Simple Connections Simplified

MAY 16, 2018

Presented by:

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Polling Question

- New requirement to earn PDH credits
- Two questions will be asked during the duration of today's presentation
- The question will appear within the polling section of your GoToWebinar Control Panel to respond

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Learning Objectives

- Understand the requirements for joist and Joist Girder anchorage to supports.
- Review bridging connections and connections that are part of lateral load resisting systems.
- Understand the options for hanging loads from joists, either from structural or trade elements.
- Identify the deck to support connection types and details.
- Summarize deck connection patterns and applications.
- Review deck hanging load connections.

Simple Joist Connection Topics

- Joist to Support
- Joist Girder to Support
- Bridging Connections
- Lateral Load Connections
- Structural Elements Connected to Joists
- Trade Elements Connected to Joists

Joist to Support

Structurally, a welded joist seat to support connection is adequate, but OSHA requires bolts in certain cases – tie joists and spans over 40 feet on steel supports.

Bolts in slotted holes may not provide adequate lateral support to the compression chord/flange of the supporting member.

Hence, bolted and welded joist end anchorage is common.

Joist to Support

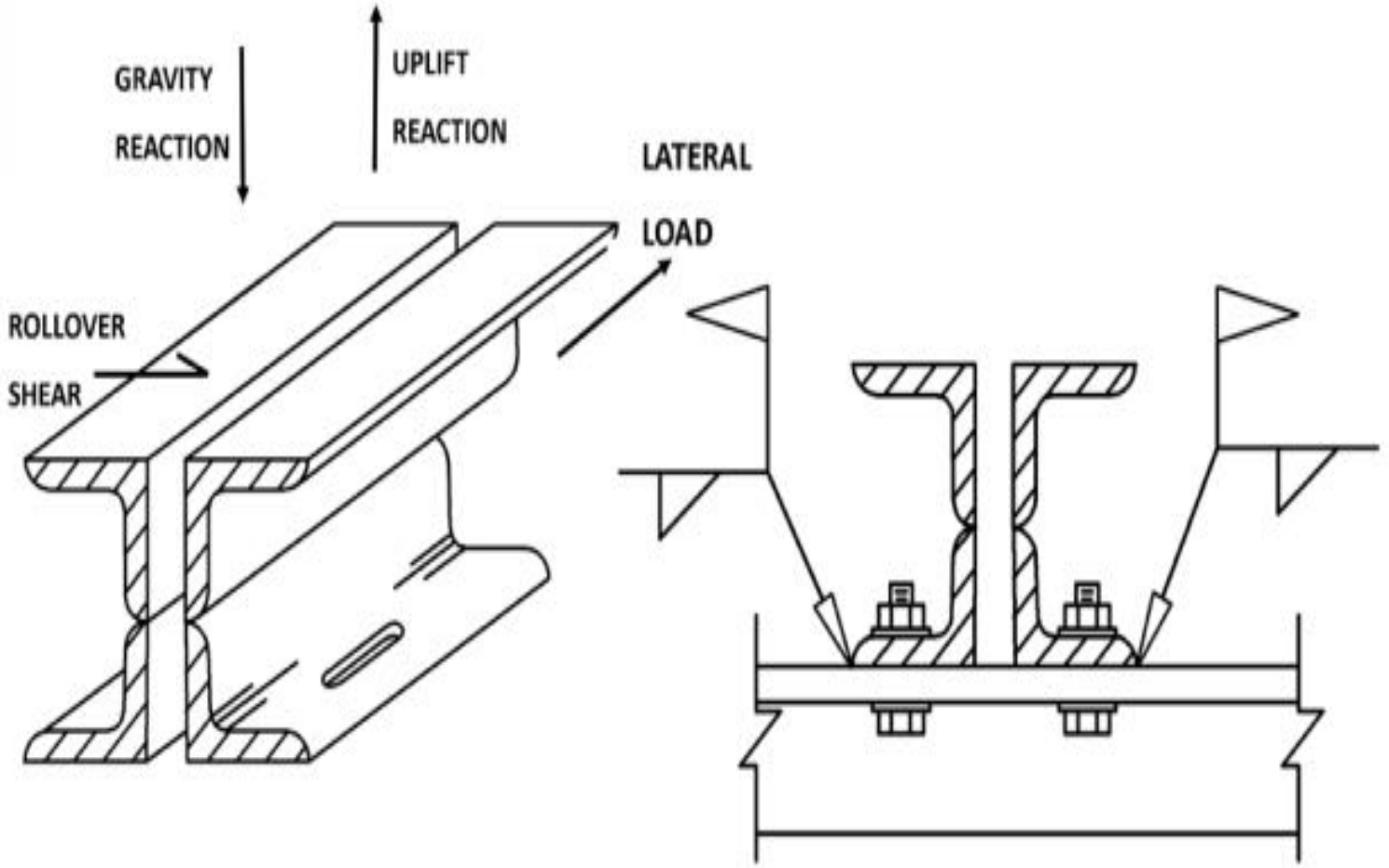


Figure 2. BEARING SEAT FORCES

BEARING SEAT CONNECTION
WELDS AND BOLTS

Joist to Support

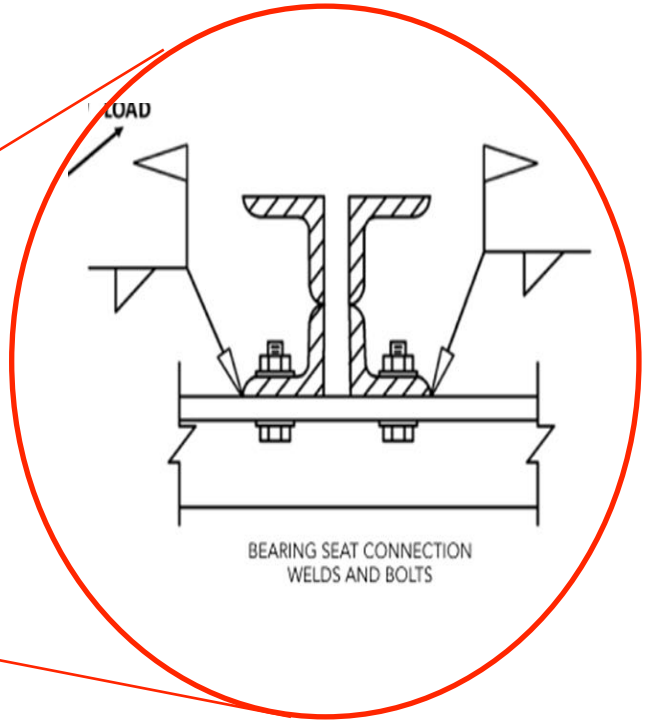
SJI requirements – weld lengths have increased to engage seat length for uplift resistance (prying action).

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
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).		

Suggestion: While end anchorage is reduced for LH02-06, it may be easiest to combine them with LH07-17.

Joist to Support

Joist bearing seat bolts only need to be “snug tight”.



Joist to Joist Girder Support

Typical joist girder web member configurations limit access for the use of power tools for bolt tensioning.

Joist to Support

OSHA rule for bolted seats

(8) Field-bolted joists.

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

(ii) These connections shall be field-bolted unless constructability does not allow.

So, while a bolted connection must be detailed, it may or may not be actually used.

Joist to Support

Where a joist seat has been detailed for a bolted connection, and for any reason the bolt is not utilized, the empty slot in the bearing seat leg severely diminishes uplift capacity. In such a condition, the weld should be applied within the empty slot.

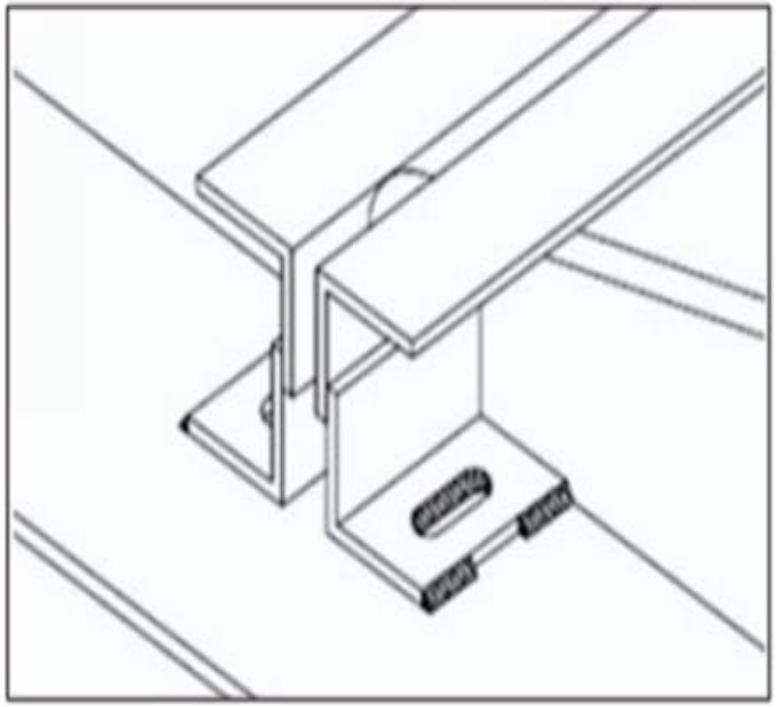
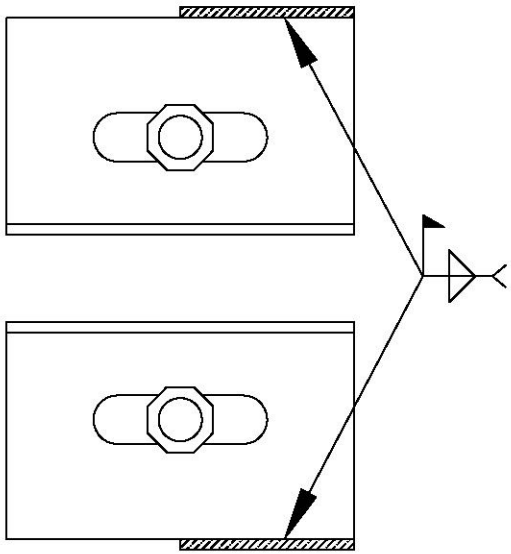


Figure 2.10-1

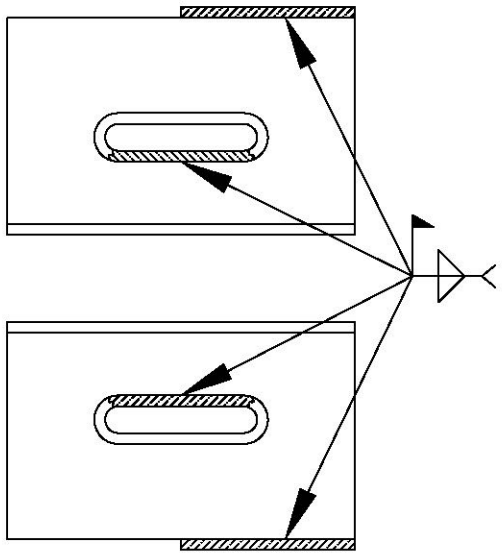
Joist to Support

Typical drawing note and detail

ERECTOR NOTE:
WHERE JOIST ARE FABRICATED TO ALLOW FOR FIELD BOLTING TO THE SUPPORTING STRUCTURE, THE BOLTED CONNECTIONS ARE FOR INITIAL ATTACHMENT ONLY, UNLESS SPECIFICALLY DIRECTED BY THE ENGINEER OF RECORD. SNUG-TIGHTENED BOLTS SHALL REMAIN IN THE BEARING SEAT SLOTS AFTER FINAL CONNECTION IS MADE VIA WELDING PER THE CONTRACT STRUCTURAL DOCUMENTS. IF A BOLTED CONNECTION IS NOT USED, OR THE BOLTS ARE REMOVED AFTER ERECTION, JOIST SEATS MUST BE WELDED ALONG THE INSIDE EDGE OF SEAT SLOTS.



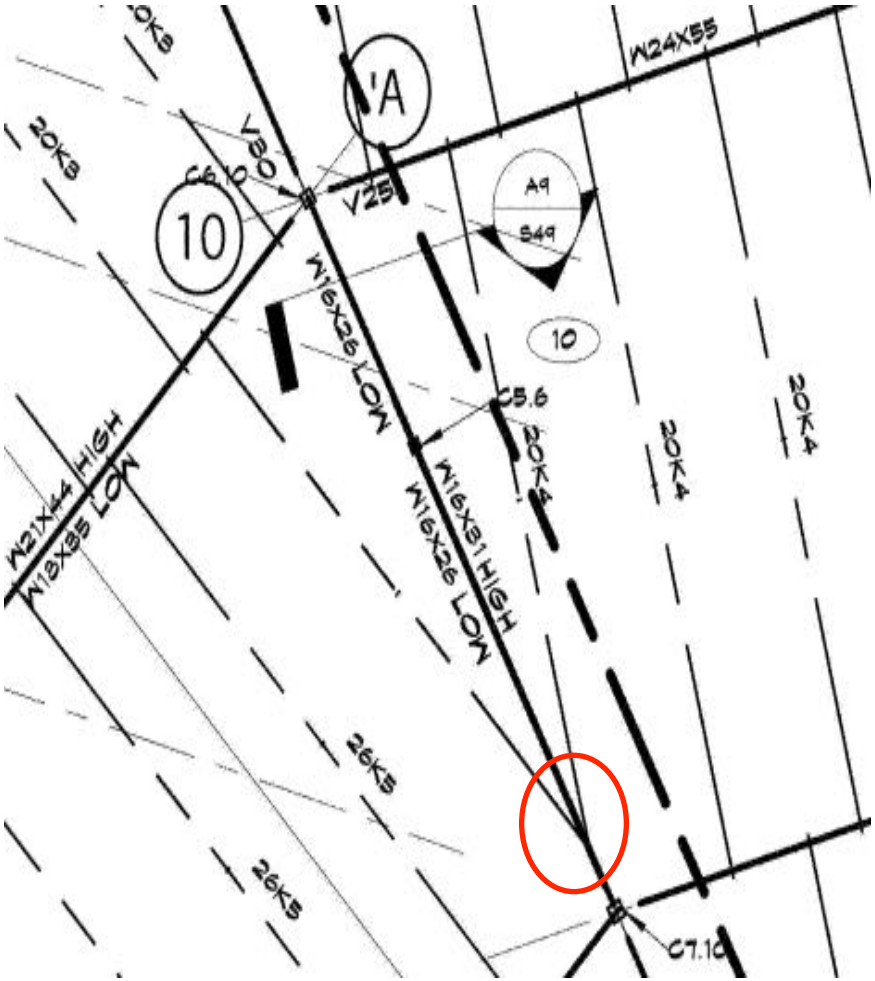
WITH BOLTS



IF BOLTS ARE REMOVED

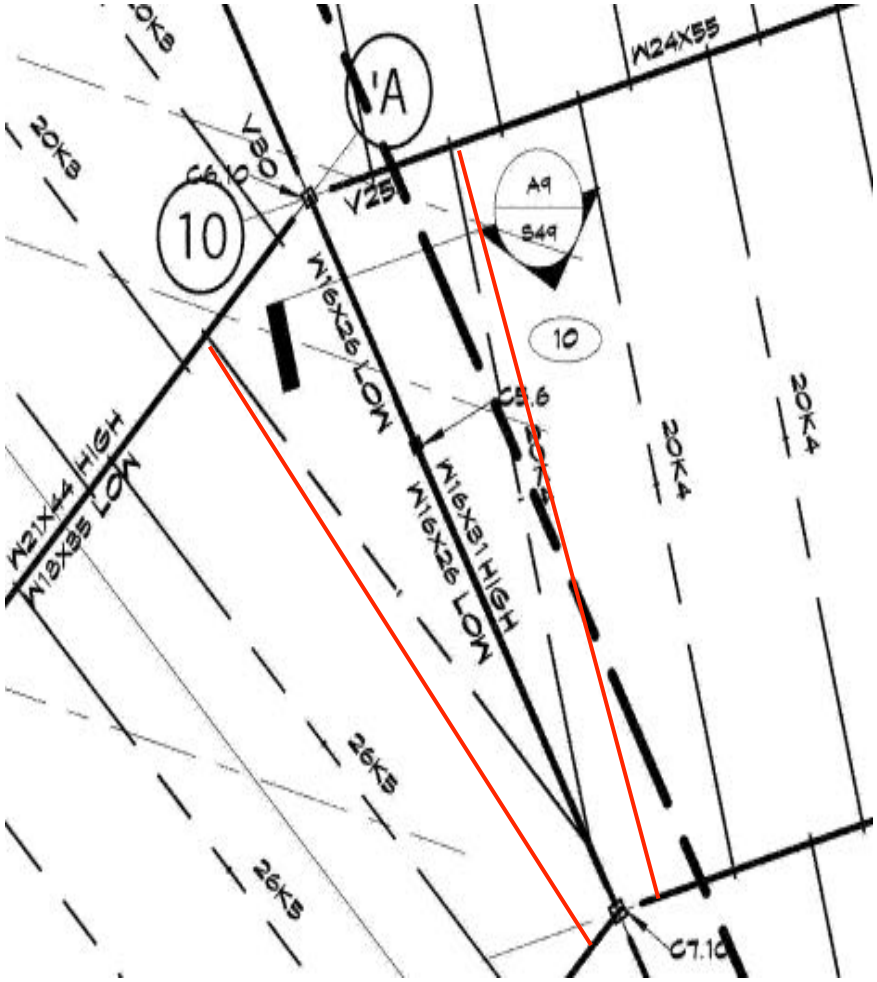
Joist to Support – Skewed Bearing

Where the angle of intersection between a joist and supporting beam would be less than 15 degrees, use alternates to avoid an eccentric connection to the beam.

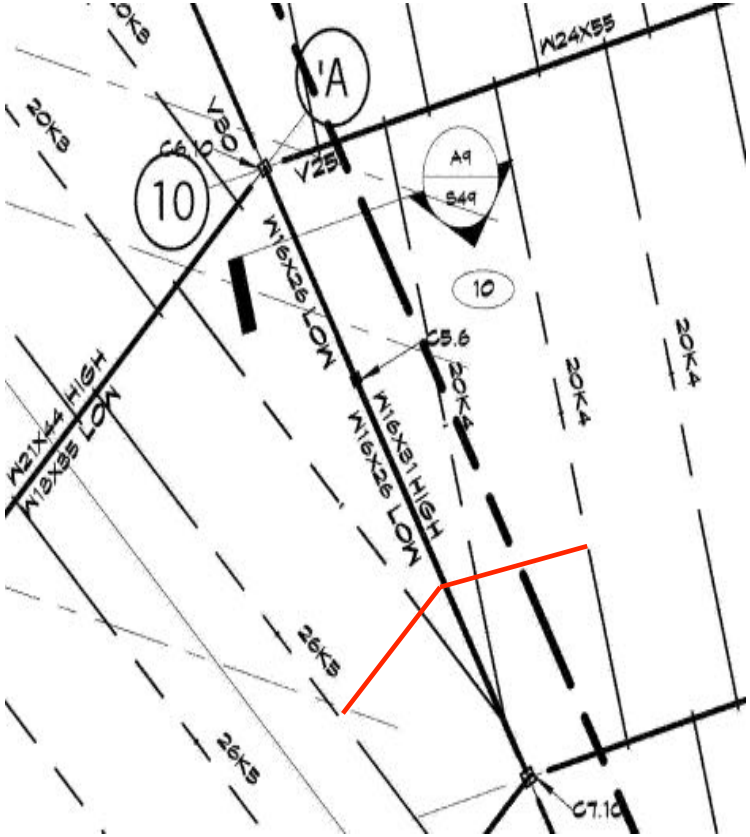


Joist to Support – Skewed Bearing

Consider skewing the joist. (The deck is not likely to lap on this joist anyway.)



Joist to Support – Skewed Bearing



Or a header can be used to support the joist end, between the skewed beam and the next joist.

Simple Joist Connection Topics

- [x] Joist to Support
- [ ] Joist Girder to Support
- [ ] Bridging Connections
- [ ] Lateral Load Connections
- [ ] Structural Elements Connected to Joists
- [ ] Trade Elements Connected to Joists

Joist Girder to Support

SJI requirements for Joist Girder end anchorage vary based upon the Joist Girder self weight.

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
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(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).

Suggestions: Use A325 bolts for all Joist Girder end anchorage. Use the reduced weld length only if ALL Joist Girders on the project are less than 50 plf.

Joist Girder to Support

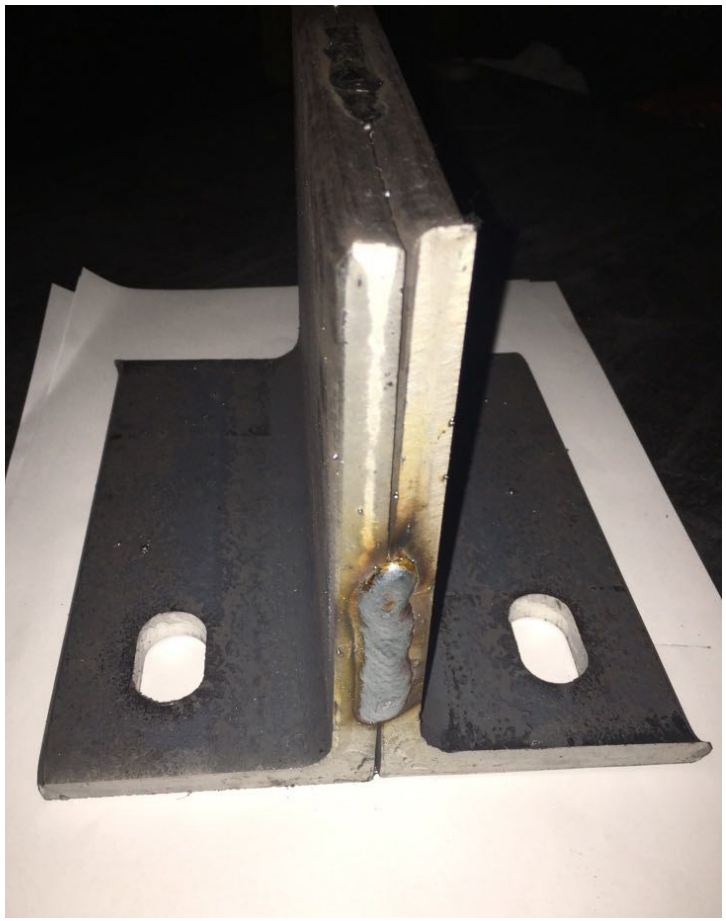
Use the Joist Girder Weight Tables to find joist girders that weigh over 50 plf.

GIRDER SPAN (ft)	JOIST SPACES (ft)	GIRDER DEPTH (in)	JOIST GIRDER WEIGHT - LOAD ON EACH P										
			6	8	10	12	14	16	18	20	24	28	32
			9	12	15	18	21	24	27	30	36	42	48
		36	26	31	37	45	52	59	66	71	87	111	11
		40	23	29	35	41	46	52	59	68	77	92	11
	5N@	44	22	27	32	37	44	48	54	61	69	80	93
	9.60	48	21	25	30	36	40	46	48	55	69	78	90
		52	21	25	29	33	39	42	50	54	62	71	82
		56	21	24	29	33	38	40	46	50	59	71	79
		36	28	35	42	51	62	70	78	83	100	122	13
		40	25	33	39	47	56	64	71	79	93	112	12
	6N@	44	24	31	36	45	50	57	65	73	81	102	11
	8.00	48	23	30	35	40	48	52	59	67	78	95	10
		52	23	27	32	38	46	51	59	60	75	83	97
		56	22	27	31	37	42	48	54	61	69	80	91
		36	36	45	56	64	78	91	100	122	134	153	16
		40	33	42	51	59	70	80	92	101	124	148	15
48	8N@	44	32	39	49	55	65	74	82	95	114	127	15
	6.00	48	30	37	47	53	60	68	76	84	105	129	13

Joist Girder to Support

The Joist Girder uplift reaction could exceed the capacity of the SJI minimum bolts.

Two bolts, ¾" A325, have a limit of about 24 kips with prying action considered, or 39 kips max tension capacity with a stiffened seat.



Simple Joist Connection Topics

- ☑ Joist to Support
- ☑ Joist Girder to Support
- ☐ Bridging Connections
- ☐ Lateral Load Connections
- ☐ Structural Elements Connected to Joists
- ☐ Trade Elements Connected to Joists

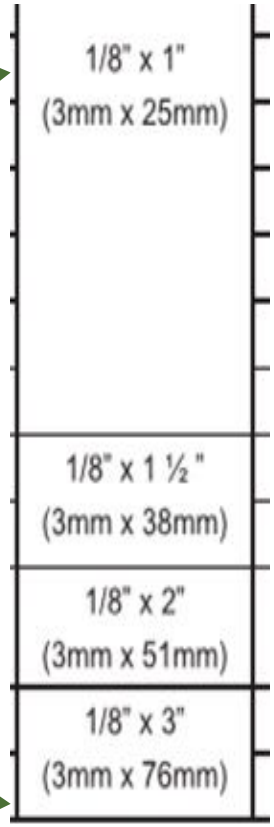
Bridging Connections - Welded

TABLE 5.5-2

BRIDGING NOMINAL HORIZONTAL UNFACTORED COMPRESSSIVE 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 ½" (3mm x 38mm)	463	(2057)
DLH18-20	2350	(10453)		585	(2602)
DLH21-22	3150	(14012)	1/8" x 2" (3mm x 51mm)	790	(3514)
DLH23-24	4130	(18371)	1/8" x 3" (3mm x 76mm)	1035	(4604)
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.

Bridging connection weld requirements are now provided in the SJI SPEC



Bridging Connections - Bolted

Bridging connection bolt requirements are tabulated in the SJI COSP

TABLE 2.7-5

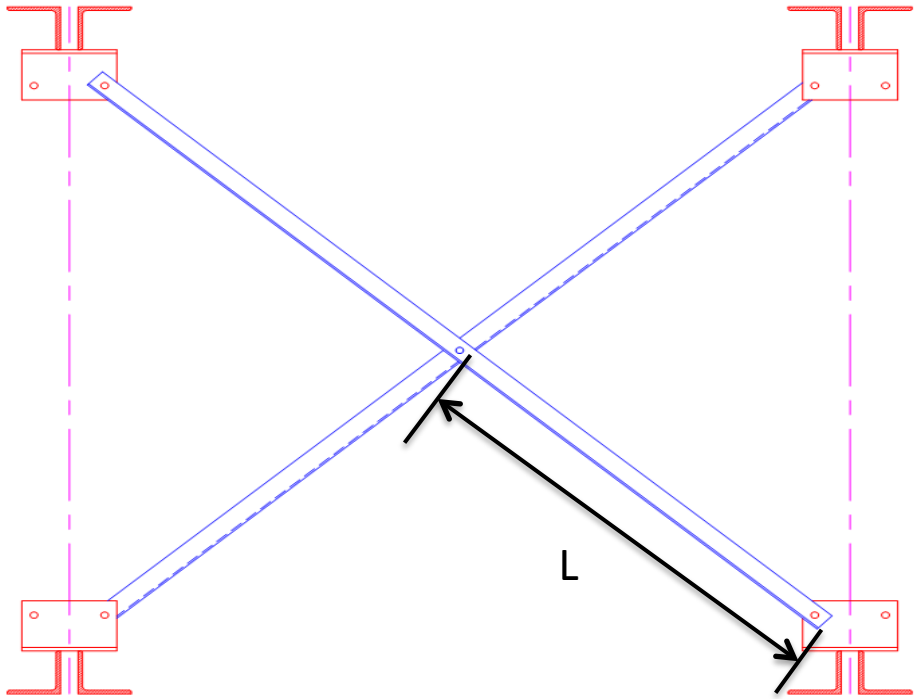
BOLT SIZES WHICH MEET BOLTED BRIDGING CONNECTION REQUIREMENTS		
JOIST SERIES	**SECTION NUMBER***	**BOLT DIAMETER**
K	ALL	3/8" (10 mm) A307
LH/DLH	2 – 12	3/8" (10 mm) A307
LH/DLH	13 – 17	1/2" (13 mm) A307
DLH	18 – 20	5/8" (16 mm) A307
DLH	21 – 22	5/8" (16 mm) A325
DLH	23 – 25	3/4" (19 mm) A325

*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.

Bridging Connections

Diagonal bridging must be connected at the intersection.



- Diagonal bridging must resist compressive axial loads and the design presumes a connection at the center of the “X”, so the unbraced length is taken as the distance from the chord attachment to the center intersection.
- The center connection can be made either by welding or bolting.

Bridging Connections

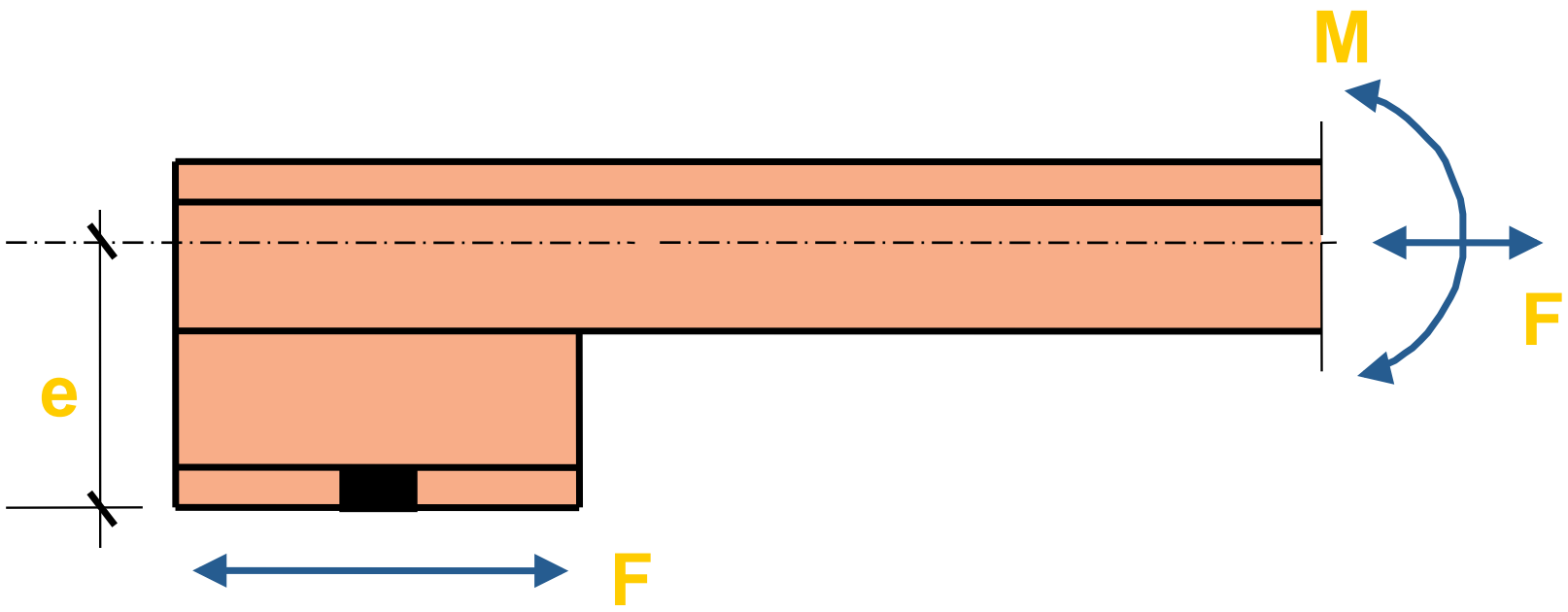
While the bridging weld requirements are often minimal, the material is thin and care must be exercised in making the welds.

Simple Joist Connection Topics

- ☑ Joist to Support
- ☑ Joist Girder to Support
- ☑ Bridging Connections
- ❑ Lateral Load Connections
- ❑ Structural Elements Connected to Joists
- ❑ Trade Elements Connected to Joists

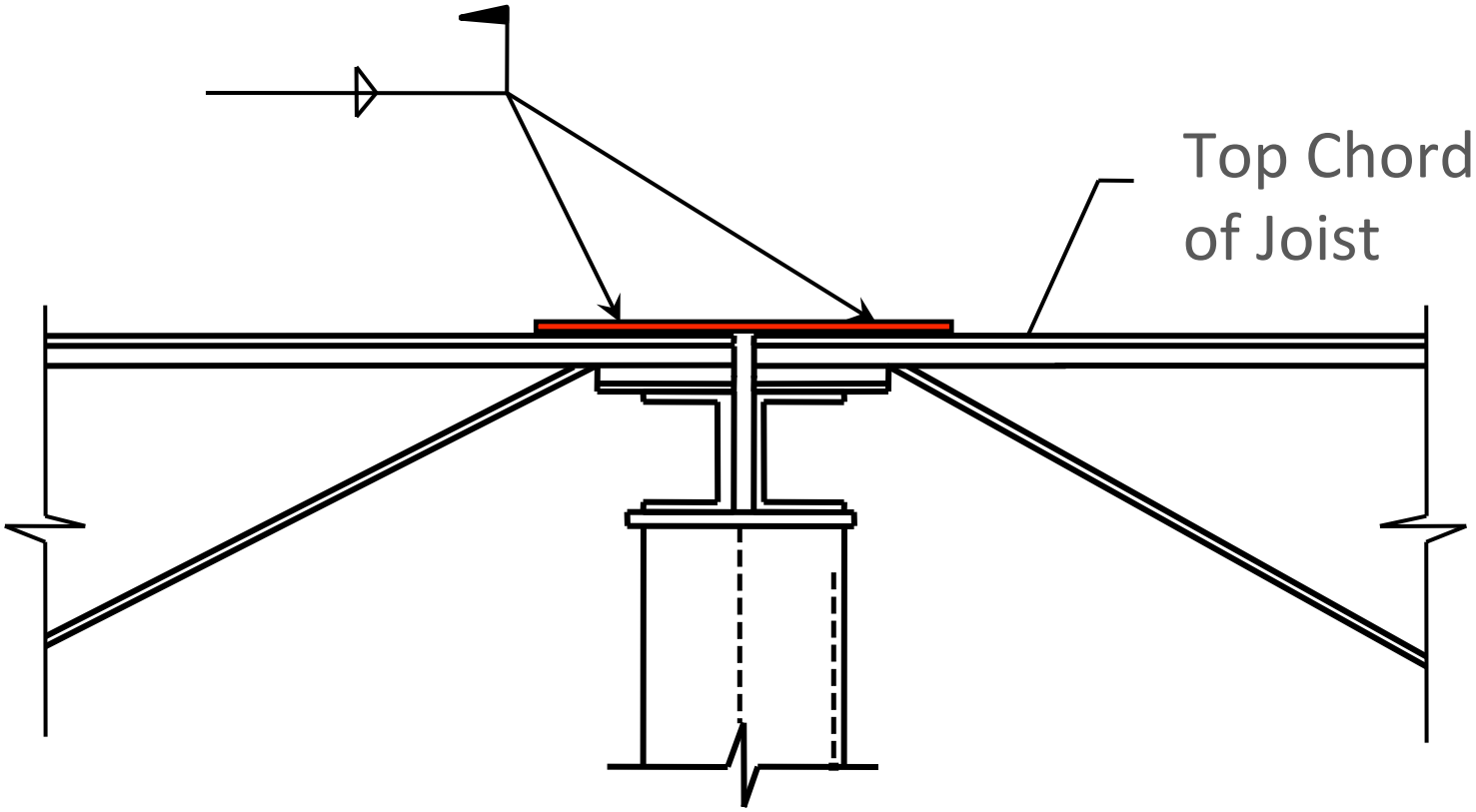
Lateral Load Connections

All top chord axial loads and end moments should be transmitted directly via tie plates or tie angles. The eccentricity of horizontal forces transferred through the bearing seats is then avoided.



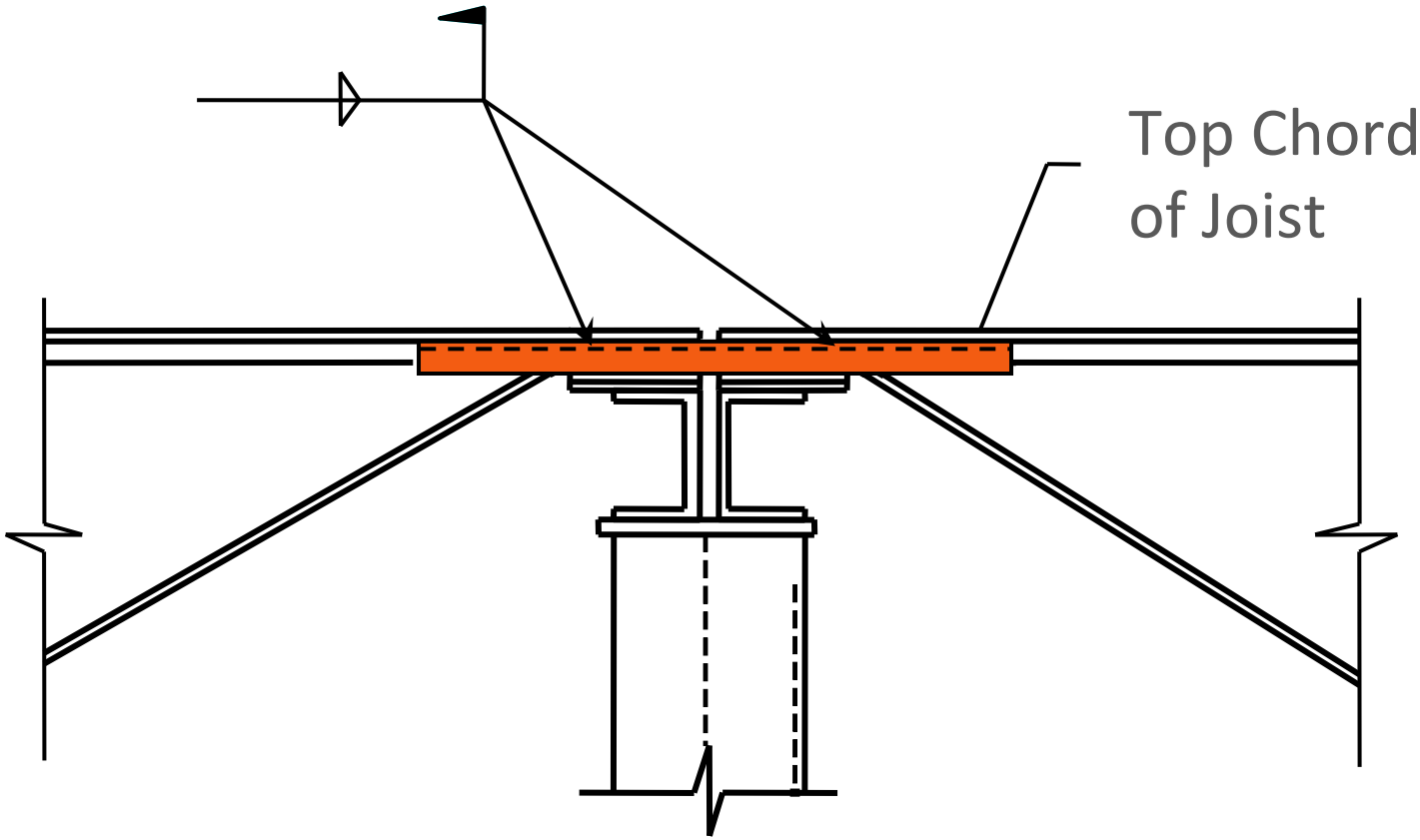
Lateral Load Connections

A tie plate creates an effective axial load path, without significant disruption for the deck above.



Lateral Load Connections

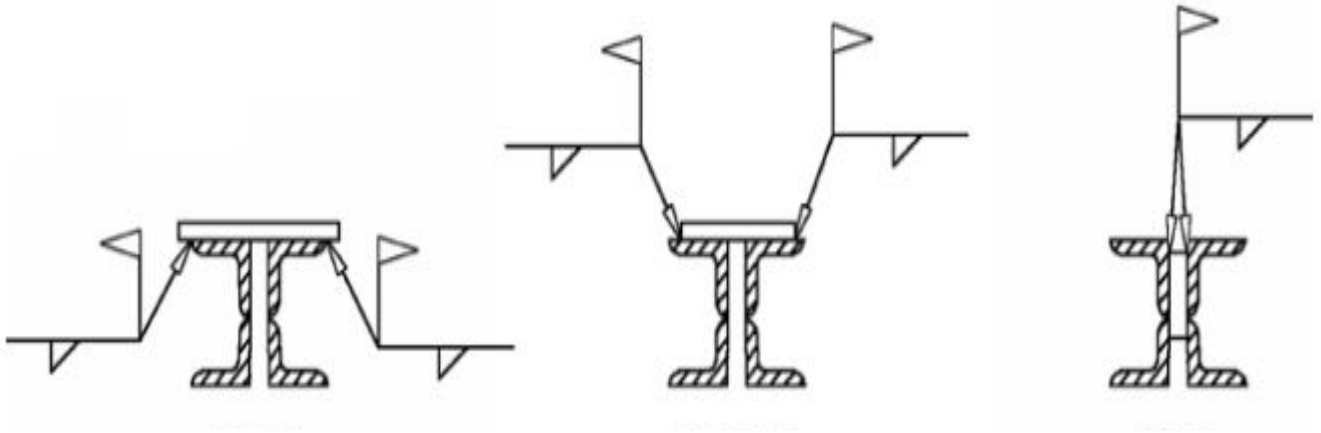
Tie angles can be tucked below the top chord, with the horizontal legs pointed in towards the joist axis.



Lateral Load Connections

Tie plates should be narrow enough to allow downward, rather than overhead, welds.

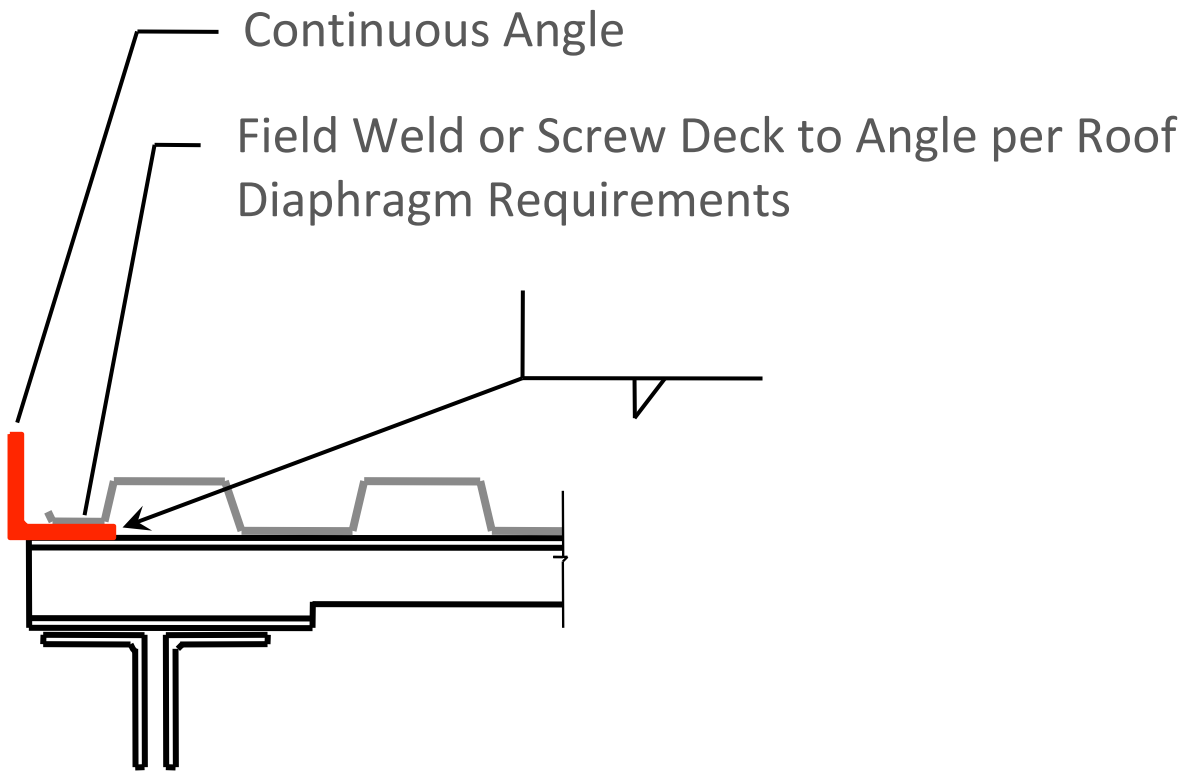
For greater capacity, the nominal 1” chord/seat gap can be held clear for a plate to be placed in the gap.



Simplest

Lateral Load Connections

Weld of diaphragm edge angle to top chord should not control top chord size.



Lateral Load Connections

Fillet weld practical limits:

At toes:

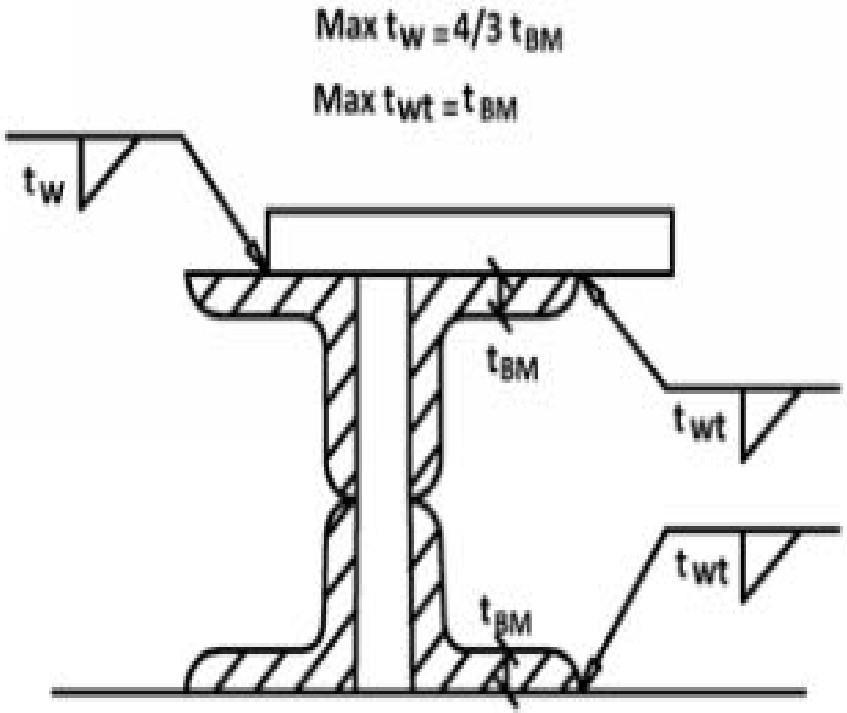
K-Series: 1/8”

LH-Series: 3/16”

Girders: 1/4”

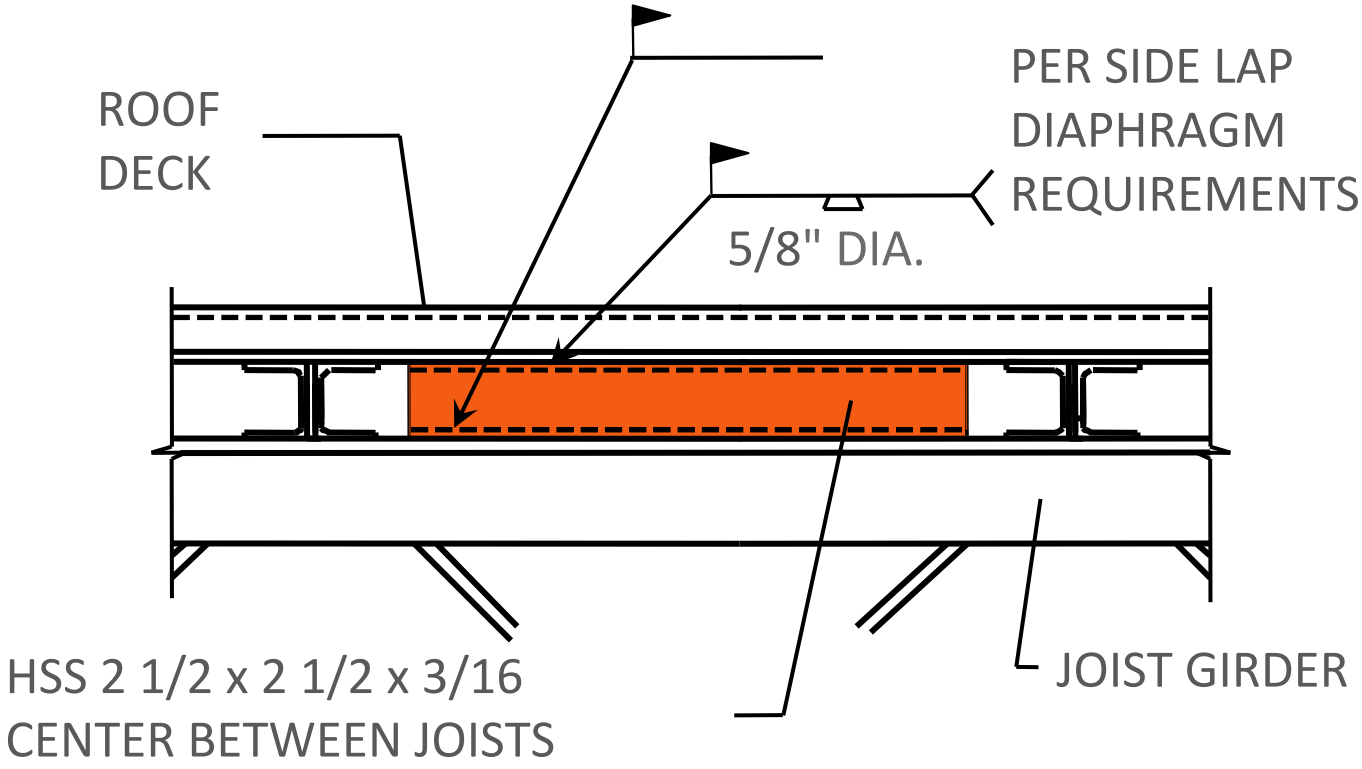
At legs:

4/3 of “toe” limits



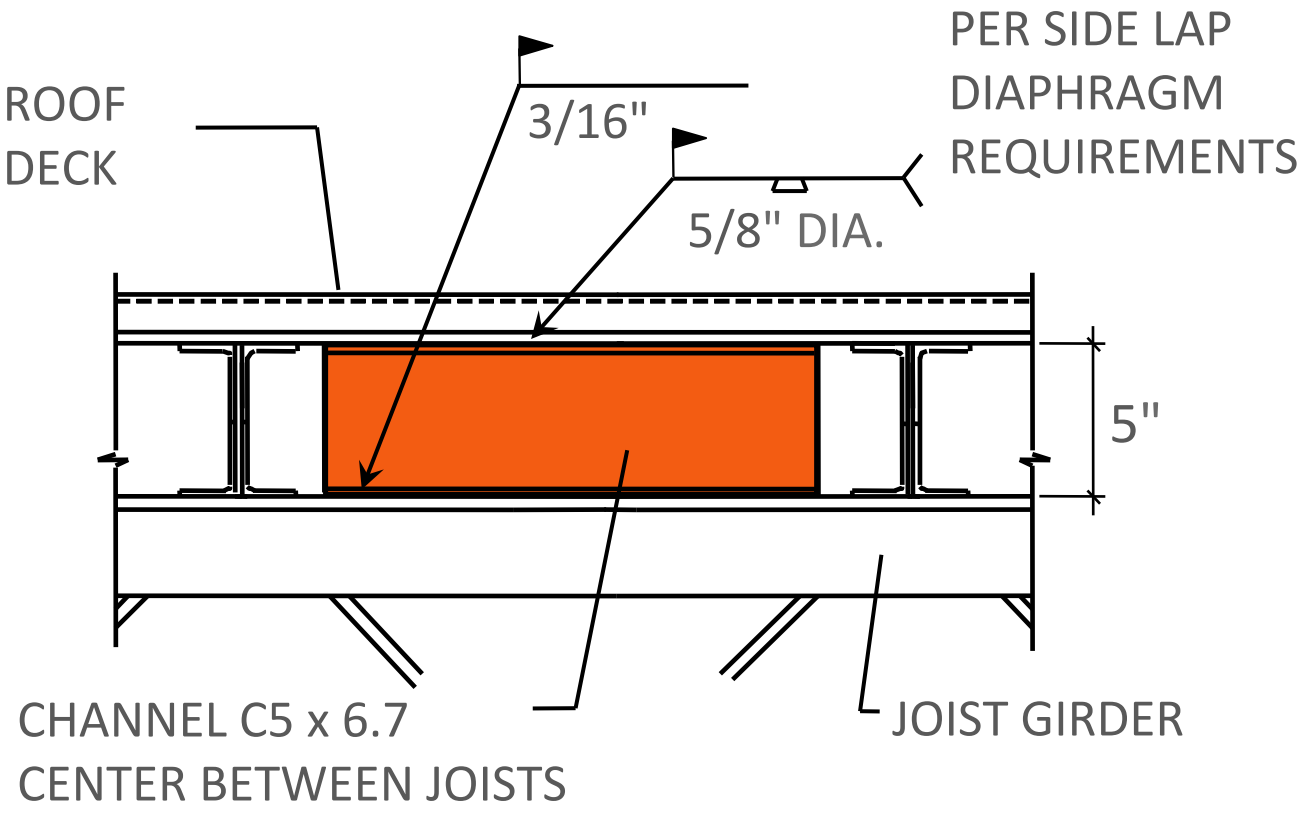
Lateral Load Connections

To transfer large shear forces from deck to structural members, and to avoid large joist seat rollover forces, a simple shear collector can be used.



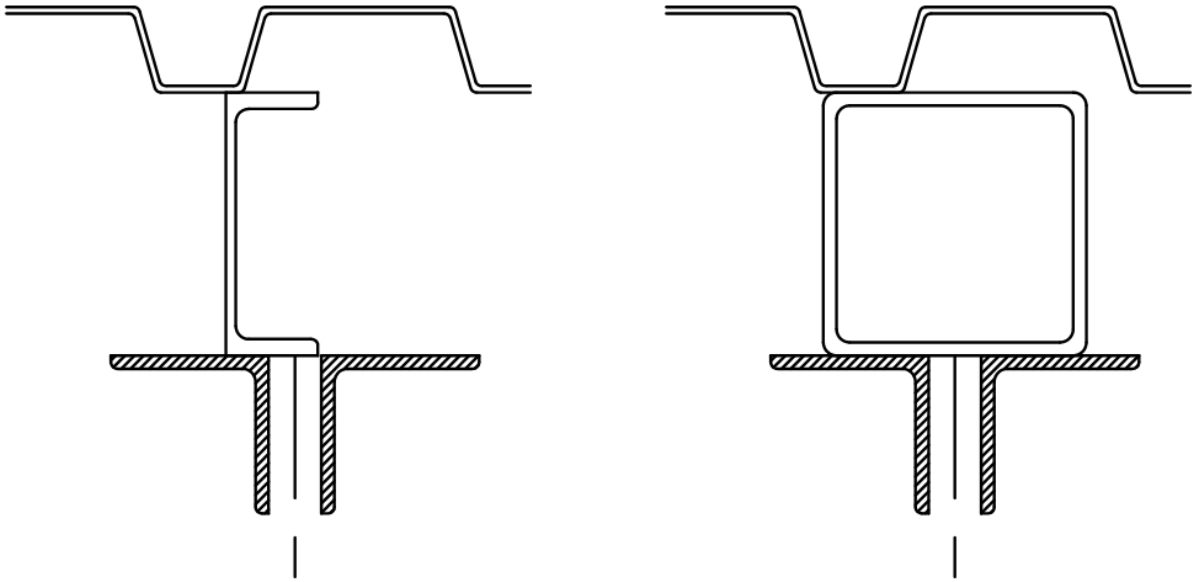
Lateral Load Connections

Here is a similar detail, for use with LH/DLH-Series joists.



Lateral Load Connections

- But maybe C5 x 6.7 is not the best choice.
- To make it simpler for the shear collector to coincide with a low deck flute, 5” HSS might be a better option.



Simple Joist Connections

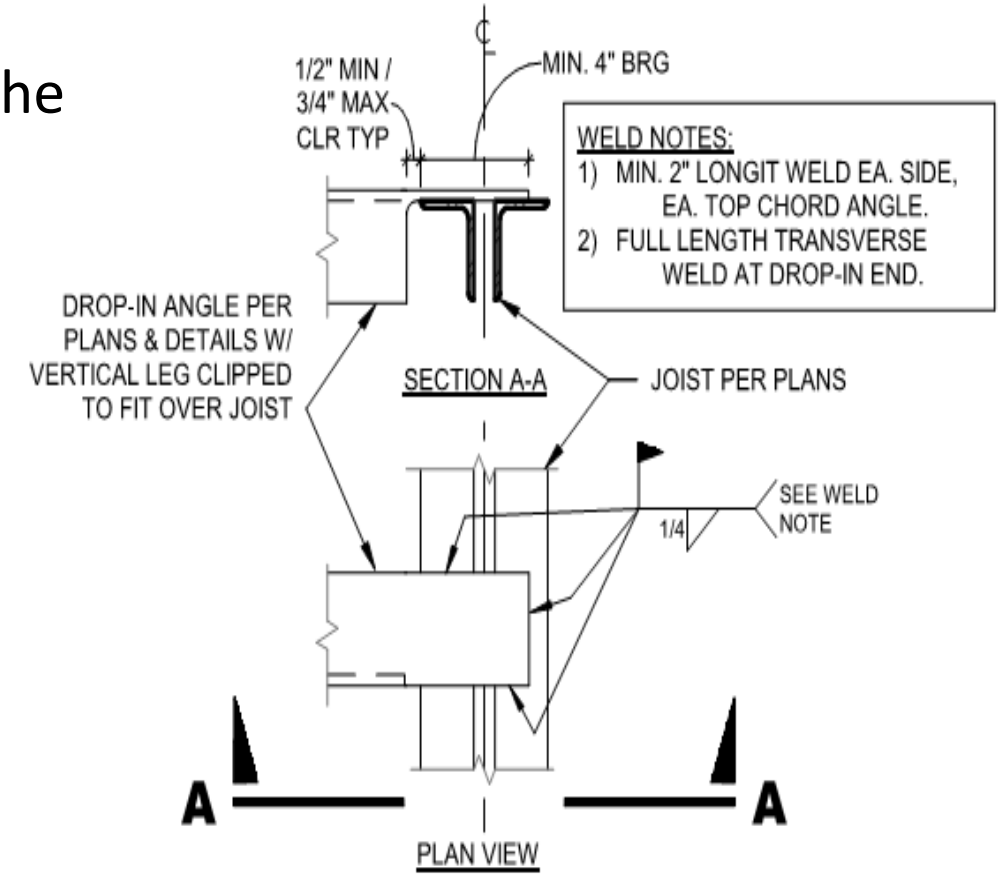
- Once the joists, Joist Girders, and bridging are installed, the connection work may not be complete!

Simple Joist Connection Topics

- ☑ Joist to Support
- ☑ Joist Girder to Support
- ☑ Bridging Connections
- ☑ Lateral Load Connections
- ❑ Structural Elements Connected to Joists
- ❑ Trade Elements Connected to Joists

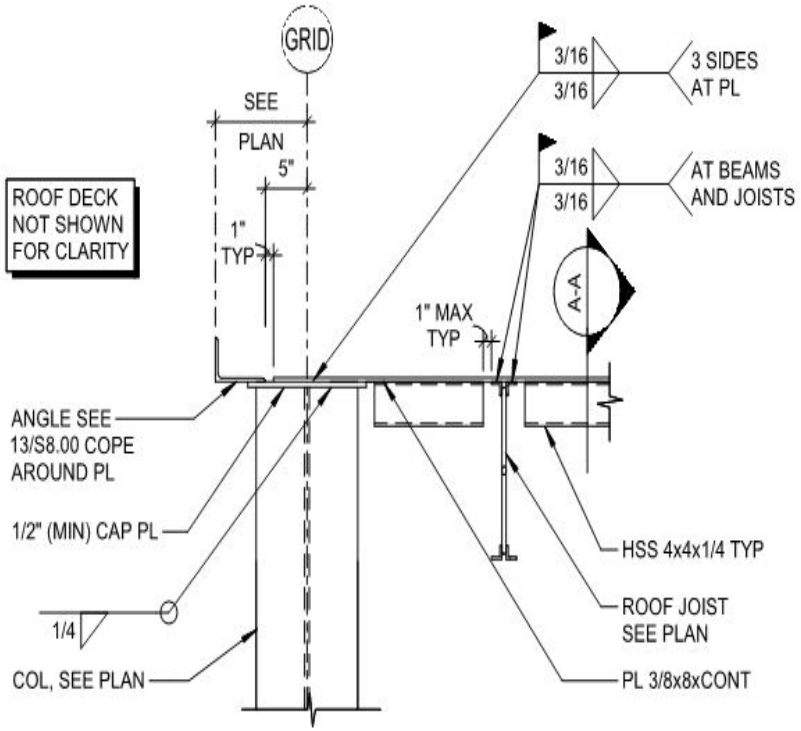
Structural Elements Connected to Joists

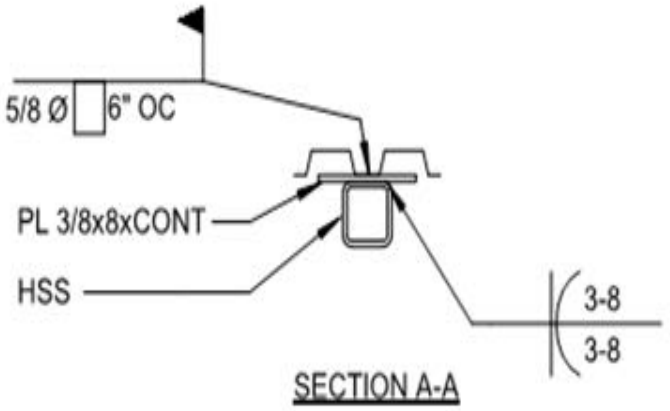
For structural members perpendicular to joists, such as an angle collector element, simply cope the angle and bear on top of the top chord.



Structural Elements Connected to Joists

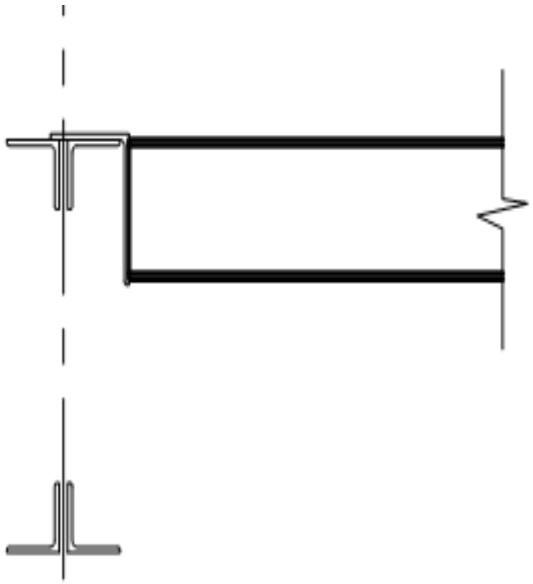
This is a similar approach with HSS and a top plate.

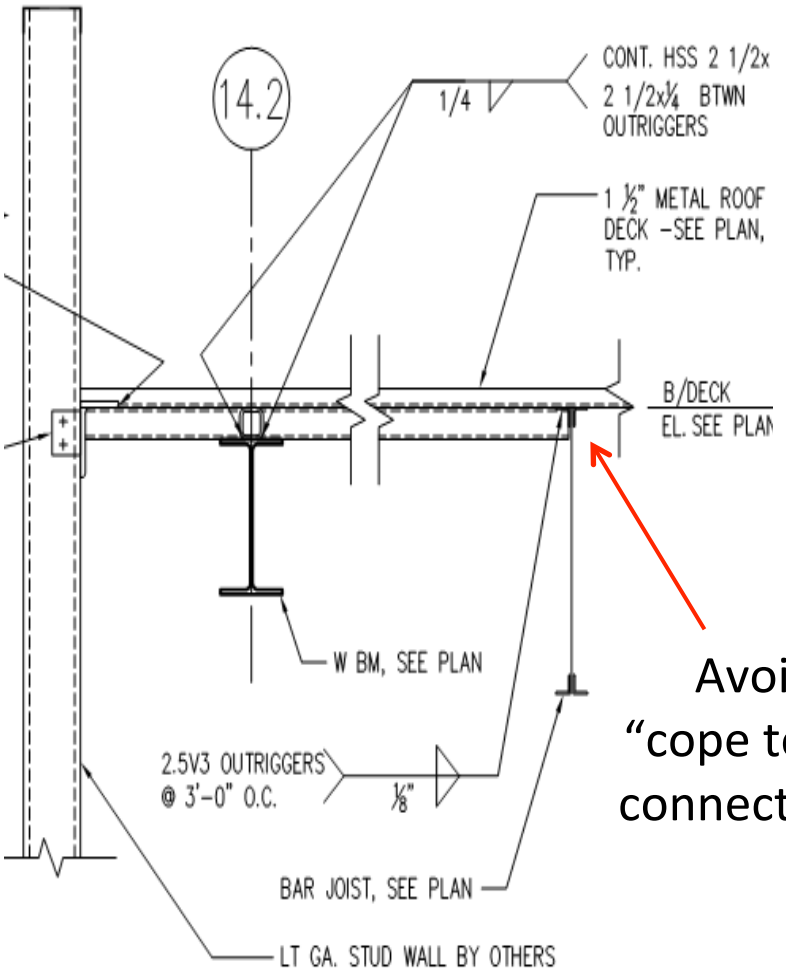




Structural Elements Connected to Joists

The next option is a hanger angle butted to the end of the structural element.





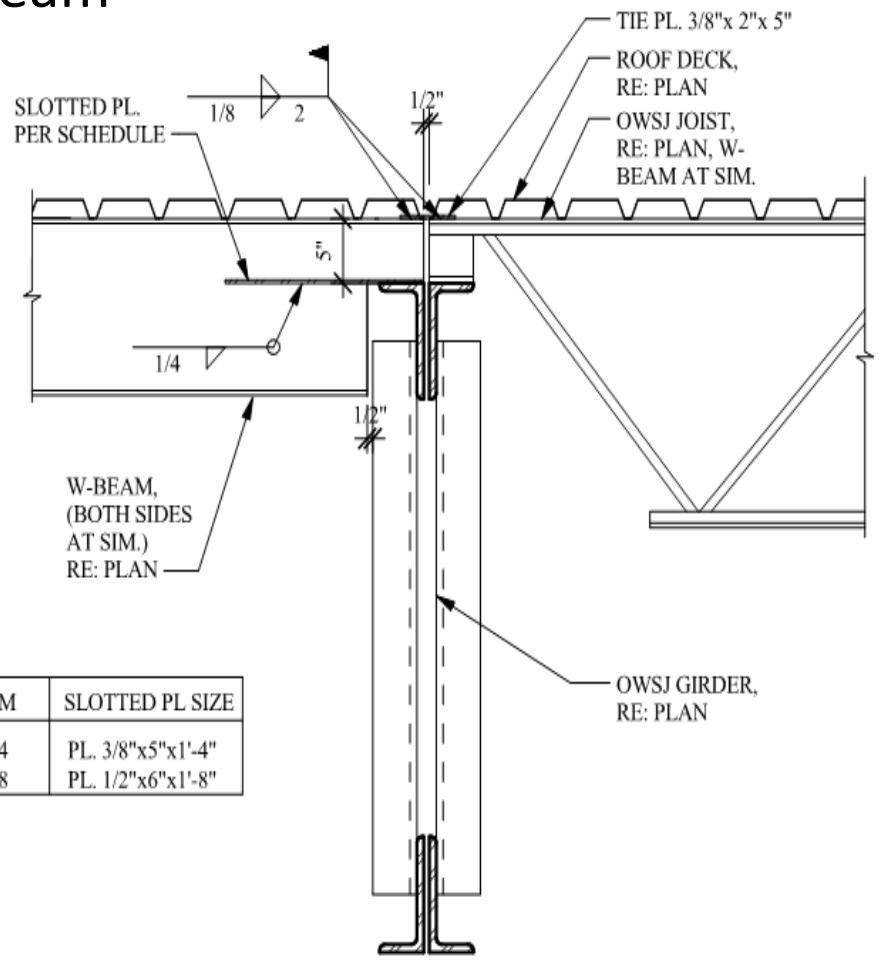
Avoid "cope to fit" connections.

Structural Elements Connected to Joists

For larger vertical WF beam connections to joists, a shear tab plate can be provided on the joist chord.

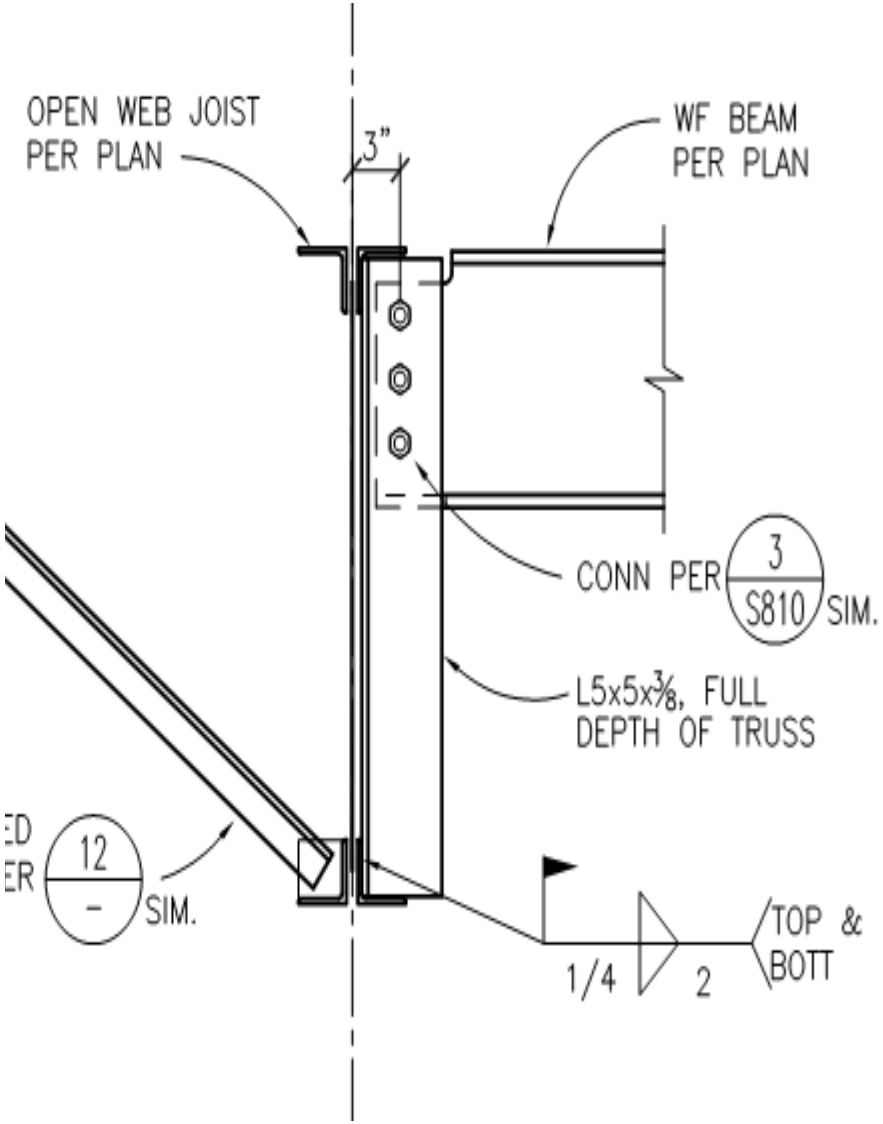
Structural Elements Connected to Joists

Where a WF beam frames to a Joist Girder, a coped, seated beam end is simplest.



BEAM	SLOTTED PL SIZE
W14	PL. 3/8"x5"x1'-4"
W18	PL. 1/2"x6"x1'-8"

Structural Elements Connected to Joists



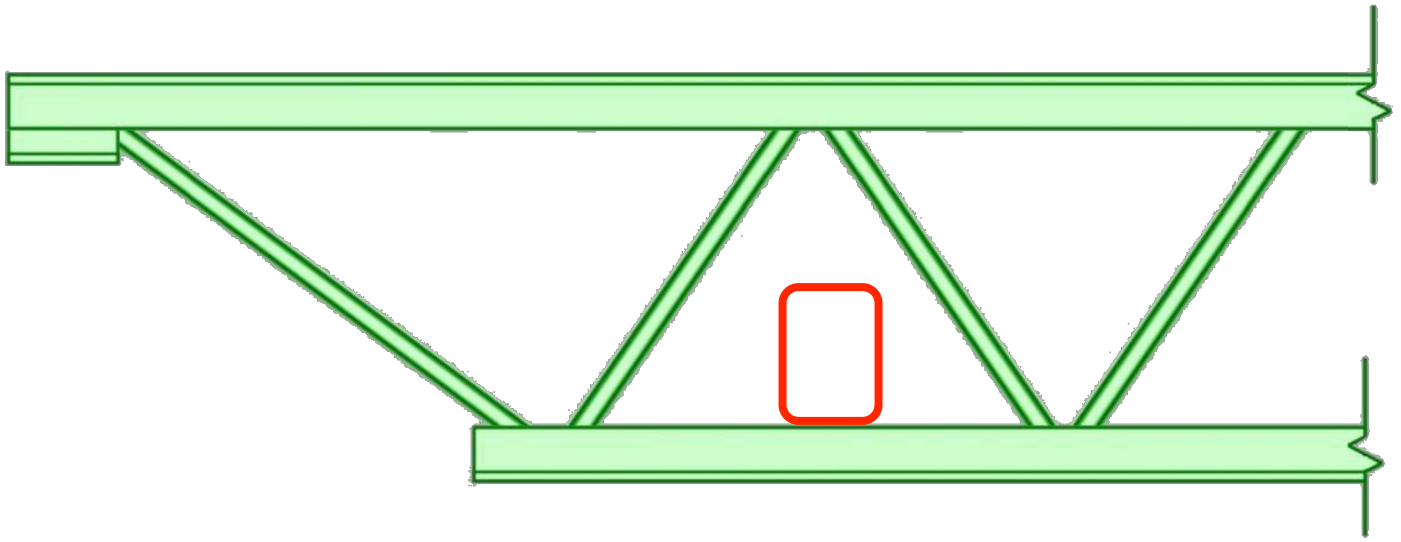
For more significant beam end reactions, a full depth connection plate or angle can be provided – shop or field installed.

Structural Elements Connected to Joists

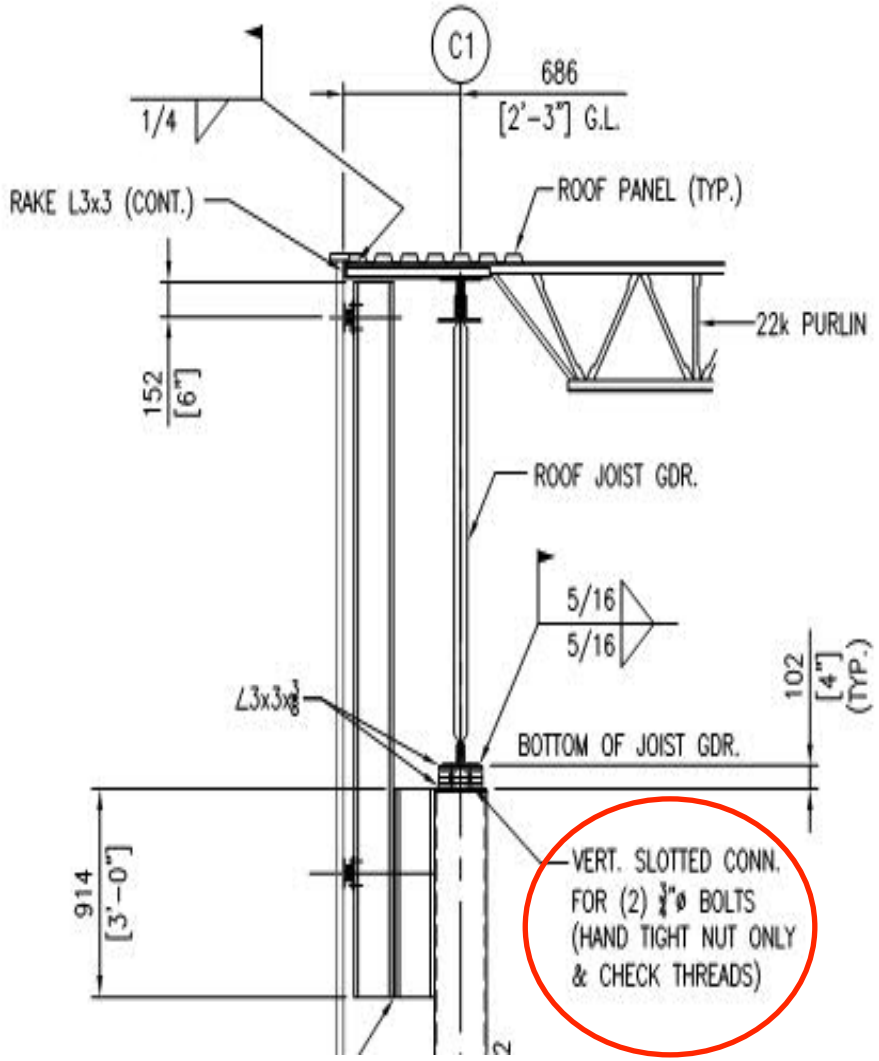
This is an example of a beam connection at mid height on a deep longspan joist.

Structural Elements Connected to Joists

While bearing a structural element across the top of the bottom chord seems like a simple connection, it is not simple to coordinate the joist geometry to avoid interference.

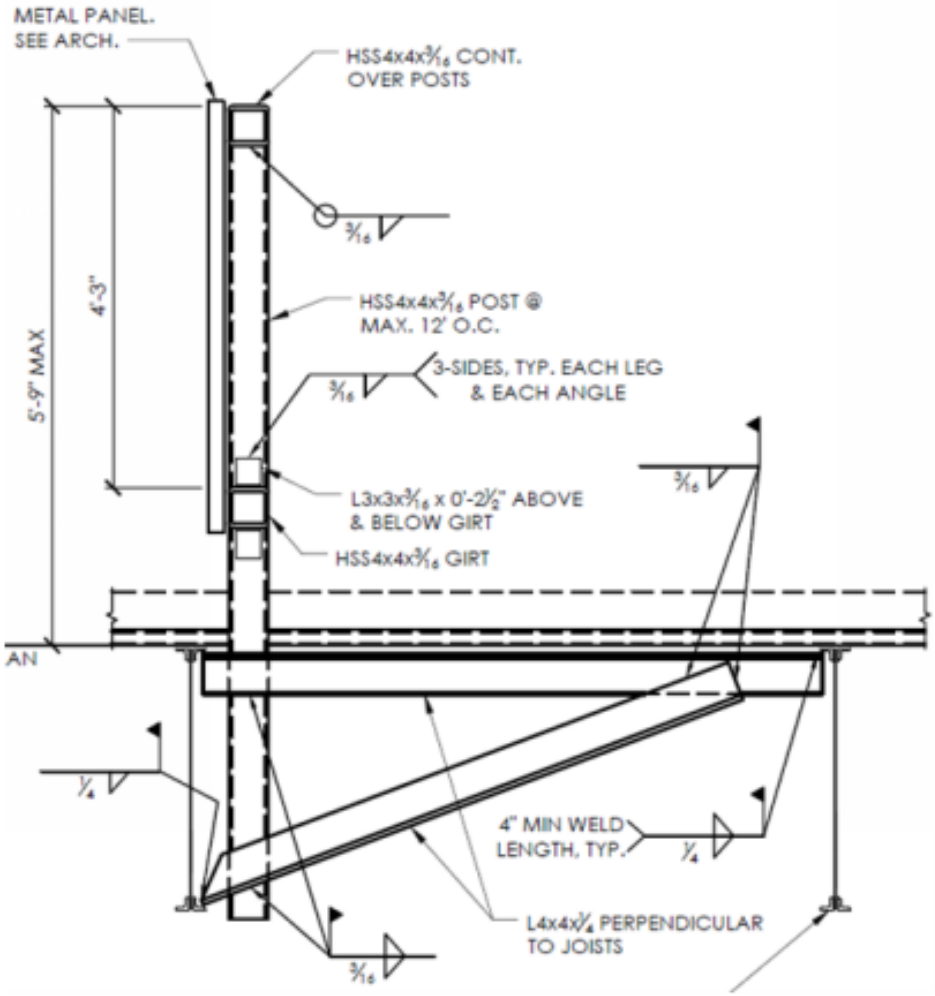


Structural Elements Connected to Joists



Wind column connections at midspan of a bottom chord require a vertically slotted connection.

Structural Elements Connected to Joists

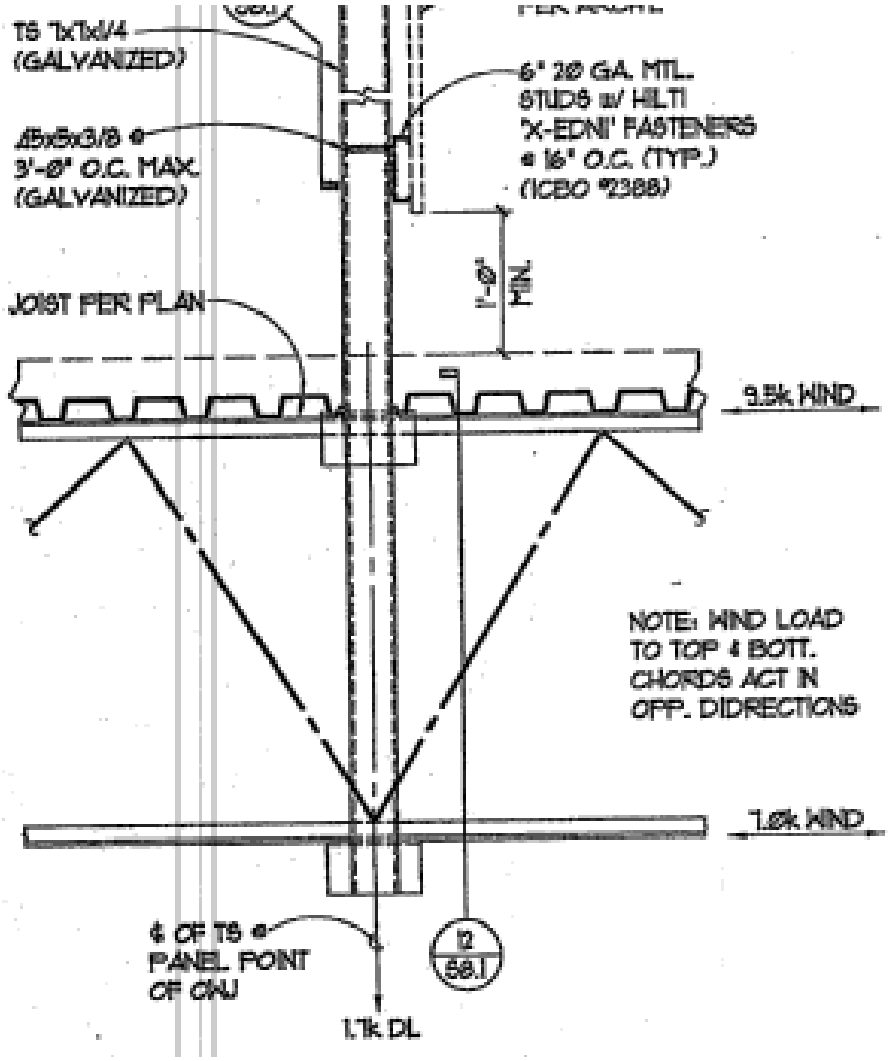


Joists simply cannot take out-of-plane torsional loads.

For a wind screen, it is best to extend the post and attach to both the top and bottom chord, resolving the overturning moment with bracing members below the roof.

Structural Elements Connected to Joists

- Where a wind screen post is not braced, and the screen is perpendicular to the joists, extending the post and attaching to both the top and bottom chord is simpler than a large local top chord overturning moment.

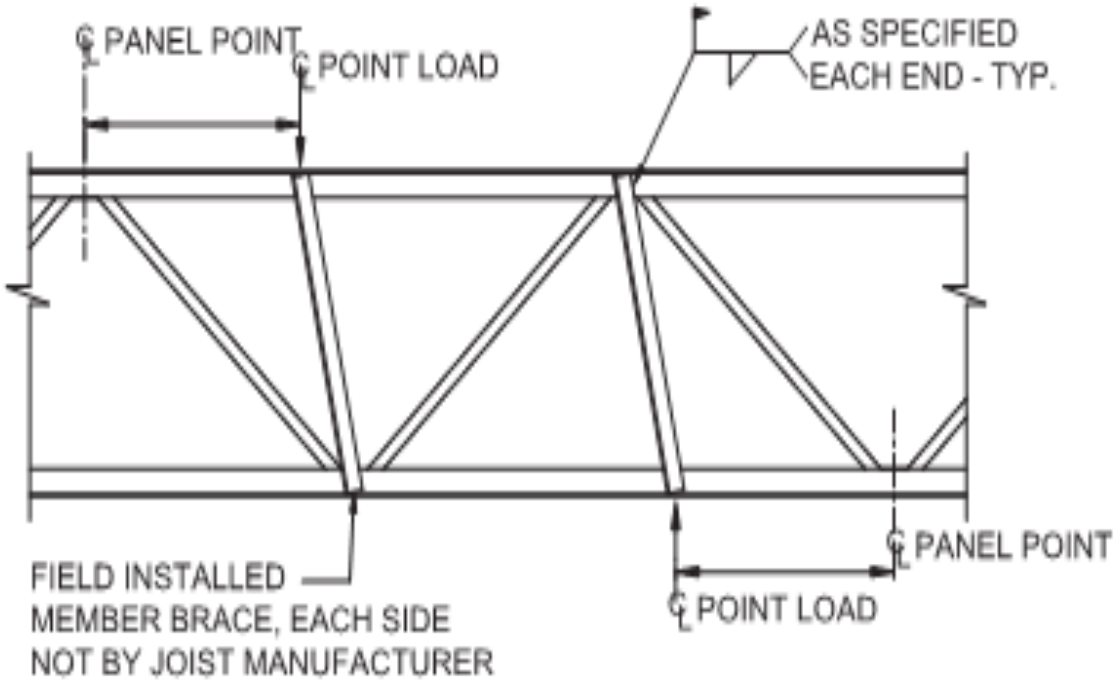


Simple Joist Connection Topics

- ☑ Joist to Support
- ☑ Joist Girder to Support
- ☑ Bridging Connections
- ☑ Lateral Load Connections
- ☑ Structural Elements Connected to Joists
- ☐ Trade Elements Connected to Joists

Trade Elements Connected to Joists

Added struts for point loads not located at panel points.



TYPICAL JOIST REINFORCMENT AT CONCENTRATED LOADS

Trade Elements Connected to Joists

SJI allows an exception for loads that meet certain conditions.

> *For nominal concentrated loads between panel points, 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 the sum of the concentrated loads within a chord panel does not exceed 100 pounds and the attachments are concentric to the chord.*

Trade Elements Connected to Joists

Additional capacity for trade elements can be specified, as Add-Loads, Bend-Check Loads, or a combination of both.

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.

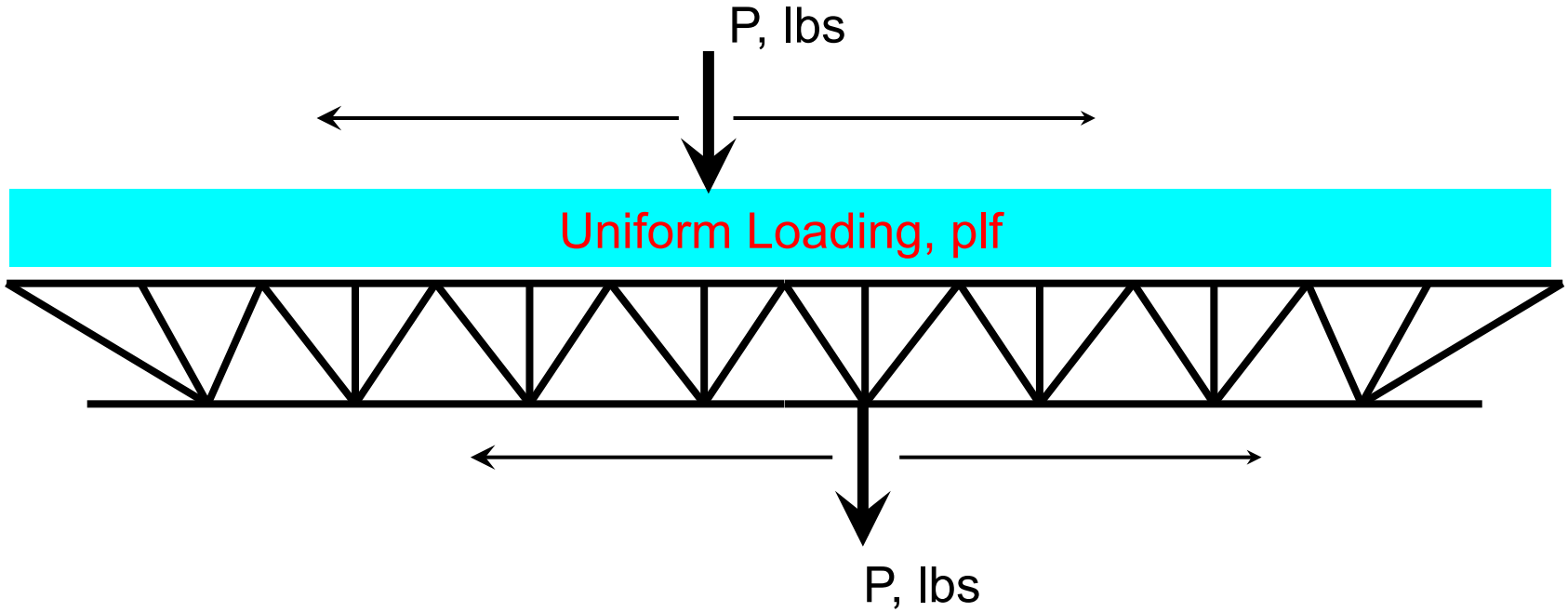
Trade Elements Connected to Joists

Add-Load - Traveling Loads at Panel Points

Magnitude of Concentrated Load, lbs

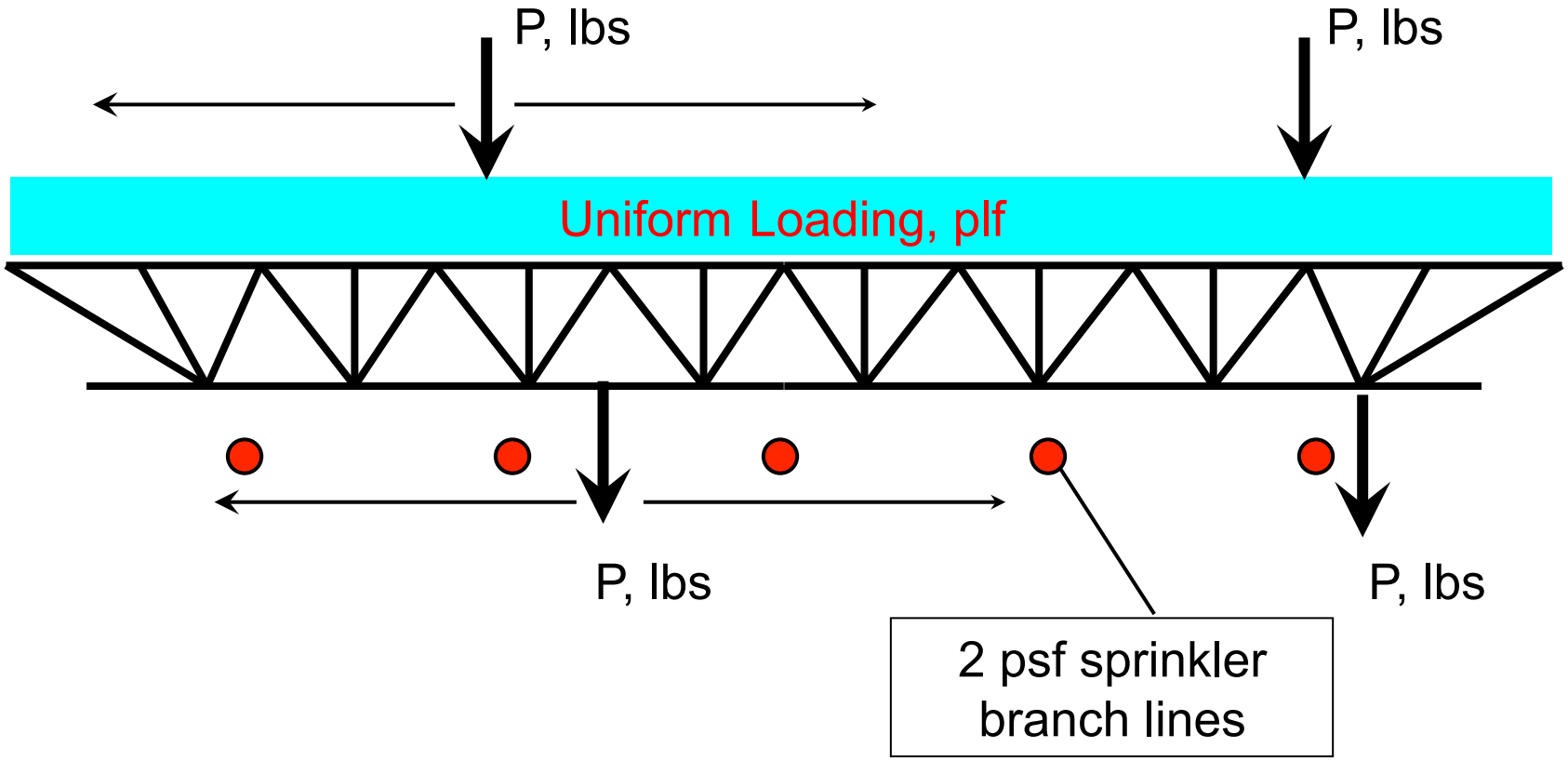
Top Chord, Bottom Chord, Either

Off Panel Point Loads Must Have Field Installed Webs



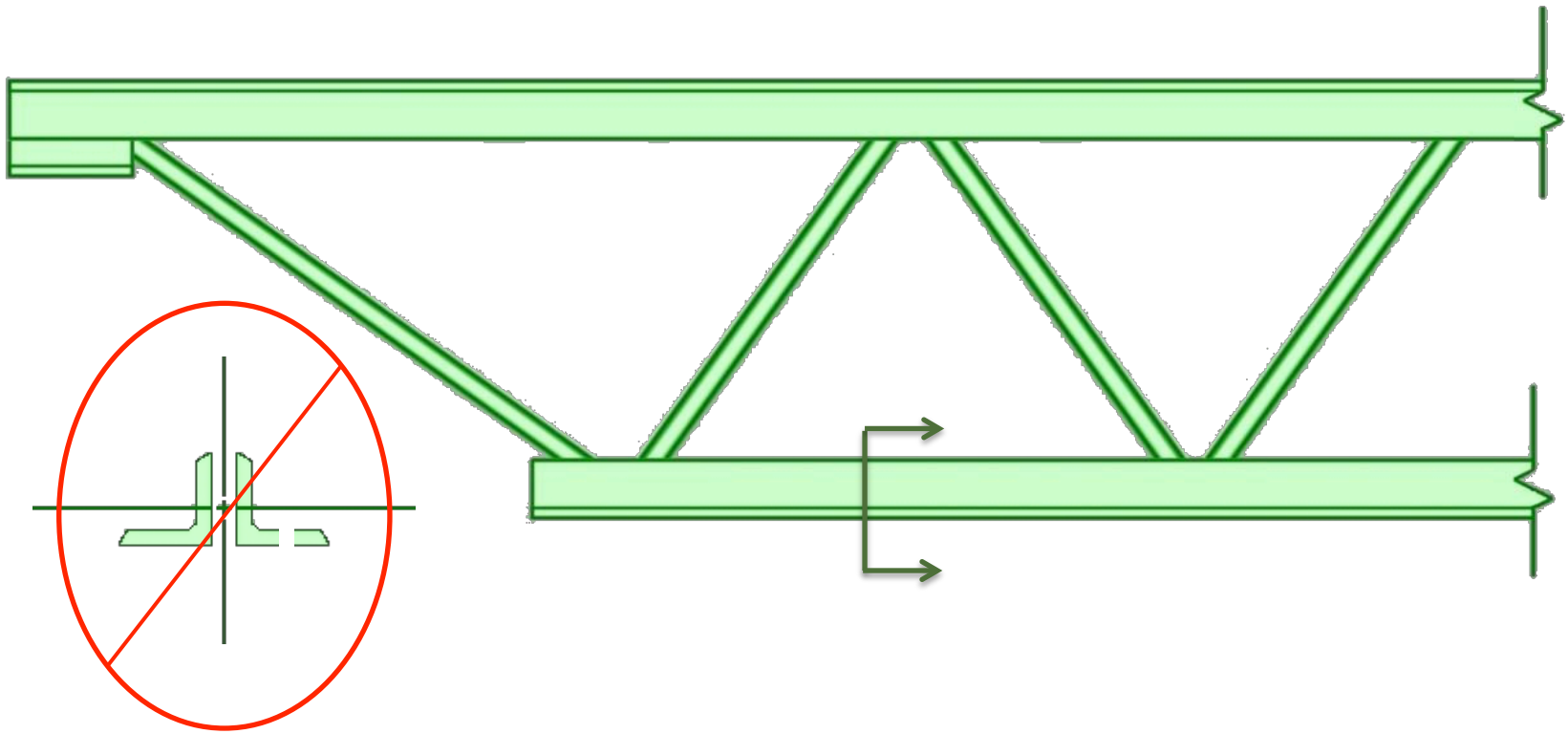
Trade Elements Connected to Joists

A Bend-Check Load will check the localized bending between panel points, while not adding to the global moment and shear.



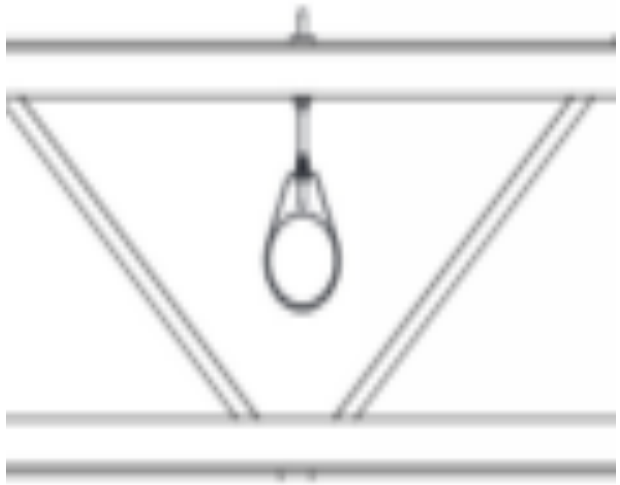
Trade Elements Connected to Joists

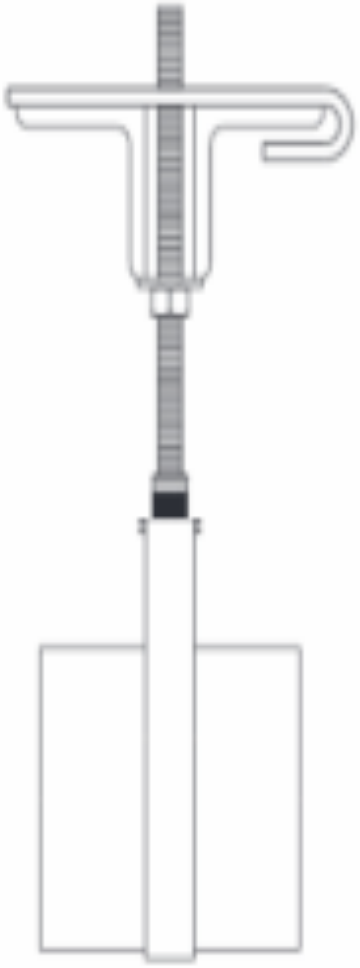
Do not field drill holes in joist members to attach trade elements.



Trade Elements Connected to Joists

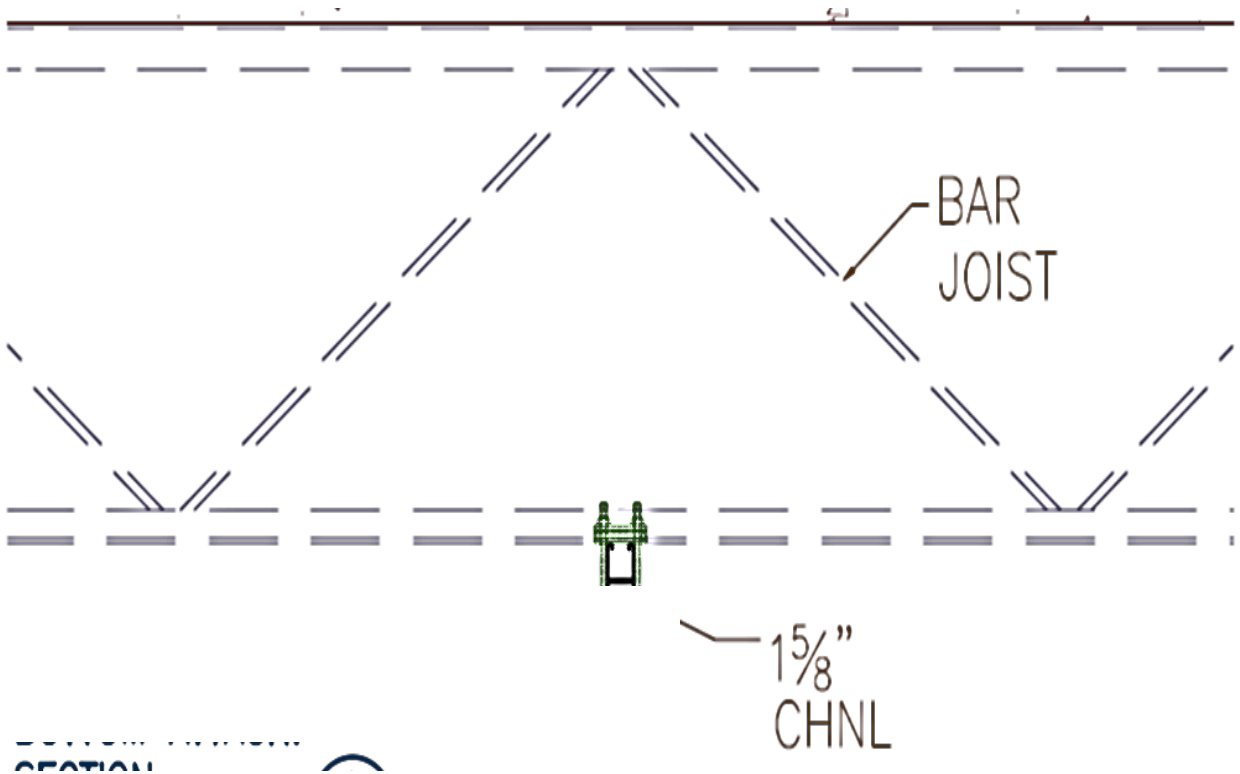
This is a simple, concentric hanger.





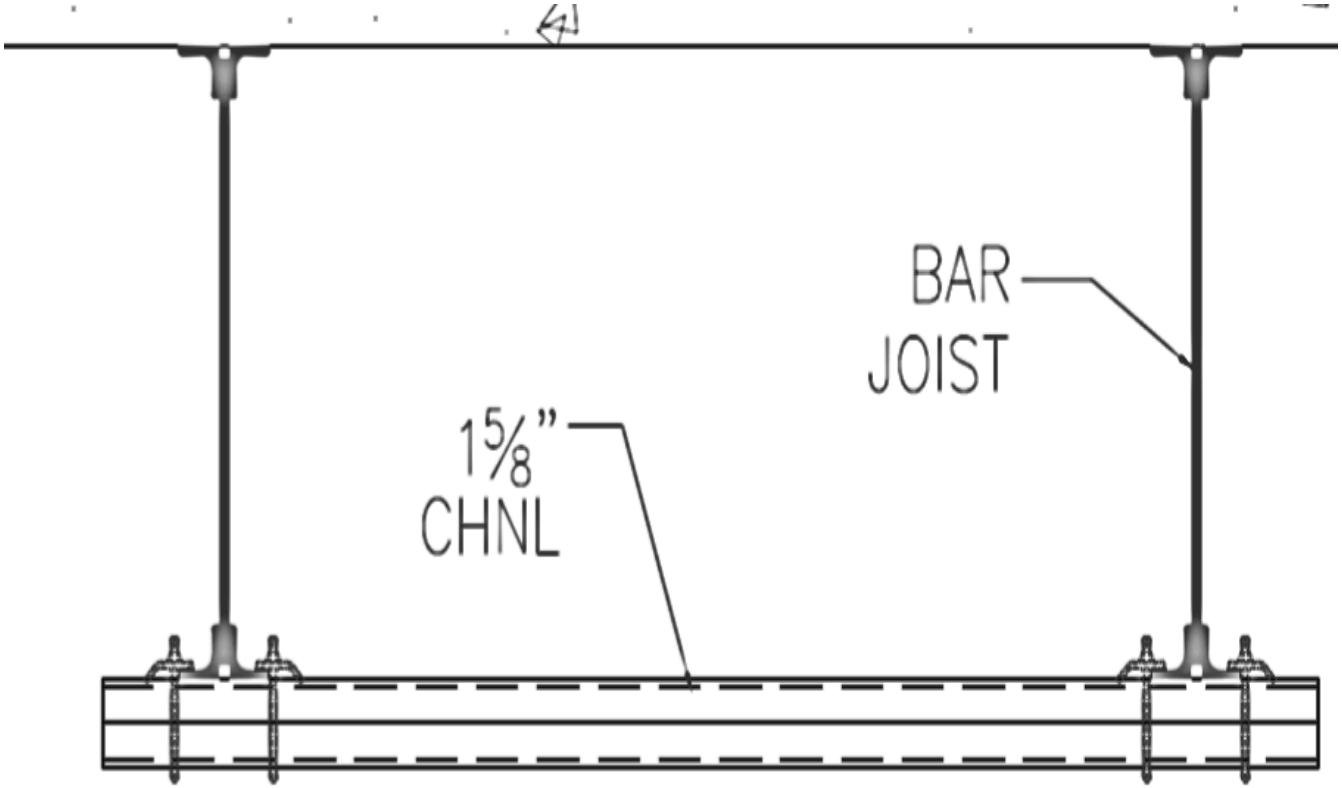
Trade Elements Connected to Joists

Hanger auxiliary steel example,
across bottom of bottom chords.



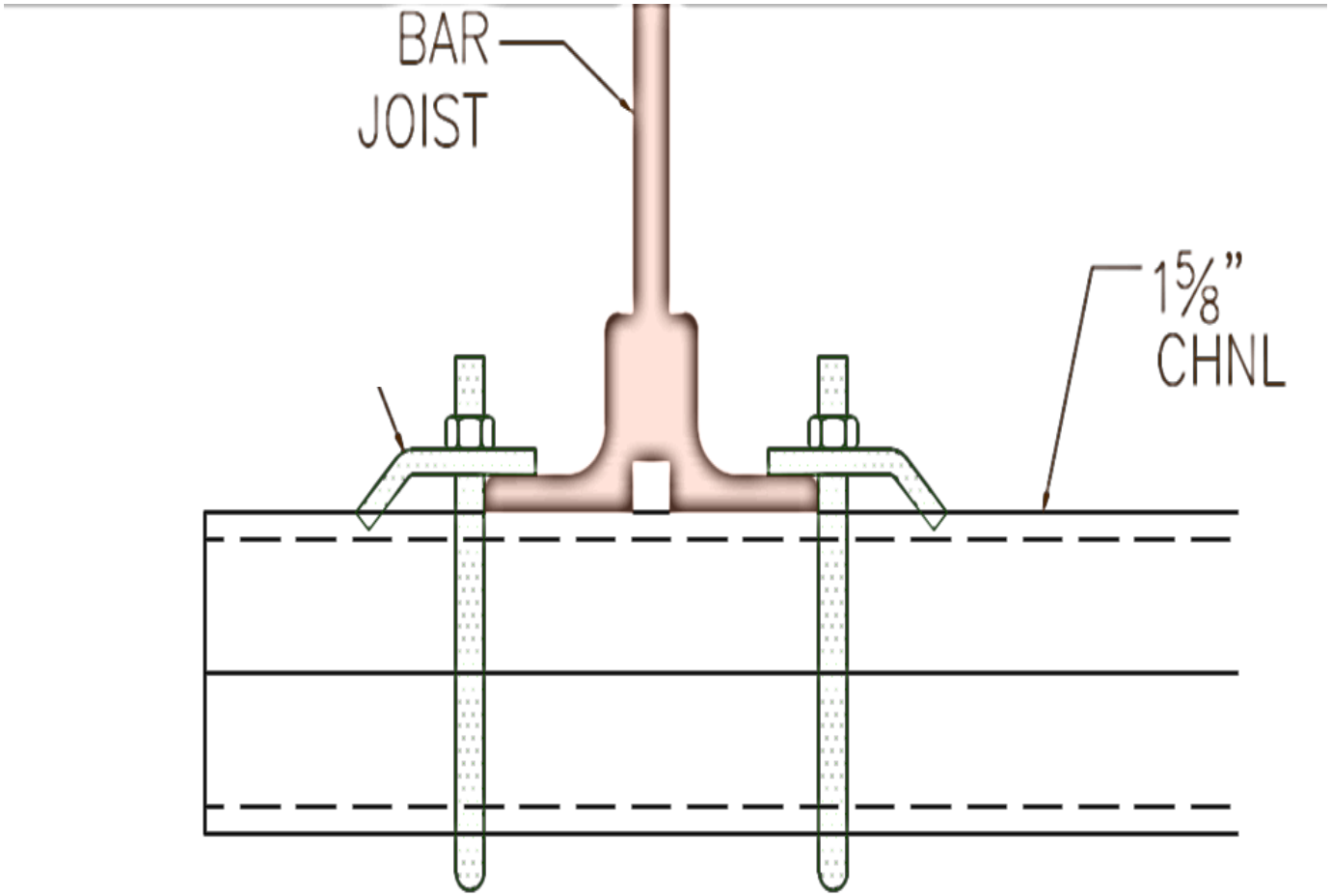
Trade Elements Connected to Joists

Cross section view.



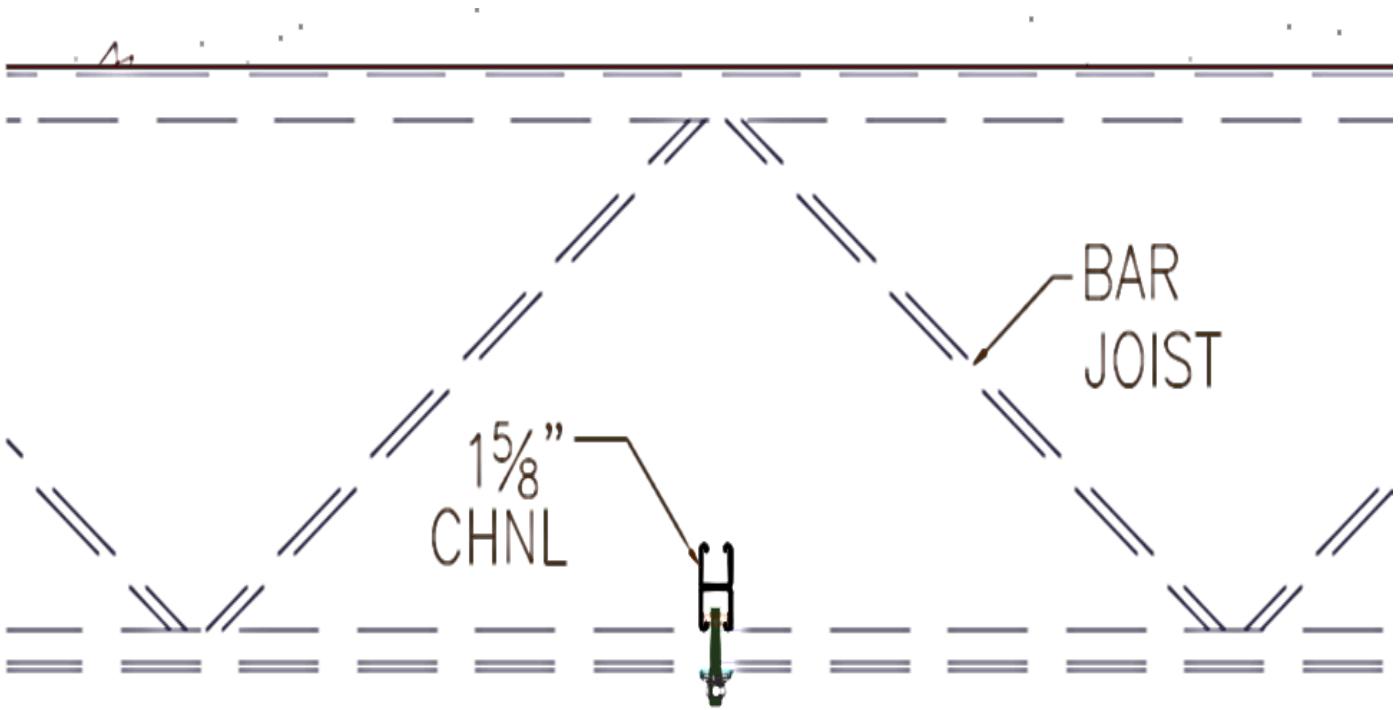
Trade Elements Connected to Joists

Attachment detail.



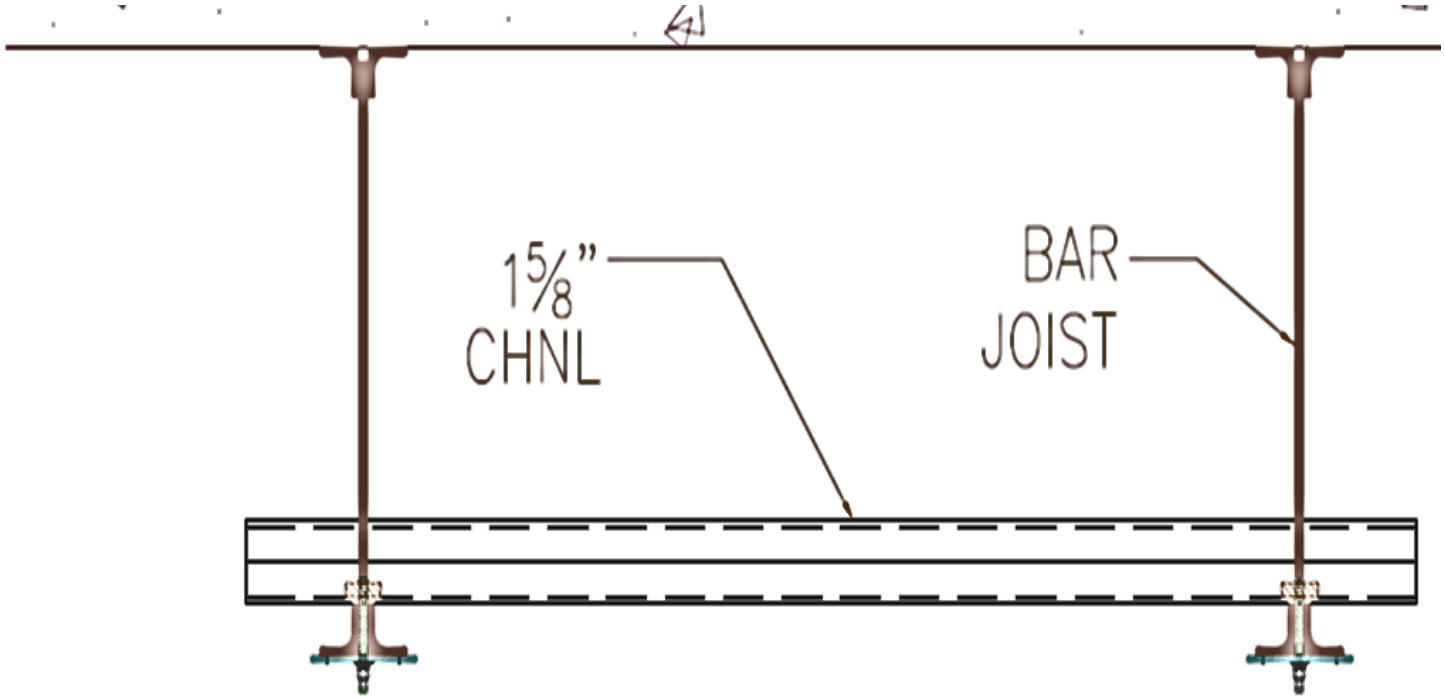
Trade Elements Connected to Joists

Hanger auxiliary steel across top of bottom chord chords (okay when field located).



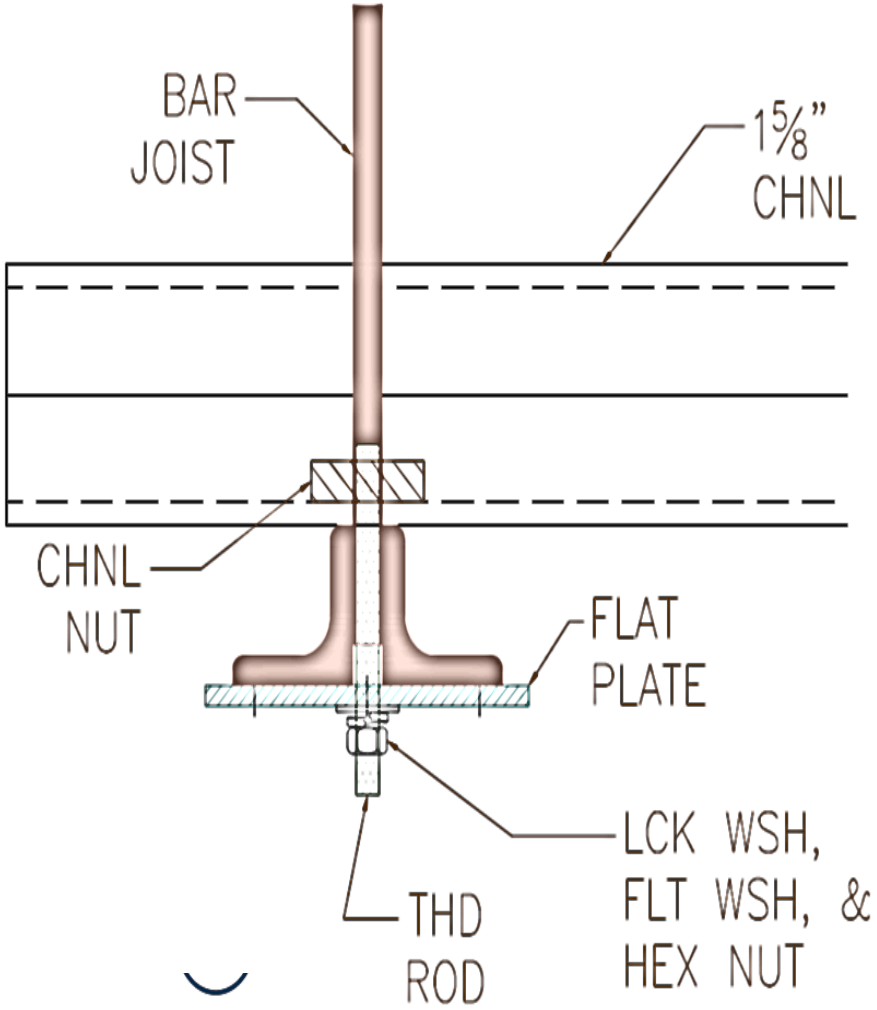
Trade Elements Connected to Joists

Cross section view.



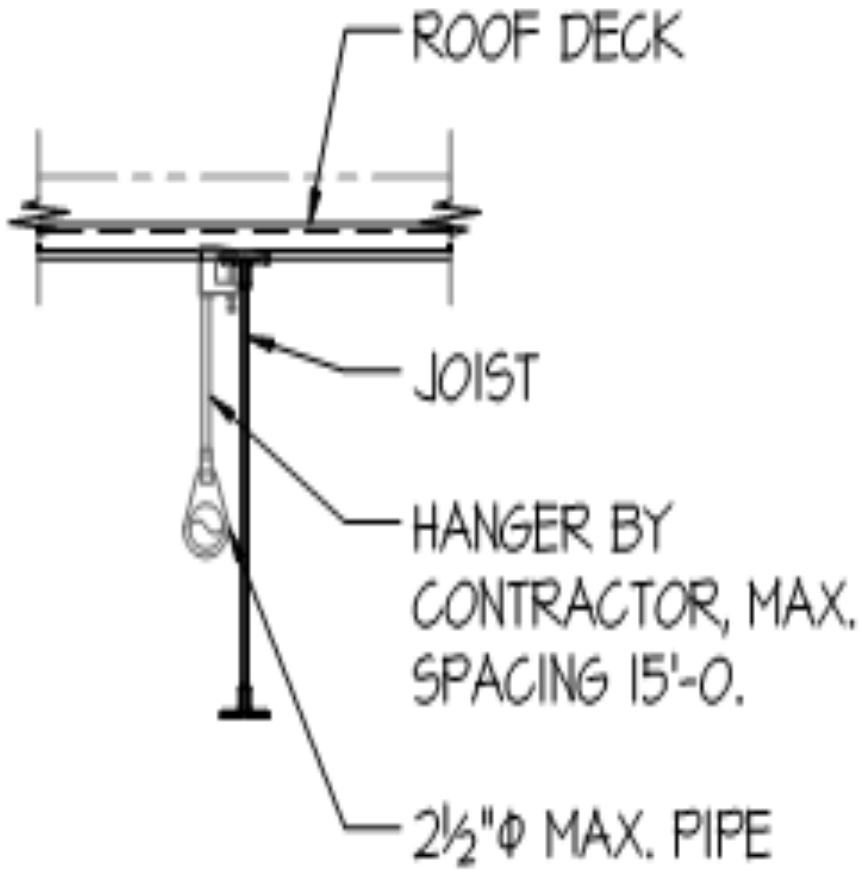
Trade Elements Connected to Joists

Attachment detail.



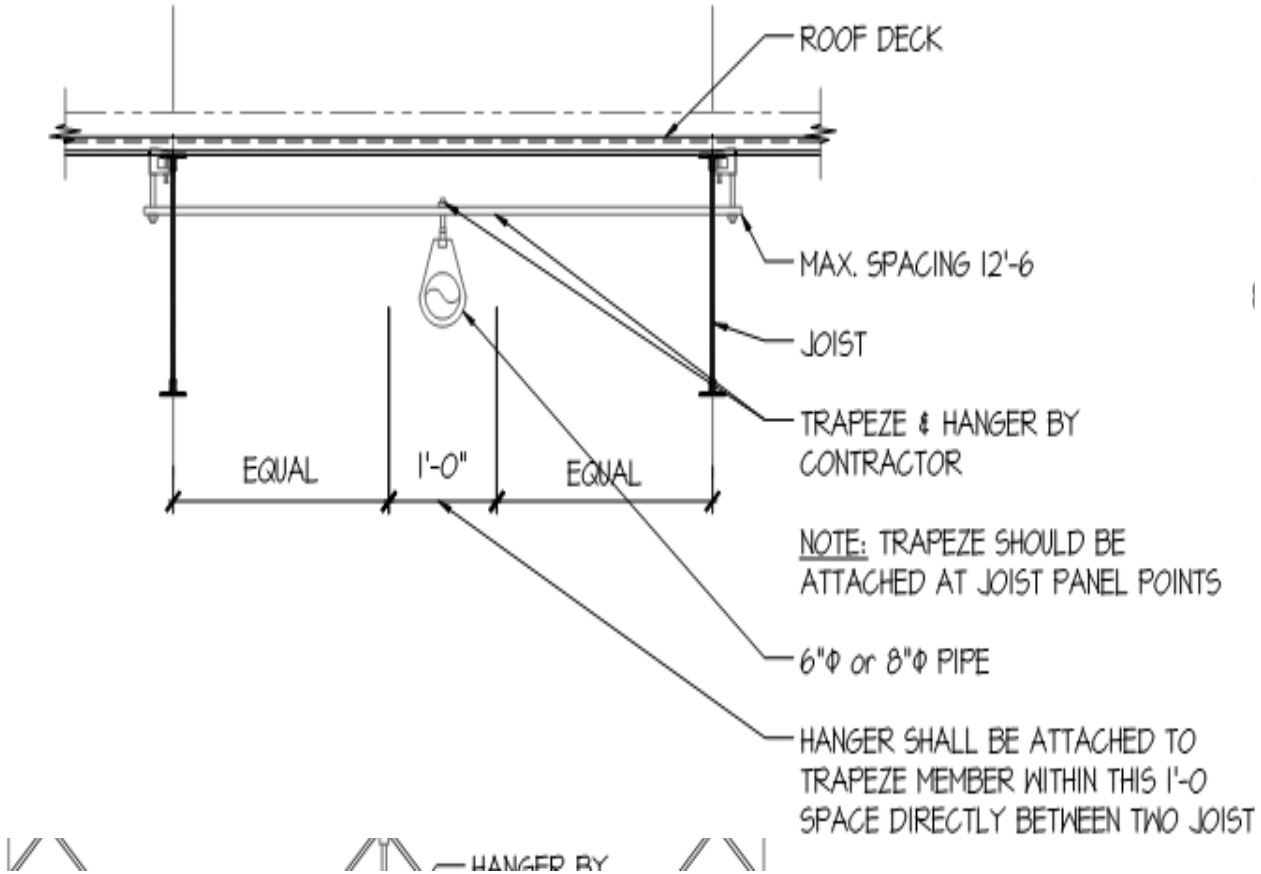
Trade Elements Connected to Joists

A beam clamp hanger is not concentric, and must be used with discretion, only for small loads.



Trade Elements Connected to Joists

This trapeze detail limits the torsional effects of the beam clamps, but the attachment is still to only one chord angle and discretion is required.



Trade Elements Connected to Joists

- Wrapped wire for a light weight
- miscellaneous hanger – good!
- Hung from bridging – bad!

Polling Question 1

Welded connections to/from steel joists are simplest if:

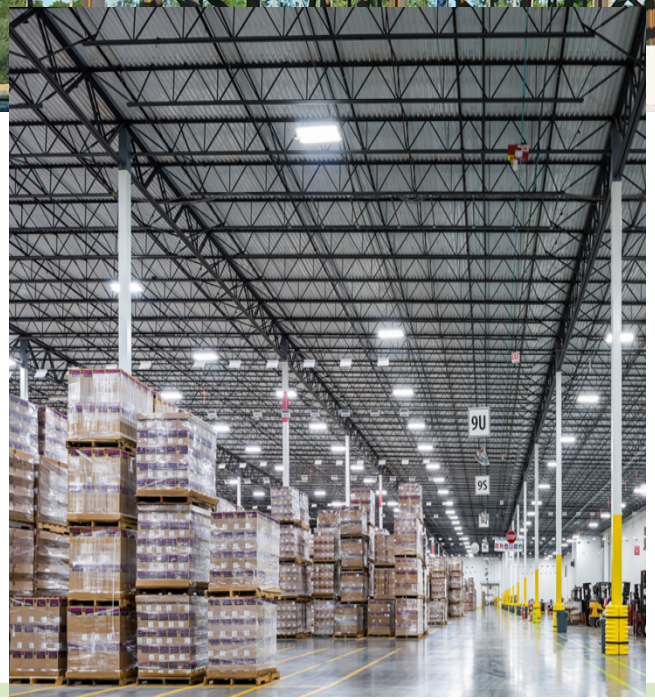
a) The weld is as thick as possible, to minimize length.

b) The weld is positioned such that it is done overhead.

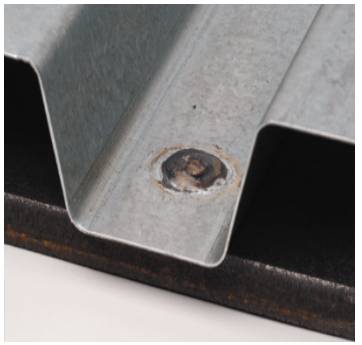
c) The weld is lengthened as required, to limit thickness.

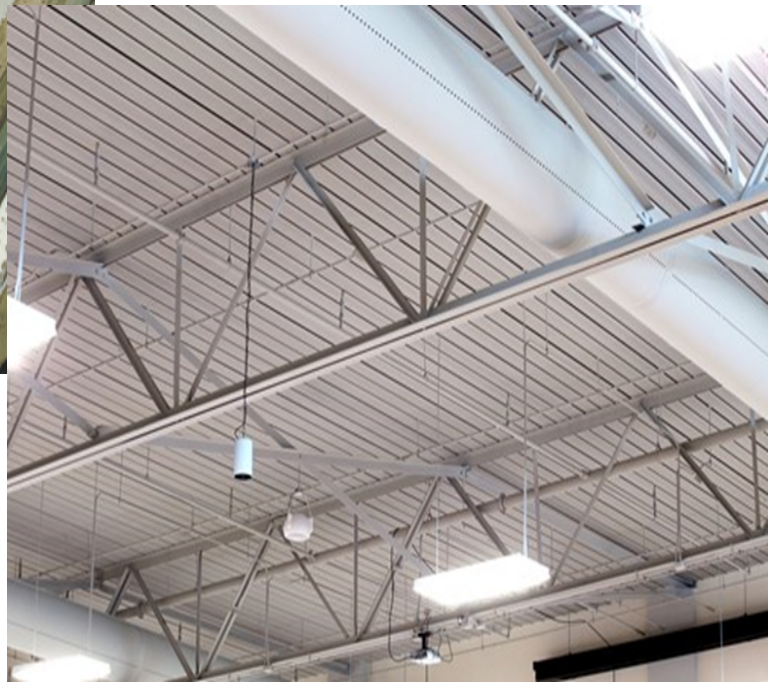
d) A multi-pass weld can be utilized.

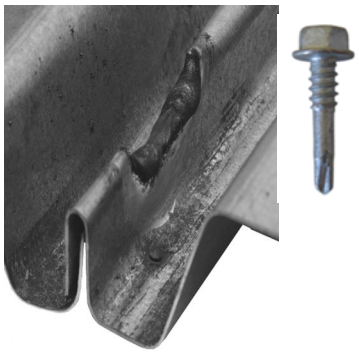
Simple Joist Connections Simplified



Simple Deck Connections Simplified



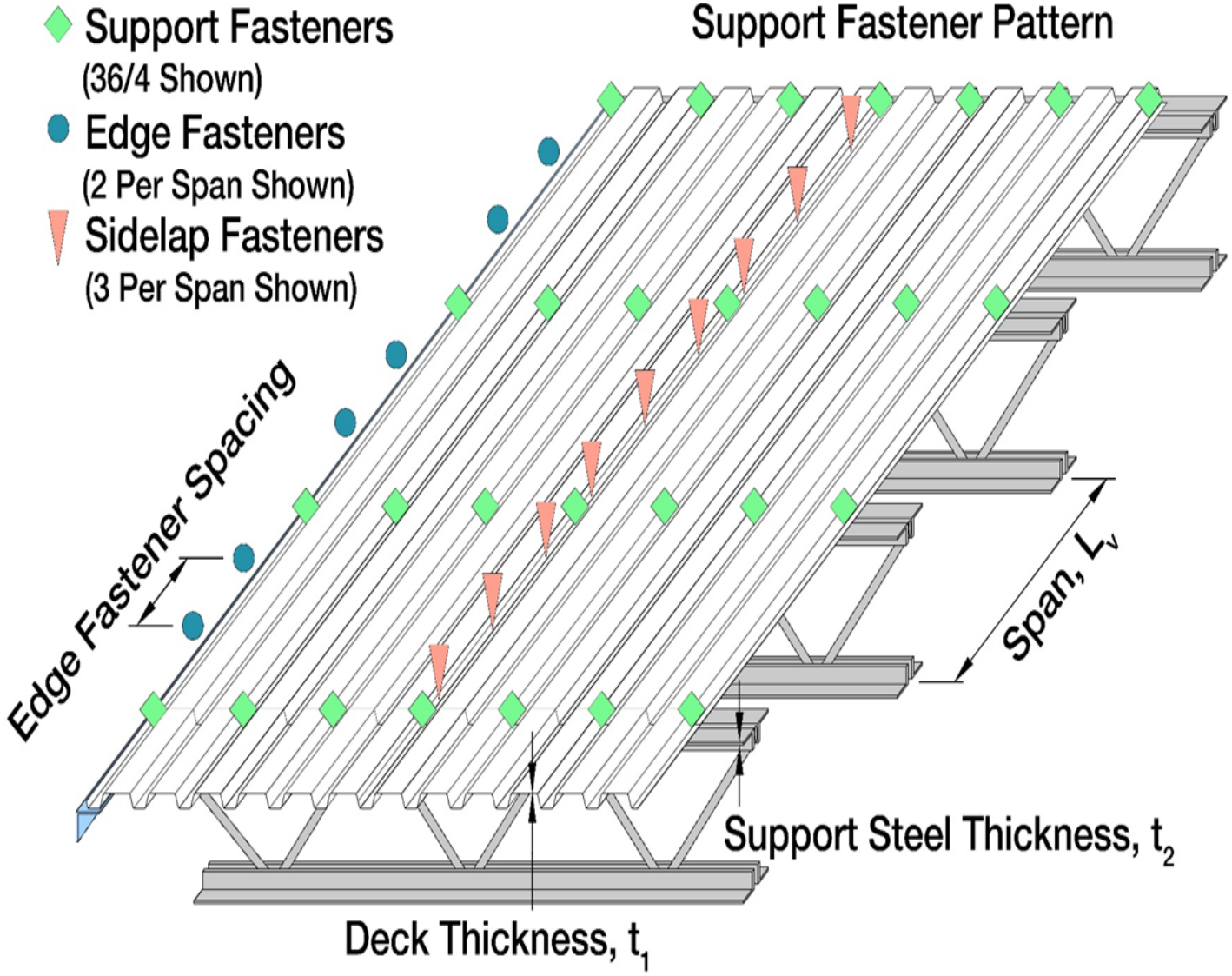




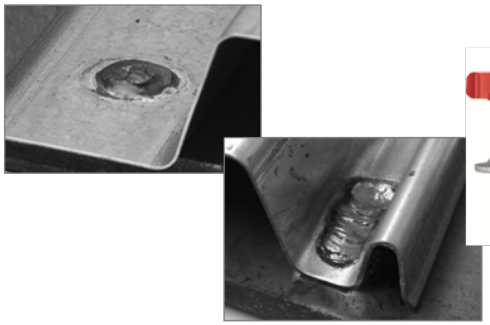
Simple Deck Connection Topics

- ❑ Connection Types
- ❑ Connection Details
- ❑ Connection Patterns
- ❑ Connection Applications
- ❑ Hanging Load Connections
- ❑ Design Resources

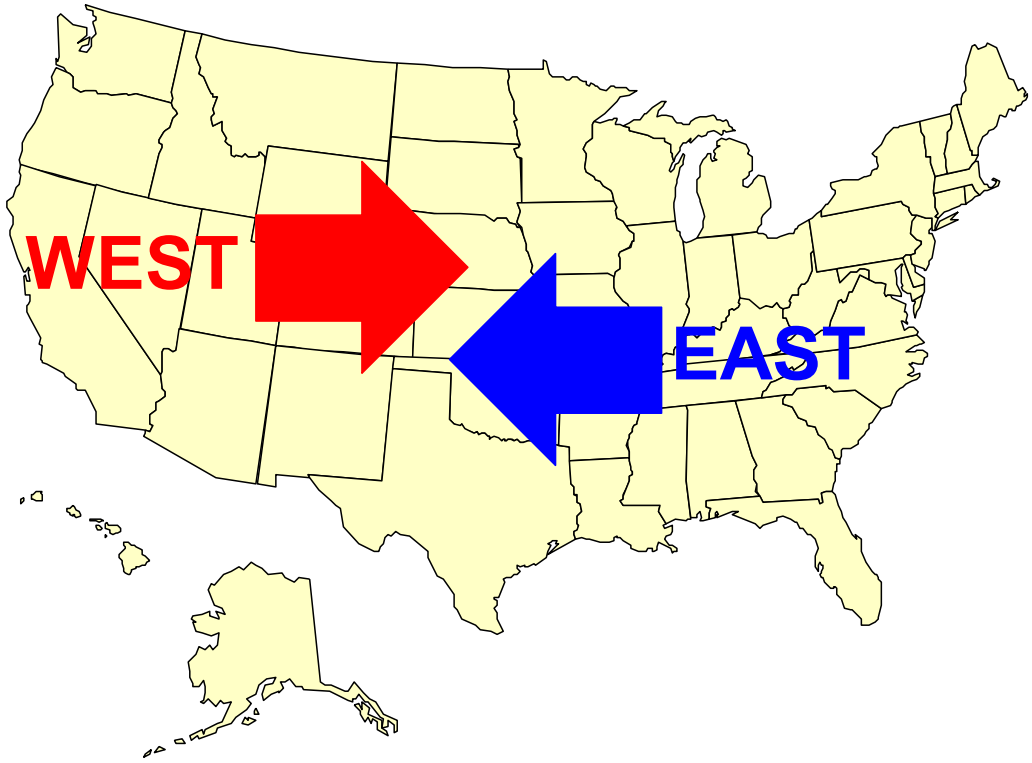
Deck Connection Types



Support Connection Choices

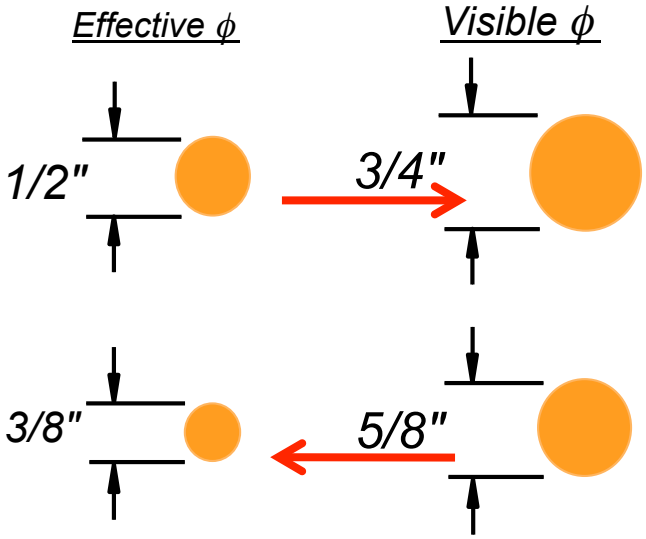
	Welds	PAF's	Self-Drilling Screws
			
Relative:	Low → High	Low → High	Low → High
Strength	●●●●●	●●●●○	●●○○○
Installation Speed	●○○○○	●●●●●	●●●○○
Installed Cost	●●●●●	●●●○○	●○○○○
Aesthetics	●○○○○	●●●●○	●●●○○

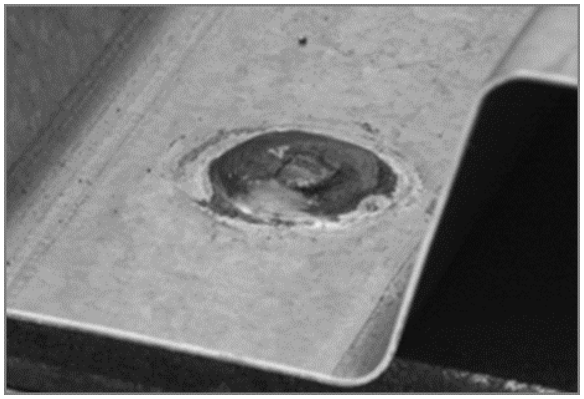
Simply Different



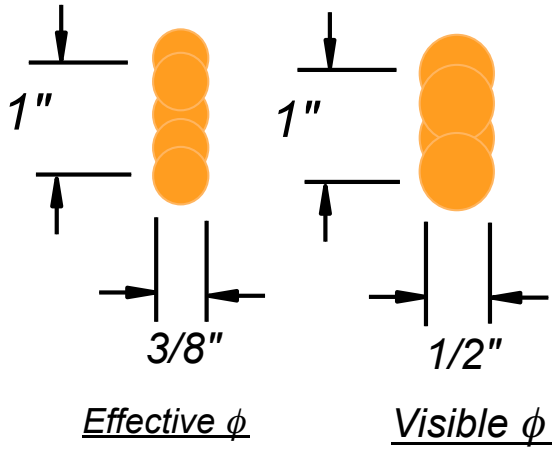
Support Weld Sizes

Arc-Spot (Puddle) Welds



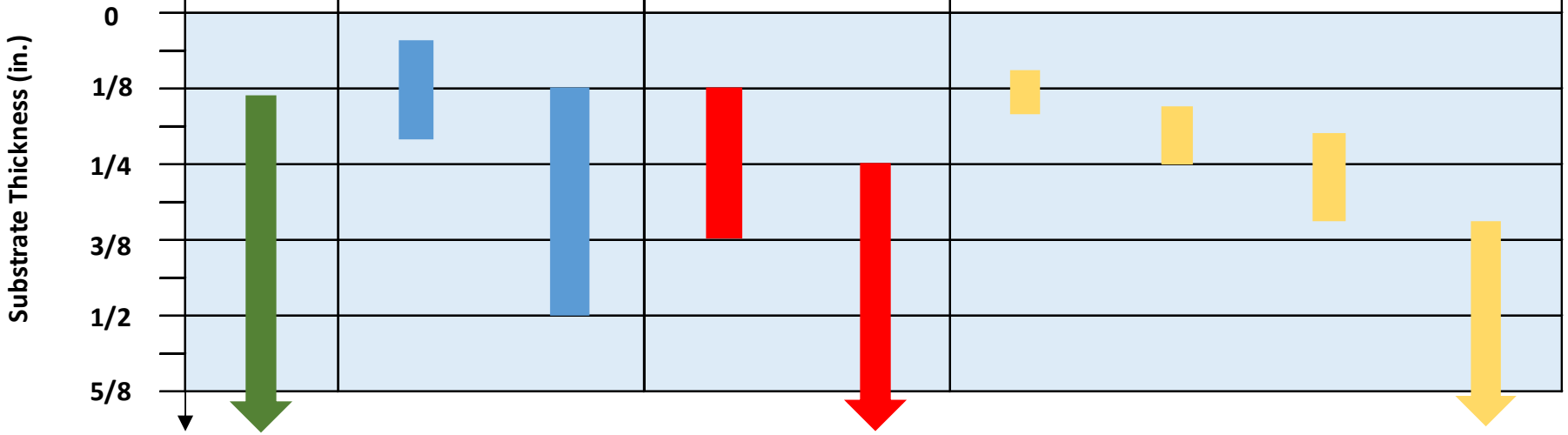


Arc Seam Welds

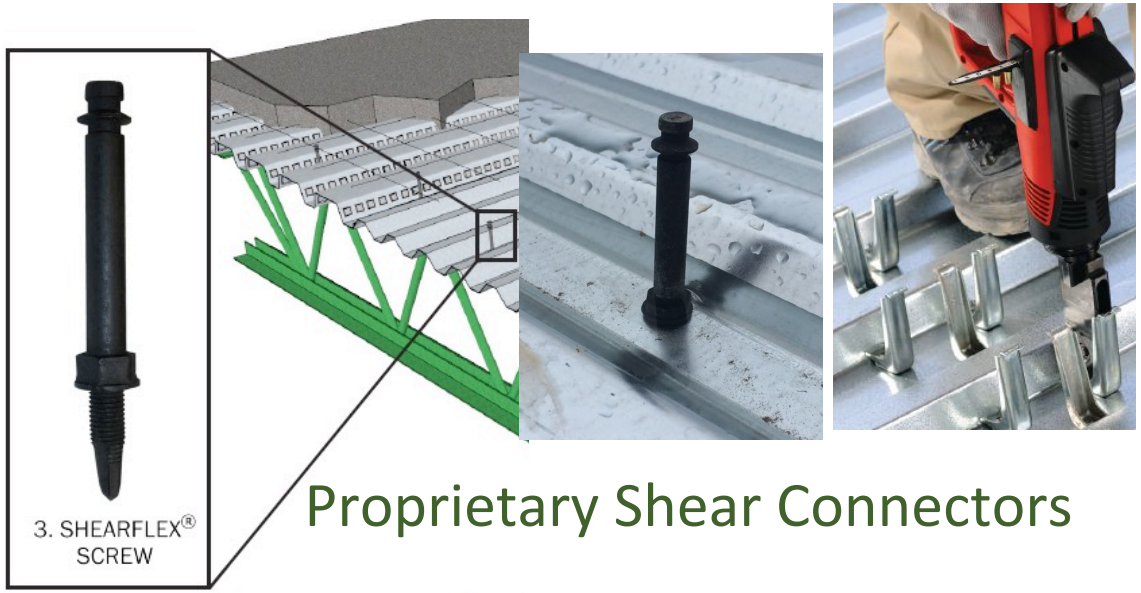


Support Connection Application Ranges

	Arc Spot Weld	Self Drilling Screws		Hilti High Shear Nails		Pneutek Fasteners			
		12-14	12-24	X-HSN 24	X-ENP-19	SDK61075	SDK63075	K64062 or K64075	K66062 or K66075
Minimum	0.135"	0.0385"	0.125"	1/8"	1/4"	0.113"	0.155"	0.187"	0.312"
Maximum	Unlimited	0.210"	0.500"	3/8"	Unlimited	0.155"	0.250"	0.312"	Unlimited

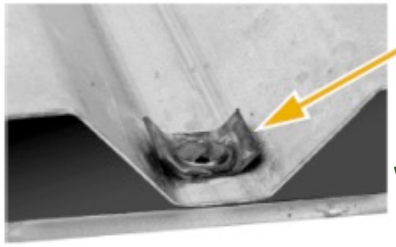


Concrete Filled Deck Connections



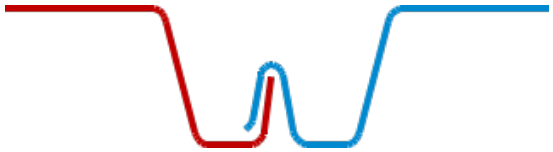
Proprietary Shear Connectors

Steel Headed
Stud Anchors

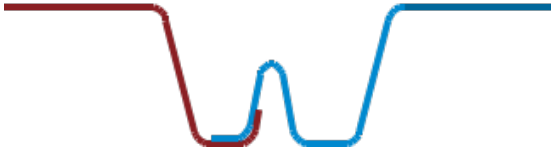


Weld Washer

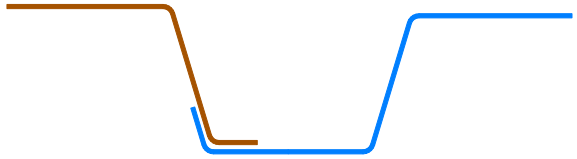
Deck Sidelap Styles



Interlocking Sidelap



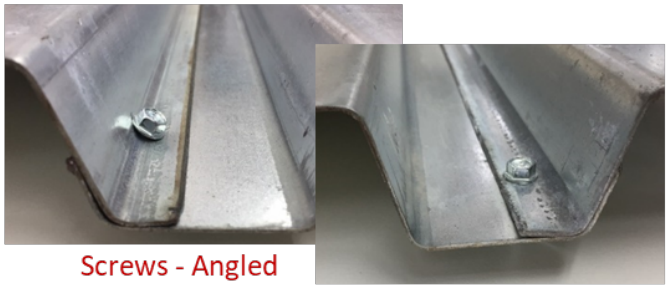
Interlocking Sidelap for
Screw Connection



Nested Sidelap

Nested Sidelap Connection Choices

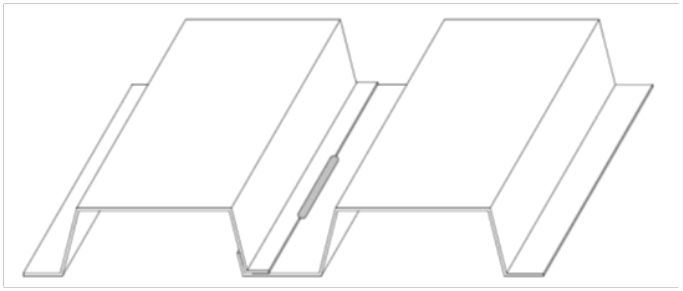
Screws



Screws - Angled

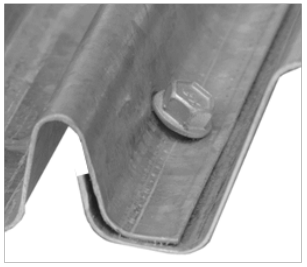
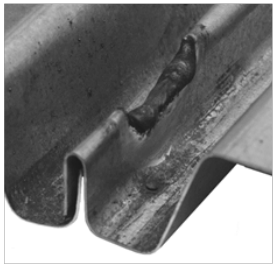
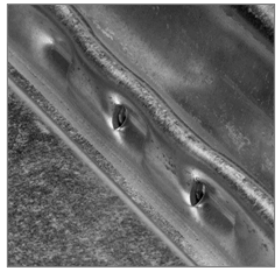
Screws - Vertical

Welds

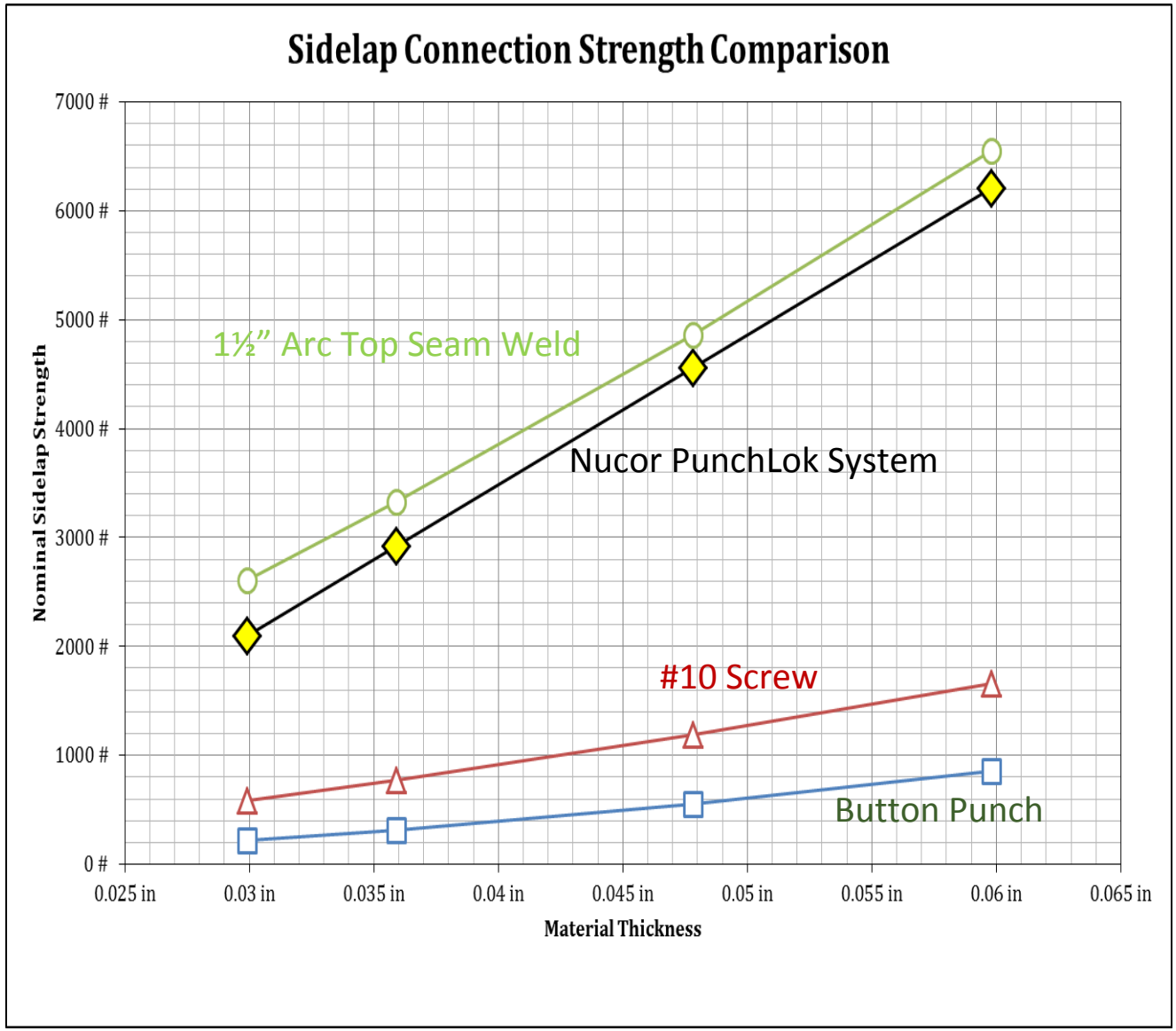


Relative:	Low → High	Low → High
Strength	●●○○○	●●●●●
Installation Speed	●●●○○	●○○○○
Installed Cost	●●○○○	●●●●●
Aesthetics	●●○○○	●○○○○
Ease of Inspection	●●●●○	●○○○○

Interlocking Sidelap Connection Choices

	Button Punches	Screws	Welds	Clinched Connections
				
Relative:	Low → High	Low → High	Low → High	Low → High
Strength	●○○○○	●●○○○	●●●●●	●●●●●
Installation Speed	●●●●●	●●●○○	●○○○○	●●●●○
Installed Cost	●○○○○	●●○○○	●●●●●	●○○○○
Aesthetics	●●●●●	●●○○○	●○○○○	●●●●●
Ease of Inspection	●●○○○	●●●●○	●○○○○	●●●●●

Sidelap Strength Comparison

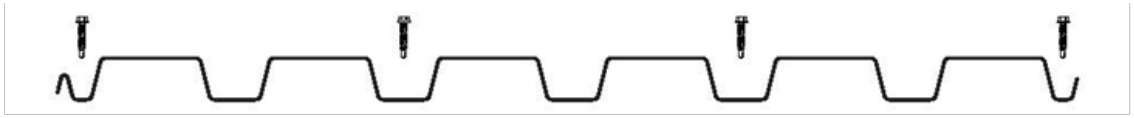


Deck Connection Aesthetics

Deck Connection Topics

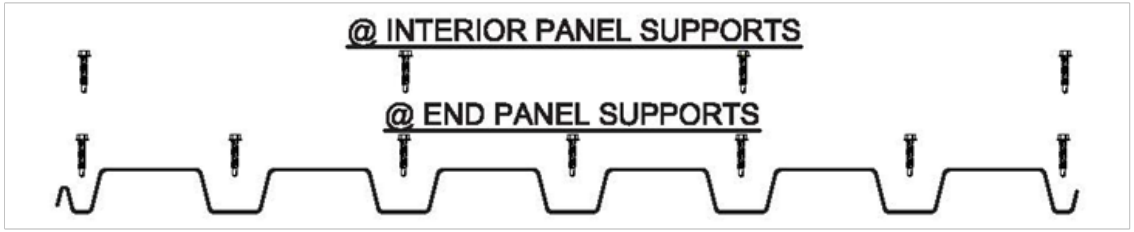
- ☑ Connection Types
- ☑ Connection Details
- ❑ Connection Patterns
- ❑ Connection Applications
- ❑ Hanging Load Connections
- ❑ Design Resources

Attachment Patterns at Supports



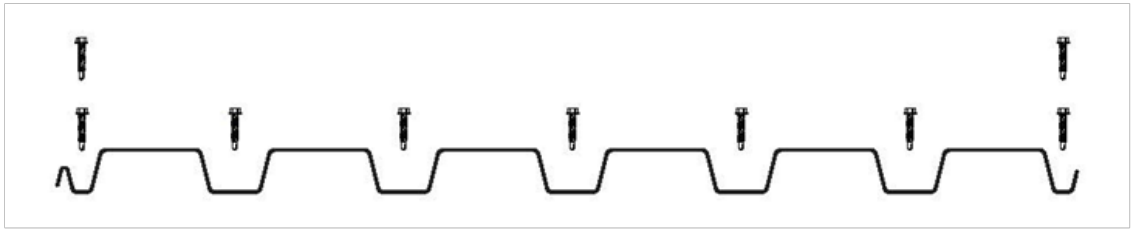
36/4

36/5



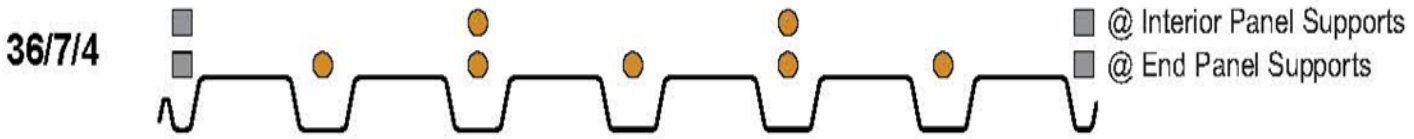
36/7/4

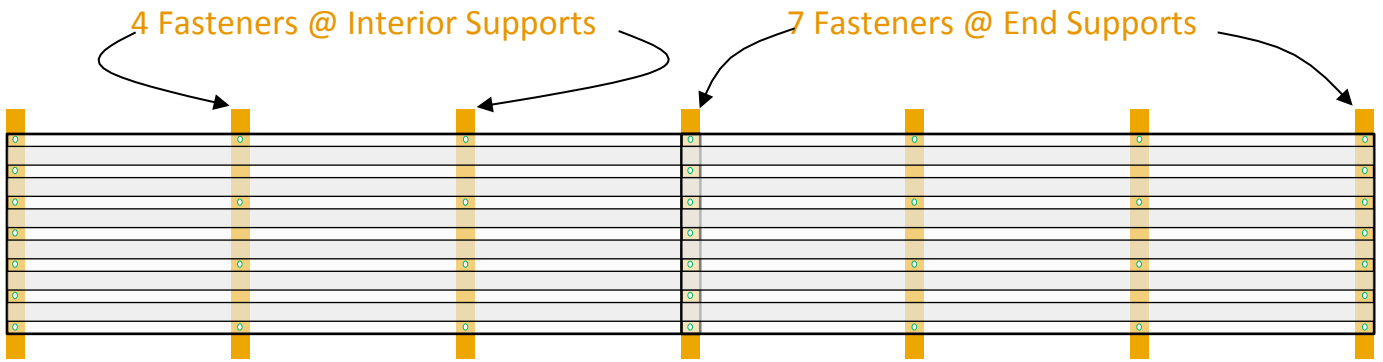
36/7



36/9

36/7/4 Support Attachment Pattern





36/7/4 Pattern = 37 Fasteners over 6 Spans

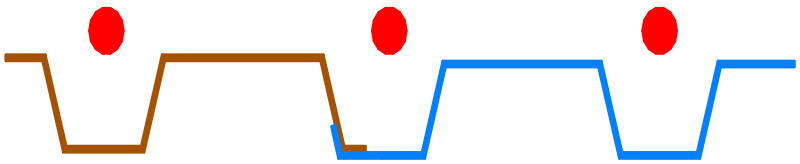
36/7/4 Pattern Provides:

- Strength ≈ 36/7 Pattern, with
- Cost ≈ 36/5 Pattern.

Support Connection at Sidelap

36/7

36/7

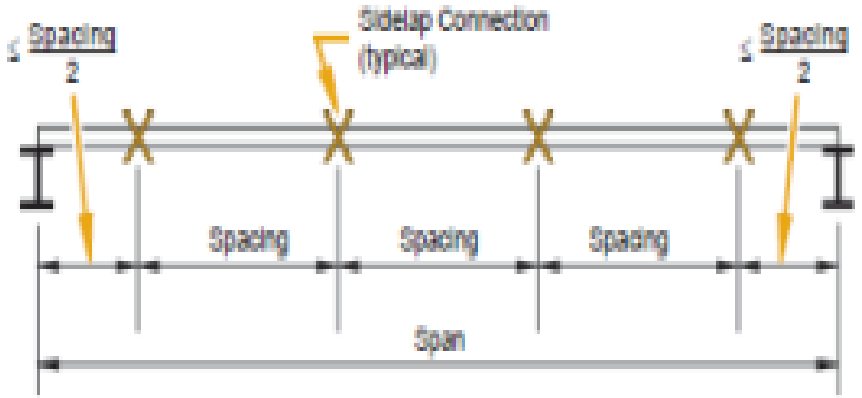


Nested

Interlocking

Sidelap Connection Specification

- Approaches to Presenting Tabular Data:
- # of sidelap connections / span
- Spacing of sidelap connections

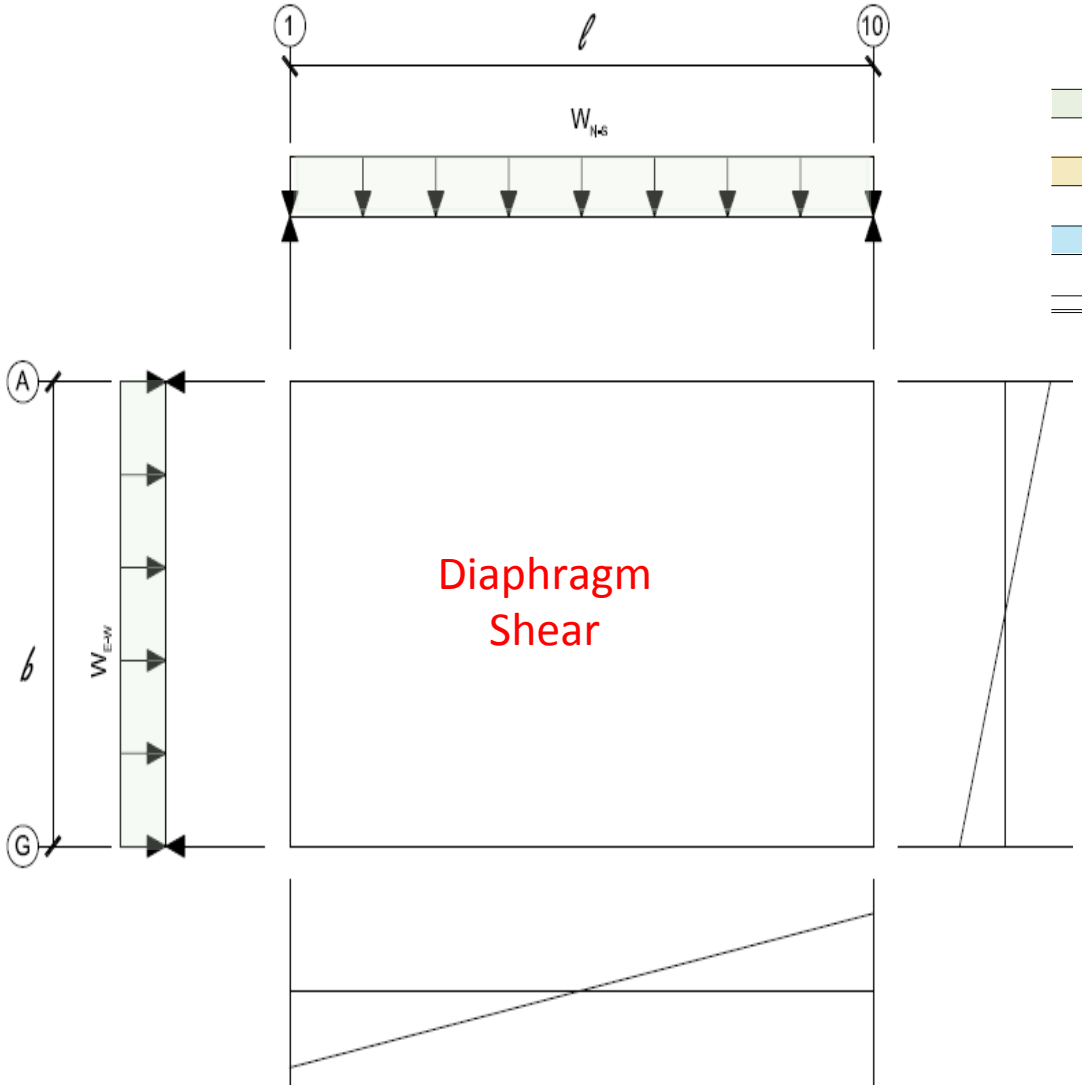


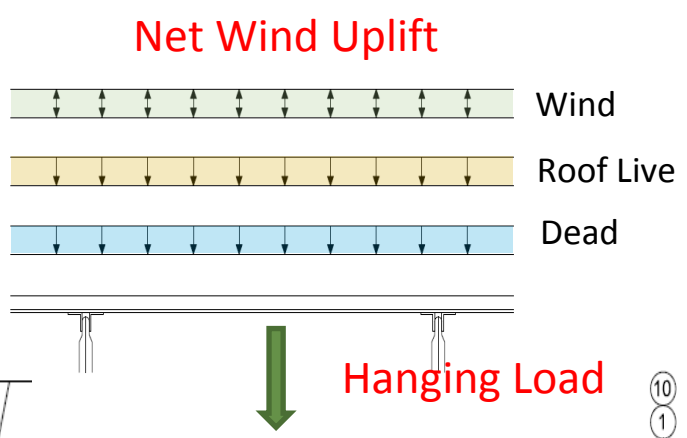
Spacing	Span (ft)						
(in.)	4'-0"	5'-0"	6'-0"	7'-0"	8'-0"	9'-0"	10'-0"
36	2	2	2	3	3	3	4
30	2	2	3	3	4	4	4
24	2	3	3	4	4	5	5
18	3	4	4	5	6	6	7
12	4	5	6	7	8	9	10
6	8	10	12	14	16	18	20
4	12	15	18	21	24	27	30

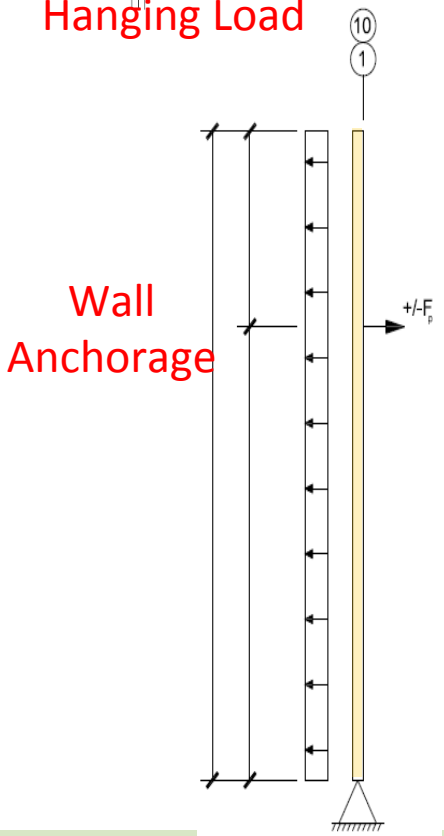
Deck Connection Topics

- [x] Connection Types
- [x] Connection Details
- [x] Connection Patterns
- [ ] Connection Applications
- [ ] Connection of Hanging Loads
- [ ] Design Resources

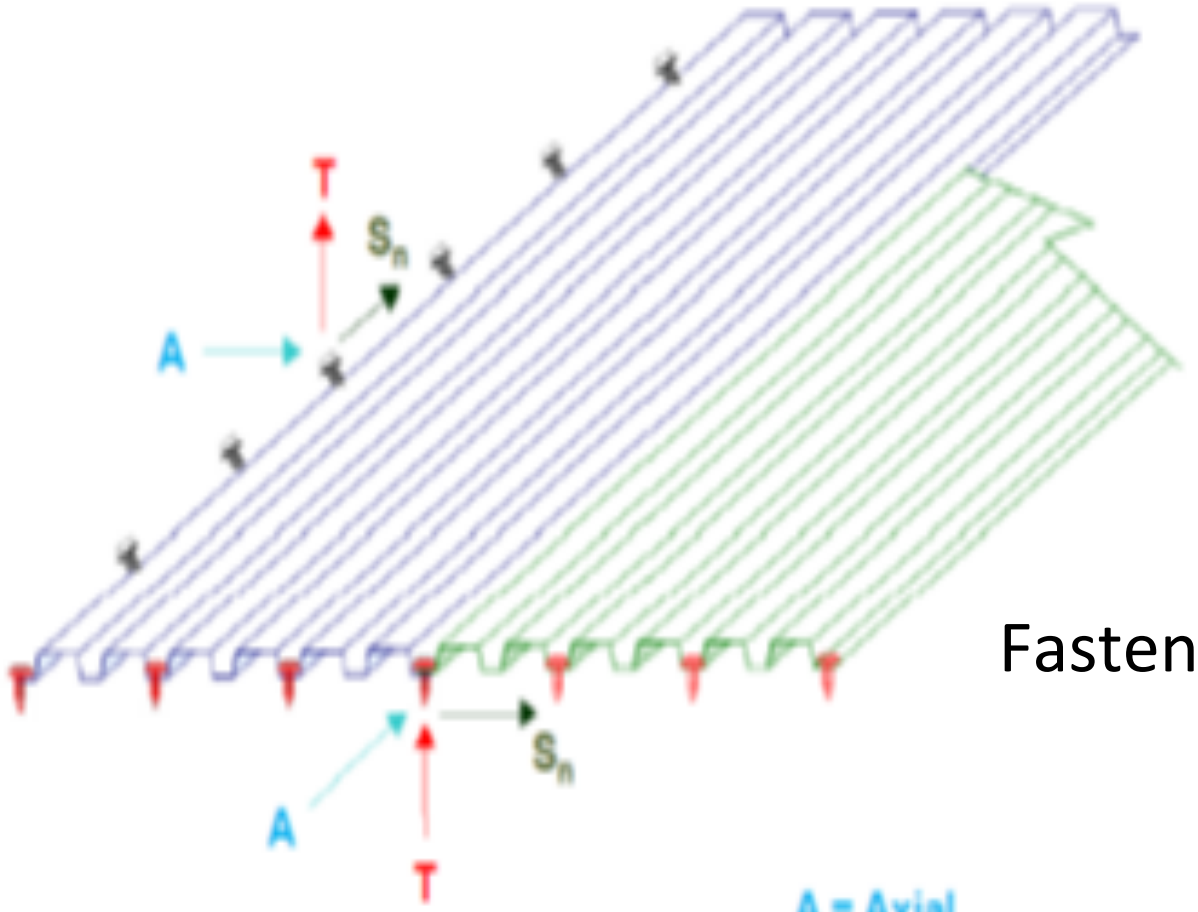
Deck Connection Design Considerations







Connection Shear / Tension Interaction



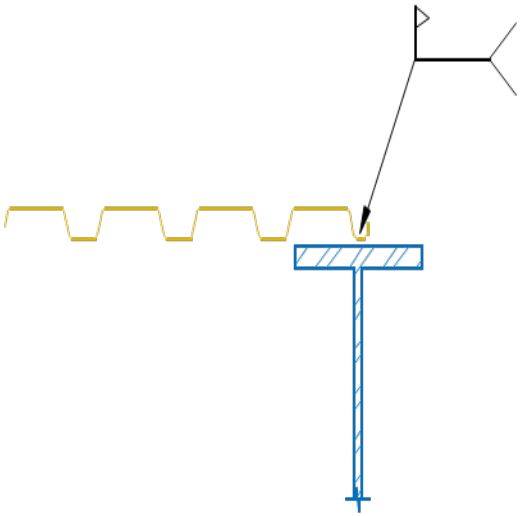
Fastener Loads

A = Axial

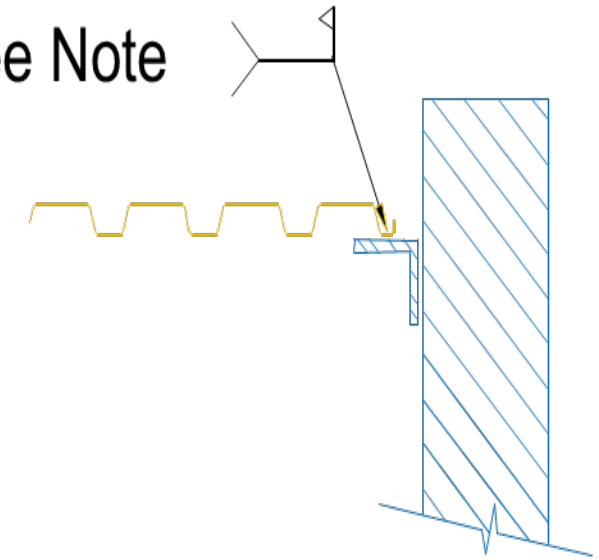
S_n = Shear

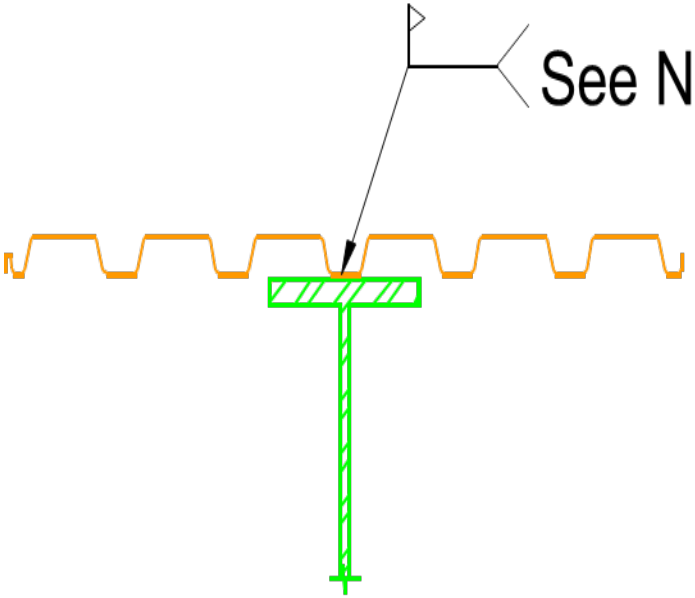
T = Tension

Parallel Collector Attachment



See Note



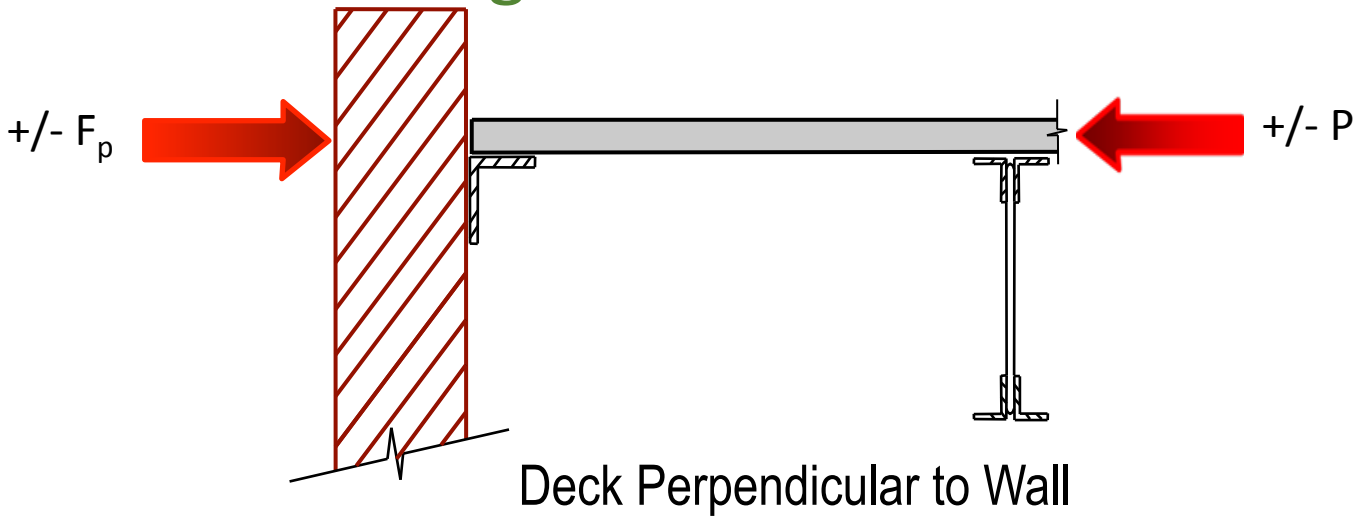


See Note

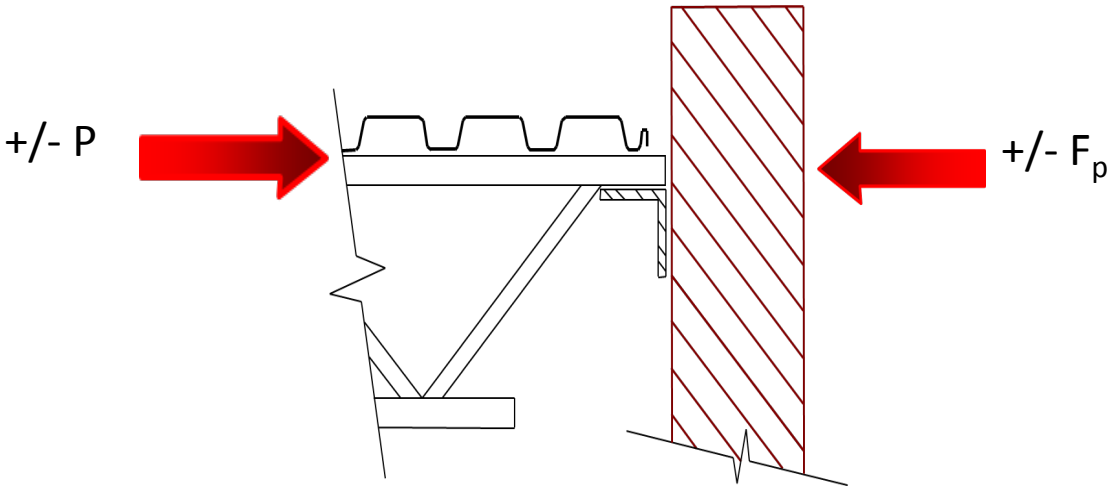
Note:

Fastener spacing based on shear capacity of fasteners being used.

Wall Anchorage Connections



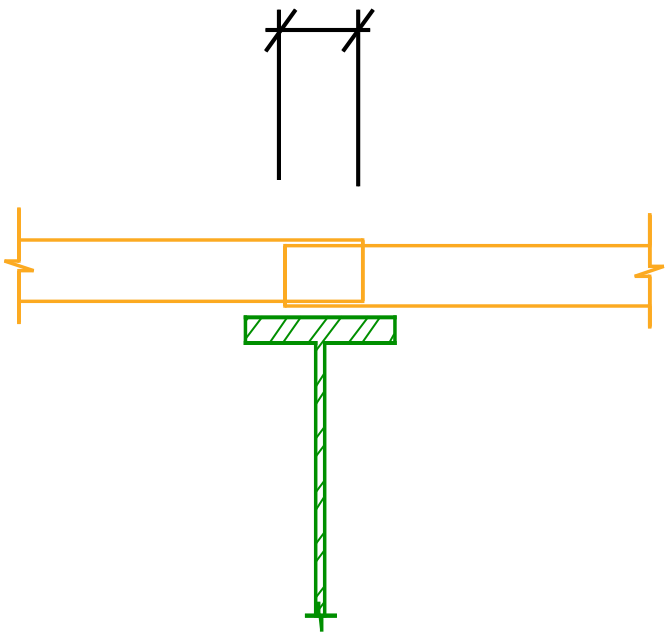
Deck Perpendicular to Wall



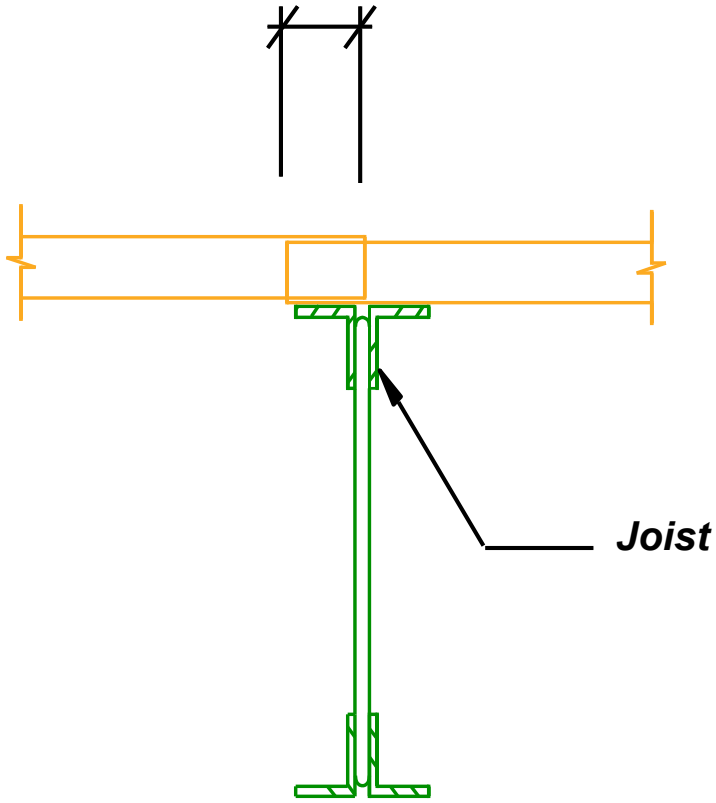
Deck Parallel to Wall

Support Connection Detailing – OWJ

2" lap



Center 2" lap over chord



Simple Deck Connection Topics

- ☑ Connection Types
- ☑ Connection Details
- ☑ Connection Patterns
- ☑ Connection Applications
- ☐ Hanging Load Connections
- ☐ Design Resources

Hanging Loads – Historical Industry Guidance

per SDI Publication No. 30 (2000), Roof Deck Specification, Section 1. Scope:

> "**Commentary:** Suspended ceilings, light fixtures, ducts, or other utilities shall not be supported by the steel deck."

Hanging Loads – Current Industry Guidance
per ANSI / SDI RD-2017

"2.4 A.6. Concentrated and Suspended Loads: All concentrated and suspended loads shall be included in the analysis and calculations for strength and deflection."

"User Note: The designer must take into account the sequence of loading. Suspended loads may include ceilings, light fixtures, ducts or other utilities. The designer should consider that loads could be applied directly to the deck rather than the support framing."

"User Note: Concentrated loads are resisted by a distribution width. A "rule of thumb" 1½ inch deck is to use the load footprint width plus 12 inches (300 mm) but not less than 18 inches (460 mm) distribution width for loads in the middle of the span."

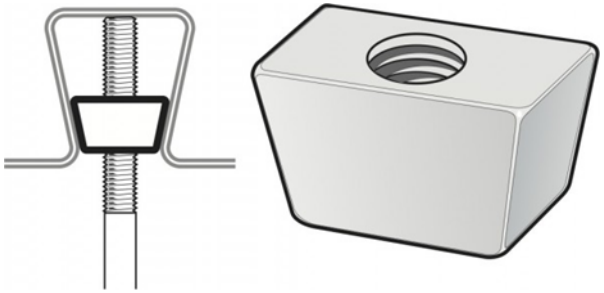
Hanging Loads – Connection Options

Roof Deck Options:

SAMMY X-PRESS from ITW

Rolled In Hanger Tabs

Self Drilling Screw Ceiling Wire Hangers

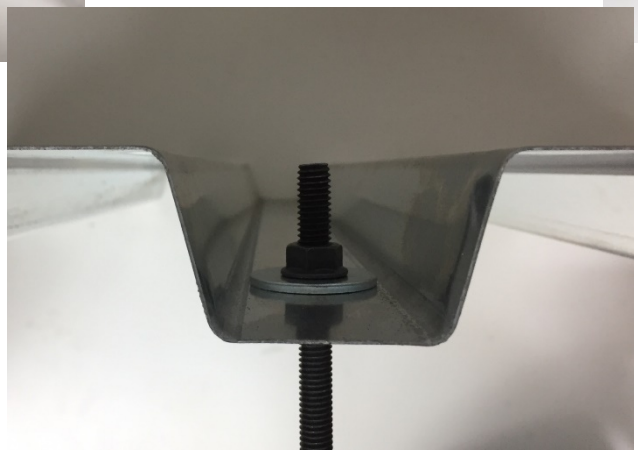


Wedge Style Hangers

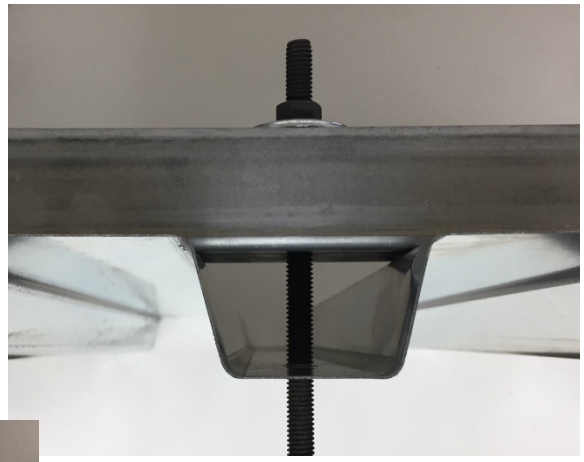
Hanging Loads – Connection Options

Additional Roof Deck Options:

Rebar Spreader



Fender Washer



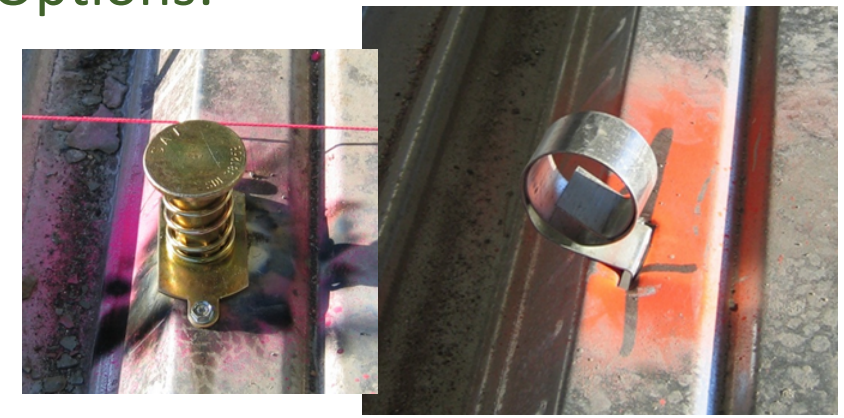
Strut Spreader

Hanging Loads – Connection Options

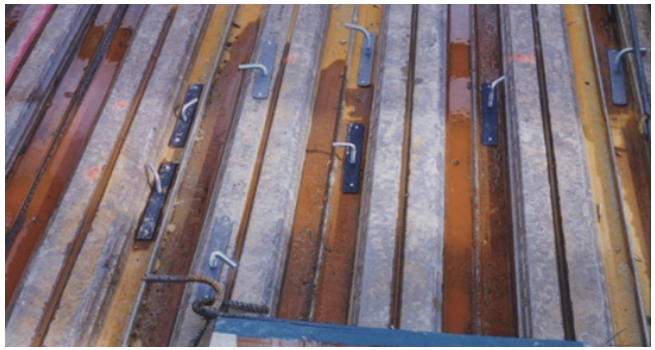
Additional Concrete Filled Deck Options:

PAF Ceiling Wire Hangers

Expansion Anchors

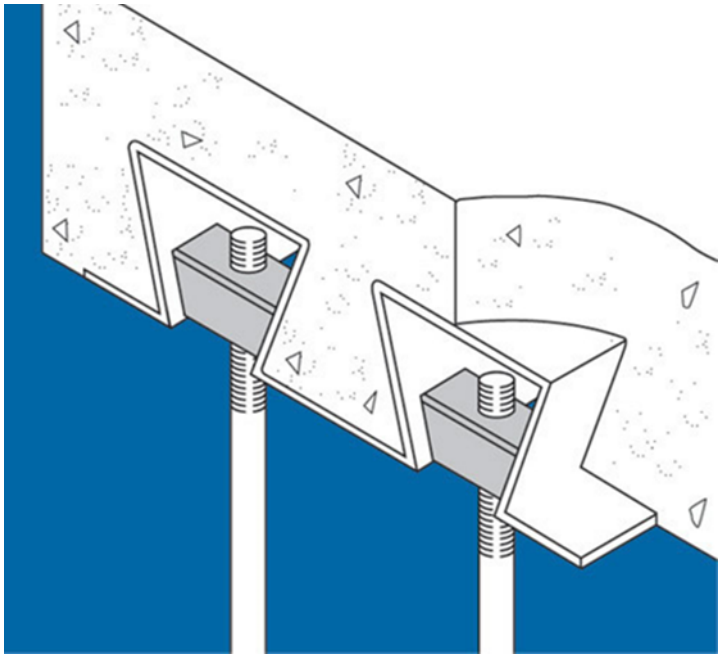


Cast-In-Place



Hanging Loads – Connection Options

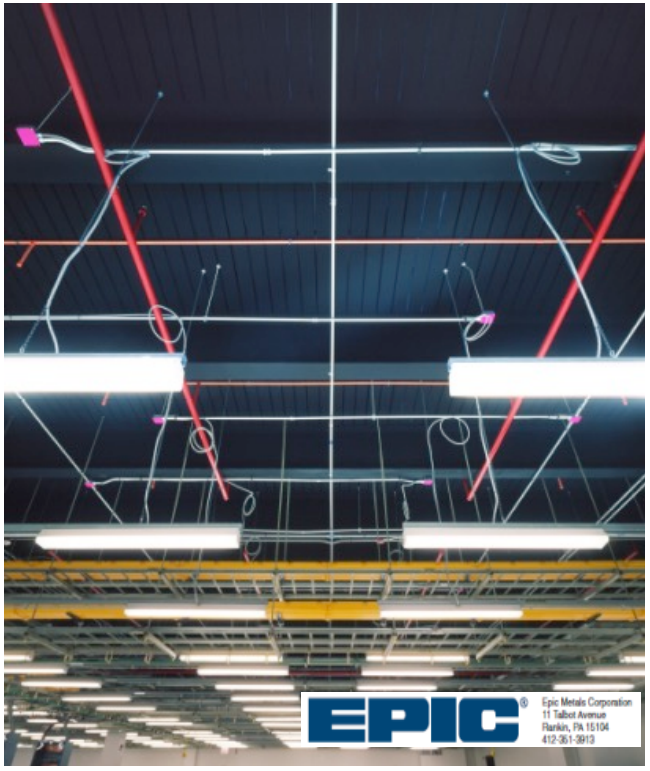
Additional Concrete Filled Deck Options:



Wedge Style Hangers

Hanging Loads – Connection Options

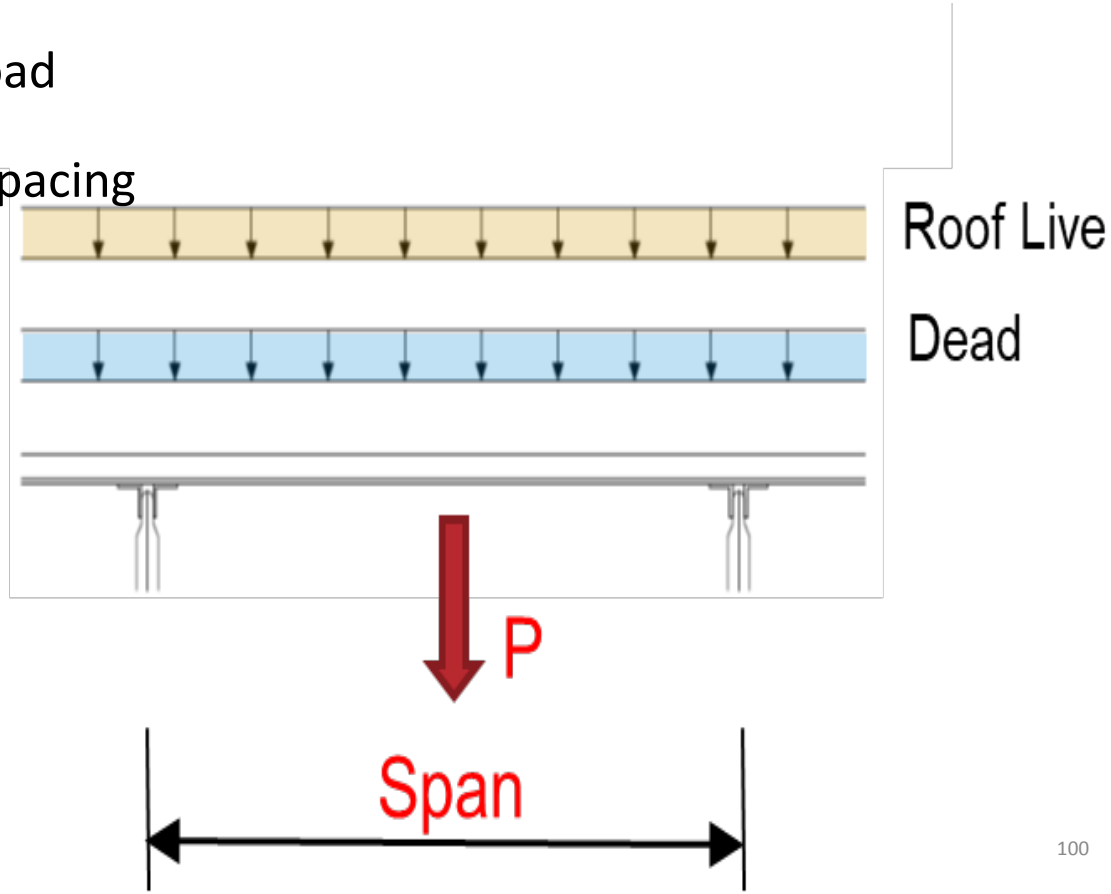
Additional Concrete Filled Deck Options:



Hanging Load Design Considerations

Determination of Allowable Hanging Loads:

- Deck gage and span
- Deck width resisting the load
- Connection capacity and spacing
- Web crippling

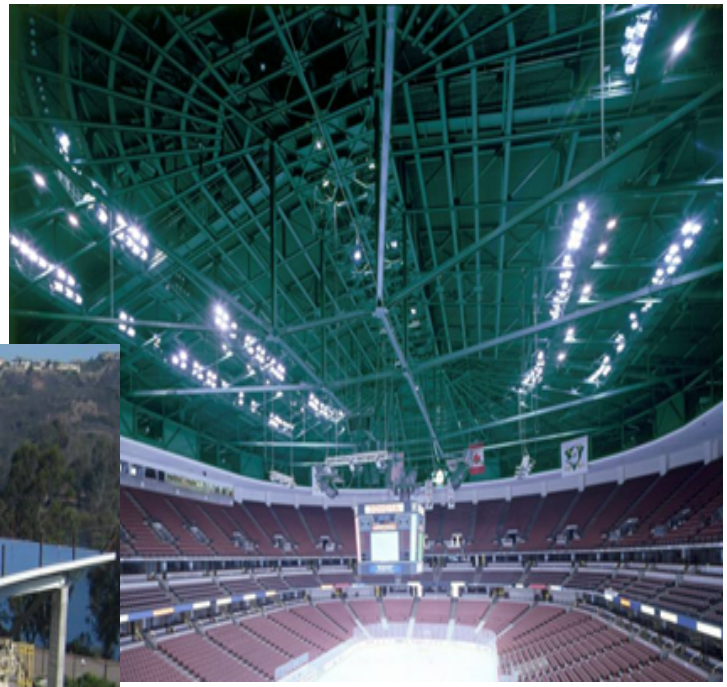


Hanging Loads – Cautionary Tale

Deck Connection Design Resources

- SDI Literature
  - DDM
  - SDCFSFDM
  - RDDM
  - FDDM
  - On-Line Tool (Coming soon)
- Deck and Fastener Manufacturer
  - Catalogs
  - Evaluation Reports (IAPMO, ICC, etc.)
  - On-Line Tools
- AISI Standards
  - S100
  - S310

Simple Deck Connections Simplified



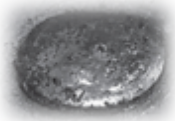
Polling Question #2

Which deck connection types are appropriate for attaching to open web joist?

a) PAF's

b) Screws

c) Welds



d) All of the above

Polling Question Answers

Welded connections to/from steel joists are simplest if:

c) **The weld is lengthened as required, to limit thickness.**

Which deck connection types are appropriate for attaching to open web joist?

d) **All of the above. Based on chord thickness, any one of the these connections could be appropriate, but not all choices work for every situation.**

THANK YOU

Presented by:

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