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ClarkDietrich™
BUILDING SYSTEMS

LIGHT-GAUGE STEEL FRAMING CONNECTION PRODUCTS

SPECIFYING TESTED CONNECTION PRODUCTS THAT LIMIT LIABILITY

CONTINUING EDUCATION AIA

COURSE NUMBER: DIE05F
AN AIA CONTINUING EDUCATION PROGRAM
CREDIT FOR THIS COURSE IS 1 AIA HSW CE HOUR

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AN AMERICAN INSTITUTE OF ARCHITECTS (AIA) CONTINUING EDUCATION PROGRAM

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COURSE DESCRIPTION

This one hour online course will define light-gauge steel framing connection products. We will discuss practical applications of deflection clips, support clips, and the various methods of installation for different types of connectors. This course will conclude with a brief 10 questions quiz for assessment.

LEARNING OBJECTIVES

Upon completion of this course the Design Professional will be able to:

- Explain how deflection clips are used to attach exterior curtain-wall studs to a building structure
- Explain how to provide for vertical building movement independent of the cold-formed steel framing
- Define what types of support clips are used for rigid or positive attachment connections
- Explain the various methods used to install the different types of connectors
- Properly interpret the allowable load tables for clips.

CONNECTION PRODUCT CATEGORIES

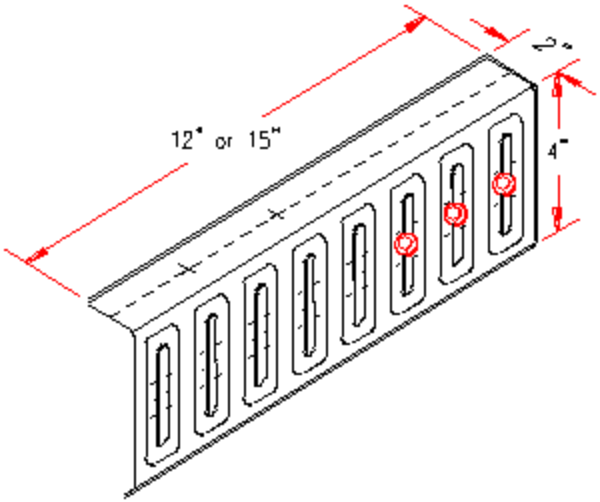
- Deflection Products
- Positive Attachments
- Miscellaneous
- Load Tables

SECTION 1 – DEFLECTION PRODUCTS

EXTENDED REACH STYLE CURTAIN-WALL CONNECTOR
IN-PLANE STYLE HEAD-OF-WALL CLIP
SURFACE MOUNTED DEFLECTION CLIP
OFFSET BY-PASS VERTICAL SLIDE CLIP
SLIDE CLIP

EXTENDED REACH STYLE CURTAIN-WALL CONNECTOR

An extended reach style curtain-wall connector is used to attach a vertical stud to a structural steel spandrel beam (or other support) when there is no provision to attach to the edge of the slab. This system is used to connect by-pass style curtain-wall assemblies as shown below.

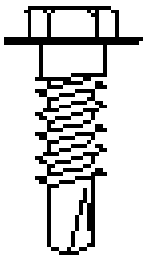


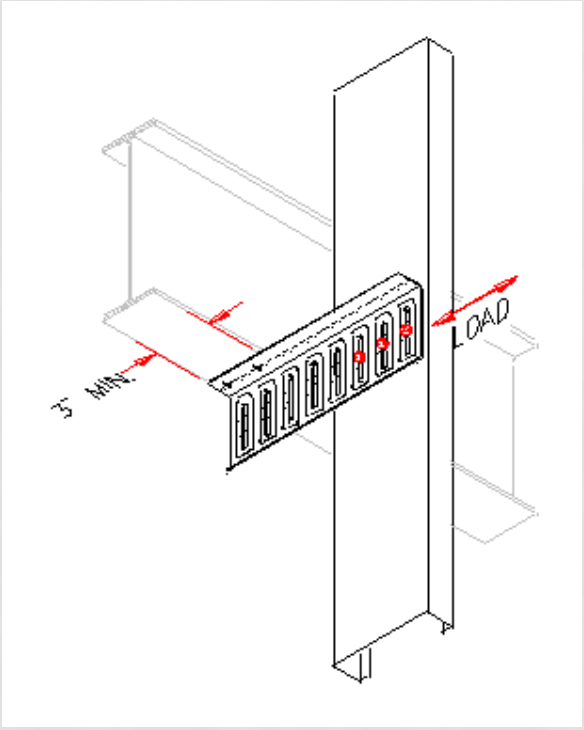
EXTENDED REACH STYLE CURTAIN-WALL CONNECTOR

The stud is outside the plane of the floor. The extended reach style curtain-wall connector can be shot, screwed or welded to the structure.

EXTENDED REACH STYLE CURTAIN-WALL CONNECTOR

The extended reach style curtain wall connector is screw attached to the web of the stud with specially designed screws. These specially designed screws permit vertical movement of the structure without transferring loads onto the studs. Connectors are manufactured with G90 50 KSI Steel.



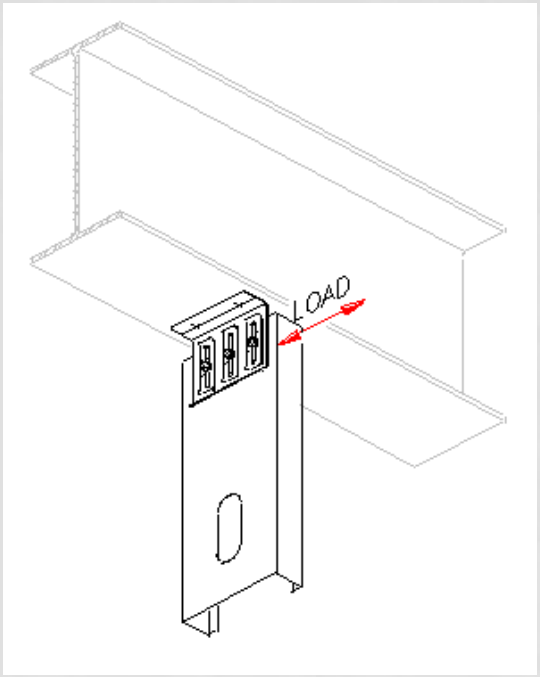


IN-PLANE STYLE HEAD-OF-WALL CLIP

The in-plane head-of-wall clip is designed to be used when studs are installed between structural supports that require vertical movement.

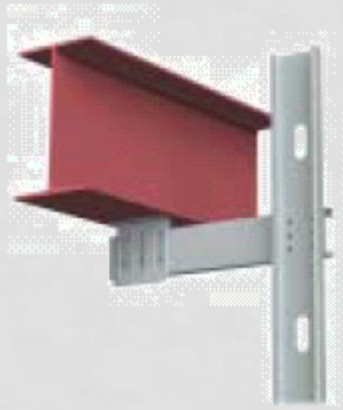
IN-PLANE STYLE HEAD-OF-WALL CLIP

The in-plane style head-of-wall clip is attached to the structure by welding or using PAFs or screws and to the top of the stud web using specially designed screws. It is manufactured with G90 50 KSI steel.

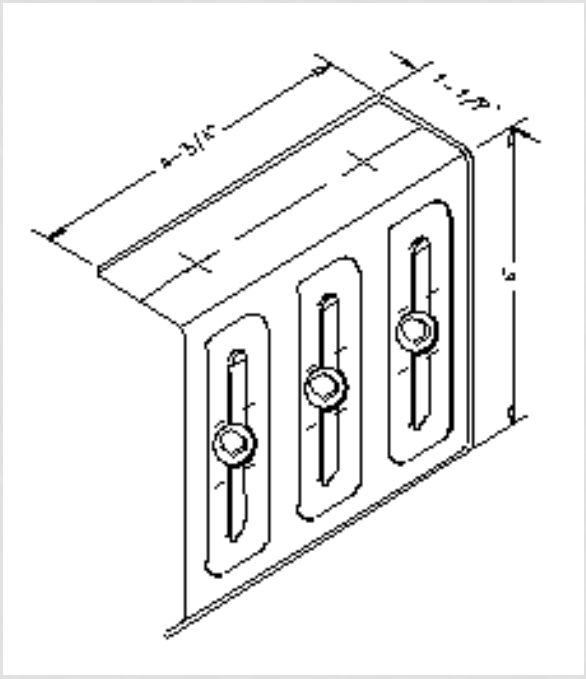


IN-PLANE STYLE HEAD-OF-WALL CLIP

This clip allows vertical movement of the structure without transferring loads onto the studs. It may be used when attaching to either concrete or steel structures. Head-of-Wall style clips can also be used with short c-sections to allow for extended reach by-pass style assemblies as shown.



Slots allow for vertical movement (deflection)

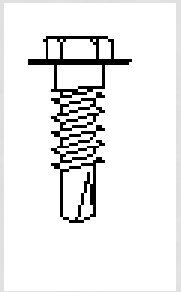


SURFACE MOUNTED DEFLECTION CLIP

The surface mounted deflection clip is used to attach a vertical stud to a structural support at the edge of the slab when the stud is outside the plane of the floor.

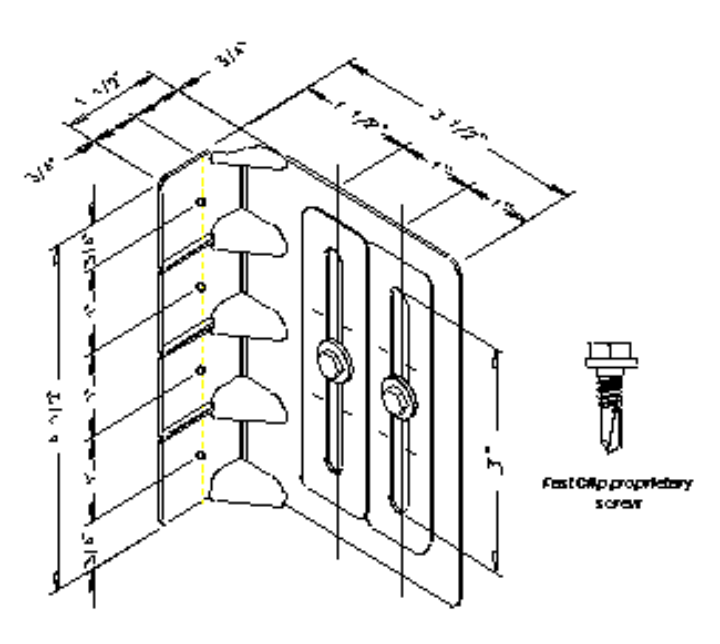
SURFACE MOUNTED DEFLECTION CLIP

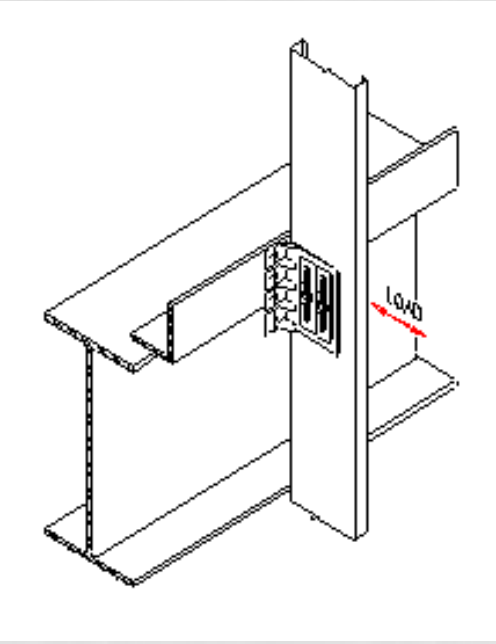
The surface mounted deflection clip can be attached by PAFs, screwed or welded to the structure. The surface mounted deflection clip is screw attached to the web of the stud with specially designed screws furnished with the surface mounted deflection clip.



SURFACE MOUNTED DEFLECTION CLIP

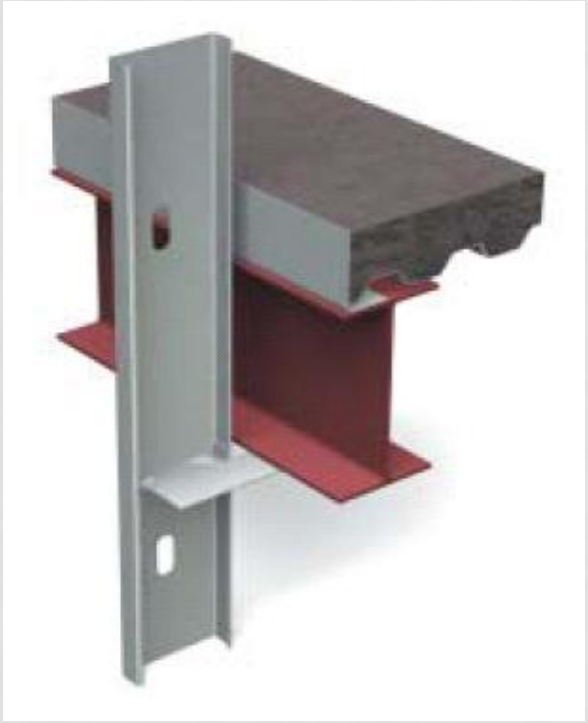
The surface mounted deflection clip allows 1 ½" vertical movement of the structure without transferring loads onto the studs. Deflection Clips are manufactured with G90 50 KSI Steel.





OFFSET BY-PASS VERTICAL SLIDE CLIPS

The offset by-pass vertical slide clip is a standoff for light gauge steel curtain-wall construction. Offset by-pass vertical slide clips are specialty clips that rotate into place and allow for the rapid attachment of studs in a curtain-wall assembly to the primary frame of a building.



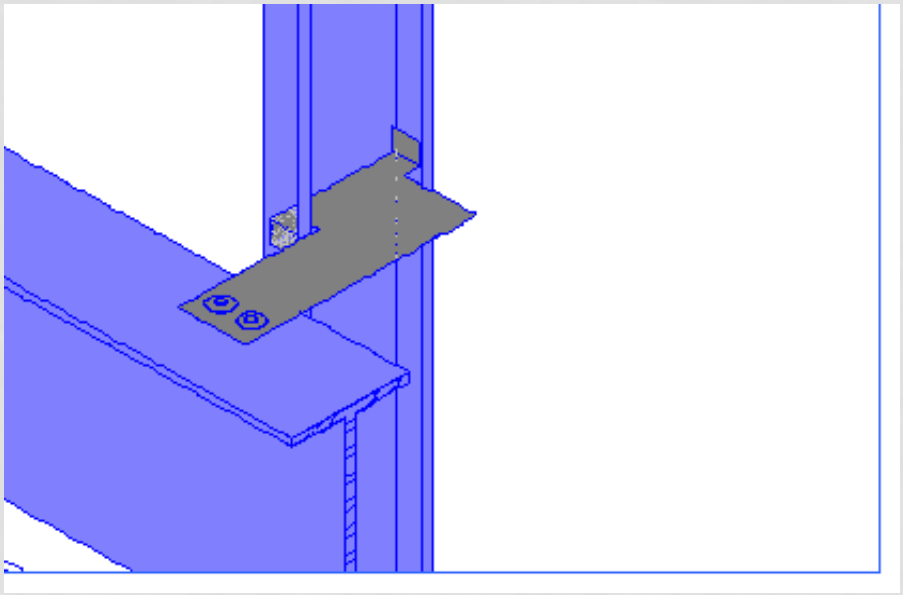
OFFSET BY-PASS VERTICAL SLIDE CLIPS

Offset by-pass vertical slide clips restrict lateral movement but allow for vertical movement of the structure without transferring loads to the curtain-wall framing.

view from below of clips attached to I-beam

OFFSET BY-PASS VERTICAL SLIDE CLIPS

The offset by-pass vertical slide clips are preferred in some applications because they allow the installer up to a 3" adjustment range on the space between the primary frame and the wall studs.



*If more than a 3" stand-off is required refer back to the extended reach style curtain-wall clip.

SLIDE CLIP

Slide clips are used to attach stud members to the primary frame of a building in a curtain-wall application.

SLIDE CLIP

These clips allow for vertical movement of the structure without transferring the load of the building to the curtain-wall assembly.

SLIDE CLIP

Slide clips are manufactured using 50 ksi, corrosion resistant, G90 galvanized steel.

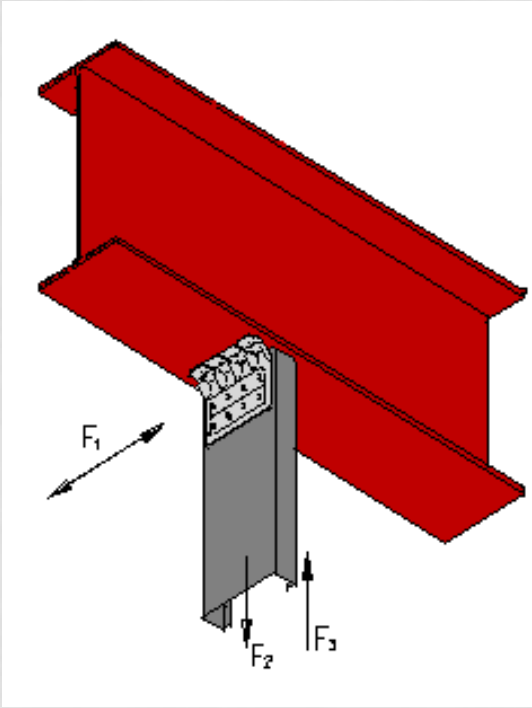
SECTION 2 – POSITIVE ATTACHMENT

FRAMING CLIP
SUPPORT CLIPS
END CLIPS
CLIP ANGLES
JOIST HANGERS

FRAMING CLIP

FRAMING CLIP

The framing clip can be used to affix the stud to a ledger or directly to red iron.



FRAMING CLIP

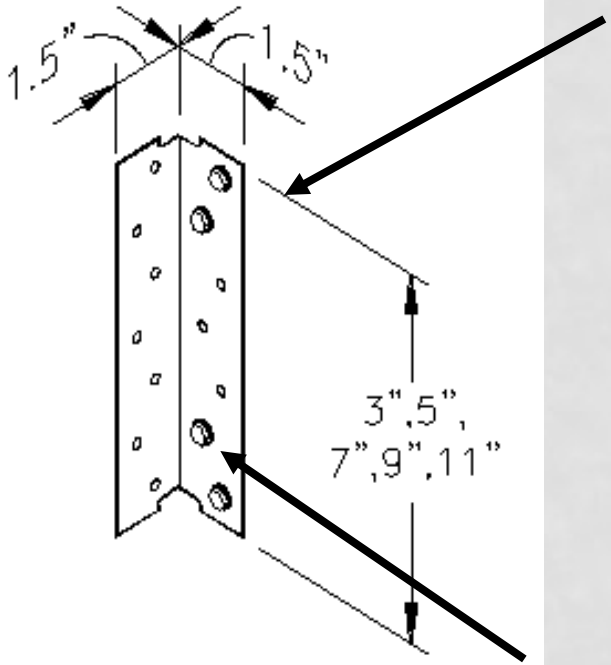
- This clip has an offset leg allowing greater versatility.
- Framing Clips do not allow for deflection.

SUPPORT CLIPS

Support clips are used to secure one framing member to another or to secure framing members to the structural frame.

SUPPORT CLIPS

Support clips are pre-punched to provide for fast, economical screw installation.

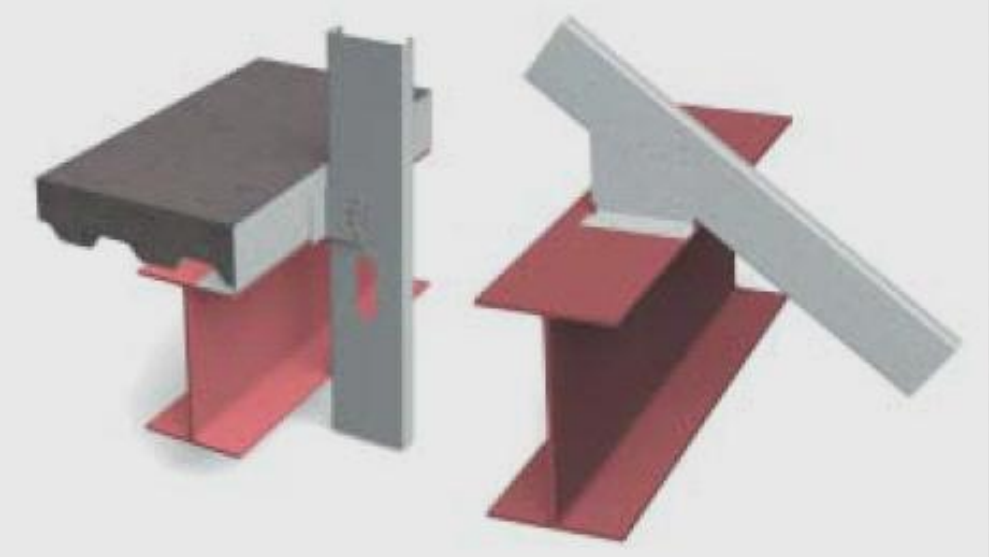


When not filling all holes, install fasteners symmetrically starting at the top and bottom edges, and moving towards the center of the clip as shown.

SUPPORT CLIPS

The E Series support clip is used for rigid stand-off connections. The 4" leg provides extra length to achieve stand-off connections up to 3".

Lengths: 3", 5", 7", 9" and 11"



SUPPORT CLIPS

Commonly used in:

- Solid blocking attachments in joist framing
- To secure rafter framing to the primary structure

SUPPORT CLIPS

The B-Series clip is used to secure u-channel to wall studs in back-to-back applications.

1-1/2" x 1-1/2" leg
Lengths: 3", 5-1/4", 7-1/4" and 9-1/4"

SUPPORT CLIPS

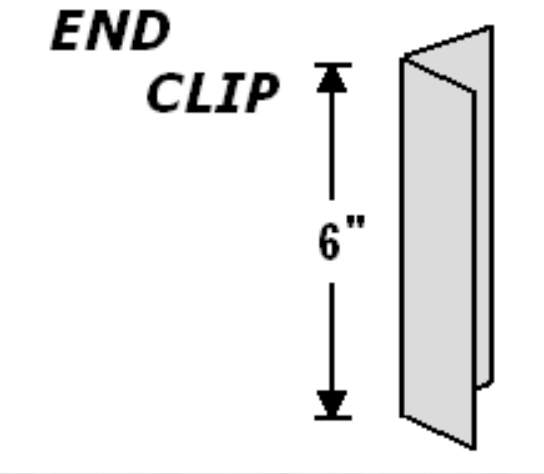
The shorter leg of this clip enables the clip to be installed inside the C-shape.

END CLIP

The A-Series End Clip is designed to attach light gauge steel framing to concrete, I-beams or as a general purpose utility clip.

END CLIP

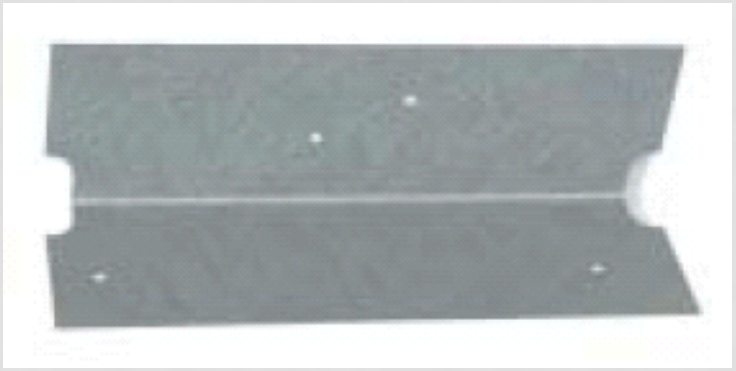
The end clip is “unpunched”, as it is normally welded, attached with powder activated fasteners or attached with a screw pattern specified by the designer.



Sizes and Gauges	*Pcs/Box*
END CLIP (UNPUNCHED) 16 ga. 3" X 3" X 3"	50
END CLIP (UNPUNCHED) 16 ga. 3" X 3" X 6"	50
END CLIP (UNPUNCHED) 14 ga. 3" X 3" X 3"	50
END CLIP (UNPUNCHED) 14 ga. 3" X 3" X 6"	50
END CLIP (UNPUNCHED) 12 ga. 3" X 3" X 3"	50
END CLIP (UNPUNCHED) 12 ga. 3" X 3" X 6"	50

CLIP ANGLES

U-Series Clip Angles are cut-to-length 90° sections of metal angle used to connect studs to U-Channel by welding or using the pre-punched holes that provide fast, economical screw attachment.



CLIP ANGLES

The X-Series Clip Angle is used to secure one framing member to another or to attach and reinforce headers and sills in door and window openings.

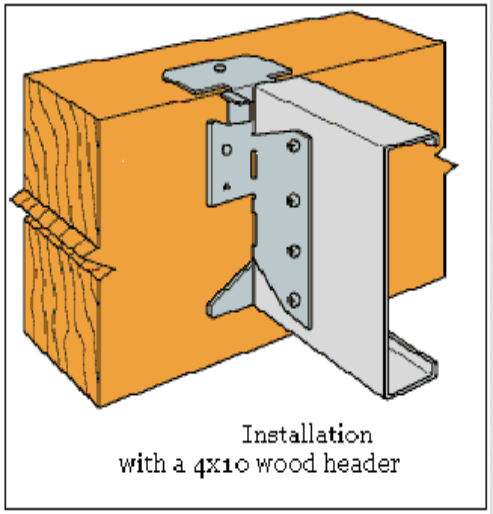
CLIP ANGLES (U AND X SERIES)

CLIP ANGLE PRODUCT LIST			
CODE	SIZES	NAME	PACKAGING
U543	16 ga. 1-1/2" X 1-1/2" X 3-3/8"	CLIP ANGLE (Punched)	400 PIECES PER BOX
U545	16 ga. 1-1/2" X 1-1/2" X 5-3/4"		200 PIECES PER BOX
U547	16 ga. 1-1/2" X 1-1/2" X 7-3/4"		100 PIECES PER BOX
U549	16 ga. 1-1/2" X 1-1/2" X 9-3/4"		100 PIECES PER BOX
U683	14 ga. 1-1/2" X 1-1/2" X 3-3/8"	CLIP ANGLE (Punched)	200 PIECES PER BOX
U685	14 ga. 1-1/2" X 1-1/2" X 5-3/4"		200 PIECES PER BOX
U687	14 ga. 1-1/2" X 1-1/2" X 7-3/4"		100 PIECES PER BOX
U689	14 ga. 1-1/2" X 1-1/2" X 9-3/4"		100 PIECES PER BOX
U973	12 ga. 1-1/2" X 1-1/2" X 3-3/8"	CLIP ANGLE (Punched)	200 PIECES PER BOX
U975	12 ga. 1-1/2" X 1-1/2" X 5-3/4"		200 PIECES PER BOX
U977	12 ga. 1-1/2" X 1-1/2" X 7-3/4"		100 PIECES PER BOX
U979	12 ga. 1-1/2" X 1-1/2" X 9-3/4"		100 PIECES PER BOX
X543	16 ga. 2" X 2" X 3-3/8"	CLIP ANGLE (Punched)	200 PIECES PER BOX
X545	16 ga. 2" X 2" X 5-3/4		200 PIECES PER BOX
X547	16 ga. 2" X 2" X 7-3/4"		100 PIECES PER BOX
X549	16 ga. 2" X 2" X 9-3/4"		100 PIECES PER BOX
X683	14 ga. 2" X 2" X 3-3/8"	CLIP ANGLE (Punched)	200 PIECES PER BOX
X685	14 ga. 2" X 2" X 5-3/4		100 PIECES PER BOX
X687	14 ga. 2" X 2" X 7-3/4"		100 PIECES PER BOX
X689	14 ga. 2" X 2" X 9-3/4"		100 PIECES PER BOX
X973	12 ga. 2" X 2" X 3-3/8"	CLIP ANGLE (Punched)	100 PIECES PER BOX
X975	12 ga. 2" X 2" X 5-3/4		100 PIECES PER BOX
X977	12 ga. 2" X 2" X 7-3/4"		100 PIECES PER BOX

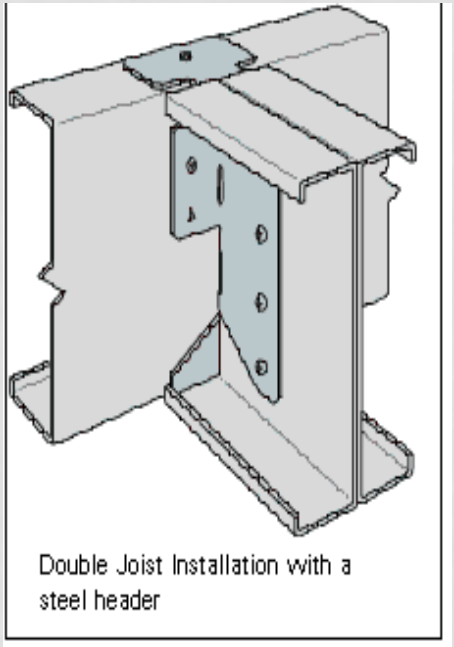
JOIST HANGER

This joist hanger is typically used to hang joists from:

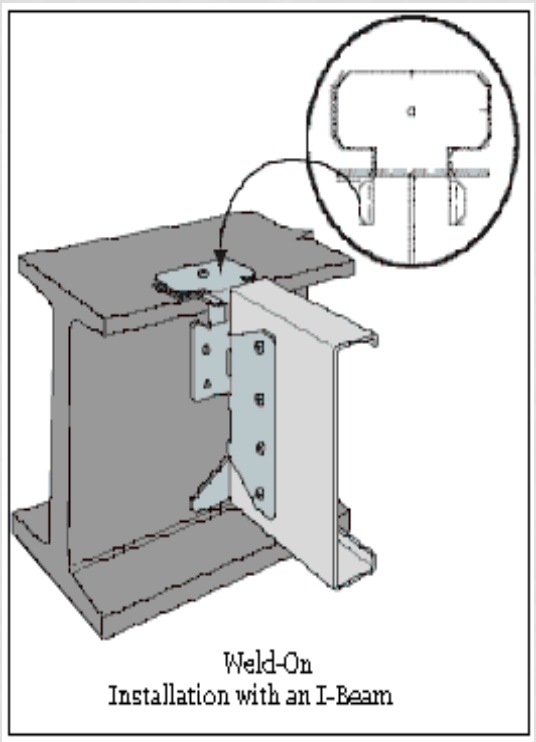
- Light-gauge steel
- Structural steel I-beams
- Glue-lams
- Wood members



Installation
with a 4x10 wood header



Double Joist Installation with a
steel header



Weld-On
Installation with an I-Beam

JOIST HANGER

- This hanger can be used with a wide variety of joist depths, widths, and gauges.
- This eliminates the need to specify different hangers for each unique joist size on a job.

JOIST HANGER

Another type of joist hanger is the bridle hanger. It is commonly used to attach light gauge C-joists to structural steel beams. Though this hanger must match the C-framing member dimensionally, it can carry a heavier load.

Bridle Hanger

JOIST HANGER

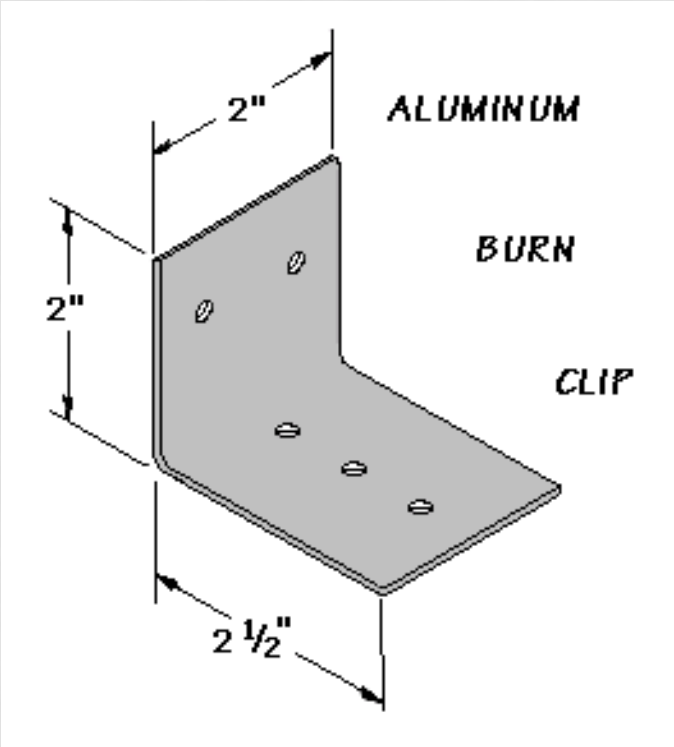
- Easily attached with welds
- Used with 2" flange floor joists
- Stock sizes for 8", 10", 12" and 14" deep joists
- Available in single-wide and double-wide

SECTION 3 - MISCELLANEOUS

ALUMINUM BURN CLIPS
METAL FURRING CHANNEL CLIPS
WEB STIFFENERS

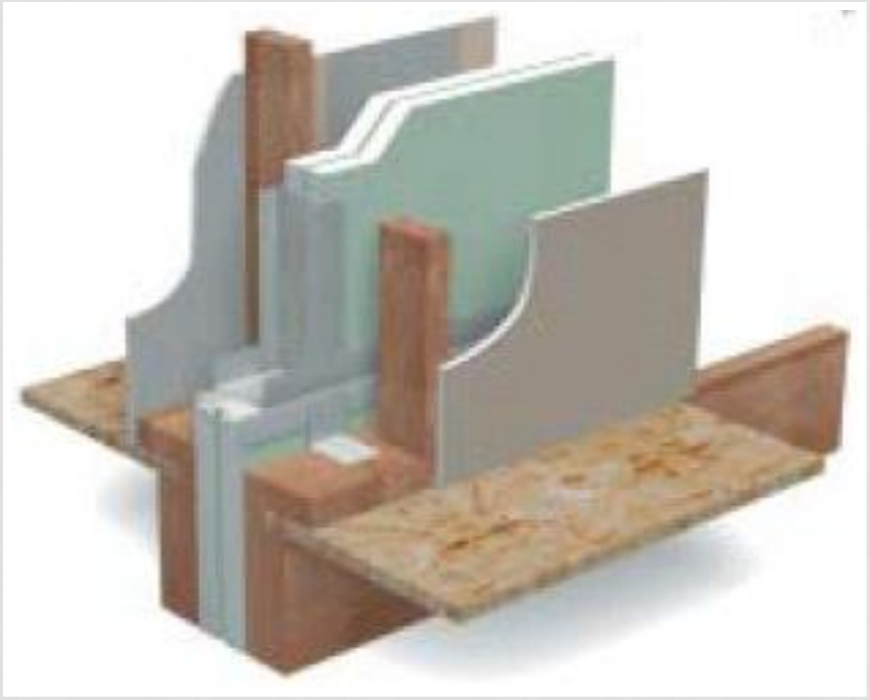
ALUMINUM BURN CLIPS

- The burn clip is a 2" wide angle clip made of aluminum.
- The clip is designed to melt and break away during a fire thus allowing the wall system to "drop" back onto the fire area.



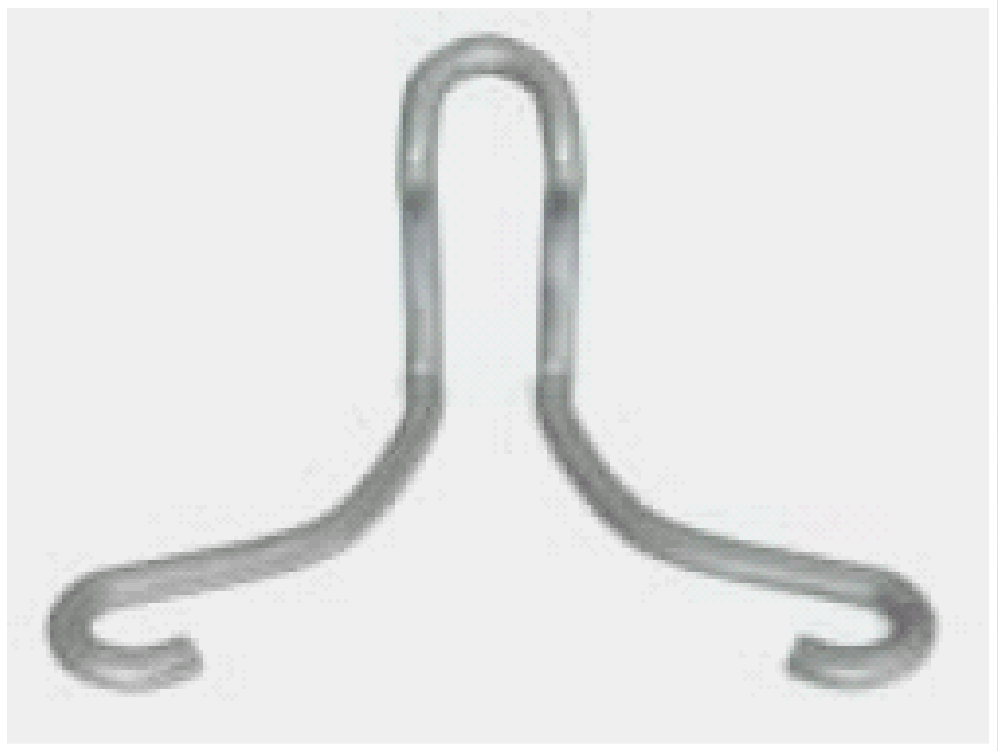
ALUMINUM BURN CLIPS

- It is a component in the H-Stud Area Separation Wall system designed to be a fire barrier.
- The clip is used to attach the area separation wall to the intermediate floor and roof framing.

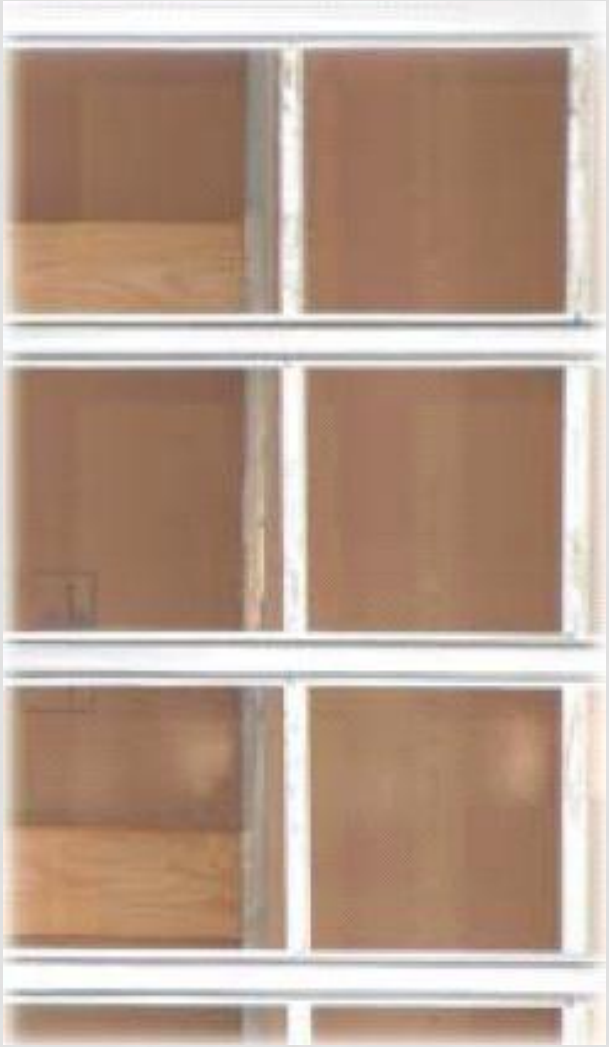


METAL FURRING CHANNEL CLIPS

Metal Furring Channel Clips are manufactured from galvanized wire.



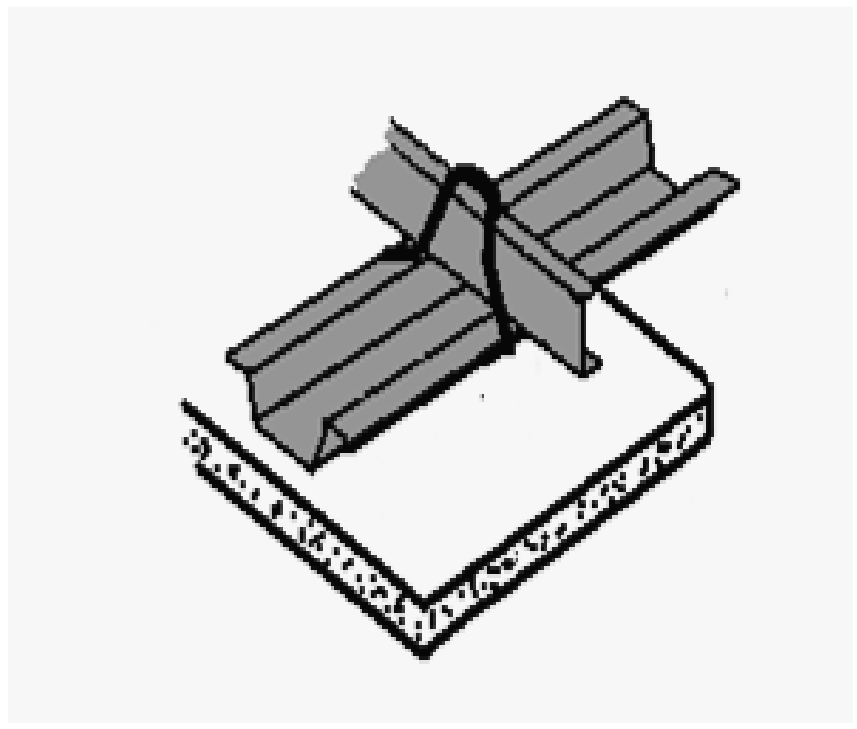
METAL FURRING CHANNEL CLIPS



- They are used to attach furring channel to a ceiling grid system constructed of 1-1/2" U-channel.
- The clips must be installed on alternating sides of the 1-1/2" channels.

METAL FURRING CHANNEL CLIPS

The system is designed to be used with a single layer of gypsum board.



WEB STIFFENER

Web stiffeners are used to provide reinforcement of joist webs to prevent crippling. Web stiffeners allow designers to specify lighter joists while still accommodating point loads.

WEB STIFFENER

Both the one piece

And the two piece

Are designed to prevent compression at bearing points on a floor joist.

WEB STIFFENER

- The one piece is affixed to the back or hard side of the joist.

- The two piece is designed to "twist" into the web of the joist.

SECTION 4 - LOAD TABLES

ALL LOAD TABLES ARE NOT CREATED EQUALLY:

LOAD TABLES

It is extremely important that the allowable load tables for clips are interpreted properly. The allowable load for a clip assembly is governed not only by the capacity of the clip but also by the method of attachment to the structure. Some manufacturers' clip tables display allowable loads for the clip, while ignoring the attachment method. Unfortunately, when attaching a clip to the structure with pins, screws or concrete anchors, the overall capacity will often be lower than the published value. Load tables that ignore the attachment to the structure essentially imply that the clip must be welded to achieve the stated values. This can add a great deal to the installed cost of the assembly.

LOAD TABLES

- In order to provide more useable information for designers and contractors, the following load tables recognize different attachment methods.
- For example, the tabulated values provided for the surface mounted deflection clip include data for screws as well as pins.

Surface Mounted Deflection Clip Allowable Loads (lbs.)

Anchor Type	Stud Thickness and Yield Strength	No. Anchors to Structure	Allowable Load (lb.)
Self-Drilling Screws to 3/16" Steel	20 ga. (33 mil) 33 ksi	2	587
		3	587
		4	587
	18 ga. (43 mil) 33 ksi and Greater	2	992
		3	992
		4	992
Powder-Actuated Fasteners to 3/16" Steel	20 ga. (33 mil) 33 ksi	2	511
		3	587
		4	587
	18 ga. (43 mil) 33 ksi and Greater	2	511
		3	767
		4	992

LOAD TABLES

Another example is the S-Series punched clip. The allowable tension assumes that the mechanical fasteners to the structure are positioned at the centerline of the clip leg.

S-Series Clip - Allowable Capcities (lbs.) Using #10-16 Self-Drilling Screws

Clip	No. of Screws to Steel Framing(1)	Stud Thickness and Yield Strength									
		20 ga. (33 mil)			18 ga. (43 mil)			16 ga. (54mil)			
		33 ksi			33 ksi			33 ksi			
		F1	F2	F3	F1	F2	F3	F1	F2	F3	F1
S543	3	233	140	421	346	140	624	488	140	879	689
	2	251	247	280	372	247	416	524	247	586	740
S545	5	515	247	701	765	247	1040	1078	247	1466	1521
	4	517	354	561	767	354	832	1081	354	1172	1526
S547	7	815	354	981	1209	354	1456	1704	354	2052	2405
	4	538	461	561	798	461	832	1124	461	1172	1587
S549	9	1115	461	1262	1655	461	1872	2333	461	2638	3293
	6	803	568	841	1192	568	1248	1680	568	1759	2372
S541	11	1414	568	1542	2097	568	2288	2956	568	3224	4173
S683	3	233	222	421	346	222	624	488	222	879	689
	2	251	280	280	372	391	416	524	391	586	740
S685	5	515	391	701	765	391	1040	1078	391	1466	1521
	4	517	561	561	767	561	832	1081	561	1172	1526
S687	7	815	561	981	1209	561	1456	1704	561	2052	2405
	4	538	561	561	798	730	832	1124	730	1172	1587
S689	9	1115	730	1262	1655	730	1872	2333	730	2638	3293
	6	803	841	841	1192	899	1248	1680	899	1759	2372
S681	11	1414	899	1542	2097	899	2288	2956	899	3224	4173
S973	3	233	421	421	346	452	624	488	452	879	689
	2	251	280	280	372	416	416	524	586	586	740
S975	5	515	701	701	765	797	1040	1078	797	1466	1521
	4	517	561	561	767	832	832	1081	1142	1172	1526
S977	7	815	981	981	1209	1142	1456	1704	1142	2052	2405
	4	538	561	561	798	832	832	1124	1172	1172	1587

This enhanced table gives designers the necessary information to provide flexible contractor-friendly designs and still have confidence that all load requirements have been satisfied.

EXTENDED REACH CURTAIN-WALL CONNECTOR LOAD TABLES

12" and 15" - Allowable Loads (lbs.)

Stud Thickness and Yield Strength	Slip Allowance (in.)	Welded	Mechanically Anchored				
			Number of Anchors	PAF in Steel (FS=5)	PAF in Steel (FS=10)	#12-14 Screws	PAF 1/4" x 1-3/4" Specialty
20 ga. (33 mil) 33 ksi	0.75	1000 (133	2	473 (473)	236 (236)	660 (660)	211 (211)
		1000 (133	3	527 (527)	264 (264)	755 (755)	—
	1.25	1000 (133	2	408 (408)	204 (204)	588 (588)	179 (179)
		1000 (133	3	443 (443)	222 (222)	655 (655)	—
18 ga. (43 mil) 33 ksi	0.75	1000 (133	2	473 (473)	236 (236)	660 (660)	211 (211)
		1000 (133	3	527 (527)	264 (264)	755 (755)	—
	1.25	1000 (133	2	408 (408)	204 (204)	588 (588)	179 (179)
		1000 (133	3	443 (443)	222 (222)	655 (655)	—
16 ga. (54 mil) 33 ksi	0.75	1612 (214	2	473 (473)	236 (236)	660 (660)	211 (211)
		1612 (214	3	527 (527)	264 (264)	755 (755)	—
	1.25	1612 (214	2	408 (408)	204 (204)	588 (588)	179 (179)
		1612 (214	3	443 (443)	222 (222)	655 (655)	—
16 ga. (54 mil) 50 ksi	0.75	1705 (226	2	473 (473)	236 (236)	660 (660)	211 (211)
		1705 (226	3	527 (527)	264 (264)	755 (755)	—
	1.25	1705 (226	2	408 (408)	204 (204)	588 (588)	179 (179)
		1705 (226	3	443 (443)	222 (222)	655 (655)	—
14 ga. (68 mil) 33 ksi	0.75	1792 (238	2	473 (473)	236 (236)	660 (660)	211 (211)
		1792 (238	3	527 (527)	264 (264)	755 (755)	—
	1.25	1792 (238	2	408 (408)	204 (204)	588 (588)	179 (179)
		1792 (238	3	443 (443)	222 (222)	655 (655)	—
14 ga. (68 mil) 50 ksi	0.75	1978 (263	2	473 (473)	236 (236)	660 (660)	211 (211)
		1978 (263	3	527 (527)	264 (264)	755 (755)	—
	1.25	1978 (263	2	408 (408)	204 (204)	588 (588)	179 (179)
		1978 (263	3	443 (443)	222 (222)	655 (655)	—
12 ga. (97 mil) 33 ksi	0.75	2481 (287	2	473 (473)	236 (236)	660 (660)	211 (211)
		2481 (287	3	527 (527)	264 (264)	755 (755)	—
	1.25	2481 (287	2	408 (408)	204 (204)	588 (588)	179 (179)
		2481 (287	3	443 (443)	222 (222)	655 (655)	—
12 ga. (97 mil) 50 ksi	0.75	2874 (287	2	473 (473)	236 (236)	660 (660)	211 (211)
		2874 (287	3	527 (527)	264 (264)	755 (755)	—
	1.25	2874 (287	2	408 (408)	204 (204)	588 (588)	179 (179)

Table Notes

1. Values given in parentheses indicate allowable loads when using a 1/3 stress increase.
2. The tabulated values for welds are based on the following weld lengths: use 4" of weld along each edge of the 1.5" E.R.S.CW.C leg for 20, and 18 gage, use 5.5" along each edge for 16 and 14 gage, use 6.5" along each edge for 12 gage. Use E60XX (min.) electrodes.
3. Tabulated values for proprietary PAFs and proprietary screws are based on the following: fasteners are spaced at 2" o/c (min.) when using 2 anchors, and 1" o/c (min.) when using 3 anchors, anchors are placed 1/2" (min.) away from the edge of the building structure, and 1/2" (min.) away from end of the curtain-wall connector.
4. Tabulated values for the specialty PAFs are based on the following: anchors are spaced at 1.75" o/c (min.), anchors are placed 3/4" (min.) away from edge of building structure and 1/2" (min.) away from end of curtain-wall connector. The tabulated values are based on 3000 psi concrete.
5. For 3/4" deflection, center the proprietary screws along the top most hash mark. For 1.25" deflection, center the screws along the center hash-mark.
6. The values given for PAFs are based on powder actuated fasteners with 15 mm washers.
7. It is the responsibility of the design professional to detail the project drawings for proper clip attachment.

IN PLANE STYLE HEAD-OF WALL SLIDE CLIP LOAD TABLE

5" Clip - Allowable Loads (lbs.)

Stud Thickness and Yield Strength	Slip Allowance (in.)		Mechanically Fastened				
		Welded	Number of Anchors	PAF in Steel (FS=5)	PAF in Steel (FS=10)	#12-14 Screws	1/4" x 1-3/4" Speciality
20 ga. (33 mil) 33 ksi	0.75	386 (513)	2	386 (513)	317 (317)	386 (513)	386 (477)
		386 (513)	3	386 (513)	386 (389)	386 (513)	386 (473)
		386 (513)	4	386 (513)	386 (440)	386 (513)	---
	1.25	386 (513)	2	386 (513)	286 (286)	386 (513)	386 (417)
		386 (513)	3	386 (513)	338 (338)	386 (513)	386 (404)
		386 (513)	4	386 (513)	371 (371)	386 (513)	---
18 ga. (43 mil) 33 ksi	0.75	505 (672)	2	505 (634)	317 (317)	505 (672)	477 (477)
		505 (672)	3	505 (672)	389 (389)	505 (672)	473 (473)
		505 (672)	4	505 (672)	440 (440)	505 (672)	---
	1.25	505 (672)	2	505 (571)	286 (286)	505 (672)	417 (417)
		505 (672)	3	505 (672)	338 (338)	505 (672)	404 (404)
		505 (672)	4	505 (672)	371 (371)	505 (672)	---
16 ga. (54 mil) 33 ksi	0.75	638 (849)	2	634 (634)	317 (317)	638 (849)	477 (477)
		638 (849)	3	638 (779)	389 (389)	638 (849)	473 (473)
		638 (849)	4	638 (849)	440 (440)	638 (849)	---
	1.25	638 (849)	2	571 (571)	286 (286)	638 (791)	417 (417)
		638 (849)	3	638 (676)	338 (338)	638 (849)	404 (404)
		638 (849)	4	638 (742)	371 (371)	638 (849)	---
16 ga. (54 mil) 50 ksi and Greater	0.75	1061 (1213	2	634 (634)	317 (317)	853 (853)	477 (477)
		1061 (1213	3	779 (779)	389 (389)	1061 (1082	473 (473)
		1061 (1213	4	879 (879)	440 (440)	1061 (1213	---
	1.25	1061 (1213	2	571 (571)	286 (286)	791 (791)	417 (417)
		1061 (1213	3	676 (676)	338 (338)	969 (969)	404 (404)
		1061 (1213	4	742 (742)	371 (371)	1061 (1092	---

Table Notes

1. Values given in parentheses indicate allowable loads when using a 1/3 stress increase.
2. Tabulated values for welds are based on 4.5" of weld along each edge of the 1.5" clip leg.
3. Tabulated values for the proprietary PAFs and proprietary screws are based on the following: the outermost anchors are placed 1/2"(min.) away from the clip edge and/or bearing edge, anchors are spaced at 3-3/4" (min) when using two anchors, 1-7/8" (min) when using three anchors, and 1-1/4" when using 4 anchors.
4. Tabulated values for the specialty PAFs are based on the following: anchors are spaced at 3-3/4" (min.) when using 2 anchors, and 1-7/8" when using 3 anchors, anchors are placed 3/4" (min.) away from edge of building structure and 1/2" (min.) away from end of HOW. The tabulated values are based on 3000 psi concrete.
5. The values given for PAFs are based on 0.145" diameter. powder actuated fasteners with 15 mm washers.
6. It is the responsibility of the design professional to detail the project drawings for proper clip attachment.

SURFACE MOUNTED DEFLECTION CLIP LOAD TABLES

Deflection Clip Allowable Loads (lbs.)

Anchor Type	Stud Thickness and Yield Strength	No. Anchors to Structure	Allowable Load (lb.)
Self-Drilling Screws to 3/16" Steel	20 ga. (33 mil) 33 ksi	2	587
		3	587
		4	587
	18 ga. (43 mil) 33 ksi and Greater	2	992
		3	992
		4	992
Powder-Actuated Fasteners to 3/16" Steel	20 ga. (33 mil) 33 ksi	2	511
		3	587
		4	587
	18 ga. (43 mil) 33 ksi and Greater	2	511
		3	767
		4	992

Table Notes:

1. The 1/3 stress increase for wind shall not be used.
2. When using 2 anchors, use the outer-most marks on the short leg of the clips for anchor placement.
3. Attach building anchors to the structure according to the manufactures instructions. Anchors shall be installed through the embossments on the scored line of the 1.5" leg of the clip.
4. It is the responsibility of the design professional to detail the project drawings for proper clip installation.

OFFSET BY-PASS VERTICAL SLIDE CLIP LOAD TABLE

Clip Type	Product Size	Product Gauge	Pcs/Box
3"	3-5/8" x 8-5/8"	10	50
4"	4" x 9"	10	50
6"	6" x 11"	10	40
8"	8" x 1'-1"	10	40

ALLOWABLE LATERAL LOAD CLIP CAPACITY - 3" STANDOFF

Clip Type	Stud Size		Clip Gauge	Lateral Capacity - lbs.
3"	3-5/8"		10	950
4"	4"		10	950
6"	6"		10	1230
8"	8"		10	1225

VERTICAL SLIDE CLIP-STUD GAUGE INTERACTION CAPACITY

Stud Gauge		Allowable Load - lbs.
20		370
18		740
16		950
14		1230
12		1230

Note: Allowable loads based on ultimate load test values conducted in accordance with AISI specification. Design loads are 1/2 ultimate capacity increased by 1/3 for wind

Note: Clips in last assemblies were bolted conjunctions with two 1/4" diameter A325 bolts.

Note: Loads based on 33ksi steel for 18 and 20 ga. studs. 50 ksi for 16, 14, and 12 ga. studs.

FRAMING CLIP LOAD TABLES

Anchor Type	Stud Thickness and Yield Strength	No. Anchors to Structure	Number/Configuration of Screws to Stud Framing											
			8 Screws			4 Screws (Option A)			4 Screws (Option B)			4 Screws (Option C)		
			F1	F2	F3	F1	F2	F3	F1	F2	F3	F1	F2	F3
#12-14 Self-Drilling Screws to 3/16" Steel	20 ga. (33 mil) 33 ksi	2	529	1121	1121	192	561	561	177	561	561	272	561	561
		3	529	1121	1121	192	561	561	177	561	561	272	561	561
		4	529	1121	1121	192	561	561	177	561	561	272	561	561
	18 ga. (43 mil) 33 ksi	2	784	1227	1664	285	832	832	263	832	832	404	832	832
		3	784	1664	1664	285	832	832	263	832	832	404	832	832
		4	784	1664	1664	285	832	832	263	832	832	404	832	832
	16 ga. (54 mil) 33 ksi	2	1105	1227	1889	402	920	1172	371	1172	1172	569	1172	1172
		3	1105	1841	1889	402	1172	1172	371	1172	1172	569	1172	1172
		4	1105	2345	1889	402	1172	1172	371	1172	1172	569	1172	1172
	16 ga. (54 mil) 50 ksi and Greater	2	1370	1227	1889	568	920	1417	523	1227	1209	804	1227	1655
		3	1560	1841	1889	568	1380	1417	523	1655	1209	804	1655	1655
		4	1560	2454	1889	568	1655	1417	523	1655	1209	804	1655	1655
0.145" Powder-Actuated Fasteners to 3/16" Steel	20 ga. (33 mil) 33 ksi	2	529	511	1121	192	383	561	177	511	561	272	511	561
		3	529	767	1121	192	561	561	177	561	561	272	561	561
		4	529	1022	1121	192	561	561	177	561	561	272	561	561
	18 ga. (43 mil) 33 ksi	2	784	511	1664	285	383	832	263	511	832	404	511	832
		3	784	767	1664	285	575	832	263	767	832	404	767	832
		4	784	1022	1664	285	767	832	263	832	832	404	832	832
	16 ga. (54 mil) 33 ksi	2	1105	511	1889	402	383	1172	371	511	1172	569	511	1172
		3	1105	767	1889	402	575	1172	371	767	1172	569	767	1172
		4	1105	1022	1889	402	767	1172	371	1022	1172	569	1022	1172
	16 ga. (54 mil) 50 ksi And Greater	2	1117	511	1889	568	383	1417	523	511	1209	804	511	1655
		3	1560	767	1889	568	575	1417	523	767	1209	804	767	1655
		4	1560	1022	1889	568	767	1417	523	1022	1209	804	1022	1655

SUPPORT CLIP (S SERIES) LOAD TABLE

S-Series Clip - Allowable Capcities (lbs.) Using #10-16 Self-Drilling Screws

Clip	No. of Screws to Steel Framing(1)	Stud Thickness and Yield Strength									
		20 ga. (33 mil) 33 ksi			18 ga. (43 mil) 33 ksi			16 ga. (54mil) 33 ksi			
		F1	F2	F3	F1	F2	F3	F1	F2	F3	F1
S543	3	233	140	421	346	140	624	488	140	879	689
S545	2	251	247	280	372	247	416	524	247	586	740
	5	515	247	701	765	247	1040	1078	247	1466	1521
S547	4	517	354	561	767	354	832	1081	354	1172	1526
	7	815	354	981	1209	354	1456	1704	354	2052	2405
S549	4	538	461	561	798	461	832	1124	461	1172	1587
	9	1115	461	1262	1655	461	1872	2333	461	2638	3293
S541	6	803	568	841	1192	568	1248	1680	568	1759	2372
	11	1414	568	1542	2097	568	2288	2956	568	3224	4173
S683	3	233	222	421	346	222	624	488	222	879	689
S685	2	251	280	280	372	391	416	524	391	586	740
	5	515	391	701	765	391	1040	1078	391	1466	1521
S687	4	517	561	561	767	561	832	1081	561	1172	1526
	7	815	561	981	1209	561	1456	1704	561	2052	2405
S689	4	538	561	561	798	730	832	1124	730	1172	1587
	9	1115	730	1262	1655	730	1872	2333	730	2638	3293
S681	6	803	841	841	1192	899	1248	1680	899	1759	2372
	11	1414	899	1542	2097	899	2288	2956	899	3224	4173
S973	3	233	421	421	346	452	624	488	452	879	689
S975	2	251	280	280	372	416	416	524	586	586	740
	5	515	701	701	765	797	1040	1078	797	1466	1521
S977	4	517	561	561	767	832	832	1081	1142	1172	1526
	7	815	981	981	1209	1142	1456	1704	1142	2052	2405
	4	538	561	561	798	832	832	1124	1172	1172	1587

SUPPORT CLIP (E SERIES) LOAD TABLE

Allowable E-Series Clip Capcities (lb.) Using #10-16 Self-Drilling Screws

Clip	No. of Screws to Steel Framing(1)	Stud Thickness and Yield Strength											
		20 ga. (33 mil)			18 ga. (43 mil)			16 ga. (54mil)					
		33 ksi			33 ksi			33 ksi			50 ksi		
		F1	F2	F3	F1	F2	F3	F1	F2	F3	F1	F2	F3
E543	3	80	140	421	118	140	507	167	140	507	236	140	507
	2	139	247	280	206	247	416	291	247	586	411	247	811
E545	5	199	247	701	295	247	912	415	247	912	586	247	912
	4	301	354	561	447	354	832	629	354	1172	888	354	1347
E547	7	361	354	981	535	354	1318	754	354	1318	1064	354	1318
	4	378	461	561	560	461	832	790	461	1172	1115	461	1655
E549	9	559	461	1262	830	461	1724	1170	461	1724	1651	461	1724
	6	576	568	841	855	568	1248	1205	568	1759	1701	568	2053
E541	11	788	568	1542	1169	568	2130	1647	568	2130	2326	568	2130
E683	3	80	222	421	118	222	624	167	222	879	236	222	1011
	2	139	280	280	206	391	416	291	391	586	411	391	828
E685	5	199	391	701	295	391	1040	415	391	1466	586	391	1817
	4	301	561	561	447	561	832	629	561	1172	888	561	1655
E687	7	361	561	981	535	561	1456	754	561	2052	1064	561	2625
	4	378	561	561	560	730	832	790	730	1172	1115	730	1655
E689	9	559	730	1262	830	730	1872	1170	730	2638	1651	730	3434
	6	576	841	841	855	899	1248	1205	899	1759	1701	899	2483
E681	11	788	899	1542	1169	899	2288	1647	899	3224	2326	899	4244
E973	3	80	421	421	118	452	624	167	452	879	236	452	1241
	2	139	280	280	206	416	416	291	586	586	411	797	828
E975	5	199	701	701	295	797	1040	415	797	1466	586	797	2069
	4	301	561	561	447	832	832	629	1142	1172	888	1142	1655
E977	7	361	981	981	535	1142	1456	754	1142	2052	1064	1142	2896
	4	378	561	561	560	832	832	790	1172	1172	1115	1486	1655
E979	9	559	1262	1262	830	1486	1872	1170	1486	2638	1651	1486	3724
	6	576	841	841	855	1248	1248	1205	1759	1759	1701	1831	2483
E971	11	788	1542	1542	1169	1831	2288	1647	1831	3224	2326	1831	4551

LOAD TABLES

- The bottom line?
- When comparing load capacities, read the fine print. Make sure that the connection product you specify can be installed using your fastener of choice.
- Don’t get stuck welding a product that you didn’t intend to weld.

COURSE SUMMARY

The Design Professional will now be able to:

- Explain how deflection clips are used to attach exterior curtain-wall studs to a building structure
- Explain how to provide for vertical building movement independent of the cold-formed steel framing
- Define what types of support clips are used for rigid or positive attachment connections
- Explain the various methods used to install the different types of connectors
- Properly interpret the allowable load tables for clips

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