TABLE OF CONTENTS

NEW MILLENNIUM
BUILDING SYSTEMS

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LIABILITY STATEMENT

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OUR FACILITIES

New Millennium Building Systems (NMBS) is a wholly-owned subsidiary of Steel Dynamics, Inc., manufacturing a complete range of joist and deck products. NMBS is a Company Member of both the Steel Joist Institute and the Steel Deck Institute.

Joist products include K, LH and DLH Series joists and joist girders, designed and manufactured in accordance with the specifications of the Steel Joist Institute. NMBS can also provide CJ Series joists (Composite Joist), designed and manufactured in accordance with the specifications of the Steel Joist Institute.

To locate the NMBS service representative in your immediate area, please call or visit www.newmill.com.

Locations:

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Fallon, Nevada
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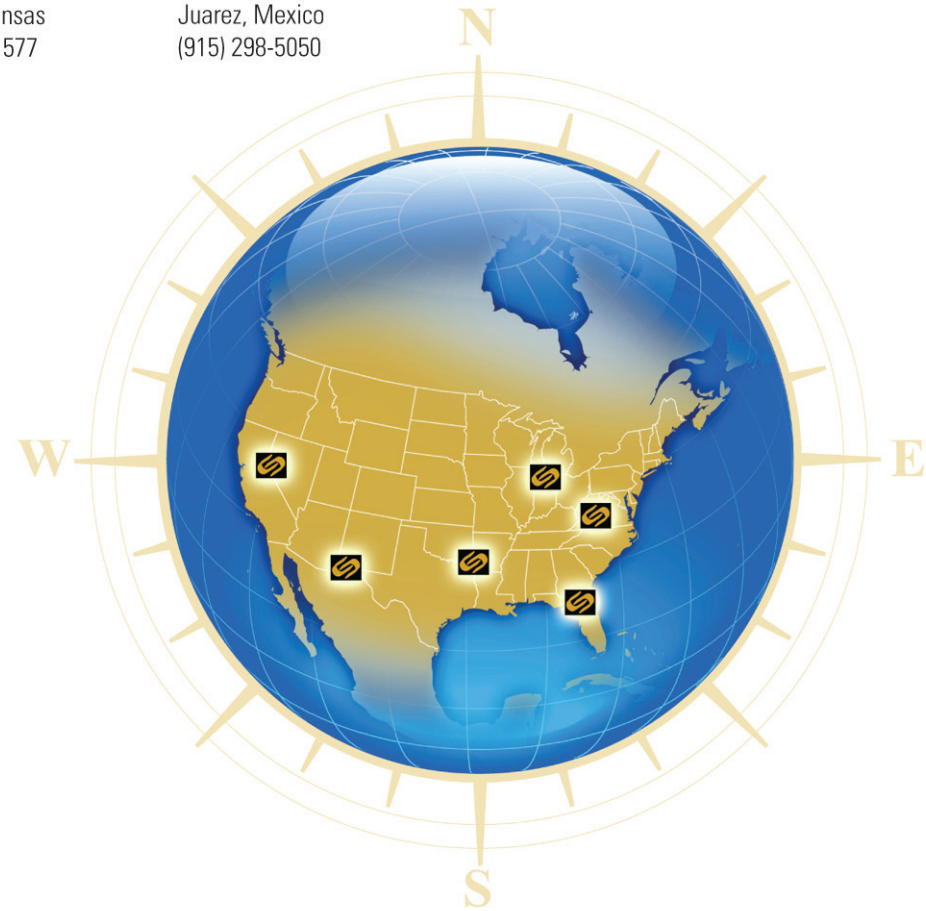


QUALITY ASSURANCE

JOIST CERTIFICATIONS

- Steel Joist Institute Member Company fully certified to manufacture K, LH, DLH Series, and Joist Girder Series.
- Welders are certified in accordance with AWS D1.1 and D1.3.
- Additionally, Indiana and Ohio facilities are certified in accordance with the requirements of the current IBC/Michigan Building Code, Chapter 17, Section 1705, Paragraph 2.2
- Additionally, Florida facility is certified in accordance with the requirements of the current Miami-Dade County, Florida Building Code, Article IV, Chapter 8 and the current Houston, Texas Building Code, Section 1704.2.2.

COMBINED SJI BRIDGING TABLES

TABLE 2.6-2
K, LH & DLH - SERIES JOISTS
MAXIMUM JOIST SPACING FOR DIAGONAL BRIDGING

	BRIDGING ANGLE SIZE - (Equal Leg Angles)				
Joist Depth	1 x 7/64 r = .20"	1 1/4 x 7/64 r = .25"	1 1/2 x 7/64 r = .30"	1 3/4 x 7/64 r = .35"	2 x 1/8 r = .40"
12	6' - 6"	8' - 3"	9' - 11"	11' - 7"	
14	6' - 6"	8' - 3"	9' - 11"	11' - 7"	
16	6' - 6"	8' - 2"	9' - 10"	11' - 6"	
18	6' - 6"	8' - 2"	9' - 10"	11' - 6"	
20	6' - 5"	8' - 2"	9' - 10"	11' - 6"	
22	6' - 4"	8' - 1"	9' - 10"	11' - 6"	
24	6' - 4"	8' - 1"	9' - 9"	11' - 5"	
26	6' - 3"	8' - 0"	9' - 9"	11' - 5"	
28	6' - 2"	8' - 0"	9' - 8"	11' - 5"	
30	6' - 2"	7' - 11"	9' - 8"	11' - 4"	
32	6' - 1"	7' - 10"	9' - 7"	11' - 4"	13' - 0"
36		7' - 9"	9' - 6"	11' - 3"	12' - 11"
40		7' - 7"	9' - 5"	11' - 2"	12' - 10"
44		7' - 5"	9' - 3"	11' - 0"	12' - 9"
48		7' - 3"	9' - 2"	10' - 11"	12' - 8"
52			9' - 0"	10' - 9"	12' - 7"
56			8' - 10"	10' - 8"	12' - 5"
60			8' - 7"	10' - 6"	12' - 4"
64			8' - 5"	10' - 4"	12' - 2"
68			8' - 2"	10' - 2"	12' - 0"
72			8' - 0"	10' - 0"	11' - 10"

MINIMUM A307 BOLT REQUIRED FOR CONNECTION

SERIES	SECTION NUMBER*	BOLT DIAMETER
K	ALL	3/8 "
LH / DLH	2 - 12	3/8 "
LH / DLH	13 - 17	1/2 "
DLH	18 & 19	5/8 "

*Refer to last digit(s) of Joist Designation.

BRIDGING SELECTION TABLE FOR KCS JOISTS

Joist Designation	Bridging Table Section Number	Joist Designation	Bridging Table Section Number
10KCS1	1	20KCS5	10
10KCS2	1	22KCS2	6
10KCS3	1	22KCS3	9
12KCS1	3	22KCS4	11
12KCS2	5	22KCS5	11
12KCS3	5	24KCS2	6
14KCS1	4	24KCS3	9
14KCS2	6	24KCS4	12
14KCS3	6	24KCS5	12
16KCS2	6	26KCS2	6
16KCS3	9	26KCS3	9
16KCS4	9	26KCS4	12
16KCS5	9	26KCS5	12
18KCS2	6	28KCS2	6
18KCS3	9	28KCS3	9
18KCS4	10	28KCS4	12
18KCS5	10	28KCS5	12
20KCS2	6	30KCS3	9
20KCS3	9	30KCS4	12
20KCS4	10	30KCS5	12

OSHA TABLES A and B
ERECTION BRIDGING

Joist	Span	Joist	Span
12K1	23' - 0"	30K9	45' - 0"
14K1	27' - 0"	30K10	50' - 0"
16K2	29' - 0"	30K11	52' - 0"
16K3	30' - 0"	30K12	54' - 0"
16K4	32' - 0"	18KCS2	35' - 0"
16K5	32' - 0"	20KCS2	36' - 0"
18K3	31' - 0"	20KCS3	39' - 0"
18K4	32' - 0"	22KCS2	36' - 0"
18K5	33 - 0"	22KCS3	40' - 0"
18K6	35' - 0"	24KCS2	39' - 0"
20K3	32' - 0"	24KCS3	44' - 0"
20K4	34' - 0"	26KCS2	39' - 0"
20K5	34' - 0"	26KCS3	44' - 0"
20K6	36' - 0"	28KCS2	40' - 0"
20K7	39' - 0"	28KCS3	45' - 0"
20K9	39' - 0"	28KCS4	53' - 0"
22K4	34' - 0"	28KCS5	53' - 0"
22K5	35' - 0"	30KCS3	45' - 0"
22K6	36' - 0"	30KCS4	54' - 0"
22K7	40' - 0"	30KCS5	54' - 0"
22K9	40' - 0"	18LH02	33' - 0"
24K4	36' - 0"	20LH02	33' - 0"
24K5	38' - 0"	20LH03	38' - 0"
24K6	39' - 0"	24LH03	35' - 0"
24K7	43' - 0"	24LH04	39' - 0"
24K8	43' - 0"	24LH05	40' - 0"
24K9	44' - 0"	24LH06	45' - 0"
26K5	38' - 0"	28LH05	42' - 0"
26K6	39' - 0"	28LH06	46' - 0"
26K7	43' - 0"	28LH07	54' - 0"
26K8	44' - 0"	28LH08	54' - 0"
26K9	44' - 0"	32LH06	47' - 0"
26K10	49' - 0"	32LH07	47' - 0"
28K6	40' - 0"	32LH08	55' - 0"
28K7	43' - 0"	36LH07	47' - 0"
28K8	44' - 0"	36LH08	47' - 0"
28K9	45' - 0"	36LH09	57' - 0"
28K10	49' - 0"	40LH08	47' - 0"
28K12	53' - 0"	40LH09	52' - 0"
30K7	44' - 0"	44LH09	52' - 0"
30K8	45' - 0"		

Joists not listed above do not require OSHA erection bridging through spans per SJI Specifications 5.2 and 104.2 or 60'-0".

COMBINED SJI BRIDGING TABLES

TABLE 2.6-1a
K - SERIES JOISTS
MAXIMUM JOIST SPACING FOR HORIZONTAL BRIDGING

Section Number*	BRIDGING MATERIAL SIZE**						
	Round Rod	Equal Leg Angles					
	1/2" round r = .13"	1 x 7/64 r = .20"	1-1/4 x 7/64 r = .25"	1-1/2 x 7/64 r = .30"	1-3/4 x 7/64 r = .35"	2 x 1/8 r = .40"	2-1/2 x 5/32 r = .50"
1 thru 9	3' - 3"	5' - 0"	6' - 3"	7' - 6"	8' - 7"	10' - 0"	12' - 6"
10	3' - 0"	4' - 8"	6' - 3"	7' - 6"	8' - 7"	10' - 0"	12' - 6"
11 and 12	2' - 7"	4' - 0"	5' - 8"	7' - 6"	8' - 7"	10' - 0"	12' - 6"

*Refer to last digit(s) of joist designation.

** Connection to Joist must resist 700 pounds.

TABLE 2.6-1b
LH - SERIES JOISTS
MAXIMUM JOIST SPACING FOR HORIZONTAL BRIDGING
SPANS OVER 60 ft. REQUIRE BOLTED DIAGONAL BRIDGING

Section Number*	BRIDGING ANGLE SIZE** - (Equal Leg Angles)					
	1 x 7/64 r = .20"	1 1/4 x 7/64 r = .25"	1 1/2 x 7/64 r = .30"	1 3/4 x 7/64 r = .35"	2 x 1/8 r = .40"	2 1/2 x 5/32 r = .50"
02, 03, 04	4' - 7"	6' - 3"	7' - 6"	8' - 9"	10' - 0"	12' - 4"
05 - 06	4' - 1"	5' - 9"	7' - 6"	8' - 9"	10' - 0"	12' - 4"
07 - 08	3' - 9"	5' - 1"	6' - 8"	8' - 6"	10' - 0"	12' - 4"
09 - 10		4' - 6"	6' - 0"	7' - 8"	10' - 0"	12' - 4"
11 - 12		4' - 1"	5' - 5"	6' - 10"	8' - 11"	12' - 4"
13 - 14		3' - 9"	4' - 11"	6' - 3"	8' - 2"	12' - 4"
15 - 16			4' - 3"	5' - 5"	7' - 1"	11' - 0"
17			4' - 0"	5' - 1"	6' - 8"	10' - 5"

* Refer to last two digits of joist designation.

** Connection to joist must resist force listed in Table 104.5.1.

TABLE 5.4-1
NUMBER OF ROWS OF BRIDGING**
Refer to K-Series Load Table and Specification Section 6 for required bolted diagonal bridging.
Distances are Joist Span lengths - See "Definition of Span" on page 23.

Section Number*	One Row	Two Rows	Three Rows	Four Rows	Five 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'	

*Refer to last digit(s) of joist designation.

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

TABLE 104.5-1

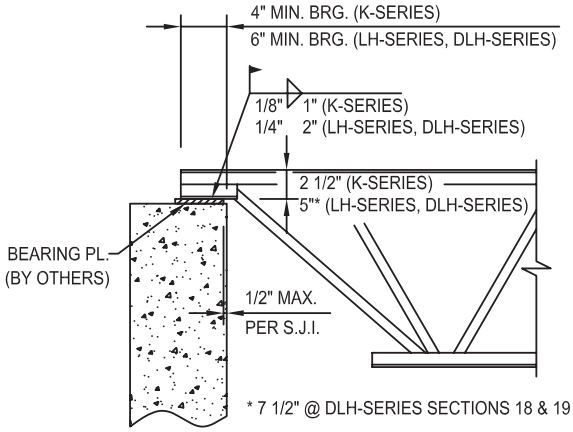
LH, DLH Section Number*	Max. Spacing of Bridging Lines	Nominal Horizontal Bracing Force**
02, 03, 04	11' - 0"	400
05, 06	12' - 0"	500
07, 08	13' - 0"	650
09, 10	14' - 0"	800
11, 12	16' - 0"	1000
13, 14	16' - 0"	1200
15, 16	21' - 0"	1600
17	21' - 0"	1800
18, 19	26' - 0"	2000

Number of lines of bridging is based on joist clear span dimensions.

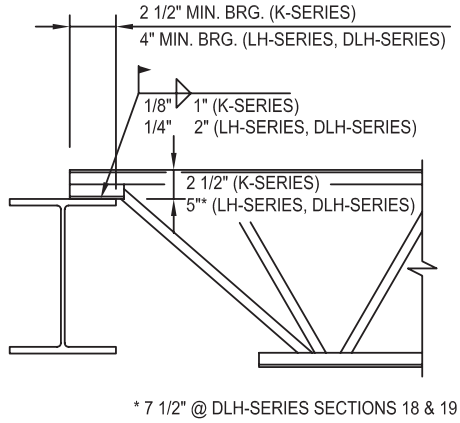
*Refer to last two digits of joist designation.

** Nominal bracing force is unfactored (lbs.).

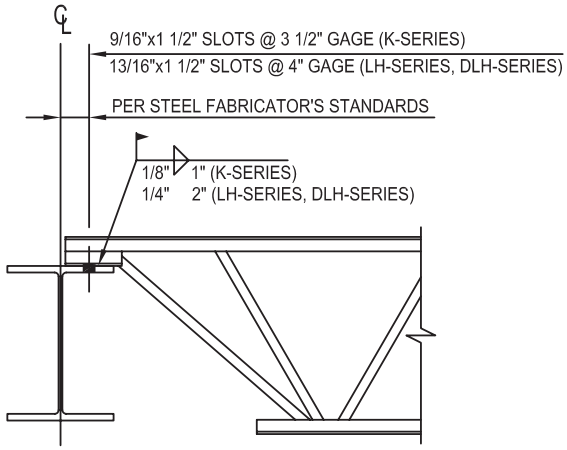
STANDARD JOIST DETAILS



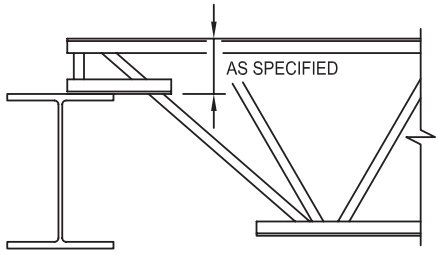
MASONRY BEARING



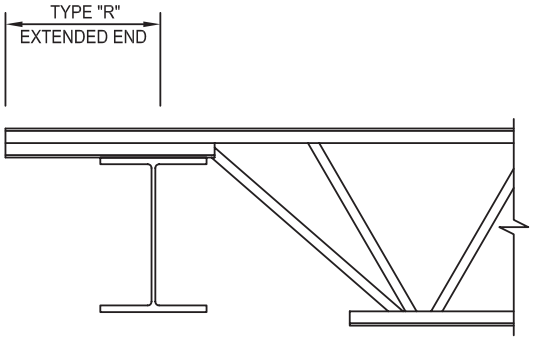
STEEL BEARING



BOLTED CONNECTION

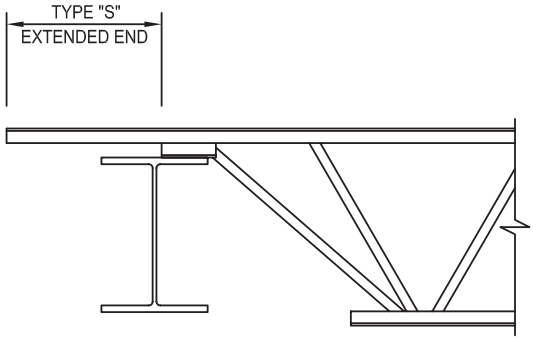


DEEP BEARING SEATS



EXTENDED ENDS WILL BE DESIGNED FOR THE JOIST UNIFORM LOAD IF NOT OTHERWISE SPECIFIED.

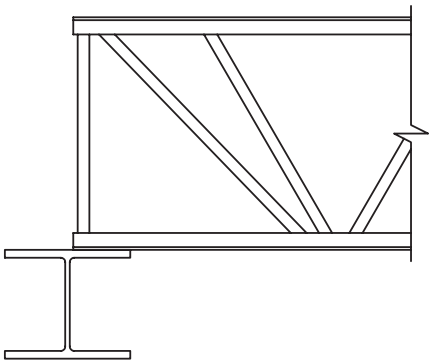
TYPE “R” EXTENDED END



EXTENDED ENDS WILL BE DESIGNED FOR THE JOIST UNIFORM LOAD IF NOT OTHERWISE SPECIFIED.

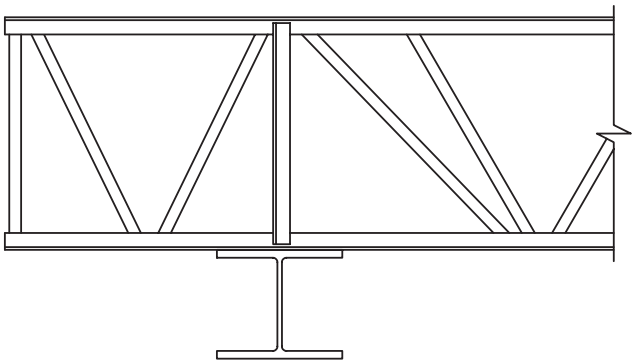
TYPE “S” EXTENDED END

STANDARD JOIST DETAILS



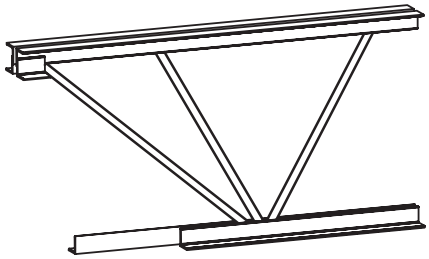
NOTE: A ROW OF DIAGONAL BRIDGING IS REQUIRED NEAR THE SUPPORT, SEE SJI SPECIFICATION SECTIONS 5.4(d) AND 104.5(f). ERECT JOISTS WITH CAMBER UPWARD.

SQUARE END

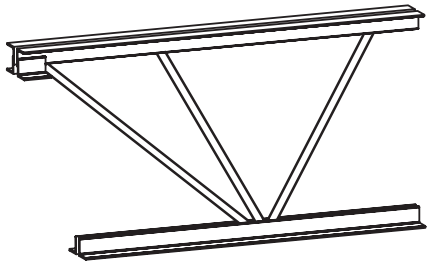


NOTE: A ROW OF DIAGONAL BRIDGING IS REQUIRED NEAR THE SUPPORT, SEE SJI SPECIFICATION SECTIONS 5.4(d) AND 104.5(f). ERECT JOISTS WITH CAMBER UPWARD.

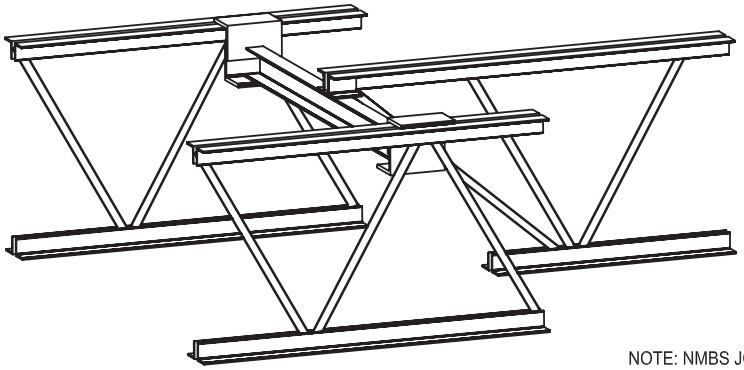
SQUARE END CANTILEVER



CEILING EXTENSION



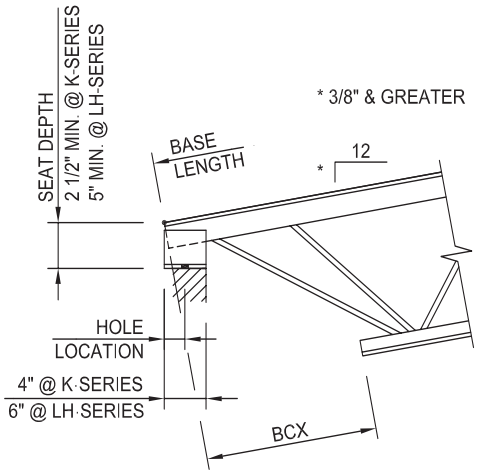
BOTTOM CHORD EXTENSION



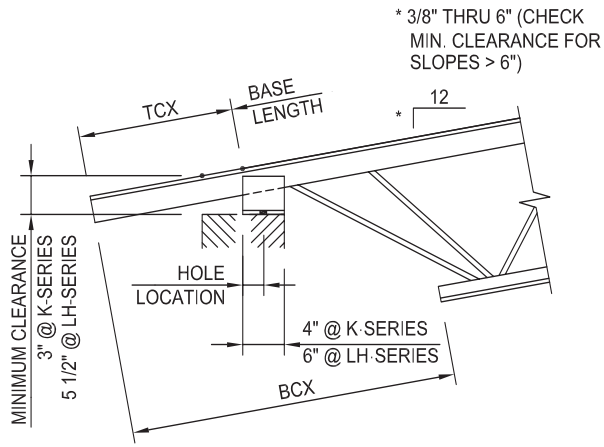
JOIST HEADER

NOTE: NMBS JOIST HEADER FOR SUPPORT OF K, KCS SERIES JOISTS ONLY. HEADERS FOR SUPPORT OF LH, DLH SERIES JOISTS BY OTHERS.

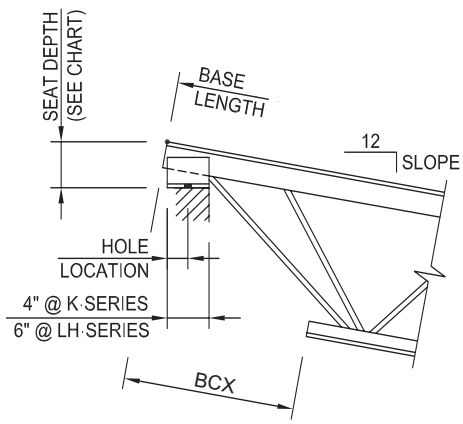
SLOPED SEAT REQUIREMENTS



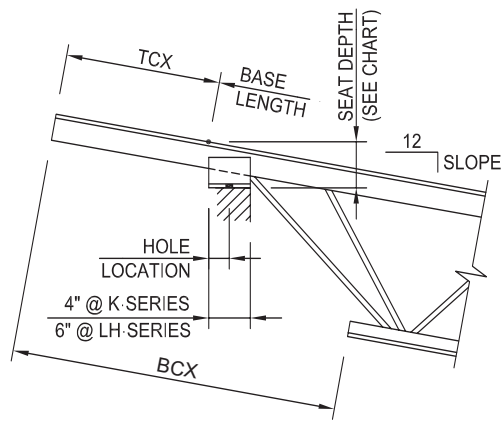
LOW END WITHOUT TCX



LOW END WITH TCX



HIGH END WITHOUT TCX



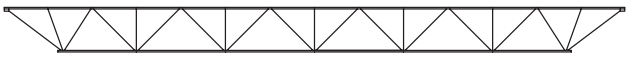
HIGH END WITH TCX

Notes:
1. Sloped seats are not required for slopes less than 3/8":12".
2. Contact NMBS for high end seat depth requirements when slope exceeds 6":12".
3. Minimum seat depths indicated were determined using TCX depths of 2 1/2" at K-Series and 5" at LH-Series. When TCX depths need to increase due to design requirements, the minimum seat depths will need to increase accordingly.
4. See chart below for minimum seat depth requirements for high end bearing conditions.

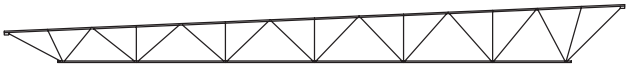
SLOPE: 12"		3/8"	1/2"	1"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	4 1/2"	5"	5 1/2"	6"
MIN. SEAT DEPTH	K-SERIES	3"	3 1/4"	3 1/4"	3 1/2"	3 3/4"	4"	4 1/4"	4 1/4"	4 1/2"	4 3/4"	5"	5 1/4"	5 1/2"
	LH-SERIES	5 3/4"	5 3/4"	6"	6 1/4"	6 1/2"	6 3/4"	7 1/4"	7 1/2"	7 3/4"	8 1/4"	8 1/2"	8 3/4"	9 1/4"

JOIST PROFILES

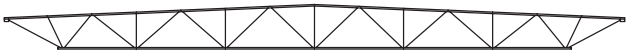
STANDARD PROFILES



PARALLEL CHORD



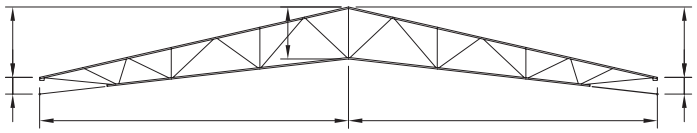
SINGLE PITCHED TOP CHORD



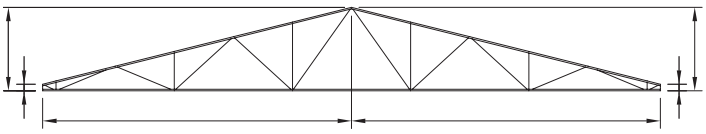
DOUBLE PITCHED TOP CHORD

All standard profile joists are available with either under-slung or square ends. LH-Series and DLH-Series joists are available with single pitched or double pitched top chords. The depth indicated in joist designation is determined by the depth of single pitched joists at the center of span and at ridge center line of double pitched joists. When top chord slope exceeds 1/8":12", total and live top chord uniform loads must be provided. All standard profile joists will be furnished with standard SJI camber as indicated in SJI Table 103.6-1, unless specified otherwise in contract documents.

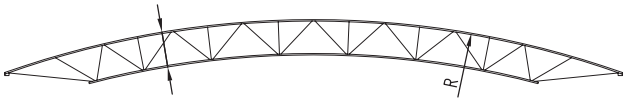
SPECIAL PROFILES



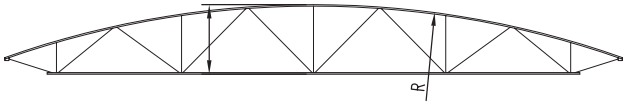
SCISSOR



GABLE



BARREL



BOWSTRING

Special profiles shown are also available. Special profile joists are available with either under-slung or square ends. Contract documents must include all dimensions as indicated along with all loading requirements. All special profile joists will be furnished with no camber unless specified otherwise in contract documents. Scissor and barrel profile joists will induce horizontal forces due to deflection, and need to be considered in building design by a design professional.

DUCT OPNG., FIELD REIN., SJI CAMBER

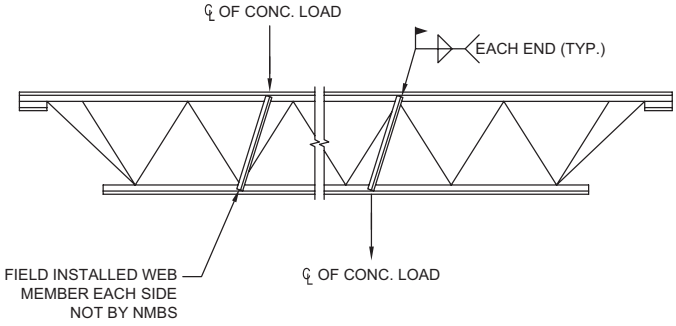
APPROXIMATE DUCT OPENING SIZES

K-SERIES JOIST DEPTH (IN.)	DUCT SIZE (IN.)		
	ROUND	SQUARE	RECTANGULAR
8	5	4 x 4	2 x 9
10	6	4 x 4	4 x 7
12	7	5 x 5	4 x 8
14	8	6 x 6	4 x 10
16	9	7 x 7	7 x 8
18	10	8 x 8	8 x 10
20	11	9 x 9	7 x 12
22	12	9 x 9	9 x 10
24	14	11 x 11	9 x 16
26	15	12 x 12	12 x 13
28	16	13 x 13	11 x 16
30	17	14 x 14	12 x 16

LH, DLH-SERIES JOIST DEPTH (IN.)	DUCT SIZE (IN.)		
	ROUND	SQUARE	RECTANGULAR
18	10	8 x 8	6 x 11
20	10	8 x 8	7 x 11
24	13	10 x 10	10 x 11
28	15	12 x 12	11 x 15
32	18	14 x 14	12 x 18
36	21	16 x 16	14 x 21
40	23	18 x 18	15 x 24
44	26	21 x 21	17 x 27
48	29	23 x 23	19 x 30
52	32	25 x 25	22 x 31
56	35	28 x 28	24 x 34
60	38	30 x 30	25 x 38
64	40	32 x 32	26 x 42
68	43	35 x 35	28 x 45
72	46	37 x 37	32 x 45

The duct sizes shown are approximate sizes that are permissible to pass through joists. The structural drawings must indicate all ducts that are required to pass through joists.

FIELD REINFORCEMENT AT CONCENTRATED LOADS

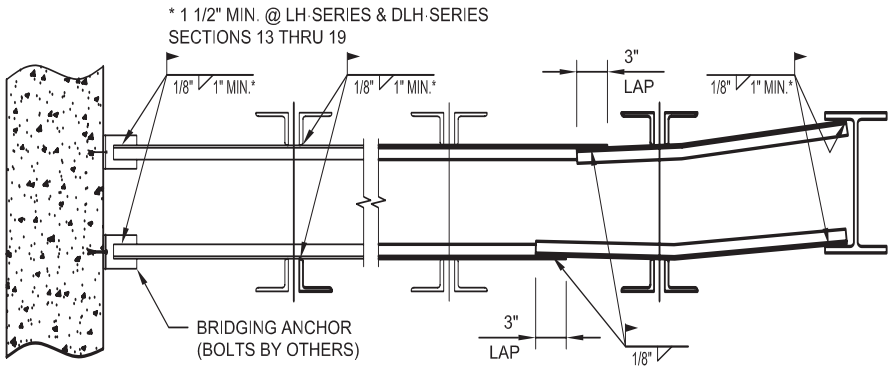


Top and bottom chords of joists, including KCS-Series, are not designed for localized bending from concentrated loads. Concentrated loads must be applied at joist panel points or field installed web members must be utilized at no cost to NMBS. NMBS can provide specially designed joists with the capability of supporting concentrated loads without the added members if this requirement and the exact locations and magnitudes of the concentrated loads are clearly shown in the contract documents. Also, NMBS can consider the worst case for both shear and bending moment for moving concentrated loads with no specific locations. When moving concentrated loads are specified, the contract documents should indicate whether the loads are to be applied at the top or bottom chord, and at any joist panel point, or at any point along the joist with the local bending effects considered.

TABLE 103.6-1

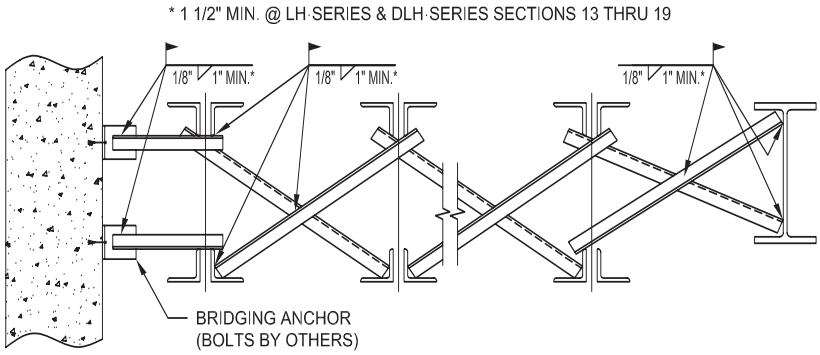
TOP CHORD LENGTH	APPROXIMATE CAMBER
20'-0"	1/4"
30'-0"	3/8"
40'-0"	5/8"
50'-0"	1"
60'-0"	1 1/2"
70'-0"	2"
80'-0"	2 3/4"
90'-0"	3 1/2"
100'-0"	4 1/4"
110'-0"	5"
120'-0"	6"
130'-0"	7"
140'-0"	8"
144'-0"	8 1/2"

STANDARD BRIDGING DETAILS



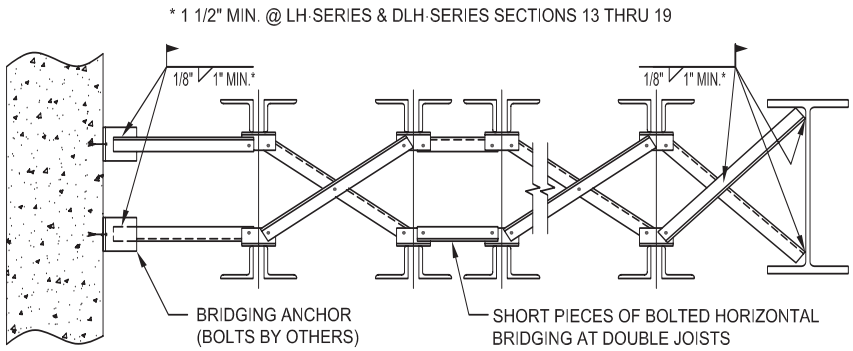
FIELD CUT HORIZONTAL BRIDGING AS REQUIRED
FROM 20'-0" LENGTHS. USE ALL DROP.

WELDED HORIZONTAL BRIDGING



NMBS RECOMMENDS THE USE OF HORIZONTAL BRIDGING IN THE SPACE
ADJACENT TO WALLS TO ALLOW FOR DEFLECTION OF THE JOIST.

WELDED DIAGONAL BRIDGING



NMBS RECOMMENDS THE USE OF HORIZONTAL BRIDGING IN THE SPACE
ADJACENT TO WALLS TO ALLOW FOR DEFLECTION OF THE JOIST.

BOLTED DIAGONAL BRIDGING

OSHA HIGHLIGHTS

NMBS joist products are fabricated to meet the erection requirements of the Occupational Safety and Health Administration (OSHA). Field compliance with OSHA is necessary. This section summarizes the OSHA Safety Standards for Steel Erection, 29 CFR, Open Web Steel Joists 1926.757 requirements governing joist fabrication. Refer to page 158 of this publication for the complete OSHA regulation for erecting steel joists.

FIELD-BOLTED JOISTS

Field-bolted bearing connections to steel framing are required where constructability allows, for joists in bays of 40'-0" or more, except where joists are preassembled in panels. Bay is defined as the length from center of steel or from face of wall. Slotted holes are provided in joist seats for this initial connection typically made with ASTM-A307 bolts. The final connection should be welded or as designated by the specifying professional.

COLUMN JOISTS

Joists at columns that are not framed in at least two directions with structural steel, are required to be bolted at the column to provide lateral stability to the column during erection. Joist bottom chords are to be extended at columns onto vertical stabilizer plates to prevent overturning during erection. Hoisting cables are to remain until both ends of joists are field-bolted and bottom chords are restrained by column stabilizer plates.

Where joists do not occur at columns and columns are not framed in at least two directions by structural steel, the joists on both sides of column, are to be field-bolted at both ends where constructability allows. Hoisting cables are to remain until joists are field-bolted and an alternate means of stabilizing joists is installed.

OSHA has adopted an enforcement policy effective indefinitely, for column joists or near column joists spanning 60'-0" or less, as referenced in 1926.757 (a) (3). The policy is as follows: “for all joists at or near columns that span 60 feet or less, employers will be considered to be in compliance with 1926.757 (a) (3) if they erect these joists either by: (1) installing bridging or otherwise stabilizing the joist prior to releasing the hoisting cable, or (2) releasing the hoisting cable without having a worker on the joists”.

NMBS will place a DANGER tag as shown below, on these column joists and near column joists to inform erectors of the OSHA requirements.

Column joists and near column joists spanning more than 60'-0" shall be set in tandem with all bridging installed and field-bolted at both ends where constructability allows, prior to releasing hoisting cables.

OSHA HIGHLIGHTS

ERECTION STABILITY BRIDGING

Where the span of the joist is equal to or greater than the span shown in Tables A and B, at right, the following shall apply: a row of bolted diagonal erection stability bridging shall be installed near the mid-span of the joist and anchored prior to releasing hoisting cables. Joists not listed in Tables A and B, do not require erection stability bridging. The spans indicated in Tables A and B, are defined as follows: from center of steel support or from 4" onto supporting wall for K-Series joists and clear span plus 8" for LH and DLH-Series joists.

Where the span of the joist is over 60'-0" through 100'-0" the following shall apply: all rows of bridging shall be bolted diagonal bridging, two rows of bolted diagonal erection stability bridging shall be installed near the third points of the joist and anchored prior to releasing hoisting cables.

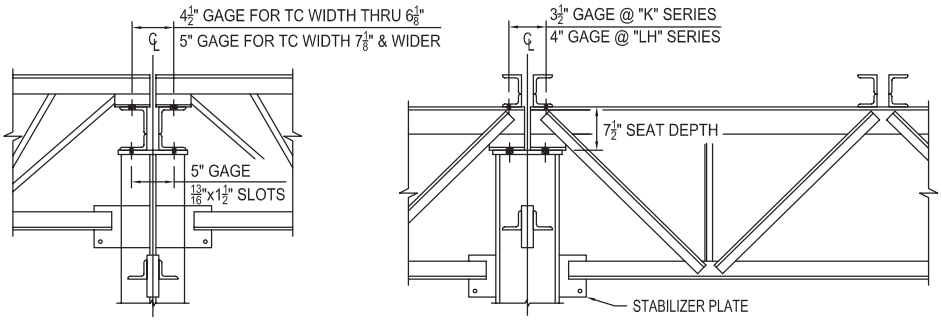
Where the span of the joist is over 100'-0" through 144'-0" the following shall apply: all rows of bridging shall be bolted diagonal erection stability bridging installed and anchored prior to releasing hoisting cables.

OSHA TABLES A and B
ERECTION STABILITY BRIDGING

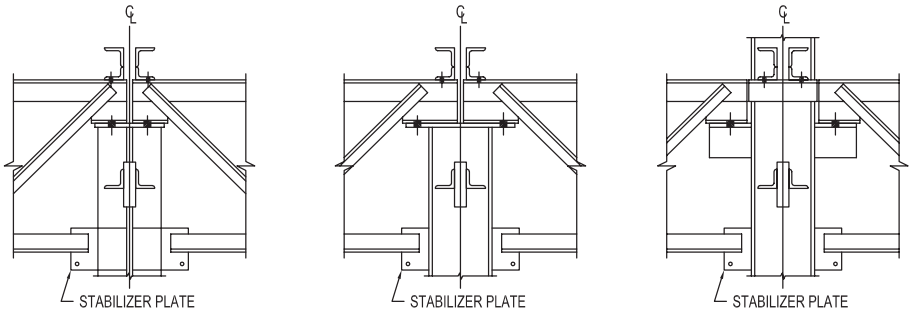
JOIST	SPAN	JOIST	SPAN
12K1	23 - 0	30K9	45 - 0
14K1	27 - 0	30K10	50 - 0
16K2	29 - 0	30K11	52 - 0
16K3	30 - 0	30K12	54 - 0
16K4	32 - 0	18KCS2	35 - 0
16K5	32 - 0	20KCS2	36 - 0
18K3	31 - 0	20KCS3	39 - 0
18K4	32 - 0	22KCS2	36 - 0
18K5	33 - 0	22KCS3	40 - 0
18K6	35 - 0	24KCS2	39 - 0
20K3	32 - 0	24KCS3	44 - 0
20K4	34 - 0	26KCS2	39 - 0
20K5	34 - 0	26KCS3	44 - 0
20K6	36 - 0	28KCS2	40 - 0
20K7	39 - 0	28KCS3	45 - 0
20K9	39 - 0	28KCS4	53 - 0
22K4	34 - 0	28KCS5	53 - 0
22K5	35 - 0	30KCS3	45 - 0
22K6	36 - 0	30KCS4	54 - 0
22K7	40 - 0	30KCS5	54 - 0
22K9	40 - 0	18LH02	33 - 0
24K4	36 - 0	20LH02	33 - 0
24K5	38 - 0	20LH03	38 - 0
24K6	39 - 0	24LH03	35 - 0
24K7	43 - 0	24LH04	39 - 0
24K8	43 - 0	24LH05	40 - 0
24K9	44 - 0	24LH06	45 - 0
26K5	38 - 0	28LH05	42 - 0
26K6	39 - 0	28LH06	46 - 0
26K7	43 - 0	28LH07	54 - 0
26K8	44 - 0	28LH08	54 - 0
26K9	44 - 0	32LH06	47 - 0
26K10	49 - 0	32LH07	47 - 0
28K6	40 - 0	32LH08	55 - 0
28K7	43 - 0	36LH07	47 - 0
28K8	44 - 0	36LH08	47 - 0
28K9	45 - 0	36LH09	57 - 0
28K10	49 - 0	40LH08	47 - 0
28K12	53 - 0	40LH09	52 - 0
30K7	44 - 0	44LH09	52 - 0
30K8	45 - 0		

Joists not listed do not require OSHA erection bridging through spans per SJI Specifications 5.2 and 104.2 or 60'-0".

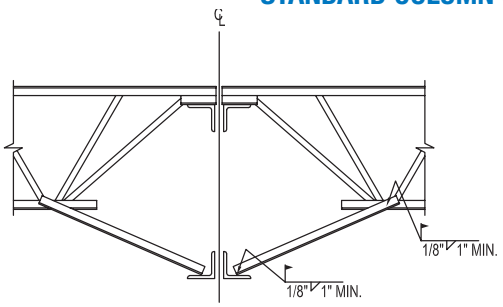
STANDARD JOIST GIRDER DETAILS AND NOTES



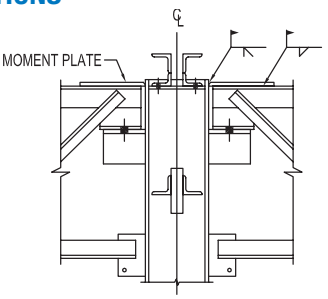
JOIST GIRDER STANDARDS



STANDARD COLUMN CONNECTIONS



BOTTOM CHORD BRACE



MOMENT CONNECTION

Joist girder dimensions shown are standard with NMBS. Under certain conditions changes are necessary and will be noted on the shop drawings.

The NMBS standard connection for joist girders to columns is 13/16" x 1 1/2" slots utilizing a 5" gage with 3/4" bolts (bolts are by others). In addition to the bolted connection, welds can also be specified if required to transmit horizontal forces. The final connection shall be made by welding or as designated by the specifying professional.

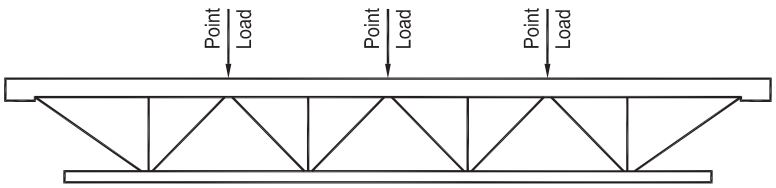
Stabilizer plates are required on the columns located at the bottom chord of the joist girder to brace the joist girder from overturning during the erection process. Welding the bottom chord to the stabilizer plate should not be done unless required to resist horizontal forces. This should only be done after the dead loads have been applied.

Joists are connected to the joist girders by welding except that joists 40' and longer shall be bolted to joist girders.

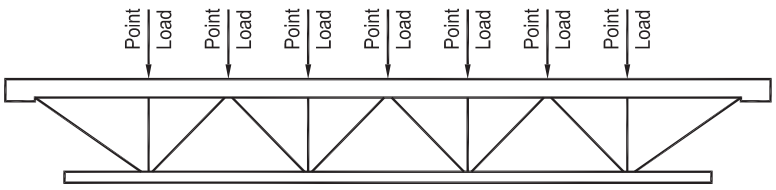
The joist girder bottom chord must be braced so that its slenderness ratio about the Y axis does not exceed 240. NMBS will supply bottom chord braces as required by the design.

When end moments occur on joist girders, a moment plate is required to transmit the forces to the column. The design and moment plate is not by NMBS.

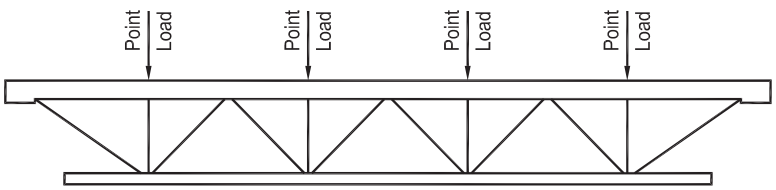
STANDARD JOIST GIRDER DETAILS AND NOTES



CONFIGURATION DESIGNATED AS "G"



CONFIGURATION DESIGNATED AS "BG"



CONFIGURATION DESIGNATED AS "VG"

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

The tables below may be used to solve for the approximate top chord width and the number of bottom chord braces for Joist Girders. Use the formulas below to solve for the TCA and the BCA. After calculating the TCA and BCA, determine the approximate TC Width and the number of bottom chord braces by checking across in the same row under the appropriate column.

For **even** joist spaces on the joist girder:	For **odd** joist spaces on the joist girder:
TCA = .03xPxSxN^2/D	**TCA = .03xPxSx(N^2-1)/D**
BCA = .026xPxSxN^2/D	**BCA = .026xPxSx(N^2-1)/D**

Where:
P = panel point load (kips),
S = joist spacing (ft.)
N = number of joist spaces
D = joist girder depth (in.)

TCA	Approximate TC Width (in.)
< = 1.02	6.125
1.03 - 1.19	6.125
1.20 - 1.78	7.125
1.79 - 2.29	8.125
2.30 - 3.75	9.125
3.76 - 4.75	11.125
4.76 - 8.44	13.125
> 8.44	Contact NMBS

BCA	JOIST GIRDER SPAN (ft.)		
	No BC Braces	One BC Brace at midspan	Two BC Braces at third points
< = 1.02	0 to 25'-8"	> 25'-8" to 51'-4"	> 51'-4" to 77'
1.03 - 1.19	0 to 29'-8"	> 29'-8" to 59'-4"	> 59'-4" to 89'
1.20 - 1.78	0 to 33'-7"	> 33'-7" to 67'-2"	> 67'-2" to 100'-9"
1.79 - 2.29	0 to 37'-9"	> 37'-9" to 75'-5"	> 75'-5" to 113'-2"
2.30 - 3.75	0 to 42'-0"	> 42'-0" to 84'-1"	> 84'-1" to 126'-2"
3.76 - 4.75	0 to 50'-2"	> 50'-2" to 100'-4"	> 100'-4" to 150'-6"
4.76 - 8.44	0 to 58'-3"	> 58'-3" to 116'-6"	> 116'-6" to 174'-9"
> 8.44	Contact NMBS		

Example:
Assume that the joist girder size is a 48G8N9.5K x 40' in length.
TCA = .03x9.5x5x8^2/48 = 1.90, 1.90 falls in the 4th row and the ~ TC Width = 8.125" .
BCA = .026x9.5x5x8^2/48 = 1.65, 1.65 falls in the 3rd row and since the length is 40', the number of bottom chord braces required = one at the midspan.
Note: Additional braces may be required by design. For critical dimensions, the top chord width needs to be verified by NMBS.

LOAD ZONE JOISTS

AN EFFICIENT ALTERNATIVE TO THE KCS JOIST

When the approximate locations of concentrated loads are known, the designer has the opportunity to design a more efficient joist. These joists can be designed to support concentrated loads residing in specific areas defined as “load zones”. Having these zones being located by boundaries and knowing the corresponding concentrated load, a more efficient joist can now be designed.

1. Load zone joists can be designed in accordance with either K or LH Series Specifications.

2. Shear and moment envelopes are developed for all load cases within the zones and the joists are designed accordingly, including any stress reversal which may occur.

3. The designer may specify as many loads and corresponding “load zones” as needed. The fewer zones specified, the more efficient the joist will be.

4. Joist chords and web members will be adequately designed to support all load case combinations. If a concentrated load does not occur at a panel point, then a reinforcement member will need to be added in the field from a panel point to the point of concentrated load.

5. Joist chords will be checked so that bridging utilized for adjacent joists will be adequate for the “load zone” joists.

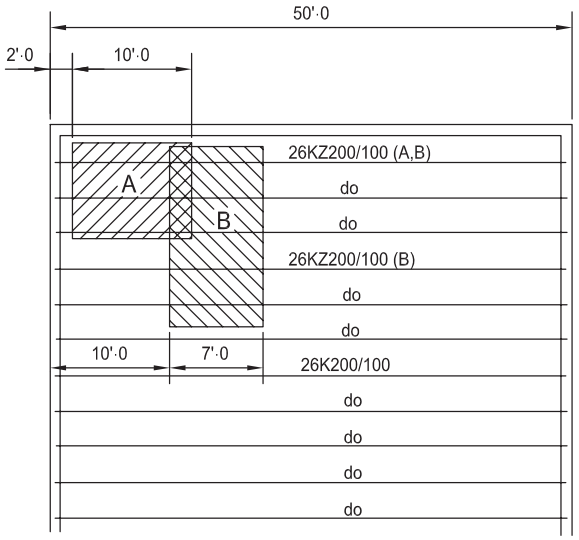
6. How to specify “load zone” joists using ASD: In the figure shown on the right is a typical framing plan. There are two load zones indicated with hatched lines. The Zone A boundary covers an area 2 feet from the left side to 12 feet from the left side over three joists. The Zone B boundary covers an area beginning 10 feet from the left side to 17 feet from the left side over 6 joists. Zone A will have a 1000 pound concentrated load which may occur anywhere within the zone. Zone B will have a 2000 pound concentrated load occurring anywhere within the zone. The joists not affected by the concentrated loads are designated as 26K200/100. The first three joists from the top of the plan are affected by Zones A and B and will be labeled as: 26KZ200/100 (A, B). When using LH Series Specifications, the joists would be labeled as 26LHZ200/100 (A, B). The next three joists are affected by only Zone B. They will be labeled as: 26KZ200/100 (B). In near proximity with the corresponding framing plan the load zone information should be listed as follows:

Zone A - 1000 lb. 2' to 12'
Zone B - 2000 lb. 10' to 17'

Note that the dimensions are from one end of the framing plan. Actual dimensions may be placed on the framing plan as shown below.

7. Compare the weight of the 26KZ200/100 (A, B) joist to a KCS joist selected to carry the same loads: Determining the shear and moment envelopes we find that (Mmax = 1077 in. kips and the Max. Shear = 7324 lbs.) the KCS selection would be a 26KCS4 (see KCS table on page 57). The KCS joist weighs 16.5 lbs. per foot. The load zone joist design shows that the 26KZ200/100 (A, B) weighs 12.4 lbs. per foot. Multiplying the weight per foot difference (16.5 minus 12.4 equals 4.1) times the length of the joist (50 feet) reveals that the load zone joist would weigh 204 lbs. less than the KCS joist.

Note: The procedure for using LRFD would be similar to the procedure shown above.



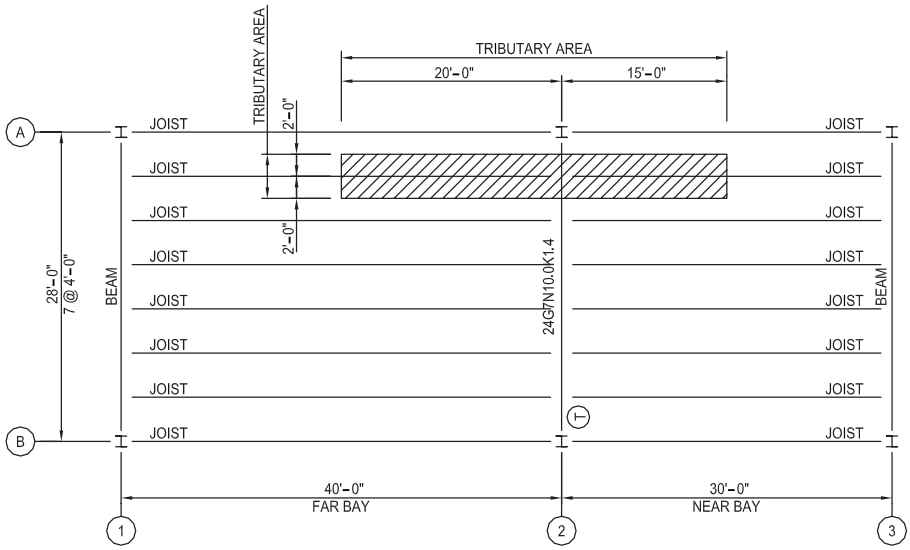
BILLS OF MATERIAL INSTRUCTIONS AND EXAMPLES

CALCULATING GIRDER UPLIFT

Girder uplift is calculated by determining the amount of roof area (tributary area) supported by each girder panel point. It is applied in the form of a Kip load at each joist bearing location. To calculate girder uplift, use the formula and example supplied below. Net uplift equals 10 psf.

((1/2 Near Bay + 1/2 Far Bay) x Uplift in PSF x Largest Joist Space) / 1000
Example: ((20' + 15') x 10 x 4')/1000 = 1.4 Kips

Girder uplift should be included at the end of the girder designation - 24G7N10.0K1.4



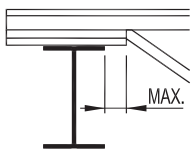
GIRDER SEAT TYPE

Standard girder seat type is “R”-Type (Full Depth) unless specified otherwise via special note.

OSHA HOLES

If OSHA holes are required for joists bearing on a girder, then specify which side requires holes. In the example shown below, a pair of holes will be provided at 3'-11 3/4" (A), from base length at the left end, and then at every 4'-0" (N) intermediate panel location on far side as denoted by placing a “F” in the OH column. Unless noted otherwise, top chord holes are provided in the standard configuration listed next to the diagram on the girder bill.

A	N		B	OH	TCL	TCR	JST. GA.	BOLT (X/16)	NOTE #
	NO.	LENGTH							
3 - 11 3/4	5	4 - 0	3 - 11 3/4	F	1 1/2	1 1/2	3 1/2	9	



MINIMUM BEARING

Achieving minimum bearing (as per SJI) on lists provided by the customer, is the responsibility of the customer. The maximum portion of the seat that may hang off of the inside edge of the support, and still allow the member to achieve minimum bearing, is as follows: 1½" for K Series joists, 2" for LH, DLH Series joists, and 2" for girders. These are maximum values allowed by SJI and require special design consideration for masonry bearing conditions. Please refer to SJI specifications provided in the appropriate sections of the NMBS catalog.

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SALEM, VA (540) 389-0378

DATE:_____

SHEET:_____ of _____

JOIST AND GIRDER SPECIAL NOTES

JOB NAME:	CUST. JOB #:	NMBS JOB#:
LOCATION:	DETAILER:	CHECKER:

NOTE #	NOTES

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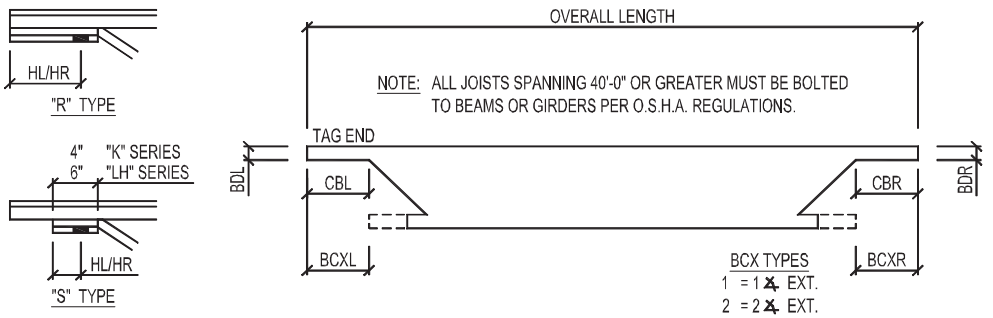
JOIST BILL OF MATERIAL

PAINT: _____ SHEET: _____ of _____

JOB NAME:	CUST. JOB #:	NMBS JOB #:
LOCATION:	DETAILER:	CHECKER:

NET UPLIFT = _____ P.L.F.



STANDARD UNLESS NOTED OTHERWISE ON BILL

	"K" SERIES	"LH" SERIES
BDL, BDR	= 21/2"	5"
CBL, CBR	= 4"	6"
SLOTS	= 9/16" x 11/2"	13/16" x 11/2"
GAGE	= 31/2"	4"
BCXL, BCXR	= NONE	NONE

NOTE: IF 13/16" x 1 1/2" SLOTS ARE REQ'D. FOR "K" SERIES JOISTS, GAGE = 4".

QTY. (THIS SHT.)

K: _____
LH: _____
JS: _____
HDR: _____

JOIST MARK	QTY.	JOIST SIZE	OVERALL LENGTH	CBL		CBR		SEAT DEPTH		BCXL		BCXR		PUNCHED SEATS			NOTES OR NOTE #
				LENGTH	TYPE	LENGTH	TYPE	BDL	BDR	LENGTH	TYPE	LENGTH	TYPE	HL	HR	GA.	

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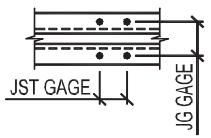
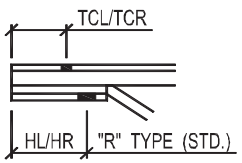
DATE: _____

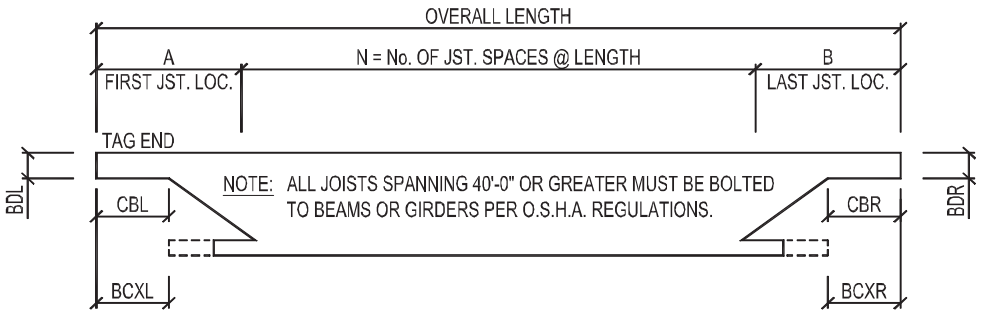
GIRDER BILL OF MATERIAL

PAINT: _____ SHEET: _____ of _____

JOB NAME:	CUST. JOB #:	NMBS JOB#:
LOCATION:	DETAILER:	CHECKER:







STANDARD UNLESS NOTED OTHERWISE ON BILL

BDL, BDR	= 71/2"
CBL, CBR	= 6"
SEAT SLOTS	= 13/16" x 1 1/2", 5" GAGE
T.C. HOLES	= 9/16" (K); 13/16" (LH, DLH)
JST GAGE	= 3 1/2" (K); 4" (LH, DLH)
JG GAGE	= 5"

O.S.H.A. HOLES (OH)
N, F, B = NEAR, FAR, BOTH

QTY. (THIS SHT.) _____

GIRDER MARK	QTY.	GIRDER SIZE	OVERALL LENGTH	CBL	CBR	SEAT DEPTH		BCXL	BCXR	PUNCHED SEATS		A	N		B	O H	TCL	TCR	JST. GA.	BOLT (X/16)	NOTE #
						BDL	BDR			HL	HR		NO.	LENGTH							

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DATE: _____

BRIDGING BILL OF MATERIAL

PAINT: _____ SHEET: _____ of _____

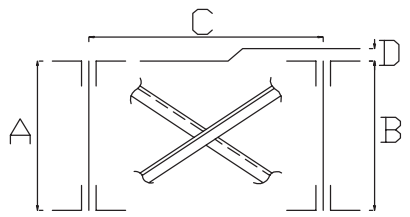
JOB NAME:	CUST. JOB #:	NMBS JOB #:
LOCATION:	DETAILER:	CHECKER:

BRIDGING TYPES:

H = WELDED HORIZONTAL (SUPPLIED IN 20'-0" PCS)
W = WELDED DIAGONAL
B = BOLTED HORIZONTAL
X = BOLTED DIAGONAL

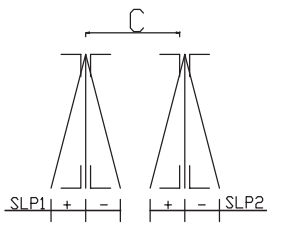
NOTE: JOIST DIMENSIONS AND SLOPE INFORMATION MUST BE PROVIDED FOR BRIDGING TYPES W, B & X
NOTE: BOLT DIAMETER 3/8", 1/2" OR 5/8", MUST BE PROVIDED FOR BRIDGING TYPES B & X

JOIST DIMENSIONS:



SPECIFY IF TO A BEAM OR WALL.
"D" IS CHANGE IN ELEVATION (+/-).

SLOPE 1 & SLOPE 2:



PIECES	BRIDGING MARK	ANGLE SIZE	BRIDGING TYPE	BOLT DIAMETER	"A"=JOIST MARK AND DEPTH	"B"=JOIST MARK AND DEPTH	SPACING "C"	ELEV. "D"	SLOPE 1	SLOPE 2

ECONOMICAL DESIGN GUIDE

ECONOMICAL LOAD TABLES

The following Economical Design Guide load tables are provided to aid designers in selecting the most economical joist for a given span and loading condition. The joist selections shown are listed based on production costs starting with the lowest cost joist for each span from 10'-0" through 145'-0". Refer to next page for definition of "Span". Bridging and erection costs have not been considered in the joist selections. The tables include K, LH and DLH Series joists.

Total load capacities are listed for both LRFD and ASD load conditions. Live loads which will produce an approximate deflection of 1/240 or 1/360 of the span are also listed. The tables also include an approximate weight per foot of each joist selection.

The tables have been shaded to indicate the joist selections requiring the installation of bolted diagonal bridging. Designers should consider erection costs associated with the bridging requirements when making joist selections.

Where the joist designation is shaded RED, SJI requires the row of bridging nearest to midspan to be bolted diagonal and shall be completely installed prior to releasing the hoisting cables.

Where the joist designation is shaded BLUE, SJI requires all rows of bridging to be bolted diagonal with the two rows nearest to the third points completely installed prior to releasing the hoisting cables.

Where the joist designation is shaded GRAY, SJI requires all rows of bridging to be bolted diagonal completely installed prior to releasing the hoisting cables.

LRFD vs. ASD DESIGN EXAMPLE

For most joist applications, the designer can potentially select a more economical joist by specifying LRFD load combinations.

For example: Given Joist with a 50'-0" span where Dead Load = 20 psf, and Live Load = 30 psf. Spacing between Joists is 6'-0" (roof application). The required Dead Load = 20 psf x 6 ft. = 120 plf, and the required Live Load = 30 psf x 6 ft. = 180 plf.

LRFD Load Case:
Using LRFD load case, the required factored load capacity for the joist is (1.2 x DL + 1.6 x LL) = (1.2 x 120 plf + 1.6 x 180 plf) = 432 plf. Page 32 of the Economical Joist Guide shows that for 50 ft. joist span the designer should choose a joist with LRFD load capacity of 436 plf. The table also shows that the service LL capacity for deflection of 1/240 of span (typical for roof application) is 249 plf > 180 plf (required service LL). The most economical joist under LRFD load case is a 30K10 (joist weight = 11.8 plf).

ASD Load Case:
Using ASD load case, the required service load capacity for the joist is (DL + LL) = (120 plf + 180 plf) = 300 plf. Page 32 of the Economical Joist Guide shows that for 50 ft. joist span the designer should choose a joist with ASD load capacity of 338 plf. The most economical joist under ASD load case is a 36LH07 (joist weight = 13.0 plf).

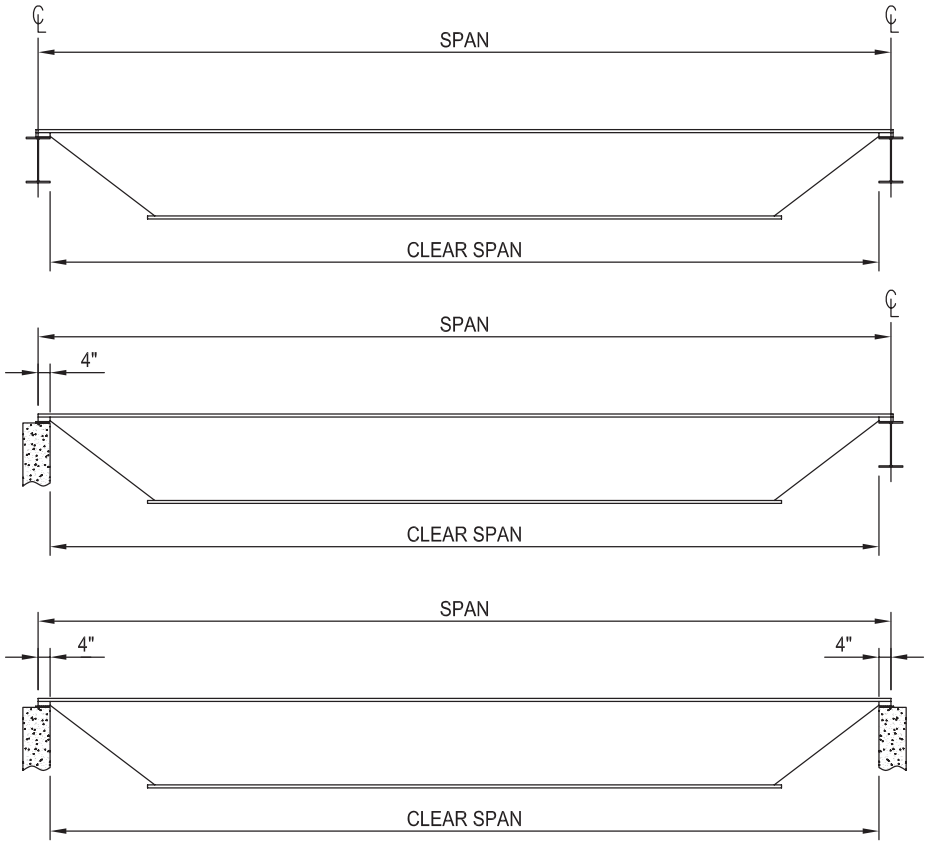
The designer should note that a more economical joist design can be selected using LRFD load case.

This condition is also true when using the published SJI Load Tables. Consider the previous example, where the maximum joist depth is 30 inches. Based on the LRFD SJI Load Table page 64, the 30K10 with a factored-load capacity of 436 plf > 432 plf (required factored TL) is selected. Based on the ASD SJI Load Table page 83, the 30K10 only has a service-load capacity of 291 plf < 300 plf (required TL) therefore the heavier 30K11 with a service-load capacity of 333 plf > 300 plf (required TL) is selected.

Again, it is shown that the LRFD load case can potentially allow the designer to select a more economical joist design.

DEFINITION OF SPAN

K-SERIES



LH, DLH-SERIES

SPAN = CLEAR SPAN + 12"

Notes:

1. Design Length = Span – 4".
2. Parallel chord joists installed to a slope greater than 1/2" per foot shall use Span defined by the length along the slope.

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
10	F 825	550	550	550	10K1	4.6
11	F 825	550	550	542	10K1	4.5
12	F 825	550	550	550	12K1	5.0
13	F 718	479	479	363	10K1	5.1
	F 825	550	550	510	12K1	5.2
14	F 618	412	412	289	10K1	4.5
	F 750	500	500	425	12K1	5.1
	F 825	550	550	463	12K3	5.3
15	F 537	358	351	234	10K1	4.6
	F 651	434	434	344	12K1	5.1
	F 814	543	543	428	12K3	5.5
	F 825	550	550	434	12K5	5.7
16	F 469	313	288	192	10K1	4.5
	F 570	380	380	282	12K1	4.7
	F 714	476	476	351	12K3	5.3
	F 825	550	550	467	14K3	5.9
17	F 415	277	238	159	10K1	4.5
	F 504	336	336	234	12K1	4.7
	F 630	420	420	291	12K3	5.4
	F 768	512	512	488	16K2	5.8
	F 825	550	550	526	16K3	6.4
18	F 369	246	201	134	10K1	4.5
	F 448	299	295	197	12K1	4.6
	F 561	374	367	245	12K3	5.3
	F 661	441	441	339	14K3	5.6
	F 684	456	456	409	16K2	6.1
	F 825	550	550	550	18K3	5.9
19	F 331	221	169	113	10K1	4.5
	F 402	268	250	167	12K1	4.6
	F 472	315	315	230	14K1	4.9
	F 502	335	310	207	12K3	5.3
	F 612	408	408	347	16K2	5.6
	F 771	514	514	494	18K3	5.8
	F 825	550	550	523	18K4	6.4
20	F 298	199	145	97	10K1	4.6
	F 361	241	213	142	12K1	4.7
	F 426	284	284	197	14K1	4.9
	F 453	302	265	177	12K3	5.4
	F 534	356	356	246	14K3	5.7
	F 552	368	368	297	16K2	5.8
	F 694	463	463	423	18K3	5.9
	F 775	517	517	517	20K3	6.4
	F 825	550	550	550	20K4	6.4
21	F 327	218	184	123	12K1	4.6
	F 385	257	255	170	14K1	4.8
	F 409	273	229	153	12K3	5.3
	F 483	322	318	212	14K3	5.5
	F 499	333	333	255	16K2	5.7
	F 556	371	371	285	16K3	5.9
	F 630	420	420	364	18K3	6.1
	F 702	468	468	453	20K3	6.5

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
21 (cont.)	F 759	506	506	426	18K4	6.9
	F 825	550	550	520	20K4	7.2
22	F 298	199	159	106	12K1	4.7
	F 351	234	220	147	14K1	4.9
	F 373	249	198	132	12K3	5.4
	F 439	293	276	184	14K3	5.5
	F 454	303	303	222	16K2	5.8
	F 505	337	337	247	16K3	6.0
	F 573	382	382	316	18K3	6.2
	F 639	426	426	393	20K3	6.0
	F 690	460	460	370	18K4	6.6
	F 777	518	518	414	18K5	7.2
	F 825	550	550	490	20K5	7.7
	F 831	554	554	439	18LH02	8.1
	F 921	614	614	488	18LH03	8.7
	F 1072	715	715	566	18LH04	9.8
	F 1212	808	808	637	18LH05	11.3
	F 1432	955	955	738	18LH06	13.2
	F 1488	992	992	776	18LH07	13.3
	F 1551	1034	1034	810	18LH08	14.0
	F 1662	1108	1108	864	18LH09	14.7
23	F 271	181	139	93	12K1	4.7
	F 321	214	192	128	14K1	4.8
	F 340	227	174	116	12K3	5.2
	F 402	268	240	160	14K3	5.4
	F 415	277	277	194	16K2	5.7
	F 462	308	308	216	16K3	5.9
	F 583	389	389	344	20K3	6.0
	F 630	420	420	323	18K4	6.5
	F 703	469	469	402	20K4	6.7
	F 777	518	518	491	22K4	7.0
	F 793	529	529	451	20K5	7.5
	F 825	550	550	468	20K6	7.5
	F 972	648	648	549	20LH04	9.3
	F 1045	697	697	589	20LH05	10.3
	F 1158	772	772	582	18LH05	11.4
	F 1396	931	931	777	20LH06	13.2
	F 1489	993	993	830	20LH07	13.3
	F 1534	1023	1023	858	20LH08	14.0
	F 1680	1120	1120	935	20LH09	14.9
	F 1813	1209	1209	1008	20LH10	15.7
24	F 249	166	121	81	12K1	4.7
	F 294	196	169	113	14K1	4.8
	F 312	208	151	101	12K3	5.3
	F 367	245	211	141	14K3	5.5
	F 381	254	254	170	16K2	5.8
	F 424	283	283	189	16K3	6.0
	F 535	357	357	302	20K3	5.9
	F 577	385	385	284	18K4	6.5
	F 645	430	430	353	20K4	6.7
	F 712	475	475	431	22K4	6.9

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
24 (cont.)	F 727	485	485	396	20K5	7.2
	F 780	520	520	516	24K4	7.3
	F 804	536	536	483	22K5	7.5
	F 825	550	550	544	24K5	7.8
	F 931	621	621	503	20LH04	9.4
	F 1002	668	668	540	20LH05	9.9
	F 1108	739	739	534	18LH05	11.7
	F 1336	891	891	713	20LH06	13.2
	F 1426	951	951	761	20LH07	14.0
	F 1470	980	980	787	20LH08	14.0
	F 1609	1073	1073	857	20LH09	15.6
	F 1737	1158	1158	924	20LH10	16.2
25	F 270	180	150	100	14K1	4.9
	F 351	234	225	150	16K2	5.7
	F 390	260	250	167	16K3	5.9
	F 441	294	294	214	18K3	6.3
	F 532	355	355	250	18K4	6.4
	F 594	396	396	312	20K4	6.6
	F 657	438	438	381	22K4	6.8
	F 669	446	446	350	20K5	7.2
	F 718	479	479	456	24K4	7.4
	F 739	493	493	427	22K5	7.5
	F 825	550	550	474	22K7	8.2
	F 894	596	596	463	20LH04	10.0
	F 960	640	640	497	20LH05	10.3
	F 1063	709	709	492	18LH05	11.7
	F 1282	855	855	656	20LH06	13.4
	F 1368	912	912	701	20LH07	14.3
	F 1410	940	940	724	20LH08	14.9
	F 1545	1030	1030	789	20LH09	15.6
	F 1666	1111	1111	851	20LH10	17.1
26	F 249	166	132	88	14K1	4.8
	F 313	209	165	110	14K3	5.5
	F 324	216	199	133	16K2	5.8
	F 408	272	272	190	18K3	5.9
	F 456	304	304	236	20K3	6.4
	F 492	328	328	222	18K4	6.5
	F 549	366	366	277	20K4	6.7
	F 606	404	404	338	22K4	7.0
	F 618	412	412	310	20K5	7.2
	F 663	442	442	405	24K4	7.3
	F 682	455	455	379	22K5	7.5
	F 744	496	496	411	22K6	7.9
	F 748	499	499	453	24K5	7.9
	F 750	500	500	373	20K7	8.4
	F 825	550	550	454	22K7	8.5
	F 861	574	574	428	20LH04	9.8
	F 924	616	616	459	20LH05	10.9
	F 1026	684	681	454	18LH05	13.0
	F 1233	822	822	606	20LH06	14.1
	F 1260	840	829	553	18LH07	14.6

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
26 (cont.)	F 1317	878	878	647	20LH07	14.8
	F 1362	908	908	669	20LH08	14.9
	F 1485	990	990	729	20LH09	16.2
	F 1602	1068	1068	786	20LH10	17.1
27	F 231	154	118	79	14K1	4.9
	F 300	200	178	119	16K2	5.7
	F 334	223	198	132	16K3	5.9
	F 378	252	252	169	18K3	6.3
	F 454	303	297	198	18K4	6.5
	F 508	339	339	247	20K4	6.6
	F 561	374	374	301	22K4	6.7
	F 573	382	382	277	20K5	7.3
	F 615	410	410	361	24K4	7.5
	F 633	422	422	337	22K5	7.3
	F 693	462	462	404	24K5	8.1
	F 754	503	503	439	24K6	8.8
	F 768	512	512	406	22K7	9.0
	F 820	547	547	519	26K6	9.6
	F 825	550	550	479	24K7	9.7
	F 849	566	566	406	20LH04	10.0
	F 913	609	609	437	20LH05	11.3
	F 972	648	621	414	18LH05	12.9
	F 1186	791	791	561	20LH06	14.0
	F 1267	845	845	599	20LH07	14.6
	F 1309	873	873	619	20LH08	15.3
	F 1429	953	953	675	20LH09	16.2
	F 1542	1028	1028	724	20LH10	17.6
28	F 214	143	105	70	14K1	4.8
	F 270	180	132	88	14K3	5.4
	F 279	186	159	106	16K2	5.7
	F 310	207	177	118	16K3	5.9
	F 351	234	226	151	18K3	6.0
	F 423	282	265	177	18K4	6.4
	F 472	315	315	221	20K4	6.5
	F 522	348	348	270	22K4	6.7
	F 571	381	381	323	24K4	6.8
	F 588	392	392	302	22K5	7.3
	F 643	429	429	362	24K5	7.6
	F 700	467	467	393	24K6	8.2
	F 712	475	475	364	22K7	8.5
	F 781	521	521	436	24K7	9.2
	F 825	550	550	456	24K8	9.6
	F 837	558	558	386	20LH04	11.2
	F 903	602	602	416	20LH05	11.6
	F 921	614	567	378	18LH05	12.9
	F 1144	763	763	521	20LH06	14.5
	F 1221	814	814	556	20LH07	15.3
	F 1263	842	842	575	20LH08	16.0
	F 1377	918	918	626	20LH09	16.7
	F 1486	991	991	673	20LH10	18.8

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
29	F 259	173	142	95	16K2	5.7
	F 289	193	159	106	16K3	5.8
	F 327	218	204	136	18K3	6.1
	F 394	263	238	159	18K4	6.4
	F 439	293	293	199	20K4	6.4
	F 486	324	324	242	22K4	6.5
	F 531	354	354	290	24K4	6.7
	F 547	365	365	272	22K5	7.2
	F 600	400	400	325	24K5	7.3
	F 651	434	434	384	26K5	7.6
	F 652	435	435	354	24K6	7.8
	F 709	473	473	417	26K6	8.3
	F 727	485	485	392	24K7	8.8
	F 738	492	492	397	24LH04	9.3
	F 766	511	511	486	28K6	9.0
	F 804	536	536	429	24K8	9.4
	F 825	550	550	479	26K8	9.3
	F 1062	708	708	567	24LH06	12.8
	F 1167	778	778	623	24LH07	14.3
	F 1245	830	830	662	24LH08	14.3
	F 1465	977	977	775	24LH09	16.9
	F 1548	1032	1032	822	24LH10	18.1
	F 1632	1088	1088	861	24LH11	18.9
30	F 241	161	129	86	16K2	5.8
	F 304	203	184	123	18K3	6.0
	F 367	245	216	144	18K4	6.4
	F 411	274	268	179	20K4	6.5
	F 453	302	302	219	22K4	6.5
	F 496	331	331	262	24K4	6.7
	F 511	341	341	245	22K5	7.2
	F 559	373	373	293	24K5	7.3
	F 607	405	405	346	26K5	7.6
	F 609	406	406	319	24K6	7.8
	F 619	413	413	295	22K7	8.3
	F 661	441	441	377	26K6	8.5
	F 679	453	453	353	24K7	8.7
	F 715	477	477	439	28K6	8.7
	F 750	500	500	387	24K8	9.4
	F 796	531	531	486	28K7	9.3
	F 816	544	544	457	26K8	9.7
	F 825	550	550	459	26K9	9.9
	F 856	571	549	366	20LH05	13.0
	F 1026	684	684	529	24LH06	13.4
	F 1128	752	752	582	24LH07	14.2
	F 1203	802	802	618	24LH08	15.4
	F 1416	944	944	724	24LH09	17.2
	F 1497	998	998	768	24LH10	18.6
	F 1578	1052	1052	804	24LH11	19.7
31	F 226	151	117	78	16K2	5.6
	F 252	168	130	87	16K3	5.9
	F 285	190	166	111	18K3	6.1

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
31 (cont.)	F 384	256	243	162	20K4	6.5
	F 424	283	283	198	22K4	6.6
	F 465	310	310	237	24K4	6.7
	F 478	319	319	222	22K5	7.3
	F 523	349	349	266	24K5	7.3
	F 568	379	379	314	26K5	7.7
	F 570	380	380	289	24K6	7.8
	F 619	413	413	341	26K6	8.0
	F 636	424	424	320	24K7	8.7
	F 669	446	446	397	28K6	8.6
	F 690	460	460	378	26K7	8.9
	F 702	468	468	350	24K8	9.4
	F 763	509	509	413	26K8	9.7
	F 765	510	510	379	24K9	10.1
	F 801	534	534	508	30K7	10.1
	F 825	550	550	444	26K9	10.3
	F 993	662	662	495	24LH06	13.3
	F 1090	727	727	545	24LH07	14.8
	F 1164	776	776	578	24LH08	15.6
	F 1369	913	913	677	24LH09	17.9
	F 1447	965	965	718	24LH10	18.6
	F 1525	1017	1017	752	24LH11	19.6
32	F 213	142	106	71	16K2	5.6
	F 237	158	118	79	16K3	6.0
	F 267	178	151	101	18K3	6.0
	F 298	199	189	126	20K3	6.5
	F 322	215	177	118	18K4	6.5
	F 360	240	220	147	20K4	6.5
	F 397	265	265	180	22K4	6.7
	F 435	290	290	215	24K4	6.8
	F 448	299	299	201	22K5	7.3
	F 490	327	327	241	24K5	7.4
	F 534	356	356	285	26K5	7.5
	F 544	363	363	266	24LH03	8.2
	F 580	387	387	309	26K6	8.2
	F 627	418	418	361	28K6	8.9
	F 648	432	432	343	26K7	9.3
	F 667	445	445	326	24LH04	9.8
	F 699	466	466	400	28K7	9.9
	F 751	501	501	461	30K7	10.2
	F 778	519	519	407	26K9	10.5
	F 823	549	549	431	26K10	11.2
	F 961	641	641	465	24LH06	13.9
	F 1056	704	704	511	24LH07	14.6
	F 1126	751	751	543	24LH08	15.4
	F 1326	884	884	635	24LH09	18.4
	F 1402	935	935	674	24LH10	18.9
	F 1477	985	985	705	24LH11	20.4
33	F 252	168	138	92	18K3	6.1
	F 303	202	162	108	18K4	6.4
	F 339	226	201	134	20K4	6.5

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
33 (cont.)	F 373	249	246	164	22K4	6.6
	F 409	273	273	196	24K4	6.7
	F 421	281	274	183	22K5	7.2
	F 462	308	308	220	24K5	7.4
	F 501	334	334	259	26K5	7.5
	F 502	335	335	239	24K6	7.9
	F 546	364	364	282	26K6	8.0
	F 559	373	373	265	24K7	8.5
	F 589	393	393	329	28K6	8.4
	F 609	406	406	312	26K7	8.6
	F 619	413	413	289	24K8	9.4
	F 672	448	448	342	26K8	9.7
	F 726	484	484	399	28K8	9.8
	F 780	520	520	460	30K8	10.2
	F 798	532	532	468	30K9	10.2
	F 931	621	621	437	24LH06	13.9
	F 1024	683	683	480	24LH07	15.4
	F 1092	728	728	510	24LH08	16.0
	F 1285	857	857	597	24LH09	18.8
	F 1359	906	906	633	24LH10	20.3
	F 1432	955	955	663	24LH11	21.1
34	F 237	158	126	84	18K3	6.0
	F 285	190	147	98	18K4	6.5
	F 318	212	183	122	20K4	6.5
	F 352	235	223	149	22K4	6.6
	F 385	257	257	179	24K4	6.6
	F 397	265	250	167	22K5	7.2
	F 435	290	290	201	24K5	7.3
	F 472	315	315	237	26K5	7.4
	F 514	343	343	257	26K6	7.9
	F 555	370	370	300	28K6	8.1
	F 573	382	382	285	26K7	8.8
	F 618	412	412	333	28K7	8.7
	F 633	422	422	312	26K8	9.5
	F 684	456	456	364	28K8	9.8
	F 735	490	490	420	30K8	10.3
	F 774	516	516	441	30K9	10.3
	F 828	552	552	443	28LH06	12.4
	F 906	604	604	411	24LH06	14.4
	F 936	624	624	499	28LH07	14.8
	F 1002	668	668	533	28LH08	14.4
	F 1060	707	707	480	24LH08	16.1
	F 1234	823	823	656	28LH09	17.4
	F 1248	832	832	562	24LH09	18.7
	F 1350	900	900	714	28LH10	18.6
	F 1447	965	965	763	28LH11	19.8
	F 1590	1060	1060	835	28LH12	21.2
	F 1657	1105	1105	872	28LH13	21.8
35	F 223	149	115	77	18K3	6.1
	F 300	200	168	112	20K4	6.5
	F 331	221	205	137	22K4	6.6

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
35 (cont.)	F 363	242	242	164	24K4	6.7
	F 373	249	229	153	22K5	7.2
	F 409	273	273	184	24K5	7.2
	F 445	297	297	217	26K5	7.4
	F 484	323	323	236	26K6	7.9
	F 523	349	349	275	28K6	8.0
	F 540	360	360	261	26K7	8.5
	F 583	389	389	305	28K7	9.0
	F 597	398	398	286	26K8	9.5
	F 627	418	418	351	30K7	9.5
	F 645	430	430	333	28K8	9.7
	F 693	462	462	384	30K8	9.9
	F 702	468	468	361	28K9	10.4
	F 751	501	501	389	28K10	10.6
	F 804	536	536	417	28LH06	12.8
	F 909	606	606	471	28LH07	14.2
	F 973	649	649	503	28LH08	14.3
	F 1015	677	670	447	24LH08	16.4
	F 1198	799	799	618	28LH09	17.4
	F 1311	874	874	673	28LH10	19.5
	F 1405	937	937	719	28LH11	19.5
	F 1545	1030	1030	787	28LH12	21.8
	F 1609	1073	1073	822	28LH13	22.9
36	F 211	141	105	70	18K3	6.0
	F 235	157	132	88	20K3	6.2
	F 253	169	123	82	18K4	6.5
	F 313	209	189	126	22K4	6.6
	F 343	229	225	150	24K4	6.8
	F 354	236	211	141	22K5	7.3
	F 387	258	253	169	24K5	7.3
	F 420	280	280	199	26K5	7.4
	F 421	281	274	183	24K6	7.9
	F 457	305	305	216	26K6	7.9
	F 495	330	330	252	28K6	8.1
	F 510	340	340	240	26K7	8.5
	F 550	367	367	280	28K7	8.7
	F 592	395	395	323	30K7	9.3
	F 609	406	406	306	28K8	9.6
	F 654	436	436	353	30K8	9.8
	F 663	442	442	332	28K9	10.3
	F 712	475	475	383	30K9	10.7
	F 730	487	487	392	30K10	11.0
	F 781	521	521	394	28LH06	12.7
	F 883	589	589	445	28LH07	14.1
	F 946	631	631	475	28LH08	15.0
	F 973	649	624	416	24LH08	16.1
	F 1165	777	777	584	28LH09	18.0
	F 1273	849	849	636	28LH10	19.4
	F 1366	911	911	680	28LH11	20.8
	F 1501	1001	1001	744	28LH12	22.6
	F 1564	1043	1043	777	28LH13	23.5

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
37	F 268	179	142	95	20K4	6.5
	F 297	198	174	116	22K4	6.6
	F 324	216	207	138	24K4	6.8
	F 334	223	195	130	22K5	7.2
	F 366	244	232	155	24K5	7.2
	F 397	265	265	183	26K5	7.4
	F 399	266	253	169	24K6	7.8
	F 433	289	289	199	26K6	7.9
	F 468	312	312	232	28K6	8.1
	F 522	348	348	257	28K7	8.9
	F 559	373	373	297	30K7	9.1
	F 576	384	384	282	28K8	9.7
	F 619	413	413	325	30K8	9.9
	F 627	418	418	305	28K9	10.5
	F 673	449	449	352	30K9	10.7
	F 690	460	460	308	26K10	11.6
	F 711	474	474	374	30K10	11.6
	F 760	507	507	373	28LH06	12.5
	F 859	573	573	421	28LH07	14.0
	F 882	588	550	367	24LH07	16.0
	F 921	614	614	449	28LH08	15.7
	F 933	622	582	388	24LH08	16.1
	F 1132	755	755	553	28LH09	18.4
	F 1239	826	826	602	28LH10	20.5
	F 1329	886	886	643	28LH11	20.8
	F 1461	974	974	704	28LH12	23.3
	F 1521	1014	1014	735	28LH13	23.9
38	F 211	141	111	74	20K3	6.2
	F 255	170	130	87	20K4	6.5
	F 280	187	160	107	22K4	6.6
	F 307	205	192	128	24K4	6.6
	F 316	211	178	119	22K5	7.2
	F 346	231	214	143	24K5	7.3
	F 376	251	251	169	26K5	7.4
	F 378	252	234	156	24K6	7.8
	F 411	274	274	184	26K6	7.9
	F 444	296	296	214	28K6	8.1
	F 457	305	305	204	26K7	8.5
	F 465	310	283	189	24K8	9.1
	F 493	329	329	237	28K7	8.7
	F 531	354	354	274	30K7	8.9
	F 546	364	364	260	28K8	9.4
	F 558	372	372	268	28LH05	10.0
	F 586	391	391	300	30K8	9.9
	F 594	396	396	282	28K9	10.4
	F 639	426	426	325	30K9	10.6
	F 654	436	426	284	26K10	11.6
	F 691	461	461	353	30K10	11.7
	F 741	494	494	354	28LH06	13.3
	F 756	504	459	306	24LH06	14.4
	F 835	557	557	399	28LH07	14.1

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
38 (cont.)	F 895	597	597	426	28LH08	15.5
	F 1102	735	735	524	28LH09	18.8
	F 1206	804	804	570	28LH10	20.4
	F 1294	863	863	609	28LH11	21.3
	F 1422	948	948	667	28LH12	23.0
	F 1482	988	988	696	28LH13	23.9
39	F 199	133	103	69	20K3	6.3
	F 241	161	121	81	20K4	6.5
	F 267	178	147	98	22K4	6.6
	F 292	195	177	118	24K4	6.6
	F 300	200	165	110	22K5	7.2
	F 328	219	198	132	24K5	7.3
	F 357	238	234	156	26K5	7.4
	F 358	239	216	144	24K6	7.8
	F 390	260	255	170	26K6	7.9
	F 420	280	280	198	28K6	8.0
	F 433	289	282	188	26K7	8.5
	F 469	313	313	219	28K7	8.6
	F 480	320	309	206	26K8	9.2
	F 504	336	336	253	30K7	9.1
	F 519	346	346	240	28K8	9.6
	F 556	371	371	277	30K8	9.7
	F 564	376	376	260	28K9	10.3
	F 606	404	404	300	30K9	10.4
	F 619	413	393	262	26K10	11.5
	F 670	447	447	306	28K10	11.7
	F 673	449	449	308	28K12	11.7
	F 729	486	486	388	32LH07	12.5
	F 792	528	528	421	32LH08	13.7
	F 814	543	543	379	28LH07	15.3
	F 873	582	582	404	28LH08	15.4
	F 993	662	662	526	32LH09	16.5
	F 1098	732	732	581	32LH10	18.0
	F 1203	802	802	635	32LH11	19.6
	F 1260	840	840	578	28LH11	22.0
	F 1411	941	941	742	32LH12	22.5
	F 1443	962	962	661	28LH13	23.8
	F 1575	1050	1050	825	32LH13	24.7
	F 1621	1081	1081	850	32LH14	25.9
	F 1675	1117	1117	878	32LH15	26.9
40	F 190	127	96	64	20K3	6.2
	F 253	169	136	91	22K4	6.6
	F 277	185	163	109	24K4	6.6
	F 285	190	153	102	22K5	7.2
	F 312	208	183	122	24K5	7.3
	F 340	227	217	145	26K5	7.3
	F 370	247	235	157	26K6	8.0
	F 399	266	266	183	28K6	8.1
	F 412	275	261	174	26K7	8.5
	F 445	297	297	203	28K7	8.6
	F 456	304	286	191	26K8	9.1

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
40 (cont.)	F 478	319	319	234	30K7	9.0
	F 492	328	328	222	28K8	9.5
	F 529	353	353	256	30K8	9.7
	F 535	357	357	241	28K9	10.2
	F 576	384	384	278	30K9	10.4
	F 589	393	364	243	26K10	11.6
	F 636	424	424	284	28K10	11.7
	F 657	438	438	315	30K10	11.8
	F 711	474	474	368	32LH07	12.9
	F 771	514	514	400	32LH08	14.2
	F 793	529	529	360	28LH07	15.4
	F 850	567	567	384	28LH08	15.4
	F 967	645	645	500	32LH09	16.3
	F 1069	713	713	552	32LH10	17.8
	F 1171	781	781	604	32LH11	19.8
	F 1228	819	819	549	28LH11	21.5
	F 1377	918	918	705	32LH12	23.0
	F 1534	1023	1023	784	32LH13	24.4
	F 1581	1054	1054	807	32LH14	25.8
	F 1633	1089	1089	834	32LH15	26.9
41	F 241	161	127	85	22K4	6.6
	F 264	176	151	101	24K4	6.7
	F 271	181	142	95	22K5	7.2
	F 297	198	171	114	24K5	7.3
	F 322	215	201	134	26K5	7.4
	F 324	216	186	124	24K6	7.8
	F 352	235	219	146	26K6	8.0
	F 379	253	253	170	28K6	8.1
	F 393	262	243	162	26K7	8.5
	F 424	283	283	189	28K7	8.6
	F 454	303	303	217	30K7	8.7
	F 468	312	309	206	28K8	9.5
	F 502	335	335	238	30K8	9.7
	F 510	340	336	224	28K9	10.2
	F 547	365	365	258	30K9	10.3
	F 561	374	337	225	26K10	11.6
	F 606	404	394	263	28K10	11.7
	F 616	411	411	315	32LH06	11.6
	F 640	427	427	300	30K10	11.8
	F 693	462	462	351	32LH07	12.8
	F 753	502	502	380	32LH08	14.3
	F 774	516	513	342	28LH07	15.5
	F 829	553	547	365	28LH08	16.4
	F 943	629	629	476	32LH09	16.9
	F 1044	696	696	525	32LH10	19.2
	F 1143	762	762	574	32LH11	20.3
	F 1342	895	895	671	32LH12	22.9
	F 1372	915	895	597	28LH13	25.3
	F 1497	998	998	746	32LH13	25.6
	F 1542	1028	1028	768	32LH14	26.5
	F 1593	1062	1062	794	32LH15	26.7

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
42	F 229	153	118	79	22K4	6.6
	F 252	168	141	94	24K4	6.6
	F 259	173	132	88	22K5	7.2
	F 283	189	159	106	24K5	7.3
	F 307	205	187	125	26K5	7.4
	F 309	206	172	115	24K6	7.8
	F 336	224	204	136	26K6	7.9
	F 361	241	237	158	28K6	8.0
	F 373	249	225	150	26K7	8.5
	F 403	269	262	175	28K7	8.5
	F 433	289	289	202	30K7	8.9
	F 445	297	288	192	28K8	9.4
	F 480	320	320	221	30K8	9.5
	F 486	324	312	208	28K9	10.2
	F 522	348	348	240	30K9	10.4
	F 576	384	367	245	28K10	11.6
	F 601	401	401	300	32LH06	12.1
	F 619	413	413	282	30K10	12.2
	F 676	451	451	334	32LH07	12.7
	F 735	490	490	362	32LH08	14.2
	F 757	505	489	326	28LH07	15.5
	F 810	540	522	348	28LH08	16.4
	F 921	614	614	453	32LH09	16.8
	F 1018	679	679	500	32LH10	19.1
	F 1116	744	744	547	32LH11	20.8
	F 1170	780	747	498	28LH11	23.2
	F 1311	874	874	639	32LH12	24.2
	F 1461	974	974	710	32LH13	26.5
	F 1504	1003	1003	732	32LH14	26.5
	F 1555	1037	1037	756	32LH15	26.5
43	F 219	146	109	73	22K4	6.6
	F 240	160	132	88	24K4	6.6
	F 247	165	123	82	22K5	7.2
	F 270	180	147	98	24K5	7.2
	F 294	196	174	116	26K5	7.4
	F 319	213	189	126	26K6	7.9
	F 345	230	220	147	28K6	8.1
	F 357	238	210	140	26K7	8.6
	F 385	257	244	163	28K7	8.7
	F 414	276	276	188	30K7	8.8
	F 426	284	268	179	28K8	9.2
	F 457	305	305	206	30K8	9.7
	F 463	309	291	194	28K9	10.3
	F 498	332	332	223	30K9	10.4
	F 508	339	292	195	26K10	11.6
	F 550	367	342	228	28K10	11.7
	F 591	394	394	263	30K10	11.8
	F 610	407	405	270	30K11	12.5
	F 651	434	434	354	36LH08	12.6
	F 661	441	441	318	32LH07	13.8
	F 717	478	478	346	32LH08	14.2

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
43 (cont.)	F 726	484	457	305	28LH07	15.5
	F 832	555	555	451	36LH09	15.4
	F 918	612	612	499	36LH10	16.7
	F 1002	668	668	543	36LH11	18.2
	F 1090	727	727	522	32LH11	20.7
	F 1198	799	799	647	36LH12	21.2
	F 1279	853	853	610	32LH12	24.1
	F 1410	940	940	758	36LH13	23.9
	F 1426	951	951	678	32LH13	26.5
	F 1470	980	980	698	32LH14	26.5
	F 1554	1036	1036	833	36LH14	26.9
	F 1638	1092	1092	877	36LH15	28.4
44	F 208	139	102	68	22K4	6.6
	F 229	153	123	82	24K4	6.6
	F 235	157	114	76	22K5	7.1
	F 258	172	138	92	24K5	7.3
	F 280	187	162	108	26K5	7.4
	F 306	204	177	118	26K6	7.9
	F 330	220	205	137	28K6	8.0
	F 340	227	196	131	26K7	8.6
	F 367	245	228	152	28K7	8.7
	F 394	263	263	176	30K7	8.8
	F 406	271	250	167	28K8	9.3
	F 436	291	288	192	30K8	9.7
	F 442	295	271	181	28K9	10.2
	F 475	317	312	208	30K9	10.4
	F 486	324	273	182	26K10	11.5
	F 525	350	318	212	28K10	11.6
	F 564	376	367	245	30K10	11.7
	F 577	385	385	309	36LH07	11.4
	F 636	424	424	338	36LH08	12.7
	F 646	431	431	304	32LH07	14.0
	F 700	467	467	330	32LH08	14.5
	F 814	543	543	431	36LH09	15.3
	F 897	598	598	476	36LH10	16.6
	F 979	653	653	518	36LH11	18.3
	F 1065	710	710	498	32LH11	20.6
	F 1171	781	781	617	36LH12	21.7
	F 1251	834	834	582	32LH12	24.0
	F 1377	918	918	724	36LH13	24.6
	F 1395	930	930	647	32LH13	26.4
	F 1435	957	957	666	32LH14	27.4
	F 1518	1012	1012	795	36LH14	26.9
	F 1600	1067	1067	837	36LH15	28.8
45	F 219	146	114	76	24K4	6.7
	F 246	164	129	86	24K5	7.3
	F 268	179	151	101	26K5	7.4
	F 291	194	165	110	26K6	7.9
	F 315	210	192	128	28K6	8.0
	F 325	217	183	122	26K7	8.6
	F 351	234	213	142	28K7	8.7

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
45 (cont.)	F 376	251	246	164	30K7	8.7
	F 388	259	234	156	28K8	9.3
	F 417	278	268	179	30K8	9.4
	F 423	282	253	169	28K9	10.2
	F 454	303	292	195	30K9	10.4
	F 465	310	255	170	26K10	11.6
	F 501	334	297	198	28K10	11.7
	F 538	359	343	229	30K10	11.8
	F 564	376	376	295	36LH07	12.2
	F 583	389	369	246	30K11	13.2
	F 621	414	414	323	36LH08	13.0
	F 631	421	421	291	32LH07	14.3
	F 685	457	457	315	32LH08	15.0
	F 712	475	427	285	28LH08	16.0
	F 796	531	531	412	36LH09	15.7
	F 876	584	584	455	36LH10	16.7
	F 957	638	638	495	36LH11	18.2
	F 1041	694	694	476	32LH11	20.8
	F 1144	763	763	590	36LH12	21.7
	F 1222	815	815	556	32LH12	23.9
	F 1347	898	898	692	36LH13	25.7
	F 1363	909	909	618	32LH13	27.3
	F 1483	989	989	760	36LH14	26.9
	F 1564	1043	1043	800	36LH15	29.8
46	F 208	139	106	71	24K4	6.6
	F 235	157	120	80	24K5	7.2
	F 256	171	142	95	26K5	7.4
	F 279	186	154	103	26K6	7.9
	F 301	201	180	120	28K6	8.0
	F 336	224	199	133	28K7	8.6
	F 361	241	229	153	30K7	8.7
	F 372	248	219	146	28K8	9.2
	F 399	266	252	168	30K8	9.3
	F 405	270	237	158	28K9	10.4
	F 435	290	273	182	30K9	10.7
	F 480	320	279	186	28K10	11.6
	F 516	344	321	214	30K10	11.8
	F 552	368	368	282	36LH07	12.4
	F 607	405	405	309	36LH08	12.8
	F 618	412	412	278	32LH07	14.2
	F 640	427	376	251	28LH07	15.4
	F 670	447	447	302	32LH08	15.1
	F 684	456	402	268	28LH08	16.1
	F 778	519	519	394	36LH09	15.7
	F 856	571	571	435	36LH10	17.9
	F 936	624	624	474	36LH11	19.6
	F 1120	747	747	564	36LH12	21.6
	F 1317	878	878	662	36LH13	24.8
	F 1333	889	886	591	32LH13	28.0
	F 1452	968	968	727	36LH14	27.2
	F 1530	1020	1020	765	36LH15	29.6

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
47	F 199	133	100	67	24K4	6.6
	F 225	150	112	75	24K5	7.2
	F 246	164	133	89	26K5	7.3
	F 267	178	144	96	26K6	7.9
	F 288	192	168	112	28K6	7.9
	F 298	199	160	107	26K7	8.5
	F 321	214	187	125	28K7	8.7
	F 345	230	216	144	30K7	8.7
	F 355	237	204	136	28K8	9.3
	F 382	255	235	157	30K8	9.4
	F 387	258	222	148	28K9	10.0
	F 415	277	256	171	30K9	10.4
	F 426	284	223	149	26K10	11.6
	F 459	306	261	174	28K10	11.6
	F 493	329	301	201	30K10	11.8
	F 540	360	360	270	36LH07	12.4
	F 594	396	396	296	36LH08	13.0
	F 604	403	399	266	32LH07	14.1
	F 655	437	433	289	32LH08	14.8
	F 657	438	378	252	28LH08	16.1
	F 762	508	508	377	36LH09	15.7
	F 838	559	559	417	36LH10	17.9
	F 909	606	598	399	32LH10	20.5
	F 916	611	611	454	36LH11	20.5
	F 996	664	654	436	32LH11	22.2
	F 1096	731	731	541	36LH12	21.9
	F 1170	780	765	510	32LH12	25.2
	F 1288	859	859	634	36LH13	25.8
	F 1305	870	849	566	32LH13	27.7
	F 1420	947	947	696	36LH14	29.0
	F 1498	999	999	733	36LH15	29.5
48	F 192	128	94	63	24K4	6.6
	F 216	144	105	70	24K5	7.2
	F 235	157	124	83	26K5	7.3
	F 256	171	135	90	26K6	7.9
	F 276	184	157	105	28K6	7.9
	F 285	190	150	100	26K7	8.5
	F 309	206	175	117	28K7	8.6
	F 331	221	202	135	30K7	8.7
	F 340	227	192	128	28K8	9.3
	F 366	244	222	148	30K8	9.4
	F 370	247	208	139	28K9	10.0
	F 399	266	240	160	30K9	10.4
	F 408	272	210	140	26K10	11.5
	F 441	294	244	163	28K10	11.6
	F 472	315	282	188	30K10	11.7
	F 528	352	352	259	36LH07	12.4
	F 543	362	322	215	30K11	13.3
	F 547	365	324	216	30K12	13.3
	F 582	388	388	284	36LH08	13.7
	F 591	394	382	255	32LH07	14.1

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
48 (cont.)	F 642	428	415	277	32LH08	15.6
	F 685	457	457	372	40LH09	15.5
	F 745	497	497	361	36LH09	16.4
	F 754	503	503	410	40LH10	15.6
	F 825	550	550	444	40LH11	17.0
	F 897	598	598	435	36LH11	20.3
	F 1003	669	669	541	40LH12	19.9
	F 1072	715	715	518	36LH12	21.8
	F 1183	789	789	634	40LH13	23.8
	F 1261	841	841	607	36LH13	26.4
	F 1353	902	902	727	40LH14	26.2
	F 1390	927	927	667	36LH14	29.0
	F 1467	978	978	703	36LH15	29.5
	F 1513	1009	1009	810	40LH15	28.9
	F 1668	1112	1112	890	40LH16	31.6
49	F 225	150	117	78	26K5	7.3
	F 246	164	127	85	26K6	7.9
	F 265	177	148	99	28K6	8.0
	F 274	183	141	94	26K7	8.5
	F 295	197	165	110	28K7	8.7
	F 318	212	190	127	30K7	8.7
	F 327	218	180	120	28K8	9.3
	F 351	234	208	139	30K8	9.3
	F 355	237	195	130	28K9	10.0
	F 382	255	225	150	30K9	10.1
	F 391	261	196	131	26K10	11.6
	F 423	282	229	153	28K10	11.7
	F 454	303	265	177	30K10	11.8
	F 514	343	330	220	32LH06	13.1
	F 520	347	303	202	30K11	13.2
	F 535	357	310	207	30K12	13.8
	F 570	380	380	272	36LH08	14.2
	F 579	386	367	245	32LH07	14.7
	F 628	419	399	266	32LH08	15.5
	F 672	448	448	357	40LH09	15.4
	F 739	493	493	393	40LH10	16.1
	F 807	538	538	426	40LH11	17.6
	F 879	586	586	417	36LH11	20.2
	F 982	655	655	519	40LH12	20.2
	F 1051	701	701	497	36LH12	21.7
	F 1159	773	773	609	40LH13	23.8
	F 1236	824	824	583	36LH13	26.4
	F 1326	884	884	697	40LH14	26.2
	F 1362	908	908	640	36LH14	29.0
	F 1435	957	957	674	36LH15	29.3
	F 1482	988	988	777	40LH15	30.0
	F 1633	1089	1089	854	40LH16	32.4
50	F 216	144	109	73	26K5	7.3
	F 255	170	139	93	28K6	7.9
	F 262	175	133	89	26K7	8.5
	F 283	189	154	103	28K7	8.6

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
50 (cont.)	F 304	203	178	119	30K7	8.7
	F 313	209	169	113	28K8	9.3
	F 337	225	195	130	30K8	9.3
	F 342	228	184	123	28K9	9.9
	F 367	245	211	141	30K9	10.1
	F 405	270	216	144	28K10	11.7
	F 436	291	249	166	30K10	11.8
	F 507	338	338	239	36LH07	13.0
	F 525	350	298	199	30K12	14.6
	F 558	372	372	262	36LH08	14.4
	F 568	379	352	235	32LH07	14.8
	F 616	411	382	255	32LH08	15.6
	F 658	439	439	343	40LH09	15.4
	F 724	483	483	378	40LH10	16.7
	F 787	525	525	368	36LH10	18.8
	F 790	527	527	409	40LH11	18.8
	F 861	574	574	400	36LH11	19.5
	F 963	642	642	498	40LH12	19.9
	F 1030	687	687	477	36LH12	23.0
	F 1135	757	757	584	40LH13	23.7
	F 1210	807	807	559	36LH13	26.2
	F 1299	866	866	669	40LH14	26.8
	F 1335	890	890	615	36LH14	29.0
	F 1452	968	968	746	40LH15	29.7
	F 1600	1067	1067	820	40LH16	34.0
51	F 208	139	103	69	26K5	7.3
	F 226	151	112	75	26K6	7.9
	F 244	163	132	88	28K6	8.0
	F 252	168	124	83	26K7	8.5
	F 273	182	145	97	28K7	8.6
	F 292	195	168	112	30K7	8.8
	F 301	201	159	106	28K8	9.3
	F 324	216	184	123	30K8	9.5
	F 328	219	172	115	28K9	10.0
	F 352	235	199	133	30K9	10.1
	F 355	237	189	126	28LH05	11.1
	F 361	241	174	116	26K10	11.4
	F 390	260	204	136	28K10	11.7
	F 418	279	235	157	30K10	11.8
	F 498	332	332	229	36LH07	13.0
	F 507	338	262	175	28K12	14.6
	F 514	343	288	192	30K12	14.6
	F 547	365	365	251	36LH08	14.3
	F 549	366	334	223	32LH07	14.7
	F 556	371	294	196	28LH08	16.0
	F 595	397	363	242	32LH08	16.1
	F 645	430	430	329	40LH09	15.3
	F 711	474	474	363	40LH10	16.7
	F 772	515	515	354	36LH10	18.7
	F 775	517	517	393	40LH11	18.6
	F 843	562	562	385	36LH11	20.4

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
51 (cont.)	F 945	630	630	479	40LH12	21.0
	F 1009	673	673	459	36LH12	23.7
	F 1113	742	742	562	40LH13	24.3
	F 1273	849	849	643	40LH14	27.3
	F 1308	872	872	591	36LH14	28.9
	F 1423	949	949	717	40LH15	30.3
	F 1569	1046	1046	788	40LH16	34.0
52	F 199	133	97	65	26K5	7.3
	F 217	145	106	71	26K6	7.9
	F 235	157	124	83	28K6	8.0
	F 243	162	118	79	26K7	8.5
	F 262	175	138	92	28K7	8.6
	F 282	188	159	106	30K7	8.7
	F 289	193	150	100	28K8	9.3
	F 312	208	174	116	30K8	9.4
	F 315	210	163	109	28K9	10.0
	F 339	226	189	126	30K9	10.1
	F 342	228	178	119	28LH05	11.1
	F 346	231	165	110	26K10	11.4
	F 375	250	192	128	28K10	11.7
	F 402	268	222	148	30K10	11.8
	F 487	325	325	220	36LH07	13.0
	F 537	358	358	242	36LH08	14.1
	F 574	383	343	229	32LH08	15.5
	F 633	422	422	317	40LH09	16.0
	F 688	459	459	308	36LH09	17.2
	F 696	464	464	349	40LH10	17.5
	F 757	505	505	340	36LH10	18.9
	F 760	507	507	378	40LH11	18.5
	F 828	552	552	370	36LH11	20.8
	F 925	617	617	460	40LH12	20.9
	F 990	660	660	441	36LH12	24.4
	F 1092	728	728	540	40LH13	24.3
	F 1164	776	775	517	36LH13	27.8
	F 1248	832	832	619	40LH14	27.3
	F 1282	855	852	568	36LH14	30.7
	F 1396	931	931	690	40LH15	30.7
	F 1539	1026	1026	758	40LH16	33.8
53	F 226	151	117	78	28K6	8.0
	F 252	168	130	87	28K7	8.6
	F 271	181	150	100	30K7	8.8
	F 279	186	142	95	28K8	9.3
	F 300	200	163	109	30K8	9.4
	F 304	203	154	103	28K9	10.3
	F 327	218	178	119	30K9	10.4
	F 330	220	169	113	28LH05	11.1
	F 360	240	181	121	28K10	11.7
	F 387	258	210	140	30K10	11.7
	F 472	315	315	233	40LH08	12.6
	F 478	319	318	212	36LH07	13.4
	F 526	351	349	233	36LH08	14.3

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
53 (cont.)	F 553	369	324	216	32LH08	15.5
	F 570	380	380	309	44LH09	14.2
	F 630	420	420	340	44LH10	15.6
	F 675	450	444	296	36LH09	17.1
	F 681	454	454	368	44LH11	16.3
	F 684	456	456	336	40LH10	17.3
	F 745	497	497	364	40LH11	18.4
	F 843	562	562	454	44LH12	19.3
	F 909	606	606	443	40LH12	21.5
	F 999	666	666	538	44LH13	21.7
	F 1071	714	714	520	40LH13	24.3
	F 1150	767	767	616	44LH14	25.9
	F 1224	816	816	595	40LH14	27.9
	F 1338	892	892	716	44LH15	28.9
	F 1369	913	913	664	40LH15	30.8
	F 1509	1006	1006	729	40LH16	33.8
	F 1543	1029	1029	824	44LH16	34.3
	F 1657	1105	1105	880	44LH17	39.1
54	F 217	145	111	74	28K6	8.0
	F 243	162	123	82	28K7	8.5
	F 261	174	141	94	30K7	8.7
	F 268	179	133	89	28K8	9.3
	F 288	192	154	103	30K8	9.4
	F 292	195	145	97	28K9	10.0
	F 313	209	168	112	30K9	10.1
	F 319	213	160	107	28LH05	11.0
	F 348	232	171	114	28K10	11.7
	F 373	249	198	132	30K10	11.8
	F 427	285	225	150	30K11	13.1
	F 441	294	253	169	32LH06	13.3
	F 463	309	309	225	40LH08	12.8
	F 469	313	306	204	36LH07	13.4
	F 486	324	255	170	30K12	14.8
	F 517	345	336	224	36LH08	14.4
	F 559	373	373	298	44LH09	14.2
	F 618	412	412	328	44LH10	15.7
	F 663	442	427	285	36LH09	17.6
	F 667	445	445	354	44LH11	16.9
	F 670	447	447	323	40LH10	17.9
	F 732	488	488	350	40LH11	18.5
	F 828	552	552	437	44LH12	19.3
	F 891	594	594	427	40LH12	21.5
	F 981	654	654	518	44LH13	23.0
	F 1051	701	701	501	40LH13	24.7
	F 1129	753	753	594	44LH14	26.0
	F 1201	801	801	573	40LH14	28.9
	F 1314	876	876	690	44LH15	29.0
	F 1344	896	896	639	40LH15	31.5
	F 1482	988	988	702	40LH16	34.4
	F 1515	1010	1010	793	44LH16	34.4
	F 1626	1084	1084	848	44LH17	39.1

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
55	F 210	140	105	70	28K6	7.9
	F 234	156	115	77	28K7	8.6
	F 252	168	133	89	30K7	8.7
	F 259	173	127	85	28K8	9.3
	F 277	185	147	98	30K8	9.4
	F 282	188	138	92	28K9	10.0
	F 303	202	159	106	30K9	10.1
	F 309	206	153	102	28LH05	11.0
	F 334	223	162	108	28K10	11.7
	F 360	240	187	125	30K10	11.8
	F 426	284	241	161	32LH06	13.3
	F 456	304	304	216	40LH08	13.1
	F 460	307	295	197	36LH07	13.5
	F 507	338	324	216	36LH08	14.4
	F 517	345	291	194	32LH08	16.0
	F 549	366	366	287	44LH09	15.5
	F 598	399	399	283	40LH09	16.3
	F 606	404	404	316	44LH10	16.0
	F 658	439	439	312	40LH10	17.7
	F 718	479	479	338	40LH11	18.6
	F 811	541	541	421	44LH12	20.0
	F 876	584	584	411	40LH12	21.3
	F 963	642	642	499	44LH13	23.1
	F 1032	688	688	482	40LH13	25.6
	F 1108	739	739	572	44LH14	25.7
	F 1180	787	787	553	40LH14	29.0
	F 1290	860	860	665	44LH15	29.6
	F 1320	880	880	616	40LH15	31.5
	F 1453	969	969	677	40LH16	34.3
	F 1486	991	991	764	44LH16	34.3
	F 1597	1065	1065	817	44LH17	39.1
56	F 202	135	99	66	28K6	7.9
	F 226	151	109	73	28K7	8.6
	F 243	162	126	84	30K7	8.6
	F 249	166	120	80	28K8	9.2
	F 268	179	138	92	30K8	9.4
	F 271	181	130	87	28K9	10.0
	F 292	195	150	100	30K9	10.2
	F 298	199	145	97	28LH05	11.0
	F 322	215	153	102	28K10	11.5
	F 346	231	177	118	30K10	11.7
	F 412	275	229	153	32LH06	13.2
	F 447	298	298	209	40LH08	13.1
	F 453	302	285	190	36LH07	14.2
	F 462	308	255	170	32LH07	14.7
	F 498	332	312	208	36LH08	15.1
	F 499	333	276	184	32LH08	16.1
	F 538	359	359	277	44LH09	15.3
	F 588	392	392	273	40LH09	16.3
	F 595	397	397	305	44LH10	15.9
	F 643	429	429	329	44LH11	16.9

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
56 (cont.)	F 646	431	431	301	40LH10	17.7
	F 706	471	471	326	40LH11	19.4
	F 798	532	532	406	44LH12	20.0
	F 859	573	573	397	40LH12	22.3
	F 946	631	631	482	44LH13	23.5
	F 1089	726	726	552	44LH14	25.6
	F 1158	772	772	533	40LH14	29.0
	F 1266	844	844	641	44LH15	30.0
	F 1296	864	864	594	40LH15	31.9
	F 1461	974	974	737	44LH16	34.3
	F 1567	1045	1045	788	44LH17	39.4
57	F 234	156	120	80	30K7	8.7
	F 259	173	132	88	30K8	9.4
	F 282	188	142	95	30K9	10.1
	F 289	193	138	92	28LH05	11.0
	F 334	223	168	112	30K10	11.7
	F 399	266	217	145	32LH06	13.2
	F 439	293	293	201	40LH08	13.0
	F 444	296	274	183	36LH07	14.2
	F 447	298	243	162	32LH07	14.7
	F 489	326	301	201	36LH08	14.9
	F 529	353	353	267	44LH09	15.3
	F 577	385	385	263	40LH09	16.1
	F 585	390	390	294	44LH10	16.5
	F 633	422	422	318	44LH11	16.8
	F 636	424	424	290	40LH10	17.7
	F 691	461	424	283	36LH10	20.0
	F 783	522	522	392	44LH12	19.7
	F 868	579	579	474	48LH13	21.3
	F 928	619	619	465	44LH13	23.4
	F 1069	713	713	532	44LH14	25.8
	F 1138	759	759	514	40LH14	29.8
	F 1177	785	785	640	48LH15	28.2
	F 1243	829	829	619	44LH15	30.5
	F 1273	849	849	573	40LH15	32.4
	F 1357	905	905	737	48LH16	31.8
	F 1434	956	956	711	44LH16	34.0
	F 1524	1016	1016	825	48LH17	38.5
	F 1540	1027	1027	760	44LH17	39.6
58	F 226	151	114	76	30K7	8.7
	F 250	167	124	83	30K8	9.4
	F 271	181	135	90	30K9	10.1
	F 322	215	159	106	30K10	11.8
	F 385	257	207	138	32LH06	13.1
	F 432	288	288	195	40LH08	13.0
	F 438	292	265	177	36LH07	14.1
	F 481	321	291	194	36LH08	14.8
	F 520	347	347	258	44LH09	15.2
	F 567	378	378	254	40LH09	16.1
	F 574	383	383	284	44LH10	16.5
	F 621	414	414	307	44LH11	16.8

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
58 (cont.)	F 624	416	416	280	40LH10	18.6
	F 769	513	513	379	44LH12	19.6
	F 853	569	569	457	48LH13	21.4
	F 913	609	609	449	44LH13	23.3
	F 978	652	651	434	40LH13	26.6
	F 1006	671	671	539	48LH14	25.5
	F 1051	701	701	514	44LH14	26.7
	F 1119	746	745	497	40LH14	29.4
	F 1158	772	772	618	48LH15	29.0
	F 1222	815	815	597	44LH15	30.8
	F 1251	834	831	554	40LH15	32.3
	F 1335	890	890	712	48LH16	31.8
	F 1410	940	940	687	44LH16	34.7
	F 1498	999	999	796	48LH17	38.5
	F 1513	1009	1009	734	44LH17	40.4
59	F 219	146	108	72	30K7	8.7
	F 241	161	118	79	30K8	9.4
	F 262	175	129	86	30K9	10.2
	F 312	208	151	101	30K10	11.8
	F 373	249	196	131	32LH06	13.1
	F 424	283	282	188	40LH08	12.9
	F 466	311	277	185	36LH08	14.9
	F 511	341	341	249	44LH09	15.0
	F 565	377	377	274	44LH10	16.4
	F 610	407	407	296	44LH11	17.2
	F 613	409	406	271	40LH10	18.5
	F 670	447	439	293	40LH11	20.2
	F 757	505	505	366	44LH12	19.7
	F 838	559	559	442	48LH13	21.3
	F 897	598	598	434	44LH13	23.3
	F 961	641	628	419	40LH13	26.5
	F 990	660	660	521	48LH14	25.5
	F 1033	689	689	497	44LH14	26.6
	F 1099	733	720	480	40LH14	29.8
	F 1137	758	758	597	48LH15	28.9
	F 1201	801	801	577	44LH15	30.8
	F 1311	874	874	688	48LH16	31.7
	F 1386	924	924	664	44LH16	35.5
	F 1473	982	982	769	48LH17	39.3
	F 1488	992	992	710	44LH17	40.4
60	F 211	141	103	69	30K7	8.8
	F 234	156	112	75	30K8	9.5
	F 253	169	121	81	30K9	10.3
	F 301	201	144	96	30K10	11.7
	F 363	242	187	125	32LH06	13.1
	F 417	278	273	182	40LH08	13.2
	F 453	302	264	176	36LH08	14.9
	F 502	335	335	241	44LH09	15.0
	F 555	370	370	265	44LH10	16.5
	F 601	401	401	287	44LH11	17.7
	F 603	402	393	262	40LH10	18.4

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
60 (cont.)	F 658	439	424	283	40LH11	20.2
	F 688	459	459	358	48LH12	19.4
	F 744	496	496	354	44LH12	20.6
	F 825	550	550	427	48LH13	21.3
	F 882	588	588	419	44LH13	24.2
	F 945	630	607	405	40LH13	26.5
	F 973	649	649	504	48LH14	26.0
	F 1015	677	677	480	44LH14	27.4
	F 1081	721	696	464	40LH14	30.4
	F 1119	746	746	577	48LH15	28.9
	F 1182	788	788	558	44LH15	30.6
	F 1209	806	775	517	40LH15	34.2
	F 1290	860	860	665	48LH16	33.4
	F 1362	908	908	642	44LH16	35.3
	F 1462	975	975	686	44LH17	40.4
61	F 351	234	178	119	32LH06	13.2
	F 399	266	229	153	36LH07	14.2
	F 411	274	264	176	40LH08	13.9
	F 439	293	252	168	36LH08	14.9
	F 495	330	330	256	48LH10	14.9
	F 537	358	358	275	48LH11	15.7
	F 546	364	364	257	44LH10	16.7
	F 591	394	394	277	44LH11	17.9
	F 594	396	379	253	40LH10	19.1
	F 648	432	411	274	40LH11	20.2
	F 678	452	452	346	48LH12	19.4
	F 732	488	488	342	44LH12	20.6
	F 811	541	541	413	48LH13	21.8
	F 868	579	579	405	44LH13	24.8
	F 957	638	638	487	48LH14	26.1
	F 999	666	666	464	44LH14	27.5
	F 1099	733	733	558	48LH15	28.6
	F 1162	775	775	540	44LH15	31.9
	F 1189	793	750	500	40LH15	34.5
	F 1269	846	846	643	48LH16	34.1
	F 1339	893	893	621	44LH16	39.1
	F 1438	959	959	664	44LH17	40.6
62	F 340	227	171	114	32LH06	13.2
	F 387	258	219	146	36LH07	14.3
	F 403	269	255	170	40LH08	14.0
	F 426	284	240	160	36LH08	15.3
	F 486	324	324	247	48LH10	14.8
	F 528	352	352	267	48LH11	15.8
	F 529	353	333	222	40LH09	17.5
	F 537	358	358	248	44LH10	17.5
	F 582	388	388	268	44LH11	18.0
	F 583	389	367	245	40LH10	19.0
	F 601	401	337	225	36LH10	20.5
	F 666	444	444	335	48LH12	19.2
	F 720	480	480	331	44LH12	20.6
	F 798	532	532	400	48LH13	21.9

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
62 (cont.)	F 853	569	569	392	44LH13	24.9
	F 942	628	628	472	48LH14	26.3
	F 966	644	644	522	52DLH13	26.2
	F 982	655	655	450	44LH14	28.1
	F 1083	722	722	540	48LH15	28.4
	F 1104	736	736	584	52DLH14	29.4
	F 1143	762	762	522	44LH15	32.3
	F 1240	827	827	658	52DLH15	32.1
	F 1248	832	832	623	48LH16	34.0
	F 1338	892	892	732	52DLH16	35.1
	F 1401	934	934	696	48LH17	39.3
	F 1416	944	944	642	44LH17	40.6
	F 1539	1026	1026	835	52DLH17	41.0
63	F 330	220	162	108	32LH06	13.2
	F 376	251	210	140	36LH07	14.3
	F 414	276	229	153	36LH08	15.2
	F 478	319	319	239	48LH10	15.2
	F 519	346	346	258	48LH11	15.5
	F 522	348	322	215	40LH09	17.3
	F 529	353	353	240	44LH10	17.4
	F 574	383	355	237	40LH10	19.0
	F 583	389	322	215	36LH10	20.5
	F 655	437	437	324	48LH12	19.2
	F 702	468	468	383	52DLH11	19.7
	F 708	472	472	321	44LH12	21.5
	F 784	523	523	387	48LH13	21.7
	F 840	560	560	380	44LH13	24.8
	F 927	618	618	457	48LH14	26.2
	F 949	633	633	506	52DLH13	26.2
	F 967	645	645	435	44LH14	29.5
	F 1065	710	710	523	48LH15	29.3
	F 1086	724	724	565	52DLH14	29.6
	F 1125	750	750	506	44LH15	32.4
	F 1228	819	819	603	48LH16	34.0
	F 1317	878	878	708	52DLH16	35.3
	F 1378	919	919	674	48LH17	39.4
	F 1393	929	929	622	44LH17	41.6
	F 1515	1010	1010	809	52DLH17	40.6
64	F 321	214	156	104	32LH06	13.2
	F 366	244	201	134	36LH07	14.3
	F 402	268	219	146	36LH08	15.0
	F 471	314	314	212	44LH09	16.5
	F 513	342	313	209	40LH09	17.4
	F 520	347	347	233	44LH10	17.4
	F 565	377	345	230	40LH10	19.0
	F 567	378	309	206	36LH10	20.3
	F 645	430	430	314	48LH12	19.3
	F 690	460	460	371	52DLH11	19.9
	F 697	465	465	311	44LH12	21.4
	F 771	514	514	405	52DLH12	21.4
	F 772	515	515	375	48LH13	22.9

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
64 (cont.)	F 826	551	551	368	44LH13	24.8
	F 912	608	608	443	48LH14	26.3
	F 936	624	624	490	52DLH13	26.6
	F 952	635	633	422	44LH14	29.6
	F 1048	699	699	507	48LH15	29.8
	F 1069	713	713	547	52DLH14	29.5
	F 1107	738	735	490	44LH15	32.3
	F 1209	806	806	584	48LH16	34.0
	F 1296	864	864	686	52DLH16	35.2
	F 1357	905	905	653	48LH17	40.4
	F 1371	914	903	602	44LH17	42.1
	F 1491	994	994	783	52DLH17	41.7
65	F 312	208	148	99	32LH06	13.2
	F 355	237	192	128	36LH07	14.3
	F 390	260	210	140	36LH08	14.9
	F 463	309	307	205	44LH09	16.4
	F 513	342	339	226	44LH10	17.3
	F 555	370	366	244	44LH11	18.4
	F 556	371	334	223	40LH10	19.7
	F 636	424	424	305	48LH12	19.8
	F 679	453	453	360	52DLH11	19.9
	F 687	458	451	301	44LH12	22.0
	F 759	506	506	392	52DLH12	21.6
	F 760	507	507	364	48LH13	22.7
	F 814	543	535	357	44LH13	25.5
	F 921	614	614	475	52DLH13	26.6
	F 937	625	613	409	44LH14	29.5
	F 1032	688	688	491	48LH15	29.7
	F 1053	702	702	531	52DLH14	29.2
	F 1090	727	712	475	44LH15	32.2
	F 1189	793	793	566	48LH16	34.3
	F 1275	850	850	665	52DLH16	39.4
	F 1336	891	891	633	48LH17	40.3
	F 1350	900	876	584	44LH17	42.0
	F 1468	979	979	759	52DLH17	41.9
66	F 345	230	183	122	36LH07	14.4
	F 379	253	201	134	36LH08	15.0
	F 381	254	225	150	40LH08	14.5
	F 457	305	298	199	44LH09	16.4
	F 498	332	294	196	40LH09	17.8
	F 505	337	328	219	44LH10	17.9
	F 546	364	355	237	44LH11	18.4
	F 550	367	324	216	40LH10	20.5
	F 598	399	351	234	40LH11	21.0
	F 610	407	407	319	52DLH10	19.5
	F 625	417	417	295	48LH12	20.2
	F 669	446	446	349	52DLH11	20.4
	F 676	451	438	292	44LH12	22.1
	F 747	498	498	380	52DLH12	22.2
	F 748	499	499	353	48LH13	24.3
	F 801	534	519	346	44LH13	26.8

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
66 (cont.)	F 907	605	605	461	52DLH13	26.7
	F 922	615	594	396	44LH14	29.5
	F 1017	678	678	476	48LH15	30.1
	F 1036	691	691	515	52DLH14	29.6
	F 1074	716	691	461	44LH15	34.2
	F 1165	777	777	580	52DLH15	34.2
	F 1171	781	781	549	48LH16	36.0
	F 1257	838	838	645	52DLH16	39.1
	F 1315	877	877	614	48LH17	40.4
	F 1329	886	849	566	44LH17	42.0
	F 1446	964	964	736	52DLH17	41.8
67	F 336	224	175	117	36LH07	14.3
	F 369	246	192	128	36LH08	14.9
	F 370	247	216	144	40LH08	14.8
	F 450	300	289	193	44LH09	16.5
	F 484	323	282	188	40LH09	17.8
	F 487	325	325	228	48LH11	16.4
	F 496	331	318	212	44LH10	17.8
	F 537	358	345	230	44LH11	19.0
	F 600	400	400	309	52DLH10	19.4
	F 616	411	411	287	48LH12	20.1
	F 658	439	439	338	52DLH11	20.4
	F 666	444	424	283	44LH12	21.9
	F 735	490	490	369	52DLH12	22.1
	F 738	492	492	342	48LH13	24.2
	F 789	526	504	336	44LH13	26.8
	F 892	595	595	447	52DLH13	26.7
	F 909	606	577	385	44LH14	29.6
	F 994	663	663	534	56DLH14	29.3
	F 1021	681	681	499	52DLH14	31.4
	F 1057	705	670	447	44LH15	34.5
	F 1147	765	765	563	52DLH15	34.2
	F 1153	769	769	533	48LH16	35.6
	F 1225	817	817	672	56DLH16	35.3
	F 1237	825	825	626	52DLH16	39.1
	F 1296	864	864	596	48LH17	40.4
	F 1309	873	823	549	44LH17	42.0
	F 1423	949	949	715	52DLH17	41.7
68	F 327	218	168	112	36LH07	14.2
	F 358	239	184	123	36LH08	15.0
	F 361	241	207	138	40LH08	14.7
	F 444	296	280	187	44LH09	16.3
	F 472	315	270	180	40LH09	18.4
	F 490	327	309	206	44LH10	17.7
	F 529	353	334	223	44LH11	19.3
	F 592	395	395	300	52DLH10	19.4
	F 607	405	405	278	48LH12	20.2
	F 649	433	433	328	52DLH11	20.3
	F 655	437	412	275	44LH12	22.0
	F 724	483	483	358	52DLH12	22.6
	F 727	485	485	332	48LH13	24.2

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
68 (cont.)	F 778	519	489	326	44LH13	26.7
	F 880	587	587	434	52DLH13	26.5
	F 895	597	559	373	44LH14	29.6
	F 979	653	653	519	56DLH14	29.6
	F 987	658	658	449	48LH15	31.4
	F 1006	671	671	485	52DLH14	31.3
	F 1042	695	651	434	44LH15	34.4
	F 1131	754	754	546	52DLH15	34.5
	F 1137	758	758	517	48LH16	35.4
	F 1207	805	805	652	56DLH16	39.1
	F 1276	851	851	578	48LH17	40.4
	F 1290	860	799	533	44LH17	42.4
	F 1402	935	935	694	52DLH17	41.7
69	F 318	212	160	107	36LH07	14.4
	F 349	233	177	118	36LH08	15.1
	F 351	234	198	132	40LH08	14.8
	F 436	291	273	182	44LH09	16.1
	F 459	306	259	173	40LH09	18.2
	F 483	322	300	200	44LH10	17.9
	F 522	348	324	216	44LH11	19.1
	F 598	399	399	270	48LH12	20.1
	F 640	427	427	319	52DLH11	20.9
	F 646	431	400	267	44LH12	22.0
	F 705	470	470	372	56DLH12	21.6
	F 714	476	476	348	52DLH12	23.2
	F 717	478	478	322	48LH13	24.2
	F 766	511	475	317	44LH13	26.8
	F 846	564	564	380	48LH14	27.0
	F 853	569	569	451	56DLH13	26.9
	F 867	578	578	421	52DLH13	27.6
	F 882	588	544	363	44LH14	29.8
	F 966	644	644	504	56DLH14	29.7
	F 991	661	661	471	52DLH14	31.2
	F 1026	684	631	421	44LH15	34.5
	F 1114	743	743	530	52DLH15	34.6
	F 1120	747	747	502	48LH16	35.4
	F 1191	794	794	633	56DLH16	39.2
	F 1201	801	801	590	52DLH16	39.8
	F 1258	839	839	562	48LH17	40.7
	F 1372	915	915	720	56DLH17	41.2
	F 1383	922	922	674	52DLH17	42.7
70	F 310	207	154	103	36LH07	14.4
	F 342	228	190	127	40LH08	14.7
	F 430	287	287	194	48LH10	16.6
	F 447	298	249	166	40LH09	18.1
	F 466	311	311	209	48LH11	16.9
	F 475	317	292	195	44LH10	18.3
	F 493	329	274	183	40LH10	19.0
	F 514	343	315	210	44LH11	19.8
	F 589	393	393	262	48LH12	20.0
	F 631	421	421	310	52DLH11	20.6

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
70 (cont.)	F 637	425	388	259	44LH12	22.2
	F 703	469	469	338	52DLH12	23.1
	F 706	471	469	313	48LH13	24.7
	F 756	504	460	307	44LH13	26.8
	F 832	555	555	370	48LH14	27.0
	F 841	561	561	438	56DLH13	26.8
	F 855	570	570	409	52DLH13	28.3
	F 870	580	528	352	44LH14	30.5
	F 951	634	634	489	56DLH14	29.3
	F 978	652	652	457	52DLH14	31.5
	F 1012	675	613	409	44LH15	34.7
	F 1098	732	732	515	52DLH15	34.3
	F 1104	736	732	488	48LH16	39.3
	F 1183	789	789	573	52DLH16	39.7
	F 1240	827	819	546	48LH17	42.3
	F 1363	909	909	654	52DLH17	42.7
71	F 301	201	148	99	36LH07	14.3
	F 331	221	163	109	36LH08	15.0
	F 333	222	183	122	40LH08	14.6
	F 424	283	258	172	44LH09	17.6
	F 436	291	240	160	40LH09	18.1
	F 460	307	304	203	48LH11	16.9
	F 481	321	264	176	40LH10	19.4
	F 507	338	306	204	44LH11	19.9
	F 582	388	382	255	48LH12	20.4
	F 597	398	398	323	56DLH11	19.9
	F 622	415	415	301	52DLH11	21.7
	F 685	457	457	351	56DLH12	21.9
	F 696	464	457	305	48LH13	24.7
	F 745	497	448	299	44LH13	26.9
	F 750	500	406	271	40LH13	29.0
	F 829	553	553	426	56DLH13	27.0
	F 843	562	562	398	52DLH13	28.5
	F 858	572	513	342	44LH14	31.3
	F 891	594	594	483	60DLH14	29.0
	F 937	625	625	476	56DLH14	29.8
	F 945	630	616	411	48LH15	32.3
	F 963	642	642	444	52DLH14	31.9
	F 1047	698	698	570	60DLH15	32.8
	F 1072	715	715	537	56DLH15	34.0
	F 1083	722	722	501	52DLH15	35.1
	F 1156	771	771	598	56DLH16	39.1
	F 1167	778	778	557	52DLH16	39.7
	F 1222	815	795	530	48LH17	42.3
	F 1344	896	896	636	52DLH17	42.5
	F 1525	1017	1017	818	60DLH18	47.1
72	F 294	196	142	95	36LH07	14.3
	F 322	215	156	104	36LH08	14.9
	F 325	217	175	117	40LH08	14.6
	F 418	279	250	167	44LH09	17.5
	F 424	283	229	153	40LH09	18.5

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
72 (cont.)	F 454	303	295	197	48LH11	17.4
	F 462	308	276	184	44LH10	18.9
	F 499	333	298	199	44LH11	19.7
	F 573	382	372	248	48LH12	20.5
	F 588	392	392	314	56DLH11	19.9
	F 613	409	409	293	52DLH11	22.2
	F 619	413	367	245	44LH12	24.0
	F 687	458	444	296	48LH13	24.7
	F 735	490	436	291	44LH13	27.8
	F 790	527	527	441	60DLH13	26.3
	F 819	546	546	414	56DLH13	27.0
	F 831	554	554	387	52DLH13	29.5
	F 925	617	617	462	56DLH14	29.5
	F 931	621	600	400	48LH15	32.3
	F 949	633	633	432	52DLH14	32.2
	F 984	656	580	387	44LH15	35.6
	F 1057	705	705	522	56DLH15	35.1
	F 1068	712	712	487	52DLH15	36.1
	F 1140	760	760	581	56DLH16	39.1
	F 1150	767	767	542	52DLH16	39.5
	F 1206	804	774	516	48LH17	42.3
	F 1303	869	869	704	60DLH17	41.1
	F 1314	876	876	661	56DLH17	42.3
	F 1324	883	883	618	52DLH17	43.5
	F 1504	1003	1003	796	60DLH18	47.0
73	F 286	191	136	91	36LH07	14.2
	F 313	209	150	100	36LH08	14.9
	F 316	211	168	112	40LH08	14.9
	F 412	275	267	178	48LH10	16.3
	F 414	276	220	147	40LH09	18.4
	F 448	299	288	192	48LH11	17.5
	F 456	304	268	179	44LH10	19.4
	F 493	329	289	193	44LH11	19.7
	F 565	377	361	241	48LH12	20.5
	F 580	387	387	305	56DLH11	19.9
	F 604	403	403	285	52DLH11	21.9
	F 610	407	357	238	44LH12	23.9
	F 676	451	432	288	48LH13	24.6
	F 724	483	424	283	44LH13	27.8
	F 780	520	520	429	60DLH13	26.2
	F 807	538	538	403	56DLH13	27.0
	F 819	546	546	376	52DLH13	29.3
	F 867	578	578	457	60DLH14	28.9
	F 912	608	608	450	56DLH14	29.4
	F 918	612	583	389	48LH15	32.3
	F 937	625	625	420	52DLH14	32.8
	F 1017	678	678	539	60DLH15	33.7
	F 1042	695	695	508	56DLH15	34.9
	F 1053	702	702	474	52DLH15	35.6
	F 1125	750	750	565	56DLH16	39.0
	F 1135	757	757	527	52DLH16	40.5

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
73 (cont.)	F 1189	793	751	501	48LH17	42.3
	F 1285	857	857	685	60DLH17	41.2
	F 1296	864	864	643	56DLH17	42.4
	F 1306	871	871	601	52DLH17	43.7
	F 1483	989	989	774	60DLH18	47.1
74	F 309	206	162	108	40LH08	14.8
	F 406	271	259	173	48LH10	16.4
	F 408	272	237	158	44LH09	18.0
	F 442	295	280	187	48LH11	17.7
	F 450	300	261	174	44LH10	19.4
	F 487	325	282	188	44LH11	19.7
	F 543	362	362	253	52DLH10	20.4
	F 558	372	352	235	48LH12	21.5
	F 597	398	398	277	52DLH11	21.9
	F 603	402	348	232	44LH12	23.9
	F 667	445	420	280	48LH13	24.5
	F 715	477	412	275	44LH13	27.8
	F 769	513	513	418	60DLH13	26.1
	F 796	531	531	392	56DLH13	27.8
	F 808	539	539	366	52DLH13	28.9
	F 855	570	570	444	60DLH14	28.8
	F 906	604	568	379	48LH15	32.4
	F 924	616	613	409	52DLH14	32.6
	F 1027	685	685	494	56DLH15	34.9
	F 1038	692	691	461	52DLH15	35.7
	F 1044	696	654	436	48LH16	40.3
	F 1104	736	736	586	60DLH16	39.7
	F 1120	747	747	513	52DLH16	40.5
	F 1173	782	732	488	48LH17	42.3
	F 1269	846	846	667	60DLH17	41.0
	F 1278	852	852	626	56DLH17	42.1
	F 1288	859	859	585	52DLH17	46.1
	F 1464	976	976	753	60DLH18	47.2
75	F 301	201	156	104	40LH08	14.7
	F 397	265	228	152	44LH09	17.6
	F 402	268	253	169	48LH10	16.4
	F 436	291	273	182	48LH11	17.5
	F 439	293	252	168	44LH10	19.3
	F 475	317	271	181	44LH11	19.7
	F 537	358	358	247	52DLH10	20.3
	F 550	367	342	228	48LH12	21.4
	F 588	392	392	270	52DLH11	21.8
	F 589	393	336	224	44LH12	23.9
	F 624	416	416	336	60DLH12	22.4
	F 658	439	409	273	48LH13	25.1
	F 699	466	397	265	44LH13	27.8
	F 759	506	506	407	60DLH13	26.3
	F 786	524	524	382	56DLH13	27.8
	F 843	562	562	433	60DLH14	29.0
	F 894	596	552	368	48LH15	32.3
	F 912	608	597	398	52DLH14	32.7

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
75 (cont.)	F 990	660	660	511	60DLH15	33.7
	F 1014	676	676	481	56DLH15	34.8
	F 1030	687	637	425	48LH16	40.3
	F 1089	726	726	571	60DLH16	39.8
	F 1095	730	730	536	56DLH16	39.9
	F 1105	737	737	499	52DLH16	41.0
	F 1156	771	712	475	48LH17	42.6
	F 1251	834	834	649	60DLH17	42.2
	F 1261	841	841	609	56DLH17	43.1
	F 1272	848	848	570	52DLH17	46.5
	F 1444	963	963	733	60DLH18	47.3
76	F 294	196	150	100	40LH08	14.6
	F 388	259	219	146	44LH09	17.1
	F 396	264	246	164	48LH10	16.9
	F 430	287	265	177	48LH11	17.5
	F 465	310	262	175	44LH11	20.1
	F 529	353	353	240	52DLH10	20.3
	F 543	362	333	222	48LH12	21.4
	F 580	387	387	263	52DLH11	21.8
	F 616	411	411	328	60DLH12	22.3
	F 649	433	399	266	48LH13	25.0
	F 681	454	381	254	44LH13	27.5
	F 750	500	500	396	60DLH13	26.6
	F 766	511	469	313	48LH14	29.5
	F 775	517	517	372	56DLH13	28.8
	F 787	525	520	347	52DLH13	29.9
	F 832	555	555	421	60DLH14	29.9
	F 900	600	582	388	52DLH14	32.7
	F 948	632	632	528	64DLH15	32.2
	F 978	652	652	497	60DLH15	33.6
	F 1000	667	667	468	56DLH15	35.5
	F 1017	678	621	414	48LH16	40.3
	F 1074	716	716	556	60DLH16	39.8
	F 1080	720	720	521	56DLH16	39.9
	F 1090	727	727	486	52DLH16	41.0
	F 1228	819	819	672	64DLH17	41.2
	F 1234	823	823	632	60DLH17	42.3
	F 1245	830	830	593	56DLH17	43.0
	F 1255	837	832	555	52DLH17	46.4
	F 1425	950	950	714	60DLH18	47.2
77	F 288	192	145	97	40LH08	14.6
	F 375	250	189	126	40LH09	18.1
	F 379	253	211	141	44LH09	18.0
	F 391	261	240	160	48LH10	17.1
	F 424	283	258	172	48LH11	18.2
	F 453	302	252	168	44LH11	20.0
	F 522	348	348	234	52DLH10	20.3
	F 535	357	325	217	48LH12	21.5
	F 573	382	382	256	52DLH11	21.8
	F 609	406	406	319	60DLH12	22.1
	F 640	427	418	279	52DLH12	24.7

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
77 (cont.)	F 642	428	388	259	48LH13	26.0
	F 666	444	369	246	44LH13	27.6
	F 712	475	475	409	64DLH13	26.3
	F 739	493	493	386	60DLH13	27.3
	F 757	505	457	305	48LH14	29.9
	F 777	518	507	338	52DLH13	29.8
	F 822	548	548	410	60DLH14	29.8
	F 888	592	567	378	52DLH14	32.7
	F 934	623	623	514	64DLH15	32.1
	F 964	643	643	484	60DLH15	34.0
	F 988	659	659	456	56DLH15	35.4
	F 997	665	637	425	52DLH15	39.7
	F 1053	702	702	576	64DLH16	38.7
	F 1060	707	707	541	60DLH16	39.6
	F 1066	711	711	508	56DLH16	39.8
	F 1075	717	709	473	52DLH16	41.0
	F 1213	809	809	655	64DLH17	41.2
	F 1219	813	813	615	60DLH17	42.0
	F 1228	819	819	578	56DLH17	44.0
	F 1239	826	810	540	52DLH17	46.4
	F 1401	934	934	741	64DLH18	47.6
	F 1407	938	938	695	60DLH18	50.7
78	F 280	187	139	93	40LH08	14.6
	F 366	244	183	122	40LH09	18.0
	F 370	247	204	136	44LH09	18.0
	F 385	257	234	156	48LH10	17.0
	F 418	279	252	168	48LH11	18.1
	F 442	295	243	162	44LH11	20.1
	F 516	344	342	228	52DLH10	20.2
	F 529	353	316	211	48LH12	22.1
	F 543	362	362	267	56DLH11	20.9
	F 565	377	373	249	52DLH11	22.2
	F 600	400	400	311	60DLH12	22.0
	F 631	421	408	272	52DLH12	24.6
	F 633	422	378	252	48LH13	26.6
	F 649	433	354	236	44LH13	27.7
	F 703	469	469	398	64DLH13	26.0
	F 730	487	487	376	60DLH13	27.3
	F 747	498	445	297	48LH14	29.3
	F 766	511	493	329	52DLH13	29.8
	F 811	541	541	400	60DLH14	29.9
	F 853	569	569	394	56DLH14	32.1
	F 922	615	615	501	64DLH15	31.7
	F 952	635	635	472	60DLH15	33.9
	F 975	650	650	444	56DLH15	35.9
	F 1047	698	698	528	60DLH16	39.5
	F 1053	702	702	495	56DLH16	39.9
	F 1062	708	691	461	52DLH16	42.0
	F 1203	802	802	600	60DLH17	42.0
	F 1213	809	809	563	56DLH17	43.9
	F 1222	815	789	526	52DLH17	49.8

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
78 (cont.)	F 1383	922	922	722	64DLH18	47.5
	F 1389	926	926	677	60DLH18	50.8
79	F 274	183	135	90	40LH08	14.5
	F 363	242	196	131	44LH09	17.7
	F 381	254	228	152	48LH10	17.4
	F 414	276	246	164	48LH11	18.2
	F 433	289	235	157	44LH11	20.5
	F 508	339	333	222	52DLH10	20.6
	F 535	357	357	260	56DLH11	20.7
	F 558	372	364	243	52DLH11	22.4
	F 571	381	381	319	64DLH12	22.0
	F 624	416	397	265	52DLH12	24.9
	F 625	417	369	246	48LH13	26.6
	F 634	423	342	228	44LH13	27.8
	F 694	463	463	388	64DLH13	26.7
	F 720	480	480	366	60DLH13	27.8
	F 738	492	435	290	48LH14	29.2
	F 757	505	481	321	52DLH13	29.8
	F 795	530	530	415	64DLH14	28.9
	F 801	534	534	390	60DLH14	29.8
	F 843	562	562	384	56DLH14	32.0
	F 865	577	538	359	52DLH14	34.0
	F 912	608	608	489	64DLH15	33.9
	F 940	627	627	460	60DLH15	34.8
	F 963	642	642	433	56DLH15	35.8
	F 1033	689	689	514	60DLH16	39.5
	F 1039	693	693	482	56DLH16	39.9
	F 1048	699	675	450	52DLH16	42.0
	F 1188	792	792	585	60DLH17	41.9
	F 1197	798	798	549	56DLH17	43.6
	F 1207	805	769	513	52DLH17	49.7
	F 1365	910	910	704	64DLH18	47.6
	F 1371	914	914	660	60DLH18	50.9
80	F 267	178	129	86	40LH08	15.5
	F 354	236	190	127	44LH09	17.7
	F 376	251	222	148	48LH10	17.4
	F 408	272	240	160	48LH11	18.2
	F 423	282	226	151	44LH11	20.8
	F 502	335	325	217	52DLH10	21.6
	F 516	344	301	201	48LH12	22.1
	F 552	368	355	237	52DLH11	22.4
	F 615	410	387	258	52DLH12	24.8
	F 618	412	360	240	48LH13	26.7
	F 685	457	457	379	64DLH13	27.0
	F 711	474	474	357	60DLH13	27.6
	F 729	486	424	283	48LH14	30.3
	F 747	498	469	313	52DLH13	29.8
	F 784	523	523	405	64DLH14	28.8
	F 790	527	527	380	60DLH14	29.9
	F 832	555	555	374	56DLH14	31.9
	F 855	570	525	350	52DLH14	33.9

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
80 (cont.)	F 900	600	600	476	64DLH15	34.3
	F 928	619	619	449	60DLH15	35.6
	F 951	634	633	422	56DLH15	39.4
	F 960	640	591	394	52DLH15	40.6
	F 1012	675	675	533	64DLH16	40.0
	F 1020	680	680	501	60DLH16	40.4
	F 1035	690	657	438	52DLH16	42.0
	F 1173	782	782	570	60DLH17	42.0
	F 1182	788	788	535	56DLH17	43.6
	F 1192	795	750	500	52DLH17	49.7
	F 1348	899	899	686	64DLH18	47.5
	F 1353	902	902	644	60DLH18	50.8
81	F 261	174	124	83	40LH08	15.4
	F 346	231	183	122	44LH09	17.6
	F 372	248	217	145	48LH10	17.4
	F 381	254	201	134	44LH10	19.3
	F 403	269	234	156	48LH11	18.8
	F 414	276	219	146	44LH11	20.8
	F 496	331	316	211	52DLH10	21.6
	F 510	340	294	196	48LH12	22.1
	F 544	363	346	231	52DLH11	22.6
	F 558	372	372	304	64DLH12	22.5
	F 607	405	378	252	52DLH12	24.9
	F 610	407	351	234	48LH13	26.7
	F 676	451	451	369	64DLH13	27.0
	F 703	469	469	348	60DLH13	27.6
	F 738	492	457	305	52DLH13	29.9
	F 775	517	517	395	64DLH14	29.4
	F 781	521	521	371	60DLH14	30.2
	F 822	548	547	365	56DLH14	32.8
	F 828	552	474	316	48LH15	34.6
	F 840	560	560	469	68DLH15	31.9
	F 844	563	511	341	52DLH14	34.3
	F 889	593	593	465	64DLH15	34.3
	F 916	611	611	438	60DLH15	35.6
	F 948	632	576	384	52DLH15	40.6
	F 1000	667	667	520	64DLH16	40.0
	F 1008	672	672	489	60DLH16	40.1
	F 1014	676	676	459	56DLH16	41.4
	F 1023	682	642	428	52DLH16	42.1
	F 1123	749	749	626	68DLH17	41.0
	F 1158	772	772	556	60DLH17	43.0
	F 1167	778	778	522	56DLH17	46.2
	F 1177	785	732	488	52DLH17	49.6
	F 1332	888	888	669	64DLH18	47.5
	F 1336	891	891	628	60DLH18	50.6
	F 1497	998	998	803	68DLH19	55.4
82	F 339	226	177	118	44LH09	17.5
	F 369	246	211	141	48LH10	17.4
	F 373	249	195	130	44LH10	19.2
	F 399	266	228	152	48LH11	18.8

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
82 (cont.)	F 403	269	210	140	44LH11	20.3
	F 504	336	286	191	48LH12	22.1
	F 516	344	344	242	56DLH11	22.2
	F 538	359	337	225	52DLH11	23.9
	F 550	367	367	296	64DLH12	22.4
	F 571	381	381	281	60DLH12	24.1
	F 592	395	394	263	56DLH12	24.6
	F 603	402	342	228	48LH13	26.6
	F 669	446	446	360	64DLH13	26.9
	F 694	463	463	340	60DLH13	27.5
	F 729	486	447	298	52DLH13	30.0
	F 766	511	511	385	64DLH14	30.1
	F 771	514	514	362	60DLH14	31.2
	F 811	541	534	356	56DLH14	32.7
	F 829	553	553	457	68DLH15	31.8
	F 834	556	499	333	52DLH14	34.9
	F 877	585	585	453	64DLH15	34.1
	F 906	604	604	427	60DLH15	35.6
	F 927	618	603	402	56DLH15	39.8
	F 936	624	562	375	52DLH15	40.7
	F 988	659	659	508	64DLH16	39.7
	F 996	664	664	477	60DLH16	40.2
	F 1000	667	667	448	56DLH16	41.3
	F 1009	673	625	417	52DLH16	42.1
	F 1138	759	759	577	64DLH17	42.2
	F 1144	763	763	542	60DLH17	44.2
	F 1153	769	763	509	56DLH17	46.3
	F 1162	775	714	476	52DLH17	49.4
	F 1315	877	877	653	64DLH18	47.6
	F 1320	880	880	613	60DLH18	52.0
	F 1479	986	986	783	68DLH19	55.2
83	F 331	221	171	114	44LH09	17.5
	F 361	241	204	136	48LH10	17.4
	F 364	243	187	125	44LH10	18.7
	F 390	260	220	147	48LH11	18.8
	F 396	264	204	136	44LH11	20.3
	F 493	329	277	185	48LH12	22.0
	F 510	340	340	236	56DLH11	22.2
	F 531	354	330	220	52DLH11	23.7
	F 544	363	363	289	64DLH12	22.3
	F 586	391	385	257	56DLH12	24.8
	F 589	393	331	221	48LH13	26.6
	F 594	396	360	240	52DLH12	26.4
	F 660	440	440	352	64DLH13	26.6
	F 685	457	457	332	60DLH13	28.1
	F 720	480	436	291	52DLH13	29.9
	F 756	504	504	376	64DLH14	30.0
	F 762	508	508	353	60DLH14	30.8
	F 802	535	522	348	56DLH14	32.9
	F 820	547	547	446	68DLH15	31.9
	F 867	578	578	442	64DLH15	34.2

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
83 (cont.)	F 894	596	596	417	60DLH15	35.2
	F 916	611	588	392	56DLH15	39.7
	F 925	617	549	366	52DLH15	40.5
	F 976	651	651	495	64DLH16	39.7
	F 984	656	656	466	60DLH16	40.0
	F 988	659	655	437	56DLH16	41.2
	F 997	665	610	407	52DLH16	42.2
	F 1125	750	750	563	64DLH17	42.3
	F 1131	754	754	529	60DLH17	44.1
	F 1140	760	745	497	56DLH17	46.5
	F 1149	766	697	465	52DLH17	49.7
	F 1269	846	846	674	68DLH18	47.8
	F 1299	866	866	637	64DLH18	51.0
	F 1305	870	870	598	60DLH18	51.8
	F 1461	974	974	765	68DLH19	55.1
84	F 324	216	165	110	44LH09	17.8
	F 354	236	198	132	48LH10	17.8
	F 357	238	181	121	44LH10	19.4
	F 382	255	213	142	48LH11	19.1
	F 387	258	196	131	44LH11	21.2
	F 483	322	268	179	48LH12	22.0
	F 504	336	336	230	56DLH11	22.2
	F 525	350	322	215	52DLH11	23.6
	F 538	359	359	282	64DLH12	22.9
	F 579	386	376	251	56DLH12	24.8
	F 586	391	351	234	52DLH12	26.8
	F 627	418	418	362	68DLH13	26.7
	F 652	435	435	343	64DLH13	27.8
	F 700	467	456	304	56DLH13	29.8
	F 711	474	426	284	52DLH13	31.3
	F 747	498	498	367	64DLH14	29.9
	F 753	502	502	345	60DLH14	30.7
	F 792	528	508	339	56DLH14	32.9
	F 810	540	540	436	68DLH15	31.9
	F 856	571	571	432	64DLH15	34.1
	F 883	589	589	407	60DLH15	35.8
	F 964	643	643	484	64DLH16	39.8
	F 972	648	648	455	60DLH16	40.0
	F 976	651	640	427	56DLH16	41.2
	F 985	657	595	397	52DLH16	42.2
	F 1111	741	741	550	64DLH17	42.1
	F 1117	745	745	517	60DLH17	44.1
	F 1135	757	681	454	52DLH17	50.0
	F 1252	835	835	658	68DLH18	47.7
	F 1284	856	856	622	64DLH18	50.8
	F 1288	859	859	584	60DLH18	51.7
	F 1443	962	962	746	68DLH19	55.2
85	F 316	211	159	106	44LH09	17.8
	F 346	231	190	127	48LH10	17.9
	F 349	233	175	117	44LH10	19.4
	F 373	249	205	137	48LH11	19.1

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
85 (cont.)	F 378	252	190	127	44LH11	21.0
	F 472	315	288	192	52DLH10	21.6
	F 498	332	332	225	56DLH11	22.1
	F 519	346	315	210	52DLH11	24.3
	F 531	354	354	276	64DLH12	22.9
	F 571	381	367	245	56DLH12	25.0
	F 579	386	343	229	52DLH12	26.8
	F 619	413	413	353	68DLH13	26.6
	F 645	430	430	335	64DLH13	27.7
	F 693	462	445	297	56DLH13	29.7
	F 744	496	496	336	60DLH14	30.8
	F 783	522	496	331	56DLH14	32.7
	F 801	534	534	425	68DLH15	32.1
	F 847	565	565	422	64DLH15	34.0
	F 873	582	582	397	60DLH15	35.4
	F 952	635	635	472	64DLH16	39.8
	F 975	650	582	388	52DLH16	42.1
	F 1098	732	732	537	64DLH17	42.2
	F 1104	736	736	505	60DLH17	44.2
	F 1113	742	711	474	56DLH17	49.6
	F 1122	748	664	443	52DLH17	50.1
	F 1212	808	808	678	72DLH18	46.7
	F 1239	826	826	642	68DLH18	47.7
	F 1269	846	846	607	64DLH18	50.7
	F 1273	849	849	570	60DLH18	51.7
	F 1426	951	951	729	68DLH19	55.1
86	F 310	207	154	103	44LH09	17.9
	F 339	226	184	123	48LH10	17.8
	F 342	228	169	113	44LH10	19.3
	F 366	244	199	133	48LH11	19.0
	F 370	247	184	123	44LH11	20.9
	F 468	312	280	187	52DLH10	22.1
	F 492	328	328	220	56DLH11	22.0
	F 513	342	307	205	52DLH11	24.4
	F 525	350	350	269	64DLH12	22.9
	F 544	363	363	256	60DLH12	24.8
	F 565	377	358	239	56DLH12	25.3
	F 573	382	334	223	52DLH12	26.6
	F 613	409	409	345	68DLH13	26.6
	F 637	425	425	327	64DLH13	27.4
	F 684	456	435	290	56DLH13	29.7
	F 694	463	406	271	52DLH13	32.1
	F 705	470	470	371	68DLH14	29.5
	F 730	487	487	350	64DLH14	30.3
	F 735	490	490	329	60DLH14	31.9
	F 792	528	528	416	68DLH15	32.2
	F 795	530	453	302	52DLH14	35.0
	F 837	558	558	412	64DLH15	35.5
	F 862	575	575	388	60DLH15	35.9
	F 883	589	547	365	56DLH15	40.7
	F 909	606	606	515	72DLH16	39.1

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
86 (cont.)	F 942	628	628	461	64DLH16	40.6
	F 949	633	633	434	60DLH16	41.7
	F 954	636	610	407	56DLH16	42.3
	F 1086	724	724	525	64DLH17	42.1
	F 1090	727	727	493	60DLH17	44.1
	F 1099	733	694	463	56DLH17	49.6
	F 1108	739	649	433	52DLH17	50.1
	F 1197	798	798	662	72DLH18	46.5
	F 1224	816	816	627	68DLH18	47.4
	F 1254	836	836	593	64DLH18	50.7
	F 1258	839	835	557	60DLH18	51.8
	F 1410	940	940	712	68DLH19	55.1
87	F 303	202	148	99	44LH09	17.9
	F 331	221	178	119	48LH10	17.7
	F 334	223	165	110	44LH10	19.2
	F 358	239	193	129	48LH11	19.0
	F 363	242	178	119	44LH11	21.0
	F 462	308	274	183	52DLH10	22.2
	F 486	324	322	215	56DLH11	22.1
	F 507	338	300	200	52DLH11	24.4
	F 519	346	346	263	64DLH12	23.5
	F 559	373	351	234	56DLH12	25.2
	F 565	377	327	218	52DLH12	26.7
	F 606	404	404	337	68DLH13	27.0
	F 630	420	420	320	64DLH13	27.8
	F 654	436	436	302	60DLH13	29.3
	F 676	451	424	283	56DLH13	30.1
	F 697	465	465	363	68DLH14	29.3
	F 721	481	481	342	64DLH14	30.7
	F 727	485	481	321	60DLH14	31.9
	F 783	522	522	406	68DLH15	32.0
	F 786	524	442	295	52DLH14	35.0
	F 828	552	552	403	64DLH15	35.9
	F 853	569	568	379	60DLH15	40.2
	F 874	583	535	357	56DLH15	40.8
	F 931	621	621	451	64DLH16	40.4
	F 937	625	625	424	60DLH16	41.5
	F 943	629	595	397	56DLH16	42.3
	F 1011	674	674	573	72DLH17	40.9
	F 1045	697	697	542	68DLH17	41.4
	F 1072	715	715	513	64DLH17	44.5
	F 1078	719	719	482	60DLH17	46.9
	F 1095	730	634	423	52DLH17	50.1
	F 1183	789	789	647	72DLH18	46.6
	F 1210	807	807	613	68DLH18	47.5
	F 1245	830	816	544	60DLH18	51.5
	F 1393	929	929	696	68DLH19	55.1
88	F 297	198	144	96	44LH09	17.8
	F 325	217	174	116	48LH10	17.7
	F 327	218	159	106	44LH10	19.0
	F 351	234	187	125	48LH11	19.0

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
88 (cont.)	F 354	236	172	115	44LH11	20.9
	F 457	305	268	179	52DLH10	22.1
	F 481	321	315	210	56DLH11	22.6
	F 501	334	294	196	52DLH11	24.4
	F 513	342	342	257	64DLH12	23.4
	F 532	355	355	244	60DLH12	24.7
	F 559	373	319	213	52DLH12	26.7
	F 622	415	415	313	64DLH13	27.5
	F 646	431	431	295	60DLH13	29.2
	F 669	446	415	277	56DLH13	30.2
	F 690	460	460	354	68DLH14	29.2
	F 714	476	476	335	64DLH14	31.3
	F 718	479	471	314	60DLH14	31.8
	F 756	504	463	309	56DLH14	34.2
	F 774	516	516	397	68DLH15	32.9
	F 817	545	545	393	64DLH15	35.5
	F 843	562	555	370	60DLH15	40.2
	F 864	576	523	349	56DLH15	40.8
	F 921	614	614	440	64DLH16	40.4
	F 927	618	618	414	60DLH16	41.4
	F 933	622	582	388	56DLH16	42.5
	F 999	666	666	560	72DLH17	40.8
	F 1033	689	689	530	68DLH17	42.5
	F 1060	707	707	501	64DLH17	44.4
	F 1066	711	706	471	60DLH17	46.9
	F 1170	780	780	632	72DLH18	46.5
	F 1195	797	797	599	68DLH18	47.8
	F 1230	820	798	532	60DLH18	51.5
	F 1377	918	918	680	68DLH19	55.2
89	F 291	194	139	93	44LH09	17.7
	F 318	212	168	112	48LH10	17.6
	F 321	214	154	103	44LH10	18.9
	F 343	229	180	120	48LH11	19.0
	F 348	232	166	111	44LH11	20.8
	F 451	301	262	175	52DLH10	22.2
	F 475	317	307	205	56DLH11	22.6
	F 495	330	286	191	52DLH11	24.4
	F 507	338	338	251	64DLH12	23.1
	F 526	351	351	239	60DLH12	24.6
	F 553	369	313	209	52DLH12	26.8
	F 616	411	411	306	64DLH13	27.4
	F 639	426	426	288	60DLH13	29.2
	F 661	441	406	271	56DLH13	30.1
	F 681	454	454	346	68DLH14	29.3
	F 705	470	470	327	64DLH14	31.2
	F 711	474	460	307	60DLH14	31.8
	F 747	498	453	302	56DLH14	34.4
	F 759	506	506	408	72DLH15	32.2
	F 765	510	510	388	68DLH15	33.8
	F 808	539	539	385	64DLH15	35.3
	F 834	556	543	362	60DLH15	40.1

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
89 (cont.)	F 855	570	511	341	56DLH15	40.9
	F 910	607	607	431	64DLH16	40.6
	F 916	611	607	405	60DLH16	41.7
	F 922	615	570	380	56DLH16	42.5
	F 988	659	659	547	72DLH17	41.4
	F 1021	681	681	518	68DLH17	42.3
	F 1048	699	699	490	64DLH17	44.3
	F 1156	771	771	618	72DLH18	46.4
	F 1182	788	788	586	68DLH18	47.8
	F 1216	811	780	520	60DLH18	51.5
	F 1362	908	908	665	68DLH19	55.4
90	F 312	208	162	108	48LH10	17.6
	F 337	225	175	117	48LH11	19.0
	F 424	283	220	147	48LH12	22.8
	F 447	298	256	171	52DLH10	22.5
	F 490	327	280	187	52DLH11	24.4
	F 502	335	335	246	64DLH12	23.4
	F 520	347	347	233	60DLH12	24.5
	F 547	365	306	204	52DLH12	26.7
	F 609	406	406	299	64DLH13	27.5
	F 633	422	422	282	60DLH13	29.3
	F 664	443	370	247	52DLH13	32.1
	F 697	465	465	320	64DLH14	31.1
	F 702	468	450	300	60DLH14	31.8
	F 751	501	501	399	72DLH15	32.2
	F 756	504	504	379	68DLH15	33.8
	F 799	533	533	376	64DLH15	35.4
	F 825	550	531	354	60DLH15	40.1
	F 868	579	579	471	72DLH16	39.2
	F 897	598	598	446	68DLH16	40.0
	F 906	604	594	396	60DLH16	41.7
	F 912	608	556	371	56DLH16	42.5
	F 976	651	651	535	72DLH17	41.4
	F 1011	674	674	506	68DLH17	42.2
	F 1036	691	691	479	64DLH17	44.2
	F 1059	706	592	395	52DLH17	50.0
	F 1144	763	763	604	72DLH18	47.8
	F 1170	780	780	573	68DLH18	50.8
	F 1197	798	798	542	64DLH18	51.6
	F 1203	802	762	508	60DLH18	54.7
	F 1347	898	898	650	68DLH19	55.4
91	F 306	204	157	105	48LH10	17.6
	F 330	220	169	113	48LH11	18.9
	F 436	291	247	165	52DLH10	22.1
	F 480	320	271	181	52DLH11	24.3
	F 496	331	331	240	64DLH12	24.4
	F 535	357	295	197	52DLH12	26.7
	F 601	401	401	292	64DLH13	27.9
	F 625	417	414	276	60DLH13	29.7
	F 649	433	358	239	52DLH13	32.2
	F 694	463	439	293	60DLH14	32.7

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
91 (cont.)	F 742	495	495	391	72DLH15	32.2
	F 748	499	499	371	68DLH15	33.4
	F 790	527	527	368	64DLH15	35.3
	F 816	544	519	346	60DLH15	40.1
	F 835	557	489	326	56DLH15	40.9
	F 897	598	580	387	60DLH16	41.4
	F 901	601	544	363	56DLH16	42.5
	F 966	644	644	524	72DLH17	41.4
	F 999	666	666	495	68DLH17	42.3
	F 1026	684	684	468	64DLH17	44.3
	F 1036	691	571	381	52DLH17	49.7
	F 1131	754	754	591	72DLH18	47.6
	F 1156	771	771	560	68DLH18	50.6
	F 1185	790	790	530	64DLH18	51.6
	F 1189	793	745	497	60DLH18	54.7
	F 1327	885	885	671	72DLH19	55.2
	F 1332	888	888	636	68DLH19	56.3
92	F 300	200	153	102	48LH10	17.6
	F 324	216	165	110	48LH11	19.0
	F 427	285	238	159	52DLH10	22.4
	F 460	307	288	192	56DLH11	24.0
	F 469	313	261	174	52DLH11	24.9
	F 490	327	327	235	64DLH12	24.3
	F 508	339	334	223	60DLH12	24.9
	F 523	349	286	191	52DLH12	27.1
	F 528	352	313	209	56DLH12	26.8
	F 595	397	397	286	64DLH13	28.6
	F 618	412	405	270	60DLH13	30.2
	F 636	424	346	231	52DLH13	32.0
	F 640	427	379	253	56DLH13	32.3
	F 642	428	428	342	72DLH14	29.7
	F 660	440	440	324	68DLH14	30.6
	F 687	458	430	287	60DLH14	32.3
	F 735	490	490	382	72DLH15	32.1
	F 739	493	493	363	68DLH15	33.5
	F 781	521	521	360	64DLH15	35.1
	F 807	538	508	339	60DLH15	40.0
	F 826	551	478	319	56DLH15	40.8
	F 877	585	585	426	68DLH16	40.6
	F 892	595	532	355	56DLH16	42.5
	F 955	637	637	512	72DLH17	41.5
	F 1014	676	676	458	64DLH17	44.3
	F 1119	746	746	578	72DLH18	47.7
	F 1171	781	777	518	64DLH18	51.5
	F 1176	784	729	486	60DLH18	54.6
	F 1312	875	875	656	72DLH19	55.2
	F 1317	878	878	622	68DLH19	56.2
93	F 294	196	148	99	48LH10	18.2
	F 318	212	159	106	48LH11	19.3
	F 418	279	231	154	52DLH10	22.3
	F 459	306	253	169	52DLH11	24.5

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
93 (cont.)	F 486	324	324	230	64DLH12	24.3
	F 504	336	327	218	60DLH12	25.4
	F 513	342	277	185	52DLH12	27.0
	F 523	349	306	204	56DLH12	26.9
	F 589	393	393	280	64DLH13	28.4
	F 612	408	396	264	60DLH13	30.2
	F 621	414	336	224	52DLH13	32.1
	F 634	423	423	335	72DLH14	29.6
	F 652	435	435	317	68DLH14	30.7
	F 675	450	448	299	64DLH14	32.2
	F 679	453	421	281	60DLH14	33.2
	F 727	485	485	374	72DLH15	32.0
	F 732	488	488	355	68DLH15	33.5
	F 774	516	516	352	64DLH15	35.7
	F 798	532	498	332	60DLH15	41.1
	F 799	533	423	282	52DLH15	42.0
	F 817	545	468	312	56DLH15	41.8
	F 867	578	578	417	68DLH16	40.7
	F 882	588	522	348	56DLH16	42.4
	F 945	630	630	501	72DLH17	41.4
	F 1003	669	669	448	64DLH17	44.2
	F 1017	678	592	395	56DLH17	50.2
	F 1107	738	738	566	72DLH18	47.9
	F 1159	773	760	507	64DLH18	51.5
	F 1164	776	714	476	60DLH18	54.7
	F 1297	865	865	642	72DLH19	55.4
	F 1303	869	869	609	68DLH19	56.1
94	F 288	192	144	96	48LH10	18.1
	F 312	208	154	103	48LH11	19.0
	F 409	273	225	150	52DLH10	22.4
	F 448	299	246	164	52DLH11	24.5
	F 450	300	276	184	56DLH11	24.0
	F 480	320	320	225	64DLH12	24.5
	F 501	334	268	179	52DLH12	27.1
	F 517	345	300	200	56DLH12	26.8
	F 561	374	374	289	68DLH13	28.2
	F 583	389	389	274	64DLH13	29.5
	F 606	404	387	258	60DLH13	30.6
	F 609	406	324	216	52DLH13	32.1
	F 627	418	418	328	72DLH14	29.7
	F 645	430	430	310	68DLH14	30.6
	F 667	445	439	293	64DLH14	32.1
	F 672	448	412	275	60DLH14	33.0
	F 708	472	406	271	56DLH14	35.2
	F 765	510	510	345	64DLH15	35.2
	F 789	526	487	325	60DLH15	40.8
	F 808	539	459	306	56DLH15	41.9
	F 831	554	554	431	72DLH16	41.0
	F 861	574	574	386	64DLH16	42.0
	F 868	579	544	363	60DLH16	42.7
	F 934	623	623	491	72DLH17	41.5

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
94 (cont.)	F 967	645	645	464	68DLH17	44.6
	F 970	647	519	346	52DLH17	49.9
	F 993	662	658	439	64DLH17	47.9
	F 997	665	618	412	60DLH17	50.0
	F 1095	730	730	554	72DLH18	47.7
	F 1119	746	746	525	68DLH18	51.7
	F 1146	764	744	496	64DLH18	55.1
	F 1152	768	699	466	60DLH18	55.0
	F 1284	856	856	629	72DLH19	55.2
	F 1288	859	859	596	68DLH19	56.0
95	F 282	188	139	93	48LH10	18.1
	F 306	204	150	100	48LH11	19.3
	F 400	267	217	145	52DLH10	22.4
	F 439	293	237	158	52DLH11	24.5
	F 445	297	270	180	56DLH11	24.7
	F 475	317	317	221	64DLH12	24.8
	F 493	329	313	209	60DLH12	25.4
	F 511	341	294	196	56DLH12	26.9
	F 555	370	370	282	68DLH13	28.3
	F 576	384	384	268	64DLH13	29.5
	F 598	399	379	253	60DLH13	30.4
	F 619	413	355	237	56DLH13	32.2
	F 639	426	426	304	68DLH14	30.7
	F 660	440	430	287	64DLH14	32.0
	F 666	444	403	269	60DLH14	33.0
	F 700	467	397	265	56DLH14	35.3
	F 711	474	474	358	72DLH15	33.7
	F 715	477	477	340	68DLH15	34.6
	F 757	505	505	337	64DLH15	36.3
	F 781	521	477	318	60DLH15	40.9
	F 799	533	448	299	56DLH15	41.9
	F 822	548	548	422	72DLH16	41.0
	F 852	568	567	378	64DLH16	42.0
	F 859	573	532	355	60DLH16	42.6
	F 925	617	617	480	72DLH17	41.4
	F 957	638	638	454	68DLH17	44.5
	F 987	658	606	404	60DLH17	50.1
	F 1084	723	723	542	72DLH18	47.7
	F 1107	738	738	514	68DLH18	51.7
	F 1134	756	729	486	64DLH18	55.0
	F 1270	847	847	615	72DLH19	55.2
	F 1275	850	850	583	68DLH19	56.1
96	F 277	185	135	90	48LH10	18.2
	F 300	200	145	97	48LH11	19.2
	F 391	261	210	140	52DLH10	22.3
	F 430	287	229	153	52DLH11	24.5
	F 441	294	264	176	56DLH11	24.7
	F 471	314	314	216	64DLH12	24.8
	F 480	320	252	168	52DLH12	27.0
	F 487	325	307	205	60DLH12	25.6
	F 507	338	288	192	56DLH12	26.9

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
96 (cont.)	F 549	366	366	277	68DLH13	28.0
	F 570	380	380	263	64DLH13	29.5
	F 592	395	372	248	60DLH13	30.3
	F 613	409	348	232	56DLH13	32.1
	F 631	421	421	298	68DLH14	30.7
	F 654	436	421	281	64DLH14	32.0
	F 658	439	396	264	60DLH14	32.9
	F 693	462	390	260	56DLH14	35.2
	F 703	469	469	351	72DLH15	33.7
	F 708	472	472	333	68DLH15	34.5
	F 750	500	495	330	64DLH15	40.3
	F 772	515	466	311	60DLH15	41.0
	F 792	528	439	293	56DLH15	41.9
	F 813	542	542	413	72DLH16	41.0
	F 843	562	555	370	64DLH16	41.9
	F 850	567	522	348	60DLH16	42.8
	F 915	610	610	470	72DLH17	42.3
	F 946	631	631	445	68DLH17	44.5
	F 984	656	556	371	56DLH17	50.3
	F 1072	715	715	531	72DLH18	51.2
	F 1096	731	731	503	68DLH18	51.7
	F 1122	748	714	476	64DLH18	55.0
	F 1257	838	838	603	72DLH19	56.7
	F 1261	841	841	571	68DLH19	58.4
97	F 271	181	130	87	48LH10	17.5
	F 294	196	141	94	48LH11	19.3
	F 384	256	204	136	52DLH10	22.2
	F 421	281	223	149	52DLH11	24.5
	F 436	291	259	173	56DLH11	24.7
	F 471	314	244	163	52DLH12	26.9
	F 483	322	301	201	60DLH12	26.0
	F 501	334	282	188	56DLH12	27.2
	F 543	362	362	271	68DLH13	28.0
	F 565	377	377	257	64DLH13	29.5
	F 586	391	364	243	60DLH13	30.3
	F 606	404	342	228	56DLH13	32.1
	F 646	431	412	275	64DLH14	32.4
	F 651	434	387	258	60DLH14	34.3
	F 696	464	464	344	72DLH15	33.7
	F 702	468	468	326	68DLH15	35.7
	F 741	494	486	324	64DLH15	40.1
	F 765	510	457	305	60DLH15	41.2
	F 783	522	430	287	56DLH15	41.9
	F 805	537	537	405	72DLH16	41.0
	F 835	557	543	362	64DLH16	42.0
	F 841	561	511	341	60DLH16	42.8
	F 846	564	480	320	56DLH16	45.7
	F 906	604	604	461	72DLH17	43.2
	F 937	625	625	436	68DLH17	44.5
	F 975	650	544	363	56DLH17	50.0
	F 1084	723	723	493	68DLH18	51.8

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
97 (cont.)	F 1111	741	699	466	64DLH18	54.9
	F 1245	830	830	590	72DLH19	56.4
	F 1249	833	833	559	68DLH19	58.5
98	F 376	251	198	132	52DLH10	22.3
	F 412	275	216	144	52DLH11	24.3
	F 432	288	253	169	56DLH11	24.9
	F 460	307	237	158	52DLH12	26.8
	F 477	318	295	197	60DLH12	25.9
	F 496	331	276	184	56DLH12	27.7
	F 537	358	358	265	68DLH13	27.9
	F 559	373	373	252	64DLH13	29.5
	F 601	401	334	223	56DLH13	32.1
	F 619	413	413	286	68DLH14	31.7
	F 640	427	405	270	64DLH14	32.7
	F 645	430	379	253	60DLH14	34.3
	F 694	463	463	320	68DLH15	35.7
	F 733	489	475	317	64DLH15	40.0
	F 796	531	531	397	72DLH16	40.3
	F 826	551	532	355	64DLH16	42.0
	F 832	555	501	334	60DLH16	42.7
	F 838	559	469	313	56DLH16	45.8
	F 897	598	598	451	72DLH17	43.0
	F 927	618	618	427	68DLH17	44.2
	F 964	643	534	356	56DLH17	50.1
	F 1074	716	716	483	68DLH18	51.7
	F 1099	733	684	456	64DLH18	54.8
	F 1231	821	821	578	72DLH19	56.4
	F 1236	824	822	548	68DLH19	58.3
99	F 369	246	192	128	52DLH10	22.3
	F 405	270	210	140	52DLH11	24.3
	F 424	283	244	163	56DLH11	25.2
	F 451	301	229	153	52DLH12	26.6
	F 456	304	304	203	64DLH12	25.2
	F 472	315	289	193	60DLH12	26.7
	F 486	324	267	178	56DLH12	27.6
	F 532	355	355	260	68DLH13	27.9
	F 553	369	369	247	64DLH13	29.4
	F 574	383	349	233	60DLH13	31.5
	F 591	394	324	216	56DLH13	32.3
	F 612	408	408	280	68DLH14	31.6
	F 634	423	396	264	64DLH14	33.6
	F 639	426	372	248	60DLH14	34.3
	F 687	458	458	313	68DLH15	35.6
	F 726	484	466	311	64DLH15	40.1
	F 789	526	526	389	72DLH16	40.2
	F 817	545	522	348	64DLH16	42.3
	F 823	549	490	327	60DLH16	42.8
	F 888	592	592	442	72DLH17	43.0
	F 918	612	612	418	68DLH17	44.2
	F 945	630	517	345	56DLH17	50.1
	F 946	631	558	372	60DLH17	50.2

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
99 (cont.)	F 1062	708	708	473	68DLH18	51.6
	F 1089	726	670	447	64DLH18	54.9
	F 1219	813	813	566	72DLH19	56.4
	F 1224	816	805	537	68DLH19	61.4
100	F 361	241	186	124	52DLH10	22.3
	F 396	264	202	135	52DLH11	24.4
	F 415	277	237	158	56DLH11	25.0
	F 442	295	223	149	52DLH12	26.6
	F 451	301	298	199	64DLH12	24.9
	F 468	312	283	189	60DLH12	26.7
	F 477	318	259	173	56DLH12	27.3
	F 526	351	351	255	68DLH13	27.8
	F 547	365	363	242	64DLH13	29.4
	F 568	379	342	228	60DLH13	31.5
	F 579	386	313	209	56DLH13	32.5
	F 589	393	393	289	72DLH14	30.9
	F 606	404	404	274	68DLH14	32.6
	F 627	418	388	259	64DLH14	33.2
	F 631	421	364	243	60DLH14	34.3
	F 652	435	351	234	56DLH14	36.3
	F 679	453	453	307	68DLH15	35.5
	F 720	480	456	304	64DLH15	40.1
	F 742	495	430	287	60DLH15	41.3
	F 747	498	396	264	56DLH15	42.3
	F 816	544	480	320	60DLH16	42.8
	F 879	586	586	433	72DLH17	43.0
	F 909	606	606	410	68DLH17	44.1
	F 927	618	502	335	56DLH17	50.4
	F 937	625	546	364	60DLH17	50.3
	F 1051	701	694	463	68DLH18	51.5
	F 1077	718	657	438	64DLH18	54.9
	F 1207	805	805	555	72DLH19	56.4
	F 1212	808	789	526	68DLH19	61.4
101	F 354	236	180	120	52DLH10	22.3
	F 388	259	198	132	52DLH11	24.4
	F 408	272	229	153	56DLH11	25.0
	F 433	289	216	144	52DLH12	26.8
	F 447	298	292	195	64DLH12	25.2
	F 463	309	277	185	60DLH12	26.6
	F 468	312	252	168	56DLH12	27.1
	F 522	348	348	250	68DLH13	27.8
	F 543	362	355	237	64DLH13	29.5
	F 562	375	336	224	60DLH13	31.4
	F 568	379	306	204	56DLH13	32.5
	F 583	389	389	284	72DLH14	31.0
	F 621	414	381	254	64DLH14	33.3
	F 625	417	357	238	60DLH14	34.3
	F 640	427	342	228	56DLH14	36.1
	F 673	449	449	301	68DLH15	35.6
	F 712	475	447	298	64DLH15	40.2
	F 735	490	421	281	60DLH15	41.2

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
101 (cont.)	F 801	534	501	334	64DLH16	42.8
	F 870	580	580	425	72DLH17	43.0
	F 900	600	600	402	68DLH17	44.2
	F 907	605	487	325	56DLH17	50.3
	F 928	619	535	357	60DLH17	50.3
	F 1041	694	681	454	68DLH18	51.5
	F 1066	711	645	430	64DLH18	55.3
	F 1195	797	797	544	72DLH19	56.1
	F 1200	800	774	516	68DLH19	61.4
102	F 346	231	174	116	52DLH10	22.2
	F 381	254	192	128	52DLH11	24.3
	F 400	267	223	149	56DLH11	24.9
	F 426	284	210	140	52DLH12	26.8
	F 442	295	286	191	64DLH12	25.9
	F 459	306	244	163	56DLH12	27.1
	F 537	358	348	232	64DLH13	30.6
	F 558	372	295	197	56DLH13	32.4
	F 579	386	386	278	72DLH14	30.9
	F 615	410	373	249	64DLH14	33.2
	F 619	413	349	233	60DLH14	35.2
	F 628	419	331	221	56DLH14	36.1
	F 667	445	442	295	68DLH15	35.4
	F 705	470	438	292	64DLH15	40.4
	F 717	478	372	248	56DLH15	42.3
	F 727	485	412	275	60DLH15	42.2
	F 793	529	490	327	64DLH16	42.9
	F 861	574	574	416	72DLH17	43.0
	F 919	613	525	350	60DLH17	50.1
	F 1009	673	673	470	72DLH18	51.9
	F 1032	688	667	445	68DLH18	54.7
	F 1060	707	592	395	60DLH18	57.2
	F 1183	789	789	534	72DLH19	58.7
	F 1188	792	759	506	68DLH19	61.5
103	F 340	227	171	114	52DLH10	22.3
	F 373	249	186	124	52DLH11	24.3
	F 393	262	217	145	56DLH11	24.9
	F 417	278	202	135	52DLH12	26.8
	F 438	292	282	188	64DLH12	25.8
	F 450	300	237	158	56DLH12	27.1
	F 454	303	267	178	60DLH12	27.5
	F 532	355	342	228	64DLH13	30.5
	F 547	365	286	191	56DLH13	32.4
	F 552	368	322	215	60DLH13	32.4
	F 573	382	382	273	72DLH14	30.8
	F 589	393	387	258	68DLH14	32.4
	F 609	406	366	244	64DLH14	34.1
	F 613	409	343	229	60DLH14	35.2
	F 616	411	321	214	56DLH14	36.1
	F 660	440	433	289	68DLH15	35.3
	F 699	466	430	287	64DLH15	41.2
	F 703	469	363	242	56DLH15	42.3

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
103 (cont.)	F 720	480	405	270	60DLH15	42.2
	F 786	524	481	321	64DLH16	42.9
	F 792	528	453	302	60DLH16	46.0
	F 853	569	569	408	72DLH17	44.3
	F 873	582	459	306	56DLH17	50.2
	F 910	607	514	343	60DLH17	50.1
	F 999	666	666	461	72DLH18	51.8
	F 1021	681	655	437	68DLH18	54.6
	F 1050	700	582	388	60DLH18	57.3
	F 1176	784	744	496	68DLH19	61.4
104	F 334	223	165	110	52DLH10	22.2
	F 366	244	180	120	52DLH11	24.3
	F 385	257	210	140	56DLH11	24.9
	F 409	273	198	132	52DLH12	26.7
	F 433	289	276	184	64DLH12	25.7
	F 442	295	229	153	56DLH12	27.1
	F 450	300	262	175	60DLH12	27.8
	F 526	351	336	224	64DLH13	30.5
	F 537	358	279	186	56DLH13	32.3
	F 547	365	316	211	60DLH13	32.4
	F 567	378	378	268	72DLH14	30.8
	F 583	389	379	253	68DLH14	32.5
	F 603	402	358	239	64DLH14	34.6
	F 607	405	336	224	60DLH14	35.3
	F 654	436	426	284	68DLH15	36.0
	F 691	461	421	281	64DLH15	41.2
	F 714	476	397	265	60DLH15	42.2
	F 775	517	499	333	68DLH16	42.3
	F 778	519	472	315	64DLH16	43.1
	F 784	523	444	296	60DLH16	46.0
	F 844	563	563	401	72DLH17	44.0
	F 856	571	447	298	56DLH17	50.2
	F 901	601	505	337	60DLH17	50.2
	F 990	660	660	452	72DLH18	51.3
	F 1011	674	642	428	68DLH18	54.7
	F 1041	694	570	380	60DLH18	57.3
	F 1165	777	729	486	68DLH19	61.4
105	F 327	218	160	107	52DLH10	22.2
	F 360	240	175	117	52DLH11	24.3
	F 379	253	204	136	56DLH11	24.9
	F 402	268	192	128	52DLH12	26.7
	F 433	289	225	150	56DLH12	27.1
	F 445	297	256	171	60DLH12	27.7
	F 522	348	328	219	64DLH13	30.5
	F 526	351	271	181	56DLH13	32.3
	F 541	361	310	207	60DLH13	32.5
	F 562	375	375	262	72DLH14	31.6
	F 577	385	373	249	68DLH14	32.8
	F 597	398	352	235	64DLH14	34.6
	F 601	401	330	220	60DLH14	35.2
	F 648	432	417	278	68DLH15	36.0

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
105 (cont.)	F 685	457	414	276	64DLH15	41.2
	F 706	471	390	260	60DLH15	42.3
	F 771	514	463	309	64DLH16	43.1
	F 777	518	435	290	60DLH16	46.0
	F 837	558	558	393	72DLH17	43.9
	F 840	560	433	289	56DLH17	49.9
	F 892	595	495	330	60DLH17	50.2
	F 979	653	653	444	72DLH18	51.3
	F 1002	668	630	420	68DLH18	54.7
	F 1030	687	559	373	60DLH18	57.2
	F 1153	769	715	477	68DLH19	61.5
106	F 372	248	199	133	56DLH11	24.9
	F 426	284	217	145	56DLH12	27.1
	F 442	295	252	168	60DLH12	27.8
	F 516	344	322	215	64DLH13	30.5
	F 537	358	304	203	60DLH13	32.8
	F 556	371	371	257	72DLH14	31.7
	F 571	381	366	244	68DLH14	32.7
	F 592	395	345	230	64DLH14	34.6
	F 597	398	324	216	60DLH14	35.7
	F 642	428	409	273	68DLH15	35.6
	F 678	452	406	271	64DLH15	41.3
	F 700	467	382	255	60DLH15	42.3
	F 763	509	454	303	64DLH16	43.1
	F 769	513	427	285	60DLH16	46.1
	F 829	553	553	385	72DLH17	44.3
	F 885	590	486	324	60DLH17	50.4
	F 970	647	647	435	72DLH18	51.3
	F 991	661	618	412	68DLH18	54.7
	F 1017	678	585	390	64DLH18	57.7
	F 1021	681	549	366	60DLH18	58.1
	F 1143	762	702	468	68DLH19	61.5
107	F 366	244	193	129	56DLH11	24.9
	F 417	278	211	141	56DLH12	27.1
	F 421	281	261	174	64DLH12	27.0
	F 433	289	244	163	60DLH12	27.7
	F 492	328	328	222	68DLH13	30.3
	F 511	341	316	211	64DLH13	31.1
	F 526	351	295	197	60DLH13	32.7
	F 567	378	358	239	68DLH14	32.8
	F 586	391	339	226	64DLH14	34.5
	F 636	424	402	268	68DLH15	35.5
	F 672	448	399	266	64DLH15	41.2
	F 687	458	372	248	60DLH15	42.6
	F 756	504	447	298	64DLH16	43.1
	F 820	547	547	378	72DLH17	44.3
	F 868	579	472	315	60DLH17	50.6
	F 871	581	507	338	64DLH17	50.6
	F 961	641	640	427	72DLH18	51.3
	F 982	655	607	405	68DLH18	55.1
	F 1006	671	574	383	64DLH18	57.7

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
107	F 1132	755	688	459	68DLH19	61.6
108	F 358	239	187	125	56DLH11	24.8
	F 409	273	205	137	56DLH12	27.5
	F 418	279	256	171	64DLH12	27.1
	F 426	284	237	158	60DLH12	27.6
	F 487	325	325	218	68DLH13	30.2
	F 496	331	249	166	56DLH13	32.3
	F 507	338	310	207	64DLH13	31.7
	F 517	345	286	191	60DLH13	32.5
	F 561	374	352	235	68DLH14	32.7
	F 580	387	333	222	64DLH14	34.6
	F 625	417	415	277	72DLH15	35.9
	F 630	420	394	263	68DLH15	40.3
	F 666	444	391	261	64DLH15	41.2
	F 675	450	363	242	60DLH15	42.6
	F 750	500	438	292	64DLH16	43.1
	F 813	542	542	371	72DLH17	44.2
	F 853	569	459	306	60DLH17	50.5
	F 864	576	498	332	64DLH17	50.6
	F 952	635	628	419	72DLH18	51.7
	F 973	649	595	397	68DLH18	55.2
	F 997	665	564	376	64DLH18	57.7
	F 1122	748	676	451	68DLH19	61.6
109	F 352	235	183	122	56DLH11	24.9
	F 402	268	199	133	56DLH12	27.2
	F 414	276	250	167	64DLH12	27.0
	F 418	279	231	154	60DLH12	27.6
	F 483	322	321	214	68DLH13	30.2
	F 487	325	241	161	56DLH13	32.2
	F 502	335	306	204	64DLH13	31.8
	F 508	339	280	187	60DLH13	32.5
	F 541	361	361	243	72DLH14	32.8
	F 556	371	346	231	68DLH14	33.8
	F 564	376	298	199	60DLH14	35.5
	F 576	384	327	218	64DLH14	35.4
	F 619	413	408	272	72DLH15	36.3
	F 624	416	387	258	68DLH15	37.5
	F 660	440	384	256	64DLH15	41.3
	F 663	442	352	235	60DLH15	42.4
	F 717	478	478	320	72DLH16	42.7
	F 739	493	454	303	68DLH16	43.6
	F 805	537	537	365	72DLH17	44.3
	F 837	558	447	298	60DLH17	50.4
	F 856	571	489	326	64DLH17	50.6
	F 943	629	616	411	72DLH18	51.8
	F 964	643	585	390	68DLH18	55.0
	F 988	659	553	369	64DLH18	57.7
	F 1111	741	664	443	68DLH19	61.8
110	F 346	231	177	118	56DLH11	24.8
	F 394	263	195	130	56DLH12	27.2
	F 411	274	225	150	60DLH12	27.6

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
110 (cont.)	F 478	319	315	210	68DLH13	30.1
	F 498	332	300	200	64DLH13	31.8
	F 499	333	271	181	60DLH13	32.5
	F 535	357	357	239	72DLH14	32.8
	F 550	367	339	226	68DLH14	33.8
	F 555	370	289	193	60DLH14	35.6
	F 570	380	321	214	64DLH14	35.5
	F 613	409	400	267	72DLH15	36.0
	F 654	436	376	251	64DLH15	41.2
	F 709	473	472	315	72DLH16	42.8
	F 733	489	447	298	68DLH16	43.5
	F 736	491	421	281	64DLH16	46.3
	F 799	533	533	358	72DLH17	44.6
	F 822	548	435	290	60DLH17	50.5
	F 847	565	480	320	64DLH17	50.7
	F 936	624	606	404	72DLH18	54.6
	F 955	637	574	383	68DLH18	54.8
	F 979	653	543	362	64DLH18	57.6
	F 1101	734	651	434	68DLH19	61.8
111	F 340	227	172	115	56DLH11	24.8
	F 388	259	189	126	56DLH12	27.2
	F 405	270	219	146	60DLH12	27.6
	F 406	271	241	161	64DLH12	28.2
	F 474	316	310	207	68DLH13	30.2
	F 493	329	294	196	64DLH13	31.8
	F 531	354	352	235	72DLH14	33.3
	F 546	364	333	222	68DLH14	34.5
	F 565	377	315	210	64DLH14	35.5
	F 609	406	393	262	72DLH15	36.4
	F 648	432	370	247	64DLH15	41.3
	F 703	469	463	309	72DLH16	42.8
	F 726	484	438	292	68DLH16	43.5
	F 729	486	414	276	64DLH16	46.3
	F 792	528	526	351	72DLH17	47.5
	F 807	538	424	283	60DLH17	50.5
	F 840	560	471	314	64DLH17	50.5
	F 927	618	595	397	72DLH18	54.5
	F 970	647	534	356	64DLH18	57.6
	F 1087	725	675	450	72DLH19	61.4
	F 1090	727	640	427	68DLH19	64.3
112	F 334	223	169	113	56DLH11	24.8
	F 381	254	184	123	56DLH12	27.1
	F 397	265	213	142	60DLH12	27.5
	F 403	269	238	159	64DLH12	28.2
	F 469	313	304	203	68DLH13	30.0
	F 489	326	289	193	64DLH13	31.8
	F 526	351	346	231	72DLH14	33.3
	F 534	356	274	183	60DLH14	35.3
	F 541	361	327	218	68DLH14	35.1
	F 559	373	309	206	64DLH14	36.0
	F 603	402	387	258	72DLH15	36.0

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
112 (cont.)	F 607	405	367	245	68DLH15	40.5
	F 642	428	363	242	64DLH15	42.4
	F 697	465	454	303	72DLH16	42.7
	F 720	480	430	287	68DLH16	43.5
	F 723	482	406	271	64DLH16	46.3
	F 738	492	357	238	56DLH17	49.7
	F 784	523	517	345	72DLH17	47.9
	F 793	529	412	275	60DLH17	50.4
	F 832	555	463	309	64DLH17	50.5
	F 919	613	585	390	72DLH18	55.0
	F 939	626	553	369	68DLH18	57.4
	F 961	641	523	349	64DLH18	60.9
	F 1077	718	663	442	72DLH19	61.4
	F 1081	721	628	419	68DLH19	64.2
113	F 328	219	165	110	56DLH11	24.8
	F 373	249	178	119	56DLH12	27.0
	F 391	261	207	138	60DLH12	27.7
	F 399	266	234	156	64DLH12	28.1
	F 454	303	217	145	56DLH13	32.2
	F 466	311	298	199	68DLH13	31.1
	F 474	316	250	167	60DLH13	32.6
	F 484	323	283	189	64DLH13	33.2
	F 522	348	339	226	72DLH14	33.2
	F 525	350	267	178	60DLH14	35.3
	F 537	358	322	215	68DLH14	35.2
	F 555	370	304	203	64DLH14	35.9
	F 598	399	379	253	72DLH15	40.4
	F 601	401	360	240	68DLH15	40.5
	F 636	424	357	238	64DLH15	42.3
	F 714	476	423	282	68DLH16	43.5
	F 717	478	400	267	64DLH16	46.2
	F 724	483	346	231	56DLH17	49.7
	F 778	519	400	267	60DLH17	50.5
	F 825	550	454	303	64DLH17	50.6
	F 910	607	574	383	72DLH18	55.3
	F 930	620	544	363	68DLH18	57.8
	F 952	635	514	343	64DLH18	60.9
	F 1068	712	651	434	72DLH19	61.6
	F 1071	714	618	412	68DLH19	64.3
114	F 384	256	201	134	60DLH12	27.6
	F 396	264	229	153	64DLH12	28.1
	F 462	308	294	196	68DLH13	30.9
	F 466	311	244	163	60DLH13	32.6
	F 481	321	279	186	64DLH13	33.1
	F 517	345	334	223	72DLH14	33.4
	F 532	355	316	211	68DLH14	35.1
	F 550	367	298	199	64DLH14	35.9
	F 597	398	354	236	68DLH15	40.3
	F 607	405	307	205	60DLH15	42.3
	F 631	421	351	234	64DLH15	42.8
	F 708	472	415	277	68DLH16	43.5

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
114 (cont.)	F 711	474	393	262	64DLH16	46.8
	F 765	510	391	261	60DLH17	50.4
	F 819	546	447	298	64DLH17	51.3
	F 903	602	564	376	72DLH18	55.1
	F 922	615	534	356	68DLH18	57.8
	F 945	630	505	337	64DLH18	61.5
	F 1059	706	640	427	72DLH19	61.5
	F 1062	708	606	404	68DLH19	64.2
115	F 378	252	196	131	60DLH12	27.9
	F 388	259	225	150	64DLH12	28.0
	F 459	306	237	158	60DLH13	32.7
	F 472	315	271	181	64DLH13	33.0
	F 513	342	328	219	72DLH14	33.2
	F 526	351	310	207	68DLH14	35.1
	F 540	360	289	193	64DLH14	35.8
	F 591	394	348	232	68DLH15	40.4
	F 597	398	300	200	60DLH15	42.4
	F 621	414	342	228	64DLH15	42.7
	F 700	467	408	272	68DLH16	43.5
	F 751	501	381	254	60DLH17	50.5
	F 804	536	435	290	64DLH17	51.1
	F 894	596	555	370	72DLH18	55.1
	F 915	610	525	350	68DLH18	57.8
	F 928	619	492	328	64DLH18	61.5
	F 1048	699	628	419	72DLH19	61.5
	F 1053	702	595	397	68DLH19	64.1
116	F 372	248	192	128	60DLH12	27.8
	F 382	255	219	146	64DLH12	28.0
	F 451	301	231	154	60DLH13	32.6
	F 454	303	283	189	68DLH13	32.1
	F 465	310	264	176	64DLH13	33.0
	F 508	339	322	215	72DLH14	33.1
	F 522	348	306	204	68DLH14	35.1
	F 531	354	283	189	64DLH14	35.8
	F 588	392	291	194	60DLH15	42.3
	F 610	407	334	223	64DLH15	42.7
	F 642	428	325	217	60DLH16	46.1
	F 673	449	424	283	72DLH16	44.1
	F 687	458	372	248	64DLH16	46.7
	F 694	463	402	268	68DLH16	46.9
	F 739	493	370	247	60DLH17	50.4
	F 790	527	424	283	64DLH17	51.2
	F 886	591	544	363	72DLH18	54.7
	F 906	604	516	344	68DLH18	57.8
	F 912	608	480	320	64DLH18	61.4
	F 1039	693	618	412	72DLH19	61.9
	F 1044	696	586	391	68DLH19	64.2
117	F 366	244	186	124	60DLH12	27.6
	F 376	251	213	142	64DLH12	28.0
	F 444	296	226	151	60DLH13	32.6
	F 450	300	279	186	68DLH13	32.1

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
117 (cont.)	F 457	305	256	171	64DLH13	33.0
	F 504	336	316	211	72DLH14	33.0
	F 517	345	300	200	68DLH14	35.1
	F 523	349	276	184	64DLH14	35.8
	F 580	387	336	224	68DLH15	41.4
	F 600	400	325	217	64DLH15	42.6
	F 667	445	417	278	72DLH16	44.1
	F 675	450	363	242	64DLH16	46.7
	F 688	459	394	263	68DLH16	46.9
	F 726	484	361	241	60DLH17	50.6
	F 777	518	412	275	64DLH17	51.1
	F 879	586	535	357	72DLH18	54.6
	F 898	599	507	338	68DLH18	57.8
	F 1030	687	607	405	72DLH19	61.8
	F 1035	690	576	384	68DLH19	64.1
118	F 360	240	181	121	60DLH12	27.6
	F 370	247	207	138	64DLH12	27.9
	F 436	291	220	147	60DLH13	32.6
	F 445	297	274	183	68DLH13	32.1
	F 450	300	252	168	64DLH13	32.9
	F 481	321	234	156	60DLH14	35.1
	F 514	343	268	179	64DLH14	35.7
	F 576	384	330	220	68DLH15	41.4
	F 591	394	316	211	64DLH15	42.4
	F 661	441	409	273	72DLH16	44.0
	F 664	443	352	235	64DLH16	46.6
	F 684	456	388	259	68DLH16	46.8
	F 714	476	352	235	60DLH17	50.6
	F 763	509	402	268	64DLH17	51.0
	F 769	513	441	294	68DLH17	50.8
	F 871	581	526	351	72DLH18	54.7
	F 891	594	499	333	68DLH18	57.8
	F 1026	684	565	377	68DLH19	64.3
119	F 354	236	177	118	60DLH12	27.6
	F 364	243	202	135	64DLH12	28.0
	F 429	286	214	143	60DLH13	32.4
	F 442	295	244	163	64DLH13	32.9
	F 474	316	228	152	60DLH14	35.1
	F 505	337	261	174	64DLH14	35.6
	F 510	340	289	193	68DLH14	36.1
	F 571	381	325	217	68DLH15	41.4
	F 580	387	309	206	64DLH15	42.4
	F 655	437	403	269	72DLH16	44.0
	F 678	452	381	254	68DLH16	46.8
	F 702	468	342	228	60DLH17	50.3
	F 751	501	393	262	64DLH17	50.8
	F 763	509	433	289	68DLH17	50.9
	F 864	576	517	345	72DLH18	54.7
	F 883	589	490	327	68DLH18	57.7
	F 1017	678	556	371	68DLH19	64.2

F = FACTORED Load

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
120	F 348	232	172	115	60DLH12	27.6
	F 358	239	198	132	64DLH12	28.0
	F 423	282	208	139	60DLH13	32.4
	F 436	291	238	159	64DLH13	32.9
	F 438	292	265	177	68DLH13	32.7
	F 465	310	223	149	60DLH14	35.1
	F 498	332	256	171	64DLH14	35.6
	F 505	337	285	190	68DLH14	36.2
	F 567	378	319	213	68DLH15	41.4
	F 571	381	301	201	64DLH15	42.4
	F 651	434	396	264	72DLH16	44.0
	F 672	448	375	250	68DLH16	47.6
	F 690	460	334	223	60DLH17	50.3
	F 738	492	382	255	64DLH17	50.6
	F 757	505	426	284	68DLH17	51.6
	F 796	531	378	252	60DLH18	57.1
	F 858	572	508	339	72DLH18	57.3
	F 876	584	481	321	68DLH18	58.8
	F 1009	673	547	365	68DLH19	64.2
121	F 342	228	169	113	60DLH12	27.6
	F 352	235	193	129	64DLH12	27.9
	F 415	277	202	135	60DLH13	32.4
	F 429	286	232	155	64DLH13	32.8
	F 435	290	261	174	68DLH13	32.6
	F 457	305	217	145	60DLH14	35.0
	F 489	326	249	166	64DLH14	35.6
	F 501	334	280	187	68DLH14	36.2
	F 541	361	256	171	60DLH15	42.3
	F 562	375	294	196	64DLH15	42.4
	F 589	393	285	190	60DLH16	45.9
	F 645	430	390	260	72DLH16	44.0
	F 666	444	369	246	68DLH16	47.5
	F 679	453	325	217	60DLH17	50.2
	F 726	484	372	248	64DLH17	50.7
	F 751	501	420	280	68DLH17	51.5
	F 783	522	369	246	60DLH18	56.9
	F 850	567	501	334	72DLH18	57.3
	F 868	579	474	316	68DLH18	58.4
	F 997	665	568	379	72DLH19	64.2
	F 1000	667	538	359	68DLH19	65.0
122	F 346	231	187	125	64DLH12	28.2
	F 421	281	228	152	64DLH13	32.9
	F 432	288	256	171	68DLH13	32.6
	F 481	321	243	162	64DLH14	35.5
	F 483	322	291	194	72DLH14	35.4
	F 498	332	276	184	68DLH14	36.2
	F 553	369	325	217	72DLH15	41.2
	F 558	372	309	206	68DLH15	41.8
	F 640	427	384	256	72DLH16	44.0
	F 714	476	364	243	64DLH17	50.7
	F 720	480	436	291	72DLH17	51.0

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
122 (cont.)	F 745	497	412	275	68DLH17	51.5
	F 823	549	411	274	64DLH18	57.7
	F 843	562	492	328	72DLH18	57.3
	F 862	575	466	311	68DLH18	61.6
	F 988	659	559	373	72DLH19	64.3
	F 993	662	529	353	68DLH19	65.0
123	F 342	228	183	122	64DLH12	28.1
	F 415	277	222	148	64DLH13	32.9
	F 426	284	252	168	68DLH13	32.6
	F 474	316	237	158	64DLH14	35.5
	F 480	320	286	191	72DLH14	35.4
	F 490	327	268	179	68DLH14	36.1
	F 549	366	319	213	72DLH15	41.3
	F 634	423	376	251	72DLH16	43.9
	F 702	468	355	237	64DLH17	50.7
	F 714	476	429	286	72DLH17	51.1
	F 733	489	402	268	68DLH17	51.4
	F 810	540	400	267	64DLH18	57.7
	F 837	558	484	323	72DLH18	57.1
	F 849	566	456	304	68DLH18	61.6
	F 981	654	550	367	72DLH19	64.2
124	F 336	224	178	119	64DLH12	28.0
	F 409	273	216	144	64DLH13	32.8
	F 418	279	246	164	68DLH13	32.5
	F 466	311	231	154	64DLH14	35.7
	F 475	317	282	188	72DLH14	36.1
	F 483	322	262	175	68DLH14	36.1
	F 537	358	273	182	64DLH15	42.5
	F 540	360	294	196	68DLH15	41.8
	F 544	363	315	210	72DLH15	42.1
	F 630	420	370	247	72DLH16	44.0
	F 691	461	346	231	64DLH17	50.8
	F 708	472	421	281	72DLH17	50.9
	F 721	481	393	262	68DLH17	51.4
	F 829	553	477	318	72DLH18	57.6
	F 835	557	445	297	68DLH18	61.6
	F 961	641	504	336	68DLH19	64.7
	F 973	649	541	361	72DLH19	64.3
125	F 331	221	174	116	64DLH12	28.0
	F 403	269	211	141	64DLH13	32.8
	F 412	275	238	159	68DLH13	32.5
	F 459	306	226	151	64DLH14	35.7
	F 471	314	277	185	72DLH14	36.0
	F 475	317	256	171	68DLH14	36.2
	F 531	354	286	191	68DLH15	41.7
	F 540	360	310	207	72DLH15	42.1
	F 624	416	364	243	72DLH16	43.4
	F 681	454	339	226	64DLH17	50.8
	F 702	468	415	277	72DLH17	50.9
	F 711	474	384	256	68DLH17	51.3
	F 823	549	469	313	72DLH18	57.5

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
125 (cont.)	F 946	631	492	328	68DLH19	64.5
	F 964	643	532	355	72DLH19	64.3
126	F 327	218	171	114	64DLH12	27.9
	F 396	264	205	137	64DLH13	32.8
	F 406	271	232	155	68DLH13	32.5
	F 451	301	220	147	64DLH14	35.7
	F 468	312	273	182	72DLH14	36.1
	F 522	348	280	187	68DLH15	41.6
	F 535	357	304	203	72DLH15	42.2
	F 582	388	289	193	64DLH16	46.7
	F 619	413	360	240	72DLH16	47.2
	F 669	446	330	220	64DLH17	50.7
	F 700	467	373	249	68DLH17	51.4
	F 816	544	462	308	72DLH18	58.4
	F 931	621	480	320	68DLH19	64.5
	F 957	638	523	349	72DLH19	64.3
127	F 321	214	166	111	64DLH12	27.9
	F 390	260	201	134	64DLH13	32.7
	F 400	267	228	152	68DLH13	32.4
	F 444	296	214	143	64DLH14	35.7
	F 463	309	268	179	72DLH14	36.1
	F 514	343	273	182	68DLH15	41.6
	F 531	354	300	200	72DLH15	42.2
	F 573	382	283	189	64DLH16	46.7
	F 615	410	354	236	72DLH16	48.0
	F 658	439	322	215	64DLH17	50.4
	F 690	460	366	244	68DLH17	51.4
	F 691	461	402	268	72DLH17	52.1
	F 810	540	454	303	72DLH18	57.8
	F 916	611	469	313	68DLH19	64.3
	F 949	633	516	344	72DLH19	64.2
128	F 316	211	163	109	64DLH12	27.9
	F 385	257	196	131	64DLH13	32.7
	F 394	263	223	149	68DLH13	32.3
	F 438	292	210	140	64DLH14	35.7
	F 454	303	238	159	68DLH14	36.1
	F 460	307	264	176	72DLH14	36.3
	F 505	337	267	178	68DLH15	41.6
	F 528	352	295	197	72DLH15	42.7
	F 564	376	276	184	64DLH16	46.3
	F 610	407	348	232	72DLH16	47.9
	F 648	432	315	210	64DLH17	50.4
	F 679	453	357	238	68DLH17	51.3
	F 685	457	396	264	72DLH17	51.6
	F 804	536	447	298	72DLH18	58.1
	F 901	601	457	305	68DLH19	64.4
	F 942	628	507	338	72DLH19	65.2
129	F 312	208	159	106	64DLH12	27.9
	F 379	253	192	128	64DLH13	32.8
	F 388	259	217	145	68DLH13	32.4
	F 430	287	204	136	64DLH14	35.4

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
129 (cont.)	F 457	305	261	174	72DLH14	36.2
	F 498	332	261	174	68DLH15	41.6
	F 523	349	291	194	72DLH15	42.7
	F 555	370	270	180	64DLH16	46.0
	F 604	403	343	229	72DLH16	47.8
	F 639	426	307	205	64DLH17	50.4
	F 669	446	348	232	68DLH17	51.1
	F 681	454	390	260	72DLH17	51.5
	F 736	491	348	232	64DLH18	60.9
	F 774	516	394	263	68DLH18	61.1
	F 798	532	441	294	72DLH18	61.4
	F 888	592	447	298	68DLH19	64.1
	F 934	623	499	333	72DLH19	65.2
130	F 382	255	213	142	68DLH13	32.3
	F 441	294	228	152	68DLH14	36.2
	F 454	303	256	171	72DLH14	37.1
	F 490	327	255	170	68DLH15	41.4
	F 520	347	286	191	72DLH15	42.7
	F 601	401	337	225	72DLH16	47.8
	F 658	439	342	228	68DLH17	51.0
	F 676	451	384	256	72DLH17	51.5
	F 762	508	385	257	68DLH18	61.1
	F 792	528	433	289	72DLH18	61.3
	F 874	583	436	291	68DLH19	64.5
	F 928	619	492	328	72DLH19	69.4
131	F 378	252	207	138	68DLH13	32.7
	F 435	290	222	148	68DLH14	36.5
	F 447	298	250	167	72DLH14	37.1
	F 483	322	249	166	68DLH15	41.3
	F 513	342	280	187	72DLH15	42.6
	F 592	395	328	219	72DLH16	47.7
	F 649	433	333	222	68DLH17	51.0
	F 667	445	375	250	72DLH17	51.5
	F 751	501	376	251	68DLH18	61.1
	F 780	520	424	283	72DLH18	61.0
	F 861	574	427	285	68DLH19	64.5
	F 913	609	481	321	72DLH19	69.4
132	F 372	248	202	135	68DLH13	32.6
	F 441	294	244	163	72DLH14	37.1
	F 475	317	243	162	68DLH15	41.7
	F 504	336	274	183	72DLH15	42.6
	F 585	390	321	214	72DLH16	47.7
	F 640	427	325	217	68DLH17	51.4
	F 657	438	367	245	72DLH17	51.5
	F 739	493	369	246	68DLH18	61.2
	F 768	512	414	276	72DLH18	60.9
	F 847	565	417	278	68DLH19	69.1
	F 900	600	469	313	72DLH19	69.2
133	F 366	244	199	133	68DLH13	32.6
	F 421	281	211	141	68DLH14	36.1
	F 435	290	238	159	72DLH14	37.1

ECONOMICAL LOAD TABLES

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
133 (cont.)	F 468	312	237	158	68DLH15	41.5
	F 496	331	267	178	72DLH15	42.6
	F 576	384	313	209	72DLH16	47.6
	F 630	420	318	212	68DLH17	51.1
	F 648	432	358	239	72DLH17	51.5
	F 729	486	360	240	68DLH18	61.1
	F 757	505	405	270	72DLH18	61.3
	F 835	557	408	272	68DLH19	69.0
	F 886	591	459	306	72DLH19	69.2
134	F 361	241	195	130	68DLH13	32.6
	F 415	277	207	138	68DLH14	36.1
	F 427	285	232	155	72DLH14	37.0
	F 462	308	232	155	68DLH15	41.5
	F 489	326	261	174	72DLH15	42.4
	F 567	378	307	205	72DLH16	47.7
	F 621	414	312	208	68DLH17	51.0
	F 639	426	349	233	72DLH17	51.5
	F 718	479	351	234	68DLH18	61.1
	F 745	497	397	265	72DLH18	61.2
	F 822	548	399	266	68DLH19	64.7
	F 873	582	450	300	72DLH19	69.2
135	F 355	237	190	127	68DLH13	32.6
	F 421	281	228	152	72DLH14	36.0
	F 454	303	228	152	68DLH15	41.5
	F 483	322	256	171	72DLH15	42.3
	F 559	373	300	200	72DLH16	47.6
	F 612	408	304	203	68DLH17	50.8
	F 630	420	342	228	72DLH17	51.5
	F 708	472	345	230	68DLH18	61.0
	F 735	490	387	258	72DLH18	61.2
	F 810	540	390	260	68DLH19	64.6
	F 859	573	439	293	72DLH19	69.1
136	F 351	234	186	124	68DLH13	32.6
	F 415	277	223	149	72DLH14	35.7
	F 448	299	222	148	68DLH15	41.5
	F 475	317	250	167	72DLH15	42.3
	F 552	368	294	196	72DLH16	47.5
	F 604	403	297	198	68DLH17	50.7
	F 621	414	336	224	72DLH17	51.3
	F 697	465	337	225	68DLH18	61.1
	F 724	483	378	252	72DLH18	61.2
	F 798	532	381	254	68DLH19	64.6
	F 847	565	429	286	72DLH19	69.2
137	F 346	231	181	121	68DLH13	32.3
	F 399	266	195	130	68DLH14	36.1
	F 411	274	219	146	72DLH14	36.9
	F 441	294	217	145	68DLH15	41.3
	F 468	312	244	163	72DLH15	42.3
	F 544	363	286	191	72DLH16	47.5
	F 595	397	291	194	68DLH17	50.7
	F 612	408	327	218	72DLH17	51.3

F = FACTORED Load

Joist Span (ft.)	Total Load (plf) Factored LRFD	Total Load (plf) Service ASD	Live Load (plf) 1/240	Live Load (plf) 1/360	Joist Designation	Joist Wgt. (plf)
137 (cont.)	F 688	459	328	219	68DLH18	61.1
	F 718	479	370	247	72DLH18	61.3
	F 787	525	372	248	68DLH19	64.6
	F 835	557	420	280	72DLH19	68.9
138	F 405	270	214	143	72DLH14	36.8
	F 462	308	240	160	72DLH15	42.4
	F 537	358	282	188	72DLH16	50.8
	F 603	402	319	213	72DLH17	51.4
	F 705	470	363	242	72DLH18	61.4
	F 823	549	411	274	72DLH19	68.8
139	F 399	266	208	139	72DLH14	36.7
	F 454	303	234	156	72DLH15	42.3
	F 529	353	274	183	72DLH16	50.5
	F 595	397	313	209	72DLH17	52.0
	F 694	463	354	236	72DLH18	61.3
	F 811	541	402	268	72DLH19	68.6
140	F 393	262	204	136	72DLH14	36.8
	F 448	299	228	152	72DLH15	42.4
	F 522	348	268	179	72DLH16	50.9
	F 586	391	307	205	72DLH17	51.4
	F 685	457	346	231	72DLH18	61.5
	F 799	533	394	263	72DLH19	69.0
141	F 388	259	199	133	72DLH14	36.8
	F 442	295	225	150	72DLH15	42.4
	F 514	343	262	175	72DLH16	50.9
	F 579	386	300	200	72DLH17	51.4
	F 675	450	340	227	72DLH18	61.4
	F 789	526	385	257	72DLH19	68.8
142	F 382	255	196	131	72DLH14	36.7
	F 436	291	220	147	72DLH15	42.4
	F 507	338	256	171	72DLH16	50.8
	F 571	381	294	196	72DLH17	51.4
	F 666	444	333	222	72DLH18	61.2
	F 777	518	376	251	72DLH19	68.7
143	F 378	252	192	128	72DLH14	36.7
	F 429	286	214	143	72DLH15	42.4
	F 501	334	253	169	72DLH16	50.8
	F 564	376	286	191	72DLH17	51.4
	F 657	438	325	217	72DLH18	61.2
	F 766	511	370	247	72DLH19	68.5
144	F 372	248	187	125	72DLH14	36.7
	F 423	282	210	140	72DLH15	42.4
	F 493	329	247	165	72DLH16	50.8
	F 556	371	282	188	72DLH17	51.3
	F 648	432	318	212	72DLH18	61.2
	F 756	504	361	241	72DLH19	68.6
145	F 367	245	184	123	72DLH14	36.6
	F 418	279	205	137	72DLH15	42.3
	F 487	325	241	161	72DLH16	50.7
	F 549	366	276	184	72DLH17	51.4
	F 639	426	313	209	72DLH18	60.9
	F 745	497	354	236	72DLH19	68.5

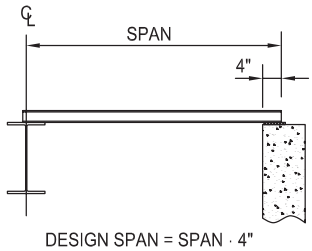
JOIST SUBSTITUTES

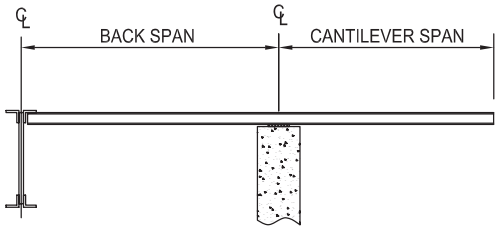
LRFD SIMPLE SPAN LOAD TABLE							
JS TYPE	**2.5JS1**	**2.5JS2**	**2.5JS3**	**2.5JS4**	**2.5JS5**	**2.5JS6**	**2.5JS7**
(SJI) K TYPE	**2.5K1**		**2.5K2**		**2.5K3**		
S in.^{3}	0.52	0.62	0.72	0.84	0.97	1.2	1.7
I in.^{4}	0.65	0.78	0.89	1.1	1.2	1.5	2.1
Span ft.-in.	**Factored Uniform Loads (plf)**						
4-0	825/550	825/550					
4-6	825/386	825/463	825/529	825/550			
5-0	717/275	825/338	825/376	825/465	825/507		
5-6	585/202	697.5/243	808.5/277	825/343	825/374	825/467	
6-0	486/153	561/189	672/210	778.5/260	825/283	825/354	
6-6	409.5/119	489/143	568.5/163	663/202	765/220	825/275	825/385
7-0	351/94	405/116	486/129	562.5/160	654/174	810/218	825/304
7-6	303/76	361.5/91	420/104	490.5/128	567/140	700.5/175	825/245
8-0	265.5/62	306/76	367.5/85	426/105	495/114	612/143	825/200
8-6	234/51	279/62	324/70	378/87	436.5/95	540/118	765/166
9-0		247.5/51	288/59	336/73	387/79	480/99	679.5/139
9-6			256.5/50	300/61	346.5/67	429/84	607.5/117
10-0				270/52	312/57	385.5/71	546/100

The factored uniform loads shown in BLACK are based on Load and Resistance Factor Design.
The loads shown in RED are the allowable live loads for a deflection of 1/360 of the span.
To determine the allowable live loads for 1/240 deflection multiply the figures in RED by 1.5.

LRFD UNSUPPORTED CANTILEVER LOAD TABLE							
JS TYPE	**2.5JS1**	**2.5JS2**	**2.5JS3**	**2.5JS4**	**2.5JS5**	**2.5JS6**	**2.5JS7**
S in.^{3}	0.52	0.62	0.72	0.84	0.97	1.2	1.7
I in.^{4}	0.65	0.78	0.89	1.1	1.2	1.5	2.1
Cant. Span ft.-in.	**Cantilever Span Factored Uniform Loads (plf)**						
2-0	825	825	825				
2-6	624	744	864	825	825	825	
3-0	433.5	516	600	700.5	808.5	825	825
3-6	318	379.5	441	514.5	594	735	825
4-0	244.5	291	337.5	394.5	454.5	562.5	796.5
4-6	192	229.5	267	310.5	360	444	630
5-0	156	186	216	252	291	360	510
5-6		153	178.5	208.5	240	297	421.5
6-0			150	175.5	202.5	250.5	354

The factored uniform loads shown are based on Load and Resistance Factor Design.
Note: When calculating the actual live load deflection at the end of the cantilever be sure to consider the length of the back span. If the back span length is greater than 2.4 X the cantilever span, then the capacity of the back span will need to be investigated.





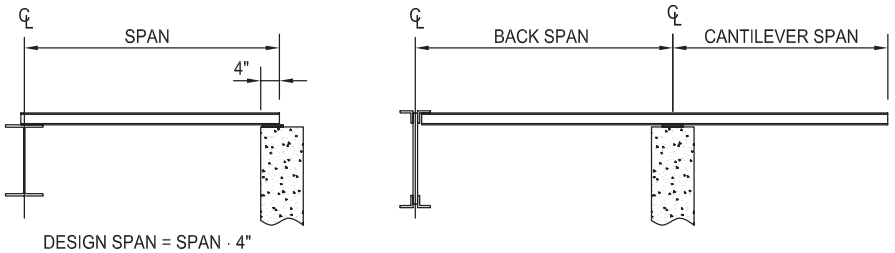
JOIST SUBSTITUTES

ASD SIMPLE SPAN LOAD TABLE							
JS TYPE	**2.5JS1**	**2.5JS2**	**2.5JS3**	**2.5JS4**	**2.5JS5**	**2.5JS6**	**2.5JS7**
(SJI) K TYPE	**2.5K1**		**2.5K2**		**2.5K3**		
S in.^{3}	0.52	0.62	0.72	0.84	0.97	1.2	1.7
I in.^{4}	0.65	0.78	0.89	1.1	1.2	1.5	2.1
Span ft.-in.	**Allowable Loads (plf)**						
4-0	550/550	550/550					
4-6	550/386	550/463	550/529	550/550			
5-0	478/275	550/338	550/376	550/465	550/507		
5-6	390/202	465/243	539/277	550/343	550/374	550/467	
6-0	324/153	374/189	448/210	519/260	550/283	550/354	
6-6	273/119	326/143	379/163	442/202	510/220	550/275	550/385
7-0	234/94	270/116	324/129	375/160	436/174	540/218	550/304
7-6	202/76	241/91	280/104	327/128	378/140	467/175	550/245
8-0	177/62	204/76	245/85	284/105	330/114	408/143	550/200
8-6	156/51	186/62	216/70	252/87	291/95	360/118	510/166
9-0		165/51	192/59	224/73	258/79	320/99	453/139
9-6			171/50	200/61	231/67	286/84	405/117
10-0				180/52	208/57	257/71	364/100

The allowable loads shown in BLACK are based on Allowable Stress Design.
The loads shown in RED are the allowable live loads for a deflection of 1/360 of the span.
To determine the allowable live loads for 1/240 deflection multiply the figures in RED by 1.5.

ASD UNSUPPORTED CANTILEVER LOAD TABLE							
JS TYPE	**2.5JS1**	**2.5JS2**	**2.5JS3**	**2.5JS4**	**2.5JS5**	**2.5JS6**	**2.5JS7**
S in.^{3}	0.52	0.62	0.72	0.84	0.97	1.2	1.7
I in.^{4}	0.65	0.78	0.89	1.1	1.2	1.5	2.1
Cant. Span ft.-in.	**Cantilever Span Allowable Loads (plf)**						
2-0	550	550	550				
2-6	416	496	576	550	550	550	
3-0	289	344	400	467	539	550	550
3-6	212	253	294	343	396	490	550
4-0	163	194	225	263	303	375	531
4-6	128	153	178	207	240	296	420
5-0	104	124	144	168	194	240	340
5-6		102	119	139	160	198	281
6-0			100	117	135	167	236

The allowable loads shown are based on Allowable Stress Design.
Note: When calculating the actual live load deflection at the end of the cantilever be sure to consider the length of the back span. If the back span length is greater than 2.4 X the cantilever span, then the capacity of the back span will need to be investigated.



LRFD

STANDARD LOAD TABLE FOR KCS OPEN WEB STEEL JOISTS
Based on a 50 ksi Maximum Yield Strength

JOIST DESIGNATION	DEPTH (inches)	MOMENT CAPACITY (inch-kips)	SHEAR CAPACITY* (lbs)	APPROX. WEIGHT** (lbs/ft)	GROSS MOMENT OF INERTIA (in.^{4})	BRIDGING TABLE SECTION NUMBER
10KCS1	10	258	3000	6.0	29	1
10KCS2	10	337	3750	7.5	37	1
10KCS3	10	444	4500	10.0	47	1
12KCS1	12	313	3600	6.0	43	3
12KCS2	12	411	4500	8.0	55	5
12KCS3	12	543	5250	10.0	71	5
14KCS1	14	370	4350	6.5	59	4
14KCS2	14	486	5100	8.0	77	6
14KCS3	14	642	5850	10.0	99	6
16KCS2	16	523	6000	8.5	99	6
16KCS3	16	705	7200	10.5	128	9
16KCS4	16	1080	7950	14.5	192	9
16KCS5	16	1401	8700	18.0	245	9
18KCS2	18	592	7050	9.0	127	6
18KCS3	18	798	7800	11.0	164	9
18KCS4	18	1225	8550	15.0	247	10
18KCS5	18	1593	9300	18.5	316	10
20KCS2	20	663	7800	9.5	159	6
20KCS3	20	892	9000	11.5	205	9
20KCS4	20	1371	11850	16.5	308	10
20KCS5	20	1786	12600	20.0	396	10
22KCS2	22	732	8850	10.0	194	6
22KCS3	22	987	9900	12.5	251	9
22KCS4	22	1518	11850	16.5	377	11
22KCS5	22	1978	12900	20.5	485	11
24KCS2	24	801	9450	10.0	232	6
24KCS3	24	1080	10800	12.5	301	9
24KCS4	24	1662	12600	16.5	453	12
24KCS5	24	2172	13350	20.5	584	12
26KCS2	26	870	9900	10.0	274	6
26KCS3	26	1174	11700	12.5	355	9
26KCS4	26	1809	12750	16.5	536	12
26KCS5	26	2364	13800	20.5	691	12
28KCS2	28	939	10350	10.5	320	6
28KCS3	28	1269	12000	12.5	414	9
28KCS4	28	1954	12750	16.5	626	12
28KCS5	28	2556	13800	20.5	808	12
30KCS3	30	1362	12000	13.0	478	9
30KCS4	30	2100	12750	16.5	722	12
30KCS5	30	2749	13800	21.0	934	12

*MAXIMUM UNIFORMLY DISTRIBUTED LOAD CAPACITY IS 825 PLF AND SINGLE CONCENTRATED LOAD CANNOT EXCEED SHEAR CAPACITY
**DOES NOT INCLUDE ACCESSORIES

ASD

STANDARD LOAD TABLE FOR KCS OPEN WEB STEEL JOISTS
Based on a 50 ksi Maximum Yield Strength

JOIST DESIGNATION	DEPTH (inches)	MOMENT CAPACITY* (inch-kips)	SHEAR CAPACITY* (lbs)	APPROX. WEIGHT** (lbs/ft)	GROSS MOMENT OF INERTIA (in.^{4})	BRIDGING TABLE SECTION NUMBER
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

LRFD

TOP CHORD EXTENSION LOAD TABLE (S TYPE)
Based on a Maximum Yield Strength of 50 ksi
Pounds per Linear Foot

TYPE	"S" ($in.^3$)	"I" ($in.^4$)	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	825 550	544 363	267 127	157 58					
S2	0.127	0.138	825 550	700 422	343 200	202 91					
S3	0.144	0.156	825 550	793 550	388 226	229 104					
S4	0.160	0.172	825 550	825 550	432 249	255 113	168 60				
S5	0.176	0.188	825 550	825 550	474 272	280 124	184 66				
S6	0.192	0.204	825 550	825 550	517 295	306 134	202 72				
S7	0.241	0.306	825 550	825 550	649 443	384 201	253 108	180 64			
S8	0.266	0.332	825 550	825 550	717 481	424 219	280 117	198 70			
S9	0.288	0.358	825 550	825 550	777 519	459 236	303 126	214 75	160 48		
S10	0.380	0.544	825 550	825 550	825 550	606 359	400 192	283 115	211 74	163 50	
S11	0.438	0.622	825 550	825 550	825 550	699 410	460 220	327 131	243 84	189 57	150 41
S12	0.494	0.696	825 550	825 550	825 550	789 459	520 246	369 147	274 94	213 64	169 45

LRFD

TOP CHORD EXTENSION LOAD TABLE (R TYPE)
Based on a Maximum Yield Strength of 50 ksi
Pounds per Linear Foot

TYPE	"S" ($in.^3$)	"I" ($in.^4$)	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	825 550	825 550	825 550	825 550	825 396	669 236	498 152	385 103	307 73	250 54	208 41	175 32
R2	0.923	1.157	825 550	825 550	825 550	825 550	825 409	690 244	514 157	399 107	318 76	259 56	216 42	181 33
R3	1.039	1.299	825 550	825 550	825 550	825 550	825 459	777 274	579 176	448 120	358 85	292 63	243 47	205 37
R4	1.147	1.433	825 550	825 550	825 550	825 550	825 507	825 302	639 195	495 132	394 94	321 69	267 52	225 41
R5	1.249	1.561	825 550	825 550	825 550	825 550	825 550	825 329	696 212	538 144	429 103	349 75	291 57	246 44
R6	1.352	1.690	825 550	825 550	825 550	825 550	825 550	825 357	753 230	583 156	465 111	379 82	315 62	265 48
R7	1.422	1.802	825 550	825 550	825 550	825 550	825 550	825 380	792 245	613 167	489 119	399 87	331 66	279 51
R8	1.558	1.948	825 550	825 550	825 550	825 550	825 550	825 411	825 265	672 180	535 128	436 94	363 71	306 55
R9	1.673	2.091	825 550	825 550	825 550	825 550	825 550	825 442	825 284	721 194	576 138	469 101	390 77	328 59
R10	1.931	2.414	825 550	825 550	825 550	825 550	825 550	825 510	825 328	825 224	664 159	541 117	450 89	379 69
R11	2.183	2.729	825 550	825 550	825 550	825 550	825 550	825 550	825 371	825 253	751 180	612 132	508 100	430 78
R12	2.413	3.016	825 550	825 550	825 550	825 550	825 550	825 550	825 410	825 279	825 199	676 146	562 111	475 86

ASD

TOP CHORD EXTENSION LOAD TABLE (S TYPE)
Based on a Maximum Yield Strength of 50 ksi
Pounds per Linear Foot

TYPE	"S" ($in.^3$)	"I" ($in.^4$)	LENGTH (L1) 0'-6"	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"
S1	0.099	0.088	550 550	363 363	178 127	105 58					
S2	0.127	0.138	550 550	467 422	229 200	135 91					
S3	0.144	0.156	550 550	529 510	259 226	153 104					
S4	0.160	0.172	550 550	550 550	288 249	170 113	112 60				
S5	0.176	0.188	550 550	550 550	316 272	187 124	123 66				
S6	0.192	0.204	550 550	550 550	345 295	204 134	135 72				
S7	0.241	0.306	550 550	550 550	433 433	256 201	169 108	120 64			
S8	0.266	0.332	550 550	550 550	478 481	283 219	187 117	132 70			
S9	0.288	0.358	550 550	550 550	518 518	306 236	202 126	143 75	107 48		
S10	0.380	0.544	550 550	550 550	550 550	404 359	267 192	189 115	141 74	109 50	
S11	0.438	0.622	550 550	550 550	550 550	466 410	307 220	218 131	162 84	126 57	100 41
S12	0.494	0.696	550 550	550 550	550 550	526 459	347 246	246 147	183 94	142 64	113 45

ASD

TOP CHORD EXTENSION LOAD TABLE (R TYPE)
Based on a Maximum Yield Strength of 50 ksi
Pounds per Linear Foot

TYPE	"S" ($in.^3$)	"I" ($in.^4$)	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	0.923	1.157	550 550	550 550	550 550	550 550	550 409	460 244	343 157	266 107	212 76	173 56	144 42	121 33
R3	1.039	1.299	550 550	550 550	550 550	550 550	550 459	518 274	386 176	299 120	239 85	195 63	162 47	137 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	550 550	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	550 550	550 357	502 230	389 156	310 111	253 82	210 62	177 48
R7	1.422	1.802	550 550	550 550	550 550	550 550	550 550	550 380	528 245	409 167	326 119	266 87	221 66	186 51
R8	1.558	1.948	550 550	550 550	550 550	550 550	550 550	550 411	550 265	448 180	357 128	291 94	242 71	204 55
R9	1.673	2.091	550 550	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	550 550	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	550 550	550 550	550 371	550 253	501 180	408 132	339 100	287 78
R12	2.413	3.016	550 550	550 550	550 550	550 550	550 550	550 550	550 410	550 279	550 199	451 146	375 111	317 86

TOP CHORD EXTENSIONS AND EXTENDED ENDS, K-SERIES

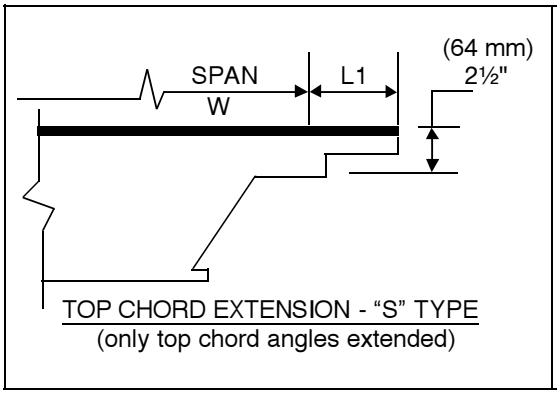
Joist extensions are commonly furnished to support a variety of overhang conditions. The two types are pictured below. The first is the TOP CHORD EXTENSION or "S" TYPE, which has only the top chord angles extended. The second is the EXTENDED END or "R" TYPE in which the standard 2 1/2 in., (64 mm) end 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 for **LRFD** and **ASD** methods of design and listed in U.S. Customary and Metric units, 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 (kiloNewton/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 2 1/2 in. (64 mm) deep "R" type extension (refer to "S" and "I" values in the Extended End Load Table), the depth of the extension must be increased to provide greater load-carrying capacity. If the loading diagram for any condition is not shown, the joist manufacturer will design the extension to support the uniform load indicated in the **K**-Series Joist Load Table for the span of the joist.

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

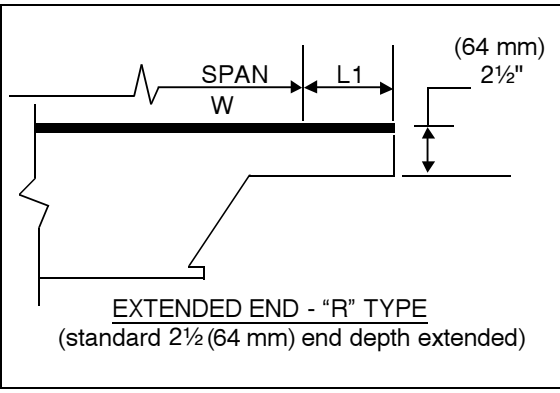
It should be noted that an "R" TYPE extension must be specified when building details dictate a 2 1/2 in., (64 mm) depth at the end of the extension. In the absence of specific instructions, the joist manufacturer may provide either type.

TOP CHORD EXTENSION



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

EXTENDED END



EXTENDED END - "R" TYPE
(standard 2½ (64 mm) end depth extended)

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

STANDARD LRFD LOAD TABLE

OPEN WEB STEEL JOISTS, K-SERIES

Based on a 50 ksi Maximum Yield Strength
Adopted by the Steel Joist Institute May 1, 2000
Revised to November 10, 2003 – Effective March 01, 2005

The black figures in the following table give the TOTAL safe factored uniformly distributed load-carrying capacities, in pounds per linear foot, of **LRFD K-Series** Steel Joists. The weight of factored DEAD loads, including the joists, must be deducted to determine the factored LIVE load-carrying capacities of the joists. Sloped parallel-chord joists shall use span as defined by the length along the slope.

The figures shown in **RED** in this load table are the unfactored nominal 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 inches^4 is;

$I_j = 26.767(W_{LL})(L^3)(10^{-6})$, where W_{LL}= **RED** figure in the Load Table and L = (Span - 0.33) in feet.

For the proper handling of concentrated and/or varying loads, see Section 6.1 in the Code of Standard Practice for Steel Joists and Joist Girders.

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.

LRFD

STANDARD LOAD TABLE FOR OPEN WEB STEEL JOISTS, K-SERIES
Based on a 50 ksi Maximum Yield Strength - Loads Shown in Pounds per Linear Foot (plf)

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	825 550															
9	825 550															
10	825 480	825 550														
11	798 377	825 542														
12	666 288	825 455	825 550	825 550	825 550											
13	565 225	718 363	825 510	825 510	825 510											
14	486 179	618 289	750 425	825 463	825 463	825 550	825 550	825 550	825 550							
15	421 145	537 234	651 344	814 428	825 434	766 475	825 507	825 507	825 507							
16	369 119	469 192	570 282	714 351	825 396	672 390	825 467	825 467	825 467	825 550	825 550	825 550	825 550	825 550	825 550	825 550
17		415 159	504 234	630 291	825 366	592 324	742 404	825 443	825 443	768 488	825 526	825 526	825 526	825 526	825 526	825 526
18		369 134	448 197	561 245	760 317	528 272	661 339	795 397	825 408	684 409	762 456	825 490	825 490	825 490	825 490	825 490
19		331 113	402 167	502 207	681 269	472 230	592 287	712 336	825 383	612 347	682 386	820 452	825 455	825 455	825 455	825 455
20		298 97	361 142	453 177	613 230	426 197	534 246	642 287	787 347	552 297	615 330	739 386	825 426	825 426	825 426	825 426
21			327 123	409 153	555 198	385 170	483 212	582 248	712 299	499 255	556 285	670 333	754 373	822 405	825 406	825 406
22			298 106	373 132	505 172	351 147	439 184	529 215	648 259	454 222	505 247	609 289	687 323	747 351	825 385	825 385
23			271 93	340 116	462 150	321 128	402 160	483 188	592 226	415 194	462 216	556 252	627 282	682 307	760 339	825 363
24			249 81	312 101	423 132	294 113	367 141	442 165	543 199	381 170	424 189	510 221	576 248	627 269	697 298	825 346
25						270 100	339 124	408 145	501 175	351 150	390 167	469 195	529 219	576 238	642 263	771 311
26						249 88	313 110	376 129	462 156	324 133	360 148	433 173	489 194	532 211	592 233	711 276
27						231 79	289 98	349 115	427 139	300 119	334 132	402 155	453 173	493 188	549 208	658 246
28						214 70	270 88	324 103	397 124	279 106	310 118	373 138	421 155	459 168	510 186	612 220
29										259 95	289 106	348 124	391 139	427 151	475 167	570 198
30										241 86	270 96	324 112	366 126	399 137	444 151	532 178
31										226 78	252 87	304 101	342 114	373 124	415 137	498 161
32										213 71	237 79	285 92	321 103	349 112	388 124	466 147

LRFD

STANDARD LOAD TABLE FOR OPEN WEB STEEL JOISTS, K-SERIES
Based on a 50 ksi Maximum Yield Strength - Loads Shown in Pounds per Linear Foot (plf)

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	10.2	11.7	6.7	7.6	8.2	8.9	9.3	10.8	12.2	8	8.8	9.2	9.7	11.3	12.6	13.8
Span (ft.) ↓																					
18	825 550	825 550	825 550	825 550	825 550	825 550	825 550														
19	771 494	825 523	825 523	825 523	825 523	825 523	825 523														
20	694 423	825 490	825 490	825 490	825 490	825 490	825 490	775 517	825 550	825 550	825 550	825 550	825 550	825 550							
21	630 364	759 426	825 460	825 460	825 460	825 460	825 460	702 453	825 520	825 520	825 520	825 520	825 520	825 520							
22	573 316	690 370	777 414	825 438	825 438	825 438	825 438	639 393	771 461	825 490	825 490	825 490	825 490	825 490	825 548	825 548	825 548	825 548	825 548	825 548	825 548
23	523 276	630 323	709 362	774 393	825 418	825 418	825 418	583 344	703 402	793 451	825 468	825 468	825 468	825 468	777 491	825 518	825 518	825 518	825 518	825 518	825 518
24	480 242	577 284	651 318	709 345	789 382	825 396	825 396	535 302	645 353	727 396	792 430	825 448	825 448	825 448	712 431	804 483	825 495	825 495	825 495	825 495	825 495
25	441 214	532 250	600 281	652 305	727 337	825 377	825 377	493 266	594 312	669 350	729 380	811 421	825 426	825 426	657 381	739 427	805 464	825 474	825 474	825 474	825 474
26	408 190	492 222	553 249	603 271	672 299	807 354	825 361	456 236	549 277	618 310	673 337	750 373	825 405	825 405	606 338	682 379	744 411	825 454	825 454	825 454	825 454
27	378 169	454 198	513 222	558 241	622 267	747 315	825 347	421 211	508 247	573 277	624 301	694 333	825 389	825 389	561 301	633 337	688 367	768 406	825 432	825 432	825 432
28	351 151	423 177	477 199	519 216	577 239	694 282	822 331	391 189	472 221	532 248	579 269	645 298	775 353	825 375	522 270	588 302	640 328	712 364	825 413	825 413	825 413
29	327 136	394 159	444 179	483 194	538 215	646 254	766 298	364 170	439 199	495 223	540 242	601 268	723 317	825 359	486 242	547 272	597 295	664 327	798 387	825 399	825 399
30	304 123	367 144	414 161	451 175	502 194	603 229	715 269	340 153	411 179	462 201	504 218	561 242	675 286	799 336	453 219	511 245	556 266	619 295	745 349	825 385	825 385
31	285 111	343 130	387 146	421 158	469 175	564 207	669 243	318 138	384 162	433 182	471 198	525 219	631 259	748 304	424 198	478 222	520 241	580 267	697 316	825 369	825 369
32	267 101	322 118	363 132	396 144	441 159	529 188	627 221	298 126	360 147	406 165	442 179	492 199	592 235	702 276	397 180	448 201	489 219	544 242	654 287	775 337	823 355
33	252 92	303 108	342 121	372 131	414 145	498 171	589 201	280 114	339 134	381 150	415 163	463 181	556 214	660 251	373 164	421 183	459 199	511 221	615 261	729 307	798 334
34	237 84	285 98	321 110	349 120	390 132	468 156	555 184	264 105	318 122	358 137	391 149	435 165	523 195	621 229	352 149	397 167	432 182	481 202	579 239	687 280	774 314
35	223 77	268 90	303 101	330 110	367 121	441 143	523 168	249 96	300 112	339 126	369 137	411 151	493 179	585 210	331 137	373 153	408 167	454 185	546 219	648 257	741 292
36	211 70	253 82	286 92	312 101	348 111	417 132	495 154	235 88	283 103	319 115	348 125	388 139	466 164	553 193	313 126	354 141	385 153	429 169	516 201	612 236	700 269
37								222 81	268 95	303 106	330 115	367 128	441 151	523 178	297 116	334 130	364 141	406 156	487 185	579 217	663 247
38								211 74	255 87	286 98	312 106	348 118	418 139	496 164	280 107	316 119	345 130	384 144	462 170	549 200	628 228
39								199 69	241 81	271 90	297 98	330 109	397 129	471 151	267 98	300 110	327 120	364 133	438 157	520 185	595 211
40								190 64	229 75	258 84	282 91	313 101	376 119	447 140	253 91	285 102	310 111	346 123	417 146	495 171	565 195
41															241 85	271 95	295 103	330 114	396 135	471 159	538 181
42															229 79	259 88	282 96	313 106	378 126	448 148	513 168
43															219 73	247 82	268 89	300 99	360 117	427 138	489 157
44															208 68	235 76	256 83	286 92	343 109	408 128	466 146

LRFD

STANDARD LOAD TABLE FOR OPEN WEB STEEL JOISTS, K-SERIES
Based on a 50 ksi Maximum Yield Strength - Loads Shown in Pounds per Linear Foot (plf)

Joist Designation	24K4	24K5	24K6	24K7	24K8	24K9	24K10	24K12	26K5	26K6	26K7	26K8	26K9	26K10	26K12
Depth (In.)	24	24	24	24	24	24	24	24	26	26	26	26	26	26	26
Approx. Wt. (lbs./ft.)	8.4	9.3	9.7	10.1	11.5	12.0	13.1	16.0	9.8	10.6	10.9	12.1	12.2	13.8	16.6
Span (ft.) ↓															
24	780 516	825 544	825 544	825 544	825 544	825 544	825 544	825 544							
25	718 456	810 511	825 520	825 520	825 520	825 520	825 520	825 520							
26	663 405	748 453	814 493	825 499	825 499	825 499	825 499	825 499	813 535	825 541	825 541	825 541	825 541	825 541	825 541
27	615 361	693 404	754 439	825 479	825 479	825 479	825 479	825 479	753 477	820 519	825 522	825 522	825 522	825 522	825 522
28	571 323	643 362	700 393	781 436	825 456	825 456	825 456	825 456	699 427	762 464	825 501	825 501	825 501	825 501	825 501
29	531 290	600 325	652 354	727 392	804 429	825 436	825 436	825 436	651 384	709 417	790 463	825 479	825 479	825 479	825 479
30	496 262	559 293	609 319	679 353	750 387	816 419	825 422	825 422	607 346	661 377	738 417	816 457	825 459	825 459	825 459
31	465 237	523 266	570 289	636 320	702 350	765 379	825 410	825 410	568 314	619 341	690 378	763 413	825 444	825 444	825 444
32	435 215	490 241	535 262	595 290	658 318	717 344	823 393	823 393	534 285	580 309	648 343	715 375	778 407	823 431	823 431
33	409 196	462 220	502 239	559 265	619 289	673 313	798 368	798 368	501 259	546 282	609 312	672 342	732 370	798 404	798 404
34	385 179	435 201	472 218	526 242	582 264	634 286	753 337	774 344	472 237	514 257	573 285	633 312	688 338	774 378	774 378
35	363 164	409 184	445 200	496 221	549 242	598 262	709 308	751 324	445 217	484 236	540 261	597 286	649 310	751 356	751 356
36	343 150	387 169	421 183	469 203	519 222	565 241	670 283	730 306	420 199	457 216	510 240	564 263	613 284	729 334	730 334
37	324 138	366 155	399 169	444 187	490 205	534 222	634 260	711 290	397 183	433 199	483 221	534 242	580 262	690 308	711 315
38	307 128	346 143	378 156	421 172	465 189	507 204	601 240	691 275	376 169	411 184	457 204	505 223	550 241	654 284	691 299
39	292 118	328 132	358 144	399 159	441 174	480 189	570 222	673 261	357 156	390 170	433 188	480 206	522 223	619 262	673 283
40	277 109	312 122	340 133	379 148	420 161	456 175	541 206	657 247	340 145	370 157	412 174	456 191	496 207	589 243	657 269
41	264 101	297 114	324 124	361 137	399 150	435 162	516 191	640 235	322 134	352 146	393 162	433 177	472 192	561 225	640 256
42	252 94	283 106	309 115	343 127	379 139	414 151	490 177	625 224	307 125	336 136	373 150	412 164	450 178	534 210	625 244
43	240 88	270 98	294 107	328 118	363 130	394 140	468 165	609 213	294 116	319 126	357 140	394 153	429 166	508 195	610 232
44	229 82	258 92	280 100	313 110	346 121	376 131	447 154	580 199	280 108	306 118	340 131	376 143	409 155	486 182	597 222
45	219 76	246 86	268 93	298 103	330 113	360 122	427 144	555 185	268 101	291 110	325 122	360 133	391 145	465 170	583 212
46	208 71	235 80	256 87	286 97	316 106	345 114	408 135	531 174	256 95	279 103	310 114	343 125	375 135	444 159	570 203
47	199 67	225 75	246 82	274 90	303 99	330 107	391 126	508 163	246 89	267 96	298 107	328 117	358 127	426 149	553 192
48	192 63	216 70	235 77	262 85	291 93	316 101	375 118	487 153	235 83	256 90	285 100	315 110	343 119	408 140	529 180
49									225 78	246 85	274 94	303 103	330 112	391 131	508 169
50									216 73	235 80	262 89	291 97	316 105	375 124	487 159
51									208 69	226 75	252 83	279 91	304 99	361 116	469 150
52									199 65	217 71	243 79	268 86	292 93	346 110	451 142

LRFD

STANDARD LOAD TABLE FOR OPEN WEB STEEL JOISTS, K-SERIES
Based on a 50 ksi Maximum Yield Strength - Loads Shown in Pounds per Linear Foot (plf)

Joist Designation	28K6	28K7	28K8	28K9	28K10	28K12	30K7	30K8	30K9	30K10	30K11	30K12
Depth (In.)	28	28	28	28	28	28	30	30	30	30	30	30
Approx. Wt. (lbs./ft.)	11.4	11.8	12.7	13.0	14.3	17.1	12.3	13.2	13.4	15.0	16.4	17.6
Span (ft.) ↓												
28	822 541	825 543	825 543	825 543	825 543	825 543						
29	766 486	825 522	825 522	825 522	825 522	825 522						
30	715 439	796 486	825 500	825 500	825 500	825 500	825 543	825 543	825 543	825 543	825 543	825 543
31	669 397	745 440	825 480	825 480	825 480	825 480	801 508	825 520	825 520	825 520	825 520	825 520
32	627 361	699 400	772 438	823 463	823 463	823 463	751 461	823 500	823 500	823 500	823 500	823 500
33	589 329	657 364	726 399	790 432	798 435	798 435	706 420	780 460	798 468	798 468	798 468	798 468
34	555 300	618 333	684 364	744 395	774 410	774 410	664 384	735 420	774 441	774 441	774 441	774 441
35	523 275	583 305	645 333	702 361	751 389	751 389	627 351	693 384	751 415	751 415	751 415	751 415
36	495 252	550 280	609 306	663 332	730 366	730 366	592 323	654 353	712 383	730 392	730 392	730 392
37	468 232	522 257	576 282	627 305	711 344	711 344	559 297	619 325	673 352	711 374	711 374	711 374
38	444 214	493 237	546 260	594 282	691 325	691 325	531 274	586 300	639 325	691 353	691 353	691 353
39	420 198	469 219	519 240	564 260	670 306	673 308	504 253	556 277	606 300	673 333	673 333	673 333
40	399 183	445 203	492 222	535 241	636 284	657 291	478 234	529 256	576 278	657 315	657 315	657 315
41	379 170	424 189	468 206	510 224	606 263	640 277	454 217	502 238	547 258	640 300	640 300	640 300
42	361 158	403 175	445 192	486 208	576 245	625 264	433 202	480 221	522 240	619 282	625 284	625 284
43	345 147	385 163	426 179	463 194	550 228	610 252	414 188	457 206	498 223	591 263	610 270	610 270
44	330 137	367 152	406 167	442 181	525 212	597 240	394 176	436 192	475 208	564 245	597 258	597 258
45	315 128	351 142	388 156	423 169	501 198	583 229	376 164	417 179	454 195	538 229	583 246	583 246
46	301 120	336 133	372 146	405 158	480 186	570 219	361 153	399 168	435 182	516 214	570 236	570 236
47	288 112	321 125	355 136	387 148	459 174	558 210	345 144	382 157	415 171	493 201	558 226	558 226
48	276 105	309 117	340 128	370 139	441 163	547 201	331 135	366 148	399 160	472 188	543 215	547 216
49	265 99	295 110	327 120	355 130	423 153	535 193	318 127	351 139	382 150	454 177	520 202	535 207
50	255 93	283 103	313 113	342 123	405 144	525 185	304 119	337 130	367 141	436 166	499 190	525 199
51	244 88	273 97	301 106	328 115	390 136	507 175	292 112	324 123	352 133	418 157	480 179	514 192
52	235 83	262 92	289 100	315 109	375 128	487 165	282 106	312 116	339 126	402 148	462 169	504 184
53	226 78	252 87	279 95	304 103	360 121	469 156	271 100	300 109	327 119	387 140	444 159	495 177
54	217 74	243 82	268 89	292 97	348 114	451 147	261 94	288 103	313 112	373 132	427 150	486 170
55	210 70	234 77	259 85	282 92	334 108	435 139	252 89	277 98	303 106	360 125	412 142	468 161
56	202 66	226 73	249 80	271 87	322 102	420 132	243 84	268 92	292 100	346 118	397 135	451 153
57							234 80	259 88	282 95	334 112	384 128	435 145
58							226 76	250 83	271 90	322 106	370 121	420 137
59							219 72	241 79	262 86	312 101	358 115	406 130
60							211 69	234 75	253 81	301 96	346 109	393 124

STANDARD LRFD LOAD TABLE
LONGSPAN STEEL JOISTS, LH-SERIES

Based on a 50 ksi Maximum Yield Strength
Adopted by the Steel Joist Institute May 1, 2000
Revised to November 10, 2003 - Effective March 01, 2005

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

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

This load table applies to joists with either parallel chords or standard pitched top chords. When top chords are pitched, the carrying capacities are determined by the nominal depth of the joists at the center of the span. Standard top chord pitch is 1/8 inch per foot. If pitch exceeds this standard, the load table does not apply. Sloped parallel-chord joists shall use span as defined by the length along the slope.

Where the joist span is in the **RED SHADED** area of the load table, the row of bridging nearest the midspan shall be diagonal bridging with bolted connections at chords and intersection. Hoisting cables shall not be released until this row of bolted diagonal bridging is completely installed.

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

The approximate moment of inertia of the joist, in inches^4 is; $I_j = 26.767(W_{LL})(L^3)(10^{-6})$, where W_{LL}= **RED** figure in the Load Table, and L = (clear span + 0.67) in feet.

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

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

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

LRFD

STANDARD LOAD TABLE FOR LONGSPAN STEEL JOISTS, LH-SERIES
Based on a 50 ksi Maximum Yield Strength - Loads Shown in Pounds per Linear Foot (plf)

Joist Designation	Approx. Wt in Lbs. Per Linear Ft (Joists only)	Depth in inches	SAFE LOAD* in Lbs. Between	CLEAR SPAN IN FEET															
			21-24	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**				
18LH02	10	18	12000	702	663	627	586	550	517	486	459	433	409	388	367				
				313	284	259	234	212	193	175	160	147	135	124	114				
18LH03	11	18	13300	781	739	700	657	613	573	538	505	475	448	424	400				
				348	317	289	262	236	213	194	177	161	148	136	124				
18LH04	12	18	15500	906	856	802	750	703	660	619	582	547	516	487	462				
				403	367	329	296	266	242	219	200	182	167	153	141				
18LH05	15	18	17500	1026	972	921	871	814	762	714	672	631	595	562	532				
				454	414	378	345	311	282	256	233	212	195	179	164				
18LH06	15	18	20700	1213	1123	1044	972	907	849	796	748	705	664	627	594				
				526	469	419	377	340	307	280	254	232	212	195	180				
18LH07	17	18	21500	1260	1213	1170	1089	1017	952	892	838	789	744	703	666				
				553	513	476	428	386	349	317	288	264	241	222	204				
18LH08	19	18	22400	1314	1264	1218	1176	1137	1075	1020	961	906	856	810	768				
				577	534	496	462	427	387	351	320	292	267	246	226				
18LH09	21	18	24000	1404	1351	1302	1257	1215	1174	1138	1069	1006	949	897	849				
				616	571	527	491	458	418	380	346	316	289	266	245				
			22-24	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
20LH02	10	20	11300	663	655	646	615	582	547	516	487	460	436	412	393	373	355	337	322
				306	303	298	274	250	228	208	190	174	160	147	136	126	117	108	101
20LH03	11	20	12000	703	694	687	678	651	621	592	558	528	499	474	448	424	403	382	364
				337	333	317	302	280	258	238	218	200	184	169	156	143	133	123	114
20LH04	12	20	14700	861	849	837	792	744	700	660	624	589	558	529	502	477	454	433	412
				428	406	386	352	320	291	265	243	223	205	189	174	161	149	139	129
20LH05	14	20	15800	924	913	903	892	856	816	769	726	687	651	616	585	556	529	504	481
				459	437	416	395	366	337	308	281	258	238	219	202	187	173	161	150
20LH06	15	20	21100	1233	1186	1144	1084	1018	952	894	840	790	745	703	666	631	598	568	541
				606	561	521	477	427	386	351	320	292	267	246	226	209	192	178	165
20LH07	17	20	22500	1317	1267	1221	1179	1140	1066	1000	940	885	834	789	745	706	670	637	606
				647	599	556	518	484	438	398	362	331	303	278	256	236	218	202	187
20LH08	19	20	23200	1362	1309	1263	1219	1177	1140	1083	1030	981	931	882	837	795	754	718	685
				669	619	575	536	500	468	428	395	365	336	309	285	262	242	225	209
20LH09	21	20	25400	1485	1429	1377	1329	1284	1242	1203	1167	1132	1068	1009	954	904	858	816	775
				729	675	626	581	542	507	475	437	399	366	336	309	285	264	244	227
20LH10	23	20	27400	1602	1542	1486	1434	1386	1341	1297	1258	1221	1186	1122	1060	1005	954	906	862
				786	724	673	626	585	545	510	479	448	411	377	346	320	296	274	254

LRFD

STANDARD LOAD TABLE FOR LONGSPAN STEEL JOISTS, LH-SERIES
Based on a 50 ksi Maximum Yield Strength - Loads Shown in Pounds per Linear Foot (plf)

Joist Designation	Approx. Wt in Lbs. Per Linear Ft. (Joists only)	Depth in inches	SAFELOAD* in Lbs. Between		CLEAR SPAN IN FEET															
			28-32		**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
24LH03	11	24	17250		513	508	504	484	460	439	418	400	382	366	351	336	322	310	298	286
					235	226	218	204	188	175	162	152	141	132	124	116	109	102	96	90
24LH04	12	24	21150		628	597	568	540	514	490	468	447	427	409	393	376	361	346	333	321
					288	265	246	227	210	195	182	169	158	148	138	130	122	114	107	101
24LH05	13	24	22650		673	669	660	628	598	570	544	520	496	475	456	436	420	403	387	372
					308	297	285	264	244	226	210	196	182	171	160	150	141	132	124	117
24LH06	16	24	30450		906	868	832	795	756	720	685	655	625	598	571	546	522	501	480	460
					411	382	356	331	306	284	263	245	228	211	197	184	172	161	152	142
24LH07	17	24	33450		997	957	919	882	847	811	774	736	702	669	639	610	583	559	535	514
					452	421	393	367	343	320	297	276	257	239	223	208	195	182	171	161
24LH08	18	24	35700		1060	1015	973	933	895	858	817	780	745	712	682	652	625	600	576	553
					480	447	416	388	362	338	314	292	272	254	238	222	208	196	184	173
24LH09	21	24	42000		1248	1212	1177	1146	1096	1044	994	948	903	861	822	786	751	720	690	661
					562	530	501	460	424	393	363	337	313	292	272	254	238	223	209	196
24LH10	23	24	44400		1323	1284	1248	1213	1182	1152	1105	1053	1002	955	912	873	834	799	766	735
					596	559	528	500	474	439	406	378	351	326	304	285	266	249	234	220
24LH11	25	24	46800		1390	1350	1312	1276	1243	1210	1180	1152	1101	1051	1006	963	924	885	850	816
					624	588	555	525	498	472	449	418	388	361	337	315	294	276	259	243
			33-40		**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**
28LH05	13	28	21000		505	484	465	445	429	412	397	382	367	355	342	330	319	309	298	289
					219	205	192	180	169	159	150	142	133	126	119	113	107	102	97	92
28LH06	16	28	27900		672	643	618	592	568	546	525	505	486	469	451	436	421	406	393	379
					289	270	253	238	223	209	197	186	175	166	156	148	140	133	126	120
28LH07	17	28	31500		757	726	696	667	640	615	591	568	547	528	508	490	474	457	442	427
					326	305	285	267	251	236	222	209	197	186	176	166	158	150	142	135
28LH08	18	28	33750		810	775	744	712	684	657	630	604	580	556	535	516	496	478	462	445
					348	325	305	285	268	252	236	222	209	196	185	175	165	156	148	140
28LH09	21	28	41550		1000	958	918	879	844	810	778	748	721	694	669	645	622	601	580	561
					428	400	375	351	329	309	291	274	258	243	228	216	204	193	183	173
28LH10	23	28	45450		1093	1056	1018	976	937	900	864	831	799	769	742	715	690	666	643	622
					466	439	414	388	364	342	322	303	285	269	255	241	228	215	204	193
28LH11	25	28	48750		1170	1143	1104	1066	1023	982	943	907	873	841	810	781	753	727	702	679
					498	475	448	423	397	373	351	331	312	294	278	263	249	236	223	212
28LH12	27	28	53550		1285	1255	1227	1200	1173	1149	1105	1063	1023	984	948	913	880	849	819	790
					545	520	496	476	454	435	408	383	361	340	321	303	285	270	256	243
28LH13	30	28	55800		1342	1311	1281	1252	1224	1198	1173	1149	1126	1083	1041	1002	964	930	897	865
					569	543	518	495	472	452	433	415	396	373	352	332	314	297	281	266
			38-46	**47-48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**
32LH06	14	32	25050	25050	507	489	472	456	441	426	412	399	385	373	363	351	340	330	321	312
					211	199	189	179	169	161	153	145	138	131	125	119	114	108	104	99
32LH07	16	32	28200	28200	568	549	529	511	493	477	462	447	432	418	406	393	381	370	360	349
					235	223	211	200	189	179	170	162	154	146	140	133	127	121	116	111
32LH08	17	32	30600	30600	616	595	574	553	535	517	499	483	468	453	439	426	412	400	388	378
					255	242	229	216	205	194	184	175	167	159	151	144	137	131	125	120
32LH09	21	32	38400	38400	774	747	720	694	670	648	627	606	586	568	550	534	517	502	487	472
					319	302	285	270	256	243	230	219	208	198	189	180	172	164	157	149
32LH10	21	32	42450	42450	856	825	796	768	742	717	693	667	645	624	603	583	564	546	529	513
					352	332	315	297	282	267	254	240	228	217	206	196	186	178	169	162
32LH11	24	32	46500	46500	937	903	870	840	811	783	757	732	709	687	664	643	624	604	585	567
					385	363	343	325	308	292	277	263	251	239	227	216	206	196	187	179
32LH12	27	32	54600	54600	1101	1068	1032	996	961	928	897	867	838	811	786	762	738	715	694	673
					450	428	406	384	364	345	327	311	295	281	267	255	243	232	221	211
32LH13	30	32	60900	60900	1225	1201	1177	1156	1113	1072	1035	999	964	931	900	871	843	816	790	766
					500	480	461	444	420	397	376	354	336	319	304	288	275	262	249	238
32LH14	33	32	62700	62700	1264	1239	1215	1192	1170	1149	1107	1069	1032	997	964	933	903	874	846	820
					515	495	476	458	440	417	395	374	355	337	321	304	290	276	264	251
32LH15	35	32	64800	64800	1305	1279	1255	1231	1207	1186	1164	1144	1125	1087	1051	1017	984	952	924	895
					532	511	492	473	454	438	422	407	393	374	355	338	322	306	292	279
			42-46	**47-56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
36LH07	16	36	25200	25200	438	424	411	399	387	376	366	355	345	336	327	318	310	301	294	286
					177	168	160	153	146	140	134	128	122	117	112	107	103	99	95	91
36LH08	18	36	27750	27750	481	466	453	439	426	414	402	390	379	369	358	349	340	331	322	313
					194	185	176	168	160	153	146	140	134	128	123	118	113	109	104	100
36LH09	21	36	35550	35550	616	597	579	561	544	528	513	499	484	471	459	445	433	423	412	400
					247	235	224	214	204	195	186	179	171	163	157	150	144	138	133	127
36LH10	21	36	39150	39150	681	660	639	619	601	583	567	550	535	520	507	492	480	466	454	442
					273	260	248	236	225	215	206	197	188	180	173	165	159	152	146	140
36LH11	23	36	42750	42750	742	720	697	676	657	637	618	601	583	567	552	537	522	508	495	483
					297	283	269	257	246	234	224	214	205	196	188	180	173	166	159	153
36LH12	25	36	51150	51150	889	862	835	810	784	762	739	717	696	675	655	636	618	600	583	567
					354	338	322	307	292	279	267	255	243	232	222	213	204	195	187	179
36LH13	30	36	60150	60150	1045	1012	981	951	922	894	868	843	819	796	774	753	732	712	694	676
					415	395	376	359	342	327	312	298	285	273	262	251	240	231	222	213
36LH14	36	36	66300	66300	1152	1132	1093	1059	1024	991	961	931	903	876	850	826	802	780	757	738
					456	434	412	392	373	356	339	323	309	295	283	270	259	247	237	228
36LH15	36	36	69900	69900	1213	1192	1171	1153	1116	1081	1047	1015	984	955	927	900	874	850	826	804
					480	464	448	434	413	394	375	358	342	327	312	299	286	274	263	252

LRFD

STANDARD LOAD TABLE FOR LONGSPAN STEEL JOISTS, LH-SERIES
Based on a 50 ksi Maximum Yield Strength - Loads Shown in Pounds per Linear Foot (plf)

Joist Designation	Approx. Wt in Lbs. Per Linear Ft. (Joists Only)	Depth in inches	SAFELOAD* in Lbs. Between		CLEAR SPAN IN FEET															
			47-59	**60-64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**
40LH08	16	40	24900	24900	381	370	361	351	342	333	325	316	309	301	294	288	280	274	267	261
					150	144	138	132	127	122	117	112	108	104	100	97	93	90	86	83
40LH09	21	40	32700	32700	498	484	472	459	447	436	424	414	403	394	384	375	366	358	349	342
					196	188	180	173	166	160	153	147	141	136	131	126	122	118	113	109
40LH10	21	40	36000	36000	550	535	520	507	493	481	469	457	445	435	424	414	403	393	382	373
					216	207	198	190	183	176	169	162	156	150	144	139	134	129	124	119
40LH11	22	40	39300	39300	598	582	567	552	537	523	510	498	484	472	462	450	439	429	418	409
					234	224	215	207	198	190	183	176	169	163	157	151	145	140	135	130
40LH12	25	40	47850	47850	729	708	688	670	652	636	619	603	588	573	559	546	532	519	507	495
					285	273	261	251	241	231	222	213	205	197	189	182	176	169	163	157
40LH13	30	40	56400	56400	859	835	813	792	771	750	730	712	694	676	660	643	628	613	598	585
					334	320	307	295	283	271	260	250	241	231	223	214	207	199	192	185
40LH14	35	40	64500	64500	984	957	930	904	880	856	834	813	792	772	753	735	717	699	682	666
					383	367	351	336	323	309	297	285	273	263	252	243	233	225	216	209
40LH15	36	40	72150	72150	1101	1068	1036	1006	978	949	924	898	874	850	828	807	786	766	747	729
					427	408	390	373	357	342	328	315	302	290	279	268	258	248	239	230
40LH16	42	40	79500	79500	1212	1194	1176	1158	1141	1126	1095	1065	1036	1009	982	957	933	909	886	864
					469	455	441	428	416	404	387	371	356	342	329	316	304	292	282	271
			52-59	**60-72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**
44LH09	19	44	30000	30000	408	397	388	379	370	363	354	346	339	331	324	316	310	303	297	291
					158	152	146	141	136	131	127	122	118	114	110	106	103	99	96	93
44LH10	21	44	33150	33150	450	439	429	418	408	399	390	381	373	364	357	349	342	334	327	321
					174	168	162	155	150	144	139	134	130	125	121	117	113	110	106	103
44LH11	22	44	35850	35850	487	475	465	453	442	433	423	414	403	396	387	378	370	363	354	348
					188	181	175	168	162	157	151	146	140	136	131	127	123	119	115	111
44LH12	25	44	44400	44400	603	589	574	561	547	534	520	508	496	484	472	462	450	439	430	420
					232	224	215	207	200	192	185	179	172	166	160	155	149	144	139	134
44LH13	30	44	52650	52650	715	699	681	666	649	634	619	606	592	579	565	553	541	529	519	507
					275	265	254	246	236	228	220	212	205	198	191	185	179	173	167	161
44LH14	31	44	60600	60600	823	801	780	759	739	721	703	685	669	654	637	622	609	594	580	568
					315	302	291	279	268	259	249	240	231	223	215	207	200	193	187	181
44LH15	36	44	70500	70500	958	934	912	889	868	847	826	805	786	768	750	732	714	699	682	667
					366	352	339	326	314	303	292	281	271	261	252	243	234	227	219	211
44LH16	42	44	81300	81300	1105	1078	1051	1026	1002	978	955	933	912	891	870	852	832	814	796	780
					421	405	390	375	362	348	336	324	313	302	291	282	272	263	255	246
44LH17	47	44	87300	87300	1185	1170	1153	1138	1125	1098	1072	1048	1024	1000	978	957	936	915	895	876
					450	438	426	415	405	390	376	363	351	338	327	316	305	295	285	276
			56-59	**60-80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**
48LH10	21	48	30000	30000	369	361	354	346	339	331	325	318	312	306	300	294	288	282	277	271
					141	136	132	127	123	119	116	112	108	105	102	99	96	93	90	87
48LH11	22	48	32550	32550	399	390	382	373	366	358	351	343	337	330	324	318	312	306	300	294
					152	147	142	137	133	129	125	120	117	113	110	106	103	100	97	94
48LH12	25	48	41100	41100	504	493	483	472	462	451	442	433	424	415	408	399	391	384	376	369
					191	185	179	173	167	161	156	151	147	142	138	133	129	126	122	118
48LH13	29	48	49200	49200	603	589	576	564	552	540	529	517	507	498	487	477	468	459	450	441
					228	221	213	206	199	193	187	180	175	170	164	159	154	150	145	141
48LH14	32	48	58050	58050	712	696	681	666	651	637	624	610	598	585	574	562	550	540	529	519
					269	260	251	243	234	227	220	212	206	199	193	187	181	176	171	165
48LH15	36	48	66750	66750	817	799	781	765	748	732	717	702	687	672	658	645	633	619	607	595
					308	298	287	278	269	260	252	244	236	228	221	214	208	201	195	189
48LH16	42	48	76950	76950	943	922	901	882	864	844	826	810	792	777	760	745	730	715	702	688
					355	343	331	320	310	299	289	280	271	263	255	247	239	232	225	218
48LH17	47	48	86400	86400	1059	1035	1012	990	969	948	928	909	889	871	853	837	820	804	787	772
					397	383	371	358	346	335	324	314	304	294	285	276	268	260	252	245

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

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

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

STANDARD LRFD LOAD TABLE
DEEP LONGSPAN STEEL JOISTS, DLH-SERIES

Based on a 50 ksi Maximum Yield Strength
Adopted by the Steel Joist Institute May 1, 2000
Revised to November 10, 2003 - Effective March 01, 2005

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

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

This load table applies to joists with either parallel chords or standard pitched top chords. When top chords are pitched, the carrying capacities are determined by the nominal depth of the joists at the center of the span. Standard top chord pitch is 1/8 inch per foot. If pitch exceeds this standard, the load table does not apply. Sloped parallel-chord joists shall use span as defined by the length along the slope.

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

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

Where the joist span is in the **GRAY SHADED** area of the load table hoisting cables shall not be released until all rows of bridging are completely installed.

The approximate moment of inertia of the joist, in inches^4 is; $I_j = 26.767(W_{LL})(L^3)(10^{-6})$, where W_{LL}= **RED** figure in the Load Table, and L = (clear span + 0.67) in feet.

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

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

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

LRFD

STANDARD LOAD TABLE FOR DEEP LONGSPAN STEEL JOISTS, DLH-SERIES
Based on a 50 ksi Maximum Yield Strength - Loads Shown in Pounds per Linear Foot (plf)

Joist Designation	Approx. Wt in Lbs. Per Linear Ft (Joists only)	Depth in inches	SAFELOAD* in Lbs. Between	CLEAR SPAN IN LINEAR FEET															
			61-88	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**	**101**	**102**	**103**	**104**
52DLH10	25	52	40050	447 171	436 165	427 159	418 154	409 150	400 145	391 140	384 136	376 132	369 128	361 124	354 120	346 116	340 114	334 110	327 107
52DLH11	26	52	43950	490 187	480 181	469 174	459 169	448 164	439 158	430 153	421 149	412 144	405 140	396 135	388 132	381 128	373 124	366 120	360 117
52DLH12	29	52	49050	547 204	535 197	523 191	513 185	501 179	490 173	480 168	471 163	460 158	451 153	442 149	433 144	426 140	417 135	409 132	402 128
52DLH13	34	52	59550	664 247	649 239	636 231	621 224	609 216	595 209	583 203	571 197	559 191	549 185	537 180	526 174	516 170	507 164	496 159	487 155
52DLH14	39	52	68100	760 276	745 266	729 258	714 249	699 242	685 234	670 227	657 220	645 213	631 207	619 201	607 194	595 189	585 184	573 178	562 173
52DLH15	42	52	76500	853 311	835 301	817 291	799 282	783 272	766 264	750 256	735 247	720 240	705 233	691 226	676 219	664 213	651 207	639 201	627 195
52DLH16	45	52	82500	921 346	901 335	882 324	862 314	844 304	826 294	810 285	792 276	777 267	760 260	745 252	730 245	717 237	702 230	688 224	676 217
52DLH17	52	52	94950	1059 395	1036 381	1014 369	991 357	970 346	951 335	930 324	912 315	892 304	874 296	858 286	840 279	823 270	808 263	792 255	777 247
			66-96	**97**	**98**	**99**	**100**	**101**	**102**	**103**	**104**	**105**	**106**	**107**	**108**	**109**	**110**	**111**	**112**
56DLH11	26	56	42150	432 169	424 163	415 158	408 153	400 149	393 145	385 140	379 136	372 133	366 129	358 125	352 122	346 118	340 115	334 113	328 110
56DLH12	30	56	48450	496 184	486 178	477 173	468 168	459 163	450 158	442 153	433 150	426 145	417 141	409 137	402 133	394 130	388 126	381 123	373 119
56DLH13	34	56	58650	601 223	591 216	579 209	568 204	558 197	547 191	537 186	526 181	516 175	507 171	496 166	487 161	478 157	471 152	462 149	454 145
56DLH14	39	56	66300	679 249	666 242	652 234	640 228	628 221	616 214	604 209	594 202	582 196	571 190	562 186	552 181	541 175	532 171	523 167	514 162
56DLH15	42	56	75750	777 281	762 272	747 264	732 256	717 248	703 242	690 234	676 228	664 221	651 215	639 209	628 204	616 198	604 192	594 188	583 182
56DLH16	46	56	81750	838 313	822 304	805 294	789 285	774 277	759 269	744 262	730 254	717 247	703 240	690 233	678 227	666 221	654 214	642 209	630 204
56DLH17	51	56	94200	964 356	945 345	927 335	907 325	891 316	873 306	856 298	840 289	823 281	808 273	793 266	780 258	765 251	751 245	738 238	724 231

LRFD

STANDARD LOAD TABLE LONGSPAN STEEL JOISTS, LRFD DLH-SERIES
Based on a 50 ksi Maximum Yield Strength - Loads Shown in Pounds per Linear Foot (plf)

Joist Designation	Approx. Wt in Lbs. Per Linear Ft (Joists only)	Depth in inches	SAFE LOAD* in Lbs. Between		CLEAR SPAN IN LINEAR FEET															
			70-99	**100-104**	**105**	**106**	**107**	**108**	**109**	**110**	**111**	**112**	**113**	**114**	**115**	**116**	**117**	**118**	**119**	**120**
60DLH12	29	60	46650	46650	442	433	426	418	411	405	397	391	384	378	372	366	360	354	348	342
					168	163	158	154	150	146	142	138	134	131	128	124	121	118	115	113
60DLH13	35	60	56700	56700	537	526	517	508	499	490	483	474	466	459	451	444	436	429	423	415
					203	197	191	187	181	176	171	167	163	158	154	151	147	143	139	135
60DLH14	40	60	63000	63000	597	586	574	564	555	544	534	525	516	507	498	490	481	474	465	457
					216	210	205	199	193	189	183	178	173	170	165	161	156	152	149	145
60DLH15	43	60	73950	73950	700	687	675	663	651	640	628	618	607	597	588	577	568	559	550	541
					255	248	242	235	228	223	216	210	205	200	194	190	185	180	175	171
60DLH16	46	60	81300	81300	769	756	741	727	714	702	690	676	666	654	642	631	621	610	600	589
					285	277	269	262	255	247	241	235	228	223	217	211	206	201	196	190
60DLH17	52	60	93450	93450	885	868	853	837	822	807	793	778	765	751	739	726	714	702	690	679
					324	315	306	298	290	283	275	267	261	254	247	241	235	228	223	217
60DLH18	59	60	107850	107850	1021	1002	984	966	948	931	915	898	883	867	852	838	823	810	796	783
					366	357	346	337	327	319	310	303	294	286	279	272	266	259	252	246
			75-99	**100-112**	**113**	**114**	**115**	**116**	**117**	**118**	**119**	**120**	**121**	**122**	**123**	**124**	**125**	**126**	**127**	**128**
64DLH12	31	64	45000	45000	396	388	382	376	370	364	358	352	346	342	336	331	327	321	316	312
					153	150	146	142	138	135	132	129	125	122	119	116	114	111	109	106
64DLH13	34	64	54600	54600	481	472	465	457	450	442	436	429	421	415	409	403	396	390	385	379
					186	181	176	171	168	163	159	155	152	148	144	141	137	134	131	128
64DLH14	40	64	62550	62550	550	540	531	523	514	505	498	489	481	474	466	459	451	444	438	430
					199	193	189	184	179	174	171	166	162	158	154	151	147	143	140	136
64DLH15	43	64	71700	71700	631	621	610	600	591	580	571	562	553	544	537	528	520	511	504	496
					234	228	223	217	211	206	201	196	191	187	182	177	173	170	165	161
64DLH16	46	64	80700	80700	711	699	687	675	664	652	642	631	621	610	601	591	582	573	564	555
					262	254	248	242	235	229	224	218	213	208	203	198	193	189	184	180
64DLH17	52	64	93000	93000	819	804	790	777	763	751	738	726	714	702	691	681	669	658	648	639
					298	290	283	275	268	262	255	248	243	237	231	226	220	215	210	205
64DLH18	59	64	107400	107400	945	928	912	897	880	867	852	838	823	810	798	784	772	760	748	736
					337	328	320	311	304	296	288	282	274	267	261	255	249	243	237	232
			80-99	**100-120**	**121**	**122**	**123**	**124**	**125**	**126**	**127**	**128**	**129**	**130**	**131**	**132**	**133**	**134**	**135**	**136**
68DLH13	37	68	52500	52500	432	426	418	412	406	400	394	388	382	378	372	366	361	355	351	346
					171	168	164	159	155	152	149	145	142	138	135	133	130	127	124	121
68DLH14	40	68	60450	60450	498	490	483	475	468	462	454	448	441	435	429	421	415	409	403	399
					184	179	175	171	167	163	159	155	152	148	145	141	138	135	133	130
68DLH15	44	68	67800	67800	558	547	540	531	522	514	505	498	490	483	475	468	462	454	448	441
					206	201	196	191	187	182	178	174	170	166	162	158	155	152	148	145
68DLH16	49	68	80400	80400	661	649	640	630	619	610	600	591	582	573	564	556	547	540	531	523
					242	236	230	225	219	214	209	204	199	195	190	186	182	178	174	171
68DLH17	55	68	90600	90600	745	733	721	711	700	690	679	669	658	649	640	630	621	612	604	595
					275	268	262	256	249	244	238	232	228	222	217	212	208	203	198	194
68DLH18	61	68	104850	104850	862	849	835	823	810	798	786	774	762	751	739	729	718	708	697	688
					311	304	297	289	283	276	269	263	257	251	246	240	234	230	225	219
68DLH19	67	68	120750	120750	993	976	961	946	931	916	901	888	874	861	847	835	822	810	798	787
					353	344	336	328	320	313	305	298	291	285	278	272	266	260	254	248
			84-99	**100-128**	**129**	**130**	**131**	**132**	**133**	**134**	**135**	**136**	**137**	**138**	**139**	**140**	**141**	**142**	**143**	**144**
72DLH14	41	72	58800	58800	454	447	441	435	427	421	415	411	405	399	393	388	382	378	372	367
					171	167	163	159	155	152	149	146	143	139	136	133	131	128	125	123
72DLH15	44	72	67350	67350	520	513	504	496	489	483	475	468	462	454	448	442	436	429	423	418
					191	187	183	178	174	171	167	163	160	156	152	150	147	143	140	137
72DLH16	50	72	77850	77850	601	592	585	576	567	559	552	544	537	529	522	514	507	501	493	487
					225	219	214	209	205	200	196	191	188	183	179	175	171	169	165	161
72DLH17	56	72	87600	87600	676	667	657	648	639	630	621	612	603	595	586	579	571	564	556	549
					256	250	245	239	233	228	224	218	213	209	205	200	196	191	188	184
72DLH18	59	72	102600	102600	792	780	768	757	745	735	724	718	705	694	685	675	666	657	648	639
					289	283	276	270	265	258	252	247	242	236	231	227	222	217	212	209
72DLH19	70	72	120300	120300	928	913	900	886	873	859	847	835	823	811	799	789	777	766	756	745
					328	321	313	306	300	293	286	280	274	268	263	257	251	247	241	236

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

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

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

DESIGN GUIDE LRFD WEIGHT TABLE
FOR JOIST GIRDERS

Based on a 50 ksi Maximum Yield Strength

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT – POUNDS PER LINEAR FOOT FACTORED LOAD ON EACH PANEL POINT – KIPS																	
			6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0	36.0	42.0	48.0	54.0	60.0	66.0	72.0	78.0	84.0
20	2N@ 10.00	20	16	19	19	19	19	20	24	24	25	30	37	41	46	50	56	62	70	75
		24	16	19	19	19	19	20	21	21	25	28	32	36	41	42	49	52	53	66
		28	16	19	19	19	19	20	20	21	23	26	28	32	39	40	42	46	48	49
	3N@ 6.67	20	15	15	19	19	20	23	24	27	31	36	44	48	54	74	75	81	84	89
		24	15	16	16	16	19	20	23	26	27	33	36	45	47	53	56	68	79	82
		28	15	16	16	16	17	20	24	24	26	31	36	44	46	49	53	57	68	80
	4N@ 5.00	20	15	15	19	21	25	29	33	38	41	50	57	65	71	88	97	100	107	120
		24	15	16	17	20	23	26	29	32	35	44	50	55	62	71	85	90	100	102
		28	16	16	17	19	22	25	28	30	34	39	49	50	59	63	72	86	91	91
	5N@ 4.00	20	15	17	21	26	31	36	39	48	51	62	71	82	99	99	109	120	141	142
		24	16	16	20	23	26	30	35	39	43	53	60	68	80	91	101	103	110	120
		28	16	16	18	22	27	28	33	37	39	48	55	64	68	77	93	95	107	111
	6N@ 3.33	20	16	19	25	29	36	41	50	57	58	72	82	99	107	118	138	141		
		24	16	18	22	28	31	37	43	46	53	61	70	85	102	102	111	123	144	147
		28	17	18	22	26	30	33	40	42	47	58	68	76	83	96	109	112	119	130
	8N@ 2.50	20	19	25	32	41	51	58	65	72	82	99	118	139	142					
		24	17	22	29	36	42	50	54	61	69	86	103	107	128	149	153			
		28	18	22	29	34	40	47	54	61	67	76	88	107	112	124	135	155	166	
22	2N@ 11.00	20	21	21	21	22	22	23	24	24	25	34	39	43	49	55	62	69	76	78
		24	18	21	21	22	22	22	23	24	24	30	33	41	41	45	51	55	61	73
		28	18	21	21	21	22	22	22	23	24	37	30	33	41	42	46	48	51	58
	3N@ 7.33	20	15	18	18	19	22	24	26	29	33	42	45	53	68	70	76	84	88	94
		24	15	15	19	19	20	23	24	26	30	35	40	45	48	55	61	74	81	84
		28	15	16	16	16	19	20	23	24	27	32	36	45	47	52	54	59	74	82
	4N@ 5.50	20	15	16	19	23	26	30	36	39	44	55	62	71	82	95	96	106	119	134
		24	15	15	17	20	25	27	29	34	38	48	52	58	71	79	89	98	101	107
		28	16	16	16	19	22	25	28	32	35	40	49	54	60	72	79	87	90	97
	5N@ 4.40	20	15	17	24	27	34	38	42	49	55	65	75	96	98	111	126	137		
		24	16	16	20	24	28	33	38	40	48	56	62	73	85	100	101	110	116	133
		28	16	16	18	22	26	30	32	38	41	51	57	65	73	86	92	102	105	111
	6N@ 3.67	20	16	21	27	33	39	49	56	57	65	79	97	106	118	137				
		24	16	19	23	28	32	39	45	51	58	66	82	98	101	109	120	142	144	
		28	16	18	22	26	30	34	39	44	50	61	70	76	89	102	104	113	127	148
	8N@ 2.75	20	19	27	36	43	56	64	71	80	96	106	135	138						
		24	18	24	31	38	46	53	60	68	75	101	105	125	145	149				
		28	18	22	28	34	40	47	54	62	69	79	87	106	118	131	152	164		
25	3N@ 8.33	20	18	18	19	22	26	27	30	37	41	49	59	66	70	76	86	89	97	102
		24	15	18	19	20	22	25	26	28	32	39	43	51	59	67	71	81	84	89
		28	15	15	19	19	20	23	24	27	29	34	39	45	47	55	59	67	81	82
		32	15	16	16	16	20	21	23	24	27	32	36	44	46	52	54	58	74	81
		36	16	16	16	17	17	20	24	24	26	32	36	40	45	48	53	54	68	79
	4N@ 6.25	20	15	18	20	25	29	35	39	42	49	55	70	78	93	99	109	119	134	135
		24	15	16	19	21	26	29	33	37	40	50	57	64	72	88	97	100	106	120
		28	15	15	17	20	24	25	29	34	37	43	51	58	66	72	89	90	101	102
		32	16	16	17	19	21	25	28	32	35	40	49	54	60	69	79	86	91	96
		36	16	16	17	19	21	26	26	29	34	38	49	50	56	63	73	85	88	92
	5N@ 5.00	20	15	18	25	31	38	43	51	55	58	73	93	100	109	125	134			
		24	15	17	23	26	32	36	42	47	53	61	75	81	98	102	112	129	140	
		28	16	16	20	24	28	31	37	41	47	56	62	72	79	93	101	106	117	125
		32	16	16	19	23	26	30	33	38	41	51	57	65	73	83	93	102	105	111
		36	16	17	18	22	26	28	31	36	39	48	54	64	69	75	88	96	101	108
	6N@ 4.17	20	16	24	29	38	45	55	58	69	78	94	104	116	134					
		24	16	20	25	31	37	44	50	56	64	75	97	99	107	118	138			
		28	16	18	23	28	32	38	44	51	55	67	73	87	101	104	120	134	143	145
		32	16	18	22	26	30	34	39	44	50	61	69	77	89	102	105	113	127	148
		36	16	18	24	25	30	36	39	43	49	58	67	74	84	98	108	116	117	129
	8N@ 3.12	20	21	29	39	48	58	70	78	94	99	115	134							
		24	19	26	33	41	50	57	65	75	81	99	118	138						
		28	18	23	30	38	44	53	60	67	75	86	103	116	127	147				
		32	18	24	28	34	39	47	54	65	71	78	87	105	117	129	152	154		
		36	18	22	29	34	40	46	52	61	63	76	87	101	114	121	136	148	166	167
	10N@ 2.50	20	26	38	49	63	78	94	100	115	134									
		24	23	33	42	54	65	75	89	99	104	130								
		28	21	30	38	48	56	64	74	84	101	109	134	147						
		32	21	28	36	43	52	62	69	76	87	107	118	130	153					
		36	22	28	37	44	52	64	71	77	85	100	116	130	151	157				

LRFD

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT – POUNDS PER LINEAR FOOT FACTORED LOAD ON EACH PANEL POINT – KIPS																	
			6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0	36.0	42.0	48.0	54.0	60.0	66.0	72.0	78.0	84.0
28	3N@ 9.33	24	18	18	19	22	24	27	29	36	39	43	53	62	70	71	78	85	89	98
		28	18	18	19	20	22	25	26	28	31	39	43	46	55	61	66	76	83	86
		32	15	18	19	19	21	23	24	27	28	34	39	45	48	53	58	66	80	81
	4N@ 7.00	24	15	16	20	24	27	32	38	40	48	55	62	71	82	95	104	106	120	135
		28	15	15	18	21	25	28	32	36	39	49	56	64	71	79	96	97	106	107
		32	15	15	17	20	23	25	29	33	37	43	50	58	62	70	85	90	99	102
	5N@ 5.60	24	15	18	24	29	34	39	46	52	58	66	78	96	102	111	126	136		
		28	15	17	21	26	30	35	39	46	50	61	68	77	90	99	107	114	130	142
		32	16	17	20	24	27	32	37	41	44	56	62	70	80	93	102	107	112	119
	6N@ 4.67	24	16	21	28	35	41	49	55	63	70	79	96	106	134	137				
		28	15	20	24	30	36	42	50	54	58	71	82	99	107	118	138	142		
		32	16	19	23	28	32	37	43	49	53	64	74	84	101	102	111	123	144	146
	7N@ 4.00	24	18	24	32	41	49	56	64	74	79	96	110	135						
		28	17	22	27	35	43	51	57	62	69	82	99	108	129	140				
		32	16	21	27	31	38	44	52	55	63	74	85	102	108	123	143	146		
	8N@ 3.50	24	20	28	37	48	55	64	74	79	95	105	134							
		28	18	25	32	39	50	58	65	72	81	99	108	129	141					
		32	17	24	29	38	43	53	60	64	70	86	103	113	127	147	149			
	10N@ 2.80	24	24	36	46	57	70	79	96	102	117	137								
		28	23	30	41	50	60	69	82	99	100	120	141							
		32	21	30	38	46	55	66	71	80	93	109	126	147						
30	3N@ 10.00	24	18	18	21	24	27	31	35	38	40	48	58	66	71	80	92	98	117	119
		28	18	18	19	22	25	27	30	35	37	42	49	56	63	70	79	82	93	99
		32	18	18	19	20	22	26	28	31	32	39	46	51	57	64	71	73	83	84
		36	16	19	19	19	21	23	26	28	31	35	39	46	52	57	64	65	73	75
	4N@ 7.50	24	16	18	23	29	33	37	42	49	53	64	76	85	101	104	126	127	149	150
		28	15	16	21	25	30	33	37	42	45	53	61	73	81	86	103	104	126	128
		32	15	16	18	22	26	30	34	37	43	51	55	62	70	77	87	103	105	116
		36	16	16	17	22	24	27	31	34	36	46	52	59	64	74	78	88	91	105
	5N@ 6.00	24	15	19	25	30	37	43	51	55	58	73	86	96	109	125	134			
		28	15	17	23	27	32	37	44	47	53	61	75	88	97	102	112	128	138	
		32	16	17	21	24	29	35	39	43	48	56	63	77	90	100	101	107	117	133
		36	16	17	20	24	27	31	36	40	43	51	60	70	80	86	94	103	110	118
	6N@ 5.00	24	16	24	29	37	45	52	58	66	73	94	104	116	134					
		28	16	20	27	32	38	44	50	57	65	75	97	99	107	137	140			
		32	16	19	24	29	34	40	45	51	58	65	82	98	100	109	121	142	144	
		36	16	18	23	26	31	37	41	46	52	61	70	84	101	102	111	123	126	148
	8N@ 3.75	24	21	32	40	51	63	73	83	99	111	124	146							
		28	20	30	37	44	53	61	73	80	86	114	126	149						
		32	18	26	34	42	49	55	63	71	79	104	117	130	154	161				
		36	17	23	32	39	46	54	61	69	76	89	108	121	134	154	169			
	10N@ 3.00	24	25	38	51	66	78	99	111	123	134									
		28	24	36	47	57	69	80	94	113	116	138								
		32	22	31	39	52	58	74	82	95	105	129	142							
		36	22	30	39	48	54	68	79	84	91	119	132	151						
32	3N@ 10.67	24	18	19	21	26	27	34	38	40	42	54	61	70	75	84	88	102	102	113
		28	16	17	18	24	26	28	31	34	37	43	55	60	69	70	76	85	89	93
		32	17	17	18	21	25	26	28	32	34	39	44	54	61	62	67	77	80	86
		36	15	17	19	20	23	25	26	28	30	38	40	45	51	53	58	67	81	77
	4N@ 8.00	24	18	19	23	26	32	37	40	47	55	61	72	86	94	103	114	133	134	
		28	15	18	20	24	28	32	37	40	45	55	62	70	78	94	96	105	121	135
		32	15	15	20	22	25	29	32	36	39	49	56	64	71	83	82	97	102	107
		36	15	16	17	21	24	26	30	34	36	43	50	58	65	70	85	90	99	102
	5N@ 6.40	24	15	20	27	33	39	44	51	57	65	77	93	100	123	133				
		28	15	18	24	28	34	39	46	52	58	66	74	96	101	110	126	137		
		32	15	17	22	26	32	35	41	46	53	61	68	77	90	99	105	114	130	142
		36	16	17	21	24	27	33	37	42	47	56	62	70	79	93	102	106	117	120
	6N@ 5.33	24	17	24	31	39	47	55	61	69	76	94	103	133	134					
		28	16	21	27	35	40	48	55	60	67	79	96	105	117	137				
		32	16	20	25	30	36	42	50	54	58	71	82	99	103	118	139	142		
		36	16	19	24	28	34	38	44	49	55	66	73	84	101	102	111	123	144	146
	8N@ 4.00	24	22	32	40	54	61	72	86	93	103	133								
		28	19	27	35	45	55	63	70	80	95	105	134	137						
		32	18	25	32	39	50	58	65	71	81	99	109	120	141					
		36	18	24	31	38	43	53	59	67	71	86	103	113	127	147				

LRFD

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT – POUNDS PER LINEAR FOOT FACTORED LOAD ON EACH PANEL POINT – KIPS																	
			6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0	36.0	42.0	48.0	54.0	60.0	66.0	72.0	78.0	84.0
35	4N@ 8.75	28	16	19	23	27	31	36	41	46	52	60	74	79	94	100	111	117	137	138
		32	15	18	21	24	28	33	37	39	45	53	60	73	80	92	100	106	112	127
		36	15	16	20	23	27	30	33	37	41	561	55	62	74	83	94	97	107	113
		40	15	16	17	21	26	27	30	37	38	46	52	61	64	75	90	95	96	108
	5N@ 7.00	28	15	20	26	32	37	43	52	57	59	73	86	100	109	126	136			
		32	15	18	24	29	34	37	45	50	53	66	75	88	100	102	112	128	138	
		36	16	17	23	27	29	35	40	46	48	62	68	77	90	100	104	115	131	133
		40	16	17	22	25	27	33	37	43	47	56	63	70	80	95	102	107	115	125
	6N@ 5.83	28	17	24	30	37	44	52	58	65	73	93	103	115	134					
		32	16	21	27	33	38	46	53	57	65	79	96	100	117	139	140			
		36	16	20	25	31	36	41	48	54	58	70	81	99	102	113	121	142	144	
		40	16	20	24	28	34	38	44	49	55	64	77	84	101	104	115	123	145	146
	7N@ 5.00	28	19	27	34	43	52	59	66	74	86	101	115	135						
		32	17	24	30	39	47	53	61	67	75	97	103	118	137					
		36	17	23	28	35	42	48	55	62	69	82	99	105	120	141	144			
		40	17	22	27	32	39	44	50	55	63	73	86	102	107	118	133	147		
	8N@ 4.38	28	21	30	39	48	59	69	78	94	98	115	136							
		32	20	27	36	42	53	61	69	79	88	101	118	138						
		36	19	26	32	39	48	55	62	71	77	99	109	121	141					
		40	18	24	30	37	44	54	60	65	73	86	102	113	127	147	149			
38	4N@ 9.50	32	16	19	21	26	31	34	39	43	48	58	67	74	87	100	101	111	127	138
		36	15	17	21	24	28	33	35	39	44	53	60	74	75	93	97	106	112	123
		40	15	16	20	23	27	30	34	37	41	51	55	62	74	83	94	98	107	109
		44	16	16	20	22	26	28	30	35	38	46	52	58	65	75	90	95	95	108
	5N@ 7.60	32	15	20	25	31	36	42	46	52	59	70	86	96	101	111	126	137		
		36	16	20	24	28	33	38	45	47	53	64	74	89	98	103	112	129	138	
		40	16	20	23	26	31	35	40	46	48	59	70	78	91	101	105	113	117	134
		44	17	20	22	25	30	33	39	41	48	56	63	75	80	93	102	107	111	118
	6N@ 6.33	32	17	24	30	35	41	49	55	62	70	86	98	105	125	136				
		36	16	21	27	33	39	47	50	57	61	75	89	100	107	118	141	142		
		40	16	21	25	31	36	40	48	55	59	71	82	99	102	109	121	143	142	
		44	17	20	24	29	33	38	44	49	55	64	77	84	102	104	115	123	145	147
	8N@ 4.75	32	20	29	38	47	56	64	74	86	95	105	135							
		36	19	28	35	42	50	57	65	76	81	101	113	138	140					
		40	19	26	32	40	48	55	62	67	78	100	103	121	142	144				
		44	20	24	30	39	47	51	57	64	71	86	102	113	127	147	149			
40	4N@ 10.00	32	17	20	23	29	37	40	47	50	56	64	73	86	103	114	126	128	149	151
		36	17	19	22	29	31	37	40	44	51	57	65	74	87	103	104	125	127	128
		40	17	18	22	25	29	33	37	40	47	52	62	73	77	87	96	104	117	127
		44	16	17	20	24	29	31	36	38	41	49	59	66	74	78	84	96	106	106
		48	17	17	20	24	25	30	32	37	39	48	53	59	67	78	78	85	99	106
	5N@ 8.00	32	15	21	26	32	38	43	52	55	62	73	86	101	109	124	134			
		36	16	20	24	30	34	39	45	53	55	66	74	88	102	102	112	128	138	
		40	16	20	24	27	32	37	41	46	51	62	68	77	90	100	105	115	130	142
		44	17	20	23	29	32	37	41	49	50	58	70	82	84	99	116	118	130	141
		48	17	20	23	26	31	34	40	41	50	57	68	75	85	95	100	119	120	132
	6N@ 6.67	32	16	24	30	38	44	52	58	65	72	93	100	115	133					
		36	17	22	27	34	39	47	53	60	67	79	97	102	117	137	141			
		40	16	21	26	30	36	43	48	54	62	71	82	99	103	114	130	142		
		44	17	21	24	28	36	40	47	51	55	66	78	91	102	107	116	134	142	146
		48	17	21	24	31	36	42	46	53	57	69	79	86	100	109	132	133	135	164
	7N@ 5.71	32	18	26	33	43	52	58	66	74	86	101	115	135						
		36	17	24	31	39	47	53	61	67	75	97	103	117	136					
		40	17	24	29	35	43	49	55	62	69	82	99	105	119	140				
		44	20	22	28	33	39	48	55	59	64	78	92	102	111	122	143			
		48	20	23	28	36	41	48	54	61	66	80	86	108	122	134	136	164	167	
	8N@ 5.00	32	21	29	38	48	58	67	78	94	96	115	135							
		36	19	27	36	46	53	60	68	80	88	102	118	137						
		40	19	25	34	39	49	58	65	72	82	99	109	120	141					
		44	21	27	33	39	47	56	63	70	75	93	103	120	136	147				
		48	20	25	32	42	47	55	62	69	80	90	104	122	136	155	170			
	10N@ 4.00	32	29	39	51	64	79	92	112	123	125	149								
		36	25	36	47	60	69	81	94	103	125	150								
		40	24	36	45	56	66	75	82	96	115	129	152							
		44	23	32	41	51	60	71	82	84	99	119	143	161						
		48	23	32	41	52	58	68	76	85	94	121	134	152						

LRFD

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT – POUNDS PER LINEAR FOOT FACTORED LOAD ON EACH PANEL POINT – KIPS																	
			6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0	36.0	42.0	48.0	54.0	60.0	66.0	72.0	78.0	84.0
42	4N@ 10.50	32	16	21	25	29	34	38	43	49	53	67	74	86	99	101	112	125	134	138
		36	16	19	22	26	32	35	39	44	47	58	67	73	87	95	101	112	118	129
		40	16	19	21	24	28	34	36	41	45	53	61	73	76	93	97	97	113	122
		44	16	19	20	23	27	31	34	38	42	51	55	62	74	84	94	97	108	109
		48	16	19	21	24	26	29	32	36	39	47	54	62	65	75	90	95	97	108
	5N@ 8.40	32	16	22	28	35	41	45	52	57	66	74	88	100	110	125				
		36	15	21	25	31	36	42	46	52	59	70	85	96	102	111	126	137		
		40	16	21	24	28	33	39	44	51	54	64	74	89	98	103	113	129	130	
		44	16	20	24	27	31	37	40	46	52	59	69	78	91	101	105	113	126	134
		48	17	20	23	27	30	35	39	42	48	57	63	75	81	95	102	107	115	118
	6N@ 7.00	32	18	25	32	39	45	55	61	69	77	93	103	124	135					
		36	17	23	30	35	41	49	56	60	67	79	96	105	117	137				
		40	17	21	26	33	39	46	54	57	61	75	89	100	108	119	141	142		
		44	16	21	24	31	35	41	48	54	59	71	81	100	102	109	121	143	142	
		48	20	20	25	29	33	39	44	49	56	64	77	85	102	104	115	124	145	147
	7N@ 6.00	32	20	28	36	45	52	65	72	85	93	102	125							
		36	19	26	34	40	49	56	67	74	79	98	110	127	138					
		40	18	24	31	38	46	54	61	68	75	90	101	113	129	142				
		44	20	23	29	35	41	49	55	63	70	78	100	106	116	132	145			
		48	18	23	28	34	39	44	50	56	64	73	92	102	108	118	136	149		
	8N@ 5.25	32	22	32	40	51	62	72	78	94	100	124	135							
		36	20	27	38	46	56	64	74	79	96	105	126	138						
		40	20	26	35	42	51	57	65	76	81	101	113	138	141					
		44	20	25	32	39	49	55	63	70	78	99	107	121	142	147				
		48	21	26	32	41	48	56	63	67	74	93	103	112	128	148				
	10N@ 4.20	32	27	38	52	62	77	94	101	114	134									
		36	25	36	46	60	70	86	97	102	112	140								
		40	24	34	45	54	64	75	89	99	104	129								
		44	23	31	41	52	61	70	79	91	100	114	143							
		48	23	30	39	49	56	66	72	80	93	107	125	146						
45	4N@ 11.25	36	18	21	25	28	33	38	42	46	52	62	72	79	95	100	112	117	128	138
		40	19	21	22	27	31	35	39	44	47	55	64	75	87	95	101	112	113	128
		44	19	21	22	24	29	33	37	39	45	53	61	74	76	89	95	102	108	114
		48	18	21	22	24	28	31	34	38	40	51	55	63	75	83	94	95	107	109
		52	18	22	23	24	27	29	33	37	39	47	52	60	66	76	91	95	96	109
	5N@ 9.00	36	16	22	27	33	38	44	52	55	63	74	86	101	109	125	136			
		40	16	21	25	30	36	42	45	53	56	68	75	88	102	111	122	128		
		44	16	21	24	29	34	38	44	46	54	65	74	85	90	103	110	123	130	142
		48	20	21	24	27	32	36	41	45	52	59	67	75	91	95	106	112	118	134
		52	20	21	24	27	30	35	39	42	48	57	64	75	81	94	98	107	117	119
	6N@ 7.50	36	19	24	31	38	45	52	58	66	74	93	100	115	134					
		40	19	23	28	34	40	47	53	60	67	79	97	103	117	137	140			
		44	19	21	27	32	38	46	50	54	62	76	90	100	107	118	139	142		
		48	20	21	26	30	36	42	48	55	59	69	78	92	102	110	122	143	143	
		52	20	21	25	29	34	39	44	50	56	64	77	85	102	102	116	124	136	148
	7N@ 6.43	36	20	27	35	44	52	58	66	74	86	101	115	135						
		40	20	26	33	40	47	54	61	67	75	97	105	127	138					
		44	20	24	30	39	46	54	61	62	69	90	100	113	129	143				
		48	20	23	29	36	41	49	55	63	70	79	92	107	117	133	145			
		52	18	23	28	34	39	45	50	56	65	73	93	102	109	118	136	149		
	8N@ 5.62	36	21	30	38	48	58	67	78	94	98	114	135							
		40	20	28	36	46	53	61	68	80	89	105	118	137						
		44	20	27	34	41	51	58	66	73	81	99	109	130	141					
		48	21	26	32	39	47	55	63	68	74	92	104	116	142	146				
		52	22	28	33	42	48	54	59	67	71	94	102	112	127	148				
	9N@ 5.00	36	24	34	45	55	66	74	88	98	104	135								
		40	22	31	39	49	61	69	80	89	100	113	138							
		44	23	31	39	48	58	66	76	89	99	108	132							
		48	23	29	37	47	55	63	70	79	91	106	117	133						
		52	23	28	36	46	55	60	70	73	84	102	112	135	148					
	10N@ 4.50	36	26	38	49	60	73	86	98	105	116	137								
		40	25	35	47	60	66	76	90	102	112	140								
		44	24	33	46	54	64	72	89	99	104	130	142							
		48	24	31	40	49	62	71	78	91	100	114	134							
		52	23	31	39	50	56	67	72	80	93	107	123	147						

LRFD

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT – POUNDS PER LINEAR FOOT FACTORED LOAD ON EACH PANEL POINT – KIPS																	
			6.0	9.0	12.0	15.0	18.0	21.0	24.0	27.0	30.0	36.0	42.0	48.0	54.0	60.0	66.0	72.0	78.0	84.0
48	5N@ 9.60	36	19	26	31	37	45	52	59	66	71	87	111	113	135	136				
		40	19	23	29	35	41	46	52	59	68	77	92	112	114	136	138			
		44	19	22	27	32	37	44	48	54	61	69	80	93	113	116	126	139	150	
		48	19	21	25	30	36	40	48	48	55	69	78	90	96	115	116	128	140	142
		52	20	21	25	29	33	39	42	50	54	62	71	82	92	99	117	118	130	141
		56	20	21	24	29	33	38	40	46	50	59	71	79	85	100	100	119	120	133
	6N@ 8.00	36	20	28	35	42	51	62	70	78	83	100	122	134	147					
		40	19	25	33	39	47	56	64	71	79	93	112	124	137	148				
		44	19	24	31	36	45	50	57	65	73	81	102	115	127	138	151			
		48	19	23	30	35	40	48	52	59	67	78	95	105	116	129	141	160		
		52	20	23	27	32	38	46	51	59	60	75	83	97	107	130	131	144	162	
		56	20	22	27	31	37	42	48	54	61	69	80	91	107	120	132	134	153	165
	8N@ 6.00	36	30	36	45	56	64	78	91	100	122	134								
		40	28	33	42	51	59	70	80	92	101	124	148							
		44	27	32	39	49	55	65	74	82	95	114	127	150						
		48	26	30	37	47	53	60	68	76	84	105	129	131	154					
		52	26	30	36	44	51	59	65	71	80	99	119	132	146	164				
		56	25	28	36	43	49	57	63	69	78	90	109	123	136	155				
	9N@ 5.33	36	35	44	55	70	79	91	99	121	122	146								
		40	34	42	52	63	74	88	93	101	113	136								
		44	33	39	50	59	69	83	91	94	103	126	150							
		48	33	37	46	56	66	76	85	94	97	118	130							
		52	31	36	46	54	63	72	80	95	101	108	132	152						
		56	31	35	44	53	62	69	80	89	98	103	123	137	165					
	12N@ 4.00	36	35	52	71	84	100	123	135	148										
		40	34	48	65	76	93	113	125	137	149									
		44	31	44	57	73	82	102	115	126	139									
		48	30	41	53	67	76	88	104	117	130	153								
		52	30	39	52	61	76	84	97	107	131	144								
		56	27	38	49	61	70	81	91	108	122	135	165							
50	5N@ 10.00	40	18	23	30	38	44	47	56	60	68	79	93	113	124	136	138			
		44	17	22	29	34	40	46	51	56	61	76	89	94	113	126	137	139		
		48	19	22	28	31	38	42	48	55	61	69	78	94	96	115	127	139	141	
		52	20	22	25	31	35	40	45	49	55	62	74	82	96	116	117	129	141	142
		56	20	22	25	30	32	40	43	50	51	63	71	83	92	99	117	119	131	142
		60	20	20	24	30	33	36	42	46	51	58	65	76	86	96	101	120	121	133
	6N@ 8.33	40	20	28	34	42	48	56	64	71	80	100	112	124	147					
		44	19	24	31	38	47	50	57	65	73	85	102	124	127	149				
		48	19	23	30	37	40	49	57	65	67	82	95	115	127	129	151			
		52	20	23	30	36	40	46	52	59	67	75	84	105	117	129	131	153	162	
		56	20	23	26	33	39	42	51	54	60	72	84	98	107	120	132	144	163	164
		60	21	23	27	33	38	43	49	53	61	70	80	87	102	110	123	134	154	165
	8N@ 6.25	40	22	31	39	51	59	67	78	86	96	110	135							
		44	21	29	37	47	53	61	70	80	96	103	118	139						
		48	21	27	35	42	51	58	69	76	81	99	114	130	142					
		52	21	25	33	40	49	55	63	70	78	99	107	121	141					
		56	24	29	36	42	47	56	64	68	78	94	108	118	137	148				
		60	24	27	35	40	47	55	61	69	74	83	103	110	123	139	149			
	9N@ 5.56	40	24	34	44	55	66	74	86	96	104	134								
		44	23	32	40	53	61	69	80	88	98	113	138							
		48	24	32	42	52	58	69	77	90	99	111	133							
		52	24	31	40	47	58	66	74	79	92	106	126	143						
		56	24	30	38	46	55	60	68	77	89	102	116	135						
		60	24	32	38	49	53	61	70	75	83	97	111	125	141					
	10N@ 5.00	40	26	38	49	60	74	87	96	104	116	136								
		44	25	36	47	60	68	84	96	102	112	140								
		48	24	34	46	54	65	76	89	99	103	130								
		52	24	34	45	52	62	70	79	91	100	114	134							
		56	23	32	41	48	60	70	76	87	93	107	134	146						
		60	24	31	40	49	57	66	73	81	94	109	119	138						
	12N@ 4.17	40	34	49	65	80	100	112	125	147										
		44	31	44	57	73	86	102	126	127	149									
		48	30	41	58	67	82	96	115	127	130	154								
		52	30	39	53	68	76	84	105	118	130	154								
		56	27	40	52	61	70	85	99	108	122	135	164							
		60	27	39	49	61	70	82	88	104	112	135	166							

LRFD

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT – POUNDS PER LINEAR FOOT FACTORED LOAD ON EACH PANEL POINT – KIPS																	
			6.0	7.5	9.0	10.5	12.0	13.5	15.0	16.5	18.0	19.5	21.0	24.0	27.0	30.0	33.0	36.0	39.0	42.0
55	5N@ 11.00	44	21	21	24	25	29	32	35	38	41	43	47	53	59	63	71	82	83	86
		48	21	21	23	24	28	30	32	35	38	41	43	49	56	60	64	71	73	83
		52	20	22	23	25	27	29	32	33	36	39	42	44	52	57	65	66	74	74
		56	20	21	24	24	26	28	31	33	36	37	39	44	51	53	58	66	66	74
		60	23	24	24	24	27	27	31	33	35	38	38	45	47	52	60	61	67	68
		66	24	24	24	25	26	28	28	33	34	37	37	42	47	48	55	56	62	69
	6N@ 9.17	44	19	22	26	29	33	36	38	43	45	51	52	59	66	75	86	86	98	101
		48	20	22	24	28	31	33	36	40	44	46	50	56	64	68	75	87	89	98
		52	20	22	24	26	29	33	35	37	41	59	59	66	74	86	93	99	109	110
		56	18	21	24	25	28	31	35	36	39	42	47	52	55	63	70	71	78	91
		60	20	21	24	25	29	30	33	35	38	39	43	48	55	60	64	71	75	80
		66	19	20	22	24	28	30	31	33	36	39	40	47	50	56	62	65	73	73
	7N@ 7.86	44	21	24	28	33	36	39	44	50	53	59	59	70	75	87	97	102	111	120
		48	21	24	27	31	34	38	43	45	51	54	56	65	72	76	89	98	103	110
		52	21	23	26	29	33	36	39	44	46	52	55	62	69	74	86	91	100	105
		56	20	22	25	28	31	35	38	40	46	48	53	55	64	70	79	87	92	101
		60	21	22	24	27	30	33	36	39	41	47	49	56	64	68	72	81	93	94
		66	22	22	24	26	30	32	36	37	40	43	48	52	58	65	70	74	83	84
	9N@ 6.11	44	24	29	34	39	46	52	55	60	67	74	74	87	98	105	116	135	137	
		48	24	28	32	38	40	47	53	57	61	68	69	81	97	103	107	118	129	139
		52	25	30	33	39	43	47	52	57	65	65	73	77	90	104	105	114	125	133
		56	24	29	32	38	43	46	51	53	59	66	67	75	87	92	105	107	117	128
		60	24	27	32	36	40	45	47	52	56	60	67	71	80	93	95	108	109	118
		66	24	27	31	35	39	42	46	49	54	58	61	71	78	83	91	97	111	113
	11N@ 5.00	44	30	36	43	49	55	63	67	74	87	88	97	106	126	137				
		48	28	33	39	45	54	61	65	69	76	87	89	103	112	128	139			
		52	27	34	37	44	52	55	62	66	73	77	88	99	105	115	131	142		
		56	27	33	39	42	48	54	60	64	68	77	80	93	102	107	118	134	146	
		60	26	31	37	40	47	49	58	64	67	72	77	82	95	108	110	121	137	148
		66	26	31	36	39	45	50	54	60	65	68	74	82	97	98	113	117	126	141
60	5N@ 12.00	48	21	23	27	29	33	35	39	43	44	49	51	57	63	69	76	87	89	94
		52	21	22	27	28	31	33	36	40	44	45	47	52	60	65	69	77	85	90
		56	22	23	24	28	30	31	34	36	41	44	45	52	59	63	69	74	78	87
		60	22	23	24	28	29	32	34	35	40	42	45	49	53	60	66	70	75	80
		66	24	24	24	26	30	30	33	35	36	38	42	47	51	56	61	67	72	73
		72	25	25	25	25	27	30	31	35	36	37	39	45	48	56	56	63	69	70
	6N@ 10.00	48	20	24	29	32	36	38	41	47	49	56	60	67	72	80	93	93	112	113
		52	20	23	28	30	33	37	39	46	48	50	57	62	69	78	80	94	94	113
		56	19	24	25	30	33	38	39	42	48	49	51	58	66	69	79	83	95	96
		60	19	23	24	29	32	34	39	40	43	49	50	57	63	70	75	83	83	96
		66	19	23	24	27	32	32	34	40	42	44	50	52	61	65	69	77	84	85
		72	22	22	24	27	28	33	34	36	41	43	44	52	54	63	68	71	75	87
	8N@ 7.50	48	24	29	34	39	43	49	56	57	64	72	72	80	93	112	123	125	136	148
		52	23	29	31	37	40	48	50	57	58	66	72	81	94	103	114	125	127	139
		56	23	26	31	36	38	44	49	51	58	60	66	75	83	96	104	116	127	129
		60	23	26	32	33	39	42	47	50	53	59	61	69	77	85	98	106	118	129
		66	28	30	33	34	41	43	46	48	53	57	62	70	78	82	90	100	108	120
		72	29	30	31	34	36	41	46	47	52	58	59	66	73	80	90	92	104	110
	10N@ 6.00	48	26	32	37	44	49	55	60	67	74	79	87	97	105	118	137	138		
		52	28	34	38	44	50	56	64	65	71	75	88	97	103	113	130	138		
		56	27	33	37	43	46	51	58	66	65	72	76	90	104	105	123	131	143	
		60	25	31	37	39	45	51	57	60	66	70	73	86	93	104	111	126	134	
		66	27	32	37	42	49	51	56	62	65	72	74	85	95	102	120	122	134	145
		72	26	32	33	38	42	47	50	55	59	66	69	74	83	96	98	111	111	121
	12N@ 5.00	48	33	39	46	53	59	68	75	86	87	97	102	111	135					
		52	31	37	45	51	57	65	69	76	88	89	98	104	118	139				
		56	29	36	41	48	55	62	66	72	77	89	91	104	113	129	140			
		60	30	35	39	47	54	56	64	73	74	79	91	102	106	116	133	145		
		66	32	35	41	48	53	61	62	70	77	80	87	100	110	122	134	147	164	
		72	29	33	38	42	50	52	60	61	69	72	77	86	100	110	114	127	142	151
	15N@ 4.00	48	40	49	64	72	80	93	102	113	124	126	136							
		52	39	48	57	66	74	81	94	103	114	126	127	150						
		56	38	46	53	67	71	80	83	96	104	116	127	140	153					
		60	38	42	51	60	68	76	83	89	98	106	118	132	144					
		66	35	41	49	55	62	70	81	87	87	103	110	123	136	153	167			
		72	35	44	46	55	64	66	77	85	90	93	106	125	139	142	160	171		

LRFD

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT – POUNDS PER LINEAR FOOT FACTORED LOAD ON EACH PANEL POINT – KIPS																		
			6.0	7.5	9.0	10.5	12.0	13.5	15.0	16.5	18.0	19.5	21.0	24.0	27.0	30.0	33.0	36.0	39.0	42.0
65	6N@ 10.83	52	22	28	30	33	39	41	45	49	54	58	61	69	78	83	95	97	115	116
		56	21	25	29	33	35	40	42	48	49	55	58	63	70	80	84	97	97	117
		60	23	24	29	32	34	39	41	44	50	50	56	64	71	76	82	92	98	99
		66	22	24	26	31	33	35	40	42	45	51	51	58	65	73	78	83	87	100
		72	24	25	27	31	32	35	37	42	43	47	49	54	60	68	76	80	87	89
	8N@ 8.12	52	25	31	38	40	44	51	58	62	66	74	74	83	97	115	127	129	141	153
		56	24	30	34	39	43	50	52	59	63	68	74	83	97	105	118	129	131	143
		60	23	28	33	39	41	47	51	53	60	68	69	77	85	99	108	119	130	133
		66	24	28	33	35	42	44	49	52	56	63	63	75	80	89	101	110	122	124
		72	38	39	39	39	42	45	47	52	56	58	65	73	78	89	92	104	113	125
	9N@ 7.22	52	30	32	38	44	49	58	62	67	74	79	83	97	116	128	129	142	153	
		56	26	32	39	42	48	53	59	68	68	76	81	98	106	118	130	142	144	155
		60	25	32	38	40	47	51	58	60	69	70	78	86	100	109	120	132	145	146
		66	28	32	37	41	44	50	53	60	64	71	72	81	89	103	112	124	136	138
		72	29	30	35	38	44	46	52	57	62	66	71	79	91	91	108	115	127	140
	10N@ 6.50	52	31	36	41	49	58	62	67	75	82	89	97	116	128	131	154	155		
		56	31	36	40	46	52	60	68	69	77	85	91	107	119	132	144			
		60	29	34	40	44	51	57	61	70	74	78	87	100	109	122	134	146		
		66	27	34	39	43	50	54	60	65	72	74	82	90	103	113	125	138	140	163
		72	27	33	37	44	47	52	56	62	67	75	76	87	93	110	127	129	141	143
	11N@ 5.91	52	33	39	45	52	59	67	75	83	89	98	106	118	131	153				
		56	32	39	44	51	60	64	69	77	85	91	99	119	132	144	156			
		60	33	38	44	49	55	63	70	74	79	86	92	109	122	134	147			
		66	30	37	42	46	54	57	64	72	73	81	90	104	113	125	139	147	164	
		72	30	36	41	47	51	57	62	67	77	77	88	93	110	118	131	144	156	173
	13N@ 5.00	52	37	45	55	64	72	79	89	98	106	117	130	142						
		56	37	43	53	61	69	77	86	91	99	108	120	133	146					
		60	35	41	50	58	64	71	77	85	93	100	108	131	134	158				
		66	34	41	49	53	62	70	75	80	87	93	102	122	134	137	161			
		72	34	41	46	53	58	64	72	78	85	90	90	113	127	138	141	170		
70	7N@ 10.00	56	24	25	30	35	39	43	46	51	56	57	64	71	83	88	102	102	110	121
		60	23	26	30	33	37	43	44	50	52	57	61	66	73	85	90	102	105	111
		66	24	27	30	32	35	39	44	46	51	53	58	67	73	75	87	93	104	106
		72	24	25	29	32	34	38	42	46	47	53	54	60	69	76	78	89	94	102
		78	25	26	28	31	34	37	40	43	47	49	50	58	63	71	78	83	90	96
		84	24	27	29	31	35	37	39	42	44	49	51	57	65	69	72	80	85	94
	9N@ 7.78	56	26	31	37	40	45	53	56	61	67	72	75	88	102	110	122	128		
		60	25	30	35	39	45	47	54	61	65	70	73	89	99	105	114	129	131	
		66	31	34	38	43	48	51	56	63	67	70	74	86	92	106	112	122	127	
		72	32	33	37	43	45	51	56	58	64	67	69	77	89	100	108	114	124	131
		78	32	34	36	39	45	48	53	59	60	66	66	76	87	93	102	110	116	118
		84	33	34	35	38	45	47	50	55	59	63	67	72	81	94	95	103	113	118
	10N@ 7.00	56	27	34	38	45	53	57	60	68	75	80	88	100	106	118	137			
		60	30	36	41	48	55	60	65	69	71	84	88	102	109	122	130			
		66	29	35	42	44	51	55	62	66	70	73	85	91	105	109	123	132		
		72	30	34	38	43	47	52	59	63	66	69	78	88	94	106	112	127	133	
		78	30	33	37	40	46	51	55	61	65	71	71	79	94	96	108	115	130	137
		84	31	33	36	40	47	49	55	57	63	70	72	80	92	98	109	112	121	133
	11N@ 6.36	56	32	41	45	51	60	64	71	83	87	89	102	108	127	138				
		60	30	39	44	50	57	65	66	73	85	89	90	104	114	129				
		66	31	38	43	46	53	59	67	67	76	86	88	105	106	117	132			
		72	32	37	42	48	55	57	62	70	70	78	82	94	108	109	119	136	148	
		78	29	35	40	47	50	55	61	65	73	72	80	92	98	110	118	124	140	141
		84	30	36	39	45	49	52	59	66	68	73	78	84	97	102	116	124	129	144
	12N@ 5.83	56	34	41	50	56	63	68	76	87	88	102	103	113	129					
		60	33	39	46	55	58	65	74	76	89	90	103	112	128	139				
		66	32	37	45	48	55	63	67	76	78	90	92	105	115	130	143			
		72	32	37	42	48	55	61	65	69	77	80	89	102	107	119	135	148		
		78	30	36	42	48	51	56	64	70	72	80	84	97	106	113	123	141	151	
		84	30	36	40	45	51	53	61	68	73	77	83	89	102	115	118	128	144	151
	14N@ 5.00	56	36	44	53	63	71	75	87	96	102	111	120	137						
		60	37	43	54	61	69	75	88	89	99	103	112	128						
		66	35	42	48	55	64	70	77	90	92	102	106	115	132					
		72	34	40	49	55	61	69	73	81	91	95	103	110	120	138				
		78	33	39	44	52	58	67	72	76	84	92	97	111	120	138	141			
		84	33	40	44	51	58	62	69	78	79	86	97	106	116	127	143	155		

LRFD

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT – POUNDS PER LINEAR FOOT FACTORED LOAD ON EACH PANEL POINT – KIPS																	
			6.0	7.5	9.0	10.5	12.0	13.5	15.0	16.5	18.0	19.5	21.0	24.0	27.0	30.0	33.0	36.0	39.0	42.0
75	8N@ 9.38	56	29	33	40	43	49	55	61	65	73	79	82	95	115	116	128	140	152	
		60	26	32	38	42	48	51	58	63	70	75	80	92	97	116	118	130	142	153
		66	27	32	35	41	44	51	53	60	64	69	72	82	98	99	118	120	132	144
		72	26	32	34	41	43	46	52	58	61	66	71	79	87	100	101	121	122	134
		78	27	29	34	37	43	45	54	54	61	64	69	77	81	89	103	105	123	125
	10N@ 7.50	60	32	39	42	50	59	67	69	76	83	89	98	117	129	131	154			
		66	32	37	42	49	55	62	69	70	78	86	87	100	119	132	134			
		72	30	36	42	45	54	57	63	72	73	81	86	101	111	123	136	138		
		78	31	35	39	46	48	56	63	66	74	75	82	91	105	114	127	139	152	
		84	31	36	39	45	49	55	59	65	69	77	78	94	95	110	128	131	143	156
	12N@ 6.25	60	38	43	51	59	68	76	84	90	98	106	118	131	144					
		66	35	42	50	55	62	70	79	87	90	100	110	122	135	148				
		72	36	41	46	54	63	65	73	81	90	91	104	124	126	141	154			
		78	35	42	47	54	61	68	76	78	86	90	98	105	126	139	152	163		
		84	34	39	46	52	56	64	70	78	79	90	92	106	126	139	141	164	171	
	14N@ 5.36	66	41	48	56	63	72	80	89	102	111	122	125	137						
		72	41	46	52	61	70	75	84	95	101	110	121	134	148					
		78	37	44	53	61	68	76	80	89	98	103	107	125	139	151				
		84	38	44	52	57	64	71	79	86	92	100	108	127	130	153	171			
		90	37	42	50	58	66	73	77	87	94	94	110	119	142	144	173	176		
	15N@ 5.00	66	41	52	60	69	77	85	98	106	118	120	132	146						
		72	42	52	59	67	74	84	87	99	110	121	123	146	160					
		78	41	47	54	65	73	77	88	91	104	112	124	139	152	169				
		84	39	46	55	63	67	76	86	92	93	109	116	131	143	171	174			
		90	38	46	52	60	69	74	81	90	95	103	118	133	145	146	177			
80	8N@ 10.00	60	28	31	37	42	45	51	56	63	64	72	75	88	97	103	112	127	137	
		66	30	31	35	38	45	47	52	57	62	65	70	77	90	103	105	113	129	131
		72	29	32	33	38	41	46	48	53	59	63	68	76	87	92	106	108	116	126
		78	30	31	33	37	41	42	47	53	56	60	64	73	81	88	94	109	111	118
		84	30	32	35	37	39	43	48	52	56	59	63	71	79	83	96	98	112	114
		90	53	54	56	56	57	57	58	60	63	67	70	79	79	90	95	103	105	118
	10N@ 8.00	60	31	35	41	47	53	60	68	75	76	88	97	103	112	129	139			
		66	31	35	39	46	52	55	62	70	75	78	90	100	107	115	132	142		
		72	33	37	43	50	55	62	63	70	74	83	87	97	106	120	127			
		78	32	36	42	46	51	56	63	68	71	76	86	90	100	112	122	130		
		84	33	37	42	45	51	57	61	65	70	77	78	91	100	109	115	125	131	
		90	34	36	40	44	49	53	60	65	68	72	77	87	92	102	111	118	132	136
	12N@ 6.67	66	36	44	50	57	65	70	73	86	90	103	103	115	130					
		72	34	42	47	54	59	67	72	77	86	92	101	107	125	133				
		78	33	39	46	53	60	65	69	79	80	88	94	108	114	129	136			
		84	34	38	47	49	56	63	70	72	79	83	92	99	111	121	138	140		
		90	36	39	44	50	56	59	66	72	74	82	86	101	113	116	125	143	149	
		96	34	37	43	50	54	60	68	71	75	79	85	98	104	117	120	130	147	156
	14N@ 5.71	66	39	47	57	64	73	77	89	98	103	109	113	129						
		72	38	46	54	59	67	76	79	91	101	106	106	125	143					
		78	36	43	50	58	66	70	78	90	95	96	109	118	136	149				
		84	36	42	50	56	64	71	74	80	92	98	99	112	124	143				
		90	36	41	48	53	61	68	74	82	86	95	100	115	121	136	146			
		96	37	40	47	53	61	67	74	79	84	88	100	108	118	127	145	152		
	16N@ 5.00	66	42	53	62	70	78	90	101	105	113	129	130							
		72	41	50	57	69	76	81	93	102	109	116	118	145						
		78	41	49	58	66	73	83	91	96	104	112	120	137	149					
		84	39	45	54	61	69	76	84	97	100	109	115	126	143					
		90	39	46	54	62	70	74	80	86	101	102	114	119	144	155				
		96	40	46	55	58	68	73	81	88	94	106	110	121	133	155	164			

LRFD

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT – POUNDS PER LINEAR FOOT FACTORED LOAD ON EACH PANEL POINT – KIPS																	
			6.0	7.5	9.0	10.5	12.0	13.5	15.0	16.5	18.0	19.5	21.0	24.0	27.0	30.0	33.0	36.0	39.0	42.0
90	9N@ 10.00	72	40	42	46	49	55	60	64	72	81	82	92	98	117	119	141	143		
		84	41	44	48	48	50	54	60	67	75	76	84	88	102	121	124	135	148	149
		90	54	55	56	56	57	59	62	65	72	77	85	88	99	105	125	128	138	
		96	55	56	57	57	58	59	64	65	69	74	80	91	98	107	110	128	131	142
		102	55	57	57	58	59	60	62	65	69	74	75	87	95	105	112	130	133	134
	10N@ 9.00	72	42	46	48	52	61	64	72	78	85	93	99	118	130	142	155			
		84	42	45	49	51	58	62	69	73	81	94	97	115	117	137	148			
		90	42	46	50	51	56	60	66	71	79	81	89	100	107	126	129	141		
		96	43	46	48	53	56	59	66	70	74	82	87	95	108	113	129	133	153	
		102	43	45	48	53	57	60	65	69	76	77	84	97	105	115	124	131	137	155
	11N@ 8.18	72	43	47	51	59	65	73	78	86	99	100	119	120	143					
		84	43	49	50	55	62	67	74	78	87	91	100	113	126	138	150			
		90	45	48	51	53	59	66	72	77	85	90	93	107	128	129	142			
		96	47	48	53	56	60	63	71	75	81	87	95	105	113	132	134	148		
		102	48	49	57	58	61	64	70	73	82	86	94	101	116	124	138	150	163	
	12N@ 7.50	78	44	49	53	60	68	72	79	88	102	103	111	124	149					
		84	45	49	52	56	65	75	79	84	91	103	105	125	137	149				
		90	46	50	52	60	68	75	79	88	89	100	106	126	128	151	152			
		96	46	48	52	58	63	72	76	82	90	93	103	110	129	132	153	156		
		108	45	49	55	56	64	66	76	81	85	92	97	107	115	135	137	160	168	
	15N@ 6.00	78	47	54	66	75	82	94	99	120	121	133	145	148						
		84	49	54	62	68	76	86	97	103	122	124	125	149						
		90	50	52	60	69	78	82	90	99	106	125	127	140	153					
		96	48	53	58	66	72	80	93	95	108	112	129	131	154	173				
		108	51	57	59	64	72	78	87	99	101	109	115	136	139	168	172			
	18N@ 5.00	78	51	62	74	84	99	102	120	133	145	148	159							
		84	51	61	73	80	89	104	113	124	137	150	151							
		90	52	58	70	79	90	93	106	126	129	142	153	166						
		96	53	58	68	78	87	95	108	113	131	133	144	158						
		108	57	59	64	76	85	95	103	113	120	127	139	151	172					
100	10N@ 10.00	78	45	49	52	55	58	62	68	75	79	91	92	106	115	131	140			
		84	47	50	53	55	58	61	69	72	77	81	93	102	109	118	133	143		
		96	55	56	56	57	62	64	68	74	84	86	87	102	116	125	126			
		102	55	56	57	58	61	64	66	73	77	86	89	100	106	121	127	133		
		108	56	57	58	59	61	64	67	70	76	80	87	92	106	107	127	130		
	12N@ 8.33	78	48	53	56	62	70	74	86	92	97	105	112	124						
		84	48	52	55	63	68	72	84	88	98	99	107	126	133					
		96	47	51	55	58	66	67	75	81	91	93	102	111	116	131				
		102	48	52	55	58	62	69	73	79	90	94	95	113	118	133	141			
		108	48	51	55	59	62	70	72	76	85	92	97	106	117	123	139	149		
	15N@ 6.67	78	53	56	67	75	86	91	104	106	115	125	133							
		84	53	56	61	69	78	88	94	107	113	118	128							
		96	52	56	61	68	72	82	93	99	105	114	118	133						
		102	53	56	60	66	74	83	85	97	102	116	117	125	144					
		108	53	56	59	65	73	77	87	99	103	104	118	123	140	149				
	16N@ 6.25	84	53	58	69	72	80	92	106	107	117	127	133							
		96	53	57	63	71	75	85	98	100	115	115	124	140						
		102	53	57	62	66	74	84	97	102	111	117	118	136	154					
		108	54	58	62	67	76	82	87	100	104	117	118	129	148					
		120	56	61	64	70	76	83	86	93	104	109	116	128	140	161				
	17N@ 5.88	84	55	61	70	77	88	94	107	114	127	133	145							
		96	54	59	65	72	80	93	99	113	115	121	135	151						
		102	55	59	66	73	79	87	98	102	118	118	127	144						
		108	55	60	65	69	78	87	91	105	107	119	120	140	160					
		120	56	62	67	71	78	87	93	100	110	112	125	133	149	168				
	18N@ 5.56	84	55	61	70	81	94	102	109	118	134	144								
		96	55	60	65	72	84	97	100	114	120	124	140							
		102	56	61	66	73	84	89	102	112	118	125	137	154						
		108	57	60	68	73	82	91	104	106	119	121	130	148						
		120	59	64	69	75	84	88	98	108	113	122	129	142	163					
	20N@ 5.00	84	58	66	77	94	103	109	118	134	146									
		96	60	65	73	83	99	108	115	123	125	144	153							
		102	59	65	71	80	89	103	114	121	129	147	147							
		108	60	67	71	80	89	106	110	123	126	134	149	164						
		120	68	73	90	101	108	113	123	133	152	155	166	182	200					

LRFD

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT – POUNDS PER LINEAR FOOT FACTORED LOAD ON EACH PANEL POINT – KIPS																	
			6.0	7.5	9.0	10.5	12.0	13.5	15.0	16.5	18.0	19.5	21.0	24.0	27.0	30.0	33.0	36.0	39.0	42.0
110	10N@ 11.00	84	54	58	61	65	69	73	82	83	94	99	100	120	143	144				
		96	62	62	63	65	69	72	81	82	91	97	98	107	125					
		108	63	63	64	67	69	72	75	82	86	91	95	105	113	131	133			
		114	63	64	67	68	72	73	76	79	86	88	96	108	115	133	136			
		120	64	64	66	69	72	74	76	81	83	88	90	100	111	128	137	140		
	12N@ 9.17	84	58	62	66	70	74	84	88	101	109	120	122	144						
		96	57	62	66	70	74	79	88	92	101	107	125	127	151					
		108	58	64	68	72	75	79	84	90	95	106	111	132	136	158				
		114	59	65	66	71	75	79	84	89	102	106	107	126	134	156	158			
		120	59	62	67	72	74	79	82	91	96	107	109	126	135	158	161			
	14N@ 7.86	84	60	66	71	76	84	97	102	122	123	134	147							
		96	60	65	69	74	83	95	100	105	124	125	136	150						
		108	60	64	69	72	78	87	99	103	108	120	128	142	155					
		114	61	65	69	74	79	84	93	103	105	111	124	133	157					
		120	60	66	69	74	80	82	90	96	106	109	126	135	158	160				
	16N@ 6.88	96	62	68	72	79	89	104	106	125	126	147	149							
		102	63	67	74	80	89	103	108	125	127	128	152	156						
		108	64	68	73	81	83	95	104	110	127	130	142	158						
		114	65	70	74	80	86	95	105	111	114	132	135	161	162					
		120	66	69	75	81	88	97	99	109	117	135	138	152	165					
	18N@ 6.11	96	64	71	77	87	99	106	125	127	148	151								
		102	66	70	80	89	101	109	127	128	139	152	153							
		108	66	71	77	83	94	106	111	129	131	144	157							
		114	67	73	79	85	97	107	113	132	134	137	159	163						
		120	68	74	79	88	91	101	110	118	136	139	152	166						
	20N@ 5.50	96	68	77	82	99	106	125	139	152	154									
		102	69	75	81	94	109	129	130	142	154	155								
		108	69	77	83	94	106	114	132	133	145	157	169							
		114	69	77	86	91	101	115	134	135	147	160	161							
		120	66	72	77	83	93	106	113	126	128	137	154	167						
120	10N@ 12.00	96	63	66	69	72	76	78	82	86	89	89	94	108	115	129				
		102	64	67	69	71	75	79	83	83	86	91	92	110	117	131	137			
		108	78	79	82	83	83	83	86	91	95	94	100	108	126					
		114	78	79	82	83	83	84	86	91	90	95	95	109	127	128				
		120	79	81	83	84	84	85	86	88	92	92	97	102	113	133				
	12N@ 10.00	96	68	69	71	77	82	86	90	99	100	113	125	130						
		102	68	69	72	78	80	85	88	96	101	102	116	130						
		108	69	70	72	75	81	86	90	91	99	103	105	128	134					
		114	70	70	71	75	82	86	87	92	95	100	130	121	135					
		120	70	71	72	76	80	84	88	92	93	102	107	123	133	138				
	15N@ 8.00	96	69	74	77	82	90	96	109	115	125	129	134							
		102	70	73	78	84	88	93	103	113	118	129	132							
		108	70	73	80	85	90	95	101	106	115	119	133							
		114	70	73	78	83	88	93	98	107	117	121	122	137						
		120	72	74	78	84	89	94	99	100	110	118	124	140						
	16N@ 7.50	96	70	76	80	85	90	100	109	114	128	134								
		102	70	74	78	86	92	97	110	112	120	131	137							
		108	70	74	80	85	90	95	100	114	120	124	133							
		114	70	73	81	86	91	96	101	107	117	122	135	145						
		120	70	75	79	85	90	94	99	103	118	119	126	147						
	18N@ 6.67	96	71	77	85	89	95	109	116	129	136									
		102	72	78	83	87	97	111	113	121	138	138								
		108	72	79	84	88	94	101	115	121	156	157								
		114	72	76	85	90	96	102	116	117	123	136	143							
		120	73	77	84	89	95	99	105	118	125	129	140							
	20N@ 6.00	96	76	82	89	94	110	116	130	136										
		102	75	83	87	92	105	114	123	140	150									
		108	75	81	88	94	101	115	121	135	142	152								
		114	77	82	87	93	103	113	119	128	138	146								
		120	77	84	90	96	102	107	121	124	133	148	150							
	24N@ 5.00	96	83	90	96	111	121	136												
		102	81	88	99	108	118	140	151											
		108	83	91	96	103	119	129	147	157										
		114	86	96	109	121	141	143	152	160										
		120	86	97	107	117	143	146	152	163	165									

STANDARD ASD LOAD TABLE

OPEN WEB STEEL JOISTS, K-SERIES

Based on a 50 ksi Maximum Yield Strength
Adopted by the Steel Joist Institute November 4, 1985
Revised to November 10, 2003 - Effective March 01, 2005

The black figures in the following table give the TOTAL safe uniformly distributed load-carrying capacities, in pounds per linear foot, of **ASD 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. Sloped parallel-chord joists shall use span as defined by the length along the slope.

The figures shown in **RED** in this load table are the nominal 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 inches^4 is;

$I_j = 26.767(W_{LL})(L^3)(10^{-6})$, where W_{LL}= **RED** figure in the Load Table and L = (Span - 0.33) in feet.

For the proper handling of concentrated and/or varying loads, see Section 6.1 in the Code of Standard Practice for Steel Joists and Joist Girders.

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.

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STANDARD LOAD TABLE FOR OPEN WEB STEEL JOISTS, K-SERIES
Based on a 50 ksi Maximum Yield Strength - Loads Shown in Pounds per Linear Foot (plf)

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

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STANDARD LOAD TABLE FOR OPEN WEB STEEL JOISTS, K-SERIES
Based on a 50 ksi Maximum Yield Strength - Loads Shown in Pounds per Linear Foot (plf)

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	10.2	11.7	6.7	7.6	8.2	8.9	9.3	10.8	12.2	8	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

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STANDARD LOAD TABLE FOR OPEN WEB STEEL JOISTS, K-SERIES
Based on a 50 ksi Maximum Yield Strength - Loads Shown in Pounds per Linear Foot (plf)

Joist Designation	24K4	24K5	24K6	24K7	24K8	24K9	24K10	24K12	26K5	26K6	26K7	26K8	26K9	26K10	26K12
Depth (In.)	24	24	24	24	24	24	24	24	26	26	26	26	26	26	26
Approx. Wt. (lbs./ft.)	8.4	9.3	9.7	10.1	11.5	12.0	13.1	16.0	9.8	10.6	10.9	12.1	12.2	13.8	16.6
Span (ft.) ↓															
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	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	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	550 501
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	550 479
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	550 459
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	550 444
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	549 431
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	532 404
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	516 378
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	501 356
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	487 334
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	474 315
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	461 299
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	449 283
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	393 243	438 269
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	427 256
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	417 244
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	407 232
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	398 222
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	389 212
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	380 203
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	369 192
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	353 180
49									150 78	164 85	183 94	202 103	220 112	261 131	339 169
50									144 73	157 80	175 89	194 97	211 105	250 124	325 159
51									139 69	151 75	168 83	186 91	203 99	241 116	313 150
52									133 65	145 71	162 79	179 86	195 93	231 110	301 142

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STANDARD LOAD TABLE FOR OPEN WEB STEEL JOISTS, K-SERIES
Based on a 50 ksi Maximum Yield Strength - Loads Shown in Pounds per Linear Foot (plf)

Joist Designation	28K6	28K7	28K8	28K9	28K10	28K12	30K7	30K8	30K9	30K10	30K11	30K12
Depth (In.)	28	28	28	28	28	28	30	30	30	30	30	30
Approx. Wt. (lbs./ft.)	11.4	11.8	12.7	13.0	14.3	17.1	12.3	13.2	13.4	15.0	16.4	17.6
Span (ft.) ↓												
28	548 541	550 543	550 543	550 543	550 543	550 543						
29	511 486	550 522	550 522	550 522	550 522	550 522						
30	477 439	531 486	550 500	550 500	550 500	550 500	550 543	550 543	550 543	550 543	550 543	550 543
31	446 397	497 440	550 480	550 480	550 480	550 480	534 508	550 520	550 520	550 520	550 520	550 520
32	418 361	466 400	515 438	549 463	549 463	549 463	501 461	549 500	549 500	549 500	549 500	549 500
33	393 329	438 364	484 399	527 432	532 435	532 435	471 420	520 460	532 468	532 468	532 468	532 468
34	370 300	412 333	456 364	496 395	516 410	516 410	443 384	490 420	516 441	516 441	516 441	516 441
35	349 275	389 305	430 333	468 361	501 389	501 389	418 351	462 384	501 415	501 415	501 415	501 415
36	330 252	367 280	406 306	442 332	487 366	487 366	395 323	436 353	475 383	487 392	487 392	487 392
37	312 232	348 257	384 282	418 305	474 344	474 344	373 297	413 325	449 352	474 374	474 374	474 374
38	296 214	329 237	364 260	396 282	461 325	461 325	354 274	391 300	426 325	461 353	461 353	461 353
39	280 198	313 219	346 240	376 260	447 306	449 308	336 253	371 277	404 300	449 333	449 333	449 333
40	266 183	297 203	328 222	357 241	424 284	438 291	319 234	353 256	384 278	438 315	438 315	438 315
41	253 170	283 189	312 206	340 224	404 263	427 277	303 217	335 238	365 258	427 300	427 300	427 300
42	241 158	269 175	297 192	324 208	384 245	417 264	289 202	320 221	348 240	413 282	417 284	417 284
43	230 147	257 163	284 179	309 194	367 228	407 252	276 188	305 206	332 223	394 263	407 270	407 270
44	220 137	245 152	271 167	295 181	350 212	398 240	263 176	291 192	317 208	376 245	398 258	398 258
45	210 128	234 142	259 156	282 169	334 198	389 229	251 164	278 179	303 195	359 229	389 246	389 246
46	201 120	224 133	248 146	270 158	320 186	380 219	241 153	266 168	290 182	344 214	380 236	380 236
47	192 112	214 125	237 136	258 148	306 174	372 210	230 144	255 157	277 171	329 201	372 226	372 226
48	184 105	206 117	227 128	247 139	294 163	365 201	221 135	244 148	266 160	315 188	362 215	365 216
49	177 99	197 110	218 120	237 130	282 153	357 193	212 127	234 139	255 150	303 177	347 202	357 207
50	170 93	189 103	209 113	228 123	270 144	350 185	203 119	225 130	245 141	291 166	333 190	350 199
51	163 88	182 97	201 106	219 115	260 136	338 175	195 112	216 123	235 133	279 157	320 179	343 192
52	157 83	175 92	193 100	210 109	250 128	325 165	188 106	208 116	226 126	268 148	308 169	336 184
53	151 78	168 87	186 95	203 103	240 121	313 156	181 100	200 109	218 119	258 140	296 159	330 177
54	145 74	162 82	179 89	195 97	232 114	301 147	174 94	192 103	209 112	249 132	285 150	324 170
55	140 70	156 77	173 85	188 92	223 108	290 139	168 89	185 98	202 106	240 125	275 142	312 161
56	135 66	151 73	166 80	181 87	215 102	280 132	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

STANDARD ASD LOAD TABLE
LONGSPAN STEEL JOISTS, LH-SERIES

Based on a 50 ksi Maximum Yield Strength
Adopted by the Steel Joist Institute May 25, 1983
Revised to November 10, 2003 - Effective March 01, 2005

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

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

This load table applies to joists with either parallel chords or standard pitched top chords. When top chords are pitched, the carrying capacities are determined by the nominal depth of the joists at the center of the span. Standard top chord pitch is 1/8 inch per foot. If pitch exceeds this standard, the load table does not apply. Sloped parallel-chord joists shall use span as defined by the length along the slope.

Where the joist span is in the **RED SHADED** area of the load table, the row of bridging nearest the midspan shall be diagonal bridging with bolted connections at chords and intersection. Hoisting cables shall not be released until this row of bolted diagonal bridging is completely installed.

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

The approximate moment of inertia of the joist, in inches^4 is; $I_j = 26.767(W_{LL})(L^3)(10^{-6})$, where W_{LL}= **RED** figure in the Load Table, and L = (clear span + 0.67) in feet.

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

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

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

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STANDARD LOAD TABLE FOR LONGSPAN STEEL JOISTS, LH-SERIES
Based on a 50 ksi Maximum Yield Strength - Loads Shown in Pounds per Linear Foot (plf)

Joist Designation	Approx. Wt in Lbs. Per Linear Ft (Joists only)	Depth in inches	SAFE LOAD* in Lbs. Between	CLEAR SPAN IN FEET															
			21-24	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**				
18LH02	10	18	12000	468	442	418	391	367	345	324	306	289	273	259	245				
				313	284	259	234	212	193	175	160	147	135	124	114				
18LH03	11	18	13300	521	493	467	438	409	382	359	337	317	299	283	267				
				348	317	289	262	236	213	194	177	161	148	136	124				
18LH04	12	18	15500	604	571	535	500	469	440	413	388	365	344	325	308				
				403	367	329	296	266	242	219	200	182	167	153	141				
18LH05	15	18	17500	684	648	614	581	543	508	476	448	421	397	375	355				
				454	414	378	345	311	282	256	233	212	195	179	164				
18LH06	15	18	20700	809	749	696	648	605	566	531	499	470	443	418	396				
				526	469	419	377	340	307	280	254	232	212	195	180				
18LH07	17	18	21500	840	809	780	726	678	635	595	559	526	496	469	444				
				553	513	476	428	386	349	317	288	264	241	222	204				
18LH08	19	18	22400	876	843	812	784	758	717	680	641	604	571	540	512				
				577	534	496	462	427	387	351	320	292	267	246	226				
18LH09	21	18	24000	936	901	868	838	810	783	759	713	671	633	598	566				
				616	571	527	491	458	418	380	346	316	289	266	245				
			22-24	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
20LH02	10	20	11300	442	437	431	410	388	365	344	325	307	291	275	262	249	237	225	215
				306	303	298	274	250	228	208	190	174	160	147	136	126	117	108	101
20LH03	11	20	12000	469	463	458	452	434	414	395	372	352	333	316	299	283	269	255	243
				337	333	317	302	280	258	238	218	200	184	169	156	143	133	123	114
20LH04	12	20	14700	574	566	558	528	496	467	440	416	393	372	353	335	318	303	289	275
				428	406	386	352	320	291	265	243	223	205	189	174	161	149	139	129
20LH05	14	20	15800	616	609	602	595	571	544	513	484	458	434	411	390	371	353	336	321
				459	437	416	395	366	337	308	281	258	238	219	202	187	173	161	150
20LH06	15	20	21100	822	791	763	723	679	635	596	560	527	497	469	444	421	399	379	361
				606	561	521	477	427	386	351	320	292	267	246	226	209	192	178	165
20LH07	17	20	22500	878	845	814	786	760	711	667	627	590	556	526	497	471	447	425	404
				647	599	556	518	484	438	398	362	331	303	278	256	236	218	202	187
20LH08	19	20	23200	908	873	842	813	785	760	722	687	654	621	588	558	530	503	479	457
				669	619	575	536	500	468	428	395	365	336	309	285	262	242	225	209
20LH09	21	20	25400	990	953	918	886	856	828	802	778	755	712	673	636	603	572	544	517
				729	675	626	581	542	507	475	437	399	366	336	309	285	264	244	227
20LH10	23	20	27400	1068	1028	991	956	924	894	865	839	814	791	748	707	670	636	604	575
				786	724	673	626	585	545	510	479	448	411	377	346	320	296	274	254

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STANDARD LOAD TABLE FOR LONGSPAN STEEL JOISTS, LH-SERIES
Based on a 50 ksi Maximum Yield Strength - Loads Shown in Pounds per Linear Foot (plf)

Joist Designation	Approx. Wt in Lbs. Per Linear Ft. (Joists only)	Depth in inches	SAFELOAD* in Lbs. Between		CLEAR SPAN IN FEET															
			28-32		**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**
24LH03	11	24	11500		342	339	336	323	307	293	279	267	255	244	234	224	215	207	199	191
					235	226	218	204	188	175	162	152	141	132	124	116	109	102	96	90
24LH04	12	24	14100		419	398	379	360	343	327	312	298	285	273	262	251	241	231	222	214
					288	265	246	227	210	195	182	169	158	148	138	130	122	114	107	101
24LH05	13	24	15100		449	446	440	419	399	380	363	347	331	317	304	291	280	269	258	248
					308	297	285	264	244	226	210	196	182	171	160	150	141	132	124	117
24LH06	16	24	20300		604	579	555	530	504	480	457	437	417	399	381	364	348	334	320	307
					411	382	356	331	306	284	263	245	228	211	197	184	172	161	152	142
24LH07	17	24	22300		665	638	613	588	565	541	516	491	468	446	426	407	389	373	357	343
					452	421	393	367	343	320	297	276	257	239	223	208	195	182	171	161
24LH08	18	24	23800		707	677	649	622	597	572	545	520	497	475	455	435	417	400	384	369
					480	447	416	388	362	338	314	292	272	254	238	222	208	196	184	173
24LH09	21	24	28000		832	808	785	764	731	696	663	632	602	574	548	524	501	480	460	441
					562	530	501	460	424	393	363	337	313	292	272	254	238	223	209	196
24LH10	23	24	29600		882	856	832	809	788	768	737	702	668	637	608	582	556	533	511	490
					596	559	528	500	474	439	406	378	351	326	304	285	266	249	234	220
24LH11	25	24	31200		927	900	875	851	829	807	787	768	734	701	671	642	616	590	567	544
					624	588	555	525	498	472	449	418	388	361	337	315	294	276	259	243
			33-40		**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**
28LH05	13	28	14000		337	323	310	297	286	275	265	255	245	237	228	220	213	206	199	193
					219	205	192	180	169	159	150	142	133	126	119	113	107	102	97	92
28LH06	16	28	18600		448	429	412	395	379	364	350	337	324	313	301	291	281	271	262	253
					289	270	253	238	223	209	197	186	175	166	156	148	140	133	126	120
28LH07	17	28	21000		505	484	464	445	427	410	394	379	365	352	339	327	316	305	295	285
					326	305	285	267	251	236	222	209	197	186	176	166	158	150	142	135
28LH08	18	28	22500		540	517	496	475	456	438	420	403	387	371	357	344	331	319	308	297
					348	325	305	285	268	252	236	222	209	196	185	175	165	156	148	140
28LH09	21	28	27700		667	639	612	586	563	540	519	499	481	463	446	430	415	401	387	374
					428	400	375	351	329	309	291	274	258	243	228	216	204	193	183	173
28LH10	23	28	30300		729	704	679	651	625	600	576	554	533	513	495	477	460	444	429	415
					466	439	414	388	364	342	322	303	285	269	255	241	228	215	204	193
28LH11	25	28	32500		780	762	736	711	682	655	629	605	582	561	540	521	502	485	468	453
					498	475	448	423	397	373	351	331	312	294	278	263	249	236	223	212
28LH12	27	28	35700		857	837	818	800	782	766	737	709	682	656	632	609	587	566	546	527
					545	520	496	476	454	435	408	383	361	340	321	303	285	270	256	243
28LH13	30	28	37200		895	874	854	835	816	799	782	766	751	722	694	668	643	620	598	577
					569	543	518	495	472	452	433	415	396	373	352	332	314	297	281	266
			38-46	**47-48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**
32LH06	14	32	16700	16700	338	326	315	304	294	284	275	266	257	249	242	234	227	220	214	208
					211	199	189	179	169	161	153	145	138	131	125	119	114	108	104	99
32LH07	16	32	18800	18800	379	366	353	341	329	318	308	298	288	279	271	262	254	247	240	233
					235	223	211	200	189	179	170	162	154	146	140	133	127	121	116	111
32LH08	17	32	20400	20400	411	397	383	369	357	345	333	322	312	302	293	284	275	267	259	252
					255	242	229	216	205	194	184	175	167	159	151	144	137	131	125	120
32LH09	21	32	25600	25600	516	498	480	463	447	432	418	404	391	379	367	356	345	335	325	315
					319	302	285	270	256	243	230	219	208	198	189	180	172	164	157	149
32LH10	21	32	28300	28300	571	550	531	512	495	478	462	445	430	416	402	389	376	364	353	342
					352	332	315	297	282	267	254	240	228	217	206	196	186	178	169	162
32LH11	24	32	31000	31000	625	602	580	560	541	522	505	488	473	458	443	429	416	403	390	378
					385	363	343	325	308	292	277	263	251	239	227	216	206	196	187	179
32LH12	27	32	36400	36400	734	712	688	664	641	619	598	578	559	541	524	508	492	477	463	449
					450	428	406	384	364	345	327	311	295	281	267	255	243	232	221	211
32LH13	30	32	40600	40600	817	801	785	771	742	715	690	666	643	621	600	581	562	544	527	511
					500	480	461	444	420	397	376	354	336	319	304	288	275	262	249	238
32LH14	33	32	41800	41800	843	826	810	795	780	766	738	713	688	665	643	622	602	583	564	547
					515	495	476	458	440	417	395	374	355	337	321	304	290	276	264	251
32LH15	35	32	43200	43200	870	853	837	821	805	791	776	763	750	725	701	678	656	635	616	597
					532	511	492	473	454	438	422	407	393	374	355	338	322	306	292	279
			42-46	**47-56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**72**
36LH07	16	36	16800	16800	292	283	274	266	258	251	244	237	230	224	218	212	207	201	196	191
					177	168	160	153	146	140	134	128	122	117	112	107	103	99	95	91
36LH08	18	36	18500	18500	321	311	302	293	284	276	268	260	253	246	239	233	227	221	215	209
					194	185	176	168	160	153	146	140	134	128	123	118	113	109	104	100
36LH09	21	36	23700	23700	411	398	386	374	363	352	342	333	323	314	306	297	289	282	275	267
					247	235	224	214	204	195	186	179	171	163	157	150	144	138	133	127
36LH10	21	36	26100	26100	454	440	426	413	401	389	378	367	357	347	338	328	320	311	303	295
					273	260	248	236	225	215	206	197	188	180	173	165	159	152	146	140
36LH11	23	36	28500	28500	495	480	465	451	438	425	412	401	389	378	368	358	348	339	330	322
					297	283	269	257	246	234	224	214	205	196	188	180	173	166	159	153
36LH12	25	36	34100	34100	593	575	557	540	523	508	493	478	464	450	437	424	412	400	389	378
					354	338	322	307	292	279	267	255	243	232	222	213	204	195	187	179
36LH13	30	36	40100	40100	697	675	654	634	615	596	579	562	546	531	516	502	488	475	463	451
					415	395	376	359	342	327	312	298	285	273	262	251	240	231	222	213
36LH14	36	36	44200	44200	768	755	729	706	683	661	641	621	602	584	567	551	535	520	505	492
					456	434	412	392	373	356	339	323	309	295	283	270	259	247	237	228
36LH15	36	36	46600	46600	809	795	781	769	744	721	698	677	656	637	618	600	583	567	551	536
					480	464	448	434	413	394	375	358	342	327	312	299	286	274	263	252

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STANDARD LOAD TABLE FOR LONGSPAN STEEL JOISTS, LH-SERIES
Based on a 50 ksi Maximum Yield Strength - Loads Shown in Pounds per Linear Foot (plf)

Joist Designation	Approx. Wt in Lbs. Per Linear Ft. (Joists Only)	Depth in inches	SAFELOAD* in Lbs. Between		CLEAR SPAN IN FEET															
			47-59	60-64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
40LH08	16	40	16600	16600	254 150	247 144	241 138	234 132	228 127	222 122	217 117	211 112	206 108	201 104	196 100	192 97	187 93	183 90	178 86	174 83
40LH09	21	40	21800	21800	332 196	323 188	315 180	306 173	298 166	291 160	283 153	276 147	269 141	263 136	256 131	250 126	244 122	239 118	233 113	228 109
40LH10	21	40	24000	24000	367 216	357 207	347 198	338 190	329 183	321 176	313 169	305 162	297 156	290 150	283 144	276 139	269 134	262 129	255 124	249 119
40LH11	22	40	26200	26200	399 234	388 224	378 215	368 207	358 198	349 190	340 183	332 176	323 169	315 163	308 157	300 151	293 145	286 140	279 135	273 130
40LH12	25	40	31900	31900	486 285	472 273	459 261	447 251	435 241	424 231	413 222	402 213	392 205	382 197	373 189	364 182	355 176	346 169	338 163	330 157
40LH13	30	40	37600	37600	573 334	557 320	542 307	528 295	514 283	500 271	487 260	475 250	463 241	451 231	440 223	429 214	419 207	409 199	399 192	390 185
40LH14	35	40	43000	43000	656 383	638 367	620 351	603 336	587 323	571 309	556 297	542 285	528 273	515 263	502 252	490 243	478 233	466 225	455 216	444 209
40LH15	36	40	48100	48100	734 427	712 408	691 390	671 373	652 357	633 342	616 328	599 315	583 302	567 290	552 279	538 268	524 258	511 248	498 239	486 230
40LH16	42	40	53000	53000	808 469	796 455	784 441	772 428	761 416	751 404	730 387	710 371	691 356	673 342	655 329	638 316	622 304	606 292	591 282	576 271
			52-59	**60-72**	**73**	**74**	**75**	**76**	**77**	**78**	**79**	**80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**
44LH09	19	44	20000	20000	272 158	265 152	259 146	253 141	247 136	242 131	236 127	231 122	226 118	221 114	216 110	211 106	207 103	202 99	198 96	194 93
44LH10	21	44	22100	22100	300 174	293 168	286 162	279 155	272 150	266 144	260 139	254 134	249 130	243 125	238 121	233 117	228 113	223 110	218 106	214 103
44LH11	22	44	23900	23900	325 188	317 181	310 175	302 168	295 162	289 157	282 151	276 146	269 140	264 136	258 131	252 127	247 123	242 119	236 115	232 111
44LH12	25	44	29600	29600	402 232	393 224	383 215	374 207	365 200	356 192	347 185	339 179	331 172	323 166	315 160	308 155	300 149	293 144	287 139	280 134
44LH13	30	44	35100	35100	477 275	466 265	454 254	444 246	433 236	423 228	413 220	404 212	395 205	386 198	377 191	369 185	361 179	353 173	346 167	338 161
44LH14	31	44	40400	40400	549 315	534 302	520 291	506 279	493 268	481 259	469 249	457 240	446 231	436 223	425 215	415 207	406 200	396 193	387 187	379 181
44LH15	36	44	47000	47000	639 366	623 352	608 339	593 326	579 314	565 303	551 292	537 281	524 271	512 261	500 252	488 243	476 234	466 227	455 219	445 211
44LH16	42	44	54200	54200	737 421	719 405	701 390	684 375	668 362	652 348	637 336	622 324	608 313	594 302	580 291	568 282	555 272	543 263	531 255	520 246
44LH17	47	44	58200	58200	790 450	780 438	769 426	759 415	750 405	732 390	715 376	699 363	683 351	667 338	652 327	638 316	624 305	610 295	597 285	584 276
			56-59	**60-80**	**81**	**82**	**83**	**84**	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**
48LH10	21	48	20000	20000	246 141	241 136	236 132	231 127	226 123	221 119	217 116	212 112	208 108	204 105	200 102	196 99	192 96	188 93	185 90	181 87
48LH11	22	48	21700	21700	266 152	260 147	255 142	249 137	244 133	239 129	234 125	229 120	225 117	220 113	216 110	212 106	208 103	204 100	200 97	196 94
48LH12	25	48	27400	27400	336 191	329 185	322 179	315 173	308 167	301 161	295 156	289 151	283 147	277 142	272 138	266 133	261 129	256 126	251 122	246 118
48LH13	29	48	32800	32800	402 228	393 221	384 213	376 206	368 199	360 193	353 187	345 180	338 175	332 170	325 164	318 159	312 154	306 150	300 145	294 141
48LH14	32	48	38700	38700	475 269	464 260	454 251	444 243	434 234	425 227	416 220	407 212	399 206	390 199	383 193	375 187	367 181	360 176	353 171	346 165
48LH15	36	48	44500	44500	545 308	533 298	521 287	510 278	499 269	488 260	478 252	468 244	458 236	448 228	439 221	430 214	422 208	413 201	405 195	397 189
48LH16	42	48	51300	51300	629 355	615 343	601 331	588 320	576 310	563 299	551 289	540 280	528 271	518 263	507 255	497 247	487 239	477 232	468 225	459 218
48LH17	47	48	57600	57600	706 397	690 383	675 371	660 358	646 346	632 335	619 324	606 314	593 304	581 294	569 285	558 276	547 268	536 260	525 252	515 245

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

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

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

STANDARD ASD LOAD TABLE
DEEP LONGSPAN STEEL JOISTS, DLH-SERIES

Based on a 50 ksi Maximum Yield Strength
Adopted by the Steel Joist Institute May 25, 1983
Revised to November 10, 2003 - Effective March 01, 2005

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

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

This load table applies to joists with either parallel chords or standard pitched top chords. When top chords are pitched, the carrying capacities are determined by the nominal depth of the joists at the center of the span. Standard top chord pitch is 1/8 inch per foot. If pitch exceeds this standard, the load table does not apply. Sloped parallel-chord joists shall use span as defined by the length along the slope.

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

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

Where the joist span is in the **GRAY SHADED** area of the load table hoisting cables shall not be released until all rows of bridging are completely installed.

The approximate moment of inertia of the joist, in inches^4 is; $I_j = 26.767(W_{LL})(L^3)(10^{-6})$, where W_{LL}= **RED** figure in the Load Table, and L = (clear span + 0.67) in feet.

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

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

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

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STANDARD LOAD TABLE LONGSPAN STEEL JOISTS, DLH-SERIES
Based on a 50 ksi Maximum Yield Strength - Loads Shown in Pounds per Linear Foot (plf)

Joist Designation	Approx. Wt in Lbs. Per Linear Ft (Joists only)	Depth in inches	SAFELOAD* in Lbs. Between	CLEAR SPAN IN FEET															
			61-88	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**	**101**	**102**	**103**	**104**
52DLH10	25	52	26700	298 171	291 165	285 159	279 154	273 150	267 145	261 140	256 136	251 132	246 128	241 124	236 120	231 116	227 114	223 110	218 107
52DLH11	26	52	29300	327 187	320 181	313 174	306 169	299 164	293 158	287 153	281 149	275 144	270 140	264 135	259 132	254 128	249 124	244 120	240 117
52DLH12	29	52	32700	365 204	357 197	349 191	342 185	334 179	327 173	320 168	314 163	307 158	301 153	295 149	289 144	284 140	278 135	273 132	268 128
52DLH13	34	52	39700	443 247	433 239	424 231	414 224	406 216	397 209	389 203	381 197	373 191	366 185	358 180	351 174	344 170	338 164	331 159	325 155
52DLH14	39	52	45400	507 276	497 266	486 258	476 249	466 242	457 234	447 227	438 220	430 213	421 207	413 201	405 194	397 189	390 184	382 178	375 173
52DLH15	42	52	51000	569 311	557 301	545 291	533 282	522 272	511 264	500 256	490 247	480 240	470 233	461 226	451 219	443 213	434 207	426 201	418 195
52DLH16	45	52	55000	614 346	601 335	588 324	575 314	563 304	551 294	540 285	528 276	518 267	507 260	497 252	487 245	478 237	468 230	459 224	451 217
52DLH17	52	52	63300	706 395	691 381	676 369	661 357	647 346	634 335	620 324	608 315	595 304	583 296	572 286	560 279	549 270	539 263	528 255	518 247
			66-96	**97**	**98**	**99**	**100**	**101**	**102**	**103**	**104**	**105**	**106**	**107**	**108**	**109**	**110**	**111**	**112**
56DLH11	26	56	28100	288 169	283 163	277 158	272 153	267 149	262 145	257 140	253 136	248 133	244 129	239 125	235 122	231 118	227 115	223 113	219 110
56DLH12	30	56	32300	331 184	324 178	318 173	312 168	306 163	300 158	295 153	289 150	284 145	278 141	273 137	268 133	263 130	259 126	254 123	249 119
56DLH13	34	56	39100	401 223	394 216	386 209	379 204	372 197	365 191	358 186	351 181	344 175	338 171	331 166	325 161	319 157	314 152	308 149	303 145
56DLH14	39	56	44200	453 249	444 242	435 234	427 228	419 221	411 214	403 209	396 202	388 196	381 190	375 186	368 181	361 175	355 171	349 167	343 162
56DLH15	42	56	50500	518 281	508 272	498 264	488 256	478 248	469 242	460 234	451 228	443 221	434 215	426 209	419 204	411 198	403 192	396 188	389 182
56DLH16	46	56	54500	559 313	548 304	537 294	526 285	516 277	506 269	496 262	487 254	478 247	469 240	460 233	452 227	444 221	436 214	428 209	420 204
56DLH17	51	56	62800	643 356	630 345	618 335	605 325	594 316	582 306	571 298	560 289	549 281	539 273	529 266	520 258	510 251	501 245	492 238	483 231

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STANDARD LOAD TABLE LONGSPAN STEEL JOISTS, DLH-SERIES
Based on a 50 ksi Maximum Yield Strength - Loads Shown in Pounds per Linear Foot (plf)

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

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

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

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

DESIGN GUIDE ASD WEIGHT TABLE
FOR JOIST GIRDERS

Based on a 50 ksi Maximum Yield Strength

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT -- POUNDS PER LINEAR FOOT LOAD ON EACH PANEL POINT – KIPS																	
			4	6	8	10	12	14	16	18	20	24	28	32	36	40	44	48	52	56
20	2N@ 10.00	20	16	19	19	19	19	20	24	24	25	30	37	41	46	50	56	62	70	75
		24	16	19	19	19	19	20	21	21	25	28	32	36	41	42	49	52	53	66
		28	16	19	19	19	19	20	20	21	23	26	28	32	39	40	42	46	48	49
	3N@ 6.67	20	15	15	19	19	20	23	24	27	31	36	44	48	54	74	75	81	84	89
		24	15	16	16	16	19	20	23	26	27	33	36	45	47	53	56	68	79	82
		28	15	16	16	16	17	20	24	24	26	31	36	44	46	49	53	57	68	80
	4N@ 5.00	20	15	15	19	21	25	29	33	38	41	50	57	65	71	88	97	100	107	120
		24	15	16	17	20	23	26	29	32	35	44	50	55	62	71	85	90	100	102
		28	16	16	17	19	22	25	28	30	34	39	49	50	59	63	72	86	91	91
	5N@ 4.00	20	15	17	21	26	31	36	39	48	51	62	71	82	99	99	109	120	141	142
		24	16	16	20	23	26	30	35	39	43	53	60	68	80	91	101	103	110	120
		28	16	16	18	22	27	28	33	37	39	48	55	64	68	77	93	95	107	111
	6N@ 3.33	20	16	19	25	29	36	41	50	57	58	72	82	99	107	118	138	141		
		24	16	18	22	28	31	37	43	46	53	61	70	85	102	102	111	123	144	147
		28	17	18	22	26	30	33	40	42	47	58	68	76	83	96	109	112	119	130
	8N@ 2.50	20	19	25	32	41	51	58	65	72	82	99	118	139	142					
		24	17	22	29	36	42	50	54	61	69	86	103	107	128	149	153			
		28	18	22	29	34	40	47	54	61	67	76	88	107	112	124	135	155	166	
22	2N@ 11.00	20	21	21	21	22	22	23	24	24	25	34	39	43	49	55	62	69	76	78
		24	18	21	21	22	22	22	23	24	24	30	33	41	41	45	51	55	61	73
		28	18	21	21	21	22	22	22	23	24	37	30	33	41	42	46	48	51	58
	3N@ 7.33	20	15	18	18	19	22	24	26	29	33	42	45	53	68	70	76	84	88	94
		24	15	15	19	19	20	23	24	26	30	35	40	45	48	55	61	74	81	84
		28	15	16	16	16	19	20	23	24	27	32	36	45	47	52	54	59	74	82
	4N@ 5.50	20	15	16	19	23	26	30	36	39	44	55	62	71	82	95	96	106	119	134
		24	15	15	17	20	25	27	29	34	38	48	52	58	71	79	89	98	101	107
		28	16	16	16	19	22	25	28	32	35	40	49	54	60	72	79	87	90	97
	5N@ 4.40	20	15	17	24	27	34	38	42	49	55	65	75	96	98	111	126	137		
		24	16	16	20	24	28	33	38	40	48	56	62	73	85	100	101	110	116	133
		28	16	16	18	22	26	30	32	38	41	51	57	65	73	86	92	102	105	111
	6N@ 3.67	20	16	21	27	33	39	49	56	57	65	79	97	106	118	137				
		24	16	19	23	28	32	39	45	51	58	66	82	98	101	109	120	142	144	
		28	16	18	22	26	30	34	39	44	50	61	70	76	89	102	104	113	127	148
	8N@ 2.75	20	19	27	36	43	56	64	71	80	96	106	135	138						
		24	18	24	31	38	46	53	60	68	75	101	105	125	145	149				
		28	18	22	28	34	40	47	54	62	69	79	87	106	118	131	152	164		
25	3N@ 8.33	20	18	18	19	22	26	27	30	37	41	49	59	66	70	76	86	89	97	102
		24	15	18	19	20	22	25	26	28	32	39	43	51	59	67	71	81	84	89
		28	15	15	19	19	20	23	24	27	29	34	39	45	47	55	59	67	81	82
		32	15	16	16	16	20	21	23	24	27	32	36	44	46	52	54	58	74	81
		36	16	16	16	17	17	20	24	24	26	32	36	40	45	48	53	54	68	79
	4N@ 6.25	20	15	18	20	25	29	35	39	42	49	55	70	78	93	99	109	119	134	135
		24	15	16	19	21	26	29	33	37	40	50	57	64	72	88	97	100	106	120
		28	15	15	17	20	24	25	29	34	37	43	51	58	66	72	89	90	101	102
		32	16	16	17	19	21	25	28	32	35	40	49	54	60	69	79	86	91	96
		36	16	16	17	19	21	26	26	29	34	38	49	50	56	63	73	85	88	92
	5N@ 5.00	20	15	18	25	31	38	43	51	55	58	73	93	100	109	125	134			
		24	15	17	23	26	32	36	42	47	53	61	75	81	98	102	112	129	140	
		28	16	16	20	24	28	31	37	41	47	56	62	72	79	93	101	106	117	125
		32	16	16	19	23	26	30	33	38	41	51	57	65	73	83	93	102	105	111
		36	16	17	18	22	26	28	31	36	39	48	54	64	69	75	88	96	101	108
	6N@ 4.17	20	16	24	29	38	45	55	58	69	78	94	104	116	134					
		24	16	20	25	31	37	44	50	56	64	75	97	99	107	118	138			
		28	16	18	23	28	32	38	44	51	55	67	73	87	101	104	120	134	143	145
		32	16	18	22	26	30	34	39	44	50	61	69	77	89	102	105	113	127	148
		36	16	18	24	25	30	36	39	43	49	58	67	74	84	98	108	116	117	129
	8N@ 3.12	20	21	29	39	48	58	70	78	94	99	115	134							
		24	19	26	33	41	50	57	65	75	81	99	118	138						
		28	18	23	30	38	44	53	60	67	75	86	103	116	127	147				
		32	18	24	28	34	39	47	54	65	71	78	87	105	117	129	152	154		
		36	18	22	29	34	40	46	52	61	63	76	87	101	114	121	136	148	166	167
	10N@ 2.50	20	26	38	49	63	78	94	100	115	134									
		24	23	33	42	54	65	75	89	99	104	130								
		28	21	30	38	48	56	64	74	84	101	109	134	147						
		32	21	28	36	43	52	62	69	76	87	107	118	130	153					
		36	22	28	37	44	52	64	71	77	85	100	116	130	151	157				

ASD

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT -- POUNDS PER LINEAR FOOT LOAD ON EACH PANEL POINT – KIPS																		
			4	6	8	10	12	14	16	18	20	24	28	32	36	40	44	48	52	56
28	3N@ 9.33	24	18	18	19	22	24	27	29	36	39	43	53	62	70	71	78	85	89	98
		28	18	18	19	20	22	25	26	28	31	39	43	46	55	61	66	76	83	86
		32	15	18	19	19	21	23	24	27	28	34	39	45	48	53	58	66	80	81
	4N@ 7.00	24	15	16	20	24	27	32	38	40	48	55	62	71	82	95	104	106	120	135
		28	15	15	18	21	25	28	32	36	39	49	56	64	71	79	96	97	106	107
		32	15	15	17	20	23	25	29	33	37	43	50	58	62	70	85	90	99	102
	5N@ 5.60	24	15	18	24	29	34	39	46	52	58	66	78	96	102	111	126	136		
		28	15	17	21	26	30	35	39	46	50	61	68	77	90	99	107	114	130	142
		32	16	17	20	24	27	32	37	41	44	56	62	70	80	93	102	107	112	119
	6N@ 4.67	24	16	21	28	35	41	49	55	63	70	79	96	106	134	137				
		28	15	20	24	30	36	42	50	54	58	71	82	99	107	118	138	142		
		32	16	19	23	28	32	37	43	49	53	64	74	84	101	102	111	123	144	146
	7N@ 4.00	24	18	24	32	41	49	56	64	74	79	96	110	135						
		28	17	22	27	35	43	51	57	62	69	82	99	108	129	140				
		32	16	21	27	31	38	44	52	55	63	74	85	102	108	123	143	146		
	8N@ 3.50	24	20	28	37	48	55	64	74	79	95	105	134							
		28	18	25	32	39	50	58	65	72	81	99	108	129	141					
		32	17	24	29	38	43	53	60	64	70	86	103	113	127	147	149			
	10N@ 2.80	24	24	36	46	57	70	79	96	102	117	137								
		28	23	30	41	50	60	69	82	99	100	120	141							
		32	21	30	38	46	55	66	71	80	93	109	126	147						
30	3N@ 10.00	24	18	18	21	24	27	31	35	38	40	48	58	66	71	80	92	98	117	119
		28	18	18	19	22	25	27	30	35	37	42	49	56	63	70	79	82	93	99
		32	18	18	19	20	22	26	28	31	32	39	46	51	57	64	71	73	83	84
		36	16	19	19	19	21	23	26	28	31	35	39	46	52	57	64	65	73	75
	4N@ 7.50	24	16	18	23	29	33	37	42	49	53	64	76	85	101	104	126	127	149	150
		28	15	16	21	25	30	33	37	42	45	53	61	73	81	86	103	104	126	128
		32	15	16	18	22	26	30	34	37	43	51	55	62	70	77	87	103	105	116
		36	16	16	17	22	24	27	31	34	36	46	52	59	64	74	78	88	91	105
	5N@ 6.00	24	15	19	25	30	37	43	51	55	58	73	86	96	109	125	134			
		28	15	17	23	27	32	37	44	47	53	61	75	88	97	102	112	128	138	
		32	16	17	21	24	29	35	39	43	48	56	63	77	90	100	101	107	117	133
		36	16	17	20	24	27	31	36	40	43	51	60	70	80	86	94	103	110	118
	6N@ 5.00	24	16	24	29	37	45	52	58	66	73	94	104	116	134					
		28	16	20	27	32	38	44	50	57	65	75	97	99	107	137	140			
		32	16	19	24	29	34	40	45	51	58	65	82	98	100	109	121	142	144	
		36	16	18	23	26	31	37	41	46	52	61	70	84	101	102	111	123	126	148
	8N@ 3.75	24	21	32	40	51	63	73	83	99	111	124	146							
		28	20	30	37	44	53	61	73	80	86	114	126	149						
		32	18	26	34	42	49	55	63	71	79	104	117	130	154	161				
		36	17	23	32	39	46	54	61	69	76	89	108	121	134	154	169			
	10N@ 3.00	24	25	38	51	66	78	99	111	123	134									
		28	24	36	47	57	69	80	94	113	116	138								
		32	22	31	39	52	58	74	82	95	105	129	142							
		36	22	30	39	48	54	68	79	84	91	119	132	151						
32	3N@ 10.67	24	18	19	21	26	27	34	38	40	42	54	61	70	75	84	88	102	102	113
		28	16	17	18	24	26	28	31	34	37	43	55	60	69	70	76	85	89	93
		32	17	17	18	21	25	26	28	32	34	39	44	54	61	62	67	77	80	86
		36	15	17	19	20	23	25	26	28	30	38	40	45	51	53	58	67	81	77
	4N@ 8.00	24	18	19	23	26	32	37	40	47	55	61	72	86	94	103	114	133	134	
		28	15	18	20	24	28	32	37	40	45	55	62	70	78	94	96	105	121	135
		32	15	15	20	22	25	29	32	36	39	49	56	64	71	83	82	97	102	107
		36	15	16	17	21	24	26	30	34	36	43	50	58	65	70	85	90	99	102
	5N@ 6.40	24	15	20	27	33	39	44	51	57	65	77	93	100	123	133				
		28	15	18	24	28	34	39	46	52	58	66	74	96	101	110	126	137		
		32	15	17	22	26	32	35	41	46	53	61	68	77	90	99	105	114	130	142
		36	16	17	21	24	27	33	37	42	47	56	62	70	79	93	102	106	117	120
	6N@ 5.33	24	17	24	31	39	47	55	61	69	76	94	103	133	134					
		28	16	21	27	35	40	48	55	60	67	79	96	105	117	137				
		32	16	20	25	30	36	42	50	54	58	71	82	99	103	118	139	142		
		36	16	19	24	28	34	38	44	49	55	66	73	84	101	102	111	123	144	146
	8N@ 4.00	24	22	32	40	54	61	72	86	93	103	133								
		28	19	27	35	45	55	63	70	80	95	105	134	137						
		32	18	25	32	39	50	58	65	71	81	99	109	120	141					
		36	18	24	31	38	43	53	59	67	71	86	103	113	127	147				

ASD

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT – POUNDS PER LINEAR FOOT LOAD ON EACH PANEL POINT – KIPS																	
			4	6	8	10	12	14	16	18	20	24	28	32	36	40	44	48	52	56
35	4N@ 8.75	28	16	19	23	27	31	36	41	46	52	60	74	79	94	100	111	117	137	138
		32	15	18	21	24	28	33	37	39	45	53	60	73	80	92	100	106	112	127
		36	15	16	20	23	27	30	33	37	41	561	55	62	74	83	94	97	107	113
		40	15	16	17	21	26	27	30	37	38	46	52	61	64	75	90	95	96	108
	5N@ 7.00	28	15	20	26	32	37	43	52	57	59	73	86	100	109	126	136			
		32	15	18	24	29	34	37	45	50	53	66	75	88	100	102	112	128	138	
		36	16	17	23	27	29	35	40	46	48	62	68	77	90	100	104	115	131	133
		40	16	17	22	25	27	33	37	43	47	56	63	70	80	95	102	107	115	125
	6N@ 5.83	28	17	24	30	37	44	52	58	65	73	93	103	115	134					
		32	16	21	27	33	38	46	53	57	65	79	96	100	117	139	140			
		36	16	20	25	31	36	41	48	54	58	70	81	99	102	113	121	142	144	
		40	16	20	24	28	34	38	44	49	55	64	77	84	101	104	115	123	145	146
	7N@ 5.00	28	19	27	34	43	52	59	66	74	86	101	115	135						
		32	17	24	30	39	47	53	61	67	75	97	103	118	137					
		36	17	23	28	35	42	48	55	62	69	82	99	105	120	141	144			
		40	17	22	27	32	39	44	50	55	63	73	86	102	107	118	133	147		
	8N@ 4.38	28	21	30	39	48	59	69	78	94	98	115	136							
		32	20	27	36	42	53	61	69	79	88	101	118	138						
		36	19	26	32	39	48	55	62	71	77	99	109	121	141					
		40	18	24	30	37	44	54	60	65	73	86	102	113	127	147	149			
38	4N@ 9.50	32	16	19	21	26	31	34	39	43	48	58	67	74	87	100	101	111	127	138
		36	15	17	21	24	28	33	35	39	44	53	60	74	75	93	97	106	112	123
		40	15	16	20	23	27	30	34	37	41	51	55	62	74	83	94	98	107	109
		44	16	16	20	22	26	28	30	35	38	46	52	58	65	75	90	95	95	108
	5N@ 7.60	32	15	20	25	31	36	42	46	52	59	70	86	96	101	111	126	137		
		36	16	20	24	28	33	38	45	47	53	64	74	89	98	103	112	129	138	
		40	16	20	23	26	31	35	40	46	48	59	70	78	91	101	105	113	117	134
		44	17	20	22	25	30	33	39	41	48	56	63	75	80	93	102	107	111	118
	6N@ 6.33	32	17	24	30	35	41	49	55	62	70	86	98	105	125	136				
		36	16	21	27	33	39	47	50	57	61	75	89	100	107	118	141	142		
		40	16	21	25	31	36	40	48	55	59	71	82	99	102	109	121	143	142	
		44	17	20	24	29	33	38	44	49	55	64	77	84	102	104	115	123	145	147
	8N@ 4.75	32	20	29	38	47	56	64	74	86	95	105	135							
		36	19	28	35	42	50	57	65	76	81	101	113	138	140					
		40	19	26	32	40	48	55	62	67	78	100	103	121	142	144				
		44	20	24	30	39	47	51	57	64	71	86	102	113	127	147	149			
40	4N@ 10.00	32	17	20	23	29	37	40	47	50	56	64	73	86	103	114	126	128	149	151
		36	17	19	22	29	31	37	40	44	51	57	65	74	87	103	104	125	127	128
		40	17	18	22	25	29	33	37	40	47	52	62	73	77	87	96	104	117	127
		44	16	17	20	24	29	31	36	38	41	49	59	66	74	78	84	96	106	106
		48	17	17	20	24	25	30	32	37	39	48	53	59	67	78	78	85	99	106
	5N@ 8.00	32	15	21	26	32	38	43	52	55	62	73	86	101	109	124	134			
		36	16	20	24	30	34	39	45	53	55	66	74	88	102	102	112	128	138	
		40	16	20	24	27	32	37	41	46	51	62	68	77	90	100	105	115	130	142
		44	17	20	23	29	32	37	41	49	50	58	70	82	84	99	116	118	130	141
		48	17	20	23	26	31	34	40	41	50	57	68	75	85	95	100	119	120	132
	6N@ 6.67	32	16	24	30	38	44	52	58	65	72	93	100	115	133					
		36	17	22	27	34	39	47	53	60	67	79	97	102	117	137	141			
		40	16	21	26	30	36	43	48	54	62	71	82	99	103	114	130	142		
		44	17	21	24	28	36	40	47	51	55	66	78	91	102	107	116	134	142	146
		48	17	21	24	31	36	42	46	53	57	69	79	86	100	109	132	133	135	164
	7N@ 5.71	32	18	26	33	43	52	58	66	74	86	101	115	135						
		36	17	24	31	39	47	53	61	67	75	97	103	117	136					
		40	17	24	29	35	43	49	55	62	69	82	99	105	119	140				
		44	20	22	28	33	39	48	55	59	64	78	92	102	111	122	143			
		48	20	23	28	36	41	48	54	61	66	80	86	108	122	134	136	164	167	
	8N@ 5.00	32	21	29	38	48	58	67	78	94	96	115	135							
		36	19	27	36	46	53	60	68	80	88	102	118	137						
		40	19	25	34	39	49	58	65	72	82	99	109	120	141					
		44	21	27	33	39	47	56	63	70	75	93	103	120	136	147				
		48	20	25	32	42	47	55	62	69	80	90	104	122	136	155	170			
	10N@ 4.00	32	29	39	51	64	79	92	112	123	125	149								
		36	25	36	47	60	69	81	94	103	125	150								
		40	24	36	45	56	66	75	82	96	115	129	152							
		44	23	32	41	51	60	71	82	84	99	119	143	161						
		48	23	32	41	52	58	68	76	85	94	121	134	152						

ASD

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT – POUNDS PER LINEAR FOOT LOAD ON EACH PANEL POINT – KIPS																	
			4	6	8	10	12	14	16	18	20	24	28	32	36	40	44	48	52	56
42	4N@ 10.50	32	16	21	25	29	34	38	43	49	53	67	74	86	99	101	112	125	134	138
		36	16	19	22	26	32	35	39	44	47	58	67	73	87	95	101	112	118	129
		40	16	19	21	24	28	34	36	41	45	53	61	73	76	93	97	97	113	122
		44	16	19	20	23	27	31	34	38	42	51	55	62	74	84	94	97	108	109
		48	16	19	21	24	26	29	32	36	39	47	54	62	65	75	90	95	97	108
	5N@ 8.40	32	16	22	28	35	41	45	52	57	66	74	88	100	110	125				
		36	15	21	25	31	36	42	46	52	59	70	85	96	102	111	126	137		
		40	16	21	24	28	33	39	44	51	54	64	74	89	98	103	113	129	130	
		44	16	20	24	27	31	37	40	46	52	59	69	78	91	101	105	113	126	134
		48	17	20	23	27	30	35	39	42	48	57	63	75	81	95	102	107	115	118
	6N@ 7.00	32	18	25	32	39	45	55	61	69	77	93	103	124	135					
		36	17	23	30	35	41	49	56	60	67	79	96	105	117	137				
		40	17	21	26	33	39	46	54	57	61	75	89	100	108	119	141	142		
		44	16	21	24	31	35	41	48	54	59	71	81	100	102	109	121	143	142	
		48	20	20	25	29	33	39	44	49	56	64	77	85	102	104	115	124	145	147
	7N@ 6.00	32	20	28	36	45	52	65	72	85	93	102	125							
		36	19	26	34	40	49	56	67	74	79	98	110	127	138					
		40	18	24	31	38	46	54	61	68	75	90	101	113	129	142				
		44	20	23	29	35	41	49	55	63	70	78	100	106	116	132	145			
		48	18	23	28	34	39	44	50	56	64	73	92	102	108	118	136	149		
	8N@ 5.25	32	22	32	40	51	62	72	78	94	100	124	135							
		36	20	27	38	46	56	64	74	79	96	105	126	138						
		40	20	26	35	42	51	57	65	76	81	101	113	138	141					
		44	20	25	32	39	49	55	63	70	78	99	107	121	142	147				
		48	21	26	32	41	48	56	63	67	74	93	103	112	128	148				
	10N@ 4.20	32	27	38	52	62	77	94	101	114	134									
		36	25	36	46	60	70	86	97	102	112	140								
		40	24	34	45	54	64	75	89	99	104	129								
		44	23	31	41	52	61	70	79	91	100	114	143							
		48	23	30	39	49	56	66	72	80	93	107	125	146						
45	4N@ 11.25	36	18	21	25	28	33	38	42	46	52	62	72	79	95	100	112	117	128	138
		40	19	21	22	27	31	35	39	44	47	55	64	75	87	95	101	112	113	128
		44	19	21	22	24	29	33	37	39	45	53	61	74	76	89	95	102	108	114
		48	18	21	22	24	28	31	34	38	40	51	55	63	75	83	94	95	107	109
		52	18	22	23	24	27	29	33	37	39	47	52	60	66	76	91	95	96	109
	5N@ 9.00	36	16	22	27	33	38	44	52	55	63	74	86	101	109	125	136			
		40	16	21	25	30	36	42	45	53	56	68	75	88	102	111	122	128		
		44	16	21	24	29	34	38	44	46	54	65	74	85	90	103	110	123	130	142
		48	20	21	24	27	32	36	41	45	52	59	67	75	91	95	106	112	118	134
		52	20	21	24	27	30	35	39	42	48	57	64	75	81	94	98	107	117	119
	6N@ 7.50	36	19	24	31	38	45	52	58	66	74	93	100	115	134					
		40	19	23	28	34	40	47	53	60	67	79	97	103	117	137	140			
		44	19	21	27	32	38	46	50	54	62	76	90	100	107	118	139	142		
		48	20	21	26	30	36	42	48	55	59	69	78	92	102	110	122	143	143	
		52	20	21	25	29	34	39	44	50	56	64	77	85	102	102	116	124	136	148
	7N@ 6.43	36	20	27	35	44	52	58	66	74	86	101	115	135						
		40	20	26	33	40	47	54	61	67	75	97	105	127	138					
		44	20	24	30	39	46	54	61	62	69	90	100	113	129	143				
		48	20	23	29	36	41	49	55	63	70	79	92	107	117	133	145			
		52	18	23	28	34	39	45	50	56	65	73	93	102	109	118	136	149		
	8N@ 5.62	36	21	30	38	48	58	67	78	94	98	114	135							
		40	20	28	36	46	53	61	68	80	89	105	118	137						
		44	20	27	34	41	51	58	66	73	81	99	109	130	141					
		48	21	26	32	39	47	55	63	68	74	92	104	116	142	146				
		52	22	28	33	42	48	54	59	67	71	94	102	112	127	148				
	9N@ 5.00	36	24	34	45	55	66	74	88	98	104	135								
		40	22	31	39	49	61	69	80	89	100	113	138							
		44	23	31	39	48	58	66	76	89	99	108	132							
		48	23	29	37	47	55	63	70	79	91	106	117	133						
		52	23	28	36	46	55	60	70	73	84	102	112	135	148					
	10N@ 4.50	36	26	38	49	60	73	86	98	105	116	137								
		40	25	35	47	60	66	76	90	102	112	140								
		44	24	33	46	54	64	72	89	99	104	130	142							
		48	24	31	40	49	62	71	78	91	100	114	134							
		52	23	31	39	50	56	67	72	80	93	107	123	147						

ASD

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT – POUNDS PER LINEAR FOOT LOAD ON EACH PANEL POINT – KIPS																	
			4	6	8	10	12	14	16	18	20	24	28	32	36	40	44	48	52	56
48	5N@ 9.60	36	19	26	31	37	45	52	59	66	71	87	111	113	135	136				
		40	19	23	29	35	41	46	52	59	68	77	92	112	114	136	138			
		44	19	22	27	32	37	44	48	54	61	69	80	93	113	116	126	139	150	
		48	19	21	25	30	36	40	48	48	55	69	78	90	96	115	116	128	140	142
		52	20	21	25	29	33	39	42	50	54	62	71	82	92	99	117	118	130	141
		56	20	21	24	29	33	38	40	46	50	59	71	79	85	100	100	119	120	133
	6N@ 8.00	36	20	28	35	42	51	62	70	78	83	100	122	134	147					
		40	19	25	33	39	47	56	64	71	79	93	112	124	137	148				
		44	19	24	31	36	45	50	57	65	73	81	102	115	127	138	151			
		48	19	23	30	35	40	48	52	59	67	78	95	105	116	129	141	160		
		52	20	23	27	32	38	46	51	59	60	75	83	97	107	130	131	144	162	
		56	20	22	27	31	37	42	48	54	61	69	80	91	107	120	132	134	153	165
	8N@ 6.00	36	30	36	45	56	64	78	91	100	122	134								
		40	28	33	42	51	59	70	80	92	101	124	148							
		44	27	32	39	49	55	65	74	82	95	114	127	150						
		48	26	30	37	47	53	60	68	76	84	105	129	131	154					
		52	26	30	36	44	51	59	65	71	80	99	119	132	146	164				
		56	25	28	36	43	49	57	63	69	78	90	109	123	136	155				
	9N@ 5.33	36	35	44	55	70	79	91	99	121	122	146								
		40	34	42	52	63	74	88	93	101	113	136								
		44	33	39	50	59	69	83	91	94	103	126	150							
		48	33	37	46	56	66	76	85	94	97	118	130							
		52	31	36	46	54	63	72	80	95	101	108	132	152						
		56	31	35	44	53	62	69	80	89	98	103	123	137	165					
	12N@ 4.00	36	35	52	71	84	100	123	135	148										
		40	34	48	65	76	93	113	125	137	149									
		44	31	44	57	73	82	102	115	126	139									
		48	30	41	53	67	76	88	104	117	130	153								
		52	30	39	52	61	76	84	97	107	131	144								
		56	27	38	49	61	70	81	91	108	122	135	165							
50	5N@ 10.00	40	18	23	30	38	44	47	56	60	68	79	93	113	124	136	138			
		44	17	22	29	34	40	46	51	56	61	76	89	94	113	126	137	139		
		48	19	22	28	31	38	42	48	55	61	69	78	94	96	115	127	139	141	
		52	20	22	25	31	35	40	45	49	55	62	74	82	96	116	117	129	141	142
		56	20	22	25	30	32	40	43	50	51	63	71	83	92	99	117	119	131	142
		60	20	20	24	30	33	36	42	46	51	58	65	76	86	96	101	120	121	133
	6N@ 8.33	40	20	28	34	42	48	56	64	71	80	100	112	124	147					
		44	19	24	31	38	47	50	57	65	73	85	102	124	127	149				
		48	19	23	30	37	40	49	57	65	67	82	95	115	127	129	151			
		52	20	23	30	36	40	46	52	59	67	75	84	105	117	129	131	153	162	
		56	20	23	26	33	39	42	51	54	60	72	84	98	107	120	132	144	163	164
		60	21	23	27	33	38	43	49	53	61	70	80	87	102	110	123	134	154	165
	8N@ 6.25	40	22	31	39	51	59	67	78	86	96	110	135							
		44	21	29	37	47	53	61	70	80	96	103	118	139						
		48	21	27	35	42	51	58	69	76	81	99	114	130	142					
		52	21	25	33	40	49	55	63	70	78	99	107	121	141					
		56	24	29	36	42	47	56	64	68	78	94	108	118	137	148				
		60	24	27	35	40	47	55	61	69	74	83	103	110	123	139	149			
	9N@ 5.56	40	24	34	44	55	66	74	86	96	104	134								
		44	23	32	40	53	61	69	80	88	98	113	138							
		48	24	32	42	52	58	69	77	90	99	111	133							
		52	24	31	40	47	58	66	74	79	92	106	126	143						
		56	24	30	38	46	55	60	68	77	89	102	116	135						
		60	24	32	38	49	53	61	70	75	83	97	111	125	141					
	10N@ 5.00	40	26	38	49	60	74	87	96	104	116	136								
		44	25	36	47	60	68	84	96	102	112	140								
		48	24	34	46	54	65	76	89	99	103	130								
		52	24	34	45	52	62	70	79	91	100	114	134							
		56	23	32	41	48	60	70	76	87	93	107	134	146						
		60	24	31	40	49	57	66	73	81	94	109	119	138						
	12N@ 4.17	40	34	49	65	80	100	112	125	147										
		44	31	44	57	73	86	102	126	127	149									
		48	30	41	58	67	82	96	115	127	130	154								
		52	30	39	53	68	76	84	105	118	130	154								
		56	27	40	52	61	70	85	99	108	122	135	164							
		60	27	39	49	61	70	82	88	104	112	135	166							

ASD

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT – POUNDS PER LINEAR FOOT LOAD ON EACH PANEL POINT – KIPS																	
			4	5	6	7	8	9	10	11	12	13	14	16	18	20	22	24	26	28
55	5N@ 11.00	44	21	21	24	25	29	32	35	38	41	43	47	53	59	63	71	82	83	86
		48	21	21	23	24	28	30	32	35	38	41	43	49	56	60	64	71	73	83
		52	20	22	23	25	27	29	32	33	36	39	42	44	52	57	65	66	74	74
		56	20	21	24	24	26	28	31	33	36	37	39	44	51	53	58	66	66	74
		60	23	24	24	24	27	27	31	33	35	38	38	45	47	52	60	61	67	68
		66	24	24	24	25	26	28	28	33	34	37	37	42	47	48	55	56	62	69
	6N@ 9.17	44	19	22	26	29	33	36	38	43	45	51	52	59	66	75	86	86	98	101
		48	20	22	24	28	31	33	36	40	44	46	50	56	64	68	75	87	89	98
		52	20	22	24	26	29	33	35	37	41	59	59	66	74	86	93	99	109	110
		56	18	21	24	25	28	31	35	36	39	42	47	52	55	63	70	71	78	91
		60	20	21	24	25	29	30	33	35	38	39	43	48	55	60	64	71	75	80
		66	19	20	22	24	28	30	31	33	36	39	40	47	50	56	62	65	73	73
	7N@ 7.86	44	21	24	28	33	36	39	44	50	53	59	59	70	75	87	97	102	111	120
		48	21	24	27	31	34	38	43	45	51	54	56	65	72	76	89	98	103	110
		52	21	23	26	29	33	36	39	44	46	52	55	62	69	74	86	91	100	105
		56	20	22	25	28	31	35	38	40	46	48	53	55	64	70	79	87	92	101
		60	21	22	24	27	30	33	36	39	41	47	49	56	64	68	72	81	93	94
		66	22	22	24	26	30	32	36	37	40	43	48	52	58	65	70	74	83	84
	9N@ 6.11	44	24	29	34	39	46	52	55	60	67	74	74	87	98	105	116	135	137	
		48	24	28	32	38	40	47	53	57	61	68	69	81	97	103	107	118	129	139
		52	25	30	33	39	43	47	52	57	65	65	73	77	90	104	105	114	125	133
		56	24	29	32	38	43	46	51	53	59	66	67	75	87	92	105	107	117	128
		60	24	27	32	36	40	45	47	52	56	60	67	71	80	93	95	108	109	118
		66	24	27	31	35	39	42	46	49	54	58	61	71	78	83	91	97	111	113
	11N@ 5.00	44	30	36	43	49	55	63	67	74	87	88	97	106	126	137				
		48	28	33	39	45	54	61	65	69	76	87	89	103	112	128	139			
		52	27	34	37	44	52	55	62	66	73	77	88	99	105	115	131	142		
		56	27	33	39	42	48	54	60	64	68	77	80	93	102	107	118	134	146	
		60	26	31	37	40	47	49	58	64	67	72	77	82	95	108	110	121	137	148
		66	26	31	36	39	45	50	54	60	65	68	74	82	97	98	113	117	126	141
60	5N@ 12.00	48	21	23	27	29	33	35	39	43	44	49	51	57	63	69	76	87	89	94
		52	21	22	27	28	31	33	36	40	44	45	47	52	60	65	69	77	85	90
		56	22	23	24	28	30	31	34	36	41	44	45	52	59	63	69	74	78	87
		60	22	23	24	28	29	32	34	35	40	42	45	49	53	60	66	70	75	80
		66	24	24	24	26	30	30	33	35	36	38	42	47	51	56	61	67	72	73
		72	25	25	25	25	27	30	31	35	36	37	39	45	48	56	56	63	69	70
	6N@ 10.00	48	20	24	29	32	36	38	41	47	49	56	60	67	72	80	93	93	112	113
		52	20	23	28	30	33	37	39	46	48	50	57	62	69	78	80	94	94	113
		56	19	24	25	30	33	38	39	42	48	49	51	58	66	69	79	83	95	96
		60	19	23	24	29	32	34	39	40	43	49	50	57	63	70	75	83	83	96
		66	19	23	24	27	32	32	34	40	42	44	50	52	61	65	69	77	84	85
		72	22	22	24	27	28	33	34	36	41	43	44	52	54	63	68	71	75	87
	8N@ 7.50	48	24	29	34	39	43	49	56	57	64	72	72	80	93	112	123	125	136	148
		52	23	29	31	37	40	48	50	57	58	66	72	81	94	103	114	125	127	139
		56	23	26	31	36	38	44	49	51	58	60	66	75	83	96	104	116	127	129
		60	23	26	32	33	39	42	47	50	53	59	61	69	77	85	98	106	118	129
		66	28	30	33	34	41	43	46	48	53	57	62	70	78	82	90	100	108	120
		72	29	30	31	34	36	41	46	47	52	58	59	66	73	80	90	92	104	110
	10N@ 6.00	48	26	32	37	44	49	55	60	67	74	79	87	97	105	118	137	138		
		52	28	34	38	44	50	56	64	65	71	75	88	97	103	113	130	138		
		56	27	33	37	43	46	51	58	66	65	72	76	90	104	105	123	131	143	
		60	25	31	37	39	45	51	57	60	66	70	73	86	93	104	111	126	134	
		66	27	32	37	42	49	51	56	62	65	72	74	85	95	102	120	122	134	145
		72	26	32	33	38	42	47	50	55	59	66	69	74	83	96	98	111	111	121
	12N@ 5.00	48	33	39	46	53	59	68	75	86	87	97	102	111	135					
		52	31	37	45	51	57	65	69	76	88	89	98	104	118	139				
		56	29	36	41	48	55	62	66	72	77	89	91	104	113	129	140			
		60	30	35	39	47	54	56	64	73	74	79	91	102	106	116	133	145		
		66	32	35	41	48	53	61	62	70	77	80	87	100	110	122	134	147	164	
		72	29	33	38	42	50	52	60	61	69	72	77	86	100	110	114	127	142	151
	15N@ 4.00	48	40	49	64	72	80	93	102	113	124	126	136							
		52	39	48	57	66	74	81	94	103	114	126	127	150						
		56	38	46	53	67	71	80	83	96	104	116	127	140	153					
		60	38	42	51	60	68	76	83	89	98	106	118	132	144					
		66	35	41	49	55	62	70	81	87	87	103	110	123	136	153	167			
		72	35	44	46	55	64	66	77	85	90	93	106	125	139	142	160	171		

ASD

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT – POUNDS PER LINEAR FOOT LOAD ON EACH PANEL POINT – KIPS																	
			4	5	6	7	8	9	10	11	12	13	14	16	18	20	22	24	26	28
65	6N@ 10.83	52	22	28	30	33	39	41	45	49	54	58	61	69	78	83	95	97	115	116
		56	21	25	29	33	35	40	42	48	49	55	58	63	70	80	84	97	97	117
		60	23	24	29	32	34	39	41	44	50	50	56	64	71	76	82	92	98	99
		66	22	24	26	31	33	35	40	42	45	51	51	58	65	73	78	83	87	100
		72	24	25	27	31	32	35	37	42	43	47	49	54	60	68	76	80	87	89
	8N@ 8.12	52	25	31	38	40	44	51	58	62	66	74	74	83	97	115	127	129	141	153
		56	24	30	34	39	43	50	52	59	63	68	74	83	97	105	118	129	131	143
		60	23	28	33	39	41	47	51	53	60	68	69	77	85	99	108	119	130	133
		66	24	28	33	35	42	44	49	52	56	63	63	75	80	89	101	110	122	124
		72	38	39	39	39	42	45	47	52	56	58	65	73	78	89	92	104	113	125
	9N@ 7.22	52	30	32	38	44	49	58	62	67	74	79	83	97	116	128	129	142	153	
		56	26	32	39	42	48	53	59	68	68	76	81	98	106	118	130	142	144	155
		60	25	32	38	40	47	51	58	60	69	70	78	86	100	109	120	132	145	146
		66	28	32	37	41	44	50	53	60	64	71	72	81	89	103	112	124	136	138
		72	29	30	35	38	44	46	52	57	62	66	71	79	91	91	108	115	127	140
	10N@ 6.50	52	31	36	41	49	58	62	67	75	82	89	97	116	128	131	154	155		
		56	31	36	40	46	52	60	68	69	77	85	91	107	119	132	144			
		60	29	34	40	44	51	57	61	70	74	78	87	100	109	122	134	146		
		66	27	34	39	43	50	54	60	65	72	74	82	90	103	113	125	138	140	163
		72	27	33	37	44	47	52	56	62	67	75	76	87	93	110	127	129	141	143
	11N@ 5.91	52	33	39	45	52	59	67	75	83	89	98	106	118	131	153				
		56	32	39	44	51	60	64	69	77	85	91	99	119	132	144	156			
		60	33	38	44	49	55	63	70	74	79	86	92	109	122	134	147			
		66	30	37	42	46	54	57	64	72	73	81	90	104	113	125	139	147	164	
		72	30	36	41	47	51	57	62	67	77	77	88	93	110	118	131	144	156	173
	13N@ 5.00	52	37	45	55	64	72	79	89	98	106	117	130	142						
		56	37	43	53	61	69	77	86	91	99	108	120	133	146					
		60	35	41	50	58	64	71	77	85	93	100	108	131	134	158				
		66	34	41	49	53	62	70	75	80	87	93	102	122	134	137	161			
		72	34	41	46	53	58	64	72	78	85	90	90	113	127	138	141	170		
70	7N@ 10.00	56	24	25	30	35	39	43	46	51	56	57	64	71	83	88	102	102	110	121
		60	23	26	30	33	37	43	44	50	52	57	61	66	73	85	90	102	105	111
		66	24	27	30	32	35	39	44	46	51	53	58	67	73	75	87	93	104	106
		72	24	25	29	32	34	38	42	46	47	53	54	60	69	76	78	89	94	102
		78	25	26	28	31	34	37	40	43	47	49	50	58	63	71	78	83	90	96
		84	24	27	29	31	35	37	39	42	44	49	51	57	65	69	72	80	85	94
	9N@ 7.78	56	26	31	37	40	45	53	56	61	67	72	75	88	102	110	122	128		
		60	25	30	35	39	45	47	54	61	65	70	73	89	99	105	114	129	131	
		66	31	34	38	43	48	51	56	63	67	70	74	86	92	106	112	122	127	
		72	32	33	37	43	45	51	56	58	64	67	69	77	89	100	108	114	124	131
		78	32	34	36	39	45	48	53	59	60	66	66	76	87	93	102	110	116	118
		84	33	34	35	38	45	47	50	55	59	63	67	72	81	94	95	103	113	118
	10N@ 7.00	56	27	34	38	45	53	57	60	68	75	80	88	100	106	118	137			
		60	30	36	41	48	55	60	65	69	71	84	88	102	109	122	130			
		66	29	35	42	44	51	55	62	66	70	73	85	91	105	109	123	132		
		72	30	34	38	43	47	52	59	63	66	69	78	88	94	106	112	127	133	
		78	30	33	37	40	46	51	55	61	65	71	71	79	94	96	108	115	130	137
		84	31	33	36	40	47	49	55	57	63	70	72	80	92	98	109	112	121	133
	11N@ 6.36	56	32	41	45	51	60	64	71	83	87	89	102	108	127	138				
		60	30	39	44	50	57	65	66	73	85	89	90	104	114	129				
		66	31	38	43	46	53	59	67	67	76	86	88	105	106	117	132			
		72	32	37	42	48	55	57	62	70	70	78	82	94	108	109	119	136	148	
		78	29	35	40	47	50	55	61	65	73	72	80	92	98	110	118	124	140	141
		84	30	36	39	45	49	52	59	66	68	73	78	84	97	102	116	124	129	144
	12N@ 5.83	56	34	41	50	56	63	68	76	87	88	102	103	113	129					
		60	33	39	46	55	58	65	74	76	89	90	103	112	128	139				
		66	32	37	45	48	55	63	67	76	78	90	92	105	115	130	143			
		72	32	37	42	48	55	61	65	69	77	80	89	102	107	119	135	148		
		78	30	36	42	48	51	56	64	70	72	80	84	97	106	113	123	141	151	
		84	30	36	40	45	51	53	61	68	73	77	83	89	102	115	118	128	144	151
	14N@ 5.00	56	36	44	53	63	71	75	87	96	102	111	120	137						
		60	37	43	54	61	69	75	88	89	99	103	112	128						
		66	35	42	48	55	64	70	77	90	92	102	106	115	132					
		72	34	40	49	55	61	69	73	81	91	95	103	110	120	138				
		78	33	39	44	52	58	67	72	76	84	92	97	111	120	138	141			
		84	33	40	44	51	58	62	69	78	79	86	97	106	116	127	143	155		

ASD

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT – POUNDS PER LINEAR FOOT LOAD ON EACH PANEL POINT – KIPS																	
			4	5	6	7	8	9	10	11	12	13	14	16	18	20	22	24	26	28
75	8N@ 9.38	56	29	33	40	43	49	55	61	65	73	79	82	95	115	116	128	140	152	
		60	26	32	38	42	48	51	58	63	70	75	80	92	97	116	118	130	142	153
		66	27	32	35	41	44	51	53	60	64	69	72	82	98	99	118	120	132	144
		72	26	32	34	41	43	46	52	58	61	66	71	79	87	100	101	121	122	134
		78	27	29	34	37	43	45	54	54	61	64	69	77	81	89	103	105	123	125
	10N@ 7.50	60	32	39	42	50	59	67	69	76	83	89	98	117	129	131	154			
		66	32	37	42	49	55	62	69	70	78	86	87	100	119	132	134			
		72	30	36	42	45	54	57	63	72	73	81	86	101	111	123	136	138		
		78	31	35	39	46	48	56	63	66	74	75	82	91	105	114	127	139	152	
		84	31	36	39	45	49	55	59	65	69	77	78	94	95	110	128	131	143	156
	12N@ 6.25	60	38	43	51	59	68	76	84	90	98	106	118	131	144					
		66	35	42	50	55	62	70	79	87	90	100	110	122	135	148				
		72	36	41	46	54	63	65	73	81	90	91	104	124	126	141	154			
		78	35	42	47	54	61	68	76	78	86	90	98	105	126	139	152	163		
		84	34	39	46	52	56	64	70	78	79	90	92	106	126	139	141	164	171	
	14N@ 5.36	66	41	48	56	63	72	80	89	102	111	122	125	137						
		72	41	46	52	61	70	75	84	95	101	110	121	134	148					
		78	37	44	53	61	68	76	80	89	98	103	107	125	139	151				
		84	38	44	52	57	64	71	79	86	92	100	108	127	130	153	171			
		90	37	42	50	58	66	73	77	87	94	94	110	119	142	144	173	176		
	15N@ 5.00	66	41	52	60	69	77	85	98	106	118	120	132	146						
		72	42	52	59	67	74	84	87	99	110	121	123	146	160					
		78	41	47	54	65	73	77	88	91	104	112	124	139	152	169				
		84	39	46	55	63	67	76	86	92	93	109	116	131	143	171	174			
		90	38	46	52	60	69	74	81	90	95	103	118	133	145	146	177			
80	8N@ 10.00	60	28	31	37	42	45	51	56	63	64	72	75	88	97	103	112	127	137	
		66	30	31	35	38	45	47	52	57	62	65	70	77	90	103	105	113	129	131
		72	29	32	33	38	41	46	48	53	59	63	68	76	87	92	106	108	116	126
		78	30	31	33	37	41	42	47	53	56	60	64	73	81	88	94	109	111	118
		84	30	32	35	37	39	43	48	52	56	59	63	71	79	83	96	98	112	114
		90	53	54	56	56	57	57	58	60	63	67	70	79	79	90	95	103	105	118
	10N@ 8.00	60	31	35	41	47	53	60	68	75	76	88	97	103	112	129	139			
		66	31	35	39	46	52	55	62	70	75	78	90	100	107	115	132	142		
		72	33	37	43	50	55	62	63	70	74	83	87	97	106	120	127			
		78	32	36	42	46	51	56	63	68	71	76	86	90	100	112	122	130		
		84	33	37	42	45	51	57	61	65	70	77	78	91	100	109	115	125	131	
		90	34	36	40	44	49	53	60	65	68	72	77	87	92	102	111	118	132	136
	12N@ 6.67	66	36	44	50	57	65	70	73	86	90	103	103	115	130					
		72	34	42	47	54	59	67	72	77	86	92	101	107	125	133				
		78	33	39	46	53	60	65	69	79	80	88	94	108	114	129	136			
		84	34	38	47	49	56	63	70	72	79	83	92	99	111	121	138	140		
		90	36	39	44	50	56	59	66	72	74	82	86	101	113	116	125	143	149	
		96	34	37	43	50	54	60	68	71	75	79	85	98	104	117	120	130	147	156
	14N@ 5.71	66	39	47	57	64	73	77	89	98	103	109	113	129						
		72	38	46	54	59	67	76	79	91	101	106	106	125	143					
		78	36	43	50	58	66	70	78	90	95	96	109	118	136	149				
		84	36	42	50	56	64	71	74	80	92	98	99	112	124	143				
		90	36	41	48	53	61	68	74	82	86	95	100	115	121	136	146			
		96	37	40	47	53	61	67	74	79	84	88	100	108	118	127	145	152		
	16N@ 5.00	66	42	53	62	70	78	90	101	105	113	129	130							
		72	41	50	57	69	76	81	93	102	109	116	118	145						
		78	41	49	58	66	73	83	91	96	104	112	120	137	149					
		84	39	45	54	61	69	76	84	97	100	109	115	126	143					
		90	39	46	54	62	70	74	80	86	101	102	114	119	144	155				
		96	40	46	55	58	68	73	81	88	94	106	110	121	133	155	164			

ASD

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT – POUNDS PER LINEAR FOOT LOAD ON EACH PANEL POINT – KIPS																
			4	5	6	7	8	9	10	11	12	13	14	16	18	20	22	24	26	28
90	9N@ 10.00	72	40	42	46	49	55	60	64	72	81	82	92	98	117	119	141	143		
		84	41	44	48	48	50	54	60	67	75	76	84	88	102	121	124	135	148	149
		90	54	55	56	56	57	59	62	65	72	77	85	88	99	105	125	128	138	
		96	55	56	57	57	58	59	64	65	69	74	80	91	98	107	110	128	131	142
		102	55	57	57	58	59	60	62	65	69	74	75	87	95	105	112	130	133	134
	10N@ 9.00	72	42	46	48	52	61	64	72	78	85	93	99	118	130	142	155			
		84	42	45	49	51	58	62	69	73	81	94	97	115	117	137	148			
		90	42	46	50	51	56	60	66	71	79	81	89	100	107	126	129	141		
		96	43	46	48	53	56	59	66	70	74	82	87	95	108	113	129	133	153	
		102	43	45	48	53	57	60	65	69	76	77	84	97	105	115	124	131	137	155
	11N@ 8.18	72	43	47	51	59	65	73	78	86	99	100	119	120	143					
		84	43	49	50	55	62	67	74	78	87	91	100	113	126	138	150			
		90	45	48	51	53	59	66	72	77	85	90	93	107	128	129	142			
		96	47	48	53	56	60	63	71	75	81	87	95	105	113	132	134	148		
		102	48	49	57	58	61	64	70	73	82	86	94	101	116	124	138	150	163	
	12N@ 7.50	78	44	49	53	60	68	72	79	88	102	103	111	124	149					
		84	45	49	52	56	65	75	79	84	91	103	105	125	137	149				
		90	46	50	52	60	68	75	79	88	89	100	106	126	128	151	152			
		96	46	48	52	58	63	72	76	82	90	93	103	110	129	132	153	156		
		108	45	49	55	56	64	66	76	81	85	92	97	107	115	135	137	160	168	
	15N@ 6.00	78	47	54	66	75	82	94	99	120	121	133	145	148						
		84	49	54	62	68	76	86	97	103	122	124	125	149						
		90	50	52	60	69	78	82	90	99	106	125	127	140	153					
		96	48	53	58	66	72	80	93	95	108	112	129	131	154	173				
		108	51	57	59	64	72	78	87	99	101	109	115	136	139	168	172			
	18N@ 5.00	78	51	62	74	84	99	102	120	133	145	148	159							
		84	51	61	73	80	89	104	113	124	137	150	151							
		90	52	58	70	79	90	93	106	126	129	142	153	166						
		96	53	58	68	78	87	95	108	113	131	133	144	158						
		108	57	59	64	76	85	95	103	113	120	127	139	151	172					
100	10N@ 10.00	78	45	49	52	55	58	62	68	75	79	91	92	106	115	131	140			
		84	47	50	53	55	58	61	69	72	77	81	93	102	109	118	133	143		
		96	55	56	56	57	62	64	68	74	84	86	87	102	116	125	126			
		102	55	56	57	58	61	64	66	73	77	86	89	100	106	121	127	133		
		108	56	57	58	59	61	64	67	70	76	80	87	92	106	107	127	130		
	12N@ 8.33	78	48	53	56	62	70	74	86	92	97	105	112	124						
		84	48	52	55	63	68	72	84	88	98	99	107	126	133					
		96	47	51	55	58	66	67	75	81	91	93	102	111	116	131				
		102	48	52	55	58	62	69	73	79	90	94	95	113	118	133	141			
		108	48	51	55	59	62	70	72	76	85	92	97	106	117	123	139	149		
	15N@ 6.67	78	53	56	67	75	86	91	104	106	115	125	133							
		84	53	56	61	69	78	88	94	107	113	118	128							
		96	52	56	61	68	72	82	93	99	105	114	118	133						
		102	53	56	60	66	74	83	85	97	102	116	117	125	144					
		108	53	56	59	65	73	77	87	99	103	104	118	123	140	149				
	16N@ 6.25	84	53	58	69	72	80	92	106	107	117	127	133							
		96	53	57	63	71	75	85	98	100	115	115	124	140						
		102	53	57	62	66	74	84	97	102	111	117	118	136	154					
		108	54	58	62	67	76	82	87	100	104	117	118	129	148					
		120	56	61	64	70	76	83	86	93	104	109	116	128	140	161				
	17N@ 5.88	84	55	61	70	77	88	94	107	114	127	133	145							
		96	54	59	65	72	80	93	99	113	115	121	135	151						
		102	55	59	66	73	79	87	98	102	118	118	127	144						
		108	55	60	65	69	78	87	91	105	107	119	120	140	160					
		120	56	62	67	71	78	87	93	100	110	112	125	133	149	168				
	18N@ 5.56	84	55	61	70	81	94	102	109	118	134	144								
		96	55	60	65	72	84	97	100	114	120	124	140							
		102	56	61	66	73	84	89	102	112	118	125	137	154						
		108	57	60	68	73	82	91	104	106	119	121	130	148						
		120	59	64	69	75	84	88	98	108	113	122	129	142	163					
	20N@ 5.00	84	58	66	77	94	103	109	118	134	146									
		96	60	65	73	83	99	108	115	123	125	144	153							
		102	59	65	71	80	89	103	114	121	129	147	147							
		108	60	67	71	80	89	106	110	123	126	134	149	164						
		120	68	73	90	101	108	113	123	133	152	155	166	182	200					

ASD

GIRDER SPAN (ft.)	JOIST SPACES (ft.)	GIRDER DEPTH (in.)	JOIST GIRDER WEIGHT – POUNDS PER LINEAR FOOT LOAD ON EACH PANEL POINT – KIPS																	
			4	5	6	7	8	9	10	11	12	13	14	16	18	20	22	24	26	28
110	10N@ 11.00	84	54	58	61	65	69	73	82	83	94	99	100	120	143	144				
		96	62	62	63	65	69	72	81	82	91	97	98	107	125					
		108	63	63	64	67	69	72	75	82	86	91	95	105	113	131	133			
		114	63	64	67	68	72	73	76	79	86	88	96	108	115	133	136			
		120	64	64	66	69	72	74	76	81	83	88	90	100	111	128	137	140		
	12N@ 9.17	84	58	62	66	70	74	84	88	101	109	120	122	144						
		96	57	62	66	70	74	79	88	92	101	107	125	127	151					
		108	58	64	68	72	75	79	84	90	95	106	111	132	136	158				
		114	59	65	66	71	75	79	84	89	102	106	107	126	134	156	158			
		120	59	62	67	72	74	79	82	91	96	107	109	126	135	158	161			
	14N@ 7.86	84	60	66	71	76	84	97	102	122	123	134	147							
		96	60	65	69	74	83	95	100	105	124	125	136	150						
		108	60	64	69	72	78	87	99	103	108	120	128	142	155					
		114	61	65	69	74	79	84	93	103	105	111	124	133	157					
		120	60	66	69	74	80	82	90	96	106	109	126	135	158	160				
	16N@ 6.88	96	62	68	72	79	89	104	106	125	126	147	149							
		102	63	67	74	80	89	103	108	125	127	128	152	156						
		108	64	68	73	81	83	95	104	110	127	130	142	158						
		114	65	70	74	80	86	95	105	111	114	132	135	161	162					
		120	66	69	75	81	88	97	99	109	117	135	138	152	165					
	18N@ 6.11	96	64	71	77	87	99	106	125	127	148	151								
		102	66	70	80	89	101	109	127	128	139	152	153							
		108	66	71	77	83	94	106	111	129	131	144	157							
		114	67	73	79	85	97	107	113	132	134	137	159	163						
		120	68	74	79	88	91	101	110	118	136	139	152	166						
	20N@ 5.50	96	68	77	82	99	106	125	139	152	154									
		102	69	75	81	94	109	129	130	142	154	155								
		108	69	77	83	94	106	114	132	133	145	157	169							
		114	69	77	86	91	101	115	134	135	147	160	161							
		120	66	72	77	83	93	106	113	126	128	137	154	167						
120	10N@ 12.00	96	63	66	69	72	76	78	82	86	89	89	94	108	115	129				
		102	64	67	69	71	75	79	83	83	86	91	92	110	117	131	137			
		108	78	79	82	83	83	83	86	91	95	94	100	108	126					
		114	78	79	82	83	83	84	86	91	90	95	95	109	127	128				
		120	79	81	83	84	84	85	86	88	92	92	97	102	113	133				
	12N@ 10.00	96	68	69	71	77	82	86	90	99	100	113	125	130						
		102	68	69	72	78	80	85	88	96	101	102	116	130						
		108	69	70	72	75	81	86	90	91	99	103	105	128	134					
		114	70	70	71	75	82	86	87	92	95	100	130	121	135					
		120	70	71	72	76	80	84	88	92	93	102	107	123	133	138				
	15N@ 8.00	96	69	74	77	82	90	96	109	115	125	129	134							
		102	70	73	78	84	88	93	103	113	118	129	132							
		108	70	73	80	85	90	95	101	106	115	119	133							
		114	70	73	78	83	88	93	98	107	117	121	122	137						
		120	72	74	78	84	89	94	99	100	110	118	124	140						
	16N@ 7.50	96	70	76	80	85	90	100	109	114	128	134								
		102	70	74	78	86	92	97	110	112	120	131	137							
		108	70	74	80	85	90	95	100	114	120	124	133							
		114	70	73	81	86	91	96	101	107	117	122	135	145						
		120	70	75	79	85	90	94	99	103	118	119	126	147						
	18N@ 6.67	96	71	77	85	89	95	109	116	129	136									
		102	72	78	83	87	97	111	113	121	138	138								
		108	72	79	84	88	94	101	115	121	156	157								
		114	72	76	85	90	96	102	116	117	123	136	143							
		120	73	77	84	89	95	99	105	118	125	129	140							
	20N@ 6.00	96	76	82	89	94	110	116	130	136										
		102	75	83	87	92	105	114	123	140	150									
		108	75	81	88	94	101	115	121	135	142	152								
		114	77	82	87	93	103	113	119	128	138	146								
		120	77	84	90	96	102	107	121	124	133	148	150							
	24N@ 5.00	96	83	90	96	111	121	136												
		102	81	88	99	108	118	140	151											
		108	83	91	96	103	119	129	147	157										
		114	86	96	109	121	141	143	152	160										
		120	86	97	107	117	143	146	152	163	165									

STANDARD SPECIFICATIONS
FOR OPEN WEB STEEL JOISTS, K-SERIES

Adopted by the Steel Joist Institute November 4, 1985
Revised to November 10, 2003 - Effective March 01, 2005

SECTION 1.
SCOPE

This specification covers the design, manufacture and use of Open Web Steel Joists, **K**-Series. Load and Resistance Factor Design (LRFD) and Allowable Strength Design (ASD) are included in this specification.

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 this specification 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 13.1 "Yield Point", and in paragraph 13.2 "Yield Strength", of ASTM A370, *Standard Test Methods and Definitions for Mechanical Testing of Steel Products*, or as specified in paragraph 3.2 of this specification.

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:

- Carbon 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.
- High-Strength Low-Alloy Columbium-Vanadium Structural Steel, ASTM A572/A572M, Grade 42 and 50.
- High-Strength Low-Alloy Structural Steel with 50 ksi (345 MPa) Minimum Yield Point to 4 inches (100 mm) Thick, ASTM A588/A588M.
- Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Corrosion Resistance, ASTM A606.
- Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, ASTM A1008/A1008M
- Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, ASTM A1011/A1011M

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, the test specimens and procedures 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 millimeters) for sheet and strip, or (b) 18 percent in 8 inches (203 millimeters) 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/A6M for plates, shapes, and bars; and ASTM A606, A1008/A1008M and A1011/A1011M 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 the AISI North American Specifications for the Design of Cold-Formed Steel Structural Members. They shall also indicate compliance with these provisions and with the following additional requirements:

a) The yield strength calculated from the test data 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 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, SSPC No. 15.

b) Or, shall be a shop paint which meets the minimum performance requirements of the above listed specification.

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:

a) Where the steel used consists of hot-rolled shapes, bars or plates, use the American Institute of Steel Construction, *Specification for Structural Steel Buildings*.

b) For members that are cold-formed from sheet or strip steel, use the American Iron and Steel Institute, *North American Specification for the Design of Cold-Formed Steel Structural Members*.

Design Basis:

Designs shall be made according to the provisions in this Specification for either Load and Resistance Factor Design (LRFD) or for Allowable Strength Design (ASD).

Load Combinations:

LRFD:

When load combinations are not specified to the joist manufacturer, the required stress shall be computed for the factored loads based on the factors and load combinations as follows:

1.4D

1.2D + 1.6 (L, or L_r, or S, or R)

ASD:

When load combinations are not specified to the joist manufacturer, the required stress shall be computed based on the load combinations as follows:

D

D + (L, or L_r, or S, or R)

Where:

D = dead load due to the weight of the structural elements and the permanent features of the structure

L = live load due to occupancy and movable equipment

L_r = roof live load

S = snow load

R = load due to initial rainwater or ice exclusive of the ponding contribution

When special loads are specified and the specifying professional does not provide the load combinations, the provisions of ASCE 7, *"Minimum Design Loads for Buildings and Other Structures"* shall be used for LRFD and ASD load combinations.

4.2 DESIGN AND ALLOWABLE STRESSES

Design Using Load and Resistance Factor Design (LRFD)

Joists shall have their components so proportioned that the required stresses, f_u, shall not exceed ϕF_n where,

f_u	=	required stress	ksi (MPa)
F_n	=	nominal stress	ksi (MPa)
ϕ	=	resistance factor	
ϕF_n	=	design stress	

Design Using Allowable Strength Design (ASD)

Joists shall have their components so proportioned that the required stresses, f, shall not exceed F_n / Ω where,

f	=	required stress	ksi (MPa)
F_n	=	nominal stress	ksi (MPa)
Ω	=	safety factor	
F_n/Ω	=	allowable stress	

Stresses:

(a) Tension: $\phi_t = 0.90$ (LRFD) $\Omega = 1.67$ (ASD)

For Chords: $F_y = 50$ ksi (345 MPa)

For Webs: $F_y = 50$ ksi (345 MPa), or $F_y = 36$ ksi (250 MPa)

Design Stress = $0.9F_y$ (LRFD) (4.2-1)

Allowable Stress = $0.6F_y$ (ASD) (4.2-2)

(b) Compression: $\phi_c = 0.90$ (LRFD) $\Omega_c = 1.67$ (ASD)

For members with $\frac{\ell}{r} \le 4.71\sqrt{\frac{E}{QF_y}}$

$$F_{cr} = Q\left[0.658^{\left(\frac{QF_y}{F_e}\right)}\right]F_y \qquad (4.2\text{-}3)$$

For members with $\frac{\ell}{r} > 4.71\sqrt{\frac{E}{QF_y}}$

$$F_{cr} = 0.877F_e \qquad (4.2\text{-}4)$$

Where F_e = Elastic buckling stress determined in accordance with Equation 4.2-5.

$$F_e = \frac{\pi^2 E}{\left(\frac{\ell}{r}\right)^2} \qquad (4.2\text{-}5)$$

For hot-rolled sections, "Q" is the full reduction factor for slender compression elements.

Design Stress = $0.9F_{cr}$ (LRFD) (4.2-6)

Allowable Stress = $0.6F_{cr}$ (ASD) (4.2-7)

In the above equations, ℓ is taken as the distance in inches (millimeters) between panel points for the chord members and the appropriate length 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).

Use 1.2 ℓ/r_x for a crimped, first primary compression web member when a moment-resistant weld group is not used for this member; where r_x = member radius of gyration in the plane of the joist.

For cold-formed sections the method of calculating the nominal column strength is given in the AISI, *North American Specification for the Design of Cold-Formed Steel Structural Members.*

(c) Bending: $\phi_b = 0.90$ (LRFD) $\Omega_b = 1.67$ (ASD)

Bending calculations are to be based on using the elastic section modulus.

For chords and web members other than solid rounds:
$F_y = 50$ ksi (345 MPa)

Design Stress = $0.9F_y$ (LRFD) (4.2-8)

Allowable Stress = $0.6F_y$ (ASD) (4.2-9)

For web members of solid round cross section:
$F_y = 50$ ksi (345 MPa), or $F_y = 36$ ksi (250 MPa)

Design Stress = $1.45F_y$ (LRFD) (4.2-10)

Allowable Stress = $0.95F_y$ (ASD) (4.2-11)

For bearing plates:
$F_y = 50$ ksi (345 MPa), or $F_y = 36$ ksi (250 MPa)

Design Stress = $1.35F_y$ (LRFD) (4.2-12)

Allowable Stress = $0.90F_y$ (ASD) (4.2-13)

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

4.4 MEMBERS

(a) Chords

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

The radius of gyration of the top chord about its vertical axis shall not be less than ℓ/145 where ℓ is the spacing in inches (millimeters) between lines of bridging as specified in Section 5.4(c).

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

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:

For LRFD:

at the panel point:

$$f_{au} + f_{bu} \le 0.9F_y \qquad (4.4\text{-}1)$$

at the mid panel: for $\frac{f_{au}}{\phi_c F_{cr}} \ge 0.2$,

$$\frac{f_{au}}{\phi_c F_{cr}} + \frac{8}{9}\left[\frac{C_m f_{bu}}{\left[1-\left(\frac{f_{au}}{\phi_c F_e}\right)\right] Q\phi_b F_y}\right] \le 1.0 \qquad (4.4\text{-}2)$$

for $\frac{f_{au}}{\phi_c F_{cr}} < 0.2$,

$$\left(\frac{f_{au}}{2\phi_c F_{cr}}\right) + \left[\frac{C_m f_{bu}}{\left[1-\left(\frac{f_{au}}{\phi_c F_e}\right)\right] Q\phi_b F_y}\right] \le 1.0 \qquad (4.4\text{-}3)$$

f_{au} = P_u/A = Required compressive stress, ksi (MPa)

P_u = Required axial strength using LRFD load combinations, kips (N)

f_{bu} = M_u/S = Required bending stress at the location under consideration, ksi (MPa)

M_u = Required flexural strength using LRFD load combinations, kip-in. (N-mm)

S = Elastic Section Modulus, in.^{3} (mm^3)

F_{cr} = Nominal axial compressive stress in ksi (MPa) based on ℓ/ r as defined in Section 4.2(b),

C_m = 1 - 0.3 $f_{au}/\phi F_e$ for end panels

C_m = 1 - 0.4 $f_{au}/\phi F_e$ for interior panels

F_y = Specified minimum yield strength, ksi (MPa)

$F_e = \dfrac{\pi^2 E}{\left(\ell / r_x\right)^2}$, ksi (MPa)

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

Q = Form factor defined in Section 4.2(b)

A = Area of the top chord, in.^{2} (mm^2)

For ASD:

at the panel point:

$$f_a + f_b \le 0.6F_y \qquad (4.4\text{-}4)$$

at the mid panel: for $\frac{f_a}{F_a} \ge 0.2$,

$$\frac{f_a}{F_a} + \frac{8}{9}\left[\frac{C_m f_b}{\left[1-\left(\frac{1.67 f_a}{F_e}\right)\right] QF_b}\right] \le 1.0 \qquad (4.4\text{-}5)$$

for $\frac{f_a}{F_a} < 0.2$,

$$\left(\frac{f_a}{2F_a}\right) + \left[\frac{C_m f_b}{\left[1-\left(\frac{1.67 f_a}{F_e}\right)\right] QF_b}\right] \le 1.0 \qquad (4.4\text{-}6)$$

f_a = P/A = Required compressive stress, ksi (MPa)

P = Required axial strength using ASD load combinations, kips (N)

f_b = M/S = Required bending stress at the location under consideration, ksi (MPa)

M = Required flexural strength using ASD load combinations, kip-in. (N-mm)

S = Elastic Section Modulus, in.^{3} (mm^3)

F_a = Allowable axial compressive stress based on ℓ/r as defined in Section 4.2(b), ksi (MPa)

F_b = Allowable bending stress; $0.6F_y$, ksi (MPa)

C_m = 1 - 0.50 f_a/F_e for end panels

C_m = 1 - 0.67 f_a/F_e for interior panels

(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 percent 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 an additional axial load of 1/2 of 1.0 percent of the top chord axial force.

(c) Extended Ends

The magnitude and location of the loads to be supported, deflection requirements, and proper bracing of extended

top chords or full depth cantilever ends 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 accredited methods.

(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 (2 millimeters) for welds oriented parallel to the principal stress.

f) The sum of surface (piping) porosity diameters shall not exceed 1/16 inch (2 millimeters) in any 1 inch (25 millimeters) of design weld length.

g) Weld spatter that does not interfere with paint coverage is acceptable.

(2) Welding Program

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

(1) Joint Connections - Joint connections shall be capable of withstanding forces due to an ultimate load equal to at least 1.35 times the LRFD, or 2.0 times the ASD load shown in the applicable Standard Load Table.

(2) Shop 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 the splice.

(c) 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 CAMBER

Joists shall have approximate camber in accordance with the following:

TABLE 4.6-1

Top Chord Length		Approximate Camber	
20'-0"	(6096 mm)	1/4"	(6 mm)
30'-0"	(9144 mm)	3/8"	(10 mm)
40'-0"	(12192 mm)	5/8"	(16 mm)
50'-0"	(15240 mm)	1"	(25 mm)
60'-0"	(18288 mm)	1 1/2"	(38 mm)

The specifying professional shall give consideration to coordinating joist camber with adjacent framing.

4.7 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 the design, in accordance with Sections 4.1 through 4.5 of this specification, will provide the theoretical strength 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.

(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 their 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 guarantee of the quality of any specific joists; this responsibility lies fully and solely with the individual manufacturer.

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 required 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 millimeters) over the masonry or concrete support and be anchored to the steel bearing plate. The plate shall be located not more than 1/2 inch (13 millimeters) from the face of the wall and shall be not less than 6 inches (152 millimeters) wide perpendicular to the length of the joist. The plate is to be designed by the specifying professional and shall be furnished by other than the joist manufacturer.

Where it is deemed necessary to bear less than 4 inches (102 millimeters) 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 2 1/2 inches (64 millimeters) on the steel bearing plate.

(b) Steel

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

5.4 BRIDGING

Top and bottom chord bridging is required and shall consist of one or both of the following types.

(a) Horizontal

Horizontal bridging shall consist of continuous horizontal steel members. Attachments to the joist chords shall be made by welding or mechanical means and shall be capable of resisting a nominal (unfactored) horizontal force of not less than 700 pounds (3114 Newtons).

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.

(b) Diagonal

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

(c) Quantity and Spacing

The number of rows of top chord bridging shall not be less than as shown in Bridging Tables 5.4-1 and 5.4-2 and the spacing shall meet the requirements of Section 4.4(a). The number of rows of bottom chord bridging, including bridging required per Section 5.11, shall not be less than the number of top chord rows. Rows of bottom chord bridging are permitted to be spaced independently of rows of top chord bridging. The spacing of rows of bottom chord bridging shall meet the slenderness requirement of Section 4.3 and any specified strength requirements.

(d) Bottom Chord Bearing Joists

Where bottom chord bearing joists are utilized, a row of diagonal bridging shall be provided near the support(s). This bridging shall be installed and anchored before the hoisting cable(s) is released.

TABLE 5.4-1

U. S. UNITS

NUMBER OF ROWS OF TOP CHORD BRIDGING**

Refer to the **K**-Series Load Table and Specification Section 6 for required bolted diagonal bridging.
Distances are Joist Span lengths in feet - See "Definition of Span" preceding Load Table.

*Section Number	One Row	Two Rows	Three Rows	Four Rows	Five 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.

TABLE 5.4-2

METRIC UNITS

NUMBER OF ROWS OF TOP CHORD BRIDGING**

Refer to the **K**-Series Metric Load Table and Specification Section 6 for required bolted diagonal bridging.
Distances are Joist Span lengths in millimeters - See "Definition of Span" preceding Load Table.

*Section Number	One Row	Two Rows	Three Rows	Four Rows	Five Rows
#1	up thru 4877	Over 4877 thru 7315	Over 7315 thru 8534		
#2	up thru 5182	Over 5182 thru 7620	Over 7620 thru 9754		
#3	up thru 5486	Over 5486 thru 8534	Over 8534 thru 11582	Over 11582 thru 12192	
#4	up thru 5791	Over 5791 thru 8534	Over 8534 thru 11582	Over 11582 thru 14630	
#5	up thru 5791	Over 5791 thru 8839	Over 8839 thru 11887	Over 11887 thru 15240	Over 15240 thru 15850
#6	up thru 5791	Over 5791 thru 8839	Over 8839 thru 11887	Over 11887 thru 15545	Over 15545 thru 17069
#7	up thru 6096	Over 6096 thru 10058	Over 10058 thru 13716	Over 13716 thru 17678	Over 17678 thru 18288
#8	up thru 6096	Over 6096 thru 10058	Over 10058 thru 13716	Over 13716 thru 17678	Over 17678 thru 18288
#9	up thru 6096	Over 6096 thru 10058	Over 10058 thru 14021	Over 14021 thru 17983	Over 17983 thru 18288
#10	up thru 6096	Over 6096 thru 11278	Over 11278 thru 15545	Over 15545 thru 18288	
#11	up thru 6096	Over 6096 thru 11582	Over 11582 thru 16154	Over 16154 thru 18288	
#12	up thru 6096	Over 6096 thru 11887	Over 11887 thru 16154	Over 16154 thru 18288	

* Last digit(s) of joist designation shown in Load Table
** See Section 5.11 for additional bridging required for uplift design.

5.5 INSTALLATION OF BRIDGING

Bridging shall support the top and bottom chords against lateral movement during the construction period and shall hold the steel joists in the approximate position as shown on the joist placement 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 1/8 inch (3 millimeters) fillet welds 1 inch (25 millimeters) long, or with two 1/2 inch (13 millimeters) ASTM A307 bolts, or the equivalent.

(b) Steel

Ends of **K**-Series Joists resting on steel supports shall be attached thereto with a minimum of two 1/8 inch (3 millimeters) fillet welds 1 inch (25 millimeters) long, or with two 1/2 inch (13 millimeters) ASTM A307 bolts, or the equivalent. When **K**-Series Joists are used to provide lateral stability to the supporting member, the final connection shall be made by welding or as designated by the specifying professional.

(c) Uplift

Where uplift forces are a design consideration, roof joists shall be anchored to resist such forces (Refer to Section 5.11 Uplift).

5.7 JOIST SPACING

Joists shall be spaced so that the loading on each joist does not exceed the design load (LRFD or ASD) for the particular joist designation and span as shown in the applicable load tables.

5.8 FLOOR AND ROOF DECKS

(a) Material

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

(b) Thickness

Cast-in-place slabs shall be not less than 2 inches (51 millimeters) 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

The spacing for slab or deck attachments along the joist top chord shall not exceed 36 inches (914 millimeters), and shall be capable of resisting a nominal (unfactored) lateral force of not less than 300 pounds (1335 Newtons), i.e., 100 plf (1.46 kN/m).

(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).

(g) Joist With Standing Seam Roofing

The stiffness and strength of standing-seam roof clips varies from one manufacturer to another. Therefore, some roof systems cannot be counted on to provide lateral stability to the joists which support the roof. Sufficient stability must be provided to brace the joists laterally under the full design load. The compression chord must resist the chord axial design force in the plane of the joist (i.e., x-x axis buckling) and out of the plane of the joist (i.e., y-y axis buckling). Out-of-plane strength may be achieved by adjusting the bridging spacing and/or increasing the compression chord area, the joist depth, and the y-axis radius of gyration. The effective slenderness ratio in the y-direction equals 0.94 L/r_y; where L is the bridging spacing in inches (millimeters). The maximum bridging spacing may not exceed that specified in Section 5.4(c).

Horizontal bridging members attached to the compression chords and their anchorage's must be designed for a compressive axial force of 0.0025nP, where n is the number of joists between end anchors and P is the chord design force in kips (Newtons). The attachment force between the horizontal bridging member and the compression chord is 0.005P. Horizontal bridging attached to the tension chords shall be proportioned so that the slenderness ratio between attachments does not exceed 300. Diagonal bridging shall be proportioned so that the slenderness ratio between attachments does not exceed 200.

5.9 DEFLECTION

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

Floors: 1/360 of span.

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

The specifying professional shall give 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*

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" and AISC Specifications.

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). The contract documents shall indicate if the net uplift is based upon LRFD or ASD. 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 verify 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, they may reserve the right to do so in their "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.

5.13 PARALLEL CHORD SLOPED JOISTS

The span of a parallel chord sloped joist shall be defined by the length along the slope. Minimum depth, load-carrying capacity, and bridging requirements shall be determined by the sloped definition of span. The Standard Load Table capacity shall be the component normal to the joist.

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.

(a) Stability Requirements

1) Before an employee is allowed on the steel joist: BOTH ends of joists at columns (or joists designated as column joists) shall be attached to its supports. For all other joists a minimum of one end shall be attached before the employee is allowed on the joist. The attachment shall be in accordance with Section 5.6 – End Anchorage.

   When a bolted seat connection is used for erection purposes, as a minimum, the bolts must be snug tightened. The snug tight condition is defined as the tightness that exists when all plies of a joint are in firm contact. This may be attained by a few impacts of an impact wrench or the full effort of an employee using an ordinary spud wrench.

2) On steel joists that do not require erection bridging as shown by the unshaded area of the Load Tables, only one employee shall be allowed on the steel joist unless all bridging is installed and anchored.

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

3) Where the span of the steel joist is within the Red shaded area of the Load Table, the following shall apply:

   a) The row of bridging nearest the mid span of the steel joists shall be bolted diagonal erection bridging; and

   b) Hoisting cables shall not be released until this bolted diagonal erection bridging is installed and anchored, unless an alternate method of stabilizing the joist has been provided; and

   c) No more than one employee shall be allowed on these spans until all other bridging is installed and anchored.

4) When permanent bridging terminus points cannot be used during erection, additional temporary bridging terminus points are required to provide stability.

5) In the case of bottom chord bearing joists, the ends of the joist must be restrained laterally per Section 5.4(d).

6) 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) Landing and Placing Loads

1) Except as stated in paragraphs 6(b)(3) and 6(b)(4) of this section, no "construction loads"[1] are allowed on the steel joists until all bridging is installed and anchored, and all joist bearing ends are attached.

2) During the construction period, loads placed on the steel joists shall be distributed so as not to exceed the capacity of the steel joists.

3) The weight of a bundle of joist bridging shall not exceed a total of 1000 pounds (454 kilograms). The bundle of joist bridging shall be placed on a minimum of 3 steel joists that are secured at one end. The edge of the bridging bundle shall be positioned within 1 foot (0.30 m) of the secured end.

   [1] See Appendix E for definition of "construction load". A copy of the OSHA Steel Erection Standard §1926.757, Open Web Steel Joists, is included in Appendix E for reference purposes.

4) No bundle of deck may be placed on steel joists until all bridging has been installed and anchored and all joist bearing ends attached, unless the following conditions are met:

   a) The contractor has first determined from a *"qualified person"* [2] and documented in a site-specific erection plan that the structure or portion of the structure is capable of supporting the load;

   b) The bundle of decking is placed on a minimum of 3 steel joists;

   c) The joists supporting the bundle of decking are attached at both ends;

   d) At least one row of bridging is installed and anchored;

   e) The total weight of the decking does not exceed 4000 pounds (1816 kilograms); and

   f) The edge of the decking shall be placed within 1 foot (0.30 meters) of the bearing surface of the joist end.

   g) The edge of the construction load shall be placed within 1 foot (0.30 meters) of the bearing surface of the joist end.

(c) Field Welding

1) All field welding shall be performed in accordance with the contract documents. Field welding shall not damage the joists.

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.

(d) Handling

Care shall be exercised at all times to avoid damage to the joists and accessories.

(e) Fall Arrest Systems

Steel joists shall not be used as anchorage points for a fall arrest system unless written direction to do so is obtained from a *"qualified person"* [2].

[2] See Appendix E for OSHA definition of "qualified person".

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 Specification for **K**-Series Joists.

Standard **K**-Series Joists are designed for simple span uniform loading 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 825 plf (12030 N/m) LRFD or 550 plf (8020 N/m) ASD is used to check end panel bending.

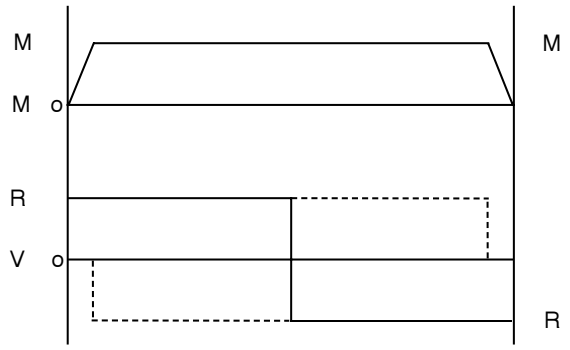
The web forces are determined based on a flat shear envelope. All webs are designed for a vertical shear equal to the specified shear capacity. Furthermore, all webs (except the first tension web which remains in tension under all simple span gravity loads) will be designed for 100% stress reversal.

Both LRFD and ASD 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 825 plf (12030 N/m) LRFD or 550 plf (8020 N/m) ASD 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 SJI Technical Digest #9 "Handling and Erection of Steel Joists and Joist Girders" for further information.

NOTE: In the following examples joist selection is based on minimum depth and minimum weight (plf, kg/m). Other selections may be more suitable for specific job conditions.

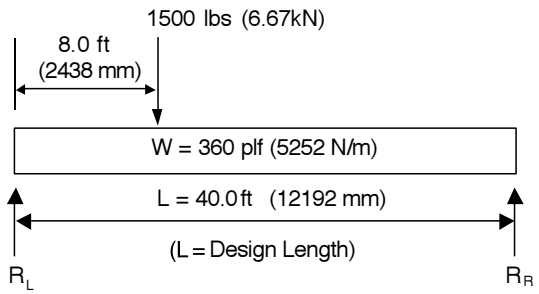


KCS JOIST
SHEAR AND MOMENT ENVELOPES

LRFD EXAMPLES

EXAMPLE 1

LRFD FACTORED LOADS



M = 938 in.-kip (105.9 kN-m)

R_L = 8400 lbs (37.37 kN), R_R = 7500 lbs (33.36 kN)

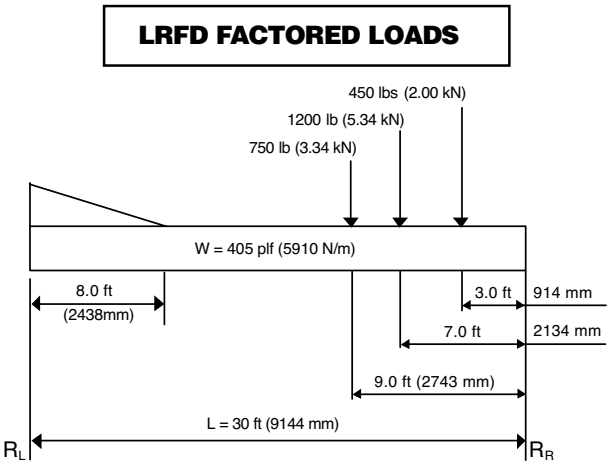
Select a 22KCS3, M = 987 in.-kip (111.5 kN-m)

R = 9900 lbs (44.0 kN)

Bridging section no. 9 for L = 40 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.

EXAMPLE 2



M = 664 in.-kip (75.03 kN-m)

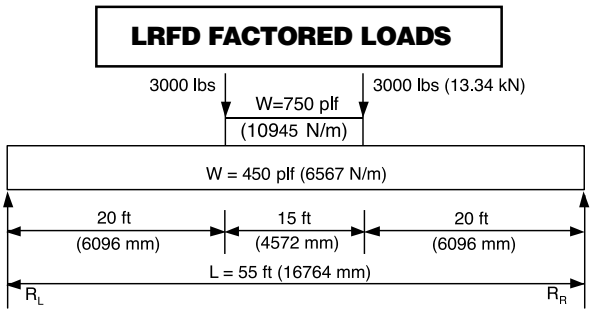
R_L = 7500 lbs (33.36 kN), R_R = 8010 lbs (35.63 kN)

Select a 22KCS2, M = 732 in.-kip (82.64 kN-m)
R = 8850 lbs (39.38 kN)

Bridging section no. 6 for L = 30 ft. (9144 mm)

Use 22K6 to determine bridging and stability requirements. Since the maximum *factored* uniform load of 639 plf (9318 N/m) (405 plf (5911 N/m) + 240 plf (3503 N/m)) does not exceed the maximum KCS Joist uniform load of 825 plf (12040 N/m) and a standard KCS Joist can be selected from the load table, a load diagram is not required.

EXAMPLE 3



M = 4365 in.-kip (492.81 kN-m)

$R_L = R_R$ = 21000 lbs (93.41 kN)

EXCEEDS CAPACITY OF 30KCS5 (MAXIMUM KCS JOIST AND EXCEEDS MAXIMUM *FACTORED* UNIFORM LOAD OF 825 plf (12040 N/m).

OPTION A: Use double joists each having a minimum M = 2183 in.-kip (246.65 kN-m) and R = 10500 lbs (46.71 kN) and a uniform load of 594 plf (8669 N/m).

Select two 28KCS5, M = 2556 in.-kip (288.7 kN-m), R = 13800 lbs (61.3 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:

$$W_M = \frac{8M}{L^2} = 962 \text{ plf (14.04 kN/m)}$$

$$W_V = \frac{2R}{L} = 764 \text{ plf (11.14 kN/m)}$$

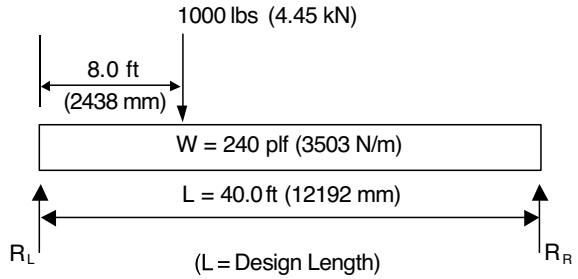
Use 962 plf (14.04 kN/m)

From the **LH**-Series LRFD Load Table select a 32LH13, W = 1035 plf (15.10 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.

ASD EXAMPLES

EXAMPLE 1



M = 625 in.-kip (70.6 kN-m)

R_L=5600 lbs (24.9 kN), R_R=5000 lbs (22.2 kN)

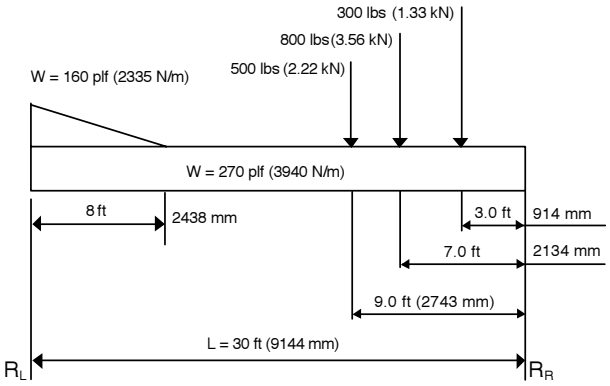
Select a 22KCS3, M = 658 in.-kip (74.3 kN-m)
R = 6600 lbs (29.3 kN)

Bridging section no. 9 for L = 40 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.

EXAMPLE 2



M = 443 in.-kip (50.1 kN-m)

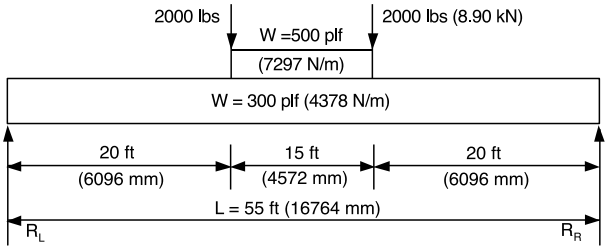
R_L = 5000 lbs (22.24 kN), R_R = 5340 lbs (23.75 kN)

Select a 22KCS2, M = 488 in.-kip (55.1 kN-m)
R = 5900 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 in.-kip (328.5 kN-m)

$R_L = R_R$ = 14000 lbs (62.28 kN)

EXCEEDS CAPACITY OF 30KCS5 (MAXIMUM KCS JOIST) AND EXCEEDS MAXIMUM UNIFORM LOAD OF 550 plf (8027 N/m).

OPTION A: Use double joists each having a minimum M = 1455 in.-kip (164.3 kN-m) and R = 7000 lbs (31.14 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:

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

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

Use 641 plf (9.35 kN/m)

From the **LH**-Series ASD 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.

STANDARD SPECIFICATIONS
FOR LONGSPAN STEEL JOISTS, LH-SERIES AND DEEP LONGSPAN STEEL JOISTS, DLH-SERIES

Adopted by the Steel Joist Institute February 15, 1978
Revised to November 10, 2003 - Effective March 01, 2005

SECTION 100.
SCOPE

This specification covers the design, manufacture and use of Longspan Steel Joists **LH**-Series, and Deep Longspan Steel Joists, **DLH**-Series. Load and Resistance Factor Design (LRFD) and Allowable Strength Design (ASD) are included in this specification.

SECTION 101.
DEFINITION

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

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

* The term "Yield Strength" as used herein shall designate the yield level of a material as determined by the applicable method outlined in paragraph 13.1, "Yield Point" and in paragraph 13.2, "Yield Strength", of ASTM Standard A370, "*Standard Test Methods and Definitions for Mechanical Testing of Steel Products*", or as specified in Section 102.2 of this Specification.

SECTION 102.
MATERIALS

102.1 STEEL

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

- Carbon 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.
- High-Strength Low-Alloy Columbium-Vanadium Structural Steel, ASTM A572/A572M Grade 42 or 50.
- High-Strength Low-Alloy Structural Steel with 50 ksi (345 MPa) Minimum Yield Point to 4 inches (100 mm) Thick, ASTM A588/A588M.
- Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Corrosion Resistance, ASTM A606.
- Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, ASTM A1008/A1008M
- Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, ASTM A1011/A1011M

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

102.2 MECHANICAL PROPERTIES

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

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

procedures 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 millimeters) for sheet and strip, or (b) 18 percent in 8 inches (203 millimeters) 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/A6M for plates, shapes, and bars; and ASTM A606, A1008/A1008M and A1011/A1011M 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 the AISI North American Specification for the Design of Cold-Formed Steel Structural Members. They shall also indicate compliance with these provisions and with the following additional requirements:

a) The yield strength calculated from the test data 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 its least radius of gyration.

d) If any test specimen fails to pass the requirements of 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.

102.3 WELDING ELECTRODES

The following electrodes shall be used for arc welding:

a) For connected members both having a specified yield strength greater than 36 ksi (250 MPa).

AWS A5.1: E70XX
AWS A5.5: E70XX-X
AWS A5.17: F7XX-EXXX, F7XX-ECXXX flux electrode combination
AWS A5.18: ER70S-X, E70C-XC, E70C-XM
AWS A5.20: E7XT-X, E7XT-XM
AWS A5.23: F7XX-EXXX-XX, F7XX-ECXXX-XX
AWS A5.28: ER70S-XXX, E70C-XXX
AWS A5.29: E7XTX-X, E7XTX-XM

b) For connected members both having a specified minimum yield strength of 36 ksi (250 MPa) or one having a specified minimum yield strength of 36 ksi (250 MPa), and the other having a specified minimum yield strength greater than 36 ksi (250 MPa).

AWS A5.1: E60XX
AWS A5.17: F6XX-EXXX, F6XX-ECXXX flux electrode combination
AWS A5.20: E6XT-X, E6XT-XM
AWS A5.29: E6XTX-X, E6XT-XM
or any of those listed in Section 102.3(a).

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

102.4 PAINT

The standard shop paint is 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, SSPC No. 15

b) Or, shall be a shop paint which meets the minimum performance requirements of the above listed specification.

SECTION 103.
DESIGN AND MANUFACTURE

103.1 METHOD

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

a) Where the steel used consists of hot-rolled shapes, bars or plates, use the American Institute of Steel Construction, *Specification for Structural Steel Buildings*.

b) For members that are cold-formed from sheet or strip steel, use the American Iron and Steel Institute, *North American Specification for the Design of Cold-Formed Steel Structural Members*.

Design Basis:

Designs shall be made according to the provisions in this Specification for either Load and Resistance Factor Design (LRFD) or for Allowable Strength Design (ASD).

Load Combinations:

LRFD:

When load combinations are not specified to the joist manufacturer, the required stress shall be computed for the

factored loads based on the factors and load combinations as follows:

1.4D

1.2D + 1.6 (L, or L_r, or S, or R)

ASD:

When load combinations are not specified to the joist manufacturer, the required stress shall be computed based on the load combinations as follows:

D

D + (L, or L_r, or S, or R)

Where:

D = dead load due to the weight of the structural elements and the permanent features of the structure

L = live load due to occupancy and movable equipment

L_r = roof live load

S = snow load

R = load due to initial rainwater or ice exclusive of the ponding contribution

When special loads are specified and the specifying professional does not provide the load combinations, the provisions of ASCE 7, *"Minimum Design Loads for Buildings and Other Structures"* shall be used for LRFD and ASD load combinations.

103.2 DESIGN AND ALLOWABLE STRESSES

Design Using Load and Resistance Factor Design (LRFD)

Joists shall have their components so proportioned that the required stresses, f_u, shall not exceed ϕF_n where,

f_u	=	required stress	ksi (MPa)
F_n	=	nominal stress	ksi (MPa)
ϕ	=	resistance factor	
ϕF_n	=	design stress	

Design Using Allowable Strength Design (ASD)

Joists shall have their components so proportioned that the required stresses, f, shall not exceed F_n / Ω where,

f	=	required stress	ksi (MPa)
F_n	=	nominal stress	ksi (MPa)
Ω	=	safety factor	
F_n/Ω	=	allowable stress	

Stresses:

(a) Tension: $\phi_t = 0.90$ (LRFD) $\Omega_t = 1.67$ (ASD)

For Chords: $F_y = 50$ ksi (345 MPa)

For Webs: $F_y = 50$ ksi (345 MPa), or $F_y = 36$ ksi (250 MPa)

Design Stress = $0.9F_y$ (LRFD) (103.2-1)

Allowable Stress = $0.6F_y$ (ASD) (103.2-2)

(b) Compression: $\phi_c = 0.90$ (LRFD) $\Omega_c = 1.67$ (ASD)

For members with $\frac{K\ell}{r} \le 4.71\sqrt{\frac{E}{QF_y}}$

$$F_{cr} = Q\left[0.658^{\left(\frac{QF_y}{F_e}\right)}\right]F_y \qquad (103.2\text{-}3)$$

For members with $\frac{K\ell}{r} > 4.71\sqrt{\frac{E}{QF_y}}$

$$F_{cr} = 0.877F_e \qquad (103.2\text{-}4)$$

Where, F_e = elastic buckling stress determined in accordance with Equation 103.2-5.

$$F_e = \frac{\pi^2 E}{\left(\frac{K\ell}{r}\right)^2} \qquad (103.2\text{-}5)$$

For hot-rolled sections, "Q" is the full reduction factor for slender compression elements.

Design Stress = $0.9F_{cr}$ (LRFD) (103.2-6)

Allowable Stress = $0.6F_{cr}$ (ASD) (103.2-7)

In the above equations, ℓ is taken as the distance in inches (millimeters) between panel points for the chord members and the appropriate length 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).

Use $1.2\,\ell/r_x$ for a crimped, first primary compression web member when a moment-resistant weld group is not used for this member; where = r_x member radius of gyration in the plane of the joist.

For cold-formed sections the method of calculating the nominal column strength is given in the AISI, *North American Specification for the Design of Cold-Formed Steel Structural Members*.

(c) Bending: $\phi_b = 0.90$ (LRFD) $\Omega_b = 1.67$ (ASD)

Bending calculations are to be based on using the elastic section modulus.

For chords and web members other than solid rounds: $F_y = 50$ ksi (345 MPa)

Design Stress = $0.9F_y$ (LRFD) (103.2-8)

Allowable Stress = $0.6F_y$ (ASD) (103.2-9)

For web members of solid round cross section: $F_y = 50$ ksi (345 MPa), or $F_y = 36$ ksi (250 MPa)

Design Stress = $1.45F_y$ (LRFD) (103.2-10)

Allowable Stress = $0.95F_y$ (ASD) (103.2-11)

For bearing plates: $F_y = 50$ ksi (345MPa), or $F_y = 36$ ksi (250MPa)

Design Stress = $1.35F_y$ (LRFD) (103.2-12)

Allowable Stress = $0.9F_y$ (ASD) (103.2-13)

(d) Weld Strength:

Shear at throat of fillet welds:

Nominal Shear Stress = $F_{nw} = 0.6F_{exx}$ (103.2-14)

LRFD: $\phi_w = 0.75$

Design Shear Strength = $\phi R_n = \phi_w F_{nw} A = 0.45F_{exx} A$ (103.2-15)

ASD: $\Omega_w = 2.0$

Allowable Shear Strength = $R_n/\Omega_w = F_{nw}A/\Omega_w = 0.3F_{exx} A$ (103.2-16)

A = effective throat area

Made with E70 series electrodes or F7XX-EXXX flux-electrode combinations.....$F_{exx} = 70$ ksi (483 MPa)

Made with E60 series electrodes or F6XX-EXXX flux-electrode combinations.....$F_{exx} = 60$ ksi (414 MPa)

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

103.3 MAXIMUM SLENDERNESS RATIOS

The slenderness ratios, $1.0\,\ell/r$ and $1.0\,\ell_s/r$ of members as a whole or any component part shall not exceed the values given in Table 103.3-1, Parts A.

The effective slenderness ratio, $K\ell/r^*$, to be used in calculating the nominal stresses F_{cr} and F'_e, is the largest value as determined from Table 103.3-1, Parts B and C.

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

The terms used in Table 103.3-1 are defined as follows:

ℓ = Length center-to-center of panel points, except $\ell = 36$ in. (914 mm) for calculating ℓ/r_y of top chord member.

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

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

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

r_z =least radius of gyration of a member component.

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

TABLE 103.3-1
MAXIMUM AND EFFECTIVE SLENDERNESS RATIOS

I TOP CHORD INTERIOR PANEL

A. The slenderness ratios, 1.0 ℓ/r and 1.0 ℓ_s/r, of members as a whole or any component part shall not exceed 90.

B. *The effective slenderness ratio to determine* "F_{cr}"

1. With fillers or ties	0.75 ℓ/r_x	1.0 ℓ/r_y		1.0 ℓ_s/r_z
2. Without fillers or ties			0.75 ℓ/r_z	
3. Single component members	0.75 ℓ/r_x	1.0 ℓ/r_y		

C. *The effective slenderness ratio to determine* "F'_e"

1. With fillers or ties	0.75 ℓ/r_x
2. Without fillers or ties	0.75 ℓ/r_x
3. Single component members	0.75 ℓ/r_x

II TOP CHORD END PANEL

A. The slenderness ratios, 1.0 ℓ/r and 1.0 ℓ_s/r, of members as a whole or any component part shall not exceed 120.

B. *The effective slenderness ratio to determine* "F_{cr}"

1. With fillers or ties	1.0 ℓ/r_x	1.0 ℓ/r_y		1.0 ℓ_s/r_z
2. Without fillers or ties			1.0 ℓ/r_z	
3. Single component members	1.0 ℓ/r_x	1.0 ℓ/r_y		

C. *The effective slenderness ratio to determine* "F'_e"

1. With fillers or ties	1.0 ℓ/r_x
2. Without fillers or ties	1.0 ℓ/r_x
3. Single component members	1.0 ℓ/r_x

III TENSION MEMBERS - CHORDS AND WEBS

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

IV COMPRESSION WEB MEMBERS

A. The slenderness ratios, 1.0 ℓ/r and 1.0 ℓ_s/r, of members as a whole or any component part shall not exceed 200.

B. *The effective slenderness ratio to determine* "F_{cr}"

1. With fillers or ties	0.75 ℓ/r_x	1.0 ℓ/r_y		1.0 ℓ_s/r_z
2. Without fillers or ties			1.0 ℓ/r_z	
3. Single component members	0.75 ℓ/r_x*	1.0 ℓ/r_y		

* Use 1.2 ℓ/r_x for a crimped, first primary compression web member when a moment-resistant weld group is not used for this member.

103.4 MEMBERS

(a) Chords

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

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

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

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

For LRFD:

at the panel point:

$$f_{au} + f_{bu} \le 0.9F_y \qquad (103.4\text{-}1)$$

at the mid panel: for $\dfrac{f_{au}}{\phi_c F_{cr}} \ge 0.2$,

$$\frac{f_{au}}{\phi_c F_{cr}} + \frac{8}{9}\left[\frac{C_m f_{bu}}{\left[1-\left(\dfrac{f_{au}}{\phi_c F'_e}\right)\right] Q\phi_b F_y}\right] \le 1.0 \qquad (103.4\text{-}2)$$

for $\dfrac{f_{au}}{\phi_c F_{cr}} < 0.2$,

$$\left(\frac{f_{au}}{2\phi_c F_{cr}}\right) + \left[\frac{C_m f_{bu}}{\left[1-\left(\dfrac{f_{au}}{\phi_c F'_e}\right)\right] Q\phi_b F_y}\right] \le 1.0 \qquad (103.4\text{-}3)$$

f_{au} = P_u/A = Required compressive stress, ksi (MPa)

P_u = Required axial strength using LRFD load combinations, kips (N)

f_{bu} = M_u/S = Required bending stress at the location under consideration, ksi (MPa)

M_u = Required flexural strength using LRFD load combinations, kip-in. (N-mm)

S = Elastic Section Modulus, in.^{3} (mm^3)

F_{cr} = Nominal axial compressive stress in ksi (MPa) based on ℓ/r as defined in Section 103.2(b)

$C_m = 1 - 0.3\, f_{au}/\phi F'_e$ for end panels

$C_m = 1 - 0.4\, f_{au}/\phi F'_e$ for interior panels

F_y = Specified minimum yield strength, ksi (MPa)

$F'_e = \dfrac{\pi^2 E}{\left(K\ell/r_x\right)^2}$, ksi (MPa)

Where ℓ is the panel length,in inches (millimeters), as defined in Section 103.2(b) and r_x is the radius of gyration about the axis of bending.

Q = Form factor defined in Section 103.2(b)

A = Area of the top chord, in.^{2}, (mm^2)

For ASD:

at the panel point:

$$f_a + f_b \le 0.6F_y \qquad (103.4\text{-}4)$$

at the mid panel: for $\dfrac{f_a}{F_a} \ge 0.2$,

$$\frac{f_a}{F_a} + \frac{8}{9}\left[\frac{C_m f_b}{\left[1-\left(\dfrac{1.67f_a}{F'_e}\right)\right] QF_b}\right] \le 1.0 \qquad (103.4\text{-}5)$$

for $\dfrac{f_a}{F_a} < 0.2$,

$$\left(\frac{f_a}{2F_a}\right) + \left[\frac{C_m f_b}{\left[1-\left(\dfrac{1.67f_a}{F'_e}\right)\right] QF_b}\right] \le 1.0 \qquad (103.4\text{-}6)$$

f_a = P/A = Required compressive stress, ksi (MPa)

P = Required axial strength using ASD load combinations, kips (N)

f_b = M/S = Required bending stress at the location under consideration, ksi (MPa)

M = Required flexural strength using ASD load combinations, kip-in. (N-mm)

S = Elastic Section Modulus, in.^{3} (mm^3)

F_a = Allowable axial compressive stress, based on ℓ/r as defined in Section 103.2(b), ksi (MPa)

F_b = Allowable bending stress; $0.6F_y$, ksi (MPa)

$C_m = 1 - 0.50\, f_a/F'_e$ for end panels

$C_m = 1 - 0.67\, f_a/F'_e$ for interior panels

(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 percent of the end reaction.

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

(c) Depth

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

(d) Eccentricity

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

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

(e) Extended Ends

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

103.5 CONNECTIONS

(a) Methods

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

(1) Welded Connections

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

b) Cracks are not acceptable and shall be repaired.

c) Thorough fusion shall exist between layers of weld metal and between weld metal and base metal for the required design length of the weld; such fusion shall be verified by visual inspection.

d) Unfilled weld craters shall not be included in the design length of the weld.

e) Undercut shall not exceed 1/16 inch (2 millimeters) for welds oriented parallel to the principal stress.

f) The sum of surface (piping) porosity diameters shall not exceed 1/16 inch (2 millimeters) in any 1 inch (25 millimeters) of design weld length.

g) Weld spatter that does not interfere with paint coverage is acceptable.

(2) Welding Program

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

(3) Weld Inspection by Outside Agencies (See Section 104.13 of this specification).

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

(b) Strength

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

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

(c) Field Splices

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

103.6 CAMBER

Joists shall have approximate cambers in accordance with the following:

TABLE 103.6-1

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

The specifying professional shall give consideration to coordinating joist camber with adjacent framing.

103.7 VERIFICATION OF DESIGN AND MANUFACTURE

(a) Design Calculations

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

(b) In-Plant Inspections

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

SECTION 104.
APPLICATION

104.1 USAGE

This specification 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 103.1, they shall be investigated and modified if necessary to limit the required stresses to those listed in Section 103.2.

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

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

104.2 SPAN

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

104.3 DEPTH

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

104.4 END SUPPORTS

(a) Masonry and Concrete

LH- and **DLH-**Series Joists supported by masonry or concrete are to bear on steel bearing plates and shall be designed as steel bearing. Due consideration of the end reactions and all other vertical and lateral forces shall be taken by the specifying professional in the design of the steel bearing plate and the masonry or concrete. The ends of **LH-** and **DLH-**Series Joists shall extend a distance of not less than 6 inches (152 millimeters) over the masonry or concrete support and be anchored to the steel bearing plate. The plate shall be located not more than 1/2 inch (13 millimeters) from the face of the wall and shall be not less than 9 inches (229 millimeters) wide perpendicular to the length of the joist. The plate is to be designed by the specifying professional and shall be furnished by other than the joist manufacturer.

Where it is deemed necessary to bear less than 6 inches (152 millimeters) 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 4 inches (102 millimeters) 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 **LH-** or **DLH-**Series Joists shall extend a distance of not less than 4 inches (102 millimeters) over the steel supports. Where it is deemed necessary to butt opposite joists over a narrow steel support with bearing less than that noted above, special ends must be specified, and such ends shall have positive attachment to the support, either by bolting or welding.

104.5 BRIDGING

Top and bottom chord bridging is required and shall consist of one or both of the following types.

(a) Horizontal

Horizontal bridging lines shall consist of continuous horizontal steel members. The 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.

(b) Diagonal

Diagonal bridging shall consist of cross-bracing with a 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 bridging 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 bridging members and the connections to the chord of the joists.

(c) Bridging Lines

For spans up through 60 feet (18288 mm), welded horizontal bridging may be used except where the row of bridging

nearest the center is required to be bolted diagonal bridging as indicated by the **Red** shaded area in the Load Table. For spans over 60 feet (18288 mm) bolted diagonal bridging shall be used as indicated by the **Blue** and **Gray** shaded areas of the Load Table.

(d) Quantity and Spacing

The maximum spacing of lines of top chord bridging shall not exceed the values in Table 104.5-1. The number of rows of bottom chord bridging, including bridging required per Section 104.12, shall not be less than the number of top chord rows. Rows of bottom chord bridging are permitted to be spaced independently of rows of top chord bridging. The spacing of rows of bottom chord bridging shall meet the slenderness requirement of Section 103.4(a) and any specified strength requirements.

Table 104.5-1

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

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

(e) Connections

Connections to the chords of the steel joists shall be made by positive mechanical means or by welding, and capable of resisting a horizontal force not less than that specified in Table 104.5-1.

(f) Bottom Chord Bearing Joists

Where bottom chord bearing joists are utilized, a row of diagonal bridging shall be provided near the support(s). This bridging shall be installed and anchored before the hoisting cable(s) is released.

104.6 INSTALLATION OF BRIDGING

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

The ends of all bridging lines terminating at walls or beams shall be anchored to resist the nominal force shown in Table 104.5-1.

104.7 END ANCHORAGE

(a) Masonry and Concrete

Ends of **LH-** and **DLH-**Series Joists resting on steel bearing plates on masonry or structural concrete shall be attached thereto with a minimum of two 1/4 inch (6 millimeters) fillet welds 2 inches (51 millimeters) long, or with two 3/4 inch (19 millimeters) ASTM A307 bolts (minimum), or the equivalent.

(b) Steel

Ends of **LH-** and **DLH-**Series Joists resting on steel supports shall be attached thereto with a minimum of two 1/4 inch (6 millimeters) fillet welds 2 inches (51 millimeters) long, or with two 3/4 inch (19 millimeters) ASTM A307 bolts, or the equivalent. When LH/DLH series joists are used to provide lateral stability to the supporting member, the final connection shall be made by welding or as designated by the specifying professional.

(c) Uplift

Where uplift forces are a design consideration, roof joists shall be anchored to resist such forces (Refer to Section 104.12).

104.8 JOIST SPACING

Joists shall be spaced so that the loading on each joist does not exceed the design load (LRFD or ASD) for the particular joist designation and span as shown in the applicable load tables.

104.9 FLOOR AND ROOF DECKS

(a) Material

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

(b) Thickness

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

(c) Centering

Centering for structural 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

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

Table 104.9-1

SECTION* NUMBER	NOMINAL** FORCE REQUIRED
02 to 04 incl.	120 lbs/ft (1.75 kN/m)
05 to 09 incl.	150 lbs/ft (2.19 kN/m)
10 to 17 incl.	200 lbs/ft (2.92 kN/m)
18 and 19	250 lbs/ft (3.65 kN/m)

* Last two digits of joist designation shown in the load table.
** Nominal force is unfactored.

(f) Wood Nailers

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

(g) Joist with Standing Seam Roofing

The stiffness and strength of standing-seam roof clips varies from one manufacturer to another. Therefore, some roof systems cannot be counted on to provide lateral stability to the joists which support the roof. Sufficient stability must be provided to brace the joists laterally under the full design load. The compression chord must resist the chord axial design force in the plane of the joist (i.e., x-x axis buckling) and out of the plane of the joist (i.e., y-y axis buckling). Out of plane strength may be achieved by adjusting the bridging spacing and/or increasing the compression chord area, the joist depth, and the y-axis radius of gyration. The effective slenderness ratio in the y-direction equals 0.94 L/r_y; where L is the bridging spacing in inches (millimeters). The maximum bridging spacing may not exceed that specified in Section 104.5(d).

Horizontal bridging members attached to the compression chords and their anchorages must be designed for a compressive axial force of 0.0025nP, where n is the number of joists between end anchors and P is the chord design force in kips (Newtons). The attachment force between the horizontal bridging member and the compression chord is 0.005P. Horizontal bridging attached to the tension chords shall be proportioned so that the slenderness ratio between attachments does not exceed 300. Diagonal bridging shall be proportioned so that the slenderness ratio between attachments does not exceed 200.

104.10 DEFLECTION

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

Floors: 1/360 of span.

Roofs: 1/360 of span where a plaster ceiling is attached or suspended.

1/240 of span for all other cases.

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

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

104.11 PONDING*

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" and AISC Specifications.

104.12 UPLIFT

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

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

104.13 INSPECTION

Joists shall be inspected by the manufacturer before shipment to verify 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, they may reserve the right to do so in their "Invitation to Bid" or the accompanying "Job Specifications".

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

104.14 PARALLEL CHORD SLOPED JOISTS

The span of a parallel chord sloped joist shall be defined by the length along the slope. Minimum depth, load-carrying capacity, and bridging requirements shall be determined by the sloped definition of span. The Load Table capacity shall be the component normal to the joist.

SECTION 105.*

ERECTION STABILITY AND HANDLING

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

(a) Stability Requirements

1) Before an employee is allowed on the steel joist: BOTH ends of joists at columns (or joists designated as column joists) shall be attached to its supports. For all other joists a minimum of one end shall be attached before the employee is allowed on the joist. The attachment shall be in accordance with Section 104.7 – End Anchorage.

   When a bolted seat connection is used for erection purposes, as a minimum, the bolts must be snug tightened. The snug tight condition is defined as the tightness that exists when all plies of a joint are in firm contact. This may be attained by a few impacts of an impact wrench or the full effort of an employee using an ordinary spud wrench.

2) On steel joists that do not require erection bridging as shown by the unshaded area of the Load Table, only one employee shall be allowed on the joist unless all bridging is installed and anchored.

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

3) Where the span of the steel joist is within the Red shaded area of the Load Table, the following shall apply:

   a) The row of bridging nearest the mid span of the steel joist shall be bolted diagonal erection bridging; and

   b) Hoisting cables shall not be released until this bolted diagonal erection bridging is installed and anchored, unless an alternate method of stabilizing the joist has been provided; and

   c) No more than one employee shall be allowed on these spans until all other bridging is installed and anchored.

4) Where the span of the steel joist is within the Blue shaded area of the Load Table, the following shall apply:

   a) All rows of bridging shall be bolted diagonal bridging; and

   b) Hoisting cables shall not be released until the two rows of bolted diagonal erection bridging nearest the third points of the steel joist are installed and anchored; and

   c) No more than two employees shall be allowed on these spans until all other bridging is installed and anchored.

5) Where the span of the steel joist is in the Gray shaded area of the Load Table, the following shall apply:

   a) All rows of bridging shall be bolted diagonal bridging; and

   b) Hoisting cables shall not be released until all bridging is installed and anchored; and

   c) No more than two employees shall be allowed on these spans until all other bridging is installed and anchored.

6) When permanent bridging terminus points cannot be used during erection, additional temporary bridging terminus points are required to provide lateral stability.

7) In the case of bottom chord bearing joists, the ends of the joist must be restrained laterally per Section 104.5(f) before releasing the hoisting cables.

8) 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 104.7- End Anchorage.

(b) Landing and Placing Loads

1) Except as stated in paragraph 105(b)(3) of this section, no "construction loads"(1) are allowed on the steel joists until all bridging is installed and anchored, and all joist bearing ends are attached.

2) During the construction period, loads placed on the joists shall be distributed so as not to exceed the capacity of the joists.

3) No bundle of deck may be placed on steel joists until all bridging has been installed and anchored and all joist bearing ends attached, unless the following conditions are met:

   a) The contractor has first determined from a *"qualified person"* (2) and documented in a site specific erection plan that the structure or portion of structure is capable of supporting the load;

   b) The bundle of decking is placed on a minimum of 3 steel joists;

   c) The joists supporting the bundle of decking are attached at both ends;

   d) At least one row of bridging is installed and anchored;

   e) The total weight of the decking does not exceed 4000 pounds (1816 kilograms); and

   f) The edge of the bundle of decking shall be placed within 1 foot (0.30 meters) of the bearing surface of the joist end.

g) The edge of the construction load shall be placed within 1 foot (0.30 meters) of the bearing surface of the joist end.

(c) Field Welding

1) All field welding shall be performed in accordance with contract documents. Field welding shall not damage the joists.

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.

(1) See Appendix E for definition of "construction load". A copy of the OSHA Steel Erection Standard §1926.757, Open Web Steel Joists, is included in Appendix E for reference purposes.

(d) Handling

Particular attention should be paid to the erection of Longspan and Deep Longspan Steel Joists. Care shall be exercised at all times to avoid damage to the joists and accessories.

Each joist shall be adequately braced laterally before any loads are applied. If lateral support is provided by bridging, the bridging lines as defined in Section 105(a), paragraphs 2, 3, 4 and 5, must be anchored to prevent lateral movement.

(e) Fall Arrest Systems

Steel joists shall not be used as anchorage points for a fall arrest system unless written approval to do so is obtained from a "qualified person" (2).

(2) See Appendix E for OSHA definition of "qualified person".

STANDARD SPECIFICATIONS
FOR JOIST GIRDERS

Adopted by the Steel Joist Institute November 4, 1985
Revised to November 10, 2003 - Effective March 01, 2005

SECTION 1000.
SCOPE

This specification covers the design, manufacture and use of Joist Girders. Load and Resistance Factor Design (LRFD) and Allowable Strength Design (ASD) are included in this specification.

SECTION 1001.
DEFINITION

The term "Joist Girders", as used herein, refers to open web, load-carrying members utilizing hot-rolled or cold-formed steel, including cold-formed steel whose yield strength* has been attained by cold working.

The design of Joist Girder chord and web sections shall be based on a yield strength of at least 36 ksi (250 MPa), but not greater than 50 ksi (345 MPa). Steel used for Joist Girder chord or web sections shall have a minimum yield strength determined in accordance with one of the procedures specified in Section 1002.2, which is equal to the yield strength assumed in the design. Joist Girders shall be designed in accordance with this specification to support panel point loadings.

* The term "Yield Strength" as used herein shall designate the yield level of a material as determined by the applicable method outlined in paragraph 13.1, "Yield Point" and in paragraph 13.2, "Yield Strength", of ASTM Standard A370, "Standard Test Methods and Definitions for Mechanical Testing of Steel Products", or as specified in Section 1002.2 of this Specification.

SECTION 1002.
MATERIALS

1002.1 STEEL

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

- Carbon 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.
- High-Strength Low-Alloy Columbium-Vanadium Structural Steel, ASTM A572/A572M Grade 42 and 50.
- High-Strength Low-Alloy Structural Steel with 50 ksi (345 MPa) Minimum Yield Point to 4 inches (100 mm) Thick, ASTM A588/A588M.
- Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Corrosion Resistance, ASTM A606.
- Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, ASTM A1008/A1008M.
- Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, ASTM A1011/A1011M.

or shall be of suitable quality ordered or produced to other than the listed specifications, provided that such material in the state used for final assembly and manufacture is weldable and is proved by tests performed by the producer or manufacturer to have the properties specified in Section 1002.2.

1002.2 MECHANICAL PROPERTIES

The yield strength used as a basis for the design stresses prescribed in Section 1003 shall be at least 36 ksi (250 MPa), but shall not be greater than 50 ksi (345 MPa). Evidence that the steel furnished meets or exceeds the design yield strength shall, if requested, be provided in the form of an affidavit or by witnessed or certified test reports.

For material used without consideration of increase in yield strength resulting from cold forming, the specimens shall be taken from as-rolled material. In the case of material properties of which conform to the requirements of one of the listed specifications, the test specimens and procedures 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 millimeters) for sheet and strip, or (b) 18 percent in 8 inches (203 millimeters) 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/A6M for plates, shapes, and bars; and ASTM A606, A1008/A1008M and A1011/A1011M 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 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 calculated from the test data 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 not be greater than 20 times its 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.

1002.3 WELDING ELECTRODES

The following electrodes shall be used for arc welding:

a) For connected members both having a specified yield strength greater than 36 ksi (250 MPa).

AWS A5.1: E70XX
AWS A5.5: E70XX-X
AWS A5.17: F7XX-EXXX, F7XX-ECXXX flux electrode combination
AWS A5.18: ER70S-X, E70C-XC, E70C-XM
AWS A5.20: E7XT-X, E7XT-XM
AWS A5.23: F7XX-EXXX-XX, F7XX-ECXXX-XX
AWS A5.28: ER70S-XXX, E70C-XXX
AWS A5.29: E7XTX-X, E7XTX-XM

b) For connected members both having a specified minimum yield strength of 36 ksi (250 MPa) or one having a specified minimum yield strength of 36 ksi (250 MPa), and the other having a specified minimum yield strength greater than 36 ksi (250 MPa).

AWS A5.1: E60XX
AWS A5.17: F6XX-EXXX, F6XX-ECXXX flux electrode combination
AWS A5.20: E6XT-X, E6XT-XM
AWS A5.29: E6XTX-X, E6XT-XM
or any of those listed in Section 1002.3(a).

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

1002.4 PAINT

The standard shop paint is 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, SSPC No. 15

b) Or, shall be a shop paint which meets the minimum performance requirements of the above listed specification.

SECTION 1003.
DESIGN AND MANUFACTURE

1003.1 METHOD

Joist Girders shall be designed in accordance with this specification as simply supported primary members. All loads shall be applied through steel joists, and will be equal in magnitude and evenly spaced along the joist girder top chord. Where any applicable design feature is not specifically covered herein, the design shall be in accordance with the following specifications:

a) Where the steel used consists of hot-rolled shapes, bars or plates, use the American Institute of Steel Construction, *Specification for Structural Steel Buildings*.

b) For members that are cold-formed from sheet or strip steel, use the American Iron and Steel Institute, *North American Specification for the Design of Cold-Formed Steel Structural Members*.

Design Basis:

Designs shall be made according to the provisions in this Specification for either Load and Resistance Factor Design (LRFD) or for Allowable Strength Design (ASD).

Load Combinations:

LRFD:

When load combinations are not specified to the joist manufacturer, the required stress shall be computed for the factored loads based on the factors and load combinations as follows:

1.4D

1.2D + 1.6 (L, or L_r, or S, or R)

ASD:

When load combinations are not specified to the joist manufacturer, the required stress shall be computed based on the load combinations as follows:

D

D + (L, or L_r, or S, or R)

Where:

D = dead load due to the weight of the structural elements and the permanent features of the structure

L = live load due to occupancy and movable equipment

L_r = roof live load

S = snow load

R = load due to initial rainwater or ice exclusive of the ponding contribution

When special loads are specified and the specifying professional does not provide the load combinations, the provisions of ASCE 7, *"Minimum Design Loads for Buildings and Other Structures"* shall be used for LRFD and ASD load combinations.

1003.2 DESIGN AND ALLOWABLE STRESSES

Design Using Load and Resistance Factor Design (LRFD)

Joist Girders shall have their components so proportioned that the required stresses, f_u, shall not exceed ϕF_n where,

f_u	=	required stress	ksi (MPa)
F_n	=	nominal stress	ksi (MPa)
ϕ	=	resistance factor	
ϕF_n	=	design stress	

Design Using Allowable Strength Design (ASD)

Joist Girders shall have their components so proportioned that the required stresses, *f*, shall not exceed F_n/Ω where,

f	=	required stress	ksi (MPa)
F_n	=	nominal stress	ksi (MPa)
Ω	=	safety factor	
F_n/Ω	=	allowable stress	

Stresses:

(a) Tension: $\phi_t = 0.90$ (LRFD) $\Omega_t = 1.67$ (ASD)

For Chords: $F_y = 50$ ksi (345 MPa)

For Webs: $F_y = 50$ ksi (345 MPa), or $F_y = 36$ ksi (250 MPa)

Design Stress = $0.9F_y$ (LRFD) (1003.2-1)

Allowable Stress = $0.6F_y$ (ASD) (1003.2-2)

(b) Compression: $\phi_c = 0.90$ (LRFD) $\Omega_c = 1.67$ (ASD)

For members with $\frac{\ell}{r} \le 4.71\sqrt{\frac{E}{QF_y}}$

$$F_{cr} = Q\left[0.658^{\left(\frac{QF_y}{F_e}\right)}\right]F_y \qquad (1003.2\text{-}3)$$

For members with $\frac{\ell}{r} > 4.71\sqrt{\frac{E}{QF_y}}$

$$F_{cr} = 0.877F_e \qquad (1003.2\text{-}4)$$

Where F_e = Elastic bucking stress determined in accordance with Equation 1003.2-5.

$$F_e = \frac{\pi^2 E}{\left(\frac{\ell}{r}\right)^2} \qquad (1003.2\text{-}5)$$

For hot-rolled sections, "Q" is the full reduction factor for slender compression elements.

Design Stress = $0.9F_{cr}$ (LRFD) (1003.2-6)

Allowable Stress = $0.6F_{cr}$ (ASD) (1003.2-7)

In the above equations, ℓ is taken as the distance, in inches (millimeters), between panel points for the chord members and the appropriate length 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).

Use 1.2 ℓ/r_x for a crimped, first primary compression web member when a moment-resistant weld group is not used for this member; where r_x = member radius of gyration in the plane of the joist.

For cold-formed sections, the method of calculating the nominal column strength is given in the AISI, *North American Specification for the Design of Cold-Formed Steel Structural Members.*

(c) Bending: $\phi_b = 0.90$ (LRFD) $\Omega_b = 1.67$ (ASD)

Bending calculations are to be based on using the elastic section modulus.

For chords and web members other than solid rounds:
$F_y = 50$ ksi (345 MPa)

Design Stress = $0.90F_y$ (LRFD) (1003.2-8)

Allowable Stress = $0.60F_y$ (ASD) (1003.2-9)

For web members of solid round cross section:
$F_y = 50$ ksi (345 MPa), or $F_y = 36$ ksi (250 MPa)

Design Stress = $1.45F_y$ (LRFD) (1003.2-10)

Allowable Stress = $0.95F_y$ (ASD) (1003.2-11)

For bearing plates:
$F_y = 50$ ksi (345 MPa), or $F_y = 36$ ksi (250 MPa)

Design Stress = $1.35F_y$ (LRFD) (1003.2-12)

Allowable Stress = $0.90F_y$ (ASD) (1003.2-13)

(d) Weld Strength:

Shear at throat of fillet welds:

Nominal Shear Stress = $F_{nw} = 0.6F_{exx}$ (1003.2-14)

LRFD: $\phi_w = 0.75$

Design Shear Strength =
$\phi R_n = \phi_w F_{nw} A = 0.45F_{exx} A$ (1003.2-15)

ASD: $\Omega_w = 2.0$

Allowable Shear Strength = (1003.2-16)
$R_n/\Omega_w = F_{nw} A/\Omega_w = 0.3F_{exx} A$

A = effective throat area

Made with E70 series electrodes or F7XX-EXXX flux-electrode combinations .....$F_{exx} = 70$ ksi (483 MPa)

Made with E60 series electrodes or F6XX-EXXX flux-electrode combinations .....$F_{exx} = 60$ ksi (414 MPa)

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

1003.3 MAXIMUM SLENDERNESS RATIOS

The slenderness ratio ℓ/r, where ℓ is the length center-to-center of support points and r is the corresponding least radius of gyration, shall not exceed the following:

Top chord end panels 120

Top chord interior panels 90

Compression members other than top chord 200

Tension members 240

1003.4 MEMBERS

(a) Chords

The bottom chord shall be designed as an axially loaded tension member. The radius of gyration of the bottom chord about its vertical axis shall not be less than $\ell/240$ where ℓ is the distance between lines of bracing.

The top chord shall be designed as an axial loaded compression member. The radius of gyration of the top chord about the vertical axis shall not be less than Span/575.

The top chord shall be considered as stayed laterally by the steel joists provided positive attachment is made.

(b) Web

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

Interior vertical web members used in modified Warren type web systems that do not support the direct loads through steel joists shall be designed to resist an axial load of 2 percent of the top chord axial force.

Tension members shall be designed to resist at least 25 percent of their axial force in compression.

(c) Fillers and Ties

In compression members composed of two components, when fillers, ties or welds are used, they shall be spaced so the ℓ/r ratio for each component does not exceed the ℓ/r ratio of the member as a whole. In tension members composed of two components, when fillers, ties or welds are used, they shall be spaced so that the ℓ/r ratio of each component does not exceed 240. The least radius of gyration shall be used in computing the ℓ/r ratio of a component.

(d) Eccentricity

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

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

(e) Extended Ends

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

1003.5 CONNECTIONS

(a) Methods

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

(1) Welded Connections

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

b) Cracks are not acceptable and shall be repaired.

c) Thorough fusion shall exist between layers of weld metal and between weld metal and base metal for the required design length of the weld; such fusion shall be verified by visual inspection.

d) Unfilled weld craters shall not be included in the design length of the weld.

e) Undercut shall not exceed 1/16 inch (2 millimeters) for welds oriented parallel to the principal stress.

f) The sum of surface (piping) porosity diameters shall not exceed 1/16 inch (2 millimeters) in any 1 inch (25 millimeters) of design weld length.

g) Weld spatter that does not interfere with paint coverage is acceptable.

(2) Welding Program

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

(3) Weld Inspection by Outside Agencies (See Section 1004.10 of this specification).

The agency shall arrange for visual inspection to determine that welds meet the acceptance standards of Section 1003.5(a)(1). Ultrasonic, X-Ray, and magnetic particle testing are inappropriate for Joists Girders due to the configurations of the components and welds.

(b) Strength

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

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

(c) Field Splices

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

1003.6 CAMBER

Joist Girders shall have approximate cambers in accordance with the following:

TABLE 1003.6-1

Top Chord Length		Approximate Camber	
20'-0"	(6096 mm)	1/4"	(6 mm)
30'-0"	(9144 mm)	3/8"	(10 mm)
40'-0"	(12192 mm)	5/8"	(16 mm)
50'-0"	(15240 mm)	1"	(25 mm)
60'-0"	(18288 mm)	1 1/2"	(38 mm)
70'-0"	(21336 mm)	2"	(51 mm)
80'-0"	(24384 mm)	2 3/4"	(70 mm)
90'-0"	(27342 mm)	3 1/2"	(89 mm)
100'-0"	(30480 mm)	4 1/4"	(108 mm)
110'-0"	(33528 mm)	5"	(127 mm)
120'-0"	(36576 mm)	6"	(152 mm)

The specifying professional shall give consideration to coordinating Joist Girder camber with adjacent framing.

1003.7 VERIFICATION OF DESIGN AND MANUFACTURE

(a) Design Calculations

Companies manufacturing Joist Girders shall submit design data to the Steel Joist Institute (or an independent agency approved by the Steel Joist Institute) for verification of compliance with the SJI Specifications.

(b) In-Plant Inspections

Each manufacturer shall verify their ability to manufacture Joist Girders through periodic In-Plant Inspections. Inspections shall be performed by an independent agency approved by the Steel Joist Institute. The frequency, manner of inspection, and manner of reporting shall be determined by the Steel Joist Institute. The In-Plant Inspections are not a guarantee of the quality of any specific Joist Girder; this responsibility lies fully and solely with the individual manufacturer.

SECTION 1004.
APPLICATION

1004.1 USAGE

This specification shall apply to any type of structure where steel joists are to be supported directly by Joist Girders installed as hereinafter specified. Where Joist Girders are used other than on simple spans under equal concentrated gravity loading, as prescribed in Section 1003.1, they shall be investigated and modified if necessary to limit the unit stresses to those listed in Section 1003.2. The magnitude and location of all loads and forces, other than equal concentrated gravity loading, shall be provided on the structural drawings. The specifying professional shall design the supporting structure, including the design of columns, connections, and moment plates*. This design shall account for the stresses caused by lateral forces and the stresses due to connecting the bottom chord to the column or other support.

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

* For further reference, refer to Steel Joist Institute Technical Digest #11, "Design of Joist-Girder Frames"

1004.2 SPAN

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

1004.3 DEPTH

Joist Girders may have either parallel top chords or a top chord slope of 1/8 inch per foot (1:96). The nominal depth of sloping chord Joist Girders shall be the depth at mid-span.

1004.4 END SUPPORTS

(a) Masonry and Concrete

Joist Girders supported by masonry or concrete are to bear on steel bearing plates and shall be designed as steel bearing. Due consideration of the end reactions and all other vertical and lateral forces shall be taken by the specifying professional in the design of the steel bearing plate and the masonry or concrete. The ends of Joist Girders shall extend a distance of not less than 6 inches (152 millimeters) over the masonry or concrete support and be anchored to the steel bearing plate. The plate shall be located not more than 1/2 inch (13 millimeters) from the face of the wall and shall be not less than 9 inches (229 millimeters) wide perpendicular to the length of the girder. The plate is to be designed by the specifying professional and shall be furnished by other than the joist manufacturer.

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

(b) Steel

Due consideration of the end reactions and all other vertical and lateral forces shall be taken by the specifying professional in the design of the steel support. The ends of Joist Girders shall extend a distance of not less than 4 inches (102 millimeters) over the steel supports and shall have positive attachment to the support, either by bolting or welding.

1004.5 BRACING

Joist Girders shall be proportioned such that they can be erected without bridging (See Section 1004.9 for bracing required for uplift forces). Therefore, the following requirements must be met:

a) The ends of the bottom chord are restrained from lateral movement to brace the girder from overturning. For Joist Girders at columns in steel frames, restraint shall be provided by a stabilizer plate on the column.

b) No other loads shall be placed on the Joist Girder until the steel joists bearing on the girder are in place and welded to the girder.

1004.6 END ANCHORAGE

(a) Masonry and Concrete

Ends of Joist Girders resting on steel bearing plates on masonry or structural concrete shall be attached thereto with a minimum of two 1/4 inch (6 millimeters) fillet welds 2 inches (51 millimeters) long, or with two 3/4 inch (19 millimeters) bolts, or the equivalent.

(b) Steel

Ends of Joist Girders resting on steel supports shall be attached thereto with a minimum of two 1/4 inch (6 millimeters) fillet welds 2 inches (51 millimeters) long, or with two 3/4 inch (19 millimeters) bolts, or the equivalent. In steel frames, bearing seats for Joist Girders shall be fabricated to allow for field bolting.

(c) Uplift

Where uplift forces are a design consideration, roof Joist Girders shall be anchored to resist such forces (Refer to Section 1004.9).

1004.7 DEFLECTION

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

Floors: 1/360 of span.

Roofs: 1/360 of span where a plaster ceiling is attached or suspended.

1/240 of span for all other cases.

The specifying professional shall give consideration to the

effects of deflection and vibration* in the selection of Joist Girders.

* 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.

1004.8 PONDING*

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" and AISC Specifications.

1004.9 UPLIFT

Where uplift forces due to wind are a design requirement, these forces must be indicated on the contract drawings in terms of NET uplift in pounds per square foot (Pascals). The contract drawings must indicate if the net uplift is based on ASD or LRFD. When these forces are specified, they must be considered in the design of Joist Girders and/or bracing. If the ends of the bottom chord are not strutted, bracing must be provided near the first bottom chord panel points whenever uplift due to wind forces is a design consideration.*

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

1004.10 INSPECTION

Joist Girders shall be inspected by the manufacturer before shipment to verify compliance of materials and workmanship with the requirements of this specification. If the purchaser wishes an inspection of the Joist Girders by someone other than the manufacturer's own inspectors, they may reserve the right to do so in their "Invitation to Bid" or the accompanying "Job Specifications". Arrangements shall be made with the manufacturer for such inspection of the Joist Girders at the manufacturing shop by the purchaser's inspectors at purchaser's expense.

SECTION 1005.*
HANDLING AND ERECTION

Particular attention should be paid to the erection of Joist Girders.

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

In steel framing, where Joist Girders are utilized at column lines, the Joist Girder shall be field-bolted at the column. Before hoisting cables are released and before an employee is allowed on the Joist Girder the following conditions must be met:

a) The seat at each end of the Joist Girder is attached in accordance with Section 1004.6.

   When a bolted seat connection is used for erection purposes, as a minimum, the bolts must be snug tightened. The snug tight condition is defined as the tightness that exists when all plies of a joint are in firm contact. This may be attained by a few impacts of an impact wrench or the full effort of an employee using an ordinary spud wrench.

b) Where stabilizer plates are required the Joist Girder bottom chord must engage the stabilizer plate.

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

Joist Girders shall not be used as anchorage points for a fall arrest system unless written direction to do so is obtained from a "qualified person".(1)

Field welding shall not damage the Joist Girder. The total length of weld at any one cross-section on cold-formed members whose yield strength has been attained by cold working and whose as-formed strength is used in the design, shall not exceed 50 percent of the overall developed width of the cold-formed section.

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

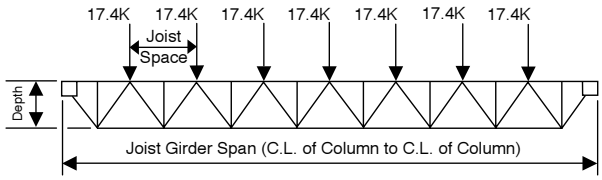
(1) See Appendix E for OSHA definition of "qualified person".

SECTION 1006.
HOW TO SPECIFY JOIST GIRDERS

For a given Joist Girder span, the specifying professional first determines the number of joist spaces. Then the panel point loads are calculated and a depth is selected. The following tables give the Joist Girder weight in pounds per linear foot (kiloNewtons per meter) for various depths and loads.

1. The purpose of the Joist Girder Design Guide Weight Table is to assist the specifying professional in the selection of a roof or floor support system.
2. It is not necessary to use only the depths, spans, or loads shown in the tables.
3. Holes in chord elements present special problems which must be considered by both the specifying professional and the Joist Girder Manufacturer. The sizes and locations of such holes shall be clearly indicated on the structural drawings.

Example using *Load and Resistance Factor Design (LRFD)* and U. S. Customary units:



STANDARD DESIGNATION

44G	8N	17.4F
Depth in Inches	Number of Joist Spaces	Factored Load in Kips at Each Panel Point

Given 42'-0" x 50"-0" bay. Joists spaced on 5'-3" centers

Live Load = 30 psf x 1.6

Dead Load = 15 psf x 1.2
(includes the approximate Joist Girder weight)

Total Load = 66 psf (factored)

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

1. Determine number of actual joist spaces (N).
   In this example, N = 8
2. Compute total factored load:

   Total load = 5.25 x 66 psf = 346.5 plf
3. Joist Girder Section: (Interior)

   a) Compute the factored concentrated load at top chord panel points

   P = 346.5 x 50 = 17,325 lbs = 17.4 kips
   (use 18K for depth selection).

   b) Select Joist Girder depth:

   Refer to the LRFD Joist Girder Design Guide Weight Table for the 42'-0" span, 8 panel, 18.0K Joist Girder. The rule of about one inch of depth for each foot of span is a good compromise of limited depth and economy. Therefore, select a depth of 44 inches.

   c) The Joist Girder will then be designated 44G8N17.4F. Note that the letter "F" is included at the end of the designation to clearly indicate that this is a factored load.

   d) The LRFD Joist Girder Design Guide Weight Table shows the weight for a 44G8N17.4K as 49 pounds per linear foot. The designer should verify that the weight is not greater than the weight assumed in the Dead Load above.

   e) Check live load deflection:

   Live load = 30 psf x 50 ft = 1500 plf

   Approximate Joist Girder moment of inertia

   = 0.018 NPLd

   = 0.018 x 8 x 17.4 x 42 x 44 = 4630 in.^{4}

Allowable deflection for plastered ceilings

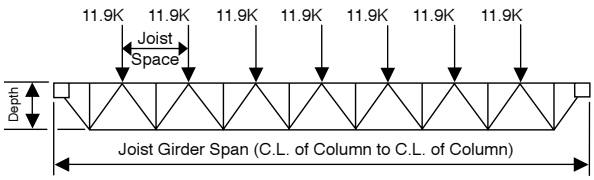
$$= L/360 = \frac{42(12)}{360} = 1.40 \text{ in.}$$

$$\text{Deflection} = 1.15\left[\frac{5wL^4}{384EI}\right] = \frac{1.15(5)(1.500/12)(42x12)^4}{384(29000)(4630)}$$

= 0.90 in. < 1.40 in., Okay

Live load deflection rarely governs because of the relatively small span-depth ratios of Joist Girders.

Example using *Allowable Strength Design (ASD)* and U. S. Customary units:



STANDARD DESIGNATION

44G	8N	11.9K
Depth in Inches	Number of Joist Spaces	Load in Kips at Each Panel Point

Given 42'-0" x 50'-0" bay. Joists spaced on 5'-3" centers.

Live Load = 30 psf

Dead Load = 15 psf
(includes the approximate Joist Girder weight)

Total Load = 45 psf

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

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

   In this example, N = 8
2. Compute total load:

   Total load = 5.25 x 45 psf = 236.25 plf
3. Joist Girder Section: (Interior)

   a) Compute the concentrated load at top chord panel points

   P = 236.25 x 50 = 11,813 lbs = 11.9 kips
   (use 12K for depth selection).

   b) Select Joist Girder depth:

   Refer to the ASD Joist Girder Design Guide Weight Table for the 42'-0" span, 8 panel, 12.0K Joist Girder.

The rule of about one inch of depth for each foot of span is a good compromise of limited depth and economy. Therefore, select a depth of 44 inches.

c) The Joist Girder will then be designated 44G8N11.9K.

d) The ASD Joist Girder Design Guide Weight Table shows the weight for a 44G8N12K as 49 pounds per linear foot. The designer should verify that the weight is not greater than the weight assumed in the Dead Load above.

e) Check live load deflection:

Live load = 30 psf x 50 ft = 1500 plf.

Approximate Joist Girder moment of inertia

= 0.027 NPLd

= 0.027 x 8 x 11.9 x 42 x 44 = 4750 in.^{4}

Allowable deflection for plastered ceilings

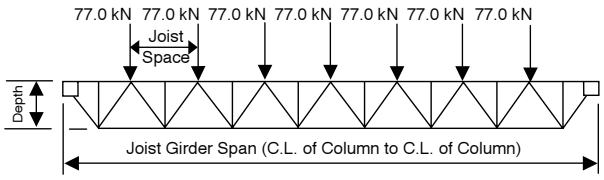
$$= L/360 = \frac{42(12)}{360} = 1.40 \text{ in.}$$

$$\text{Deflection} = 1.15\left[\frac{5wL^4}{384EI}\right] = \frac{1.15(5)(1.500/12)(42x12)^4}{384(29000)(4750)}$$

= 0.88 in. < 1.40 in., Okay

Live load deflection rarely governs because of the relatively small span-depth ratios of Joist Girders.

Joist Girder design example using Load and Resistance Factor Design (LRFD) and Metric Units:



STANDARD DESIGNATION

1118G	8N	77.0F
Depth in mm	Number of Joist Spaces	Factored Load in kN at Each Panel Point

Given 12.80 m x 15.24 m bay. Joists spaced on 1.600 m centers.

Live Load = 1.436 kN/m^2 x 1.6

Dead Load = 0.718 kN/m^2 x 1.2
(includes approximate Joist Girder weight)

Total Load = 3.160 kN/m^2 (Factored)

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

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

In this example N = 8

2. Compute total load:

Total Load = 1.600 m x 3.160 kN/m^2 = 5.055 kN/m

3. Joist Girder Selection: (Interior)

a) Compute the factored concentrated load at top chord panel points

P = 5.055 kN/m x 15.24 m = 77.0 kN (use 80.0 kN).

b) Select Joist Girder depth:

Refer to the LRFD Metric Joist Girder Design Guide Weight Table for the 12800 mm span, 8 panel, 80.0 kN Joist Girder. The rule of about one millimeter of depth for each 12 millimeters of span is a good compromise of limited depth and economy. Therefore, select a depth of 1118 mm.

c) The Joist Girder will then be designated 1118G8N77.0F. Note that the letter "F" is included at the end of the designation to clearly indicate that this is a factored load.

d) The LRFD Metric Joist Girder Design Guide Weight Table shows the weight for a 1118G8N80F as 73 kg/m. To convert the mass to a force multiply 73 kg/m x 0.0098 = 0.715 kN/m. The designer should verify that the weight is not greater than the weight assumed in the Dead Load above.

e) Check live load deflection:

Live load = 1.436 kN/m^2 x 15.24 m = 21.88 kN/m

Approximate Joist Girder moment of inertia:

I_{JG} = 0.2197NPLd where d = effective depth

= 0.2197 x 8 x 77.0 x 12800 x 1118

= 1937 x 10^6 mm^4

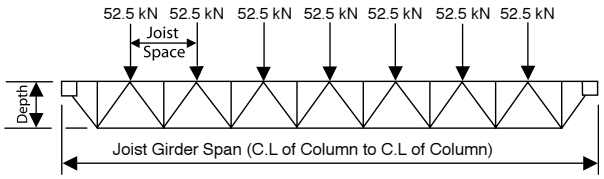
Allowable deflection for plastered ceilings

$$= L/360 = \frac{12800}{360} = 35.56 \text{ mm}$$

$$\text{Deflection} = 1.15\left[\frac{5wL^4}{384EI}\right] = \frac{1.15(5)(21.88)(12800)^4}{384(200000)(1937x10^6)}$$

= 27.7 mm < 35.56 mm, Okay

Joist Girder design example using *Allowable Strength Design (ASD)* and Metric Units:



STANDARD DESIGNATION

1118G	8N	52.5 kN
Depth in mm	Number of Joist Spaces	kN Load on Each Panel Point

Given 12.80 m x 15.24 m bay. Joists spaced on 1.600 m centers.

Live Load = 1.436 kN/m^2

Dead Load 0.718 kN/m^2
(includes approximate Joist Girder weight)

Total Load 2.155 kN/m^2

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

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

   In this example N = 8

2. Compute total load:

   Total Load = 1.600 m x 2.155 kN/m^2 = 3.44 kN/m

3. Joist Girder Selection: (Interior)

   a) Compute the concentrated load at top chord panel points

      P = 3.44 kN/m x 15.24 m = 52.5 kN (use 54.0 kN).

   b) Select Joist Girder depth:

      Refer to the ASD Metric Joist Girder Design Guide Weight Table for the 12800 mm span, 8 panel, 54.0 kN Joist Girder. The rule of about one millimeter of depth for each 12 millimeters of span is a good compromise of limited depth and economy. Therefore, select a depth of 1118 mm from the table.

   c) The Joist Girder will then be designated 1118G8N52.5 kN.

   d) The ASD Metric Joist Girder Design Guide Weight Table shows the weight for a 1118G8N52.5K as 73 kg/m. To convert the mass to a force multiply 73 kg/m by 0.0098 = 0.715 kN/m. The designer should verify that the weight is not greater than the weight assumed in the dead load above.

   e) Check live load deflection:

      Live load = 1.436 kN/m^2 x 15.24 m = 21.88 kN/m

      Approximate Joist Girder moment of inertia:

      IJG = 0.3296NPLd where d = effective depth

      = 0.3296 x 8 x 52.5 x 12800 x 1118

      = 1981 x 10^6 mm^4

Allowable deflection for
plastered ceilings = L/360 = 12800/360 = 35.56 mm

$$\text{Deflection} = 1.15\left[\frac{5wL^4}{384EI}\right] = \frac{1.15(5)(21.88)(12800)^4}{384(200000)(1981\times10^6)}$$

= 22.20 mm < 35.56 mm, Okay

CODE OF STANDARD PRACTICE FOR STEEL JOISTS AND JOIST GIRDERS

Adopted by the Steel Joist Institute April 7, 1931
Revised to May 1, 2000 - Effective May 03, 2005

SECTION 1. GENERAL

1.1 SCOPE

The practices and customs set forth herein are in accordance with good engineering practice, tend to ensure 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 DEFINITIONS

Material. Steel joists, Joist Girders, and accessories as provided by the seller.

Seller. A company certified by the Steel Joist Institute engaged in the manufacture and distribution of steel joists, Joist Girders, and accessories.

Buyer. The entity that has agreed to purchase Material from the manufacturer and has also agreed to the terms of sale.

Owner. The entity that is identified as such in the Contract Documents.

Erector. The entity that is responsible for the safe and proper erection of the Materials in accordance with all applicable codes and regulations.

Specifying Professional. The licensed professional who is responsible for sealing the building Contract Documents, which indicates that he or she has performed or supervised the analysis, design and document preparation for the structure and has knowledge of the load-carrying structural system.

Structural Drawings. The graphic or pictorial portions of the Contract Documents showing the design, location and dimensions of the work. These documents generally include plans, elevations, sections, details, connections, all loads, schedules, diagrams and notes.

Placement Plans. Drawings that are prepared depicting the interpretation of the Contract Documents requirements for the Material to be supplied by the Seller. These floor and/or roof plans are approved by the **Specifying Professional**, Buyer or owner for conformance with the design requirements. The Seller uses the information contained on these drawings for final Material design. A unique piece mark number is typically shown for the individual placement of the steel joists, Joist Girders and accessories along with sections that describe the end bearing conditions and minimum attachment required so that material is placed in the proper location in the field.

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 Steel Joist Institute Standard Specifications Load Tables & Weight Tables 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 Steel Joist Institute Standard Specifications Load Tables & Weight Tables of latest adoption, and this code. Pertinent design information shall be provided to the Seller as stipulated in Section 6.1. 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 performance tests on a structure are required, joists in the test panel 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 nominal 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 nominal 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 Steel Joist Institute Standard Specifications Load Tables & Weight Tables of latest adoption.

K-Series joists are furnished with parallel chords only, and with minimum standard end bearing depth of 2 1/2 inches (64 mm).

LH- and **DLH-**Series joists are furnished either underslung or square ended, with top chords either parallel, pitched one way or pitched two ways. Underslung types are furnished with standard end bearing depth of 5 inches (127 mm) for

LH-Series. **DLH**-Series are furnished with standard end bearing depths of 5 inches (127 mm) for section numbers thru 17 and 7 1/2 inches (191 mm) for section numbers 18 and 19. The standard pitch is 1/8 inch in 12 inches (1:96). The nominal depth of a pitched Longspan Joist is taken at the center of the span.

Joist Girders are furnished either underslung or square ended with top chords either parallel, pitched one way or pitched two ways. Underslung types are furnished with a standard end bearing depth of 7 1/2 inches (191 mm). The standard pitch is 1/8 inch in 12 inches (1:96). The nominal depth of a pitched Joist Girder is taken at the center of the span.

Because **LH-** and **DLH-**Series joists may have exceptionally high end reactions, it is recommended that the supporting structure be designed to provide a nominal minimum unit bearing pressure of 750 pounds per square inch (5171 kilo Pascal).

2.2 JOIST LOCATION AND SPACING

The maximum joist spacing shall be in accordance with the requirements of the Steel Joist Institute Standard Specifications Load Tables & Weight Tables 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. Joists are provided with camber and 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.

Open Web Steel Joists, **K**-Series, should be placed no closer than 6 inches (152 mm) to supporting walls or members. Where partitions occur parallel to joists, there shall be at least one 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. When partitions occur perpendicular to the joists, they shall be treated as concentrated loads, and joists shall be investigated as indicated in Section 6.1.

2.3 SLOPED END BEARINGS

Where steel joists or Joist Girders are sloped, beveled ends or sloped end bearings may be provided where the slope exceeds 1/4 inch in 12 inches (1:48). When sloped end bearings are required, the seat depths shall be adjusted to maintain the standard height at the shallow end of the sloped bearing. For Open Web Steel Joists, **K**-Series, bearing ends will not be beveled for slopes of 1/4 inch or less in 12 inches (1:48).

2.4 EXTENDED ENDS

Steel joist extended ends shall be in accordance with Manufacturer's Standard and shall meet the requirements of — Appendix B.

2.5 CEILING EXTENSIONS

Ceiling extensions shall be furnished to support ceilings which are to be attached to the bottom of the joists. They are not furnished for the support of suspended ceilings. The ceiling extension shall be either an extended bottom chord element or a loose unit, whichever is standard with the manufacturer, and shall be of sufficient strength to properly support the ceiling.

TABLE 2.6-1a
K-SERIES JOISTS
MAXIMUM JOIST SPACING FOR HORIZONTAL BRIDGING

	BRIDGING MATERIAL SIZE						
	Round Rod	**Equal Leg Angles**					
SECTION NUMBER*	1/2" round (13 mm) r = 0.13" (3.30 mm)	1 x 7/64 (25 mm x 3 mm) r = 0.20" (5.08 mm)	1-1/4 x 7/64 (32 mm x 3 mm) r = 0.25" (6.35 mm)	1-1/2 x 7/64 (38 mm x 3 mm) r = 0.30" (7.62 mm)	1-3/4 x 7/64 (45 mm x 3 mm) r = 0.35" (8.89 mm)	2 x 1/8 (52 mm x 3 mm) r = 0.40" (10.16 mm)	2-1/2 x 5/32 (64 mm x 4 mm) r = 0.50" (12.70 mm)
1 – 9	3'- 3" (991 mm)	5'- 0" (1524 mm)	6'- 3" (1905 mm)	7'- 6" (2286 mm)	8'- 7" (2616 mm)	10'- 0" (3048 mm)	12'- 6" (3810 mm)
10	3'- 0" (914 mm)	4'- 8" (1422 mm)	6'- 3" (1905 mm)	7'- 6" (2286 mm)	8'- 7" (2616 mm)	10'- 0" (3048 mm)	12'- 6" (3810 mm)
11–12	2'- 7" (787 mm)	4'- 0" (1219 mm)	5'- 8" (1727 mm)	7'- 6" (2286 mm)	8'- 7" (2616 mm)	10'- 0" (3048 mm)	12'- 6" (3810 mm)

* Refer to last digit(s) of Joist Designation
* * Connection to Joist must resist a nominal unfactored 700 pound force (3114 N)

TABLE 2.6-1b
LH-SERIES JOISTS
MAXIMUM JOIST SPACING FOR HORIZONTAL BRIDGING
SPANS OVER 60 ft. (18.3 m) REQUIRE BOLTED DIAGONAL BRIDGING

SECTION NUMBER*	**BRIDGING ANGLE SIZE – (EQUAL LEG ANGLE)					
	1 x 7/64 (25 mm x 3 mm) r = 0.20" (5.08 mm)	1-1/4 x 7/64 (32 mm x 3 mm) r = 0.25" (6.35 mm)	1-1/2 x 7/64 (38 mm x 3 mm) r = 0.30" (7.62 mm)	1-3/4 x 7/64 (45 mm x 3 mm) r = 0.35" (8.89 mm)	2 x 1/8 (52 mm x 3 mm) r = 0.40" (10.16 mm)	2-1/2 x 5/32 (64 mm x 4 mm) r = 0.50" (12.70 mm)
02, 03, 04	4' – 7" (1397 mm)	6' – 3" (1905 mm)	7' – 6" (2286 mm)	8' – 9" (2667 mm)	10' – 0" (3048 mm)	12' – 4" (3759 mm)
05 – 06	4' – 1" (1245 mm)	5' – 9" (1753 mm)	7' – 6" (2286 mm)	8' – 9" (2667 mm)	10' – 0" (3048 mm)	12' – 4" (3759 mm)
07 – 08	3' – 9" (1143 mm)	5' – 1" (1549 mm)	6' – 8" (2032 mm)	8' – 6" (2590 mm)	10' – 0" (3048 mm)	12' – 4" (3759 mm)
09 – 10		4' – 6" (1372 mm)	6' – 0" (1829 mm)	7' – 8" (2337 mm)	10' – 0" (3048 mm)	12' – 4" (3759 mm)
11 – 12		4' – 1" (1245 mm)	5' – 5" (1651 mm)	6' – 10" (2083 mm)	8' – 11" (2718 mm)	12' – 4" (3759 mm)
13 – 14		3' – 9" (1143 mm)	4' – 11" (1499 mm)	6' – 3" (1905 mm)	8' – 2" (2489 mm)	12' – 4" (3759 mm)
15 – 16			4' – 3" (1295 mm)	5' – 5" (1651 mm)	7' – 1" (2159 mm)	11' – 0" (3353 mm)
17			4' – 0" (1219 mm)	5' – 1" (1549 mm)	6' – 8" (2032 mm)	10' – 5" (3175 mm)

* Refer to last two digits of Joist Designation

** Connection to Joist must resist force listed in Table 104.5-1

2.6 BRIDGING AND BRIDGING ANCHORS

(a) Bridging standard with the manufacturer and complying with the Steel Joist Institute Standard Specifications Load Tables & Weight Tables 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 **K-** and **LH-**Series Joists horizontal bridging is recommended for spans up to and including 60 feet (18.3 m) except where the Steel Joist Institute Standard Specifications Load Tables & Weight Tables require bolted diagonal bridging for erection stability.

LH- and **DLH-**Series Joists exceeding 60 feet (18.3 m) in length shall have bolted diagonal bridging for all rows.

Refer to Section 6 in the **K-**Series Specifications and Section 105 in the **LH-** and **DLH-**Series Specifications for erection stability requirements.

Refer to Appendix E for OSHA steel joist erection stability requirements.

Horizontal bridging shall consist of continuous horizontal steel members. The ℓ/r ratio for horizontal bridging shall not exceed 300. The material sizes shown in Tables 2.6-1a and 2.6-1b meet the criteria.

(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 Standard Specifications Load Tables & Weight Tables 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 material sizes listed in Table 2.6-2 will meet the above specification.

(d) When bolted diagonal erection bridging is required, the following shall apply:

1. The bridging shall be indicated on the joist placement plan.
2. The joist placement plan shall be the exclusive indicator for the proper placement of this bridging.
3. Shop installed bridging clips, or functional equivalents, shall be provided where the bridging bolts to the steel joist.
4. When two pieces of bridging are attached to the steel joist by a common bolt, the nut that secures the first piece of bridging shall not be removed from the bolt for the attachment of the second piece.
5. Bridging attachments shall not protrude above the top chord of the steel joists.

TABLE 2.6-2
K, LH AND DLH SERIES JOISTS
MAXIMUM JOIST SPACING FOR DIAGONAL BRIDGING

JOIST DEPTH	**BRIDGING ANGLE SIZE – (EQUAL LEG ANGLE)				
	1 x 7/64 (25 mm x 3 mm) r = 0.20" (5.08 mm)	1-1/4 x 7/64 (32 mm x 3 mm) r = 0.25" (6.35 mm)	1-1/2 x 7/64 (38 mm x 3 mm) r = 0.30" (7.62 mm)	1-3/4 x 7/64 (45 mm x 3 mm) r = 0.35" (8.89 mm)	2 x 1/8 (50 mm x 3 mm) r = 0.40" (10.16 mm)
12" (305 mm)	6' – 6" (1981 mm)	8' – 3" (2514 mm)	9' – 11" (3022 mm)	11' – 7" (3530 mm)	
14" (356 mm)	6' – 6" (1981 mm)	8' – 3" (2514 mm)	9' – 11" (3022 mm)	11' – 7" (3530 mm)	
16" (406 mm)	6' – 6" (1981 mm)	8' – 2" (2489 mm)	9' – 10" (2997 mm)	11' – 6" (3505 mm)	
18" (457 mm)	6' – 6" (1981 mm)	8' – 2" (2489 mm)	9' – 10" (2997 mm)	11' – 6" (3505 mm)	
20" (508 mm)	6' – 5" (1955 mm)	8' – 2" (2489 mm)	9' – 10" (2997 mm)	11' – 6" (3505 mm)	
22" (559 mm)	6' – 4" (1930 mm)	8' – 1" (2463 mm)	9' – 10" (2997 mm)	11' – 6" (3505 mm)	
24" (610 mm)	6' – 4" (1930 mm)	8' – 1" (2463 mm)	9' – 9" (2971 mm)	11' – 5" (3479 mm)	
26" (660 mm)	6' – 3" (1905 mm)	8' – 0" (2438 mm)	9' – 9" (2971 mm)	11' – 5" (3479 mm)	
28" (711 mm)	6' – 2" (1879 mm)	8' – 0" (2438 mm)	9' – 8" (2946 mm)	11' – 5" (3479 mm)	
30" (762 mm)	6' – 2" (1879 mm)	7' – 11" (2413 mm)	9' – 8" (2946 mm)	11' – 4" (3454 mm)	
32" (813 mm)	6' – 1" (1854 mm)	7' – 10" (2387 mm)	9' – 7" (2921 mm)	11' – 4" (3454 mm)	13' – 0" (3962 mm)
36" (914 mm)		7' – 9" (2362 mm)	9' – 6" (2895 mm)	11' – 3" (3429 mm)	12' – 11" (3973 mm)
40" (1016 mm)		7' – 7" (2311 mm)	9' – 5" (2870 mm)	11' – 2" (3403 mm)	12' – 10" (3911 mm)
44" (1118 mm)		7' – 5" (2260 mm)	9' – 3" (2819 mm)	11' – 0" (3352 mm)	12' – 9" (3886 mm)
48" (1219 mm)		7' – 3" (2209 mm)	9' – 2" (2794 mm)	10' – 11" (3327 mm)	12' – 8" (3860 mm)
52" (1321 mm)			9' – 0" (2743 mm)	10' – 9" (3276 mm)	12' – 7" (3835 mm)
56" (1422 mm)			8' – 10" (2692 mm)	10' – 8" (3251 mm)	12' – 5" (3784 mm)
60" (1524 mm)			8' – 7" (2616 mm)	10' – 6" (3200 mm)	12' – 4" (3759 mm)
64" (1626 mm)			8' – 5" (2565 mm)	10' – 4" (3149 mm)	12' – 2" (3708 mm)
68" (1727 mm)			8' – 2" (2489 mm)	10' – 2" (3098 mm)	12' – 0" (3657 mm)
72" (1829 mm)			8' – 0" (2438 mm)	10' – 0" (3048 mm)	11' – 10" (3606 mm)

MINIMUM A307 BOLT REQUIRED FOR CONNECTION

SERIES	*SECTION NUMBER	BOLT DIAMETER
K	ALL	3/8" (10 mm)
LH, DLH	2 - 12	3/8" (10 mm)
LH, DLH	13 - 17	1/2" (13 mm)
DLH	18 and 19	5/8" (16 mm)

*Refer to last digit(s) of Joist Designation

2.7 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.

2.8 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 chord radius of gyration from exceeding that specified in the Steel Joist Institute Standard Specifications Load Tables & Weight Tables of latest adoption. The lateral bracing shall be that which is standard with the manufacturer, and shall be sufficient to properly brace 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 Steel Joist Institute Standard Specifications Load Tables & Weight Tables of latest adoption.

3.2 PAINT

(a) Standard Shop Paint - The shop coat of paint, when specified, shall comply with the Steel Joist Institute Standard Specifications Load Tables & Weight Tables of latest adoption.

(b) Disclaimer - The typical shop applied paint that is used to coat steel joists and Joist Girders is a dip applied, air dried paint. The paint is intended to be an impermanent and provisional coating which will protect the steel for only a short period of exposure in ordinary atmospheric conditions.

Since most steel joists and Joist Girders are painted using a standard dip coating, the coating may not be uniform and may include drips, runs, and sags. Compatibility of any coating including fire protective coatings applied over a standard shop paint shall be the responsibility of the specifier and/or painting contractor.

The shop applied paint may require field touch-up/repair as a result of, but not limited to, the following:

1. Abrasions from: Bundling, banding, loading and unloading, chains, dunnage during shipping, cables and chains during erection, bridging, installation, and other handling at the jobsite.

   NOTE: Rusting should be expected at any abrasion.
2. Dirt.
3. Diesel smoke.
4. Road salt.
5. Weather conditions during storage.

The joist manufacturer shall not be responsible for the condition of the paint if it is not properly protected after delivery.

SECTION 4.
INSPECTION

Inspections shall be made in accordance with the Steel Joist Institute Standard Specifications Load Tables & Weight Tables Section 5.12 for **K**-Series, Section 104.13 for **LH**- and **DLH**-Series, and Section 1004.10 for Joist Girders.

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]), including any special design or configuration requirements.

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.

Loads and their locations as defined in Section 6.1.

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 6.1.

Steel Joists.

Joist Girders.

Joist Substitutes.

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 by the joist manufacturer 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, decking, 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.

Special joist configuration or bridging layouts for ductwork or sprinkler systems.

Shear Studs.

SECTION 6.

PLANS AND SPECIFICATIONS

6.1 PLANS FURNISHED BY BUYER

The Buyer shall furnish the Seller plans and specifications as prepared by the **specifying professional** showing all Material requirements and steel joist and/or steel Joist Girder designations, 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, roofs, and bearings shall be shown with due consideration taken for the effects of dead load deflections.

(a) Loads -

The Steel Joist Institute does not presume to establish the loading requirements for which structures are designed.

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 linear foot" (kiloNewtons per Meter) of joist. The Steel Joist Institute Joist Girder 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 (kiloNewtons) per panel point on the Joist Girder.

The **specifying professional** shall provide the nominal loads and load combinations as stipulated by the applicable code under which the structure is designed and shall provide the design basis (ASD or LRFD).

The **specifying professional** shall calculate and provide the magnitude and location of ALL JOIST and JOIST GIRDER LOADS. This includes all special loads (drift loads, mechanical units, net uplift, axial loads, moments, structural bracing loads, or other applied loads) which are to be incorporated into the joist or Joist Girder design. For Joist Girders, reactions from supported members shall be clearly denoted as point loads on the Joist Girder. When necessary to clearly convey the information, a Load Diagram or Load Schedule shall be provided.

The **specifying professional** shall give due consideration to the following loads and load effects:

1. Ponded rain water.
2. Accumulation of snow in the vicinity of obstructions such as penthouses, signs, parapets, adjacent buildings, etc.
3. Wind.
4. Type and magnitude of end moments and/or axial forces at the joist and Joist Girder end supports shall be shown on the structural drawings. For moment resisting joists or Joist Girders 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 or Joist Girder top chord and the column.

   Avoid resolving joist or Joist Girder end moments and axial forces through the bearing seat connection.

   A note shall be provided on the structural drawings stating that all moment resisting joists shall have all dead loads applied to the joist before the bottom chord struts are welded to the supporting connection whenever the moments provided do not include dead load.

   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 nominal loads, as determined by the **specifying professional**, shall not be less than that specified in the applicable building codes.

Where concentrated loads occur, 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 consideration by the joist manufacturer.

The **specifying professional** shall use one of the following options that allows the:

- Estimator to price the joists.
- Joist manufacturer to design the joists properly.
- Owner to obtain the most economical joists.

Option 1: Select a Standard Steel Joist Institute joist for the uniform design loading and provide the load and location of any additional loads on the structural plan with a note "Joist manufacturer shall design joists for additional loads as shown". This option works well for a few added loads per joist with known locations.

Option 2: Select a KCS joist using moment and end reaction. This option works well for concentrated loads for which exact locations are not known or for multiple loading. See examples and limitations on the pages accompanying the KCS Joist Load Tables.

a) Determine the maximum moment

b) Determine the maximum end reaction (shear)

c) Select the required KCS joist that provides the required moment and end reaction (shear).

Option 3: Specify a SPECIAL joist with load diagrams. This option is preferred when the joist includes loading that cannot clearly be denoted on the structural drawings.

a) Provide a load diagram to clearly define ALL loads

b) Place the designation (i.e. 18K SP or 18LH SP) under the load diagram with the following note: "Joist manufacturer to design joist to support loads as shown above".

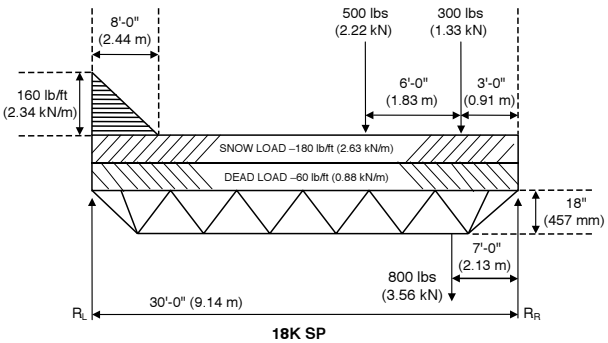
CAUTION: The **specifying professional** shall compare the equivalent uniform loads derived from the maximum moment and shear to the uniform loads tabulated in the **K**-Series Load Table. An equivalent unfactored uniform load in excess of 550 plf (8020 N/m) or a maximum unfactored end reaction exceeding 9200 lbs (40.9 kN) indicates that the **specifying professional** shall consider using additional joists to reduce the loading or use an **LH**-Series Joist and make provisions for 5 inch (127 mm) deep bearing seats.

SPECIAL LOADING : Please note the load combinations shown are for referenced examples only and it is not to be presumed that the joist designer is responsible for the applicable building code load combinations. If the loading criteria are too complex to adequately communicate in a simple load diagram, then the specifying professional shall provide a load schedule showing the specified design loads, load categories, and required load combinations with applicable load factors.

ASD EXAMPLE:

U.S. CUSTOMARY UNITS AND (METRIC UNITS)

Load diagram per ASCE 7 2.4.1(3) D + S

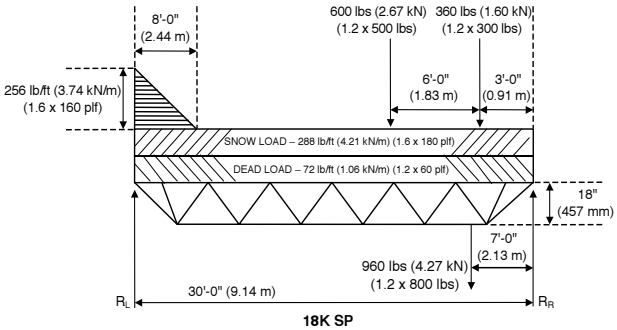


Joist manufacturer to design joist to support loads as shown above.

LRFD EXAMPLE:

U.S. CUSTOMARY UNITS AND (METRIC UNITS)

Factored Load diagram per ASCE 7 2.3.2(3) 1.2D + 1.6S



Joist manufacturer to design joist to support **factored loads** as shown.

(b) Connections -

Minimum End Anchorage for simple span gravity loading shall be in accordance with Steel Joist Institute Standard Specifications Load Tables & Weight Tables Section 5.6 for **K**-Series, Section 104.4 for **LH**- and **DLH**-Series, and Section 1004.6 for Joist Girders. The **specifying professional** is responsible for the design of the joist and Joist Girder connection when it is subject to any loads other than simple span gravity loading including uplift and lateral loads. The **specifying professional** is also responsible for bridging termination connections. The contract documents must clearly illustrate these connections.

(c) Special Considerations

The **specifying professional** shall indicate on the construction documents special considerations including:

a) Profiles for non-standard joist and Joist Girder configurations (Standard joist and Joist Girder configurations are as indicated in the Steel Joist Institute Standard Specifications Load Tables & Weight Tables of latest adoption).

b) Oversized or other non-standard web openings

c) Extended ends

d) Deflection criteria for live and total loads for non-SJI standard joists

e) Non-SJI standard bridging

6.2 PLANS FURNISHED BY SELLER

The Seller shall furnish the Buyer with steel joist placement plans to show the Material as specified on the construction documents and are to be utilized for field installation in accordance with specific project requirements as stated in Section 6.1. Steel placement plans shall include, at a minimum, the following:

1. Listing of all applicable loads as stated in Section 6.1 and used in the design of the steel joists and Joist Girders as specified in the construction documents.

2. Profiles for non-standard joist and Joist Girder configurations (Standard joist and Joist Girder configurations are as indicated in the Steel Joist Institute Standard Specifications Load Tables & Weight Tables of latest adoption).
3. Connection requirements for:
   a) Joists supports
   b) Joist Girder supports
   c) Field splices
   d) Bridging attachments
4. Deflection criteria for live load and total loads for non-SJI standard joists.
5. Size, location, and connections for all bridging
6. Joists headers

All Material shall be identified with its mark which also appears on the bill of material. The shop paint shall be as noted on the joist placement plans. **Steel joist placement plans do not require the seal and signature of the joist manufacturer's registered design professional.**

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 their 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 the 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 the buyers representative) either prior to or after approval of detailed plans, or when any Material is required and was not shown on the 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.

6.6 CALCULATIONS

The seller shall design the steel joists and/or steel Joist Girders in accordance with the current Steel Joist Institute Standard Specifications Load Tables & Weight Tables to support the load requirements of Section 6.1. The **specifying professional** may require submission of the steel joist and Joist Girder calculations as prepared by a registered design professional responsible for the product design. If requested by the **specifying professional**, the steel joist manufacturer shall submit design calculations with a cover letter bearing the seal and signature of the joist manufacturer's registered design professional. In addition to standard calculations under this seal and signature, submittal of the following shall be included:

1. Non-SJI standard bridging details (e.g. for cantilevered conditions, net uplift, etc.)
2. Connection details for:
   a) Non-SJI standard connections (e.g. flush framed or framed connections)
   b) Field splices
   c) Joist headers

SECTION 7.*
HANDLING AND ERECTION

The current OSHA SAFETY STANDARDS FOR STEEL ERECTION, 29 CFR PART 1926, SUBPART R- STEEL ERECTION, refers to certain joists at or near columns to be designed with sufficient strength to allow one employee to release the hoisting cable without the need for erection bridging. **This STANDARD shall not be interpreted that any joist at or near a column line is safe to support an employee without bridging installed.** Many limitations exist that prevent these joists from being designed to safely allow an employee on an un-bridged joist. Because of these limitations these joists must be erected by incorporating erection methods ensuring joist stability and either:

1) Installing bridging or otherwise stabilizing the joist prior to releasing the hoisting cable, or
2) Releasing the hoisting cable without having a worker on the joist.

A steel joist or Joist Girder shall not be placed on any support structure unless such structure is stabilized. When steel joists or Joist Girders are landed on a structure, they shall be secured to prevent unintentional displacement prior to installation.

A bridging terminus point shall be established before joist bridging is installed.

Steel joist and Joist Girders shall not be used as anchorage points for a fall arrest system unless written directions to do so is obtained from a "qualified person"[1].

No modification that affects the strength of a steel joist or Joist Girder shall be made without the written approval of the project engineer of record.

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 Steel Joist Institute Standard Specifications Load Tables & Weight Tables 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 due to inaccurate construction work.

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

(1) See Appendix E for OSHA definition of a qualified person.

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 final judgment upon all questions, both of law and fact, and their findings shall be conclusive.

REFERENCED SPECIFICATIONS, CODES AND STANDARDS

The following documents are referenced in the Open Web Steel Joists, K-Series, Longspan and Deep Longspan Steel Joists, LH-and DLH-Series and Joist Girder Specifications:

American Institute of Steel Construction, Inc. (AISC) (2005), *Specification for Structural Steel Buildings,* Chicago, IL.

American Iron and Steel Institute (AISI) (2001), *North American Specification for Design of Cold-Formed Steel Structural Members,* Washington, D.C.

American Society of Civil Engineers (ASCE) (2002), *Minimum Design Loads for Buildings and Other Structures,* ASCE 7-02, Reston, VA.

American Society of Testing and Materials (2004), ASTM A6/A6M-04b, Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling, West Conshohocken, PA.

American Society of Testing and Materials (2004), ASTM A36/A36M-04, Standard Specification for Carbon Structural Steel, West Conshohocken, PA.

American Society of Testing and Materials (2004), ASTM A242/242M-04, Standard Specification for High-Strength Low-Alloy Structural Steel, West Conshohocken, PA.

American Society of Testing and Materials (2004), A307-04, Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength, West Conshohocken, PA.

American Society of Testing and Materials (2003), ASTM A370-03a, Standard Test Methods and Definitions for Mechanical Testing of Steel Products, West Conshohocken, PA.

American Society of Testing and Materials (2004), ASTM A529/A529M-04, Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality, West Conshohocken, PA.

American Society of Testing and Materials (2004), ASTM A572/A572M-04, Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel, West Conshohocken, PA.

American Society of Testing and Materials (2004), ASTM A588/A588M-04, Standard Specification for High-Strength Low-Alloy Structural Steel with 50 ksi [345 MPa] Minimum Yield Point to 4-in. [100-mm] Thick, West Conshohocken, PA.

American Society of Testing and Materials (2004), ASTM A606-04, Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance, West Conshohocken, PA.

American Society of Testing and Materials (2004), ASTM A1008/A1008M-04b, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, West Conshohocken, PA.

American Society of Testing and Materials (2004), ASTM A1011/A1011M-04a, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, West Conshohocken, PA.

American Welding Society, AWS A5.1-2004, Specification for Carbon Steel Electrodes for Shielded Metal Arc Welding, Miami, FL.

American Welding Society, AWS A5.5-96, Specification for Low Alloy Steel Electrodes for Shielded Metal Arc Welding, Miami, FL.

American Welding Society, AWS A5.17-97, Specification for Carbon Steel Electrodes and Fluxes for Submerged Arc Welding, Miami, FL.

American Welding Society, AWS A5.18-2001, Specification for Carbon Steel Electrodes and Rods for Gas Shielded Arc Welding, Miami, FL.

American Welding Society, AWS A5.20-95, Specification for Carbon Steel Electrodes for Flux Cored Arc Welding, Miami, FL.

REFERENCED SPECIFICATIONS, CODES AND STANDARDS

American Welding Society, AWS A5.23-97, Specification for Low Alloy Steel Electrodes and Fluxes for Submerged Arc Welding, Miami, FL.

American Welding Society, AWS A5.28-96, Specification for Low Alloy Steel Filler Metals for Gas Shielded Arc Welding, Miami, FL.

American Welding Society, AWS A5.29-98, Specification for Low Alloy Steel Electrodes for Flux Cored Arc Welding, Miami, FL.

Federal Register, Department of Labor, Occupational Safety and Health Administration (2001), 29 CFR Part 1926 Safety Standards for Steel Erection; Final Rule, §1926.757 Open Web Steel Joists - January 18, 2001, Washington, D.C.

Fire Resistance Directory – Volume 1 (2004), Underwriters Laboratories Inc., Chicago, IL.

Steel Joist Institute (SJI) (2006), Technical Digest #3, *Structural Design of Steel Joist Roofs to Resist Ponding Loads,* Myrtle Beach, SC.

Steel Joist Institute (SJI) (1988), Technical Digest #5, *Vibration of Steel Joist-Concrete Slab Floors,* Myrtle Beach, SC.

Steel Joist Institute (SJI) (2006), Technical Digest #6, *Structural Design of Steel Joist Roofs to Resist Uplift Loads,* Myrtle Beach, SC.

Steel Joist Institute (SJI) (1983), Technical Digest #8, *Welding of Open Web Steel Joists,* Myrtle Beach, SC.

Steel Joist Institute (SJI) (2006), Technical Digest #9, *Handling and Erection of Steel Joists and Joist Girders,* Myrtle Beach, SC.

Steel Joist Institute (SJI) (2003), Technical Digest #10, *Design of Fire Resistive Assemblies with Steel Joists,* Myrtle Beach, SC.

Steel Joist Institute (SJI) (1999), Technical Digest #11, *Design of Joist-Girder Frames*, Myrtle Beach, SC.

Steel Structures Painting Council (SSPC) (2000), *Steel Structures Painting Manual, Volume 2, Systems and Specifications,* Paint Specification No. 15, Steel Joist Shop Primer, May 1, 1999, Pittsburgh, PA.

GLOSSARY

NOTES:

Terms in **Bold** and their definitions come from the AISC AND AISI STANDARD Standard Definitions for Use in the Design of Steel Structures, 2004 Edition, First Printing April 2005.

* These terms are usually qualified by the type of *load effect*, e.g., nominal tensile strength, available compressive strength, design flexural strength.

** Term usually qualified by the type of component, e.g. local web buckling, local flange buckling, etc.

Accessories. Structural components related to the design, fabrication and erection of *joists* and *Joist Girders* including, but not limited to sloped *end bearings, extended ends, ceiling extensions, bridging* and bridging anchors, *headers* and bottom chord lateral bracing for *Joist Girders*.

ASD (Allowable Strength Design). Method of proportioning structural components such that the *allowable strength* equals or exceeds the *required strength* of the component under the action of the *ASD load combinations*.

ASD Load Combination. *Load* combination in the *applicable building code* intended for allowable *strength design* (allowable stress design).

Allowable Strength*. *Nominal strength* divided by the safety factor, R_n/Ω.

Applicable Building Code. Building code under which the structure is designed.

Available Strength*. *Design strength* or *allowable strength* as appropriate.

Bay. The distance between the main structural frames or walls of a building.

Bearing. The distance that the bearing shoe or seat of a *joist* or *Joist Girder* extends over its masonry, concrete or steel support.

Bearing Plate. The steel plate used for a *joist* or *Joist Girder* to bear on when it is supported by masonry or concrete supports. The plate is designed by the *Specifying Professional* to carry the *joist* reaction to the supporting structure.

Bottom Chord Extension (BCX). The two angle extended part of a *joist* bottom chord from the first bottom chord panel point towards the end of the joist.

Bridging. In general, a member connected to a joist to brace it from lateral movement. See also Diagonal Bridging and Horizontal Bridging

Buckling. *Limit state* of sudden change in the geometry of a structure or any of its elements under a critical loading condition.

Buckling Strength. *Nominal strength* for *buckling* or instability *limit states*.

Buyer. The entity that has agreed to purchase *material* from the manufacturer and has also agreed to the terms of sale.

Camber. An upward curvature of the chords of a *joist* or *Joist Girder* induced during shop fabrication. Note this is in addition to the pitch of the top chord.

Ceiling Extension. A *bottom chord extension* except that only one angle of the *joist* bottom chord is extended from the first bottom chord panel point towards the end of the joist.

Chords. The top and bottom members of a *joist* or *Joist Girder*. When a chord is comprised of two angles there is usually a gap between the members.

Clear Span. The actual clear distance or opening between supports for a joist, that is the distance between walls or the distance between the edges of flanges of beams.

Cold-Formed Steel Structural Member. Shape manufactured by press-braking blanks sheared from sheets, cut lengths of coils or plates, or by roll forming cold- or hot-rolled coils or sheets; both forming operations being performed at ambient room temperature, that is, without manifest addition of heat such as would be required for hot forming.

Collateral Load. All additional dead loads other than the weight of the building, such as sprinklers, pipes, ceilings, and mechanical or electrical components.

Connection. Combination of structural elements and *joints* used to transmit forces between two or more members. See also Splice.

Deck. A floor or roof covering made out of gage metal attached by welding or mechanical means to *joists*, beams, *purlins*, or other structural members and can be galvanized, painted, or unpainted.

Design Load. Applied load determined in accordance with either *LRFD load combinations* or *ASD load combinations*, whichever is applicable.

Design Strength*. *Resistance factor* multiplied by the *nominal strength*, ϕR_n.

Diagonal Bridging. Two angles or other structural shapes connected from the top chord of one *joist* to the bottom chord of the next joist to form an 'X' shape. These members are almost always connected at their point of intersection.

Diaphragm. Roof, floor or other membrane or bracing system that transfers in-plane forces to the lateral force resisting system.

Effective Length. Length of an otherwise identical column with the same strength when analyzed with pin-ended boundary conditions.

Elastic Analysis. *Structural analysis* based on the assumption that the structure returns to its original geometry on removal of the *load*.

End Diagonal or Web. The first web member on either end of a joist or Joist Girder which begins at the top chord at the seat and ends at the first bottom chord panel point.

Erector. The entity that is responsible for the safe and proper erection of the *materials* in accordance with all applicable codes and regulations.

Extended End. The extended part of a joist top chord with the seat angles also being extended from the end of the joist extension back into the joist and maintaining the standard end *bearing* depth over the entire length of the extension.

Factored Load. Product of a *load factor* and the *nominal load*.

Filler. A rod, plate or angle welded between a two angle web member or between a top or bottom chord panel to tie them together, usually located at the middle of the member.

Flexural Buckling. Buckling mode in which a compression member deflects laterally without twist or change in cross-sectional shape.

Flexural-Torsional Buckling. Buckling mode in which a compression member bends and twists simultaneously without change in cross-sectional shape.

Girt. Horizontal structural member that supports wall panels and is primarily subjected to bending under horizontal loads, such as wind load.

Gravity Load. *Load*, such as that produced by dead and live loads, acting in the downward direction.

Header. A structural member located between two *joists* or between a joist and a wall which carries another joist or joists. It is usually made up of an angle, channel, or beam with saddle angle connections on each end for bearing.

Horizontal Bridging. A continuous angle or other structural shape connected to the top and bottom chord of a joist.

Inelastic Analysis. *Structural analysis* that takes into account inelastic material behavior, including plastic analysis.

Instability. *Limit state* reached in the loading of a *structural component*, frame or structure in which a slight disturbance in the loads or geometry produces large displacements.

Joint. Area where two or more ends, surfaces or edges are attached. Categorized by type of fastener or weld used and the method of force transfer.

Joist. A structural load-carrying member with an open web system which supports floors and roofs utilizing hot-rolled or cold-formed steel and is designed as a simple span member. Currently, the SJI has the following joist designations: K-Series including KCS, LH-Series and DLH-Series.

Joist Girder. A primary structural load-carrying member with an open web system designed as a simple span supporting equally spaced concentrated loads of a floor or roof system acting at the panel points of the member and utilizing hot-rolled or cold-formed steel.

Joist Substitute. A structural member who's intended use is for very short spans (10 feet or less) where open web steel joists are impractical. They are usually used for short spans in skewed bays, over corridors or for outriggers. It can be made up of two or four angles to form channel sections or box sections.

Lateral Buckling. Buckling mode of a flexural member involving deflection normal to the plane of bending.

Lateral-Torsional Buckling. Buckling mode of a flexural member involving deflection normal to the plane of bending occurring simultaneously with twist about the shear center of the cross section.

Limit State. Condition in which a structure or component becomes unfit for service and is judged either to be no longer useful for its intended function (*serviceability limit state*) or to have reached its ultimate load-carrying capacity (*strength limit state*).

Load. Force or other action that results from the weight of building materials, occupants and their possessions, environmental effects, differential movement, or restrained dimensional changes.

Load Effect. Forces, stresses, and deformations produced in a *structural component* by the applied loads.

Load Factor. Factor that accounts for deviations of the *nominal load* from the actual *load*, for uncertainties in the analysis that transforms the *load* into a *load effect*, and for the probability that more than one extreme *load* will occur simultaneously.

Local Buckling**. *Limit state* of *buckling* of a compression element within a cross section.

LRFD (Load and Resistance Factor Design). Method of proportioning *structural components* such that the *design strength* equals or exceeds the *required strength* of the component under the action of the LRFD load *combinations*.

LRFD Load Combination. Load combination in the *applicable building code* intended for strength design *(Load and Resistance Factor Design)*.

Material. *Joists*, *Joist Girders* and accessories as provided by the *Seller*.

Nailers. Strips of lumber attached to the top chord of a *joist* so plywood or other flooring can be nailed directly to the *joist*.

Nominal Load. Magnitude of the load specified by the *applicable building code*.

Nominal Strength*. Strength of a structure or component (without the *resistance factor or safety factor* applied) to resist the *load effects*, as determined in accordance with these *Standard Specifications*.

Owner. The entity that is identified as such in the Contract Documents.

Permanent Load. *Load* in which variations over time are rare or of small magnitude. All other *loads* are *variable loads*.

Placement Plans. Drawings that are prepared depicting the interpretation of the Contract Documents requirements for the *material* to be supplied by the *Seller*. These floor and/or roof plans are approved by the *Specifying Professional*, *Buyer* or *Owner* for conformance with the design requirements. The *Seller* uses the information contained on these drawings for final material design. A unique piece mark number is typically shown for the individual placement of *joists*, *Joist Girders* and accessories along with sections that describe the *end bearing* conditions and minimum attachment required so that *material* is placed in the proper location in the field.

Ponding. Retention of water at low or irregular areas on a roof due solely to the deflection of flat roof framing.

Purlin. Horizontal structural member that supports roof deck and is primarily subjected to bending under vertical loads such as dead, snow or wind loads.

Quality Assurance. System of shop and field activities and controls implemented by the *owner* or his/her designated representative to provide confidence to the *owner* and the building authority that quality requirements are implemented.

Quality Control. System of shop and field controls implemented by the *seller* and *erector* to ensure that contract and company fabrication and erection requirements are met.

Required Strength*. Forces, stress, and deformations produced in a *structural component*, determined by either *structural analysis*, for the *LRFD* or *ASD load combinations*, as appropriate, or as specified by these *Standard Specifications*.

Resistance Factor, ϕ. Factor that accounts for unavoidable deviations of the *nominal strength* from the actual strength and for the manner and consequences of failure.

Safety Factor, Ω. Factor that accounts for deviations of the actual strength from the *nominal strength*, deviations of the actual load from the *nominal load*, uncertainties in the analysis that transforms the load into a load effect and for the manner and consequences of failure.

Seller. A company certified by the Joist Institute engaged in the manufacture and distribution of *joists*, *Joist Girders* and accessories.

Service Load. Load under which serviceability limit states are evaluated.

Serviceability Limit State. Limiting condition affecting the ability of a structure to preserve its appearance, maintainability, durability, or the comfort of its occupants or function of machinery, under normal usage.

Slenderness Ratio. The ratio of the effective length of a column to the radius of gyration of the column about the same axis of bending.

Span. The centerline-to-centerline distance between structural steel supports such as a beam, column or *Joist Girder* or the *clear span* distance plus four inches onto a masonry or concrete wall.

Specified Minimum Yield Stress. Lower limit of *yield stress* specified for a material as defined by ASTM.

Specifying Professional. The licensed professional who is responsible for sealing the building Contract Documents, which indicates that he or she has performed or supervised the analysis, design and document preparation for the structure and has knowledge of the load-carrying structural system.

Splice. *Connection* between two structural members joined at their ends by either bolting or welding to form a single, longer member.

Stability. Condition reached in the loading of a *structural component*, frame or structure in which a slight disturbance in the loads or geometry does not produce large displacements.

Stabilizer Plate. A steel plate at a column or wall inserted between the end of a bottom *chord of a joist or Joist Girder*.

Standard Specifications. Documents developed and maintained by the Steel Joist Institute for the design and manufacture of open web steel joists and Joist Girders. The term "SJI Standard Specifications" encompass by reference the following:

ANSI/SJI-K-1.1 Standard Specifications for Open Web Steel Joists, **K-Series;** ANSI/SJI-LH/DLH-1.1 Standard Specifications for Longspan Steel Joists, **LH-Series** and Deep Longspan Steel Joists, **DLH-Series;** and ANSI/SJI-JG-1.1 Standard Specifications for **Joist Girders**.

Strength Limit State. Limiting condition affecting the safety of the structure, in which the ultimate load-carrying capacity is reached.

Structural Analysis. Determination of *load effects* on members and connections based on principles of structural mechanics.

Structural Drawings. The graphic or pictorial portions of the Contract Documents showing the design, location and dimensions of the work. These documents generally include plans, elevations, sections, details, connections, all loads, schedules, diagrams and notes.

Tagged End. The end of a *joist* or *Joist Girder* where an identification or piece mark is shown by a metal tag. The member must be erected with this tagged end in the same position as the tagged end noted on the *placement plan*.

Tensile Strength (of material). Maximum tensile stress that a material is capable of sustaining as defined by ASTM.

Tie Joist. A *joist* that is bolted at a column.

Top Chord Extension (TCX). The extended part of a *joist* top chord. This type of extension only has the two top chord angles extended past the joist seat.

Torsional Buckling. *Buckling* mode in which a compression member twists about its shear center axis.

Unbraced Length. Distance between braced points of a member, measured between the centers of gravity of the bracing members.

Variable Load. *Load* not classified as *permanent load*.

Webs. The vertical or diagonal members joined at the top and bottom *chords* of a *joist* or *Joist Girder* to form triangular patterns.

Yield Point. First stress in a material at which an increase in strain occurs without an increase in stress as defined by ASTM.

Yield Strength. Stress at which a material exhibits a specified limiting deviation from the proportionality of stress to strain as defined by ASTM.

Yield Stress. Generic term to denote either *yield point or yield strength*, as appropriate for the material.

FIRE-RESISTANCE RATINGS WITH STEEL JOISTS

The Underwriters Laboratories (U.L.) Fire Resistance Directory lists hundreds of assemblies and their fire resistance ratings. The Specifying Professional can choose between numerous Floor-Ceiling and Roof-Ceiling assemblies that include steel joists and Joist Girders.

As a convenience, a selected number of assemblies are listed on the following pages. In addition, the Steel Joist Institute's Technical Digest #10 "Design of Fire Resistive Assemblies with Steel Joists" has a complete listing of steel joist assemblies and additional information about fire ratings. However, the listing that follows and the Technical Digest are intended as a guide only, and the Specifying Professional must refer to the current U.L. Fire Resistance Directory for complete design requirements.

Hundreds of fire tests on steel joist-supported assemblies have been conducted at nationally recognized testing laboratories in accordance with ASTM Standard E119, ANSI A2.1/UL 263, and NFPA 251. Because of practical loading restrictions and limitations of furnace dimensions, the vast majority of these tests were run using lightweight joists – normally from 8 inches to 14 inches (203 mm to 356 mm) deep. This practice was advantageous in that it established the minimum acceptable joists at the shallow and lightweight end of the joist load tables. This also resulted in a specified minimum joist designation being listed in the U.L. Fire Resistance Assembly, which is the joist that combines the required minimum depth and minimum weight per foot. Joists of the same series which equal or exceed the specified minimum joist depth and joist weight per foot may be used provided the accessories are compatible. The dimension from the bottom chord of the joists to the ceiling, whether given or calculated, is a minimum.

Where a U.L. Fire Resistance Assembly is being utilized, the Specifying Professional shall indicate the assembly number being used on the structural contract drawings. In addition, the Specifying Professional shall consider the following, as applicable:

- Joist designations specified on the structural contract drawings shall not be less than the minimum size for that assembly. The assembly may also require a minimum bridging size that may be larger than required by the SJI Specifications for the particular designation and joist spacing.
- Some assemblies stipulate minimum size materials or minimum cross sectional areas for individual joist and Joist Girder components. It is the responsibility of the Specifying Professional to show all special requirements on the contract drawings.
- Note that the maximum joist spacing shown for Floor-Ceiling Assemblies may be increased from the spacing listed in the U.L. Fire Resistance Directory to a maximum of 48 inches on center, provided the floor slab meets the structural requirements and the spacing of hanger wires supporting the ceiling is not increased.
- Some assemblies stipulate an allowable maximum joist design stress level less than the 30 ksi (207 MPa) used in the joist and Joist Girder Specifications. It is the responsibility of the Specifying Professional to apply the proper stress level reductions (when applicable) when selecting joists and/or Joist Girders. This is accomplished by prorating the joist and/or Joist Girder capacities. To adjust the stress level of joists or Joist Girders, multiply the design load by the ratio of the joist design stress to the required maximum [e.g. 30/26 (207/179), 30/24 (207/165), 30/22 (207/152)], and then using this increased load, select a joist or Joist Girder from the load and/or weight tables.
- Some U.L. Roof-Ceiling Assemblies using direct applied protection limit the spacing of the joists for certain types and gages of metal decking – refer to the U.L. Fire Resistance Directory for this information.
- Where fire protective materials are to be applied directly to the steel joists or Joist Girders, it is often desired to have the joist furnished as unpainted. The Specifying Professional should indicate on the structural contract drawings if the joists or Joist Girders are to be painted or not.
- Certain older U.L. fire rated assemblies may refer to joist series that predate the K-Series joists. Where one of these assemblies is selected, refer to the U.L Fire Resistance Directory for special provisions for substituting a K-Series joist in lieu of an S-, J-, and/or H-Series joist.

FLOOR – CEILING ASSEMBLIES WITH MEMBRANE PROTECTION

Restrained Assembly Rating	Protection Material	Minimum Joist Size	Concrete		Maximum Joist Spacing (in.)	Minimum Primary Support Member	UL Design Number
			Minimum Thickness (in.)	Type			
1 Hr.	Acoustical	12K1, 18LH02	2.5	LW, NW	NL	20G@13plf W8 x 15	D216
							D219
	Exposed Grid	10K1	2.5	NW	72	20G@14plf* W6 x 12	G205
		10K1	2		72	W6 x 12	G208
		10K1	2.5		72	20G@14plf* W6 x 12	G256
	Gypsum Board	10K1	2.5	NW	48	W8 x 24	G548
1 1/2 Hr.	Acoustical	12K1, 18LH02	2.5	LW, NW	NL	20G@13plf W8 x 15	D216
							D219
	Gypsum Board			NW		20G@20plf W8 x 28	D502
	Exposed Grid	10K1	2.5	NW	24 (48)	20G@13plf W6 x 12	G203
		10K1	2.5		72	20G@14plf* W6 x 12	G205
		10K1	2		72	W6 x 12	G208
		10K1	2.5		24 (48)		G213
		10K1	2.5		24 (48)	20G@13plf W8 x 31	G228
		10K1	2		24 (48)	20G@13plf W8 x 24	G229
		10K1	2.5		24 (48)	20G@13plf W6 x 12	G243
		10K1	2.5		24 (48)	20G@13plf W8 x 31	G268
	Gypsum Board	12K1	2	NW	24 (48)	NS	G502
2 Hr.	Acoustical	12K1, 18LH02	2.5	LW, NW	NL	20G@13plf W8 x 15	D216
							D219
	Gypsum Board			NW		20G@20plf W8 x 28	D502
	Concealed Grid	10K1	2.25	NW	24 (48)	W6 x 25	G023
		8K1	2.5		24 (48)	20G@13plf W8 x 20	G031
		10K1			30 (48)	20G@13plf W10 x 21	G036
	Exposed Grid	10K1	2.5	NW	24 (48)	20G@13plf W6 x 12	G203
		10K1	2.5		72	20G@14plf* W6 x 12	G205
		10K1	2.5		72	W6 x 12	G208
		10K1	2.5		24 (48)		G213
		10K1	2.5		24 (48)	W8 x 31	G227
		10K1	2.5		24 (48)	20G@13plf W8 x 31	G228

FLOOR – CEILING ASSEMBLIES WITH MEMBRANE PROTECTION

Restrained Assembly Rating	Protection Material	Minimum Joist Size	Concrete		Maximum Joist Spacing (in.)	Minimum Primary Support Member	UL Design Number
			Minimum Thickness (in.)	Type			
2 Hr.	Exposed Grid	10K1	2.5	NW	24 (48)	20G@13plf W8 x 24	G229
		10K1	2.5		24 (48)	20G@13plf W6 x 12	G243
		10K1	2.5		72	20G@14plf* W6 x 12	G256
		10K1	2.5		24 (48)	20G@13plf W8 x 31	G268
	Gypsum Board	10K1	2	NW	24 (48)	NS	G505
		10K1	2.5		24 (48)	20G@14plf* W8 x 31	G514
		10K1	2.5		24 (48)	20G@13plf W10 x 21	G523
		10K1	2.5		24 (48)	20G@13plf W8 x 24	G529
		10K1	2.5		24 (48)	20G@13plf W10 x 21	G547
3 Hr.	Acoustical	12K1, 18LH02	3.25	LW, NW	NL	20G@13plf W8 x 15	D216
							D219
	Concealed Grid	10K1	3.5	NW	24 (48)	20G@13plf W8 x 20	G033
		10K1	3.25		30 (48)	20G@13plf W10 x 21	G036
	Exposed Grid	10K1	3.5	NW	48	20G@14plf* W6 x 12	G205
		10K1	3.5		24 (48)	W6 x 12	G213
		10K1	3.25		24 (48)	20G@13plf W8 x 24	G229
		10K1	3.5		48	20G@14plf* W6 x 12	G256
		10K1 (22 ksi max.)	2.63		24 (48)	20G@13plf W8 x 31	G268
	Gypsum Board	10K1	3	NW	24 (48)	20G@13plf W10 x 21	G523
		10K1	2.75		24 (48)	20G@13plf W8 x 24	G529
		10K1	3		24 (48)	20G@13plf W10 x 21	G547

* Special Area Requirements
NL = Not Listed
NS = Not Specified

FLOOR – CEILING ASSEMBLIES WITH SPRAY APPLIED FIRE RESISTIVE MATERIALS

Restrained Assembly Rating	Protection Material	Minimum Joist Size	Concrete		Maximum Joist Spacing	Minimum Primary Support Member	UL Design Number
			Minimum Thickness (in.)	Type			
1 Hr.	SAFRM	NS	2.5	LW, NW	NL	W8 x 28	D759
		10K1	2.5				D779
		10K1	2.5				D780
		NS	3.25	LW			D782
		10K1*	2.5	LW			D925
			3.5	NW			
		16K6*	NS	LW, NW	42	20G@20plf W8 x 28	G701
		16K6	3	LW	50.5	NS	G702
			3.75	NW			
		16K6*	2.5	LW, NW	42	NS	G705
		16K6	3	LW	50.5	NS	G706
			3.75	NW			
		16K6*	2.5	LW, NW	42	20G@20plf W8 x 28	G708
		NS	2.5		42	W8 x 28	G709
		16K6*	2.5		42	20g@20plf W8 x 24	G801
		12K1	3	LW	50.5	NS	G802
			3.75	NW			
1 1/2 Hr.	SAFRM	NS	2.5	LW, NW	NL	W8 x 28	D759
		10K1	2.5				D779
		10K1	2.5				D780
		NS	3.25	LW			D782
		10K1*	3	LW			D925
			4	NW			
		16K6*	2.5	LW, NW	42	20G@20plf W8 x 28	G701
		16K6	3.5	LW	50.5	NS	G702
			4.5	NW			
		16K6*	2.5	LW, NW	42	NS	G705
		16K6	3.5	LW	50.5	NS	G706
			4.5	NW			
		16K6*	2.5	LW, NW	42	20G@20plf W8 x 28	G708
		NS	2.5		42	W8 x 28	G709
		16K6*	2.5		42	20G@20plf W8 x 24	G801
		12K5	3.5	LW	50.5	NS	G802
			4.5	NW			

FLOOR – CEILING ASSEMBLIES WITH SPRAY APPLIED FIRE RESISTIVE MATERIALS

Restrained Assembly Rating	Protection Material	Minimum Joist Size	Concrete		Maximum Joist Spacing	Minimum Primary Support Member	UL Design Number
			Minimum Thickness (in.)	Type			
2 Hr.	SAFRM	NS	2.5	LW, NW	NL	W8 x 28	D759
		10K1	2.5				D779
		10K1	2.5				D780
		NS	3.25	LW			D782
		10K1*	3.25	LW			D925
			4.5	NW			
		16K6*	2.5	LW, NW	42	20G@20plf W8 x 28	G701
		16K6	4	LW	50.5	NS	G702
			5.25	NW			
		16K6*	2.5	LW,NW	42	NS	G705
		16K6	4	LW	50.5	NS	G706
			5.25	NW			
		16K6*	2.5	LW, NW	42	20G@20plf W8 x 28	G708
		NS	2.5		42	W8 x 28	G709
		16K6*	2.5		42	20G@20plf W8 x 24	G801
		12K5	4	LW	50.5	NS	G802
			5.25	NW			
3 Hr.	SAFRM	NS	2.5	LW, NW	NL	W8 x 28	D759
		10K1	2.5				D779
		10K1	2.5				D780
		NS	3.25	LW			D782
		10K1*	4.19	LW			D925
			5.25	NW			
		16K6*	NS	LW, NW	42	20G@20plf W8 x 28	G701
		16K6*	2.75		42	NS	G705
		16K6*	2.75		42	20G@20plf W8 x 28	G708
		NS	2.75		42	W8 x 28	G709
		16K6*	2.75		42	20G@20plf W8 x 24	G801
4 Hr.	SAFRM	10K1	2.5	LW, NW	NL	W8 x 28	D779
		NS	3.25	LW			D782

* Special Area Requirements
NL = Not Listed
NS = Not Specified

ROOF – CEILING ASSEMBLIES WITH MEMBRANE PROTECTION

Restrained Assembly Rating	Protection Material	Minimum Joist Size	Built Up Roof		Maximum Joist Spacing (in.)	Minimum Primary Support Member	UL Design Number
			Deck Material Description	Insulation			
1 Hr.	Exposed Grid	12K1	22 MSG Min.	Fiber Board	84	W8 x 17	P201
		10K1	26 MSG Min.		48	W6 x 12	P202
		10K1	26 MSG Min.		48	20G@13plf	P211
		12K3	28 MSG Min.		72	20G@13plf W8 x 17	P214
		12K1	26 MSG Min.		72	20G@13plf W6 x 12	P225
		12K3	24 MSG Min.	Building Units	48	NS	P227
		12K3	26 MSG Min.	Fiber Board	72	20G@13plf W6 x 12	P230
		12K1	26 MSG Min.	Insulating Concrete	48	20G@14plf* W8 x 15	P231
		12K3	24 MSG Min.	Foamed Plastic	72	W8 x 15	P235
		10K1	28 MSG Min.	Insulating Concrete	72	20G@13plf W8 x 15	P246
		12K5	26 MSG Min.	Fiber Board	48	W6 x 12	P250
		12K1	28 MSG Min.	Insulating Concrete	72	20G@13plf W6 x 12	P251
		10K1	22 MSG Min.	Fiber Board	72	W6 x 12	P254
		10K1	28 MSG Min.	Insulating Concrete	72	W8 x 15	P255
		10K1	24 MSG Min.	Fiber Board	72	NS	P259
		12K1	28 MSG Min.	Insulating Concrete	72	20G@13plf W6 x 12	P261
		12K1	26 MSG Min.	Insulating Concrete	72	20G@14plf* W8 x 15	P264
		10K1	Metal Roof Deck Panels	Batts and Blankets	60	NS	P265
		10K1	26 MSG Min.	Fiber Board	48	W6 x 16	P267
		10K1	Metal Roof Deck Panels	Batts and Blankets	60	NS	P268
		12K1	26 MSG Min.	Insulating Concrete	72	20G@14plf* W8 x 15	P269
	Fiber Board	10K1	24 MSG Min.	Fiber Board	NS	W6 x 16	P301
		10K1	22 MSG Min.		48	NS	P302
		10K1	22 MSG Min.		NS	W6 x 16	P303
	Gypsum Board	12K3	26 MSG Min.	Insulating Concrete	60	W8 x 24	P509
		12K3	24 MSG Min.	Fiber Board	72	20G@13plf W8 x 13	P510
		10K1	20 MSG Min.	Fiber Board	48	NS	P519

ROOF – CEILING ASSEMBLIES WITH MEMBRANE PROTECTION

Restrained Assembly Rating	Protection Material	Minimum Joist Size	Built Up Roof		Maximum Joist Spacing (in.)	Minimum Primary Support Member	UL Design Number
			Deck Material Description	Insulation			
1 1/2 Hr.	Exposed Grid	12K1	26 MSG Min.	Fiber Board	72	20G@13plf W6 x 12	P225
		12K3	24 MSG Min.	Building Units	48	NS	P227
		12K3	26 MSG Min.	Fiber Board	48	20G@13plf W6 x 12	P230
		12K1	26 MSG Min.	Insulating Concrete	48	20G@14plf* W8 x 24	P231
		12K5	26 MSG Min.	Fiber Board	48	W6 x 12	P250
		12K1	28 MSG Min.	Insulating Concrete	72	20G@13plf W6 x 12	P251
		10K1	24 MSG Min.	Fiber Board	72	NS	P259
		10K1	Metal Roof Deck Panels	Batts and Blankets	60	NS	P265
		10K1	20 MSG Min.	Fiber Board	48	NS	P266
		10K1	Metal Roof Deck Panels	Batts and Blankets	60	NS	P268
		12K1	26 MSG Min.	Insulating Concrete	72	20G@14plf* W8 x 24	P269
	Fiber Board	10K1	24 MSG Min.	Fiber Board	NS	W6 x 16	P301
	Metal Lath	12K5	22 MSG Min.	Fiber Board	72	NS	P404
	Gypsum Board	12K3	24 MSG Min.	Fiber Board	72	20G@13plf W8 x 13	P510
2 Hr.	Exposed Grid	10K1	24 MSG Min.	Fiber Board	72	W6 x 12	P237
		12K1	28 MSG Min.	Insulating Concrete	72	20G@13plf W6 x 12	P251
		10K1	20 MSG Min.	Fiber Board	48	NS	P266
	Fiber Board	10K1	24 MSG Min.	Fiber Board	NS	W6 x 16	P301
	Metal Lath	12K5	22 MSG Min.	Fiber Board	72	NS	P404
	Gypsum Board	10K1	22 MSG Min.	Fiber Board	72	20G@13plf	P514
			20 MSG Min.		48	NS	P519
		14K1	26 MSG Min.	Insulating Concrete	66	NS	P520
3 Hr.	Metal Lath	10K1	28 MSG Min.	Insulating Concrete	48	NS	P405

* Special Area Requirements
NL = Not Listed
NS = Not Specified

ROOF – CEILING ASSEMBLIES WITH SPRAY APPLIED FIRE RESISTIVE MATERIALS

Restrained Assembly Rating	Protection Material	Minimum Joist Size	Built Up Roof		Maximum Joist Spacing (in.)	Minimum Primary Support Member	UL Design Number
			Deck Material Description	Insulation			
1 Hr.	SAFRM	10K1	22 MSG Min.	Building Units	NS	NS	P822
		12K3	22 MSG Min.	Fiber Board	NS	W8 x 20	P824
1 Hr. and 1-1/2 Hr.	SAFRM	12K5	28 MSG Min.	Insulating Concrete	96	W6 x 16	P919
1-1/2 Hr. and 2 Hr.	SAFRM	10K1	22 MSG Min.	Building Units	NS	W6 x 16	P728
1 Hr., 1-1/2 Hr. and 2 Hr.	SAFRM	14K4	22 MSG Min.	Fiber Board	NS	20G@13plf W6 x 16	P701
		14K4	22 MSG Min.	Fiber Board	NS	20G@13plf W6 x 16	P711
		12K3	22 MSG Min.	Foamed Plastic	NS	W6 x 16	P717
		10K1	22 MSG Min.	Foamed Plastic	NS	20G@13plf W8 x 28	P725
		10K1	22 MSG Min.	Fiber Board	NS	20G@13plf W6 x 16	P726
		14K4	22 MSG Min.	Fiber Board	NS	20G@13plf W6 x 16	P734
		14K4	22 MSG Min.	Fiber Board	NS	20G@13plf W6 x 16	P736
		10K1	22 MSG Min.	Foamed Plastic	NS	W6 x 16	P739
		10K1	22 MSG Min.	Fiber Board	NS	W6 x 16	P740
		10K1	22 MSG Min.	Foamed Plastic	NS	W6 x 16	P743
		12K3	22 MSG Min.	Fiber Board	NS	20G@13plf W6 x 16	P801
		10K1	22 MSG Min.	Fiber Board	NS	20G@13plf W6 x 16	P815
		10K1	22 MSG Min.	Fiber Board	NS	W6 x 16	P816
		10K1	22 MSG Min.	Foamed Plastic	NS	W6 x 16	P819
		10K1	22 MSG Min.	Foamed Plastic	NS	W6 x 16	P825
		10K1	22 MSG Min.	Foamed Plastic	NS	W6 x 16	P827
		12K1	22 MSG Min.	Fiber Board	NS	20G@13plf W8 x 20	P828
		10K1	28 MSG Min.	Insulating Concrete	NS	20G@13plf W8 x 10	P902
		10K1	28 MSG Min.	Insulating Concrete	NS	W8 x 10	P907
		10K1	28 MSG Min.	Insulating Concrete	NS	20G@13plf W8 x 10	P908

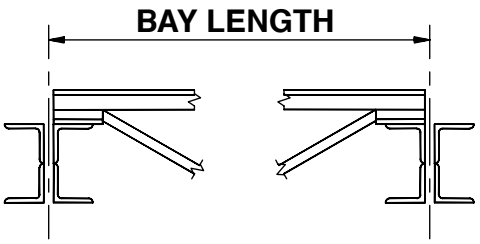
ROOF – CEILING ASSEMBLIES WITH SPRAY APPLIED FIRE RESISTIVE MATERIALS

Restrained Assembly Rating	Protection Material	Minimum Joist Size	Built Up Roof		Maximum Joist Spacing (in.)	Minimum Primary Support Member	UL Design Number
			Deck Material Description	Insulation			
1 Hr., 1-1/2 Hr. and 2 Hr.	SAFRM	10K1	28 MSG Min.	Insulating Concrete	NS	W8 x 10	P920
		12K5	28 MSG Min.	Insulating Concrete	NS	20G@13plf W8 x 10	P921
		10K1	28 MSG Min.	Insulating Concrete	NS	W6 x 16	P922
		10K1	28 MSG Min.	Insulating Concrete	NS	20G@13plf W8 x 10	P923
		10K1	28 MSG Min.	Insulating Concrete	NS	20G@13plf W8 x 10	P925
		12K5	28 MSG Min.	Insulating Concrete	NS	W8 x 10	P926
		14K4	28 MSG Min.	Insulating Concrete	NS	20G@13plf W8 x 10	P927
		12K5	28 MSG Min.	Insulating Concrete	NS	20G@13plf W8 x 10	P928
		12K3	28 MSG Min.	Insulating Concrete	NS	20G@13plf W8 x 10	P929
		10K1	28 MSG Min.	Insulating Concrete	NS	W6 x 16	P936
2 Hr.	SAFRM	12K3	22 MSG Min.	Foamed Plastic	NS	W6 x 16	P718
		12K3	22 MSG Min.	Foamed Plastic	NS	20G@13plf W6 x 16	P720
		12K3	22 MSG Min.	Foamed Plastic	NS	W6 x 16	P729
1 Hr., 1-1/2 Hr., 2 Hr. and 3 Hr.	SAFRM	10K1	22 MSG Min.	Foamed Plastic	NS	20G@13plf W6 x 16	P719
		10K1	22 MSG Min.	Foamed Plastic	NS	W6 x 16	P722
		10K1	22 MSG Min.	Foamed Plastic	NS	W6 x 16	P723
		10K1	22 MSG Min.	Foamed Plastic	NS	W8 x 28	P732
		10K1*,16K2	22 MSG Min.	Foamed Plastic	NS	W6 x 16	P733
		10K1*	22 MSG Min.	Foamed Plastic	NS	W6 x 16	P826

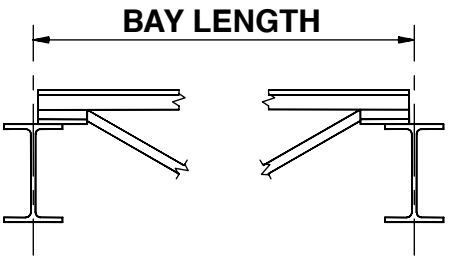
* Special Area Requirements
NS = Not Specified

OSHA SAFETY STANDARDS FOR STEEL ERECTION

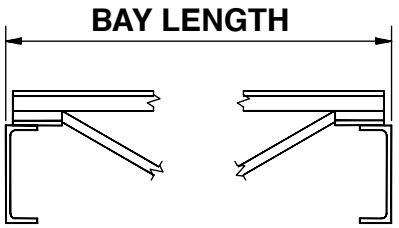
BAY LENGTH DEFINITIONS



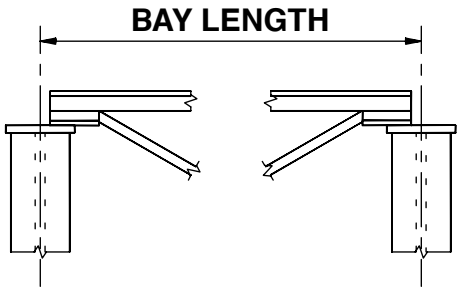
JOIST GIRDERS



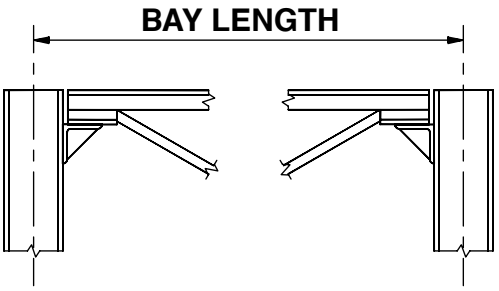
STEEL BEAM



STEEL CHANNEL



STEEL COLUMN



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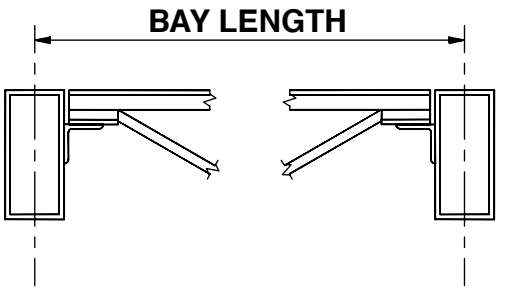
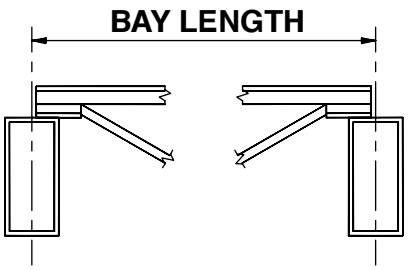
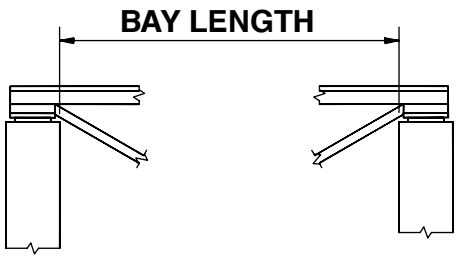


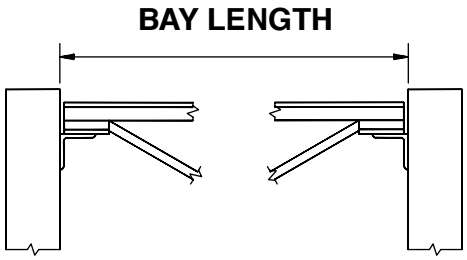
STEEL TUBE



STEEL TUBE



MASONRY OR TILT-UP



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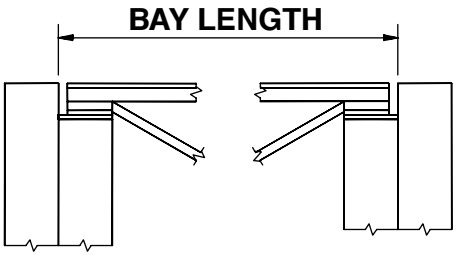
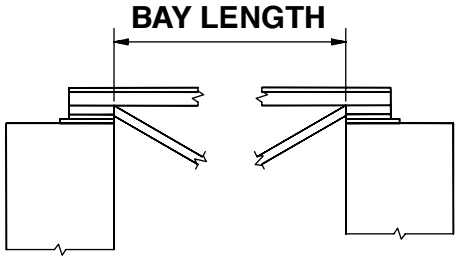


MASONRY WITH PILASTER



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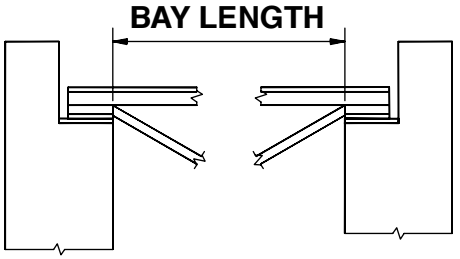

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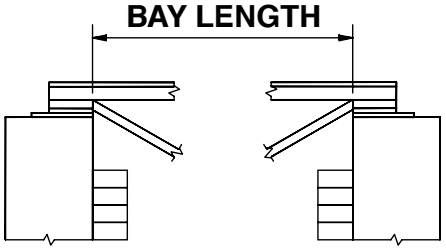


MASONRY WITH FACE BRICK

§ 1926.751 DEFINITIONS
(Selected items only).

Anchored bridging means that the steel joist bridging is connected to a bridging terminus point.

Bolted diagonal bridging means diagonal bridging that is bolted to a steel joist or joists.

Bridging clip means a device that is attached to the steel joist to allow the bolting of the bridging to the steel joist.

Bridging terminus point means a wall, a beam, tandem joists (with all bridging installed and a horizontal truss in the plane of the top chord) or other element at an end or intermediate point(s) of a line of bridging that provides an anchor point for the steel joist bridging.

Column means a load-carrying vertical member that is part of the primary skeletal framing system. Columns do not include posts.

Constructibility means the ability to erect structural steel members in accordance with subpart R without having to alter the over-all structural design.

Construction load (for joist erection) means any load other than the weight of the employee(s), the joists and the bridging bundle.

Erection bridging means the bolted diagonal bridging that is required to be installed prior to releasing the hoisting cables from the steel joists.

Personal fall arrest system means a system used to arrest an employee in a fall from a working level. A personal fall arrest system consists of an anchorage, connectors, a body harness and may include a lanyard, deceleration device, lifeline, or suitable combination of these. The use of a body belt for fall arrest is prohibited.

Project structural engineer means the registered, licensed professional responsible for the design of structural steel framing and whose seal appears on the structural contract documents.

Qualified person (also defined in § 1926.32) means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project.

Steel joist means an open web, secondary load-carrying member of 144 feet (43.9 m) or less, designed by the manufacturer, used for the support of floors and roofs. This does not include structural steel trusses or cold-formed joists.

Steel joist girder means an open web, primary load-carrying member, designed by the manufacturer, used for the support of floors and roofs. This does not include structural steel trusses.

Structural steel means a steel member, or a member made of a substitute material (such as, but not limited to, fiberglass, aluminum or composite members). These members include, but are not limited to, steel joists, joist girders, purlins, columns, beams, trusses, splices, seats, metal decking, girts, and all bridging, and cold formed metal framing which is integrated with the structural steel framing of a building.

§ 1926.757 OPEN WEB STEEL JOISTS

(a) General.

(1) Except as provided in paragraph (a)(2) of this section, where steel joists are used and columns are not framed in at least two directions with solid web structural steel members, a steel joist shall be field-bolted at the column to provide lateral stability to the column during erection. For the installation of this joist:

(i) A vertical stabilizer plate shall be provided on each column for steel joists. The plate shall be a minimum of 6 inch by 6 inch (152 mm by 152 mm) and shall extend at least 3 inches (76 mm) below the bottom chord of the joist with a 13 /16 inch (21 mm) hole to provide an attachment point for guying or plumbing cables.

(ii) The bottom chords of steel joists at columns shall be stabilized to prevent rotation during erection.

(iii) Hoisting cables shall not be released until the seat at each end of the steel joist is field-bolted, and each end of the bottom chord is restrained by the column stabilizer plate.

(2) Where constructibility does not allow a steel joist to be installed at the column:

(i) an alternate means of stabilizing joists shall be installed on both sides near the column and shall:

(A) provide stability equivalent to paragraph (a)(1) of this section;

(B) be designed by a qualified person;

(C) be shop installed; and

(D) be included in the erection drawings.

(ii) hoisting cables shall not be released until the seat at each end of the steel joist is field-bolted and the joist is stabilized.

(3) Where steel joists at or near columns span 60 feet (18.3 m) or less, the joist shall be designed with sufficient strength to allow one employee to release the hoisting cable without the need for erection bridging.

(4) Where steel joists at or near columns span more than 60 feet (18.3 m), the joists shall be set in tandem with all bridging installed unless an alternative method of erection, which provides equivalent stability to the steel joist, is designed by a qualified person and is included in the site-specific erection plan.

(5) A steel joist or steel joist girder shall not be placed on any support structure unless such structure is stabilized.

(6) When steel joist(s) are landed on a structure, they shall be secured to prevent unintentional displacement prior to installation.

(7) No modification that affects the strength of a steel joist or steel joist girder shall be made without the approval of the project structural engineer of record.

(8) *Field-bolted joists*.

(i) Except for steel joists that have been pre-assembled into panels, connections of individual steel joists to steel structures in bays of 40 feet (12.2 m) or more shall be fabricated to allow for field bolting during erection.

(ii) These connections shall be field-bolted unless constructibility does not allow.

(9) Steel joists and steel joist girders shall not be used as anchorage points for a fall arrest system unless written approval to do so is obtained from a qualified person.

(10) A bridging terminus point shall be established before bridging is installed. (See Appendix C to this subpart.)

(b) Attachment of steel joists and steel joist girders.

(1) Each end of "K" series steel joists shall be attached to the support structure with a minimum of two 1/8 -inch (3 mm) fillet welds 1 inch (25 mm) long or with two 1/2 -inch (13 mm) bolts, or the equivalent.

(2) Each end of "LH" and "DLH" series steel joists and steel joist girders shall be attached to the support structure with a minimum of two 1/4 -inch (6 mm) fillet welds 2 inches (51 mm) long, or with two 3/4 -inch (19 mm) bolts, or the equivalent.

(3) Except as provided in paragraph (b)(4) of this section, each steel joist shall be attached to the support structure, at least at one end on both sides of the seat, immediately upon placement in the final erection position and before additional joists are placed.

(4) Panels that have been pre-assembled from steel joists with bridging shall be attached to the structure at each corner before the hoisting cables are released.

(c) Erection of steel joists.

(1) Both sides of the seat of one end of each steel joist that requires bridging under Tables A and B shall be attached to the support structure before hoisting cables are released.

(2) For joists over 60 feet, both ends of the joist shall be attached as specified in paragraph (b) of this section and the provisions of paragraph (d) of this section met before the hoisting cables are released.

(3) On steel joists that do not require erection bridging under Tables A and B, only one employee shall be allowed on the joist until all bridging is installed and anchored.

▶ NOTE: TABLES "A" & "B" HAVE BEEN EDITED TO CONFORM WITH STEEL JOIST INSTITUTE BOLTED DIAGONAL BRIDGING REQUIREMENTS.

▶ TABLE A. — ERECTION BRIDGING FOR SHORT SPAN JOISTS

Joist	Sp
8K1	NM
10K1	NM
12K1	23–0
12K3	NM
12K5	NM
14K1	27–0
14K3	NM
14K4	NM
14K6	NM
16K2	29–0
16K3	30–0
16K4	32–0
16K5	32–0
16K6	NM
16K7	NM
16K9	NM
18K3	31–0
18K4	32–0
18K5	33–0
18K6	35–0
18K7	NM
18K9	NM
18K10	NM
20K3	32–0
20K4	34–0
20K5	34–0
20K6	36–0
20K7	39–0
20K9	39–0
20K10	NM
22K4	34–0
22K5	35–0
22K6	36–0
22K7	40–0
22K9	40–0
22K10	NM
22K11	NM
24K4	36–0
24K5	38–0
24K6	39–0
24K7	43–0
24K8	43–0
24K9	44–0
24K10	NM
24K12	NM
26K5	38–0
26K6	39–0

NM = diagonal bolted bridging not mandatory

▶ TABLE A. — ERECTION BRIDGING FOR SHORT SPAN JOISTS (continued)

Joist	Span
26K7	43–0
26K8	44–0
26K9	44–0
26K10	49–0
26K12	NM
28K6	40–0
28K7	43–0
28K8	44–0
28K9	45–0
28K10	49–0
28K12	53–0
30K7	44–0
30K8	45–0
30K9	45–0
30K10	50–0
30K11	52–0
30K12	54–0
10KCS1	NM
10KCS2	NM
10KCS3	NM
12KCS1	NM
12KCS2	NM
12KCS3	NM
14KCS1	NM
14KCS2	NM
14KCS3	NM
16KCS2	NM
16KCS3	NM
16KCS4	NM
16KCS5	NM
18KCS2	35–0
18KCS3	NM
18KCS4	NM
18KCS5	NM
20KCS2	36–0
20KCS3	39–0
20KCS4	NM
20KCS5	NM
22KCS2	36–0
22KCS3	40–0
22KCS4	NM
22KCS5	NM
24KCS2	39–0
24KCS3	44–0
24KCS4	NM
24KCS5	NM
26KCS2	39–0
26KCS3	44–0
26KCS4	NM
26KCS5	NM
28KCS2	40–0
28KCS3	45–0
28KCS4	53–0
28KCS5	53–0
30KCS3	45–0
30KCS4	54–0
30KCS5	54–0

NM = diagonal bolted bridging not mandatory

▶ TABLE B. — ERECTION BRIDGING FOR LONG SPAN JOISTS

Joist	Span
18LH02	33–0
18LH03	NM
18LH04	NM
18LH05	NM
18LH06	NM
18LH07	NM
18LH08	NM
18LH09	NM
20LH02	33–0
20LH03	38–0
20LH04	NM
20LH05	NM
20LH06	NM
20LH07	NM
20LH08	NM
20LH09	NM
20LH10	NM
24LH03	35–0
24LH04	39–0
24LH05	40–0
24LH06	45–0
24LH07	NM
24LH08	NM
24LH09	NM
24LH10	NM
24LH11	NM
28LH05	42–0
28LH06	46–0
28LH07	54–0
28LH08	54–0
28LH09	NM
28LH10	NM
28LH11	NM
28LH12	NM
28LH13	NM
32LH06	47–0 through 60–0
32LH07	47–0 through 60–0
32LH08	55–0 through 60–0
32LH09	NM through 60–0
32LH10	NM through 60–0
32LH11	NM through 60–0
32LH12	NM through 60–0
32LH13	NM through 60–0
32LH14	NM through 60–0
32LH15	NM through 60–0
36LH07	47–0 through 60–0
36LH08	47–0 through 60–0
36LH09	57–0 through 60–0
36LH10	NM through 60–0
36LH11	NM through 60–0
36LH12	NM through 60–0
36LH13	NM through 60–0
36LH14	NM through 60–0
36LH15	NM through 60–0
40LH08	47–0 through 60–0
40LH09	47–0 through 60–0
44LH09	52–0 through 60–0

NM = diagonal bolted bridging not mandatory

(4) Employees shall not be allowed on steel joists where the span of the steel joist is equal to or greater than the span shown in Tables A and B except in accordance with § 1926.757(d).

(5) When permanent bridging terminus points cannot be used during erection, additional temporary bridging terminus points are required to provide stability. (See appendix C of this subpart.)

(d) Erection bridging.

(1) Where the span of the steel joist is equal to or greater than the span shown in Tables A and B, the following shall apply:

(i) A row of bolted diagonal erection bridging shall be installed near the midspan of the steel joist;

(ii) Hoisting cables shall not be released until this bolted diagonal erection bridging is installed and anchored; and

(iii) No more than one employee shall be allowed on these spans until all other bridging is installed and anchored.

(2) Where the span of the steel joist is over 60 feet (18.3 m) through 100 feet (30.5 m), the following shall apply:

(i) All rows of bridging shall be bolted diagonal bridging;

(ii) Two rows of bolted diagonal erection bridging shall be installed near the third points of the steel joist;

(iii) Hoisting cables shall not be released until this bolted diagonal erection bridging is installed and anchored; and

(iv) No more than two employees shall be allowed on these spans until all other bridging is installed and anchored.

(3) Where the span of the steel joist is over 100 feet (30.5 m) through 144 feet (43.9 m), the following shall apply:

(i) All rows of bridging shall be bolted diagonal bridging;

(ii) Hoisting cables shall not be released until all bridging is installed and anchored; and

(iii) No more than two employees shall be allowed on these spans until all bridging is installed and anchored.

(4) For steel members spanning over 144 feet (43.9 m), the erection methods used shall be in accordance with § 1926.756.

(5) Where any steel joist specified in paragraphs (c)(2) and (d)(1), (d)(2), and (d)(3) of this section is a bottom chord bearing joist, a row of bolted diagonal bridging shall be provided near the support(s). This bridging shall be installed and anchored before the hoisting cable(s) is released.

(6) When bolted diagonal erection bridging is required by this section, the following shall apply:

(i) The bridging shall be indicated on the erection drawing;

(ii) The erection drawing shall be the exclusive indicator of the proper placement of this bridging;

(iii) Shop-installed bridging clips, or functional equivalents, shall be used where the bridging bolts to the steel joists;

(iv) When two pieces of bridging are attached to the steel joist by a common bolt, the nut that secures the first piece of bridging shall not be removed from the bolt for the attachment of the second; and

(v) Bridging attachments shall not protrude above the top chord of the steel joist.

(e) Landing and placing loads.

(1) During the construction period, the employer placing a load on steel joists shall ensure that the load is distributed so as not to exceed the carrying capacity of any steel joist.

(2) Except for paragraph (e)(4) of this section, no construction loads are allowed on the steel joists until all bridging is installed and anchored and all joist-bearing ends are attached.

(3) The weight of a bundle of joist bridging shall not exceed a total of 1,000 pounds (454 kg). A bundle of joist bridging shall be placed on a minimum of three steel joists that are secured at one end. The edge of the bridging bundle shall be positioned within 1 foot (.30 m) of the secured end.

(4) No bundle of decking may be placed on steel joists until all bridging has been installed and anchored and all joist bearing ends attached, unless all of the following conditions are met:

(i) The employer has first determined from a qualified person and documented in a site-specific erection plan that the structure or portion of the structure is capable of supporting the load;

(ii) The bundle of decking is placed on a minimum of three steel joists;

(iii) The joists supporting the bundle of decking are attached at both ends;

(iv) At least one row of bridging is installed and anchored;

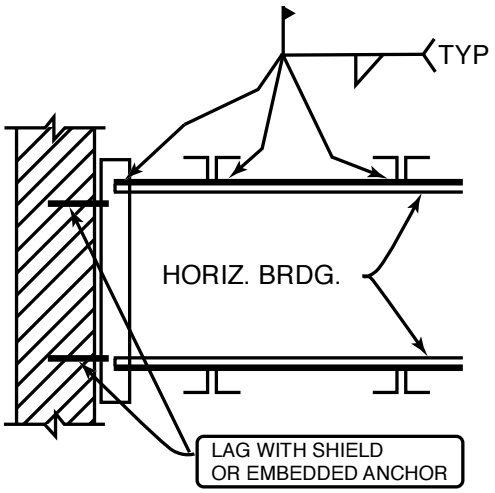
(v) The total weight of the bundle of decking does not exceed 4,000 pounds (1816 kg); and

(vi) Placement of the bundle of decking shall be in accordance with paragraph (e)(5) of this section.

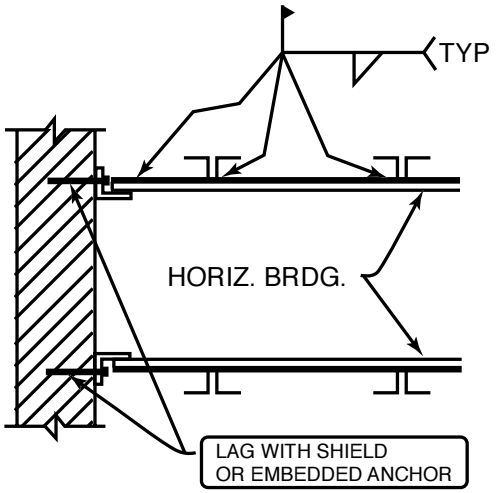
(5) The edge of the construction load shall be placed within 1 foot (.30 m) of the bearing surface of the joist end.

ILLUSTRATIONS OF OSHA BRIDGING TERMINUS POINTS
(NON-MANDATORY)

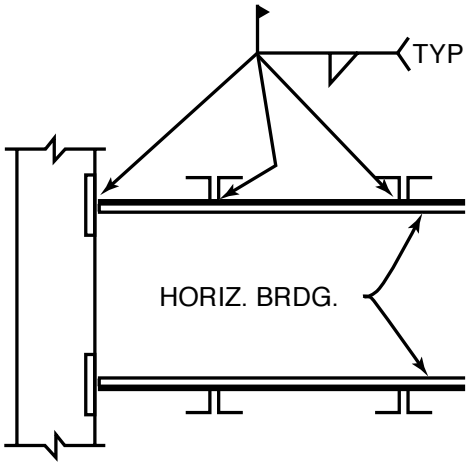
Guidelines for Complying with OSHA Steel Erection Standard, Paragraph §1926.757(a)(10) and §1926.757(c)(5).



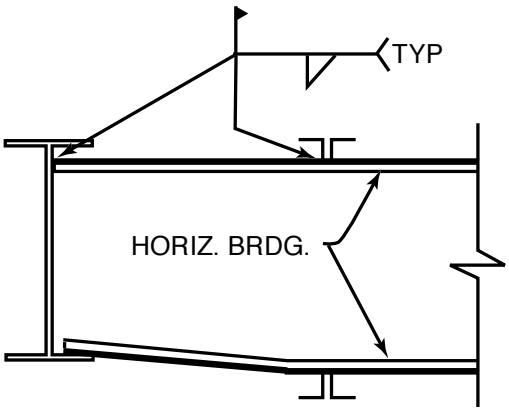
HORIZONTAL BRIDGING
TERMINUS AT WALL



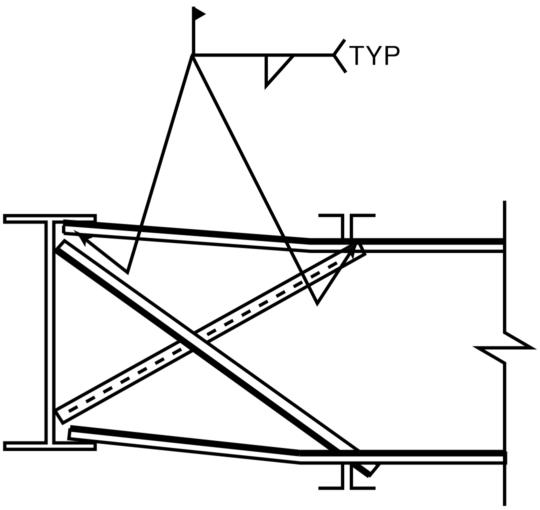
HORIZONTAL BRIDGING
TERMINUS AT WALL



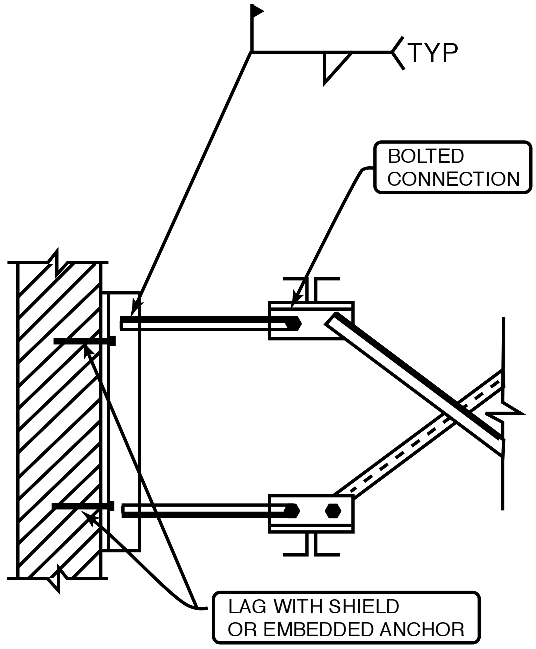
HORIZONTAL BRIDGING
TERMINUS AT PANEL WALL



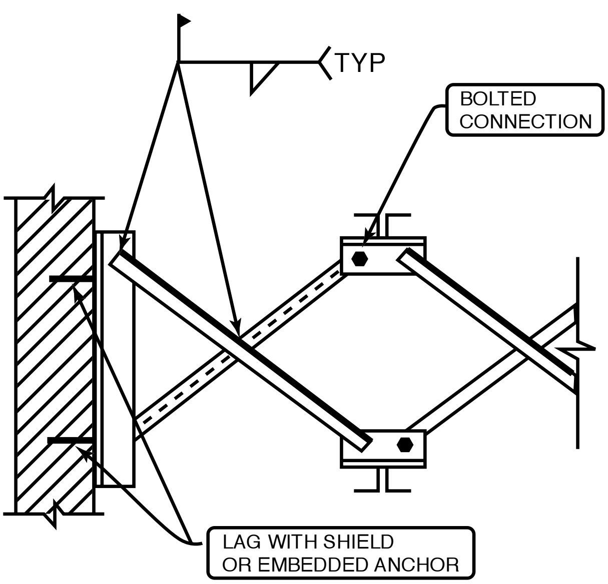
HORIZONTAL BRIDGING
TERMINUS AT
STRUCTURAL SHAPE



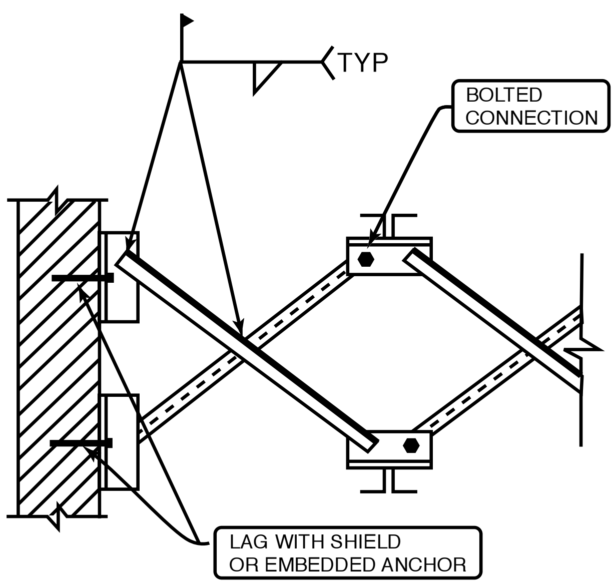
HORIZONTAL BRIDGING
TERMINUS AT STRUCTURAL
SHAPE WITH OPTIONAL
"X-BRIDGING"



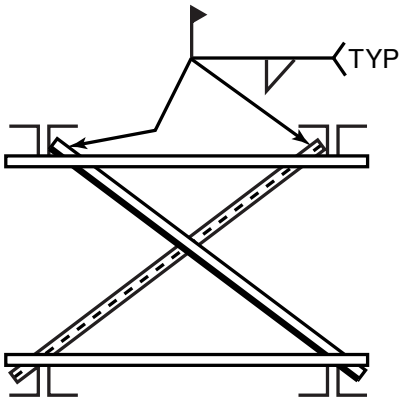
BOLTED DIAGONAL BRIDGING
TERMINUS AT WALL



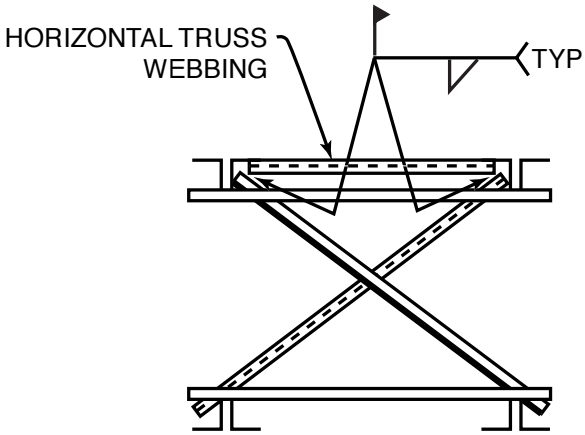
BOLTED DIAGONAL BRIDGING
TERMINUS AT WALL



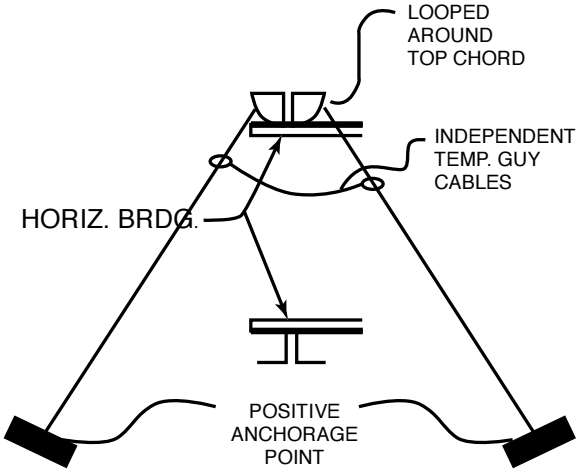
BOLTED DIAGONAL BRIDGING
TERMINUS AT WALL



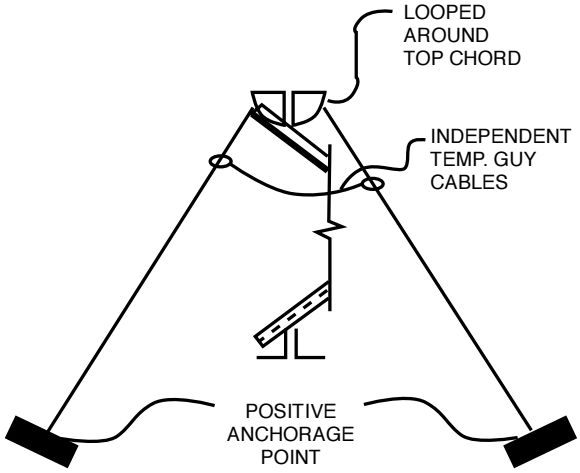
JOISTS PAIR BRIDGING
TERMINUS POINT



JOISTS PAIR BRIDGING
TERMINUS POINT



HORIZONTAL BRIDGING
TERMINUS POINT
SECURED BY TEMP.
GUY CABLES



DIAGONAL BRIDGING
TERMINUS POINT
SECURED BY TEMP.
GUY CABLES

NOTES

NOTES

TABLE OF CONTENTS

NEW MILLENNIUM BUILDING SYSTEMS

Pages identified with the NMBS Logo as shown above, have been produced by NMBS to assist specifiers and consumers in the application of New Millennium Building Systems' Deck products.

STEEL DECK INSTITUTE sdi

Pages identified with the Steel Deck Institute Logo as shown above, have been reproduced from the SDI Publication #30, Design Manual for Composite Decks, Form Decks and Roof Decks.

LIABILITY STATEMENT

The data published in this catalog has been developed using recognized engineering principles and is intended for general information only. Although the data shown is believed to be accurate, New Millennium Building Systems does not assume any liability or obligation of any kind or nature arising from or related to the data provided herein and/or its use. Applicability of the products and the accuracy of the data should be assessed by a licensed professional engineer or architect to determine the suitability for the intended application.

OUR FACILITIES

NEW MILLENNIUM BUILDING SYSTEMS

New Millennium Building Systems (NMBS) is a wholly-owned subsidiary of Steel Dynamics, Inc., manufacturing a complete range of joist and deck products. NMBS is a Company Member of both the Steel Joist Institute and the Steel Deck Institute.

Deck products include roof, form and composite decks and deck accessories, designed and manufactured in accordance with the specifications of the Steel Deck Institute.

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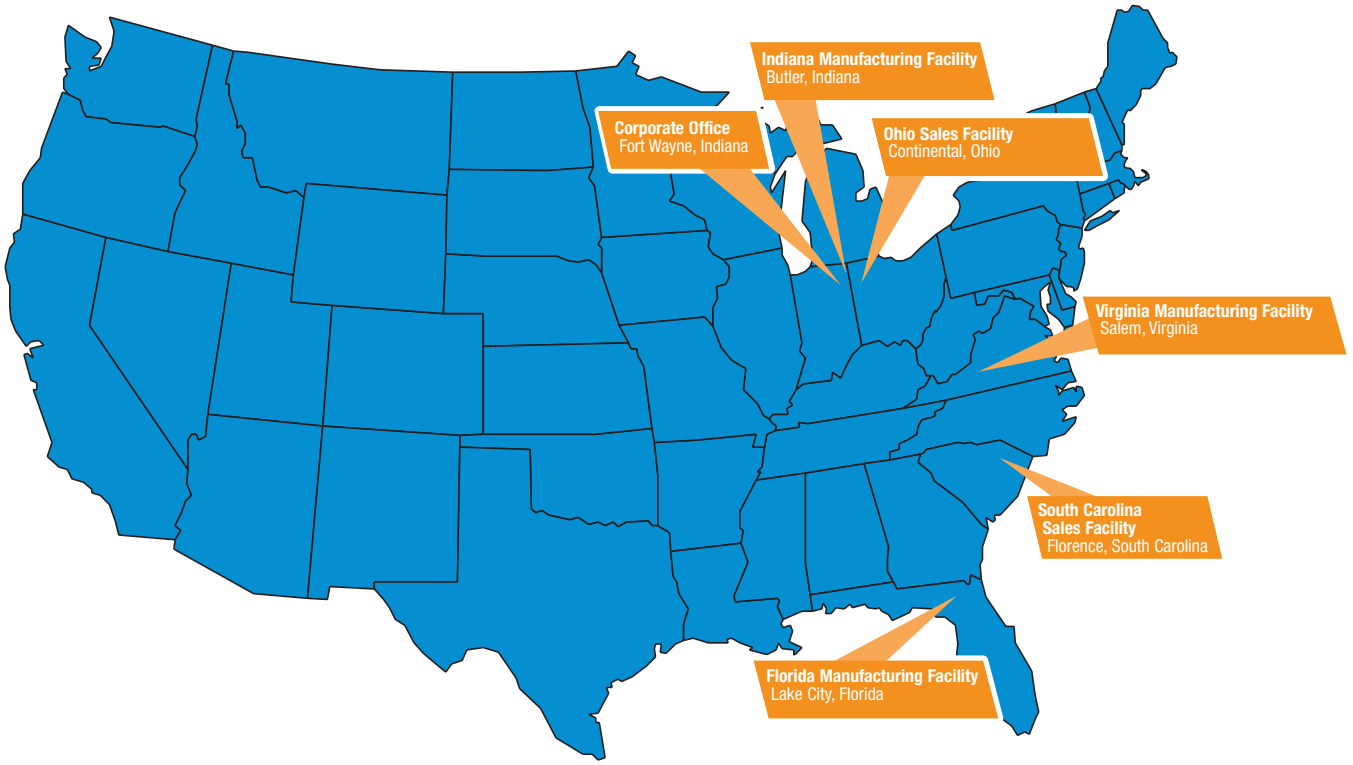
Fax (419) 596-3120

South Carolina Sales Facility
2527 E. National Cemetery Road
Florence, SC 29506
Voice (843) 669-5183
Fax (843) 669-0675



QUALITY ASSURANCE

DECK PRODUCTS

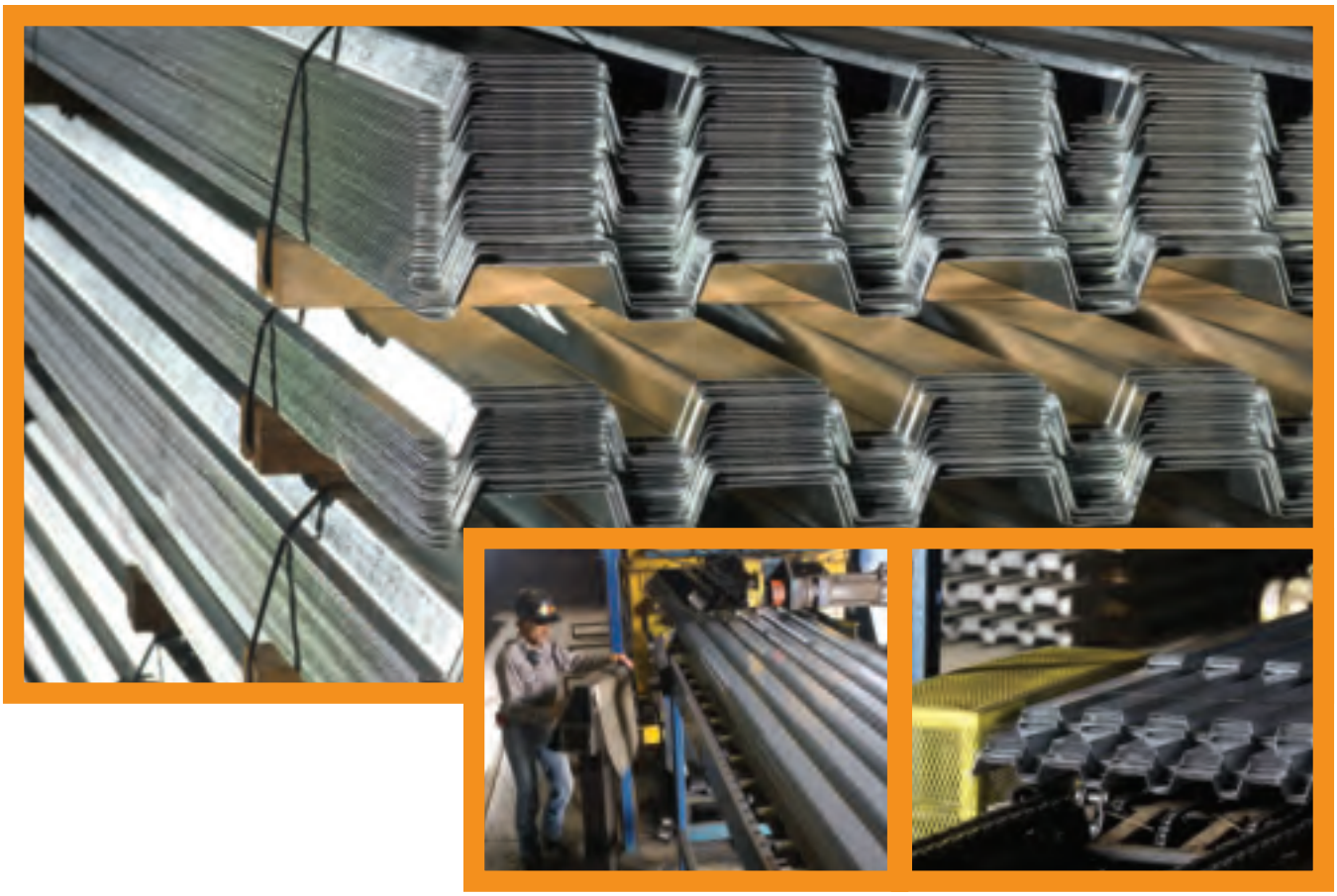
New Millennium Building Systems produces a wide range of floor and roof deck at the Butler, Indiana and Lake City, Florida manufacturing facilities. Our Salem, Virginia location will also be producing deck by the third quarter of 2007. This catalog contains information on all the products currently being produced, for use by specifying engineers and architects. The load tables shown herein have been calculated using Allowable Stress Design. Deck is available in lengths from 6'-0 to 50'-0. Extra charges are applied to lengths less than 6'-0.

DECK FINISHES

New Millennium Building Systems offers primer-painted or galvanized deck finishes. The standard primer-painted finish is gray on both the top and bottom sides. The galvanized finish is available in G40, G60, & G90 coatings. Deck can also be furnished with a two coat bright white primer bottom side combined with either a primer-painted or galvanized top side. The primer-painted finish is intended to protect the steel for a reasonable installation period while exposed to ordinary atmospheric conditions and shall be considered an impermanent and provisional coating. Always store deck off the ground with one end elevated and protected from the elements with a weather-proof covering that is ventilated to avoid condensation.

DECK CERTIFICATIONS

- Steel Deck Institute Member Company fully approved to manufacture roof deck, form deck, and composite floor deck.
- B deck is Factory Mutual approved for use as a component in Class 1-60, 1-75, & 1-90 wind uplift steel roof deck construction.
- Deck products are approved by Underwriters Laboratory and listed in the UL Fire Resistance Directory.
- All acoustical deck has been tested in accordance with ANSI ASTM C423 & E795 to determine the noise reduction coefficient (NRC) rating.



B, BA, BV DECK

Height	1 1/2 in.
Fy (minimum)	33 ksi
Modulus of Elasticity	29500 ksi

SECTION PROPERTIES

Gage	Fy (ksi)	Coverage (in)	Thickness (in)	Weight (psf)	I (in^4/ft)	Sp (in^3/ft)	Sn (in^3/ft)
22	33	36	0.0295	1.63	0.177	0.189	0.198
20	33	36	0.0358	1.96	0.213	0.235	0.247
18	33	36	0.0474	2.57	0.290	0.315	0.316

ALLOWABLE UNIFORM LOADS

Span Condition	Gage	Allowable Total (Dead + Live) Uniform Load (psf) Center to Center Span (ft. - in.)										Max. Constr. Span (ctr. to ctr.)
		5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	9 - 6	
Single	22	91	71	57	47	40	34	30	27	24	22	5 - 8
	20	111	86	69	56	47	40	35	31	27	25	6 - 7
	18	156	119	94	76	63	53	46	40	35	31	8 - 2
Double	22	107	88	74	63	54	47	42	37	33	30	6 - 8
	20	133	110	92	79	68	59	52	46	41	37	7 - 10
	18	170	140	118	101	87	76	66	59	53	47	9 - 6
Triple	22	133	110	93	79	68	59	50	44	38	34	6 - 9
	20	166	137	115	98	84	70	59	51	45	39	7 - 11
	18	213	176	146	125	107	93	78	67	58	51	9 - 8

Notes

1. Section properties are calculated using the AISI Cold Formed Steel Design Specifications, 1996 Edition.
2. Loads and maximum construction spans are based on the SDI Design Manual for Composite Decks, Form Decks and Roof Decks, Publication No. 30.
3. Maximum cantilever spans are based on SDI criteria and are sensitive to adjacent spans. For this table, adjacent span is assumed to be at least 1.5 times longer than the cantilever span.
4. Minimum end bearing length shall be 1 1/2".
5. Loads shown in RED are governed by the live load deflection not in excess of 1/240 of span. 10 psf dead load has been included.
6. Perforations which are placed in the vertical ribs of type BA deck reduce the strength less than 5%.

FACTORY MUTUAL SPANS

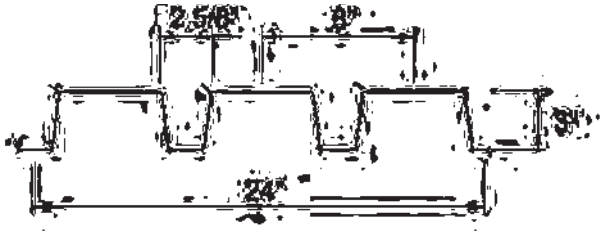
Gage	Max. Ctr. to Ctr. Span (ft.-in.)
22	6 - 0
20	6 - 6
18	7 - 5

CANTILEVER SPANS

Gage	Maximum Cantilever Span (ft.-in.)
22	2 - 0
20	2 - 4
18	2 - 8

- Type B deck provides the best balance of strength and economy of all the 1 1/2" deep roof decks. 1" (minimum) rigid roofing insulation is required to be used with type B deck.
- Available with nested side laps only.
- Available as an acoustic deck. Type BA deck is manufactured with perforations in the vertical ribs, having a NRC rating of 0.60 with 1 1/2" (minimum) rigid roofing insulation.
- Available as a vented deck. Type BV deck is manufactured with slot vents in the bottom flutes. The openings equal 0.5% of total surface. Type BV deck is to be specified when venting is required for cementitious insulation fills. Type BV deck is manufactured at our Lake City, FL facility only.
- Type B deck is Factory Mutual approved. Type BA and BV decks are not Factory Mutual approved.
- Type B, BA and BV decks are manufactured from steel conforming to ASTM A1008-00 Grades C, D or E or from A653/A653M-00 structural quality grade SQ33 or higher. The minimum yield strength used by NMBS is 33 KSI.
- Minimum attachment to supporting structural members requires connections at all side lap ribs plus a sufficient number of interior ribs to limit the spacing between connections to 18". Side laps are to be fastened together between supports, at a maximum spacing of 36" o.c. whenever the deck span exceeds 5'-0". Connections can be made either by welding using a minimum 5/8" diameter puddle weld or properly designed mechanical fasteners.

N, NA, DECK



Height	3 in.
Fy (minimum)	33 ksi
Modulus of Elasticity	29500 ksi

SECTION PROPERTIES

Gage	Fy (ksi)	Coverage (in)	Thickness (in)	Weight (psf)	I (in^4/ft)	Sp (in^3/ft)	Sn (in^3/ft)
22	33	24	0.0295	2.04	0.898	0.423	0.465
20	33	24	0.0358	2.46	1.089	0.528	0.574
18	33	24	0.0474	3.23	1.440	0.719	0.757

ALLOWABLE UNIFORM LOADS

Span Condition	Gage	Allowable Total (Dead + Live) Uniform Load (psf) Center to Center Span (ft. - in.)										Max. Constr. Span (ctr. to ctr.)
		10 - 0	10 - 6	11 - 0	11 - 6	12 - 0	12 - 6	13 - 0	13 - 6	14 - 0	14 - 6	
Single	22	53	47	43	38	35	32	30	28	26	24	11 - 3
	20	66	58	52	47	42	39	36	33	30	28	13 - 2
	18	92	81	71	64	57	52	47	43	40	37	15 - 9
Double	22	62	56	51	47	43	40	37	34	32	29	14 - 11
	20	77	69	63	58	53	49	45	42	39	36	16 - 7
	18	101	92	83	76	70	65	60	55	51	48	19 - 0
Triple	22	78	70	64	59	54	50	46	43	40	37	15 - 0
	20	96	87	79	72	66	61	57	52	49	46	16 - 8
	18	126	114	104	95	88	81	75	69	64	60	19 - 2

Notes

1. Section properties are calculated using the AISI Cold Formed Steel Design Specifications, 1996 Edition.
2. Loads and maximum construction spans are based on the SDI Design Manual for Composite Decks, Form Decks and Roof Decks, Publication No. 30.
3. Maximum cantilever spans are based on SDI criteria and are sensitive to adjacent spans. For this table, adjacent span is assumed to be at least 1.5 times longer than the cantilever span.
4. Minimum end bearing length shall be 1 1/2".
5. Loads shown in RED are governed by the live load deflection not in excess of 1/240 of span. 10 psf dead load has been included.
6. Perforations which are placed in the vertical ribs of type NA deck reduce the strength less than 5%.

CANTILEVER SPANS

Gage	Maximum Cantilever Span (ft.-in.)
22	3 - 2
20	4 - 2
18	5 - 2

- Type N deck is well-suited for applications where it is desirable to space the supporting members as far apart as possible. This is often the case in structures such as gymnasiums where it is usually more economical to minimize the number of long span structural members by using type N deck to span large spaces.
- Available with nested side laps only.
- Available as an acoustic deck. Type NA deck is manufactured with perforations in the vertical ribs, having a NRC rating of 0.65 with or without rigid roofing insulation.
- Neither type N nor NA decks are covered under Factory Mutual.
- Type N and NA decks are manufactured from steel conforming to ASTM A1008-00 Grades C, D or E or from A653/A653M-00 structural quality grade SQ33 or higher. The minimum yield strength used by NMBS is 33 KSI.
- Minimum attachment to supporting structural members requires connections at all side lap ribs plus a sufficient number of interior ribs to limit the spacing between connections to 18". Side laps are to be fastened together between supports, at a maximum spacing of 36" o.c. whenever the deck span exceeds 5'-0". Connections can be made either by welding using a minimum 5/8" diameter puddle weld or properly designed mechanical fasteners.

.6 FD, .6 FDV DECK

SECTION PROPERTIES

Gage	Fy (ksi)	Coverage (in)	Thickness (in)	Weight (psf)	Ip (in^4/ft)	In (in^4/ft)	Sp (in^3/ft)	Sn (in^3/ft)
28	60	35	0.0149	0.74	0.011	0.011	0.037	0.037
26	60	35	0.0179	0.86	0.013	0.013	0.045	0.045
24	60	35	0.0238	1.15	0.017	0.017	0.059	0.059
22	60	35	0.0295	1.47	0.022	0.022	0.073	0.073

Height	9/16 in.
Fy (minimum)	60 ksi
Modulus of Elasticity	29500 ksi

CONSTRUCTION SPANS

Total Slab Depth (in.)	Gage	Normal Weight Concrete (145 pcf)				Light Weight Concrete (110 pcf)			
		Concrete Weight (psf)	Maximum Construction Clear Span (ft.-in.)			Concrete Weight (psf)	Maximum Construction Clear Span (ft.-in.)		
			Single	Double	Triple		Single	Double	Triple
2 1/2	28	27	2 - 1	2 - 10	2 - 11	20	2 - 1	3 - 0	3 - 0
	26	27	2 - 5	3 - 5	3 - 5	20	2 - 6	3 - 6	3 - 7
	24	27	2 - 11	4 - 2	4 - 3	20	3 - 1	4 - 5	4 - 6
	22	27	3 - 5	4 - 11	5 - 0	20	3 - 7	5 - 3	5 - 4
3	28	33	2 - 0	2 - 9	2 - 10	25	2 - 1	2 - 11	2 - 11
	26	33	2 - 4	3 - 3	3 - 4	25	2 - 5	3 - 5	3 - 6
	24	33	2 - 10	4 - 0	4 - 1	25	3 - 0	4 - 3	4 - 4
	22	33	3 - 4	4 - 9	4 - 8	25	3 - 6	5 - 0	5 - 1
3 1/2	28	39	2 - 0	2 - 8	2 - 9	29	2 - 1	2 - 10	2 - 10
	26	39	2 - 4	3 - 2	3 - 2	29	2 - 5	3 - 4	3 - 4
	24	39	2 - 10	3 - 10	3 - 11	29	2 - 11	4 - 1	4 - 2
	22	39	3 - 3	4 - 6	4 - 5	29	3 - 5	4 - 10	4 - 10
4	28	45	1 - 11	2 - 7	2 - 8	34	2 - 0	2 - 9	2 - 9
	26	45	2 - 3	3 - 0	3 - 1	34	2 - 4	3 - 3	3 - 3
	24	45	2 - 9	3 - 9	3 - 9	34	2 - 10	4 - 0	4 - 0
	22	45	3 - 2	4 - 4	4 - 3	34	3 - 4	4 - 8	4 - 8
4 1/2	28	51	1 - 11	2 - 6	2 - 7	39	2 - 0	2 - 8	2 - 9
	26	51	2 - 2	2 - 11	3 - 0	39	2 - 4	3 - 2	3 - 2
	24	51	2 - 8	3 - 7	3 - 8	39	2 - 10	3 - 10	3 - 11
	22	51	3 - 1	4 - 2	4 - 1	39	3 - 3	4 - 6	4 - 5
5	28	57	1 - 10	2 - 6	2 - 6	43	1 - 11	2 - 7	2 - 8
	26	57	2 - 2	2 - 10	2 - 11	43	2 - 3	3 - 1	3 - 1
	24	57	2 - 7	3 - 6	3 - 6	43	2 - 9	3 - 9	3 - 10
	22	57	3 - 0	4 - 1	3 - 11	43	3 - 2	4 - 5	4 - 4

Notes

1. Section properties are calculated using the AISI Cold Formed Steel Design Specifications, 1996 Edition.
2. Loads and maximum construction spans are based on the SDI Design Manual for Composite Decks, Form Decks and Roof Decks, Publication No. 30.
3. Minimum interior bearing length shall be 3". Minimum exterior bearing length shall be 1 1/2".

ALLOWABLE SUPERIMPOSED UNIFORM LOADS

Slab Depth (in.)	Reinforcement		Uniform Load (psf) Clear Span (ft.- in.)										
	Mesh	As	2 - 0	2 - 3	2 - 6	2 - 9	3 - 0	3 - 3	3 - 6	3 - 9	4 - 0	4 - 6	5 - 0
2 1/2	6 x 6 W 1.4 x W 1.4	0.028*	191	151	122	101	85	72	62	54	47	37	30
	6 x 6 W 2.1 x W 2.1	0.042	283	223	181	149	125	107	92	80	70	55	45
	6 x 6 W 2.9 x W 2.9	0.058	384	303	246	203	170	145	125	109	96	75	61
3	6 x 6 W 1.4 x W 1.4	0.028*	242	191	155	128	107	91	79	68	60	47	
	6 x 6 W 2.1 x W 2.1	0.042*	359	284	230	190	159	136	117	102	89	71	
	6 x 6 W 2.9 x W 2.9	0.058	400	387	313	259	217	185	160	139	122	96	
3 1/2	6 x 6 W 2.1 x W 2.1	0.042*	400	400	400	386	325	277	238	208	182		
	6 x 6 W 2.9 x W 2.9	0.058*	400	400	400	400	400	371	320	279	245		
	4 x 4 W 2.9 x W 2.9	0.087	400	400	400	400	400	400	400	400	363		
4	6 x 6 W 2.1 x W 2.1	0.042*	400	400	400	400	399	340	293	255	224		
	6 x 6 W 2.9 x W 2.9	0.058*	400	400	400	400	400	400	396	345	303		
	4 x 4 W 2.9 x W 2.9	0.087	400	400	400	400	400	400	400	400	400		
4 1/2	6 x 6 W 2.9 x W 2.9	0.058*	400	400	400	400	400	400	400	400	366		
	4 x 4 W 2.9 x W 2.9	0.087	400	400	400	400	400	400	400	400	400		
	4 x 4 W 4.0 x W 4.0	0.120	400	400	400	400	400	400	400	400	400		
5	6 x 6 W 2.9 x W 2.9	0.058*	400	400	400	400	400	400	400	400			
	4 x 4 W 2.9 x W 2.9	0.087*	400	400	400	400	400	400	400	400			
	4 x 4 W 4.0 x W 4.0	0.120	400	400	400	400	400	400	400	400			

Notes:
1. *(As) does not meet ACI criteria for temperature and shrinkage reinforcement (0.0018Ac).
2. Uniform loads shown are based on reinforcement mesh being draped over supports for all slab depths over 3".
3. If uncoated deck is used, the weight of the slab must be deducted from the uniform loads.
4. Uniform loads are based on three span conditions and ACI moment coefficients.
5. Deck gages recommended are for normal weight concrete and are based on SDI criteria for unshored spans.

Recommended Gage Key: 28 Gage | 26 Gage | 24 Gage | 22 Gage

.6 FD, .6 FDV DECK

ALLOWABLE CONSTRUCTION UNIFORM LOADS

Gage	Span Condition	Loading Condition	Uniform Load (psf) Clear Span (ft. - in.)												
			2 - 0	2 - 3	2 - 6	2 - 9	3 - 0	3 - 3	3 - 6	3 - 9	4 - 0	4 - 6	5 - 0	5 - 6	6 - 0
28	Single	Uniform total load	222	175	142	117	99	84	72	63	56	44	36	29	25
		Deflection l/180	120	85	62	46	36	28	22	18	15	11	8	6	4
		Deflection l/240	90	63	46	35	27	21	17	14	11	8	6	4	3
		W1*	48	28	15	6									
	Double	Uniform total load	222	175	142	117	99	84	72	63	56	44	36	29	25
		Deflection l/180	222	175	142	111	86	68	54	44	36	25	19	14	11
		Deflection l/240	217	153	111	84	64	51	41	33	27	19	14	10	8
		W1*	130	87	58	38	23	12	4						
	Triple	Uniform total load	278	219	178	147	123	105	91	79	69	55	44	37	31
		Deflection l/180	227	159	116	87	67	53	42	34	28	20	15	11	8
		Deflection l/240	170	119	87	65	50	40	32	26	21	15	11	8	6
		W1*	136	91	61	40	25	14	5						
26	Single	Uniform total load	270	213	173	143	120	102	88	77	68	53	43	36	30
		Deflection l/180	142	100	73	55	42	33	27	22	18	12	9	7	5
		Deflection l/240	107	75	55	41	32	25	20	16	13	9	7	5	4
		W1*	80	53	35	22	13	7	2						
	Double	Uniform total load	270	213	173	143	120	102	88	77	68	53	43	36	30
		Deflection l/180	270	213	173	132	101	80	64	52	43	30	22	16	13
		Deflection l/240	257	180	132	99	76	60	48	39	32	23	16	12	10
		W1*	193	137	98	71	51	36	24	15	9				
	Triple	Uniform total load	338	267	216	179	150	128	110	96	84	67	54	45	38
		Deflection l/180	268	188	137	103	79	62	50	41	34	24	17	13	10
		Deflection l/240	201	141	103	77	60	47	38	30	25	18	13	10	7
		W1*	199	142	102	74	53	38	26	17	10				
24	Single	Uniform total load	354	280	227	187	157	134	116	101	89	70	57	47	39
		Deflection l/180	186	131	95	72	55	43	35	28	23	16	12	9	7
		Deflection l/240	140	98	71	54	41	33	26	21	17	12	9	7	5
		W1*	136	97	71	52	38	28	20	14	9	2			
	Double	Uniform total load	354	280	227	187	157	134	116	101	89	70	57	47	39
		Deflection l/180	354	280	227	172	133	104	84	68	56	39	29	22	17
		Deflection l/240	336	236	172	129	100	78	63	51	42	29	21	16	12
		W1*	302	223	168	128	99	77	60	47	36	21	10	3	
	Triple	Uniform total load	443	350	283	234	197	168	144	126	111	87	71	59	49
		Deflection l/180	351	246	179	135	104	82	65	53	44	31	22	17	13
		Deflection l/240	263	185	135	101	78	61	49	40	33	23	17	13	10
		W1*	311	230	174	133	103	80	63	49	38	22	11	4	
22	Single	Uniform total load	438	346	280	232	195	166	143	125	110	87	70	58	49
		Deflection l/180	241	169	123	93	71	56	45	37	30	21	15	12	9
		Deflection l/240	181	127	92	69	54	42	34	27	23	16	12	9	7
		W1*	191	141	107	82	63	49	38	30	23	13	7	2	
	Double	Uniform total load	438	346	280	232	195	166	143	125	110	87	70	58	49
		Deflection l/180	438	346	280	223	172	135	108	88	72	51	37	28	21
		Deflection l/240	435	305	223	167	129	101	81	66	54	38	28	21	16
		W1*	412	310	238	186	148	118	96	78	63	42	28	18	11
	Triple	Uniform total load	548	433	350	290	243	207	179	156	137	108	88	72	61
		Deflection l/180	454	319	232	174	134	106	85	69	57	40	29	22	17
		Deflection l/240	340	239	174	131	101	79	63	52	43	30	22	16	13
		W1*	423	318	232	174	134	106	85	69	57	40	29	19	12

* W1 = maximum weight of concrete and deck, psf

- Type .6 FD deck is used extensively in floor construction as an economical form to support concrete slabs during construction. Specifying .6 FD deck eliminates the need for expensive temporary shoring. Floor systems using .6 FD deck are some of the most economical floors available.
- Available with nested side laps only.
- Available as a vented deck. Type .6 FDV deck is manufactured with slot vents in the bottom flute. The openings equal 0.5% of total surface. Type .6 FDV deck is to be specified when venting is required for cementitious insulation fills. Type .6 FDV deck is manufactured at our Lake City, FL facility only.
- Type .6 FD deck is manufactured from steel conforming to ASTM A1008-00 Grades C, D or E or from A653/A653M-00 structural quality grade SQ33 or higher. The minimum yield strength used by NMBS is 60 KSI.
- Refer to Figure 4 on page 204 for minimum attachment requirements to supporting structural members. Side laps are to be fastened together between supports, at a maximum spacing of 36" o.c. whenever the deck span exceeds 5'-0". Connections can be made either by welding using a minimum 5/8" diameter puddle weld or properly designed mechanical fasteners. Welding washers must be used on all deck units that are less than 22 gage.

1.0 FD, 1.0 FDV DECK

SECTION PROPERTIES

Gage	Fy (ksi)	Coverage (in)	Thickness (in)	Weight (psf)	Ip (in^4/ft)	In (in^4/ft)	Sp (in^3/ft)	Sn (in^3/ft)
26	60	36	0.0179	0.96	0.040	0.040	0.067	0.071
24	60	36	0.0238	1.28	0.057	0.057	0.098	0.103
22	60	36	0.0295	1.57	0.073	0.073	0.130	0.134
20	60	36	0.0358	1.91	0.088	0.088	0.167	0.165

Height	1 in.
Fy (minimum)	60 ksi
Modulus of Elasticity	29500 ksi

CONSTRUCTION SPANS

Total Slab Depth (in.)	Gage	Normal Weight Concrete (145 pcf)				Light Weight Concrete (110 pcf)			
		Concrete Weight (psf)	Maximum Construction Clear Span (ft.-in.)			Concrete Weight (psf)	Maximum Construction Clear Span (ft.-in.)		
			Single	Double	Triple		Single	Double	Triple
2 1/2	26	25	3 - 3	4 - 9	4 - 9	19	3 - 4	5 - 0	5 - 1
	24	25	4 - 3	6 - 3	6 - 4	19	4 - 5	6 - 8	6 - 9
	22	25	5 - 2	7 - 9	7 - 8	19	5 - 5	8 - 3	8 - 4
	20	25	6 - 1	8 - 9	8 - 1	19	6 - 4	9 - 7	8 - 10
3	26	31	3 - 2	4 - 6	4 - 7	24	3 - 3	4 - 9	4 - 10
	24	31	4 - 2	5 - 11	6 - 0	24	4 - 4	6 - 4	6 - 5
	22	31	5 - 0	7 - 3	7 - 2	24	5 - 3	7 - 10	7 - 9
	20	31	5 - 11	8 - 3	7 - 7	24	6 - 2	8 - 11	8 - 2
3 1/2	26	37	3 - 1	4 - 4	4 - 4	29	3 - 2	4 - 7	4 - 7
	24	37	4 - 0	5 - 8	5 - 9	29	4 - 2	6 - 1	6 - 2
	22	37	4 - 10	6 - 11	6 - 9	29	5 - 1	7 - 5	7 - 3
	20	37	5 - 9	7 - 9	7 - 2	29	6 - 0	8 - 5	7 - 9
4	26	43	3 - 0	4 - 2	4 - 2	33	3 - 2	4 - 5	4 - 6
	24	43	3 - 11	5 - 5	5 - 6	33	4 - 1	5 - 10	5 - 11
	22	43	4 - 9	6 - 7	6 - 5	33	5 - 0	7 - 2	7 - 0
	20	43	5 - 6	7 - 5	6 - 10	33	5 - 10	8 - 1	7 - 5
4 1/2	26	49	2 - 11	4 - 0	4 - 1	38	3 - 1	4 - 3	4 - 4
	24	49	3 - 10	5 - 3	5 - 3	38	4 - 0	5 - 8	5 - 8
	22	49	4 - 7	6 - 4	6 - 2	38	4 - 10	6 - 10	6 - 8
	20	49	5 - 3	7 - 1	6 - 6	38	5 - 8	7 - 8	7 - 1
5	26	55	2 - 11	3 - 10	3 - 11	42	3 - 0	4 - 2	4 - 3
	24	55	3 - 9	5 - 0	5 - 1	42	3 - 11	5 - 6	5 - 6
	22	55	4 - 6	6 - 1	5 - 11	42	4 - 9	6 - 8	6 - 6
	20	55	5 - 1	6 - 10	6 - 4	42	5 - 7	7 - 6	6 - 10

Notes

1. Section properties are calculated using the AISI Cold Formed Steel Design Specifications, 1996 Edition.
2. Loads and maximum construction spans are based on the SDI Design Manual for Composite Decks, Form Decks and Roof Decks, Publication No. 30.
3. Minimum interior bearing length shall be 3". Minimum exterior bearing length shall be 1 1/2".

ALLOWABLE SUPERIMPOSED UNIFORM LOADS

Slab Depth (in.)	Reinforcement		Uniform Load (psf) Clear Span (ft.- in.)										
	Mesh	As	2 - 6	2 - 9	3 - 0	3 - 6	4 - 0	4 - 6	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0
2 1/2	6 x 6 W 1.4 x W 1.4	0.028*	94	77	65	48	36	29	23	19	16	13	12
	6 x 6 W 2.1 x W 2.1	0.042	138	114	96	70	54	42	34	28	24	20	17
	6 x 6 W 2.9 x W 2.9	0.058	187	154	129	95	73	57	46	38	32	27	23
3	6 x 6 W 1.4 x W 1.4	0.028*	126	104	88	64	49	39	31	26	22	18	16
	6 x 6 W 2.1 x W 2.1	0.042	187	154	130	95	73	57	46	38	32	27	23
	6 x 6 W 2.9 x W 2.9	0.058	254	210	176	129	99	78	63	52	44	37	32
3 1/2	6 x 6 W 2.1 x W 2.1	0.042*	400	348	292	214	164	130	105	87	73	62	53
	6 x 6 W 2.9 x W 2.9	0.058	400	400	391	287	220	174	140	116	97	83	71
	4 x 4 W 2.9 x W 2.9	0.087	400	400	400	400	325	257	208	172	144	123	106
4	6 x 6 W 2.1 x W 2.1	0.042*	400	400	366	269	206	163	132	109	91	78	
	6 x 6 W 2.9 x W 2.9	0.058*	400	400	400	363	278	219	177	147	123	105	
	4 x 4 W 2.9 x W 2.9	0.087	400	400	400	400	400	325	263	217	183	156	
4 1/2	6 x 6 W 2.1 x W 2.1	0.042*	400	400	400	400	324	248	196	158	131	110	94
	6 x 6 W 2.9 x W 2.9	0.058*	400	400	400	400	400	335	265	214	177	149	127
	4 x 4 W 2.9 x W 2.9	0.087	400	400	400	400	400	394	319	263	221	188	
5	6 x 6 W 2.9 x W 2.9	0.058*	400	400	400	400	393	311	251	208	174		
	4 x 4 W 2.9 x W 2.9	0.087	400	400	400	400	400	400	374	309	260		
	4 x 4 W 4.0 x W 4.0	0.120	400	400	400	400	400	400	400	400	350		

Notes:
1. *(As) does not meet ACI criteria for temperature and shrinkage reinforcement (0.0018Ac).
2. Uniform loads shown are based on reinforcement mesh being draped over supports for all slab depths over 3"
3. If uncoated deck is used, the weight of the slab must be deducted from the uniform loads
4. Uniform loads are based on three span conditions and ACI moment coefficients.
5. Deck gages recommended are for normal weight concrete and based on SDI criteria for unshored spans

Recommended Gage Key: 26 Gage | 24 Gage | 22 Gage | 20 Gage

1.0 FD, 1.0 FDV DECK

ALLOWABLE CONSTRUCTION UNIFORM LOADS

Gage	Span Condition	Loading Condition	Uniform Load (psf) Clear Span (ft. - in.)												
			3 - 0	3 - 3	3 - 6	3 - 9	4 - 0	4 - 6	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0
26	Single	Uniform total load	179	152	131	114	101	79	64	53	45	38	33	29	25
		Deflection l/180	130	102	82	66	55	38	28	21	16	13	10	8	7
		Deflection l/240	97	77	61	50	41	29	21	16	12	10	8	6	5
		W1*	52	40	30	23	17	8	3						
	Double	Uniform total load	189	161	139	121	107	84	68	56	47	40	35	30	27
		Deflection l/180	189	161	139	121	107	84	67	51	39	31	25	20	16
		Deflection l/240	189	161	139	120	99	69	51	38	29	23	18	15	12
		W1*	127	101	80	64	52	33	20	12	5	1			
	Triple	Uniform total load	237	202	174	151	133	105	85	70	59	50	43	38	33
		Deflection l/180	237	192	154	125	103	72	53	40	31	24	19	16	13
		Deflection l/240	183	144	115	94	77	54	40	30	23	18	14	12	10
		W1*	131	104	83	67	54	35	22	13	6	2			
24	Single	Uniform total load	261	223	192	167	147	116	94	78	65	56	48	42	37
		Deflection l/180	185	145	116	95	78	55	40	30	23	18	15	12	10
		Deflection l/240	139	109	87	71	58	41	30	22	17	14	11	9	7
		W1*	107	87	71	58	48	33	23	15	10	6	3	1	
	Double	Uniform total load	275	234	202	176	155	122	99	82	69	59	50	44	39
		Deflection l/180	275	234	202	176	155	122	96	72	56	44	35	28	23
		Deflection l/240	275	234	202	171	141	99	72	54	42	33	26	21	18
		W1*	235	192	159	133	112	81	59	44	32	24	17	12	8
	Triple	Uniform total load	343	293	252	220	193	153	124	102	86	73	63	55	48
		Deflection l/180	343	274	219	178	147	103	75	57	44	34	27	22	18
		Deflection l/240	261	205	164	134	110	77	56	42	33	26	21	17	14
		W1*	241	198	164	137	116	84	61	45	34	25	18	13	9
22	Single	Uniform total load	347	295	255	222	195	154	125	103	87	74	64	55	49
		Deflection l/180	237	186	149	121	100	70	51	38	30	23	19	15	12
		Deflection l/240	178	140	112	91	75	53	38	29	22	17	14	11	9
		W1*	164	135	112	94	80	58	43	32	24	18	14	10	7
	Double	Uniform total load	357	304	263	229	201	159	129	106	89	76	66	57	50
		Deflection l/180	357	304	263	229	201	159	123	92	71	56	45	36	30
		Deflection l/240	357	304	263	219	180	127	92	69	53	42	34	27	23
		W1*	337	284	241	204	175	130	99	77	60	47	38	30	24
	Triple	Uniform total load	447	381	328	286	251	199	161	133	112	95	82	71	63
		Deflection l/180	446	351	281	228	188	132	96	72	56	44	35	29	24
		Deflection l/240	334	263	211	171	141	99	72	54	42	33	26	21	18
		W1*	355	295	248	210	180	132	96	72	56	44	35	29	24
20	Single	Uniform total load	445	379	327	285	251	198	160	132	111	95	82	71	63
		Deflection l/180	285	224	180	146	120	85	62	46	36	28	22	18	15
		Deflection l/240	214	168	135	110	90	63	46	35	27	21	17	14	11
		W1*	230	191	161	136	117	85	62	46	36	28	22	18	15
	Double	Uniform total load	440	375	323	282	248	196	158	131	110	94	81	70	62
		Deflection l/180	440	375	323	282	248	196	148	111	86	68	54	44	36
		Deflection l/240	440	375	323	264	217	153	111	84	64	51	41	33	27
		W1*	420	355	303	262	228	176	138	111	86	68	54	44	36
	Triple	Uniform total load	550	469	404	352	309	244	198	164	138	117	101	88	77
		Deflection l/180	538	423	339	275	227	159	116	87	67	53	42	34	28
		Deflection l/240	403	317	254	206	170	119	87	65	50	40	32	26	21
		W1*	450	381	325	275	227	159	116	87	67	53	42	34	28

* W1 = maximum weight of concrete and deck, psf

- Type 1.0 FD deck is used extensively in floor construction as an economical form to support concrete slabs during construction. Specifying 1.0 FD deck eliminates the need for expensive temporary shoring. Floor systems using 1.0 FD deck are some of the most economical floors available.
- Available with nested side laps only.
- Available as a vented deck. Type 1.0 FDV deck is manufactured with slot vents in the bottom flute. The openings equal 0.5% of total surface. Type 1.0 FDV deck is to be specified when venting is required for cementitious insulation fills. Type 1.0 FDV deck is manufactured at our Lake City, FL facility only.
- Type 1.0 FD deck is manufactured from steel conforming to ASTM A1008-00 Grades C, D or E or from A653/A653M-00 structural quality grade SQ33 or higher. The minimum yield strength used by NMBS is 60 KSI.
- Refer to Figure 4 on page 204 for minimum attachment requirements to supporting structural members. Side laps are to be fastened together between supports, at a maximum spacing of 36" o.c. whenever the deck span exceeds 5'-0". Connections can be made either by welding using a minimum 5/8" diameter puddle weld or properly designed mechanical fasteners. Welding washers must be used on all deck units that are less than 22 gage.

1.5 FD DECK

SECTION PROPERTIES

Gage	Fy (ksi)	Coverage (in)	Thickness (in)	Weight (psf)	Ip (in4/ft)	In (in4/ft)	Sp (in3/ft)	Sn (in3/ft)
22	33	36	0.0295	1.63	0.177	0.155	0.198	0.189
20	33	36	0.0358	1.96	0.213	0.193	0.247	0.235
18	33	36	0.0474	2.57	0.285	0.277	0.316	0.315

Height	1 1/2 in.
Fy (minimum)	33 ksi
Modulus of Elasticity	29500 ksi

CONSTRUCTION SPANS

Total Slab Depth (in.)	Gage	Normal Weight Concrete (145 pcf)				Light Weight Concrete (110 pcf)			
		Concrete Weight (psf)	Maximum Construction Clear Span (ft.-in.)			Concrete Weight (psf)	Maximum Construction Clear Span (ft.-in.)		
			Single	Double	Triple		Single	Double	Triple
3 1/2	22	36	4 - 4	6 - 2	6 - 3	27	4 - 7	6 - 8	6 - 9
	20	36	5 - 0	7 - 2	7 - 3	27	5 - 3	7 - 9	7 - 11
	18	36	5 - 10	8 - 4	8 - 6	27	6 - 2	9 - 1	9 - 4
4	22	42	4 - 3	5 - 10	5 - 11	32	4 - 5	6 - 4	6 - 5
	20	42	4 - 10	6 - 10	6 - 11	32	5 - 2	7 - 5	7 - 6
	18	42	5 - 8	8 - 0	8 - 1	32	6 - 0	8 - 8	8 - 10
4 1/2	22	48	4 - 1	5 - 8	5 - 8	37	4 - 4	6 - 1	6 - 2
	20	48	4 - 9	6 - 6	6 - 7	37	5 - 0	7 - 1	7 - 2
	18	48	5 - 6	7 - 7	7 - 9	37	5 - 10	8 - 4	8 - 5
5	22	54	4 - 0	5 - 5	5 - 6	42	4 - 3	5 - 11	5 - 11
	20	54	4 - 7	6 - 3	6 - 4	42	4 - 11	6 - 10	6 - 11
	18	54	5 - 5	7 - 4	7 - 5	42	5 - 8	8 - 0	8 - 1
5 1/2	22	60	3 - 11	5 - 3	5 - 4	47	4 - 2	5 - 8	5 - 9
	20	60	4 - 6	6 - 1	6 - 2	47	4 - 9	6 - 7	6 - 8
	18	60	5 - 3	7 - 0	7 - 2	47	5 - 7	7 - 8	7 - 10
6	22	66	3 - 9	5 - 1	5 - 2	52	4 - 0	5 - 6	5 - 7
	20	66	4 - 4	5 - 10	5 - 11	52	4 - 8	6 - 4	6 - 5
	18	66	5 - 1	6 - 9	6 - 11	52	5 - 5	7 - 5	7 - 7

Notes

1. Section properties are calculated using the AISI Cold Formed Steel Design Specifications, 1996 Edition.
2. Loads and maximum construction spans are based on the SDI Design Manual for Composite Decks, Form Decks and Roof Decks, Publication No. 30.
3. Minimum interior bearing length shall be 3". Minimum exterior bearing length shall be 1 1/2".

ALLOWABLE SUPERIMPOSED UNIFORM LOADS

Slab Depth (in.)	Reinforcement		Uniform Load (psf) Clear Span (ft.- in.)										
	Mesh	As	3 - 0	3 - 6	4 - 0	4 - 6	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0
3 1/2	6 x 6 W 2.1 x W 2.1	0.042*	254	187	143	113	91	75	63	54	46	40	35
	6 x 6 W 2.9 x W 2.9	0.058	346	254	194	153	124	103	86	73	63	55	48
	4 x 4 W 2.9 x W 2.9	0.087	400	375	287	227	184	152	127	108	93	81	71
4	6 x 6 W 2.1 x W 2.1	0.042*	322	237	181	143	116	96	80	68	59	51	45
	6 x 6 W 2.9 x W 2.9	0.058	400	323	247	195	158	130	109	93	80	70	61
	4 x 4 W 2.9 x W 2.9	0.087	400	400	366	289	234	193	162	138	119	104	91
4 1/2	6 x 6 W 2.1 x W 2.1	0.042*	390	287	219	173	140	116	97	83	71	62	
	6 x 6 W 2.9 x W 2.9	0.058*	400	392	300	237	192	158	133	113	98	85	
	4 x 4 W 2.9 x W 2.9	0.087	400	400	400	352	285	235	198	168	145	126	
5	6 x 6 W 2.9 x W 2.9	0.058*	400	400	352	278	225	186	156	133	115		
	4 x 4 W 2.9 x W 2.9	0.087	400	400	400	400	335	277	233	198	171		
	4 x 4 W 4.0 x W 4.0	0.120	400	400	400	400	400	377	317	270	232		
5 1/2	6 x 6 W 2.9 x W 2.9	0.058*	400	400	400	320	259	214	180	153	132		
	4 x 4 W 2.9 x W 2.9	0.087	400	400	400	400	386	319	268	228	197		
	4 x 4 W 4.0 x W 4.0	0.120	400	400	400	400	400	400	365	311	268		
6	6 x 6 W 2.9 x W 2.9	0.058*	400	400	400	362	293	242	203	173			
	4 x 4 W 2.9 x W 2.9	0.087*	400	400	400	400	400	361	303	258			
	4 x 4 W 4.0 x W 4.0	0.120	400	400	400	400	400	400	400	352			

Notes:
1. *(As) does not meet ACI criteria for temperature and shrinkage reinforcement (0.0018Ac).
2. Uniform loads shown are based on reinforcement mesh being draped over supports for all slab depths over 3".
3. If uncoated deck is used, the weight of the slab must be deducted from the uniform loads.
4. Uniform loads are based on three span conditions and ACI moment coefficients.
5. Deck Gages recommended are for normal weight concrete and based on SDI criteria for unshored spans.

Recommended Gage Key: 22 Gage | 20 Gage | 18 Gage

ALLOWABLE CONSTRUCTION UNIFORM LOADS

Gage	Span Condition	Loading Condition	Uniform Load (psf) Clear Span (ft.- in.)												
			4 - 0	4 - 6	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	9 - 6	10 - 0
22	Single	Uniform total load	165	130	106	87	73	62	54	47	41	37	33	28	26
		Deflection l/180	165	130	106	87	72	56	45	37	30	25	21	18	15
		Deflection l/240	165	128	93	70	54	42	34	28	23	19	16	14	12
		W1*	60	42	30	22	16	11	7	5	2	1			
	Double	Uniform total load	158	124	101	83	70	60	51	45	39	35	31	28	25
		Deflection l/180	158	124	101	83	70	60	51	45	39	35	31	28	25
		Deflection l/240	158	124	101	83	70	60	51	45	39	35	31	28	25
		W1*	136	99	74	56	43	33	25	19	14	10	7	5	3
	Triple	Uniform total load	197	156	126	104	88	75	64	56	49	44	39	35	32
		Deflection l/180	197	156	126	104	88	75	64	56	49	44	38	32	27
		Deflection l/240	197	156	126	104	88	75	60	49	40	33	28	24	21
		W1*	140	102	77	58	44	34	26	20	15	11	8	5	3
20	Single	Uniform total load	206	163	132	109	91	78	67	59	51	46	41	36	33
		Deflection l/180	206	163	132	109	86	68	54	44	36	30	26	22	19
		Deflection l/240	206	153	112	84	65	51	41	33	27	23	19	16	14
		W1*	87	64	48	36	28	21	16	12	9	7	5	3	2
	Double	Uniform total load	196	155	125	104	87	74	64	56	49	43	39	35	31
		Deflection l/180	196	155	125	104	87	74	64	56	49	43	39	35	43
		Deflection l/240	196	155	125	104	87	74	64	56	49	43	39	35	31
		W1*	176	135	105	84	66	53	42	34	27	22	18	14	11
	Triple	Uniform total load	245	193	157	129	109	93	80	70	61	54	48	43	39
		Deflection l/180	245	193	157	129	109	93	80	70	61	54	46	39	33
		Deflection l/240	245	193	157	129	109	91	73	60	49	41	34	29	25
		W1*	189	145	111	87	68	55	44	35	29	23	19	15	12
18	Single	Uniform total load	263	208	169	139	117	100	86	75	66	58	52	47	42
		Deflection l/180	263	208	169	139	116	91	73	59	49	41	34	29	25
		Deflection l/240	263	205	150	112	87	68	55	44	37	30	26	22	19
		W1*	125	94	72	56	45	36	29	23	19	15	12	10	8
	Double	Uniform total load	263	207	168	139	117	99	86	75	66	58	52	47	42
		Deflection l/180	263	207	168	139	117	99	86	75	66	58	52	47	42
		Deflection l/240	263	207	168	139	117	99	86	75	66	58	52	47	42
		W1*	243	187	148	119	97	79	66	55	46	38	32	27	22
	Triple	Uniform total load	328	259	210	174	146	124	107	93	82	73	65	58	53
		Deflection l/180	328	259	210	174	146	124	107	93	82	73	64	54	46
		Deflection l/240	328	259	210	174	146	124	101	82	68	57	48	41	35
		W1*	260	202	159	127	102	84	69	57	48	40	34	28	24

* W1 = maximum weight of concrete and deck, psf

- Type 1.5 FD deck is used extensively in floor construction as an economical form to support concrete slabs during construction. Floor systems using 1.5 FD deck enables the designer to space the structural members to over 7'-0" o.c. without any additional shoring.
- Available with nested side laps only.
- Type 1.5 FD deck is manufactured from steel conforming to ASTM A1008-00 Grades C, D or E or from A653/A653M-00 structural quality grade SQ33 or higher. The minimum yield strength used by NMBS is 33 KSI.
- Refer to Figure 4 on page 204 for minimum attachment requirements to supporting structural members. Side laps are to be fastened together between supports, at a maximum spacing of 36" o.c. whenever the deck span exceeds 5'-0". Connections can be made either by welding using a minimum 5/8" diameter puddle weld or properly designed mechanical fasteners.

2.0 FD DECK

SECTION PROPERTIES

Gage	Fy (ksi)	Coverage (in)	Thickness (in)	Weight (psf)	Ip (in^4/ft)	In (in^4/ft)	Sp (in^3/ft)	Sn (in^3/ft)
22	40	36	0.0295	1.56	0.330	0.327	0.300	0.306
20	40	36	0.0358	1.89	0.420	0.413	0.388	0.394
18	40	36	0.0474	2.50	0.560	0.560	0.522	0.522

Height	2 in.
Fy (minimum)	40 ksi
Modulus of Elasticity	29500 ksi

CONSTRUCTION SPANS

Total Slab Depth (in.)	Gage	Normal Weight Concrete (145 pcf)				Light Weight Concrete (110 pcf)			
		Concrete Weight (psf)	Maximum Construction Clear Span (ft.-in.)			Concrete Weight (psf)	Maximum Construction Clear Span (ft.-in.)		
			Single	Double	Triple		Single	Double	Triple
4	22	36	6 - 5	9 - 1	9 - 4	28	6 - 9	9 - 10	10 - 2
	20	36	7 - 7	10 - 3	10 - 7	28	8 - 0	11 - 2	11 - 7
	18	36	9 - 0	11 - 10	12 - 2	28	9 - 6	12 - 10	13 - 3
4 1/2	22	42	6 - 3	8 - 7	8 - 11	32	6 - 7	9 - 5	9 - 9
	20	42	7 - 4	9 - 9	10 - 1	32	7 - 9	10 - 8	11 - 0
	18	42	8 - 9	11 - 3	11 - 7	32	9 - 3	12 - 3	12 - 8
5	22	48	6 - 1	8 - 3	8 - 6	37	6 - 5	9 - 0	9 - 4
	20	48	7 - 1	9 - 4	9 - 8	37	7 - 6	10 - 3	10 - 7
	18	48	8 - 5	10 - 9	11 - 1	37	9 - 0	11 - 9	12 - 2
5 1/2	22	54	5 - 11	7 - 10	8 - 2	41	6 - 3	8 - 8	9 - 0
	20	54	6 - 11	8 - 11	9 - 3	41	7 - 4	9 - 10	10 - 2
	18	54	8 - 2	10 - 3	10 - 8	41	8 - 9	11 - 4	11 - 8
6	22	60	5 - 9	7 - 7	7 - 10	46	6 - 2	8 - 4	8 - 8
	20	60	6 - 8	8 - 7	8 - 11	46	7 - 2	9 - 6	9 - 10
	18	60	7 - 11	9 - 11	10 - 3	46	8 - 7	10 - 11	11 - 4
6 1/2	22	66	5 - 6	7 - 3	7 - 6	50	6 - 0	8 - 1	8 - 4
	20	66	6 - 5	8 - 4	8 - 7	50	7 - 0	9 - 2	9 - 6
	18	66	7 - 8	9 - 7	9 - 10	50	8 - 4	10 - 7	10 - 11

Notes

1. Section properties are calculated using the AISI Cold Formed Steel Design Specifications, 1996 Edition.
2. Loads and maximum construction spans are based on the SDI Design Manual for Composite Decks, Form Decks and Roof Decks, Publication No. 30.
3. Minimum interior bearing length shall be 4". Minimum exterior bearing length shall be 2".

ALLOWABLE SUPERIMPOSED UNIFORM LOADS

Slab Depth (in.)	Reinforcement		Uniform Load (psf) Clear Span (ft.- in.)										
	Mesh	As	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	9 - 6	10 - 0
4	6 x 6 W 2.1 x W 2.1	0.042*	91	75	63	54	46	40	35	31	28	25	22
	6 x 6 W 2.9 x W 2.9	0.058	124	103	86	73	63	55	48	43	38	34	31
	4 x 4 W 2.9 x W 2.9	0.087	184	152	127	108	93	81	71	63	56	50	46
4 1/2	6 x 6 W 2.1 x W 2.1	0.042*	116	96	80	68	59	51	45	40	35	32	29
	6 x 6 W 2.9 x W 2.9	0.058	158	130	109	93	80	70	61	54	48	43	39
	4 x 4 W 2.9 x W 2.9	0.087	234	193	162	138	119	104	91	81	72	65	58
5	6 x 6 W 2.1 x W 2.1	0.042*	140	116	97	83	71	62	54	48	43	38	35
	6 x 6 W 2.9 x W 2.9	0.058*	192	158	133	113	98	85	75	66	59	53	48
	4 x 4 W 2.9 x W 2.9	0.087	285	235	198	168	145	126	111	98	88	79	71
5 1/2	6 x 6 W 2.9 x W 2.9	0.058*	225	186	156	133	115	100	88	78	69	62	56
	4 x 4 W 2.9 x W 2.9	0.087	335	277	233	198	171	149	131	116	103	93	83
	4 x 4 W 4.0 x W 4.0	0.120	400	377	317	270	232	202	178	157	140	126	114
6	6 x 6 W 2.9 x W 2.9	0.058*	259	214	180	153	132	115	101	89	80	71	64
	4 x 4 W 2.9 x W 2.9	0.087	386	319	268	228	197	171	151	133	119	107	96
	4 x 4 W 4.0 x W 4.0	0.120	400	400	365	311	268	233	205	182	162	145	131
6 1/2	6 x 6 W 2.9 x W 2.9	0.058*	293	242	203	173	149	130	114	101	90	81	
	4 x 4 W 2.9 x W 2.9	0.087*	400	361	303	258	223	194	170	151	134	121	
	4 x 4 W 4.0 x W 4.0	0.120	400	400	400	352	304	264	232	206	184	165	

Notes:
1. *(As) does not meet ACI criteria for temperature and shrinkage reinforcement (0.0018Ac).
2. Uniform loads shown are based on reinforcement mesh being draped over supports for all slab depths over 3".
3. If uncoated deck is used, the weight of the slab must be deducted from the uniform loads.
4. Uniform loads are based on three span conditions and ACI moment coefficients.
5. Deck gages recommended are for normal weight concrete and based on SDI criteria for unshored spans.

Recommended Gage Key: 22 Gage | 20 Gage | 18 Gage

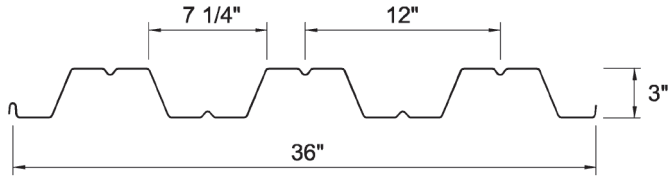
ALLOWABLE CONSTRUCTION UNIFORM LOADS

Gage	Span Condition	Loading Condition	Uniform Load (psf) Clear Span (ft. - in.)												
			5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	9 - 6	10 - 0	10 - 6	11 - 0
22	Single	Uniform total load	192	159	133	114	98	85	75	66	59	53	48	44	40
		Deflection l/180	192	159	133	105	84	68	56	47	40	34	29	25	22
		Deflection l/240	173	130	100	79	63	51	42	35	30	25	22	19	16
		W1*	88	69	55	45	37	30	25	21	17	14	12	10	8
	Double	Uniform total load	196	162	136	116	100	87	77	68	60	54	49	44	40
		Deflection l/180	196	162	136	116	100	87	77	68	60	54	49	44	40
		Deflection l/240	196	162	136	116	100	87	77	68	60	54	49	44	39
		W1*	176	142	116	96	80	67	57	48	40	34	29	24	20
	Triple	Uniform total load	245	202	170	145	125	109	96	85	76	68	61	56	51
		Deflection l/180	245	202	170	145	125	109	96	85	74	63	54	47	41
		Deflection l/240	245	202	170	145	118	96	79	66	56	47	41	35	31
		W1*	189	153	124	102	85	71	60	51	43	37	32	27	23
20	Single	Uniform total load	248	205	172	147	127	110	97	86	77	69	62	56	51
		Deflection l/180	248	205	170	134	107	87	72	60	50	43	37	32	28
		Deflection l/240	221	166	128	100	80	65	54	45	38	32	28	24	21
		W1*	125	100	81	67	56	47	40	34	29	25	21	18	16
	Double	Uniform total load	252	208	175	149	129	112	99	87	78	70	63	57	52
		Deflection l/180	252	208	175	149	129	112	99	87	78	70	63	57	66
		Deflection l/240	252	208	175	149	129	112	99	87	78	70	63	57	49
		W1*	232	188	155	129	109	92	79	67	58	50	43	37	32
	Triple	Uniform total load	315	260	219	187	161	140	123	109	97	87	79	71	65
		Deflection l/180	315	260	219	187	161	140	123	109	94	80	69	59	52
		Deflection l/240	315	260	219	187	150	122	101	84	71	60	52	45	39
		W1*	249	203	167	139	117	100	85	73	63	55	47	41	36
18	Single	Uniform total load	334	276	232	198	170	148	131	116	103	93	84	76	69
		Deflection l/180	334	276	227	179	143	116	96	80	67	57	49	42	37
		Deflection l/240	294	221	170	134	107	87	72	60	50	43	37	32	28
		W1*	182	147	121	101	85	72	62	53	46	41	36	31	28
	Double	Uniform total load	334	276	232	198	170	148	131	116	103	93	84	76	69
		Deflection l/180	334	276	232	198	170	148	131	116	103	93	84	76	69
		Deflection l/240	334	276	232	198	170	148	131	116	103	93	84	76	67
		W1*	314	256	212	178	150	128	111	96	83	73	64	56	49
	Triple	Uniform total load	418	345	290	247	213	186	163	144	129	116	104	95	86
		Deflection l/180	418	345	290	247	213	186	163	144	127	108	92	80	69
		Deflection l/240	418	345	290	247	202	164	135	113	95	81	69	60	52
		W1*	337	275	228	191	162	139	119	104	90	79	69	61	54

* W1 = maximum weight of concrete and deck, psf

- Type 2.0 FD deck is used in floor construction as an economical form to support concrete slabs during construction. Floor systems using 2.0 FD deck enables the designer to space the structural members to over 10'-0" o.c. without any additional shoring.
- Available with interlocking side laps only.
- Type 2.0 FD deck is manufactured from steel conforming to ASTM A1008-00 Grades C, D or E or from A653/A653M-00 structural quality grade SQ33 or higher. The minimum yield strength used by NMBS is 40 KSI.
- Refer to Figure 4 on page 204 for minimum attachment requirements to supporting structural members. Connections can be made either by welding using a minimum 5/8" diameter puddle weld or properly designed mechanical fasteners. Side laps are to be fastened together between supports, at a maximum spacing of 36" o.c. whenever the deck span exceeds 5'-0". Side lap connections can be made by button punching.

3.0 FD DECK



SECTION PROPERTIES

Gage	Fy (ksi)	Coverage (in)	Thickness (in)	Weight (psf)	Ip (in^4/ft)	In (in^4/ft)	Sp (in^3/ft)	Sn (in^3/ft)
22	40	36	0.0295	1.72	0.733	0.727	0.455	0.466
20	40	36	0.0358	2.08	0.933	0.927	0.596	0.608
18	40	36	0.0474	2.75	1.253	1.253	0.808	0.808

Height	3 in.
Fy (minimum)	40 ksi
Modulus of Elasticity	29500 ksi

CONSTRUCTION SPANS

Total Slab Depth (in.)	Gage	Normal Weight Concrete (145 pcf)				Light Weight Concrete (110 pcf)			
		Concrete Weight (psf)	Maximum Construction Clear Span (ft.-in.)			Concrete Weight (psf)	Maximum Construction Clear Span (ft.-in.)		
			Single	Double	Triple		Single	Double	Triple
5	22	43	8 - 0	10 - 6	10 - 10	32	8 - 6	11 - 6	11 - 11
	20	43	9 - 5	12 - 1	12 - 6	32	10 - 0	13 - 2	13 - 8
	18	43	11 - 2	13 - 11	14 - 5	32	11 - 11	15 - 2	15 - 8
5 1/2	22	49	7 - 9	10 - 0	10 - 4	37	8 - 4	11 - 0	11 - 5
	20	49	9 - 1	11 - 6	11 - 11	37	9 - 9	12 - 8	13 - 1
	18	49	10 - 10	13 - 4	13 - 9	37	11 - 7	14 - 7	15 - 1
6	22	55	7 - 7	9 - 7	9 - 11	42	8 - 1	10 - 7	10 - 11
	20	55	8 - 10	11 - 1	11 - 5	42	9 - 6	12 - 2	12 - 7
	18	55	10 - 6	12 - 9	13 - 3	42	11 - 3	14 - 1	14 - 6
6 1/2	22	61	7 - 4	9 - 3	9 - 6	46	7 - 11	10 - 3	10 - 7
	20	61	8 - 7	10 - 8	11 - 0	46	9 - 3	11 - 9	12 - 2
	18	61	10 - 2	12 - 4	12 - 9	46	11 - 0	13 - 7	14 - 0
7	22	67	7 - 1	8 - 11	9 - 2	51	7 - 8	9 - 11	10 - 2
	20	67	8 - 3	10 - 3	10 - 7	51	9 - 0	11 - 4	11 - 9
	18	67	9 - 9	11 - 11	12 - 3	51	10 - 9	13 - 2	13 - 7
7 1/2	22	73	6 - 10	8 - 7	8 - 10	55	7 - 6	9 - 7	9 - 11
	20	73	7 - 11	9 - 11	10 - 3	55	8 - 10	11 - 0	11 - 5
	18	73	9 - 5	11 - 6	11 - 11	55	10 - 6	12 - 9	13 - 2

Notes

1. Section properties are calculated using the AISI Cold Formed Steel Design Specifications, 1996 Edition.
2. Loads and maximum construction spans are based on the SDI Design Manual for Composite Decks, Form Decks and Roof Decks, Publication No. 30.
3. Minimum interior bearing length shall be 5". Minimum exterior bearing length shall be 2 1/2".

ALLOWABLE SUPERIMPOSED UNIFORM LOADS

Slab Depth (in.)	Reinforcement		Uniform Load (psf) Clear Span (ft.- in.)										
	Mesh	As	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	9 - 6	10 - 0	10 - 6	11 - 0	11 - 6
5	6 x 6 W 2.1 x W 2.1	0.042*	54	46	40	35	31	28	25	22	20	18	17
	6 x 6 W 2.9 x W 2.9	0.058	73	63	55	48	43	38	34	31	28	25	23
	4 x 4 W 2.9 x W 2.9	0.087	108	93	81	71	63	56	50	46	41	38	34
5 1/2	6 x 6 W 2.1 x W 2.1	0.042*	68	59	51	45	40	35	32	29	26	24	21
	6 x 6 W 2.9 x W 2.9	0.058	93	80	70	61	54	48	43	39	35	32	29
	4 x 4 W 2.9 x W 2.9	0.087	138	119	104	91	81	72	65	58	53	48	44
6	6 x 6 W 2.1 x W 2.1	0.042*	83	71	62	54	48	43	38	35	31	29	26
	6 x 6 W 2.9 x W 2.9	0.058*	113	98	85	75	66	59	53	48	43	39	36
	4 x 4 W 2.9 x W 2.9	0.087	168	145	126	111	98	88	79	71	64	58	53
6 1/2	6 x 6 W 2.9 x W 2.9	0.058*	133	115	100	88	78	69	62	56	51	46	42
	4 x 4 W 2.9 x W 2.9	0.087	198	171	149	131	116	103	93	83	76	69	63
	4 x 4 W 4.0 x W 4.0	0.120	270	232	202	178	157	140	126	114	103	94	86
7	6 x 6 W 2.9 x W 2.9	0.058*	153	132	115	101	89	80	71	64	58	53	49
	4 x 4 W 2.9 x W 2.9	0.087	228	197	171	151	133	119	107	96	87	79	73
	4 x 4 W 4.0 x W 4.0	0.120	311	268	233	205	182	162	145	131	119	108	99
7 1/2	6 x 6 W 2.9 x W 2.9	0.058*	173	149	130	114	101	90	81	73	66	60	55
	4 x 4 W 2.9 x W 2.9	0.087*	258	223	194	170	151	134	121	109	99	90	82
	4 x 4 W 4.0 x W 4.0	0.120	352	304	264	232	206	184	165	149	135	123	112

Notes:
1. *(As) does not meet ACI criteria for temperature and shrinkage reinforcement (0.0018Ac).
2. Uniform loads shown are based on reinforcement mesh being draped over supports for all slab depths over 3".
3. If uncoated deck is used, the weight of the slab must be deducted from the uniform loads.
4. Uniform loads are based on three span conditions and ACI moment coefficients.
5. Deck gages recommended are for normal weight concrete and based on SDI criteria for unshored spans.

Recommended Gage Key: 22 Gage | 20 Gage | 18 Gage

ALLOWABLE CONSTRUCTION UNIFORM LOADS

Gage	Span Condition	Loading Condition	Uniform Load (psf) Clear Span (ft. - in.)												
			6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	9 - 6	10 - 0	10 - 6	11 - 0	11 - 6	12 - 0	12 - 6
22	Single	Uniform total load	172	149	129	114	101	90	81	73	66	60	55	51	47
		Deflection l/180	172	149	129	114	101	88	75	64	55	48	42	37	33
		Deflection l/240	172	140	114	94	78	66	56	48	42	36	32	28	25
		W1*	84	70	59	51	44	38	33	28	25	22	19	17	15
	Double	Uniform total load	176	152	133	117	103	92	83	75	68	62	56	52	48
		Deflection l/180	176	152	133	117	103	92	83	75	68	62	56	52	48
		Deflection l/240	176	152	133	117	103	92	83	75	68	62	56	52	48
		W1*	156	132	113	97	83	72	63	55	48	42	36	32	28
	Triple	Uniform total load	221	190	166	146	129	115	103	93	85	77	70	65	60
		Deflection l/180	221	190	166	146	129	115	103	93	85	77	70	65	62
		Deflection l/240	221	190	166	146	129	115	103	90	78	68	59	52	46
		W1*	169	143	122	104	90	78	68	60	52	46	40	35	31
20	Single	Uniform total load	226	195	170	149	132	118	106	95	86	79	72	66	61
		Deflection l/180	226	195	170	149	132	112	95	82	71	61	54	47	42
		Deflection l/240	223	179	145	120	100	84	71	61	53	46	40	35	31
		W1*	119	101	86	74	64	56	49	43	39	34	31	27	25
	Double	Uniform total load	230	199	173	152	135	120	108	97	88	80	74	68	62
		Deflection l/180	230	199	173	152	135	120	108	97	88	80	74	68	100
		Deflection l/240	230	199	173	152	135	120	108	97	88	80	74	68	62
		W1*	210	179	153	132	115	100	88	77	68	60	54	48	42
	Triple	Uniform total load	288	248	216	190	168	150	135	122	110	100	92	84	78
		Deflection l/180	288	248	216	190	168	150	135	122	110	100	92	84	78
		Deflection l/240	288	248	216	190	168	150	134	115	99	86	76	67	59
		W1*	226	192	165	142	124	108	95	84	74	66	59	52	47
18	Single	Uniform total load	306	264	230	202	179	160	143	129	117	107	98	90	83
		Deflection l/180	306	264	230	202	179	150	128	110	95	82	72	63	56
		Deflection l/240	300	240	195	161	134	113	96	82	71	62	54	48	42
		W1*	173	147	126	109	96	84	74	66	59	53	48	43	39
	Double	Uniform total load	306	264	230	202	179	160	143	129	117	107	98	90	83
		Deflection l/180	306	264	230	202	179	160	143	129	117	107	98	90	83
		Deflection l/240	306	264	230	202	179	160	143	129	117	107	98	90	83
		W1*	286	244	210	182	159	140	123	109	97	87	78	70	63
	Triple	Uniform total load	382	330	287	253	224	200	179	162	147	134	122	112	103
		Deflection l/180	382	330	287	253	224	200	179	162	147	134	122	112	103
		Deflection l/240	382	330	287	253	224	200	179	155	134	116	102	90	79
		W1*	307	262	226	196	171	151	133	118	105	94	84	76	68

* W1 = maximum weight of concrete and deck, psf

- Type 3.0 FD deck is used in floor construction as an economical form to support concrete slabs during construction. Floor systems using 3.0 FD deck enables the designer to space the structural members to over 12'-0" o.c. without any additional shoring.
- Available with interlocking side laps only.
- Type 3.0 FD deck is manufactured from steel conforming to ASTM A1008-00 Grades C, D or E or from A653/A653M-00 structural quality grade SQ33 or higher. The minimum yield strength used by NMBS is 40 KSI.
- Refer to Figure 4 on page 204 for minimum attachment requirements to supporting structural members. Connections can be made either by welding using a minimum 5/8" diameter puddle weld or properly designed mechanical fasteners. Side laps are to be fastened together between supports, at a maximum spacing of 36" o.c. whenever the deck span exceeds 5'-0". Side lap connections can be made by button punching.

1.5 CD DECK

SECTION PROPERTIES

Gage	Fy (ksi)	Coverage (in)	Thickness (in)	Weight (psf)	Ip (in4/ft)	In (in4/ft)	Sp (in3/ft)	Sn (in3/ft)
22	40	36	0.0295	1.63	0.143	0.173	0.187	0.197
20	40	36	0.0358	1.98	0.187	0.213	0.231	0.240
18	40	36	0.0474	2.62	0.270	0.280	0.312	0.316

Height	1 1/2 in.
Fy (minimum)	40 ksi
Modulus of Elasticity	29500 ksi

NORMAL WEIGHT CONCRETE (145 pcf), fc'=3,000 psi

Total Slab Depth (in.)	Gage	Concrete Weight (psf)	SDI Max. Unshored Clear Span (ft.-in.)			Superimposed Live Load (psf) Clear Span (ft.-in.)														
			Single Span	Double Span	Triple Span	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	9 - 6	10 - 0	10 - 6	11 - 0	11 - 6	12 - 0
3 1/2	22	31	4 - 11	7 - 1	7 - 2	400	363	300	251	212	180	154	133	115	100	87	76	66	58	50
	20	31	5 - 7	8 - 2	8 - 3	400	400	362	303	257	219	189	164	142	124	109	96	84	74	66
	18	31	6 - 9	9 - 8	10 - 0	400	400	400	363	308	264	228	198	173	152	134	118	105	93	83
4	22	37	4 - 9	6 - 9	6 - 10	400	400	381	319	270	230	197	170	148	129	112	98	86	76	66
	20	37	5 - 5	7 - 9	7 - 10	400	400	400	385	327	280	241	209	182	160	140	124	109	97	86
	18	37	6 - 7	9 - 2	9 - 6	400	400	400	400	400	348	301	262	230	202	179	158	141	125	112
4 1/2	22	43	4 - 7	6 - 5	6 - 6	400	400	400	390	330	282	242	209	182	159	139	122	107	94	83
	20	43	5 - 3	7 - 5	7 - 6	400	400	400	400	400	343	296	257	224	197	173	153	135	120	107
	18	43	6 - 4	8 - 9	9 - 0	400	400	400	400	400	400	385	335	294	259	230	204	182	163	146
5	22	49	4 - 6	6 - 2	6 - 3	400	400	400	400	392	335	288	250	217	190	166	146	129	113	100
	20	49	5 - 1	7 - 1	7 - 2	400	400	400	400	400	400	353	307	268	235	207	183	162	144	128
	18	49	6 - 2	8 - 4	8 - 8	400	400	400	400	400	400	400	400	357	316	280	249	222	199	178
5 1/2	22	55	4 - 4	5 - 11	6 - 0	400	400	400	400	400	390	336	291	253	222	194	171	151	133	118
	20	55	5 - 0	6 - 9	6 - 10	400	400	400	400	400	400	400	357	313	275	242	214	190	169	151
	18	55	6 - 0	8 - 0	8 - 3	400	400	400	400	400	400	400	400	400	369	327	291	260	233	209
6	22	61	4 - 3	5 - 9	5 - 9	400	400	400	400	400	400	384	333	290	254	223	196	173	153	136
	20	61	4 - 10	6 - 7	6 - 8	400	400	400	400	400	400	400	400	358	315	278	246	219	195	174
	18	61	5 - 10	7 - 9	8 - 0	400	400	400	400	400	400	400	400	400	400	375	334	299	268	241

MINIMUM ACI SLAB REINFORCEMENT

Total Slab Depth (in.)	ACI Recommended Welded Wire Fabric	Wire Area ($in.^2/ft.$)
3.5	6 x 6 - W1.4 x W1.4	0.028
4	6 x 6 - W1.4 x W1.4	0.028
4.5	6 x 6 - W1.4 x W1.4	0.028
5	6 x 6 - W2.1 x W2.1	0.040
5.5	6 x 6 - W2.1 x W2.1	0.040
6	6 x 6 - W2.1 x W2.1	0.040

Notes

1. Minimum required interior bearing length is 4". Minimum required exterior bearing length is 1 1/2". If these minimum lengths are not provided, web crippling must be checked.
2. Welded wire fabric should be supplied per ACI requirements (0.00075 x concrete section area).
3. Section properties are based on AISI Cold Formed Steel Design Specifications, 1996 Edition.
4. The superimposed live load and maximum construction spans are based on SDI Composite Deck Design Handbook and Design Manual for Composite Decks, Form Decks and Roof Decks, Publication No. 30.
5. The superimposed live load and maximum construction spans are based on the AISI/ASD design method.

1.5 CD DECK

LIGHT WEIGHT CONCRETE (110 pcf), fc'=3,000 psi

Total Slab Depth (in.)	Gage	Concrete Weight (psf)	SDI Max. Unshored Clear Span (ft.-in.)			Superimposed Live Load (psf) Clear Span (ft.-in.)														
			Single Span	Double Span	Triple Span	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	9 - 6	10 - 0	10 - 6	11 - 0	11 - 6	12 - 0
3 1/2	22	23	5 - 1	7 - 8	7 - 9	400	348	289	242	205	176	151	131	114	100	88	77	68	60	53
	20	23	5 - 10	8 - 10	9 - 0	400	400	345	290	247	212	183	159	139	120	102	88	77	67	59
	18	23	7 - 1	10 - 5	10 - 10	400	400	400	374	318	273	225	188	158	134	115	99	86	75	66
4	22	28	5 - 0	7 - 3	7 - 4	400	400	368	309	263	225	194	169	147	129	113	100	89	79	70
	20	28	5 - 8	8 - 5	8 - 6	400	400	400	371	316	271	235	204	179	158	139	124	110	98	87
	18	28	6 - 11	9 - 11	10 - 3	400	400	400	400	400	351	305	267	234	199	170	147	128	112	98
4 1/2	22	32	4 - 10	7 - 0	7 - 1	400	400	400	380	323	277	239	208	182	160	141	124	110	98	87
	20	32	5 - 7	8 - 1	8 - 2	400	400	400	400	388	334	289	252	221	195	173	153	137	122	109
	18	32	6 - 9	9 - 6	9 - 10	400	400	400	400	400	400	376	329	290	257	228	204	181	158	139
5	22	37	4 - 9	6 - 9	6 - 10	400	400	400	400	385	330	286	249	218	191	169	149	133	118	105
	20	37	5 - 5	7 - 9	7 - 10	400	400	400	400	400	399	346	302	265	234	207	184	164	147	132
	18	37	6 - 7	9 - 2	9 - 5	400	400	400	400	400	400	400	395	348	308	274	245	220	198	178
5 1/2	22	41	4 - 8	6 - 6	6 - 7	400	400	400	400	400	385	333	290	254	224	198	175	156	139	124
	20	41	5 - 4	7 - 5	7 - 6	400	400	400	400	400	400	400	353	310	274	243	216	193	173	155
	18	41	6 - 5	8 - 10	9 - 1	400	400	400	400	400	400	400	400	400	361	322	288	258	232	210
6	22	46	4 - 6	6 - 3	6 - 4	400	400	400	400	400	400	382	333	292	257	227	202	179	160	143
	20	46	5 - 2	7 - 2	7 - 3	400	400	400	400	400	400	400	400	356	314	279	249	222	199	179
	18	46	6 - 3	8 - 6	8 - 10	400	400	400	400	400	400	400	400	400	400	370	331	297	268	242

- Type 1.5 CD deck has embossments in the vertical ribs that bond with the concrete slab to develop a composite floor system. The 1.5 CD composite deck acts as a form during the concrete pour enabling the designer to space the structural members to over 10'-0" o.c. without any additional shoring. Once the concrete cures, the resulting composite floor system provides both superior strength and stiffness.
- Available with nested side laps only.
- Type 1.5 CD deck is manufactured from steel conforming to ASTM A1008-00, Grades C and D, or from A653-00, Structural Steel with a minimum yield strength of 40 KSI.
- Minimum attachment to supporting structural members requires connections at all side lap ribs plus a sufficient number of interior ribs to obtain a maximum average spacing of 12”. Maximum spacing between connections shall not exceed 18”. Side laps are to be fastened together between supports, at a maximum spacing of 36" o.c. whenever the deck span exceeds 5'-0". Connections can be made either by welding using a minimum 5/8" diameter puddle weld or properly designed mechanical fasteners.

2.0 CD DECK

SECTION PROPERTIES

Gage	Fy (ksi)	Coverage (in)	Thickness (in)	Weight (psf)	Ip (in4/ft)	In (in4/ft)	Sp (in3/ft)	Sn (in3/ft)
22	40	36	0.0295	1.56	0.330	0.327	0.300	0.306
20	40	36	0.0358	1.89	0.420	0.413	0.388	0.394
18	40	36	0.0474	2.50	0.560	0.560	0.522	0.522

Height	2 in.
Fy (minimum)	40 ksi
Modulus of Elasticity	29500 ksi

NORMAL WEIGHT CONCRETE (145 pcf), fc'=3,000 psi

Total Slab Depth (in.)	Gage	Concrete Weight (psf)	SDI Max. Unshored Clear Span (ft.-in.)			Superimposed Live Load (psf) Clear Span (ft.-in.)														
			Single Span	Double Span	Triple Span	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	9 - 6	10 - 0	10 - 6	11 - 0	11 - 6	12 - 0
4	22	36	6 - 5	9 - 1	9 - 4	400	400	352	294	249	212	181	156	135	117	102	89	78	68	59
	20	36	7 - 7	10 - 3	10 - 7	400	400	400	359	304	260	224	194	169	147	129	114	100	88	78
	18	36	9 - 0	11 - 10	12 - 2	400	400	400	400	398	342	296	257	225	198	175	155	138	123	110
4 1/2	22	42	6 - 3	8 - 7	8 - 11	400	400	400	357	302	257	221	190	165	144	125	110	96	84	73
	20	42	7 - 4	9 - 9	10 - 1	400	400	400	400	368	315	272	236	205	180	158	139	123	108	96
	18	42	8 - 9	11 - 3	11 - 7	400	400	400	400	400	400	359	313	274	242	214	190	169	150	135
5	22	48	6 - 1	8 - 3	8 - 6	400	400	400	400	358	305	262	226	196	171	150	131	115	101	88
	20	48	7 - 1	9 - 4	9 - 8	400	400	400	400	400	374	322	280	244	214	188	166	147	130	115
	18	48	8 - 5	10 - 9	11 - 1	400	400	400	400	400	400	400	372	326	288	255	226	201	180	161
5 1/2	22	54	5 - 11	7 - 10	8 - 2	400	400	400	400	400	355	305	264	229	200	175	153	135	118	104
	20	54	6 - 11	8 - 11	9 - 3	400	400	400	400	400	400	375	325	284	249	219	194	171	152	135
	18	54	8 - 2	10 - 3	10 - 8	400	400	400	400	400	400	400	400	380	336	297	264	236	211	189
6	22	60	5 - 9	7 - 7	7 - 10	400	400	400	400	400	400	349	302	262	229	201	176	155	137	120
	20	60	6 - 8	8 - 7	8 - 11	400	400	400	400	400	400	400	373	325	286	252	222	197	175	156
	18	60	7 - 11	9 - 11	10 - 3	400	400	400	400	400	400	400	400	400	385	341	304	271	243	218
6 1/2	22	66	5 - 6	7 - 3	7 - 6	400	400	400	400	400	400	394	341	297	259	227	200	176	155	137
	20	66	6 - 5	8 - 4	8 - 7	400	400	400	400	400	400	400	400	368	323	285	252	223	199	177
	18	66	7 - 8	9 - 7	9 - 10	400	400	400	400	400	400	400	400	400	400	386	344	307	275	247

MINIMUM ACI SLAB REINFORCEMENT

Total Slab Depth (in.)	ACI Recommended Welded Wire Fabric	Wire Area ($in.^2/ft.$)
4	6 x 6 - W1.4 x W1.4	0.028
4.5	6 x 6 - W1.4 x W1.4	0.028
5	6 x 6 - W1.4 x W1.4	0.028
5.5	6 x 6 - W2.1 x W2.1	0.040
6	6 x 6 - W2.1 x W2.1	0.040
6.5	6 x 6 - W2.1 x W2.1	0.040

Notes

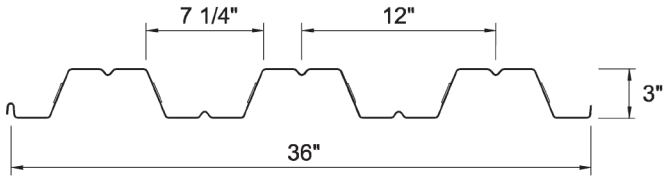
1. Minimum required interior bearing length is 4". Minimum required exterior bearing length is 2". If these minimum lengths are not provided, web crippling must be checked.
2. Welded wire fabric should be supplied per ACI requirements (0.00075 x concrete section area).
3. Section properties are based on AISI Cold Formed Steel Design Specifications, 1996 Edition.
4. The superimposed live load and maximum construction spans are based on SDI Composite Deck Design Handbook and Design Manual for Composite Decks, Form Decks and Roof Decks, Publication No. 30.
5. The superimposed live load and maximum construction spans are based on the AISI/ASD design method.

LIGHT WEIGHT CONCRETE (110 pcf), fc'=3,000 psi

Total Slab Depth (in.)	Gage	Concrete Weight (psf)	SDI Max. Unshored Clear Span (ft.-in.)			Superimposed Live Load (psf) Clear Span (ft.-in.)														
			Single Span	Double Span	Triple Span	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	9 - 6	10 - 0	10 - 6	11 - 0	11 - 6	12 - 0
4	22	28	6 - 9	9 - 10	10 - 2	400	400	343	288	244	209	180	156	136	119	105	92	81	72	64
	20	28	8 - 0	11 - 2	11 - 7	400	400	400	348	296	254	220	191	167	147	130	115	102	91	81
	18	28	9 - 6	12 - 10	13 - 3	400	400	400	400	384	330	286	250	220	194	168	145	126	110	97
4 1/2	22	32	6 - 7	9 - 5	9 - 9	400	400	400	350	297	254	220	191	166	146	128	113	100	89	79
	20	32	7 - 9	10 - 8	11 - 0	400	400	400	400	360	309	267	233	204	180	159	141	125	112	100
	18	32	9 - 3	12 - 3	12 - 8	400	400	400	400	400	400	349	305	268	237	211	188	168	151	134
5	22	37	6 - 5	9 - 0	9 - 4	400	400	400	400	353	302	261	227	198	174	153	135	120	106	95
	20	37	7 - 6	10 - 3	10 - 7	400	400	400	400	400	367	318	277	243	214	189	168	150	134	119
	18	37	9 - 0	11 - 9	12 - 2	400	400	400	400	400	400	400	363	320	283	251	224	201	180	162
5 1/2	22	41	6 - 3	8 - 8	9 - 0	400	400	400	400	400	352	304	265	231	203	179	158	141	125	111
	20	41	7 - 4	9 - 10	10 - 2	400	400	400	400	400	400	370	323	283	250	221	197	175	157	140
	18	41	8 - 9	11 - 4	11 - 8	400	400	400	400	400	400	400	400	373	331	294	263	235	211	191
6	22	46	6 - 2	8 - 4	8 - 8	400	400	400	400	400	400	349	303	265	233	206	182	162	144	128
	20	46	7 - 2	9 - 6	9 - 10	400	400	400	400	400	400	400	370	325	287	254	226	202	180	162
	18	46	8 - 7	10 - 11	11 - 4	400	400	400	400	400	400	400	400	400	380	338	302	271	244	220
6 1/2	22	50	6 - 0	8 - 1	8 - 4	400	400	400	400	400	400	394	343	300	264	233	207	184	164	146
	20	50	7 - 0	9 - 2	9 - 6	400	400	400	400	400	400	400	400	368	325	288	256	229	205	184
	18	50	8 - 4	10 - 7	10 - 11	400	400	400	400	400	400	400	400	400	400	383	343	308	277	250

- Type 2.0 CD deck has embossments in the vertical ribs that bond with the concrete slab to develop a composite floor system. The 2.0 CD composite deck acts as a form during the concrete pour enabling the designer to space the structural members to over 12'-0" o.c. without any additional shoring. Once the concrete cures, the resulting composite floor system provides both superior strength and stiffness.
- Available with interlocking side laps only.
- Type 2.0 CD deck is manufactured from steel conforming to ASTM A1008-00, Grades C and D, or from A653-00, Structural Steel with a minimum yield strength of 40 KSI.
- Minimum attachment to supporting structural members requires connections at each rib, including all side lap ribs. Connections can be made either by welding using a minimum 5/8" diameter puddle weld or properly designed mechanical fasteners. Side laps are to be fastened together between supports, at a maximum spacing of 36" o.c. whenever the deck span exceeds 5'-0". Side lap connections can be made by button punching.

3.0 CD DECK



SECTION PROPERTIES

Gage	Fy (ksi)	Coverage (in)	Thickness (in)	Weight (psf)	Ip (in^4/ft)	In (in^4/ft)	Sp (in^3/ft)	Sn (in^3/ft)
22	40	36	0.0295	1.72	0.733	0.727	0.455	0.466
20	40	36	0.0358	2.08	0.933	0.927	0.596	0.608
18	40	36	0.0474	2.75	1.253	1.253	0.808	0.808

Height	3 in.
Fy (minimum)	40 ksi
Modulus of Elasticity	29500 ksi

NORMAL WEIGHT CONCRETE (145 pcf), fc'=3,000 psi

Total Slab Depth (in.)	Gage	Concrete Weight (psf)	SDI Max. Unshored Clear Span (ft.-in.)			Superimposed Live Load (psf) Clear Span (ft.-in.)													
			Single Span	Double Span	Triple Span	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	9 - 6	10 - 0	10 - 6	11 - 0	11 - 6	12 - 0	12 - 6	13 - 0	13 - 6	14 - 0
5	22	43	8 - 0	10 - 6	10 - 10	323	275	237	204	177	155	135	118	104	91	80	70	62	54	47
	20	43	9 - 5	12 - 1	12 - 6	395	338	292	253	221	194	170	150	133	118	104	93	82	73	65
	18	43	11 - 2	13 - 11	14 - 5	400	400	386	337	295	260	230	205	182	163	146	131	118	106	95
5 1/2	22	49	7 - 9	10 - 0	10 - 4	378	323	278	240	209	182	159	140	123	108	95	84	73	64	56
	20	49	9 - 1	11 - 6	11 - 11	400	396	342	297	259	227	200	177	156	139	123	110	97	87	77
	18	49	10 - 10	13 - 4	13 - 9	400	400	400	394	346	305	270	240	214	192	172	154	139	125	112
6	22	55	7 - 7	9 - 7	9 - 11	400	373	321	278	242	211	185	163	143	126	111	98	86	76	66
	20	55	8 - 10	11 - 1	11 - 5	400	400	395	343	300	263	232	205	182	161	143	128	114	101	90
	18	55	10 - 6	12 - 9	13 - 3	400	400	400	400	400	353	313	278	249	222	200	179	161	145	131
6 1/2	22	61	7 - 4	9 - 3	9 - 6	400	400	366	317	276	242	212	186	164	145	128	113	100	88	77
	20	61	8 - 7	10 - 8	11 - 0	400	400	400	391	342	300	265	234	208	185	165	147	131	117	104
	18	61	10 - 2	12 - 4	12 - 9	400	400	400	400	400	400	358	318	284	255	229	206	185	167	151
7	22	67	7 - 1	8 - 11	9 - 2	400	400	400	358	312	273	240	211	186	164	145	128	113	100	88
	20	67	8 - 3	10 - 3	10 - 7	400	400	400	400	386	339	299	265	235	209	187	167	149	133	119
	18	67	9 - 9	11 - 11	12 - 3	400	400	400	400	400	400	400	360	322	288	259	233	210	190	172
7 1/2	22	73	6 - 10	8 - 7	8 - 10	400	400	400	400	348	305	268	236	208	184	163	144	128	113	100
	20	73	7 - 11	9 - 11	10 - 3	400	400	400	400	400	379	335	296	263	235	209	187	167	149	134
	18	73	9 - 5	11 - 6	11 - 11	400	400	400	400	400	400	400	400	360	323	290	262	236	213	193

MINIMUM ACI SLAB REINFORCEMENT

Total Slab Depth (in.)	ACI Recommended Welded Wire Fabric	Wire Area ($in.^2$/ft.)
5	6 x 6 - W1.4 x W1.4	0.028
5.5	6 x 6 - W1.4 x W1.4	0.028
6	6 x 6 - W1.4 x W1.4	0.028
6.5	6 x 6 - W2.1 x W2.1	0.040
7	6 x 6 - W2.1 x W2.1	0.040
7.5	6 x 6 - W2.1 x W2.1	0.040

Notes

1. Minimum required interior bearing length is 5". Minimum required exterior bearing length is 2 1/2". If these minimum lengths are not provided, web crippling must be checked.
2. Welded wire fabric should be supplied per ACI requirements (0.00075 x concrete section area).
3. Section properties are based on AISI Cold Formed Steel Design Specifications, 1996 Edition.
4. The superimposed live load and maximum construction spans are based on SDI Composite Deck Design Handbook and Design Manual for Composite Decks, Form Decks and Roof Decks, Publication No. 30.
5. The superimposed live load and maximum construction spans are based on the AISI/ASD design method.

3.0 CD DECK

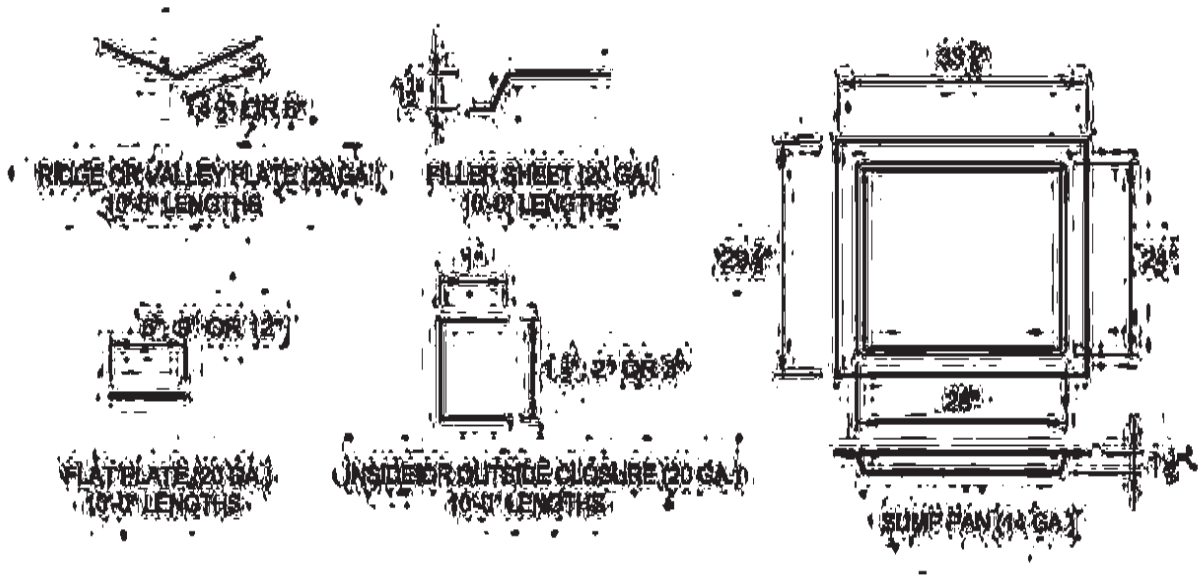
LIGHT WEIGHT CONCRETE (110 pcf), fc'=3,000 psi

Total Slab Depth (in.)	Gage	Concrete Weight (psf)	SDI Max. Unshored Clear Span (ft.-in.)			Superimposed Live Load (psf) Clear Span (ft.-in.)														
			Single Span	Double Span	Triple Span	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	9 - 6	10 - 0	10 - 6	11 - 0	11 - 6	12 - 0	12 - 6	13 - 0	13 - 6	14 - 0
5	22	32	8 - 6	11 - 6	11 - 11	317	272	235	204	178	156	138	122	108	96	85	76	67	60	53
	20	32	10 - 0	13 - 2	13 - 8	385	331	287	250	219	193	171	152	135	121	108	97	87	78	70
	18	32	11 - 11	15 - 2	15 - 8	400	400	375	328	289	256	227	203	182	163	147	132	120	108	98
5 1/2	22	37	8 - 4	11 - 0	11 - 5	372	319	276	240	210	184	162	144	127	113	101	90	80	71	64
	20	37	9 - 9	12 - 8	13 - 1	400	388	336	293	257	227	201	178	159	142	127	114	103	92	83
	18	37	11 - 7	14 - 7	15 - 1	400	400	400	384	338	299	266	238	213	192	173	156	141	128	116
6	22	42	8 - 1	10 - 7	10 - 11	400	369	319	278	243	214	189	167	148	132	118	105	94	84	75
	20	42	9 - 6	12 - 2	12 - 7	400	400	388	339	298	262	233	207	185	165	148	133	120	108	97
	18	42	11 - 3	14 - 1	14 - 6	400	400	400	400	391	346	308	275	247	222	200	181	164	149	135
6 1/2	22	46	7 - 11	10 - 3	10 - 7	400	400	365	317	278	244	216	191	170	151	135	121	108	97	86
	20	46	9 - 3	11 - 9	12 - 2	400	400	400	387	340	300	266	237	211	189	170	153	137	124	112
	18	46	11 - 0	13 - 7	14 - 0	400	400	400	400	400	396	353	315	283	255	230	208	188	171	156
7	22	51	7 - 8	9 - 11	10 - 2	400	400	400	358	314	276	244	217	193	172	153	137	123	110	99
	20	51	9 - 0	11 - 4	11 - 9	400	400	400	400	384	339	301	268	239	214	193	173	156	141	127
	18	51	10 - 9	13 - 2	13 - 7	400	400	400	400	400	400	399	357	320	288	260	236	214	194	177
7 1/2	22	55	7 - 6	9 - 7	9 - 11	400	400	400	400	351	309	273	243	216	193	172	154	138	124	111
	20	55	8 - 10	11 - 0	11 - 5	400	400	400	400	400	379	337	300	268	240	216	195	175	158	143
	18	55	10 - 6	12 - 9	13 - 2	400	400	400	400	400	400	400	400	359	323	292	265	240	219	199

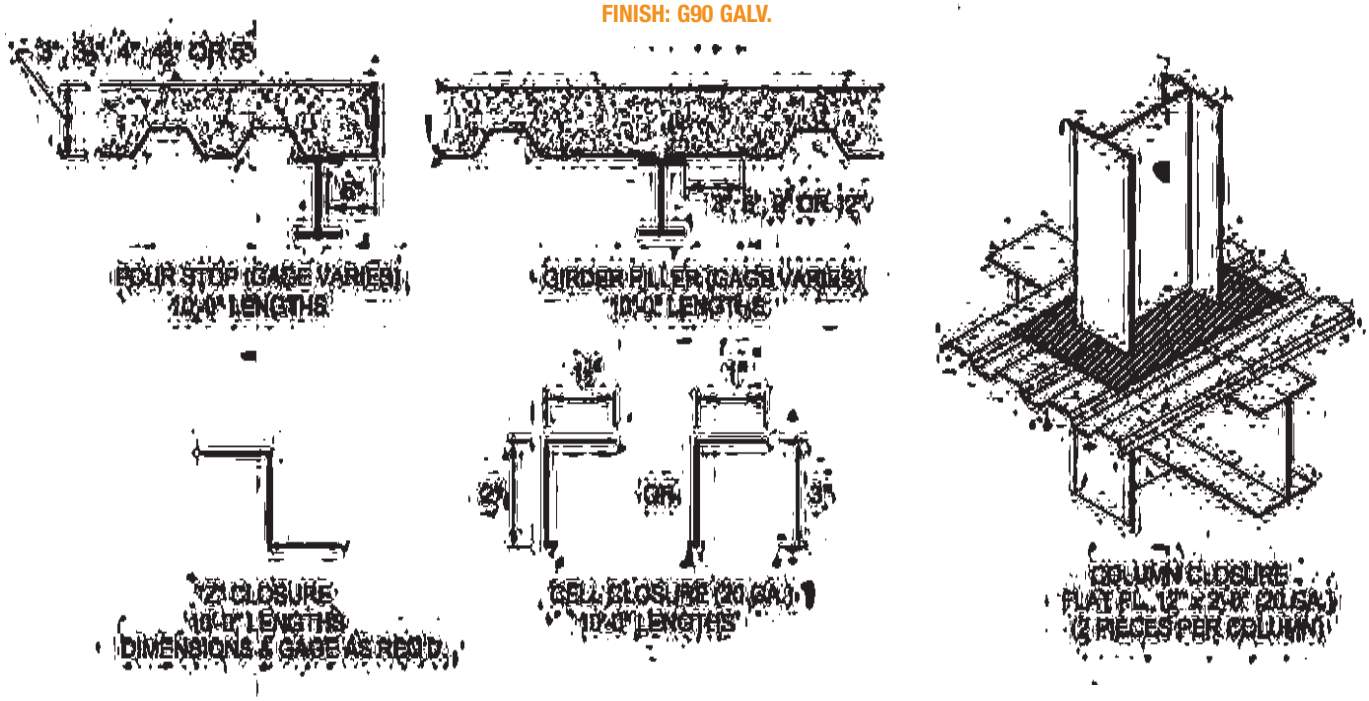
- Type 3.0 CD deck has embossments in the vertical ribs that bond with the concrete slab to develop a composite floor system. The 3.0 CD composite deck acts as a form during the concrete pour enabling the designer to space the structural members to over 13'-0" o.c. without any additional shoring. Once the concrete cures, the resulting composite floor system provides both superior strength and stiffness.
- Available with interlocking side laps only.
- Type 3.0 CD deck is manufactured from steel conforming to ASTM A1008-00, Grades C and D, or from A653-00, Structural Steel with a minimum yield strength of 40 KSI.
- Minimum attachment to supporting structural members requires connections at each rib, including all side lap ribs. Connections can be made either by welding using a minimum 5/8" diameter puddle weld or properly designed mechanical fasteners. Side laps are to be fastened together between supports, at a maximum spacing of 36" o.c. whenever the deck span exceeds 5'-0". Side lap connections can be made by button punching.

STANDARD ACCESSORIES

STANDARD ROOF DECK ACCESSORIES
FINISH: G90 GALV.



STANDARD FLOOR DECK ACCESSORIES
FINISH: G90 GALV.



ROLLED-IN HANGER TABS
CAPACITY = 100 lbs.
AVAILABLE IN DECK TYPES 2.0 FD,
3.0 FD, 1.5 CD, 2.0 CD AND 3.0 CD

FIRE RESISTANCE RATINGS

ROOF DECK					
Restrained Assembly Rating (Hrs.)	**Type of Protection**	**Classified Deck Type**	**Roof Covering**	**U.L. Design No.**	**Unrestrained Beam Rating (hrs.)**
1 & 1-1/2	Acoustical Grid	B & N	Roof Insulation	P225	1 & 1-1/2
1 & 1-1/2		B	Roof Insulation	P230	1 & 1-1/2
1 & 1-1/2		1.0FD & 1.5FD	Insulating Concrete	P231	1 & 1-1/2
1		.6FD, 1.0FD & 1.5FD	Insulating Concrete	P246	1
1 & 1-1/2		B & N	Roof Insulation	P250	1 & 1-1/2
1-1/2 & 2	Metal Lath & Plaster	B	Roof Insulation	P404	NA
1	Gypsum Board	B	Insulating Concrete	P509	1
1 & 1-1/2		B & N	Roof Insulation	P510	NA
1 & 2		B	Roof Insulation	P519	NA
1, 1-1/2 & 2	Sprayed on Mat'ls	B, N, .6FD, 1.0FD & 1.5FD	Roof Insulation	P819	1, 1-1/2 & 2
1, 1-1/2 & 2	Unprotected	B, N, .6FD, 1.0FD & 1.5FD	Insulating Concrete	P921	1, 1-1/2 & 2
1, 1-1/2 & 2		B, N, .6FD, 1.0FD & 1.5FD	Cellular Concrete	P923	1, 1-1/2 & 2
COMPOSITE FLOOR DECK					
Restrained Assembly Rating (Hrs.)	**Type of Protection**	**Classified Deck Type**	**Concrete Topping**	**U.L. Design No.**	**Unrestrained Beam Rating (hrs.)**
1, 1-1/2, 2 & 3	Exposed Grid	1.5CD, 2CD & 3CD	2-1/2" to 3-1/2" LW, NW	D216	1, 1-1/2, 2 & 3
1, 1-1/2, 2 & 3		1.5CD, 2CD & 3CD	2-1/2" to 3-1/2" LW, NW	D219	1, 1-1/2, 2 & 3
1-1/2 & 2	Gypsum Board	1.5CD, 2CD & 3CD	2-1/2" NW	D502	1-1/2 & 2
1, 1-1/2, 2 & 3	Sprayed on Fire Resistive Materials	1.5CD, 2CD & 3CD	2-1/2" LW, NW	D703	1-1/2
1, 1-1/2 & 2		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D712	2
1, 1-1/2 & 2		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D722	1, 1-1/2 & 2
2		1.5CD, 2CD & 3CD	2-1/2" NW	D730	NA
1, 1-1/2, 2, 3 & 4		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D739	1, 1-1/2, 2, 3 & 4
1, 1-1/2, 2 & 3		1.5CD, 2CD & 3CD	2" LW, NW	D743	1, 1-1/2, 2 & 3
2 & 3		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D755	1, 1-1/2, 2 & 3
1, 1-1/2, 2 & 3		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D759	1, 1-1/2, 2 & 3
2, 3 & 4		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D760	1, 1-1/2, 2, 3 & 4
1, 1-1/2, 2, 3 & 4		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D767	1, 1-1/2, 2, 3 & 4
3		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D768	1-1/2 & 3
2 & 3		1.5CD, 2CD & 3CD	2-1/2" to 3-1/2" NW	D771	1 & 1-1/2
2 & 3		1.5CD, 2CD & 3CD	2-1/2" LW	D773	1, 1-1/2, 2 & 3
2		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D775	1-1/2 & 2
1, 1-1/2, 2, 3 & 4		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D779	1, 1-1/2, 2, 3 & 4
1, 1-1/2, 2, 3 & 4		1.5CD, 2CD & 3CD	3-1/4" LW	D782	1-1/2, 2, 3 & 4
2 & 3		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D784	1, 1-1/2, & 2
2, 3 & 4		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D785	1, 1-1/2, 2 & 3
2		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D786	1 & 1-1/2
1, 1-1/2, 2, 3 & 4		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D787	1, 1-1/2, 2, 3 & 4
3		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D816	1-1/2 & 2
2		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D822	1
2		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D825	1, 1-1/2 & 2
2		1.5CD, 2CD & 3CD	3-1/4" LW	D826	1, 1-1/2 & 2
2 & 3		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D831	1, 1-1/2 & 2
1, 1-1/2, 2 & 3		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D832	1, 1-1/2, 2 & 3
2 & 3		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D833	1-1/2
2		1.5CD, 2CD & 3CD	3-1/4" & 3-1/2" LW	D840	1 & 1-1/2
1, 1-1/2, 2, 3 & 4		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D858	1, 1-1/2, 2, 3 & 4
1, 1-1/2, 2 & 3		1.5CD, 2CD & 3CD	2" LW, NW	D859	1, 1-1/2, 2 & 3
2, 3 & 4		1.5CD, 2CD & 3CD	3-1/4" LW	D860	1, 1-1/2 & 2
2		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D861	1 & 1-1/2
1, 1-1/2, 2 & 3		1.5CD, 2CD & 3CD	2-1/2" LW, NW	D871	1, 1-1/2, 2 & 3
1, 1-1/2, 2 & 3	Unprotected	1.5CD, 2CD & 3CD	2-1/2" to 5-1/4" LW, NW	D902	1, 1-1/2, 2 & 3
2		1.5CD, 2CD & 3CD	3-1/4" LW	D907	1 & 2
2		1.5CD, 2CD & 3CD	3-1/4" LW	D913	1
3/4, 1, 1-1/2, 2 & 3		1.5CD, 2CD & 3CD	2-1/2" to 5-1/4" LW, NW	D916	1, 1-1/2, 2 & 3
1, 1-1/2, 2 & 3		1.5CD, 2CD & 3CD	2-1/2" to 5-1/4" LW, NW	D918	1 & 1-1/2
1, 1-1/2, 2 & 3		1.5CD, 2CD & 3CD	2-1/2" to 5-1/4" LW, NW	D919	1 & 1-1/2
3/4, 1, 1-1/2, 2 & 3		1.5CD, 2CD & 3CD	2-1/2" to 5-1/4" LW, NW	D922	1, 1-1/2, 2 & 3
3/4, 1, 1-1/2, 2 & 3		1.5CD, 2CD & 3CD	2-1/2" to 5-1/4" LW, NW	D923	1, 1-1/2, 2 & 3
3/4, 1, 1-1/2, 2 & 3		1.5CD, 2CD & 3CD	2-1/2" to 5-1/4" LW, NW	D925	1, 1-1/2, 2, 3 & 4
3/4, 1, 1-1/2, 2 & 3		1.5CD, 2CD & 3CD	2-1/2" to 5-1/4" LW, NW	D927	1, 1-1/2, 2 & 3
1, 1-1/2, 2 & 3		1.5CD, 2CD & 3CD	2-1/2" to 5-1/4" LW, NW	D929	1, 1-1/2 & 2
2		1.5CD, 2CD & 3CD	2-1/2" to 5-1/4" LW, NW	D931	1
2 & 3		1.5CD, 2CD & 3CD	2-5/8" to 5-1/4" LW, NW	D935	1, 1-1/2 & 2
2 & 3		1.5CD, 2CD & 3CD	2-1/2" to 5-1/4" LW, NW	D936	1, 1-1/2, 2 & 3
2		1.5CD, 2CD & 3CD	2-1/2" to 4-1/2" LW, NW	D937	1 & 1-1/2
3/4, 1, 1-1/2, 2 & 3		1.5CD, 2CD & 3CD	2-5/8" to 5-1/4" LW, NW	D943	1, 1-1/2, 2 & 3

NEW MILLENNIUM
BUILDING SYSTEMS

SALES FAX

BUTLER, IN (260) 868-6002
CONTINENTAL, OH (419) 596-3120
FLORENCE, SC (843) 669-0675
LAKE CITY, FL (386) 466-1302
SALEM, VA (540) 389-0378

DATE: ________________

STEEL DECK BILL OF MATERIAL

SHEET:________ of ________

JOB NAME:	CUST. JOB #:	NMBS JOB #:
LOCATION:	DETAILER:	CHECKER:

SEQ.:			SEQ.:			SEQ.:		
TYPE: ________		GAGE: ________	TYPE: ________		GAGE: ________	TYPE: ________		GAGE: ________
WIDTH:		FINISH:	WIDTH:		FINISH:	WIDTH:		FINISH:
PIECES	LENGTH	BUNDLE #	PIECES	LENGTH	BUNDLE #	PIECES	LENGTH	BUNDLE #
	TOTAL PIECES:			TOTAL PIECES:			TOTAL PIECES:	
	TOTAL SQUARES:			TOTAL SQUARES:			TOTAL SQUARES:	
	WELD WASHERS:			WELD WASHERS:			WELD WASHERS:	
	SCREWS:			SCREWS:			SCREWS:	
	SUMP PANS:			SUMP PANS:			SUMP PANS:	

REMARKS:

SALES FAX

BUTLER, IN (260) 868-6002
CONTINENTAL, OH (419) 596-3120
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SALEM, VA (540) 349-0378

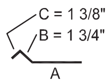
NEW MILLENNIUM BUILDING SYSTEMS

DATE: _______________

STEEL DECK ACCESSORIES

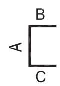
SHEET:_______ of _______

JOB NAME:	CUST. JOB #:	NMBS JOB#:
LOCATION:	DETAILER:	CHECKER:



STOCK DIMS:
GF3: A = 3", 20Ga
GF6: A = 6", 20Ga
GF9: A = 9", 18Ga
GF12: A = 12", 16Ga

Girder Filler (GFx)

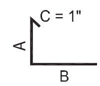


STOCK DIMS:
SC1: A = 1 1/2", B & C = 1"
SC2: A = 2", B & C = 1"
SC3: A = 3", B & C = 1"

Side Closure (SCx)

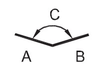
STOCK DIMS:
CC2: A = 2", B = 1 1/2"
CC3: A = 3", B = 1"

Cell Closure (CCx)



STOCK DIMS:
PS1: A = 3", B = 5"
PS2: A = 3 1/2", B = 5"
PS3: A = 4", B = 5"
PS4: A = 4 1/2", B = 5", 18Ga
PS5: A = 5", B = 5", 18Ga

Pour Stop (PSx)

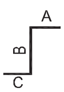


STOCK DIMS:
RVP1: A & B = 4 1/2", C = 153°
RVP2: A & B = 6", C = 153°

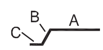
Ridge/Valley Plate (RVPx)

STOCK DIMS:
FP6 = 6"
FP9 = 9"
FP12 = 12", 18Ga

Flat Plate (FPx)



Zee Closure (Zx)



STOCK DIMS:
FS1: A = 7", B = 1 1/2", C = 1/2"

Filler Strip (FSx)

COL: 12" x 24" x 20 Ga. COLUMN CLOSURE
SS1: #10-16 TEK3 x 3/4" STANDARD SIDELAP SCREW
SS2: #12-14 TEK3 x 3/4" SIDELAP SCREW
DS1: #12-24 TEK5 x 1 1/4" DECK ATTACHMENT SCREW
SUMP: 30" x 34" x 14 Ga. STANDARD SUMP PAN
WW: WELD WASHER

*NOTES:
ALL ACCESSORIES ARE 20Ga, G90 GALVANIZED - UNO.
ALL ACCESSORIES ARE FURNISHED IN 10' LENGTHS - UNO.

MARK	QTY.	GAGE	DIMENSIONS A	DIMENSIONS B	DIMENSIONS C	REMARKS	OFFICE USE

SDI Specifications and Commentary

FOR STEEL ROOF DECK

1. Scope

The requirements of this section shall govern only ribbed steel roof deck construction of varying configurations used for the support of roofing materials, design live loads and SDI construction loads shown on page 25.

Commentary: Suspended ceilings, light fixtures, ducts, or other utilities shall not be supported by the steel deck.

2. Materials

2.1 Steel Roof Deck: The steel roof deck units and accessories shall be fabricated from steel conforming to Section A3 of the latest edition, (1996) of the American Iron and Steel Institute, Specifications for the Design of Cold-Formed Steel Structural Members. The steel used shall have a minimum yield strength of 33 ksi (230 MPa).

2.2 Tolerances:
Panel length: Plus or minus ½ inch (13 mm).
Thickness: Shall not be less than 95% of the design thickness.
Panel cover width: Minus 3/8 inch (10 mm), plus ¾ inch (20 mm).
Panel camber and/or sweep: ¼ inch in 10 foot length (6 mm in 3 meters).
Panel end out of square: 1/8 inch per foot (3 mm in 300 mm) of panel width.

Commentary: The above tolerances reflect the fabrication processes for steel deck products. Variation in cover width tolerances may vary due to trucking, storage, handling.

The steel roof deck shall be manufactured from steel conforming to ASTM Designation A1008-00 Grades C, D or E or from A653/A 653M-00 Structural Quality grade SQ33 or higher. If the published product literature does not show the uncoated steel thickness in decimal inches (or millimeters) but lists gages or type numbers, then the thickness of steel before coating with paint or metal shall be in conformance with the following table:

TYPE NO.	DESIGN THICKNESS		MINIMUM THICKNESS	
	in.	mm	in.	mm
22	0.0295	0.75	0.028	0.70
20	0.0358	0.90	0.034	0.85
18	0.0474	1.20	0.045	1.15
16	0.0598	1.50	0.057	1.45

3. Design

3.1a Allowable Stress Design (ASD): Under the combined dead and design live loads, the bending stress in the steel deck shall not exceed 0.6 times the yield strength or 36ksi (250MPa).

3.1b Load Resistance Factor Design (LRFD): The load and resistance factors and the load combinations shall be as required by the AISI Specification.

Commentary: Either ASD or LRFD design is acceptable to the Steel Deck Institute. If LRFD uniform load tables are desired, the SDI Roof Deck Construction Handbook is a source. Generally, in ASD, 20 ksi (140Mpa) is the published maximum stress as is shown in the load tables of this manual.

3.2 Section Properties: Structural properties of roof deck sections shall be computed in accordance with the American Iron and Steel Institute (AISI) specification for the Design of Cold-formed Steel Structural Members, 1996 edition.

Commentary: Arbitrarily assumed effective compression flange widths shall not be allowed. Testing shall not be used in lieu of the above in determination of vertical load carrying capacity of steel deck.

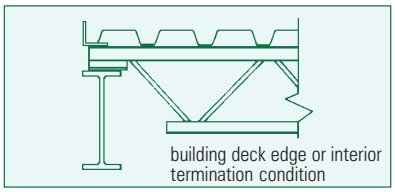
3.3 Load Tables: Uniform loads determined for published tables shall be based on equal adjacent two and three span conditions and on single spans. Appropriate combinations of shear and bending shall be made to determine the published loads. Widths of 2.0 inches (50mm) for end bearing and 4.0 inches (100mm) for interior shall be used to check web crippling. Deflection coefficients shall be 0.013 for single spans, 0.0054 for double spans and 0.0069 for triple spans.

Commentary: For deck layouts that provide more than three equal spans, the user can apply the loads published for three spans. Published uniform load tables do not apply for adjacent spans that differ in length by more than 10%.

3.4 Maximum Deflections: Deflection of the deck shall not exceed L/240 or 1 inch (25 mm) whichever is less, under the uniformly distributed design live load. All spans are to be considered center-to-center of supports.

Commentary: The adequacy of deck edge support details should be reviewed. At the building perimeter or any other deck termination or direction change, occasional concentrated loading of the roof

deck could result in temporary differences in deflection between the roof deck and the adjacent stationary building component. Supplemental support such as a perimeter angle may be warranted.



Construction and Maintenance loads:
SPANS are governed by a maximum stress of 26 ksi (180 MPa) and a maximum deflection of L/240 with a 200-pound (0.89 kN) concentrated load at midspan on a 1'-0" (300 mm) wide section of deck. If the designer contemplates loads of greater magnitude, spans shall be de-creased or the thickness of the steel deck increased as required.

All loads shall be distributed by appropriate means to prevent damage to the completed assembly during construction.

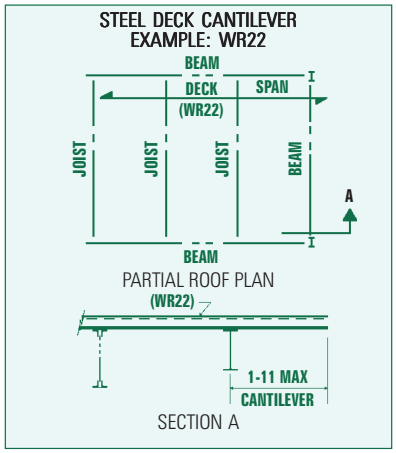
Cantilever loads:
Construction phase load of 10 psf (0.48 kPa) on adjacent span and cantilever, plus 200 pound load (0.89 kN) at end of cantilever with a stress limit of 26 ksi (180 MPa) (ASD).

Service load of 45 psf (2.15 kPa) on adjacent span and cantilever, plus 100 pound load (0.44 kN) at end of cantilever with a stress limit of 20 ksi (140 MPa) (ASD).

Deflection limited to L/240 of adjacent span for interior span and deflection at end of cantilever to L/120 of overhang.

RECOMMENDED MAXIMUM SPANS FOR CONSTRUCTION AND MAINTENANCE LOADS STANDARD FOR 1½ INCH AND 3 INCH ROOF DECK

	TYPE	SPAN CONDITION	SPAN FT.-IN.	SPAN METERS	MAX. RECOMMENDED SPANS ROOF DECK CANTILEVER FT.-IN.	MAX. RECOMMENDED SPANS ROOF DECK CANTILEVER METERS
NARROW RIB DECK	NR22	1	3'-10"	1.15 m	1'0"	.30 m
	NR22	2 or more	4'-9"	1.45 m		
	NR20	1	4'-10"	1.45 m	1'2"	.35 m
	NR20	2 or more	5'-11"	1.80 m		
	NR18	1	5'-11"	1.80 m	1'7"	.45 m
	NR18	2 or more	6'-11"	2.10 m		
INTERMEDIATE RIB DECK	IR22	1	4'-6"	1.35 m	1'2"	.35 m
	IR22	2 or more	5'-6"	1.65 m		
	IR20	1	5'-3"	1.60 m	1'5"	.40 m
	IR20	2 or more	6'-3"	1.90 m		
WIDE RIB DECK	WR22	1	5'-6"	1.65 m	1'11"	.55 m
	WR22	2 or more	6'-6"	1.75 m		
	WR20	1	6'-3"	1.90 m	2'4"	.70 m
	WR20	2 or more	7'-5"	2.25 m		
	WR18	1	7'-6"	2.30 m	2'-10"	.85 m
	WR18	2 or more	8'-10"	2.70 m		
DEEP RIB DECK	3DR22	1	11'-0"	3.35 m	3'-5"	1.05 m
	3DR22	2 or more	13'-0"	3.95 m		
	3DR20	1	12'-6"	3.80 m	3'-11"	1.20 m
	3DR20	2 or more	14'-8"	4.45 m		
	3DR18	1	15'-0"	4.55 m	4'-9"	1.45 m
	3DR18	2 or more	17'-8"	5.40 m		



Notes:

1. Adjacent span: Limited to those spans shown in Section 3.4 of Roof Deck Specifications. In those instances where the adjacent span is less than 3 times the cantilever span, the individual manufacturer should be consulted for the appropriate cantilever span.

2. Sidelaps must be attached at end of cantilever and at a maximum of 12 inches (300 mm) on center from end.

3. No permanent suspended loads are to be supported by the steel deck.

4. The deck must be completely attached to the supports and at the sidelaps before any load is applied to the cantilever.

continued on next page

FOR STEEL ROOF DECK

continued

4. Installation & Site Storage

4.1 Site Storage: Steel deck shall be stored off the ground with one end elevated to provide drainage, and shall be protected from the elements with a waterproof covering, ventilated to avoid condensation.

4.2 Deck Placement: Place each deck unit on supporting structural frame. Adjust to final position with accurately aligned side laps and ends bearing on supporting members. On joist framing, be sure the appropriate end lap occurs over a top chord angle for proper anchorage.

Commentary: Staggering roof deck end laps is not a recommended practice. The deck capacity is not increased by staggering the end laps, yet layout and erection costs are increased.

4.3 Lapped or Butted Ends: Deck Ends may be either butted or lapped over supports. Standard tolerance for ordered length is plus or minus ½ inch (13 mm).

4.4 Anchorage: Roof deck units shall be anchored to supporting members including perimeter support steel and/or bearing walls by either welding or mechanical fasteners, to provide lateral stability to the top flange of the supporting structural members and to resist the following minimum gross uplifts; 45 pounds per square foot (2.15 kPa) for eave overhang; 30 pounds per square foot (1.44 kPa) for all other roof areas. The dead load of the roof deck construction shall be deducted from the above forces. The location and number of fasteners required for satisfactory attachment of deck to supporting structural members are as follows:
All side laps plus a sufficient number of interior ribs to limit the spacing between adjacent points of attachment to 18 inches (500 mm). Do not walk or stand on deck until these minimum attachments are accomplished at the structural supports. Deck units with spans greater than 5 feet (1.5 m) shall have side laps and perimeter edges (at perimeter support steel) fastened at midspan or 36 inches (1 m) intervals, whichever distance is smaller. Sidelap attachment shall progress from support to midspan.

A perimeter deck system support parallel to deck flutes or ribs is necessary to provide for a minimum fastener spacing as specified. The design and detailing of this perimeter deck support system is the responsibility of the project designer.

Commentary: The deck should be anchored as soon as possible to act as a working platform, to prevent blowoff and slipoff from supports and to provide stability to deck system and frame. The designer should check the appropriate codes for the required uplift loading and show the required anchorage connections on the plans. If no information is shown on the plans, the uplift loads shown in paragraph 4.4 will be assumed. Sidelap fasteners can be welds, screws, crimps (button punching), or other methods approved by the designer. Welding sidelaps on thicknesses 0.028 inches (.7 mm) or less may cause large burn holes and is not recommended. The objective of sidelap fastening is to prevent differential sheet deflection. The five foot (1.5 m) limit on side lap spacing is based on experience.
The deck erector should not leave broken bundles or unattached deck at the end of the day as the wind may displace the sheets and cause injury to persons or property. In the past, 1½ inches (38 mm) of end bearing was the minimum; this is still a good "rule of thumb" that will, in general prevent slip off. If less than 1½ inches (38 mm) of end bearing is available, or if high support reactions are expected, the design engineer should ask the deck manufacturer to check the deck web stress. In any case, the deck must be adequately attached to the structure to prevent slip off.

The SDI Diaphragm Design Manual, Second Edition, should be used to determine fastening requirements if the deck is to be designed to resist horizontal loads. The most stringent requirements, of either section 4.4 or, if applicable, the SDI Diaphragm Design Manual, should be used.

4.4a Welding: All field welding of deck shall be in strict accordance with ANSI/AWS D1.3 Structural Welding Code-Sheet Steel. Each welder must demonstrate an ability to produce satisfactory welds using a procedure such as shown in the Steel Deck Institute Manual of Construction with Steel Deck or as described in ANSI/AWS D1.3. A minimum visible 5/8 inch (15 mm) diameter puddle weld or an elongated weld with an equal perimeter is required. Fillet welds, when used, shall be at least 1 inch (25 mm)

long. Weld metal shall penetrate all layers of deck material at end laps and shall have good fusion to the supporting members. Welding washers shall be used on all deck units with a metal thickness less than 0.028 inches (0.7 mm). Welding washers shall be a minimum thickness of 0.056 inches (1.5 mm), 16 gage, and have a nominal 3/8 inch (10 mm) diameter hole. Care shall be exercised in the selection of electrodes and amperage to provide a positive weld and prevent high amperage blow holes.

Commentary: The obligation is placed on the contractor to prepare welding procedure specifications and to qualify them before production use. These procedure specifications must include classification of the filler metal, its size, and for each type of weld, its melting rate or any other suitable means of current control indicative of melting rate, as applicable.

The welder qualification test requires each welder to prove the ability to produce satisfactory welds using these qualified procedures. The fact that the welder may have been successfully qualified on plate or pipe under the provisions of ANSI/AWS D1.1 Structural Welding Code-Steel for structural welding, or on plate or pipe under the provisions of other codes governing the welding of specific products, does not qualify the welder for welding steel sheet.

The selections of welding rod and amperage are left to the individual welder. Welds are made from the top side of the deck, with the welder immediately following the placement crew. In general, stronger welds are obtained on 0.028 inches (.70 mm) or thicker deck without weld washers. Welds on deck less than 0.028 inches (.70 mm) are stronger with washers.

4.4b Mechanical Fasteners: Mechanical fasteners (powder-actuated, screws, pneumatically driven fasteners, etc.) are recognized as viable anchoring methods, provided the type and spacing of the fasteners satisfy the design criteria. Documentation in the form of test data, design calculations, or design charts should be submitted by the fastener manufacturer as the basis for obtaining approval. The deck manufacturer may recommend additional fasteners to stabilize the given profile against sideslip of any unfastened ribs.

Commentary: The allowable load value per fastener used to determine the maximum fastener spacing is based on a structural support thickness of not less than 1/8 inch (3 mm) when powder-actuated or pneumatically driven fasteners with 5/16 inch (8 mm) diameter minimum bearing surface (fastener head size) are used. When the structural support thickness is less than 1/8 inch (3 mm), powder actuated or pneumatically driven fasteners shall not be used but screws are acceptable.

5. Protective Coatings

5.1 Finishes: All steel to be used for roof deck shall be galvanized, aluminized or prime painted. The roof deck shall be free of grease and dirt prior to the coating.

Commentary: The primer coat is 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. Field painting of prime painted deck is recommended especially where the deck is exposed. In corrosive or high moisture atmospheres, a galvanized finish is desirable in a G-60 (Z180) or G-90 (Z275) coating. In highly corrosive or chemical atmospheres or where reactive materials could be in contact with the steel deck, special care in specifying the finish should be used. In this case, individual manufacturers should be contacted. See important information Section 4.1. Insulation, page 7.

In most cases, deck welds are removed from a corrosive environment when the roof is installed and no weld touch up paint or cold galvanizing is necessary. In those instances where the welds are left exposed to a corrosive atmosphere, the weld should be wire brushed and coated with an approved substance.

5.2 Fireproofing: The metal deck manufacturer shall not be responsible for the cleaning of the underside of metal deck to ensure bond of fireproofing. Adherence of fireproofing materials is dependent on many variables; the deck manufacturer (supplier) is not responsible for the adhesion or adhesive ability of the fireproofing.

continued on next page

FOR STEEL ROOF DECK

continued

6. Erection

Deck sheets will be placed in accordance with approved erection layout drawings supplied by the deck manufacturer and in conformance with the deck manufacturer's standards. End joints of sheets shall occur over supports. (see Section 4.4)

Commentary: Openings greater than 25 square feet (2.3m²) are generally located and shown on the detailed erection drawings and deck will be provided to the job in lengths to accommodate the opening. Openings less than 25 square feet (2.3m²) can be located and shown on the erection drawings, and be decked over; the deck erector or the appropriate trade is to cut these openings as well as provide any skew cutting shown.

It is extremely important that deck cantilevers and decked over areas are not overloaded. Openings in the deck and building edges must be protected by using OSHA approved methods.

Openings not shown on the erection drawings, such as those required for stacks, conduits, plumbing, vents, etc. are to be cut, and reinforced if necessary, by the trades requiring the openings. Refer to the *SDI Manual of Construction with Steel Deck* for a reinforcing schedule.

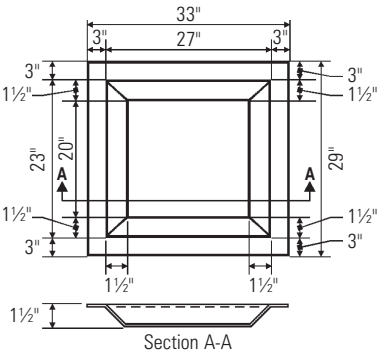
7. Insulation

Insulation board shall be of sufficient strength and thickness to permit unsupported spans and edges over the deck's rib openings. Cementitious insulating fills shall be poured only over galvanized deck and shall be adequately vented. In all cases, the recommendations of the insulation manufacturer shall be followed.

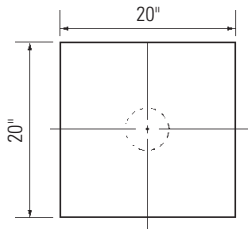
8. CAUTION

Steel roof deck may be used in a variety of ways, some of which do not lend themselves to a standard "steel deck" analysis for span and loading. There are, in these cases, other criteria which must be considered besides that given by the Steel Deck Institute. Make sure that this investigation starts with a review of the applicable Codes and that any special conditions are included in the design.

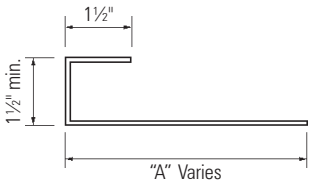
9. Accessories



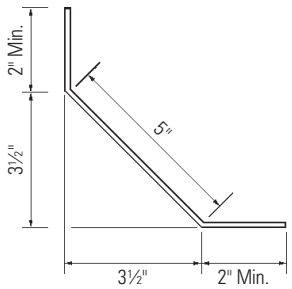
Recessed Sump Pan - Level (0.071" Min.)
(Hole cut in field by others)



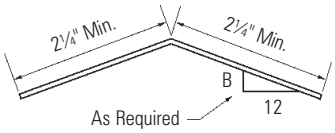
Flat Sump Plate (0.071" Min.)
Dimensions shown are minumum.
(Hole cut in field by others)



Eave Plate (0.028" Min.)
(Hole cut in field by others)



Cant Strip (0.028" Min.)



Ridge and Valley Plate (0.028" Min.)

DESIGN EXAMPLE

Given:
A. Joist spacing 6'-0" c. to c.
B. Live Load = 30 psf
C. Total Load = 50 psf
D. 2" total insulation with built-up roof*
E. Steel deck diaphragm not required.**

1

Refer to Standard Load Tables on pages 30, 31, 32, and 33.

Enter 50 psf total load at 6'-0" span, 3 span condition.

Select deck types that equal or exceed the 50 psf (2.4 kPa) required.

From Table:
NR20 = 54 psf capacity
IR22 = 50 psf capacity
WR22 = 83 psf capacity

2

Refer to Maximum Spans for Construction and Maintenance Loads on page 25.

Select deck types that equal or exceed the 6'-0" (1.75 m) span required.

From Table:
NR20 = 5'11" span (not sufficient)
NR18 = 6'-11" span
IR20 = 6'-3" span
WR22 = 6'-6" span

WR22 fulfills requirements most efficiently.

*Refer to Roof Deck Specifications Section 7-Insulation, page 28. Also refer to insulation manufacturers' recommendations for maximum allowable rib opening.

** If the steel deck is required to act as a diaphragm, refer to *Steel Deck Institute Diaphragm Design Manual, Second Edition*.

SDI Specifications and Commentary

FOR NON-COMPOSITE STEEL FLOOR DECK

1. Scope

This specification and commentary pertains to the use of non-composite steel deck as a form for reinforced concrete slabs.

Commentary: This specification is not intended to cover highway bridges (see SDI publication *Bridge Form*, 1996), siding applications, or exposed roofs. In the past, most of the steel decking used in the manner that this specification covers, was referred to as "centering," however, various roof deck units have successfully been used as non-composite forms. The specification is intended to also include these applications.

2. Materials

2.1 Non-Composite Steel Form Deck: The steel deck units shall be manufactured from steel conforming to ASTM designation A1008-00, Grades C, D, or E, or A653-00 Structural Steel with a minimum yield strength of 33 ksi (230 MPa). The unit design stress shall not exceed the yield strength multiplied by 0.60, with a maximum of 36 ksi (250 MPa).

Commentary: Most of the "centering" materials are offered in A653-00 grade 80, steel (galvanized) or ASTM A1008-00 grade E steel, (uncoated); this steel has a minimum yield strength of 80 ksi (550 MPa) and is generally over 90 ksi (620 MPa); the AISI specifications allow a design stress of 36 ksi (250 MPa) for this material.

2.2 Tolerance:
Panel length: Plus or minus 1/2 inch (12 mm).
Thickness: Shall not be less than 95% of the design thickness.
Panel cover width: Minus 3/8 inch. (10 mm), plus 3/4 inch (20 mm).
Panel camber and/or sweep: 1/4 inch in 10 foot length (6 mm in 3 m).
Panels end out of square: 1/8 inch per foot of panel width (10 mm per m).

Commentary: The above tolerances reflect fabrication practices for steel deck products. Cover width tolerances may vary due to trucking, storage, or handling.

TYPE NO.	DESIGN THICKNESS		MINIMUM THICKNESS	
	in.	mm	in.	mm
28	0.0149	0.38	0.014	0.35
26	0.0179	0.45	0.017	0.43
24	0.0238	0.60	0.023	0.57
22	0.0295	0.75	0.028	0.71
20	0.0358	0.91	0.034	0.86
18	0.0474	1.20	0.045	1.14
16	0.0598	1.52	0.057	1.44

Finishes available are:

1) Galvanized (Conforming to ASTM A924-99 and or ASTM A653-00);
2) Uncoated (Black);
3) Painted with a shop coat of primer paint (one or both sides).
The uncoated finish is, by custom, referred to as "black" by some users and manufacturers; the use of the word "black" does not refer to paint color on the product.

Centering materials are usually available galvanized or uncoated. When unshored galvanized material is used to support a reinforced concrete slab, the slab load is considered to be permanently carried by the deck. When uncoated or painted deck is used to support a reinforced concrete slab, the form is considered impermanent and the concrete load should be deducted from the load capacity of the reinforced slab.

For any permanent load carrying function, a minimum galvanized coating conforming to ASTM A653-98a, G30 (Z090) is recommended.

3. Design

3.1 The section properties of the steel deck unit shall be computed in accordance with American Iron and Steel Institute, *Specification for the Design of Cold-Formed Steel Structural Members*, 1996 edition (AISI Specifications).

3.2 Deck used as a form for structural (reinforced) concrete slab:
3.2a Allowable Stress Design (ASD): Stress shall not exceed 0.60 times the yield strength, nor exceed 36 ksi (250 MPa) under the combined loads of wet concrete, deck, and the following construction live loads: 20 pounds per square foot (1 kPa) uniform load or 150 pound concentrated load on a 1'-0" wide section of deck (2.2 kN per m). The interaction of shear and bending shall be considered in the calculations. *See Figure 1*.

3.2b Load and Resistance Factor Design (LRFD) The load factors for the construction shown in Figure 1 and the resistance factors for bending, shear, and interior bearing shall be as required in the 1996 AISI Specification.

Commentary: The loading shown in Figure 1 is representative of the sequential loading of wet concrete on the form. The 150 pound load (per foot of width) is the result of distributing a 300 pound man over a 2 foot width. Experience has shown this to be a conservative distribution and, if welded wire reinforcing is present , the distribution is greater than 2 feet. The metric equivalent of the 150 pound load is 2.2kN per meter of width. For single span deck conditions, the ability to control the concrete placement may be restricted and a factor of 1.5 is applied to the concrete load to address this condition; however, in order to keep this 50% load increase within a reasonable limit the increase is not to exceed 30 psf (1.44 kPa).

3.2c Calculated theorectical deflection of the deck shall be based on the load of the wet concrete (as determined by the design slab thickness) and the steel deck weight, uniformly loaded on all spans, and shall be limited to L/180 or 3/4 inch (20 mm), whichever is smaller. Deflection shall be relative to supporting members. *See Figure 2*.

Commentary: The deflection limits of L/180 and 3/4 inches (20 mm) are intended to be minimum requirements. Architectural or other considerations may influence the design professional to use a more stringent limit.

If the design professional wants to include additional concrete loading on the deck because of frame deflection, the additional load should be shown on the design drawings or stated in the deck section of the job specifications. The deck supplier is not responsible for frame deflection, nor for any cambering.

3.2d The minimum bearing lengths shall be determined in accordance with the 1996 AISI Specification; the uniform loading case of wet concrete plus deck plus 20 pounds per square foot (1 kPa) construction load shall be used. Minimum bearing shall be 1-1/2 inches (40 mm) unless otherwise shown.

Commentary: Form decks made of grade E steel may have a radius to thickness ratio not covered by the AISI Specification. Experience has shown that 1-1/2 inches (40 mm) of bearing is sufficient for these decks. If less than 1-1/2 inches (40 mm) of end bearing is available for any form deck, or if high support reactions are expected, the design professional should check the deck web crippling capacity. The deck must be adequately attached to the structure to prevent slip off.

3.2e Design of the concrete slabs shall be done in accordance with the ACI 318 Building Code. The concrete cover over the top of the deck shall not be less than 1-1/2 inches (40 mm). Randomly distributed fibers or fibrous add mixes shall not be substituted for welded wire fabric tensile reinforcement. Admixtures containing chloride salts shall not be used.

Commentary: In following the ACI 318 requirements for temperature reinforcement, the designer may eliminate the concrete area that is displaced by the deck ribs. For slabs with total depth of 3 inches (75 mm) or less, the reinforcing mesh may be considered to be at the center of the concrete above the deck. *See Figure 3*. If uncoated or painted deck is used as the form, the load of the concrete slab must be deducted from the calculated capacity of the reinforced concrete slab. If galvanized form is used, the load of the slab is considered to be permanently carried by the deck and need not be deducted from the live load. If temporary shoring is used, the load of the slab must be deducted from the calculated capacity of the reinforced slab regardless of the deck finish. Except for some diaphragm values, the deck should not be assumed to act compositely with the concrete even though strong chemical bonds can, and do, develop.

4. Installation & Site Storage

4.1 Site Storage: Steel deck shall be stored off the ground with one end elevated to provide drainage and shall be protected from the elements with a waterproof covering, ventilated to avoid condensation.

4.2 Deck Placement: Place each deck unit on the supporting structural frame. Adjust to final position with accurately aligned side laps and ends bearing on supporting members and attach immediately. On joist framing, be sure the appropriate end joint occurs over a top chord angle for proper anchorage.

continued on next page

FOR NON-COMPOSITE STEEL FLOOR DECK *continued*

Commentary: Staggering deck ends is not a recommended practice. The deck capacity as a form and the load capacity of the non-composite deck/slab system are not increased by staggering the end joints, yet layout and erection costs are increased.

4.3 Lapped or Butted Ends: Deck ends may be either butted or lapped over supports.

Commentary: Gaps are acceptable at butted ends. If taping of butted ends is requested, it is not the responsibility of the deck manufacturer.

4.4 Anchorage: Form deck units shall be anchored to supporting members including perimeter support steel and/or bearing walls by either welding or by mechanical fastening. This shall be done immediately after alignment. The minimun recommended attachment is defined in Section 4.4a. Do not walk or stand on deck until the minimum attachments are accomplished at the structural supports.

Deck units with spans greater than five feet (1.5 m) shall have side laps and perimeter edges (at perimeter support steel) fastened at midspan or 36 inch (1 m) intervals - whichever is smaller.

Commentary: This anchorage may be required to provide lateral stability to the top flange of the supporting structural members. The minimum attachment is to prevent slip off from supports and provide stability of the deck systems. The deck should be anchored to act as a working platform and to prevent blow off. The frame fastening shown in Figure 4 and the side lap fastening of 4.4 ARE MINIMUM REQUIREMENTS. In no case should fasteners to the supports be spaced greater than 36 inches (1 m) on center. The SDI *Diaphragm Design Manual, Second Edition*, should be used to determine fastening requirements when the deck is designed to resist horizontal loads. The most stringent fastening requirements, of this specification or, if applicable, the SDI *Diaphragm Design Manual, Second Edition,* should be used. Side lap fasteners can be welds, screws, crimps (button punching), or other methods approved by the designer. Welding side laps on thickness less than 0.028 inches (0.7 mm) may cause large burn holes, and is not recommended. The objective of side lap fastening is to prevent differential sheet deflection during concrete loading, therefore preventing side joints from opening. The five foot (1.5 m) limit on side lap spacing is based on experience.

The deck contractor should not leave unattached deck at the end of the day as the wind may displace the sheets and cause injury to persons or property. If studs are being welded to the top flange of the beams, deck sheets should be butted over the supports.

4.4a Welding: All welding of deck shall be in strict accordance with ANSI/AWS D1.3, *Structural Welding Code - Sheet Steel*. Each welder must demonstrate an ability to produce satisfactory welds using a procedure such as shown in the SDI *Manual of Construction with Steel Deck*, or as described in ANSI/AWS D1.3. Welding washers shall be used on all deck units with metal thickness less than 0.028 inches (0.7 mm). Welding washers shall be a minimum thickness of 0.0598 inches (16 gage, 1.50 mm) and have a nominal 3/8 inch (12 mm) diameter hole. Where welding washers are not used, a minimum visible 5/8 inch (15 mm) diameter arc puddle weld shall be used. Weld metal shall penetrate all layers of deck material at end laps and shall have good fusion to the supporting members. When used, fillet welds shall be at least 1 inch (25 mm) long.

Commentary: The welder may be qualified under ANSI/AWS D1.1, *Structural Welding Code - Steel*, or under the provisions of other codes governing the welding of specific products, but may not be qualified for welding sheet steel. In general, stronger welds are obtained on 0.028 inches (0.7 mm) or thicker deck without weld washers. Welds on deck less than 0.028 inches (0.7 mm) are stronger with washers. The layout, design, numbering or sizing of shear connectors is not the responsibility of the deck manufacturer. If studs are being applied through the deck onto structural steel, the stud welds can be used to replace the puddle welds.

4.4b Mechanical Fasteners: Mechanical fasteners (powder actuated, screws, pneumatically driven, etc.) are recognized as viable anchoring methods, provided the type and spacing of the fasteners satisfy the design criteria. Documentation in the form of test data, design calculations, or design charts should be submitted by the fastener manufacturer as the bases for obtaining approval. The deck manufacturer may recommend additional fasteners to stabilize the given profile against sideslip of any unfastened ribs.

Commentary: When the fasteners are powder actuated or pneumatically driven, the load value per fastener spacing is based on a minimum structural support thickness of not less than 1/8 inch (3 mm) and on the fastener providing a 5/16 inch (8 mm) diameter bearing surface (fastener head size). When the structural support thickness is less than 1/8 inch (3 mm), powder actuated or pneumatically driven fasteners shall not be used, but screws are acceptable.

4.5 Construction Practice

4.5a All deck sheets shall have adequate bearing and fastening to all supports so as not to lose support during construction. Deck areas subject to heavy or repeated traffic, concentrated loads, impact loads, wheel loads, etc. shall be adequately protected by planking or other approved means to avoid overloading and/or damage. Damaged deck (sheets containing distortions or deformations caused by construction practices) shall be repaired, replaced, or shored to the satisfaction of the designer before placing concrete. The cost of repairing, replacing, or shoring of damaged units shall be the liability of the trade contractor responsible for the damage.

Commentary: For temporary construction loads prior to concrete placement, it should be safe to assume that the deck will support a minimum uniform load of 50 psf (2.4 kPa) without further investigation.

4.5b The need for temporary shoring shall be investigated and, if required, it shall be designed and installed in accordance with the applicable ACI code and shall be left in place until the slab attains 75% of its specified compressive strength.

4.5c Prior to concrete placement, the steel deck shall be free of soil, debris, standing water, loose mill scale and all other foreign matter.

4.5d Care must be exercised when placing concrete so the deck will not be subjected to any impact that exceeds the design capacity of the deck. Concrete shall be placed from a low level to avoid impact, in a uniform manner, over the supporting structure and spread toward the center of the deck span. If buggies are used to place the concrete, runways shall be planked and the buggies shall only operate on planking. Planks shall be of adequate stiffness to transfer loads to the steel deck without damaging the deck. Deck damage caused by roll bars or careless placement must be avoided.

4.6 Information:

Commentary: Fire ratings, diaphragm design information, and reinforced concrete slab capacities are available from most SDI form deck manufacturers.

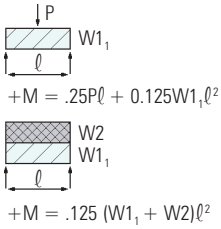
Steel form deck may be used in a variety of ways, some of which do not lend themselves to a standard "steel deck" analysis for span and loading. In these cases there are other criteria which must be considered besides those given by the Steel Deck Institute. Make sure that this investigation starts with a review of the applicable codes and that any special conditions are included in the design.

4.7 Fireproofing: The steel deck manufacturer shall not be responsible for ensuring the bonding of fireproofing. The adherence of fireproofing materials is dependent on many variables; the deck manufacturer (supplier) is not responsible for the adhesion or adhesive ability of the fireproofing.

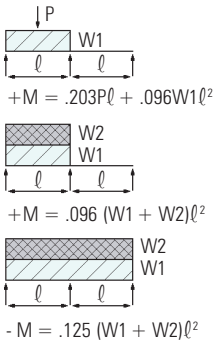
FIGURE 1

Loading Diagrams and Bending Moments

Simple Span Condition



Double Span Condition



Triple Span Condition

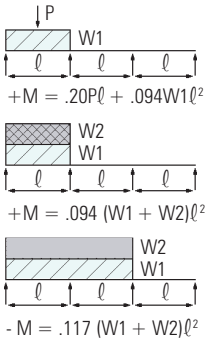
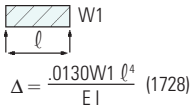


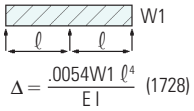
FIGURE 2

Loading Diagrams and Deflections

Simple Span Condition



Double Span Condition



Triple Span Condition

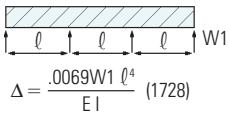
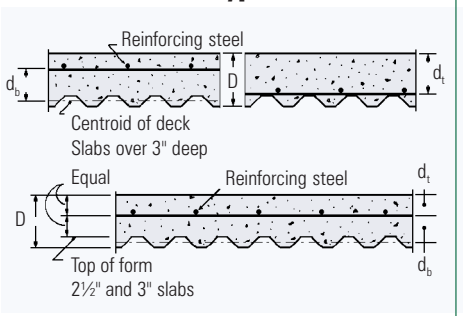


FIGURE 3

Form Deck Typical Slabs



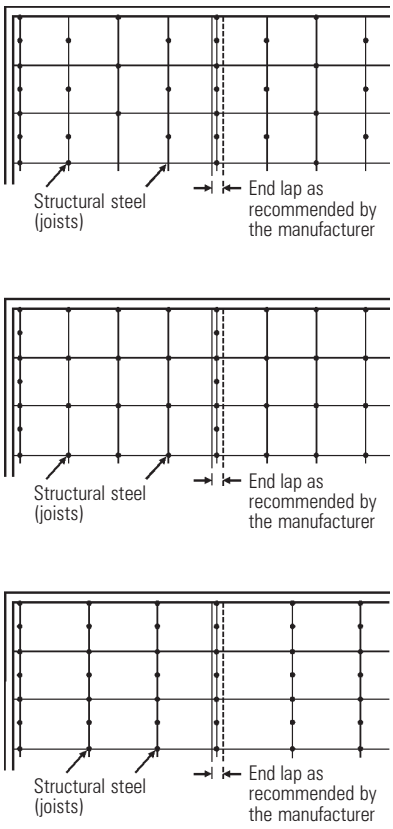
Notes for Figures 1, 2, and 3

P = 150 - pound concentrated load
I = In^4/ft. - deck moment of inertia
W1 = slab weight + deck weight, psf
W2 = 20 pounds per square foot construction load
E = 29.5 x 10^6 psi
ℓ = clear span length (ft.)
$W1_1$ = 1.5 x slab weight + deck weight ≤ slab weight + 30 + deck weight
D = depth of slab
d_t = distance from reinforcing steel to top of concrete
d_b = distance from reinforcing steel to centroid of deck

Dimensional check shows the need for the 1728 factor when calculating deflections using pound inch units.

FIGURE 4

Minimum Fastening Patterns



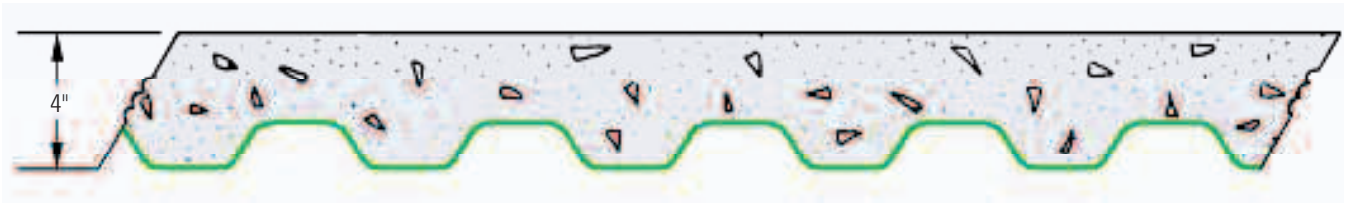
Intermediate side lap attachments not shown. See Section 4.4 Anchorage non-composite steel form deck.

Note:
Fastener patterns A and B are for deck spans up to 4'6". Fastener pattern C is for deck spans from 4'6" to 8'0". If spans exceed 8'0", fastener should be placed so that the average spacing (at supports) is not more that 12".

Non-Composite Steel Form Deck

DESIGN EXAMPLE

1. Deck is to be used as a permanent form for a reinforced concrete slab. Specify the form section properties based on the following conditions:



1.1 Concrete slab is 4" total thickness - 150 pcf concrete.

1.2 Deck to be used is nominal 1 3/8" deep, grade E steel conforming to ASTM-A653-98a (galvanized)

fy = 80,000 psi
f = 36,000 psi

1.3 Joists at 5'0" o.c. with 3" flange width (clear span = 4.75 ft.) All sheets of deck can span three or more supports.

1.4 For architectural considerations, the wet load deflection is to be limited to L/240 of the span.

2. Constructions Loads
(to find concrete weight, consult manufacturer's catalog).

Concrete weight (typical)	43 psf
Deck weight (estimated)	2 psf
Total wet load (W_1)	45 psf

3. Negative Bending

$-M = .117\ (W_1 + W_2)\ \ell^2(12)$
$= .117\ (45 + 20)\ (4.75)^2(12)$
$-M = 2059$ in. lbs.

4. Positive Bending

$+M = [0.20\ P\ell + .094\ W_1\ell^2]\ 12$
$+M = [0.20 \times 150 \times 4.75 +$
$0.094 \times 45 \times (4.75)^2]\ 12$
$+M = 2855$ in. lbs.

5. Section Moduli

$-S$ (required) $= 2059/36{,}000$
$= 0.057$ in.^{3}

$+S$ (required) $= 2855/36{,}000$
$= 0.079$ in.^{3}

6. Calculate Required I.

$\Delta = \ell/240 = 4.75 \times 12/240$
$= 0.2375$ in.

$$\Delta = \frac{0.0069 W_1 \ell^4\ (1728)}{EI}$$

$$\mathbf{I} = \frac{.0069\ (45)(4.75)^4\ 1728}{29.5 \times 10^6 \times .2375}$$

I (required) $= 0.039$ in.^{4}

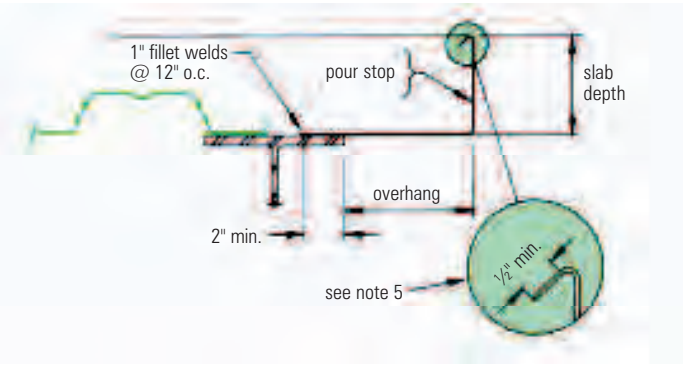
7. Summary.
Designer should specify deck based on these properties or specify the performance requirements.

SDI Pour Stop

SELECTION TABLE

SLAB DEPTH (INCHES)	OVERHANG (INCHES) 0	1	2	3	4	5	6	7	8	9	10	11	12
	POUR STOP TYPES												
4.00	20	20	20	20	18	18	16	14	12	12	12	10	10
4.25	20	20	20	18	18	16	16	14	12	12	12	10	10
4.50	20	20	20	18	18	16	16	14	12	12	12	10	10
4.75	20	20	18	18	16	16	14	14	12	12	10	10	10
5.00	20	20	18	18	16	16	14	14	12	12	10	10	
5.25	20	18	18	16	16	14	14	12	12	12	10	10	
5.50	20	18	18	16	16	14	14	12	12	12	10	10	
5.75	20	18	16	16	14	14	12	12	12	12	10	10	
6.00	18	18	16	16	14	14	12	12	12	10	10	10	
6.25	18	18	16	14	14	12	12	12	12	10	10		
6.50	18	16	16	14	14	12	12	12	12	10	10		
6.75	18	16	14	14	14	12	12	12	10	10	10		
7.00	18	16	14	14	12	12	12	12	10	10	10		
7.25	16	16	14	14	12	12	12	10	10	10			
7.50	16	14	14	12	12	12	12	10	10	10			
7.75	16	14	14	12	12	12	10	10	10	10			
8.00	14	14	12	12	12	12	10	10	10				
8.25	14	14	12	12	12	10	10	10	10				
8.50	14	12	12	12	12	10	10	10					
8.75	14	12	12	12	12	10	10	10					
9.00	14	12	12	12	10	10	10						
9.25	12	12	12	12	10	10	10						
9.50	12	12	12	10	10	10							
9.75	12	12	12	10	10	10							
10.00	12	12	10	10	10	10							
10.25	12	12	10	10	10								
10.50	12	12	10	10	10								
10.75	12	10	10	10									
11.00	12	10	10	10									
11.25	12	10	10										
11.50	10	10	10										
11.75	10	10											
12.00	10	10											

TYPES	DESIGN THICKNESS
20	0.0358
18	0.0474
16	0.0598
14	0.0747
12	0.1046
10	0.1345



NOTES: This Selection Chart is based on following criteria:

1. Normal weight concrete (150 PCF).
2. Horizontal and vertical deflection is limited to ¼" maximum for concrete dead load.
3. Design stress is limited to 20 KSI for concrete dead load temporarily increased by one-third for the construction live load of 20 PSF.
4. Pour Stop Selection Chart does not consider the effect of the performance, deflection, or rotation of the pour stop support which may include both the supporting composite deck and/or the frame.
5. Vertical leg return lip is recommended for all types (gages).
6. This selection is not meant to replace the judgement of experienced Structural Engineers and shall be considered as a reference only.

SDI reserves the right to change any information in this selection table without notice.

FOR COMPOSITE STEEL FLOOR DECK

1. Scope

This specification pertains to composite steel floor deck. Composite steel floor deck is cold formed steel deck which acts as a permanent form and as the positive bending reinforcement for the structural concrete. When suitably fastened, the steel deck also acts as a working platform for the various trades. After the concrete cures, the steel deck and the concrete are interlocked by the shape of the deck, mechanical means, surface bond, or by a combination of these means.

2. Materials

2.1 Composite Steel Deck: Composite steel floor deck shall be fabricated from steel conforming to Section A3 of the 1996 edition of the American Iron and Steel Institute, *Specification for the Design of Cold Formed Steel Structural Members*, (AISI Specifications). The steel used shall have a minimum yield point of 33 ksi (230 MPa).

2.1a Tolerances:
Panel length: Plus or minus 1/2 inch (12 mm).
Thickness: Shall not be less than 95% of the design thickness.
Panel cover width: minus 3/8 inch (10 mm), plus 3/4 inch (20 mm).
Panel camber and/or sweep: 1/4 inch in 10 foot length (6 mm in 3 m).
Panel end out of square: 1/8 inch per foot of panel width (10 mm per m).

Commentary: Most composite steel floor deck is manufactured from steel conforming to ASTM Designation A1008-00, Grades C and D, or from A653-00, Structural Steel. If the published product literature does not show the uncoated steel thickness in decimal inches (or millimeters), but lists gage or type numbers, then the thickness of steel before coating with paint or metal shall be in conformance with the following table:

TYPE NO.	DESIGN THICKNESS		MINIMUM THICKNESS	
	in.	mm	in.	mm
22	0.0295	0.75	0.028	0.71
21	0.0329	0.84	0.031	0.79
20	0.0358	0.91	0.034	0.86
19	0.0418	1.06	0.040	1.01
18	0.0474	1.20	0.045	1.14
17	0.0538	1.37	0.051	1.30
16	0.0598	1.52	0.057	1.44

The tolerances reflect fabrication processes for steel deck products. Variation in cover width may be from trucking, storage or handling.

2.1b Finish: The finish on the steel composite deck shall be as specified by the designer and be suitable for the environment of the structure.

Commentary: Since the composite deck is the positive bending reinforcement for the slab, it must be designed to last the life of the structure; a minimum of recommended finish is a galvanized coating as defined in ASTM A653-00, G30 (Z090).

3. Design (Deck as a Form)

3.1: The section properties for the steel floor deck (as a form in bending) shall be computed in accordance with the AISI Specifications.

3.2a: Allowable Stress Design (ASD): The interaction of shear and bending shall be considered in the calculations. Bending stress in the deck shall not exceed 0.6 times the yield strength with a maximum of 36 ksi (250 MPa) under the combined loads of wet concrete, deck, and the following construction live loads: 20 pounds per square foot uniform load (1 kPa) or 150 pound concentrated load on a 1'0" wide section of deck (2.2 kN per m). *See Figure 1.*

3.2b: Load and Resistance Factor Design (LRFD): The load factors for the construction shown in Figure 1 and the resistance factors for bending, shear, and interior bearing shall be as required in the 1996 AISI Specification.

continued on next page

FOR COMPOSITE STEEL FLOOR DECK *continued*

Commentary: The loading shown in Figure 1 is representative of the sequential loading of wet concrete on the form. The 150 pound load (per foot of width) is the result of distributing a 300 pound man over a 2 foot width. Experience has shown this to be a conservative distribution and, if welded wire reinforcing is present the distribution is greater than 2 feet. The metric equivalent of the 150 pound load is 2.2 kN per meter of width. For single span deck conditions, the ability to control the concrete placement may be restricted and a factor of 1.5 is applied to the concrete load to address this condition; however, in order to keep this 50% load increase within a reasonable limit, the increase is not to exceed 30 psf (1.44 kPa).

3.3 Calculated theoretical deflections of the deck, as a form, shall be based on the load of the wet concrete (as determined by the design slab thickness) and the load from the steel deck, uniformly loaded on all spans, and shall be limited to L/180 or 3/4 inch (20 mm), whichever is smaller. Deflections shall be relative to supporting members. *See Figure 2.*

Commentary: The deflection calculations do not take into account construction loads since these are considered as temporary loads. The deck is designed to always be in the elastic range so removal of temporary loads should allow the deck to recover. The structural steel also deflects under the loading of the wet concrete.

The design professional is urged to check the deflection of the total system especially if composite beams and girders are being used. If the designer wants to include additional concrete loading on the deck because of frame deflection, the additional load should be shown on the design drawings or stated in the deck section of the job specifications. The deck supplier is not responsible for frame deflection, nor for any cambering.

3.4: Minimum interior bearing lengths shall be determined in accordance with the 1996 AISI Specification; a uniform loading case of wet concrete, plus deck, plus 20 psf (1 kPa) construction load shall be used. *See Figure 3.*

Commentary: In the past, 1-1/2 inches (40 mm) of end bearing was the minimum; this is still a good "rule of thumb" that will, in general, prevent slip off. The deck must be adequately attached to the structure to prevent slip off.

4. Installation & Site Storage

4.1 Site Storage: Steel deck shall be stored off the ground with one end elevated to provide drainage and shall be protected from the elements with a waterproof covering, ventilated to avoid condensation.

4.2 Deck Placement: Place each deck unit on the supporting structural frame. Adjust to final position with accurately aligned side laps and ends bearing on supporting members.

Commentary: Staggering floor deck end joints is not a recommended practice. The deck capacity as a form and the load capacity of the composite deck/slab system are not increased by staggering the ends, yet layout and erection costs are increased.

4.3 Butted Ends: Deck sheets shall be butted over supports. [Standard tolerance for ordered length is plus or minus 1/2 inch (12 mm), - See section 2.1a]

Commentary: Lapping composite deck ends can be difficult because shear lugs (web embossment) or profile shape can prevent a tight metal to metal fit. The space between lapped sheets can make welded attachments more difficult. Gaps are acceptable at butted ends. If taping of butted ends is requested, it is not the responsibility of the deck manufacturer.

4.4 Anchorage: Floor deck units shall be anchored to supporting members including perimeter support steel and/or bearing walls by either welding or by mechanical fastening. This shall be done immediately after alignment. The minimum recommended attachments are defined in Section 4.4a. Do not walk or stand on deck until these minimum attachments are provided at the structural support. Deck units with spans greater than five feet (1.5 m) shall have side laps and perimeter edges (at perimeter support steel) fastened at midspan or 36 inch (1 m) intervals, whichever distance is smaller. Side lap attachment shall progress from the support to midspan.

Commentary: This anchorage may be required to provide lateral stability to the top flange of the supporting structural members. The

minimum attachment is to prevent slip off from supports and to provide stability to the deck system. The deck must be anchored to act as a working platform and to prevent blow off. Side lap fasteners can be welds, screws, crimps (button punching), or other methods approved by the designer. Welding side laps on thicknesses 0.028 inches (0.7 mm) or less may cause large burn holes, and is not recommended. The objective of side lap fastening is to prevent differential sheet deflection during concrete placing and therefore prevent side joints from opening. The five foot (1.5 m) limit on side lap spacing is based on experience. The deck erector must not leave unattached deck at the end of the day, as the wind may displace the sheets and cause injury to persons or property. The SDI *Diaphragm Design Manual, Second Edition*, should be used to determine fastening requirements if the deck will be designed to resist horizontal loads. The most stringent requirements, of either section 4.4 or, if applicable, the SDI *Diaphragm Design Manual*, *Second Edition*, should be used.

4.4a Welding: All welding of deck shall be in strict accordance with ANSI/AWS D1.3 *Structural Welding Code - Sheet Steel*. Each welder must demonstrate an ability to produce satisfactory welds using a procedure such as shown in the SDI *Manual of Construction with Steel Deck* or as described in ANSI/AWS D1.3. A minimum visible 5/8 inch (15 mm) diameter puddle weld or equivalent is required at all edge ribs, plus a sufficient number of interior ribs to provide a maximum average spacing of 12 inches (300 mm). The maximum spacing between adjacent points of attachment shall not exceed 18 inches (460 mm). Fillet welds, when used, shall be at least 1 inch (25 mm) long. Weld metal shall penetrate all layers of deck material at end laps and shall have good fusion to the supporting members. Welding washers shall be used on all deck units with a metal thickness less than 0.028 inches (0.7 mm, 22gage). Welding washers shall be a minimum thickness of 0.0567 inches (1.5 mm, 16 gage) and have a nominal 3/8 inch (10 mm) diameter hole.

Commentary: The welder may be qualified on plate or pipe under ANSI/AWS D1.1, *Structural Welding Code - Steel*, or under the provisions of other codes governing the welding of specific products, but may not be qualified for welding sheet steel. The layout, design numbering or sizing of shear connectors is not the responsibility of the deck manufacturer. If studs are being applied through the deck onto structural steel, the stud welds can be used to replace the puddle welds. In general, stronger welds are obtained on 0.028 inches (0.7 mm, 22 gage) or thicker deck without weld washers. Welds on deck less than 0.028 inches (0.7 mm, 22 gage) are stronger with washers.

4.4b Mechanical Fasteners: Mechanical fasteners (powder actuated, screws, pneumatically driven fasteners, etc.) are recognized as viable anchoring methods, provided the type and spacing of the fastener satisfies the design criteria. Documentation in the form of test data, design calculations, or design charts should be submitted by the fastener manufacturer as the basis for obtaining approval. The deck manufacturer may recommend additional fasteners to stabilize the given profile against sideslip of unfastened ribs.

Commentary: When the fasteners are powder actuated or pneumatically driven, the load value per fastener used to determine the maximum fastener spacing is based on a minimum structural support thickness of not less than 1/8 inch (3mm) and on the fastener providing a 5/16 inch (8mm) diameter bearing surface (fastener head size). When the structural support thickness is less than 1/8 inch (3mm), powder actuated or pneumatically driven fasteners shall not be used, but screws are acceptable.

5. Design Deck and Concrete As A Composite Unit

5.1 General: The composite slab shall be designed as a reinforced concrete slab with the steel deck acting as the positive reinforcement. Slabs shall be designed as simple or continuous spans under uniform loads.

Commentary: High concentrated loads, diaphragm loads, etc. require additional analysis. Horizontal load capacities can be checked by referring to the *SDI Diaphragm Design Manual, Second Edition*. Concentrated loads may be analyzed by the methods shown in the SDI *Composite Deck Design Handbook, 1997.*

continued on next page

FOR COMPOSITE STEEL FLOOR DECK *continued*

Most published live load tables are based on simple span analysis of the composite system; that is, the slab is assumed to crack over each support. If the designer wants a continuous slab, then negative reinforcing should be designed using conventional reinforced concrete design techniques. The welded wire mesh, chosen for temperature reinforcing (Section 5.5), does not usually supply enough area for continuity. The deck is not considered to be compression reinforcing. Care should be used during the placement of loads on all types of hanger tabs for the support of ceilings so that an approximate uniform loading is maintained. The individual manufacturer should be consulted for allowable loading on single hanger tabs. Improper use of hanger tabs could result in the overstressing of tabs and/or the overloading of the composite deck slab.

5.2 Testing: The deck manufacturer shall have performed, under the supervision of a professional engineer, a sufficient number of tests on the composite deck slab system to have verified composite behavior; or, the deck manufacturer shall have participated in the Steel Deck Institute research program used to establish the design criteria as shown in the SDI *Composite Deck Design Handbook, 1992 or 1997*; or, the deck manufacturer shall have submitted deck drawings and samples to the Steel Deck Institute for certification as composite deck.

5.2a Load Determination: Using standard reinforced concrete design procedures, the allowable superimposed load shall be found by using appropriate load resistance design factors and applicable reduction factors based on the presence, absence, or spacing of shear studs on beams perpendicular to the deck as shown in the SDI *Composite Deck Design Handbook, 1997*.

Commentary: By using the referenced analysis techniques or test results, the deck manufacturer determines the live loads that can be applied to the composite deck slab combination. The results are usually published as uniform load tables. The manufacturer may instead publish loads based on the results of a "shear bond" testing program and these loads would also be appropriate. For most applications, the deck thickness and profile is selected so that shoring is not required; the live load capacity of the composite system is usually more than adequate for the superimposed (live) loads. In calculating the section properties of the deck (under section 3.1 of these specifications), the AISI provisions may require that compression zones in the deck be reduced to an "effective width," but as tensile reinforcement, the total area of the cross section may be used.

Coatings other than those tested may be investigated, and if there is evidence that their performance will be better than that of the tested product, additional testing may not be required. For example, it is well accepted that deck with light tight rust provides better shear bond than galvanized, therefore tested galvanized load capacities may be used for rusted decking.

5.3 Concrete: Concrete shall be in accordance with the applicable sections of Chapters 3, 4 and 5 of the ACI 318 *Building Code Requirements for Reinforced Concrete*. Minimum compressive strength (f'_c) shall be 3 ksi (20 MPa) or as required for fire ratings or durability. Admixtures containing chloride salts shall not be used.

Commentary: Load tables are generally calculated by using a concrete strength of 3 ksi (20 MPa). Composite slab capacities are not greatly affected by variations in concrete strength; but, if the strength falls below 3 ksi (20 MPa), it would be advisable to check shear stud strengths. Fire rating requirements may dictate the minimum concrete strength.

The use of admixtures containing chloride salts is not allowed because the salts will corrode the steel deck which has been designed as the slab reinforcement.

5.3a Minimum Cover: The minimum concrete above the top of the floor deck shall be 2 inches (50 mm). When additional (negative bending) reinforcement is placed in the slab, the minimum cover of concrete above the reinforcing shall be 3/4 inch (20 mm).

5.4 Deflection: Deflection of the composite slab shall not exceed L/360 under the superimposed load.

Commentary: Live load deflections are seldom a design factor. The

deflection of the slab/deck combination can best be predicted by using the average of the cracked and uncracked moments of inertia as determined by the transformed section method of analysis.

5.5 Temperature and Shrinkage Reinforcement: Temperature and Shrinkage reinforcement, consisting of welded wire fabric or reinforcing bars, shall have a minimum area of 0.00075 times the area of concrete above the deck (per foot or per meter of width), but shall not be less than the area provided by 6 x 6 - W1.4 x W1.4 welded wire fabric. For those products so manufactured, shear transfer wires welded to the top of the deck may be considered to act as shrinkage or temperature reinforcement.

Commentary: Welded wire fabric with a steel area given by the above formula will generally not be sufficient as the total negative reinforcement; however, the mesh has shown that it does a good job of crack control especially if kept near the top of the slab (3/4 inch to 1 inch cover, 20 to 25 mm).

All deck sheets shall have adequate bearing and fastening to all supports to prevent slip off during construction. Deck areas subject to heavy or repeated traffic, concentrated loads, impact loads, wheel loads, etc. shall be adequately protected by planking or other approved means to avoid overloading and/or damage.

Damaged deck (sheets containing distortions or deformations caused by construction practices) shall be repaired, replaced, or shored to the satisfaction of the design professional before placing concrete. The cost of repairing, replacing, or shoring of damaged units shall be the liability of the trade contractor responsible for the damage.

Commentary: Deck must be selected to support a minimum uniform load of 50 psf (2.4kPa)

6. Construction Practice

6.1 Temporary Shoring: If temporary shoring is required to attain the minimum uniform load of 50 psf (2.4 kpa), the shoring must be securely in place before the floor deck erection begins. The shoring shall be designed and installed in accordance with the applicable ACI code and shall be left in place until the slab attains 75% of its specified compressive strength.

6.2: Prior to concrete placement, the steel deck shall be free of soil, debris, standing water, loose mill scale and all other foreign matter.

6.3: Care must be exercised when placing concrete so that the deck will not be subjected to any impact that exceeds the design capacity of the deck. Concrete shall be placed from a low level to avoid impact, and in a uniform manner over the supporting structure and spread toward the center of the deck span. If buggies are used to place the concrete, runways shall be planked and the buggies shall only operate on planking. Planks shall be of adequate stiffness to transfer loads to the steel deck without damaging the deck. Deck damage caused by roll bars or careless placement must be avoided.

7. Commentary and Information

7.1 Parking Garages: Composite floor deck has been used successfully in many parking structures around the country; however, the following precautions should be observed:

1. Slabs should be designed as continuous spans with negative bending reinforcing over the supports;

2. Additional reinforcing should be included to deter cracking caused by large temperature differences and to provide load distribution; and,

3. In areas where salt water; either brought into the structure by cars in winter or carried by the wind in coastal areas, may deteriorate the deck, protective measures must be taken. The top surface of the slab must be effectively sealed so that the salt water cannot migrate through the slab to the steel deck. A minimum G90 (Z275) galvanizing is recommended, and, the exposed bottom surface of the deck should be protected with a durable paint. The protective measures must be maintained for the life of the building. If the protective measures cannot be assured, the steel deck can be used as a stay in place form and the concrete can be reinforced with mesh or bars as required.

7.2 Cantilevers: When cantilevered slabs are encountered, the deck acts only as a permanent form; top reinforcing steel must be proportioned by the designer.

continued on next page

FOR COMPOSITE STEEL FLOOR DECK *continued*

7.3 Composite Beam and Girders: Most composite floor deck sections are suitable for use with composite beams. The AISC Specification specifically provides for the use of deck in this type of construction.

7.4 Fire Ratings: Many fire rated assemblies that use composite floor decks are available. Consult a SDI member manufacturer for a list of ratings.

In the Underwriters Laboratories *Fire Resistance Directory*, the composite deck constructions show hourly ratings for restrained and unrestrained assemblies. ASTM E119 provides information in appendix X3 called *Guide for Determining Conditions of Restraint for Floor and Roof Assemblies and for Individual Beams*. After a careful review of this guide, the Steel Deck Institute determined that all interior and exterior spans of multispan deck properly attached to bearing walls are restrained. In fact, there is almost no realistic condition that a composite deck-slab could not be considered to be restrained - except perhaps a single span deck system which is unattached to framing or a wall in order to provide a removable slab.

7.5 Fireproofing: The steel deck manufacturer shall not be responsible for ensuring the bonding of fireproofing. The adherence of fireproofing materials is dependent on many variables; the deck manufacturer (supplier) is not responsible for the adhesion or adhesive ability of the fireproofing.

7.6 Concentrated Loads: Concentrated loads can be analyzed and distributed with the methods shown in the SDI *Composite Deck Design Handbook, 1997*.

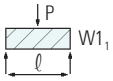
7.7 Conduits: Conduits are permitted in deck slabs subject to local code requirements and fire rating considerations. When conduit sizes are 1" (25.4 mm) or less in diameter, or less than 1/3 the concrete cover, and no crossovers occur, and conduit is spaced at least 18" apart with ¾" (19 mm) minimum cover, conduit may be permitted in the slab unless further restricted by the design documents.

7.8 Other Criteria: Composite steel floor deck may be used in a variety of ways, some of which do not lend themselves to a standard "steel deck" analysis for span and loading. There are, in these cases, other criteria which must be considered besides that given by the Steel Deck Institute. Make sure this investigation starts with a review of the applicable Codes and that any special conditions are included in the design.

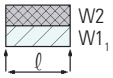
FIGURE 1

Loading Diagrams and Bending Moments

Simple Span Condition

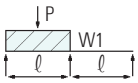


$+M = .25P\ell + 0.125W1_1\ell^2$

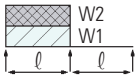


$+M = .125\ (W1_1 + W2)\ell^2$

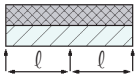
Double Span Condition



$+M = .203P\ell + .096W1\ell^2$

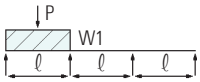


$+M = .096\ (W1 + W2)\ell^2$

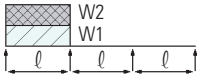


$-M = .125\ (W1 + W2)\ell^2$

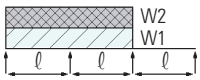
Triple Span Condition



$+M = .20P\ell + .094W1\ell^2$



$+M = .094\ (W1 + W2)\ell^2$



$-M = .117\ (W1 + W2)\ell^2$

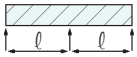
FIGURE 2

Loading Diagrams and Deflections

Simple Span Condition

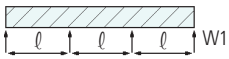
$$\Delta = \frac{.0130W1\ \ell^4}{E\ I} \quad (1728)$$

Double Span Condition



$$\Delta = \frac{.0054W1\ \ell^4}{E\ I} \quad (1728)$$

Triple Span Condition

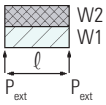


$$\Delta = \frac{.0069W1\ \ell^4}{E\ I} \quad (1728)$$

FIGURE 3

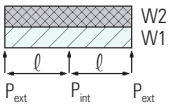
Loading Diagrams and Support Reactions

Simple Span Condition



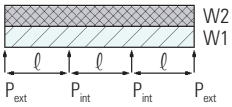
$P_{ext} = .5\ (W1 + W2)\ell$

Double Span Condition



$P_{ext} = .375\ (W1 + W2)\ell$
$P_{int} = 1.25\ (W1 + W2)\ell$

Triple Span Condition



$P_{ext} = .4\ (W1 + W2)\ell$
$P_{int} = 1.1\ (W1 + W2)\ell$

Notes for Figures 1, 2, and 3

P = 150 - pound concentrated load

I = In^4/ft. - deck moment of inertia

W1 = slab weight + deck weight, psf

W2 = 20 pounds per square foot construction load

E = 29.5 x 10^6 psi

ℓ = clear span length (ft.)

$W1_1$ = 1.5 x slab weight + deck weight ≤ slab weight + 30 + deck weight

Dimensional check shows the need for the 1728 factor when calculating deflections using pound inch units.

Composite Steel Floor Deck

DESIGN EXAMPLE

Given:
A. Bay Size = 26' x 26'
B. Superimposed loads = 155 psf
C. Fire rating required = 2 hour
D. Concrete cover required on deck = 3 ¼" lightweight
E. Composite beam construction.
F. Temporary shoring not desired.

1

Review deck manufacturer's literature or SDI *Composite Deck Design Handbook* for available deck types.

In shoring tables, choose deck that will not require temporary shoring during construction.

Check the allowable superimposed load tables for the required loading.

2

Review deck manufacturer's literature or SDI *Composite Deck Design Handbook* for combinations that meet requirements.

13'0" Beam Spacing
Embossed Deck: Formed and reinforced with 3" x 0.0474" design thickness composite steel deck. Determine required shrinkage and temperature reinforcement.

8'8" Beam Spacing
Embossed Deck: Formed and reinforced with 2" x 0.0358" design thickness composite steel deck. Determine required shrinkage and temperature reinforcement.

6'6" Beam Spacing
Embossed Deck: Formed and reinforced with 1 1/2" x 0.0295" design thickness composite steel deck. Determine required shrinkage and temperature reinforcement.

NOTE:
For all the above, **no spray-applied fireproofing** of the deck is required for a 2-hour fire rating.

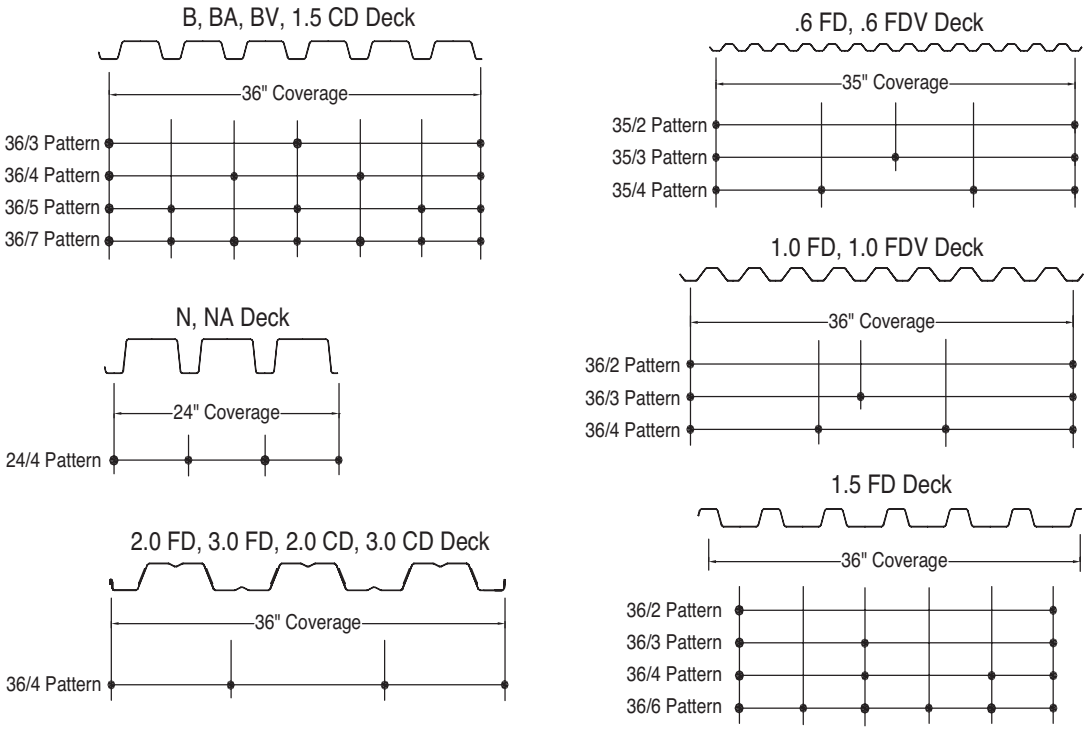
3

Factors that should be considered in selecting composite floor deck systems:

- Compatibility of deck to total structure.
- Hanging requirements.
- Rib width-to-height ratio to determine stud values.
- Electrical requirements.
- Future flexibility.
- Deck material and erection costs. (Obtain from Steel Deck Institute member companies.)
- Overall floor depth.
- Cost of temporary shoring, if shored forming is selected.
- Deck fireproofing cost, if protected deck is selected.
- Concrete availability and cost: (lightweight) (semi-lightweight) (regular weight).
- Concrete volume required.
- Various beam spacings.
- Total material cost.
- Steel erection cost.
- Steel fireproofing cost.

REVIEW OF *COMPOSITE DECK DESIGN HANDBOOK* SHOWS THAT 8'-8" BEAM SPACING MEETS REQUIREMENTS MOST EFFICIENTLY.

TYPICAL FASTENER LAYOUT



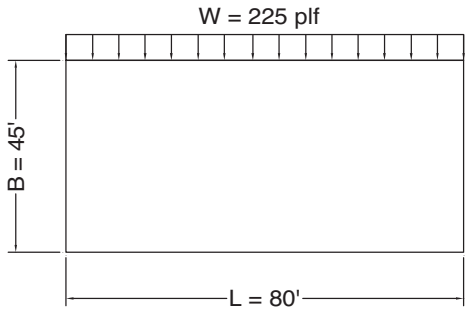
• = Location of attachments to supports, either by puddle welds or TEK screws

DIAPHRAGM SHEAR STRENGTH AND STIFFNESS DESIGN EXAMPLE

From the roof plan shown, calculate the deflection of the diaphragm at the center line and check the shear strength:

Joist spacing 6' - 0"
Deck size: B 20 ga., 18' panels (3 span condition)
using a 36/4 fastener pattern
Fasteners: at supports - #12 TEK screws
at side laps - 2 #10 TEK screws

From diaphragm shear tables:
K1 = .459
DB = 643
K2 = 1056
Span = 6'



ROOF PLAN

$$G' = \frac{K_2}{3.53 + (0.3 \times D_B) / Span + 3 \times K_1 \times Span} = \frac{1056}{3.53 + (0.3 \times 643) / 6 + 3 \times .459 \times 6} = 24.03 \text{ K / in.}$$

$$\Delta\text{¢} = \frac{W \times L^2}{8 \times B \times G'} = \frac{.225 \times 80^2}{8 \times 45 \times 24.03} = .17 \text{ in.}$$

$$R = \frac{W \times L}{2} = \frac{225 \times (80)}{2} = 9000 \text{ lbs.} \qquad S = \frac{9000}{45} = 200 \text{ plf} < 217 \text{ plf (from tables) OK}$$

B, BA 22 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: #12 TEK screws

SIDE LAP FASTENERS: #10 TEK screws

Fastener Pattern	No. of Side Lap Fasteners Per Span	Factor of Safety = 2.75 DECK SPAN (FT. - IN.) 3 - 0	3 - 6	4 - 0	4 - 6	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	10 - 0	K_1
36/3 D_B = 1775	0	160	143	129	117	105										1.098
	1	202	185	171	158	146	136	127								0.665
	2	228	214	201	188	177	166	156	148	140	132	126	120	114		0.477
	3	245	233	222	210	200	190	180	171	163	156	149	142	136	125	0.372
	4	256	246	237	227	217	208	199	191	183	175	168	161	155	144	0.305
	5	263	255	247	239	231	223	214	207	199	192	185	178	172	160	0.258
	6	268	262	255	248	241	234	226	219	212	205	199	192	186	175	0.224
	7	272	267	261	255	249	242	236	230	223	217	211	204	199	187	0.198
	8	275	270	266	260	255	249	244	238	232	226	220	215	209	198	0.177
	9	277	273	269	265	260	255	250	245	239	234	229	223	218	208	0.160
	10	279	275	272	268	264	259	255	250	245	241	236	231	226	212	0.146
36/4 D_B = 860	0	191	169	150	132	118										0.824
	1	248	223	201	183	168	155	141								0.554
	2	291	266	244	224	207	192	179	167	157	147	137	128	121		0.417
	3	322	299	278	258	241	225	211	198	187	177	167	159	151	135	0.334
	4	345	325	305	286	269	253	239	226	214	203	193	183	175	160	0.279
	5	362	344	326	309	293	277	263	250	238	226	216	206	197	181	0.240
	6	375	359	343	328	312	298	284	271	259	247	236	226	217	200	0.210
	7	385	371	357	343	329	315	302	289	277	266	255	245	236	212	0.187
	8	392	380	368	355	342	330	317	305	294	283	272	262	253	212	0.168
	9	398	388	377	365	354	342	330	319	308	297	287	277	262	212	0.153
	10	403	394	384	374	363	352	341	331	320	310	300	291	262	212	0.140
36/5 D_B = 605	0	250	220	196	175	156										0.659
	1	310	276	249	226	206	189	173								0.474
	2	358	324	295	270	248	229	213	198	186	173	161	151	142		0.370
	3	397	364	334	308	285	265	247	231	217	205	193	183	172	154	0.304
	4	428	397	368	342	319	298	279	262	247	233	221	210	199	181	0.257
	5	452	423	396	371	348	327	308	290	274	260	247	235	224	204	0.223
	6	471	445	420	396	374	353	333	316	299	284	271	258	246	212	0.197
	7	487	463	440	417	396	376	357	339	322	307	293	280	262	212	0.177
	8	499	478	457	436	415	396	377	360	343	328	314	293	262	212	0.160
	9	509	490	471	451	432	413	396	379	362	347	331	293	262	212	0.146
	10	518	501	483	465	447	429	412	395	380	365	331	293	262	212	0.134
36/7 D_B = 96	0	283	246	214	189	169										0.549
	1	355	311	276	248	223	202	184								0.414
	2	419	371	332	299	273	250	229	211	195	181	169	159	149		0.333
	3	475	425	383	347	317	292	270	251	233	217	203	190	179	160	0.278
	4	524	473	429	392	360	332	308	287	268	252	237	222	209	187	0.239
	5	566	515	471	432	399	369	344	321	301	283	267	253	239	212	0.209
	6	602	553	509	470	435	404	377	353	332	313	296	280	262	212	0.186
	7	633	586	542	503	468	437	409	384	362	341	323	293	262	212	0.168
	8	659	614	573	534	499	467	439	413	390	369	331	293	262	212	0.152
	9	682	640	599	562	527	496	467	440	416	377	331	293	262	212	0.140
	10	701	662	623	587	553	522	493	466	432	377	331	293	262	212	0.129

K_2 = 870

$$G' = \frac{K_2}{3.53 + (0.3 \times D_B) / SPAN + 3 \times K_1 \times SPAN}$$

(Where SPAN is in feet, G' is in kips/inch.)

Diaphragm shear values were derived from the Steel Deck Institute Second Edition of the Diaphragm Design Manual.

B, BA 22 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: #12 TEK screws

SIDE LAP FASTENERS: #12 TEK screws

Fastener Pattern	No. of Side Lap Fasteners Per Span	Factor of Safety = 2.75 DECK SPAN (FT. - IN.) 3 - 0	3 - 6	4 - 0	4 - 6	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	10 - 0	K_1
36/3 D_B = 1775	0	160	143	129	117	105										1.098
	1	206	190	175	162	150	140	131								0.665
	2	233	220	207	195	183	173	163	154	146	139	132	126	120		0.477
	3	249	239	228	218	207	198	188	180	171	164	157	150	144	132	0.372
	4	260	251	243	234	225	216	208	200	192	184	177	170	164	152	0.305
	5	267	260	253	245	238	230	223	215	208	201	194	188	181	170	0.258
	6	271	266	260	254	247	241	234	227	221	214	208	202	196	185	0.224
	7	275	270	265	260	255	249	243	237	231	225	220	214	208	198	0.198
	8	277	273	269	265	260	255	250	245	240	234	229	224	219	208	0.177
	9	279	276	272	269	264	260	256	251	246	242	237	232	227	212	0.160
	10	280	278	275	271	268	264	260	256	252	248	243	239	234	212	0.146
36/4 D_B = 860	0	191	169	150	132	118										0.824
	1	255	229	207	189	173	160	147								0.554
	2	300	275	253	234	217	201	188	176	165	156	146	137	128		0.417
	3	332	310	289	270	253	237	222	209	198	187	177	169	161	145	0.334
	4	355	335	317	299	282	266	252	239	226	215	205	195	187	171	0.279
	5	371	354	338	322	306	291	277	264	252	240	229	220	210	194	0.240
	6	383	369	354	340	325	312	298	285	273	262	251	241	232	212	0.210
	7	392	380	367	354	341	328	316	304	292	281	271	261	251	212	0.187
	8	399	388	377	366	354	342	331	319	308	298	288	278	262	212	0.168
	9	404	395	385	375	364	354	343	333	322	312	302	293	262	212	0.153
	10	408	400	392	382	373	363	354	344	334	325	315	293	262	212	0.140
36/5 D_B = 605	0	250	220	196	175	156										0.659
	1	317	283	255	232	212	195	179								0.474
	2	369	335	306	280	258	239	222	207	194	182	170	159	150		0.370
	3	410	377	348	322	299	278	260	244	229	216	204	194	184	164	0.304
	4	441	411	383	358	334	313	294	277	261	247	234	223	212	193	0.257
	5	465	438	412	388	365	344	325	307	291	276	262	250	239	212	0.223
	6	483	459	436	413	391	371	352	334	318	302	288	275	262	212	0.197
	7	498	477	455	434	414	394	375	358	342	326	312	293	262	212	0.177
	8	510	491	471	452	433	414	396	379	363	348	331	293	262	212	0.160
	9	519	502	485	467	449	431	414	398	382	368	331	293	262	212	0.146
	10	527	512	496	479	463	447	430	415	400	377	331	293	262	212	0.134
36/7 D_B = 96	0	283	246	214	189	169										0.549
	1	364	319	284	255	230	208	190								0.414
	2	434	385	345	312	285	261	241	221	205	190	178	167	157		0.333
	3	495	444	401	365	334	308	285	265	248	231	216	203	191	171	0.278
	4	547	496	451	413	380	352	327	305	285	268	253	239	225	201	0.239
	5	590	540	496	457	423	392	366	342	321	303	286	271	257	212	0.209
	6	627	579	535	496	461	430	402	377	355	335	317	293	262	212	0.186
	7	657	612	570	532	497	465	436	411	387	366	331	293	262	212	0.168
	8	683	641	600	563	528	497	468	441	417	377	331	293	262	212	0.152
	9	704	665	627	591	557	526	497	470	432	377	331	293	262	212	0.140
	10	723	686	650	616	583	552	524	497	432	377	331	293	262	212	0.129

K_2 = 870

$$G' = \frac{K_2}{3.53 + (0.3 \times D_B) / SPAN + 3 \times K_1 \times SPAN}$$

(Where SPAN is in feet, G' is in kips/inch.)

Diaphragm shear values were derived from the Steel Deck Institute Second Edition of the Diaphragm Design Manual.

B, BA 22 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 5/8" puddle welds

SIDE LAP FASTENERS: #10 TEK screws

Fastener Pattern	No. of Side Lap Fasteners Per Span	Factor of Safety = 2.75 DECK SPAN (FT. - IN.) 3 - 0	3 - 6	4 - 0	4 - 6	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	10 - 0	K_1
36/3 D_B = 1775	0	234	209	189	171	153										0.971
	1	273	248	226	208	191	177	164								0.617
	2	303	279	258	239	222	207	193	181	170	159	148	138	130		0.452
	3	325	304	284	265	248	233	219	206	195	184	175	165	155	138	0.356
	4	343	324	305	287	271	255	241	228	216	206	196	186	178	161	0.294
	5	356	339	322	306	290	275	261	248	236	225	215	205	196	180	0.251
	6	367	351	336	321	306	292	279	266	254	243	232	223	213	197	0.218
	7	375	361	348	334	320	307	294	281	270	259	248	238	229	212	0.193
	8	381	370	357	344	332	319	307	295	284	273	263	253	244	212	0.173
	9	387	376	365	354	342	330	319	307	296	286	276	266	257	212	0.157
	10	391	382	372	361	350	340	329	318	308	298	288	278	262	212	0.144
36/4 D_B = 860	0	280	247	219	193	172										0.729
	1	331	295	265	240	218	197	179								0.509
	2	375	338	306	279	256	236	218	200	184	171	159	149	140		0.391
	3	412	375	342	314	290	268	249	233	217	202	188	176	166	148	0.318
	4	443	407	375	346	321	298	278	261	245	231	217	203	191	171	0.267
	5	468	434	403	374	349	326	305	287	270	255	241	229	217	194	0.231
	6	490	458	428	400	374	351	330	311	294	278	264	251	239	212	0.203
	7	507	478	449	422	397	374	353	334	316	300	285	271	259	212	0.181
	8	522	495	468	442	418	395	374	354	337	320	305	291	262	212	0.164
	9	535	510	484	460	436	414	393	374	356	339	324	293	262	212	0.149
	10	546	522	499	475	453	431	411	392	374	357	331	293	262	212	0.137
36/5 D_B = 605	0	366	322	286	255	228										0.583
	1	419	372	333	301	274	248	226								0.433
	2	466	417	376	341	312	287	265	243	225	209	195	182	171		0.345
	3	508	458	415	379	348	321	298	277	257	239	223	209	197	176	0.286
	4	545	495	452	414	382	353	329	307	287	270	252	236	222	199	0.245
	5	577	528	485	447	413	384	358	335	314	296	280	264	248	212	0.214
	6	605	558	515	477	443	413	386	362	340	321	303	288	262	212	0.190
	7	629	584	542	504	470	440	412	387	365	345	326	293	262	212	0.171
	8	650	607	567	530	496	465	437	411	388	368	331	293	262	212	0.155
	9	669	628	589	553	519	488	460	434	411	377	331	293	262	212	0.142
	10	685	646	609	574	541	510	482	456	432	377	331	293	262	212	0.131
36/7 D_B = 96	0	413	359	313	276	247										0.486
	1	476	416	369	327	293	265	242								0.377
	2	535	470	418	376	339	307	280	257	238	221	206	193	182		0.308
	3	591	522	466	420	382	349	319	293	271	252	235	220	207	185	0.261
	4	642	570	511	462	421	387	357	328	304	283	264	248	233	208	0.226
	5	689	615	554	503	459	422	391	363	337	313	293	275	259	212	0.199
	6	733	658	595	541	496	457	423	394	368	344	322	293	262	212	0.178
	7	772	697	633	578	531	490	455	424	397	373	331	293	262	212	0.161
	8	809	734	670	613	565	523	486	453	425	377	331	293	262	212	0.147
	9	842	769	704	647	597	554	516	482	432	377	331	293	262	212	0.135
	10	873	800	736	679	628	584	544	502	432	377	331	293	262	212	0.125

K_2 = 870

$$G' = \frac{K_2}{3.53 + (0.3 \times D_B) / SPAN + 3 \times K_1 \times SPAN}$$

(Where SPAN is in feet, G' is in kips/inch.)

Diaphragm shear values were derived from the Steel Deck Institute Second Edition of the Diaphragm Design Manual.

B, BA 22 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 5/8" puddle welds

SIDE LAP FASTENERS: welded (NMBS does not recommend welded side laps for 22 ga.)

Fastener Pattern	No. of Side Lap Fasteners Per Span	Factor of Safety = 2.75 DECK SPAN (FT. - IN.) 3 - 0	3 - 6	4 - 0	4 - 6	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	10 - 0	K_1
36/3 D_B = 1775	0	234	209	189	171	153										0.971
	1	304	281	260	240	223	208	195								0.408
	2	344	325	307	289	273	258	244	231	219	208	198	189	180		0.258
	3	368	353	338	323	309	295	281	269	257	246	235	225	216	200	0.189
	4	383	371	359	347	334	322	310	298	287	276	266	256	247	212	0.149
	5	392	383	373	363	353	342	331	321	311	301	291	282	262	212	0.123
	6	399	391	383	375	366	357	348	338	329	320	311	293	262	212	0.105
	7	403	397	391	384	376	368	360	352	344	336	328	293	262	212	0.091
	8	407	402	396	390	384	377	370	363	356	348	331	293	262	212	0.081
	9	409	405	400	395	390	384	378	372	365	359	331	293	262	212	0.072
	10	411	408	404	399	394	389	384	379	373	367	331	293	262	212	0.066
36/4 D_B = 860	0	280	247	219	193	172										0.729
	1	377	340	308	281	258	238	220								0.358
	2	446	410	378	349	324	301	281	264	248	234	220	206	194		0.237
	3	493	461	431	404	378	355	334	315	298	282	267	254	242	212	0.177
	4	526	498	472	446	422	399	378	359	341	324	309	293	262	212	0.142
	5	549	526	502	479	457	436	416	397	379	362	331	293	262	212	0.118
	6	565	546	526	505	485	466	447	428	411	377	331	293	262	212	0.101
	7	578	561	544	526	508	490	472	455	432	377	331	293	262	212	0.088
	8	587	573	558	542	526	510	493	477	432	377	331	293	262	212	0.078
	9	594	582	569	555	541	526	511	496	432	377	331	293	262	212	0.071
	10	600	589	578	565	553	539	526	502	432	377	331	293	262	212	0.064
36/5 D_B = 605	0	366	322	286	255	228										0.583
	1	469	419	378	343	314	289	267								0.319
	2	549	499	456	418	385	357	332	310	291	273	255	240	225		0.219
	3	609	562	520	482	448	417	390	366	344	325	307	292	262	212	0.167
	4	655	612	572	535	501	470	442	417	394	373	331	293	262	212	0.135
	5	689	651	615	579	547	516	488	462	432	377	331	293	262	212	0.113
	6	716	682	649	616	585	556	528	502	432	377	331	293	262	212	0.098
	7	737	707	677	647	618	590	563	502	432	377	331	293	262	212	0.086
	8	753	727	700	672	645	619	589	502	432	377	331	293	262	212	0.076
	9	766	743	718	694	669	644	589	502	432	377	331	293	262	212	0.069
	10	776	756	734	711	688	666	589	502	432	377	331	293	262	212	0.063
36/7 D_B = 96	0	413	359	313	276	247										0.486
	1	539	473	421	379	342	309	282								0.287
	2	647	575	516	467	426	391	361	332	308	286	267	251	236		0.204
	3	740	665	601	548	502	463	429	399	373	349	326	293	262	212	0.158
	4	817	742	677	621	572	530	493	460	431	377	331	293	262	212	0.129
	5	881	809	744	687	637	592	552	502	432	377	331	293	262	212	0.109
	6	934	866	803	746	695	649	589	502	432	377	331	293	262	212	0.094
	7	978	914	854	798	747	700	589	502	432	377	331	293	262	212	0.083
	8	1015	956	898	845	795	700	589	502	432	377	331	293	262	212	0.074
	9	1046	991	937	886	837	700	589	502	432	377	331	293	262	212	0.067
	10	1072	1021	971	922	848	700	589	502	432	377	331	293	262	212	0.061

K_2 = 870

$$G' = \frac{K_2}{3.53 + (0.3 \times D_B) / SPAN + 3 \times K_1 \times SPAN}$$

(Where SPAN is in feet, G' is in kips/inch.)

Diaphragm shear values were derived from the Steel Deck Institute Second Edition of the Diaphragm Design Manual.

B, BA 20 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: #12 TEK screws

SIDE LAP FASTENERS: #10 TEK screws

Fastener Pattern	No. of Side Lap Fasteners Per Span	Factor of Safety = 2.75													
		DECK SPAN (FT. - IN.)													
		3 - 0	3 - 6	4 - 0	4 - 6	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	10 - 0	K_1
36/3 D_B = 1328	0	194	174	156	142	128										1.209
	1	245	225	207	191	177	165	154								0.733
	2	277	260	243	228	214	201	190	179	169	160	152	145	138		0.526
	3	297	283	269	255	242	230	219	208	198	189	180	172	165	152	0.410
	4	310	299	287	275	264	253	242	232	222	213	204	196	188	174	0.336
	5	319	310	300	290	280	270	260	251	242	233	224	216	209	194	0.285
	6	325	318	310	301	292	284	275	266	258	249	241	233	226	212	0.247
	7	330	324	317	310	302	294	286	279	271	263	255	248	241	227	0.218
	8	334	328	322	316	309	303	296	289	282	274	267	261	254	241	0.195
	9	336	332	327	321	315	309	303	297	290	284	278	271	265	252	0.177
	10	338	334	330	325	320	315	309	304	298	292	286	280	274	263	0.161
36/4 D_B = 643	0	232	205	182	161	144										0.907
	1	301	271	244	222	204	188	173								0.610
	2	353	323	296	272	251	233	217	203	191	179	168	157	148		0.459
	3	391	363	337	314	292	273	256	241	227	214	203	193	183	164	0.368
	4	419	394	370	348	327	308	290	274	259	246	234	222	212	194	0.307
	5	440	418	396	375	355	337	319	303	288	274	262	250	239	219	0.264
	6	455	436	417	398	379	361	345	329	314	300	287	275	264	243	0.231
	7	467	450	433	416	399	382	366	351	337	323	310	298	286	265	0.206
	8	476	462	446	431	415	400	385	370	356	343	330	318	306	281	0.185
	9	483	471	457	443	429	415	401	387	374	361	348	336	325	281	0.168
	10	489	478	466	453	440	427	414	401	389	376	364	353	342	281	0.154
36/5 D_B = 453	0	303	267	238	213	191										0.725
	1	376	335	302	274	250	230	211								0.522
	2	435	393	358	327	301	278	258	241	225	211	197	184	174		0.408
	3	482	442	406	374	346	322	300	281	264	248	235	222	210	188	0.334
	4	519	481	447	415	387	361	338	318	300	283	268	254	242	220	0.283
	5	548	514	481	450	422	397	373	352	333	315	299	285	271	248	0.246
	6	572	540	510	481	453	428	405	383	363	345	328	313	299	274	0.217
	7	591	562	534	506	480	456	433	411	391	373	356	340	325	281	0.195
	8	606	580	554	529	504	480	458	437	417	398	381	365	348	281	0.176
	9	618	595	571	548	524	502	480	459	440	421	404	388	348	281	0.161
	10	628	607	586	564	542	521	500	480	461	443	425	390	348	281	0.148
36/7 D_B = 72	0	343	298	261	230	206										0.605
	1	430	377	335	301	272	246	224								0.456
	2	508	450	403	363	331	303	279	257	238	221	206	194	182		0.366
	3	577	515	464	421	385	354	328	305	284	265	247	232	219	196	0.306
	4	636	574	521	475	436	403	374	348	326	306	288	271	255	228	0.263
	5	687	625	572	525	484	448	417	389	365	343	324	307	291	261	0.230
	6	731	671	617	570	528	491	458	429	403	380	359	340	323	281	0.205
	7	768	711	658	611	568	530	496	466	439	414	392	372	348	281	0.185
	8	800	746	695	648	606	567	533	501	473	447	424	390	348	281	0.168
	9	827	776	727	682	640	601	566	534	505	479	440	390	348	281	0.154
	10	851	803	756	712	671	633	598	566	536	500	440	390	348	281	0.142

K_2 = 1056

$$G' = \frac{K_2}{3.53 + (0.3 \times D_B) / SPAN + 3 \times K_1 \times SPAN}$$

(Where SPAN is in feet, G' is in kips/inch.)

Diaphragm shear values were derived from the Steel Deck Institute Second Edition of the Diaphragm Design Manual.

B, BA 20 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: #12 TEK screws

SIDE LAP FASTENERS: #12 TEK screws

Fastener Pattern	No. of Side Lap Fasteners Per Span	Factor of Safety = 2.75 DECK SPAN (FT. - IN.) 3 - 0	3 - 6	4 - 0	4 - 6	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	10 - 0	K_1
36/3 D_B = 1328	0	194	174	156	142	128										1.209
	1	250	230	212	197	183	170	159								0.733
	2	283	267	251	236	222	210	198	187	177	168	160	152	146		0.526
	3	303	290	277	264	252	240	228	218	208	199	190	182	174	161	0.410
	4	315	305	294	284	273	262	252	242	233	224	215	207	199	185	0.336
	5	323	315	307	298	288	279	270	261	252	244	236	228	220	206	0.285
	6	329	323	315	308	300	292	284	276	268	260	253	245	238	224	0.247
	7	333	328	322	316	309	302	295	288	281	274	266	260	253	240	0.218
	8	336	332	327	321	316	310	303	297	291	284	278	272	265	253	0.195
	9	339	335	330	326	321	316	310	305	299	293	287	282	276	264	0.177
	10	340	337	333	329	325	321	316	311	306	300	295	290	285	274	0.161
36/4 D_B = 643	0	232	205	182	161	144										0.907
	1	309	278	252	229	210	194	180								0.610
	2	364	334	307	284	263	244	228	213	200	189	178	167	157		0.459
	3	403	376	351	328	306	287	270	254	240	227	215	205	195	177	0.368
	4	430	407	384	363	342	323	306	290	275	261	249	237	226	207	0.307
	5	450	430	410	390	371	353	336	320	305	291	278	266	255	235	0.264
	6	465	447	430	412	395	378	362	346	332	318	305	293	281	260	0.231
	7	475	461	445	430	414	398	383	369	355	341	328	316	305	281	0.206
	8	484	471	458	444	430	415	401	388	374	361	349	337	326	281	0.185
	9	490	479	467	455	442	429	417	404	391	379	367	356	344	281	0.168
	10	495	485	475	464	453	441	429	417	406	394	383	372	348	281	0.154
36/5 D_B = 453	0	303	267	238	213	191										0.725
	1	385	344	310	281	257	236	219								0.522
	2	448	407	371	340	313	290	269	251	236	221	207	194	183		0.408
	3	497	458	423	391	363	338	316	296	278	262	248	235	223	201	0.334
	4	535	499	465	434	406	380	357	336	317	300	285	270	257	235	0.283
	5	564	532	500	471	443	417	394	373	353	335	318	303	289	265	0.246
	6	587	558	529	501	475	450	427	405	385	367	350	334	319	281	0.217
	7	604	579	552	527	502	478	456	434	415	396	379	362	347	281	0.195
	8	619	596	572	548	525	502	481	460	441	422	405	389	348	281	0.176
	9	630	609	588	566	545	524	503	483	464	446	429	390	348	281	0.161
	10	639	621	602	582	562	542	522	503	485	467	440	390	348	281	0.148
36/7 D_B = 72	0	343	298	261	230	206										0.605
	1	441	387	344	310	280	254	232								0.456
	2	527	468	419	379	345	317	293	270	250	232	217	204	192		0.366
	3	601	539	487	443	406	374	346	322	301	282	263	247	233	208	0.306
	4	663	601	548	502	461	427	396	370	346	326	307	290	274	245	0.263
	5	716	656	602	555	513	476	444	415	390	367	347	328	312	281	0.230
	6	760	702	650	602	560	522	488	458	431	407	385	365	347	281	0.205
	7	797	743	692	645	603	564	529	498	470	444	421	390	348	281	0.185
	8	829	777	729	683	641	603	568	536	507	480	440	390	348	281	0.168
	9	855	807	761	717	676	638	603	571	541	500	440	390	348	281	0.154
	10	877	833	789	747	708	670	635	603	573	500	440	390	348	281	0.142

K_2 = 1056

$$G' = \frac{K_2}{3.53 + (0.3 \times D_B) / SPAN + 3 \times K_1 \times SPAN}$$

(Where SPAN is in feet, G' is in kips/inch.)

Diaphragm shear values were derived from the Steel Deck Institute Second Edition of the Diaphragm Design Manual.

B, BA 20 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 5/8" puddle welds

SIDE LAP FASTENERS: #10 TEK screws

Fastener Pattern	No. of Side Lap Fasteners Per Span	Factor of Safety = 2.75 DECK SPAN (FT. - IN.) 3 - 0	3 - 6	4 - 0	4 - 6	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	10 - 0	K_1
36/3 D_B = 1328	0	281	251	226	206	186										1.070
	1	328	298	272	250	230	213	198								0.679
	2	364	336	310	288	267	249	233	218	205	193	180	168	158		0.498
	3	391	366	342	319	299	280	264	248	234	222	211	200	189	168	0.393
	4	412	389	367	346	326	308	291	275	261	248	236	225	215	196	0.324
	5	428	408	388	368	349	331	315	299	285	271	259	248	237	218	0.276
	6	441	423	405	386	369	352	336	321	306	293	280	268	258	238	0.240
	7	451	435	418	402	385	369	354	339	325	312	299	288	277	256	0.213
	8	459	445	430	415	399	385	370	356	342	329	317	305	294	274	0.191
	9	465	452	439	425	411	398	384	370	357	345	333	321	310	281	0.173
	10	470	459	447	435	422	409	396	383	371	359	347	336	325	281	0.158
36/4 D_B = 643	0	336	296	264	233	208										0.803
	1	399	355	319	289	264	239	217								0.561
	2	452	407	368	336	308	284	263	242	224	208	194	181	170		0.431
	3	496	451	412	379	349	323	301	281	263	245	229	214	202	180	0.350
	4	533	490	451	417	386	359	336	314	295	278	263	247	233	208	0.294
	5	564	523	485	451	420	393	368	346	326	308	291	277	263	236	0.254
	6	589	551	515	482	451	423	398	375	354	335	318	303	288	263	0.224
	7	611	575	541	509	479	451	426	402	381	362	344	327	312	281	0.200
	8	629	596	564	533	504	476	451	428	406	386	368	351	335	281	0.180
	9	644	614	583	554	526	499	474	451	429	409	391	373	348	281	0.164
	10	657	629	600	573	546	520	496	473	451	431	412	390	348	281	0.151
36/5 D_B = 453	0	439	386	344	308	276										0.642
	1	504	447	400	362	329	300	274								0.477
	2	561	502	452	411	376	346	320	294	272	253	236	221	208		0.380
	3	612	552	500	457	419	387	359	334	312	290	271	254	239	213	0.315
	4	656	596	544	499	460	426	396	370	347	326	306	287	270	241	0.270
	5	694	636	584	539	498	463	431	404	379	357	337	319	301	269	0.236
	6	728	672	621	575	534	498	465	436	410	387	366	347	330	281	0.209
	7	757	703	653	608	567	530	497	467	440	416	394	374	348	281	0.188
	8	783	731	683	638	598	560	527	496	469	444	421	390	348	281	0.171
	9	805	756	710	666	626	589	555	524	496	470	440	390	348	281	0.156
	10	824	778	734	692	652	615	581	550	522	495	440	390	348	281	0.144
36/7 D_B = 72	0	496	431	377	333	298										0.535
	1	573	500	444	395	354	321	292								0.415
	2	644	566	504	453	410	371	339	312	288	268	250	234	220		0.340
	3	711	628	561	506	460	422	386	355	328	305	285	267	252	225	0.287
	4	773	687	616	557	508	466	431	398	368	343	320	300	283	253	0.249
	5	830	742	668	606	554	509	471	438	408	380	355	333	314	281	0.219
	6	883	793	717	653	598	551	511	475	445	417	390	366	345	281	0.196
	7	931	841	764	698	641	592	549	512	479	450	424	390	348	281	0.178
	8	975	885	808	740	682	631	586	547	513	482	440	390	348	281	0.162
	9	1015	927	849	780	721	668	622	582	546	500	440	390	348	281	0.149
	10	1052	965	887	819	758	705	657	615	574	500	440	390	348	281	0.138

K_2 = 1056

$$G' = \frac{K_2}{3.53 + (0.3 \times D_B) / SPAN + 3 \times K_1 \times SPAN}$$

(Where SPAN is in feet, G' is in kips/inch.)

Diaphragm shear values were derived from the Steel Deck Institute Second Edition of the Diaphragm Design Manual.

B, BA 20 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 5/8" puddle welds

SIDE LAP FASTENERS: welded

Fastener Pattern	No. of Side Lap Fasteners Per Span	Factor of Safety = 2.75 DECK SPAN (FT. - IN.) 3 - 0	3 - 6	4 - 0	4 - 6	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	10 - 0	K_1
36/3 D_B = 1328	0	281	251	226	206	186										1.070
	1	365	337	312	289	268	250	234								0.450
	2	414	391	369	348	328	310	293	277	263	250	238	226	216		0.285
	3	442	424	406	388	371	354	338	323	308	295	282	271	260	240	0.208
	4	460	446	431	416	401	386	372	358	344	332	319	308	296	276	0.164
	5	471	460	448	436	423	411	398	385	373	361	349	338	327	281	0.135
	6	479	470	460	450	440	429	418	406	395	384	374	363	348	281	0.115
	7	484	477	469	461	452	442	433	423	413	403	393	384	348	281	0.100
	8	488	482	476	469	461	453	444	436	427	418	409	390	348	281	0.089
	9	491	486	481	475	468	461	454	446	438	431	423	390	348	281	0.080
	10	494	489	485	479	474	468	461	454	448	441	433	390	348	281	0.072
36/4 D_B = 643	0	336	296	264	233	208										0.803
	1	453	408	370	337	309	286	265								0.394
	2	535	492	454	419	389	362	338	317	298	281	265	250	235		0.261
	3	592	554	518	485	454	426	401	378	357	338	321	305	291	265	0.195
	4	631	598	567	536	507	480	454	431	409	390	371	354	338	281	0.156
	5	659	631	603	576	549	523	499	476	455	434	416	390	348	281	0.130
	6	679	655	631	607	583	559	536	514	493	473	440	390	348	281	0.111
	7	694	674	653	631	610	588	567	546	526	500	440	390	348	281	0.097
	8	705	688	670	651	631	612	592	573	554	500	440	390	348	281	0.086
	9	713	699	683	666	649	631	614	596	574	500	440	390	348	281	0.078
	10	720	708	694	679	663	648	631	615	574	500	440	390	348	281	0.071
36/5 D_B = 453	0	439	386	344	308	276										0.642
	1	563	504	454	412	377	347	321								0.351
	2	659	599	547	502	463	429	399	372	349	328	308	289	272		0.242
	3	731	675	624	578	537	501	469	439	413	390	369	350	333	281	0.184
	4	786	735	687	642	602	565	531	500	473	447	424	390	348	281	0.149
	5	828	782	738	696	656	620	586	555	526	500	440	390	348	281	0.125
	6	860	819	779	740	703	667	634	603	574	500	440	390	348	281	0.108
	7	884	849	813	777	742	708	676	646	574	500	440	390	348	281	0.094
	8	904	872	840	807	775	743	713	666	574	500	440	390	348	281	0.084
	9	919	892	863	833	803	773	744	666	574	500	440	390	348	281	0.076
	10	932	907	881	854	827	799	772	666	574	500	440	390	348	281	0.069
36/7 D_B = 72	0	496	431	377	333	298										0.535
	1	647	568	506	455	412	373	341								0.317
	2	777	691	619	561	511	469	434	401	371	345	323	303	285		0.225
	3	888	798	722	658	603	556	515	479	448	421	394	370	348	281	0.174
	4	981	891	813	746	687	636	591	552	518	487	440	390	348	281	0.142
	5	1058	971	894	825	764	711	663	621	574	500	440	390	348	281	0.120
	6	1122	1040	964	896	834	779	730	666	574	500	440	390	348	281	0.104
	7	1175	1098	1026	959	897	842	782	666	574	500	440	390	348	281	0.092
	8	1219	1148	1079	1014	954	899	782	666	574	500	440	390	348	281	0.082
	9	1256	1190	1125	1063	1005	931	782	666	574	500	440	390	348	281	0.074
	10	1287	1226	1165	1107	1050	931	782	666	574	500	440	390	348	281	0.068

K_2 = 1056

$$G' = \frac{K_2}{3.53 + (0.3 \times D_B) / SPAN + 3 \times K_1 \times SPAN}$$

(Where SPAN is in feet, G' is in kips/inch.)

Diaphragm shear values were derived from the Steel Deck Institute Second Edition of the Diaphragm Design Manual.

B, BA 18 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: #12 TEK screws

SIDE LAP FASTENERS: #10 TEK screws

Fastener Pattern	No. of Side Lap Fasteners Per Span	Factor of Safety = 2.75 DECK SPAN (FT. - IN.) 3 - 0	3 - 6	4 - 0	4 - 6	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	10 - 0	K_1
36/3 D_B = 871	0	257	230	207	188	172										1.392
	1	324	298	274	253	235	218	204								0.843
	2	366	344	322	302	284	267	251	237	224	212	202	192	183		0.605
	3	393	374	356	338	321	305	290	275	262	250	239	228	218	201	0.472
	4	411	396	380	365	349	335	320	307	294	282	270	259	249	231	0.387
	5	423	410	397	384	371	358	345	332	320	308	297	286	276	257	0.327
	6	431	421	410	399	387	376	364	352	341	330	319	309	299	281	0.284
	7	437	429	420	410	400	390	379	369	358	348	338	329	319	301	0.251
	8	442	435	427	418	410	401	391	382	373	363	354	345	336	319	0.224
	9	445	439	432	425	418	410	401	393	385	376	367	359	351	334	0.203
	10	448	443	437	431	424	417	410	402	394	387	379	371	363	348	0.186
36/4 D_B = 422	0	308	271	241	215	193										1.044
	1	399	358	324	294	270	248	230								0.702
	2	468	427	392	360	333	309	288	269	252	238	224	210	197		0.529
	3	518	481	446	415	387	362	339	319	300	284	269	255	243	220	0.424
	4	555	522	490	460	433	407	384	363	343	326	309	295	281	257	0.354
	5	582	553	524	497	471	446	423	401	382	363	346	331	316	290	0.304
	6	603	577	552	526	502	479	456	435	416	397	380	364	349	322	0.266
	7	618	596	574	551	528	506	485	465	446	427	410	394	379	351	0.237
	8	630	611	591	571	550	530	510	490	472	454	437	421	406	378	0.213
	9	640	623	605	587	568	549	531	512	495	478	461	445	430	402	0.194
	10	648	633	617	600	583	566	549	532	515	498	483	467	452	425	0.178
36/5 D_B = 297	0	402	353	315	283	254										0.835
	1	498	444	400	362	331	304	281								0.601
	2	576	521	474	433	398	368	342	319	298	280	262	246	232		0.469
	3	638	585	537	495	459	426	397	372	349	329	311	294	280	251	0.385
	4	687	637	591	550	512	478	448	421	397	375	355	337	320	292	0.326
	5	726	680	637	596	559	525	494	466	441	417	396	377	359	328	0.283
	6	757	715	675	636	600	567	536	507	481	457	435	415	396	363	0.250
	7	782	744	707	671	636	603	573	544	518	493	471	450	430	395	0.224
	8	802	768	734	700	667	636	606	578	552	527	504	483	463	427	0.203
	9	818	788	756	725	694	664	636	608	582	558	535	513	493	438	0.185
	10	832	804	776	747	718	689	662	635	610	586	563	542	521	438	0.170
36/7 D_B = 47	0	454	395	347	307	275										0.696
	1	570	500	444	399	362	328	299								0.525
	2	673	596	533	481	438	402	371	342	316	294	275	258	243		0.422
	3	764	682	615	558	510	469	434	404	377	352	329	309	291	261	0.352
	4	842	760	689	629	578	533	495	461	431	405	382	360	340	304	0.303
	5	910	828	757	695	641	593	552	516	483	455	429	406	385	348	0.265
	6	967	888	817	754	699	650	606	568	533	503	475	450	427	388	0.236
	7	1017	941	872	809	753	702	657	617	581	548	519	492	468	426	0.212
	8	1059	987	920	858	802	751	705	664	626	592	561	533	508	438	0.193
	9	1096	1028	963	903	847	796	750	708	669	634	602	573	541	438	0.177
	10	1127	1063	1001	943	888	838	791	749	710	674	641	606	541	438	0.164

K_2 = 1398

$$G' = \frac{K_2}{3.53 + (0.3 \times D_B) / SPAN + 3 \times K_1 \times SPAN}$$

(Where SPAN is in feet, G' is in kips/inch.)

Diaphragm shear values were derived from the Steel Deck Institute Second Edition of the Diaphragm Design Manual.

B, BA 18 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: #12 TEK screws

SIDE LAP FASTENERS: #12 TEK screws

Fastener Pattern	No. of Side Lap Fasteners Per Span	Factor of Safety = 2.75 DECK SPAN (FT. - IN.) 3 - 0	3 - 6	4 - 0	4 - 6	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	10 - 0	K1
36/3 D_B = 871	0	257	230	207	188	172										1.392
	1	331	305	281	260	242	225	210								0.843
	2	374	353	332	313	294	278	262	248	235	223	212	202	193		0.605
	3	401	384	366	349	333	317	302	288	275	263	252	241	231	213	0.472
	4	417	404	390	376	361	347	334	321	308	296	285	274	264	245	0.387
	5	428	418	406	394	382	370	358	346	334	323	312	302	292	273	0.327
	6	436	427	418	408	397	387	376	365	355	345	334	325	315	297	0.284
	7	441	434	426	418	409	400	390	381	372	362	353	344	335	317	0.251
	8	445	439	433	425	418	410	402	393	385	376	368	360	351	335	0.224
	9	448	443	438	431	425	418	411	403	396	388	380	373	365	350	0.203
	10	451	446	441	436	430	424	418	411	405	398	391	384	377	363	0.186
36/4 D_B = 422	0	308	271	241	215	193										1.044
	1	409	368	333	304	278	257	238								0.702
	2	482	443	407	376	348	323	302	282	265	250	236	223	210		0.529
	3	534	498	465	434	406	380	357	336	318	301	285	271	258	235	0.424
	4	570	539	509	480	453	428	405	384	364	346	329	314	300	275	0.354
	5	596	569	543	517	492	468	445	424	404	386	369	353	338	311	0.304
	6	615	592	569	546	523	501	479	459	439	421	404	388	372	345	0.266
	7	629	610	590	569	548	528	508	488	470	452	435	419	403	375	0.237
	8	640	624	606	587	569	550	531	513	496	479	462	446	431	403	0.213
	9	649	634	619	602	586	569	551	535	518	502	486	471	456	428	0.194
	10	655	643	629	615	599	584	568	553	537	522	507	492	478	438	0.178
36/5 D_B = 297	0	402	353	315	283	254										0.835
	1	509	455	410	372	340	313	289								0.601
	2	593	539	491	450	415	384	357	333	312	293	276	259	244		0.469
	3	658	606	560	518	480	447	418	392	368	347	328	311	296	268	0.385
	4	708	661	616	575	537	503	473	445	420	397	377	358	341	311	0.326
	5	747	704	662	623	587	553	522	493	467	443	422	402	383	351	0.283
	6	777	738	700	664	629	596	565	537	510	486	463	442	423	388	0.250
	7	800	766	731	697	665	633	603	575	549	524	501	480	460	424	0.224
	8	819	789	757	726	695	665	637	609	584	559	536	515	494	438	0.203
	9	834	807	779	750	721	693	666	640	615	591	568	546	526	438	0.185
	10	846	822	796	770	744	718	692	667	642	619	597	575	541	438	0.170
36/7 D_B = 47	0	454	395	347	307	275										0.696
	1	584	513	456	410	372	338	309								0.525
	2	698	619	555	502	457	420	388	359	333	310	289	272	256		0.422
	3	796	714	645	587	537	495	458	426	398	374	351	329	310	278	0.352
	4	878	796	725	664	611	565	525	490	459	431	407	385	365	327	0.303
	5	948	868	797	734	679	631	588	550	516	486	459	435	413	375	0.265
	6	1007	930	860	797	741	691	646	607	571	539	510	483	459	418	0.236
	7	1056	983	916	854	798	747	701	660	622	588	558	530	504	438	0.212
	8	1097	1029	965	905	849	798	752	709	671	636	604	574	541	438	0.193
	9	1132	1069	1008	949	895	845	798	756	716	680	647	606	541	438	0.177
	10	1161	1103	1045	989	937	887	841	799	759	722	684	606	541	438	0.164

K_2 = 1398

$$G' = \frac{K_2}{3.53 + (0.3 \times D_B) / SPAN + 3 \times K_1 \times SPAN}$$

(Where SPAN is in feet, G' is in kips/inch.)

Diaphragm shear values were derived from the Steel Deck Institute Second Edition of the Diaphragm Design Manual.

B, BA 18 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 5/8" puddle welds

SIDE LAP FASTENERS: #10 TEK screws

Fastener Pattern	No. of Side Lap Fasteners Per Span	Factor of Safety = 2.75 DECK SPAN (FT. - IN.) 3 - 0	3 - 6	4 - 0	4 - 6	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	10 - 0	K_1
36/3 D_B = 871	0	364	326	294	267	244										1.231
	1	427	388	355	325	300	278	258								0.782
	2	474	438	405	375	348	325	304	285	268	253	238	223	210		0.573
	3	510	477	446	417	390	366	344	325	307	290	275	262	249	224	0.452
	4	537	508	479	451	426	402	380	360	341	324	309	294	281	257	0.373
	5	558	532	506	480	456	433	412	391	373	355	339	324	310	285	0.318
	6	574	551	527	504	481	460	439	419	401	383	367	352	337	311	0.277
	7	587	566	545	524	503	482	463	444	425	408	392	377	362	336	0.245
	8	597	579	560	541	521	502	483	465	448	431	415	400	385	359	0.220
	9	605	589	572	554	537	519	501	484	467	451	435	420	406	380	0.199
	10	612	597	582	566	550	533	517	500	484	469	454	439	425	399	0.182
36/4 D_B = 422	0	436	384	342	306	273										0.923
	1	519	462	415	376	343	314	286								0.645
	2	589	530	481	438	402	371	344	320	296	275	256	240	226		0.496
	3	647	589	539	494	456	422	393	367	344	324	303	284	267	238	0.403
	4	695	640	590	545	505	470	439	411	387	365	345	327	308	275	0.339
	5	735	683	634	590	550	514	482	453	427	403	382	362	345	312	0.293
	6	769	719	673	630	590	554	521	491	464	440	417	397	378	345	0.257
	7	796	751	707	665	626	590	557	527	499	474	451	429	410	375	0.230
	8	819	777	736	696	658	623	590	560	532	506	482	460	440	404	0.207
	9	839	800	761	724	687	653	621	591	563	536	512	490	469	431	0.189
	10	855	820	784	748	713	680	648	619	591	565	540	517	496	438	0.174
36/5 D_B = 297	0	570	501	446	402	361										0.738
	1	655	581	521	471	429	394	359								0.549
	2	731	654	590	536	490	451	417	387	358	333	311	292	274		0.437
	3	797	720	653	596	547	505	469	437	409	382	357	335	316	282	0.363
	4	855	778	711	652	601	557	518	484	453	426	402	379	357	319	0.310
	5	906	831	763	704	652	605	565	528	496	467	442	418	397	356	0.271
	6	950	877	811	751	698	651	609	571	537	507	480	455	432	393	0.241
	7	988	918	854	795	742	694	651	612	577	545	516	490	467	425	0.216
	8	1021	955	892	835	782	734	690	650	614	581	552	525	500	438	0.196
	9	1050	987	927	871	819	771	727	687	650	616	586	558	532	438	0.180
	10	1075	1016	958	904	853	805	761	721	684	650	618	589	541	438	0.166
36/7 D_B = 47	0	644	560	492	435	390										0.615
	1	745	651	577	518	464	420	384								0.478
	2	840	738	657	591	536	488	445	410	379	353	329	309	291		0.391
	3	928	820	733	661	601	551	507	467	432	402	376	352	332	297	0.330
	4	1010	897	805	728	664	610	563	523	485	451	422	396	373	334	0.286
	5	1085	970	873	793	725	667	617	574	536	501	468	440	414	371	0.253
	6	1154	1037	938	855	783	722	669	623	582	547	515	483	455	408	0.226
	7	1217	1100	999	913	839	775	720	671	628	590	556	526	497	438	0.204
	8	1274	1158	1057	969	893	827	769	718	673	633	597	565	536	438	0.187
	9	1326	1212	1111	1022	944	876	816	763	716	674	636	603	541	438	0.172
	10	1374	1262	1161	1072	993	924	862	807	758	715	675	606	541	438	0.159

K_2 = 1398

$$G' = \frac{K_2}{3.53 + (0.3 \times D_B) / SPAN + 3 \times K_1 \times SPAN}$$

(Where SPAN is in feet, G' is in kips/inch.)

Diaphragm shear values were derived from the Steel Deck Institute Second Edition of the Diaphragm Design Manual.

B, BA 18 ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 5/8" puddle welds

SIDE LAP FASTENERS: welded

Fastener Pattern	No. of Side Lap Fasteners Per Span	Factor of Safety = 2.75 DECK SPAN (FT. - IN.) 3 - 0	3 - 6	4 - 0	4 - 6	5 - 0	5 - 6	6 - 0	6 - 6	7 - 0	7 - 6	8 - 0	8 - 6	9 - 0	10 - 0	K_1
36/3 D_B = 871	0	364	326	294	267	244										1.231
	1	474	438	405	375	348	325	304								0.517
	2	537	507	478	451	426	402	380	360	341	324	308	294	281		0.327
	3	574	551	527	504	481	459	438	419	400	383	366	351	337	311	0.239
	4	597	579	560	540	521	502	483	465	447	430	414	399	385	358	0.189
	5	611	597	582	566	549	533	516	500	484	468	453	439	425	398	0.156
	6	622	610	598	584	571	556	542	527	513	499	485	471	458	433	0.133
	7	629	619	609	598	586	574	562	549	536	523	511	498	486	438	0.115
	8	634	626	618	608	598	588	577	566	554	543	531	520	509	438	0.102
	9	638	631	624	616	607	598	589	579	569	559	548	538	528	438	0.092
	10	641	635	629	622	615	607	599	590	581	572	563	553	541	438	0.083
36/4 D_B = 422	0	436	384	342	306	273										0.923
	1	588	530	480	438	402	371	344								0.454
	2	695	639	589	544	505	470	439	411	386	364	344	326	308		0.301
	3	768	719	672	629	590	553	521	491	464	439	417	396	377	345	0.225
	4	819	777	735	696	658	623	590	559	531	506	482	460	439	403	0.180
	5	855	819	783	747	713	679	648	618	590	564	539	517	495	438	0.150
	6	881	851	819	788	756	726	696	667	640	615	590	567	541	438	0.128
	7	900	874	847	819	791	763	736	709	683	658	635	606	541	438	0.112
	8	915	893	869	845	819	794	769	744	720	696	673	606	541	438	0.099
	9	926	907	886	865	842	820	796	774	751	729	684	606	541	438	0.090
	10	935	918	900	881	861	841	820	798	777	757	684	606	541	438	0.081
36/5 D_B = 297	0	570	501	446	402	361										0.738
	1	731	654	589	535	490	450	417								0.404
	2	855	778	710	652	601	556	517	483	453	426	402	378	356		0.278
	3	949	876	810	751	698	650	608	570	537	506	479	454	432	393	0.212
	4	1020	954	892	834	781	733	689	649	613	581	551	524	499	438	0.171
	5	1074	1015	958	903	852	804	760	720	683	649	617	588	541	438	0.144
	6	1116	1063	1011	961	912	866	823	783	745	710	678	606	541	438	0.124
	7	1148	1102	1055	1008	963	919	877	838	801	766	684	606	541	438	0.109
	8	1173	1132	1090	1048	1006	965	925	887	851	779	684	606	541	438	0.097
	9	1193	1157	1120	1081	1042	1004	966	930	894	779	684	606	541	438	0.087
	10	1210	1178	1144	1109	1073	1037	1002	967	894	779	684	606	541	438	0.080
36/7 D_B = 47	0	644	560	492	435	390										0.615
	1	839	738	656	590	536	487	445								0.364
	2	1009	896	804	728	663	609	563	523	484	451	421	396	373		0.259
	3	1153	1036	937	854	782	721	668	622	582	546	514	483	455	407	0.200
	4	1273	1157	1056	968	892	826	768	717	672	632	596	564	535	438	0.164
	5	1373	1261	1160	1071	992	922	861	806	757	713	674	606	541	438	0.138
	6	1456	1349	1252	1163	1083	1011	947	890	838	779	684	606	541	438	0.120
	7	1525	1425	1331	1244	1165	1092	1027	968	894	779	684	606	541	438	0.106
	8	1582	1489	1400	1316	1238	1166	1100	1037	894	779	684	606	541	438	0.094
	9	1630	1544	1460	1380	1304	1233	1168	1037	894	779	684	606	541	438	0.085
	10	1670	1591	1513	1436	1363	1294	1216	1037	894	779	684	606	541	438	0.078

K_2 = 1398

$$G' = \frac{K_2}{3.53 + (0.3 \times D_B) / SPAN + 3 \times K_1 \times SPAN}$$

(Where SPAN is in feet, G' is in kips/inch.)

Diaphragm shear values were derived from the Steel Deck Institute Second Edition of the Diaphragm Design Manual.

N, NA ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: #12 TEK screws

SIDE LAP FASTENERS: #10 TEK screws

Fastener Pattern	No. of Side Lap Fasteners Per Span	Factor of Safety = 2.75 DECK SPAN (FT. - IN.) 8 - 0	8 - 6	9 - 0	9 - 6	10 - 0	10 - 6	11 - 0	11 - 6	12 - 0	12 - 6	13 - 0	13 - 6	14 - 0	15 - 0	K_1
22 Gage	2	127	118	110												0.625
	3	160	150	140	132	124	117	111	105	100						0.502
	4	194	181	170	160	151	143	135	129	122	117	111	106	102	94	0.419
	5	228	213	200	189	178	169	160	152	145	138	132	126	121	112	0.359
24/4	6	259	245	230	217	205	194	184	176	167	160	153	146	140	130	0.315
D_N = 653	7	284	271	258	245	232	220	209	199	190	181	174	166	160	148	0.280
K_2 = 870	8	308	294	280	268	257	246	234	222	212	203	194	186	179	166	0.252
	9	330	316	302	289	277	267	256	246	235	225	215	206	198	184	0.229
	10	351	336	322	309	297	286	275	265	256	246	236	226	218	202	0.210
	11	370	355	341	328	315	304	293	283	273	264	255	246	237	220	0.194
	12	388	373	359	346	333	321	310	299	289	280	271	263	255	238	0.180
20 Gage	2	156	145	136												0.689
	3	197	184	172	162	153	145	137	130	124						0.553
	4	238	222	209	197	186	176	167	158	151	144	137	132	126	116	0.461
	5	279	261	245	231	218	207	196	187	178	170	163	156	149	138	0.396
24/4	6	314	299	282	266	251	238	226	215	205	196	188	180	173	160	0.347
D_N = 489	7	345	328	313	299	284	269	256	244	233	223	213	204	196	182	0.308
K_2 = 1056	8	374	356	340	326	312	299	286	272	260	249	238	229	220	203	0.278
	9	401	383	366	351	337	323	311	300	287	275	263	253	243	225	0.253
	10	426	408	391	375	360	347	334	322	310	300	289	277	266	247	0.232
	11	449	431	414	398	383	369	355	343	331	320	310	300	290	269	0.214
	12	471	453	436	419	404	390	376	363	351	340	329	319	309	291	0.199
18 Gage	2	210	197	184												0.793
	3	265	248	232	219	206	195	185	176	168						0.636
	4	319	299	281	264	250	237	225	214	204	195	186	178	171	158	0.531
	5	373	350	329	310	293	278	264	251	240	229	219	210	202	187	0.455
24/4	6	416	395	376	356	337	319	304	289	276	264	253	242	233	215	0.399
D_N = 321	7	457	435	414	396	379	361	343	327	312	299	286	275	264	244	0.355
K_2 = 1398	8	495	472	451	431	413	396	381	365	348	333	319	307	295	273	0.320
	9	531	507	485	465	446	428	412	397	382	368	353	339	326	302	0.291
	10	564	540	518	497	477	459	442	426	411	397	384	371	357	331	0.266
	11	595	571	548	527	507	488	470	454	438	424	410	397	385	360	0.246
	12	624	600	577	555	535	516	498	481	465	450	436	422	409	386	0.229

$$G' = \frac{K_2}{4.36 + (0.3 \times D_N) / SPAN + 3 \times K_1 \times SPAN}$$

(Where SPAN is in feet, G' is in kips/inch.)

Diaphragm shear values were derived from the Steel Deck Institute Second Edition of the Diaphragm Design Manual.

N, NA ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: #12 TEK screws

SIDE LAP FASTENERS: #12 TEK screws

Fastener Pattern	No. of Side Lap Fasteners Per Span	Factor of Safety = 2.75 DECK SPAN (FT. - IN.) 8 - 0	8 - 6	9 - 0	9 - 6	10 - 0	10 - 6	11 - 0	11 - 6	12 - 0	12 - 6	13 - 0	13 - 6	14 - 0	15 - 0	K_1
22 Gage	2	135	126	118												0.625
	3	173	162	152	143	135	127	120	114	109						0.502
	4	212	198	186	175	165	156	148	141	134	128	122	117	112	103	0.419
	5	250	234	220	207	196	185	176	167	160	152	146	139	134	123	0.359
24/4	6	279	265	253	239	226	214	204	194	185	177	169	162	156	144	0.315
D_N = 653	7	306	292	279	266	255	243	231	220	210	201	193	185	177	164	0.280
K_2 = 870	8	331	316	303	290	278	267	257	247	236	225	216	207	199	184	0.252
	9	354	339	325	312	300	289	278	268	259	250	239	230	221	205	0.229
	10	376	361	347	333	321	309	298	288	278	269	260	252	243	225	0.210
	11	396	381	366	353	340	328	317	306	296	287	278	269	261	245	0.194
	12	414	399	385	371	358	346	335	324	314	304	295	286	278	262	0.180
20 Gage	2	167	155	146												0.689
	3	213	199	187	176	166	157	149	141	134						0.553
	4	259	243	228	215	203	192	182	173	165	158	151	144	138	127	0.461
	5	303	286	269	254	240	227	216	205	196	187	179	172	165	152	0.396
24/4	6	338	322	307	293	277	262	249	238	227	217	208	199	191	177	0.347
D_N = 489	7	371	354	338	323	310	297	283	270	258	246	236	226	218	201	0.308
K_2 = 1056	8	402	384	367	352	338	324	312	300	288	276	264	254	244	226	0.278
	9	430	412	395	379	364	350	337	325	314	303	293	281	270	251	0.253
	10	456	438	421	404	389	375	362	349	337	326	316	306	296	276	0.232
	11	480	462	445	428	413	398	385	372	360	348	337	327	317	299	0.214
	12	502	484	467	451	435	420	406	393	381	369	358	347	337	318	0.199
18 Gage	2	225	210	197												0.793
	3	286	267	251	237	223	211	201	191	182						0.636
	4	347	325	306	288	272	258	245	233	223	213	203	195	187	173	0.531
	5	401	381	360	340	321	305	290	276	263	252	241	231	222	205	0.455
24/4	6	448	426	406	388	370	352	334	319	304	291	279	267	257	238	0.399
D_N = 321	7	492	469	448	428	410	393	378	361	345	330	317	304	292	271	0.355
K_2 = 1398	8	532	508	486	466	447	430	413	398	384	369	354	340	327	303	0.320
	9	570	545	523	502	482	464	447	431	416	402	388	376	362	336	0.291
	10	604	580	557	536	515	497	479	462	447	432	418	405	392	369	0.266
	11	636	612	589	567	547	527	509	492	476	461	446	433	420	396	0.246
	12	665	641	618	597	576	556	538	521	504	488	474	459	446	421	0.229

$$G' = \frac{K_2}{4.36 + (0.3 \times D_N) / SPAN + 3 \times K_1 \times SPAN}$$

(Where SPAN is in feet, G' is in kips/inch.)

Diaphragm shear values were derived from the Steel Deck Institute Second Edition of the Diaphragm Design Manual.

N, NA ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 5/8" puddle welds

SIDE LAP FASTENERS: #10 TEK screws

Fastener Pattern	No. of Side Lap Fasteners Per Span	Factor of Safety = 2.75 DECK SPAN (FT. - IN.) 8 - 0	8 - 6	9 - 0	9 - 6	10 - 0	10 - 6	11 - 0	11 - 6	12 - 0	12 - 6	13 - 0	13 - 6	14 - 0	15 - 0	K_1
22 Gage	2	144	134	125												0.587
	3	173	161	150	141	132	124	117	111	105						0.476
	4	202	188	176	165	155	146	138	131	124	118	112	107	102	93	0.401
	5	231	215	202	189	178	168	159	151	143	137	130	124	119	109	0.346
24/4	6	259	242	227	214	201	190	180	171	163	155	148	141	135	124	0.305
D_N=653	7	288	269	253	238	224	212	201	191	182	173	166	158	152	139	0.272
K_2=870	8	317	297	278	262	248	234	222	211	201	192	183	175	168	155	0.246
	9	346	324	304	286	271	256	243	231	220	210	201	192	185	170	0.224
	10	373	351	330	311	294	278	264	251	240	229	219	210	201	186	0.206
	12	416	396	378	359	340	322	306	291	278	266	254	244	234	216	0.177
	13	437	416	397	380	363	344	327	312	297	284	272	261	250	232	0.165
20 Gage	2	177	165	154												0.646
	3	212	198	185	173	163	154	145	137	130						0.525
	4	247	231	216	203	191	180	171	162	154	146	139	133	127	116	0.442
	5	282	264	247	232	219	207	196	186	177	169	161	154	147	135	0.381
24/4	6	317	296	278	262	247	234	222	210	200	191	182	174	167	154	0.336
D_N=489	7	352	329	309	291	275	260	247	235	224	213	204	195	187	172	0.300
K_2=1056	8	387	362	340	321	303	287	272	259	247	236	225	216	207	191	0.270
	9	422	395	371	350	331	314	298	283	270	258	247	236	227	209	0.247
	10	451	428	403	380	359	340	323	308	294	280	268	257	247	228	0.227
	12	503	479	456	436	415	394	374	356	340	325	311	299	287	265	0.195
	13	528	503	480	459	439	420	400	381	364	348	333	319	307	284	0.182
18 Gage	2	237	221	207												0.744
	3	284	265	248	233	219	207	196	186	177						0.604
	4	330	308	289	272	257	243	230	218	207	198	189	180	172	158	0.508
	5	376	352	330	311	294	278	263	250	238	227	217	208	199	183	0.439
24/4	6	423	396	372	350	331	313	297	283	269	257	246	235	225	208	0.386
D_N=321	7	469	439	413	389	368	348	331	315	300	287	274	263	252	233	0.345
K_2=1398	8	515	483	454	428	405	384	365	347	331	316	303	290	278	257	0.311
	9	556	526	495	467	442	419	398	379	362	346	331	317	305	282	0.284
	10	592	562	535	506	479	454	432	412	393	376	360	345	331	307	0.261
	12	661	629	600	573	549	525	499	476	455	435	417	400	384	356	0.224
	13	693	661	631	603	578	554	532	508	485	465	445	427	411	381	0.210

$$G' = \frac{K_2}{4.36 + (0.3 \times D_N) / SPAN + 3 \times K_1 \times SPAN}$$

(Where SPAN is in feet, G' is in kips/inch.)

Diaphragm shear values were derived from the Steel Deck Institute Second Edition of the Diaphragm Design Manual.

N, NA ALLOWABLE DIAPHRAGM SHEAR STRENGTH (PLF)

SUPPORT FASTENERS: 5/8" puddle welds

SIDE LAP FASTENERS: welded (NMBS does not recommend welded side laps for 22 ga.)

Fastener Pattern	No. of Side Lap Fasteners Per Span	Factor of Safety = 2.75 DECK SPAN (FT. - IN.) 8 - 0	8 - 6	9 - 0	9 - 6	10 - 0	10 - 6	11 - 0	11 - 6	12 - 0	12 - 6	13 - 0	13 - 6	14 - 0	15 - 0	K_1
22 Gage	2	205	191	179												0.356
	3	264	247	232	218	205	194	184	175	166						0.266
	4	324	303	284	268	253	239	227	216	206	196	187	179	172	158	0.213
	5	379	359	337	318	300	284	270	257	245	234	224	214	206	190	0.177
24/4	6	423	403	384	367	348	330	313	298	285	272	260	250	240	222	0.152
D_N = 653	7	464	443	423	405	388	373	356	340	324	310	297	285	273	253	0.133
K_2 = 870	8	502	480	460	441	423	407	392	377	364	348	333	320	307	285	0.118
	9	537	515	494	475	456	439	423	409	395	381	369	355	341	316	0.106
	10	568	546	525	506	487	470	454	438	424	410	397	385	365	318	0.096
	11	598	576	555	535	516	499	482	466	451	437	424	393	365	318	0.088
	12	624	602	582	562	543	526	509	493	477	458	424	393	365	318	0.081
20 Gage	2	250	233	218												0.392
	3	321	300	281	265	250	236	224	213	203						0.293
	4	392	367	345	325	307	291	276	262	250	239	228	219	210	193	0.234
	5	455	432	408	385	364	345	328	312	298	284	272	261	250	231	0.195
24/4	6	508	484	461	441	421	399	379	362	345	330	316	303	291	269	0.167
D_N = 489	7	557	532	508	487	466	448	430	411	393	375	360	345	332	307	0.146
K_2 = 1056	8	603	576	552	529	508	489	470	453	437	421	404	387	372	345	0.130
	9	644	618	593	570	548	528	508	491	474	458	443	429	413	383	0.117
	10	683	656	631	607	585	564	545	526	509	492	477	462	448	421	0.106
	11	717	691	666	642	620	599	579	560	542	525	509	493	479	425	0.097
	12	749	723	699	675	652	631	611	591	573	556	539	524	488	425	0.090
18 Gage	2	330	308	289												0.451
	3	422	395	371	349	330	313	297	282	269						0.337
	4	514	482	453	427	404	383	364	346	330	316	302	289	278	257	0.269
	5	591	561	534	505	478	453	431	411	392	375	359	344	331	306	0.224
24/4	6	660	628	599	572	548	524	498	475	454	434	416	399	383	355	0.192
D_N = 321	7	723	690	660	631	605	581	558	537	515	493	473	454	436	405	0.168
K_2 = 1398	8	782	748	717	687	660	634	611	588	567	548	530	508	489	454	0.149
	9	836	802	770	740	711	685	660	637	615	594	575	557	540	503	0.134
	10	886	851	819	788	759	732	707	683	660	639	619	599	581	548	0.122
	11	931	897	865	834	805	777	751	726	703	681	660	640	622	587	0.112
	12	973	939	907	876	847	819	793	768	744	721	700	680	660	624	0.103

$$G' = \frac{K_2}{4.36 + (0.3 \times D_N) / SPAN + 3 \times K_1 \times SPAN}$$

(Where SPAN is in feet, G' is in kips/inch.)

Diaphragm shear values were derived from the Steel Deck Institute Second Edition of the Diaphragm Design Manual.

NOTES