	69	80	86	91	106	119	142	170	196	221	277	318						
14N@ 5.00	54	40	48	58	66	75	90	92	105	106	131	152	164	177	225	266										
	60	38	46	56	64	71	79	92	93	104	117	133	155	169	205	244	288									
	66	36	43	50	58	65	74	81	94	96	110	120	136	160	184	233	267									
	72	36	42	51	58	65	72	76	84	95	110	115	126	145	189	223	251	285								
84	34	43	47	54	62	66	74	78	83	101	108	122	134	166	199	234	262	320								
80	8N@ 10.00	60	29	32	38	43	47	52	58	65	66	78	91	100	105	131	153	189	205	253						
		66	29	32	36	40	46	48	53	59	63	71	79	93	105	126	154	177	192	233	284					
		72	30	32	34	38	43	47	79	54	61	69	78	89	95	115	136	159	182	260	258					
		84	30	32	34	38	43	47	48	54	61	69	78	89	95	115	134	157	179	217	264					
	96	30	32	34	38	43	47	49	54	61	69	78	89	95	115	126	141	163	199	225	272	301				
	10N@ 8.00	60	32	37	42	49	55	62	70	78	78	100	105	115	132	164	191	226	252							
		66	35	42	46	55	61	64	72	77	86	98	109	114	129	169	194	219	250							
		72	34	38	46	51	57	64	65	74	78	91	101	110	126	159	183	207	235							
		84	34	37	46	48	53	59	61	67	72	82	95	104	113	135	166	185	212	256						
	96	35	36	42	48	50	55	58	64	72	78	86	98	104	125	143	171	192	239	281						
	13N@ 6.15	60	40	47	59	66	71	78	92	101	106	116	143	155	175	206	252									
		66	38	47	54	60	68	77	80	94	103	109	134	145	157	195	231	261								
		72	37	44	50	59	67	71	79	83	96	111	120	137	152	186	213	253	298							
		84	36	43	50	54	59	67	75	79	84	101	112	119	128	170	193	229	255							
	96	37	42	47	53	57	66	72	81	79	94	109	118	124	155	177	201	235	294							
	16N@ 5.00	60	47	55	67	78	92	101	107	115	132	153	175	192	206	252										
66		44	55	65	72	80	94	104	109	117	134	158	180	194	232	287										
72		43	51	59	70	79	83	97	107	111	121	149	162	185	225	268										
84		42	49	57	64	74	81	90	104	106	120	131	152	174	207	253	287									
96	44	48	58	64	70	81	86	92	97	114	128	140	159	196	231	268	298									
90	9N@ 10.00	72	38	40	44	47	52	57	61	68	76	88	94	108	115	145	178	205	228	278						
		84	38	40	44	47	52	57	61	69	73	82	94	104	114	134	162	187	212	258						
		96	38	40	44	47	52	57	61	67	71	77	85	98	108	125	139	170	190	221	278					
		108	38	40	44	47	52	57	61	67	70	75	80	89	99	114	129	152	176	205	247	286				
	11N@ 8.18	72	41	46	51	61	64	73	78	89	94	108	115	131	146	181	216	246								
		84	41	45	47	53	61	67	72	78	90	94	113	120	133	161	190	220	250							
		96	44	45	47	50	56	64	70	72	80	94	98	107	123	146	180	196	235	286						
		108	45	46	48	51	57	60	66	75	76	84	98	104	113	140	164	186	204	262						
	15N@ 6.00	72	45	55	61	72	80	94	103	109	114	134	156	179	184	233	285									
		84	47	50	58	65	73	81	93	98	112	121	140	163	166	210	242	295								
		96	48	50	57	64	71	81	87	92	106	121	128	144	163	199	232	261	302							
		108	49	53	57	62	70	75	83	93	97	113	126	134	152	182	210	249	277							
18N@ 5.00	72	49	62	73	80	94	108	115	128	135	157	181	205	229	280											
	84	49	62	74	82	91	107	117	122	130	149	174	195	210	256	306										
	96	49	60	69	77	86	95	111	121	126	139	156	181	199	233	285										
	108	49	61	66	74	87	92	101	115	118	132	145	165	184	223	267	298									
Bearing Depth			7 1/2 in.												10 in.											

Joist Girder weights to the right of the heavy blue line have 10 inch bearing depths. Check with Vulcraft for material availability.

DESIGN GUIDE WEIGHT TABLE FOR JOIST GIRDERS U. S. CUSTOMARY

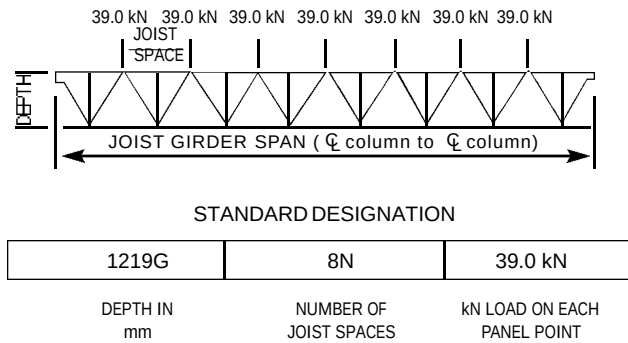
Based on an allowable tensile stress of 30ksi

Girder Span (ft)	Joist Spaces (ft)	Girder Depth (in)	Joist Girder Weight – Pounds Per Linear Foot																						
			Load on Each Panel Point																						
			4K	5K	6K	7K	8K	9K	10K	11K	12K	14K	16K	18K	20K	25K	30K	35K	40K	50K	60K	70K	80K	100K	
100	10N@ 10.00	84	56	57	58	62	64	72	76	88	90	103	118	129	142	172	200	225	257	258	289				
		96	58	58	59	61	64	67	70	78	88	94	106	120	131	152	180	204	228						
		108	58	60	60	61	63	68	70	73	77	93	96	111	111	139	170	188	209						
		120	60	60	62	64	66	67	68	71	74	85	99	108	113	139	157	188	201						
	12N@ 8.33	84	50	54	58	66	70	75	89	92	101	112	129	138	159	187	221	257	271	299					
		96	50	54	57	61	68	70	80	84	96	106	116	123	137	179	205	228							246
		108	52	54	58	62	65	72	74	79	89	101	110	121	128	164	193	221							239
		120	54	57	60	62	66	69	77	79	86	92	107	117	126	151	178	206							239
	16N@ 6.25	84	55	60	71	76	83	96	110	112	119	139	161	184	199	235	288	301	304						
		96	56	60	67	75	79	88	102	105	119	128	145	168	191	218	265								285
		108	58	63	67	72	81	87	93	106	111	125	136	157	180	204	251								292
		120	60	65	68	74	79	90	93	98	110	117	134	147	166	208	248								275
	17N@ 5.88	84	57	65	73	82	92	98	112	114	123	151	164	187	203	250	285	308	330						
		96	60	65	72	81	89	103	110	123	123	145	177	179	198	256									285
		108	64	67	72	76	86	96	108	113	123	135	158	172	182	231									264
		120	67	68	73	80	85	90	99	112	119	133	143	167	178	214									250
	20N@ 5.00	84	67	77	87	105	115	122	132	148	159	193	208	226	246	279	316								
		96	67	73	82	95	111	120	126	135	152	177	199	211	227										
		108	66	72	79	91	101	116	125	130	131	162	184	197	207										
		120	71	75	82	88	96	106	120	123	136	149	170	193	205										
Bearing Depth			7 1/2 in.							10 in.															

Joist Girder weights to the right of the heavy blue line have 10 inch bearing depths. Check with Vulcraft for material availability.

METRIC JOIST GIRDERS

Joist Girder design example using Metric Units:



Given 15.24 m x 12.19m bay. Joists spaced on 1.905m centers.

Live Load = .958 kN/m²
 Dead Load = .718 kN/m² Includes approximate
 Total Load = 1.676 kN/m² Joist Girder Weight.

NOTE: Web configuration may vary from that shown. Contact Joist Girder manufacturer if exact layout must be known.

- Determine number of actual joist spaces (N)
In this example N = 8
- Compute the total load:
T. L. = 1.905 m x 1.676 kN/m² = 3.193 kN/m
- Joist Girder Selection (Interior):
 - Compute the concentrated load at top chord panel points P = 3.193 kN/m x 12.19 m = 38.92 kN (use 39.0 kN).
 - Select Joist Girder depth:
Refer to the Joist Girder Design Guide Weight Table for the 15240mm span, 8 panel, 40.0kN Joist Girder. The rule of about one millimeter of depth for each 12 millimeters of span is a good compromise of limited depth and economy. Therefore, select a depth of 1219mm from the table.
 - The Joist Girder will be designated 1219G8N39.0 kN.
 - The Joist Girder table shows the weight for a 1219G8N40K as 64 kg/m. To convert mass multiply 64 x .0098 = .627 kN/m. The designer should verify that the weight is not greater than the weight assumed in the dead load above.

(e) Check live load deflection:

Live load = .958 kN/m² x 12.19m = 11.68 kN/m
 Approximate Joist Girder moment of inertia:

$$I_{JG} = 0.3296NPLd \text{ where } d = \text{effective depth} \\ = 0.3296 \times 8 \times 39.0 \times 15240 \times 1219 \\ = 1910 \times 10^6 \text{ mm}^4$$

Allowable deflection
 for plaster ceilings = L/360 = 15240/360 = 42.33 mm

$$\text{Deflection} = 1.15 \left[\frac{5wL^4}{384EI} \right] = \\ = \frac{1.15 \times 5 \times 11.68 \times (15.24 \times 1000)^4}{384 (200,000) 1910 \times 10^6} \\ = 24.70 \text{ mm} < 42.33 \text{ mm O'K'}$$

- The purpose of the Design Guide Weight Table for Joist Girders is to assist the specifying professional in their selection of a roof or floor support system.
- It is not necessary to use only the depths, spans or loads shown in the tables.
- Holes in chord elements present special problems which must be considered by both the specifying professional and the Joist Girder Manufacturer. The sizes and locations of such holes shall be clearly indicated on the structural drawings.



JOIST GIRDERS DESIGN GUIDE WEIGHT TABLE FOR JOIST GIRDERS

Based on Allowable Tensile Stress of 207 MPa
Joist Girder Weight – kilogram/meter (kg/m).

Span (mm)	No. Of Joist Spaces	Depth (mm)	Panel Point Loads																
			18 kN	22 kN	27 kN	31 kN	36 kN	40 kN	44 kN	49 kN	53 kN	58 kN	62 kN	67 kN	71 kN	76 kN	80 kN	85 kN	89 kN
6096	3N@ 2033	508	19	19	21	24	25	30	33	34	37	40	43	45	46	51	54	58	60
		610	19	21	21	21	22	25	28	31	33	36	37	37	43	43	45	48	49
		711	19	21	21	21	22	25	25	25	31	33	34	36	36	39	40	45	46
	4N@ 1524	508	21	21	22	25	27	31	34	36	39	42	46	49	51	55	57	61	64
		610	21	22	22	22	24	27	30	33	34	37	40	42	48	48	48	51	52
		711	21	22	22	22	24	27	27	27	33	34	37	39	39	42	43	48	49
6705	4N@ 1676	508	25	25	25	27	30	34	36	40	42	45	49	51	58	60	64	68	68
		610	25	25	25	25	27	28	31	34	36	40	43	43	49	51	51	60	60
		711	25	25	25	25	25	27	28	30	31	36	37	40	42	43	45	51	52
7315	4N@ 1828	508	22	22	25	28	33	36	39	43	48	51	54	55	61	67	68	73	76
		610	22	22	22	25	28	31	34	37	40	45	46	49	51	55	57	60	64
		711	22	22	22	24	25	27	31	36	36	39	42	43	46	49	51	52	55
		813	22	22	22	24	24	28	28	33	33	37	37	40	43	45	46	46	51
	5N@ 1463	508	25	27	27	34	39	42	43	49	58	58	63	67	73	77	77	83	89
		610	25	25	27	28	30	36	39	43	45	51	51	60	60	64	70	70	74
7620	4N@ 1904	711	25	25	27	28	31	36	37	42	43	46	51	52	57	61	61	67	67
		813	27	27	27	27	27	28	30	33	37	39	43	46	48	49	55	55	64
		508	24	24	27	30	33	37	40	46	48	52	55	58	63	65	68	71	77
		610	22	22	25	25	30	33	36	39	40	45	48	51	52	57	60	63	67
	5N@ 1524	711	22	22	22	24	27	30	33	34	39	42	42	46	49	51	52	55	58
		813	22	22	24	24	25	28	30	33	36	37	40	42	43	46	49	51	52
7924	4N@ 1981	508	24	24	28	33	36	39	43	48	49	55	58	63	65	70	74	77	79
		610	22	22	24	28	31	33	37	40	45	48	49	52	57	60	61	64	67
		711	22	22	22	25	27	30	34	36	40	42	45	49	49	52	54	57	60
		813	22	22	24	24	25	27	30	34	36	39	40	42	46	49	51	52	54
	5N@ 1584	508	28	28	31	37	42	46	54	58	63	64	71	74	82	86	91	97	101
		610	24	24	28	33	39	40	46	48	52	57	61	63	68	71	74	79	83
8534	4N@ 2133	711	22	22	25	25	30	33	36	40	40	45	49	49	54	55	58	63	67
		813	22	22	22	25	27	30	33	36	37	40	42	46	49	51	51	55	60
		914	24	24	24	24	27	28	30	34	36	37	43	43	43	46	49	51	52
		508	30	30	36	40	45	54	58	63	65	71	77	82	88	92	97	100	104
	5N@ 1706	610	27	27	31	34	39	43	48	54	55	61	63	68	73	79	83	86	89
		711	25	25	28	31	34	39	43	46	49	55	55	60	64	67	70	73	76
6N@ 1428	813	24	24	25	28	33	36	40	42	45	49	51	57	57	61	65	68	71	
	914	24	24	24	28	30	34	37	40	42	46	49	49	54	57	61	63	64	
	508	30	34	39	43	52	57	65	70	76	82	86	95	101	109	113			
	610	27	28	34	39	43	49	54	58	63	67	77	77	83	88	94	98	110	
9144	5N@ 1828	711	25	25	28	33	39	42	46	48	54	55	60	64	68	71	74	80	85
		813	25	25	25	31	33	37	42	45	48	51	55	57	61	64	67	71	76
		914	24	24	27	30	33	34	40	42	46	49	49	52	58	60	63	65	68
		1016	24	24	25	27	30	36	36	40	43	45	46	51	52	57	61	63	65
	6N@ 1524	610	25	30	34	42	48	52	57	61	67	76	77	86	88	97			
		711	25	27	30	36	40	45	51	58	58	64	68	73	79	83	89	91	
9753	6N@ 1950	813	25	27	28	31	37	42	43	49	52	60	60	65	71	74	80	82	86
		914	27	27	28	30	36	39	43	45	48	52	57	63	64	68	73	73	82
		1016	27	27	28	30	31	37	40	45	48	49	54	57	64	65	67	70	74
		610	33	33	39	45	51	55	63	67	71	77	82	88	94	100			
	6N@ 1624	711	30	30	33	39	45	49	55	60	64	68	73	77	83	89	95	100	103
		813	28	28	31	36	40	45	49	54	58	63	67	70	76	79	83	86	91
10363	5N@ 2072	914	27	27	30	36	39	43	48	51	55	57	60	64	71	74	76	82	86
		1016	25	25	28	33	37	42	43	48	52	52	58	61	64	68	73	76	79
		610	30	30	37	43	45	54	58	63	67	71	77	82	91	95	101	106	110
		711	30	30	31	36	42	46	49	55	58	63	68	73	77	83	89	95	
		813	25	25	30	31	39	42	46	51	54	55	63	64	70	73	74	80	85
		914	25	25	28	31	36	39	43	46	48	52	57	60	64	67	71	74	77

JOIST GIRDERS DESIGN GUIDE WEIGHT TABLE FOR JOIST GIRDERS

Based on Allowable Tensile Stress of 207 MPa
Joist Girder Weight – kilogram/meter (kg/m).

Span (mm)	No. Of Joist Spaces	Depth (mm)	Panel Point Loads																
			18 kN	22 kN	27 kN	31 kN	36 kN	40 kN	44 kN	49 kN	53 kN	58 kN	62 kN	67 kN	71 kN	76 kN	80 kN	85 kN	89 kN
10363	6N@ 1728	610	36	36	40	46	54	60	64	71	76	82	88	94	104	110	116	125	
		711	33	33	37	42	48	54	58	63	65	73	77	83	86	92	97	101	106
		813	28	28	34	40	43	49	52	55	61	67	68	76	76	83	89	94	97
		914	27	27	31	36	40	45	48	51	57	58	64	68	73	76	79	83	88
		1016	27	27	30	34	37	42	46	49	51	55	61	63	68	73	77	80	82
10668	5N@ 2133	711	30	30	34	37	43	46	52	57	61	64	70	73	79	85	89	92	95
		813	27	27	30	34	40	43	48	49	55	58	63	65	70	73	77	80	85
		914	25	25	28	31	37	40	45	48	48	55	57	61	65	68	71	74	77
		1016	25	25	27	33	33	40	42	45	48	49	52	57	58	63	67	70	73
	6N@ 1777	711	33	33	37	43	48	54	58	65	68	73	77	83	89	95	101	110	118
		813	30	30	34	39	45	49	55	57	61	67	71	76	79	85	89	94	98
		914	28	28	33	37	42	46	51	52	57	61	65	68	74	79	82	86	91
		1016	27	27	30	36	39	42	48	51	54	58	60	65	71	74	77	80	85
	7N@ 1524	711	37	37	43	48	55	63	67	74	80	86	94	101					
		813	33	33	39	45	49	55	63	67	71	76	85	88	97				
		914	31	31	37	42	46	51	57	61	67	71	77	82	88	94			
		1016	31	31	34	40	45	49	52	60	64	67	71	77	80	86	91	94	98
10972	6N@ 1828	711	33	33	37	45	52	54	61	65	71	74	82	86	95	100	104	110	116
		813	31	31	34	40	48	49	55	60	64	68	74	76	85	89	94	98	103
		914	28	28	33	37	42	48	51	57	58	63	68	71	77	82	85	89	92
		1016	27	27	31	36	42	43	48	51	55	58	63	67	71	76	79	83	86
		1118	28	28	31	34	39	43	46	49	52	57	61	61	67	70	73	77	95
	7N@ 1566	711	37	37	45	51	58	63	70	74	82	88	94	104	116				
		813	33	33	39	46	51	58	64	68	74	79	85	91	97	103	107		
		914	33	33	37	43	48	52	57	64	68	73	79	85	88	94	98	104	110
		1016	31	31	37	42	46	49	55	60	63	68	74	79	82	88	92	97	101
		1118	28	28	33	39	43	48	52	57	61	65	71	74	79	83	86	91	95
11582	6N@ 1929	711	36	36	42	46	54	58	63	67	74	82	85	94	97	104			
		813	31	31	37	42	48	55	57	63	65	73	74	83	88	92	97	103	107
		914	30	30	34	40	45	48	54	55	61	65	70	76	77	83	89	94	97
		1016	30	30	33	39	42	45	49	52	58	63	67	70	73	77	82	86	91
		1118	28	28	31	34	39	42	46	51	54	60	61	65	70	73	77	82	85
	7N@ 1655	711	39	39	46	54	60	67	71	82	86	94	104	106					
		813	36	36	42	48	55	60	65	73	79	83	89	95	103	110			
		914	33	33	40	45	49	57	61	65	71	76	80	86	92	100	106	113	119
		1016	31	31	37	42	48	51	58	63	67	70	79	80	86	91	94	101	107
		1118	31	31	34	42	45	51	52	61	61	68	73	76	80	86	91	94	97
12192	6N@ 2033	711	37	37	43	48	54	63	67	71	77	82	91	94	101	109			
		813	33	33	37	46	49	55	58	64	68	73	82	83	92	98	103		
		914	31	31	36	40	48	51	55	60	65	70	74	76	85	89	94	101	107
		1016	30	30	33	39	45	48	51	57	61	65	68	71	77	82	86	89	92
		1118	28	28	34	37	42	46	51	52	58	60	64	67	74	76	79	83	89
	7N@ 1740	711	40	40	48	57	63	71	76	85	92	100	104						
		813	37	37	45	51	55	63	68	73	83	86	95	103	106	112			
		914	34	34	40	48	52	57	64	70	76	79	86	91	98	103	107	113	119
		1016	34	34	39	45	49	54	58	64	70	74	77	85	88	94	98	106	112
		1118	31	31	37	43	46	51	55	60	64	70	74	79	85	89	94	98	103
	8N@ 1524	711	46	46	54	63	70	76	85	92	104								
		813	42	42	48	55	64	68	76	83	89	98	106						
		914	39	39	45	51	58	64	71	76	83	89	98	101	109	115			
		1016	36	36	42	49	54	60	65	71	77	83	89	94	100	106	112	118	
		1118	34	34	43	48	54	58	63	67	73	79	82	88	94	100	104	112	118
12801	6N@ 2133	813	36	36	42	46	54	58	63	68	73	79	83	92	95	101	106	112	
		914	31	31	37	43	48	55	55	64	67	71	74	82	85	91	97	103	107
		1016	31	31	34	40	45	48	57	57	64	65	71	77	80	83	86	92	98
		1118	30	30	34	40	42	48	49	57	58	63	67	71	76	80	83	88	92
		1219	28	28	33	36	40	45	51	54	55	60	64	68	71	76	80	83	85
		1321	30	30	33	36	40	46	49	52	54	57	61	65	70	74	77	80	82
	7N@ 1828	813	37	37	45	54	58	65	71	77	83	94	101	106					
		914	37	37	43	49	55	60	64	70	76	85	91	97	104				
		1016	33	33	42	45	49	57	61	65	71	77	82	88	92	100	106	113	121
		1118	34	34	39	42	49	54	58	64	68	73	79	83	88	94	98	104	109
		1219	31	31	36	43	48	52	55	61	64	70	73	80	82	88	92	97	101
		1321	33	33	37	42	46	49	54	57	63	67	71	74	79	85	89	92	95
	8N@ 1600	813	34	42	49	57	67	71	76	86	92	98	109	115	122	134	138	146	
		914	31	39	43	51	58	63	68	79	83	89	100	100	112	118	128	135	144
		1016	30	36	42	46	52	60	65	70	80	82	91	92	101	103	113	121	131
		1118	28	33	39	45	51	54	61	67	73	77	83	89	94	100	104	116	116
		1219	28	31	39	45	48	54	58	64	70	76	80	85	91	95	97	107	109
		1321	30	31	36	42	46	51	58	63	67	73	77	79	88	88	94	100	106

JOIST GIRDERS

DESIGN GUIDE WEIGHT TABLE FOR JOIST GIRDERS

Based on Allowable Tensile Stress of 207 MPa
Joist Girder Weight – kilogram/meter (kg/m).

Span (mm)	No. Of Joist Spaces	Depth (mm)	Panel Point Loads																
			18 kN	22 kN	27 kN	31 kN	36 kN	40 kN	44 kN	49 kN	53 kN	58 kN	62 kN	67 kN	71 kN	76 kN	80 kN	85 kN	89 kN
13411	7N@ 1917	813	42	42	48	54	63	67	73	82	91	94	104	116	116	126			
		914	39	39	45	49	55	64	68	74	79	85	94	97	106	113	119	128	
		1016	36	36	40	48	52	57	65	70	76	80	86	91	98	103	109	115	121
		1118	34	34	40	46	49	57	58	67	70	76	77	85	88	94	100	106	112
		1219	34	34	39	43	48	52	58	61	67	70	74	80	85	91	97	100	103
		1321	33	33	37	43	46	54	55	63	64	68	71	77	83	88	92	95	98
	8N@ 1676	813	45	45	54	61	68	74	82	94	101	106	116	124					
		914	42	42	49	55	63	68	74	85	89	97	104	107	118	128			
		1016	40	40	46	51	57	65	71	76	82	89	98	101	109	115	121	131	
		1118	36	36	43	51	55	61	68	74	79	83	89	95	101	107	113	119	124
		1219	36	36	45	48	54	60	63	70	73	80	83	92	95	100	104	112	118
		1321	36	36	40	46	52	57	63	67	73	76	83	86	92	97	100	106	110
	9N@ 1490	813	40	48	57	67	71	80	86	97	107	115							
		914	36	43	51	60	68	73	79	89	100	100	112	118					
		1016	31	42	46	52	61	70	74	80	91	97	103	113	113	121	128		
		1118	30	39	45	52	57	63	73	77	83	89	94	104	106	115	122		
		1219	30	37	43	48	55	63	65	76	79	86	91	97	103	107	119	121	126
		1321	31	36	42	48	52	58	67	73	77	82	88	94	100	100	110	112	122
13716	7N@ 1959	813	33	40	46	52	57	65	76	77	86	95	97	107	109	128			
		914	28	36	42	48	57	58	67	67	77	86	88	98	98	110	110		
		1016	28	34	40	43	49	58	60	68	70	79	79	89	91	100	100	112	113
		1118	28	30	36	42	45	52	60	61	70	70	79	80	91	91	92	101	103
		1219	27	30	36	37	45	51	54	61	63	71	73	74	82	83	92	94	104
		1321	28	30	33	37	43	46	52	55	63	64	73	74	74	83	85	95	95
	8N@ 1716	1422	28	30	33	37	40	46	49	54	58	65	67	71	76	76	86	86	88
		813	45	45	54	63	68	77	85	94	101	116	116						
		914	43	43	49	55	64	68	76	85	89	97	107	118	119				
		1016	40	40	48	54	58	65	71	77	86	89	98	106	109	113	122		
		1118	37	37	45	49	58	63	68	73	79	83	92	98	101	106	113	119	124
		1219	37	37	45	49	54	61	65	70	76	80	85	92	97	100	110	116	125
	9N@ 1524	1321	37	37	42	46	54	58	64	67	71	77	83	88	94	97	106	110	115
		1422	36	36	42	48	52	57	61	65	70	76	80	86	88	92	100	106	110
		813	51	51	61	70	77	86	94	104	116	124							
		914	46	46	55	64	71	79	86	95	107	118	119		121	128			
		1016	43	43	51	60	65	73	79	86	95	101	110	121	118		125	131	
		1118	42	42	51	57	63	71	76	80	89	95	103	113	118	125	131		
14020	7N@ 2002	1219	42	42	49	54	63	65	74	79	83	92	95	106	113	121	126	131	
		1321	42	42	46	52	58	64	71	76	82	86	94	98	107	113	119	126	132
		1422	40	40	48	52	60	64	68	74	79	85	89	95	101	107	112	119	125
		813	43	43	49	58	63	71	77	85	94	101	104	116	122				
		914	39	39	46	54	60	64	71	79	83	92	95	103	112	119	125		
		1016	37	37	43	48	57	61	65	73	76	83	88	94	103	109	115	118	121
	8N@ 1752	1118	34	34	42	48	52	58	63	67	73	77	82	88	97	101	107	113	118
		1219	34	34	40	45	51	54	60	64	68	73	79	83	89	94	98	103	109
		1321	33	33	36	45	49	52	55	61	65	70	76	82	83	88	92	98	103
		1422	33	33	37	43	48	52	54	61	64	67	73	79	82	86	89	94	98
		813	46	46	55	63	71	77	85	94	104	116	122						
		914	42	42	51	57	64	73	79	85	95	103	107	118	125				
	9N@ 1557	1016	40	40	48	52	61	65	73	77	86	92	98	106	109	118	128		
		1118	39	39	45	51	58	63	71	76	80	88	92	100	107	115	122	125	129
		1219	37	37	43	49	54	61	65	71	77	82	88	94	100	106	110	118	125
		1321	37	37	45	49	54	58	63	68	74	77	83	88	94	100	104	112	118
		1422	37	37	42	48	54	57	64	67	71	77	80	86	91	94	98	104	110
		813	40	49	57	67	76	86	92	101	109								
14630	7N@ 2090	914	36	45	51	58	67	77	83	89	98	110	118						
		1016	36	42	49	60	64	70	79	85	91	101	106	113	119				
		1118	33	39	45	54	61	65	73	82	88	94	98	104	115	116	122		
		1219	31	37	45	49	55	63	70	74	85	85	95	97	106	107	119	125	
		1321	31	34	45	48	54	60	67	71	77	86	88	98	98	109	110	121	121
		1422	31	34	42	48	52	60	68	70	77	80	89	91	97	103	107	112	113
	8N@ 1828	813	45	45	52	60	67	71	82	91	98	104	115	116					
		914	42	42	46	55	61	68	73	80	88	95	101	106	118	126			
		1016	37	37	45	49	57	63	70	74	79	85	94	97	104	112	119		
		1118	37	37	43	49	55	58	64	70	76	80	86	92	98	104	110	118	121
		1219	34	34	40	46	51	57	61	67	73	76	79	86	89	95	101	107	112
		1321	34	34	40	45	49	55	58	64	68	74	77	80	88	92	97	103	107
	7N@ 2090	1422	34	34	37	43	49	52	57	63	65	71	76	80	83	89	94	100	103
		1524	33	33	37	45	48	52	54	58	65	68	73	74	82	86	91	92	95
	8N@ 1828	813	48	48	58	65	71	82	91	101	104	116	0						
		914	45	45	54	60	67	73	83	89	95	106	116	118					
		1016	42	42	49	57	63	70	76	80	88	97	104	107	119				
		1118	40	40	48	52	58	67	73	77	82	88	97	100	110	116	122		
		1219	39	39	45	51	55	61	70	74	79	83	89	97	101	107	113	119	125
		1321	39	39	45	49	54	63	65	71	76	82	88	92	97	101	106	113	119
		1422	37	37	42	49	54	58	64	68	73	79	85	89	94	98	103	110	116
		1524	36	36	43	49	52	55	61	67	71	76	82	86	88	95	101	107	112

JOIST GIRDERS DESIGN GUIDE WEIGHT TABLE FOR JOIST GIRDERS

Based on Allowable Tensile Stress of 207 MPa
Joist Girder Weight – kilogram/meter (kg/m).

Span (mm)	No. Of Joist Spaces	Depth (mm)	Panel Point Loads																
			18 kN	22 kN	27 kN	31 kN	36 kN	40 kN	44 kN	49 kN	53 kN	58 kN	62 kN	67 kN	71 kN	76 kN	80 kN	85 kN	89 kN
14630	9N@ 1624	813	54	54	65	71	82	92	103	115	122								
		914	48	48	60	67	74	83	95	103	107	118							
		1016	46	46	57	61	70	77	85	92	100	109	119	126					
		1118	45	45	52	58	67	73	80	88	94	100	112	122	124				
		1219	45	45	51	55	63	70	76	82	89	94	103	110	115	121	126		
		1321	42	42	49	55	63	67	73	79	85	94	97	106	109	119	128	132	137
		1422	42	42	48	54	60	65	71	77	83	88	94	100	109	115	121	126	132
		1524	40	40	49	54	58	63	68	74	80	85	89	97	103	109	113	119	125
15240	8N@ 1904	813	51	51	58	67	76	85	92	103	115	122							
		914	46	46	55	64	68	77	83	94	101	106	116	124	135				
		1016	43	43	51	57	64	70	80	85	94	97	107	118	119				
		1118	40	40	49	55	61	67	73	79	86	92	98	106	110	116	122	131	
		1219	40	40	46	52	60	64	68	76	80	88	95	101	107	115	124	126	131
		1321	39	39	43	52	57	61	65	73	80	83	91	95	100	106	112	119	126
		1422	37	37	45	49	54	61	64	71	76	83	85	92	94	101	107	113	119
		1524	37	37	43	49	55	58	65	70	74	77	85	86	91	97	103	107	112
	9N@ 1694	813	57	57	65	76	85	92	103	116									
		914	51	51	60	68	77	86	94	106	116	124							
		1016	48	48	57	65	73	80	88	97	104	119	119						
		1118	46	46	52	61	67	77	82	91	98	107	110	122	128	137	144		
		1219	43	43	51	60	64	71	80	85	91	101	104	113	124	128	132	141	
		1321	45	45	49	55	63	70	74	82	86	94	101	106	116	122	128	138	
		1422	42	42	49	55	60	68	73	79	85	89	95	101	107	115	121	126	132
		1524	42	42	48	55	60	67	70	76	82	88	92	98	104	112	119	125	131
	10N@ 1524	813	65	65	76	91	101	113											
		914	63	63	70	82	92	101	115	119									
		1016	55	55	65	73	83	94	103	118	121								
		1118	52	52	61	68	77	85	97	104	112	122							
		1219	51	51	58	65	74	82	89	98	107	113	124	126					
		1321	49	49	55	64	71	77	83	91	101	109	112	122	128	137			
		1422	49	49	55	61	68	73	80	86	95	103	110	113	124	132	141	146	149
		1524	49	49	52	58	68	70	79	83	92	97	104	113	115	124	131	141	152
15850	8N@ 1981	914	48	48	55	63	73	80	88	94	104								
		1016	45	45	52	60	67	74	82	89	95	103	113						
		1118	43	43	49	57	63	70	76	80	86	95	106	109	121				
		1219	42	42	48	54	60	67	73	77	83	89	98	100	107	115	122		
		1321	39	39	46	51	58	64	70	74	79	85	91	100	103	109	113	119	125
		1422	39	39	45	52	55	63	67	71	77	82	88	92	98	106	113	119	125
		1524	37	37	45	51	54	58	65	68	73	79	85	89	95	101	107	112	116
	9N@ 2371	914	55	55	64	73	82	88	101	106									
		1016	49	49	57	64	74	83	91	97	107								
		1118	48	48	55	61	68	77	86	92	98	109	121						
		1219	46	46	52	60	68	74	79	89	94	101	109	113					
		1321	45	45	52	57	65	71	76	82	91	97	103	112	115	122			
		1422	43	43	51	57	64	68	76	79	85	94	100	107	115	121	129	134	137
		1524	42	42	48	55	61	67	74	77	85	91	97	100	109	115	121	126	134
	10N@ 1584	914	45	57	67	76	86	97	107	115	125	137							
		1016	43	51	60	68	77	88	98	110	112	129	137	147					
		1118	40	46	55	64	70	80	91	97	103	113	119	129	146				
		1219	39	46	54	61	71	76	83	94	100	104	115	124	138	152			
		1321	37	45	49	60	64	74	79	85	97	101	107	119	119	138	150		
		1422	36	42	49	57	65	71	77	86	89	98	104	110	122	122	128	140	
		1524	34	42	49	54	60	68	79	82	91	97	103	107	113	124	125	134	150
16459	8N@ 2057	914	49	49	58	67	58	83	91	101	112	116							
		1016	46	46	55	61	68	74	85	92	100	106	118	119					
		1118	43	43	51	57	65	71	76	85	94	97	106	115	121				
		1219	42	42	49	57	63	67	74	79	86	94	100	107	110	116	122		
		1321	40	40	46	52	60	64	70	76	83	89	95	101	109	115	121	122	125
		1422	40	40	45	52	57	63	68	74	80	86	92	97	100	106	112	119	126
		1524	37	37	46	51	54	61	67	73	77	83	88	94	97	103	107	113	119
		1626	40	40	46	52	55	60	65	70	74	80	85	91	97	101	106	112	118
	9N@ 1828	914	55	55	63	73	82	94	104	116	122	135							
		1016	51	51	60	68	76	85	95	103	118	118	137						
		1118	48	48	57	65	71	80	86	97	104	109	121	128					
		1219	46	46	52	63	68	77	83	88	100	107	112	122	124				
		1321	43	43	51	60	64	73	80	85	91	100	104	113	125	128	132		
		1422	45	45	52	57	63	71	76	82	88	94	101	106	116	122	128	138	
		1524	43	43	51	55	64	68	74	79	85	89	95	104	109	115	121	126	132
		1626	43	43	51	57	61	67	71	76	82	88	98	98	109	113	119	126	135

JOIST GIRDERS

DESIGN GUIDE WEIGHT TABLE FOR JOIST GIRDERS

Based on Allowable Tensile Stress of 207 MPa
Joist Girder Weight – kilogram/meter (kg/m).

Span (mm)	No. Of Joist Spaces	Depth (mm)	Panel Point Loads																
			18 kN	22 kN	27 kN	31 kN	36 kN	40 kN	44 kN	49 kN	53 kN	58 kN	62 kN	67 kN	71 kN	76 kN	80 kN	85 kN	89 kN
16459	10N@ 1645	914	67	67	76	86	100	113	119										
		1016	60	60	70	79	91	101	115	119									
		1118	60	60	65	74	83	92	104	116	122								
		1219	51	51	61	70	80	85	97	106	116	124							
		1321	52	52	63	67	74	83	89	100	107	110	121	126					
		1422	51	51	58	65	71	79	85	94	101	110	113	122	128				
		1524	51	51	55	65	68	74	83	91	95	107	112	115	125				
		1626	51	51	57	60	68	74	82	89	94	98	110	113	116	125	132		
16764	8N@ 2097	914	51	51	60	67	76	83	94	101	116	116							
		1016	46	46	55	64	68	79	83	92	103	106	118	125					
		1118	46	46	51	60	65	73	80	85	94	103	109	119	119				
		1219	42	42	49	57	63	67	74	82	88	97	100	107	116	119	122		
		1321	40	40	48	54	60	65	73	79	83	89	98	101	107	116	124		
		1422	39	39	48	52	58	64	70	76	80	85	91	97	103	109	115	121	126
		1524	37	37	46	52	55	63	68	73	77	83	89	92	100	106	110	116	121
		1626	39	39	46	52	55	60	65	71	74	80	85	91	97	101	106	112	118
		1727	40	40	46	51	55	60	65	71	76	79	85	88	94	100	104	109	112
	9N@ 1862	914	55	55	65	74	82	94	104	116									
		1016	51	51	60	68	79	88	95	106	118	125							
		1118	48	48	57	65	73	80	89	97	104	119	121						
		1219	48	48	54	63	67	77	83	91	100	107	112	122	129				
		1321	46	46	52	61	67	74	80	86	94	103	109	113	125				
		1422	45	45	52	57	63	71	76	82	92	95	104	112	116	122	128		
		1524	45	45	52	57	64	68	74	79	86	94	98	107	116	121	129	134	138
		1626	43	43	51	57	61	67	74	79	86	92	98	101	110	116	122	129	135
		1727	43	43	51	55	61	68	73	77	83	89	94	100	107	112	115	122	128
	10N@ 1676	914	67	67	76	89	100	113	131										
		1016	61	61	71	82	94	101	115	121									
		1118	60	60	68	74	83	95	104	118	122								
		1219	55	55	64	70	80	88	97	106	119	124							
		1321	52	52	61	68	76	83	92	104	107	119	125						
		1422	54	54	58	67	71	79	88	94	106	110	122	128	131				
		1524	52	52	55	65	70	77	85	91	100	109	112	125	129	129	132		
		1626	51	51	55	60	70	76	82	89	95	101	110	115	126	129	132		
		1727	52	52	55	57	70	73	79	86	95	100	106	115	116	125	132		
	11N@ 1524	914	68	68	80	97	106	119											
		1016	67	67	74	86	101	109	121										
		1118	61	61	70	79	89	104	110	122									
		1219	57	57	65	76	86	97	106	119	122								
		1321	55	55	63	71	83	88	100	107	121	125							
		1422	54	54	64	68	76	85	94	103	110	122	128						
		1524	54	54	60	68	74	82	91	97	109	115	125	129	131				
		1626	52	52	58	68	71	80	89	94	106	113	116	126	132	129	132		
		1727	52	52	58	65	71	79	86	94	100	109	116	119	131				
17068	8N@ 2133	914	52	52	60	67	77	83	94	104	116	116							
		1016	46	46	55	64	71	79	83	95	103	113	118						
		1118	46	46	52	61	65	74	80	85	94	104	109	119	121				
		1219	45	45	49	58	64	71	77	83	88	97	104	110	116				
		1321	42	42	48	54	60	68	73	79	86	89	98	101	109	116	124		
		1422	40	40	48	52	58	65	70	76	80	88	91	100	103	109	115	121	126
		1524	39	39	46	52	57	63	68	71	77	83	89	94	103	107	112	119	125
		1626	39	39	46	52	55	63	65	71	76	82	85	92	97	103	107	113	118
		1727	40	40	48	51	57	61	67	70	76	82	85	88	95	101	107	112	118
	9N@ 1895	914	58	58	67	77	85	94	104	116									
		1016	54	54	64	68	79	89	95	106	118	124							
		1118	49	49	57	65	76	80	91	97	107	119	121						
		1219	48	48	57	63	70	77	88	92	100	107	121	122					
		1321	46	46	54	61	68	74	79	89	95	101	109	113	124				
		1422	45	45	52	60	65	71	76	83	92	97	104	112	116	122	128		
		1524	45	45	51	57	64	68	76	83	88	95	100	107	115	121	129	134	138
		1626	46	46	51	57	61	67	74	80	86	91	98	103	110	116	122	129	135
		1727	43	43	51	57	61	68	71	77	83	89	94	100	107	115	122	128	132
	10N@ 1706	914	67	67	77	89	101	113	131										
		1016	63	63	71	82	94	101	115	132									
		1118	60	60	68	79	86	100	104	118	122								
		1219	55	55	64	71	80	89	103	107	119	124							
		1321	52	52	63	70	76	86	95	103	110	121	125						
		1422	54	54	58	67	71	82	88	97	106	112	122	128					
		1524	52	52	55	65	70	80	85	94	100	112	113	124	129				
		1626	52	52	57	63	70	76	82	91	97	104	113	116	126	126	134		
		1727	52	52	57	61	70	74	79	89	94	100	107	116	118	126	134		

JOIST GIRDERS DESIGN GUIDE WEIGHT TABLE FOR JOIST GIRDERS

Based on Allowable Tensile Stress of 207 MPa
Joist Girder Weight – kilogram/meter (kg/m).

Span (mm)	No. Of Joist Spaces	Depth (mm)	Panel Point Loads																
			18 kN	22 kN	27 kN	31 kN	36 kN	40 kN	44 kN	49 kN	53 kN	58 kN	62 kN	67 kN	71 kN	76 kN	80 kN	85 kN	89 kN
17068	11N@ 1554	914	52	70	79	89	100	110											
		1016	51	61	71	80	91	101	113										
		1118	46	58	67	77	88	94	104	115	122								
		1219	46	55	64	74	83	91	97	107	118	125							
		1321	45	52	63	71	77	86	98	104	110	121	128						
		1422	43	51	60	68	79	83	91	101	107	112	124	131					
		1524	43	51	57	65	71	82	92	94	104	110	116	126	132				
		1626	42	51	57	64	73	80	86	95	101	107	118	119	129	132			
		1727	40	49	58	64	70	77	88	92	98	104	110	122	124	134	135	143	
17678	9N@ 1962	914	58	58	67	79	91	100	115	122									
		1016	55	55	64	73	83	92	101	112	118								
		1118	51	51	61	67	76	85	94	104	107	119							
		1219	48	48	57	64	71	79	86	95	106	110	121	128					
		1321	48	48	54	63	68	77	83	89	98	107	112	124	124				
		1422	45	45	52	61	65	73	80	86	92	100	109	115	126	137			
		1524	46	46	52	58	64	71	77	82	91	94	103	112	118	124	129	140	
		1626	46	46	54	57	65	70	74	79	86	92	100	106	113	122	129	132	134
		1727	48	48	51	57	63	67	73	79	88	92	98	101	109	115	121	128	135
		1829	46	46	52	58	63	70	73	79	85	91	95	101	109	113	116	122	128
	10N@ 1767	914	71	71	82	97	103	118											
		1016	65	65	74	85	98	104	119										
		1118	60	60	68	79	91	103	112	121									
		1219	58	58	67	74	85	94	104	115	122								
		1321	55	55	64	70	79	88	98	106	116	121							
		1422	54	54	63	68	77	83	91	104	109	119	122	131					
		1524	55	55	60	67	71	79	89	95	107	110	121	124	132				
		1626	54	54	55	65	71	74	88	92	100	109	113	122	126	138			
		1727	54	54	57	60	71	76	83	91	95	101	112	115	125	129	132		
		1829	52	52	57	60	70	74	80	89	95	98	107	115	118	125	132	140	
	11N@ 1606	914	61	70	80	91	101	118											
		1016	54	63	73	86	97	107	119										
		1118	49	63	73	83	94	100	115	116									
		1219	49	57	65	74	85	95	106	118	119								
		1321	48	57	67	71	82	88	98	110	121	121							
		1422	45	52	61	68	80	89	97	103	113	122	125						
		1524	45	54	60	70	76	83	94	98	106	115	126	128	135				
		1626	45	54	58	65	74	85	89	95	107	109	118	129	131	138			
		1727	43	51	58	67	76	83	89	97	100	110	116	122	132	135	143		
		1829	43	52	58	67	73	80	91	92	101	109	115	119	126	137	138	146	
18288	9N@ 2033	1016	57	60	65	73	83	92	101	112	119								
		1118	57	57	63	70	79	85	95	104	119	119							
		1219	55	57	58	67	74	82	89	97	106	116	121						
		1321	54	55	57	65	70	74	80	91	94	103	109	115					
		1422	54	54	54	63	68	73	80	86	94	101	104	113	116	122			
		1524	52	52	54	60	67	73	80	86	92	101	104	113	116	116	129		
		1626	52	52	52	55	64	70	76	77	88	89	97	100	109	109	121	122	
		1727	51	51	51	55	64	70	74	79	86	88	97	101	109	112	121	124	138
		1829	49	49	51	57	64	68	74	79	86	89	97	101	110	116	122	131	138
	10N@ 1828	1016	48	63	73	82	92	103	116										
		1118	46	61	73	82	91	103	116	122	140	143							
		1219	45	55	67	77	86	101	104	119	122	141	144						
		1321	43	52	63	71	77	86	97	107	112	119	129	137					
		1422	42	51	63	70	74	85	95	100	110	116	126	132	143				
		1524	42	49	61	68	73	82	92	98	107	113	124	129	141				
		1626	37	48	58	64	71	77	86	95	98	110	116	119	126	126			
		1727	36	45	58	63	71	76	86	94	97	107	115	113	124	125	134	134	
		1829	36	57	58	61	71	76	85	91	95	104	113	116	119	125	134	134	
	11N@ 1661	1016	49	63	76	86	97	109	115										
		1118	49	60	68	79	89	100	110	118									
		1219	45	54	65	71	82	92	103	113	121								
		1321	45	52	63	71	82	88	97	106	116	122							
		1422	43	51	60	68	76	85	97	98	109	118	126						
		1524	42	49	58	67	76	82	89	98	106	113	122	128					
		1626	42	49	58	67	70	82	89	95	103	113	116	125	132				
		1727	42	49	55	63	71	82	83	92	100	106	116	118	129	135			
		1829	42	48	57	63	73	76	86	91	97	107	109	121	122	132	140		
	12N@ 1524	1016	58	70	79	95	109	121											
		1118	57	70	79	95	104	121	138	140									
		1219	55	64	76	86	98	110	122	140	143								
		1321	48	58	68	77	85	95	106	118	125								
		1422	46	57	65	77	85	92	101	112	124	128							
		1524	46	57	65	77	85	92	101	112	124	128	147						
		1626	45	52	60	70	80	86	97	104	115	116	126	135					
		1727	45	52	61	71	79	85	95	101	109	119	129	132	138				
		1829	45	55	61	71	79	86	92	98	109	118	125	135	137				

STANDARD SPECIFICATIONS FOR JOIST GIRDERS

Adopted by the Steel Joist Institute November 4, 1985 – Revised to May 2, 1994 – Effective September 1, 1994

SECTION 1000. SCOPE

These specifications cover the design, manufacture and use of Joist Girders.

SECTION 1001. DEFINITION

The term “Joist Girders”, as used herein, refers to open web, load- carrying members utilizing hot-rolled or cold-formed steel, including cold-formed steel whose yield strength* has been attained by cold working.

The design of Joist Girder chord or web sections shall be based on a yield strength of at least 36 ksi (250 MPa) but not greater than 50 ksi (345 MPa) Steel used for Joist Girder chord or web sections shall have a minimum yield strength determined in accordance with one of the procedures specified in Section 1002.2, which is equal to the yield strength assumed in the design. Joist Girders shall be designed in accordance with these specifications to support panel point loadings.

* The term “yield strength” as used herein shall designate the yield level of a material as determined by the applicable method outlined in paragraph 13 - “Yield Strength”, or paragraph 12 - “Yield Point”, of ASTM A370, “Mechanical Testing of Steel Products”, or as specified in Section 1002.2 of this Specification.

SECTION 1002. MATERIALS

1002.1 STEEL

The steel used in the manufacture of chord and web sections shall conform to one of the following ASTM Specifications of latest adoption:

- Structural Steel, ASTM A36/A36M.
- High-Strength Low-Alloy Structural Steel, ASTM A242/A242M.

Standards Specifications and Weight Tables
for Joist Girders

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- High-Strength Carbon-Manganese Steel of Structural Quality, ASTM A529/A529M, Grade 50.
- Hot-Rolled Carbon Steel Sheets and Strip, Structural Quality, ASTM A570/A570M.
- High-Strength Low-Allow Columbium-Vanadium Steel of Structural Quality, ASTM A572/A572M Grades 42, 45, and 50.
- High-Strength Low-Alloy Structural Steel with 50 ksi (345 MPa) Minimum Yield Point to 4 inches (102 mm) thick, ASTM A588/A588M.
- Steel Sheet and Strip, Hot-Rolled and Cold-Rolled, High- Strength, Low-Alloy, with Improved Corrosion Resistance, ASTM A606.
- Steel Sheet and Strip, Hot-Rolled and Cold-Rolled, High-Strength, Low-Alloy, Columbium and/ or Vanadium, ASTM A607, Grades 45 and 50.
- Steel, Cold-Rolled Sheet, Carbon Structural, ASTM A611, Grade D.

or shall be of suitable quality ordered or produced to other than the listed specifications, provided that such material in the state used for final assembly and manufacture is weldable and is proved by tests performed by the producer or manufacturer to have the properties specified in Section 1002.2.

1002.2 MECHANICAL PROPERTIES

The yield strength used as a basis for the design stresses prescribed in Section 1003 shall be at least 36 ksi (250 MPa) but shall be not greater than 50 ksi (345 MPa). Evidence that the steel furnished meets or exceeds the design yield strength shall, if requested, be provided in the form of an affidavit or by witnessed or certified test reports.

For material used without consideration of increase in yield strength resulting from cold forming, the specimens shall be taken from as-rolled material. In the case of material properties of which conform to the requirements of one of the listed specifications, test specimens and procedure shall conform to those of such specifications and to ASTM A370.

In the case of material the mechanical properties of which do not conform to the requirements of one of the listed specifications, the test specimens and procedure shall conform to the applicable requirements of ASTM A370



and the specimens shall exhibit a yield strength equal to or exceeding the design yield strength and an elongation of not less than (a) 20 percent in 2 inches (51 mm) for sheet and strip or (b) 18 percent in 8 inches (203 mm) for plates, shapes and bars with adjustments for thickness for plates, shapes and bars as prescribed in ASTM A36/A36M, A242/A242M, A529/A529M, A572/A572M, and A588/A588M, whichever specification is applicable on the basis of design yield strength.

The number of tests shall be the same as prescribed in ASTM A6 for plates, shapes and bars; and ASTM A570, A570M, A606, A607, and A611 for sheet and strip.

If as-formed strength is utilized, the test reports shall show the results of tests performed on full section specimens in accordance with the provisions of Sections 3.1.1 and 6.3 of the AISI Specifications for the Design of Cold-Formed Steel Structural Members, and shall indicate compliance with these provisions and with the following additional requirements:

1. The yield strength measured in the tests shall equal or exceed the design yield strength.
2. Where tension tests are made for acceptance and control purposes, the tensile strength shall be at least 6 percent greater than the yield strength of the section.
3. Where compression tests are used for acceptance and control purposes, the specimen shall withstand a gross shortening of 2 percent of its original length without cracking. The length of specimen shall not be greater than 20 times its least radius of gyration.
4. If any test specimen fails to pass the requirements of subparagraph 1, 2, or 3 above, as applicable, two retests shall be made of specimens from the same lot. Failure of one of the retest specimens to meet such requirements shall be cause for rejection of the lot represented by the specimens.

1002.3 WELDING ELECTRODES

The following electrodes shall be used for arc welding:

- a) For connected members both having a specified minimum yield strength greater than 36 ksi (250 MPa).
AWS A5.1 or A5.5, E70XX
AWS A5.17 F7X EXXX flux electrode combination
AWS A5.18, E70S-X or E70U-1
AWS A5.20, E70T-X

- b) For connected members both having a specified minimum yield strength of 36, ksi (250 MPa) or one having a specified minimum yield strength of 36 ksi (250 MPa) and the other having a specified minimum yield strength greater than 36 ksi (250 MPa).

AWS A5.1, E60XX

AWS A5.17, F6X-EXXX flux electrode combination

AWS A5.20, E60T-X

or any of those listed in Section 1002.3(a).

Other welding methods, providing equivalent strength as demonstrated by tests, may be used.

1002.4 PAINT

The standard shop paint is a primer coat intended to protect the steel for only a short period of exposure in ordinary atmospheric conditions and shall be considered an impermanent and provisional coating.

When specified, the Standard shop paint shall conform to one of the following:

- a) Steel Structures Painting Council Specification 15-68T, Type 1 (red oxide).
- b) Federal Specification TT-P-636 (red oxide).
- c) Or, shall be a shop paint which meets the minimum performance requirements of one of the above listed specifications.

SECTION 1003. DESIGN AND MANUFACTURE

1003.1 METHOD

Joist Girders shall be designed in accordance with these specifications as simply supported primary members. All loads will be applied through steel joists, and will be equal in magnitude and evenly spaced along joist girder top chord. Where any applicable design feature is not specifically covered herein, the design shall be in accordance with the following specifications of latest adoption:

- a) American Institute of Steel Construction Specification for the Design, Fabrication and Erection of Structural Steel for Buildings (Allowable Stress Design), where the material used consists of plates, shapes or bars.
- b) American Iron and Steel Institute Specification for the Design of Cold-Formed Steel Structural Members, for members which are cold-formed from sheet or strip material.



1003.2 UNIT STRESSES

Joist Girders shall have their components so proportioned that the unit stresses in kips per square inch (Mega Pascals) shall not exceed the following, where F_y is the yield strength defined in Section 1002.2:

a) Tension:

All Members $F_t = 0.6F_y$

b) Compression:

For Members with l/r less than C_c :

$$F_a = \left[\frac{1 - (l/r)^2}{2C_c^2} \right] QF_y$$

$$\frac{5}{3} + \frac{3}{8} \left(\frac{l/r}{C_c} \right) - \frac{1}{8} \left(\frac{l/r}{C_c} \right)^3$$

$$\text{where } C_c = \sqrt{\frac{2p^2E}{QF_y}} \quad \text{and}$$

where Q is a form factor equal to unity except when the width-thickness ratio of one or more elements of the profile exceeds the limits specified in the AISC Specification, Section B5 (Allowable Stress Design), for hot-rolled sections and in the AISI Specification, Section 3., for cold-formed sections. For members with l/r greater than C_c :

$$F_a = \frac{12p^2E}{23(l/r)^2}$$

In the above formula l is the length center-to-center of panel points, and r is the corresponding least radius of gyration of the member or any component thereof, both in inches (millimeters) and E is equal to 29,000 ksi (200,000 MPa).

c) Bending:

For chords, and for web members

other than solid rounds $F_b = 0.6F_y$

For web members of solid round

cross section $F_b = 0.9F_y$

For outstanding legs of top chord

angles at points of loading $F_b = 0.75F_y$

For bearing plates $F_b = 0.75F_y$

d) Weld Stresses:

Shear at throat of fillet welds:

Made with E70 series electrodes or F7X-EXXX
flux-electrode combinations 21 ksi (145 MPa)

Made with E60 series electrodes or F6X-EXXX
flux-electrode combinations 18 ksi (124 MPa)

Tension or compression on groove or butt welds shall be the same as those specified for the connected material.

1003.3 MAXIMUM SLENDERNESS RATIOS

The slenderness ratio, l/r , where l is the length center-to-center of support points and r is the corresponding least radius of gyration, shall not exceed the following:

Top chord interior panels	90
Top chord end panels	120
Compression members other than top chord	200
Tension members	240

If moment-resistant weld groups are not used at the ends of a crimped, first primary compression web member, then $1.2 l/r_x$ must be used. Where r_x = member radius of gyration in the plane of the joist.

1003.4 MEMBERS

a) Chords

The bottom chord shall be designed as an axially loaded tension member. The radius of gyration of the bottom chord about its vertical axis shall be not less than $l/240$ where l is the distance between lines of bracing.

The top chord shall be designed as an axially loaded compression member. The radius of gyration of the top chord about the vertical axis shall be not less than $\text{Span}/575$.

The top chord shall be considered as stayed laterally by the steel joists provided positive attachment is made.

b) Web

The vertical shears to be used in the design of the web members shall be determined from full loading but such vertical shear shall be not less than 25 percent of the end reaction.

Interior vertical web members used in modified Warren type web systems that do not support the direct loads through steel joists shall be designed to resist 2 percent of the top chord axial force.

Tension members shall be designed to resist, in compression, at least 25 percent of their axial force.

c) Fillers and Ties

Chord and web members in compression, composed of two components, shall have fillers, ties or welds spaced so that the l/r ratio for each component shall not exceed the l/r ratio of the whole member.



Chord and web members in tension, composed of two components, shall have fillers, ties or welds spaced so that the l/r ratio of each component shall not exceed 240. The least r shall be used in computing the l/r ratio of a component.

d) Eccentricity

Members connected at a joint shall have their center of gravity lines meet at a point, if practical. Eccentricity on either side of the centroid of chord members may be neglected when it does not exceed the distance between the centroid and the back of the chord. Otherwise, provision shall be made for the stresses due to eccentricity. Ends of Joist Girders shall be proportioned to resist bending produced by eccentricity at the support. In those cases where a single angle compression member is attached to the outside of the stem of a tee or double angle chord, due consideration shall be given to eccentricity.

e) Extended Ends

Extended top chords or full depth cantilever ends require the special attention of the specifying professional.

The magnitude and location of the design loads to be supported, the deflection requirements, and the proper bracing shall be clearly indicated on the structural drawings.

1003.5 CONNECTIONS

a) Methods

Joint connections and splices shall be made by attaching the members to one another by arc or resistance welding or other approved method.

1) Welded Connections

- (a) Selected welds shall be inspected visually by the manufacturer. Prior to this inspection, weld slag shall be removed.
- (b) Cracks are not acceptable and shall be removed.
- (c) Thorough fusion shall exist between layers of weld metal and between weld metal and base metal for the required design length of the weld; such fusion shall be verified by visual inspection.
- (d) Unfilled weld craters shall not be included in the design length of the weld.
- (e) Undercut shall not exceed $\frac{1}{16}$ inch (2 mm) for welds oriented parallel to the principal stress.

- (f) The sum of surface (piping) porosity diameters shall not exceed $\frac{1}{16}$ inch (2 mm) in any 1 inch (25 mm) of design weld length.

- (g) Weld spatter that does not interfere with paint coverage is acceptable.

2. Welding Program

Manufacturers shall have a program for establishing weld procedures and operator qualification, and for weld sampling and testing.

3. Weld inspection by Outside Agencies (See Section 1004.10 of these specifications).

The agency shall arrange for visual inspection to determine that welds meet the acceptance standards of Section 1003.5.1) above. Ultrasonic, X-Ray, and magnetic particle testing are inappropriate for joists due to the configurations of the components and welds.

b) Strength

Joint connections shall develop the maximum force due to any of the design loads, but not less than 50 percent of the allowable strength of the member in tension or compression, whichever force is the controlling factor in the selection of the member.

c) Shop Splices

Shop splices may occur at any point in chord or web members. Splices shall be designed for the member force but not less than 50 percent of the allowable member strength. Members containing a butt weld splice shall develop an ultimate tensile force of at least 57 ksi (393 MPa) times the full design area of the chord or web. The term "member" shall be defined as all component parts, comprising the chord or web, at the point of splice.

d) Field Splices

Field splices shall be designed by the manufacturer and may be either bolted or welded. Splices shall be designed for the member force, but not less than 50 percent of the allowable member strength.

1003.6 CAMBER

Joist Girders shall have approximate cambers in accordance with the following:

Top Chord Length	Approximate Camber
20'-0" (6096 mm)	$\frac{1}{4}$ " (6 mm)
30'-0" (9144 mm)	$\frac{3}{8}$ " (10 mm)
40'-0" (12192 mm)	$\frac{5}{8}$ " (16 mm)
50'-0" (15240 mm)	1" (25 mm)
60'-0" (18288 mm)	1½" (38 mm)

1003.7 VERIFICATION OF DESIGN AND MANUFACTURE

a) Design Calculations

Companies manufacturing Joist Girders shall submit design data to the Steel Joist Institute (or an independent agency approved by the Steel Joist Institute) for verification of compliance with the SJI Specifications.

b) In-Plant Inspections

Each manufacturer shall verify his ability to manufacture Joist Girders through periodic In-Plant Inspections. Inspections shall be performed by an independent agency approved by the Steel Joist Institute. The frequency, manner of inspection, and manner of reporting shall be determined by the Steel Joist Institute. The In-Plant Inspections are not a guaranty of the quality of any specific Joist Girders; this responsibility lies fully and solely with the individual manufacturer.

SECTION 1004. APPLICATION

1004.1 USAGE

These specifications shall apply to any type of structure where steel joists are to be supported directly by Joist Girders installed as hereinafter specified. Where Joist Girders are used other than on simple spans under equal concentrated gravity loading, as prescribed in Section 1003.1, they shall be investigated and modified if necessary to limit the unit stresses to those listed in Section 1003.2. The magnitude and location of all loads and forces, other than equal concentrated gravity loadings, shall be provided on the structural drawings. The specifying professional shall design the supporting structure, including the design of columns, connections, and moment plates. This design shall account for the stresses caused by lateral forces and the stresses due to connecting the bottom chord to the column or other support.

The designed detail of a rigid type connection and moment plates shall be shown on the structural drawings

by the specifying professional. The moment plates shall be furnished by other than the joist manufacturer.

1004.2 SPAN

The span of a Joist Girder shall not exceed 24 times its depth.

1004.3 DEPTH

The nominal depth of sloping chord Joist Girders shall be the depth at mid-span.

1004.4 END SUPPORTS

a) Masonry and Concrete

Joist Girders supported by masonry or concrete are to bear on steel bearing plates and shall be designed as steel bearing. Due consideration of the end reactions and all other vertical or lateral forces shall be taken by the specifying professional in the design of the steel bearing plate and the masonry or concrete. The ends of the Joist Girders shall extend a distance of not less than 6 inches (152 mm) over the masonry or concrete support and be anchored to the steel bearing plate. The plate shall be located not more than $\frac{1}{2}$ inch (13 mm) from the face of the wall and shall be not less than 9 inches (229 mm) wide perpendicular to the length of the girder. It is to be designed by the specifying professional in compliance with the allowable unit stresses in Section A5.1 (Allowable Stress Design) of the A.I.S.C. Specifications of latest adoption. The steel bearing plate shall be furnished by other than the joist manufacturer.

Where it is deemed necessary to bear less than 6 inches (152 mm) over the masonry or concrete support, special consideration is to be given to the design of the steel bearing plate and the masonry or concrete by the specifying professional. The girders must bear a minimum of 4 inches (102 mm) on the steel bearing plate.

b) Steel

Due consideration of the end reactions and all other vertical and lateral forces shall be taken by the specifying professional in the design of the steel support. The ends of Joist Girders shall extend a distance of not less than 4 inches (102 mm) over the steel supports and shall have positive attachment to the support, either by bolting or welding.

1004.5 BRACING

Joist Girders shall be proportioned such that they can be erected without bridging (See Section 1004.9 for bracing required for uplift forces). Therefore, the following requirements must be met:

- a) The ends of the bottom chord are restrained from lateral movement to brace the girder from overturning.
- b) No other loads shall be placed on the Joist Girder until the steel joists bearing on the girder are in place and welded to the girder.

1004.6 END ANCHORAGE

a) Masonry and Concrete

Ends of Joist Girders resting on steel bearing plates on masonry or structural concrete shall be attached thereto with a minimum of two $\frac{1}{4}$ inch (6mm) fillet welds 2 inches (51 mm) long, or with two $\frac{3}{4}$ inch (19 mm) bolts.

b) Steel

Ends of Joist Girders resting on steel supports shall be attached thereto with a minimum of two $\frac{1}{4}$ inch (6 mm) fillet welds 2 inches (51 mm) long, or with two $\frac{3}{4}$ inch (19 mm) bolts. In steel frames, Joist Girders at column lines shall be field bolted to the columns to provide lateral stability during construction.

c) Uplift

Where uplift forces are a design consideration, roof Joist Girders shall be anchored to resist such forces.

1004.7 DEFLECTION

The deflections due to the design live load shall not exceed the following:

Floors: $\frac{1}{360}$ of span.

Roofs: $\frac{1}{360}$ of span where a plaster ceiling is attached or suspended.

$\frac{1}{240}$ of span for all other cases

The specifying professional shall give due consideration to the effects of deflection and vibration* in the selection of Joist Girders.

* For further reference, refer to Steel Joist Institute Technical Digest No 5, "Vibration of Steel Joist-Concrete Slab Floors" and Computer Vibration program.

1004.8 PONDING

Unless a roof surface is provided with sufficient slope toward points of free drainage or adequate individual

drains to prevent the accumulation of rain water, the roof system shall be investigated to assure stability under ponding conditions in accordance with Section K2 (Allowable Stress Design) of the AISC Specifications.*

The ponding investigation shall be performed by the specifying professional.

* For further reference, refer to the Steel Joist Institute Technical Digest #3, "Structural Design of Steel Joist Roofs to Resist Ponding Loads".

1004.9 UPLIFT

Where uplift forces due to wind are a design requirement, these forces must be indicated on the contract drawings in terms of net uplift in pounds per square foot (Pascals). When these forces are specified, they must be considered in the design of the Joist Girders and/or bracing. If the ends of the bottom chord are not strutted, bracing must be provided near the first bottom chord panel points whenever uplift due to wind forces is a design consideration.*

* For further reference, refer to Steel Joist Institute Technical Digest #6, "Structural Design of Steel Joist Roofs to Resist Uplift Loads".

1004.10 INSPECTION

Joist Girders shall be inspected by the manufacturer before shipment to insure compliance of materials and workmanship with the requirements of these specifications. If the purchaser wishes an inspection of the Joist Girders by someone other than the manufacturer's own inspectors, he may reserve the right to do so in his "Invitation to Bid" or the accompanying "Job Specifications". Arrangements shall be made with the manufacturer for such inspection of the Joist Girders at the manufacturing shop by the purchaser's inspectors at purchaser's expense.

SECTION 1005.* HANDLING AND ERECTION

Particular attention should be paid to the erection of Joist Girders.

Care shall be exercised at all times to avoid damage through careless handling during unloading, storing and erecting. Dropping of Joist Girders shall not be permitted.

During the construction period, the contractor shall provide means for the adequate distribution of concentrated loads so that the carrying capacity of any



STANDARD SPECIFICATIONS / FOR JOIST GIRDERS

Joist Girder is not exceeded.

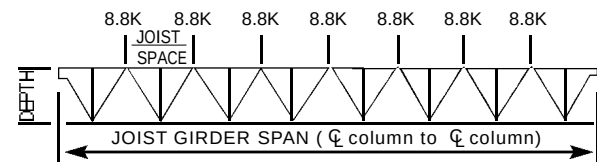
Field welding shall not damage the Joist Girder. The total length of weld at any one cross-section on cold-formed members whose yield strength has been attained by cold working and whose as-formed strength is used in the design, shall not exceed 50 percent of the overall developed width of the cold-formed section.

* For thorough coverage of this topic, refer to SJI Technical Digest #9, "Handling and Erection of Steel Joists and Joist Girders".

SECTION 1006. How To Specify Joist Girders

For a given Joist Girder span, the specifying professional first determines the number of joist spaces. Then the panel point loads are calculated and a depth is selected. The following tables give the Joist Girder weight per linear foot (Kilograms/Meter) for various depths and loads.

Example using English units:



STANDARD DESIGNATION

48G	8N	8.8K
DEPTH IN INCHES	NUMBER OF JOIST SPACES	KIP LOAD ON EACH PANEL POINT

Given 50'-0" x 40'-0" bay. Joists spaced on 6'-3" centers

Live Load = 20 psf

Dead Load = 15 psf (includes the approximate

Total Load = 35 psf Joist Girder weight)

NOTE: Web configuration may vary from that shown. Contact Joist Girder manufacturer if exact layout must be known.

- Determine number of actual joist spaces (N).
In this example, N = 8.
- Compute total load:
Total load = 6.25 x 35 psf = 218.75 plf
- Joist Girder Section: (Interior)
 - Compute the concentrated load at top chord panel points $P = 218.75 \times 40 = 8,750$ lbs = 8.8 kips (use 9K for depth selection).

- Select Joist Girder depth:

Refer to the Joist Girder Design Guide Weight Table for the 50'-0" span, 8 panel, 9.0K Joist Girder. The rule of about one inch of depth for each foot of span is a good compromise of limited depth and economy. Therefore, select a depth of 48 inches.

- The Joist Girder will then be designated 48G8N8.8K.
- The Joist Girder table shows the weight for a 48G8N9K as 43 pounds per linear foot. The designer should verify that the weight is not greater than the weight assumed in the dead load above.
- Check live load deflection:

Live load = 20 psf x 40 ft. = 800 plf Approximate Joist Girder moment of inertia = 0.027 NPLd = $0.027 \times 8 \times 9 \times 50 \times 48 = 4666 \text{ in}^4$

Allowable deflection
for plastered ceilings = $L/360 = \frac{50 \times 12}{360} = 1.67 \text{ in.}$

$$\text{Deflection} = 1.15 \left[\frac{5wL^4}{384EI} \right] = \frac{1.15 \times 5 \left(\frac{0.800}{12} \right) (50 \times 12)^4}{384 \times 29,000 \times 4666} = 0.96 \text{ in} < 1.67 \text{ in., O'K'}$$

Live load deflection rarely governs because of the relatively small span-depth ratios of Joist Girders.

- The purpose of the Design Guide Weight Table for Joist Girders is to assist the specifying professional in the selection of a roof or floor support system.
- It is not necessary to use only the depths, spans, or loads shown in the tables.
- Holes in chord elements present special problems which must be considered by both the specifying professional and the Joist Girder Manufacturer. The sizes and locations of such holes shall be clearly indicated on the structural drawings.



FIRE-RESISTANCE RATINGS WITH STEEL JOISTS

Hundreds of fire tests on steel joist-supported assemblies have been conducted at nationally recognized testing laboratories in accordance with ASTM Standard E119, ANSI A2.1/UL 263, and NFPA 251. Because of practical loading restrictions and limitations of furnace dimensions, the vast majority of these tests were run using lightweight joists - normally from 8 inches to 14 inches deep. This practice was advantageous in that it established the minimum acceptable joists at the shallow and lightweight end of the joist load tables.

The specified minimum size joist as listed in **Underwriters Laboratories (U.L.) Fire Resistance Designs** is the joist which combines the required minimum depth and minimum weight per foot. Joists, of the same series, which meet, or exceed the specified minimums may be used provided the accessories are compatible. The dimension from the bottom chord of joists to the ceiling, whether given or calculated, is a minimum.

K-Series Joists, LH Series Joists and Joist Girders specified in floor- or roof-ceiling assemblies, shall be designed and manufactured in accordance with the Steel Joist Institute's Specifications adopted November 4, 1985 revised November 12, 1991.

Many of U.L.'s Fire Rated Assemblies now specifically list **K-Series Joists**. When a **K-Series Joist** is specified in a particular U.L. assembly the **K-Series Joist** shall have its design stress limited only if the assembly specifically limits the design stress of the **K-Series Joist**.

K-Series Joists may be substituted for S-, J-, and/or H-Series Joists specified in U.L. floor-, or roof-ceiling designs as follows:

Floor-Ceiling Assemblies:

K-Series Steel Joists of equal or greater depth and weight per foot may be substituted for any S-, J-, and/or H-Series Joist in any floor-ceiling design, which employs a structural concrete floor and suspended membrane ceiling.

Roof-Ceiling Assemblies:

K-Series Steel Joists of equal or greater depth and weight per foot may be substituted for any S-, J-, and/or H-Series Joists in any roof-ceiling design with the following restrictions:

- Minimum Nominal Depth = 10 inches (254mm)
- Maximum Tensile Stress = 26 KSI (179 MPa)

Any stress limitation specified in a U.L. floor or roof fire rated assembly containing S, J and/or H Series Joists shall remain applicable when a **K-Series Joist** is substituted. Also, certain U.L. assembly designs contain restrictions regarding minimum allowable joist member sizes, areas of

steel, and/or bridging material sizes. These restrictions remain applicable when a K-Series Joist is substituted and it is the responsibility of the specifying professional to list all such restrictions on the contract drawings.

The following procedure may be used to substitute the proper **K-Series Joist** for any S-, J-, and/or H-Series Joist listed in a U.L. design assembly.

- Determine the uniform load per foot the joist is required to support.
- Select a design from the U.L. "Fire Resistance Directory" that matches the building construction and has the required fire rating.
- Floor Assemblies:**
Adjust the design load per foot calculated in step #1 for any required reduction in stress level by multiplying the load by a factor of 30 ksi (207 MPa) divided by the specified stress level, i.e. [30/24 (207/165), 30/22 (207/152). etc.].
 - Roof Assemblies:**
Adjust the design load per foot calculated in step #1 by multiplying by the factor of 30/26 (207/179), or a greater factor if the particular assembly design requires a lesser stress level.
- Enter the K-Series Economy Table and select the proper joist for the calculated load requirement.
- Insure that the **K-Series Joist** selected has a depth and load table weight per foot equal to, or greater than, the S-, J- and/or H-Series joist listed in the U.L. Design. Joists used in roof assemblies must have a minimum depth of 10 inches (254mm).

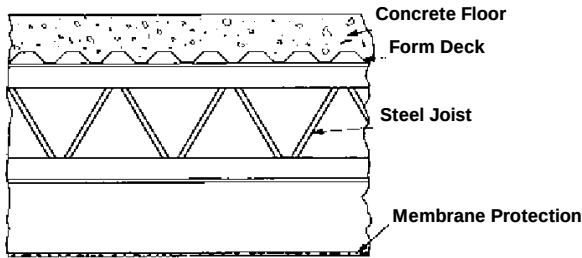
So that the proper **K-Series Joist** can be selected for U.L. Designs not presently containing a K-Series designation the weights of various S-, J-, and H-Series Joists used in the U.L. Fire Resistance Designs are listed below:

Joist Designation	Load Table Weight lbs./ft.	Joist Designation	Load Table Weight lbs./ft.
8S2	4.0	14J5	7.3
10S3	5.0	14J7	9.7
8J2	4.2	8H2	4.2
10J2	4.2	8H3	5.0
10J3	4.8	10H2	4.2
10J4	6.0	10H3	5.0
12J2	4.5	10H4	6.1
12J3	5.1	12H4	6.2
12J4	6.0	12H5	7.1
12J5	7.0		
12J6	8.1		



FIRE-RESISTANCE RATINGS WITH STEEL JOISTS

FLOOR-CEILING ASSEMBLIES WITH MEMBRANE PROTECTION

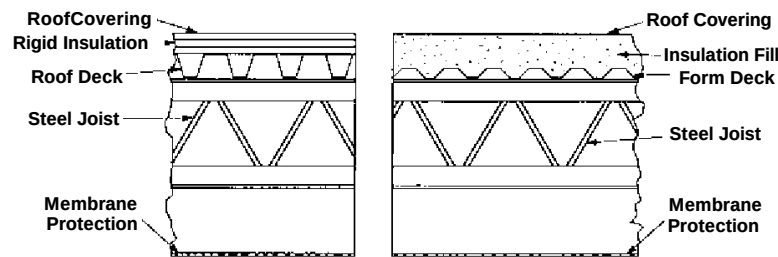


Restrained Assembly Rating	Type of Protection System	Concrete		Minimum Joist Size See Note #3 & #4	Maximum Joist Spacing See Note #2	Primary Support Member Min. Depth & Wt. See Note #3	U.L. Design Number
		Thickness Above Deck	Type				
1 Hr.	Exposed Grid	2 1/2"	NW	10K1	72"	20g @14.0 plf. Min. Area Top & Bottom Chord 1.12 Sq. Inch	G256
		2 1/2"	NW	12K1,18LH02	Unrestricted	—	D216
1 1/2 Hr.	Exposed Grid	2 1/2"	NW	10K1	48"	20G @13.0 plf.	G228
		2"	NW	10K1	48"	20G @13.0 plf.	G229
		2 1/2"	NW	10K1	48"	20g @13.0 plf.	G243
	Gypsum Brd.	2"	NW	12K1	48"	—	G502
	Cementitious	2 1/2"	LW NW	16K6 Min. 3/4" dia. web	Unrestricted	20G @20.0 plf.	G701
2 Hr.	Concealed Grid	2 1/4"	NW	10K1	48"	20G @13.0 plf.	G023
		2 1/2"	NW	8K1,10K1	48"	20G @13.0 plf.	G031
		2 1/2"	NW	10K1	48"	20G @13.0 plf.	G036
	Exposed Grid	2 1/2"	NW	10K1	48"	W6x12	G213
		2 1/2"	NW	10K1	48"	W8x31	G227
		2 1/2"	NW	10K1	48"	20G @13.0 plf.	G228
		2 1/2"	NW	10K1	48"	20G @13.0 plf.	G243
		2 1/2"	NW	10K1	48"	—	G256
		2 1/2"	NW	12K1,18LH02	Unrestricted	—	D216
		2"	NW	10K1	48"	—	G505
	Gypsum Board	2 1/2"	NW	10K1	48"	20G @14.0 plf. Min. Area Top & Bottom Chord 1.12 Sq. inch	G514
		2 1/2"	NW	10K1	48"	20G @13.0 plf.	G253
		2 1/2"	LW NW	10K1	48"	20G @13.0 plf.	G529
		2 1/2"	NW	12K1	Unrestricted	20G @20.0 plf.	D502
	Cementitious	2 1/2"	LW NW	16K6 Min. 3/4" dia. web	Unrestricted	20G @20.0 plf.	D701
		2 1/2"	LW NW	16K6 Min. 3/4" dia. web	Unrestricted	20G @20.0 plf.	D801
	Sprayed Fiber	2 1/2"	LW NW	16K6 Min. 3/4" dia. web	Unrestricted	20G @20.0 plf.	D801
3 Hr.	Concealed Grid	3 1/2"	NW	10K1	48"	20G @13.0 plf.	G033
		3 1/4"	NW	10K1	48"	20G @13.0 plf.	G036
	Exposed Grid	3 1/2"	NW	10K1	48"	W6x12	G213
		3 1/4"	NW	10K1	48"	20G @13.0 plf.	G229
		3 1/2"	NW	10K1	48"	20G @14.0 plf. Min. Area Top & Bottom Chord 1.12 Sq. inch	G256
		3 1/2"	NW	12K1, 18LH02	Unrestricted	—	D216
	Gypsum Board	3"	NW	10K1	48"	20G @13.0 plf.	G523
		2 3/4"	LW, NW	10K1	48"	20G @13.0 plf.	G529



FIRE-RESISTANCE RATINGS WITH STEEL JOISTS

ROOF-CEILING ASSEMBLIES WITH MEMBRANE PROTECTION

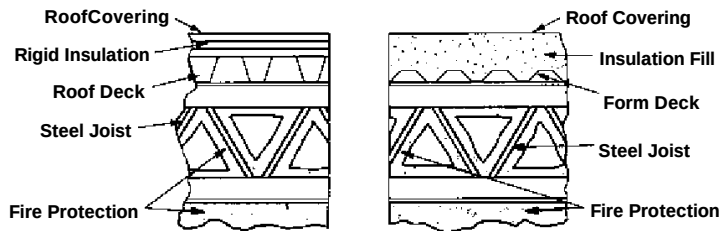


Restrained Assembly Rating	Type of Protection System	Built Up Roof		Minimum Joist Size See Note #3 & #4	Maximum Joist Spacing See Note #3	Primary Support Member Min. Depth & Wt. Number	U.L. Design
		Type of Insulation	Metal Deck Min. Size				
1 Hr.	Exposed Grid	Rigid Insulation	26 Ga.	10K1	48"	20G @20.00 plf.	P211
			22 Ga. 28 Ga.	12K3 12K3	72" 48"	20G @13.0 plf. or W8x18	P214
			26 Ga. 24,22 Ga.	12K1 12K1	60" 72"	—	P224
			26,24,22 Ga.	12K1	72"	20G @13.0 plf.	P225
			24 Ga.	12K3	48"	—	P227
			26 Ga.	12K3	72"	20G @13.0 plf.	P230
			26 Ga.	12K5 or 14K4	48"	W6x12	P250
			22 Ga.	10K1	48"	W6x12	P254
		Insulating Fill	26,22Ga.	12K1	72"	20G @14.0 plf.	P231
			28 Ga.	10K1	72"	20G @13.0 plf.	P246
			28,26 Ga.	12K1	72"	20G @13.0 plf.	P251
			28 Ga.	10K1	72"	W8x15	P255
			28,26 GA.	12K1	72"	20g @13.0 plf.	P261
	Gypsum	Insulating Fill	26 Ga. 24 Ga.	12K3 12K3	48" 60"	W8x24	P509
1 1/2 Hr.	Exposed Grid	Rigid Insulation	26,24,22GA.	12K1	72"	20G @13.0 plf.	P225
			24 Ga.	12K3	48"	—	P227
			26 Ga.	12K5, 14K4	48"	W6x12	P250
		Insulating Fill	26,22 Ga.	12K1	72"	20G @14.0 plf.	P231
			28,26 Ga.	12K1	72"	20G @13.0 plf.	P251
2 Hr.	Metal Lathe	Rigid Insulation	22 Ga.	12K5 14K3	72"	—	P404
	Exposed Grid	Insulating Fill	18,16 Ga.	12K1	72"	20G @13.0 plf.	P251
		Rigid Insulation	24 Ga.	10K1	72"	W6x12	P237
	Gypsum Board	Rigid Insulation	22 Ga.	10K1	48"	—	P514
3 Hr.	Metal Lathe	Insulating Fill	28,22 Ga.	10K1	48"	—	P405



FIRE-RESISTANCE RATINGS WITH STEEL JOISTS

ROOF-CEILING ASSEMBLIES WITH DIRECT APPLIED PROTECTION



Restrained Assembly Rating	Type of Protection System	Built Up Roof		Minimum Joist Size See Note #3 & #4	Maximum Joist Spacing See Note #5	Primary Support Member Min. Depth & Wt.	U.L. Design Number
		Type of Insulation	Metal Deck Min. Size				
1 Hr. 1 1/2 Hr. 2 Hr.	Cementitious	Rigid Insulation	22 Ga.	14K4 or LH	Unrestricted	20G @13.0 plf.	P701
			22 Ga.	14K4	Unrestricted	20G @13.0 plf.	P711
	Sprayed Fiber	Rigid Insulation	22 Ga.	16K6	Unrestricted	–	P801
			22 Ga.	10K1	Unrestricted	20G @13.0 plf.	P815
			22 Ga.	12K3	Unrestricted	–	P816
			22 Ga.	12K3	Unrestricted	20G @13.0 plf.	P817
			22 Ga.	12K1	Unrestricted	20G @13.0 plf.	P818
			22 Ga.	14K4	96"	20G @13.0 plf.	P902
	Cementitious and Sprayed Fiber	Insulating Fill	24 Ga.	12K5, 14K3	96"	–	P907
			28 Ga.	12K5, 14K3	96"	–	P920
			24 Ga.	12K5	96"	20G @13.0 plf.	P921
			24 Ga.	12K3	96"	–	P922
			22 Ga.	12K3	96"	20G @13.0 plf.	P923

NOTES:

1. The **UNDERWRITERS LABORATORY FIRE RESISTANCE DIRECTORY** lists hundreds of assemblies and their fire ratings. As a convenience a selected number of assemblies are listed on 3 preceding pages. This listing is intended as a guide only and the specifying professional must refer to the U.L. Directory for complete design information.
2. The maximum joist spacing shown for Floor-Ceiling Assemblies may be increased from the spacing listed in the U.L. Directory to a maximum of 48 inches on center, provided the floor slab meets the structural requirements and the spacing of hanger wires supporting the ceiling is not increased.
3. Some U.L. Design Assemblies stipulate minimum size materials for Steel Joist and Joist Girder components, and/or bridging. It is the responsibility of the specifying professional to show all special requirements on the Structural Drawings.
4. Some U.L. Fire Assembly Designs stipulate an allowable maximum joist design stress level less than the 30 ksi (207MPa) used in the K-Series Joist Specifications.

It is the responsibility of the specifying professional to apply the proper stress level reductions (if required) when selecting Joists and/or Joist Girders.

To adjust the stress level of K-Series Joists or Joist Girders multiply the design load by the required factor [30/26 (207/179), 30/24 (207/165), 30/22 (207/1520)], and then using this increased load select a Joist or Joist Girder from the load and/or weight tables.
5. Some U.L. Roof-Ceiling Design assemblies using direct applied protection limit the spacing of the joists for certain types and gages of metal decking – refer to the U.L. Directory for this information.



Combined K, VS, LH & DLH Series Load Table

The following table is an economy guide with the Joists listed in sequence of increasing relative cost. That is, the most economical joist for given length is listed first. The economies were based on production costs and do not include bridging requirements or erection costs.

HOW TO USE THE ECONOMICAL JOIST GUIDE: The specifying professional simply turns to the length required and proceeds down the allowable loads column until the first joist type in the list that will carry the required load is found. (However, additional bridging due to erection stability requirements should be taken into consideration.) This will then be the most economical joist type for the combination of length and required load. The approximate weight per foot of the joist is listed to the right of the live load.

EXAMPLE: Given 40'-0" length and a required load of 300 plf. On page 110 of the table under 40', it is found that a 30K7 at 40'-" will carry 319 plf TL. (page 110)

The figures shown in red are the live loads per lineal foot of joist which will produce an approximate deflection of 1/360 of the length. If a deflection limitation of 1/240 is required multiply the figures in red by 1.5. In no case shall the total load capacity of the joist be exceeded.

NOTE: Length as used in the economical joist guide means: **clear span + 8" for K Series and clear span + 12" for LH and DLH Series joists.**

You will note that the tables have been shaded to match the load tables. This shading indicates when bolted cross bridging needs to be installed per the Steel Joist Institute specification for a particular joist series.

IT IS VERY IMPORTANT FOR JOIST SPECIFIERS AND ERECTORS TO KNOW THAT OSHA IS INTERPRETING 29CFR-1926.751(c)2 TO MEAN ALL JOIST FORTY (40) FEET (12192MM) AND LONGER TO REQUIRE A ROW OF BOLTED BRIDGING TO BE IN PLACE BEFORE SLACKENING OF HOISTING LINES.

Where the joist span is in the **RED SHADED** area of the table, the row of bridging nearest the mid span shall be diagonal bridging with bolted connections at chords and intersection. Hoisting cables shall not be released until this row of bolted diagonal bridging is completely installed.

Where the joist span is in the **BLUE SHADED** area of the table, all rows of bridging shall be diagonal bridging with bolted connections at chords and intersection. Hoist cables shall not be released until the two rows of bridging nearest the third points are completely installed.

Where the joist span is in the **GRAY SHADED** area of the table hoisting cables shall not be released until all rows of bridging are completely installed.

SHADING LEGEND	
	RED
	BLUE
	GRAY

ECONOMICAL JOIST GUIDE
Combined K, VS, LH & DLH Series Load Table

Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)
	Total	Live	
10' LENGTH			
10K 1	550	550	5.0
11' LENGTH			
10K 1	550	542	5.0
12' LENGTH			
10K 1	550	455	5.0
13' LENGTH			
10K 1	479	363	5.0
12K 1	550	510	5.0
14' LENGTH			
10K 1	412	289	5.0
14K 1	550	550	5.2
15' LENGTH			
10K 1	358	234	5.0
12K 1	434	344	5.0
14K 1	511	475	5.2
14K 3	550	507	5.9
16' LENGTH			
10K 1	313	192	5.0
12K 1	380	282	5.0
14K 1	448	390	5.2
12K 3	476	351	5.7
14K 3	550	467	5.9
17' LENGTH			
10K 1	277	159	5.0
12K 1	336	234	5.0
14K 1	395	324	5.2
12K 3	420	291	5.7
16K 2	512	488	5.5
16K 3	550	526	6.3
18' LENGTH			
10K 1	246	134	5.0
12K 1	299	197	5.0
14K 1	352	272	5.2
12K 3	374	245	5.5
14K 3	441	339	5.8
16K 2	456	409	5.5
16K 3	508	456	6.3
14K 4	530	397	6.7
14K 6	550	408	6.9
19' LENGTH			
10K1	221	113	5.0
12K1	268	167	5.0
14K1	315	230	5.2
12K3	335	207	5.6
16K2	408	347	5.5
16K3	455	386	6.3
18K3	514	494	6.6
16K4	547	452	7.0
16K5	550	455	7.2
20' LENGTH			
12K 1	241	142	5.0
14K 1	284	197	5.2
12K 3	302	177	5.5
20' LENGTH (Cont.)			
16K2	368	297	5.5
16K3	410	330	6.2
18K3	463	423	6.5
16K4	493	386	7.0
16K5	550	426	7.5
21' LENGTH			
12K1	218	123	5.0
14K1	257	170	5.2
12K3	273	153	5.5
14K3	322	212	5.7
16K2	333	255	5.5
16K3	371	285	6.3
18K3	420	364	6.6
16K4	447	333	7.0
20K3	468	453	6.7
16K5	503	373	7.5
18K4	506	426	7.2
20K4	550	520	7.6
22' LENGTH			
12K1	199	106	5.0
14K1	234	147	5.1
12K3	249	132	5.5
14K3	293	184	5.6
16K2	303	222	5.5
16K3	337	247	6.2
18K3	382	316	6.5
16K4	406	289	6.9
20K3	426	393	6.7
18K4	460	370	7.2
20K4	514	461	7.6
18K5	518	414	7.7
22K6	550	548	7.5
18LH2	554	439	8.8
18LH3	614	488	10
18LH4	715	566	11
18LH5	808	637	12
18LH6	955	738	14
18LH7	992	776	15
18LH8	1034	810	15
18LH9	1108	864	16
23' LENGTH			
14K1	214	128	5.1
12K3	227	116	5.5
16K2	277	194	5.5
16K3	308	216	6.0
18K3	349	276	6.6
16K4	371	252	7.0
20K3	389	344	6.7
18K4	420	323	7.2
20K4	469	402	7.6
18K5	473	362	7.7
22K6	550	518	7.7
18LH3	587	446	10
18LH4	684	517	11
20LH5	697	589	11
18LH5	772	582	13
18LH6	913	674	15
18LH7	949	709	15
20LH8	1024	858	15
18LH9	1059	790	16
20LH9	1121	935	16
20LH10	1209	1008	17
24' LENGTH			
14K1	196	113	5.1
12K3	208	101	5.6
24' LENGTH (Cont.)			
16K2	254	170	5.5
16K3	283	189	6.1
18K3	320	242	6.5
16K4	340	221	6.9
20K3	357	302	6.7
18K4	385	284	7.2
20K4	430	353	7.6
18K5	434	318	7.7
18K6	473	345	8.5
20K5	485	396	8.2
24K6	550	544	7.7
18LH3	562	409	10
20LH4	621	503	10
18LH4	655	474	11
20LH5	668	540	11
18LH5	739	534	12
18LH6	875	619	15
20LH6	892	713	15
18LH7	908	650	15
18LH8	946	679	16
20LH7	951	761	15
20LH8	980	787	16
18LH9	1014	725	17
20LH9	1073	857	16
20LH10	1158	924	17
25' LENGTH			
14K1	180	100	5.1
16K2	234	150	5.5
16K3	260	167	5.9
18K3	294	214	6.3
16K4	313	195	6.9
20K3	329	266	6.7
18K4	355	250	7.1
16K6	384	238	8.1
18K5	400	281	7.7
16K7	428	263	8.6
18K6	435	305	8.5
20K5	446	350	8.2
18K7	485	337	9.0
20K6	486	380	8.9
16K9	514	311	10
24K6	550	520	8.6
20LH4	596	463	10
18LH4	628	436	11
20LH5	641	497	11
19LH5	709	492	13
20LH6	855	656	15
18LH7	872	599	16
18LH8	908	625	16
20LH7	912	701	16
20LH8	941	724	16
18LH9	973	667	17
20LH9	1030	789	17
20LH10	1111	851	18
26' LENGTH			
14K1	166	83	5.1
16K2	216	133	5.5
16K3	240	148	5.9
18K3	272	190	6.4
16K4	289	173	6.8
20K3	304	236	6.7
18K4	328	222	7.2
20K4	366	277	7.6
18K5	369	249	7.7
22K4	404	338	8.0
20K5	412	310	8.2
20K6	449	337	8.9
22K5	455	379	8.8
26K5	542	535	8.8
26' LENGTH (Cont.)			
24K6	543	493	8.9
24K7	550	499	9.2
20LH4	574	428	11
18LH4	604	403	12
20LH5	616	459	11
18LH5	684	454	13
20LH6	822	606	15
18LH7	840	553	16
18LH8	876	577	16
20LH7	878	647	16
18LH9	936	616	17
20LH9	990	729	17
20LH10	1068	786	18
27' LENGTH			
14K1	154	79	5.1
16K2	200	119	5.5
16K3	223	132	5.9
18K3	252	169	6.3
16K4	268	155	6.8
20K3	281	211	6.6
18K4	303	198	7.0
20K4	339	247	7.4
18K5	342	222	7.7
22K4	374	301	8.0
20K5	382	277	8.2
20K6	416	301	8.8
22K5	422	337	8.7
24K6	503	439	8.6
26K6	547	519	8.9
26K7	550	522	9.1
20LH4	566	406	11
18LH4	571	367	12
20LH5	609	437	12
18LH5	648	414	14
20LH6	791	561	15
20LH7	845	599	16
20LH8	873	619	16
20LH9	953	675	17
20LH10	1028	724	19
28' LENGTH			
14K1	143	70	5.1
16K2	186	106	5.5
16K3	207	118	5.8
18K3	234	151	6.2
16K4	249	138	6.6
20K3	261	189	6.7
16K5	281	155	7.4
18K4	282	177	7.2
20K4	315	221	7.5
18K5	318	199	7.7
18K6	346	216	8.5
20K5	355	248	8.2
22K5	392	302	8.8
26K5	466	427	8.1
24K6	467	393	8.5
22K7	475	364	9.2
26K6	508	464	8.9
28K6	548	541	9.2
28K7	550	543	9.2
20LH4	558	386	12
20LH5	602	416	13
18LH5	614	378	14
20LH6	763	521	15
20LH7	814	556	16
20LH8	842	575	17
20LH9	918	626	18
20LH10	991	673	20

ECONOMICAL JOIST GUIDE
Combined K, VS, LH & DLH Series Load Table

Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)
	Total	Live	
29' LENGTH			
16K3	193	106	5.9
18K3	218	136	6.2
16K4	232	124	6.7
20K3	243	170	6.6
18K4	263	159	7.0
20K4	293	199	7.4
18K5	296	179	7.7
22K4	324	242	7.8
20K5	330	223	8.1
22K5	365	272	8.7
26K5	434	384	8.0
24K6	435	354	8.4
28K6	511	486	9.1
28K7	550	522	9.5
18LH5	581	345	14
20LH5	595	395	13
18LH6	648	377	15
24LH6	708	567	14
24LH7	778	623	15
20LH7	786	518	16
24LH8	830	662	16
24LH9	977	775	18
24LH10	1033	822	19
24LH11	1088	861	20
30' LENGTH			
18K3	203	123	6.1
16K4	216	112	6.6
20K3	227	153	6.5
18K4	245	144	6.9
20K4	274	179	7.3
18K5	276	161	7.7
20K5	308	201	8.0
20K6	336	218	8.7
22K6	371	266	8.2
26K5	405	346	8.0
24K6	406	319	8.4
26K6	441	377	8.8
28K6	477	439	9.0
26K7	492	417	9.2
28K7	531	486	9.5
26K8	544	457	10
26K9	550	459	10
20LH5	571	366	13
18LH6	605	340	15
24LH6	684	529	14
24LH7	752	582	15
24LH8	802	618	16
24LH9	944	724	18
24LH10	998	768	19
24LH11	1052	804	21
31' LENGTH			
16K4	203	101	6.6
20K3	212	138	6.6
18K4	229	130	6.9
20K4	256	162	7.4
18K5	258	146	7.7
22K4	283	198	7.8
20K5	289	182	8.1
24K4	310	237	8.4
20K6	314	198	8.8
22K5	319	222	8.7
22K6	347	241	8.3
26K5	379	314	8.1
24K6	380	289	8.6
22K7	387	267	8.8
28K6	446	397	9.0
22K9	465	316	10
28K8	550	480	10
24LH6	662	495	14
31' LENGTH (Cont.)			
24LH7	727	545	15
24LH8	776	579	16
24LH9	913	677	19
24LH10	965	718	20
24LH11	1017	752	21
32' LENGTH			
16K2	142	71	5.5
16K3	158	79	5.8
18K3	178	101	6.1
20K4	240	147	7.2
18K5	242	132	7.6
20K5	271	165	7.9
24K4	290	215	8.1
22K5	299	201	8.4
22K6	326	219	8.4
26K5	356	285	8.0
24K6	357	262	8.5
26K6	387	309	8.6
28K6	418	361	8.9
22K9	436	287	10
28K7	466	400	9.5
26K8	477	375	9.9
28K8	515	433	10
28K9	549	463	11
24LH6	641	465	14
24LH7	704	511	15
24LH8	752	543	16
24LH9	884	635	19
24LH10	935	674	20
24LH11	985	705	20
33' LENGTH			
18K3	168	92	6.1
20K4	226	134	7.3
22K4	249	164	7.9
20K5	254	150	8.1
24K4	273	196	8.3
20K6	277	163	8.7
22K5	281	183	8.5
26K5	334	259	8.0
24K6	335	239	8.3
26K6	364	282	8.6
28K6	393	329	8.8
26K7	406	312	9.1
28K7	438	364	9.4
28K8	484	399	10
26K9	488	370	11
28K9	527	432	11
28K10	532	435	11
24LH6	621	437	15
24LH7	683	480	16
24LH8	729	510	16
24LH9	857	597	19
24LH10	906	633	20
24LH11	955	663	22
34' LENGTH			
18K3	158	84	6.1
20K3	176	105	6.4
18K4	190	98	6.9
18K6	233	120	8.2
24K4	257	179	8.1
20K6	261	149	8.6
22K5	265	167	8.4
26K5	315	237	7.9
26K6	343	257	8.5
28K6	370	300	8.8
26K7	382	285	9.1
28K7	412	333	9.4
34' LENGTH (Cont.)			
24K9	423	286	10
28K8	456	364	10
28K9	496	395	11
28K10	516	410	11
28LH6	552	443	13
28LH7	624	499	14
28LH8	668	533	15
24LH8	707	480	17
28LH9	823	656	17
24LH9	832	562	20
28LH10	900	714	19
28LH11	965	763	20
28LH12	1060	835	23
28LH13	1105	872	23
35' LENGTH			
18K3	149	77	6.1
20K3	166	96	6.5
18K4	179	90	6.9
20K4	200	112	7.3
20K6	246	137	8.7
26K5	297	217	7.9
26K6	323	236	8.5
28K6	349	275	8.7
26K7	360	261	9.0
28K7	389	305	9.4
28K8	430	333	9.9
26K9	433	310	10
28K9	468	361	11
28K10	501	389	11
28LH6	537	417	13
28LH7	606	471	14
28LH8	649	503	15
24LH8	677	447	17
28LH9	799	618	18
28LH10	874	673	20
28LH11	938	719	21
28LH12	1030	787	23
28LH13	1073	822	24
36' LENGTH			
8K3	141	70	6.1
20K3	157	88	6.4
18K4	169	82	6.9
20K4	189	103	7.2
18K5	191	92	7.5
24K6	281	183	8.3
22K7	286	169	8.7
24K7	313	203	8.8
28K6	330	252	8.8
26K7	340	240	9.1
24K8	346	222	9.5
28K7	367	280	9.4
26K8	376	263	9.8
30K7	395	323	9.6
28K9	442	332	11
28K10	487	366	12
28LH6	521	394	13
28LH7	589	445	14
28LH8	631	475	15
24LH8	649	416	17
28LH9	777	584	18
28LH10	850	636	19
28LH11	911	680	21
28LH12	1001	744	23
28LH13	1043	777	24
37' LENGTH			
20K3	148	81	6.4
20K4	179	95	7.3
37' LENGTH (Cont.)			
26K5	265	183	7.9
24K6	266	169	8.3
28K6	312	232	8.7
26K7	322	221	9.1
28K7	348	257	9.3
30K7	373	297	9.5
28K8	384	282	9.9
26K9	387	262	10
30K8	413	325	10
28K9	418	305	11
30K9	449	352	11
30K10	474	374	12
28LH6	507	373	13
24LH6	530	331	15
28LH7	573	421	15
24LH7	588	367	16
28LH8	614	449	16
24LH8	622	388	17
28LH9	755	553	18
28LH10	826	602	21
28LH11	886	643	21
28LH12	974	704	23
28LH13	1015	735	25
38' LENGTH			
20K3	141	74	6.3
20K4	170	87	7.2
24K6	252	156	8.3
28K6	296	214	8.6
26K7	305	204	9.0
28K7	329	237	9.2
30K7	354	274	9.5
28K8	364	260	9.9
26K9	367	241	10
30K8	391	300	10
28K9	396	282	11
30K9	426	325	11
30K10	461	353	11
28LH6	494	354	13
24LH6	504	306	15
28LH7	558	399	15
24LH7	565	343	16
28LH8	597	426	16
28LH9	735	524	19
28LH10	804	570	20
28LH11	863	609	22
28LH12	948	667	23
28LH13	988	696	26
39' LENGTH			
20K3	133	69	6.4
20K4	161	81	7.3
20K5	181	90	7.9
28K6	280	198	8.6
26K7	289	188	9.0
28K7	313	219	9.1
30K7	336	253	9.5
28K8	346	240	9.9
26K9	348	223	10
30K8	371	277	10
28K9	376	260	11
30K9	404	300	11
26K10	413	262	12
30K10	449	333	12
32LH7	486	388	13
23LH8	528	421	14
28LH7	543	379	15
32LH9	662	526	17
32LH10	732	581	18
32LH11	802	635	20
28LH11	841	578	22

ECONOMICAL JOIST GUIDE

Combined K, VS, LH & DLH Series Load Table

* IT IS VERY IMPORTANT FOR JOIST SPECIFIERS AND ERECTORS TO KNOW THAT OSHA IS INTERPRETING 29CFR-1926.751(c)2 TO MEAN ALL JOIST FORTY (40) FEET (12192MM) AND LONGER TO REQUIRE A ROW OF BOLTED BRIDGING TO BE IN PLACE BEFORE SLACKENING OF HOISTING LINES.

39' LENGTH (Cont.)				42' LENGTH (Cont.)				45' LENGTH*				47' LENGTH (Cont.)			
Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)
Total	Live			Total	Live			Total	Live			Total	Live		
32LH12	941	742	23	28K10	384	245	12	24K4	146	76	7.8	36LH12	731	541	23
28LH13	962	661	26	30K10	413	282	12	26K5	179	101	7.9	32LH12	780	510	26
32LH13	1050	825	25	30K11	417	284	12	26K6	194	110	8.5	36LH13	859	634	26
32LH14	1081	850	26	32LH7	451	334	14	28K6	210	128	8.6	32LH13	870	566	28
32LH15	1117	878	26	32LH8	490	362	15	26K7	217	122	9.0	36LH14	947	696	29
40' LENGTH*				28LH7	505	326	16	24K8	220	113	9.5	36LH15	999	733	30
20K3	127	64	6.4	28LH8	540	348	16	28K7	234	142	9.2	48' LENGTH*			
20K4	153	75	7.2	32LH9	614	453	17	24K10	285	144	12	24K4	128	63	7.9
22K4	169	91	7.6	32LH10	679	500	19	26K10	310	170	12	26K5	157	83	7.8
20K5	172	84	7.9	32LH11	744	547	21	28K10	334	198	12	26K6	171	90	8.4
24K7	253	148	8.9	32LH12	874	639	24	30K10	359	229	12	24K7	175	85	8.9
26K7	275	174	9.0	32LH13	974	710	26	30K11	389	246	13	28K6	184	105	8.6
28K7	297	203	9.1	32LH14	1003	732	27	36LH8	414	323	13	24K6	194	93	9.6
30K7	319	234	9.4	32LH15	1037	756	28	32LH7	421	291	14	24K10	250	118	12
28K8	328	222	9.9	43' LENGTH*				32LH8	457	315	15	26K10	272	140	12
26K9	331	207	10	22K4	146	73	7.5	36LH9	531	412	16	28K10	294	163	12
28K9	357	241	11	24K4	160	88	8.0	36LH10	584	455	17	30K10	315	188	12
30K9	384	278	11	26K5	196	116	7.9	36LH11	638	495	19	30K12	365	216	14
26K10	393	243	12	30K7	276	188	9.3	36LH12	763	590	21	36LH8	388	284	14
30K10	438	315	12	26K9	286	166	10	32LH12	815	556	26	28LH7	394	222	16
32LH7	474	368	13	30K8	305	206	10	36LH13	898	692	25	32LH8	428	277	16
32LH8	514	400	14	28K9	309	194	11	36LH14	990	760	28	36LH9	497	362	17
28LH7	529	360	15	30K9	332	223	11	36LH15	1043	800	29	36LH10	548	400	18
32LH9	645	500	16	26K10	339	195	12	46' LENGTH*				36LH11	598	435	20
32LH10	713	552	18	28K10	367	228	12	24K4	139	71	7.9	32LH11	650	418	23
32LH11	782	604	20	30K10	394	263	12	26K5	171	95	7.9	36LH12	715	518	23
32LH12	918	705	23	30K11	407	270	13	26K6	186	103	8.5	32LH12	764	489	27
32LH13	1024	784	26	36LH8	434	354	13	28K6	201	120	8.6	36LH13	841	607	26
32LH14	1054	807	26	32LH7	441	318	14	26K7	207	114	9.1	36LH14	927	667	29
32LH15	1089	834	27	32LH8	478	346	15	24K8	211	106	9.6	36LH15	978	703	31
41' LENGTH*				36LH9	555	451	16	26K8	229	125	9.7	40LH15	1009	810	31
22K4	161	85	7.6	36LH10	612	499	17	26K10	296	159	12	40LH16	1112	890	34
24K4	176	101	8.0	36LH11	668	543	18	28K10	320	186	12	49' LENGTH*			
24K7	241	137	8.9	32LH11	727	522	21	30K10	344	214	12	26K5	150	78	7.9
26K7	262	162	9.0	36LH12	799	647	21	30K11	380	236	14	26K6	164	85	8.4
24K8	266	150	9.5	32LH12	853	610	25	36LH8	405	309	13	28K6	177	99	8.6
24K9	290	162	10	36LH13	940	758	25	32LH7	412	278	14	26K7	183	94	9.1
30K7	303	217	9.5	32LH13	952	678	27	28LH7	427	251	16	28K7	197	110	9.3
26K9	315	192	10	36LH14	1036	833	28	32LH8	447	302	16	26K8	202	103	9.7
28K9	340	224	11	36LH15	1092	877	29	36LH9	519	394	16	30K7	212	127	9.4
30K9	365	258	11	44' LENGTH*				36LH10	572	435	18	28K8	218	120	9.9
26K10	374	225	12	22K4	139	68	7.5	36LH11	624	474	19	26K9	220	112	10
30K10	427	300	12	24K4	153	82	8.1	32LH11	679	455	22	30K8	234	139	10
32LH7	462	351	13	22K5	157	76	8.3	36LH12	747	564	23	30K10	303	177	12
32LH8	502	380	14	26K5	187	108	7.9	32LH12	797	532	26	30K11	347	202	14
28LH7	516	342	16	26K6	204	118	8.5	36LH13	878	662	26	30K12	357	207	14
32LH9	630	476	17	24K7	209	110	8.9	36LH14	968	727	28	28LH7	379	209	16
32LH10	696	525	19	28K6	220	137	8.6	36LH15	1020	765	30	32LH8	419	266	16
32LH11	762	574	21	30K8	291	192	10	47' LENGTH*				36LH9	487	347	17
28LH11	799	523	23	28K9	295	181	11	24K4	133	67	7.9	36LH10	536	383	18
32LH12	895	671	23	30K9	317	208	11	26K5	164	89	7.9	36LH11	586	417	20
32LH13	998	746	26	26K10	324	182	12	26K6	178	96	8.5	32LH11	637	401	23
32LH14	1028	768	26	28K10	350	212	12	28K6	192	112	8.6	36LH12	701	497	24
32LH15	1062	794	28	30K10	376	245	12	24K8	202	99	9.6	32LH12	748	469	27
42' LENGTH*				30K11	398	258	13	24K10	261	126	12	36LH13	824	583	28
22K4	153	79	7.6	36LH8	424	338	13	26K10	284	149	12	32LH13	834	521	30
24K7	229	127	8.9	32LH7	431	304	14	28K10	306	174	12	32LH14	859	536	31
26K7	249	150	9.0	32LH8	467	330	15	30K10	329	201	12	36LH14	908	640	30
24K8	253	139	9.6	36LH9	543	431	16	36LH7	360	270	12	36LH15	958	674	31
28K7	269	175	9.2	36LH10	598	476	17	30K11	372	226	14	40LH15	988	777	31
26K8	275	164	9.7	36LH11	653	518	18	36LH8	396	296	13	40LH16	1089	854	34
30K7	289	202	9.5	32LH12	781	617	21	32LH7	403	266	15	50' LENGTH*			
26K9	300	178	10	32LH12	834	582	25	28LH7	410	236	16	26K5	144	73	7.9
30K8	320	221	10	36LH13	918	724	25	32LH8	437	289	16	26K6	157	80	8.5
28K9	324	208	11	36LH14	1012	795	28	28LH8	438	525	17	26K7	175	89	9.1
30K9	348	240	11	36LH15	1067	837	29	36LH9	508	377	17	28K7	189	103	9.3
26K10	356	210	12					36LH10	559	417	18	26K8	194	97	9.7
								36LH11	611	454	20				
								32LH11	664	436	22				

ECONOMICAL JOIST GUIDE

Combined K, VS, LH & DLH Series Load Table

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50' LENGTH* (Cont.)				52' LENGTH (Cont.)				55' LENGTH (Cont.)				57' LENGTH (Cont.)			
Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)
Total	Live			Total	Live			Total	Live			Total	Live		
30K7	203	119	9.4	32LH11	580	343	23	28K7	156	77	9.3	48LH11	383	316	15
26K9	211	105	10	36LH12	660	441	25	30K7	168	89	9.4	36LH9	418	256	18
28K9	228	123	11	36LH13	776	517	28	28K8	173	85	9.9	44LH11	422	318	17
30K9	245	141	11	36LH14	855	568	31	30K8	185	98	10	40LH10	424	290	17
26K10	250	124	12	36LH15	902	598	33	28K9	188	92	11	36LH10	461	283	21
28K10	270	144	12	40LH15	931	690	31	30K9	202	106	11	36LH11	503	308	22
30K11	333	190	14	40LH16	1026	758	34	28K10	223	108	12	36LH12	602	367	25
30K12	350	199	14					30K10	240	125	12	44LH13	619	465	23
36LH8	372	262	14	53' LENGTH*				40LH8	304	216	13	40LH13	664	449	26
32LH8	411	255	16					36LH7	307	197	13	36LH13	708	430	30
36LH9	477	333	17	28K6	151	78	8.6	30K12	312	161	16	32LH14	713	374	33
36LH10	526	368	18	28K7	168	87	9.2	44LH9	366	287	15	36LH14	780	472	34
36LH11	574	400	21	30K7	181	100	9.4	36LH9	434	275	18	36LH15	822	497	36
32LH11	625	385	23	28K8	186	95	9.9	40LH10	439	312	17	44LH14	829	619	31
36LH12	687	477	23	28K9	203	103	11	36LH10	477	304	20	40LH15	849	573	33
36LH13	807	559	28	30K9	218	119	11	36LH11	521	330	22	48LH16	905	737	31
36LH14	890	615	30	28K10	240	121	12	32LH11	522	292	24	44LH16	956	711	36
36LH15	938	647	32	30K10	258	140	12	44LH12	541	421	20	44LH17	1027	761	38
40LH15	968	746	31	40LH8	315	233	12	36LH12	624	394	25				
40LH16	1067	820	34	30K12	330	177	16	44LH13	642	499	23	58' LENGTH*			
51' LENGTH*				44LH9	380	309	14	36LH13	734	462	29	30K7	151	76	9.4
26K5	139	69	7.9	36LH9	450	296	18	44LH14	739	572	26	30K8	167	83	10
26K6	151	75	8.5	44LH11	454	368	16	36LH14	809	507	32	30K9	181	90	11
28K6	163	88	8.6	32LH9	463	270	19	36LH15	852	534	34	30K10	215	106	12
26K7	168	83	9.1	36LH10	496	327	19	44LH15	860	665	31	30K11	247	121	14
28K7	182	97	9.3	36LH11	541	356	21	40LH15	880	616	33	40LH8	288	195	13
26K8	186	91	9.8	44LH12	562	454	19	44LH16	991	765	34	44LH9	347	258	15
26K9	203	99	10	36LH12	647	424	25	44LH17	1065	817	36	48LH11	376	305	15
28K9	219	115	11	36LH13	761	498	28	56' LENGTH*				40LH9	378	254	17
30K9	235	133	11	44LH14	767	616	26	28K6	135	66	8.6	44LH10	383	284	16
26K10	241	116	12	36LH14	839	547	31	28K7	151	73	9.2	32LH9	391	208	19
28K10	260	136	12	36LH15	885	575	34	30K7	162	84	9.4	44LH11	414	307	17
30K10	279	157	12	44LH15	892	716	31	28K8	166	80	9.9	40LH10	416	280	18
30K11	320	179	14	40LH15	913	664	32	30K8	179	92	10	36LH10	454	273	21
30K12	343	192	15	44LH16	1029	824	34	28K9	181	87	11	36LH11	495	297	22
28LH7	352	186	16	44LH17	1105	880	37	30K9	195	100	11	36LH12	593	354	25
36LH8	365	251	14	54' LENGTH*				28K10	215	102	12	44LH13	609	449	23
32LH8	397	242	16	28K6	145	74	8.7	30K10	231	118	12	36LH13	697	415	30
36LH9	468	320	17	28K7	162	82	9.2	30K11	265	135	14	44LH14	701	514	28
36LH10	515	354	19	30K7	174	94	9.4	40LH8	298	209	13	36LH14	768	456	35
36LH11	563	385	21	28K8	179	89	9.9	30K12	301	153	16	36LH15	809	480	36
32LH11	602	363	23	28K9	195	97	11	44LH9	359	277	15	44LH15	815	597	31
36LH12	673	459	24	30K9	209	112	11	36LH9	426	265	18	48LH16	890	712	31
36LH13	791	538	28	28K10	232	114	12	44LH11	429	329	17	40LH16	919	608	37
32LH13	801	480	30	30K10	249	132	12	40LH10	431	301	17	44LH16	940	687	37
36LH14	872	591	31	30K11	285	150	14	36LH10	469	293	21	48LH17	999	796	37
36LH15	920	622	33	40LH8	309	225	13	40LH11	471	326	19	44LH17	1009	734	40
40LH15	949	717	31	36LH7	313	204	13	36LH11	512	319	23	59' LENGTH*			
40LH16	1046	788	33	30K12	324	170	16	44LH12	532	406	20	30K7	146	72	9.4
52' LENGTH*				44LH9	373	298	14	36LH12	613	380	25	30K8	161	79	10
26K5	133	65	7.9	36LH9	442	285	18	44LH13	631	482	23	30K9	175	86	11
26K6	145	71	8.4	44LH11	445	354	16	40LH13	675	465	26	30K10	208	101	12
28K6	157	83	8.6	32LH9	447	256	19	36LH13	720	445	30	40LH8	283	188	13
26K7	162	79	9.1	36LH10	486	315	19	44LH14	726	552	27	48LH10	341	273	14
28K7	175	92	9.3	40LH11	488	350	18	32LH14	738	395	33	44LH10	377	274	16
26K8	179	86	9.7	36LH11	531	343	22	36LH14	794	489	34	32LH9	379	198	19
26K9	195	93	10	44LH12	552	437	19	36LH15	837	515	35	44LH11	407	296	17
28K9	210	109	11	36LH12	635	409	25	44LH15	844	641	30	36LH10	440	260	20
30K9	226	126	11	44LH13	654	518	23	40LH15	864	594	33	36LH11	480	283	23
26K10	231	110	12	36LH13	747	479	29	44LH16	974	737	35	36LH12	575	338	25
28K10	250	128	12	44LH14	753	594	26	44LH17	1046	788	37	44LH13	598	434	24
30K10	268	148	12	36LH14	824	527	32	57' LENGTH*				36LH13	675	395	30
28K12	325	165	15	36LH15	868	554	34	30K7	156	80	9.4	44LH14	689	497	28
30K12	336	184	15	44LH15	876	690	31	30K8	173	88	10	36LH14	755	434	35
28LH7	339	176	16	40LH15	896	639	33	30K9	188	95	11	36LH15	795	464	36
32LH8	383	229	16	44LH16	1010	793	34	30K10	223	112	12	44LH15	801	577	31
36LH9	459	308	18	44LH17	1084	848	37	30K11	256	128	14	40LH15	820	535	34
36LH10	505	340	19	55' LENGTH*				40LH8	293	201	13	48LH16	874	688	32
36LH11	552	370	21	28K6	140	70	8.6	48LH10	353	293	15	40LH16	903	588	37
												44LH16	924	664	37

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59' LENGTH* (Cont.)				62' LENGTH (Cont.)				65' LENGTH (Cont.)				68' LENGTH (Cont.)			
Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)
Total	Live			Total	Live			Total	Live			Total	Live		
48LH17	982	769	37	48LH16	832	623	33	44LH13	543	357	26	48LH14	572	392	28
44LH17	992	710	39	44LH16	879	601	37	40LH13	581	344	28	52DLH13	587	434	27
60' LENGTH*				52DLH16	892	732	34	52DLH13	614	475	26	44LH14	597	373	30
30K7	141	69	9.4	48LH17	934	696	37	44LH14	625	409	29	48LH15	658	449	32
30K8	156	75	10	44LH17	944	642	41	52DLH14	702	531	30	52DLH14	671	485	31
30K9	169	81	11	52DLH17	1026	835	40	44LH15	727	475	31	44LH15	695	434	31
30K10	201	96	12	63' LENGTH				52DLH15	789	598	33	52DLH15	754	546	34
30K11	231	109	14	40LH8	265	165	14	52DLH16	851	665	34	48LH16	758	517	36
40LH8	278	182	13	48LH10	319	239	15	44LH17	900	584	43	52DLH16	813	608	37
48LH10	335	264	15	40LH9	348	215	18	52DLH17	979	759	40	48LH17	851	578	41
44LH10	370	265	16	44LH10	353	240	17	66' LENGTH				44LH17	860	533	45
44LH11	401	287	17	44LH11	381	260	18	40LH8	254	150	15	52DLH17	935	694	42
36LH10	426	248	20	40LH10	383	237	19	48LH10	305	216	16	69' LENGTH			
40LH11	439	283	19	36LH10	389	215	21	44LH10	337	219	17	40LH8	234	132	15
36LH11	465	269	23	40LH11	418	257	21	44LH11	364	237	18	4LH9	291	182	17
36LH12	557	322	25	36LH11	425	234	23	40LH10	367	216	20	40LH9	306	173	18
44LH13	588	419	25	44LH12	472	321	22	40LH11	399	234	22	44LH10	322	200	18
36LH13	654	376	30	40LH12	509	313	25	48LH12	417	295	20	40LH10	338	190	20
44LH14	677	480	28	44LH13	560	380	25	44LH12	451	292	23	44LH11	348	216	20
36LH14	729	412	34	40LH13	600	367	28	40LH12	486	285	25	56DLH11	409	342	21
48LH15	746	577	28	52DLH13	634	506	26	52DLH12	498	380	23	44LH12	431	267	23
36LH15	781	448	36	44LH14	645	435	29	44LH13	535	346	26	40LH12	447	251	25
44LH15	788	558	31	52DLH14	724	565	29	52DLH13	605	461	26	48LH13	478	323	24
48LH16	860	665	32	44LH15	750	506	31	44LH14	615	396	31	44LH13	511	317	29
44LH16	908	642	36	52DLH15	814	637	32	52DLH14	691	515	30	52DLH13	578	421	27
48LH17	965	744	37	48LH16	819	603	33	44LH15	716	461	31	44LH14	588	363	31
44LH17	975	686	39	44LH16	865	582	37	40LH15	734	427	36	48LH15	648	436	32
61' LENGTH				52DLH16	878	708	35	52DLH15	777	580	34	52DLH14	661	471	31
40LH8	274	176	13	48LH17	919	674	38	48LH16	781	549	35	44LH15	684	421	31
48LH10	330	256	15	44LH17	929	622	40	52DLH16	838	645	37	56DLH15	735	568	32
44LH10	364	257	16	52DLH17	1010	809	40	44LH17	886	566	43	52DLH15	743	530	34
44LH11	394	277	17	64' LENGTH				52DLH17	964	736	40	48LH16	747	502	36
40LH10	396	253	18	40LH8	261	160	15	67' LENGTH				52DLH16	801	590	38
36LH10	413	236	21	48LH10	314	232	15	40LH8	247	144	15	48LH17	839	562	41
40LH11	432	274	21	40LH9	342	209	18	44LH9	300	193	16	44LH17	848	518	45
36LH11	451	257	23	44LH10	347	233	17	44LH10	323	188	18	52DLH17	922	674	44
44LH12	488	342	21	44LH11	375	252	18	40LH9	332	212	18	70' LENGTH			
40LH12	526	334	25	40LH10	377	230	19	44LH11	359	230	18	40LH8	228	127	15
44LH13	579	405	25	36LH10	378	206	21	56DLH11	422	363	20	40LH9	298	166	18
40LH13	620	391	28	40LH11	412	249	21	44LH12	444	283	23	44LH10	317	195	18
48LH14	638	487	26	48LH12	430	314	19	36LH12	450	232	25	40LH10	329	183	20
44LH14	666	464	28	44LH12	465	311	22	40LH12	472	273	25	44LH11	343	210	20
48LH15	734	558	29	36LH12	493	267	25	52DLH12	491	369	23	36LH11	348	173	23
44LH15	775	540	31	44LH13	551	368	25	44LH13	527	336	26	40LH11	358	198	22
40LH15	793	500	36	40LH13	591	355	28	48LH14	581	404	27	56DLH11	403	332	21
48LH16	846	643	33	52DLH13	625	490	26	52DLH13	596	447	27	44LH12	425	259	24
44LH16	893	621	37	44LH14	635	422	29	44LH14	606	385	30	40LH12	435	241	25
48LH17	949	719	37	52DLH14	713	547	29	40LH14	638	367	34	52DLH12	469	338	24
44LH17	959	664	39	44LH15	738	490	31	48LH15	668	462	31	48LH13	471	313	24
62' LENGTH				52DLH15	801	617	32	52DLH14	681	499	31	44LH13	504	307	27
40LH8	269	170	14	48LH16	806	584	34	44LH15	705	447	31	48LH14	556	370	29
48LH10	324	247	15	48LH17	905	653	39	40LH15	712	408	36	52DLH13	570	409	29
44LH10	358	248	17	44LH17	914	602	43	52DLH15	765	563	34	44LH14	580	352	31
44LH11	388	268	18	52DLH17	994	783	40	48LH16	770	533	35	48LH15	639	423	32
40LH10	389	245	19	65' LENGTH				52DLH16	825	626	37	52DLH14	652	457	31
36LH10	401	225	21	40LH8	257	155	15	48LH17	864	596	40	44LH15	675	409	31
40LH11	425	265	21	48LH10	309	225	15	44LH17	873	549	44	52DLH15	732	515	34
36LH11	438	246	23	44LH10	342	226	17	52DLH17	950	715	40	48LH16	736	488	36
44LH12	480	331	21	44LH11	370	244	18	68' LENGTH				52DLH16	789	573	37
40LH12	517	323	25	40LH10	371	223	19	40LH8	241	138	15	48LH17	827	546	41
44LH13	569	392	25	40LH11	405	241	21	44LH9	296	187	17	44LH17	835	503	45
40LH13	610	379	29	48LH12	424	305	20	40LH9	315	180	18	56DLH17	901	700	40
48LH14	628	472	26	44LH12	458	301	23	56DLH11	415	352	20	52DLH17	909	654	44
44LH14	655	450	29	36LH12	478	255	25	44LH12	437	275	23	71' LENGTH			
52DLH14	736	584	29	40LH12	493	294	25	40LH12	459	261	25	40LH8	222	122	15
44LH15	762	522	31	52DLH12	506	392	22	44LH13	519	326	26	44LH9	283	172	17
52DLH15	827	658	32									40LH9	291	160	18

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Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)
71' LENGTH (Cont.)				74' LENGTH				76' LENGTH (Cont.)				79' LENGTH (Cont.)			
44LH10	313	189	18	40LH8	206	108	15	44LH17	769	428	47	48LH16	652	383	40
40LH10	321	176	20	40LH9	269	141	18	60DLH17	823	632	41	60DLH16	689	514	38
44LH11	338	204	20	44LH9	272	158	18	52DLH17	837	555	45	56DLH16	693	482	38
40LH11	349	190	22	40LH10	297	156	20	60DLH18	950	714	47	52DLH16	699	450	41
56DLH11	398	323	21	44LH10	300	174	19	77' LENGTH				48LH17	732	428	45
44LH12	419	252	24	56DLH11	381	297	21					64DLH17	788	622	41
40LH12	424	231	25	44LH12	402	232	25					60DLH17	792	585	44
52DLH12	463	328	24	52DLH12	444	302	24					52DLH17	805	513	48
48LH13	464	305	26	48LH13	445	280	25					60DLH18	914	660	47
44LH13	497	299	28	44LH13	477	275	29								
40LH13	500	271	30	48LH14	525	331	29	40LH8	192	97	16				
52DLH13	562	398	28	52DLH13	539	366	29	44LH9	253	141	18	44LH9	236	127	18
44LH14	572	342	31	44LH14	549	315	31	48LH10	279	155	19	40LH10	255	124	20
52DLH14	642	444	31	52DLH14	616	409	32	48LH11	283	172	18	44LH10	260	139	19
44LH15	665	398	31	44LH15	639	366	31	44LH11	302	168	21	48LH11	272	160	18
52DLH15	722	501	35	60DLH15	669	525	32	44LH12	374	207	25	44LH11	282	151	21
52DLH16	778	557	37	52DLH15	692	461	37	52DLH11	382	256	24	52DLH10	335	217	22
48LH17	815	530	41	52DLH16	747	513	38	52DLH12	427	279	26	44LH12	347	185	25
44LH17	824	489	45	48LH17	782	488	45	48LH13	428	259	27	52DLH11	368	237	24
56DLH17	889	680	40	44LH17	790	450	47	44LH13	444	246	28	52DLH12	410	258	26
52DLH17	896	636	44	60DLH17	846	667	40	52DLH13	518	338	30	48LH13	412	240	26
60DLH18	1017	818	46	52DLH17	859	585	45	40LH15	538	268	36	44LH13	413	220	29
72' LENGTH				60DLH18	976	753	46	56DLH14	577	404	32	48LH14	486	283	32
				75' LENGTH				52DLH14	592	378	34	52DLH13	498	313	31
36LH7	196	95	15					40LH8	201	104	15	44LH15	593	326	31
36LH8	215	104	16	44LH9	265	152	18	60DLH15	643	484	34	56DLH14	555	374	32
40LH8	217	117	16	40LH10	290	150	20	52DLH16	665	425	38	52DLH14	570	350	35
44LH9	279	167	17	44LH10	293	168	19	60DLH16	707	541	36	52DLH15	640	394	38
40LH9	283	153	18	56DLH11	376	289	21	56DLH16	711	508	37	64DLH16	675	533	35
44LH10	308	184	18	44LH12	393	224	25	52DLH16	717	473	40	60DLH16	680	501	38
40LH10	313	169	20	48LH13	439	273	25	48LH17	751	450	45	56DLH16	684	470	38
44LH11	333	199	19	44LH13	466	265	28	52DLH17	826	540	46	52DLH16	690	438	41
56DLH11	392	314	20	48LH14	518	322	29	60DLH18	938	695	47	48LH17	723	417	47
44LH12	413	245	25	56DLH13	532	356	29	78' LENGTH				60DLH17	782	570	44
52DLH12	456	319	24	44LH14	534	302	31					52DLH17	826	540	46
48LH13	458	296	26	52DLH14	608	398	33					60DLH18	903	644	48
44LH13	490	291	29	44LH15	623	352	31					81' LENGTH			
52DLH13	554	387	28	60DLH15	660	511	32	40LH8	187	93	16				
44LH14	564	333	31	52DLH15	683	449	37	44LH9	247	136	18	44LH10	254	134	19
52DLH14	633	432	31	48LH16	687	425	39	44LH10	272	150	19	48LH11	269	156	18
44LH15	656	387	31	60DLH16	726	571	35	48LH11	279	168	18	44LH11	276	146	21
52DLH15	712	487	35	52DLH16	737	499	40	44LH11	295	162	21	52DLH10	331	211	22
48LH16	716	461	38	48LH17	771	475	45	44LH12	365	200	25	44LH12	339	179	25
52DLH16	767	542	38	44LH17	780	438	47	52DLH11	377	249	24	48LH12	340	196	23
44LH17	812	475	45	60DLH17	834	649	40	52DLH12	421	272	26	52DLH11	363	231	23
52DLH17	883	618	44	52DLH17	848	570	45	48LH13	422	252	26	52DLH12	405	252	26
60DLH18	1003	796	46	60DLH18	963	733	47	44LH13	433	236	28	48LH13	407	234	27
73' LENGTH				76' LENGTH								82' LENGTH			
40LH8	211	112	15	40LH8	196	100	15	79' LENGTH				44LH9	226	118	18
44LH9	275	162	17	44LH9	259	146	17					44LH10	249	130	19
40LH9	276	147	18	40LH10	283	144	20					44LH11	269	140	21
44LH10	304	179	18	44LH10	286	162	19					44LH12	331	172	25
40LH10	305	162	20	48LH11	287	177	18								
44LH11	329	193	19	44LH11	310	175	21								40LH8
56DLH11	387	305	20	52DLH10	353	240	21	44LH9	242	131	18	44LH10	249	130	19
44LH12	407	238	25	44LH12	383	215	25	44LH10	266	144	19	44LH11	269	140	21
52DLH12	450	311	24	52DLH	387	263	23	48LH11	276	164	18	44LH12	331	172	25
48LH13	451	288	26	52DLH12	432	286	26	44LH11	289	157	21				
44LH13	483	283	29	48LH13	433	266	26	52DLH10	339	222	22				
52DLH13	546	376	28	44LH13	454	254	28	44LH12	356	192	25				
44LH14	556	324	31	48LH14	511	313	30	52DLH11	372	243	24				
52DLH14	625	420	32	52DLH13	525	347	30	52DLH12	416	265	26				
44LH15	647	376	31	52DLH14	600	388	34	48LH13	417	246	26				
52DLH15	702	474	37	44LH15	608	339	31	44LH13	423	228	29				
48LH16	706	448	37	60DLH15	652	497	32	52DLH13	505	321	30				
52DLH16	757	527	38	52DLH15	674	437	37	56DLH14	562	384	31				
44LH17	801	462	47	60DLH16	716	556	36	52DLH14	577	359	34				
52DLH17	871	601	44	52DLH16	727	486	40	52DLH15	648	404	38				
60DLH18	989	774	46	48LH17	761	462	45								

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Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)
	Total	Live			Total	Live			Total	Live			Total	Live	
82' LENGTH (Cont.)				84' LENGTH (Cont.)				87' LENGTH (Cont.)				89' LENGTH (Cont.)			
52DLH11	359	225	24	68DLH19	962	746	54	44LH14	396	193	31	52DLH17	714	404	52
52DLH12	400	246	27	85' LENGTH				48LH14	425	227	32	72DLH18	771	581	47
48LH13	402	228	28					56DLH13	451	283	31	68DLH18	788	586	48
44LH14	446	231	31					52DLH13	458	264	33	60DLH18	811	520	53
52DLH13	486	298	31					44LH15	466	227	31	72DLH19	905	659	54
60DLH14	514	362	31	44LH9	211	108	18	60DLH14	485	321	32	68DLH19	908	665	55
44LH15	524	271	31	44LH10	233	117	19	48LH15	488	260	36	90' LENGTH			
52DLH14	556	333	35	44LH11	252	127	21	52DLH14	524	295	37				
60DLH15	604	427	34	44LH12	308	155	25	64DLH15	552	403	35				
52DLH15	624	375	39	52DLH10	315	192	24	56DLH15	583	357	38				
64DLH16	659	508	36	52DLH11	346	210	25	52DLH15	588	333	41	48LH10	208	108	18
60DLH16	664	477	38	52DLH12	386	229	27	64DLH16	621	451	38	48LH11	225	117	20
52DLH16	673	417	44	44LH14	415	207	31	56DLH16	629	397	41	52DLH10	298	171	24
48LH17	706	397	47	56DLH13	462	297	30	52DLH16	635	370	45	52DLH11	327	187	26
52DLH17	775	476	48	52DLH13	469	277	32	72DLH17	674	538	39	48LH13	338	175	29
64DLH18	877	653	46	44LH15	488	243	31	60DLH17	719	482	46	52DLH12	365	204	29
60DLH18	880	613	53	60DLH14	496	336	31	56DLH17	725	452	48	48LH14	399	206	32
68DLH19	986	783	52	48LH15	510	278	36	52DLH17	730	423	52	60DLH13	422	282	30
83' LENGTH				52DLH14	536	310	37	68DLH18	807	613	46	56DLH13	436	265	31
				60DLH15	582	397	34	60DLH18	830	544	53	52DLH13	443	247	34
				56DLH15	596	374	38	68DLH19	929	696	54	60DLH14	468	300	32
				60DLH16	640	444	39	88' LENGTH				52DLH14	507	276	38
56DLH16	644	416	41	64DLH15	533	376	34								
52DLH16	650	388	45	60DLH15	550	354	37								
48LH17	660	358	47	64DLH16	600	421	39								
72DLH17	690	564	38	60DLH17	736	505	45	44LH9	198	96	18	60DLH16	604	396	40
60DLH17	742	474	46	56DLH17	748	443	52	44LH10	218	106	19	52DLH16	614	346	45
52DLH17	748	443	52	64DLH18	846	607	47	44LH11	236	115	21	72DLH17	651	503	40
64DLH18	849	570	53	68DLH19	951	729	54	44LH12	287	139	25	60DLH17	695	450	46
86' LENGTH				87' LENGTH				52DLH10	305	179	23	72DLH18	763	568	46
								52DLH11	334	196	26	68DLH18	780	573	48
								52DLH12	373	213	27	60DLH18	802	508	53
								44LH14	387	187	31	72DLH19	894	644	54
48LH14	416	220	32	44LH9	207	103	18	56DLH13	446	277	31	68DLH19	898	650	55
56DLH13	453	258	33	44LH10	228	113	19	52DLH13	453	258	33	91' LENGTH			
44LH15	455	219	31	44LH11	247	123	21	44LH15	455	219	31				
60DLH14	479	314	32	44LH12	300	149	25	60DLH14	479	314	32				
52DLH14	518	289	37	52DLH10	312	187	24	52DLH14	518	289	37				
64DLH15	545	393	35	52DLH11	342	205	26	64DLH15	545	393	35	48LH10	204	105	18
60DLH15	562	370	37	52DLH12	382	223	27	60DLH15	562	370	37	48LH11	220	113	20
56DLH15	582	325	41	44LH14	406	200	31	56DLH15	582	325	41	52DLH10	291	165	24
64DLH16	614	440	38	56DLH13	456	290	30	64DLH16	614	440	38	52DLH11	320	181	26
52DLH16	627	362	45	52DLH13	463	271	33	52DLH16	627	362	45	48LH13	332	170	29
72DLH17	666	526	41	60DLH14	490	329	32	72DLH17	666	526	41	52DLH12	357	197	29
60DLH17	711	471	46	48LH15	499	269	36	60DLH17	711	471	46	48LH14	390	199	32
56DLH17	716	442	48	52DLH14	530	302	37	56DLH17	716	442	48	60DLH13	417	276	30
52DLH17	722	413	52	60DLH15	575	388	36	52DLH17	722	413	52	52DLH13	433	239	33
72DLH18	780	594	47	56DLH15	589	365	38	72DLH18	780	594	47	48LH15	448	228	36
68DLH18	797	599	48	52DLH15	595	341	41	68DLH18	797	599	48	64DLH14	460	313	32
60DLH18	820	532	53	68DLH16	626	488	37	60DLH18	820	532	53	60DLH14	463	293	34
72DLH19	915	674	54	64DLH16	628	461	38	72DLH19	915	674	54	52DLH14	497	266	38
68DLH19	918	680	56	60DLH16	633	434	40	89' LENGTH				64DLH15	527	368	35
88' LENGTH				56DLH16	636	407	41					60DLH15	544	346	37
				52DLH16	642	379	45					64DLH16	593	412	39
				48LH17	646	346	47					60DLH16	598	387	42
				72DLH17	682	551	38	52DLH16	601	335	45				
60DLH17	727	493	45	64DLH17	642	379	45	48LH10	212	112	18	60DLH17	687	440	46
56DLH17	733	463	48	48LH17	646	346	47	48LH11	229	120	20	72DLH18	754	555	46
52DLH17	739	433	52	72DLH17	727	493	45	52DLH10	301	175	23	67DLH18	771	560	48
68DLH18	816	627	46	60DLH17	727	493	45	52DLH11	330	191	26	60DLH18	793	497	53
60DLH18	839	557	53	56DLH17	733	463	48	52DLH12	369	209	28	72DLH19	885	630	54
68DLH19	940	712	54	52DLH17	739	433	52	48LH14	407	212	32	68DLH19	888	636	55
87' LENGTH				68DLH18	816	627	46	52DLH13	448	253	33	92' LENGTH			
				60DLH18	839	557	53	60DLH14	474	307	32				
				52DLH18	856	622	48	52DLH14	512	282	38				
				52DLH19	873	639	49	64DLH15	539	385	34				
52DLH20	890	656	50	60DLH15	556	362	37	60DLH15	556	362	37	48LH10	200	102	18
52DLH21	907	673	51	52DLH15	575	318	41	64DLH16	607	431	38	48LH11	216	110	20
52DLH22	924	690	52	64DLH16	611	405	40	60DLH16	611	405	40	52DLH10	285	159	24
52DLH23	941	707	53	52DLH16	620	354	45	52DLH16	620	354	45	52DLH11	313	174	26
52DLH24	958	724	54	72DLH17	659	514	41	72DLH17	659	514	41	48LH13	325	164	29
52DLH25	975	741	55	60DLH17	703	460	46	60DLH17	703	460	46	52DLH12	349	191	29
52DLH26	992	758	56	56DLH17	708	432	49	56DLH17	708	432	49	56DLH12	352	209	27
52DLH27	1009	775	57									48LH14	383	193	32
52DLH28	1026	792	58									60DLH13	412	270	30
52DLH29	1043	809	59									52DLH13	424	231	33
52DLH30	1060	826	60												

ECONOMICAL JOIST GUIDE
Combined K, VS, LH & DLH Series Load Table

Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)
92' LENGTH (Cont.)				95' LENGTH				97' LENGTH (Cont.)				100' LENGTH (Cont.)			
56DLH13	427	253	32	48LH10	188	93	18	64DLH15	494	324	37	52DLH13	358	180	33
48LH15	439	221	36	48LH11	204	100	20	60DLH15	510	305	40	60DLH13	379	228	32
60DLH14	458	287	34	52DLH10	267	145	23	72DLH16	537	380	38	56DLH13	386	209	33
52DLH14	486	258	38	52DLH11	293	158	26	64DLH16	557	362	42	52DLH14	413	201	37
64DLH15	521	360	35	52DLH12	327	173	29	60DLH16	561	341	44	60DLH14	421	243	35
60DLH15	538	339	38	56DLH12	341	196	27	72DLH17	604	433	42	56DLH14	435	234	38
52DLH15	545	291	42	48LH14	360	176	32	64DLH17	641	412	46	64DLH15	480	304	37
56DLH15	551	319	41	52DLH13	397	209	33	56DLH17	650	363	51	60DLH15	495	287	41
60DLH16	591	379	42	60DLH13	399	253	31	72DLH18	708	488	48	72DLH16	521	358	39
56DLH16	595	355	45	48LH15	413	201	36	64DLH18	741	466	53	60DLH16	544	320	45
60DLH17	680	431	46	60DLH14	444	269	34	60DLH18	744	437	59	72DLH17	586	407	44
72DLH18	746	543	46	52DLH14	457	234	37	72DLH19	830	554	55	64DLH17	622	388	49
68DLH18	763	548	48	56DLH14	467	265	37	68DLH19	833	559	60	72DLH18	686	459	48
60DLH18	784	486	53	68DLH15	477	340	34	98' LENGTH				64DLH18	718	438	55
68DLH19	878	622	55	60DLH15	521	318	38	99' LENGTH				60DLH18	721	411	59
93' LENGTH				56DLH15	533	299	41					72DLH19	805	521	58
94' LENGTH				68DLH16	566	400	38	52DLH10	251	132	24	101' LENGTH			
				64DLH16	568	378	41	52DLH11	275	144	26	102' LENGTH			
48LH10	196	99	18	60DLH16	573	355	44	52DLH12	307	158	29				
48LH11	212	106	20	56DLH16	576	333	45	60DLH12	318	197	27	52DLH11	259	132	26
52DLH10	279	154	23	72DLH17	617	451	42	56DLH12	331	184	30	56DLH12	289	144	29
52DLH11	306	169	26	60DLH17	658	404	48	52DLH13	373	191	33	60DLH12	309	185	27
48LH13	318	159	29	56DLH17	663	379	51	60DLH13	387	238	32	56DLH12	312	168	29
52DLH12	342	185	29	72DLH18	723	509	48	56DLH13	401	223	34	52DLH13	351	174	33
56DLH12	349	204	27	60DLH18	760	456	56	60DLH14	430	253	34	60DLH13	375	224	32
48LH14	375	187	32	72DLH19	847	578	55	56DLH14	453	249	38	56DLH13	379	204	33
52DLH13	414	224	33	68DLH19	850	583	60	64DLH15	489	317	37	52DLH14	405	194	37
48LH15	430	214	36	96' LENGTH				64DLH16	551	355	42	60DLH14	417	238	35
60DLH14	453	281	34	48LH10	185	90	18	60DLH16	555	334	44	56DLH14	427	228	37
52DLH14	476	249	38	48LH11	200	91	20	56DLH16	559	313	46	68DLH15	449	301	35
56DLH14	477	277	37	52DLH10	261	140	24	72DLH17	598	424	43	64DLH15	475	298	39
60DLH15	532	332	38	52DLH11	287	153	26	64DLH17	635	404	46	60DLH15	490	281	41
52DLH15	533	282	42	48LH13	300	145	29	56DLH17	643	356	51	60DLH16	538	314	46
56DLH15	545	312	41	52DLH12	320	168	29	72DLH18	700	478	48	72DLH17	580	399	44
68DLH16	578	417	38	60DLH12	325	205	27	64DLH18	733	456	53	64DLH17	616	380	49
60DLH16	585	371	42	56DLH12	338	192	29	60DLH18	736	428	59	60DLH17	619	357	52
56DLH16	588	348	45	48LH14	353	171	32	72DLH19	821	543	55	72DLH18	679	450	51
64DLH17	669	448	46	52DLH13	389	203	33	68DLH19	824	548	60	64DLH18	711	430	56
60DLH17	672	421	49	60DLH13	395	248	32	99' LENGTH				60DLH18	714	403	59
56DLH17	678	395	51	48LH15	405	195	36	52DLH10	246	128	24	72DLH19	797	511	60
68DLH18	754	536	48	64DLH14	436	281	32	52DLH11	270	140	26	68DLH19	800	516	61
64DLH18	773	507	53	60DLH14	439	264	34	52DLH12	301	153	29	103' LENGTH			
60DLH18	776	476	56	52DLH14	447	227	38	52DLH13	315	193	27	52DLH10	227	114	24
68DLH19	869	609	54	56DLH14	462	260	38	60DLH12	315	193	27	52DLH11	249	124	26
94' LENGTH				60DLH15	515	311	38	56DLH12	324	178	29	52DLH12	278	135	29
				48LH17	525	252	47	52DLH14	472	271	37	52DLH13	366	185	33
48LH10	192	96	18	64DLH16	562	370	41	60DLH14	426	248	34	64DLH13	358	232	31
48LH11	208	103	20	60DLH16	567	348	44	56DLH14	444	242	38	60DLH13	372	219	34
52DLH10	273	150	23	56DLH16	570	326	45	64DLH15	484	311	37	52DLH14	397	189	37
52DLH11	299	164	26	72DLH17	610	442	42	60DLH15	500	292	40	60DLH14	413	233	35
48LH13	312	154	29	64DLH17	648	421	46	64DLH16	545	348	42	56DLH14	419	221	38
52DLH12	334	179	29	60DLH17	651	395	49	60DLH16	549	327	44	68DLH15	445	295	35
56DLH12	345	200	27	56DLH17	656	371	51	72DLH17	592	415	43	64DLH15	470	292	39
48LH14	367	181	32	72DLH18	715	499	48	64DLH17	628	395	46	60DLH15	485	275	41
52DLH13	406	216	33	64DLH18	748	476	53	56DLH17	630	345	51	60DLH16	533	308	46
48LH15	422	208	36	60DLH18	752	447	57	72DLH18	693	469	48	72DLH17	574	391	45
60DLH14	448	275	34	72DLH19	838	566	55	64DLH18	726	447	53	60DLH17	610	372	49
52DLH14	466	242	37	68DLH19	841	571	60	60DLH18	729	420	59	60DLH18	613	350	52
52DLH14	472	271	37	97' LENGTH				72DLH19	813	532	58	72DLH18	673	442	51
60DLH15	526	325	38	52DLH10	256	136	24	68DLH19	816	537	61	60DLH19	707	395	59
56DLH15	539	306	41	52DLH11	281	149	26	100' LENGTH				72DLH19	789	501	60
68DLH16	572	408	38	52DLH12	314	163	29	52DLH10	241	124	24	68DLH19	792	506	61
60DLH16	579	363	41	60DLH12	322	201	27	52DLH11	264	135	26	103' LENGTH			
56DLH16	582	340	45	56DLH12	334	188	28	52DLH12	295	149	29	52DLH10	227	114	24
72DLH17	623	461	42	52DLH13	381	197	33	60DLH12	312	189	27	52DLH11	249	124	26
60DLH17	665	412	49	60DLH13	391	243	32	56DLH12	318	173	29	52DLH12	278	135	29
56DLH17	670	387	51	60DLH14	434	258	34								
72DLH18	730	520	47	52DLH14	438	220	38								
60DLH18	768	466	55	56DLH14	457	254	38								
72DLH19	856	590	55												
68DLH19	859	596	58												

ECONOMICAL JOIST GUIDE
Combined K, VS, LH & DLH Series Load Table

Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	
103' LENGTH (Cont.)				106' LENGTH (Cont.)				109' LENGTH (Cont.)				112' LENGTH (Cont.)				
60DLH12	303	178	28	56DLH12	284	145	29	60DLH15	442	235	43	72 DLH17	523	324	47	
52DLH13	338	164	33	60DLH12	295	168	29	72DLH16	478	301	41	64 DLH17	555	309	52	
64DLH13	355	228	32	56DLH13	344	175	34	64DLH16	495	287	46	72 DLH18	613	366	53	
60DLH13	368	215	34	60DLH13	358	203	34	72DLH17	537	342	47	64 DLH18	641	349	59	
52DLH14	390	184	38	64DLH14	395	230	34	60DLH17	558	298	52	72 DLH19	718	415	61	
64DLH14	406	244	34	60DLH14	398	216	37	64DLH17	571	326	52	68 DLH19	721	419	67	
60DLH14	409	229	37	68DLH15	428	273	37	60DLH18	644	337	59	113' LENGTH				
56DLH14	411	214	38	64DLH15	452	271	40	64DLH18	659	369	59	60 DLH12	261	138	29	
68DLH15	440	289	35	60DLH15	467	255	43	72DLH19	738	439	61		64 DLH12	266	156	29
64DLH15	466	287	39	72DLH16	491	318	41	68DLH19	741	443	67		60 DLH13	316	167	34
60DLH15	480	270	41	64DLH16	509	303	45	110' LENGTH					64 DLH13	323	189	34
68DLH16	522	340	41	60DLH16	513	285	46	56DLH11	231	118	26		60 DLH14	350	178	37
60DLH16	528	302	46	68DLH17	572	365	46	60DLH12	274	150	29		64 DLH14	370	203	37
72DLH17	569	384	45	60DLH17	590	324	52	60DLH13	333	181	34		68 DLH15	401	240	39
68DLH17	588	386	47	68DLH18	662	412	53	60DLH14	370	193	37		64 DLH15	424	238	41
60DLH17	607	343	52	60DLH18	681	366	59	64DLH14	380	214	37		60 DLH16	451	235	46
64DLH18	697	413	56	68DLH19	762	468	60	72DLH15	409	251	36		72 DLH16	461	280	43
60DLH18	700	388	59	107' LENGTH				68DLH15	412	254	38	68 DLH16	476	282	45	
72DLH19	781	491	60	56DLH11	244	129	36	60DLH15	434	228	43	72 DLH17	518	318	47	
68DLH19	784	496	61		56DLH12	278	141	29	64DLH15	436	251	41	60 DLH17	519	267	52
104' LENGTH					60DLH12	289	163	29	72DLH16	473	295	41	64 DLH17	550	303	52
52DLH10	223	110	24		60DLH13	351	197	34	60DLH16	476	255	46	72 DLH18	607	360	53
52DLH11	244	120	26		64DLH14	391	226	34	64DLH16	491	281	46	64 DLH18	636	343	59
52DLH12	273	132	29		68DLH15	424	268	38	72DLH17	533	336	47	72 DLH19	712	408	62
56DLH12	295	153	30		64DLH15	448	266	40	60DLH17	548	290	52	68 DLH19	714	412	67
60DLH12	300	175	29		60DLH15	458	248	43	68DLH17	551	338	49	114' LENGTH			
52DLH13	331	159	33		72DLH16	487	312	41	64DLH17	565	320	52	60 DLH12	256	134	29
64DLH13	351	224	32		64DLH16	504	298	46	60DLH18	632	327	59		64 DLH12	264	153
56DLH13	358	186	34	72DLH17	548	355	46	68DLH18	637	383	56	60 DLH13		311	163	34
60DLH13	365	211	34	68DLH17	566	358	49	64DLH18	653	362	59	64 DLH13		321	186	34
52DLH14	382	178	38	60DLH17	579	315	52	72DLH19	731	431	61	60 DLH14		344	173	37
64DLH14	402	239	34	64DLH17	581	338	52	68DLH19	734	434	67	64 DLH14		367	199	37
60DLH14	405	224	37	68DLH18	655	405	53	111' LENGTH				68 DLH15		398	236	39
64DLH15	461	281	39	60DLH18	668	357	59	56 DLH11	227	115	26	60 DLH15		405	205	43
60DLH15	476	265	43	64DLH18	671	383	59	56 DLH12	259	126	30	64 DLH15		421	234	43
72DLH16	501	331	40	68DLH19	755	459	61	60 DLH12	270	146	29	60 DLH16		444	228	46
68DLH16	517	333	41	108' LENGTH				64 DLH12	271	161	28	72 DLH16	457	275	43	
60DLH16	523	296	46	56DLH11	239	125	26	56 DLH13	314	152	34	68 DLH16	472	277	46	
72DLH17	563	376	45	56DLH12	273	137	29	60 DLH13	327	176	34	64 DLH16	474	262	46	
68DLH17	583	379	46	60DLH12	284	158	29	64 DLH13	329	196	33	72 DLH 17	514	313	50	
60DLH17	601	337	52	60DLH13	345	191	34	60 DLH14	363	189	37	64 DLH17	546	298	52	
72DLH18	660	425	53	60DLH14	383	205	37	64 DLH14	377	210	37	60 DLH18	589	394	59	
68DLH18	674	428	53	64DLH14	387	222	36	68 DLH15	408	249	38	64 DLH18	630	337	59	
60DLH18	694	380	59	72DLH15	417	260	36	64 DLH15	432	247	41	72 DLH19	706	401	64	
68DLH19	777	486	61	68DLH15	420	263	38	64 DLH16	436	214	46	68 DLH19	708	404	67	
105' LENGTH				64DLH15	444	261	40	72 DLH16	486	276	46	115' LENGTH				
56DLH11	253	136	26	60DLH15	450	242	43	72 DLH17	528	330	47	60 DLH12	252	131	29	
56DLH12	289	150	29	72DLH16	482	307	41	68 DLH17	546	332	49		64 DLH12	259	150	29
60DLH12	297	171	29	64DLH16	500	292	46	64 DLH17	560	314	52		60 DLH13	306	158	34
64DLH13	348	219	32	72DLH17	542	349	46	72 DLH18	618	373	53		64 DLH13	315	181	34
56DLH13	351	181	34	60DLH17	569	306	52	60 DLH18	621	319	59		60 DLH14	338	170	37
60DLH13	361	207	34	64DLH17	576	332	52	64 DLH18	647	356	59		64 DLH14	360	193	37
64DLH14	398	235	34	60DLH18	656	346	59	72 DLH19	725	423	61		68 DLH15	394	232	39
60DLH14	401	220	37	64DLH18	665	376	59	68 DLH19	727	427	67		60 DLH15	398	200	43
68DLH15	432	278	37	72DLH19	745	447	61	112' LENGTH					64 DLH15	414	228	43
64DLH15	457	276	40	68DLH19	748	451	61	56 DLH11	223	113	26		72 DLH16	453	270	43
60DLH15	471	260	43	109' LENGTH				56 DLH12	254	123	29	68 DLH16	467	272	46	
72DLH16	496	324	40	56DLH11	235	122	26	60 DLH12	265	142	29	72 DLH17	509	307	50	
68DLH16	512	327	42	56DLH12	268	133	29	64 DLH12	269	159	29	64 DLH17	536	290	52	
60DLH16	518	290	45	60DLH12	279	154	29	56 DLH13	308	149	33	60 DLH18	578	286	59	
68DLH17	577	372	46	56DLH13	325	161	33	60 DLH13	322	171	34	72 DLH18	597	347	54	
60DLH17	595	330	52	60DLH13	339	187	34	64 DLH13	326	193	34	64 DLH18	619	328	59	
68DLH18	668	420	53	60DLH14	376	199	37	60 DLH14	356	183	37	68 DLH19	702	397	66	
60DLH18	687	373	59	64DLH14	384	218	37	64 DLH14	373	206	37	116' LENGTH				
68DLH19	769	477	61	72DLH15	413	255	36	68 DLH15	405	245	38	60 DLH12	248	128	29	
106' LENGTH				68DLH15	416	258	38	64 DLH15	428	242	41					
56DLH11	248	133	26	64DLH15	440	256	41	64 DLH16	482	271	46					

ECONOMICAL JOIST GUIDE
Combined K, VS, LH & DLH Series Load Table

Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)				
116' LENGTH (Cont.)				119' LENGTH (Cont.)				123' LENGTH (Cont.)				127' LENGTH (Cont.)							
64DLH12	255	146	29	64DLH15	387	206	43	64DLH13	277	148	34	72DLH15	354	188	41				
60DLH13	301	154	34	60DLH16	407	201	46	68DLH13	284	168	35	64DLH16	382	189	46				
64DLH13	310	176	34	72DLH16	437	252	45	64DLH14	316	158	37	72DLH16	410	221	47				
60DLH14	332	165	37	68DLH16	452	254	46	68DLH14	327	179	38	64DLH17	439	215	52				
64DLH14	354	189	37	72DLH17	492	287	49	68DLH15	365	201	42	72DLH17	461	252	53				
68DLH15	391	228	39	64DLH17	501	262	52	72DLH15	366	200	41	64DLH18	507	243	59				
60DLH15	392	194	43	68DLH17	509	289	53	72DLH16	423	236	45	68DLH18	532	276	60				
64DLH15	407	223	43	60DLH18	540	259	59	68DLH16	433	236	49	72DLH18	540	284	59				
60DLH16	428	217	46	64DLH18	578	296	59	64DLH17	468	237	52	72DLH19	633	323	67				
68DLH16	463	268	46	68DLH18	589	327	60	68DLH17	489	268	53	128' LENGTH							
60DLH17	493	247	52	72DLH19	676	368	67	64DLH18	540	267	59	129' LENGTH							
72DLH17	505	302	50	68DLH19	678	371	67	68DLH18	566	304	60								
64DLH17	527	283	52	120' LENGTH				72DLH19	654	344	67								
60DLH18	568	279	59	121' LENGTH				124' LENGTH											
64DLH18	608	320	59					125' LENGTH											
68DLH19	696	391	66									126' LENGTH							
117' LENGTH																			
60DLH12	244	124	29	60DLH12	232	115	29									64DLH12	224	119	29
64DLH12	251	142	29	64DLH12	239	132	29	64DLH13	273	144	34								
60DLH13	296	151	34	60DLH13	282	139	34	68DLH13	279	164	35								
64DLH13	305	171	34	64DLH13	291	159	34	68DLH13	279	164	35								
60DLH14	327	161	37	60DLH14	310	149	37	64DLH14	311	154	37	72DLH14	307	166	37				
64DLH14	349	184	37	64DLH14	332	171	37	68DLH14	322	175	38	68DLH15	337	178	41				
72DLH15	385	222	38	68DLH14	337	190	38	68DLH15	360	196	42	72DLH15	352	185	41				
68DLH15	387	224	41	72DLH15	375	211	38	72DLH15	363	197	41	64DLH16	376	185	46				
64DLH15	400	217	43	68DLH15	378	213	40	64DLH16	401	203	46	72DLH16	407	218	47				
60DLH16	421	211	46	64DLH15	381	201	43	72DLH16	420	232	47	64DLH17	432	210	52				
64DLH16	450	242	46	60DLH16	400	196	46	68DLH16	427	230	49	68DLH17	453	238	53				
68DLH16	459	263	46	72DLH16	434	248	45	64DLH17	461	231	52	72DLH17	457	248	53				
60DLH17	484	241	52	68DLH16	448	250	46	68DLH17	481	262	53	64DLH18	499	237	59				
72DLH17	501	297	50	72DLH17	488	282	49	64DLH18	532	261	59	68DLH18	524	269	60				
64DLH17	518	275	52	64DLH17	492	255	52	68DLH18	557	297	60	72DLH18	536	280	59				
60DLH18	559	272	59	68DLH17	505	284	53	72DLH19	649	339	68	68DLH19	601	305	67				
64DLH18	598	311	59	60DLH18	531	252	59	127' LENGTH				72DLH19	628	318	67				
68DLH18	599	388	60	64DLH18	568	288	59	128' LENGTH				129' LENGTH							
72DLH19	687	381	67	68DLH18	584	321	60					130' LENGTH							
68DLH19	690	384	67	68DLH19	673	365	67									131' LENGTH			
118' LENGTH																			
60DLH12	240	121	29	64DLH12	235	129	29	64DLH12	221	216	29								
64DLH12	247	138	29	64DLH13	286	155	34	64DLH13	269	141	34	68DLH14	299	155	38				
60DLH13	291	147	34	64DLH14	326	166	37	64DLH14	306	151	37	72DLH14	305	163	38				
60DLH14	321	156	37	68DLH14	334	187	38	68DLH14	317	171	38	72DLH15	349	182	41				
64DLH14	343	179	37	72DLH15	372	207	40	68DLH15	354	191	41	72DLH16	403	215	49				
72DLH15	382	218	38	68DLH15	375	209	40	72DLH15	360	194	41	68DLH17	446	232	53				
68DLH15	384	220	41	72DLH16	430	244	45	64DLH16	394	198	46	72DLH17	454	244	53				
64DLH15	394	211	43	68DLH16	444	246	49	72DLH16	416	229	47	68DLH18	516	263	60				
60DLH16	414	206	46	72DLH17	484	278	49	68DLH16	420	225	49	72DLH18	532	276	59				
72DLH16	441	257	45	68DLH17	501	280	53	64DLH17	454	226	52	72DLH19	623	313	67				
68DLH16	456	259	46	64DLH18	559	282	59	68DLH17	474	256	53	130' LENGTH							
72DLH17	496	292	50	68DLH18	579	316	60	64DLH18	523	255	59	68DLH13	255	142	35				
64DLH17	509	268	52	68DLH19	667	359	67	68DLH18	549	289	60	68DLH14	294	152	38				
68DLH17	513	294	53	122' LENGTH				72DLH19	643	333	67	72DLH14	303	171	38				
60DLH18	549	266	59	64DLH12	231	125	29	126' LENGTH				72DLH15	347	191	41				
64DLH18	587	304	59	64DLH13	281	152	34	64DLH12	218	114	29	72DLH16	401	225	49				
68DLH18	594	333	60	68DLH13	288	171	35	64DLH13	264	131	34	68DLH17	439	228	55				
72DLH19	682	374	67	64DLH14	321	162	37	64DLH14	301	147	37	72DLH17	451	256	56				
68DLH19	684	377	67	68DLH14	332	185	38	68DLH14	312	167	38	68DLH18	508	257	60				
119' LENGTH				72DLH15	369	204	40	72DLH15	357	191	41	72DLH18	528	289	59				
60DLH12	236	118	29	68DLH15	372	206	42	68DLH16	388	193	46	68DLH19	583	291	67				
64DLH12	243	135	29	72DLH16	427	240	45	64DLH17	467	249	53	72DLH19	619	328	70				
60DLH13	286	143	34	68DLH16	441	242	49	64DLH18	515	249	59	131' LENGTH							
64DLH13	295	163	34	64DLH17	476	243	52	68DLH18	540	283	60	68DLH13	252	138	35				
60DLH14	316	152	37	68DLH17	497	275	53	72DLH18	544	289	59	68DLH14	290	148	38				
64DLH14	337	174	37	64DLH18	549	274	59	72DLH19	638	328	67	72DLH14	298	167	38				
68DLH14	340	193	38	68DLH18	575	311	60	127' LENGTH				68DLH15	322	166	41				
72DLH15	378	214	38	72DLH19	659	350	67	64DLH12	214	111	29	72DLH15	342	187	43				
68DLH15	381	217	40	68DLH19	662	353	67	64DLH13	260	134	34	72DLH16	395	219	49				
123' LENGTH				123' LENGTH				68DLH14	308	163	38	68DLH17	433	222	53				
64dlh12	228	122	29	123' LENGTH				72DLH14	309	168	37	72DLH17	445	250	53				
								68DLH15	343	182	41	68DLH18	501	251	59				
												72DLH18	520	283	59				
												68DLH19	574	285	67				
												72DLH19	609	321	70				

ECONOMICAL JOIST GUIDE

Combined K, VS, LH & DLH Series Load Table

Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)	Joist Type	Allowable Loads (PLF)		Joist Weight (lbs./ft.)
Total	Live			Total	Live			Total	Live		
132' LENGTH				136' LENGTH (Cont.)				144' LENGTH (Cont.)			
68DLH13	248	135	35	72DLH18	483	252	59	72DLH 18	432	212	59
68DLH14	286	145	38	68DLH19	532	254	67	72DLH19	504	241	70
72DLH14	294	163	38	72DLH19	565	286	70				
68DLH15	317	162	41	137' LENGTH							
72DLH15	336	183	43	72DLH14	274	146	38				
68DLH16	376	190	49	72DLH15	312	163	41				
72DLH16	390	214	49	72DLH16	363	191	49				
68DLH17	427	217	53	72DLH17	408	218	53				
72DLH17	438	245	56	72DLH18	479	247	59				
68DLH18	493	246	59	72DLH19	557	280	70				
72DLH18	512	276	59	138' LENGTH							
68DLH19	565	278	67	72DLH14	270	143	38				
72DLH19	600	313	70	72DLH15	308	160	42				
133' LENGTH				72DLH16	358	188	49				
68DLH13	244	133	35	72DLH17	402	213	53				
68DLH14	281	141	38	72DLH18	470	242	59				
72DLH14	290	159	38	72DLH19	549	274	70				
68DLH15	312	158	41	139' LENGTH (Cont.)							
72DLH15	331	178	41	72DLH14	266	139	38				
68DLH16	371	186	49	72DLH15	303	156	41				
72DLH16	384	209	49	72DLH16	353	183	49				
68DLH17	420	212	53	72DLH17	397	209	53				
72DLH17	432	239	56	72DLH18	463	236	59				
68DLH18	486	240	59	72DLH19	541	274	70				
72DLH18	505	270	59	140' LENGTH							
68DLH19	557	272	67	72DLH14	262	136	38				
72DLH19	591	306	70	72DLH15	299	152	41				
134' LENGTH				72DLH16	348	179	49				
68DLH13	241	130	35	72DLH17	391	205	53				
68DLH14	277	138	38	72DLH18	457	231	59				
72DLH14	285	155	38	72DLH19	533	263	70				
68DLH15	308	155	41	141' LENGTH							
72DLH15	326	174	41	72DLH14	259	133	38				
68DLH16	365	182	49	72DLH15	295	150	42				
72DLH16	378	205	49	72DLH16	343	175	49				
72DLH17	426	233	53	72DLH17	386	200	53				
68DLH18	479	234	60	72DLH18	450	227	59				
72DLH18	497	265	59	72DLH19	526	257	70				
68DLH19	548	266	67	142' LENGTH							
72DLH19	582	300	70	72DLH14	255	131	38				
135' LENGTH				72DLH15	291	147	42				
68DLH13	237	127	35	72DLH16	338	171	49				
68DLH14	273	135	38	72DLH17	381	196	53				
72DLH14	281	152	38	72DLH18	444	222	59				
68DLH15	303	152	42	72DLH19	518	251	70				
72DLH15	322	171	42	143' LENGTH							
68DLH16	360	178	49	72DLH14	252	128	38				
72DLH16	373	200	49	72DLH15	286	143	41				
68DLH17	408	203	53	72DLH16	334	169	49				
72DLH17	420	228	53	72DLH17	376	191	53				
68DLH18	472	230	60	72DLH18	438	217	59				
72DLH18	490	258	59	72DLH19	511	247	70				
68DLH19	540	260	67	144' LENGTH							
72DLH19	573	293	70	72DLH14	248	125	38				
136' LENGTH				72DLH15	282	140	41				
68DLH13	234	124	35	72DLH16	329	165	49				
68DLH14	269	133	38	72DLH17	371	188	53				
72DLH14	277	149	38								
68DLH15	299	148	41								
72DLH15	317	167	42								
68DLH16	354	174	49								
72DLH16	368	196	49								
68DLH17	403	198	53								
72DLH17	414	224	56								
68DLH18	465	225	60								

RECOMMENDED CODE OF STANDARD PRACTICE FOR STEEL JOISTS AND JOIST GIRDERS

Adopted by the Steel Joist Institute April 7, 1931 - Revised to May 2, 1994 - Effective September 1, 1994.

SECTION 1. GENERAL

1.1 SCOPE

The practices and customs set forth herein are in accordance with good engineering practice, tend to insure safety in steel joist and Joist Girder construction, and are standard within the industry. There shall be no conflict between this code and any legal building regulation. This code shall only supplement and amplify such laws. Unless specific provisions to the contrary are made in a contract for the purchase of steel joists or Joist Girders, this code is understood to govern the interpretation of such a contract.

1.2 APPLICATION

This Code of Standard Practice is to govern as a standard 'unless otherwise covered in the architects' and engineers' plans and specifications.

1.3 DEFINITION

The term Seller as used herein is defined as a company engaged in the manufacture and distribution of steel joists, Joist Girders and accessories. The term Material as used herein is defined as steel joists, Joist Girders and accessories.

1.4 DESIGN

In the absence of ordinances or specifications to the contrary, all designs prepared by the specifying professional shall be in accordance with the applicable Steel Joist Institute specifications and table of latest adoption.

1.5 RESPONSIBILITY FOR DESIGN AND ERECTION

When Material requirements are specified, the seller shall assume no responsibility other than to furnish the items listed in Section 5.2 (a). When Material requirements are not specified, the Seller shall furnish the items listed in Section 5.2 (a) in accordance with applicable Steel Joist Institute Specifications of latest adoption, and this code. The Seller shall identify Material by showing size and type. In no case shall the Seller assume any responsibility for the erection of the item furnished.

1.6 PERFORMANCE TEST FOR K-SERIES STEEL JOIST CONSTRUCTION

When job tests on a structure are required, joists shall have bridging and top deck applied as used. In addition to the full dead load, the test panel shall sustain for one hour a test load of 1.65 times the design live load. After this test load has been removed for a minimum of 30 minutes, the remaining deflection shall not exceed 20% of the deflection caused by the test load. The weight of the test panel itself shall constitute the dead load of the construction and shall include the weight of the joists, bridging, top deck, slab, ceiling materials, etc. The design live load shall be the live load specified and in no case shall it be more than the published joist capacity less the dead load. The cost of such tests shall be borne by the purchaser.

SECTION 2. JOISTS AND ACCESSORIES

2.1 STEEL JOISTS AND JOIST GIRDERS

Steel joists and Joist Girders shall carry the designations and meet the requirements of the applicable Steel Joist Institute Specification and Table of latest adoption.

K-Series joists are furnished with parallel chords only, and with minimum standard end bearing depth of 21/2 inches (64 mm).

LH- and **DLH-Series** joists are furnished either underslung or square ended, with top chords either parallel, pitched one way or pitched two ways. Underslung types are furnished with standard end bearing depth of 5 inches (127 mm) for LH-Series. **DLH-Series** are furnished with standard end bearing depths of 5 inches (127 mm) for section numbers thru 17 and 7 1/2 inches (191 mm) for section numbers 18 and 19. The standard pitch is 1/8 inch in 12 inches (1:96). The nominal depth of a pitched Longspan Joist is taken at the center of the span

Joist Girders are furnished either underslung or square ended with top chords either parallel, pitched one way or pitched two ways. Under-slung types are furnished with a standard end bearing depth of 6 inches (152 mm) for Joist Girders weighing less than 60 pounds per lineal foot (89 kg/m), and 7 1/2 inches (191mm) for Joist Girders weighing 60 pounds per lineal foot (89 kg/m) or more.



RECOMMENDED CODE OF STANDARD PRACTICE FOR STEEL JOISTS AND JOIST GIRDERS

The standard pitch is 1/8 inch in 12 inches (1:96). The nominal depth of a pitched Joist Girder is taken at the center of the span.

Because Longspan and Deep Long Span Joists may have exceptionally high end reactions, it is recommended that the supporting structure be designed to provide a minimum unit bearing pressure of 750 pounds per square inch (5171 Kilo Pascal).

2.2 SLOPED END BEARINGS

Where steel joists or Joist Girders are sloped, beveled ends or sloped shoes may be provided where the slope exceeds 1/4 inch in 12 inches (1:48). For Open Web Steel Joists, K-Series, bearing ends will not be beveled for slopes of 1/4 inch or less in 12 inches (1:48).

2.3 EXTENDED ENDS

Steel joist extended ends shall be in accordance with Manufacturer's Standard and shall meet the requirements of the Steel Joist Institute specification of latest adoption.

2.4 CEILING EXTENSIONS

Ceiling extensions shall be furnished to support ceilings which are to be attached to the bottom of the joists. They are not furnished for the support of suspended ceilings. The ceiling extension shall be either an extended bottom chord element or a loose unit, whichever is standard with the manufacturer, and shall be of sufficient strength to properly support the ceiling.

TABLE 2.5.1a K - SERIES JOIST MAXIMUM JOIST SPACING FOR HORIZONTAL BRIDGING							
SECTION NUMBER*	**BRIDGING MATERIAL SIZE						
	Round Rod	Equal leg Angles					
	1/2" round (13mm) r = .13"	1 x 7/64 (25mm x 3mm) r = .20"	1-1/4 x 7/64 (32mm x 3mm) r = .25"	1-1/2 x 7/64 (38mm x 3mm) r = .30"	1-3/4 x 7/64 (45mm x 3mm) r = .35"	2 x 1/8 (51mm x 3mm) r = .40"	2-1/2 x 5/32 (64mm x 4mm) r = .50"
1 thru 9	3'- 3" (991mm)	5'- 0" (1524mm)	6'- 3" (1905mm)	7'- 6" (2286mm)	8'- 7" (2616mm)	10'- 0" (3048mm)	12'- 6" (3810mm)
10	3'- 0" (914mm)	4'- 8" (1422mm)	6'- 3" (1905mm)	7'- 6" (2286mm)	8'- 7" (2616mm)	10'- 0" (3048mm)	12'- 6" (3810mm)
11 and 12	2'- 7" (787mm)	4'- 0" (1219mm)	5'- 8" (1727mm)	7'- 6" (2286mm)	8'- 7" (2616mm)	10'- 0" (3048mm)	12'- 6" (3810mm)

* Refer to last digit(s) of Joist Designation

** Connection to Joist must resist 700 pounds (3114 N)

TABLE 2.5.1b LH SERIES JOISTS MAXIMUM JOIST SPACING FOR HORIZONTAL BRIDGING SPANS OVER 60' REQUIRE BOLTED DIAGONAL BRIDGING						
Section Number*	**BRIDGING ANGLE SIZE - (EQUAL LEG ANGLE)					
	1 x 7/64 (25mm x 3mm) r = .20"	1-1/4 x 7/64 (32mm x 3mm) r = .25"	1-1/2 x 7/64 (38mm x 3mm) r = .30"	1-3/4 x 7/64 (45mm x 3mm) r = .35"	2 x 1/8 (52mm x 3mm) r = .40"	2-1/2 x 5/32 (64mm x 4mm) r = .50"
02, 03, 04	4'- 7" (1397mm)	6'- 3" (1905mm)	7'- 6" (2286mm)	8'- 9" (2667mm)	10'- 0" (3048mm)	12'- 4" (3759mm)
05 - 06	4'- 1" (1245mm)	5'- 9" (1753mm)	7'- 6" (2286mm)	8'- 9" (2667mm)	10'- 0" (3048mm)	12'- 4" (3759mm)
07 - 08	3'- 9" (1143mm)	5'- 1" (1549mm)	6'- 8" (2032mm)	8'- 6" (2590mm)	10'- 0" (3048mm)	12'- 4" (3759mm)
09 - 10		4'- 6" (1372mm)	6'- 0" (1829mm)	7'- 8" (2337mm)	10'- 0" (3048mm)	12'- 4" (3759mm)
11 - 12		4'- 1" (1245mm)	5'- 5" (1651mm)	6'- 10" (2083mm)	8'- 11" (2118mm)	12'- 4" (3759mm)
13 - 14		3'- 9" (1143mm)	4'- 1" (1245mm)	6'- 3" (1905mm)	8'- 2" (2489mm)	12'- 4" (3759mm)
15 - 16			4'- 3" (1295mm)	5'- 5" (1651mm)	7'- 1" (2159mm)	11'- 0" (3353mm)
17			4'- 0" (1219mm)	5'- 1" (1549mm)	6'- 8" (2032mm)	10'- 5" (3175mm)

* Refer to last two digits of Joist Designation

** Connection to Joist must resist force listed in Table 104.5.1



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2.5 BRIDGING AND BRIDGING ANCHORS

(a) Bridging standard with the manufacturer and complying with the applicable Steel Joist Institute specification of latest adoption shall be used for bridging all joists furnished by the manufacturer. Positive anchorage shall be provided at the ends of each bridging row at both top and bottom chords.

(b) For the **K-** and **LH-Series** Joists horizontal bridging is recommended for spans up to and including 60 feet (18288 mm) except where Code or OSHA requirements for *erection stability* and/or the Steel Joist Institute Specifications require bolted diagonal bridging.

LH- and **DLH-Series** Joists exceeding 60 feet (18288 mm) in length shall have bolted diagonal bridging for all rows.

Refer to Section #5 in the **K-Series** Specifications and Section #105 in the **LH/DLH-** Specifications for Erection Stability requirements.

The I/r ratio for horizontal bridging shall not exceed 300. The material sizes shown in TABLES 2.5.1a and 2.5.1b meet the criteria (page 120).

Horizontal bridging shall consist of two continuous steel members, one of which is attached to the top chord and the other attached to the bottom chord.

(c) Diagonal cross bridging consisting of angles or other shapes connected to the top and bottom chords, of **K-**, **LH-**, and **DLH-Series** Joists shall be used when required by the applicable Steel Joist Institute standards and specifications of latest adoption.

Diagonal bridging, when used, shall have an I/r ratio not exceeding 200.

When the bridging members are connected at their point of intersection, the following table will meet the above specification.

TABLE 2.5.2
K, LH & DLH SERIES JOISTS
MAXIMUM JOIST SPACING FOR DIAGONAL BRIDGING

JOIST DEPTH	BRIDGING ANGLE SIZE - (EQUAL LEG ANGLES)				
	1 X 7/64 (25mm x 3mm) r = .20"	1-1/4 x 7/64 (32mm x 3mm) r = .25"	1-1/2 x 7/64 (38mm x 3mm) r = .30"	1-3/4 x 7/64 (45mm x 3mm) r = .35"	2x1/8 (51mm x 3mm) r = .40"
12	6'- 6" (1981mm)	8'- 3" (2514mm)	9'- 11" (3022mm)	11'- 7" (3530mm)	
14	6'- 6" (1981mm)	8'- 3" (2514mm)	9'- 11" (3022mm)	11'- 7" (3530mm)	
16	6'- 6" (1981mm)	8'- 2" (2489mm)	9'- 10" (2997mm)	11'- 6" (3505mm)	
18	6'- 6" (1981mm)	8'- 2" (2489mm)	9'- 10" (2997mm)	11'- 6" (3505mm)	
20	6'- 5" (1955mm)	8'- 2" (2489mm)	9'- 10" (2997mm)	11'- 6" (3505mm)	
22	6'- 4" (1930mm)	8'- 1" (2463mm)	9'- 10" (2997mm)	11'- 6" (3505mm)	
24	6'- 4" (1930mm)	8'- 1" (2463mm)	9'- 9" (2971mm)	11'- 5" (3479mm)	
26	6'- 3" (1905mm)	8'- 0" (2438mm)	9'- 9" (2971mm)	11'- 5" (3479mm)	
28	6'- 2" (1879mm)	8'- 0" (2438mm)	9'- 8" (2946mm)	11'- 5" (3479mm)	
30	6'- 2" (1879mm)	7'- 11" (2413mm)	9'- 8" (2946mm)	11'- 4" (3454mm)	
32	6'- 1" (1854mm)	7'- 10" (2387mm)	9'- 7" (2921mm)	11'- 4" (3454mm)	13'- 0" (3962mm)
36		7'- 9" (2362mm)	9'- 6" (2895mm)	11'- 3" (3429mm)	12'- 11" (3973mm)
40		7'- 7" (2311mm)	9'- 5" (2870mm)	11'- 2" (3403mm)	12'- 10" (3911mm)
44		7'- 5" (2260mm)	9'- 3" (2819mm)	11'- 0" (3352mm)	12'- 9" (3886mm)
48		7'- 3" (2209mm)	9'- 2" (2794mm)	10'- 11" (3327mm)	12'- 8" (3860mm)
52			9'- 0" (2743mm)	10'- 9" (3276mm)	12'- 7" (3835mm)
56			8'- 10" (2692mm)	10'- 8" (3251mm)	12'- 5" (3784mm)
60			8'- 7" (2616mm)	10'- 6" (3200mm)	12'- 4" (3759mm)
64			8'- 5" (2565mm)	10'- 4" (3149mm)	12'- 2" (3708mm)
68			8'- 2" (2489mm)	10'- 2" (3098mm)	12'- 0" (3657mm)
72			8'- 0" (2438mm)	10'- 0" (3048mm)	11'-10" (3606mm)

MINIMUM A307 BOLT REQUIRED FOR CONNECTION

SERIES	*SECTION NUMBER	A307 BOLT DIAMETER
K	ALL	3/8" (9mm)
LH/DLH	2 - 12	3/8" (9mm)
LH/DLH	13 - 17	1/2" (12mm)
DLH	18 & 19	5/8" (15mm)

* Refer to last digit(s) of joist designation



2.6 HEADERS

Headers for Open Web Steel Joists, **K-Series** as outlined and defined in Section 5.2 (a) shall be furnished by the Seller. Such headers shall be any type standard with the manufacturer. Conditions involving headers shall be investigated and, if necessary, provisions made to provide a safe condition. Headers are not provided for Longspan Steel Joists, **LH-Series**, and Deep Longspan Steel Joists, **DLH-Series**.

2.7 BOTTOM CHORD LATERAL BRACING FOR JOIST GIRDERS

Bottom chord lateral bracing may be furnished to prevent lateral movement of the bottom chord of the Joist Girder and to prevent the ratio of chord length to radius of gyration from exceeding that specified. The lateral bracing shall be that which is standard with the manufacturer, and shall be of sufficient strength to properly resist any lateral force exerted by the bottom chord of the Joist Girder.

**SECTION 3.
MATERIALS****3.1 STEEL**

The steel used in the manufacture of joists and Joist Girders shall comply with the applicable Steel Joist Institute specification of latest adoption.

3.2 PAINT

The shop coat of paint, when specified, shall comply with the applicable Steel Joist Institute specification of latest adoption.

**SECTION 4.
INSPECTION**

All joist and Joist Girder inspections shall be made in accordance with the provision for inspection in the applicable Steel Joist Institute specification of latest adoption.

**SECTION 5.
ESTIMATING****5.1 PLANS FORBIDDING**

Plans to serve as the basis for bids shall show the character of the work with sufficient clarity to permit making an accurate estimate and shall show the following:

Designation and location of Materials (See Section 5.2 [a]).

Locations and elevations of all steel and concrete supporting members and bearing walls.

Location and length of joist extended ends.

Location and size of all openings in floors and roofs.

Location of all partitions.

Location and magnitude of concentrated loads as defined in Section 5.5.

Construction and thickness of floor slabs, roof deck, ceilings and partitions.

Joists or Joist Girders requiring extended bottom chords.

Paint, if other than manufacturer's standard.

5.2 SCOPE OF ESTIMATE

- (a) Unless otherwise specified, the following items shall be included in the estimate, and requirements shall be determined as outlined in Section 5.3 through 5.5.

Steel Joists

Joist Girders

Joist Extended Ends

Ceiling Extensions.

Extended bottom chord used as strut.

Bridging and bridging anchors.

Joist Girder bottom chord bracing.

Headers which are defined as members supported by and carrying Open Web Steel Joists, **K-Series**.

One shop coat of paint, when specified, shall be in accordance with Section 3.2.

- (b) The following items shall not be included in the estimate but may be quoted and identified as separate items:

Headers for Longspan Steel Joists, **LH-Series**.

Headers for Deep Longspan Steel Joists, **DLH-Series**.

Reinforcement in slabs over joists.

Centering material and attachments.

Miscellaneous framing between joists for openings at ducts, dumbwaiters, ventilators, skylights, etc.



Loose individual or continuous bearing plates and bolts or anchors for such plates.

Erection bolts for joist and Joist Girder end anchorage.

Horizontal bracing in the plane of the top and bottom chords from joist to joist or joist to structural framing and walls.

Wood nailers.

Moment plates.

5.3 JOIST LOCATION AND SPACING

The maximum joist spacing shall be in accordance with the requirements of the applicable SJI specification and load table of latest adoption.

Where sidewalls, wall beams or tie beams are capable of supporting the floor slab or roof deck, the first adjacent joists may be placed one full space from these members. Longspan Steel Joists and Deep Longspan Steel Joists are provided with camber. These joists may have a significant difference in elevation with respect to the adjacent structure because of this camber. This difference in elevation should be given consideration when locating the first joist adjacent to a side wall, wall beam or tie beam. Therefore, it is recommended that this joist be located one full space away from these members.

Open Web Steel Joists, **K-Series**, should be no closer than 6 inches (152 mm) to these supporting walls or members. Where partitions occur parallel to joists, there shall be at least one typical joist provided under each such partition, and more than one such joist shall be provided if necessary to safely support the weight of such partition and the adjacent floor, less the live load, on a strip of floor one foot (305 mm) in width. Where such partitions extend less than one-third ($1/3$) of the span from the support, special spacing or additional joists shall not be required provided the loads do not exceed those in Section 5.5. When partitions occur normal to the joists, they shall be treated as concentrated loads, and joists shall be investigated as indicated in Section 5.5.

5.4 ACCESSORIES

Joist accessories standard with the manufacturer shall comply with applicable Steel Joist Institute specifications of latest adoption and shall be in accordance with Section 2 of this Code.

5.5 LOADS

The Steel Joist Institute Load Tables are based on uniform loading conditions and are valid for use in selecting joist sizes for gravity loads that can be expressed in terms of "Pounds per lineal foot" (Newtons per Meter) of joist. The Steel Joist Institute Weight Tables are based on uniformly spaced panel point loading conditions and are valid for use in selecting Joist Girder sizes for gravity conditions that can be expressed in kips (Kilo Newton) per panel point on the Joist Girder. When Joist Girders are required to support unequal panel point loads or other special loads, a load diagram should be provided on the structural drawings.

Loads such as Bulb "T"s, purlins, partitions, heavy pipes, monorail or tramrail type carrier, etc., running normal to the length of the joist, or a mechanical unit mounted on the joist, are concentrated loads. Where concentrated loads occur, the joist must be selected to carry the full combination of uniform load plus concentrated load. The magnitude and location of these concentrated loads shall be shown on the structural drawings when, in the opinion of the specifying professional, they may require special consideration by the manufacturer. Such joists shall be labeled "Special" on the structural drawings.

When Steel Joists are subjected to concentrated and/or varying loads, the specifying professional shall use the following procedure which will allow the:

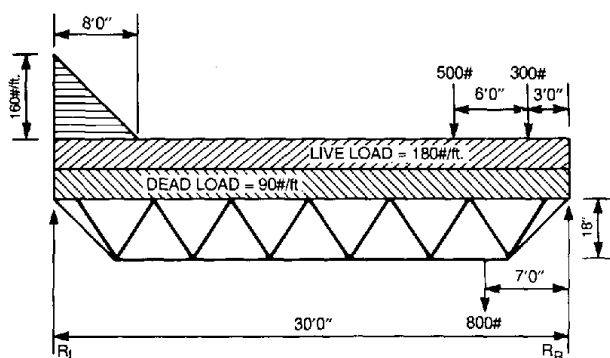
1. Estimator to price the joists.
 2. Joist manufacturer to design the joists properly.
 3. Owner to obtain the most economical joists.
- A.** Sketch the joist(s) on the structural drawings showing all loads to be supported.
 - B.** Determine the maximum moment in the joist and derive the uniform load that will produce that moment.
 - C.** Determine the maximum end reaction and derive the uniform load that will produce that reaction.
 - D.** Determine the maximum end reaction and derive the uniform load that will produce that reaction.
 - E.** Place the designation under the sketch with the following note: "Joist supplier to design joist to support loads as shown above."



RECOMMENDED CODE OF STANDARD PRACTICE FOR STEEL JOISTS AND JOIST GIRDERS

ESTIMATING JOIST SIZE FOR SPECIAL LOADINGS

EXAMPLE: U.S. CUSTOMARY UNITS



18K9 SP

(See Method of Joist Selection Below)

Joist supplier to design joist to support loads as shown above.

$$\text{Total Load} = \frac{160}{2} (8) + (180 + 90)30 + 500 + 800 + 300 = \mathbf{10,300 \text{ lbs.}}$$

$$R_L = \frac{160(8)}{2} + \left[\frac{30-8}{30} \right] \frac{(180+90)(30)}{2} + 500 \left[\frac{9}{30} \right] + 800 \left[\frac{7}{30} \right] + 300 \left[\frac{3}{30} \right] =$$

$$R_L = \mathbf{5000 \text{ lbs.}}$$

$$R_R = \mathbf{5340 \text{ lbs.}} W_{e1}(L) = \frac{2(5340)}{30}$$

$$\text{Assume } R_R = \frac{2}{2}, W_{e1} = \frac{2(5340)}{30} = \mathbf{356 \text{ lbs/ft.}}$$

Point of Max. Mom. = Point of Zero Shear(V) = L_1
(dist. from rt. end of Jst.)

$$V = \text{Zero} = 5340 - (300 + 500 + 800) - (180 + 90)(L_1)$$

$$L_1 = 13.85 \text{ ft.}$$

$$M @ L_1 = 5340(13.85) - 300(10.85) -$$

$$800(6.86) - 500(4.85) - \frac{(180+90)(13.85)^2}{2}$$

$$M = \mathbf{36,903 \text{ ft. lbs.}}$$

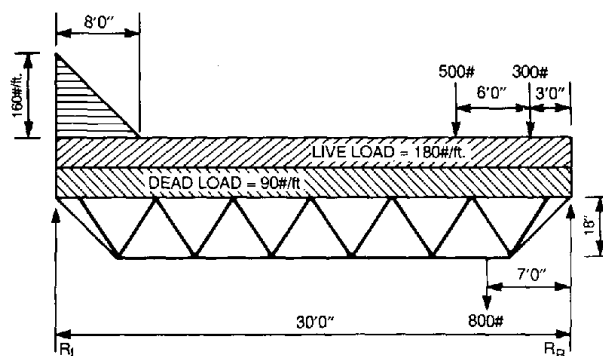
$$\text{Assume } M = \frac{W_{e2}(L)^2}{8}, W_{e2} = \frac{8(36,903)}{(30)^2} = \mathbf{328 \text{ lbs/ft.}}$$

Using $W_{e1} = 356 \text{ lb/ft.}$ @ SPAN = 30',
and D = 18"

Select 18K9 for total load (402) and live load (229) and call it: **18K9SP**

The specifying professional shall compare the equivalent uniform loads W_{e1} & W_{e2} to the uniform loads tabulated in the **K-Series Load Table**. Loads in excess of the load table loads indicate that the specifying professional shall consider using additional joists to reduce the loading, or use the **LH-Series Joist** and make provisions for 5" deep bearing seats.

EXAMPLE: METRIC



18K9 SP

(See Method of Joist Selection Below)

Joist supplier to design joist to support loads as shown above.

$$\text{Total Load} = \left[\frac{2.34}{2} \right] (2.44) + (2.63 + 1.31)9.14 + 2.22 + 3.56 + 1.33 =$$

$$\text{Total Load} = 2.86 + 36.01 + 2.22 + 3.56$$

$$+ 1.33 = \mathbf{45.98 \text{ kN}}$$

$$R_L = \frac{2.34(2.44)}{2} \times \frac{9.14-(2.44/3)}{9.14} + \frac{(2.63+1.31)9.14}{2}$$

$$+ 2.22 \left[\frac{2.74}{9.14} \right] + 3.56 \left[\frac{2.13}{9.14} \right] + 1.33 \left[\frac{.91}{9.14} \right] =$$

$$R_L = (2.86 \times .91) + 18.01 + .67 + .83 + .13 = \mathbf{22.24 \text{ kN}}$$

$$R_R = 45.98 - 22.24 = \mathbf{23.74 \text{ kN}}$$

$$\text{Assume } R_R = \frac{W_{e1}(L)}{2}, W_{e1} = \frac{2(23.75)}{9.14} = \mathbf{5.20 \text{ kN/m}}$$

Point of Max. Mom. = Zero Shear(V) = L_1 (dist. from right end of joist)

$$V = \text{Zero} = 23.75 - (1.31+2.22+3.56) - (2.63+1.31)(L_1)$$

$$L_1 = \mathbf{4.23 \text{ m}}$$

$$M @ L_1 = 23.75(4.23) - 1.33(3.32) -$$

$$2.22(1.49) - 3.56(2.10) - \frac{(2.63+1.31)(4.23)^2}{2} =$$

$$\text{Moment @ } L_1 = \mathbf{50.01 \text{ kN-m}}$$

$$\text{Assume } M = \frac{W_{e2}(L)^2}{8}, W_{e2} = \frac{8(50.01)}{(9.14)^2} = \mathbf{4.79 \text{ N/m}}$$

Using $W_{e1} = 5.20 \text{ kN/m}$ @ SPAN 9.14 m,
and D = 457 mm

Select 18K9 for total load (5.86 kN/m) and live load of (3.34 kN/m) and call it: **18K9SP**

The specifying professional shall compare the equivalent uniform loads W_{e1} & W_{e2} to the uniform loads tabulated in the **K-Series Load Table**. Loads in excess of the load table loads indicate that the specifying professional shall consider using additional joists to reduce the loading, or use the **LH-Series Joist** and make provisions for 127 mm deep bearing seats.



Due consideration by the specifying professional shall be given to live loads due to:

1. Ponded rain water.
2. Excessive accumulation of snow in the vicinity of obstructions such as penthouses, signs, parapets, adjacent buildings, etc.
3. Wind uplift.
4. End moments at the joist end supports due to live and/or wind/seismic loads shall be shown on the structural drawings by the specifying professional.

For moment resisting joists framing near the end of a column, due consideration shall be given to extend the column length to allow a plate type connection between the top of the joist top chord and the column. Preferably, avoid resolving joist end moment forces through the joist bearing seat connection.

The structural drawings shall specify that all moment resisting joists shall have all dead loads applied to the joist before the bottom chord struts are welding to the column connection.

The top and bottom chord moment connection details shall be designed by the specifying professional. The joist designer shall furnish the specifying professional with the joist detail information if requested.

The design loads, as determined by the specifying professional, shall not be less than that specified in the applicable building codes.

SECTION 6. PLANS AND SPECIFICATIONS

6.1 PLANS FURNISHED BY BUYER

The Buyer shall furnish the Seller plans and specifications showing all Material requirements, the layout of walls, columns, beams, girders and other supports, as well as floor and roof openings and partitions correctly dimensioned. The live loads to be used, the wind uplift if any, the weights of partitions and the location and amount of any special loads, such as monorails, fans, blowers, tanks, etc., shall be indicated. The elevation of finished floors and roofs and bearings shall be shown.

6.2 PLANS FURNISHED BY SELLER

The Seller shall furnish the Buyer with detailed plans and

lists showing the number, type, locations, spacing, anchorage and mark of all Material as may be required for proper installation. All Material shall be identified with its mark which also appears on the bill of material. The type of shop paint, when required, shall be indicated on the drawings.

6.3 DISCREPANCIES

The specifying professional's bid plans and specifications will be assumed to be correct in the absence of written notice from the Buyer to the contrary. When plans are furnished by the Buyer which do not agree with the Architect's bid plans, such detailed plans shall be considered as a written notice of change of plans. However, it shall be the Buyer's responsibility to advise the Seller of those changes which affect the joists or Joist Girders.

6.4 APPROVAL

When joist placement plans are furnished by the Seller, prints thereof are submitted to the Buyer and owner for examination and approval. The Seller allows a maximum of fourteen (14) calendar days in his schedule for the return of placement plans noted with the owner's and customer's approval, or approval subject to corrections as noted. The Seller makes the corrections, furnishes corrected prints for field use to the owner/customer and is released by the owner/customer to start joist manufacture.

Approval by the owner/customer of the placement plans, sections, notes and joist schedule prepared by the Seller indicates that the Seller has correctly interpreted the contract requirements, and is released by the owner/customer to start joist manufacture. This approval constitutes the owner's/customer's acceptance of all responsibility for the design adequacy of any detail configuration of joist support conditions shown by the Seller as part of his preparation of these placement plans.

Approval does not relieve the Seller of the responsibility for accuracy of detail dimensions on the plans, nor the general fit-up of joists to be placed in the field.

6.5 CHANGES

When any changes in plans are made by the buyer (or Architect) either prior to or after approval of detailed plans, or when any Material is required and was not shown on plans used as the basis of the bid, the cost of such changes and/or extra Material shall be paid by the Buyer at a price to be agreed upon between Buyer and Seller.



SECTION 7.* HANDLING AND ERECTION

The Buyer and/or Erector shall check all materials on arrival at job site and promptly report to Seller any discrepancies and/or damages. The Buyer and/or Erector shall comply with the requirements of the applicable Steel Joist Institute specification of latest adoption in the handling and erection of Material.

The Seller shall not be responsible for the condition of paint finish on Material if it is not properly protected after delivery.

The Seller shall not be responsible for improper fit of Material in the case of inaccurate finish dimensions of field construction work.

* For thorough coverage of this topic, refer to SJI Technical Digest #9, "Handling and Erection of Steel Joists and Joist Girders".

SECTION 8. BUSINESS RELATIONS

8.1 PRESENTATION OF PROPOSALS

All proposals for furnishing Material shall be made on a Sales Contract Form. After acceptance by the Buyer, these proposals must be approved or executed by a qualified official of the Seller. Upon such approval the proposal becomes a contract.

8.2 ACCEPTANCE OF PROPOSALS

All proposals are intended for prompt acceptance and are subject to change without notice.

8.3 BILLING

Contracts on a lump sum basis are to be billed proportionately as shipments are made.

8.4 PAYMENT

Payments shall be made in full on each invoice without retention.

8.5 ARBITRATION

All business controversies which cannot be settled by direct negotiations between Buyer and Seller shall be submitted to arbitration. Both parties shall sign a submission to arbitration and if possible agree upon an arbitrator. If they are unable to agree, each shall appoint an arbitrator and these two shall appoint a third arbitrator. The expenses of the arbitration shall be divided equally between the parties, unless otherwise provided for in the agreements to submit to arbitration. The arbitrators shall pass finally upon all questions, both of law and fact, and their findings shall be conclusive.

PUBLICATIONS

Vulcraft (Refer to back cover for address and telephone number of division nearest you)

STEEL JOISTS AND JOIST GIRDERS 1995

VULCRAFT COMPOSITE AND NONCOMPOSITE FLOOR JOISTS 1996

DESIGNING WITH JOIST, JOIST GIRDERS AND STEEL DECK

James Fisher, Ph.D., P.E., Michael West, P.E., AIA, Julius P. Van de Pas, P.E.

(A 289 page book provided to engineers and architects for help in designing with steel joists, joist girders and steel deck)

STEEL DECK INSTITUTE - P.O. Box 25, Fox River Grove, IL60021-0025 (847) 462-1930 Fax (847) 462-940 • www.sdi.org

DESIGN MANUAL FOR COMPOSITE DECKS, FORM DECKS, ROOF DECKS AND CELLULAR METAL FLOOR DECK WITH ELECTRICAL DISTRIBUTION. NO. 30

DIAPHRAGM DESIGN MANUAL - (THIRD EDITION). NO. DDMO3

MANUAL OF COSTRUCTION WITH STEEL DECK NO. MOC2

LRFD DESIGN MANUAL for Composite Beams and Girders with Steel Deck. No. LRFD1

COMPOSITE DECK DESIGN HANDBOOK. NO. CDD2

STANDARD PRACTICE DETAILS. NO. SPD1

BINDER FILE

DECK DAMAGE & PENETRATIONS

METAL DECK & CONCRETE QUANTITIES

A RATIONAL APPROACH TO STEELDECK CORROSION PROTECTION

BRAND NEW FLOOR DESIGN SOFTWARE LRFD SOFT

Steel Joist Institute - 3127 10th Ave. North Ext., Myrtle Beach, SC 29577-6760
(843) 626-1995 Fax: 843-626-5565

STANDARD SPECIFICATIONS, LOAD TABLES AND WEIGHTTABLES FOR STEELJOISTS AND JOIST GIRDERS
40TH Edition (1994)

SIXTY-YEAR MANUAL. (1992)

TECHNICAL DIGEST #3 - Ponding (1971)

TECHNICAL DIGEST #5 - Vibration (1988)

TECHNICAL DIGEST #6 - Uplift Loading (1998)

TECHNICAL DIGEST #8 - Welding of Open Web Steel Joist (1983)

TECHNICAL DIGEST #9 - Handling and Erection (1987)

TECHNICAL DIGEST #11 - Design of Joist - Girder Frames (1999)

NEW LRFD GUIDE (2000)

COMPUTER VIBRATION PROGRAM Ver1.2 (Used in Conjunction with Technical Digest #5)

SJI VIDEO - Introduction to Steel Joists

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