

WAC 296-155-709 Open web steel joists. (1) General.

(a) Where steel joists are used and columns are not framed in at least two directions with solid web structural steel members, a steel joist must be field-bolted at the column to provide lateral stability to the column during erection.

Exception:

See (b) of this subsection. For the installation of this joist:

(i) A vertical stabilizer plate must be provided on each column for steel joists. The plate must be a minimum of 6 inch by 6 inch (152 mm by 152 mm) and must extend at least 3 inches (76 mm) below the bottom chord of the joist with a 13/16-inch (21 mm) hole to provide an attachment point for guying or plumbing cables.

(ii) The bottom chords of steel joists at columns must be stabilized to prevent rotation during erection.

(iii) You must not release hoisting cables until the seat at each end of the steel joist is field-bolted, and each end of the bottom chord is restrained by the column stabilizer plate.

(b) Where constructibility does not allow a steel joist to be installed at the column:

(i) You must install an alternate means of stabilizing joists on both sides near the column and it must:

- Provide stability equivalent to (a) of this subsection;
- Be designed by a qualified person;
- Be shop installed; and
- Be included in the erection drawings.

(ii) You must not release hoisting cables until the seat at each end of the steel joist is field-bolted and the joist is stabilized.

(c) Where steel joists at or near columns span 60 feet (18.3 m) or less, the joist must be designed with sufficient strength to allow one employee to release the hoisting cable without the need for erection bridging.

(d) Where steel joists at or near columns span more than 60 feet (18.3 m), the joists must be set in tandem with all bridging installed unless an alternative method of erection, which provides equivalent stability to the steel joist, is designed by a qualified person and is included in the site-specific erection plan.

(e) You must not place a steel joist or steel joist girder on any support structure unless such structure is stabilized.

(f) When steel joist(s) are landed on a structure, you must secure them to prevent unintentional displacement prior to installation.

(g) You must not make any modification that affects the strength of a steel joist or steel joist girder without the approval of the project structural engineer of record.

(h) Field-bolted joists.

(i) Except for steel joists that have been preassembled into panels, connections of individual steel joists to steel structures in bays of 40 feet (12.2 m) or more must be fabricated to allow for field bolting during erection.

(ii) These connections must be field-bolted unless constructibility does not allow.

(i) You must not use steel joists and steel joist girders as anchorage points for a fall arrest system unless written approval to do so is obtained from a qualified person.

(j) You must establish a bridging terminus point before bridging is installed. (See Appendix E to this part.)

(2) Attachment of steel joists and steel joist girders.

(a) You must attach each end of "K" series steel joists to the support structure with a minimum of two 1/8-inch (3 mm) fillet welds one inch (25 mm) long or with two 1/2-inch (13 mm) bolts, or the equivalent.

(b) You must attach each end of "LH" and "DLH" series steel joists and steel joist girders to the support structure with a minimum

of two 1/4-inch (6 mm) fillet welds two inches (51 mm) long, or with two 3/4-inch (19 mm) bolts, or the equivalent.

(c) Except as provided in (d) of this subsection, you must attach each steel joist to the support structure, at least at one end on both sides of the seat, immediately upon placement in the final erection position and before additional joists are placed.

(d) You must attach panels that have been preassembled from steel joists with bridging to the structure at each corner before the hoisting cables are released.

(3) Erection of steel joists.

(a) You must attach both sides of the seat of one end of each steel joist that requires bridging under Tables A and B to the support structure before hoisting cables are released.

(b) For joists over 60 feet, you must attach both ends of the joist as specified in subsections (2) and (4) of this section before the hoisting cables are released.

(c) On steel joists that do not require erection bridging under Tables A and B, you must only allow one employee on the joist until all bridging is installed and anchored.

Table A—Erection of Bridging for Short Span Joists

Joist	Span	Joist	Span	Joist	Span
8L1	NM	22K10	40-0	14KCS1	NM
10K1	NM	22K11	40-0	14KCS2	NM
12K1	23-0	24K4	36-0	14KCS3	NM
12K3	NM	24K5	38-0	16KCS2	NM
12K5	NM	24K6	39-0	16KCS3	NM
14K1	27-0	24K7	43-0	16KCS4	NM
14K3	NM	24K8	43-0	16KCS5	NM
14K4	NM	24K9	44-0	18KCS2	35-0
14K6	NM	24K10	NM	18KCS3	NM
16K2	29-0	24K12	NM	18KCS4	NM
16K3	30-0	26K5	38-0	18KCS5	NM
16K4	32-0	26K6	39-0	20KCS2	36-0
16K5	32-0	26K7	43-0	20KCS3	39-0
16K6	NM	26K8	44-0	20KCS4	NM
16K7	NM	26K9	45-0	20KCS5	NM
16K9	NM	26K10	49-0	22KCS2	36-0
18K3	31-0	26K12	NM	22KCS3	40-0
18K4	32-0	28K6	40-0	22KCS4	NM
18K5	33-0	28K7	43-0	22KCS5	NM
18K6	35-0	28K8	44-0	24KCS2	39-0
18K7	NM	28K9	45-0	24KCS3	44-0
18K9	NM	28K10	49-0	24KCS4	NM
18K10	NM	28K12	53-0	24KCS5	NM
20K3	32-0	30K7	44-0	26KCS2	39-0
20K4	34-0	30K8	45-0	26KCS3	44-0
20K5	34-0	30K9	45-0	26KCS4	NM
20K6	36-0	30K10	50-0	26KCS5	NM
20K7	39-0	30K11	52-0	28KCS2	40-0
20K9	39-0	30K12	54-0	28KCS3	45-0
20K10	NM	10KCS1	NM	28KCS4	53-0
22K4	34-0	10KCS2	NM	28KCS5	53-0
22K5	35-0	10KCS3	NM	30KCS3	45-0

Joist	Span		Joist	Span		Joist	Span
22K6	36-0		12KCS1	NM		30KCS4	54-0
22K7	40-0		12KCS2	NM		30KCS5	54-0
22K9	40-0		12KCS3	NM			

NM = Diagonal bolted bridging not mandatory for joists under 40 feet.

Table B—Erection Bridging for Long Span Joists

Joist	Span		Joist	Span
18LH02	33-0		28LH06	42-0
18LH03	NM		28LH07	NM
18LH04	NM		28LH08	NM
18LH05	NM		28LH09	NM
18LH06	NM		28LH10	NM
18LH07	NM		28LH11	NM
18LH08	NM		28LH12	NM
18LH09	NM		28LH13	NM
20LH02	33-0		32LH06	47-0 through 60-0
20LH03	38-0		32LH07	47-0 through 60-0
20LH04	NM		32LH08	55-0 through 60-0
20LH05	NM		32LH09	NM through 60-0
20LH06	NM		32LH10	NM through 60-0
20LH07	NM		32LH11	NM through 60-0
20LH08	NM		32LH12	NM through 60-0
20LH09	NM		32LH13	NM through 60-0
20LH10	NM		32LH14	NM through 60-0
24LH03	35-0		32LH15	NM through 60-0
24LH04	39-0		36LH07	47-0 through 60-0
24LH05	40-0		36LH08	47-0 through 60-0
24LH06	45-0		36LH09	57-0 through 60-0
24LH07	NM		36LH10	NM through 60-0
24LH08	NM		36LH11	NM through 60-0
24LH09	NM		36LH12	NM through 60-0
24LH10	NM		36LH13	NM through 60-0
24LH11	NM		36LH14	NM through 60-0
28LH05	42-0		36LH15	NM through 60-0

NM = Diagonal bolted bridging not mandatory for joists under 40 feet.

(d) You must not allow employees on steel joists where the span of the steel joist is equal to or greater than the span shown in Tables A and B except in accordance with WAC 296-155-709(4).

(e) When permanent bridging terminus points cannot be used during erection, additional temporary bridging terminus points are required to provide stability. (See Appendix E of this part.)

(4) Erection bridging.

(a) Where the span of the steel joist is equal to or greater than the span shown in Tables A and B, the following applies:

(i) You must install a row of bolted diagonal erection bridging near the midspan of the steel joist;

(ii) You must not release hoisting cables until this bolted diagonal erection bridging is installed and anchored; and

(iii) You must not allow more than one employee on these spans until all other bridging is installed and anchored.

(b) Where the span of the steel joist is over 60 feet (18.3 m) through 100 feet (30.5 m), the following applies:

- (i) All rows of bridging must be bolted diagonal bridging;
- (ii) You must install two rows of bolted diagonal erection bridging near the third points of the steel joist;
- (iii) You must not release hoisting cables until this bolted diagonal erection bridging is installed and anchored; and
- (iv) You must not allow more than two employees on these spans until all other bridging is installed and anchored.
- (c) Where the span of the steel joist is over 100 feet (30.5 m) through 144 feet (43.9 m), the following applies:
 - (i) You must bolt all rows of bridging diagonal bridging;
 - (ii) You must not release hoisting cables until all bridging is installed and anchored; and
 - (iii) You must not allow more than two employees on these spans until all bridging is installed and anchored.
- (d) For steel members spanning over 144 feet (43.9 m), the erection methods used must be in accordance with WAC 296-155-708.
- (e) Where any steel joist specified in subsections (3)(b), (4)(a), (b), and (c) of this section is a bottom chord bearing joist, you must provide a row of bolted diagonal bridging near the support(s). You must install and anchor this bridging before the hoisting cable(s) is released.
- (f) When bolted diagonal erection bridging is required by this section, the following applies:
 - (i) The bridging must be indicated on the erection drawing;
 - (ii) The erection drawing must be the exclusive indicator of the proper placement of this bridging;
 - (iii) You must use shop-installed bridging clips, or functional equivalents, where the bridging bolts to the steel joists;
 - (iv) When two pieces of bridging are attached to the steel joist by a common bolt, you must not remove the nut that secures the first piece of bridging from the bolt for the attachment of the second; and
 - (v) Bridging attachments must not protrude above the top chord of the steel joist.
- (5) **Landing and placing loads.**
 - (a) During the construction period, the employer placing a load on steel joists must ensure that the load is distributed so as not to exceed the carrying capacity of any steel joist.
 - (b) Except for (d) of this subsection, no construction loads are allowed on the steel joists until all bridging is installed and anchored and all joist-bearing ends are attached.
 - (c) The weight of a bundle of joist bridging must not exceed a total of 1,000 pounds (454 kg). You must place a bundle of joist bridging on a minimum of 3 steel joists that are secured at one end. The edge of the bridging bundle must be positioned within one foot (.30 m) of the secured end.
 - (d) No bundle of decking may be placed on steel joists until all bridging has been installed and anchored and all joist bearing ends attached, unless all of the following conditions are met:
 - (i) The employer has first determined from a qualified person and documented in a site-specific erection plan that the structure or portion of the structure is capable of supporting the load;
 - (ii) The bundle of decking is placed on a minimum of 3 steel joists;
 - (iii) The joists supporting the bundle of decking are attached at both ends;
 - (iv) At least one row of bridging is installed and anchored;

- (v) The total weight of the bundle of decking does not exceed 4,000 pounds (1816 kg); and
- (vi) Placement of the bundle of decking must be in accordance with (e) of this subsection.
- (e) The edge of the construction load must be placed within one foot (.30 m) of the bearing surface of the joist end.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060. WSR 16-09-085, § 296-155-709, filed 4/19/16, effective 5/20/16. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. WSR 02-13-115, § 296-155-709, filed 6/19/02, effective 9/1/02.]