ICC-ES Evaluation Report

ESR-4294

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This report also contains:

- City of LA Supplement
- FL Supplement w/ HVHZ

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DIVISION: 05 00 00 — METALS **Section: 05 05 23 — Metal Fastenings** **Section: 05 40 00 — Cold-Formed Metal Framing**	**REPORT HOLDER:** **SIMPSON STRONG-TIE COMPANY INC.**	**EVALUATION SUBJECT:** **CURTAIN WALL BYPASS CLIPS AND CONNECTORS FOR COLD-FORMED STEEL CONSTRUCTION**	

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2024, 2021 and 2018 *International Building Code®* (IBC)
- 2024, 2021 and 2018 *International Residential Code®* (IRC)

Property evaluated:

Structural

2.0 USES

The Simpson Strong-Tie bypass clip connectors described in this report are used in structures with bypass framed exterior curtain walls to attach the steel framing members of the curtain wall to the supporting members of the building structure, resisting loads applied to the curtain wall. The slide-clip versions of the bypass clips are designed to transfer loads while accommodating movement between the exterior curtain wall elements and the structure supporting the curtain wall.

The additional Simpson Strong-tie connectors described in this report are used as connectors for cold-formed steel structural framing members.

3.0 DESCRIPTION

3.1 General:

3.1.1 SCB and MSCB Series Bypass Framing Slide-Clip Connectors: The SCB and MSCB connectors are slide-clip connectors used to connect cold-formed steel curtain wall bypass framing members to the supporting structure with provisions to accommodate vertical relative movement between the curtain wall and the supporting structure. The SCB and MSCB connectors are manufactured from No. 16 gauge and No. 14 gauge galvanized steel, respectively. The connectors include prepunched slots in one leg of the connector and round holes in the opposite leg. When installed with fasteners centered in the slotted hole, the connectors provide for one inch (25.4 mm) of movement in either direction, parallel to the slot length. See Tables 1A and 1B for model numbers and dimensions, required fasteners and allowable loads; and Figure 1 for product drawings and installation details.

3.1.2 SSB Bypass Framing Slide-Clip Connector: The SSB connector is a slide-clip connector used to connect cold-formed steel curtain wall bypass framing members to the bottom of a structural supporting

member to accommodate spacing between the supported framing members and the supporting members greater than provided by the other clips described in this report. The SSB connectors have slotted holes to accommodate vertical relative movement between the curtain wall and the structural support. The SSB connector is 18 inches long (457 mm), manufactured from No. 16 gauge galvanized steel and includes prepunched slots and round holes. When installed with fasteners centered in the slotted hole, the connectors provide for one inch of movement in either direction, parallel to the slot length. See Table 2 for model number and dimensions, required fasteners and allowable loads; and Figure 2 for product drawing and installation details.

3.1.3 SCW Series Top-of-Wall Connectors: The SCW connectors are used to attach the top of nonload-bearing cold-formed steel wall framing (top-of-wall connection) to the building's structural floor/ceiling or roof/ceiling immediately above the wall and are designed to transfer loads acting perpendicular to the wall and to accommodate vertical movement of the floor/ceiling or roof/ceiling. The SCW connector is manufactured from No. 16 gauge galvanized steel and includes prepunched slots and round holes. When installed with fasteners centered in the slotted hole, the connectors provide for one inch (25.4 mm) of movement in either direction, parallel to the slot length. See Table 3 for model numbers and dimensions, required fasteners and allowable loads; and Figure 3 for product drawing and installation details.

3.1.4 FCB and MFCB Series Bypass Framing Fixed-Clip Connectors: The FCB and MFCB connectors are fixed-clip connectors used to attach cold-formed steel curtain wall bypass framing members to the structural supporting members, transferring loads applied to the curtain wall and also the gravity load of the curtain wall. The FCB and MFCB connectors are manufactured from No. 16 and No. 14 gauge galvanized steel, respectively. The connectors include round and triangle-shaped prepunched holes.

The round holes accommodate the minimum number of fasteners used to attach the connector to the curtain wall framing members and supporting members. Using both the round holes and triangle-shaped holes represents the maximum number of fasteners. See Tables 4A, 4B, and 4C for model numbers and dimensions, required fasteners and allowable loads; and Figures 4 for product drawings and installation details.

3.1.5 DSSCB Series Bypass Framing Drift Strut Connectors: The DSSCB connectors are used to connect cold-formed steel curtain wall bypass framing members to the supporting structure. The DSSCB has provisions for use as either a slide-clip or fixed-clip connector. The connectors include vertical slots for installation of shouldered screws for use as a slide clip to accommodate vertical relative movement of one inch (25.4 mm) in either direction between the curtain wall and the supporting structure. The connectors also include round holes for installation of self-drilling screws for use as a fixed clip. The DSSCB connectors must be installed with steel strut channels described in Section 3.2.6 of this report. The DSSCB connectors are manufactured from No. 12 gauge galvanized steel and are available with leg lengths of $3^1/_2$, 6 and 8 inches (89, 152 and 203 mm). Where the connector is used to transfer horizontal loads parallel to the plane of the curtain wall, each connector must be installed with a DSHS connecting clip and a fastener attaching the DSHS connector to the strut channel. The DSHS connector is also formed from No.12 gauge galvanized steel. See Tables 5A, 5B and 5C for connector model numbers and dimensions, required fasteners and allowable loads; and Figures 5A, 5B, 5C, and 5D for product drawings, installation details and strut channel details.

3.1.6 SCS Series Seismic Bypass Framing Connectors: The SCS connectors are used to connect cold-formed steel curtain wall bypass framing members to the supporting steel structure. The SCS connectors have provisions for use as either a slide-clip or fixed-clip connector. The connectors include vertical slots for installation of shouldered screws for use as a slide-clip to accommodate vertical relative movement of one inch (25.4 mm) in either direction between the curtain wall and the supporting structure. The connectors also include round holes for installation of self-drilling screws for use as a fixed clip. The SCS/97 and SCS/118 series connectors are manufactured from No. 12 and No. 10 gauge galvanized steel, respectively. See Tables 6A, 6B and 6C for model numbers and dimensions, required fasteners and allowable loads; and Figures 6A, 6B and 6C for product drawing and installation details.

3.1.7 LSFC and SFC Series Steel Framing Connectors: The SFC and LSFC connectors are for use in cold-formed steel wall framing connection applications. The SFC and LSFC connectors are manufactured from No. 16 gauge and No. 18 gauge galvanized steel, respectively, and include prepunched round and triangle-shaped holes.

For the connectors used to transfer lateral loads between members, see Table 7 for connector model numbers and dimensions, required fasteners and allowable loads; and Figure 7 for product drawings and installation details.

For the SFC connector used in U-channel wall bridging applications, connecting cold-formed steel wall framing to U-channel bridging, see Table 7A for model number and dimensions, required fasteners and allowable loads.

3.1.8 LSSC, SSC and MSSC Series Steel Framing Connectors: The LSSC, SSC and MSSC series connectors are for use in cold-formed steel roof, floor and wall framing connection applications to provide connection between cold-formed steel (CFS) stud to CFS framing members and CFS stud to structural members.

The LSSC, SSC and MSSC connectors are manufactured from No. 16 gauge, No.14 gauge, and No. 12 gauge thick galvanized steel, respectively.

The connectors include pre-punched round and triangle-shaped holes for installation of self-drilling screws to attach the connectors to either cold-formed steel or structural steel members. The round holes accommodate the minimum number of screw fasteners. Using both the round holes and triangle-shaped holes is to accommodate the maximum number of screw fasteners. In addition to these holes, the connectors also have square holes are for use with the round and triangle-shaped holes for custom screw patterns specified by a registered design professional.

The LSSC, SSC and MSSC series connectors are for use in a variety of cold-formed steel framed connection applications, including general connections, bypass framed curtain wall fixed clip, header-to-jamb, wall jamb-to-base, rafter-to-wall, U-channel wall bridging, and knee wall base connection applications. See Tables 8A, 8B, 8C, 8D, 8E, 8F and 8G for application types, model numbers, fastener requirements and allowable loads. See Figures 8B, 8C, 8D, 8E, 8F and 8G for product drawings, load directions and installation details. Table 8B includes alternatives for the connection of the connectors to the supporting members.

SSC connectors in U-channel wall bridging connection applications shall be used with cold-formed steel $1^1/_2$-inch by $^1/_2$-inch (38.1 mm x 12.7 mm) U-channel bridging members supplied by others and complying with Section 3.2.5 of this report.

MSSCKW connectors used in knee wall base connection applications to provide moment resistance shall be used with Simpson Strong-tie steel bearing plate, Model No. BP1/2-3, described in Section 3.2.8 of this report.

3.1.9 SJC and MSJC Series Connectors: The SJC and MSJC series connectors are for use in cold-formed steel joist connection applications.

The SJC and MSJC connectors are formed from No.14 gauge and No. 12 gauge thick galvanized steel, respectively.

The connectors include pre-punched round and triangle-shaped holes for installation of self-drilling screws to attach the connectors to the joist framing members. The round holes accommodate the minimum number of screw fasteners. Using both the round holes and triangle-shaped holes is to accommodate the maximum number of screw fasteners. In addition to these holes, the connectors also have square holes for use with the round and triangle-shaped holes for custom screw patterns specified by a registered design professional.

See Table 9A for model numbers and dimensions, fastener requirements and allowable loads. See Figure 9A for product drawings and installation details.

SJC series connectors are also for use in kickbrace connection applications. See Table 9B for fastener requirements and allowable loads and Figure 9B for load direction and installation details.

3.1.10 RCKW Series Knee Wall Connectors and RCKWS Stiffeners: RCKW series connectors, with or without the RCKWS stiffener, are for use in cold-formed steel framed walls to create a moment resisting connection at the base of knee walls, parapets, interior non-full height walls, and also handrail and guardrail wall systems.

The RCKWS is for use as a stiffener to the RCKW connectors, such that with the stiffener nested into the RCKW connector the screw and anchor holes align in the stiffener and the connector. The RCKW and RCKWS connectors are both manufactured from No.7 gauge galvanized steel. The holes in the connectors and stiffeners are for installation of screws to attach the connectors to wall framing and to attach the connector to the supporting member at the base of the wall.

See Table 10 for model numbers, fastener requirements and allowable loads. See Figure 10 for product drawings, load directions and installation details.

3.2 Materials:

3.2.1 Connector Steel Materials: The connectors described in this report are manufactured from galvanized steel with a minimum G90 zinc coating complying with ASTM A653 and have a minimum base-metal thickness as shown in the following table:

Model No.	Nominal Thickness (gauge)	Minimum Base-metal Thickness (inch)
SCB	No. 16	0.054
MSCB	No. 14	0.068
SSB	No. 16	0.054
SCW	No. 16	0.054
FCB	No. 16	0.054
MFCB	No. 14	0.068
DSSCB/DSHS	No. 12	0.097
SCS 97	No. 12	0.097
SCS 118	No. 10	0.118
SFC	No. 16	0.054
LSFC	No. 18	0.043
LSSC	No. 16	0.054
SSC	No. 14	0.068
MSSC	No. 12	0.097
SJC	No. 14	0.068
MSJC	No. 12	0.097
RCKW/RCKWS	No. 7	0.171

For **SI:** 1 inch=25.4 mm.

The DSSCB, SCS, SSC, SJC and SFC series connectors are manufactured from galvanized steel complying with ASTM A653 SS designation, Grade 50 with a minimum yield strength, F_y, of 50,000 psi (345 MPa) and a minimum tensile strength, F_u, of 65,000 psi (448 MPa). The MSCB, SCB, SSB, SCW, FCB and MFCB series connectors are manufactured from galvanized steel complying with ASTM A653 SS designation, Grade 40 with a minimum yield strength, F_y, of 40,000 psi (276 MPa) and a minimum tensile strength, F_u, of 55,000 psi (379 MPa). The DSHS clip, RCKW series connectors and RCKWS series connector stiffeners are manufactured from galvanized steel complying with ASTM A653, SS designation, Grade 33 with a minimum yield strength, F_y, of 33,000 psi (228 MPa) and a minimum tensile strength, F_u, of 45,000 psi (310 MPa).

3.2.2 No. 14 Shouldered Screws: The screws that are to be installed in the slotted holes of the bypass slide-clip connectors to connect the connectors to the cold-formed steel framing shall be the Simpson Strong-tie Strong-drive® shouldered screws in ICC-ES evaluation report ESR-3006. The XLSH78B1414 shouldered screws shall be used with the DSSCB series connectors. The XLSH34B1414 shouldered screws shall be used with the remaining curtain wall bypass framing slide-clip connectors.

3.2.3 Self-Drilling Screws: Except for the shouldered screws installed into the slotted holes of the bypass slide-clip connectors, screws used to attach the connectors described in this report to cold-formed steel members or structural steel members must be self-drilling screws complying with ASTM C1513 or be recognized in an ICC-ES evaluation report. The screw length must be such that the screw extends beyond the backside of the connected steel thickness a minimum of three threads. The self-drilling screws specified in the tables in this evaluation report must also comply with the following:

3.2.3.1 No. 12-14 Self-drilling Screws: These screws must be 0.216-inch (5.5 mm) minimum shank diameter screws with 14 threads per inch and a hex-washer head having a washer diameter of 0.398-inch (10.1 mm). The allowable shear strength and tensile strength of these screws must be 840 lbf (3736 N) and 845 lbf (3759 N), respectively.

3.2.3.2 No. 10-16 Self-drilling Screws: These screws must be 0.190-inch (4.8 mm) minimum shank diameter screw with 16 threads per inch and a hex-washer head having a washer diameter of 0.375-inch (10 mm). The allowable shear strength and tensile strength of these screws must be 540 lbf (2402 N) and 820 lbf (3648 N), respectively.

3.2.3.3 No. 12-24 Self-drilling Screws: These screws must be 0.216-inch (5.5 mm) minimum shank diameter screws with 24 threads per inch and a hex-washer head having a washer diameter of 0.415-inch (10.5 mm). The allowable shear strength and tensile strength of these screws must be 935 lbf (4159 N) and 1420 lbf (6316 N), respectively.

3.2.4 Cold-formed Steel Framing Members: The steel of the cold-formed steel framing members to which the connectors are attached must comply with the American Iron and Steel Institute North American Specification for the Design of Cold-formed Steel Structural Members (AISI S100).The following material properties are the required minimums for the steel of the cold-formed steel framing members:

Member Steel Thickness Designation		Design Thickness (inch)	Minimum Base-metal Thickness (inch)	Min. Yield Strength (ksi)	Min. Tensile Strength (ksi)
Mils	Gauge				
33	20	0.0346	0.033	33	45
43	18	0.0451	0.043	33	45
54	16	0.0566	0.054	50	65
68	14	0.0713	0.068	50	65
97	12	0.1017	0.097	50	65
118	10	0.1242	0.118	50	65

For **SI:** 1 inch=25.4 mm, 1 ksi= 6.89 MPa.

3.2.5 U-Channel Bridging Members: U-Channel bridging members supplied by others that are to be used with the SFC and SCC series connectors shall measure $1^1/_2$-inch-by-$^1/_2$-inch (38 by 12.7 mm) and manufactured from cold-formed steel having a minimum base-metal thickness of 0.0566-inch (1.4 mm), a minimum yield strength of 33,000 psi (227 MPa) and a minimum tensile strength of 45,000 psi (310 MPa).

3.2.6 Strut Channel: Strut channels that are to be used with the DSSCB series connectors are supplied by others and must be manufactured from cold-formed steel having a minimum base-metal thickness of 0.0966-inch (2.4 mm), minimum yield strength of 33,000 psi (227 MPa) and a minimum tensile strength of 45,000 psi (310 MPa). The strut channels must have the shape and dimensions shown in Figure 1 and have a minimum allowable moment for bending about the weak axis of 1,455 lb-in (164.4 N-m) and 4,565 lb-in (515.8 N-m) for the strut channels with $^{13}/_{16}$-inch (20.6 mm) or $^7/_8$-inch (22.2 mm) and $1^5/_8$-inch (41.3 mm) wide flanges, respectively.

3.2.7 Structural Steel Supporting Members: The structural steel supporting members to which the connectors are attached shall have a minimum thickness of $^3/_{16}$-inch (4.8 mm), a minimum yield strength of 36,000 psi (248 MPa) and a minimum tensile strength of 58,000 psi (400 MPa), except for MFCB connectors, for which the structural steel supporting member has a minimum thickness of $^3/_8$-inch (9.5 mm).

3.2.8 Bearing Plate: Simpson Strong-Tie® BP1/2-3 bearing plate used with MSSC series connectors must have a minimum base-metal thickness of 0.0229-inch (0.6 mm) with a minimum yield strength of 33,000 psi (227 MPa) and a minimum tensile strength of 52,000 psi (360 MPa).

3.2.9 Weld Filler Metal: The allowable loads in this report for the connectors welded to structural steel supporting members are based on the use of minimum E70XX electrodes.

3.2.10 Powder-Actuated Fasteners: Power-actuated fasteners used to attach the connectors to structural steel members as described in this report must be Simpson Strong-Tie PDPAT-XXK powder-actuated fasteners with premounted tophat washers described in ICC-ES evaluation report ESR-2138. When using PDPAT fasteners, installation and requirements must comply with ESR-2138.

3.2.11 Anchor Bolts: Threaded rods used as anchor bolts to connect the MSSC, RCKW and SSC series connectors to concrete foundations must comply with ASTM F1554 Grade 36 or ASTM A307 Grade A. Where high strength bolts are specified in this report these must comply with ASTM F3125 Grade A325 or ASTM A449.

4.0 DESIGN AND INSTALLATION

4.1 Design:

4.1.1 General: The load values for the connectors in this report are for use with Allowable Stress Design (ASD) without allowable load increases for wind or seismic loads. Tabulated load values in this report must be multiplied by an adjustment factor of 0.92 except Tables 2, 4A, 4B, and 4C for compliance with the 2024, 2021 and 2018 IBC and IRC.

The load capacity of the connections must be the lesser of the load value tabulated for the connectors' connection to the supported member and the allowable strength for the connection of the connector to the supporting member. Unless noted otherwise in the tables, a serviceability limit of $^1/_8$-inch has been applied when determining the allowable load values. The allowable strength of alternate connections of the connectors to supporting members must be justified to the satisfaction of the code official.

Connected cold-formed steel and structural steel members must be analyzed for load carrying capacity at the connection in accordance with code requirements.

4.1.2 The cold-formed steel framing members to which the connectors are attached shall comply with the information provided in the tables, and the fastener patterns shall be as shown in the accompanying figures of this report.

4.1.3 Design values for SCB and MSCB Series bypass framing slide-clip connectors in Tables 1A and 1B; SSB Series steel framing connectors in Table 2; SCW Series top of wall connectors in Table 3; DSSCB Series bypass framing drift strut connectors in Table 5A; and SCS Series seismic bypass framing connectors in Tables 6A and 6C are applicable for a movement up to $^1/_2$ inch (12.7 mm) from the center of the slot in either direction, parallel to the slot. Design values at larger movements are outside the scope of this evaluation report.

4.2 Installation: Installation of the connectors must be in accordance with this evaluation report and the manufacturer's published installation instructions. In the event of a conflict between this report and the manufacturer's published installation instructions, this report governs.

4.2.1 Welding of connectors to the supporting steel member shall be in accordance with code requirements. The weld size must be equal to or greater than the base metal thickness for the connector listed in Section 3.2.1 of this report. For MFCB connectors, the minimum weld size is $^1/_8$ inch (3.18 mm).

4.2.2 Power-actuated fasteners used to attach the connectors to structural steel supporting members must be installed in accordance with ICC-ES evaluation report ESR-2138 with a minimum fastener-to-supporting member edge distance of $^1/_2$-inch (12.7 mm).

5.0 CONDITIONS OF USE:

The Simpson Strong-Tie connectors described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 The connectors must be manufactured, identified, and installed in accordance with this report and the manufacturer's published installation instructions. A copy of the instructions must be available at the jobsite at all times during installation.

5.2 Calculations showing compliance with this report must be submitted to the code official. The calculations must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

5.3 Use of PDPAT fasteners described in Section 3.2.10 of this report subject to seismic loads is outside the scope of this report.

5.4 Under the 2024, 2021 and 2018 IBC and IRC, the tabulated load values must be adjusted in accordance with Section 4.1.1 of this report.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Connectors Used with Cold-formed Steel Structural Members (AC261), dated February 2019 (Editorially revised April 2024).

7.0 IDENTIFICATION

7.1 The Simpson Strong-Tie connectors described in this report must be stamped with the model number and the company name (Simpson Strong-Tie). Each box label must include the company name (Simpson Strong-Tie, Inc.), model number, quantity, and the ICC-ES evaluation report number (ESR-4294).

7.2 The report holder's contact information is the following:

SIMPSON STRONG-TIE COMPANY, INC.
5956 WEST LAS POSITAS BOULEVARD
PLEASANTON, CALIFORNIA 94588
(800) 925-5099
www.strongtie.com

TABLE 1A—SCB AND MSCB SERIES BYPASS SLIDE-CLIP CONNECTORS ALLOWABLE STRESS DESIGN (ASD) LOADS (lbf)[1,2,3]

Model No.	Connector Length, L (inches)	Quantity of Shouldered Screws[4]	Stud Thickness (mils)							
			33		43		54		68	
			F2	F3	F2	F3	F2	F3	F2	F3
SCB43.5	3½	2	480	480	570	640	705	905	705	905
SCB45.5	5½	2[2]	455	480	570	640	705	905	705	905
		3	625	625	930	930	990	1,260	990	1,260
MSCB45.5	5½	2[2]	455	480	720	640	1,055	1,115	1,115	1,475
		3	625	625	995	930	1,220	1,930	1,365	1,930
SCB47.5	7½	2[2]	455	480	570	640	705	875	705	875
		3	625	625	930	930	990	1,260	990	1,260
MSCB47.5	7½	2[2]	455	480	720	640	1,055	1,115	1,115	1,475
		3	625	625	995	930	1,220	1,930	1,365	1,930
SCB49.5	9½	2[2]	455	480	640	640	705	905	705	905
		3	625	625	930	930	990	1,260	990	1,260
SCB411.5	11½	2[2]	455	480	640	640	990	905	990	905
		3	625	625	860	930	990	1,260	990	1,260

For **SI:** 1 mil=0.001 inch; 1 inch = 2.54 mm; 1 lbf = 4.45 N.

[1] The tabulated load values are for the connection of the SCB and MSCB bypass slide-clip connectors to the curtain wall framing member. The allowable load values for connection of the connector to the steel supporting member are in Table 1B of this report. The minimum tabulated load value from Table 1A and Table 1B must be used as the allowable load of the connection.
[2]When the SCB or MSCB connectors are fastened to the curtain wall framing members using two shouldered screws, the screws may be installed in any two slots in the connector.
[3]See Figure 1 for load orientation.
[4]Shouldered screws must comply with Section 3.2.2 of this report and be installed at the center of the slotted hole in the connector, adjacent to the "no equal" symbol on the connector.

TABLE 1B—SCB AND MSCB SERIES CONNECTORS CONNECTION TO STRUCTURAL STEEL SUPPORTING MEMBER ALLOWABLE STRESS DESIGN (ASD) LOADS [1]

Connection Type[2]	Fastener Quantity	ASD Allowable Loads[3] (lbf)			
		SCB		MSCB	
		F2	F3	F2	F3
No. 12-14 Self-Drilling Screws	2	795		1,045	
	3	1,120		1,725	
	4	No Reduction for Table 1A load values		No Reduction for Table 1A load values	
PDPAT	2	440	-	520	-
	3	585	-	780	-
	4	895	-	1,040	-
Welded	N/A	No Reduction for Table 1A load values		No Reduction for Table 1A load values	

For **SI:** 1 inch = 25.4 mm, 1 lbf = 4.45 N

[1]The allowable loads in this table are the connection capacity values for the connectors attached to a structural steel member and do not consider the connector's attachment to the supported member. The minimum tabulated load value from Table 1A and 1B must be used as the allowable connection capacity.
[2]See Figure 1 of this report for connection details. Self-drilling screws must comply with Section 3.2.3.1 of this report. PDPAT fasteners must comply with Section 3.2.10 of this report. Welding must comply with Section 4.2.1 and Figure 1 of this report.
[3]Allowable loads are based on fasteners or welding use to attach the connector to structural steel members complying with Section 3.2.7 of this report.

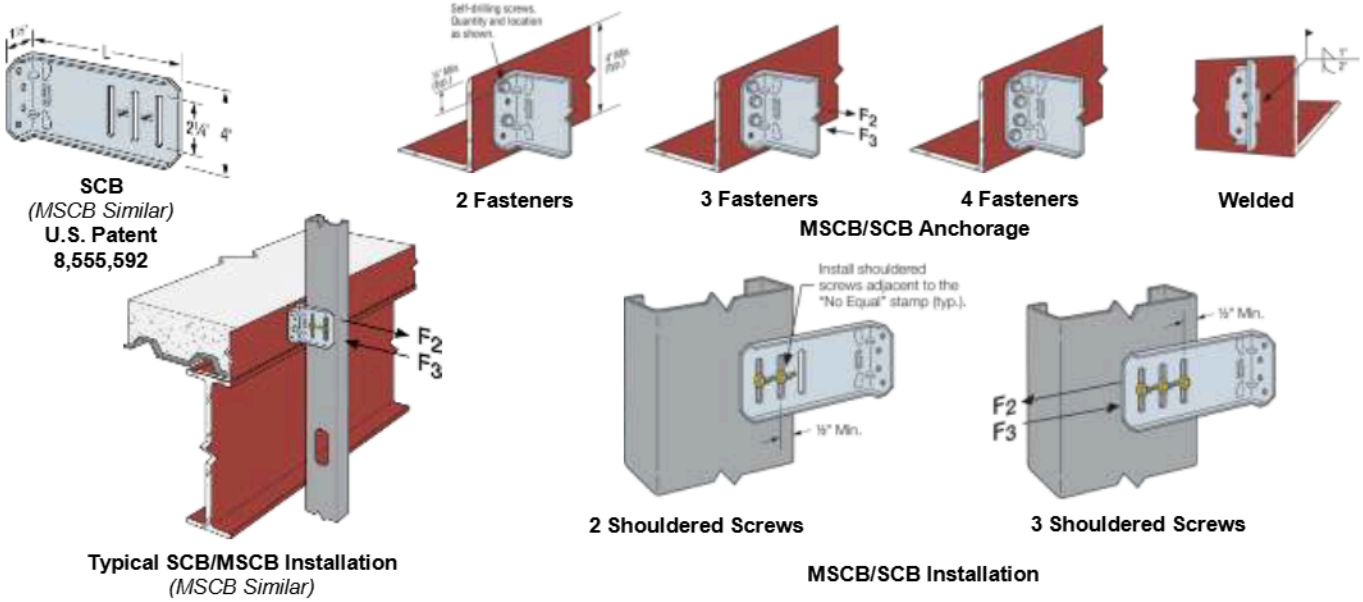


FIGURE 1—SCB AND MSCB SERIES BYPASS SLIDE-CLIP CONNECTORS AND INSTALLATION DETAILS

TABLE 2—SSB BYPASS SLIDE-CLIP CONNECTOR ALLOWABLE STRESS DESIGN (ASD) LOADS (lbf)[1,2,5,6]

Model No.	Quantity of Shouldered Screws[3]	Supported Framing Member Thickness(mils)					
		33		43		54	
		F2	F3	F2	F3	F2	F3
SSB3.518	2[4]	480	480	640	640	890	890
	3	755	755	955	1,000	1235	1,370

For **SI:** 1 mil=0.001 inch; 1 inch = 2.54 mm; 1 lbf = 4.45 N.

[1]Except as noted otherwise in this table, the tabulated load values are for the entire connection of the curtain wall framing members to a structural steel supporting member with the SSB connector as detailed in Figure 2 of this report.
[2]See Figure 2 for load orientation.
[3]Shouldered screws must comply with Section 3.2.2 of this report and be located at the center of the slotted hole in the connector, adjacent to the "no equal" symbol on the connector.
[4]The shouldered screws may be installed in any two slots.
[5]No. 12 self-drilling screws used to attach the connector to structural steel supports must comply with Section 3.2.3.1 of this report. Welding of the connector to structural steel supports must comply with Section 4.2.1 and Figure 2 of this report.
[6]Allowable loads are based on fasteners or welding installed to structural steel supporting members complying with Section 3.2.7 of this report.

TABLE 3—SCW SERIES HEAD-OF-WALL SLIDE-CLIP CONNECTOR ALLOWABLE STRESS DESIGN (ASD) LOADS, lbf[1,2,6]

Model No.	Connector Length, W (inches)	Quantity of Shouldered Screws[3]	Stud Thickness (mils)		
			33	43	54
			F4	F4	F4
SCW3.25	3¼	2	425	590	695[5]
SCW5.5	5½	2[4]	425	590	920
		3	425	590	1,130[5]

For **SI:** 1 mil=0.001 inch; 1 inch = 2.54 mm; 1 lbf = 4.45 N.

[1]Except as noted otherwise in this table, the tabulated load values are for the entire connection of the curtain wall framing members to a structural steel supporting member with the SSB connector as detailed in Figure 3.
[2]See Figure 3 for load orientation.
[3]Shouldered screws must comply with Section 3.2.2 of this report and be located at the center of the slotted hole in the connector, adjacent to the "no equal" symbol on the connector.
[4]The shouldered screws must be located in the outermost slotted holes for installation of the SCW5.5 connector with two screws.
[5]For installations with two No. 12 self-drilling screws, these tabulated load values for the SCW3.25 and SCW5.5 connectors must be reduced to 640 lbf and 1200 lbf, respectively
[6]Allowable loads are based on fasteners installed to structural steel member complying with Section 3.2.3.1 of this report. No. 12 self-drilling screws must comply with Section 3.2.3.1 of this report.

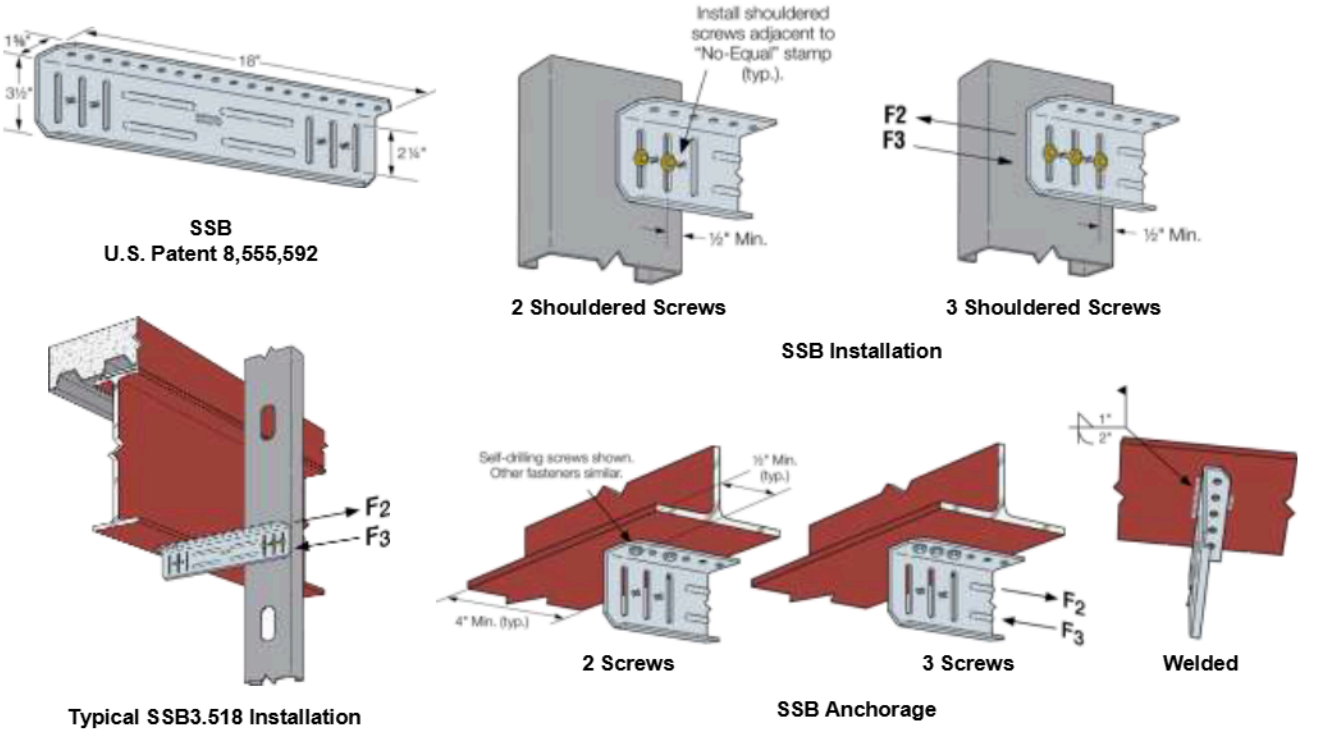


FIGURE 2—SSB3.518 BYPASS SLIDE-CLIP CONNECTOR AND INSTALLATION DETAILS

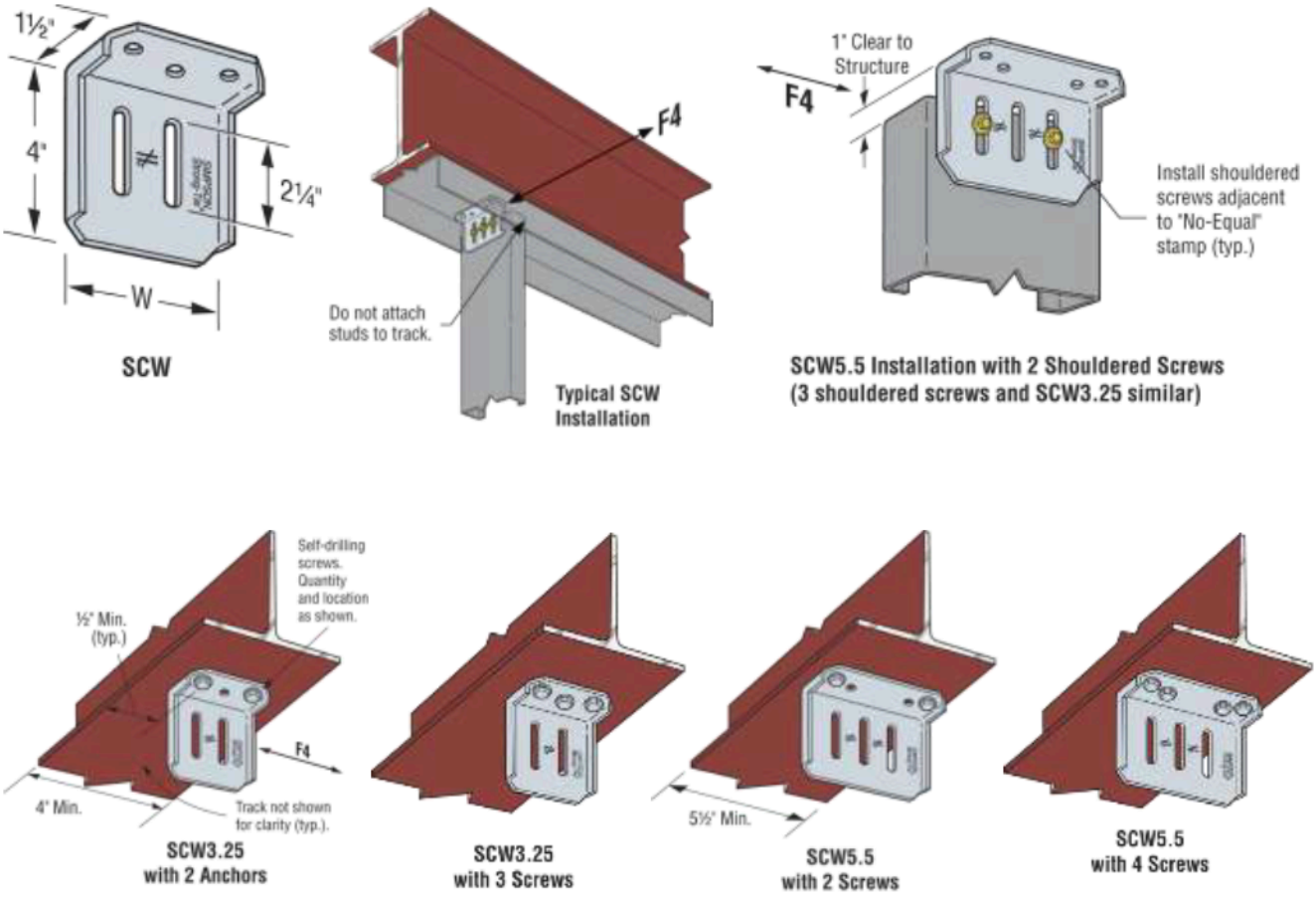


FIGURE 3—SCW SERIES HEAD-OF-WALL SLIDE-CLIP CONNECTORS AND INSTALLATION DETAILS

TABLE 4A—FCB AND MFCB SERIES BYPASS FIXED-CLIP CONNECTORS ALLOWABLE STRESS DESIGN (ASD) LOADS[1,2] (lbf)

Model No.	L (in.)	No. of #12-14 Self-drilling Screws[3]		Stud Thickness								
				33 mil (20 ga.)			43 mil (18 ga.)			54 mil (16 ga.)		
				F2	F3	F4	F2	F3	F4	F2	F3	F4
FCB43.5	3½	Min.	4	755	755	755	1,105	905	1,055	1,250	905	1,235
		Max.	6	1,100	1,130	1,075	1,105	1,105	1,350	1,250	2,245	1,770
MFCB43.5	3½	Min.	4	755	755	755	1,105	1,105	1,055	1,530	2,280	1,595
		Max.	6	1,130	1,130	1,075	1,265	1,105	1,545	1,530	2,630	1,770
FCB45.5	5½	Min.	4	755	755	700	1,105	905	875	1,105	905	1,100
		Max.	9	1,100	1,260	1,095	1,105	1,105	1,380	1,105	2,245	1,785
MFCB45.5	5½	Min.	4	755	755	700	1,105	1,105	1,030	1,530	2,280	1,595
		Max.	9	1,265	1,260	1,695	1,265	1,105	2,315	1,605	3,205	2,315
FCB47.5	7½	Min.	4	755	755	220	1,105	875	330	1,105	875	815
		Max.	12	1,100	1,260	705	1,105	1,260	1,050	1,105	2,245	1,345
MFCB47.5	7½	Min.	4	755	755	415	1,105	1,105	540	1,580	2,280	1,025
		Max.	12	1,265	1,260	1,345	1,265	1,405	1,530	1,605	3,350	2,700
FCB49.5	9½	Min.	4	755	755	170	1,105	905	255	1,105	905	340
		Max.	12	1,100	1,260	750	1,105	1,260	1,115	1,105	2,245	1,200
FCB411.5	11½	Min.	4	755	755	140	1,105	935	205	1,105	935	340
		Max.	12	1,100	1,260	795	1,105	1,260	860	1,105	2,245	860

For **SI:** 1 mil=0.001 inch; 1 inch = 2.54 mm; 1 lbf = 4.45 N.

[1]The tabulated load values are for the connection of the FCB and MFCB series connectors to the curtain wall framing member. The allowable load values for connection of the connector to the steel supporting member are in Table 4B and Table 4C of this report. The minimum tabulated load value from Table 4A, Table 4B, and Table 4C must be used as the allowable load of the connection.
[2]See Figure 4 for load orientation.
[3]Self-drilling screws must comply with Section 3.2.3.1 of this report. Minimum fastener quantity requires a screw to be installed into all round holes in the connectors. Maximum fastener quality requires a screw to be installed into all round and triangle holes in the connector.

TABLE 4B—FCB SERIES CONNECTORS CONNECTION TO STRUCTURAL STEEL SUPPORTING MEMBER ALLOWABLE STRESS DESIGN (ASD) LOADS [1]

Connection Type[2]	Fastener Quantity	Allowable Loads[4] (lbf)								
		F2 and F3	F4							
			FCB43.5	FCB45.5	FCB47.5		FCB49.5		FCB411.5	
			Min./Max.[5]	Min./Max.[5]	Min.[5]	Max.[5]	Min.[5]	Max.[5]	Min.[5]	Max.[5]
No. 12-14 Self-Drilling Screws	2	795	625	410	255	445	185	265	120	190
	3	1,120	690	450	280	490	200	295	135	210
	4	1,590	1,255	820	490	890	340	535	275	380
PDPAT	2	390[3]	535				-			
	3	715[3]	560				-			
	4	970[3]	560				-			
Welded	Hard side: 2" Free side: 1"	1,740	1,770	1,785	790	1,345	340	1,200	340	860

For **SI**: 1 inch = 25.4 mm, 1 lb = 4.45 N, 1 ksi = 6.895 MPa

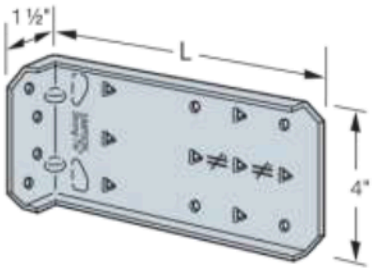
[1]Tabulated allowable loads are based on connection capacity of FCB connectors to structural steel supporting member and do not consider the FCB connector attachment to the supported member. The minimum tabulated load value shown in Tables 4A and 4B must be as the allowable connection capacity.
[2]See Figure 4 of this report for connection details. Self-drilling screws must comply with Section 3.2.3.1 of this report. PDPAT fasteners must comply with Section 3.2.10 of this report. Welding must comply with Section 4.2.1 and Figure 4 of this report. The hard side represents the weld located at the return leg of the connector and the free side represents the weld located at the opposite end of the leg of the connector.
[3]These tabulated load values are for the F2 direction only.
[4]Allowable loads are based on screw fastening or welding of the connector to structural steel members complying with Section 3.2.7 of this report.
[5]Min./Max. tabulated load values must be used with the corresponding Min. and Max. load values shown in Table 4A for the specific connector fastener quantity.

TABLE 4C—MFCB SERIES CONNECTORS CONNECTION TO STRUCTURAL STEEL SUPPORTING MEMBER ALLOWABLE STRESS DESIGN (ASD) LOADS [1]

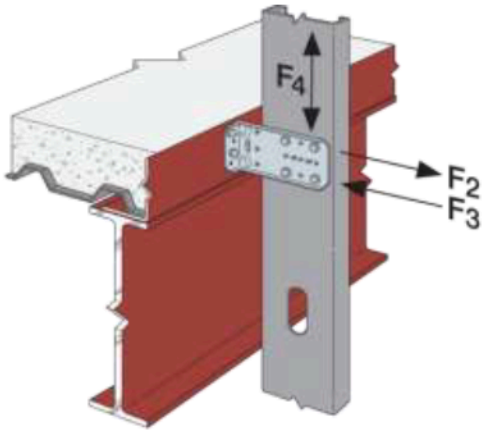
Anchorage Type[2]	No. of Anchors	Allowable Loads (lb.)[4]				
		F2 and F3	F4			
			MFCB43.5	MFCB45.5	MFCB47.5	
			Min./Max.[5]	Min./Max.[5]	Min.[5]	Max.[5]
No. 12-24 Self-Drilling Screws	2	1,045	800	1,160	515	1,350
	3	1,725	1,195	1,735	770	2,025
	4	2,090	1,595	2,315	1,025	2,700
PDPAT	2	390[3]	535			
	3	715[3]	560			
	4	970[3]	560			
Welded	Hard Side: 2" Free Side: 1"	3,350	1,770	2,315	1,025	2,645

For **SI**: 1 inch = 25.4 mm, 1 lb = 4.45 N, 1 ksi = 6.895 MPa

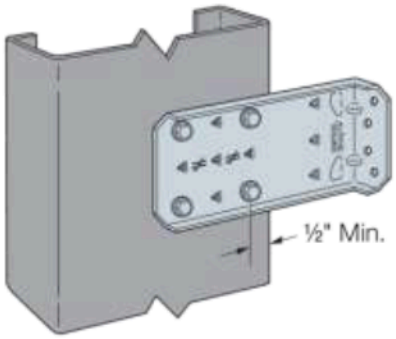
[1]Tabulated allowable loads are based on connection capacity of MFCB connectors to structural steel supporting member and do not consider the MFCB connector attachment to the supported member. The minimum tabulated load value shown in Tables 4A and 4C must be as the allowable connection capacity.
[2]See Figure 4 of this report for connection details. Self-drilling screws must comply with Section 3.2.3.1 of this report. PDPAT fasteners must comply with Section 3.2.10 of this report. Welding must comply with Section 4.2.1 and Figure 4 of this report. The hard side represents the weld located at the return leg of the connector and the free side represents the weld located at the opposite end of the leg of the connector.
[3]These tabulated load values are for the F2 direction only.
[4]Allowable loads are based on screw fastening or welding of the connector to structural steel members complying with Section 3.2.7 of this report.
[5]Min./Max. tabulated load values must be used with the corresponding Min. and Max. load values shown in Table 4A for the specific connector fastener quantity.



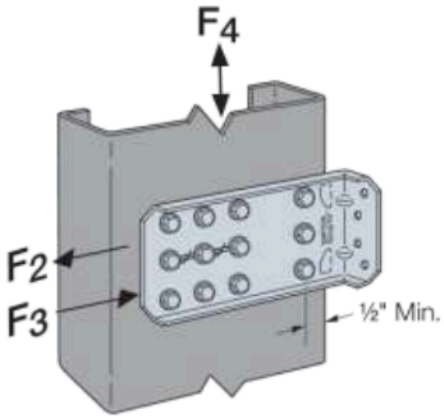
FCB / MFCB
U.S. Patent
8,555,592



Typical FCB / MFCB Installation

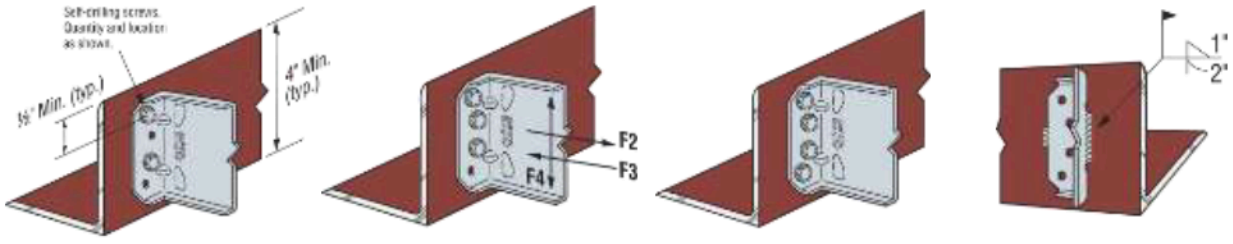


Min. Fasteners



Max Fasteners

FCB / MFCB Installation



FCB / MFCB Connection to Supporting member

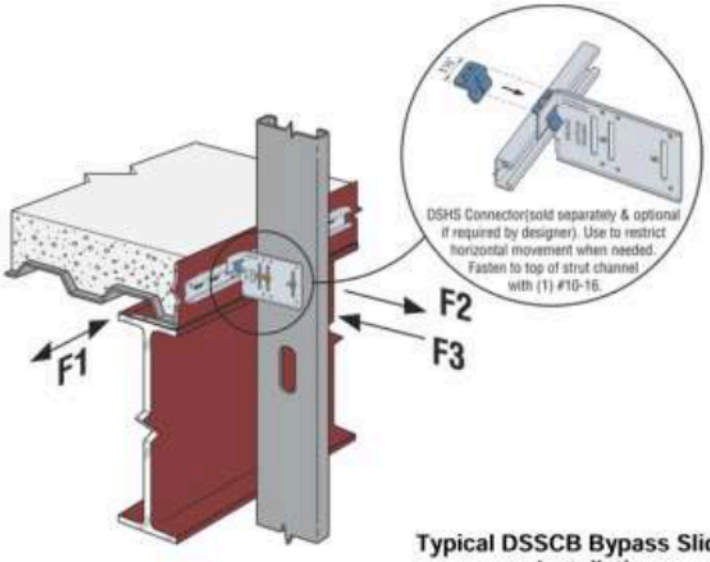
FIGURE 4—FCB / MFCB SERIES BYPASS FIXED CLIP CONNECTORS AND INSTALLATION DETAILS

TABLE 5A—DSSCB SERIES BYPASS SLIDE-CLIP CONNECTORS ALLOWABLE STRESS DESIGN (ASD) LOADS[1]

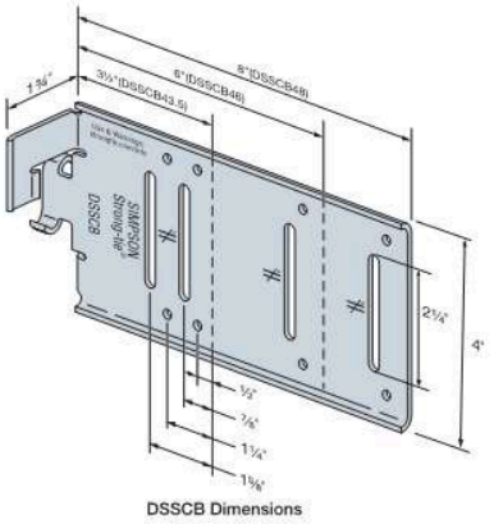
Model No.	Supported Framing Member Thickness (mils)	Fasteners to Supported Member		Allowable Loads (lbf)		
				Load Direction[4]		
		Fastener Pattern[2]	Quantity of Shouldered Screws[3]	F1[5]	F2	F3
DSSCB43.5	33	A	2	105	515	570
DSSCB46		B	3	105	765	850
		C, D	2	105	515	570
DSSCB48		E	4	105	765	1,135
		F, G	3	105	765	850
DSSCB43.5	43	A	2	155	785	875
DSSCB46		B	3	155	1,175	1,310
		C, D	2	155	785	875
DSSCB48		E	4	155	1,175	1,745
		F, G	3	155	1,175	1,310
DSSCB43.5	54	A	2	225	1,075	1,250
DSSCB46		B	3	225	1,475	1,875
		C, D	2	225	1,075	1,190
DSSCB48		E	4	225	1,475	2,445
		F, G	3	225	1,475	1,820
DSSCB43.5	68 and 97	A	2	300	1,075	1,640
DSSCB46		B	3	300	1,475	2,675
		C, D	2	300	1,075	1,560
DSSCB48		E	4	300	1,475	2,675
		F, G	3	300	1,475	2,600

For **SI**: 1 mil=0.001 inch; 1 inch = 2.54 mm; 1 lbf = 4.45 N.

[1]The tabulated load values are for the connection of the DSSCB series bypass slide-clip connector to the curtain wall framing member. The allowable load values for connection of the connector to the steel supporting member, using the strut channel connection, are in Table 5C of this report. The minimum tabulated load value from Table 5A and Table 5C must be used as the allowable load of the connection.
[2]See Figure 5A for the fastener pattern for the shouldered screw fastener placement to attach the connectors to the curtain wall framing.
[3]Shouldered screws must comply with Section 3.2.2 of this report and be located at the center of the slotted hole in the connector, adjacent to the "no equal" symbol on the connector.
[4]See Figure 5A for load orientation.
[5]F1 load values are based on assembly tests with the load applied through the centerline of a 6-inch deep stud. A DSHS connector (fastened to the strut channel with one No. 10 self-tapping screw complying with Section 3.2.3.2 of this report) must be used at each DSSCB connector to transfer the F1 load from the connector to the strut channel.



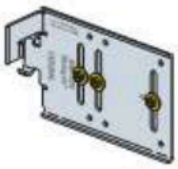
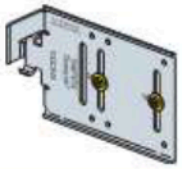
Typical DSSCB Bypass Slide-clip Installation



DSSCB Dimensions

DSSCB Screw Patterns
(Slide-Clip Applications)

Model	Pattern A
DSSCB43.5	

Model	Pattern B	Pattern C	Pattern D
DSSCB46			

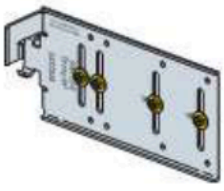
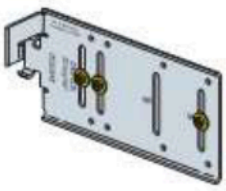
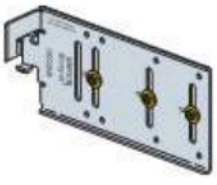
Model	Pattern E	Pattern F	Pattern G
DSSCB48			

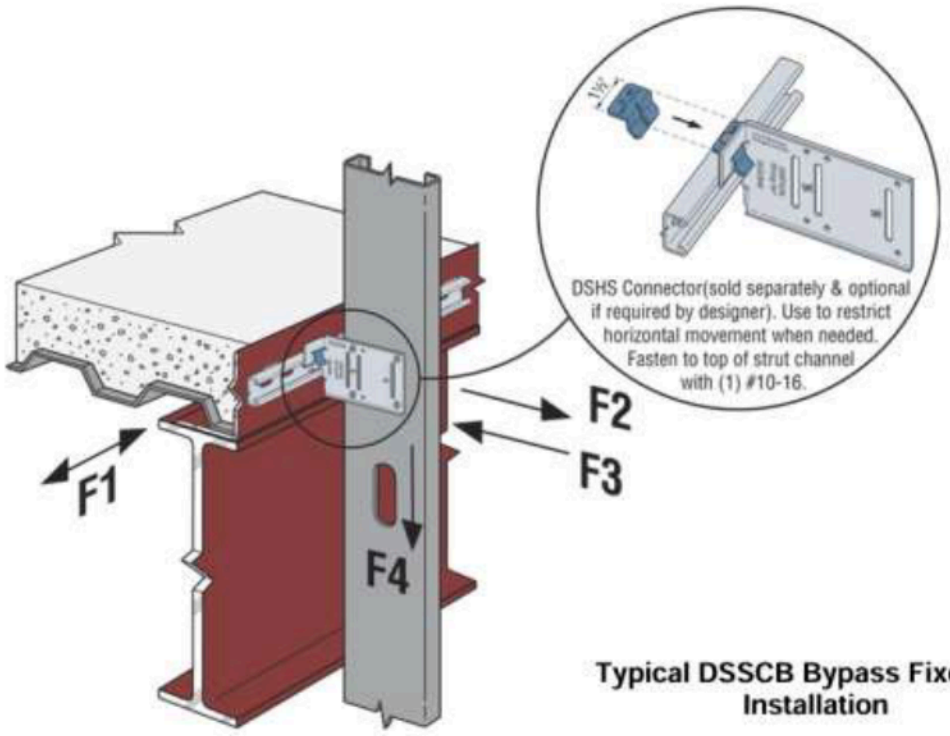
FIGURE 5A—DSSCB SERIES BYPASS SLIDE-CLIP CONNECTORS AND INSTALLATION DETAILS

TABLE 5B—DSSCB SERIES BYPASS FIXED-CLIP CONNECTORS ALLOWABLE STRESS DESIGN (ASD) LOADS[1]

Model No.	Supported Framing Member Thickness (mils)	Fasteners to Supported Framing Member		Allowable Loads (lbf)			
				Load Direction[4]			
		Fastener Pattern[2]	Quantity of No. 10 Self-drilling Screws[3]	F1[5]	F2	F3	F4
DSSCB43.5	33	H	4	220	705	705	345
		I, J	2	185	355	355	175
DSSCB46		K	6	220	1,060	1,060	355
		L, M	4	185	705	705	350
DSSCB48		N	8	220	1,060	1,060	545
		O, P	4	185	705	705	505
DSSCB43.5	43	H	4	285	1,050	1,050	450
		I, J	2	240	525	525	230
DSSCB46		K	6	285	1,125	1,580	460
		L, M	4	240	1,050	1,050	455
DSSCB48		N	8	285	1,145	1,580	710
		O, P	4	240	1,050	1,050	660
DSSCB43.5	54	H	4	330	1,410	2,085	1,025
		I, J	2	300	1,070	1,045	515
DSSCB46		K	6	360	1,410	3,130	1,050
		L, M	4	300	1,410	2,135	1,040
DSSCB48		N	8	360	1,440	3,130	1,145
		O, P	4	300	1,420	2,135	1,070
DSSCB43.5	68 and 97	H	4	395	1,410	2,160	1,025
		I, J	2	300	1,080	1,080	515
DSSCB46		K	6	395	1,410	3,130	1,050
		L, M	4	300	1,410	2,160	1,040
DSSCB48		N	8	395	1,440	3,240	1,145
		O, P	4	300	1,420	2,160	1,070

For **SI**: 1 mil=0.001 inch; 1 inch = 2.54 mm; 1 lbf = 4.45 N.

[1]The tabulated load values are for the connection of the DSSCB series bypass fixed-clip connector to the curtain wall framing member. The allowable load values for connection of the connector to the steel supporting member, using the strut channel connection are in Table 5C of this report. The minimum tabulated load value from Table 5B and Table 5C must be used to as the allowable load of the connection.
[2]See Figure 5B for the fastener pattern for the self-drilling screw fastener placement to attach the connectors to the curtain wall framing.
[3]Self-drilling screws must comply with Section 3.2.3.2 of this report.
[4]See Figure 5B for load orientation.
[5]F1 load values are based on assembly tests with the load applied through the centerline of a 6-inch deep stud for the DSSCB46 and DSSCB3.5 connectors and 8-inch deep stud for the DSSCB48 connector. A DSHS connector (fastened to the strut channel with one No. 10 self-tapping screw complying with Section 3.2.3.2 of this report) must be used at each DSSCB connector to transfer the F1 load from the connector to the strut channel.



Typical DSSCB Bypass Fixed-clip Installation

DSSCB Screw Patterns (Fixed-Clip Applications)

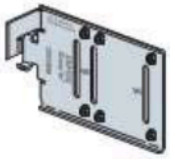
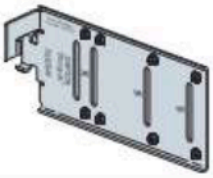
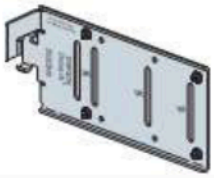
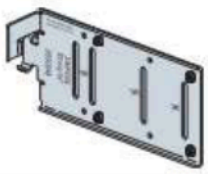
Model	Pattern H	Pattern I	Pattern J
DSSCB43.5			
Model	**Pattern K**	**Pattern L**	**Pattern M**
DSSCB46			
Model	**Pattern N**	**Pattern O**	**Pattern P**
DSSCB48			

FIGURE 5B—DSSCB BYPASS FIXED-CLIP CONNECTOR APPLICATION

TABLE 5C—DSSCB SERIES BYPASS CONNECTORS STRUT CHANNEL CONNECTION TO STEEL SUPPORTING MEMBER ALLOWABLE STRESS DESIGN (ASD) LOADS [1,3,4,5,6,11]

Strut Channel Flange Width (inch)[6]	Strut Channel Welded to Steel Supporting Member[2,7]						Strut Channel Fastened to Steel Supporting Member with No. 12 Self-drilling Screws[8,9,10]				
	Weld Spacing (inches)	Required Weld Length (inch)	Allowable Loads (lbf)				Screw Spacing (inches)	Allowable Loads (lbf)			
			Load Direction					Load Direction			
			F1	F2[12,13]	F3	F4		F1	F2	F3	F4
7/8	4	1	775	1,800	2,710	3,200	4	755	1,530	2,710	1,650
	6	1	775	1,200	2,710	2,135	6	755	1,040	2,710	1,155
	8	1	775	900	2,710	1,600	8	755	800	2,710	865
	10	1	775	720	2,710	1,280	—	—	—	—	—
	12	1	775	600	2,710	1,065	—	—	—	—	—
	16	1	775	450	2,710	800	—	—	—	—	—
1⅝	4	1	775	4,310	3,925	1,745	4	755	1,530	3,925	1,315
	6	1	775	2,875	3,925	1,720	6	755	1,040	3,925	1,155
	8	1	775	2,155	3,925	1,690	8	755	800	3,925	865
	10	1	775	1,725	3,925	1,350	—	—	—	—	—
	12	1	775	1,435	3,925	1,125	—	—	—	—	—
	16	1	775	1,080	3,925	845	—	—	—	—	—

For **SI**: 1 inch = 25.4 mm, 1 lbf = 4.45 N.

[1]The minimum of the tabulated values from Tables 5A, 5B and 5C must be used as the allowable load of the DSSCB series connectors.

[2]Maximum allowable load of strut channel connection to the steel supporting member may be increased at high concentrated loads by welding each flange of the strut channel to the steel supporting member, with a minimum weld length of 1inches, directly at clip location:

a. For strut channel with a 7/8-inch wide flange: F1 = 775 lb., F2 = 1,800 lb., F3 = 2,710 lb., and F4 = 3,200 lb.

b. For strut channel with a 1⅝-inch wide flange: F1 = 775 lb., F2 = 4,310 lb., F3 = 3,925 lb., and F4 = 1,745 lb.

[3]The allowable F2 and F4 loads must not exceed 865 pounds and 875 pounds, respectively, for DSSCB connectors located within 2 inches of a strut channel splice.

[4]Weld or screw spacing must not exceed the DSSCB connector or framing spacing.

[5]DSSCB connectors must be located at least 2 inches from the end of the strut channels. Maximum spacing of DSSCB connectors along the strut channel is 24 inches on center.

[6]Strut channels must comply with Section 3.2.6 of this report.

[7]The welds must be on each strut channel flange at the length and spacing specified in this report. Welding must comply with Section 4.2.1 and Figure 5C.

[8]The allowable loads for the strut channel fastened to structural steel supporting members using the specified screws are based on structural steel support members complying with Section 3.2.7 of this report. The tabulated values are also applicable for the strut channels attached to supporting members with another steel thickness provided the fastener has equivalent capacity to the tabulated values. A registered design professional must select the proper screw type, diameter and length based on the steel thickness installation.

[9]Predrilling of both the steel supporting member and concrete is recommended for installations where the steel supporting members are backed by concrete. For predrilling, use a maximum 3/16-inch diameter drill bit.

[10]Screws must be fastened through the solid steel portion of the strut channel (a minimum distance of 1.5 times the screw diameter from the edge of web punchout holes) and centered vertically in the web.

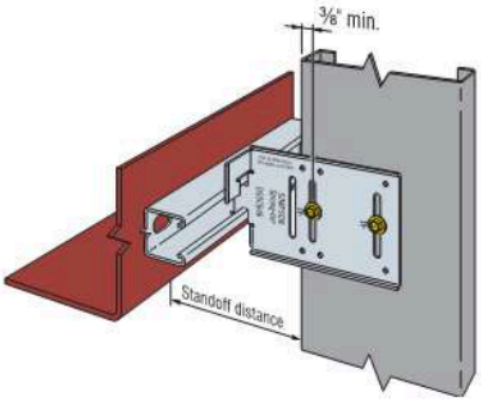
[11]Tabulated values for 7/8" x 1⅝" strut may be used for 13/16" x 1⅝" strut except F2 welded anchorage values are limited to a maximum load of 1,615 lb. If 13/16" struts are pierced, a load modifier per note 12 is required. See Figure 5C for channel dimension requirements.

[12]F1, F3 and F4 have no load reductions for allowed piercings. F2 has no load reductions for piercings, except for welded conditions as follows:

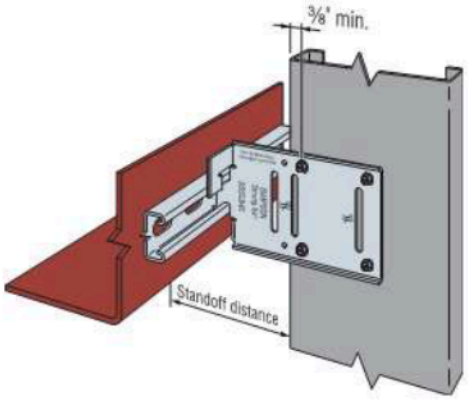
- For 9/16" hole at 1 7/8" o.c., multiply by 0.9;
- For 7/8" hole at 6" o.c., multiply by 0.9;
- For slotted hole (1⅛" x 9/16") at 2" o.c, multiply by 0.85.

For images of allowed piercing, reference Figure 5C.

[13]F2 weld capacities of the 1⅝" strut were limited by its strong axis bending.

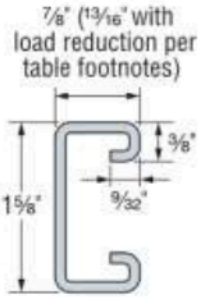


DSSCB Standoff Distance with 1⅝" Strut (1⅜" Strut Similar) and Minimum Fastener Edge Distance for Slide-Clip Application

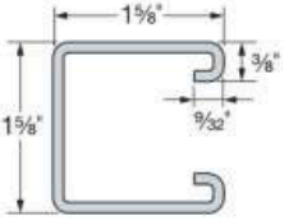


DSSCB Standoff Distance with 1⅜" Strut and Minimum Fastener Edge Distance for Fixed-Clip Application

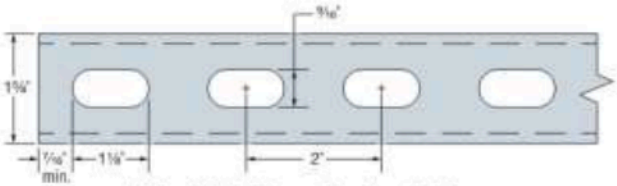
Struts must meet the strut channel dimensions, gauge, yield strength, and punch patterns shown in these requirements.



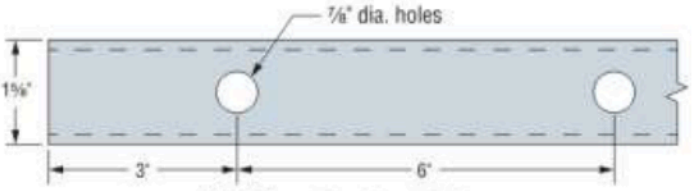
⅞" 12 ga. 33 ksi Strut Channel *(by others)*



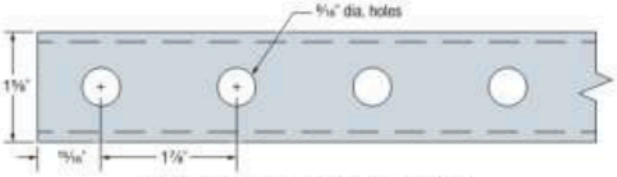
1⅝" 12 ga. 33 ksi Strut Channel *(by others)*



1⅛" x 9/16" @ 2" o.c. Punchout Pattern



⅞" @ 6" o.c. Punchout Pattern



9/16" @ 1⅞" o.c. Punchout Pattern



Unpunched Condition

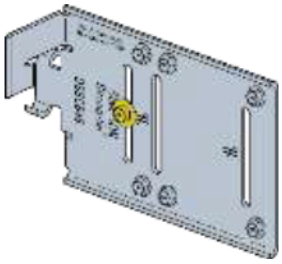
FIGURE 5C—DSSCB SERIES CONNECTORS STRUT CHANNEL CONNECTION TO STRUCTURAL STEEL SUPPORT

TABLE 5D—DSSCB46 BYPASS FIXED-CLIP CONNECTOR WITH ALTERNATE FASTENER CONNECTION ALLOWABLE STRESS DESIGN (ASD) LOAD[1,8]

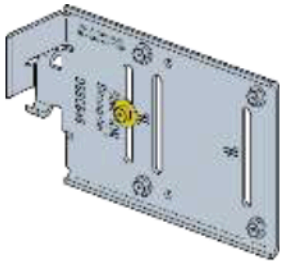
Model No.	Supported Framing Member Thickness (mils)	Fasteners to Supported Framing Member		Fasteners to Supporting Member	In-Plane, F1[5,6,7], Allowable Load (lbf)
		DSSCB to Stud Framing (Fastener Patterns K, L and M)[2]		DHSH to Strut Channel	
DSSCB46 & DSHS	54	4 – No.10 Screws[3] or 6 - No.10 Screws[3]	1 – No.14 Shouldered Screws[4]	1 – No.10 Screw[3]	455

For **SI:** 1 mil= 0.001 inch; 1 inch= 25.4 mm, 1 lbf= 4.45 N.

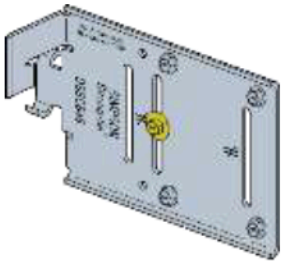
[1]The tabulated load value is for the connection of the DSSCB46 bypass fixed-clip connector to the curtain wall framing member. The allowable load values for connection of the connector to the steel supporting member, using the strut channel connection are in Table 5C of this report. The minimum tabulated load value from Table 5D and Table 5C must be used as the allowable load of the connection.
[2]See Figure 5D for the screw fastener placement to attach the connector to the curtain wall framing member.
[3] No. 10 self-drilling screws must comply with Section 3.2.3.2 of this report.
[4]No. 14 shouldered screws must comply with Section 3.2.2 of this report.
[5]See Figure 5B for load orientation.
[6]F1 load values are based on assembly tests with the load applied through the centerline of a 6-inch deep stud. A DSHS connector (fastened to the strut channel with one No. 10 self-tapping screw complying with Section 3.2.3.2 of this report) must be used at each DSSCB46 connector to transfer the F1 load from the connector to the strut channel.
[7]Interaction load analysis of the DSSCB46 connector with the DSHS clip for the combined F1 and F4 load directions is not required using the F1 in-plane loads in this table with the F4 allowable loads in Table 5B.
[8]For additional loads and important information, see Table 5B.



Pattern K



Pattern L



Pattern M

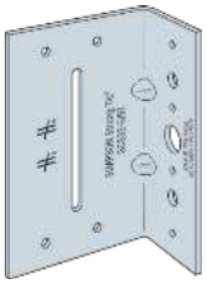
FIGURE 5D—DSSCB46 CONNECTOR: FIXED-CLIP APPLICATION ADDITIONAL IN-PLANE (F1) LOAD

TABLE 6A—SCS SERIES BYPASS SLIDE-CLIP CONNECTORS ALLOWABLE STRESS DESIGN (ASD) LOADS[1]

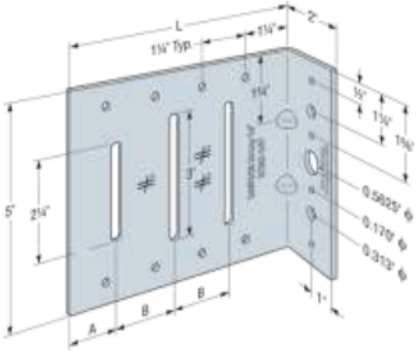
Model No.	Supported Framing Member Depth (inches)	Supported Framing Member Thickness (mil)	Fasteners to Supported Framing Member		Maximum Standoff Distance (inches)	Allowable Loads (lbf)		
						Load Direction[4]		
			Fastener Pattern Number[2]	Quantity of Shouldered Screws[3]		F1[5]	F2	F3
SCS32-5/97	3½	33	S1	2	1½	190	395	395
SCS62-5/97	6		S1	3	1½	190	590	705
			S2	3	3	190	590	705
SCS62-5/118	6		S1	3	1½	250	605	705
			S2	3	3	250	605	705
SCS82-5/118	8		S1	3	1½	250	605	705
			S2	3	3	250	605	705
SCS32-5/97	3½	43	S1	2	1½	290	500	500
SCS62-5/97	6		S1	3	1½	350	830	1,080
			S2	3	3	335	830	1,080
SCS62-5/118	6		S1	3	1½	435	875	1,080
			S2	3	3	435	875	1,080
SCS82-5/118	8		S1	3	1½	435	875	1,080
			S2	3	3	435	875	1,080
SCS32-5/97	3½	54	S1	2	1½	535	890	890
SCS62-5/97	6		S1	3	1½	655	1,520	1,880
			S2	3	3	620	1,520	1,600
SCS62-5/118	6		S1	3	1½	655	1,795	2,185
			S2	3	3	620	1,795	2,185
SCS82-5/118	8		S1	3	1½	655	1,795	2,185
			S2	3	3	620	1,795	2,185
SCS32-5/97	3½	68	S1	2	1½	535	925	925
SCS62-5/97	6		S1	3	1½	705	1,695	2,000
			S2	3	3	665	1,695	1,705
SCS62-5/118	6		S1	3	1½	705	2,065	2,325
			S2	3	3	665	2,065	2,325
SCS82-5/118	8		S1	3	1½	705	2,065	2,325
			S2	3	3	665	2,065	2,325
SCS32-5/97	3½	97	S1	2	1½	650	925	925
SCS62-5/97	6		S1	3	1½	975	1,695	2,000
			S2	3	3	925	1,695	1,705
SCS62-5/118	6		S1	3	1½	975	2,065	2,325
			S2	3	3	925	2,065	2,325
SCS82-5/118	8		S1	3	1½	975	2,065	2,325
			S2	3	3	925	2,065	2,325

For **SI:** 1 mil = 0.0254 mm, 1 inch = 25.4 mm, 1 lbf = 4.45 N.

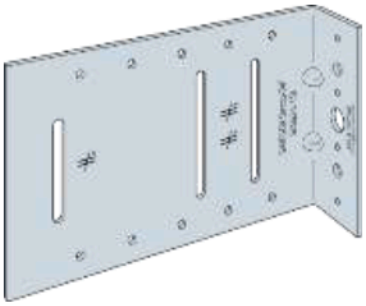
[1]The tabulated load values are for the connection of the SCS series bypass slide-clip connectors to the curtain wall framing member. The allowable load values for connection of the connector to the steel supporting member are in Table 6C of this report. The minimum tabulated load value from Table 6A and Table 6C must be used as the allowable load of the connection.
[2]See Figure 6A for shouldered screw fastener pattern placement for attachment of the connector to the supported framing.
[3]Shouldered screws must comply with Section 3.2.2 of this report and be located at the center of the slotted hole in the connector, adjacent to the "no equal" symbol on the connector.
[4]See Figure 6A for load orientation.
[5]F1 load values are based on assembly tests with the load applied through the centerline of the stud.



SCS32-5/97

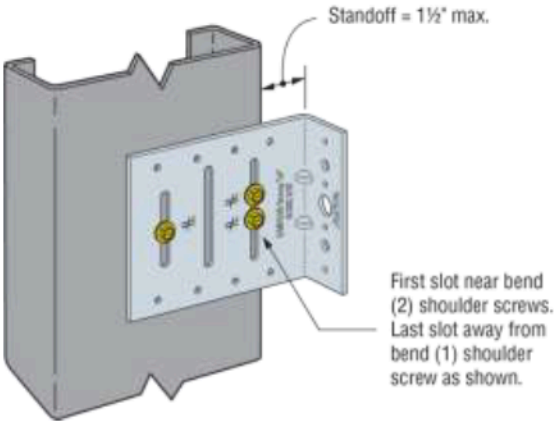


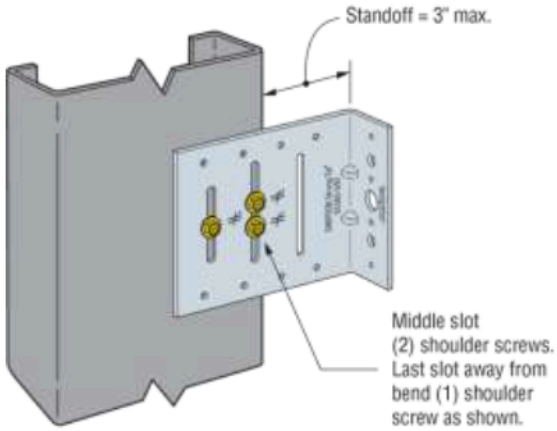
SCS62-5/97, SC62-5/118



SCS82-5/118

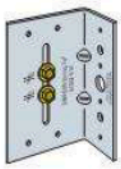
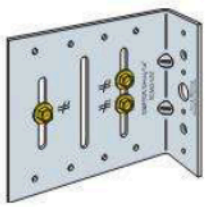
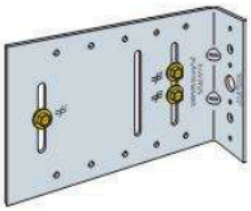
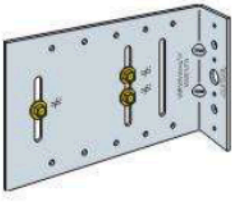
SCS62-5/97
1½-inch Maximum Standoff
(Pattern S1)

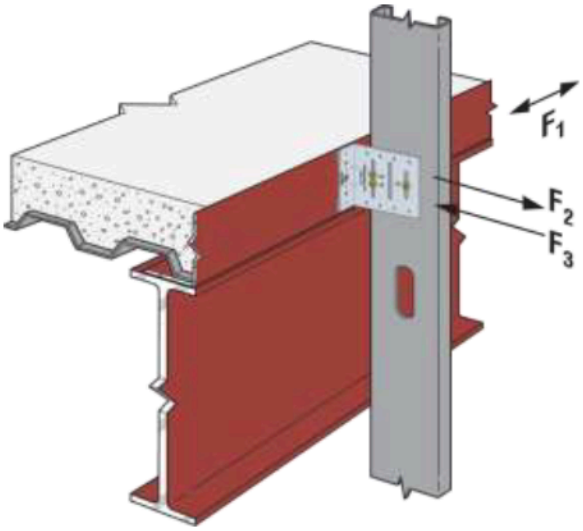




SCS62-5/97
3-inch Maximum Standoff
(Pattern S2)

Fastener Patterns: Slide-Clip Conditions

Model No.	Pattern S1	Pattern S2
SCS32-5/97		
SCS62-5/97 SCS62-5/118		
SCS82-118		



Typical SCS Bypass Slide-Clip Installation

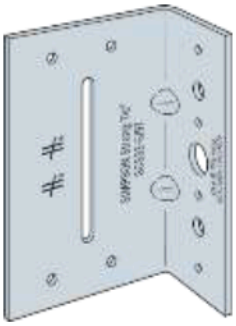
FIGURE 6A—SCS BYPASS SLIDE-CLIP CONNECTORS AND INSTALLATION DETAILS

TABLE 6B—SCS SERIES BYPASS FIXED-CLIP CONNECTORS ALLOWABLE STRESS DESIGN (ASD) LOADS[1]

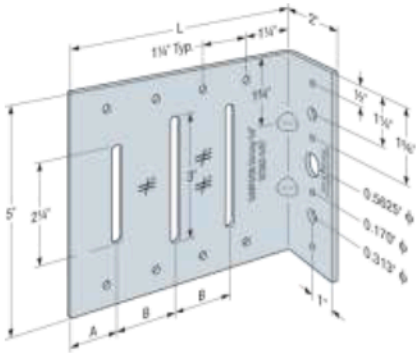
Model No.	Supported Framing Member Depth (inches)	Supported Framing Member Thickness (mils)	Fasteners to Supported Framing Member		Maximum Standoff Distance (inches)	Allowable Loads (lbf)			
						Load Direction[4]			
			Fastener Pattern	Quantity of No. 10 Self-Drilling Screws		F1	F2	F3	F4
SCS32-5/97	3	33	R1	4	1	160	705	705	705
SCS62-5/97	6		R1	6	2¼	145	1,060	1,060	650
			R2	8	1	175	1,415	1,415	995
SCS62-5/118	6		R1	6	2¼	165	1,060	1,060	650
			R2	8	1	175	1,415	1,415	995
SCS82-5/118	8		R1	8	2¼	165	1,415	1,415	640
			R2	10	1	175	1,765	1,765	975
SCS32-5/97	3	43	R1	4	1	200	1,050	1,050	1,050
SCS62-5/97	6		R1	6	2¼	190	1,580	1,580	970
			R2	8	1	225	2,105	2,105	1,480
SCS62-5/118	6		R1	6	2¼	210	1,580	1,580	970
			R2	8	1	265	2,105	2,105	1,480
SCS82-5/118	8		R1	8	2¼	210	2,105	2,105	950
			R2	10	1	265	2,630	2,105	1,455
SCS32-5/97	3	54	R1	4	1	395	2,135	2,135	1,405
SCS62-5/97	6		R1	6	2¼	345	3,205	2,380	1,970
			R2	8	1	410	4,275	3,275	3,005
SCS62-5/118	6		R1	6	2¼	385	3,205	2,550	1,970
			R2	8	1	480	4,275	3,510	3,005
SCS82-5/118	8		R1	8	2¼	385	4,275	2,550	1,935
			R2	10	1	480	4,540	3,510	2,950
SCS32-5/97	3	68	R1	4	1	430	2,160	2,160	1,405
SCS62-5/97	6		R1	6	2¼	410	3,240	2,380	1,970
			R2	8	1	435	4,320	3,275	3,005
SCS62-5/118	6		R1	6	2¼	535	3,240	2,550	1,970
			R2	8	1	540	4,320	3,510	3,005
SCS82-5/118	8		R1	8	2¼	535	4,320	3,120	1,935
			R2	10	1	675	4,720	4,290	2,950
SCS32-5/97	3	97	R1	4	1	615	2,160	2,160	1,405
SCS62-5/97	6		R1	6	2¼	770	3,240	2,380	1,970
			R2	8	1	770	4,320	3,275	3,005
SCS62-5/118	6		R1	6	2¼	770	3,240	2,550	1,970
			R2	8	1	770	4,320	3,510	3,005
SCS82-5/118	8		R1	8	2¼	770	4,320	3,120	1,935
			R2	10	1	770	4,720	4,290	2,950

For **SI:** 1 mil = 0.0254 mm, 1 inch = 25.4 mm, 1 lbf = 4.45 N.

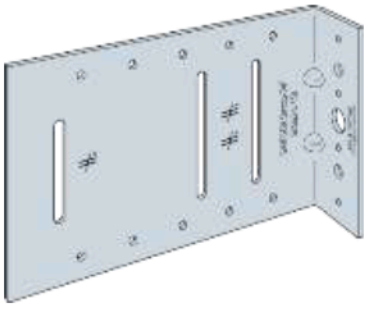
[1]The tabulated load values are for the connection of the SCS series bypass fixed-clip connectors to the curtain wall framing member. The allowable load values for connection of the connector to the steel supporting member are in Table 6C of this report. The minimum tabulated load value from Table 6B and Table 6C must be used as the allowable load of the connection.
[2]See Figure 6B for self-drilling screw fastener pattern placement for attachment of the connector to the supported framing.
[3]Self-drilling screws must comply with Section 3.2.3.2 of this report.
[4]See Figure 6B for load orientation.
[5]F1 load values are based on assembly tests with the load applied through the centerline of the stud.



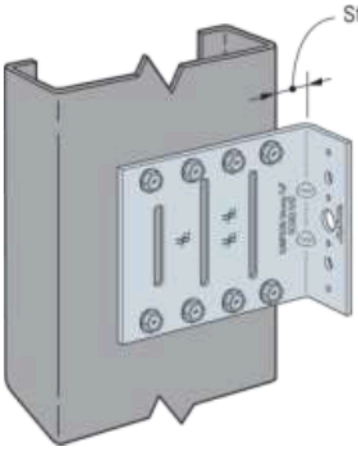
SCS32-5/97

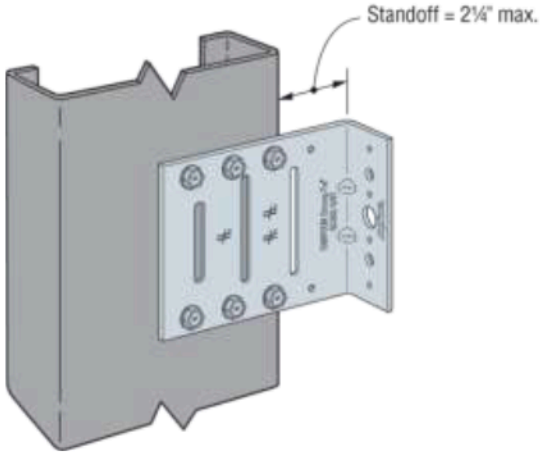


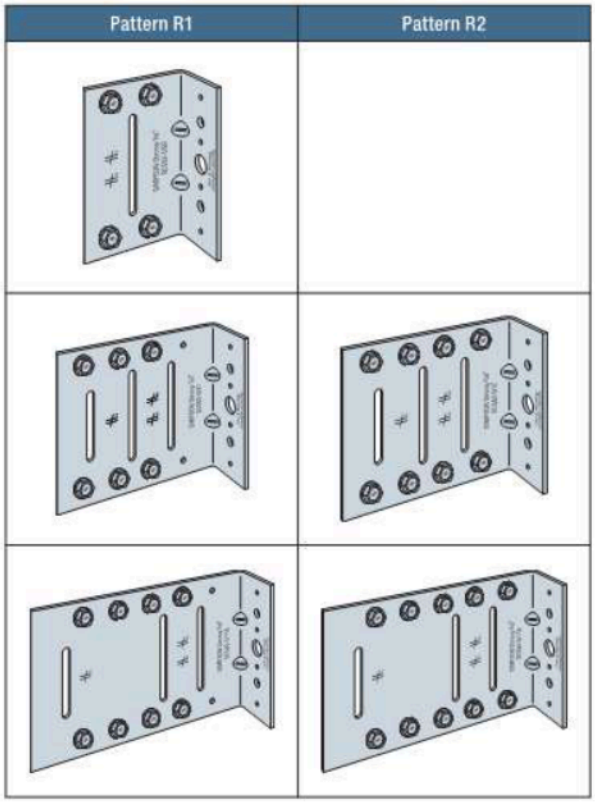
SCS62-5/97, SC62-5/118



SCS82-5/118







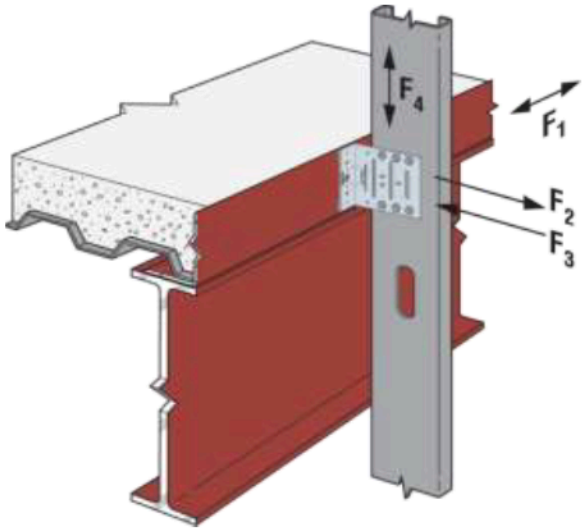


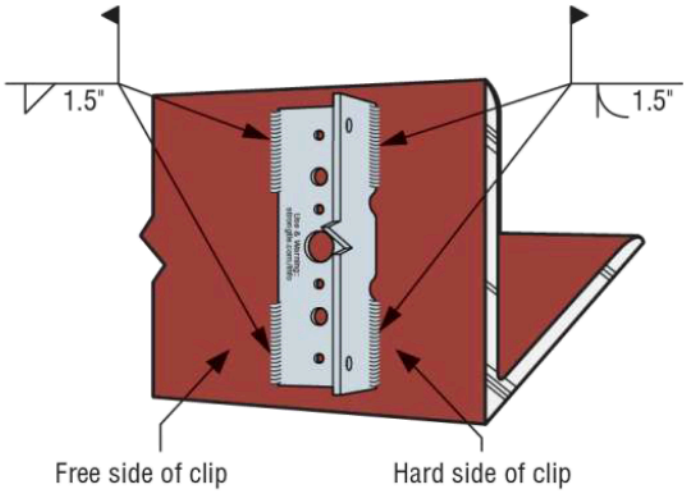
FIGURE 6B—SCS SERIES BYPASS FIXED-CLIP CONNECTORS AND INSTALLATION DETAILS

TABLE 6C—SCS SERIES CONNECTOR CONNECTION TO STEEL SUPPORTING MEMBER ALLOWABLE STRESS DESIGN (ASD) LOADS[1]

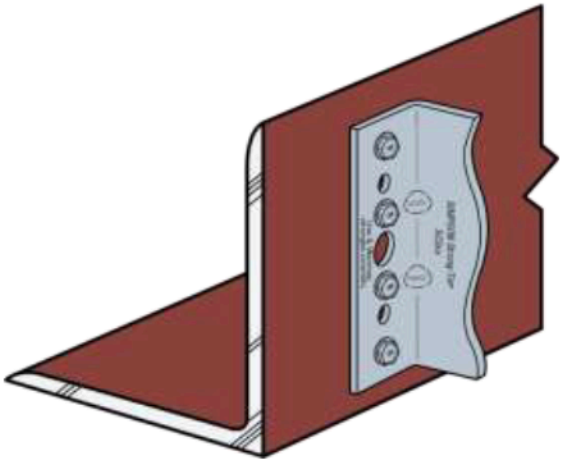
Connection Type[2]	Minimum Base Material of Steel Supporting Member	Fastener Quantity	Allowable Loads[3] (lbf) Load Direction[4]		
			F1	F2 and F3	F4
No. 12 Self-Drilling Screws	A36 Steel $^{3}/_{16}$-inch thick	3	730	1,910	1,475
		4	975	2,545	2,950
Welded E70XX electrodes	A36 Steel $^{3}/_{16}$-inch thick	(2) Hard Side: 1.5 inches (2) Free Side: 1.5 inches	1,700	4,720	3,480

For **SI:** 1 mil = 0.0254 mm, 1 inch = 25.4 mm, 1 lbf = 4.45 N.

[1]Tabulated allowable loads are based on connection capacity of SCS connectors to structural steel member and do not consider the SCS connector attachment to the supported member. The minimum tabulated load value from Table 6A, 6B and 6C must be used as the allowable load of the connection.
[2]See Figure 6C of this report for connection details. Self-drilling screws must comply with Section 3.2.3.1 of this report. Welding must comply with Section 4.2.1 and Figure 6C of this report.
[3]Allowable loads are based on fastening or welding of the connector to structural steel members complying with Section 3.2.7 of this report.
[4]See Figure 6A and 6B for load orientation.



SCS– Welded Connection



SCS – Self-Drilling Screws Connection

FIGURE 6C—SCS CONNECTOR CONNECTION TO STRUTURAL STEEL MEMBER INSTALLATION DETAILS

TABLE 7—SFC SERIES STEEL FRAMING CONNECTORS ALLOWABLE STRESS DESIGN (ASD) LOADS

Model No.	L (inches)	Framing Member Depth (inches)	Quantity of No. 10 Self-drilling Screws[1]			Allowable F4 Loads[3] (lbf)			
			Pattern[2]	Connection to Supported Member	Connection to Supporting Member	Minimum Framing Member Thickness(mils)			Maximum Load Capacity[4]
						33	43	54	
LSFC2.25	2¼	3⅝	Min.	2	2	295	310	475	585
SFC2.25	2¼	3⅝	Min.	2	2	295	355	585	585
LSFC4.25	4¼	6	Min.	2	2	355	525	690	1,615
			Max.	6	6	440	750	1,320	
SFC4.25	4¼	6	Min.	2	2	355	525	690	1,615
			Max.	6	6	575	750	1,615	
LSFC6.25	6¼	8	Min.	4	4	490	920	1,475	2,440
			Max.	8	8	510	920	1,495	
SFC6.25	6¼	8	Min.	4	4	590	920	1,840	2,440
			Max.	*8*	*8*	590	920	1,880	

For **SI:** 1 mil = 0.0254 mm, 1 inch = 25.4 mm, 1 lbf = 4.45 N.

[1]Self-drilling screws must comply with Section 3.2.3.2 of this report.
[2]A screw must be installed into each of the round holes in the connector for the minimum fastener pattern. A screw must be installed into all of the round and triangle-shaped holes for the maximum fastener pattern.
[3]The allowable loads are based on the members being braced within 12 inches of the connection.
[4]For methods of attachment of the connectors that differ from the screw attachment described in this table, the capacity of the connection is to be designed to the satisfaction of the code official, but not to exceed the tabulated maximum load capacity values.

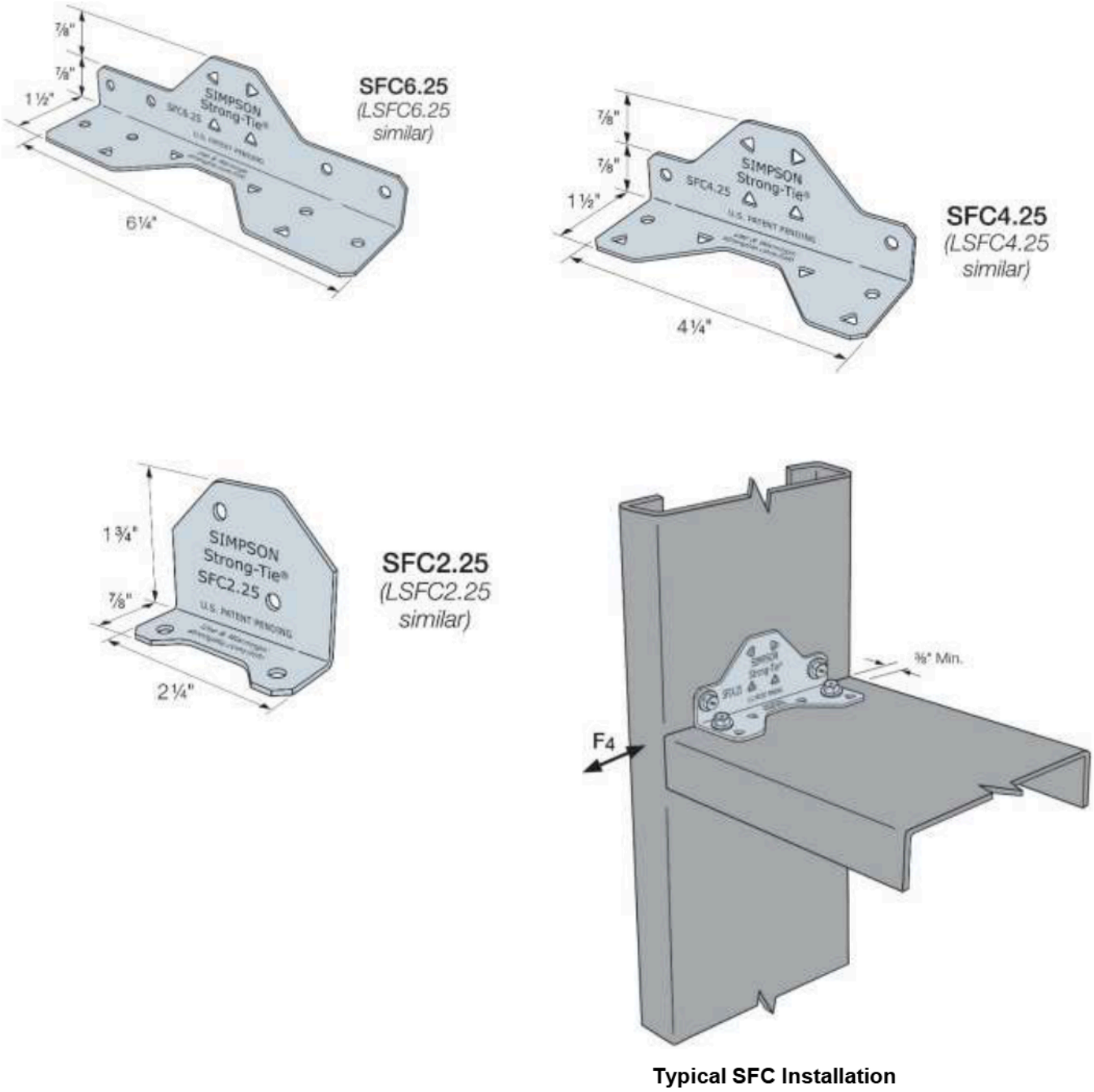


FIGURE 7—SFC SERIES STEEL FRAMING CONNECTORS AND INSTALLATION DETAILS

TABLE 7A—SFC STEEL FRAMING CONNECTOR INSTALLATION WITH U-CHANNEL BRIDGING ALLOWABLE STRESS DESIGN (ASD) LOADS[1]

Model No.	Connector Length, (inches)	Wall Framing Member Depth, (inches)	Wall Framing Member Thickness (mils)	Quantity of No. 10 Fasteners[2]		Laterally Loaded Wall Stud	Axially Loaded Wall Stud	
				Connection to Stud	Connection to U-Channel Bridging[3]	Maximum Brace-to Wall Stud Connection Torsional Resisting Moment[4] (inch-lbf)	Brace Maximum Allowable Axial Load Strength[3] (lbf)	Brace Stiffness (lbf/in.)[5]
SFC4.25	4¼	6	33	2	2	275	125	860
			43	2	2	510	190	1,220
			54	2	2	645	280	2,045

For **SI:** 1 mil = 0.0254 mm, 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1 inch-lbf = 0.113 N-m, 1 lbf/in = 175 N/m.

[1]For the design of axially loaded studs, the tabulated brace stiffness shall also be considered in accordance with the stiffness requirements given in Section C2.3 of AISI S100-16 and Section D3.3 of AISI S100-12. The tabulated brace stiffness is based on 10 percent of nominal axial load. Allowable torsional resisting moment, brace axial strength, and brace stiffness values are for use with Section C2.2.1 and C2.3 of AISI S100-16 and Sections D3.2.1 and D3.3 of AISI S100-12.
[2]Self-drilling screws must comply with Section 3.2.3.2 of this report.
[3]U-channel bridging must comply with Section 3.2.5 of this report. For axial compression load on the U-channel member, a buckling analysis of the U-channel member must be by registered design professional.
[4]For use under Load Resistance Factor Design (LRFD), the tabulated ASD load values must be multiplied by 1.6.
[5]Tabulated stiffness values apply to both ASD and LRFD.

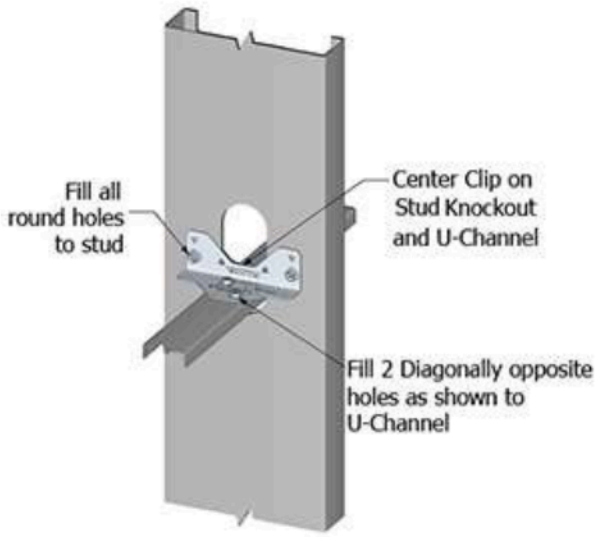


FIGURE 7A—SFC FRAMING CONNECTOR U-CHANNEL BRIDGING

TABLE 8A—SSC SERIES CONNECTORS, FRAMING MEMBER END SUPPORT APPLICATIONS, ALLOWABLE STRESS DESIGN (ASD) LOADS

Model No.	L (inches)	Supported Member Depth (inches)	Quantity of No. 10 Self-Drilling Screws[1]			Allowable F4 Loads[3,4] (lbf)			
			Pattern[2]	Supported Member	Supporting Member	Minimum Framing Member Thickness (mils)			Maximum Connector Load[5]
						33	43	54	
SSC2.25	2¼	3⅝	Minimum	3	2	165	225	345	635
MSSC2.25	2¼	3⅝	Minimum	3	2	165	225	345	635
LSSC4.25	4¼	6	Minimum	2	2	215	440	675	1,490
			Maximum	5	4	215	440	795	
			Outer	4	4	200	310	545	
SSC4.25	4¼	6	Minimum	2	2	355	525	890	1,490
			Maximum	5	4	365	600	1,005	
			Outer	4	4	235	345	650	
MSSC4.25	4¼	6	Minimum	2	2	355	525	890	1,490
			Maximum	5	4	365	600	1,005	
			Outer	4	4	235	345	650	
LSSC6.25	6¼	8	Minimum	4	4	265	545	1,190	2,395
			Maximum	7	6	265	545	1,190	
			Outer	6	4	270	375	765	
SSC6.25	6¼	8	Minimum	4	4	385	720	1,190	2,395
			Maximum	7	6	385	720	1,190	
			Outer	6	4	270	460	725	
MSSC6.25	6¼	8	Minimum	4	4	385	720	1,190	2,395
			Maximum	7	6	385	720	1,365	
			Outer	6	4	270	460	725	

For **SI:** 1 mil = 0.0254 mm, 1 inch = 25.4 mm, 1 lbf = 4.45 N.

[1] Self-drilling screws must comply with Section 3.2.3.2 of this report.
[2] A screw must be installed into each of the round holes in the connector for the minimum fastener pattern. A screw must be installed into all of the round and triangle-shaped holes for the maximum fastener pattern. The outer fastener pattern is described in Figure 8A.
[3] See Figure 8A for load direction and installation details.
[4] The allowable loads are based on the framing members being braced within 12 inches of the connection.
[5] For methods of attachment of the connectors that differ from the screw attachment described in this table, the capacity of the connection is to be designed to the satisfaction of the code official, but not to exceed the tabulated maximum connector load capacity values.

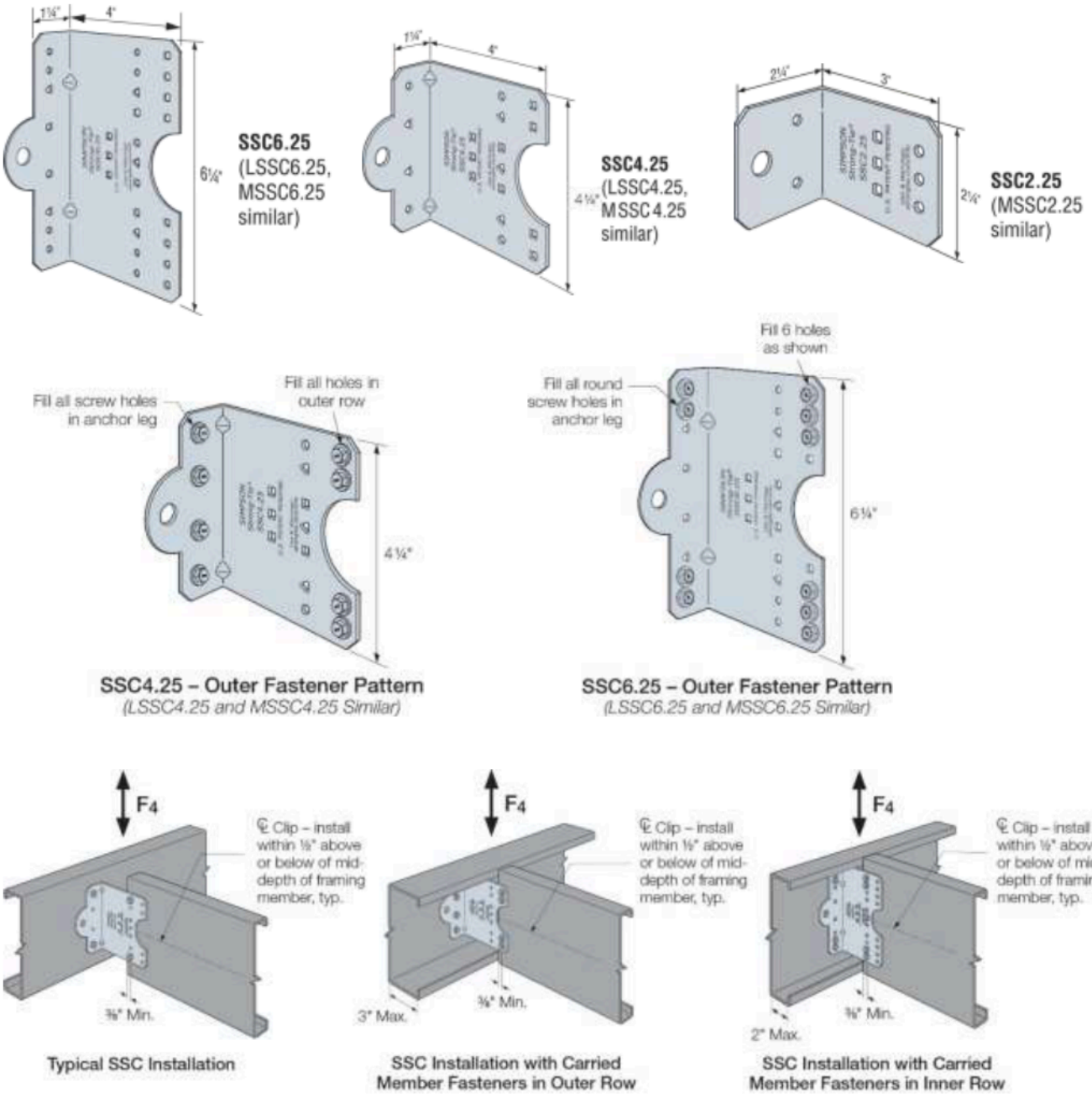


FIGURE 8A—SSC CONNECTORS AND INSTALLATION DETAILS

TABLE 8B—SSC SERIES CONNECTORS, FIXED-CLIP CURTAIN WALL BYPASS FRAMING APPLICATIONS, ALLOWABLE STRESS DESIGN (ASD) LOADS

Model No.	L (inch)	Fasteners[1,2]		Allowable Loads[3,4] (lbf)											
				Supported Member Thickness (mils)											
		Supporting Member Connection	Supported Member Connection	33				43				54			
				F1[5]	F2	F3	F4	F1[5]	F2	F3	F4	F1[5]	F2	F3	F4
SSC4.25	4¼	3 - No.12	4 - No.10	40	705	705	700	40	870	1,050	850	40	935	1,265	850
		3 – PDPAT[4]	4 – No. 10	40	705	705	700	40	780	1,050	850	40	780	1,265	850
MSSC4.25	4¼	3 - No. 12	4 – No. 10	105	705	705	705	105	1,050	1,050	850	105	1,265	1,265	850
		3 – PDPAT[4]	4 – No.10	105	705	705	705	105	780	1,050	850	105	780	1,265	850

For **SI:** 1 mil = 0.0254 mm, 1 inch = 25.4 mm, 1 lbf = 4.45 N.

[1]See Figure 8B for fastener placement.
[2]No. 12 self-drilling screws must comply with Section 3.2.3.1 of this report. No. 10 self-drilling screws must comply with Section 3.2.3.2 of this report. PDPAT fasteners must comply with Section 3.2.10 of this report.
[3]See Figure 8B for load orientation.
[4]Tabulated load values are based on the connectors being attached to supporting structural steel members complying with Section 3.2.7 of this report.
[5]The F1 allowable loads are based on assembly tests with the loads applied at the centroid of the fastener pattern of the fasteners attaching the connector to the curtain wall framing member, with no rotational restraint provided to the wall framing member.

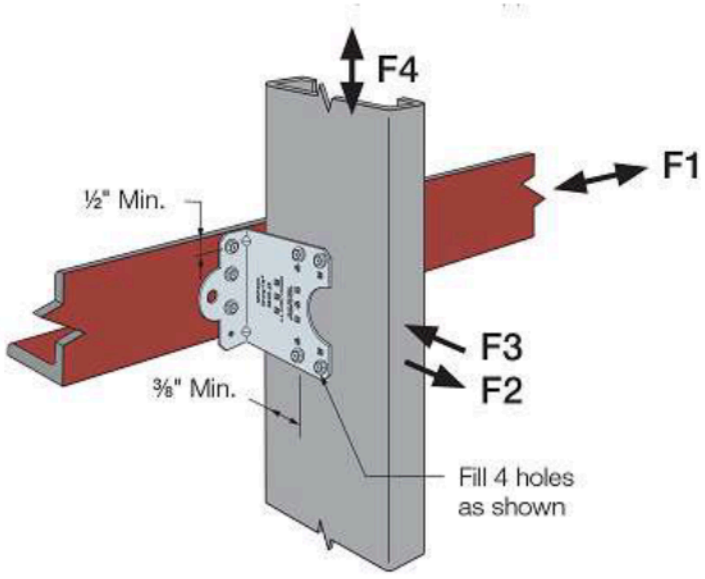


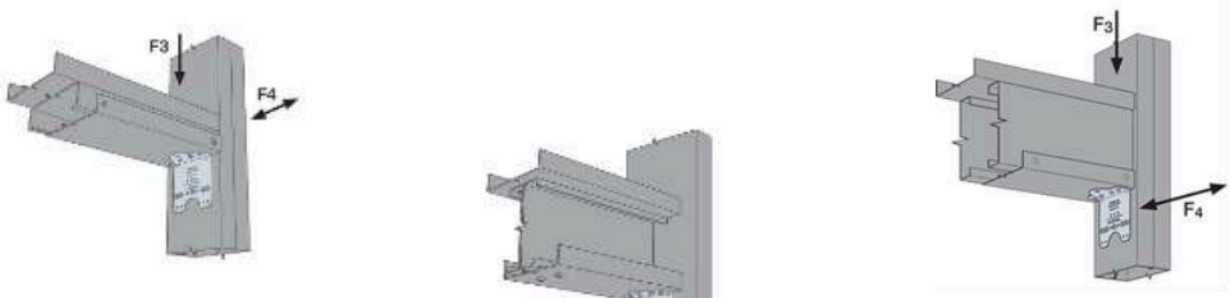
FIGURE 8B—SSC BYPASS FIXED-CLIP APPLICATION AND INSTALLATION DETAILS

TABLE 8C—SSC SERIES CONNECTORS, HEADER APPLICATION, ALLOWABLE STRESS DESIGN (ASD) LOADS[1]

Model No.	L (inches)	Jamb Stud Depth (inches)	Quantity of No. 10 Self-drilling Screws[3]			Jamb & Header Thickness (mils)	Allowable F3 Loads[4] (lbf)		Allowable F4 Loads (lbf)
			Pattern[2]	Connection to Jamb	Connection to Header		Nested Stud & Track Header	Back to Back Header	
LSSC4.25	4¼	6	Maximum	5	4	33	140	455	215
						43	220	835	440
SSC4.25	4¼	6	Maximum	5	4	54	375	1,325	1,005
						68	570	1,325	1,005
LSSC6.25	6¼	8	Maximum	7	6	33	160	455	265
						43	250	915	545
SSC6.25	6¼	8	Maximum	7	6	54	410	1,395	1,190
						68	640	1,395	1,190

For **SI:** 1 mil = 0.0254 mm, 1 inch = 25.4 mm, 1 lbf = 4.45 N.

[1]The Box Headers must be as shown in Figure 8C of this report.
[2] A screw must be installed into all of the round and triangular-shaped holes for the maximum fastener pattern.
[3]No. 10 self-drilling screws must comply with Section 3.2.3.2 of this report. The entire pointed portion of the fastener shall penetrate through the base steel.
[4]Web crippling of the header must be evaluated by a registered design professional, with the allowable load values reduced as needed.



Nested Stud and Track Box Header **Back-to-back Header**

Box Headers

FIGURE 8C—SSC SERIES CONNECTORS HEADER APPLICATION AND INSTALLATION DETAILS

TABLE 8D—SSC SERIES CONNECTORS BASE OF JAMB APPLICATION, ALLOWABLE STRESS DESIGN (ASD) LOADS[1,2]

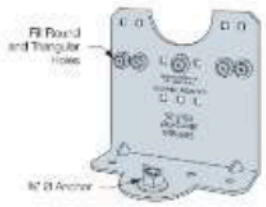
Model No.	L (inches)	Stud Member Depth (inches)	Fasteners[3]		Wall Stud Steel Thickness, mil (gauge)	Allowable F4 Load[6] (lbf)
			Anchor Diameter (inch)[4]	Stud Fasteners[5]		
SSC2.25	2¼	3⅝	⅜	3- No.10	33 (20)	430
					43 (18)	605
					54 (16)	940
SSC4.25	4¼	6	⅜	5-No. 10	33 (20)	460
					43 (18)	750
					54 (16)	1,190
SSC6.25	6¼	8	⅜	7- No. 10	33 (20)	515
					43 (18)	790
					54 (16)	1,220

For **SI:** 1 mil = 0.0254 mm, 1 inch = 25.4 mm, 1 lbf = 4.45 N.

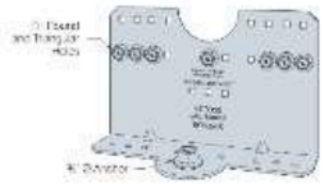
[1]Tabulated load values are based on the wall framing member and track having the same thickness, and one No. 10 self-drilling screw fastened into each stud flange.
[2]Tabulated load values assume adequate torsional bracing is provided. Bracing design must be determined by registered design professional.
[3]See Figure 8D for fastener placement.
[4]Steel anchor must comply with ASTM A307 Grade A or ASTM F1554 Grade 36 as indicated in Section 3.1.1 of this report. Anchorage to concrete must be designed by a registered design professional.
[5]No. 10 self-drilling screws must comply with Section 3.2.3.2 of this report.
[6]See Figure 8D for load orientation.



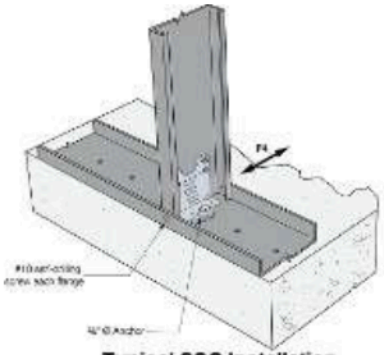
SSC2.25 Fastener Pattern



SSC4.25 Fastener Pattern



SSC6.25 Fastener Pattern



Typical SSC Installation

FIGURE 8D—SSC SERIES CONNECTOR BASE OF JAMB APPLICATION INSTALLATION DETAILS

TABLE 8E—SSC SERIES CONNECTORS RAFTER CONNECTION APPLICATION ALLOWABLE STRESS DESIGN (ASD) LOADS[1]

Model No.	L (inch)	Fasteners[2,3]		Allowable Loads[4,5] (lbf)		
		Connection to Supporting Steel Member	Connection to Supported Member	43 mil Supported Member Thickness		
				F2	F3	F4
SSC4.25	4¼	2 – No.12	5 – No.10	710	1,125	595
MSSC4.25	4¼	2 – No.12	5 – No.10	710	1,395	595

For **SI:** 1 mil = 0.0254 mm, 1 inch = 25.4 mm, 1 lbf = 4.45 N.

[1]Tabulated load values are based on a 6-inch deep supported rafter member. Web crippling of the supported rafter member must be considered in the design of deeper rafter members by a registered design professional.
[2]See Figure 8E for fastener placement.
[3]No. 12 self-drilling screws must comply with Section 3.2.3.1 of this report. No. 10 self-drilling screws must comply with Section 3.2.3.2 of this report.
[4]See Figure 8E for load orientation.
[5]Tabulated load values are based on fasteners attached to supporting structural steel members complying with Section 3.2.10 of this report.

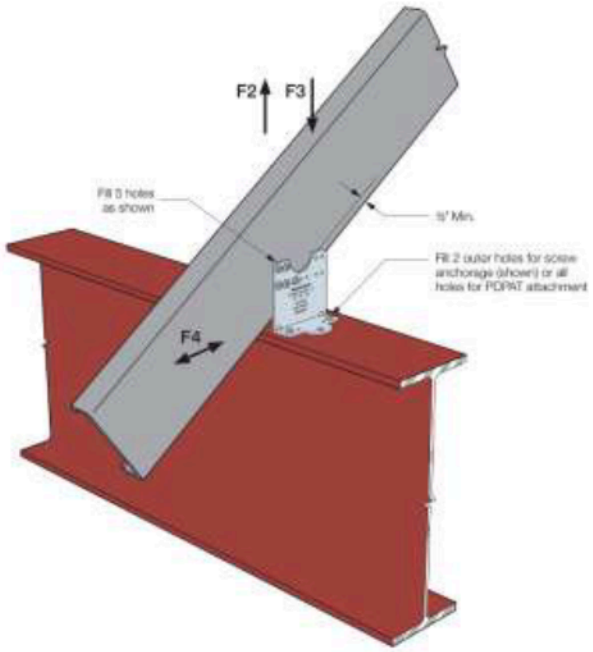


FIGURE 8E—SSC SERIES CONNECTOR RAFTER CONNECTION APPLICATION INSTALLATION DETAILS

TABLE 8F—SSC CONNECTOR U-CHANNEL WALL BRIDGING APPLICATION ALLOWABLE STRESS DESIGN (ASD) LOADS[5]

Model No.	Connector Length, (inches)	Wall Framing Member Depth, (inches)	Wall Framing Member Thickness (mils)	Quantity of No. 10 Self-drilling Screws[1]		Laterally Loaded Wall Stud	Axially Loaded Wall Stud	
				Connection to Wall Stud	Connection to U-Channel Bridging[2]	Maximum Brace-to Wall Stud Connection Torsional Resisting Moment[3] (inch-lbf)	Brace Maximum Allowable Axial Load Strength[3] (lbf)	Brace Stiffness[4] (lbf/inch)
SSC 4.25	4¼	6	54	2	2	655	280	2,045
			68	2	2	805	335	2,305
			97	2	2	920	660	4,230

For **SI:** 1 mil = 0.0254 mm, 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1 inch-lbf = 0.113 N-m, 1 lbf/in = 175 N/m.

[1]Self-drilling screws must comply with Section 3.2.3.2 of this report.
[2]U-channel bridging must comply with Section 3.2.5 of this report. For axial compression load on the U-channel member, a buckling analysis of the U-channel member must be by registered design professional.
[3]For use under Load Resistance Factor Design (LRFD), the tabulated ASD load values must be multiplied by 1.6.
[4]Tabulated stiffness values apply to both ASD and LRFD.
[5]For the design of axially loaded studs, the tabulated brace stiffness shall also be considered in accordance with the stiffness requirements given in Section C2.3 of AISI S100-16 and Section D3.3 of AISI S100-12. The tabulated brace stiffness is based on 10 percent of nominal axial load. Allowable torsional resisting moment, brace axial strength, and brace stiffness values are for use with Section C2.2.1 and C2.3 of AISI S100-16 and Sections D3.2.1 and D3.3 of AISI S100-12.

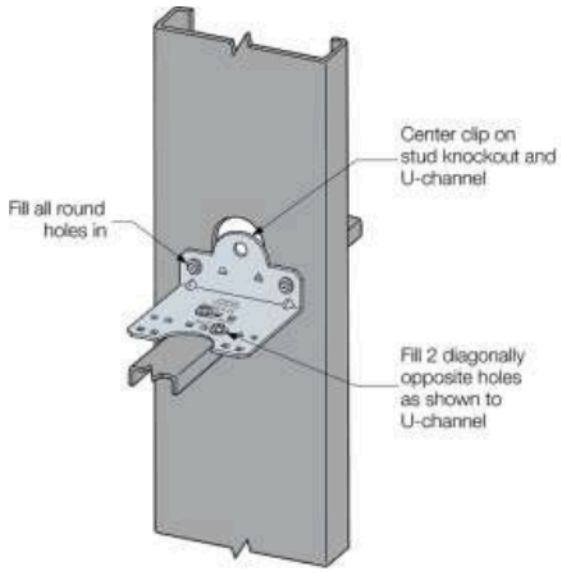


FIGURE 8F—SSC CONNECTOR U-CHANNEL WALL BRIDGING APPLICATION INSTALLATION DETAILS

TABLE 8G—MSSC SERIES CONNECTORS KNEE WALL APPLICATION ALLOWABLE STRESS DESIGN (ASD) LOADS[1,2,3]

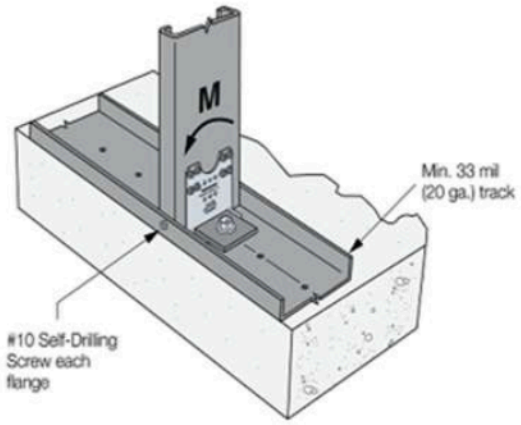
Model No.	L (inches)	Wall Framing Member Stud Designation	Fastener Requirements[4]		Wall Stud Thickness (mils)	Maximum Allowable Moment, M (in.-lbf)	Anchor Tension Load at Allowable Moment[7] (lbf)	Rotational Stiffness for Wall Defl. (inch-lbf/radian)[8,9]
			Anchor Diameter[5] (inch)	Connection to Wall Stud[6]				
MSSC4.25KW	4¼	600S162	⅜	8 – No. 10	33	3,135	1,610	64,800
					43	4,320	2,305[10]	
					54	5,830	3,300[10]	
MSSC6.25KW	6¼	800S162	⅜	12– No.10	33	3,845	1,290	110,350
					43	3,845	1,290	
					54	8,350	2,980[10]	

For **SI:** 1 mil = 0.0254 mm, 1 inch = 25.4 mm, 1 lbf = 4.45 N, 1 inch-lbf = 0.113 N-m, 1 inch-lbf/radian = 0.113 N-m/radian.

[1]Tabulated moment values are based on the maximum connector strength. Serviceability has not been considered. A registered design professional must analyze wall deflections using the connection's tabulated rotational stiffness values.
[2]Anchor tension loads may be reduced by linear interpolation for design moments less than the tabulated maximum allowable moment values.
[3]Tabulated moment values are based on minimum 33 mil thick steel track, and having a minimum 1¼-inch wide flange (600T125-33 or 800T125-33) with one No. 10 self-drilling screw fastened into each wall stud flange.
[4]See Figure 8G for fastener placement.
[5]Steel anchor must comply with Section 3.2.11 of this report. BP ½-3 bearing plate must comply with Section 3.2.8 of this report and must be installed as shown in Figure 8G. For ASTM A307 Grade A or ASTM F1554 Grade 36, ⅜-inch-diameter anchor bolts, the tabulated values for the connectors are limited to a maximum anchor bolt tension load of 2200 lbf. Anchorage to concrete must be designed by registered design professional.
[6]No. 10 self-drilling screws must comply with Section 3.2.3.2 of this report. The entire pointed portion of the fastener shall penetrate through the base steel.
[7]Tabulated anchor tension load at allowable moment values are based on AISC Steel Design Guide 1, Section 3.4 - Design of Column Base Plates with Large Moments. The minimum concrete compression strength, f'_c is 3,000 psi (20.68 MPa) and the concrete bearing limit is based on the following bearing ratio:

$$(A2/A1)^{0.5} \geq 2$$

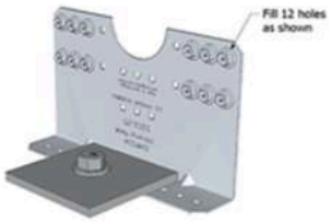
where A1 is the connector bearing area and A2 is area of the concrete supporting surface. The allowable moment and allowable anchor tension shall be reduced as required if concrete bearing ratio is less than 2.
[8]Tabulated rotational stiffness values are applicable for walls up to 38 inches tall. For taller walls, the registered design professional must also consider additional deflection due to bending in the studs.
[9]In calculating wall deflections, the component and cladding wind loads are not to be reduced in accordance with IBC Table 1604.3, Footnote f, since the tabulated rotational stiffness values have been increased for use with unreduced wind loads. For other loading conditions, the tabulated rotational stiffness values must be reduced by a multiplication factor of 0.7.
[10]Tabulated allowable tension loads for the connectors with ⅜-inch-diameter anchor bolts require ASTM F3125 Grade A325 or ASTM A449 high strength bolts.



Typical MSSCKW Installation



MSSC4.25KW Fastener Pattern



MSSC6.25KW Fastener Pattern

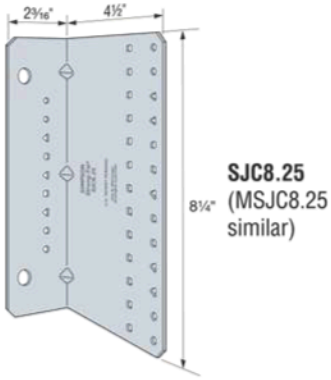
FIGURE 8G—MSSC SERIES CONNECTORS KNEEWALL APPLICATION INSTALLATION DETAILS

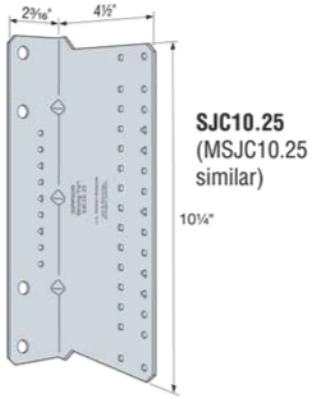
TABLE 9A—SJC SERIES STEEL JOIST CONNECTORS ALLOWABLE STRESS DESIGN (ASD) LOADS

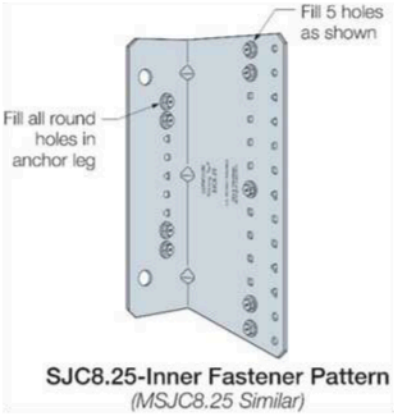
Model No.	L (inches)	Supported Framing Member Depth (inches)	Quantity of No. 10 Self-drilling Screws[1,2]			Allowable F4 Loads (lbf)[4,5]		
			Pattern[3]	Connection to Supported Member	Connection to Supporting Member	Minimum Supported and Supporting Member Thicknesses (mils)		Maximum Connector Load[6]
						54	68	
SJC8.25	8¼	10	Min.	4	4	980	980	2,715
			Max.	9	7	1,060	1,490	
			Inner	5	4	1,345	2,005	
MSJC8.25	8¼	10	Min.	4	4	1,055	1,710	2,715
			Max.	9	7	1,250	1,765	
			Inner	5	4	1,535	2,160	
SJC10.25	10¼	12	Min.	6	4	1,285	1,785	3,640
			Max.	11	7	1,285	1,785	
			Inner	7	5	1,620	2,385	
MSJC10.25	10¼	12	Min.	6	4	1,200	2,045	3,640
			Max.	11	7	1,285	2,045	
			Inner	7	5	1,730	2,635	

For **SI:** 1 mil = 0.0254 mm, 1 inch = 25.4 mm, 1 lbf = 4.45 N.

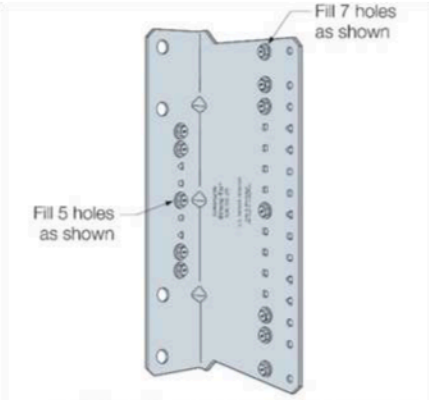
[1] Self-drilling screws must comply with Section 3.2.3.2 of this report.
[2]A screw must be installed into each of the round holes in the connector for the minimum fastener pattern. A screw must be installed into all of the round and triangle-shaped holes for the maximum fastener pattern. The inner fastener pattern is described in Figure 9A.
[3]See Figure 9A for fastener placement.
[4]See Figure 9A for load direction and installation details.
[5]The allowable loads are based on the framing members being braced within 12 inches of the connection.
[6]For methods of attachment of the connectors that differ from the screw attachment described in this table, the capacity of the connection is to be designed to the satisfaction of the code official, but not to exceed the tabulated maximum connector load capacity values.



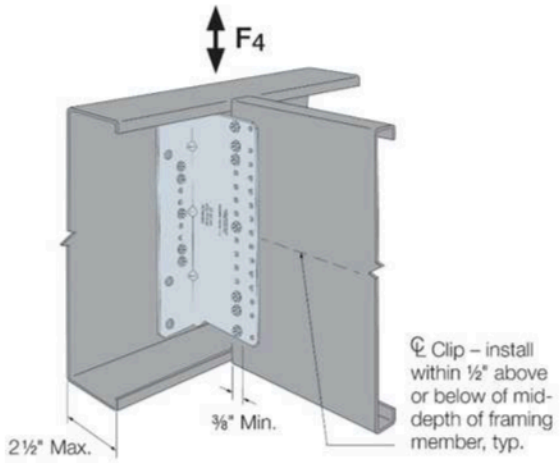




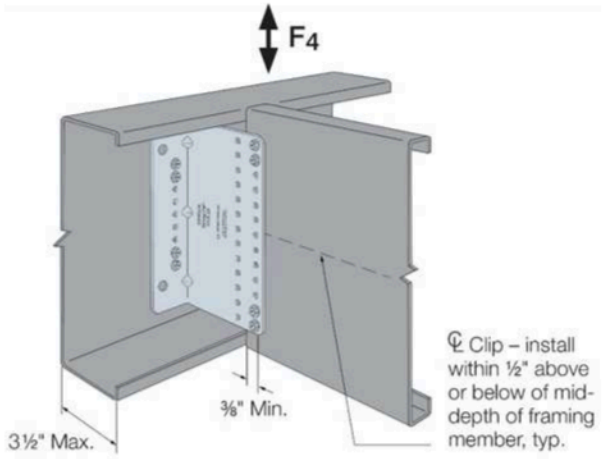
SJC8.25-Inner Fastener Pattern
(MSJC8.25 Similar)



SJC10.25-Inner Fastener Pattern
(MSJC10.25 Similar)



SJC Installation with Carried Member
Fasteners in Inner Row



SJC Installation with Carried Member
Fasteners in Outer Row
(For Min./Max. Load Values)

FIGURE 9A—SJC SERIES STEEL JOIST CONNECTOR AND INSTALLATION DETAILS

TABLE 9B—SJC SERIES CONNECTORS KICKER APPLICATION ALLOWABLE STRESS DESIGN (ASD) LOADS[1]

Model No.	L (inches)	Fasteners[2]		Kicker Angle[5]	Maximum Allowable Load[6] (lbf)
		Concrete Anchor Quantity and Diameter[3] (inch)	Quantity and Size of Screws to Kicker[4]		
SJC8.25	8¼	2-⅜	6 – No. 10	30°	490
				45°	535
SJC10.25	10¼	2-⅜	6 – No.10	30°	625
				45°	530
MSJC10.25	10¼	2-⅜	6 – No.10	30°	950
				45°	780

For **SI:** 1 mil=0.0254 inch, 1 inch= 25.4 mm, 1 lbf=4.45 N.

[1]The kicker must be manufactured from minimum 33 mil thick cold-formed steel complying with ASTM A653, Type SS Grade 33.
[2]See Figure 9B for fastener placement.
[3] The anchor bolt and anchor bolt connection to concrete must be designed by registered design professional.
[4]No. 10 self-drilling screws must comply with Section 3.2.3.2 of this report. Screws must penetrate through structural steel.
[5]Kicker angle is the acute angle between the kicker longitudinal axis and the horizontal plane of the steel deck.
[6]The connectors shall be installed either parallel or perpendicular to the direction of the steel deck flutes.

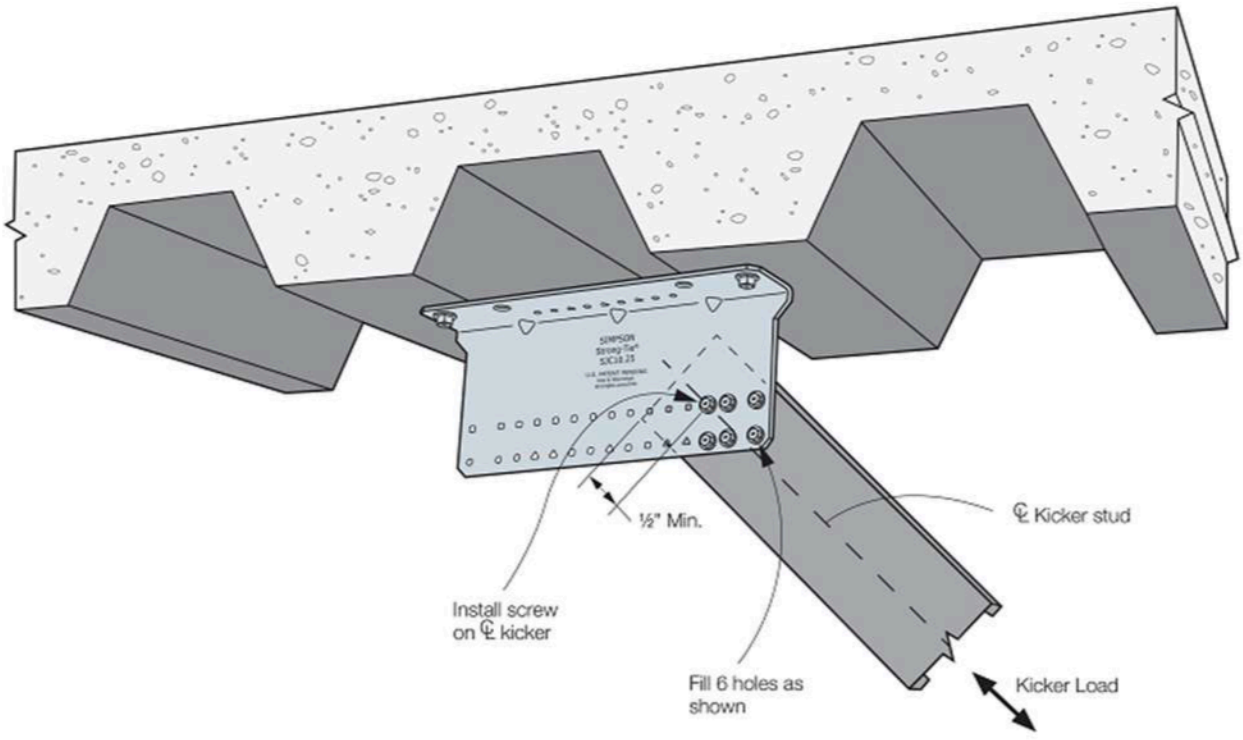


FIGURE 9B—SJC SERIES CONNECTOR KICKER APPLICATION INSTALLATION DETAILS

TABLE 10-RCKW SERIES KNEE WALL CONNECTORS ALLOWABLE STRESS DESIGN (ASD) LOADS

Model No.	Wall Framing Member Stud Designation	Fastener Pattern No.[1]	Concrete Anchor Bolt Quantity and Diameter[2] (inch)	Quantity of No. 12 Self-drilling Screws to Stud[3]	Wall Framing Member Thickness[4] (mils)	Maximum Allowable Moment[4,6] M (inch-lbf)	Assembly Rotational Stiffness[7,9] β (inch-kip / radian)	Connector Rotational Stiffness[8,9] β_c (inch-kip / radian)	Anchor Tension Load, T, at Allowable Moment[10] (lbf)	
									f'_c = 3000 psi	f'_c = 4000 psi
RCKW3	362S162	1	(1) 1/2	4	33	2,060	94	101	1,545	1,495
					43	2,860	116	125	2,290	2,160
					54	4,015	135	145	3,640	3,255
					68	5,150	148	157	6,520[11]	4,570[11]
RCKW3 & RCKW3S (Stiffener)		2	(1) 1/2	9	33	3,335	156	172	2,790	2,590
					43	3,910	156	172	3,490	3,145
					54	5,855	156	172	6,700[11]	4,585[11]
					68	5,855	156	172	6,700[11]	4,585[11]
RCKW5.5	600S162	3	(1) 1/2	6	30 (20 DW)[5]	3,625	258	280	1,395	1,375
					33 (20 STR)[5]	4,360	258	280	1,700	1,670
					33	4,360	270	289	1,700	1,670
					43	5,795	316	332	2,320	2,260
					54	7,630	316	332	3,175	3,050
					68	9,375	415	438	4,060	3,850
		3A	(2) 3/8	6	30 (20 DW)[5]	3,625	258	280	735	735
					33 (20 STR)[5]	4,360	258	280	890	885
					33	4,360	270	289	890	885
					43	5,795	347	370	1,190	1,180
					54	8,865	411	438	1,845	1,830
					68	10,775	502	534	2,265[12]	2,235[12]
		3B	(2) 1/2	6	30 (20 DW)[5]	3,625	258	280	735	735
					33 (20 STR)[5]	4,360	258	280	890	885
					33	4,360	270	289	890	885
					43	5,795	347	370	1,190	1,180
					54	9,995	593	650	2,095	2,070
					68	10,015	717	786	2,100	2,075
RCKW5.5 & RCKW5.5S (Stiffener)	600S162	4	(1) 1/2	10	33	4,855	460	503	1,910	1,870
					43	7,835	460	503	3,275	3,140
					54	10,740	476	512	4,830[11]	4,510[11]
					68	13,020	517	552	6,315[11]	5,700[11]
		4A	(2) 3/8	10	33	4,855	460	503	990	985
					43	7,835	460	503	1,625	1,610
					54	11,985	482	520	2,535[12]	2,500[12]
					68	14,300	625	676	3,065[12]	3,010[12]
		4B	(2) 1/2	10	33	4,855	460	503	990	985
					43	7,835	460	503	1,625	1,610
					54	12,485	681	759	2,650	2,610
					68	16,515	826	919	3,585	3,505

(continued)

TABLE 10—RCKW SERIES KNEE WALL CONNECTORS ALLOWABLE STRESS DESIGN (ASD) LOADS (continued)

Model No.	Wall Framing Member Stud Designation	Fastener Pattern No.	Concrete Anchor Bolt Quantity and Diameter (inch)	Quantity of No. 12 Self-drilling Screws to Stud[3]	Framing Member Thickness[4,5] (mils)	Maximum Allowable Moment[4,5] M (inch-lbf)	Assembly Rotational Stiffness[6,8] β (inch-kip / radian)	Connector Rotational Stiffness[7,8] β_c (inch-kip / radian)	Anchor Tension Load, T, at Allowable Moment (lbf)	
									f'_c = 3000 psi	f'_c = 4000 psi
RCKW7.5	800S162	5	(1) 1/2	6	33	5,990	531	559	1,680	1,655
					43	7,610	531	559	2,165	2,125
					54	10,570	565	590	3,100	3,020
					68	13,895	605	628	4,225	4,065
		5A	(2) 3/8	6	33	5,990	531	559	1,015	1,010
					43	7,610	531	559	1,300	1,290
					54	12,840	806	858	2,230[12]	2,205[12]
					68	13,835	1,129	1,212	2,410[12]	2,385[12]
		5B	(2) 1/2	6	33	5,990	531	559	1,015	1,010
					43	7,610	531	559	1,300	1,290
					54	13,255	865	925	2,305	2,280
					68	15,640	912	965	2,745	2,705
RCKW7.5 & RCKW5.5S (Stiffener)	800S162	6	(1) 1/2	10	33	8,705	484	514	2,505	2,455
					43	10,125	600	636	2,955	2,880
					54	13,030	625	650	3,920	3,785
					68	15,460	625	650	4,790[11]	4,580[11]
		6A	(2) 3/8	10	33	8,705	484	514	1,490	1,480
					43	10,125	600	636	1,745	1,730
					54	15,930	901	966	2,795[12]	2,760[12]
					68	17,040	977	1,038	3,005[12]	2,960[12]
		6B	(2) 1/2	10	33	8,705	484	514	1,490	1,480
					43	10,125	600	636	1,745	1,730
					54	18,495	938	1,009	3,280	3,225
					68	21,735	1,104	1,183	3,900	3,820

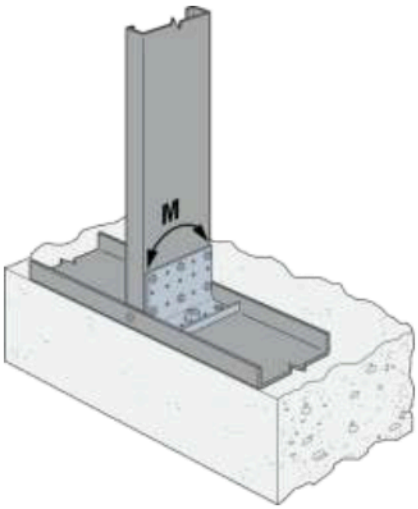
For **SI:** 1 mil = 0.0254 mm, 1 inch = 25.4 mm, 1 kip= 1000 lbf, 1 lbf = 4.45 N, 1 psi = 6.9 kPa, 1 inch-lbf= 0.113 N-m, 1 inch-kip/radian = 0.114 kN-m/radian.

[1]See Figure 10 for fastener pattern.
[2]Steel anchor bolt must comply with Section 3.2.11 of this report. For ASTM A307 Grade A or ASTM F1554, Grade 36 1/2-inch-diameter anchor bolts, the tabulated values for the connectors are limited to a maximum anchor bolt tension load of 4410 lbf. For ASTM A307 Grade A or ASTM F1544, Grade 36 3/8-inch-diameter anchor bolts, the tabulated values for the connectors are limited to a maximum anchor bolt tension load of 2200 lbf. The anchorage to concrete must be designed by a registered design professional.
[3]No. 12 self-drilling screws must comply with Section 3.2.3.1 of this report.
[4]Tabulated load values are based on framing members with track and stud of the same thicknesses, with a track minimum flange width of 1 1/4 inches attached with one No.10 screw fastened into each stud flange. The No. 10 screws must comply with Section 3.2.3.2 of this report.
[5]20 DW designates a No. 20 gauge drywall steel stud framing member, and 20 STR designates a No. 20 gauge structural steel stud framing member.
[6]Tabulated moment values are based on the maximum connector strength. Serviceability has not been considered. A registered design professional must analyze wall deflections using the tabulated rotational stiffness values.
[7]Tabulated Assembly Rotational Stiffness values are applicable for 38-inch tall walls with correspond framing member depth and thickness. For taller walls, the registered design professional must also consider additional deflection due to bending in the studs.
[8]Tabulated connector rotational stiffness values are for rotation at the base of the wall due to the base connection.
[9]Tabulated rotational stiffness values may be increased for calculating wall deflections subjected to component and cladding wind loads, instead of reducing loads in accordance with IBC Section 1604.
[10]Tabulated allowable anchor tension load at allowable moment values are based on AISC Steel Design Guide 1, Section 3.4 - Design of Column Base Plates with Large Moments. The tabulated values are for corresponding minimum concrete compressive strength, f'c, values shown in the table. The concrete bearing limit is based on the following bearing ratio:

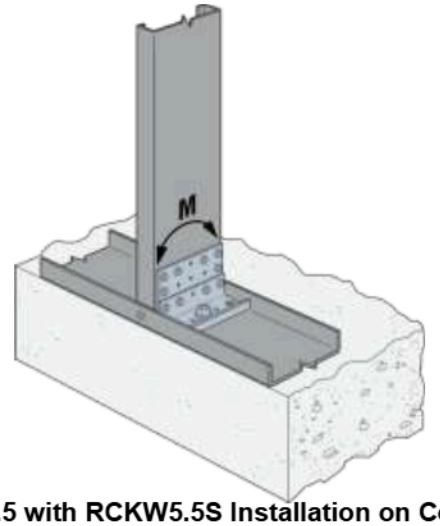
$$(A1/A2)^{0.5} \geq 2$$

Where A1 is the connector bearing area and A2 is area of the concrete supporting surface. The allowable moment and allowable anchor tension shall be reduced as required if concrete bearing ratio is less than 2.

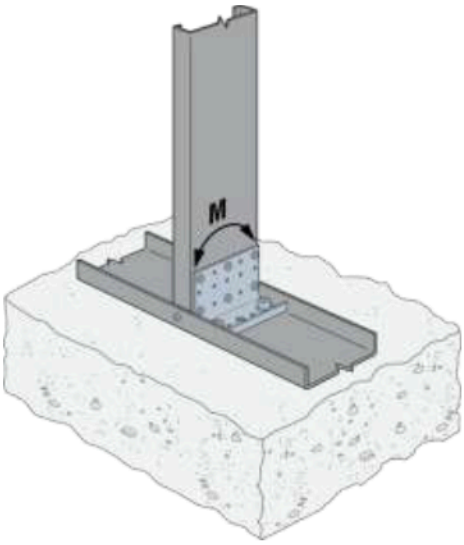
[11]Tabulated allowable tension loads for the connectors with 1/2-inch diameter anchor bolts require ASTM F3125, Grade A325 or ASTM A449 high strength bolts.
[12]Tabulated allowable tension loads for the connectors with 3/8-inch diameter anchor bolts require ASTM F3125, Grade A325 ASTM A449 high strength bolts.



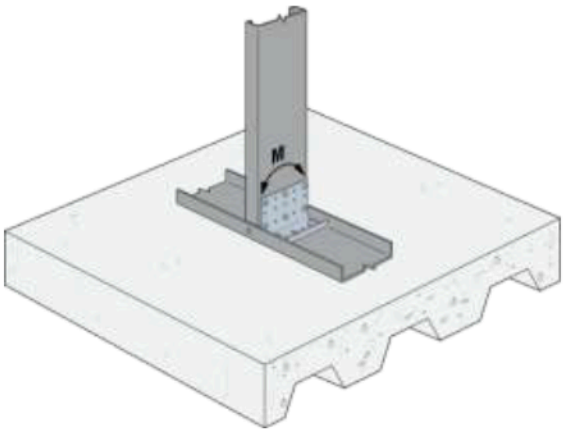
RCKW5.5 Installation on Concrete
(RCKW 3 and RCKW7.5 similar)



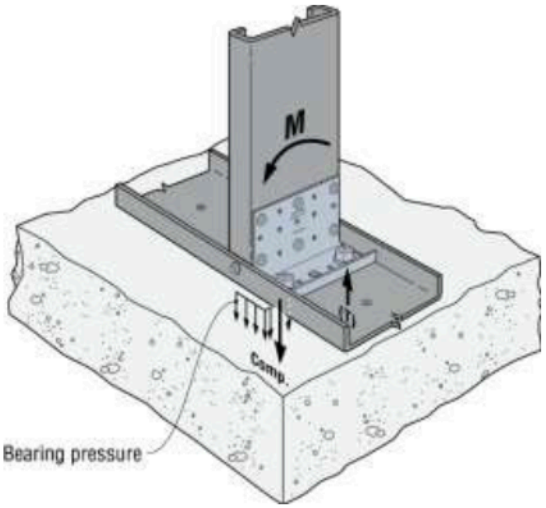
RCKW5.5 with RCKW5.5S Installation on Concrete
(RCKW3 with RCKW3S and RCKW7.5 with RCKW5.5S similar)



RCKW5.5 Installation on Concrete Slab w/ 2-bolts
(RCKW7.5 similar)



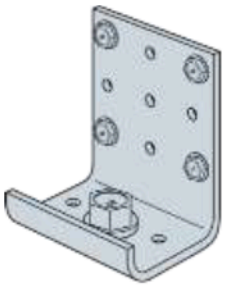
RCKW5.5 Installation on Deck Concrete w/ 2-3/8" bolts
(RCKW7.5 similar)



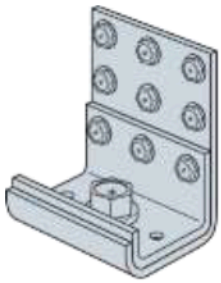
Anchor Bolt Design

FIGURE 10—RCKW SERIES KNEE WALL CONNECTORS INSTALLATION DETAILS

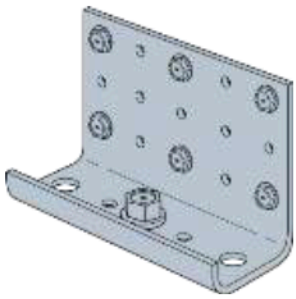
(continued)



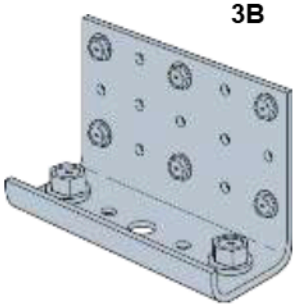
RCKW3 – PATTERN 1



RCKW3 with RCKW3S – PATTERN 2

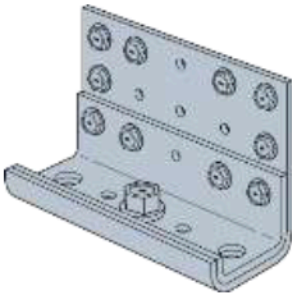


3A

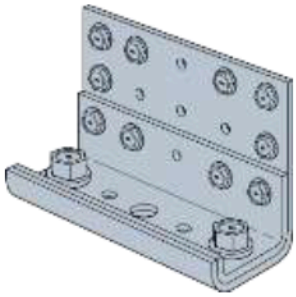


3B

RCKW5.5 – PATTERN 3

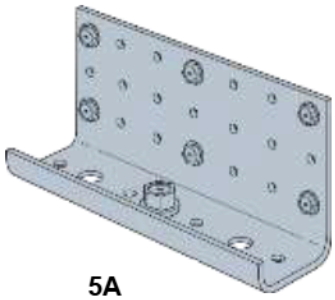


4A

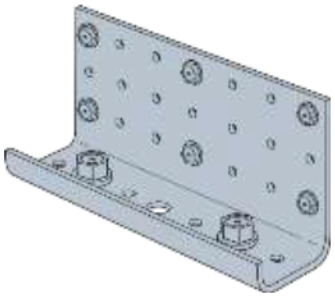


4B

RCKW5.5 with RCKW5.5S – PATTERN 4

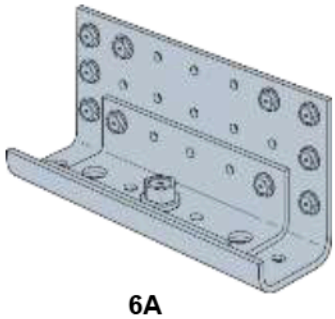


5A

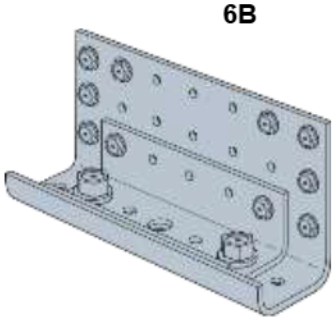


5B

RCKW7.5 – PATTERN 5



6A



6B

RCKW7.5 with RCKW5.5S – PATTERN 6

FIGURE 10—RCKW SERIES KNEE WALL CONNECTORS INSTALLATION DETAILS (continued)

DIVISION: 05 00 00—METALS
Section: 05 05 23—Metal Fastenings
Section: 05 40 00—Cold-Formed Metal Framing

REPORT HOLDER:

SIMPSON STRONG-TIE COMPANY INC.

EVALUATION SUBJECT:

CURTAIN WALL BYPASS CLIPS AND CONNECTORS FOR COLD-FORMED STEEL CONSTRUCTION

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Curtain Wall Bypass Clips and Connectors for Cold-formed Steel Construction, described in ICC-ES evaluation report ESR-4294, have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2026* *City of Los Angeles Building Code* (LABC)
- 2026* *City of Los Angeles Residential Code* (LARC)

*For evaluation for compliance with the anticipated requirements of the 2026 LABC and LARC

2.0 CONCLUSIONS

The Curtain Wall Bypass Clips and Connectors for Cold-formed Steel Construction, described in Sections 2.0 through 7.0 of the evaluation report ESR-4294, comply with the LABC Chapter 22, and the LARC, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Curtain Wall Bypass Clips and Connectors for Cold-formed Steel Construction described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-4294.
- The design, installation, conditions of use and identification of the Curtain Wall Bypass Clips and Connectors for Cold-formed Steel Construction are in accordance with the 2024 *International Building Code®* (IBC) and the 2024 *International Residential Code®* (IRC) provisions, as applicable, noted in the evaluation report ESR-4294.
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 16, 17 and 22, as applicable.
- Under the LARC, an engineered design in accordance with LARC Section R301.1.3 must be submitted.
- The connectors must be used in dry and non-corrosive environments only.

This supplement expires concurrently with the evaluation report, reissued September 2026.

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DIVISION: 05 00 00—METALS
Section: 05 05 23—Metal Fastenings
Section: 05 40 00—Cold-formed Metal Framing

REPORT HOLDER:

SIMPSON STRONG-TIE COMPANY INC.

EVALUATION SUBJECT:

CURTAIN WALL BYPASS CLIPS AND CONNECTORS FOR COLD-FORMED STEEL CONSTRUCTION

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Curtain Wall Bypass Clips and Connectors for Cold-formed Steel Construction, described in ICC-ES evaluation report ESR-4294, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2023 *Florida Building Code—Building*
- 2023 *Florida Building Code—Residential*

2.0 CONCLUSIONS

The Curtain Wall Bypass Clips and Connectors for Cold-formed Steel Construction, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-4294, comply with the *Florida Building Code—Building* and *Florida Building Code—Residential*. The design requirements must be determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-4294 for the 2021 *International Building Code®* and the 2021 *International Residential Code®* meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the Curtain Wall Bypass Clips and Connectors for Cold-formed Steel Construction has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential* with the following condition:

a) For connections subject to uplift, the connection must be designed for no less than 700 pounds (3114 N).

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report, reissued September 2026.

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