

NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS

CJ-SERIES

Normal Weight Concrete



SJI COMPOSITE STEEL JOIST BRIDGING TABLES

The following tables may be used as a guide to determine the size and number of rows of bridging. These bridging tables only apply to uniformly loaded composite steel joists with parallel chords. The top chords are considered as laterally supported by the structural deck and slab. The tables are applicable for normal weight concrete with a unit weight of 145 pcf (2350 kg/m³) and light weight concrete with a unit weight of 110 pcf (1800 kg/m³) and based on a steel yield strength of 50 ksi (345 MPa). Concrete strength listed in the bridging tables can vary from 3 – 5 ksi (20.7 – 34.5 MPa), with the higher concrete strength required for longer joist spans.

The first row of figures for each joist depth, denoted as “ P_{br} ”, lbs (N) gives the nominal horizontal force to resist the top chord. See Section 104.5(e) for more information. Use 1/4 of the P_{br} force shown in the tables to calculate the bolted diagonal horizontal force.

The second row lists the minimum bolted diagonal bridging size for the joist spacing indicated.

The third row lists the minimum horizontal bridging size for the joist spacing indicated.

The fourth row denoted as “ $I_{Non-comp\ eff}$ ” lists the non-composite moment of inertia for the joist that will allow the Specifying Professional to determine the deflection under non-composite loading.

A description of the terms and abbreviations used in the bridging tables is provided below:

P_{br} = Nominal horizontal top chord force, lbs (N)

$I_{Non-comp\ eff}$ = Non-composite moment of inertia, in.⁴ (mm⁴)

At least one row of top and bottom chord bridging is required and shall consist of the bridging size and type listed in the tables.



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Based on a 50 ksi Maximum Yield Strength												
		Concrete Slab Parameters										
		Normal Weight Concrete (145 pcf) f'c = 4.0 ksi										
		hr (in.)	1	1	1	1	1	1	1	1	1	
		tc (in.)	2	2	2	2	2	2	2	2	2	
Js (ft.)	3	3	3	3	3	3	3	3	3.5	4		
Joist Span (ft.)	Joist Depth (in.)	Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot										
		TL	300	400	500	600	700	800	900	1000	1200	
20	10	Pbr(lbs)	350	350	350	350	350	350	350	350	500	
		X mat'l size										
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	21	21	24	27	30	31	33	35	45	
	12	Pbr(lbs)	300	300	300	300	300	300	300	300	450	
		X mat'l size										
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	30	30	34	37	38	43	45	47	60	
	14	Pbr(lbs)	300	300	300	300	300	300	300	400	400	
		X mat'l size										
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	41	41	41	47	50	52	55	68	75	
	16	Pbr(lbs)	250	250	250	250	250	300	400	400	450	
		X mat'l size										
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	53	53	53	61	61	68	77	83	100	
	18	Pbr(lbs)	250	250	250	250	250	250	250	250	250	
		X mat'l size										
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	68	68	68	68	79	79	85	93	98	
	20	Pbr(lbs)	250	250	250	250	250	250	250	250	350	
		X mat'l size										
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	82	82	82	82	95	95	102	110	138	
24	Pbr(lbs)	200	200	200	200	200	200	200	250	300		
	X mat'l size											
	H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	
	I non-comp eff	111	111	111	111	128	128	138	149	187		
28	Pbr(lbs)	200	200	200	200	200	200	200	200	300		
	X mat'l size											
	H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	
	I non-comp eff	139	139	139	139	161	161	173	187	236		
32	Pbr(lbs)	200	200	200	200	200	200	250	300	300		
	X mat'l size											
	H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	
	I non-comp eff	166	166	166	166	166	200	223	236	281		



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Based on a 50 ksi Maximum Yield Strength												
Concrete Slab Parameters												
Normal Weight Concrete (145 pcf) f'c = 4.0 ksi												
1.5	1.5	1.5	2	2	2	2	2	2	3	3	3	3
2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
5	5.5	6	7	7.5	8	9	10	11	12	13	14	15
Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot												
1400	1600	1800	2000	2200	2400	2700	3000	3300	3600	3900	4200	4500
500	600	600	750	750	750	1050	1050	1050	1050	1250	1250	1250
L1.25x0.109H	L1.25x0.125H	L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H	L2x0.163X	L2.5x0.187X	L2.5x0.187X
46	53	56	64	66	70	83	91	91	94	103	105	108
450	450	550	550	650	650	700	750	950	950	950	950	1150
L1.25x0.109H	L1.25x0.109H	L1.25x0.125H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H	L2x0.163X	L2.5x0.187X	L2.5x0.187X
62	66	75	77	90	92	102	108	121	126	132	138	154
500	500	550	600	650	750	750	900	900	1100	1100	1100	1200
L1.25x0.109H	L1.25x0.109H	L1.25x0.125H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H	L2x0.163X	L2.5x0.187X	L2.5x0.187X
88	92	98	113	119	130	138	161	161	180	189	199	210
450	550	600	700	700	700	800	800	1000	1000	1000	1100	1250
L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.5x0.123H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H	L2x0.163X	L2.5x0.187X	L2.5x0.187X
105	122	134	152	160	165	189	203	228	237	249	277	290
250	350	350	350	450	450	550	550	550	600	750	750	750
L1.25x0.109H	L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H	L2x0.163X	L2.5x0.187X	L2.5x0.187X
107	132	144	149	167	173	204	216	230	247	287	299	314
350	400	400	450	500	500	600	600	600	700	700	700	850
L1.25x0.109H	L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H	L2x0.163X	L2.5x0.187X	L2.5x0.187X
147	166	180	194	216	239	262	280	288	323	336	349	397
300	350	350	350	450	450	550	550	550	600	600	600	750
L1.25x0.109H	L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H	L2x0.163X	L2.5x0.187X	L2.5x0.187X
200	225	245	264	294	325	357	381	393	441	459	477	544
300	350	350	350	400	450	500	500	500	600	600	600	700
L1.25x0.109H	L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
251	282	308	332	370	410	450	481	497	557	580	604	690
350	350	400	450	450	500	500	500	600	600	700	700	700
L1.25x0.109H	L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
320	337	392	434	466	495	538	575	641	667	755	790	828



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Based on a 50 ksi Maximum Yield Strength												
		Concrete Slab Parameters										
		Normal Weight Concrete (145 pcf) f'c = 4.0 ksi										
		hr (in.)	1	1	1	1	1	1	1	1	1	
		tc (in.)	2	2	2	2	2	2	2	2	2	
Js (ft.)	3	3	3	3	3	3	3	3.5	4			
Joist Span (ft.)	Joist Depth (in.)	Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot										
		TL	300	400	500	600	700	800	900	1000	1200	
25	10	Pbr(lbs)	200	350	350	350	350	350	550	550	550	
		X mat'l size										
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
	I non-comp eff	25	30	33	35	38	39	50	52	56	56	
	12	Pbr(lbs)	350	350	350	350	350	350	350	500	500	500
		X mat'l size										
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
	I non-comp eff	36	39	42	47	50	54	55	71	75	75	
	14	Pbr(lbs)	300	300	300	300	300	450	450	450	550	550
		X mat'l size										
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
	I non-comp eff	42	48	53	60	63	81	84	91	106	106	
	16	Pbr(lbs)	300	300	300	300	300	350	450	450	450	450
		X mat'l size										
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
	I non-comp eff	54	63	67	74	78	91	105	110	118	118	
	18	Pbr(lbs)	300	300	300	300	300	300	300	300	300	300
		X mat'l size										
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
	I non-comp eff	71	71	82	88	97	108	112	115	123	123	
	20	Pbr(lbs)	250	250	250	250	250	250	250	250	250	250
		X mat'l size										
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
	I non-comp eff	87	87	100	108	118	125	132	137	146	146	
24	Pbr(lbs)	250	250	250	250	250	250	250	250	250	250	
	X mat'l size											
	H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	
I non-comp eff	121	121	121	140	151	166	175	185	192	192		
28	Pbr(lbs)	200	200	200	200	200	250	250	300	350	350	
	X mat'l size											
	H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	
I non-comp eff	157	157	157	182	196	212	241	266	320	320		
32	Pbr(lbs)	200	200	200	200	200	200	250	300	300	300	
	X mat'l size											
	H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	
I non-comp eff	193	193	193	224	241	260	289	328	366	366		



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Based on a 50 ksi Maximum Yield Strength												
Concrete Slab Parameters												
Normal Weight Concrete (145 pcf) f'c = 4.0 ksi												
1.5	1.5	1.5	2	2	2	2	2	3	3	3	3	3
2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
5	5.5	6	7	7.5	8	9	10	11	12	13	14	15
Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot												
1400	1600	1800	2000	2200	2400	2700	3000	3300	3600	3900	4200	4500
650	650	800	800	900	1100	1100	1350	1350	1500	1650	1650	1950
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.5x0.109H	L1.5x0.109H	L1.5x0.155H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
61	67	75	81	88	101	104	121	121	135	150	150	169
500	600	600	700	700	800	1050	1050	1050	1250	1250	1400	1400
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
77	88	93	109	113	122	146	150	150	171	177	196	206
550	650	700	750	850	850	950	1150	1150	1150	1300	1450	1450
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.5x0.109H	L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
109	131	139	150	159	165	189	215	220	228	251	274	287
500	650	650	700	750	750	900	900	1100	1100	1100	1200	1350
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.125H	L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
138	161	171	189	202	208	236	247	283	290	299	331	349
350	400	500	500	600	600	650	850	850	850	1000	1000	1150
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
143	165	190	196	233	240	266	312	327	340	375	384	422
300	400	450	450	550	550	600	700	800	800	950	950	1050
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
170	196	229	234	277	287	306	339	385	404	463	463	505
300	350	400	400	400	500	500	600	700	700	850	850	950
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
229	268	312	321	340	390	416	480	544	571	628	657	717
350	400	450	500	550	550	550	600	750	750	750	750	850
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
349	391	432	479	524	544	583	630	745	781	823	823	913
350	350	400	450	500	500	500	550	600	700	700	700	700
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
430	464	533	572	647	672	721	779	845	967	1020	1020	1070



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Based on a 50 ksi Maximum Yield Strength												
		Concrete Slab Parameters										
		Normal Weight Concrete (145 pcf) f'c = 4.0 ksi										
		hr (in.)	1	1	1	1	1	1	1	1		
		tc (in.)	2	2	2	2	2	2	2	2		
Js (ft.)	3	3	3	3	3	3	3	3.5	4			
Joist Span (ft.)	Joist Depth (in.)	Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot										
		TL	300	400	500	600	700	800	900	1000	1200	
30	12	Pbr(lbs)	350	350	350	350	350	350	500	500	500	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X						
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	41	49	52	56	60	62	81	83	87	
	14	Pbr(lbs)	350	350	350	350	500	500	500	500	600	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X						
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H	
		I non-comp eff	54	62	68	73	94	100	103	108	128	
	16	Pbr(lbs)	300	300	300	350	450	450	550	550	650	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X							
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H	
		I non-comp eff	65	76	85	93	113	122	142	146	176	
	18	Pbr(lbs)	300	300	300	300	300	300	300	350	450	
		X mat'l size										
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	
		I non-comp eff	83	90	104	109	117	125	129	145	176	
	20	Pbr(lbs)	300	300	300	300	300	300	300	300	400	
		X mat'l size										
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	
		I non-comp eff	89	103	121	128	141	150	155	160	214	
	24	Pbr(lbs)	250	250	250	250	250	250	250	250	350	
		X mat'l size										
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	
		I non-comp eff	127	146	158	173	183	201	206	214	280	
26	Pbr(lbs)	250	250	250	250	250	250	250	250	300		
	X mat'l size											
	H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H		
	I non-comp eff	147	147	170	189	212	224	233	240	289		
28	Pbr(lbs)	250	250	250	250	250	250	250	250	300		
	X mat'l size											
	H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H		
	I non-comp eff	168	168	194	209	230	243	256	274	331		
32	Pbr(lbs)	200	200	200	200	200	250	250	300	350		
	X mat'l size											
	H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H		
	I non-comp eff	211	211	244	263	289	322	355	400	469		



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
Concrete Slab Parameters												
Normal Weight Concrete (145 pcf) f'c = 4.0 ksi												
1.5	1.5	1.5	2	2	2	2	2	3	3	3	3	3
2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
5	5.5	6	7	7.5	8	9	10	11	12	13	14	15
Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot												
1400	1600	1800	2000	2200	2400	2700	3000	3300	3600	3900	4200	4500
600	650	750	1100	1100	1100	1300	1300	1650	1650	1900	1900	2100
L1.25x0.109H	L1.25x0.125H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H	L2x0.163X	L2.5x0.187X	L2.5x0.187X
99	107	123	157	162	166	191	200	228	237	258	264	291
700	750	850	1000	1000	1000	1250	1250	1400	1550	1650	1650	1800
L1.25x0.125H	L1.5x0.109H	L1.5x0.123H	L1.75x0.155H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H	L2x0.163X	L2.5x0.187X	L2.5x0.187X
148	159	178	203	207	213	251	261	280	312	324	338	355
700	800	800	950	950	1150	1150	1300	1450	1550	1550	1700	1850
L1.25x0.109H	L1.5x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H	L2x0.163X	L2.5x0.187X	L2.5x0.187X
188	215	223	255	266	299	309	352	373	404	426	447	494
450	500	650	650	650	700	900	1100	1100	1250	1250	1350	1450
L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H	L2x0.163X	L2.5x0.187X	L2.5x0.187X
184	216	251	260	280	302	353	403	418	460	480	510	558
400	500	500	600	650	700	850	850	1050	1050	1150	1300	1300
L1.25x0.109H	L1.25x0.109H	L1.25x0.125H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H	L2x0.163X	L2.5x0.187X	L2.5x0.187X
224	260	278	312	334	363	431	440	504	522	575	637	637
350	450	450	550	550	600	750	750	950	950	1050	1150	1150
L1.25x0.109H	L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H	L2x0.163X	L2.5x0.187X	L2.5x0.187X
298	344	375	422	449	483	596	596	686	705	776	852	882
350	400	450	500	550	550	750	750	900	900	1000	1100	1100
L1.25x0.109H	L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
334	390	425	474	506	563	663	695	765	801	875	957	996
350	400	400	500	500	550	700	700	850	850	950	1050	1050
L1.25x0.109H	L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
372	435	472	544	579	624	729	798	879	919	1010	1100	1140
350	450	450	500	550	550	550	600	750	750	750	850	850
L1.25x0.109H	L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
511	609	645	710	787	817	848	922	1110	1170	1200	1320	1370



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength											
		Concrete Slab Parameters									
		Normal Weight Concrete (145 pcf) f'c = 4.0 ksi									
		hr (in.)	1	1	1	1	1	1	1	1	
		tc (in.)	2	2	2	2	2	2	2	2	
		Js (ft.)	3	3	3	3	3	3	3.5	4	
Joist Span (ft.)	Joist Depth (in.)	Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot									
		TL	300	400	500	600	700	800	900	1000	1200
35	14	Pbr(lbs)	400	400	400	500	500	500	600	750	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X						
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H	
		I non-comp eff	68	77	83	104	108	113	119	135	165
	16	Pbr(lbs)	350	350	350	350	500	500	500	550	600
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X					
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	78	87	97	103	134	144	146	171	188
	18	Pbr(lbs)	300	300	300	300	300	300	450	450	450
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X				
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	90	104	118	126	132	139	182	185	199
	20	Pbr(lbs)	300	300	300	300	300	300	350	450	450
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X				
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	112	130	142	152	161	170	186	226	237
	22	Pbr(lbs)	300	300	300	300	300	300	300	400	400
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X				
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	126	149	166	177	190	196	221	268	281
	24	Pbr(lbs)	250	250	250	250	250	250	300	400	400
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X						
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	150	166	187	205	219	227	255	304	327
	26	Pbr(lbs)	250	250	250	250	250	250	300	350	350
		X mat'l size									
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	175	188	207	230	246	265	291	343	373
	28	Pbr(lbs)	250	250	250	250	250	250	250	350	350
		X mat'l size									
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	174	217	238	265	276	295	326	386	421
32	Pbr(lbs)	200	200	200	200	200	250	300	300	400	
	X mat'l size										
	H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	
	I non-comp eff	222	257	277	304	339	374	456	477	553	



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
Concrete Slab Parameters												
Normal Weight Concrete (145 pcf) f'c = 4.0 ksi												
1.5	1.5	1.5	2	2	2	2	2	3	3	3	3	3
2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
5	5.5	6	7	7.5	8	9	10	11	12	13	14	15
Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot												
1400	1600	1800	2000	2200	2400	2700	3000	3300	3600	3900	4200	4500
800	900	900	1050	1300	1300	1450	1450	1750	1900	2050	2250	2250
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.125H	L1.5x0.109H	L1.5x0.123H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2x0.176H	L2.5x0.187H	L2.5x0.187H	L2.5x0.212H			
177	200	206	234	270	270	303	315	349	375	414	439	459
700	800	850	1000	1000	1000	1200	1350	1350	1500	1650	1800	1950
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.5x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
214	240	260	297	305	315	353	397	412	440	468	513	543
550	650	700	750	950	950	1150	1150	1300	1450	1550	1700	1850
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.125H	L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
229	272	291	310	366	378	450	471	507	540	586	630	696
500	650	650	700	900	900	1100	1100	1200	1350	1450	1600	1600
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.125H	L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
277	327	351	380	445	458	543	565	606	678	706	776	793
500	600	600	700	850	850	1050	1050	1150	1300	1400	1500	1500
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.125H	L1.5x0.109H	L1.5x0.123H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
329	384	413	447	531	543	644	664	742	788	865	909	951
450	550	550	650	700	800	1000	1000	1100	1200	1300	1450	1450
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.5x0.123H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
381	445	475	534	577	634	744	771	850	944	983	1090	1090
450	550	550	600	650	800	950	950	1050	1150	1150	1350	1350
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.109H	L1.25x0.125H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
434	522	538	601	652	745	846	875	968	1060	1110	1210	1280
400	500	500	600	650	750	900	900	1000	1100	1100	1200	1300
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.109H	L1.25x0.125H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
488	582	602	669	722	827	952	980	1080	1190	1230	1340	1410
400	450	500	550	550	600	650	800	900	900	1000	1100	1200
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
593	678	770	829	892	970	1060	1230	1340	1390	1530	1650	1820



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength											
		Concrete Slab Parameters									
		Normal Weight Concrete (145 pcf) f'c = 4.0 ksi									
		hr (in.)	1	1	1	1	1	1	1	1	
		tc (in.)	2	2	2	2	2	2	2	2	
Js (ft.)	3	3	3	3	3	3	3	3.5	4		
Joist Span (ft.)	Joist Depth (in.)	Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot									
		TL	300	400	500	600	700	800	900	1000	1200
40	16	Pbr(lbs)	400	400	500	500	500	600	650	750	850
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X					
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H	L1.25x0.109H
		I non-comp eff	99	115	138	144	155	176	193	221	251
	18	Pbr(lbs)	350	350	350	350	450	450	450	550	600
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X					
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	110	125	139	150	182	191	200	230	247
	20	Pbr(lbs)	300	300	300	300	350	450	450	450	550
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X				
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	123	143	158	165	190	232	238	249	297
	22	Pbr(lbs)	300	300	300	300	350	450	450	450	500
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X				
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	150	167	185	197	223	270	283	290	350
	24	Pbr(lbs)	300	300	300	300	300	400	400	400	500
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X				
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	163	199	213	229	257	315	331	338	407
	26	Pbr(lbs)	250	250	250	250	300	400	400	400	450
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X				
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	191	222	243	260	296	361	379	389	467
	28	Pbr(lbs)	250	250	250	250	300	350	350	350	450
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X				
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	205	242	270	300	332	403	429	439	526
	30	Pbr(lbs)	250	250	250	250	300	350	350	350	400
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X				
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	234	277	309	331	380	450	479	491	584
	32	Pbr(lbs)	250	250	250	250	250	250	350	350	400
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X			
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	265	294	331	363	388	430	522	541	644



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
Concrete Slab Parameters												
Normal Weight Concrete (145 pcf) f'c = 4.0 ksi												
1.5	1.5	1.5	2	2	2	2	2	3	3	3	3	3
2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
5	5.5	6	7	7.5	8	9	10	11	12	13	14	15
Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot												
1400	1600	1800	2000	2200	2400	2700	3000	3300	3600	3900	4200	4500
900	1050	1250	1250	1250	1400	1550	1700	2000	2200	2500	2500	2900
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.5x0.109H	L1.5x0.123H	L1.5x0.17H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2x0.205H	L2.5x0.187H	L2.5x0.187H	L2.5x0.25H			
268	306	364	364	380	425	462	500	560	594	668	692	757
700	800	1000	1000	1200	1200	1350	1500	1750	1900	1900	2100	2400
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.212H			
281	319	389	402	451	472	528	574	632	698	703	771	834
650	700	800	950	950	1150	1300	1300	1550	1650	1650	1800	1950
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.5x0.109H	L1.5x0.109H	L1.5x0.17H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
352	371	428	475	505	567	639	664	740	796	829	880	972
650	650	750	900	900	1100	1200	1200	1350	1600	1600	1750	1900
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.125H	L1.5x0.109H	L1.5x0.17H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
416	446	496	564	597	696	747	784	871	958	980	1080	1140
600	650	750	850	850	1050	1050	1150	1300	1400	1500	1650	1800
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.125H	L1.5x0.109H	L1.5x0.155H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
480	516	583	676	698	803	836	942	1000	1100	1150	1250	1370
550	600	650	750	800	1000	1000	1100	1200	1300	1450	1550	1700
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.125H	L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
546	608	658	737	797	920	948	1060	1190	1240	1360	1440	1560
550	550	600	700	800	950	950	1050	1150	1250	1350	1500	1650
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
614	656	738	836	899	1030	1070	1230	1310	1440	1520	1680	1760
500	500	600	700	750	900	900	1000	1100	1200	1300	1450	1550
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.5x0.123H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
703	725	810	923	1010	1150	1230	1350	1510	1570	1740	1840	2030
500	500	550	650	700	850	850	950	1050	1150	1250	1350	1500
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.5x0.123H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
769	821	918	1050	1140	1300	1340	1490	1630	1780	1870	2090	2190



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength											
		Concrete Slab Parameters									
		Normal Weight Concrete (145 pcf) f'c = 4.0 ksi									
		hr (in.)	1	1	1	1	1	1	1	1	
		tc (in.)	2	2	2	2	2	2	2	2	
Js (ft.)	3	3	3	3	3	3	3	3.5	4		
Joist Span (ft.)	Joist Depth (in.)	Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot									
		TL	300	400	500	600	700	800	900	1000	1200
45	18	Pbr(lbs)	450	500	500	500	500	500	600	600	700
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X		
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	135	159	174	186	196	205	238	244	293
	20	Pbr(lbs)	400	400	450	450	450	450	550	550	700
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X			
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	158	177	212	228	238	250	288	297	359
	22	Pbr(lbs)	350	350	350	350	450	450	550	550	650
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X			
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	177	198	216	232	283	299	341	352	431
	24	Pbr(lbs)	300	300	300	300	400	400	500	500	600
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X			
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	190	214	237	249	333	349	399	409	501
	26	Pbr(lbs)	300	300	300	300	400	400	500	500	600
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X			
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	211	245	271	305	382	400	457	483	592
	28	Pbr(lbs)	250	250	250	300	400	400	450	450	550
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X			
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	245	273	304	346	423	455	516	547	662
	30	Pbr(lbs)	250	250	250	300	350	350	450	450	500
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X			
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	264	313	335	385	485	509	577	610	708
	32	Pbr(lbs)	250	250	250	250	300	300	350	400	500
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X			
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	290	337	380	409	460	513	593	673	780
	36	Pbr(lbs)	250	250	250	250	300	350	350	400	400
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X				
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	337	398	444	526	597	665	708	798	900



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
Concrete Slab Parameters												
Normal Weight Concrete (145 pcf) f'c = 4.0 ksi												
1.5	1.5	1.5	2	2	2	2	2	3	3	3	3	3
2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
5	5.5	6	7	7.5	8	9	10	11	12	13	14	15
Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot												
1400	1600	1800	2000	2200	2400	2700	3000	3300	3600	3900	4200	4500
850	1000	1000	1250	1400	1400	1550	1800	1950	2150	2450	2450	2850
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.5x0.109H	L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L2x0.163H	L2x0.163H	L2x0.187H	L2.5x0.187H	L2.5x0.187H	L2.5x0.25H			
342	403	419	472	528	537	596	663	731	772	865	891	1020
750	1000	1000	1200	1300	1300	1450	1700	1900	2050	2350	2350	2700
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.125H	L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2x0.187H	L2.5x0.187H	L2.5x0.187H	L2.5x0.23H			
400	489	506	594	640	665	724	830	882	974	1060	1090	1240
750	950	950	1150	1150	1250	1400	1650	1800	1950	2250	2250	2600
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.125H	L1.5x0.109H	L1.5x0.123H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2x0.176H	L2.5x0.187H	L2.5x0.187H	L2.5x0.23H			
477	583	599	698	730	786	873	983	1090	1140	1300	1300	1480
700	900	900	1100	1100	1200	1350	1550	1700	1850	2150	2150	2450
										L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.5x0.109H	L1.5x0.123H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.212H			
562	680	701	807	841	947	1050	1160	1260	1380	1500	1580	1730
650	750	850	1050	1050	1150	1150	1250	1500	1650	1800	2050	2050
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.5x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
633	707	829	927	995	1070	1120	1250	1370	1490	1640	1780	1870
600	700	800	800	1000	1000	1100	1200	1450	1550	1700	1700	1950
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.5x0.109H	L1.5x0.109H	L1.5x0.155H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
713	806	936	966	1110	1160	1310	1400	1610	1740	1830	1920	2080
550	650	700	800	950	950	1050	1150	1350	1500	1500	1650	1900
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.5x0.109H	L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
787	926	995	1080	1240	1280	1440	1610	1770	1960	2010	2120	2400
550	650	700	800	900	1000	1100	1200	1300	1450	1550	1800	1800
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.125H	L1.5x0.109H	L1.5x0.155H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
895	1020	1110	1250	1370	1510	1740	1820	2020	2230	2350	2610	2740
500	550	650	700	850	850	950	1050	1200	1350	1350	1450	1650
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.109H	L1.5x0.109H	L1.5x0.123H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
1050	1170	1340	1460	1670	1720	1970	2190	2400	2690	2690	2960	3190



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength											
		Concrete Slab Parameters									
		Normal Weight Concrete (145 pcf) f'c = 4.0 ksi									
		hr (in.)	1	1	1	1	1	1	1	1	
		tc (in.)	2	2	2	2	2	2	2	2	
Js (ft.)	3	3	3	3	3	3	3	3.5	4		
Joist Span (ft.)	Joist Depth (in.)	Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot									
		TL	300	400	500	600	700	800	900	1000	1200
50	20	Pbr(lbs)	500	500	500	500	550	550	550	700	750
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X		
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	184	212	228	245	288	298	306	359	400
	22	Pbr(lbs)	400	450	450	450	450	550	550	650	700
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X		
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	206	249	271	292	306	352	364	432	479
	24	Pbr(lbs)	350	350	350	350	450	500	500	600	700
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X		
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	231	267	289	307	359	410	437	482	561
	26	Pbr(lbs)	350	350	350	350	400	500	500	550	650
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X		
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	250	290	316	336	413	472	500	538	648
	28	Pbr(lbs)	300	300	300	300	400	400	500	500	600
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	275	325	356	375	468	493	565	605	741
	30	Pbr(lbs)	250	250	300	400	400	450	450	550	600
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X		
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	299	338	400	489	526	615	633	713	826
	32	Pbr(lbs)	250	250	250	300	350	350	450	450	550
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X		
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	340	373	413	480	583	613	700	769	908
	36	Pbr(lbs)	250	250	250	250	300	350	400	450	500
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X			
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	405	451	502	573	639	735	857	915	1070
	40	Pbr(lbs)	200	200	250	300	300	400	400	400	450
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X				
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H
		I non-comp eff	450	523	657	742	826	968	1020	1050	1260



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
Concrete Slab Parameters												
Normal Weight Concrete (145 pcf) f'c = 4.0 ksi												
1.5	1.5	1.5	2	2	2	2	2	3	3	3	3	3
2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
5	5.5	6	7	7.5	8	9	10	11	12	13	14	15
Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot												
1400	1600	1800	2000	2200	2400	2700	3000	3300	3600	3900	4200	4500
1000	1000	1200	1350	1500	1500	1750	1950	2100	2400	2400	2800	2800
									L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.5x0.109H	L1.5x0.109H	L1.5x0.17H	L1.75x0.155H	L2x0.163H	L2x0.163H	L2x0.232H	L2.5x0.187H	L2.5x0.212H				
506	526	616	665	725	751	837	924	1010	1100	1130	1300	1300
800	950	1150	1150	1300	1450	1700	1850	2000	2300	2300	2650	2650
									L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.5x0.109H	L1.5x0.109H	L1.5x0.155H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2x0.219H	L2.5x0.187H	L2.5x0.187H				
539	621	731	758	818	892	1020	1140	1200	1350	1350	1530	1600
800	900	1100	1100	1250	1350	1500	1750	1900	2200	2200	2550	2550
									L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.125H	L1.5x0.109H	L1.5x0.155H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2x0.187H	L2.5x0.187H	L2.5x0.187H	L2.5x0.25H			
634	748	843	882	987	1060	1170	1310	1400	1580	1640	1800	1860
750	900	1050	1050	1200	1300	1550	1700	1850	2100	2100	2450	2450
									L2.5x0.187X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.125H	L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2x0.205H	L2.5x0.187H	L2.5x0.187H	L2.5x0.25H			
729	855	999	999	1130	1250	1410	1560	1650	1800	1880	2140	2140
700	850	1000	1000	1150	1250	1350	1600	1750	2050	2050	2350	2350
									L2.5x0.187X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.125H	L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2x0.176H	L2.5x0.187H	L2.5x0.187H	L2.5x0.23H			
828	972	1120	1170	1320	1400	1530	1750	1930	2090	2210	2420	2510
700	750	800	1000	1100	1100	1200	1400	1550	1700	1950	1950	2250
									L2.5x0.187X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.5x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
934	1030	1120	1350	1450	1520	1690	1910	2030	2230	2450	2560	2800
650	800	950	950	1050	1150	1250	1350	1500	1600	1850	2150	2150
									L2.5x0.187X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.5x0.109H	L1.5x0.123H	L1.5x0.17H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
1060	1200	1430	1480	1650	1760	1940	2130	2320	2440	2770	3060	3210
550	650	800	850	950	1050	1150	1250	1400	1500	1750	1750	2000
									L2.5x0.187X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.125H	L1.5x0.109H	L1.5x0.155H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
1240	1410	1600	1810	2000	2230	2330	2580	2860	3010	3360	3520	3840
550	600	650	800	800	900	1000	1150	1300	1400	1600	1600	1850
									L2.5x0.187X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.125H	L1.5x0.109H	L1.5x0.155H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
1520	1670	1820	2080	2230	2380	2740	3180	3350	3700	3990	4130	4730



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength											
		Concrete Slab Parameters									
		Normal Weight Concrete (145 pcf) f'c = 4.0 ksi									
		hr (in.)	1	1	1	1	1	1	1	1	
		tc (in.)	2	2	2	2	2	2	2	2	
Js (ft.)	3	3	3	3	3	3	3	3.5	4		
Joist Span (ft.)	Joist Depth (in.)	Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot									
		TL	300	400	500	600	700	800	900	1000	1200
55	24	Pbr(lbs)	450	450	450	450	550	550	550	650	750
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	282	310	341	359	423	438	469	541	620
	26	Pbr(lbs)	400	400	450	450	450	500	550	650	700
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	304	336	394	414	434	518	554	626	717
	28	Pbr(lbs)	350	400	400	400	400	500	500	600	700
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	328	382	438	469	495	584	628	717	815
	30	Pbr(lbs)	350	350	350	350	400	450	500	550	650
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	365	410	448	478	555	653	700	769	917
	32	Pbr(lbs)	300	300	300	300	400	450	500	550	650
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	398	467	510	545	633	725	799	877	1050
	34	Pbr(lbs)	300	300	300	350	350	450	450	500	550
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	449	506	557	663	696	819	843	956	1110
36	Pbr(lbs)	300	300	400	400	450	500	600	650	650	
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X				
	H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H	
	I non-comp eff	474	587	699	799	872	1010	1120	1250	1310	
40	Pbr(lbs)	250	250	300	300	350	400	400	450	550	
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
	H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	
	I non-comp eff	527	617	725	765	912	1060	1140	1280	1480	
44	Pbr(lbs)	300	300	300	300	350	350	400	450	550	
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X			
	H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	
	I non-comp eff	674	763	864	979	1140	1210	1320	1490	1780	



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength

Concrete Slab Parameters												
Normal Weight Concrete (145 pcf) f'c = 4.0 ksi												
1.5	1.5	1.5	2	2	2	2	2	3	3	3	3	3
2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
5	5.5	6	7	7.5	8	9	10	11	12	13	14	15
Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot												
1400	1600	1800	2000	2200	2400	2700	3000	3300	3600	3900	4200	4500
950	1150	1150	1250	1400	1550	1800	1950	2250		2250	2600	2950
									L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X
L1.5x0.109H	L1.5x0.123H	L1.5x0.155H	L1.75x0.155H	L2x0.163H	L2x0.163H	L2x0.232H	L2.5x0.187H	L2.5x0.212H				
749	883	915	988	1080	1170	1380	1460	1640	1690	1950	1950	2120
900	1100	1100	1200	1350	1450	1750	1900	2150	2150	2500	2500	2850
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.5x0.109H	L1.5x0.123H	L1.5x0.155H	L1.75x0.155H	L2x0.163H	L2x0.163H	L2x0.219H	L2.5x0.187H	L2.5x0.212H	L2.5x0.25H			
857	1000	1050	1170	1280	1390	1570	1730	1890	1950	2220	2320	2530
850	1100	1050	1150	1300	1400	1650	1800	2100	2100	2400	2400	2750
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.5x0.109H	L1.5x0.123H	L1.5x0.138H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2x0.219H	L2.5x0.187H	L2.5x0.212H	L2.5x0.25H			
1000	1000	1230	1320	1470	1570	1840	1950	2210	2210	2520	2600	2970
850	1000	1000	1150	1250	1350	1600	1750	2000	2000	2300	2300	2650
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.5x0.109H	L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2x0.205H	L2.5x0.187H	L2.5x0.187H	L2.5x0.23H			
1130	1300	1350	1530	1700	1780	2040	2240	2460	2570	2920	2920	3280
800	950	950	1100	1200	1300	1550	1700	1950	1950	2250	2250	2550
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.125H	L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2x0.205H	L2.5x0.187H	L2.5x0.187H	L2.5x0.23H			
1250	1480	1550	1660	1860	2040	2330	2570	2790	2940	3230	3350	3630
700	750	950	1050	1150	1150	1350	1500	1600	1850	2150	2150	2150
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.5x0.109H	L1.5x0.123H	L1.75x0.155H	L1.75x0.155H	L1.75x0.17H	L2x0.176H	L2.5x0.187H	L2.5x0.187H	L2.5x0.212H			
1300	1460	1680	1880	2110	2110	2430	2650	2910	3200	3670	3670	3810
750	800	900	1000	1000	1100	1200	1300	1550	1550	1800	2050	2050
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.125H	L1.5x0.109H	L1.5x0.123H	L1.75x0.155H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
1540	1670	1890	2120	2120	2370	2590	2810	3130	3280	3600	4130	4130
650	750	850	950	1050	1100	1200	1350	1450	1650	1900	1900	2200
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.5x0.109H	L1.5x0.109H	L1.5x0.17H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
1760	2000	2260	2490	2780	2900	3220	3570	3750	4190	4800	4870	5520
550	650	800	800	850	950	1050	1250	1350	1550	1550	1800	1800
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.25x0.125H	L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
1940	2210	2530	2720	3000	3340	3690	4100	4520	4880	5060	5790	5790



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength											
		Concrete Slab Parameters									
		Normal Weight Concrete (145 pcf) f'c = 4.0 ksi									
		hr (in.)	1	1	1	1	1	1	1	1	1.5
		tc (in.)	2	2	2	2	2	2	2	2	2
Js (ft.)	3	3	3	3	3	3	3	3.5	4		
Joist Span (ft.)	Joist Depth (in.)	Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot									
		TL	300	400	500	600	700	800	900	1000	1200
60	24	Pbr(lbs)	550	550	550	600	600	600	650	700	950
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1.25x0.109H
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	327	369	401	440	469	476	555	589	749
	26	Pbr(lbs)	500	500	500	500	500	550	650	700	900
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1.25x0.109H
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	361	423	460	486	518	555	641	683	889
	28	Pbr(lbs)	400	400	400	500	500	550	600	650	800
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1.25x0.109H
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	388	438	470	568	585	648	732	778	950
	30	Pbr(lbs)	400	400	400	400	500	500	550	650	800
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1.25x0.109H
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	428	493	530	571	675	726	795	877	1070
	32	Pbr(lbs)	400	400	400	400	450	500	550	600	750
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1.25x0.109H
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	488	541	589	635	748	801	880	982	1220
	36	Pbr(lbs)	350	350	350	450	450	500	550	600	650
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1.25x0.109H
		H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H
		I non-comp eff	547	617	731	849	924	1040	1160	1320	1400
40	Pbr(lbs)	300	350	400	400	450	550	600	600	600	
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1.25x0.109H	
	H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H	
	I non-comp eff	643	761	890	1020	1170	1390	1500	1560	1690	
44	Pbr(lbs)	350	350	450	550	500	500	550	600	750	
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1.25x0.109H	
	H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H	
	I non-comp eff	784	914	1160	1370	1470	1570	1740	1890	2260	
48	Pbr(lbs)	250	250	300	350	350	400	450	450	450	
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1.25x0.109H	
	H mat'l size	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1x0.109H	L1.25x0.109H	
	I non-comp eff	805	954	1130	1260	1440	1660	1830	1990	2070	



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
Concrete Slab Parameters												
Normal Weight Concrete (145 pcf) f'c = 4.0 ksi												
1.5	1.5	1.5	2	2	2	2	2	3	3	3	3	3
2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.5	3.5	3.5
5	5.5	6	7	7.5	8	9	10	11	12	13	14	15
Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot												
1400	1600	1800	2000	2200	2400	2700	3000	3300	3600	3900	4200	4500
1150	1150	1300	1450	1700	1700	2000	2300	2700	2700	3400		
								L1.75x0.155X	L2x0.163X	L2x0.163X		
L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2x0.163H	L2.5x0.187H	L2.5x0.187H					
883	915	1010	1120	1250	1290	1500	1690	1950	1950	2240		
900	1100	1250	1400	1500	1650	1950	2250	2250	2550	2900	3250	
									L2x0.163X	L2.5x0.187X	L2.5x0.187X	
L1.5x0.109H	L1.5x0.123H	L1.5x0.17H	L1.75x0.155H	L2x0.163H	L2x0.163H	L2x0.25H	L2.5x0.187H	L2.5x0.212H				
924	1090	1200	1330	1400	1540	1730	1950	2010	2320	2530	2680	
900	1100	1200	1350	1450	1550	1700	2150	2150	2450	2800	2800	3150
									L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.5x0.109H	L1.5x0.123H	L1.5x0.17H	L1.75x0.155H	L2x0.163H	L2x0.163H	L2x0.219H	L2.5x0.187H	L2.5x0.212H				
1040	1230	1370	1500	1640	1730	1930	2300	2300	2610	2980	2980	3150
850	1050	1150	1300	1400	1500	1650	2050	2050	2400	2400	2700	2700
									L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.5x0.109H	L1.5x0.123H	L1.5x0.155H	L1.75x0.155H	L2x0.163H	L2x0.163H	L2x0.205H	L2.5x0.187H	L2.5x0.212H				
1200	1420	1590	1700	1830	2000	2150	2570	2670	3030	3030	3460	3460
900	1000	1100	1250	1350	1450	1700	2000	2000	2300	2600	2600	2900
									L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.5x0.109H	L1.5x0.109H	L1.5x0.155H	L1.75x0.155H	L2x0.163H	L2x0.163H	L2x0.219H	L2.5x0.187H	L2.5x0.187H				
1400	1550	1750	1950	2090	2210	2580	2950	2950	3370	3640	3770	4220
750	950	950	1050	1150	1250	1500	1600	1850	1850	2150	2150	2400
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.125H	L1.5x0.109H	L1.5x0.123H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2x0.187H	L2.5x0.187H	L2.5x0.187H	L2.5x0.212H			
1640	1900	1980	2240	2490	2610	3000	3300	3620	3790	4150	4320	4840
700	850	850	950	1050	1150	1250	1350	1700	1700	2000	2000	2250
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.5x0.109H	L1.5x0.109H	L1.75x0.155H	L1.75x0.155H	L1.75x0.17H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
1970	2280	2450	2640	2950	3230	3410	3880	4450	4510	5160	5160	5810
750	900	1000	1100	1100	1150	1400	1600	1600	1850	1850	2100	2100
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.125H	L1.5x0.109H	L1.5x0.138H	L1.75x0.155H	L1.75x0.155H	L1.75x0.17H	L2x0.176H	L2.5x0.187H	L2.5x0.187H	L2.5x0.212H			
2430	2830	3220	3540	3540	3930	4580	5130	5130	5870	5960	6760	6760
600	700	750	850	950	1000	1200	1300	1500	1500	1750	1750	1950
										L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
L1.25x0.109H	L1.5x0.109H	L1.5x0.109H	L1.5x0.155H	L1.75x0.155H	L1.75x0.155H	L2x0.163H	L2.5x0.187H	L2.5x0.187H	L2.5x0.187H			
2530	2880	3250	3590	4010	4190	4920	5420	6080	6080	6960	6960	8020



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
		Concrete Slab Parameters										
		Normal Weight Concrete (145 pcf) f'c = 4.0 ksi										
		hr (in.)	1	1	1	1	1	1	1	1	1.5	
		tc (in.)	2	2	2	2	2	2	2	2	2	
		Js (ft.)	3	3	3	3	3	3	3	3.5	4	
Joist Span (ft.)	Joist Depth (in.)	Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot										
		TL	300	400	500	600	700	800	900	1000	1200	
65	30	Pbr(lbs)	450	500	500	500	500	600	600	700	850	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size										
		I non-comp eff	486	570	620	676	699	846	866	970	1200	
	32	Pbr(lbs)	450	450	500	500	500	550	650	700	800	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size										
		I non-comp eff	536	610	708	750	832	910	1050	1160	1260	
	34	Pbr(lbs)	450	450	450	450	450	550	550	650	800	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size										
		I non-comp eff	606	672	778	826	875	999	1080	1220	1510	
	36	Pbr(lbs)	400	400	450	450	450	500	550	600	700	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	649	754	852	928	954	1120	1210	1340	1570	
	38	Pbr(lbs)	350	350	450	450	450	500	550	600	750	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	692	769	922	1010	1070	1210	1310	1470	1840	
	40	Pbr(lbs)	350	350	400	400	450	500	600	650	700	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	732	830	980	1080	1190	1390	1570	1700	1880	
44	Pbr(lbs)	350	350	350	450	500	500	500	500	650		
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X		
	H mat'l size											
	I non-comp eff	852	1020	1120	1380	1570	1700	1760	1840	2210		
48	Pbr(lbs)	350	400	500	500	500	550	600	650	800		
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X		
	H mat'l size											
	I non-comp eff	999	1260	1550	1690	1810	2080	2250	2450	2980		
52	Pbr(lbs)	300	300	300	350	400	500	450	450	500		
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X		
	H mat'l size											
	I non-comp eff	1090	1270	1450	1660	1960	2240	2260	2350	2730		



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
Concrete Slab Parameters												
Normal Weight Concrete (145 pcf) f'c = 4.0 ksi												
1.5	1.5	1.5	2	2	2	2	2	3	3	3	3	3
2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.5	3.5	3.5
5	5.5	6	7	7.5	8	9	10	11	12	13	14	15
Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot												
1400	1600	1800	2000	2200	2400	2700	3000	3300	3600	3900	4200	4500
1050	1200	1300	1400	1550	1700	1850	2100	2450	2450	2750		
L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2.5x0.187X		
1420	1590	1740	1900	2010	2240	2440	2750	3030	3180	3460		
950	1000	1150	1250	1500	1650	1750	2050	2350	2350	2650	2650	
L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	
1460	1630	1820	2000	2300	2470	2710	3070	3480	3650	3980	3980	
1000	1100	1200	1300	1450	1550	1700	1950	2250	2250	2550	2850	2850
L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
1770	1990	2220	2380	2620	2780	3090	3490	3840	3960	4540	4820	4820
850	950	1050	1150	1400	1500	1650	1900	2200	2200	2500	2500	2750
L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
1870	2080	2240	2500	2830	3140	3340	3800	4330	4330	4860	5120	5440
900	1050	1150	1250	1350	1450	1600	1800	2100	2100	2400	2650	2650
L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
2130	2390	2680	2930	3170	3360	3700	4260	4670	4850	5440	5770	6100
800	900	1000	1100	1200	1400	1550	1750	1750	2050	2300	2300	2600
L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
2230	2470	2790	2970	3260	3740	4120	4530	4740	5400	5850	6060	6420
750	850	950	1000	1100	1200	1300	1650	1650	1900	1900	2150	2150
L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
2620	2860	3210	3600	3780	4160	4540	5430	5510	6320	6320	7110	7370
850	950	1050	1050	1250	1350	1550	1550	1800	1800	2050	2250	2250
L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
3390	3730	4250	4250	4980	5220	5930	6150	7050	7160	8120	8580	8970
600	750	800	900	1000	1050	1150	1450	1450	1700	1700	1900	1900
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
3210	3710	4240	4730	4950	5500	6100	7190	7190	8240	8380	9500	9500



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
		Concrete Slab Parameters										
		Normal Weight Concrete (145 pcf) f'c = 4.0 ksi										
		hr (in.)	1	1	1	1	1	1	1	1	1.5	
		tc (in.)	2	2	2	2	2	2	2	2	2.5	
Js (ft.)	3	3	3	3	3	3	3	3	3.5	4		
Joist Span (ft.)	Joist Depth (in.)	Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot										
		TL	300	400	500	600	700	800	900	1000	1200	
70	32	Pbr(lbs)	500	500	500	550	550	600	700	750	850	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size										
		I non-comp eff	611	712	779	883	911	992	1110	1190	1380	
	34	Pbr(lbs)	450	450	500	500	500	600	650	700	900	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	654	760	858	911	944	1100	1230	1350	1660	
	36	Pbr(lbs)	450	450	450	450	500	550	600	700	800	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	734	829	903	957	1060	1160	1310	1490	1760	
	38	Pbr(lbs)	450	450	450	500	550	650	650	650	800	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	789	903	979	1170	1300	1540	1570	1620	1900	
	40	Pbr(lbs)	400	400	400	400	450	500	550	650	750	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	845	936	1090	1150	1270	1400	1560	1800	2110	
	44	Pbr(lbs)	350	350	350	400	400	500	550	600	700	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	973	1090	1220	1350	1490	1690	1910	2120	2490	
48	Pbr(lbs)	350	350	400	450	500	500	500	550	650		
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X		
	H mat'l size											
	I non-comp eff	1100	1260	1480	1760	1960	2030	2200	2460	2780		
52	Pbr(lbs)	350	500	450	450	550	550	700	700	750		
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X		
	H mat'l size											
	I non-comp eff	1270	1690	1880	2060	2360	2660	3040	3190	3630		
56	Pbr(lbs)	450	450	450	450	450	450	450	500	600		
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X		
	H mat'l size											
	I non-comp eff	1710	1800	2060	2290	2460	2640	2730	3050	3640		



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
Concrete Slab Parameters												
Normal Weight Concrete (145 pcf) f'c = 4.0 ksi												
1.5	1.5	1.5	2	2	2	2	2	3	3	3	3	3
2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.5	3.5	3.5
5	5.5	6	7	7.5	8	9	10	11	12	13	14	15
Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot												
1400	1600	1800	2000	2200	2400	2700	3000	3300	3600	3900	4200	4500
1050	1150	1300	1500	1650	1800	2050	2050	2400	2700			
L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X			
1690	1860	2070	2310	2570	2720	3160	3300	3660	3990			
1000	1250	1350	1450	1600	1750	2000	2300	2300	2600	2900		
L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2.5x0.187X		
1850	2220	2390	2620	2810	3090	3500	3970	4170	4540	4820		
950	1100	1200	1400	1550	1700	1950	2250	2250	2550	2550		
L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2.5x0.187X		
2090	2340	2560	2960	3150	3490	3810	4340	4490	5130	5130		
950	1050	1150	1250	1350	1500	1850	1850	2150	2450	2450	2750	
L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	
2230	2520	2800	3010	3310	3560	4270	4420	5030	5460	5760	6120	
900	1000	1100	1300	1450	1550	1800	2100	2100	2350	2350	2650	3000
L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
2480	2800	3110	3540	3920	4130	4760	5420	5420	6080	6420	6830	7410
850	950	1050	1150	1350	1350	1700	1700	1950	2200	2200	2450	2800
L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
2880	3230	3620	3970	4570	4770	5470	5790	6360	7160	7410	7860	9040
800	900	1000	1050	1150	1250	1400	1600	1850	1850	2100	2100	2300
L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
3320	3850	4310	4530	4980	5440	5990	6610	7590	7590	8540	8850	9400
950	1000	1000	1200	1300	1500	1500	1750	1750	1950	2200	2200	2200
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
4220	4750	5010	5880	6160	7010	7270	8330	8480	9610	10160	10620	11030
650	800	850	950	1050	1150	1200	1400	1650	1650	1850	1850	2050
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
4080	4780	5520	5780	6420	6780	7480	8390	9620	9790	11100	11100	12280



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
		Concrete Slab Parameters										
		Normal Weight Concrete (145 pcf) f'c = 4.0 ksi										
		hr (in.)	1	1	1	1	1	1	1.5	1.5	1.5	
		tc (in.)	2	2	2	2	2	2	2.5	2.5	2.5	
Js (ft.)	3	3	3	3	3	3	3	3.5	4			
Joist Span (ft.)	Joist Depth (in.)	Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot										
		TL	300	400	500	600	700	800	900	1000	1200	
75	34	Pbr(lbs)	550	550	550	600	600	700	700	800	950	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size										
		I non-comp eff	755	877	934	1040	1140	1320	1360	1480	1740	
	38	Pbr(lbs)	450	450	450	500	500	600	700	750	850	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	870	987	1080	1210	1300	1510	1620	1800	2100	
	40	Pbr(lbs)	450	450	450	450	500	550	650	700	850	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	937	1100	1200	1270	1400	1600	1800	1950	2340	
	42	Pbr(lbs)	400	400	450	450	500	600	650	700	800	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	1010	1140	1280	1360	1610	1810	1940	2160	2580	
	44	Pbr(lbs)	400	450	550	550	550	600	650	800	800	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	1060	1310	1550	1720	1780	2080	2240	2560	2730	
	48	Pbr(lbs)	400	400	400	400	450	500	600	600	750	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	1200	1410	1530	1660	1950	2180	2470	2660	3160	
	52	Pbr(lbs)	350	350	400	500	500	500	550	600	700	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	1300	1520	1870	2290	2400	2490	2790	3040	3580	
56	Pbr(lbs)	450	450	450	500	550	650	650	650	800		
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X		
	H mat'l size											
	I non-comp eff	1720	2010	2250	2640	2970	3380	3530	3720	4490		
60	Pbr(lbs)	450	450	450	450	450	450	500	550	650		
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X		
	H mat'l size											
	I non-comp eff	1960	2200	2480	2730	2930	3150	3510	3840	4560		



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
Concrete Slab Parameters												
Normal Weight Concrete (145 pcf) f'c = 4.0 ksi												
1.5	1.5	1.5	2	2	2	2	2	3	3	3	3	3
2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.5	3.5	3.5
5	5.5	6	7	7.5	8	9	10	11	12	13	14	15
Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot												
1400	1600	1800	2000	2200	2400	2700	3000	3300	3600	3900	4200	4500
1150	1250	1350	1500	1650	1750	2050	2350	2650				
L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X				
2080	2270	2480	2740	2930	3190	3600	4170	4550				
1050	1200	1300	1400	1500	1650	1900	2200	2500	2500			
L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X			
2520	2810	3140	3320	3700	3920	4430	5040	5770	5770			
1050	1150	1350	1500	1600	1850	2150	2150	2400	2700	3050		
L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2.5x0.187X		
2810	3120	3550	3930	4190	4770	5440	5620	6430	6840	7430		
900	1100	1200	1300	1450	1550	1800	2050	2350	2350	2600		
L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X		
2880	3450	3720	4090	4350	4830	5280	6020	6760	7130	7590		
950	1050	1150	1250	1400	1500	1750	1900	2000	2250	2250	2550	
L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	
3250	3640	3990	4320	4790	5110	5820	7630	6850	7850	7850	8360	
900	1000	1100	1200	1300	1400	1600	1900	2150	2150	2350	2700	2700
L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
3870	4340	4760	5010	5480	6030	6660	7630	8600	8900	9450	10880	10880
750	850	950	1100	1200	1350	1550	1750	1750	2000	2250	2250	2550
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
4040	4540	5090	5880	6230	6760	7700	8970	8970	10110	11120	11120	12800
900	950	1050	1250	1450	1450	1650	1650	1900	2100	2100	2100	2400
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
5120	5840	6490	7180	8170	8490	9730	9900	11220	11870	12410	12890	13930
700	800	850	1000	1100	1200	1400	1600	1600	1850	1850	2050	2300
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
4980	5700	6370	7410	7820	8630	9690	11110	11310	12830	12830	14190	15930



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
		Concrete Slab Parameters										
		Normal Weight Concrete (145 pcf) f'c = 4.0 ksi										
		hr (in.)	1	1	1	1	1	1.5	1.5	1.5	1.5	
		tc (in.)	2	2	2	2	2	2	2.5	2.5	2.5	
Js (ft.)	3	3	3	3	3	3	3	3.5	4			
Joist Span (ft.)	Joist Depth (in.)	Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot										
		TL	300	400	500	600	700	800	900	1000	1200	
80	38	Pbr(lbs)	550	550	550	600	600	650	750	800	950	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	1010	1140	1270	1410	1440	1590	1800	1980	2340	
	40	Pbr(lbs)	500	500	550	550	650	650	650	700	950	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	1050	1190	1360	1510	1760	1800	1860	2080	2610	
	42	Pbr(lbs)	500	500	500	500	550	600	700	750	900	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	1160	1310	1440	1550	1670	1900	2160	2340	2880	
	44	Pbr(lbs)	500	500	500	600	550	550	650	700	800	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	1220	1400	1540	1840	1930	1970	2190	2380	2850	
	46	Pbr(lbs)	450	450	450	450	450	550	600	700	850	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	1250	1530	1680	1790	1860	2180	2400	2740	3320	
	48	Pbr(lbs)	400	500	500	500	500	600	700	850	850	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
		H mat'l size										
		I non-comp eff	1360	1660	1910	2060	2220	2480	2810	3360	3620	
52	Pbr(lbs)	500	500	500	600	700	700	700	800	900		
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X		
	H mat'l size											
	I non-comp eff	1670	1970	2170	2590	3080	3240	3380	3800	4350		
56	Pbr(lbs)	450	450	450	450	450	500	500	600	750		
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X		
	H mat'l size											
	I non-comp eff	1840	2200	2420	2690	2790	3250	3370	3820	4560		
60	Pbr(lbs)	450	450	500	550	650	650	650	700	850		
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X		
	H mat'l size											
	I non-comp eff	1980	2390	2820	3280	3890	4070	4280	4710	5660		



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
Concrete Slab Parameters												
Normal Weight Concrete (145 pcf) f'c = 4.0 ksi												
1.5	1.5	1.5	2	2	2	2	2	3	3	3	3	3
3	3	3	3	3	3.5	3.5	3.5	3.5	3.5	3.5	4	4
5	5.5	6	7	7.5	8	9	10	11	12	13	14	15
Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot												
1400	1600	1800	2000	2200	2400	2700	3000	3300	3600	3900	4200	4500
1100	1300	1400	1550	1700	1950	2250	2550	2850				
L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X				
2630	3140	3320	3710	4050	4440	5050	5780	6140				
1050	1150	1350	1500	1650	1900	2150	2150	2450				
L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X				
2920	3200	3700	3980	4370	4950	5630	5900	6440				
1000	1200	1350	1450	1600	1800	2100	2400	2400	2650			
L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L2x0.163X	L2x0.163X			
3230	3730	4100	4360	4840	5290	6040	6770	7140	7600			
1000	1100	1300	1400	1550	1750	2050	2050	2300	2550			
L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L2x0.163X	L2x0.163X			
3420	3810	4340	4800	5120	5840	6650	6870	7880	8390			
950	1050	1250	1350	1500	1700	1950	1950	2250	2500	2850		
L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X		
3750	4170	4750	5260	5620	6400	7300	7540	8190	9210	10000		
950	1050	1100	1350	1450	1650	1650	1900	2150	2150	2400		
L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X		
4080	4540	4910	5500	6050	6680	6990	7970	8940	9440	10060		
1050	1150	1250	1350	1550	1550	1800	2050	2300	2300	2600	2600	
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
5090	5650	6260	6810	7750	7750	9030	10170	10780	11190	11860	12880	12880
850	900	1000	1200	1300	1450	1450	1700	1950	2150	2150	2450	2450
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
5290	5930	6220	7260	7890	8990	9130	10470	11800	12510	12990	14960	14960
950	1000	1100	1400	1400	1400	1600	1850	2050	2050	2050	2300	2300
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
6370	7060	7900	9430	9430	9790	11230	12300	13710	14340	14340	16100	17150



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
		Concrete Slab Parameters										
		Normal Weight Concrete (145 pcf) $f_c = 4.0$ ksi										
		hr (in.)	1	1	1	1	1	1.5	1.5	1.5	1.5	
		tc (in.)	2	2	2	2	2	2.5	2.5	2.5	2.5	
		Js (ft.)	3	3	3	3	3	3	3.5	4		
Joist Span (ft.)	Joist Depth (in.)	Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot										
		TL	300	400	500	600	700	800	900	1000	1200	
90	44	Pbr(lbs)	600	600	650	650	650	700	750	900	1000	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size										
		I non-comp eff	1490	1720	2010	2090	2200	2450	2680	3180	3570	
	46	Pbr(lbs)	600	600	600	650	650	650	750	900	1000	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size										
		I non-comp eff	1630	1880	2020	2290	2410	2480	2940	3330	3910	
	48	Pbr(lbs)	550	550	550	550	550	650	700	850	950	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size										
		I non-comp eff	1730	1980	2210	2380	2440	2850	3090	3640	4110	
	50	Pbr(lbs)	500	550	500	500	600	650	700	850	950	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size										
		I non-comp eff	1760	2150	2240	2430	2780	3010	3350	3960	4460	
	52	Pbr(lbs)	500	500	500	500	500	600	650	800	900	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size										
		I non-comp eff	1900	2160	2400	2590	2720	3090	3540	4100	4830	
	56	Pbr(lbs)	500	500	500	500	550	600	650	750	850	
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size										
		I non-comp eff	2120	2450	2710	2920	3400	3670	3970	4750	5340	
60	Pbr(lbs)	450	450	500	650	650	650	750	800	1000		
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	
	H mat'l size											
	I non-comp eff	2350	2700	3200	3940	4340	4530	5100	5650	6830		
66	Pbr(lbs)	450	600	650	650	800	850	950	1000	1000		
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1.25x0.109X		
	H mat'l size											
	I non-comp eff	2710	3570	4160	4530	5490	6100	6660	7500	8140		
72	Pbr(lbs)	650	650	650	650	650	650	650	700	800		
	X mat'l size	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X		
	H mat'l size											
	I non-comp eff	3640	4200	4700	5120	5590	5850	6430	7000	8020		



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
Concrete Slab Parameters												
Normal Weight Concrete (145 pcf) f'c = 4.0 ksi												
1.5	1.5	1.5	2	2	2	2	2	3	3	3	3	3
3	3	3	3	3	3.5	3.5	3.5	3.5	3.5	3.5	4	4
5	5.5	6	7	7.5	8	9	10	11	12	13	14	15
Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot												
1400	1600	1800	2000	2200	2400	2700	3000	3300	3600	3900	4200	4500
1250	1350	1600	1800	1800	2100	2400						
L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X						
4120	4530	5350	6060	6060	6900	7900						
1100	1300	1400	1550	1750	2050	2300	2300					
L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X					
4290	4970	5340	5870	6660	7570	8680	8680					
1150	1250	1500	1700	1700	2000	2250	2500					
L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X					
4800	5420	6160	7020	7270	8010	9490	10110					
1050	1200	1350	1450	1650	1950	1950	2200	2450				
L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X				
4970	5670	6280	6980	7640	8720	9010	10330	11010				
1000	1200	1300	1600	1600	1850	2100	2100	2350				
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X				
5380	6140	6800	7930	8290	9450	10610	11200	11950				
950	1100	1250	1350	1550	1750	1750	2000	2250	2550			
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2x0.163X			
5990	6930	7570	8340	9220	10580	11000	12350	13920	15120			
1050	1150	1250	1450	1450	1700	1900	2100	2100	2400			
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X		
7590	8410	9150	10430	10430	12160	13140	13700	15100	16010	17390		
1200	1400	1400	1600	1850	1850	2050	2050	2300	2450	2450	2800	
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X	
9490	10890	11520	13010	14750	14750	16800	17570	18930	20320	21710	23470	
950	1000	1100	1200	1400	1400	1600	1850	2050	2300	2300	2450	2800
L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X
9710	10790	11400	12580	14150	14870	16540	18760	20790	22400	23340	25710	27790



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength											
		Concrete Slab Parameters									
		Normal Weight Concrete (145 pcf) f'c = 5.0 ksi									
		hr (in.)	1	1	1	1	1	1.5	1.5	1.5	1.5
		tc (in.)	2	2	2	2	2.5	2.5	2.5	2.5	3
		Js (ft.)	3	3	3	3	3	3	3.5	4	
Joist Span (ft.)	Joist Depth (in.)	Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot									
		TL	300	400	500	600	700	800	900	1000	1200
100	50	Pbr(lbs)	600	600	600	650	700	850	850	850	1050
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size									
		I non-comp eff	2150	2410	2620	3020	3280	3970	4150	4150	5110
	52	Pbr(lbs)	600	600	600	600	650	700	850	850	1050
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size									
		I non-comp eff	2250	2610	2840	3020	3370	3650	4300	4500	5400
	54	Pbr(lbs)	600	600	600	750	750	750	800	900	1100
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size									
		I non-comp eff	2430	2710	3070	3810	3930	4180	4640	5240	6140
	56	Pbr(lbs)	550	550	550	550	600	700	700	800	1000
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size									
		I non-comp eff	2510	2920	3160	3420	3800	4380	4700	5000	6280
	58	Pbr(lbs)	550	550	550	550	600	650	750	750	950
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size									
		I non-comp eff	2620	3130	3390	3670	4080	4430	5130	5370	6470
	60	Pbr(lbs)	550	550	600	700	700	750	850	950	1100
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size									
		I non-comp eff	2800	3230	3960	4570	4710	5330	5880	6570	7650
66	Pbr(lbs)	450	600	650	650	800	850	950	1000	1000	
	X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1.25x0.109X	
	H mat'l size										
	I non-comp eff	3090	4040	4800	5290	6170	6990	7600	8230	9250	
72	Pbr(lbs)	650	650	650	650	650	650	650	700	850	
	X mat'l size	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	
	H mat'l size										
	I non-comp eff	3890	4780	5420	5950	6260	6740	6960	7630	9420	
80	Pbr(lbs)	650	650	650	650	650	700	800	850	1000	
	X mat'l size	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	
	H mat'l size										
	I non-comp eff	5670	5670	6080	6940	7260	8030	9240	10120	11920	



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
Concrete Slab Parameters												
Normal Weight Concrete (145 pcf) f'c = 5.0 ksi												
1.5	1.5	1.5	2	2	2	2	2	3	3	3	3	3
3	3	3	3	3	3.5	3.5	3.5	3.5	3.5	3.5	4	4
5	5.5	6	7	7.5	8	9	10	11	12	13	14	15
Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot												
1400	1600	1800	2000	2200	2400	2700	3000	3300	3600	3900	4200	4500
1150	1350	1500	1700	2000	2000							
L1x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X							
5590	6620	7000	7940	9030	9490							
1200	1350	1650	1650	1950	2200	2200						
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X						
6420	6910	8320	8620	9800	11240	11240						
1200	1300	1400	1600	1900	1900	2150						
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X						
6660	7380	8210	9320	10600	10600	12160						
1050	1250	1350	1600	1850	1850	2050	2300					
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X					
6800	7950	8850	9700	11060	11430	13110	14000					
1100	1250	1550	1550	1800	2000	2000	2550					
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X					
7710	8540	9970	10420	11890	13350	14090	16350					
1100	1200	1500	1500	1750	1750	1950	2200					
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X					
8010	9150	10680	11160	12740	12740	14310	16130					
1200	1400	1400	1600	1850	1850	2050	2050	2300				
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X				
10780	12120	12730	14150	16050	16050	18460	19570	21260				
950	1100	1200	1400	1600	1600	1850	2050	2300	2450			
L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X			
10430	12160	13240	15110	16800	17640	19880	21940	25270	26120			
1000	1100	1400	1400	1400	1600	1850	2050	2300	2300	2800	2800	
L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X	L2.5x0.187X	
12640	14150	16910	17600	18490	20570	23340	25880	29070	29070	34640	34640	



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength											
		Concrete Slab Parameters									
		Normal Weight Concrete (145 pcf) f'c = 5.0 ksi									
		hr (in.)	1	1	1	1	1	1.5	1.5	1.5	1.5
		tc (in.)	2	2	2	2	2.5	2.5	2.5	2.5	3
Js (ft.)	3	3	3	3	3	3	3.5	4	4		
Joist Span (ft.)	Joist Depth (in.)	Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot									
		TL	300	400	500	600	700	800	900	1000	1200
110	56	Pbr(lbs)	600	600	650	650	800	800	800	900	1100
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size									
		I non-comp eff	2930	3310	3780	4140	4800	5020	5250	5890	6820
	58	Pbr(lbs)	600	600	600	600	700	700	800	900	1050
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size									
		I non-comp eff	3030	3560	3870	4090	4850	5060	5640	6320	7330
	60	Pbr(lbs)	600	600	700	700	700	850	950	1050	1150
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X
		H mat'l size									
		I non-comp eff	3240	3650	4590	4880	5050	6200	6960	7300	8290
	62	Pbr(lbs)	600	600	600	600	700	700	750	850	1000
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X
		H mat'l size									
		I non-comp eff	3460	3900	4260	4550	5400	5790	6170	6960	8160
	64	Pbr(lbs)	550	550	550	550	650	650	750	800	1000
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X
		H mat'l size									
		I non-comp eff	3550	4160	4540	4850	5750	5920	6580	7420	8700
	66	Pbr(lbs)	500	600	650	650	800	900	950	1050	1050
		X mat'l size	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1x0.109X	L1.25x0.109X	L1.25x0.109X
		H mat'l size									
		I non-comp eff	3640	4410	5320	5730	6670	7590	8380	9310	9750
72	Pbr(lbs)	650	650	800	850	1000	1000	1000	1100	1400	
	X mat'l size	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	
	H mat'l size										
	I non-comp eff	4480	5250	6650	7760	8710	9490	9850	11000	13200	
80	Pbr(lbs)	650	650	650	650	650	650	700	800	950	
	X mat'l size	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	
	H mat'l size										
	I non-comp eff	5750	6170	7040	7750	8100	8620	9450	10440	12930	
88	Pbr(lbs)	950	950	950	950	950	950	950	1000	1000	
	X mat'l size	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	
	H mat'l size										
	I non-comp eff	7890	7890	9450	10560	11230	11840	12810	13960	15370	



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
Concrete Slab Parameters												
Normal Weight Concrete (145 pcf) f'c = 5.0 ksi												
1.5	1.5	1.5	2	2	2	2	2	3	3	3	3	3
3	3	3	3	3	3.5	3.5	3.5	3.5	3.5	3.5	4	4
5	5.5	6	7	7.5	8	9	10	11	12	13	14	15
Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot												
1400	1600	1800	2000	2200	2400	2700	3000	3300	3600	3900	4200	4500
1300	1400	1600	1850	1850	2150							
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X							
8070	8880	10070	11460	12040	13150							
1250	1350	1600	1850	2050	2050							
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X							
8570	9540	10830	12330	14140	14140							
1250	1350	1550	1800	1800	2000							
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X							
9190	10230	11610	12800	13220	15170							
1200	1300	1500	1750	1750	1950	2200						
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X						
9820	10510	11990	13690	14140	16230	17340						
1150	1250	1450	1700	1900	1900	2150						
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X						
10470	11210	12800	14600	16400	17310	18500						
1250	1450	1450	1650	1850	1850	2100						
L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X						
11240	12820	13620	15550	17460	17460	19710						
1400	1600	1850	1850	2050	2050	2300	2450					
L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L2x0.163X					
14520	16650	18270	19250	21330	21330	25530	26380					
1100	1200	1400	1600	1600	1850	2050	2300	2450				
L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2x0.163X				
15090	16440	18760	20880	21920	24700	27280	31440	32510				
1200	1400	1400	1600	1600	1850	2050	2300	2300	2800			
L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X	L2.5x0.187X			
18040	20560	21410	24560	25050	28430	31540	35420	37760	42250			



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength											
		Concrete Slab Parameters									
		Normal Weight Concrete (145 pcf) f'c = 5.0 ksi									
		hr (in.)	1	1	1	1	1.5	1.5	1.5	1.5	
		tc (in.)	2	2	2	2	2.5	2.5	2.5	2.5	3
Js (ft.)	3	3	3	3	3	3	3.5	4	4		
Joist Span (ft.)	Joist Depth (in.)	Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot									
		TL	300	400	500	600	700	800	900	1000	1200
120	72	Pbr(lbs)	650	650	700	850	950	1000	1000	1000	1400
		X mat'l size	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X
		H mat'l size									
		I non-comp eff	5060	5780	7000	8420	9150	10510	11140	11140	14610
	74	Pbr(lbs)	650	650	650	650	800	850	950	1000	1100
		X mat'l size	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X
		H mat'l size									
		I non-comp eff	5340	6100	6720	7230	8750	10110	10590	11770	13050
	76	Pbr(lbs)	650	650	650	650	650	700	800	950	1000
		X mat'l size	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X
		H mat'l size									
		I non-comp eff	5630	6430	7080	7620	8140	8890	10010	11800	13000
	78	Pbr(lbs)	650	800	950	1000	1000	1200	1400	1400	1400
		X mat'l size	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X
		H mat'l size									
		I non-comp eff	5530	7450	9010	10270	10710	12710	14540	15580	16480
	80	Pbr(lbs)	650	700	850	1000	1000	1000	1100	1400	1400
		X mat'l size	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X
		H mat'l size									
		I non-comp eff	5810	7080	9140	10370	11250	12210	13640	16380	17320
	82	Pbr(lbs)	650	650	700	850	950	1000	1000	1100	1400
		X mat'l size	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X
		H mat'l size									
		I non-comp eff	6090	7110	8180	10090	11330	12340	13590	14310	18180
	84	Pbr(lbs)	650	650	650	950	950	950	1000	1000	1100
		X mat'l size	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X
		H mat'l size									
		I non-comp eff	6380	7450	8180	10970	11870	12390	14250	14250	16750
	88	Pbr(lbs)	950	950	1000	1100	1400	1400	1400	1400	1850
		X mat'l size	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X
		H mat'l size									
		I non-comp eff	8000	9110	11070	12260	14860	16410	17140	18390	22560
	96	Pbr(lbs)	1000	1000	1000	1000	1000	1000	1000	1000	1400
		X mat'l size	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X
		H mat'l size									
		I non-comp eff	12330	12330	12330	13900	14690	15950	16670	17310	23240



NORMAL WEIGHT CONCRETE

DESIGN GUIDE LRFD BRIDGING TABLE FOR COMPOSITE STEEL JOISTS, CJ-SERIES

Based on a 50 ksi Maximum Yield Strength												
Concrete Slab Parameters												
Normal Weight Concrete (145 pcf) f'c = 5.0 ksi												
1.5	1.5	1.5	2	2	2	2	3	3	3	3	3	3
3	3	3	3	3	3.5	3.5	3.5	4	4	4	4	4
5	5.5	6	7	7.5	8	9	10	11	12	13	14	15
Total Safe Factored Uniformly Distributed Joist Load in Pounds Per Linear Foot												
1400	1600	1800	2000	2200	2400	2700	3000	3300	3600	3900	4200	4500
1400	1400	1600	1850	2050	2050							
L1.25x0.109X	L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X							
15350	16320	18630	20200	22290	23640							
1200	1400	1600	1600	1850	2050	2300						
L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X						
14880	16500	18940	19690	22120	24990	27150						
1100	1400	1600	1600	1850	2050	2300						
L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X						
14870	17410	19980	20770	23330	26360	28650						
1600	2050	2050	2050	2300	2300	2450						
L1.25x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L1.75x0.155X						
18630	22800	24110	25210	28310	28310	31200						
1400	1600	1850	2050	2050	2050	2300						
L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L1.75x0.155X						
18030	20670	23910	26520	26520	27540	31740						
1400	1400	1600	1850	2050	2050	2300	2300					
L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L1.75x0.155X	L2x0.163X					
18920	19880	23230	25110	27840	28920	33330	33330					
1400	1400	1400	1600	1850	2050	2300	2300					
L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L1.75x0.155X	L2x0.163X					
19830	20840	21210	24350	27450	30330	34950	34950					
2050	2050	2050	2300	2300	2450	2800	2800					
L1.5x0.109X	L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2x0.163X					
25240	28230	28900	32830	34460	35510	39850	42820					
1400	1400	1600	1850	2050	2050	2300	2300	2800				
L1.5x0.109X	L1.5x0.109X	L1.75x0.155X	L1.75x0.155X	L1.75x0.155X	L1.75x0.155X	L2x0.163X	L2x0.163X	L2.5x0.187X				
24580	25610	29370	32270	36090	37750	42400	45210	50610				



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CODE OF STANDARD PRACTICE FOR STEEL JOISTS AND JOIST GIRDERS

Adopted by the Steel Joist Institute April 7, 1931
Revised to Nov. 10, 2014 - Effective Jan.1, 2015

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

Add-Load. A single vertical concentrated load that occurs at any one panel point along the joist chord. This load is in addition to any other gravity loads specified.

Bend-Check Load. A vertical concentrated load used to design the joist chord for the additional bending stresses resulting from this load being applied at any location between the joist panel points. This load shall already be accounted for in the specified joist designation load, uniform load, or Add-Load and is used only for the additional bending check in the chord and does not contribute to the overall axial forces within the joist. An ideal use of this is for incidental loads which have already been accounted for in the design loading but may induce additional bending stress due to this load occurring at any location along the chord.

Buyer. The entity that has agreed to purchase Material from the manufacturer and has also agreed to the terms of sale.

Erector. The entity that is responsible for the safe and proper erection of the materials in accordance with all applicable codes and regulations.

Material. Steel joists, Joist Girders and accessories as provided by the seller.

Owner. The entity that is identified as such in the contract documents.

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Placement Plans. Drawings that are prepared depicting the interpretation of the contract document's requirements for the Material to be supplied by the Seller. These floor 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.

Seller. A company certified by the Steel Joist Institute engaged in the manufacture and distribution of steel joists, Joist Girders and accessories.

Specifying Professional. The licensed professional who is responsible for sealing the building contract documents, that 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.

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 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 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 TESTS FOR OPEN WEB STEEL JOIST CONSTRUCTION

When a performance test on a joist is required, the following criteria shall be used:

- a) The performance test load shall be the maximum factored uniformly distributed downward design load for the selected joist.
 - (1) The TOTAL safe factored uniformly distributed load-carrying capacity tabulated in the Standard LRFD Load Table for the specific joist designation and span.
 - (2) For a joist with factored loading conditions other than those found in the Standard LRFD Load Table, this is the LRFD Load Combination resulting in the highest uniformly distributed downward factored design load.
 - (3) For a joist with loading conditions other than those found in the Standard ASD Load Table, this is the ASD Load Combination resulting in the highest uniformly distributed downward design load multiplied times 1.50.
- b) Joist self-weight and the weight of all test materials shall be included in the calculation of applied performance test loading as appropriate for the joist during testing.

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- c) Loading shall be uniformly distributed across the full length of the joist top chord, and the load application shall maintain uniform distribution throughout the test. At any stage during the application of the test loading, the test load shall not be distributed in such a manner as to result in any joist component being subjected to a higher proportion of force than intended by the joist design.
- d) If tested as a panel assembly, the joists shall be tested in pairs with deck, deck attachments, and bridging installed per the approved joist and deck Placement Plans. All bottom chord horizontal bridging rows shall be terminated by bracing back to the top chord of the adjacent joist or by a lateral restraint system which does not inhibit the vertical deflection of the test joist.
- e) If tested singly in a load test machine apparatus, the joist chords shall be braced to prevent lateral movement, without inhibiting vertical displacement. The joist top chord shall have lateral braces located at equal spacing of no more than 36 inches (914 mm) on center. The joist bottom chord shall have lateral braces located, at a minimum, per the bottom chord bridging locations shown on the approved joist placement plan.
- f) The performance test loading shall be applied at a rate of no greater than 25 plf per minute and shall be sustained for no less than 15 minutes. After the maximum test load has been removed for a minimum of 10 minutes, the remaining vertical displacement at midspan shall not exceed 20% of the vertical midspan deflection sustained under the full performance test load.
- g) All costs associated with such testing shall be borne by the purchaser.
- h) Joists that have been designed and manufactured and have satisfied the above performance test criteria shall be considered to satisfy the intent of the Steel Joist Institute Standard Specifications, and shall be considered acceptable for use in construction. No further proof of strength of individual joist components or connections is required.

SECTION 2.

JOISTS, JOIST GIRDERS, 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 of latest adoption.

K-Series, LH-Series, DLH-Series joists, and Joist Girders are furnished either underslung or square ended, with top chords either parallel, pitched one way or pitched two ways. It is not recommended that any Joist Girder, or any DLH-Series joist that exceeds 72 inches (1829 mm) in depth and has a span greater than 80 feet (24384 mm), be used in a bottom bearing configuration.

The steel joist or Joist Girder designation depth or nominal depth shall be the depth at midspan, except for double pitched joists which shall be the depth at the ridge. K-Series, LH-Series, DLH-Series joists, and Joist Girders shall be permitted to have either parallel chords or a top chord pitch of up to 1/2 inch per foot (1:24).

2.2 BEARING SEATS

Underslung types are furnished with minimum end bearing depths as shown in Table 2.2-1. A standard maximum joist bearing seat width (perpendicular to the joist length) is provided. This width shall be permitted to vary based on the joist design and joist manufacturer.

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TABLE 2.2-1

STANDARD END BEARING SEAT DEPTH AND STANDARD MAXIMUM SEAT WIDTH		
JOIST SECTION NUMBER ¹	MINIMUM BEARING DEPTH	MAXIMUM SEAT WIDTH ²
K1-12	2 ½" (64 mm)	6" (152 mm)
LH02-06	5" (127 mm)	6" (152 mm)
LH07-17, DLH10-17	5" (127 mm)	8" (203 mm)
JG	7 ½" (191 mm)	8" (203 mm)
LH/DLH18-25, JG ³	7 ½" (191 mm)	13" (330 mm)
JG ⁴	10" (254 mm)	13" (330 mm)
⁽¹⁾ Last two digits of joist designation shown in Load Table. ⁽²⁾ THE SEAT WIDTH MAY VARY BASED ON DESIGN. ⁽³⁾ Joist Girders with a self weight greater than 50 plf (0.73 kN/m). ⁽⁴⁾ Joist Girders with a self weight equal to or greater than 150 plf (2.19 kN/m).		

Joist Girder bearing seat widths vary depending on the Joist Girder size and shall be permitted to be up to 13" (330 mm) wide. The supporting structural member shall be made wide enough to accommodate the seat widths.

Where steel joists or Joist Girders are sloped, sloped end bearings may be provided where the slope exceeds 1/4 inch per foot (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 shall be permitted to not be beveled for slopes of 1/4 inch or less per foot (1:48). For sloped joist bearing seats refer to the sloped seat depth requirements of Table 2.2-2 and Table 2.2-3.



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TABLE 2.2-2
SLOPED SEAT REQUIREMENTS FOR SLOPES 3/8":12 AND GREATER
K-SERIES OPEN WEB STEEL JOISTS

LOW END W/OUT TOP CHORD EXTENSIONS	HIGH END W/OUT TOP CHORD EXTENSIONS	SLOPE "X":12	MINIMUM HIGH END SEAT DEPTH "d"
		3/8	3 1/2
		1/2	3 1/2
		1	3 1/2
		1 1/2	4
		2	4
		2 1/2	4
		3	4 1/2
		3 1/2	4 1/2
		4	4 1/2
		4 1/2	5
		5	5
		5 1/2	5 1/2
SEE NOTE (2) FOR SLOPE RATES GREATER THAN 6:12		6	5 1/2

Notes:

- (1) Depths shown are the minimum required for manufacturing of sloped seats. Depths may vary depending on actual bearing conditions.
- (2) $d = 1/2 + 2.5/\cos\theta + 4\tan\theta$ (Rounded up to the nearest 1/2".)
- (3) Clearance must be checked at outer edge of support. Increase bearing depths as required to allow passage of 2 1/2" deep extension.
- (4) If extension depth greater than 2 1/2" is required, increase bearing depths accordingly.
- (5) If slope is 1/4 : 12 or less, sloped seats are not required.
- (6) Required bearing seat depth is determined at END OF SEAT.
- (7) Also refer to SJI Specification 5.4 for special considerations of joist end reaction location.

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TABLE 2.2-3
SLOPED SEAT REQUIREMENTS FOR SLOPES 3/8":12 AND GREATER
LH- AND DLH-SERIES OPEN WEB STEEL JOISTS

LOW END W/OUT TOP CHORD EXTENSIONS	HIGH END W/OUT TOP CHORD EXTENSIONS	SLOPE "X" : 12	MINIMUM HIGH END SEAT DEPTH "d"
		3/8	6
		1/2	6
		1	6 1/2
		1 1/2	6 1/2
		2	7
		2 1/2	7
LOW END W/ TOP CHORD EXTENSIONS	HIGH END W/ TOP CHORD EXTENSIONS	3 1/2	7 1/2
		4	8
		4 1/2	8 1/2
		5	8 1/2
		5 1/2	9
		6	9 1/2
		SEE NOTE (2) FOR SLOPE RATES GREATER THAN 6:12	

Notes:

- (1) Depths shown are the minimum required for manufacturing of sloped seats. Depth may vary depending on actual bearing condition.
- (2) $d = 1/2 + 5 / \cos\theta + 6 \tan\theta$
- (3) Clearance must be checked at outer edge of support. Increase bearing seat depth as required to allow passage of 5" deep extension.
- (4) If extension depth greater than 5" is required, increase bearing depths accordingly.
- (5) Add 2 1/2" to seat depth at 18 thru 25 chord section numbers. Consult with joist manufacturer for information when TCXs are present.
- (6) If slope is 1/4 : 12 or less, sloped seats may not be required.
- (7) Required bearing seat depth shall be determined at END OF SEAT.
- (8) Also refer to SJI Specification 5.4 for special considerations of joist end reaction location.

2.3 JOIST LOCATION AND SPACING

The uniform loads as shown in the Standard Specifications Load Tables & Weight Tables of latest adoption shall be used to determine maximum joist spacing.

Where sidewalls, wall beams or tie beams are capable of supporting the floor slab or roof deck, the first adjacent joists should 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 shall be given consideration when locating the first joist adjacent to a side wall, wall beam, or tie beam.

K-Series Joists should be placed no closer than 6 inches (152 mm) to adjacent walls or structural members. LH-Series and DLH-Series Joists should be placed no closer than 12 inches (305 mm) to adjacent walls or structural members. Where partition walls are supported by parallel floor 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. When partitions occur perpendicular to the joists, they shall be treated as concentrated loads on the supporting joists.

2.4 SPECIFYING DESIGN LOADS

Neither the Steel Joist Institute nor the joist manufacturer establishes the loading requirements for which structures are designed.

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:

- Ponded rain water.
- Accumulation of snow in the vicinity of obstructions such as penthouses, signs, parapets, adjacent buildings, etc.
- Wind and seismic forces. Indicate wind NET uplift in pounds per square foot (Pascals) and any other wind or seismic forces required to be incorporated into the joist or Joist Girder design. If applicable, make clear if loads specified are reduced (i.e. for ASD $0.6W=$, $0.7E=$) and provide any pertinent S_{Ds} values. Connection details shall be designed by the *specifying professional*.
- Movable partitions. Convey any special deflection requirements as well as any stacked loading conditions.
- 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 at or near the top 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 transferring 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 design 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. Additional design tools and details are available at the Steel Joist Institute's website, www.steeljoist.org.
- Joist chords shall not carry out-of-plane or torsional loads, such as from horizontal components of concentrated loads applied to laterally sloped joists, braces, screen walls, posts, etc. The structural contract drawings shall show the required structural bracing to resolve these forces.



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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 shall require consideration by the joist manufacturer. For nominal concentrated loads, which have been accounted for in the specified uniform design loads, a “strut” to transfer the load to a panel point on the opposite chord shall not be required provided that the sum of the concentrated loads within a chord panel does not exceed 100 pounds (445 N) and the attachments are concentric to the chord. When exact dimensional locations for concentrated loads which do not meet the above criteria are provided by the *specifying professional*, the joist shall be designed for the loads and load locations provided without the need for additional field applied web members at the specified locations.

(a) Specifying Joist Design Loads

The Steel Joist Institute Load Tables are based on uniform loading conditions and are valid for use in selecting joist sizes for gravity loads that can be expressed in terms of “pounds per linear foot” (kiloNewtons per meter) of joist.

For other loads, the Specifying Professional shall use one of the five options described below that allows:

- The estimator to price the joists.
- The joist manufacturer to design the joists in accordance with the Standard Specifications of latest adoption.
- The owner to obtain the most economical joists.

Option 1: Select a joist designation from the Standard Load Table (or specify a joist type using a uniform load in the designation) which has been determined to be adequate for all design loads. The shear and moment envelope resulting from the selected uniform load shall meet the actual shear and moment requirements. Thus, this option alone may not be adequate if large concentrated loads need to be designed for.

Option 2: Select a joist designation from the Standard Load Table (or specify a joist type using a uniform load in the designation) and also provide the load and location of any additional loads on the structural plan with a note “Joist manufacturer shall design joists for additional loads at locations shown.” This option works well for a few added loads per joist with known magnitude and locations.

Option 3: For additional point loads with exact locations not known along the joist or for incidental loads, any one, or both, of the following can be specified on the structural plan in addition to option 1 or 2 above:

- a) “**Design for a () lb. concentrated load located at any one panel point along the joist**”. This is referred to as an *Add-Load*.
- b) “**Design for additional bending stresses resulting from a () lb. concentrated load located at any location along () chord**”. This is referred to as a *Bend-Check* and can be specified on the top chord, bottom chord, or both top and bottom chords. This can be used when the concentrated load is already accounted for in the joist designation, uniform load, or specified *Add-Load* yet this specified amount of load shall be permitted to also be located at any location between panel points. The additional bending stresses as a result of this load are then designed for. A *Bend-Check* load shall not exceed (*Add-Load* + 400 lbs.) A *Bend-Check* load can be specified by itself without an *Add-Load*.
- c) Both (a) and (b) above can be specified with equal concentrated loads for each; or simply denote “**Design joist for a () lb. concentrated load at any location along the () chord.**”

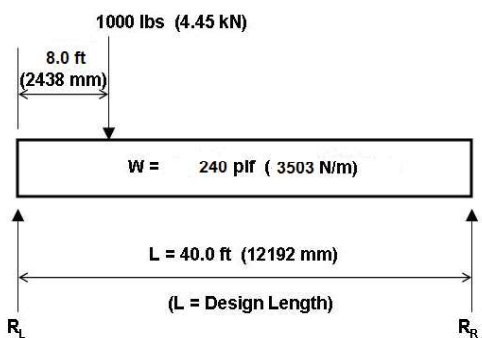
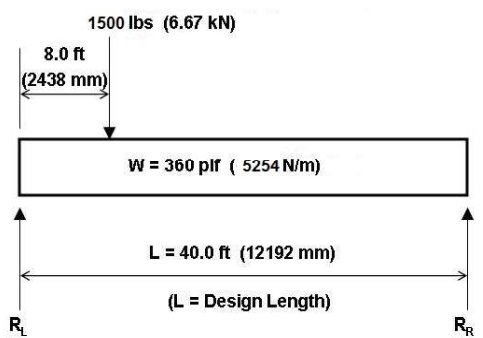
Example uses:

- *Specifying professional* selects a standard joist capable of carrying a 500 lb. RTU. However, the location and exact frame size is not yet known but the frame load shall result in two- 250 lb. point loads at least 5'-0" apart. **Specify a 250 lb. Bend-Check.**
- Standard joist specified but not selected for 500 lb. RTU load, location not known. **Specify a 500 lb. Add-Load and 250 lb. Bend-Check.**
- Standard SJI joist selected to carry collateral load of 3 psf. *Specifying professional* wants bending from 150 lb. incidental loads to also be designed for. **Specify a 150 lb. Bend-Check.**

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Option 4: Select a KCS joist using moment and end reaction without specifying added loads or diagrams. This option works well for concentrated loads for which exact locations are not known or for multiple loading.

- Determine the maximum moment.
- Determine the maximum end reaction (shear).
- Select the required KCS joist that provides the required moment and end reaction (shear). Note that the top chord end panel is designed for axial load based on the force in the first tension web, that is based on the specified end reaction. A uniform load of 825 plf (12030 N/m) LRFD or 550 plf (8020 N/m) ASD is used to check end panel bending. If the end panel loading exceeds this, reduce the joist spacing or go to Option 5.
- Specify on the structural drawings that an extra web shall be field applied at all concentrated loads not occurring at panel points.

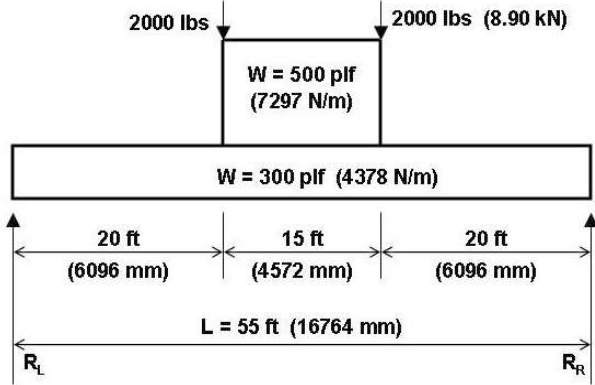
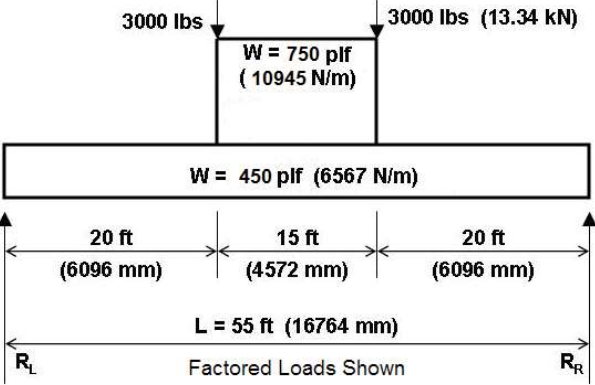
OPTION 4 - ASD EXAMPLE 1:	OPTION 4 - LRFD EXAMPLE 1:
<p>U.S. CUSTOMARY UNITS AND (METRIC UNITS)</p> 	<p>U.S. CUSTOMARY UNITS AND (METRIC UNITS)</p> 
<p>M = 625 k-in. (70.6 kN-m) RL = 5600 lbs (24.9 kN), RR = 5000 lbs (22.2 kN) Select a 22KCS3, M = 658 k-in. (74.3 kN-m) R = 6600 lbs (29.3 kN) Bridging 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.</p>	<p>M = 938 k-in. (105.9 kN-m) RL = 8400 lbs (37.37 kN), RR = 7500 lbs (33.36 kN) Select a 22KCS3, M = 987 k-in. (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.</p>



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OPTION 4 - ASD EXAMPLE 2:	OPTION 4 - LRFD EXAMPLE 2:
U.S. CUSTOMARY UNITS AND (METRIC UNITS)	U.S. CUSTOMARY UNITS AND (METRIC UNITS)
<p>M = 443 k-in. (50.1 kN-m) R_L = 5000 lbs (22.24 kN), R_R = 5340 lbs (23.75 kN) Select a 22KCS2, M = 488 k-in. (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.</p>	<p>M = 664 k-in. (75.03 kN-m) R_L = 7500 lbs (33.36 kN), R_R = 8010 lbs (35.63 kN) Select a 22KCS2, M = 732 k-in. (82.64 kN-m) R = 8850 lbs (39.3 kN) Bridging section no. 6 for L = 30 ft. (9144mm) Use 22K6 to determine bridging and stability requirements. Since the maximum factored uniform load of 645 plf (9413 N/m) (405 plf (5911 N/m) + 240 plf (3503 N/m)) does not exceed the maximum KCS Joist uniform load of 825 plf (12030 N/m) and a standard KCS Joist can be selected from the load table, a load diagram is not required.</p>

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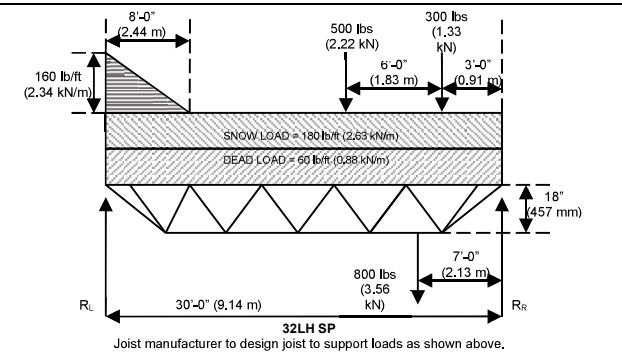
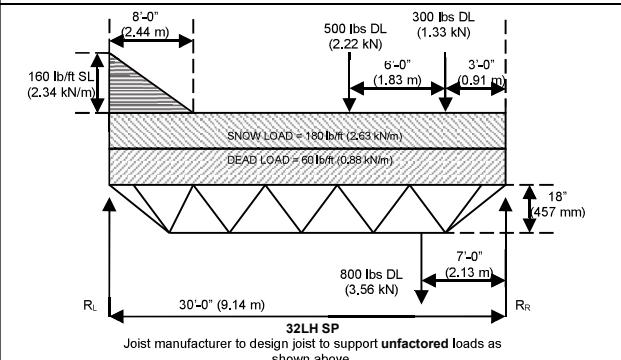
OPTION 4 - ASD EXAMPLE 3:	OPTION 4 - LRFD EXAMPLE 3:
U.S. CUSTOMARY UNITS AND (METRIC UNITS)	U.S. CUSTOMARY UNITS AND (METRIC UNITS)
	
<p>M = 2910 k-in. (328.8 kN-m) RL = RR = 14000 lbs (62.28 kN) EXCEEDS CAPACITY OF 30KCS5 (MAXIMUM KCS JOIST) AND EXCEEDS MAXIMUM UNIFORM LOAD OF 550 plf (8027 N/m). OPTION A: Use double joists each having a minimum moment capacity, M = 1455 k-in. (164.4 kN-m) and shear capacity, R = 7000 lbs (31.14 kN) and a uniform load of 400 plf (5838 N/m). Select two 28KCS5, M = 1704 k-in. (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 a LH-Series Joist. See OPTION 5.</p>	<p>M = 4365 k-in. (493.2 kN-m) RL = RR = 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 moment capacity, M = 2183 k-in. (246.65 kN-m) and shear capacity, R = 10500 lbs (46.71 kN) and a uniform load of 600 plf (8756 N/m). Select two 28KCS5, M = 2556 k-in. (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 a LH-Series Joist. See OPTION 5.</p>

Option 5: Specify a SPECIAL joist designation when the joist includes more complex loading or for conditions which need consideration of multiple potentially controlling load combinations.

- Provide a load diagram and/or enough information on the drawings to clearly define ALL loads.
- If the loading criteria are too complex to adequately communicate on the drawings or with a simple load diagram, then the *specifying professional* shall provide a load schedule along with the appropriate load combinations. Regardless of where the loads are shown, unfactored design loads broken down by load categories shall be provided in order to design the joists correctly with applicable load combinations.

Place the designation (e.g. 28K SP or 28LH SP) with the following note: "Joist manufacturer to design joist to support loads as shown."

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OPTION 5 - ASD EXAMPLE: U.S. CUSTOMARY UNITS AND (METRIC UNITS)	OPTION 5 - LRFD EXAMPLE: U.S. CUSTOMARY UNITS AND (METRIC UNITS)
Load diagram per ASCE 7 2.4.1(3), D + S	Unfactored Load diagram per ASCE 7 2.3.2(3), 1.2D+1.6S
	
PLEASE NOTE THE LOAD COMBINATIONS SHOWN ARE FOR REFERENCE EXAMPLES ONLY.	

CAUTION FOR OPTIONS 1 thru 5 ABOVE:

If a K-Series joist is being specified, 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 use additional joists to reduce the loading or use an LH-Series joist and make provisions for 5 inch (127 mm) deep bearing seats.

If the joist has not been designed for localized accumulation of loads that results in a point or concentrated load, this load attachment shall be made at top or bottom chord panel points. Therefore, specify on the structural drawings, "Where concentrated loads do not occur at panel points, an extra web shall be field applied from the point of attachment to a panel point on the opposite chord", and indicate the extra web size and weld requirements. When exact dimensional locations for concentrated loads are provided by the *specifying professional*, the joist shall be designed for the loads and load locations provided without the need for additional field applied web members at the specified locations.

(b) Specifying Joist Girder Design Loads

The Steel Joist Institute's Design Guide ASD or LRFD Weight Tables for Joist Girders 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. Note that anything other than point loads shall be shown unfactored or in a Load Schedule. 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 information provided in the tables gives 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 that shall 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.
4. Live load deflection rarely governs because of the relatively small span to depth ratios of Joist Girders. However, it is recommended that a breakdown of the point loads, by load category (i.e. TL/LL), be provided so specified deflection requirements and load combinations can be properly accounted for in design.



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Example using <u>Allowable Strength Design (ASD)</u> and U. S. Customary units:	Example using <u>Load and Resistance Factor Design (LRFD)</u> and U. S. Customary units:												
<table border="1" data-bbox="332 632 634 674"> <tr> <td>44G</td> <td>8N</td> <td>11.9K</td> </tr> <tr> <td>Depth in Inches</td> <td>Number of Joist Spaces</td> <td>Load in Kips at Each Panel Point</td> </tr> </table>	44G	8N	11.9K	Depth in Inches	Number of Joist Spaces	Load in Kips at Each Panel Point	<table border="1" data-bbox="971 632 1273 674"> <tr> <td>44G</td> <td>8N</td> <td>17.4F</td> </tr> <tr> <td>Depth in Inches</td> <td>Number of Joist Spaces</td> <td>Factored Load in Kips at Each Panel Point</td> </tr> </table>	44G	8N	17.4F	Depth in Inches	Number of Joist Spaces	Factored Load in Kips at Each Panel Point
44G	8N	11.9K											
Depth in Inches	Number of Joist Spaces	Load in Kips at Each Panel Point											
44G	8N	17.4F											
Depth in Inches	Number of Joist Spaces	Factored Load in Kips at Each Panel Point											
<p>Given 42'-0" x 50'-0" bay. Joists spaced on 5'-3" centers</p> <p>Live Load = 30 psf Dead Load = 15 psf (includes the approximate Joist Girder weight) Total Load = 45 psf</p> <p>Note: Web configuration may vary from that shown. Contact joist manufacturer if exact layout must be known.</p> <ol style="list-style-type: none"> Determine number of actual joist spaces (N). In this example, N = 8. Compute total load: Total load = 5.25 x 45 psf = 236.25 plf Joist Girder Section: (Interior) <ol style="list-style-type: none"> Compute the concentrated load at top chord panel points $P = 236.25 \times 50 = 11,813 \text{ lbs} = 11.9 \text{ kips}$ (use 12K for depth selection). 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. The Joist Girder shall then be designated 44G8N11.9K. 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. 	<p>Given 42'-0" x 50'-0" bay. Joists spaced on 5'-3" centers</p> <p>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)</p> <p>Note: Web configuration may vary from that shown. Contact joist manufacturer if exact layout must be known.</p> <ol style="list-style-type: none"> Determine number of actual joist spaces (N). In this example, N = 8. Compute total factored load: Total load = 5.25 x 66 psf = 346.50 plf Joist Girder Section: (Interior) <ol style="list-style-type: none"> Compute the factored concentrated load at top chord panel points $P = 346.5 \times 50 = 17,325 \text{ lbs} = 17.4 \text{ kips}$ (use 18K for depth selection). 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. The Joist Girder shall 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. The LRFD Joist Girder Design Guide Weight Table shows the weight for a 44G8N18.0F 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. 												

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<p>e) Check live load deflection:</p> <p>Live load = 30 psf x 50 ft. = 1500 plf</p> <p>Approximate Joist Girder moment of inertia = 0.027 NPLd</p> <p>= 0.027 x 8 x 11.9 x 42 x 44 = 4750 in.⁴</p> <p>Allowable deflection for plastered ceilings</p> <p>= L/360 = $\frac{42(12)}{360} = 1.40$ in.</p> <p>$\Delta = 1.15 \left[\frac{5wL^4}{384EI} \right] = \frac{1.15(5)(1.500/12)[(42)(12)]^4}{384(29000)(4750)}$</p> <p>= 0.88 in. <1.40 in., Okay</p>	<p>e) Check live load deflection:</p> <p>Live load = 30 psf x 50 ft. = 1500 plf</p> <p>Approximate Joist Girder moment of inertia = 0.018 NPLd</p> <p>= 0.018 x 8 x 17.4 x 42 x 44 = 4630 in.⁴</p> <p>Allowable deflection for plastered ceilings</p> <p>= L/360 = $\frac{42(12)}{360} = 1.40$ in.</p> <p>$\Delta = 1.15 \left[\frac{5wL^4}{384EI} \right] = \frac{1.15(5)(1.500/12)[(42)(12)]^4}{384(29000)(4630)}$</p> <p>= 0.90 in. <1.40 in., Okay</p>
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

(c) Load Schedule Example

LOAD SCHEDULE (all loads are to be shown as unfactored)

MARK	DESIGNATION ⁽¹⁾ (TL/LL) Joists: (plf) Girders: (kips)	LOADING ⁽²⁾		W WIND		ADD-LOAD ⁽⁶⁾ TL/LL (kips/kips)	BEND-CHECK ⁽⁷⁾		REMARKS
		DL ⁽³⁾ (plf)	LL ⁽⁴⁾ or L _r /S/R (plf)	DOWN WARD (plf)	NET ⁽⁵⁾ UPLIFT (plf)		D TC (kips)	D BC (kips)	
J1	18KSP	120	185		180	1.0/0.6		0.3	Axial Loads Wind Moments Drift Loads, see diagram
J2	24K7SP	85	155						
J3	28LHSP	110	355	95	175	0.5			
G1	36G5N6.5K/3.5K				360				End Moments

- (1) Joist designation loads include all uniform gravity loads. **Provide both Total and Live loads.**
- (2) Loading values are not required if designation loading values are correct for deflection and load combinations.
- (3) When standard SJI designations are used, the design Dead Load is required for load combinations with Wind or Seismic.
- (4) The Floor or Roof Live load, Snow, or Rain load.
- (5) When Net Uplift is specified for simple loading, it shall already take into account possible reduced Dead Loading present in order to create the largest Net uplift load combination. For more complex loading or when the Dead Load varies greatly for use in load combinations below, **Gross** uplift should be specified with the minimum and maximum Dead Loading values clearly defined. If the uplift cannot be assigned in pounds per lineal foot, a diagram can be shown for joist loading using pounds per square foot.
- (6) A concentrated load applied at any panel point on both the top chord and bottom chord.
- (7) Chord members shall be designed for additional bending stresses created by this concentrated Total load.



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When in-plane moments (wind load, seismic load) are specified, continuity moments (live load) **shall** also be specified. A Load Schedule that shows a complete breakdown of all loads by Load Category may be required.

AXIAL and END MOMENT LOAD SCHEDULE

MARK	DESIGNATION (TL/LL) Joists: (plf) Girders: (kips)	MIN. I (in. ⁴)	AXIAL			END MOMENTS								TRANSFER DETAILS @ GRIDS	
			W WIND (kips)	E SEISMIC (kips)	E _m (kips)	LIVE LOAD CONTINUITY MOMENTS (k-ft.)	LATERAL MOMENTS (k-ft.)								
							W WIND		E		E _m				
							LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT		RIGHT
J1 J2 G1	18KSP 24K7SP 36G5N6.5K/3.5K	985	W=18.0	E=21.8											9/S8 @ 4 11/S8 @ B,C

When special loads as shown in the tables above are specified, the load combinations to be used for joist and Joist Girder design **shall** be provided. Two examples showing how to list load combinations are shown below:

LRFD example- Basic Load Combinations	ASD example - Basic Load Combinations
1. 1.4D	1. D
2. 1.2D + 1.6L + 0.5(L _r or S or R)	2. D + L
3. 1.2D + 1.6(L _r or S or R) + (1.0L or 0.5W)	3. D + (L _r or S or R)
4. 1.2D + 1.0W + 1.0L + 0.5(L _r or S or R)	4. D + 0.75L + 0.75(L _r or S or R)
5. 1.2D + 1.0E + 1.0L + 0.2S	5. D + (0.6W or 0.7E)
6. 0.9D + 1.0W	6a. D + 0.75L + 0.75(0.6W) + 0.75(L _r or S or R)
7. 0.9D + 1.0E	6b. D + 0.75L + 0.75(0.7E) + 0.75S
	7. 0.6D + 0.6W
	8. 0.6D + 0.7E
Special Seismic Load Combinations	Special Seismic Load Combinations
8. (1.2 + 0.2S _{DS})D + E _h + L + 0.2S	9. (1.0 + 0.14S _{DS})D + 0.7E _h
9. (0.9 - 0.2S _{DS})D + E _h	10. (1.0 + 0.105S _{DS})D + 0.525E _h + 0.75L + 0.75(L _r or S or R)
	11. (0.6 - 0.14S _{DS})D + 0.7E _h

2.5 JOIST AND JOIST GIRDER EXTENSIONS

Steel joist and Joist Girder extensions shall be specified and designed in accordance with the requirements of the Steel Joist Institute Standard Specifications of latest adoption.



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2.6 CEILING EXTENSIONS

Ceiling extensions shall be furnished to support ceilings that are to be attached directly 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 any specified ceiling loads.

2.7 BRIDGING AND BRIDGING ANCHORS

- (a) Bridging standard with the manufacturer and complying with the Steel Joist Institute Standard Specifications of latest adoption shall be used for bridging all joists furnished by the joist manufacturer. Positive anchorage shall be provided at the ends of each bridging row at both top and bottom chords.
- (b) For K-Series and LH-Series joists, horizontal bridging is recommended for spans up to and including 60 feet (18288 mm) except where the Steel Joist Institute Standard Specifications Load Tables & Weight Tables require bolted diagonal bridging for erection stability.

LH-Series and DLH-Series joists exceeding 60 feet (18288 mm) in length shall have bolted diagonal bridging for all rows.

Refer to Section 5.5 in the Steel Joist Institute Standard Specification for erection stability requirements.

Refer to Appendix B for OSHA steel joist erection stability requirements.

Horizontal bridging shall consist of continuous horizontal steel members designed per Section 5.5 in the Steel Joist Institute Standard Specifications. The material sizes listed in Table 2.7-1 meet the requirements of the specifications. Alternately, or for "load/length" designation joists, Table 2.7-2 provides the maximum horizontal bridging force, P_{br} , for various combinations of joist spacing and bridging angle size.

- (c) Diagonal cross bridging consisting of angles or other shapes connected to the top and bottom chords of K-Series, LH-Series, and DLH-Series joists shall be used when required by the Steel Joist Institute Standard Specifications of latest adoption.

Diagonal bridging, when used, shall be designed per Section 5.5 in the Steel Joist Institute Standard Specifications.

When the bridging members are connected at their point of intersection, the material sizes listed in Table 2.7-3 and Table 2.7-4 meet the requirements of the specifications.

For LH-Series and DLH-Series joists, where the joist spacing is less than 70 percent of the joist depth, bolted horizontal bridging shall be provided in addition to the diagonal bridging, as shown in Table 2.7-4.

- (d) When bolted diagonal erection bridging is required, the following shall apply:
1. The bridging shall be indicated on the joist placement plans.
 2. The joist placement plans 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 a 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.
 6. See Table 2.7-5 for bolt sizes that meet the connection requirements of the Steel Joist Institute Standard Specifications Section 5.5.

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TABLE 2.7-1

MAXIMUM JOIST SPACING FOR HORIZONTAL BRIDGING							
SPANS OVER 60 ft. (18.3 m) REQUIRE BOLTED DIAGONAL BRIDGING							
JOIST SECTION NUMBER ¹	Nominal Unfactored Force P _{br} lbs (N)	BRIDGING MATERIAL SIZE ²					
		Equal Leg Angles					
		1 x 7/64 (25 x 3 mm) r = 0.20" (5.08 mm)	1-1/4 x 7/64 (32 x 3 mm) r = 0.25" (6.35 mm)	1-1/2 x 7/64 (38 x 3 mm) r = 0.30" (7.62 mm)	1-3/4 x 7/64 (45 x 3 mm) r = 0.35" (8.89 mm)	2 x 1/8 (52 x 3 mm) r = 0.40" (10.16 mm)	2-1/2 x 5/32 (64 x 4 mm) r = 0.50" (12.70 mm)
ft.-in. (mm)	ft.-in. (mm)	ft.-in. (mm)	ft.-in. (mm)	ft.-in. (mm)	ft.-in. (mm)		
K1 – 8	340 (1512)	5'-0" (1524)	6'-3" (1905)	7'-6" (2286)	8'-9" (2667)	10'-0" (3048)	12'-6" (3810)
K9-10, LH02-03	450 (2002)	4'-4" (1321)	6'-1" (1854)	7'-6" (2286)	8'-9" (2667)	10'-0" (3048)	12'-6" (3810)
K11-12, LH04-05	560 (2491)	3'-11" (1194)	5'-6" (1676)	7'-4" (2235)	8'-9" (2667)	10'-0" (3048)	12'-6" (3810)
LH06-08	750 (3336)		4'-9" (1448)	6'-3" (1905)	7'-11" (2413)	10'-0" (3048)	12'-6" (3810)
LH09	850 (3781)		4'-5" (1346)	5'-10" (1778)	7'-5" (2261)	9'-9" (2972)	12'-6" (3810)
LH/DLH10	900 (4003)		4'-4" (1321)	5'-8" (1727)	7'-3" (2210)	9'-5" (2870)	12'-6" (3810)
LH/DLH11	950 (4226)		4'-2" (1270)	5'-7" (1702)	7'-0" (2134)	9'-2" (2794)	12'-6" (3810)
LH/DLH12	1100 (4893)		3'-11" (1194)	5'-2" (1575)	6'-8" (2032)	8'-6" (2591)	12'-6" (3810)
LH/DLH13	1200 (5338)		3'-9" (1143)	4'-11" (1499)	6'-3" (1905)	8'-2" (2489)	12'-6" (3810)
LH/DLH14	1300 (5783)			4'-9" (1448)	6'-0" (1829)	7'-10" (2388)	12'-4" (3759)
LH/DLH15	1450 (6450)			4'-6" (1372)	5'-8" (1727)	7'-5" (2261)	11'-8" (3556)
LH/DLH16-17	1850 (8229)			4'-0" (1219)	5'-0" (1524)	6'-7" (2007)	10'-4" (3150)
LH/DLH18-20	2350 (10453)			3'-7" (1067)	4'-4" (1321)	5'-10" (1778)	9'-1" (2769)
LH/DLH21-22	3150 (14012)				3'-10" (1168)	5'-0" (1524)	7'-11" (2413)
LH/DLH23-24	4130 (18371)				3'-4" (1016)	4'-5" (1346)	6'-11" (2108)
LH/DLH25	4770 (21218)					4'-1" (1245)	6'-5" (1956)

(1) Refer to last two digit(s) of Joist Designation

(2) Connection to joist shall resist force listed in the Steel Joist Institute Standard Specifications Table 5.5-2



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TABLE 2.7-2

JOIST SPACING (ft.-in.)	MAXIMUM BRIDGING FORCE (P _{br}) FOR HORIZONTAL BRIDGING (lbs)						
	BRIDGING ANGLE SIZE (EQUAL LEG ANGLE)						
	1 x 7/64 r = 0.20"	1¼ x 7/64 r = 0.25"	1½ x 7/64 r = 0.30"	1¾ x 7/64 r = 0.35"	2 x 1/8 r = 0.40"	2½ x 5/32 r = 0.50"	3 x 3/16 r = 0.60"
2'-0"	2150	3960	5600				
2'-6"	1370	2730	4410	5910			
3'-0"	950	1890	3290	4850			
3'-6"	700	1390	2420	3840	6180		
4'-0"	530	1060	1850	2960	5030		
4'-6"	420	840	1460	2340	4000		
5'-0"	340	680	1180	1890	3240		
5'-6"	-	560	980	1560	2670		
6'-0"	-	470	820	1310	2250	5490	
6'-6"	-	-	700	1120	1910	4680	
7'-0"	-	-	600	960	1650	4030	
7'-6"	-	-	520	840	1440	3510	
8'-0"	-	-	-	740	1260	3090	
8'-6"	-	-	-	650	1120	2740	5680
9'-0"	-	-	-	-	1000	2440	5060
9'-6"	-	-	-	-	890	2190	4540
10'-0"	-	-	-	-	810	1970	4100
10'-6"	-	-	-	-	-	1790	3720
11'-0"	-	-	-	-	-	1630	3390
11'-6"	-	-	-	-	-	1490	3100
12'-0"	-	-	-	-	-	1370	2850



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TABLE 2.7-3

K, LH, and DLH SERIES JOISTS MAXIMUM JOIST SPACING FOR DIAGONAL BRIDGING ¹								
JOIST DEPTH	BRIDGING ANGLE SIZE – (EQUAL LEG ANGLE) ²							
	1 x 7/64 (25 x 3 mm) r = 0.20" (5.08 mm)	1-1/4 x 7/64 (32 x 3 mm) r = 0.25" (6.35 mm)	1-1/2 x 7/64 (38 x 3 mm) r = 0.30" (7.62 mm)	1-3/4 x 7/64 (45 x 3 mm) r = 0.35" (8.89 mm)	2 x 1/8 (50 x 3 mm) r = 0.40" (10.16 mm)	2 1/2 x 5/32 (64 x 4 mm) r = 0.50" (12.70 mm)	3 x 3/16 (76 x 5 mm) r = 0.60" (15.24 mm)	3 1/2 x 1/4 (89 x 6 mm) r = 0.70" (17.78 mm)
in. (mm)	ft.-in. (mm)	ft.-in. (mm)	ft.-in. (mm)	ft.-in. (mm)	ft.-in. (mm)	ft.-in. (mm)	ft.-in. (mm)	ft.-in. (mm)
12" (305)	6'-7" (2007)	8'-3" (2514)	9'-11" (3022)	11'-7" (3530)	13'-3" (4038)	16'-7" (5055)	19'-11" (6070)	23'-3" (7086)
14" (356)	6'-6" (1981)	8'-3" (2514)	9'-11" (3022)	11'-7" (3530)	13'-3" (4038)	16'-7" (5055)	19'-11" (6070)	23'-3" (7086)
16" (406)	6'-6" (1981)	8'-2" (2489)	9'-10" (2997)	11'-7" (3530)	13'-3" (4038)	16'-7" (5055)	19'-11" (6070)	23'-3" (7086)
18" (457)	6'-6" (1981)	8'-2" (2489)	9'-10" (2997)	11'-6" (3505)	13'-3" (4038)	16'-7" (5055)	19'-11" (6070)	23'-3" (7086)
20" (508)	6'-5" (1955)	8'-2" (2489)	9'-10" (2997)	11'-6" (3505)	13'-2" (4013)	16'-7" (5055)	19'-11" (6070)	23'-3" (7086)
22" (559)	6'-4" (1930)	8'-1" (2463)	9'-10" (2997)	11'-6" (3505)	13'-2" (4013)	16'-6" (5029)	19'-11" (6070)	23'-3" (7086)
24" (610)	6'-4" (1930)	8'-1" (2463)	9'-9" (2971)	11'-5" (3479)	13'-2" (4013)	16'-6" (5029)	19'-10" (6045)	23'-3" (7086)
26" (660)	6'-3" (1905)	8'-0" (2438)	9'-9" (2971)	11'-5" (3479)	13'-1" (3987)	16'-6" (5029)	19'-10" (6045)	23'-2" (7061)
28" (711)	6'-3" (1905)	8'-0" (2438)	9'-8" (2946)	11'-5" (3479)	13'-1" (3987)	16'-6" (5029)	19'-10" (6045)	23'-2" (7061)
30" (762)	6'-2" (1879)	7'-11" (2413)	9'-8" (2946)	11'-4" (3454)	13'-1" (3987)	16'-5" (5004)	19'-10" (6045)	23'-2" (7061)
32" (813)	6'-1" (1854)	7'-10" (2387)	9'-7" (2921)	11'-4" (3454)	13'-0" (3962)	16'-5" (5004)	19'-9" (6020)	23'-2" (7061)
36" (914)	5'-11" (1803)	7'-9" (2362)	9'-6" (2895)	11'-3" (3429)	12'-11" (3973)	16'-4" (4979)	19'-9" (6020)	23'-1" (7035)
40" (1016)	5'-9" (1753)	7'-7" (2311)	9'-5" (2870)	11'-2" (3403)	12'-10" (3911)	16'-4" (4979)	19'-8" (5994)	23'-1" (7035)
44" (1118)	5'-6" (1676)	7'-5" (2260)	9'-3" (2819)	11'-0" (3352)	12'-9" (3886)	16'-3" (4953)	19'-7" (5969)	23'-0" (7010)
48" (1219)	5'-4" (1626)	7'-3" (2209)	9'-2" (2794)	10'-11" (3327)	12'-8" (3860)	16'-2" (4928)	19'-7" (5969)	22'-11" (6985)
52" (1321)	5'-0" (1524)	7'-1" (2159)	9'-0" (2743)	10'-10" (3302)	12'-7" (3835)	16'-1" (4902)	19'-6" (5943)	22'-11" (6985)
56" (1422)	4'-9" (1448)	6'-10" (2083)	8'-10" (2692)	10'-8" (3251)	12'-5" (3784)	16'-0" (4877)	19'-5" (5918)	22'-10" (6960)
60" (1524)	4'-4" (1321)	6'-8" (2032)	8'-7" (2616)	10'-6" (3200)	12'-4" (3759)	15'-10" (4826)	19'-4" (5893)	22'-9" (6935)
64" (1626)	**	6'-4" (1931)	8'-5" (2565)	10'-4" (3149)	12'-2" (3708)	15'-9" (4801)	19'-3" (5867)	22'-8" (6909)
68" (1727)	**	6'-1" (1854)	8'-2" (2489)	10'-2" (3098)	12'-0" (3657)	15'-8" (4775)	19'-2" (5842)	22'-7" (6884)
72" (1829)	**	5'-9" (1753)	8'-0" (2438)	10'-0" (3048)	11'-10" (3606)	15'-6" (4724)	19'-1" (5816)	22'-6" (6858)
80" (2032)	**	5'-0" (1524)	7'-5" (2260)	9'-6" (2895)	11'-6" (3505)	15'-3" (4648)	18'-10" (5740)	22'-4" (6808)
88" (2235)		**	6'-9" (2058)	9'-0" (2743)	11'-1" (3378)	14'-11" (4546)	18'-7" (5664)	22'-1" (6731)
96" (2438)		**	6'-0" (1829)	8'-5" (2565)	10'-8" (3251)	14'-7" (4445)	18'-4" (5588)	21'-11" (6680)
104" (2642)			**	7'-9" (2362)	10'-1" (3073)	14'-2" (4318)	18'-0" (5486)	21'-8" (6604)
112" (2845)			**	7'-0" (2134)	9'-6" (2895)	13'-9" (4191)	17'-8" (5385)	21'-4" (6503)
120" (3048)				**	8'-9" (2667)	13'-4" (4064)	17'-3" (5258)	21'-1" (6426)

**** INTERPOLATION BELOW THE MINIMUM VALUES SHOWN IS NOT ALLOWED.**

1) SEE TABLE 2.7-4 FOR MINIMUM JOIST SPACE FOR DIAGONAL ONLY BRIDGING.
 2) In the shaded range of the Table, for LH23, 24, and 25, compressive strength requirements may control, reducing the maximum joist spacing shown. Either select a larger bridging angle size (outside of the shaded area) or check compression strength (Ref. Section 2.7(c)) for LH23, 24, and 25.



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TABLE 2.7-4

LH AND DLH SERIES JOISTS HORIZONTAL PLUS DIAGONAL BRIDGING REQUIREMENTS		
JOIST DEPTH	MINIMUM JOIST SPACE FOR DIAGONAL ONLY BRIDGING (0.70 x DEPTH)*	HORIZONTAL AND DIAGONAL MINIMUM ANGLE SIZE REQUIRED FOR JOIST SPACING < (0.70 X DEPTH) AND JOIST SPANS > 60'-0" (18.3 m)
in. (mm)	ft.-in. (mm)	in. (mm)
52" (1321)	3'- 0" (914)	1" x 1" x 7/64" (25 x 3)
56" (1422)	3'- 3" (990)	1" x 1" x 7/64" (25 x 3)
60" (1524)	3'- 6" (1066)	1" x 1" x 7/64" (25 x 3)
64" (1626)	3'- 8" (1117)	1 1/4" x 1 1/4" x 7/64" (32 x 3)
68" (1727)	3'-11" (1193)	1 1/4" x 1 1/4" x 7/64" (32 x 3)
72" (1829)	4'- 2" (1270)	1 1/4" x 1 1/4" x 7/64" (32 x 3)
80" (2032)	4'- 8" (1422)	1 1/4" x 1 1/4" x 7/64" (32 x 3)
88" (2235)	5'- 1" (1549)	1 1/2" x 1 1/2" x 7/64" (38 x 3)
96" (2438)	5'- 7" (1702)	1 1/2" x 1 1/2" x 7/64" (38 x 3)
104" (2642)	6'- 0" (1829)	1 3/4" x 1 3/4" x 7/64" (44 x 3)
112" (2845)	6'- 6" (1981)	1 3/4" x 1 3/4" x 7/64" (44 x 3)
120" (3048)	7'- 0" (2134)	2" x 2" x 1/8" (51 x 3)

*NOTE: WHEN THE JOIST SPACING IS LESS THAN 0.70 x JOIST DEPTH,
BOLTED HORIZONTAL BRIDGING SHALL BE USED IN ADDITION TO DIAGONAL BRIDGING.

TABLE 2.7-5

BOLT SIZES WHICH MEET BOLTED BRIDGING CONNECTION REQUIREMENTS		
JOIST SERIES	SECTION NUMBER*	BOLT DIAMETER
K	ALL	3/8" (10 mm) A307
LH/DLH	2 – 12	3/8" (10 mm) A307
LH/DLH	13 – 17	1/2" (13 mm) A307
LH/DLH	18 – 20	5/8" (16 mm) A307
LH/DLH	21 – 22	5/8" (16 mm) A325
LH/DLH	23 – 25	3/4" (19 mm) A325

*REFER TO LAST DIGIT(S) OF JOIST DESIGNATION
NOTE: WASHERS SHALL BE USED WITH SLOTTED OR OVERSIZED HOLES. BOLTS SHALL BE TIGHTENED TO A MINIMUM SNUG TIGHT CONDITION.



2.8 HEADERS

Where the end reaction of a steel joist is supported by a header, as outlined and defined in Section 5.2(a), and is not more than 10,000 pounds (44482 N), the header shall be furnished by the Seller. Such headers shall be any type standard with the joist manufacturer. Conditions involving headers shall be investigated during erection and, if necessary, provisions made to provide a safe condition. Headers are not provided for steel joists with end reactions greater than 10,000 pounds (44482 N).

2.9 BOTTOM CHORD LATERAL BRACING FOR JOIST GIRDERS

Bottom chord lateral bracing shall be furnished as required 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 of latest adoption. The lateral bracing shall be that which is standard with the joist manufacturer, and shall be sufficient to properly brace the bottom chord of the Joist Girder.

2.10 CONNECTIONS

The adequacy of the end anchorage connection (bolted or welded) between the joist or Joist Girder bearing seat and the supporting structure is the responsibility of the *specifying professional*. The contract documents shall clearly illustrate the end anchorage connection. Forces to be considered include end moments, axial loads, and diaphragm boundaries. Particular attention is required where there is net uplift.

Welded End Anchorage for Uplift

The strength of the joist bearing seat for an uplift loading combination is a function of both the joist seat thickness and length of the end anchorage welds. The minimum end anchorage welds as shown in the Steel Joist Institute Standard Specifications Table 5.7-1 may not develop the full capacity of the joist seat assembly for the specified uplift resistance. When the support dimensions allow, it is recommended the *specifying professional* use a small fillet weld thickness in conjunction with a longer weld length for the connection design to facilitate the design of the joist bearing seat. The joist manufacturer will provide a seat of sufficient thickness and strength to resist the uplift end reaction resulting from the specified uplift. For additional information, including tables for welded end anchorage uplift capacities, refer to Steel Joist Institute Technical Digest 6, "Structural Design of Steel Joist Roofs to Resist Uplift Loads"

Bolted End Anchorage for Uplift

Typically, joists and Joist Girders with bolted end anchorage also require a final connection by welding in order to provide lateral stability to the supporting member. However, only the bolts are relied on to provide uplift anchorage. The bolt type and diameter designed by the *specifying professional* shall provide sufficient tensile strength to resist the uplift end reaction resulting from the specified uplift. Bolts of higher strength than the minimum required by the Steel Joist Institute Standard Specifications may be required.

When the bearing seats are detailed for a bolted connection, bolts shall be installed. If the bolts are not installed, an equivalent welded connection may be permitted by the *specifying professional*, provided the weld is deposited in the slot on the side farthest from the edge of the seat. Additional weld required to meet that specified for the welded connection shall be placed at a location on the seat away from the outer edge of the slot as shown in Figure 2.10-1.

For additional information, including tables for bolted end anchorage uplift capacities, refer to Steel Joist Institute Technical Digest 6, "Structural Design of Steel Joist Roofs to Resist Uplift Loads"

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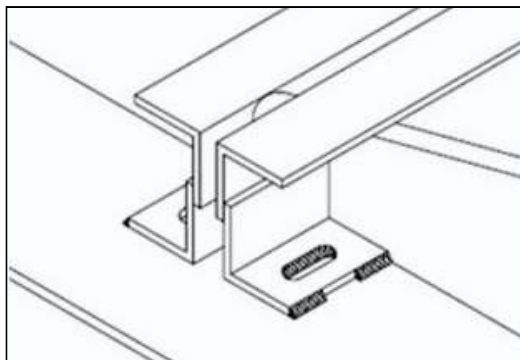


Figure 2.10-1

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 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 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 shall protect the steel for only a short period of exposure in ordinary atmospheric conditions.

Since most joists and Joist Girders are painted using a standard dip coating, the coating shall be permitted to not be uniform and shall be permitted to include drips, runs, and sags. Compatibility of any coating including fire protective coatings applied over the 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 Section 5.14 of the Steel Joist Institute Standard Specifications of latest adoption.

SECTION 5. **ESTIMATING**

5.1 PLANS FOR BIDDING

Plans to serve as the basis for bids shall show the character of the work with sufficient clarity to permit making an accurate estimate and shall show the following:

- Designation and location of Materials [see Section 5.2(a)], 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
- Joist Girder bottom chord bracing
- Headers which are defined as members supported by and carrying Open Web Steel Joists with end reactions of no more than 10,000 lbs. (44482 N)
- 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 shall be permitted to be quoted and identified by the joist manufacturer as separate items:

- Headers carrying Open Web Steel Joists with end reactions greater than 10,000 lbs. (44482 N)
- Headers for Deep Longspan Steel Joists, **DLH-Series**

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- 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
- Bridging anchors and anchorage
- 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 elevation of finished floors, roofs, and bearings shall be shown.

(a) Loads

The *specifying professional* shall clearly provide all design loads as described in Section 2.4 This includes 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.

(b) Connections

Minimum end anchorage for simple span gravity loading shall be in accordance with Steel Joist Institute Standard Specifications of latest adoption, Section 5.7. The end anchorage of a steel joist or Joist Girder is the connection of the joist or Joist Girder bearing seat to the support of the joist or Joist Girder.

The adequacy of the end anchorage connection (bolted or welded) between the joist or Joist Girder bearing seat and the supporting structure is the responsibility of the *specifying professional*. The contract documents shall clearly illustrate the end anchorage connection.

The joist manufacturer is responsible for the design of the bearing seats of joists or Joist Girders for the loads designated by the *specifying professional* in the contract documents.

The *specifying professional* is responsible for bridging termination connections. The contract documents shall clearly illustrate these termination connections.

(c) Special Considerations

The *specifying professional* shall indicate on the construction documents special considerations including:

- 1) 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 of latest adoption).
- 2) Oversized or other non-standard web openings
- 3) Extended Ends

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- 4) Deflection criteria for live and total loads for non-SJI standard joists
- 5) 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:

- a) 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.
- b) 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 of latest adoption).
- c) Connection requirements for:
 - 1) Joist supports
 - 2) Joist Girder supports
 - 3) Field splices
 - 4) Bridging attachments
- d) Deflection criteria for live load and total loads for non-SJI standard joists.
- e) Size, location, and connections for all bridging
- f) Joist headers

All Material shall be identified with its mark which also appears on the Bill of Materials. 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 shall be assumed to be correct in the absence of written notice from the Buyer to the contrary. When plans are furnished by the Buyer that 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, they 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.



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6.5 CHANGES

When any changes in plans are made by the Buyer (or the buyer's 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 of latest adoption 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:

- a) Non-SJI standard bridging details (e.g. for cantilevered conditions, net uplift, etc.)
- b) Connection details for:
 - 1) Non-SJI standard connections (e.g. flush framed or framed connections)
 - 2) Field splices
 - 3) Joist headers

SECTION 7.**HANDLING AND ERECTION**

The Buyer and Erector shall comply with the requirements of the Steel Joist Institute Standard Specifications of latest adoption in the handling and erection of Material. For additional coverage of this topic, refer to the Steel Joist Institute's Technical Digest 9, "Handling and Erection of Steel Joists and Joist Girders".

The Buyer and/or Erector shall check all materials on arrival at job site and promptly report to Seller any discrepancies and/or damages.

When joists cannot be delivered as a single piece, they shall be permitted to be delivered in several pieces therefore requiring the pieces to be spliced together in the field. The manufacturer's instructions SHALL be followed to ensure matching pieces are joined, proper bolts are used, and any required bolt tensioning is incorporated.

All joists shall be handled by methods which avoid damage to any part of the joist. For long LH-Series joists, DLH-Series joists, or Joist Girders this may require the use of spreader bars, multiple hoisting cables, or multiple cranes as necessary to safely handle the joist. Hoisting cables shall be attached at panel points and shall be at panel point locations selected to minimize erection stresses.

The current OSHA, 29 CFR Part 1926, Safety Standards for Steel Erection; 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 shall 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.

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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”. (For definition of “qualified person” see Code of Federal Regulations (CFR), Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926, Safety Standards for Steel Erection; Subpart R- Steel Erection, §1926.751 Definitions, January 18, 2001, Washington, D.C.)

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 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.

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 shall 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.

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STANDARD SPECIFICATION

FOR K-SERIES, LH-SERIES, AND DLH-SERIES OPEN WEB STEEL JOISTS AND FOR JOIST GIRDERS.

K-Series Adopted by the Steel Joist Institute November 4, 1985
LH/DLH-Series Adopted by the Steel Joist Institute May 10, 2006
Joist Girders Adopted by the Steel Joist Institute November 4, 1985
Revised to April 27, 2020, Effective July 1, 2020

SECTION 1.

SCOPE AND DEFINITIONS

1.1 SCOPE

The *Standard Specification for K-Series, LH-Series, DLH-Series Open Web Steel Joists and for Joist Girders*, hereafter referred to as the Specification, covers the design, manufacture, application, and erection stability and handling of Joist Girders and Open Web Steel Joists K-Series, LH-Series, and DLH-Series in buildings or other structures, where other structures are defined as those structures designed, manufactured, and erected in a manner similar to buildings. Joist Girders and K-Series, LH-Series, and DLH-Series joists shall be designed using Allowable Stress Design (ASD) or Load and Resistance Factor Design (LRFD) in accordance with this Specification. Included as part of this Specification are KCS joists, K-Series; Joist Substitutes, K-Series; and Top Chord Extensions and Extended Ends, K-Series.

1.2 OTHER REGULATIONS

Joist Girders and K-Series, LH-Series, and DLH-Series joists shall be erected in accordance with the Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926, Safety Standards for Steel Erection, Subpart R – Steel Erection. The erection of Joist Girders and K-Series, LH-Series, and DLH-Series joists 144 ft. (43.9 m) or less in length shall be in accordance with the requirements of Section 1926.757, Open Web Steel Joists. Joist Girders and DLH-Series joists greater than 144 ft. (43.9 m) in length shall be in accordance with the requirements of Section 1926.756 Beams and Columns.

1.3 APPLICATION

This Specification includes Section 1 through Section 6. The user notes shall not be part of the Specification.

User Note: User notes are intended to provide practical guidance in the use and application of this Specification.

1.4 DEFINITIONS

The following terms shall, for the purposes of this Specification, have the meanings shown in this Section. Where terms are not defined in this Section, those terms shall have their ordinary accepted meanings in the context in which it applies.

Joist Girders, K-Series, LH-Series, and DLH-Series shall be open web, in-plane load-carrying steel members utilizing hot-rolled or cold-formed steel, including cold-formed steel whose yield strength has been attained by cold working.

Joist Girders shall be open web steel trusses used as primary framing members designed as simple spans supporting in-plane concentrated loads for a floor or roof system. These concentrated loads shall be considered to act at the top chord panel points of the Joist Girders unless otherwise specified.



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The Joist Girder standard designation in ASD shall be established by its nominal depth in inches (mm), the letter “G”, followed by the number of joist spaces, the letter “N”, the load in kips (kN) at each panel point, and the letter “K”. The Joist Girder standard designation in LRFD shall be established by its nominal depth in inches (mm), the letter “G”, followed by the number of joist spaces, the letter “N”, the factored load in kips (kN) at each panel point, and the letter “F”. Joist Girders shall be designed in accordance with this Specification to support the loads defined by the specifying professional.

Joist Girders shall be designed and manufactured as either simple framing members with underslung ends and bottom chord extensions or as part of an ordinary steel moment frame (OMF). Where used as part of an OMF the specifying professional shall be responsible for carrying out all the required frame analyses (i.e. first-order and second-order), provide all the required load information and stiffness data to the joist manufacturer, and indicate the type of **Joist Girder** to column connections that are being designed on the structural drawings.

User Note: Joist Girders have been standardized in depths from 20 inches (508 mm) through 120 inches (3048 mm), for spans from 20 feet (6096 mm) through 120 feet (36576 mm).

Where this Specification refers to “steel joists”, this shall mean the K-Series, LH-Series, and DLH-Series joists.

User Note: Joists are suitable for the direct support of floors and roof slabs or decks. The K-Series joists are standardized in depths from 10 inches (254 mm) through 30 inches (762 mm), for spans up through 60 feet (18288 mm). The LH-Series joists are standardized in depths from 18 inches (457 mm) through 48 inches (1219 mm), for spans up through 96 feet (29261 mm). The DLH-Series joists are standardized in depths from 52 inches (1321 mm) through 120 inches (3048 mm), for spans up through 240 feet (73152 mm).

The K-Series, LH-Series and DLH-Series standard joist designations shall be established by their nominal depth, followed by the letters K, LH or DLH as appropriate, and then by the Section Number designation assigned. The Section Number designations shall range from 01 to 25. The K-Series, LH-Series and DLH-Series standard joist designations listed in the following Standard Load Tables shall support the uniformly distributed loads as provided in the applicable tables:

Standard LRFD Load Table Open Web Steel Joists, K-Series – U.S. Customary Units
 Standard ASD Load Table Open Web Steel Joists, K-Series – U.S. Customary Units
 Standard LRFD Load Table Longspan Steel Joists, LH-Series – U.S. Customary Units
 Standard ASD Load Table Longspan Steel Joists, LH-Series – U.S. Customary Units
 Standard LRFD Load Table Deep Longspan Steel Joists, DLH-Series – U.S. Customary Units
 Standard ASD Load Table Deep Longspan Steel Joists, DLH-Series – U.S. Customary Units
 Standard LRFD Load Table Open Web Steel Joists, K-Series – S.I. Units
 Standard ASD Load Table Open Web Steel Joists, K-Series – S.I. Units
 Standard LRFD Load Table Longspan Steel Joists, LH-Series – S.I. Units
 Standard ASD Load Table Longspan Steel Joists, LH-Series – S.I. Units
 Standard LRFD Load Table Deep Longspan Steel Joists, DLH-Series – S.I. Units
 Standard ASD Load Table Deep Longspan Steel Joists, DLH-Series – S.I. Units

Wherever a standard SJI Section Number is specified in the joist designation (e.g. 18K4, 32LH10) and other design load cases are also specified for the joist, the steel joist shall be designed for the corresponding total load as shown in the Standard Load Tables as a minimum.

User Note: Six standard types of K-Series, LH-Series and DLH-Series joists are designed and manufactured. These types are underslung (top chord bearing) or square-ended (bottom chord bearing), with parallel chords or with single or double pitched top chords. The Standard Load Tables apply for a pitched top chord up to 1/2 inch per foot (1:24).

The steel joist or Joist Girder designation depth shall be the depth at mid-span.

An alternate method of specifying a standard K-Series, LH-Series, or DLH-Series joist shall be permitted by providing the designation in a “load/load” sequence. The format used shall be ddKt/ll, ddLHt/ll, or ddDLHt/ll where:

dd is the nominal depth of the joist in inches (mm)

tl is the total uniformly distributed load applied to the joist top chord, plf (kN/m)

ll is the uniform live load for which the deflection shall be checked and limited as required by this Specification, plf (kN/m)

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User Note: The load/load K-Series, LH-Series, or DLH-Series joists can be specified in depths from 10 inches (254 mm) through 120 inches (3048 mm) and spans up through 240 feet (73152 mm). The maximum uniformly distributed load-carrying capacity of 2400 plf (35.03 kN/m) in ASD and 3600 plf (52.54 kN/m) in LRFD has been established for this alternate K-Series, LH-Series, or DLH-Series format. The maximum capacity for any given load/load joist designation is a function of span, depth and chord member size. When requirements exceed the standard K-Series load table limitations for loading, span, and depth, an LH-Series designation is recommended to facilitate the proper determination of minimum seat depth, end anchorage, bridging size, deck attachment, etc. Thus, any joist exceeding a 30 inch depth, a span of 60 feet, an in-kip moment of Depth x 61 kips in ASD or Depth x 91.5 kips in LRFD, or an end reaction of 9.2 kips in ASD or 13.8 kips in LRFD should be designated as an LH-Series which allows for a cross-reference with a standard LH designation as listed in this Specification for seat, end anchorage, bridging, attachment tables, etc.

A KCS Joist is a particular type of K-Series joist, and shall be designed in accordance with this Specification based on an envelope of moment and shear capacity, rather than uniform load capacity, to support uniform plus concentrated loads or other non-uniform loads. The KCS Joists shall be selected from standardized depths from 10 inches (254 mm) through 30 inches (762 mm), for spans up through 60 feet (18288 mm). The maximum total safe uniformly distributed load-carrying capacity of a KCS Joist, K-Series, shall be 550 plf (8.02 kN/m) in ASD or 825 plf (12.03 kN/m) in LRFD. A KCS Joist shall be parallel chord only and shall be permitted to be underslung or bottom chord bearing.

The KCS Joists, K-Series, standard designations shall be established by their nominal depth, followed by the letters "KCS", and then by the Section Number designation assigned. The Section Number designations shall range from 1 to 5. A KCS Joist shall not be designated using the alternate "load/load" method. The KCS Joists, K-Series, standard designations listed in the following Standard Load Tables shall provide the moment capacity and shear capacity as listed in the applicable tables:

- Standard LRFD Load Table for KCS Open Web Steel Joists – U.S. Customary Units
- Standard ASD Load Table for KCS Open Web Steel Joists – U.S. Customary Units
- Standard LRFD Load Table for KCS Open Web Steel Joists – S.I. Units
- Standard ASD Load Table for KCS Open Web Steel Joists – S.I. Units

Where an open web configuration becomes impractical, a Joist Substitute, K-Series, shall be designed in accordance with this Specification to support uniform loads when the span is less than 10 feet (3048 mm). The maximum total safe uniformly distributed load-carrying capacity of a Joist Substitute shall be 550 plf (8.02 kN/m) in ASD or 825 plf (12.03 kN/m) in LRFD.

The Joist Substitutes, K-Series, standard designations shall be established by their nominal depth, e.g. 2.5, followed by the letter "K" and then by the chord size designation assigned. The chord size designations shall range from 1 to 3. The Joist Substitutes, K-Series, standard designations listed in the following Load Tables shall support the uniformly distributed loads as provided in the applicable tables:

User Note: The Joist Substitutes, K-Series, are standardized as 2.5 inch (64 mm) deep sections for spans up through 10'-0" (3048 mm).

- LRFD Simple Span Load Table for 2.5 Inch K-Series Joist Substitutes – U.S. Customary Units
- ASD Simple Span Load Table for 2.5 Inch K-Series Joist Substitutes – U.S. Customary Units
- LRFD Simple Span Load Table for 64 mm K-Series Joist Substitutes – S.I. Units
- ASD Simple Span Load Table for 64 mm K-Series Joist Substitutes – S.I. Units

- LRFD Outriggers Load Table for 2.5 Inch K-Series Joist Substitutes – U.S. Customary Units
- ASD Outriggers Load Table for 2.5 Inch K-Series Joist Substitutes – U.S. Customary Units
- LRFD Outriggers Load Table for 64 mm K-Series Joist Substitutes – S.I. Units
- ASD Outriggers Load Table for 64 mm K-Series Joist Substitutes – S.I. Units

A Top Chord Extension or Extended End, K-series, shall be a joist accessory that shall be designed in accordance with this Specification to support uniform loads when one or both ends of an underslung joist needs to be cantilevered beyond its bearing seat.

User Note: The Top Chord Extensions and Extended Ends are standardized as an "S" Type (top chord angles extended only) and an "R" Type (top chord and bearing seat angles extended), respectively.

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Standard designations for the “S” Type shall range from S1 to S12 for spans from 0'-6" to 4'-6" (152 to 1372 mm). Standard designations for the “R” Type shall range from R1 to R12 for spans from 0'-6" to 6'-0" (152 to 1829 mm). The maximum total safe uniformly distributed load-carrying capacity of either an “R” or “S” Type extension shall be 550 plf (8.02 kN/m) in ASD or 825 plf (12.03 kN/m) in LRFD. The “S” Type Top Chord Extensions and “R” Type Extended Ends listed in the following Standard Load Tables shall support the uniformly distributed loads as provided in the applicable tables:

LRFD Top Chord Extension Load Table (S Type) – U.S. Customary Units
 ASD Top Chord Extension Load Table (S Type) – U.S. Customary Units
 LRFD Top Chord Extension Load Table (R Type) – U.S. Customary Units
 ASD Top Chord Extension Load Table (R Type) – U.S. Customary Units
 LRFD Top Chord Extension Load Table (S Type) – S.I. Units
 ASD Top Chord Extension Load Table (S Type) – S.I. Units
 LRFD Top Chord Extension Load Table (R Type) – S.I. Units
 ASD Top Chord Extension Load Table (R Type) – S.I. Units

1.5 STRUCTURAL DESIGN DRAWINGS AND SPECIFICATIONS

The structural design drawings and specifications shall meet the requirements in the *Code of Standard Practice for Steel Joists and Joist Girders*, except for deviations specifically identified in the design drawings and/or specifications.

SECTION 2.

REFERENCED

SPECIFICATIONS, CODES

AND STANDARDS

2.1 REFERENCES

The standards listed below shall be considered as part of the requirements of this Specification. Where conflicts occur between this Specification and a referenced standard, the provisions of this Specification shall take precedence unless otherwise stated. This section lists the standards that are referenced in this Specification. The standards are listed in alphabetical order by name of standards developer organization, with the specific standard designations, title and dates of each of the referenced standards below.

American Institute of Steel Construction, Inc. (AISC), Chicago, IL

ANSI/AISC 360-10 *Specification for Structural Steel Buildings*

American Iron and Steel Institute (AISI), Washington, DC

ANSI/AISI S100-2012 *North American Specification for the Design of Cold-Formed Steel Structural Members*

American Society of Civil Engineers (ASCE), Reston, VA

SEI/ASCE 7-10 *Minimum Design Loads for Buildings and Other Structures*

American Society of Testing and Materials, ASTM International (ASTM), West Conshohocken, PA

ASTM A6/A6M-13A, *Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling*

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- ASTM A36/A36M-12, *Standard Specification for Carbon Structural Steel*
- ASTM A242/242M-13, *Standard Specification for High-Strength Low-Alloy Structural Steel*
- ASTM A307-12a, *Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength*
- ASTM A325/325M-13, *Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi [830 MPa] Minimum Tensile Strength*
- ASTM A370-12a, *Standard Test Methods and Definitions for Mechanical Testing of Steel Products*
- ASTM A500/A500M-13, *Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes*
- ASTM A501-07 *Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing* ASTM A529/A529M-05(2009), *Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality* ASTM A572/A572M-13a, *Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel*
- ASTM A588/A588M-10, *Standard Specification for High-Strength Low-Alloy Structural Steel, up to 50 ksi [345 MPa] Minimum Yield Point, with Atmospheric Corrosion Resistance*
- ASTM A606/A606M-09a, *Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance*
- ASTM A992/A992M-11, *Standard Specification for Structural Steel Shapes*
- ASTM A1008/A1008M-13, *Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable*
- ASTM A1011/A1011M-13, *Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength*
- ASTM A1065/A1065M-09(2014) *Standard Specification for Cold-Formed Electric-Fusion (ARC) Welded High-Strength Low-Alloy Structural Tubing in Shapes with 50 ksi (345 MPA) Minimum Yield Point*
- ASTM A1085-13 *Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS)*

American Welding Society (AWS), Miami, FL

- AWS A5.1/A5.1M-2012, *Specification for Carbon Steel Electrodes for Shielded Metal Arc Welding*
- AWS A5.5/A5.5M:2006, *Specification for Low-Alloy Steel Electrodes for Shielded Metal Arc Welding*
- AWS A5.17/A5.17M-97:R2007, *Specification for Carbon Steel Electrodes and Fluxes for Submerged Arc Welding*
- AWS A5.18/A5.18M:2005, *Specification for Carbon Steel Electrodes and Rods for Gas Shielded Arc Welding*
- AWS A5.20/A5.20M:2005, *Specification for Carbon Steel Electrodes for Flux Cored Arc Welding*
- AWS A5.23/A5.23M:2011, *Specification for Low-Alloy Steel Electrodes and Fluxes for Submerged Arc Welding*
- AWS A5.28/A5.28M:2005, *Specification for Low-Alloy Steel Electrodes and Rods for Gas Shielded Arc Welding*
- AWS A5.29/A5.29M:2010, *Specification for Low-Alloy Steel Electrodes for Flux Cored Arc Welding*
- AWS D1.1/D1.1M:2015, *Structural Welding Code - Steel*
- AWS D1.3/D1.3M:2008, *Structural Welding Code Sheet Steel*

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User Note: The following informative references provide practical guidance in the use and application of this Specification:

Code of Federal Regulations (CFR), Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926, Safety Standards for Steel Erection; Subpart R - Steel Erection; January 18, 2001, Washington, D.C.

Steel Joist Institute (SJI), Florence, SC

SJI-COSP-2015, *Code of Standard Practice for Steel Joists and Joist Girders*

Technical Digest No. 3 (2007), *Structural Design of Steel Joist Roofs to Resist Ponding Loads*

Technical Digest No. 5 (2015), *Vibration of Steel Joist-Concrete Slab Floors*

Technical Digest No. 6 (2012), *Structural Design of Steel Joist Roofs to Resist Uplift Loads*

Technical Digest No. 8 (2008), *Welding of Open Web Steel Joists and Joist Girders*

Technical Digest No. 9 (2008), *Handling and Erection of Steel Joists and Joist Girders*

Technical Digest No. 10 (2003), *Design of Fire Resistive Assemblies with Steel Joists*

Technical Digest No. 11 (2007), *Design of Lateral Load Resisting Frames Using Steel Joists and Joist Girders*

Technical Digest No. 12 (2007), *Evaluation and Modification of Open-Web Steel Joists and Joist Girders*

The Society for Protective Coatings (SSPC), *Steel Structures Painting Manual, Volume 2, Systems and Specifications*, Paint Specification No. 15, Steel Joist Shop Primer, May 1, 1999, Pittsburgh, PA.

Van Malssen, S.H. (1984), *The Effects of Arc Strikes on Steel Used in Nuclear Construction*, Welding Journal, American Welding Society, Miami, FL, July 1984.

SECTION 3. MATERIALS

3.1 STEEL

The steel used in the manufacture of Joist Girders and K-Series, LH-Series, and DLH-Series joists shall conform to one of the following ASTM specifications:

ASTM A36/A36M, Carbon Structural Steel

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

ASTM A500/A500M, Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes

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

ASTM A572/A572M, High-Strength Low-Alloy Columbium-Vanadium Structural Steel

ASTM A588/A588M, High-Strength Low-Alloy Structural Steel up to 50 ksi [345 MPa] Minimum Yield Point with Atmospheric Corrosion Resistance

ASTM A606/A606M, Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance

ASTM A992/A992M, Structural Steel Shapes

ASTM A1008/A1008M, Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable

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ASTM A1011/A1011M, Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

ASTM A1018/A1018M, Steel, Sheet and Strip, Heavy Thickness Coils, Hot Rolled, Carbon, Structural, High-Strength Low-Alloy, Columbium or Vanadium, and High-Strength Low-Alloy with Improved Formability and Ultra-High Strength

EXCEPTION: Steel used in the manufacture of Joist Girders and K-Series, LH-Series, and DLH-Series joists shall be permitted to be of suitable quality ordered or produced to other than the listed ASTM specifications, provided that such material in the state used for final assembly and manufacture is weldable and is proven by tests performed by the producer or manufacturer to have properties, in accordance with Section 3.2.

3.2 MECHANICAL PROPERTIES

3.2.1 Minimum Yield Strength: Steel used for Joist Girders and K-Series, LH-Series, and DLH-Series joists shall have a minimum yield strength determined in accordance with one of the procedures specified in this section, which is equal to the yield strength assumed in the design.

User note: The term "Yield Strength" as used herein designates 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 Section 3.2.3.

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 such material, the mechanical properties of which conform to the requirements of one of the listed ASTM specifications in Section 3.1, the test specimens and procedures shall conform to those of the applicable ASTM specification and to ASTM A370.

3.2.2 Other Materials: For materials where the mechanical properties do not conform to the requirements of one of the ASTM specifications listed in Section 3.1, these materials shall conform to the following requirements:

- a) The specimens shall comply with ASTM A370,
- b) The specimens shall exhibit a yield strength equal to or exceeding the design yield strength,
- c) The specimens shall have an elongation of not less than 20 percent in 2 inches (51 mm) for sheet strip, or 18 percent in 8 inches (203 mm) for plates, shapes and bars with adjustments for thickness for plates, shapes and bars as prescribed in either ASTM A36/A36M, A242/A242M, A500/A500M, A529/A529M, A572/A572M, A588/A588M, or A992/A992M, whichever ASTM specification is applicable, on the basis of design yield strength.
- d) The number of tests for a), b), and c) above shall be as prescribed in ASTM A6/A6M for plates, shapes, and bars; and ASTM A606/A606M, A1008/A1008M and A1011/A1011M for sheet and strip.

3.2.3 As-Formed Strength: 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 S100. The reports shall also indicate compliance 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 8 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.

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3.3 WELDING ELECTRODES

3.3.1 Welding Electrodes: The welding electrodes used for arc welding shall be in accordance with the following:

- a) For connected members both having a specified minimum yield strength greater than 36 ksi (250 MPa), one of the following electrodes shall be used:

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), one of the following electrodes shall be used:

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, E6XTX-XM

or any of those listed in Section 3.3.1(a).

3.3.2 Other Welding Methods: Other welding methods, providing equivalent strength as demonstrated by tests, shall be permitted to be used.

3.4 PAINT

The standard shop paint shall be considered an impermanent and provisional coating.

User Note: The standard shop paint is intended to protect the steel for only a short period of exposure in ordinary atmospheric conditions.

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

- The Society for Protective Coatings, SSPC Paint Specification No. 15.
- Or, shall be a shop paint which meets the minimum performance requirements of SSPC Paint Specification No. 15.

SECTION 4.**DESIGN AND MANUFACTURE****4.1 METHOD**

Joist Girders support steel joists or other secondary members and shall be designed in accordance with this Specification as simply-supported primary load-carrying members for in-plane loading. Steel joists shall be designed in accordance with this Specification as simply-supported trusses supporting a floor or roof deck so constructed as to brace the top chord of the steel joists against lateral buckling. Where any applicable design feature is not specifically covered herein, the design shall be in accordance with the following Specifications:

- Where the steel used consists of hot-rolled shapes, bars or plates, AISC 360.
- For members which are cold-formed from sheet or strip steel, AISI S100.

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4.1.1 Design Basis:

Steel joist and Joist Girder designs shall be in accordance with the provisions in this Specification using Load and Resistance Factor Design (LRFD) or Allowable Strength Design (ASD) as specified by the specifying professional for the project.

4.1.2 Loads, Forces and Load Combinations:

The loads and forces used for the steel joist and Joist Girder design shall be calculated by the specifying professional in accordance with the applicable building code and specified and provided on the structural drawings.

For nominal concentrated loads, which have been accounted for in the specified uniform loads, the addition of chord bending moments or an added shop or field web member due to these nominal concentrated loads shall not be required provided that the sum of the concentrated loads within a chord panel does not exceed 100 pounds and the attachments are concentric to the chord. When exact dimensional locations for concentrated loads which do not meet the above criteria are provided by the specifying professional, the joist shall be designed for the loads and load locations provided without the need for additional field applied web members at the specified locations.

The load combinations shall be specified by the specifying professional on the structural drawings in accordance with the applicable building code. In the absence of an applicable building code, the load combinations shall be those stipulated in SEI/ASCE 7 Section 2.3 and Section 2.4 as appropriate. For LRFD designs, the load combinations in SEI/ASCE 7, Section 2.3 shall apply. For ASD designs, the load combinations in SEI/ASCE 7, Section 2.4 shall apply.

4.2 DESIGN AND ALLOWABLE STRESSES

4.2.1 Design Using Load and Resistance Factor Design (LRFD)

Joists and 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	ksi (MPa)

4.2.2 Design Using Allowable Strength Design (ASD)

Joists and 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	ksi (MPa)

4.2.3 Stresses:

The calculation of design stress or allowable stress for chords shall be based on a yield strength, F_y , of the material used in manufacturing equal to 50 ksi (345 MPa). The calculation of design stress or allowable stress for all other joist elements shall be based on a yield strength, F_y , of the material used in manufacturing, but shall not be less than 36 ksi (250 MPa) nor greater than 50 ksi (345 MPa). Yield strengths greater than 50 ksi shall not be used for the design of any members.

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

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

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

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

$$\text{Design Stress} = 0.9F_{cr} \text{ (LRFD)} \quad (4.2-3)$$

$$\text{Allowable Stress} = 0.6F_{cr} \text{ (ASD)} \quad (4.2-4)$$

Where:

For members with $k\ell/r \leq 4.71\sqrt{E/QF_y}$

$$F_{cr} = Q \left[0.658^{\left(\frac{QF_y}{F_e}\right)} \right] F_y \quad (4.2-5)$$

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

$$F_{cr} = 0.877F_e \quad (4.2-6)$$

Where F_e = Elastic buckling stress determined in accordance with Equation 4.2-7

$$F_e = \frac{\pi^2 E}{\left(\frac{k\ell}{r}\right)^2} \quad (4.2-7)$$

In the above equations, ℓ is the length, k is the effective length factor, and r is the corresponding radius of gyration of the member as defined in Section 4.3. E is equal to 29,000 ksi (200,000 MPa).

For hot-rolled sections and cold-formed angles, Q shall be taken as the full reduction factor for slender compression members as determined in accordance with AISI 360-10.

Exception: Where a compression web member is a crimped-end angle member intersecting at the first bottom chord panel point, whether hot-rolled or cold-formed, then Q shall be determined as follows:

$$Q = [5.25/(w/t)] + t \leq 1.0 \quad (4.2-8a)$$

Where: w = angle leg length, inches
 t = angle leg thickness, inches

or,

$$Q = [5.25/(w/t)] + (t/25.4) \leq 1.0 \quad (4.2-8b)$$

Where: w = angle leg length, millimeters
 t = angle leg thickness, millimeters

For all other cold-formed sections the method of calculating the nominal compression strength shall be in accordance with AISI S100.

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

Bending calculations shall be based on the elastic section modulus.

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For chords and web members other than solid rounds: $F_n = F_y$

$$\text{Design Stress} = \phi_b F_n = 0.9F_y \text{ (LRFD)} \quad (4.2-9)$$

$$\text{Allowable Stress} = F_n/\Omega_b = 0.6F_y \text{ (ASD)} \quad (4.2-10)$$

For web members of solid round cross section: $F_n = 1.6 F_y$

$$\text{Design Stress} = \phi_b F_n = 1.45F_y \text{ (LRFD)} \quad (4.2-11)$$

$$\text{Allowable Stress} = F_n/\Omega_b = 0.95F_y \text{ (ASD)} \quad (4.2-12)$$

For bearing plates used in joist seats: $F_n = 1.5 F_y$

$$\text{Design Stress} = \phi_b F_n = 1.35F_y \text{ (LRFD)} \quad (4.2-13)$$

$$\text{Allowable Stress} = F_n/\Omega_b = 0.90F_y \text{ (ASD)} \quad (4.2-14)$$

4.2.3.4 Weld Strength:

Shear at throat of fillet welds, flare bevel groove welds, partial joint penetration groove welds, and plug/slot welds shall be determined as follows:

$$\text{Nominal Shear Stress} = F_{nw} = 0.6F_{exx} \quad (4.2-15)$$

LRFD: $\phi_w = 0.75$

$$\text{Design Shear Strength} = \phi R_n = \phi_w F_{nw} A = 0.45F_{exx} A_w \quad (4.2-16)$$

ASD: $\Omega_w = 2.0$

$$\text{Allowable Shear Strength} = R_n/\Omega_w = F_{nw}A/\Omega_w = 0.3F_{exx} A_w \quad (4.2-17)$$

Where:

F_{exx} is determined as follows:

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

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

A_w = effective throat area, where:

For fillet welds, A_w = effective throat area

Other design methods demonstrated to provide sufficient strength by testing shall be permitted to be used.

For flare bevel groove welds, the effective weld area is based on a weld throat width, T, where:

$$T \text{ (inches)} = 0.12D + 0.11 \quad (4.2-18a)$$

Where D = web diameter, inches

or,

$$T \text{ (mm)} = 0.12D + 2.8 \quad (4.2-18b)$$

Where D = web diameter, mm

For plug/slot welds, A_w = cross-sectional area of the hole or slot in the plane of the faying surface provided that the hole or slot meets the requirements of AISC 360.

User Note: For more on plugs/slot welds see Steel Joist Institute Technical Digest No. 8, "Welding of Open-Web Steel Joists and Joist Girders".

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Strength of resistance welds and complete-joint-penetration groove or butt welds in tension or compression (only where the stress is normal to the weld axis) shall be equal to the base metal strength:

$$\phi_t = \phi_c = 0.90 \text{ (LRFD)} \quad \Omega_t = \Omega_c = 1.67 \text{ (ASD)}$$

$$\text{Design Stress} = 0.9 F_y \text{ (LRFD)} \quad (4.2-19)$$

$$\text{Allowable Stress} = 0.6 F_y \text{ (ASD)} \quad (4.2-20)$$

4.3 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 4.3-1, Part A.

4.3.1 Effective Slenderness Ratios: 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 4.3-1, Part B and Part C, and modified where required with equation 4.3-1. The effective length k shall be taken as 1.0 for all components in Joist Girders.

4.3.2 Compressive Members: In compression members where 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 4.3-1 shall be defined as follows:

- ℓ = length center-to-center of panel points, except $\ell = 36$ inches (914 millimeters) for calculating ℓ/r_y of the top chord member for joists, and for Joist Girders this distance shall be the unbraced length between joists which are positively attached to the top chord, in. (mm).
- ℓ_s = maximum length center-to-center between panel point and filler (tie), or between adjacent fillers (ties), in. (mm).
- r_x = member radius of gyration about the horizontal axis of the joist or Joist Girder cross section, in. (mm).
- r_y = member radius of gyration about the vertical axis of the joist or Joist Girder cross section, in. (mm).
- r_z = least radius of gyration of a member component, in. (mm).

Compression web members shall be those web members subject to compressive axial loads under gravity loading.

4.3.3 Tension Members: Tension web members shall be those web members subject to tension axial loads under gravity loading, and which shall be permitted to be subject to compressive axial loads under alternate loading conditions

User Note: An example of a non-gravity alternate loading condition is net uplift.

4.3.4 Top Chords: For top chords, the end panel(s) shall be the panels between the bearing seat and the first primary interior panel point comprised of at least two intersecting web members.

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4.3.5 Built-Up Web Members: For built-up web members composed of two interconnected shapes, where $\ell_s/r_z > 40$,

a modified slenderness ratio $\left(\frac{k\ell}{r_y}\right)_m$ shall replace $\frac{k\ell}{r_y}$ in equations 4.2-5, 4.2-6, and 4.2-7, where:

$$\left(\frac{k\ell}{r_y}\right)_m = \sqrt{\left(\frac{k\ell}{r_y}\right)^2 + \left(\frac{k_i\ell_s}{r_z}\right)^2} \quad (4.3-1)$$

and,

$$\begin{aligned} k_i &= 0.50 \text{ for angles back-to-back} \\ &= 0.75 \text{ for channels back-to-back} \end{aligned}$$

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TABLE 4.3-1

MAXIMUM AND EFFECTIVE SLENDERNESS RATIOS¹

Description		$k\ell/r_x$	$k\ell/r_y$	$k\ell/r_z$	$k\ell_s/r_z$
I. TOP CHORD INTERIOR PANELS					
A.	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 90.				
B.	The effective slenderness ratio for joists, $k\ell/r$, to determine F_{cr} where k is:				
1.	Two shapes with fillers or ties	0.75	0.94	---	1.0
2.	Two shapes without fillers or ties	---	---	0.75	---
3.	Single component members	0.75	0.94	---	---
C.	For bending, the effective slenderness ratio, $k\ell/r$, to determine F'_e where k is:				
		0.75	---	---	---
II. TOP CHORD END PANELS					
A.	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 120.				
B.	The effective slenderness ratio for joists, $k\ell/r$, to determine F_{cr} where k is:				
1.	Two shapes with fillers or ties	1.0	0.94	---	1.0
2.	Two shapes without fillers or ties	---	---	1.0	---
3.	Single component members	1.0	0.94	---	---
C.	For bending, the effective slenderness ratio, $k\ell/r$, to determine F'_e where k is:				
		1.0	---	---	---
III. ALL BOTTOM CHORD PANELS					
A.	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 240.				
B.	For members subject to compression, the effective slenderness ratio for joists, $k\ell/r$, to determine F_{cr} where k is:				
1.	Two shapes with fillers or ties	0.9	0.94	---	1.0
2.	Two shapes without fillers or ties	---	---	0.9	---
3.	Single component members	0.9	0.94	---	---
C.	For bending, the effective slenderness ratio, $k\ell/r$, to determine F'_e where k is:				
		0.9	---	---	---
IV. WEB MEMBERS					
A.	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 240 for a tension member or 200 for a compression member.				
B.	For members subject to compression, the effective slenderness ratio for joists, $k\ell/r$, to determine F_{cr} where k is:				
1.	Two shapes with fillers or ties	0.75	1.0	---	1.0
2.	Two shapes without fillers or ties	---	---	1.0	---
3.	Single component members	0.75	0.9*	---	---
	*For end tension web members subject to compression, k shall equal 0.8				
(1) The effective length k shall equal 1.0 for all components of Joist Girders.					

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4.4 MEMBERS

4.4.1 Chords

The joist and Joist Girder bottom chord shall be designed as an axially loaded tension member.

For Joist Girders, 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 radius of gyration of a Joist Girder top chord about the vertical axis shall not be less than $\text{Span}/575$.

For steel joists, the radius of gyration of the top chord about its vertical axis shall not be less than the results of equation 4.4-1 or 4.4-2:

$$r_y \geq \ell_{br} / \left(124 + 0.67 d_j + 28 \frac{d_j}{L} \right), \text{ in.} \quad (4.4-1a)$$

$$r_y \geq \ell_{br} / \left(124 + 0.026 d_j + 0.34 \frac{d_j}{L} \right), \text{ mm} \quad (4.4-1b)$$

or,

$$r_y \geq \ell_{br} / 170 \quad (4.4-2)$$

Where:

d_j is the steel joist depth, in. (mm)

L is the joist span length, ft. (m)

r_y is the radius of gyration of the top chord about the vertical axis of the joist cross section, in. (mm)

ℓ_{br} is the spacing in inches (millimeters) between lines of bracing as specified in Section 5.5.3.1.

A steel joist top chord shall be considered as laterally braced by the floor slab or roof deck provided the requirements of Section 5.9 are met.

A Joist Girder top chord shall be considered as laterally braced by the steel joists provided positive attachment is made. The outstanding part of the top chord member shall be designed such that the allowable reaction from a single joist shall not exceed equation 4.4-3 or 4.4-4:

$$\phi P_p \text{ and } \phi P_p (1.6 - f_{au}/\phi Q F_y) \quad (\text{LRFD, } \phi = 0.9) \quad (4.4-3)$$

$$P_p/\Omega \text{ and } P_p/\Omega (1.6 - \Omega f_{au}/Q F_y) \quad (\text{ASD, } \Omega = 1.67) \quad (4.4-4)$$

Where:

F_y = Specified minimum yield strength, ksi (MPa)

P_p = Plastic failure mode = $[(t^2 F_y) / [2(b-k)]] [g + 5.66(b-k)]$, kips (N)

Q = Form factor defined in Section 4.2.3.2

b = width of the outstanding part of the top chord member, in. (mm)

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

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

g = width of bearing seat, in. (mm)

k = value from angle properties or similar dimension for other members, in (mm)

t = thickness of the outstanding part of the top chord member, in. (mm)

The top chord of a steel joist or Joist Girder shall be designed as a continuous member subject to combined axial and bending stresses, except a Joist Girder loaded only at panel points shall be designed as an axial loaded compression member. For combined stresses the top chord shall be so proportioned that:



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For LRFD:

at the panel point:

$$f_{au} + f_{bu} \leq 0.9F_y \quad (4.4-5)$$

at the mid panel:

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

$$\frac{f_{au}}{\phi_c F_{cr}} + \frac{8}{9} \left[\frac{C_m f_{bu}}{\left[1 - \left(\frac{f_{au}}{\phi_c F'_e} \right) \right] Q \phi_b F_y} \right] \leq 1.0 \quad (4.4-6)$$

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

$$\frac{f_{au}}{2\phi_c F_{cr}} + \left[\frac{C_m f_{bu}}{\left[1 - \left(\frac{f_{au}}{\phi_c F'_e} \right) \right] Q \phi_b F_y} \right] \leq 1.0 \quad (4.4-7)$$

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

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

A = Area of the top chord, in.² (mm²)

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

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

S = Elastic Section Modulus, in.³ (mm³)

F_{cr} = Nominal axial compressive stress in ksi (MPa) based on $k\ell/r$ as defined in Section 4.3

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

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

Q = Form factor defined in Section 4.2.3.2

ϕ_c = Resistance factor for compression = 0.9

ϕ_b = Resistance factor for flexure = 0.9

F_y = Specified minimum yield strength, ksi (MPa)

$$F'_e = \frac{\pi^2 E}{(k\ell/r_x)^2}, \text{ ksi (MPa),}$$

where ℓ is the length, k is the effective length factor, and r_x is the corresponding radius of gyration of the member as defined in Section 4.3

E = Modulus of elasticity, 29,000 ksi (200,000 MPa)

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For **ASD**:

at the panel point:

$$f_a + f_b \leq 0.6F_y \quad (4.4-8)$$

at the mid panel:

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

$$\frac{f_a}{F_a} + \frac{8}{9} \left[\frac{C_m f_b}{\left[1 - \left(\frac{1.67f_a}{F'_e} \right) \right] QF_b} \right] \leq 1.0 \quad (4.4-9)$$

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

$$\left(\frac{f_a}{2F_a} \right) + \left[\frac{C_m f_b}{\left[1 - \left(\frac{1.67f_a}{F'_e} \right) \right] QF_b} \right] \leq 1.0 \quad (4.4-10)$$

- f_a = P/A required compressive stress using ASD load combinations, ksi (MPa)
- A = Area of the top chord, in.² (mm²)
- P = Required axial strength using ASD load combinations, kips (N)
- f_b = M/S = required bending stress at the location under consideration using ASD load combinations, ksi (MPa)
- S = Elastic Section Modulus, in.³ (mm³)
- M = Required flexural strength using ASD load combinations, k-in. (N-mm)
- F_a = Allowable axial compressive stress based on $k\ell/r$ as defined in Section 4.3; $0.6F_{cr}$, 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
- Q = Form factor defined in Section 4.2.3.2
- $F'_e = \frac{\pi^2 E}{(k\ell/r_x)^2}$, ksi (MPa),
where ℓ is the length, k is the effective length factor, and r_x is the corresponding radius of gyration of the member as defined in Section 4.3
- E = Modulus of elasticity, 29,000 ksi (200,000 MPa)

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The top chord and bottom chord shall be designed such that at each joint complies with equation 4.4-11 or 4.4-12:

$$f_{vmod} \leq \phi_v F_n \quad (\text{LRFD, } \phi_v = 1.00) \quad (4.4-11)$$

$$f_{vmod} \leq F_n / \Omega_v \quad (\text{ASD, } \Omega_v = 1.50) \quad (4.4-12)$$

F_n = nominal shear stress = $0.6F_y$, ksi (MPa)

f_t = axial stress = P/A , ksi (MPa)

f_v = shear stress = V/bt , ksi (MPa)

f_{vmod} = modified shear stress = $(1/2)\sqrt{f_t^2 + 4f_v^2}$

b = length of vertical part(s) of cross section, in. (mm)

t = thickness of vertical part(s) of cross section, in. (mm)

It shall not be necessary to design the top chord and bottom chord for the modified shear stress, f_{vmod} , where a round bar web member is continuous through a joint. The minimum required shear of section 4.4.2 (25 percent of the maximum end reaction) shall not be required when evaluating Equation 4.4-11 or 4.4-12.

KCS Joist, K-Series, chords shall be designed for a flat positive bending moment envelope where the moment capacity is constant at all interior panels. The top chord end panel(s) shall be designed for an axial load based on the force in the first tension web resulting from the specified shear. A uniform load of 550 plf (8.02 kN/m) in ASD or 825 plf (12.03 kN/m) in LRFD shall be used to check bending in the end panel(s). The top chord interior panels shall be designed for an axial stress resulting from the constant moment capacity plus the bending stress. The bending stress shall be determined from the smaller uniform load derived from the constant moment and constant shear, not to exceed 550 plf (ASD) or 825 plf (LRFD). The constant moment and shear shall be those values as listed in the Standard Load Table for KCS Steel Joists.

4.4.2 Web

The vertical shears to be used in the design of the web members shall be determined by including all loads, but such vertical shears shall be not less than 25 percent of the maximum end reaction from the design load combinations.

4.4.2.1 Redundant Web Members: Redundant 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. For a **Joist Girder**, this total axial load shall not be less than 2 percent of the top chord axial force.

4.4.2.2 Joist Girders: For Joist Girders, the tension web members shall be designed to resist at least 25 percent of their axial force in compression.

4.4.2.3 KCS Joist Web Forces: KCS Joist web forces shall be determined based on a flat shear envelope, and the following:

- a) All webs shall be designed for a vertical shear equal to the specified shear capacity.
- b) All webs shall be designed for 100 percent stress reversal except for the first tension web which remains in tension under all simple span gravity loads.

4.4.2.4 Single Component Web Member: In those cases where a single component web member is attached to the outside of the stem of a tee or double angle chord or any other orientation of a single web member which creates an out-of-plane moment, the web member design shall account for the stresses due to eccentricity.

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4.4.2.4.1 Uncrimped Single Angle Web Members

For 1 inch uncrimped single angle web members where one leg is placed flat against one chord member in the gap, the resulting eccentricities and the effects in loading shall be considered in the design. A minimum of 50 percent of the required weld shall be deposited to each chord angle.

For angles subjected to tensile loading, the following requirements shall be met:

For **LRFD**: combined axial and bending stresses shall be proportioned in accordance with Eq. 4.4-5.

For **ASD**: combined axial and bending stresses shall be proportioned in accordance with Eq. 4.4-8.

For angles subjected to compression loading, the following requirements shall be met:

For **LRFD**:

at the panel point, combined axial and bending stresses shall be proportioned in accordance with Eq. 4.4-5.

at the mid length, the strength shall meet Eqs. 4.4-6 or 4.4-7, and 4.4-13:

$$\frac{f_{au}}{\phi_c F_{crz}} \leq 1.0 \quad (4.4-13)$$

where

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

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

A = Area of the uncrimped angle web, in.², (mm²)

f_{bu} = M_u/S = required bending stress, ksi (MPa)

M_u = Required flexural strength = $0.5 P_u \left(\frac{\text{chord gap}}{2} - \bar{y} \right)$, kip-in. (N-mm)

S = Minimum Elastic Section Modulus, in.³ (mm³)

F_{cr} = F_{crx} , ksi (MPa)

F_{crx} = Nominal axial compressive stress in ksi (MPa) based on $k\ell/r_x$, where ℓ is the length, k is the effective length factor, and r_x is the corresponding radius of gyration of the member as defined in Section 4.3

F_{crz} = Nominal axial compressive stress in ksi (MPa) based on $k\ell/r_z$ where $k = 1.0$

C_m = 1.0

F_y = Specified minimum yield strength, ksi (MPa)

$F'_c = \frac{\pi^2 E}{(k\ell/r_x)^2}$, ksi (MPa)

Q = Form factor defined in Section 4.2.3.2

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For **ASD**:

at the panel point, combined axial and bending stresses shall be proportioned in accordance with Eq. 4.4-8.

at the mid length the strength shall meet Eqs. 4.4-9 or 4.4-10, and 4.4-14:

$$\frac{f_a}{F_{az}} \leq 1.0 \quad (4.4-14)$$

where

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

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

A = Area of the uncrimped angle web, in.², (mm²)

f_b = M/S = required bending stress, ksi (MPa)

S = Minimum Elastic Section Modulus, in.³ (mm³)

M = Required flexural strength = $0.5 P \left(\frac{\text{chord gap}}{2} - \bar{y} \right)$, kip-in. (N-mm)

F_a = F_{ax} , ksi (MPa)

F_{ax} = Nominal axial compressive stress in ksi (MPa) based on $k\ell/r_x$, where ℓ is the length, k is the effective length factor, and r_x is the corresponding radius of gyration of the member as defined in Section 4.3

F_{az} = Nominal axial compressive stress in ksi (MPa) based on $K\ell/r_z$, where $k = 1.0$

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

Alternate methods of design shall be permitted provided they provide strength equal to or greater than those given. Alternate design procedures shall be submitted to the Steel Joist Institute's consulting engineer for approval.

4.4.3 Fillers and Ties

Fillers or ties added on chord or web compression members shall be designed and connected for a force equal to 2 percent of the required member axial force.

4.4.4 Joist and Joist Girder Extensions

Joist and Joist Girder extensions shall be designated as one of three extension types, as follows: top chord extensions (TCX), extended ends, or full depth cantilevers.

Design criteria for joist extensions shall be specified using one of the following methods:

- A joist top chord extension (TCX), extended end, or full depth cantilevered end shall be designed for the load from the Standard Load Tables based on the design length and designation of the specified joist. In the absence of other design information, the joist manufacturer shall design the joist extension for this loading as a default.
- A loading diagram shall be provided for the joist extension, extended end, or full depth cantilevered end. The diagram shall include the magnitude and location of the loads to be supported, as well as the applicable load combinations.

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- c) 2½" deep steel joist extensions shall be permitted to be specified using extension designations found in the Top Chord Extension Load Table (S Type) for TCXs or the Top Chord Extension Load Table (R Type) for extended ends.

Any deflection requirements or limits due to the accompanying loads and load combinations on the steel joist or Joist Girder extension shall be provided by the specifying professional, regardless of the method used to specify the extension. Unless otherwise specified, the joist manufacturer shall check the extension for the specified deflection limit under uniform live load acting simultaneously on both the joist base span and the extension.

The joist manufacturer shall consider the effects of steel joist or Joist Girder extension loading on the base span of the steel joist or Joist Girder. This shall include carrying the design bending moment due to the loading on the extension into the top chord end panel(s), and the effect on the overall steel joist or Joist Girder chord and web axial forces. In the case of a K-Series Standard Type 'R' Extended End or 'S' TCX, the design bending moment shall be determined by the tabulated extension section modulus (S) multiplied by the appropriate allowable (ASD) or design (LRFD) flexural stress.

Bracing of extensions shall be clearly indicated on the structural drawings.

4.5 CONNECTIONS

4.5.1 Methods

Member connections and splices shall be made by attaching the members to one another by arc or resistance welding or other accredited methods in accordance with the following:

- a) Steel joist and Joist Girder arc welded joints shall be in accordance with the American Welding Society, "Structural Welding Code-Steel", D1.1, and/or the "Structural Welding Code Sheet Steel", D1.3 with the following seven modified acceptance criteria as permitted by AWS D1.1 Clause 6.8:

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

User Note: The typical diagonal web member connection to one leg of a chord angle is considered to be parallel to the principal stress.

- 2) Discontinuities outside of the weld design length shall be permitted provided no cracks exist and undercut does not exceed the limits of item 1).

User Note: The weld design length is the minimum weld length needed for the connection force and weld thickness. Portions of the actual weld length with imperfections or discontinuities such as porosity or lack of a full profile are not included when comparing the actual weld length to the weld design length.

- 3) One unrepaired arc strike shall be permitted per joint provided it does not result in other unacceptable defects.

User Note: Minor arc strikes do not reduce the strength of AWS Group II materials (refer to Van Malssen, 1984).

- 4) The effective throat for flare bevel groove welds shall be calculated in accordance with equation 4.2-18.

User Note: The effective weld throat used by the SJI with round bars is based on SJI research and is more conservative than AWS D1.1 for GMAW for round bars in excess of 9/16" (14 mm). See Steel Joist Institute Technical Digest 8, "Welding of Open Web Steel Joists and Joist Girders".

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- 5) Tack welds that are discontinuous from other welds shall meet the criteria for undercut, but shall be exempt from all other acceptance criteria.

User Note: Joist manufacturers use tack welds in the assembly process, and so long as they do not diminish the strength of the base metal and are not incorporated into the final weld for strength, they are not required to meet other inspection criteria.

- 6) The weld profile shall be considered acceptable provided neither the weld leg nor the weld throat is undersized less than AWS D1.1 limits within the weld design length.
- 7) For material with thickness less than 1/8", AWS D1.1 or D1.3 shall be considered appropriate.

User Note: AWS D1.1 does not address thicknesses less than 1/8" for hot rolled material and AWS D1.3 does not address hot rolled material, thus SJI has extended the ranges to include these material thicknesses.

- b) Steel joist and Joist Girder resistance welded joints shall follow a preproduction validation procedure and a production checking procedure and shall meet the strength requirements of this Specification.

User Note: Spot, flash or upset resistance welds should have a written welding procedure qualification record and a systematic quality plan. For further information, see Steel Joist Institute Technical Digest 8, "Welding of Open Web Steel Joists and Joist Girders".

- c) Welded Connections for Crimped-End Angle Web Members

- 1) The connection of each end of a crimped angle web member to each side of the chord shall consist of a weld group made of more than a single line of weld. The design weld length shall include an end return of no less than two times the nominal weld size.

- d) Welding Program

- 1) The manufacturer's welders shall be qualified in accordance with either AWS D1.1 or AWS D1.3 for the applicable weld type, position, and material.
- 2) Manufacturers shall have a program for establishing weld procedures and operator qualification, and for weld sampling and testing. Each manufacturing facility shall have trained inspectors, and an engineer responsible for all welding procedures.

- e) Weld Inspection by Outside Agencies (See Section 5.14)

- 1) The agency shall arrange for visual inspection to determine that welds meet the acceptance standards of Section 4.5.1.

User Note: Ultrasonic, X-ray, and magnetic particle testing are inappropriate for joists due to the configurations of the components and welds.

4.5.2 Strength

4.5.2.1 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.

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4.5.2.2 Shop Splices: Shop splices shall be permitted to 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. All component parts comprising the cross section of the chord or web member (including reinforcing plates, rods, etc.) at the point of the splice shall develop a nominal tensile strength of at least 1.2 times the product of the yield strength and the full design area of the chord or web. The "full design area" shall be defined as the minimum required area such that the required stress will be less than the design (LRFD) or allowable (ASD) stress.

User Note: For more information on welding, see Steel Joist Institute Technical Digest 8, "Welding of Open Web Steel Joists and Joist Girders".

4.5.3 Field Splices

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

4.5.4 Eccentricity

Members connected at a joint shall have their center of gravity lines meet at a point, where practical. Ends of joists or Joist Girders shall be proportioned to resist bending produced by eccentricity at the support.

For a single component web member, the eccentricity shall be permitted to be neglected where it does not exceed the lesser of three-quarters of the over-all dimension of the chord or 2" (51 mm). This eccentricity, measured in the plane of the joist, 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 axis of the web member(s) forming the joint in accordance with Figure 4.5-1.

For a web member composed of at least two shapes, the eccentricity on either side of the neutral axis of chord members, measured in the plane of the joist at the joint work point, shall be permitted to be neglected where the web intersect point does not exceed one and one-half times the distance between the neutral axis and the back of the chord in accordance with Figure 4.5-2.

If these limits are exceeded, provision shall be made for the stresses due to eccentricity.

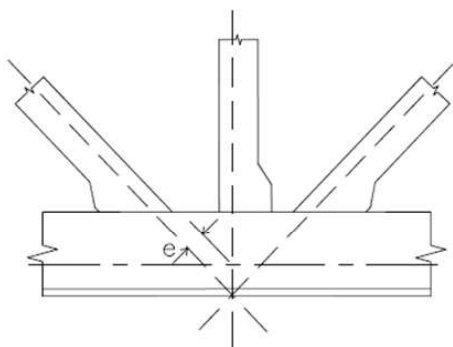


FIGURE 4.5-1

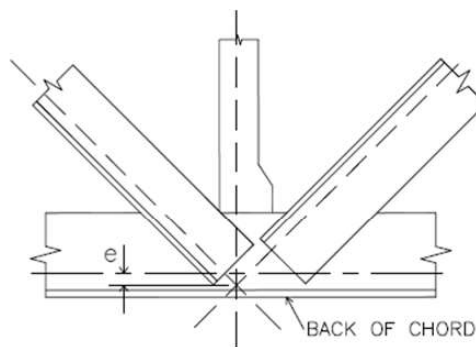


FIGURE 4.5-2

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4.6 CAMBER

Steel joists and Joist Girders 100'-0" or less shall have a manufactured camber in accordance with Table 4.6-1:

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)
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)

For lengths exceeding 100'-0", manufactured camber equal to Span/300 shall be used.

User Note: The specifying professional shall give consideration to coordinating this approximate camber with adjacent framing.

4.7 VERIFICATION OF DESIGN AND MANUFACTURE

User Note: This Section is included as part of this Specification since the verification of design and manufacture is a requirement of any Steel Joist Institute member company in order to be in compliance with this Specification. This Section applies only to a Steel Joist Institute member manufacturer.

4.7.1 Design Calculations

Companies manufacturing any K-Series, LH-Series, DLH-Series Joists or 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 this Specification. Design data shall be submitted in detail and in the format specified by the Steel Joist Institute.

4.7.2 Tests of Chord and Web Members

Each manufacturer shall, at the time of design review by the Steel Joist Institute, verify by tests that the design, in accordance with Section 4.1 through Section 4.5, provides 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.

4.7.3 Tests of Joints and Connections

Each manufacturer shall, at the time of design review by the Steel Joist Institute, verify by shear tests on representative joints of typical joists that connections will meet the provision of Section 4.5.2. Chord and web members shall be permitted to be reinforced for such tests.

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4.7.4 In-Plant Inspections

Each manufacturer shall verify their ability to manufacture K-Series, LH-Series, DLH-Series Joists and 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 plant inspections shall not represent a guarantee of the quality of any specific joists; this responsibility shall lie fully and solely with the individual manufacturer.

**SECTION 5.
APPLICATION****5.1 USAGE**

5.1.1 Scope: This Specification shall apply to any type of structure where floors or roofs are to be supported directly by steel joists installed as hereinafter specified or where steel joists are to be supported directly by Joist Girders installed as hereinafter specified. Where joists or Joist Girders are used other than on simple spans under uniformly distributed loading for joists, or under equal concentrated gravity loading for Joist Girders, as prescribed in Section 4.1, they shall be designed to limit the required stresses to those listed in Section 4.2. The magnitude and location of all loads and forces to be considered in the joist or Joist Girder design shall be provided on the structural drawings.

5.1.2 Continuous Frame Action: Where a rigid connection of the bottom chord is to be made to a column or other structural support, the steel joist or Joist Girder is then no longer simply-supported, and the system shall be investigated for continuous frame action by the specifying professional. 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 structural 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.

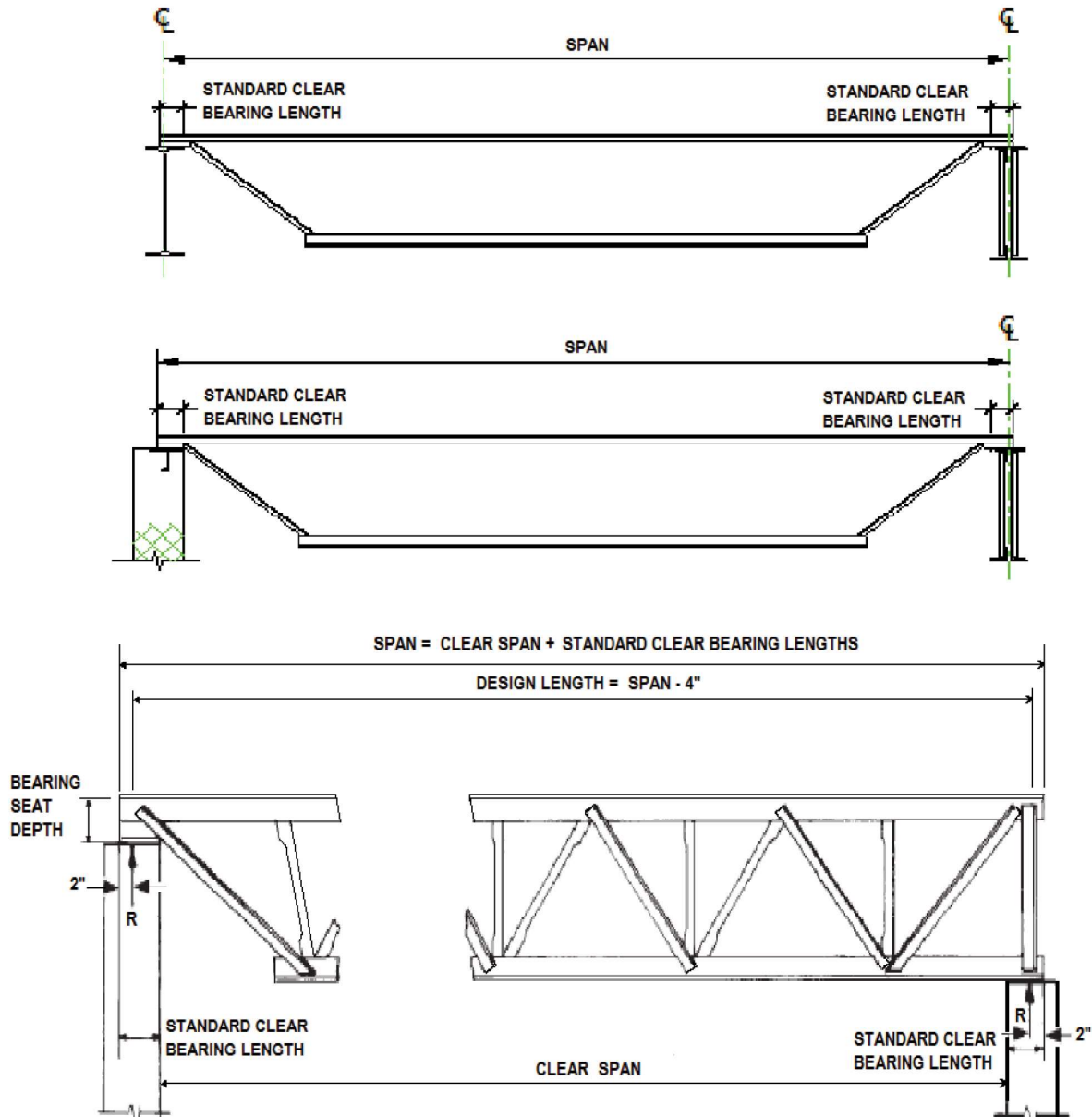
User Note: For further reference concerning continuous frame action and their connections, refer to Steel Joist Institute Technical Digest No. 11, "Design of Lateral Load Resisting Frames Using Steel Joists and Joist Girders".

5.2 SPAN

Except for joist substitutes, the span of a joist or Joist Girder shall not exceed 24 times the depth. Design length shall equal the span minus 4 inches (102 mm) as shown in Figure 5.2-1 "Definition of Span".

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Figure 5.2-1
DEFINITION OF SPAN
(U. S. Customary Units)



- NOTES:
- 1) DESIGN LENGTH = SPAN - 4"
 - 2) MINIMUM BEARING LENGTHS SHALL MEET THE REQUIREMENTS OF SECTION 5.4. BEARING LENGTHS SHOWN MAY VARY BETWEEN STANDARD CLEAR BEARING AND MINIMUM BEARING LENGTH.
 - 3) PARALLEL CHORD JOISTS INSTALLED TO A SLOPE GREATER THAN 1/2 INCH PER FOOT SHALL USE A SPAN DEFINED BY THE LENGTH ALONG THE SLOPE.

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5.3 DEPTH

Steel joists or Joist Girders shall have either parallel chords or a top chord pitch of up to 1/2 inch per foot (1:24). The steel joist or Joist Girder designation depth or nominal depth shall be the depth at mid-span, except for double pitched joists which shall be the depth at the ridge.

5.4 END SUPPORTS

Consideration of the reactions, vertical and lateral, shall be taken by the specifying professional in the design of the steel support, or the steel bearing plate on masonry or concrete. The standard location of the end reaction shall be 2" (51 mm) from the end of the span (exclusive of extensions) at each end of the steel joist or Joist Girder as shown in Figure 5.2-1 "Definition of Span". The standard end reaction location shall require the minimum bearing lengths shown in Table 5.4-1.

TABLE 5.4-1

JOIST SECTION NUMBER ¹	STANDARD CLEAR BEARING LENGTH	MINIMUM BEARING LENGTH ON STEEL
K1-12	4" (102 mm)	2 ½" (64 mm)
LH02-06	6" (152 mm)	2 ½" (64 mm)
LH07-17, DLH10-17, JG	6" (152 mm)	4" (102 mm)
LH/DLH18-25, JG ²	6" (152 mm)	6" (152 mm)
⁽¹⁾ Last digit(s) of joist designation shown in Load Table. ⁽²⁾ Joist Girders with a self weight greater than 50 plf (0.73 kN/m).		

If the specifying professional requires the end reaction to be located at a distance from the face of support more than the standard clear bearing length values shown in Table 5.4-1 minus 2" (51 mm), the structural drawings shall indicate the required special location of the end reaction. The seat depth shall also be increased to the special minimum bearing seat depth per Table 5.4-3.

5.4.1 Masonry and Concrete

5.4.1.1 Scope: A K-Series, LH-Series, DLH-Series Joist or Joist Girder end supported by masonry or concrete shall bear on steel bearing plates and shall be designed as steel bearing.

5.4.1.2 Bearing Length: The ends of K-Series Joists shall extend a distance of not less than 4 inches (102 mm) over the face of masonry or concrete support unless it is deemed necessary to bear less than 4 inches (102 mm) over the support. The ends of LH-Series, DLH-Series Joists and Joist Girders shall extend a distance of not less than 6 inches (152 mm) over the face of masonry or concrete support unless it is deemed necessary to bear less than 6 inches (152 mm) over the support.

5.4.1.3 Anchorage: K-Series, LH-Series, DLH-Series Joists and **Joist Girders** shall be anchored to the steel bearing plate per Section 5.7.

The steel bearing plate shall be located not more than 1/2 inch (13 mm) from the face of the wall. If the steel bearing plate is located more than 1/2 inch (13 mm) from the face of the wall, or the minimum bearing over the masonry or concrete support cannot be provided as shown in Table 5.4-1, special consideration shall be given to the design of the steel bearing plate and the masonry or concrete by the specifying professional.

The steel bearing plate width shall not be less than that shown in Table 5.4-2 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.

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TABLE 5.4-2

JOIST SECTION NUMBER ¹	MINIMUM BEARING PLATE WIDTH
K1-12, LH02-06	7" (178 mm)
LH07-17, DLH10-17, JG	9" (229 mm)
LH/DLH18-25, JG ²	14" (356 mm)
⁽¹⁾ Last digit(s) of joist designation shown in Load Table.	
⁽²⁾ Joist Girders with a self weight greater than 50 plf (0.73 kN/m).	

5.4.2 Steel

The ends of K-Series, LH-Series, DLH-Series Joists and Joist Girders shall be anchored to the support per Section 5.7.

5.4.3 Bearing Depth

The standard non-sloping bearing seat depths shall be as shown in Table 5.4-3. If the steel joist slopes 3/8 inch per foot or greater, the high end bearing seat shall require additional depth due to the slope.

User Note: The Steel Joist Institute Code of Standard Practice provides guidance for determining additional seat depth requirements for sloped joists.

TABLE 5.4-3

JOIST SECTION NUMBER ¹	STANDARD BEARING SEAT DEPTH	STANDARD CLEAR BEARING LENGTH	SPECIAL MINIMUM BEARING SEAT DEPTH ²
K1-12	2 ½" (64 mm)	4" (102 mm)	0.6 x (RP + 2 ½" (64 mm))
LH02-17, DLH10-17	5" (127 mm)	6" (152 mm)	0.6 x (RP + 4" (102 mm))
LH/DLH18-25	7 ½" (191 mm)	6" (152 mm)	0.6 x (RP + 4" (102 mm)) + 2 ½" (64 mm)
JG	7 ½" (191 mm)	6" (152 mm)	RP + 4" (102 mm)
⁽¹⁾ Last digit(s) of joist designation shown in Load Table.			
⁽²⁾ RP is equal to the distance the reaction is to occur from the face of the wall or leading edge of support member. The equation is not applicable for the high end of a sloped joist or Joist Girder.			

When the specifying professional requires the steel joist or Joist Girder reaction to occur at or near the centerline of the wall or other support, a special bearing seat depth shall be required and a note shall be placed on the structural drawings identifying where the reaction is to occur. The specified bearing seat depth shall be increased according to Table 5.4-3 to allow for this special requirement.

5.5 BRIDGING or BRACING

Joist Girders shall be proportioned such that they can be erected without bridging. Therefore, the following requirements shall be met:

- The ends of the bottom chord shall be 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.
- No other loads shall be placed on the Joist Girder until the steel joists bearing on the Joist Girder are in place and positively attached to the Joist Girder.

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User Note: See Section 5.12 for bridging or bracing required for uplift forces.

Steel joist top and bottom chord bridging shall be required and shall consist of one or both of either horizontal or diagonal bridging.

5.5.1 Horizontal Bridging

Horizontal bridging lines shall consist of continuous horizontal steel members. The ℓ/r ratio of the bridging member shall not exceed 300, where ℓ is the distance in inches (millimeters) between attachments and r is the least radius of gyration of the bridging member.

5.5.2 Diagonal Bridging

Diagonal bridging lines 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 bridging members and the connections to the chords of the joists.

5.5.2.1 Diagonal Erection Bridging

User Note: Joists exhibit varying degrees of stability dependent upon the span, depth, member sizes, self weight and other parameters. Bolted diagonal Erection Bridging which must be installed prior to releasing hoisting cables may be required.

Where required as identified below, bolted diagonal Erection Bridging shall be required and shall be in accordance with the following:

- (a) For joist spans up through and including 60 feet (18288 mm) in length;

Welded horizontal bridging shall be permitted except where the row of bridging nearest the center is required to be bolted diagonal Erection Bridging as indicated by the **Red shaded area** in the Load Tables. Hoisting cables shall not be released until this row of bolted diagonal Erection Bridging is completely installed and anchored.

Bolted diagonal Erection Bridging shall be provided as required in the SJI Load Tables wherever a standard SJI Section Number designation is specified. For spans 60 feet (18288mm) or less, in the absence of a standard SJI Section Number designation, minimum bolted diagonal Erection Bridging requirements shall be determined by:

- 1) Matching the joist design to an equivalent standard SJI Section Number designation to determine the span at which Erection Bridging is needed as designated in the tables; or
- 2) Using Equation 5.5-1 to determine the joist stability and the need for Erection Bridging.

$$W = \frac{-b + \sqrt{b^2 - 4 \cdot a \cdot c}}{2 \cdot a} ; \quad \text{If, } \frac{w_u}{w_{actual}} > 1.00 \text{ Erection Bridging is not required.} \quad (5.5-1)$$

$$a = \left(\frac{\pi^2 + 3}{24} \right)^2$$

$$b = P \cdot \frac{\pi^2 + 3}{12} \cdot \frac{\pi^2 + 4}{16} - \frac{\pi^4 \cdot E \cdot I_y}{2 \cdot (k \cdot L)^3} \cdot \left[\beta_x \cdot \left(\frac{\pi^2 - 3}{24} \right) - \frac{y_o}{2} \right]$$

$$c = (P)^2 \left(\frac{\pi^2 + 4}{16} \right)^2 - \frac{\pi^4 \cdot E \cdot I_y}{2 \cdot (k \cdot L)^3} \cdot \left[P \cdot \left(\beta_x \cdot \frac{\pi^2 - 4}{16} - a_e \right) + \frac{\pi^4 \cdot E \cdot C_w}{2 \cdot (k \cdot L)^3} + \frac{\pi^2 \cdot G \cdot J}{2 \cdot k \cdot L} \right]$$



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Where:

P = Factored weight of erector = 1.2 x (assumed weight of 250 lbs.) = 300 lbs. (1334 N)

E = Modulus of elasticity = 29,000,000 psi (200,000 MPa)

I_y = Joist moment of inertia about y-axis, in.⁴ (mm⁴) $I_y = I_{yt} + I_{yb}$

I_{yt} = Top chord moment of inertia about y-axis, in.⁴ (mm⁴)

I_{yb} = Bottom chord moment of inertia about y-axis, in.⁴ (mm⁴)

L = Joist Span, in. (mm)

k = Effective length factor = 0.85

β_x = Cross-Sectional parameter
$$\beta_x = \frac{1}{I_x} \left[A_b \cdot (d_e - y)^3 - A_t \cdot y^3 \right] - 2 \cdot y_o$$

A_b = Area of bottom chord, in.² (mm²)

A_t = Area of top chord, in.² (mm²)

d_e = Joist effective depth, in. (mm) $d_e = d - y_t - y_b$

y_t = Neutral axis of top chord, in. (mm)

y_b = Neutral axis of bottom chord, in. (mm)

y = Distance from centroid of top chord to centroid of cross section, in. (mm) $y = \frac{A_b \cdot d_e}{A_t + A_b}$

I_x = Joist moment of inertia about x-axis, in.⁴ (mm⁴) $I_x = A_t y^2 + A_b (d_e - y)^2$

y_o = Distance from centroid of cross section to shear center, in. (mm) $y_o = -y + \frac{I_{yb} \cdot d_e}{I_y}$

a_e = Vertical location of load P from shear center (locate at joist center of gravity), in. (mm), where $a_e = y_o$

C_w = Warping constant
$$C_w = \frac{d_e^2 \cdot I_{yb} \cdot I_{yt}}{I_y}$$

G = Shear modulus, psi (MPa) $G = 0.385E$

J = St. Venant torsion constant, in.⁴ (mm⁴) $J = \frac{1}{3} (A_t \cdot t_t^2 + A_b \cdot t_b^2)$

t_t = Thickness of top chord, in. (mm)

t_b = Thickness of bottom chord, in. (mm)

w_u = Ultimate lateral buckling load $w_u = \frac{W \cdot 12}{L}$, plf $w_u = \frac{W}{L}$, (kN/m)

w_{actual} = Joist self-weight, plf (kN/m)

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- b) For joist spans greater than 60 feet (18288 mm) in length; Bolted diagonal Erection Bridging shall be used as indicated by the **Blue and Gray shaded areas** of the Load Tables. Hoisting cables shall not be released until all rows of bolted diagonal Erection Bridging are completely installed and anchored. Where the joist spacing is less than 0.70 x joist depth, bolted horizontal bridging shall be used in addition to bolted diagonal Erection Bridging.
- c) The bolted diagonal Erection Bridging determined by Section 5.5.2.1a and Section 5.5.2.1b shall be considered a minimum. This bolted diagonal Erection Bridging shall be indicated on the placement plans.

User Note: Joists with special profiles having a higher center of gravity as compared to a parallel chord joist, joists which are canted, or joists having any condition which may create instability, may require additional bridging and/or special erection methods.

5.5.3 Quantity and Spacing of Bridging

5.5.3.1 Scope: Bridging shall be properly spaced and anchored to support the decking and the employees prior to the attachment of the deck to the top chord. The maximum spacing between lines of bridging, ℓ_{brmax} shall be the lesser of,

$$\ell_{brmax} = \left(124 + 0.67 d_j + 28 \frac{d_j}{L} \right) r_y, \text{ in.} \quad (5.5-2a)$$

$$\ell_{brmax} = \left(124 + 0.026 d_j + 0.34 \frac{d_j}{L} \right) r_y, \text{ mm} \quad (5.5-2b)$$

or,
$$\ell_{brmax} = 170 r_y \quad (5.5-3)$$

Where:

d_j is the steel joist depth, in. (mm)

L is the joist span length, ft. (m)

r_y is the radius of gyration of the top chord about the vertical axis of the joist cross section, in. (mm)

5.5.3.2 Number of Rows: The number of rows of top chord bridging shall not be less than as shown in Table 5.5-1 and the spacing shall meet the requirements of Equations 5.5-2 and 5.5-3. The number of rows of bottom chord bridging, including bridging required per Section 5.12, shall not be less than the number of top chord rows. Rows of bottom chord bridging shall be 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.

5.5.3.3 DLH Joist Section 21 and Greater: For DLH-Series joist Section Number 21 and greater, bridging shall be installed near a bottom chord panel point or an extra web member shall be furnished to brace the bottom chord for the vertical component of the bridging force equal to the horizontal bracing force.

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TABLE 5.5-1

U.S. CUSTOMARY UNITS										
NUMBER OF ROWS OF TOP CHORD BRIDGING ²										
Section Number ¹	Joist Depth	1 Row	2 Rows	3 Rows	4 Rows	5 Rows	6 Rows	7 Rows	8 Rows	9 Rows
K1	All	17	>17 to 26	>26 to 28						
K2	All	21	>21 to 30	>30 to 32						
K3	All	18	>18 to 26	>26 to 40						
K4	All	20	>20 to 30	>30 to 41	>41 to 48					
K5	12K to 24K	20	>20 to 30	>30 to 42	>42 to 48					
	26K	28	>28 to 41	> 41 to 52						
K6	14K to 24K	20	>20 to 31	>31 to 42	>42 to 48					
	26K & 28K	28	>28 to 41	>41 to 54	>54 to 56					
K7	16K to 24K	23	>23 to 34	>34 to 48						
	26K to 30K	29	>29 to 44	>44 to 60						
K8	24K	25	>25 to 39	>39 to 48						
	26K to 30K	29	>29 to 44	>44 to 60						
K9	16K to 24K	22	>22 to 34	>34 to 48						
	26K to 30K	29	>29 to 44	>44 to 60						
K10	18K to 24K	22	>22 to 38	>38 to 48						
	26K to 30K	29	>29 to 48	>48 to 60						
K11	22K	24	>24 to 39	>39 to 44						
	30K	34	>34 to 49	>49 to 60						
K12	24K	25	>25 to 43	>43 to 48						
	26K to 30K	29	>29 to 47	>47 to 60						
LH02-03	All	20	>20 to 30	>30 to 40	>40					
LH04-05	All	22	>22 to 33	>33 to 44	>44 to 55	>55				
LH06-08	All	26	>26 to 45	>45 to 60	>60 to 75	>75				
LH09	All	26	>26 to 48	>48 to 64	>64 to 80	>80				
LH/DLH10	All	28	>28 to 54	>54 to 72	>72 to 90	>90				
LH/DLH11	All	30	>30 to 54	>54 to 72	>72 to 90	>90 to 108	>108			
LH/DLH12	All	34	>34 to 55	>55 to 74	>74 to 92	>92 to 111	>111			
LH/DLH13	All	36	>36 to 63	>63 to 84	>84 to 105	>105 to 126	>126			
LH/DLH14	All	38	>38 to 64	>64 to 86	>86 to 107	>107 to 129	>129			
LH/DLH15	All	42	>42 to 73	>73 to 98	>98 to 122	>122 to 147	>147			
LH/DLH 16-17	All	44	>44 to 75	>75 to 100	>100 to 125	>125 to 150	>150 to 175	>175		
LH/DLH 18-20	All	52	>52 to 78	>78 to 104	>104 to 130	>130 to 156	>156 to 182	>182 to 208	>208 to 234	>234
LH/DLH 21-25	All	60	>60 to 90	>90 to 120	>120 to 150	>150 to 180	>180 to 210	>210		

(1) Last digit(s) of joist designation shown in Load Table.
 (2) Distances are Joist Span lengths in feet – See “Definition of Span” Figure 5.2-1. Refer to the Joist Load Table and Specification Section 6 for required bolted diagonal bridging and additional stability requirements. See Section 5.12 for additional bridging required for uplift design.



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5.5.4 Sizing of Bridging

Horizontal and diagonal bridging shall be capable of resisting the nominal unfactored horizontal compressive force, P_{br} given in Equation 5.5-4.

$$P_{br} = 0.0025 n A_t F_{\text{construction}}, \text{ kips (N)} \quad (5.5-4)$$

Where:

$n = 8$ for horizontal bridging

$n = 2$ for diagonal bridging

A_t = cross sectional area of joist top chord, in.² (mm²)

$F_{\text{construction}}$ = assumed ultimate stress in top chord to resist construction loads, determined in accordance with the following:

$$F_{\text{construction}} = \left(\frac{\pi^2 E}{\left(\frac{0.9 \ell_{brmax}}{r_y} \right)^2} \right) \geq 12.2 \text{ ksi} \quad (5.5-5a)$$

$$F_{\text{construction}} = \left(\frac{\pi^2 E}{\left(\frac{0.9 \ell_{brmax}}{r_y} \right)^2} \right) \geq 84.1 \text{ MPa} \quad (5.5-5b)$$

Where:

E = Modulus of Elasticity of steel = 29,000 ksi (200,000 MPa)

and $\frac{\ell_{brmax}}{r_y}$ is determined from Equations 5.5-2 or 5.5-3

The bridging nominal horizontal unfactored compressive forces, P_{br} , shall be in accordance with Table 5.5-2.

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TABLE 5.5-2

BRIDGING NOMINAL HORIZONTAL UNFACTORED COMPRESSIVE FORCE					
JOIST SECTION NUMBER ¹	HORIZONTAL BRIDGING P_{br} (n=8)		REQUIRED BRIDGING CONNECTION WELD ²	DIAGONAL BRIDGING P_{br} (n=2)	
	Lbs.	(N)	In.	Lbs.	(N)
K1-8	340	(1512)	1/8" x 1" (3mm x 25mm)	85	(378)
K9-10, LH02-03	450	(2002)		113	(503)
K11-12, LH04-05	560	(2491)		140	(623)
LH06-08	750	(3336)		188	(836)
LH09	850	(3781)		213	(945)
LH/DLH10	900	(4003)		225	(1001)
LH/DLH11	950	(4226)		238	(1056)
LH/DLH12	1100	(4893)		275	(1223)
LH/DLH13	1200	(5338)		300	(1334)
LH/DLH14	1300	(5783)		325	(1446)
LH/DLH15	1450	(6450)		363	(1612)
LH/DLH16-17	1850	(8229)	1/8" x 1 1/2" (3mm x 38mm)	463	(2057)
LH/DLH18-20	2350	(10453)		585	(2602)
LH/DLH21-22	3150	(14012)	1/8" x 2" (3mm x 51mm)	790	(3514)
LH/DLH23-24	4130	(18371)	1/8" x 3" (3mm x 76mm)	1035	(4604)
LH/DLH25	4770	(21218)		1195	(5316)

(¹) Last digit(s) of joist designation shown in Load Table.
(²) Or other connection type designed for the required force.

5.5.5 Connections

Connections to the joist chords shall be made by welding or mechanical means and shall be capable of resisting the unfactored or nominal horizontal force, P_{br} , of Equation 5.5-4 but not less than 700 pounds (3114 N).

5.5.6 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.

5.6 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 thereto.

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5.7 BEARING SEAT ATTACHMENTS

5.7.1 Masonry and Concrete

Ends of K-Series, LH-Series, and DLH-Series Joists and Joist Girders resting on steel bearing plates on masonry or structural concrete shall be attached thereto, as shown in Table 5.7-1, with a minimum of two fillet welds, or with two bolts, or the equivalent.

5.7.2 Steel

Ends of K-Series, LH-Series, and DLH-Series Joists and Joist Girders resting on steel supports shall be attached thereto, as shown in Table 5.7-1, with a minimum of two fillet welds, or with two bolts, or the equivalent. Where K-Series, LH-Series and DLH-Series Joists and Joist Girders 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.

TABLE 5.7-1

JOIST SECTION NUMBER ¹	MINIMUM FILLET WELD	MINIMUM BEARING SEAT BOLTS FOR ERECTION
K1-12	2– 1/8" x 2 1/2" (3 x 64 mm)	2– 1/2" (13 mm) A307
LH02-06	2– 3/16" x 2 1/2" (5 x 64 mm)	
LH07-17, DLH10-17, JG	2– 1/4" x 2 1/2" (6 x 64 mm)	2– 3/4" (19 mm) A307
LH/ DLH18-25, JG ²	2– 1/4" x 4" (6 x 102 mm)	2– 3/4" (19 mm) A325
⁽¹⁾ Last digit(s) of joist designation shown in load table.		
⁽²⁾ Joist Girders with a self weight greater than 50 plf (0.73 kN/m).		

5.7.3 Uplift

Where uplift forces are a design consideration, roof joists shall be anchored to resist such forces and shall meet the requirements of Section 5.12.

5.8 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.

5.9 FLOOR AND ROOF DECKS

5.9.1 Material

Floor and roof decks shall be permitted to consist of cast-in-place or pre-cast concrete or gypsum, cold-formed steel, wood, or other suitable material capable of supporting the required load at the specified joist spacing.

5.9.2 Thickness

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

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5.9.3 Centering

Centering for cast-in-place slabs shall be permitted to 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.

5.9.4 Bearing

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

5.9.5 Attachments

The spacing of attachments along the joist top chord shall not exceed 36 inches (914 mm). Such attachments of the slab or deck to the top chords of joists shall be capable of resisting the forces given in Table 5.9-1.

TABLE 5.9-1

JOIST SECTION NUMBER ¹	NOMINAL FORCE REQUIRED ²
K1-12	100 lbs/ft. (1.46 kN/m)
LH02-04	120 lbs/ft. (1.75 kN/m)
LH05-09	150 lbs/ft. (2.19 kN/m)
LH/DLH10-17	200 lbs/ft. (2.92 kN/m)
LH/DLH18-19	250 lbs/ft. (3.65 kN/m)
LH/DLH20-21	300 lbs/ft. (4.38 kN/m)
LH/DLH22-24	420 lbs/ft. (6.13 kN/m)
LH/DLH25	520 lbs/ft. (7.59 kN/m)
⁽¹⁾ Last digit(s) of joist designation shown in Load Table.	
⁽²⁾ Nominal bracing force is unfactored.	

5.9.6 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 5.9.5.

5.9.7 Joist With Standing Seam Roofing or Laterally Unbraced Top Chords

Where the roof systems do not provide lateral stability for the steel joists in accordance with Section 5.9.5 sufficient stability shall be provided to brace the steel joists laterally under the full design load. For this condition, the compression chord design shall include the effects of both the in-plane and out-of-plane buckling of the steel joist (e.g., buckling about the vertical axis of the steel joist cross section). In any case where the attachment requirement of Section 5.9.5 is not achieved, out-of-plane strength shall be achieved by adjusting the bridging spacing and/or increasing the compression chord area and the y-axis radius of gyration. The effective slenderness ratio about the vertical axis equals $0.94 L/r_y$; where L is the bridging spacing in inches (millimeters) and r_y is the radius of gyration of the top chord in inches (millimeters). The maximum bridging spacing shall not exceed that specified in Section 5.5.3.

User Note: Some examples of roof systems which may not provide adequate top chord lateral stability may be standing seam roofs, skylights, or other openings which do not provide top chord attachments per Section 5.9.5.

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Horizontal bridging members attached to the compression chords and their anchorages shall be designed for a compressive axial force, P_{br} , given in Equation 5.9-1.

$$P_{br} = 0.001nP + 0.004P\sqrt{n} \geq 0.0025nP, \text{ kips (N)} \quad (5.9-1)$$

Where n is the number of joists between end anchors and P is the chord design force in kips (N)

The attachment force between the horizontal bridging member and the compression chord shall be $0.01P$. 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.

5.10 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, or
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.

User Note: For further information on vibration, refer to Steel Joist Institute Technical Digest 5, "Vibration of Steel Joist-Concrete Slab Floors".

5.11 PONDING

The ponding investigation shall be performed by the specifying professional.

User Note: For further reference, refer to Steel Joist Institute Technical Digest 3, "Structural Design of Steel Joist Roofs to Resist Ponding Loads" and AISC 360.

5.12 UPLIFT

Where uplift forces due to wind are a design requirement, these forces shall be indicated on the structural drawings in terms of NET uplift in pounds per square foot (Pascals). The structural drawings shall indicate if the net uplift is based upon an LRFD or ASD load combination. When these forces are specified, they shall be considered in the design of joists, Joist Girders, and required bridging or bracing. Wherever uplift due to wind forces is a design consideration, the following shall be required:

- For joists, a single line of **bottom chord** bridging shall be provided near the first bottom chord panel points.
- For **Joist Girders**, if the ends of the bottom chord are not strutted and extended to column stabilizer plates, bracing shall be provided near the first bottom chord panel points.

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

5.13 DIAPHRAGMS AND COLLECTORS

Where diaphragm collector forces due to wind or seismic forces are a design requirement, these forces shall be indicated on the structural drawings. The structural drawings shall indicate the nominal (unfactored) forces. The structural drawings shall also indicate the Seismic Design Category, and the Seismic Force Resisting System type, and applicable seismic design coefficients. When this data is specified, joist collectors or chords in horizontal diaphragm systems, shall be designed in conformance with the provisions of Section 4 through Section 6. End connections and splices in joists incorporated into Seismic Force Resisting System (SFRS) as horizontal diaphragms as collectors or chords shall adhere to the requirements stipulated by the applicable building code.

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5.14 INSPECTION

Joists shall be inspected by the manufacturer before shipment to verify compliance of materials and workmanship with the requirements of this Specification.

User Note: If the purchaser requires an inspection of the steel joists or Joist Girders by someone other than the manufacturer's own inspectors, they shall be permitted to 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 or Joist Girders at the manufacturing shop by the purchaser's inspectors at purchaser's expense.

5.15 PARALLEL CHORD SLOPED JOISTS AND JOIST GIRDERS

The span of a parallel chord sloped joist or Joist Girder 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 6

**ERECTION STABILITY
AND HANDLING**

As a minimum, erection stability and handling of joists and Joist Girders shall meet the requirements of this Section 6.

User Note: Additional requirements for erection of steel joists and Joist Girders can be found in Steel Joist Institute Technical Digest No. 9, "Handling and Erection of Steel Joists and Joist Girders".

6.1 STABILITY REQUIREMENTS

User Note: It is not recommended that an erector climb on unbridged joists, extreme caution shall be exercised since unbridged joists exhibit some degree of instability under the erector's weight.

- a) In steel framing, where joists/Joist Girders are utilized at column lines, the joist/Joist Girder shall be field-bolted at the column. Before hoisting cables are released and before an employee is allowed on the joists/Joist Girder the following conditions shall be met:
 - 1) The seat at each end of the joist/Joist Girder is attached in accordance with Section 5.7. Where a bolted seat connection is used for erection purposes, as a minimum, the bolts shall be snug tightened. The snug tight condition shall be defined as the tightness that exists where all plies of a joint are in firm contact. This shall be attained by a few impacts of an impact wrench or the full effort of an employee using an ordinary spud wrench.
 - 2) Where stabilizer plates are required the joist/Joist Girder bottom chord shall 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 or Joist Girder is not exceeded.

- b) 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 5.7.

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

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- c) On steel joists that do not require erection bridging as shown by either the unshaded area of the Load Tables or as determined by Section 5.5.2.1, only one employee shall be allowed on the steel joist until all bridging is installed and anchored.
- d) Where the span of the steel joist is within the Red shaded area of the Load Table, or in the absence of a standard SJI Section Number designation and Erection Bridging is required in accordance with Section 5.5.2.1, the following shall apply:
 - 1) The row of bridging nearest the midspan of the steel joist shall be bolted diagonal Erection Bridging; and
 - 2) 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
 - 3) No more than one employee shall be allowed on these spans until all other bridging is installed and anchored.
- e) Where the span of the steel joist is within the Blue shaded area of the Load Table, the following shall apply:
 - 1) All rows of bridging shall be bolted diagonal bridging; and
 - 2) 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
 - 3) No more than two employees shall be allowed on these spans until all bridging is installed and anchored.
- f) Where the span of the steel joist is in the Gray shaded area of the Load Table, the following shall apply:
 - 1) All rows of bridging shall be bolted diagonal bridging; and
 - 2) Hoisting cables shall not be released until all bridging is installed and anchored; and
 - 3) No more than two employees shall be allowed on these spans until all other bridging is installed and anchored.
- g) Where permanent bridging terminus points cannot be used during erection, additional temporary bridging terminus points shall be required to provide lateral stability.
- h) In the case of bottom chord bearing joists, the ends of the joist shall be restrained laterally per Section 5.5.6 before releasing the hoisting cables.
- i) 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 5.7.

6.2 LANDING AND PLACING LOADS

- a) Except as stated in Section 6.2(d), no "construction loads" shall be allowed on the steel joists until all bridging is installed and anchored, and all joist bearing ends are attached.

User Note: For definition of "construction load" see Code of Federal Regulations (CFR), Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926, Safety Standards for Steel Erection; Subpart R - Steel Erection, §1926.751 Definitions; January 18, 2001, Washington, D.C.

- b) During the construction period, loads placed on the steel joists shall be distributed so as not to exceed the capacity of the steel joists.
- c) 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 three 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.
- d) No bundle of deck shall 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:
 - 1) The contractor 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;
 - 2) The bundle of decking is placed on a minimum of three steel joists;

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- 3) The joists supporting the bundle of decking are attached at both ends;
- 4) At least one row of bridging is installed and anchored;
- 5) The total weight of the decking does not exceed 4000 pounds (1816 kilograms); and
- 6) The edge of the bundle of decking is placed within 1 foot (0.30 meters) of the bearing surface of the joist end.

User Note: For definition of “qualified person” see Code of Federal Regulations (CFR), Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926, Safety Standards for Steel Erection; Subpart R - Steel Erection, §1926.751 Definitions; January 18, 2001, Washington, D.C.

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

6.3 FIELD WELDING

All field welding shall be performed in accordance with the structural drawings. Field welding shall not damage the joists or Joist Girders.

On cold-formed steel 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.

6.4 HANDLING

Particular attention shall be considered for the handling and erection of K-Series, LH-Series, DLH-Series steel joists and Joist Girders. Damage to the joists and accessories shall be avoided. Hoisting cables shall be attached at panel point locations and those locations shall be selected to minimize erection stresses.

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 6.1(c), 6.1(d), 6.1(e), and 6.1(f) shall be anchored to prevent lateral movement.

6.5 FALL ARREST SYSTEMS

Steel joists and 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”.

User Note: For definition of “qualified person” see Code of Federal Regulations (CFR), Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926, Safety Standards for Steel Erection; Subpart R - Steel Erection, §1926.751 Definitions; January 18, 2001, Washington, D.C.