

OPEN WEB STEEL JOISTS, K-SERIES

INTRODUCTION

Open Web Steel Joists, K-Series, were primarily developed to provide structural support for floors and roofs of buildings. They possess the following advantages and features which have resulted in their wide use and acceptance throughout the United States and other countries.

First and foremost, they are economical. For many types of buildings, no other products or methods for supporting floors and roofs can compete with steel joists. The advantages listed in the following paragraphs all contribute to the overall economy of using Open Web Steel Joists.

K-Series Joists are light in weight - they possess an exceptionally high strength-to-weight ratio in comparison with other building materials. Coupled with their low price per pound, they contribute significantly to lower building costs. An additional economy stemming from their light weight is the fact that the structural materials supporting the joists, such as beams and Joist Girders, columns, and the foundations themselves, can therefore be lighter, thus leading to even greater economies.

Open Web Steel Joists represent unitized construction. Upon arrival at the job site, the joists are ready immediately for proper installation. No forming, pouring, curing, or stripping is required. Furthermore, their light weight makes the erection procedure simple and fast.

K-Series Joists are standardized regarding depths, spans, and load-carrying capacities. There are 64 separate designations in the Load Tables, representing joist depths from 8 inches (203 mm) through 30 inches (762 mm) in 2" (51 mm) increments and spans through 60 feet (18,288 mm). Standard K-series Joists have a 2½ inch (64 mm) end bearing depth so that, regardless of the overall joist depths, the tops of the joists lie in the same plane.

The open webs in the joists permit the ready passage and concealment of pipes, ducts and electric conduits within the depth of the floor. In high rise buildings this can result in a lesser overall building height, which translates into considerable cost savings. As soon as

the joists are erected and bridged, with ends fixed, a working platform is available for the immediate follow-up of allied trades; this allows field work to progress rapidly and efficiently.

In combination with other materials, joists can provide fire resistive assemblies for both floors and roofs of buildings for nearly any hourly rating required. The preceding pages on Fire Resistance Ratings with Steel Joists provide detailed information on this subject.

Steel joists produce a permanent support system; they will not rot, nor can they be damaged by vermin.

There are no restrictions on the types, sizes or heights of buildings in which joists can be used. They can be found in the roof of the neighborhood drug store as well as in every floor of the twin towers of the World Trade Center in New York City.



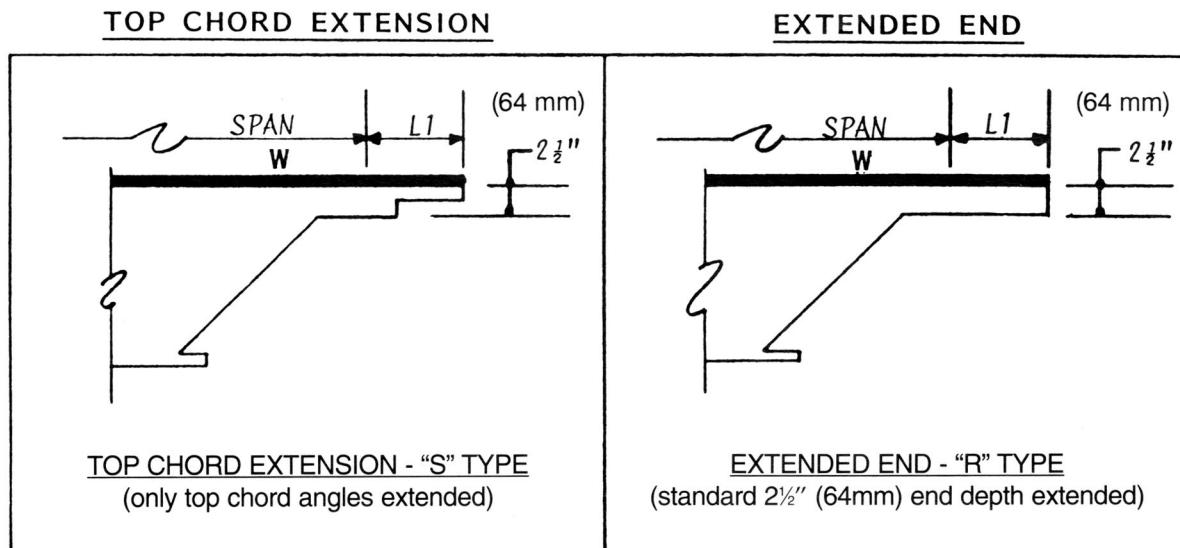
TOP CHORD EXTENSIONS AND EXTENDED ENDS

Joist 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 2½” (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 L1/240, where L1 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 2½” (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 2½” (64 mm) depth at the end of the extension. In the absence of specific instructions, the joist manufacturer may provide either type.



W = Uniform Load
 L1 = Length of Extension
 SPAN = See K-Series Load Table for definition of Span



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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	363 372	178 127	105 58					
S2	0.115	0.138	550 550	422 550	207 200	122 91					
S3	0.139	0.159	550 550	510 550	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	433 443	256 201	169 108	120 64			
S8	0.266	0.332	550 550	550 550	478 481	283 219	187 117	132 70			
S9	0.288	0.358	550 550	550 550	518 519	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

EXTENDED END 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	117 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	497 274	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	464 212	359 144	286 103	233 75	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 82	210 62	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 51	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 55	204 55
R9	1.673	2.091	550 550	550 550	550 550	550 550	550 442	550 284	481 194	384 138	313 101	260 77	219 59	
R10	1.931	2.414	550 550	550 550	550 550	550 550	550 510	550 328	550 224	443 159	361 117	300 89	253 69	
R11	2.183	2.729	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	550 410	550 279	550 199	550 146	451 111	375 111	317 86	



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TOP CHORD EXTENSION LOAD TABLE (S TYPE)														
kiloNewtons per Meter (kN/m)														
TYPE	"S" mm ³	"I" mm ⁴	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" mm ³	"I" mm ⁴	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	8.02 2.83	7.01 2.01	5.60 1.47	4.56 1.12	3.79 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	8.02 2.32	6.46 1.70	5.26 1.29	4.37 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	8.02 2.62	7.31 1.92	5.95 1.45	4.94 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	8.02 2.13	6.58 1.61	5.47 1.25	

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:

- (a) The yield strength measured in the tests shall equal or exceed the design yield strength.
- (b) 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.
- (c) 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.

- (d) 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:

- (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 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.

- (a) 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.
- (b) 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:

Chords

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

Webs

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

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

(b) Compression

For members with ℓ/r less than C_c :

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

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

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 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 :

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

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).

(c) Bending:

For chords

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

For web members other than solid rounds

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

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

For web members of solid round cross-section

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

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

For bearing plates

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

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

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 $1.2 \ell/r_x$ 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

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

$$\frac{f_a}{F_a} + \frac{C_m f_b}{\left[1 - \frac{f_a}{F_e} \right] QF_b} \leq 1.0, \text{ at mid-panel;}$$

in which

$$C_m = 1 - 0.3f_a/F_e \text{ for end panels}$$

$$C_m = 1 - 0.4f_a/F_e \text{ for interior panels}$$

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

F_y = Specified minimum yield strength

$$F_e = \frac{12\pi^2 E}{23(\ell/r_x)^2}$$

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 $\ell/145$ 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.

(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
 - 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 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 1/16 inch (2mm) 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 (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 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)	¼ inch (6 mm)
30 feet (9144 mm)	⅜ inch (10 mm)
40 feet (12192 mm)	½ inch (16 mm)
50 feet (15240 mm)	1 inch (25 mm)
60 feet (18288 mm)	1½ 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 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.

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 ½ 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 professional. The joists must bear a minimum of 2½ 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 2½ 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 ½ 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.



OPEN WEB STEEL JOISTS, K-SERIES

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” preceeding Load Table.					
*Section Number	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” preceeding Metric Load Table.					
*Section Number	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.

(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.

(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.

(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 span of the joist exceeds the erection stability span as indicated by the Red

shaded area of 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.

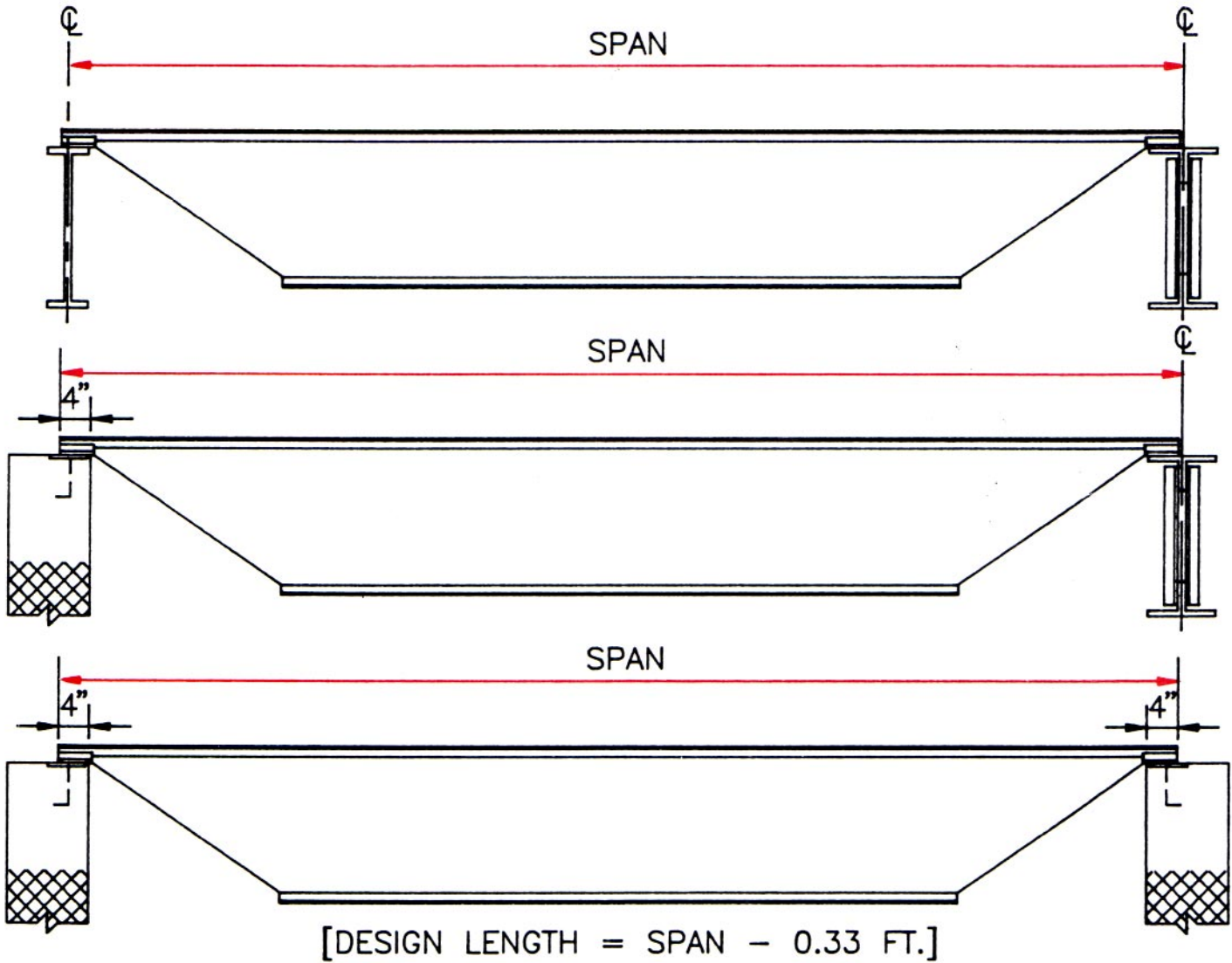
c) Handling

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



STANDARD LOAD TABLE

OPEN WEB STEEL JOISTS, K-SERIES

Based on a Maximum Allowable Tensile Stress of 30 ksi

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 inches⁴ 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 exceeds the unshaded area of the table, the row of bridging nearest the mid span shall be diagonal bridging with bolted connections at chords and midspan.

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

STANDARD LOAD TABLE/OPEN WEB STEEL JOISTS, K-SERIES
Based on a Maximum Allowable Tensile Stress of 30 ksi

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	550 550	550 550	550 550	550 550																
19	514 494	550 523	550 523	550 523	550 523	550 523	550 523																
20	463 423	550 490	550 490	550 490	550 490	550 490	550 490		517 517	550 550	550 550	550 550	550 550	550 550	550 550								
21	420 364	506 426	550 460	550 460	550 460	550 460	550 460		468 453	550 520	550 520	550 520	550 520	550 520	550 520								
22	382 316	460 370	518 414	550 438	550 438	550 438	550 438		426 393	514 461	550 490	550 490	550 490	550 490	550 490		550 548	550 548	550 548	550 548	550 548	550 548	550 548
23	349 276	420 323	473 362	516 393	550 418	550 418	550 418		389 344	469 402	529 451	550 468	550 468	550 468	550 468		518 491	550 518	550 518	550 518	550 518	550 518	550 518
24	320 242	385 284	434 318	473 345	526 382	550 396	550 396		357 302	430 353	485 396	528 430	550 448	550 448	550 448		475 431	536 483	550 495	550 495	550 495	550 495	550 495
25	294 214	355 250	400 281	435 305	485 337	550 377	550 377		329 266	396 312	446 350	486 380	541 421	550 426	550 426		438 381	493 427	537 464	550 474	550 474	550 474	550 474
26	272 190	328 222	369 249	402 271	448 299	538 354	550 361		304 236	366 277	412 310	449 337	500 373	550 405	550 405		404 338	455 379	496 411	550 454	550 454	550 454	550 454
27	252 169	303 198	342 222	372 241	415 267	498 315	550 347		281 211	339 247	382 277	416 301	463 333	550 389	550 389		374 301	422 337	459 367	512 406	550 432	550 432	550 432
28	234 151	282 177	318 199	346 216	385 239	463 282	548 331		261 189	315 221	355 248	386 269	430 298	517 353	550 375		348 270	392 302	427 328	475 364	550 413	550 413	550 413
29	218 136	263 159	296 179	322 194	359 215	431 254	511 298		243 170	293 199	330 223	360 242	401 268	482 317	550 359		324 242	365 272	398 295	443 327	532 387	550 399	550 399
30	203 123	245 144	276 161	301 175	335 194	402 229	477 269		227 153	274 179	308 201	336 218	374 242	450 286	533 336		302 219	341 245	371 266	413 295	497 349	550 385	550 385
31	190 111	229 130	258 146	281 158	313 175	376 207	446 243		212 138	256 162	289 182	314 198	350 219	421 259	499 304		283 198	319 222	347 241	387 267	465 316	550 369	550 369
32	178 101	215 118	242 132	264 144	294 159	353 188	418 221		199 126	240 147	271 165	295 179	328 199	395 235	468 276		265 180	299 201	326 219	363 242	436 287	517 337	549 355
33	168 92	202 108	228 121	248 131	276 145	332 171	393 201		187 114	226 134	254 150	277 163	309 181	371 214	440 251		249 164	281 183	306 199	341 221	410 261	486 307	532 334
34	158 84	190 98	214 110	233 120	260 132	312 156	370 184		176 105	212 122	239 137	261 149	290 165	349 195	414 229		235 149	265 167	288 182	321 202	386 239	458 280	516 314
35	149 77	179 90	202 101	220 110	245 121	294 143	349 168		166 96	200 112	226 126	246 137	274 151	329 179	390 210		221 137	249 153	272 167	303 185	364 219	432 257	494 292
36	141 70	169 82	191 92	208 101	232 111	278 132	330 154		157 88	189 103	213 115	232 125	259 139	311 164	369 193		209 126	236 141	257 153	286 169	344 201	408 236	467 269
37									148 81	179 95	202 106	220 115	245 128	294 151	349 178		198 116	223 130	243 141	271 156	325 185	386 217	442 247
38									141 74	170 87	191 98	208 106	232 118	279 139	331 164		187 107	211 119	230 130	256 144	308 170	366 200	419 228
39									133 69	161 81	181 90	198 98	220 109	265 129	314 151		178 98	200 110	218 120	243 133	292 157	347 185	397 211
40									127 64	153 75	172 84	188 91	209 101	251 119	298 140		169 91	190 102	207 111	231 123	278 146	330 171	377 195
41																	161 85	181 95	197 103	220 114	264 135	314 159	359 181
42																	153 79	173 88	188 96	209 106	252 126	299 148	342 168
43																	146 73	165 82	179 89	200 99	240 117	285 138	326 157
44																	139 68	157 76	171 83	191 92	229 109	272 128	311 146

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

Based on a Maximum Allowable Tensile Stress of 30 ksi

Joist Designation	24K4	24K5	24K6	24K7	24K8	24K9	24K10	24K12		26K5	26K6	26K7	26K8	26K9	26K10	26K12		28K6	28K7	28K8	28K9	28K10	28K12
Depth (In.)	24	24	24	24	24	24	24	24		26	26	26	26	26	26	26		28	28	28	28	28	28
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		11.4	11.8	12.7	13.0	14.3	17.1
Span (ft.)	↓																						
24	520 516	550 544	550 544	550 544	550 544	550 544	550 544	550 544															
25	479 456	540 511	550 520	550 520	550 520	550 520	550 520	550 520															
26	442 405	499 453	543 493	550 499	550 499	550 499	550 499	550 499		542 535	550 541	550 541	550 541	550 541	550 541								
27	410 361	462 404	503 439	550 479	550 479	550 479	550 479	550 479		502 477	547 519	550 522	550 522	550 522	550 522								
28	381 323	429 362	467 393	521 436	550 456	550 456	550 456	550 456		466 427	508 464	550 501	550 501	550 501	550 501		548 541	550 543	550 543	550 543	550 543	550 543	
29	354 290	400 325	435 354	485 392	536 429	550 436	550 436	550 436		434 384	473 417	527 463	550 479	550 479	550 479		511 486	550 522	550 522	550 522	550 522	550 522	
30	331 262	373 293	406 319	453 353	500 387	544 419	550 422	550 422		405 346	441 377	492 417	544 457	550 459	550 459		477 439	531 486	550 500	550 500	550 500	550 500	
31	310 237	349 266	380 289	424 320	468 350	510 379	550 410	550 410		379 314	413 341	460 378	509 413	550 444	550 444		446 397	497 440	550 480	550 480	550 480	550 480	
32	290 215	327 241	357 262	397 290	439 318	478 344	549 393	549 393		356 285	387 309	432 343	477 375	519 407	549 431		418 361	466 400	515 438	549 463	549 463	549 463	
33	273 196	308 220	335 239	373 265	413 289	449 313	532 368	532 368		334 259	364 282	406 312	448 342	488 370	532 404		393 329	438 364	484 399	527 432	532 435	532 435	
34	257 179	290 201	315 218	351 242	388 264	423 286	502 337	516 344		315 237	343 257	382 285	422 312	459 338	516 378		370 300	412 333	456 364	496 395	516 410	516 410	
35	242 164	273 184	297 200	331 221	366 242	399 262	473 308	501 324		297 217	323 236	360 261	398 286	433 310	501 356		349 275	389 305	430 333	468 361	501 389	501 389	
36	229 150	258 169	281 183	313 203	346 222	377 241	447 283	487 306		280 199	305 216	340 240	376 263	409 284	486 334		330 252	367 280	406 306	442 332	487 366	487 366	
37	216 138	244 155	266 169	296 187	327 205	356 222	423 260	474 290		265 183	289 199	322 221	356 242	387 262	460 308		312 232	348 257	384 282	418 305	474 344	474 344	
38	205 128	231 143	252 156	281 172	310 189	338 204	401 240	461 275		251 169	274 184	305 204	337 223	367 241	436 284		296 214	329 237	364 260	396 282	461 325	461 325	
39	195 118	219 132	239 144	266 159	294 174	320 189	380 222	449 261		238 156	260 170	289 188	320 206	348 223	413 262		280 198	313 219	346 240	376 260	447 306	449 308	
40	185 109	208 122	227 133	253 148	280 161	304 175	361 206	438 247		227 145	247 157	275 174	304 191	331 207	438 243		266 183	297 203	328 222	357 241	424 284	438 291	
41	176 101	198 114	216 124	241 137	266 150	290 162	344 191	427 235		215 134	235 146	262 162	289 177	315 192	374 225		253 170	283 189	312 206	340 224	404 263	427 277	
42	168 94	189 106	206 115	229 127	253 139	276 151	327 177	417 224		205 125	224 136	249 150	275 164	300 178	356 210		241 158	269 175	297 192	324 208	384 245	417 264	
43	160 88	180 98	196 107	219 118	242 130	263 140	312 165	406 213		196 116	213 126	238 140	263 153	286 166	339 195		230 147	257 163	284 179	309 194	367 228	407 252	
44	153 82	172 92	187 100	209 110	231 121	251 131	298 154	387 199		187 108	204 118	227 131	251 143	273 155	324 182		220 137	245 152	271 167	295 181	350 212	398 240	
45	146 76	164 86	179 93	199 103	220 113	240 122	285 144	370 185		179 101	194 110	217 122	240 133	261 145	310 170		210 128	234 142	259 156	282 169	334 198	389 229	
46	139 71	157 80	171 87	191 97	211 106	230 114	272 135	354 174		171 95	186 103	207 114	229 125	250 135	296 159		201 120	224 133	248 146	270 158	320 186	380 219	
47	133 67	150 75	164 82	183 90	202 99	220 107	261 126	339 163		164 89	178 96	199 107	219 117	239 127	284 149		192 112	214 125	237 136	258 148	306 174	372 210	
48	128 63	144 70	157 77	175 85	194 93	211 101	250 118	325 153		157 83	171 90	190 100	210 110	229 119	272 140		184 105	206 117	227 128	247 139	294 163	365 201	
49										150 78	164 85	183 94	202 103	220 112	261 131		177 99	197 110	218 120	237 130	282 153	357 193	
50										144 73	157 80	175 89	194 97	211 105	250 124		170 93	189 103	209 113	228 123	270 144	350 185	
51										139 69	151 75	168 83	186 91	203 99	241 116		163 88	182 97	201 106	219 115	260 136	338 175	
52										133 65	145 71	162 79	179 86	195 93	231 110		157 83	175 92	193 100	210 109	250 128	325 165	
53																	151 78	168 87	186 95	203 103	240 121	313 156	
54																	145 74	162 82	179 89	195 97	232 114	301 147	
55																	140 70	156 77	173 85	188 92	223 108	290 139	
56																	135 66	151 73	166 80	181 87	215 102	280 132	

STANDARD LOAD TABLE/OPEN WEB STEEL JOISTS, K-SERIES
Based on a Maximum Allowable Tensile Stress of 30 ksi

Joist Designation	30K7	30K8	30K9	30K10	30K11	30K12
Depth (In.)	30	30	30	30	30	30
Approx. Wt. (lbs./ft.)	12.3	13.2	13.4	15.0	16.4	17.6
Span (ft.) ↓						
30	550 543	550 543	550 543	550 543	550 543	550 543
31	534 508	550 520	550 520	550 520	550 520	550 520
32	501 461	549 500	549 500	549 500	549 500	549 500
33	471 420	520 460	532 468	532 468	532 468	532 468
34	443 384	490 420	516 441	516 441	516 441	516 441
35	418 351	462 384	501 415	501 415	501 415	501 415
36	395 323	436 353	475 383	487 392	487 392	487 392
37	373 297	413 325	449 352	474 374	474 374	474 374
38	354 274	391 300	426 325	461 353	461 353	461 353
39	336 253	371 277	404 300	449 333	449 333	449 333
40	319 234	353 256	384 278	438 315	438 315	438 315
41	303 217	335 238	365 258	427 300	427 300	427 300
42	289 202	320 221	348 240	413 282	417 284	417 284
43	276 188	305 206	332 223	394 263	407 270	407 270
44	263 176	291 192	317 208	376 245	398 258	398 258
45	251 164	278 179	303 195	359 229	389 246	389 246
46	241 153	266 168	290 182	344 214	380 236	380 236
47	230 144	255 157	277 171	329 201	372 226	372 226
48	221 135	244 148	266 160	315 188	362 215	365 216
49	212 127	234 139	255 150	303 177	347 202	357 207
50	203 119	225 130	245 141	291 166	333 190	350 199
51	195 112	216 123	235 133	279 157	320 179	343 192
52	188 106	208 116	226 126	268 148	308 169	336 184
53	181 100	200 109	218 119	258 140	296 159	330 177
54	174 94	192 103	209 112	249 132	285 150	324 170
55	168 89	185 98	202 106	240 125	275 142	312 161
56	162 84	179 92	195 100	231 118	265 135	301 153
57	156 80	173 88	188 95	223 112	256 128	290 145
58	151 76	167 83	181 90	215 106	247 121	280 137
59	146 72	161 79	175 86	208 101	239 115	271 130
60	141 69	156 75	169 81	201 96	231 109	262 124

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.

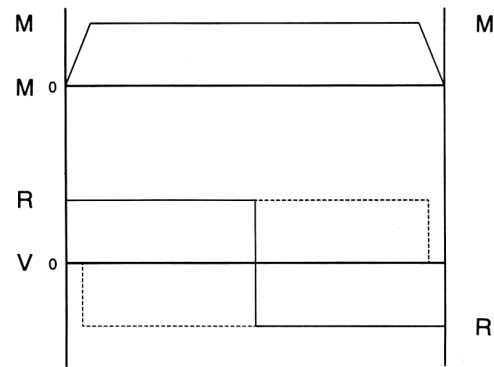
KCS Joist chords are designed for a flat positive moment envelope. The moment capacity is constant at all interior panels. The top chord end panel is designed for axial load based on the force in the first tension web, which is based on the specified shear. A uniform load of 550 plf (8020 N/m) is used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

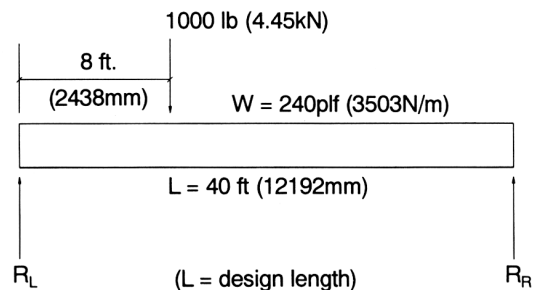
loads shall be provided to the joist manufacturer by the specifying professional.

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).



KCS JOIST
SHEAR AND MOMENT ENVELOPES

EXAMPLE 1



$$M = 625 \text{ in-kip (70.6 kN}\cdot\text{m)}$$
$$R_L = 5600 \text{ lbs. (24.9 kN), } R_R = 5000 \text{ lbs. (22.2 kN)}$$

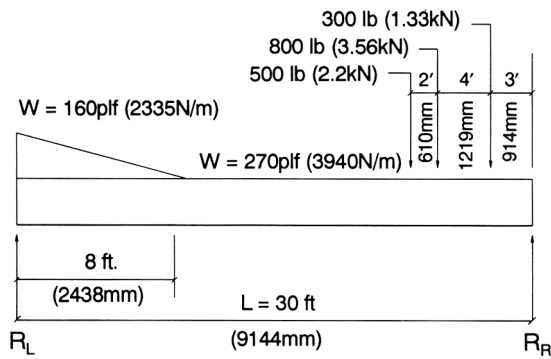
Select A 22KCS3, $M = 658 \text{ in-kip (74.3 kN}\cdot\text{m)}$
 $R = 6600 \text{ lbs. (29.3 kN)}$
Bridging section no. 9 for $L = 40 \text{ ft. (12192 mm)}$
Use 22K9 to determine bridging and stability requirements.

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, $M = 488$ in-kip (55.1 kN·m)

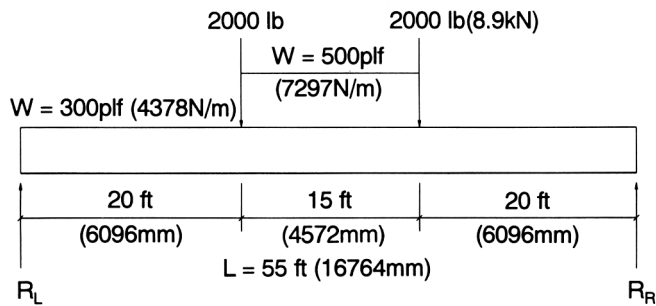
$$R = 5900 \text{ lbs. (26.2 kN)}$$

Bridging section no. 6 for $L = 30$ 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 kN).

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

Select two 28KCS5, $M = 1704$ in-kip (192.5 kN·m), $R = 9200$ lbs. (40.9 kN).

Bridging section no. 12 for $L = 55$ 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 - $W = 690$ 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



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.

**DOES NOT INCLUDE ACCESSORIES



ECONOMY TABLE

K-SERIES JOISTS

The table on the following pages is provided as an aid to the designer in selecting the most economical K-Series Joists for the loads and spans required. Although considerable care has been taken in developing this chart, it must be realized that each joist manufacturer has his own unique cost; consequently, the Steel Joist Institute cannot guaranty the accuracy of this Table.

The K-Series Joists are arranged in accordance with their weight per foot; where 2 or more joists weigh the same, they are arranged according to their depth.

To utilize this table, determine the span (ft.) and load (#/ft.) required; go to the required span in the left hand column, then read across until a load equal to or greater than the required load is reached. The first joist that satisfies this loading is the most economical joist for those conditions. If this joist is too deep or too shallow, or does not satisfy the deflection limitations, continue on horizontally to the right until a joist is found that satisfies the depth requirements as well as the load and deflection requirements.

EXAMPLE:

Floor joists @ 2'-6" on center, supporting a structural

concrete slab. (Section 5.9 of the Specifications limits the deflection due to the design live load to $\frac{1}{360}$ of the span).

Span = 30'- 0"

Maximum joist depth allowed = 20"

DL = 48 psf (includes joist weight)

LL + 100 psf

TL = 148 psf

$W = 148 \times 2.5 = 370 \text{ \#/ft.}$

$W_{LL} = 100 \times 2.5 = 250 \text{ \#/ft.}$

A 22K6 at a span of 30 feet can carry 371 #/ft. of Total Load and possesses a Live Load deflection figure of 266 #/ft. However, it exceeds the maximum depth limitation of 20 inches. A 20K7 fulfills the Total Load requirement but possesses a Live Load deflection figure of only 242 #/ft. It is then found that a 20K9 is the most economical joist that satisfies all the requirements of Total Load, Live Load deflection, and maximum depth limitation.

Where the joist span exceeds the unshaded area of the table, the row of bridging nearest the midspan shall be diagonal bridging with bolted connections at chords and midspan.



K-SERIES ECONOMY TABLE

Joist Designation	10K1	12K1	8K1	14K1	16K2	12K3	14K3	16K3	18K3	14K4	20K3	16K4	12K5	18K4	16K5	20K4
Depth (In.)	10	12	8	14	16	12	14	16	18	14	20	16	12	18	16	20
Approx. Wt. (lbs./ft.)	5.0	5.0	5.1	5.2	5.5	5.7	6.0	6.3	6.6	6.7	6.7	7.0	7.1	7.2	7.5	7.6
Span (ft.) ↓																
8			550 550													
9			550 550													
10	550 550		550 480													
11	550 542		532 377													
12	550 455	550 550	444 288			550 550							550 550			
13	479 363	550 510	377 225			550 510							550 510			
14	412 289	500 425	324 179	550 550		550 463	550 550			550 550			550 463			
15	358 234	434 344	281 145	511 475		543 428	550 507			550 507			550 434			
16	313 192	380 282	246 119	448 390	550 550	476 351	550 467	550 550		550 467		550 550	550 396		550 550	
17	277 159	336 234		395 324	512 488	420 291	495 404	550 526		550 443		550 526	550 366		550 526	
18	246 134	299 197		352 272	456 409	374 245	441 339	508 456	550 550	530 397		550 490	507 317	550 550	550 490	
19	221 113	268 167		315 230	408 347	335 207	395 287	455 386	514 494	475 336		547 452	454 269	550 523	550 455	
20	199 97	241 142		284 197	368 297	302 177	356 246	410 330	463 423	428 287	517 517	493 386	409 230	550 490	550 426	550 550
21		218 123		257 170	333 255	273 153	322 212	371 285	420 364	388 248	468 453	447 333	370 198	506 426	503 373	550 520
22		199 106		234 147	303 222	249 132	293 184	337 247	382 316	353 215	426 393	406 289	337 172	460 370	458 323	514 461
23		181 93		214 128	277 194	227 116	268 160	308 216	349 276	322 188	389 344	371 252	308 150	420 323	418 282	469 402
24		166 81		196 113	254 170	208 101	245 141	283 189	320 242	295 165	357 302	340 221	282 132	385 284	384 248	430 353
25				180 100	234 150		226 124	260 167	294 214	272 145	329 266	313 195		355 250	353 219	396 312
26				166 88	216 133		209 110	240 148	272 190	251 129	304 236	289 173		328 222	326 194	366 277
27				154 79	200 119		193 98	223 132	252 169	233 115	281 211	268 155		303 198	302 173	339 247
28				143 70	186 106		180 88	207 118	234 151	216 103	261 189	249 138		282 177	281 155	315 221
29					173 95			193 106	218 136		243 170	232 124		263 159	261 139	293 199
30					161 86			180 96	203 123		227 153	216 112		245 144	244 126	274 179
31					151 78			168 87	190 111		212 138	203 101		229 130	228 114	256 162
32					142 71			158 79	178 101		199 126	190 92		215 118	214 103	240 147
33									168 92		187 114			202 108		226 134
34									158 84		176 105			190 98		212 122
35									149 77		166 96			179 90		200 112
36									141 70		157 88			169 82		189 103
37											148 81					179 95
38											141 74					170 87
39											133 69					161 81
40											127 64					153 75

K-SERIES ECONOMY TABLE

Joist Designation	14K6	18K5	22K4	16K6	20K5	24K4	18K6	16K7	22K5	20K6	18K7	22K6	20K7	24K5	22K7	24K6
Depth (In.)	14	18	22	16	20	24	18	16	22	20	18	22	20	24	22	24
Approx. Wt. (lbs./ft.)	7.7	7.7	8.0	8.1	8.2	8.4	8.5	8.6	8.8	8.9	9.0	9.2	9.3	9.3	9.7	9.7
Span (ft.) ↓																
14	550 550															
15	550 507															
16	550 467			550 550				550 550								
17	550 443			550 526				550 526								
18	550 408	550 550		550 490			550 550	550 490			550 550					
19	550 383	550 523		550 455			550 523	550 455			550 523					
20	525 347	550 490		550 426	550 550		550 490	550 426		550 550	550 490		550 550			
21	475 299	550 460		548 405	550 520		550 460	550 406		550 520	550 460		550 520			
22	432 259	518 414	550 548	498 351	550 490		550 438	550 385	550 548	550 490	550 438	550 548	550 490		550 548	
23	395 226	473 362	518 491	455 307	529 451		516 393	507 339	550 518	550 468	550 418	550 518	550 468		550 518	
24	362 199	434 318	475 431	418 269	485 396	520 516	473 345	465 298	536 483	528 430	526 382	550 495	550 448	550 544	550 495	550 544
25	334 175	400 281	438 381	384 238	446 350	479 456	435 305	428 263	493 427	486 380	485 337	537 464	541 421	540 511	550 474	550 520
26	308 156	369 249	404 338	355 211	412 310	442 405	402 271	395 233	455 379	449 337	448 299	496 411	500 373	499 453	550 454	543 493
27	285 139	342 222	374 301	329 188	382 277	410 361	372 241	366 208	422 337	416 301	415 267	459 367	463 333	462 404	512 406	503 439
28	265 124	318 199	348 270	306 168	355 248	381 323	346 216	340 186	392 302	386 269	385 239	427 328	430 298	429 362	475 364	467 393
29		296 179	324 242	285 151	330 223	354 290	322 194	317 167	365 272	360 242	359 215	398 295	401 268	400 325	443 327	435 354
30		276 161	302 219	266 137	308 201	331 262	301 175	296 151	341 245	336 218	335 194	371 266	374 242	373 293	413 295	406 319
31		258 146	283 198	249 124	289 182	310 237	281 158	277 137	319 222	314 198	313 175	347 241	350 219	349 266	387 267	380 289
32		242 132	265 180	233 112	271 165	290 215	264 144	259 124	299 201	295 179	294 159	326 219	328 199	327 241	363 242	357 262
33		228 121	249 164		254 150	273 196	248 131		281 183	277 163	276 145	306 199	309 181	308 220	341 221	335 239
34		214 110	235 149		239 137	257 179	233 120		265 167	261 149	260 132	288 182	290 165	290 201	321 202	315 218
35		202 101	221 137		226 126	242 164	220 110		249 153	246 137	245 121	272 167	274 151	273 184	303 185	297 200
36		191 92	209 126		213 115	229 150	208 101		236 141	232 125	232 111	257 153	259 139	258 169	286 169	281 183
37			198 116		202 106	216 138			223 130	220 115		243 141	245 128	244 155	271 156	266 169
38			187 107		191 98	205 128			211 119	208 106		230 130	232 118	231 143	256 144	252 156
39			178 98		181 90	195 118			200 110	198 98		218 120	220 109	219 132	243 133	239 144
40			169 91		172 84	185 109			190 102	188 91		207 111	209 101	208 122	231 123	227 133
41			161 85			176 101			181 95			197 103		198 114	220 114	216 124
42			153 79			168 94			173 88			188 96		189 106	209 106	206 115
43			146 73			160 88			165 82			179 89		180 98	200 99	196 107
44			139 68			153 82			157 76			171 83		172 92	191 92	187 100
45						146 76								164 86		179 93
46						139 71								157 80		171 87
47						133 67								150 75		164 82
48						128 63								144 70		157 77

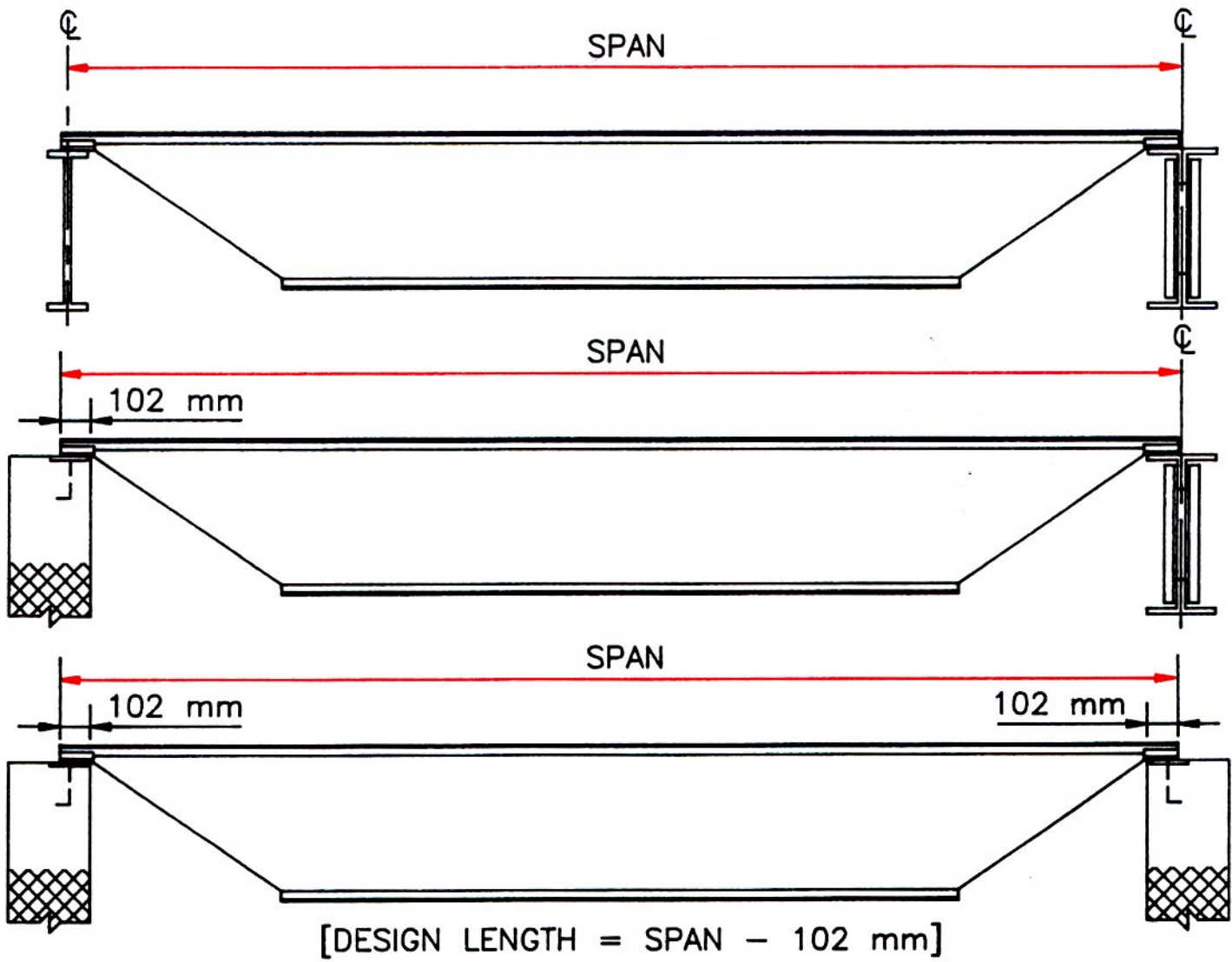
K-SERIES ECONOMY TABLE

Joist Designation	26K5	16K9	24K7	18K9	26K6	20K9	26K7	22K9	28K6	24K8	18K10	28K7	24K9	26K8	20K10	26K9
Depth (In.)	26	16	24	18	26	20	26	22	28	24	18	28	24	26	20	26
Approx. Wt. (lbs./ft.)	9.8	10.0	10.1	10.2	10.6	10.8	10.9	11.3	11.4	11.5	11.7	11.8	12.0	12.1	12.2	12.2
Span (ft.) ↓																
16		550														
17		550														
18		550		550							550					
19		550		550							550					
20		550		550		550					550				550	
21		550		550		550					550				550	
22		550		550		550		550			550				550	
23		550		550		550		550			550				550	
24		550	550	550		550		550		550	550		550		550	
25		514	550	550		550		550		550	550		550		550	
26	542	474	550	538	550	550	550	550		550	550		550	550	550	550
27	502	439	550	498	547	550	550	550		550	550		550	550	550	550
28	466	408	521	463	508	517	550	550	548	550	548	550	550	550	550	550
29	434	380	485	431	473	482	527	532	511	536	511	550	550	550	550	550
30	405	355	453	402	441	450	492	497	477	500	477	531	544	544	533	550
31	379	332	424	376	413	421	460	465	446	468	446	497	510	509	499	550
32	356	311	397	353	387	395	432	436	418	439	418	466	478	477	468	519
33	334		373	332	364	371	406	410	393	413	393	438	449	448	440	488
34	315		351	312	343	349	382	386	370	388	370	412	423	422	414	459
35	297		331	294	323	329	360	364	349	366	349	389	399	398	390	433
36	280		313	278	305	311	340	344	330	346	330	367	377	376	369	409
37	265		296		289	294	322	325	312	327	312	348	356	356	349	387
38	251		281		274	279	305	308	296	310		329	338	337	331	367
39	238		266		260	265	289	292	280	294		313	320	320	314	348
40	227		253		247	251	275	278	266	280		297	304	304	298	331
41	215		241		235		262	264	253	266		283	290	289		315
42	205		229		224		249	252	241	253		269	276	275		300
43	196		219		213		238	240	230	242		257	263	263		286
44	187		209		204		227	229	220	231		245	251	251		273
45	179		199		194		217		210	220		234	240	240		261
46	171		191		186		207		201	211		224	230	229		250
47	164		183		178		199		192	202		214	220	219		239
48	157		175		171		190		184	194		206	211	210		229
49	150				164		183		177			197		202		220
50	144				157		175		170			189		194		211
51	139				151		168		163			182		186		203
52	133				145		162		157			175		179		195
53									151			168				
54									145			162				
55									140			156				
56									135			151				

K-SERIES ECONOMY TABLE

Joist Designation	30K7	22K10	28K8	28K9	24K10	30K8	30K9	22K11	26K10	28K10	30K10	24K12	30K11	26K12	28K12	30K12
Depth (In.)	30	22	28	28	24	30	30	22	26	28	30	24	30	26	28	30
Approx. Wt. (lbs./ft.)	12.3	12.6	12.7	13.0	13.1	13.2	13.4	13.8	13.8	14.3	15.0	16.0	16.4	16.6	17.1	17.6
Span (ft.)																
22		550 548						550 548								
23		550 518						550 518								
24		550 495			550 544			550 495				550 544				
25		550 474			550 520			550 474				550 520				
26		550 454			550 499			550 454	550 541			550 499		550 541		
27		550 432			550 479			550 432	550 522			550 479		550 522		
28		550 413	550 543	550 543	550 456			550 413	550 501	550 543		550 456		550 501	550 543	
29		550 399	550 522	550 522	550 436			550 399	550 479	550 522		550 436		550 479	550 522	
30	550 543	550 385	550 500	550 500	550 422	550 543	550 543	550 385	550 459	550 500	550 543	550 422	550 543	550 459	550 500	550 543
31	534 508	550 369	550 480	550 480	550 410	550 520	550 520	550 369	550 444	550 480	550 520	550 410	550 520	550 444	550 480	550 520
32	501 461	517 337	515 438	549 463	549 393	549 500	549 500	549 355	549 431	549 463	549 500	549 393	549 500	549 431	549 463	549 500
33	471 420	486 307	484 399	527 432	532 368	520 460	532 468	532 334	532 404	532 435	532 468	532 368	532 468	532 404	532 435	532 468
34	443 384	458 280	456 364	496 395	502 337	490 420	516 441	516 314	516 378	516 410	516 441	516 344	516 441	516 378	516 410	516 441
35	418 351	432 257	430 333	468 361	473 308	462 384	501 415	494 292	501 356	501 389	501 415	501 324	501 415	501 356	501 389	501 415
36	395 323	408 236	406 306	442 332	447 283	436 353	475 383	467 269	486 334	487 366	487 392	487 306	487 392	487 334	487 366	487 392
37	373 297	386 217	384 282	418 305	423 260	413 325	449 352	442 247	460 308	474 344	474 374	474 290	474 374	474 315	474 344	474 374
38	354 274	366 200	364 260	396 282	401 240	391 300	426 325	419 228	436 284	461 325	461 353	461 275	461 353	461 299	461 325	461 353
39	336 253	347 185	346 240	376 260	380 222	371 277	404 300	397 211	413 262	447 306	449 333	449 261	449 333	449 283	449 308	449 333
40	319 234	330 171	328 222	357 241	361 206	353 256	384 278	377 195	393 243	424 284	438 315	438 247	438 315	438 269	438 291	438 315
41	303 217	314 159	312 206	340 224	344 191	335 238	365 258	359 181	374 225	404 263	427 300	427 235	427 300	427 256	427 277	427 300
42	289 202	299 148	297 192	324 208	327 177	320 221	348 240	342 168	356 210	384 245	413 282	417 224	417 284	417 244	417 264	417 284
43	276 188	285 138	284 179	309 194	312 165	305 206	332 223	326 157	339 195	367 228	394 263	406 213	407 270	407 232	407 252	407 270
44	263 176	272 128	271 167	295 181	298 154	291 192	317 208	311 146	324 182	350 212	376 245	387 199	398 258	398 222	398 240	398 258
45	251 164		259 156	282 169	285 144	278 179	303 195		310 170	334 198	359 229	370 185	389 246	389 212	389 229	389 246
46	241 153		248 146	270 158	272 135	266 168	290 182		296 159	320 186	344 214	354 174	380 236	380 203	380 219	380 236
47	230 144		237 136	258 148	261 126	255 157	277 171		284 149	306 174	329 201	339 163	372 226	369 192	372 210	372 226
48	221 135		227 128	247 139	250 118	244 148	266 160		272 140	294 163	315 188	325 153	362 215	353 180	365 201	365 216
49	212 127		218 120	237 130		234 139	255 150		261 131	282 153	303 177		347 202	339 169	357 193	357 207
50	203 119		209 113	228 123		225 130	245 141		250 124	270 144	291 166		333 190	325 159	350 185	350 199
51	195 112		201 106	219 115		216 123	235 133		241 116	260 136	279 157		320 179	313 150	338 175	343 192
52	188 106		193 100	210 109		208 116	226 126		231 110	250 128	268 148		308 169	301 142	325 165	336 184
53	181 100		186 95	203 103		200 109	218 119		240 121	258 140			296 159		313 156	330 177
54	174 94		179 89	195 97		192 103	209 112		232 114	249 132			285 150		301 147	324 170
55	168 89		173 85	188 92		185 98	202 106		223 108	240 125			275 142		290 139	312 161
56	162 84		166 80	181 87		179 92	195 100		215 102	231 118			265 135		280 132	301 153
57	156 80					173 88	188 95						223 112			290 145
58	151 76					167 83	181 90						215 106			280 137
59	146 72					161 79	175 86						208 101			271 130
60	141 69					156 75	169 81						201 96			262 124

DEFINITION OF SPAN (SYSTEME INTERNATIONAL)



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:

$I_j = 2.6953 (W_{LL})(L^3)(10^{-5})$, where W_{LL} = **RED** figure in the Load Table: L = (span-102) 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 exceeds the unshaded area of the load table, the row of bridging nearest the mid span shall be diagonal bridging with bolted connections at the chords and intersections.



**STANDARD LOAD TABLE IN METRIC UNITS/OPEN WEB STEEL JOISTS, K-SERIES
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)																
↓																
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	8.02 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	7.22 5.89	8.02 6.46	8.02 6.46	8.02 7.47	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02	8.02 8.02
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) ↓																					
5486	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														
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							
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							
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
12496								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
12801															2.34	2.64	2.87	3.21	3.85	4.58	5.23
13106															1.24	1.38	1.50	1.66	1.97	2.32	2.64
13411															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
															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
															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



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)																					
↓																					
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 6.40	7.34 6.99	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 2.99	4.77 3.23	5.19 3.79	6.17 4.23	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	6.12 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

**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) ↓						
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

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 2½ 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 7½ inches (191 mm) for section numbers 18 and 19. The standard pitch is ⅛ inch in 12 inches (1:96). The nom-



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inal 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 7½ inches (191mm) for Joist Girders weighing 60 pounds per lineal foot (89 kg/m) or more. The standard pitch is ⅛ 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 ¼ inch in 12 inches (1:48). For Open Web Steel Joists, K-Series, bearing ends will not be beveled for slopes of ¼ 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

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" (2626mm)	10'- 0" (3048mm)	12'- 6" (3810mm)
11 and 12	2'- 7" (787mm)	4'- 0" (1219mm)	5'- 8" (1727mm)	7'- 6" (2286mm)	8'- 7" (2626mm)	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" (2289mm)	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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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.

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 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 ℓ/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 88).

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 ℓ/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 FOR BIDDING

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 ($\frac{1}{3}$) 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.**

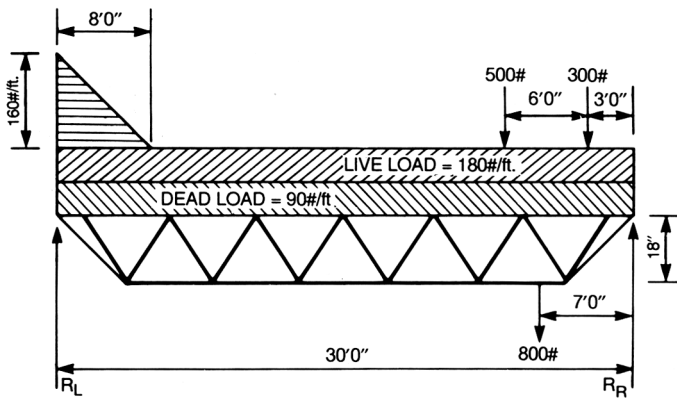
Loads such as Bulb "T"s, purlins, partitions, heavy pipes, monorail or tramrail type carrier, etc., running normal to the length of the joist, or a mechanical unit mounted on the joist, are concentrated loads. Where concentrated loads occur, the joist must be selected to carry the full combination of 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. Using the largest of the 2 uniform loads in B and C, select a joist from the load table and add an "SP" after the joist designation.
 - E. Place the designation under the sketch with the following note:
"Joist supplier to design joist to support loads as shown above."



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.

$$\text{Total Load} = \frac{160}{2} (8) + (180 + 90)30 + 500 + 800 + 300 = 10,300 \text{ lbs.}$$

$$R_L = \frac{160(8)}{2} \left[\frac{30 - \frac{8}{3}}{30} \right] + \frac{(180+90)(30)}{2} + 500 \left[\frac{9}{30} \right] + 800 \left[\frac{7}{30} \right] + 300 \left[\frac{3}{30} \right] =$$

$$R_L = 5000 \text{ lbs.}$$

$$R_R = 5340 \text{ lbs.}$$

$$\text{Assume } R_R = \frac{W_{e1}(L)}{2}, W_{e1} = \frac{2(5340)}{30} = 356 \text{ lbs/ft.}$$

Point of Max. Mom. = Point of Zero Shear (V) = L_1
 (dist. from rt. end of Jst.)

$$V = \text{Zero} = 5340 - (300+500+800) - (180+90)(L_1)$$

$$L_1 = 13.85 \text{ ft.}$$

$$M @ L_1 = 5340 (13.85) - 300(10.85) -$$

$$800(6.86) - 500(4.85) - \frac{(180+90)(13.85)^2}{2}$$

$$M = 36,903 \text{ ft. lbs.}$$

$$\text{Assume } M = \frac{W_{e2}(L)^2}{8}, W_{e2} = \frac{8(36,903)}{(30)^2} = 328 \text{ lbs/ft.}$$

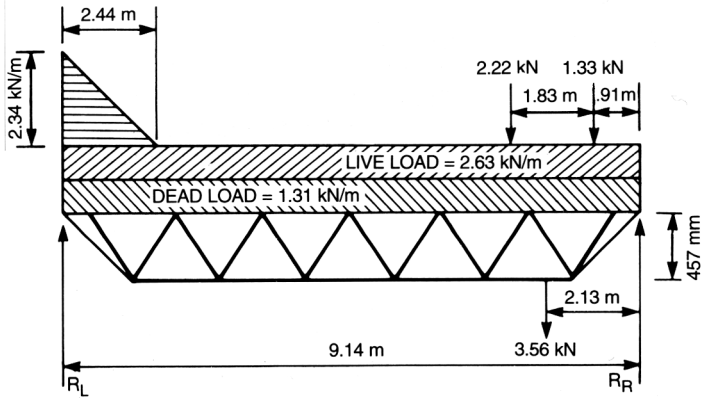
Using $W_{e1} = 356 \text{ lb/ft. @ SPAN} = 30'$,
 and $D = 18''$

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.



METRIC EXAMPLE:



18K9 SP

(See Method of Joist Selection Below)

Joist supplier to design joist to support loads as shown above.

$$\text{Total Load} = \left[\frac{2.34}{2} \right] (2.44) + (2.63 + 1.31)9.14 + 2.22 + 3.56 + 1.33 =$$

$$\text{Total Load} = 2.86 + 36.01 + 2.22 + 3.56 + 1.33 = 45.98 \text{ kN}$$

$$R_L = \frac{2.34(2.44)}{2} \times \frac{9.14 - (2.44/3)}{9.14} + \frac{(2.63 + 1.31)9.14}{2} + 2.22 \left[\frac{2.74}{9.14} \right] + 3.56 \left[\frac{2.13}{9.14} \right] + 1.33 \left[\frac{.91}{9.14} \right] =$$

$$R_L = (2.86 \times .91) + 18.01 + .67 + .83 + .13 = 22.24 \text{ kN}$$

$$R_R = 45.98 - 22.24 = 23.74 \text{ kN}$$

$$\text{Assume } R_R = \frac{W_{e1}(L)}{2}, W_{e1} = \frac{2(23.75)}{9.14} = 5.20 \text{ kN/m}$$

Point of Max. Mom. = zero Shear (V) = L_1 (dist. from right end of joist)

$$V = \text{Zero} = 23.75 - (1.31 + 2.22 + 3.56) - (2.63 + 1.31)(L_1)$$

$$L_1 = 4.23 \text{ m}$$

$$M @ L_1 = 23.75 (4.23) - 1.33(3.32) -$$

$$2.22(1.49) - 3.56(2.10) - \frac{(2.63 + 1.31)(4.23)^2}{2} =$$

$$\text{Moment @ } L_1 = 50.01 \text{ kN-m}$$

$$\text{Assume } M = \frac{W_{e2}(L)^2}{8}, \text{ where } W_{e2} = \frac{8(50.01)}{(9.14)^2} = 4.79 \text{ N/m}$$

Using $W_{e1} = 5.20 \text{ kN/m}$ @ SPAN = 9.14 m, and $d = 457 \text{ mm}$

Select 18K9 for total load (5.86 kN/m) and live load of (3.34 kN/m)

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 an 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 welded 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 in 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.



