

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:

- 2018, 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2018, 2015, 2012 and 2009 *International Residential Code*® (IRC)

For evaluation for compliance with codes adopted by Los Angeles Department of Building and Safety (LADBS), see [ESR-4294 LABC and LARC Supplement](#).

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 gage and No. 14 gage 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 1-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 gage galvanized steel and includes prepunched slots and round holes. When installed with fasteners centered in the slotted hole, the connectors provide for 1-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 gage galvanized steel and includes prepunched slots and round holes. When installed with fasteners centered in the slotted hole, the connectors provide for 1-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 Series Bypass Framing Fixed-Clip Connectors: The FCB 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 connectors are manufactured from No. 16 gage galvanized steel. The FCB 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](#) and [4B](#) 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 1-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 gage galvanized steel and are available with leg lengths of 3½, 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 gage 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 1-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 gage 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 gage and No. 18 gage 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 gage, No.14 gage, and No. 12 gage 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 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 1½-inch by ½-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 gage and No. 12 gage 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
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 and FCB 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.

3.2.4 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	Gage				
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 1½-inch-by-½-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 $1\frac{3}{16}$ inch (20.6 mm) or $\frac{7}{8}$ -inch (22.2 mm) and $1\frac{5}{8}$ 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 $\frac{3}{16}$ -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).

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 for compliance with the 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.

4.2 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.

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 $\frac{1}{2}$ -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 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 October 2011 (Editorially revised August 2018).

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) 999-5099
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	520	520	610	690	760	975	760	975
SCB45.5	5½	2 ²	490	520	610	690	760	975	760	975
		3	675	675	895	1,000	990	1,260	990	1,260
MSCB45.5	5½	2 ²	490	520	780	690	1,055	1,200	1,195	1,475
		3	675	675	1,070	1,000	1,220	1,540	1,365	1,590
SCB47.5	7½	2 ²	490	520	610	690	760	945	760	945
		3	675	675	895	1,000	990	1,260	990	1,260
MSCB47.5	7½	2 ²	490	520	780	690	1,055	1,200	1,195	1,475
		3	675	675	1,070	1,000	1,220	1,540	1,365	1,590
SCB49.5	9½	2 ²	490	520	690	690	760	945	760	945
		3	675	675	895	1,000	990	1,260	990	1,260
SCB411.5	11½	2 ²	490	520	690	690	990	920	990	920
		3	675	675	860	1,000	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.

²When 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.

³See [Figure 1](#) for load orientation.

⁴Shouldered 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) LOADS¹

Connection Type ²	Fastener Quantity	ASD Allowable Loads ³ (lbf)			
		SCB		MSCB	
		F2	F3	F2	F3
No. 12-14 Self-Drilling Screws	2	795		795	
	3	1,120		1,365	
	4	No Reduction for Table 2A load values		No Reduction for Table 2A load values	
PDPAT	2	440	-	520	-
	3	585	-	780	-
	4	895	-	1,040	-
Welded	N/A	No Reduction for Table 2A load values		No Reduction for Table 2A load values	

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

¹The 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.

²See [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.

³Allowable 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.

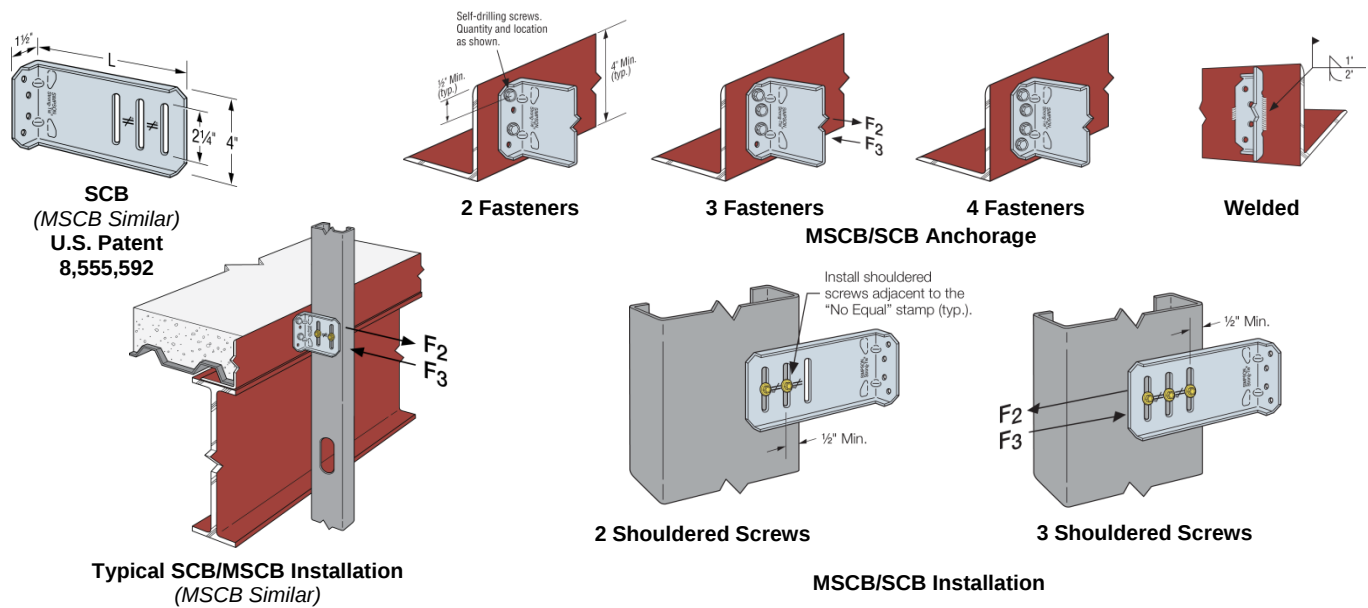


FIGURE 1—SCB AND MSCB SERIES BYPASS SLIDE-CLIP CONNECTORS AND INSTALLATION DETAILS

TABLE 2—SSB BYPASS SLIDE-CLIP CONNECTOR ALLOWABLE STRESS DESIGN (ASD) LOADS (lbf)^{1,2,6,7}

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	520	520	690	690	1,075	960
	3	815	815	1,030	1,080	1,335 ⁵	1,225

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

¹Except 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.

²See [Figure 2](#) for load orientation.

³Shouldered 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.

⁴The shouldered screws may be installed in any two slots.

⁵This tabulated load value must be reduced to 1,250 lbf for the SSB connector attached to the structural steel member with two self-drilling screws.

⁶No. 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.

⁷Allowable 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	3 3/4	2	455	630	755 ⁵
SCW5.5	5 1/2	2 ⁴	455	630	995
		3	455	630	1,220 ⁵

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

¹Except 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](#).

²See [Figure 3](#) for load orientation.

³Shouldered 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.

⁴The shouldered screws must be located in the outermost slotted holes for installation of the SCW5.5 connector with two screws.

⁵For 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

⁶Allowable 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.

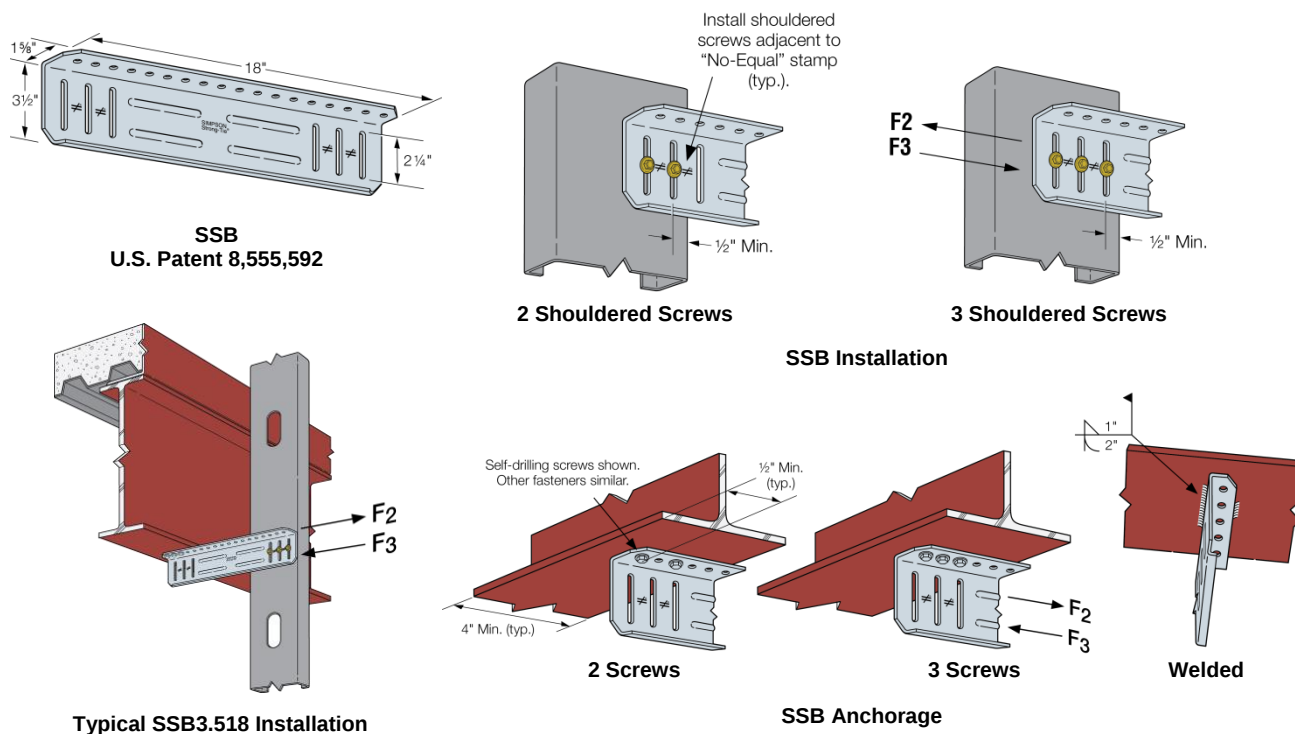


FIGURE 2—SSB3.518 BYPASS SLIDE-CLIP CONNECTOR AND INSTALLATION DETAILS

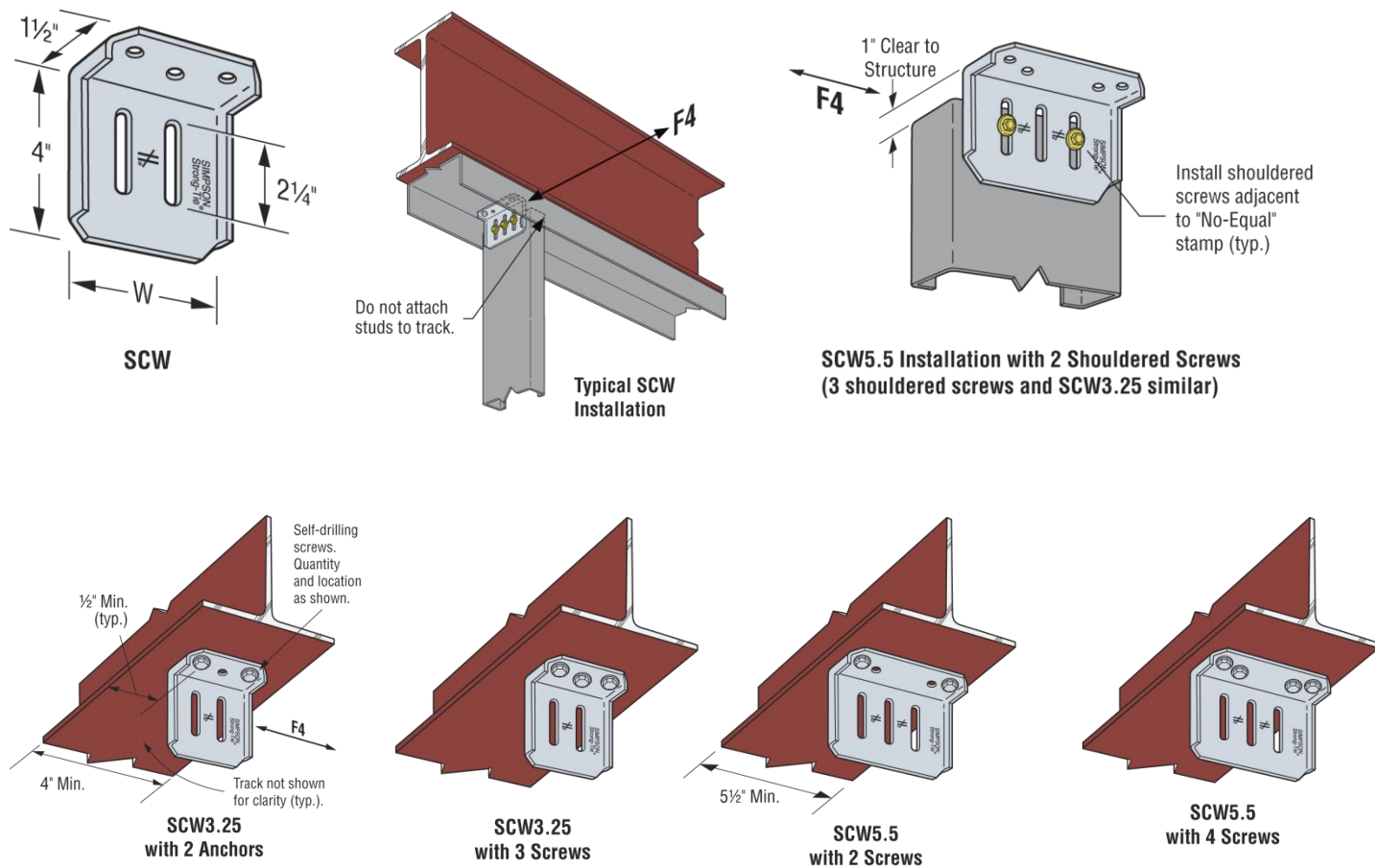


FIGURE 3—SCW SERIES HEAD-OF-WALL SLIDE-CLIP CONNECTORS AND INSTALLATION DETAILS

TABLE 4A—FCB SERIES BYPASS FIXED-CLIP CONNECTORS ALLOWABLE STRESS DESIGN (ASD) LOADS^{1,2} (lbf)

Model No.	Connector Length, L (inches)	Quantity of No. 12 Self-drilling Screws ³		Supported Framing Member Thickness (mils)								
				33			43			54		
				F2	F3	F4	F2	F3	F4	F2	F3	F4
FCB43.5	3½	Min.	4	755	755	755	1,105	975	1,120	1,250	975	1,490
		Max.	6	1,100	1,130	1,130	1,105	1,260	1,455	1,250	1,735	1,910
FCB45.5	5½	Min.	4	755	755	755	1,105	975	945	1,105	975	1,325
		Max.	9	1,100	1,260	1,180	1,105	1,260	1,485	1,105	1,735	1,925
FCB47.5	7½	Min.	4	755	755	220	1,105	945	330	1,105	945	365
		Max.	12	1,100	1,260	705	1,105	1,260	1,050	1,105	1,735	1,445
FCB49.5	9½	Min.	4	755	755	170	1,105	945	255	1,105	945	365
		Max.	12	1,100	1,260	750	1,105	1,260	1,115	1,105	1,735	1,200
FCB411.5	11½	Min.	4	755	755	140	1,105	920	205	1,105	920	365
		Max.	12	1,100	1,260	795	1,105	1,260	860	1,105	1,735	860

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

¹The tabulated load values are for the connection of the FCB 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](#) of this report. The minimum tabulated load value from Table 4A and [Table 4B](#) must be used as the allowable load of the connection.

²See [Figure 4](#) for load orientation.

³Self-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 quantity 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) LOADS¹

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	1,585	1,255	820	365	890	350	535	275	380
PDPAT	2	390 ³	535				-			
	3	715 ³	560				-			
	4	970 ³	560				-			
Welded	Hard side: 2" Free side: 1"	1,735	1,910	1,925	365	1,445	365	1,200	365	860

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

¹Tabulated 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.

²See [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.

³These tabulated load values are for the F2 direction only.

⁴Allowable loads are based on screw fastening or welding of the connector to structural steel members complying with Section [3.2.7](#) of this report.

⁵Min./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.

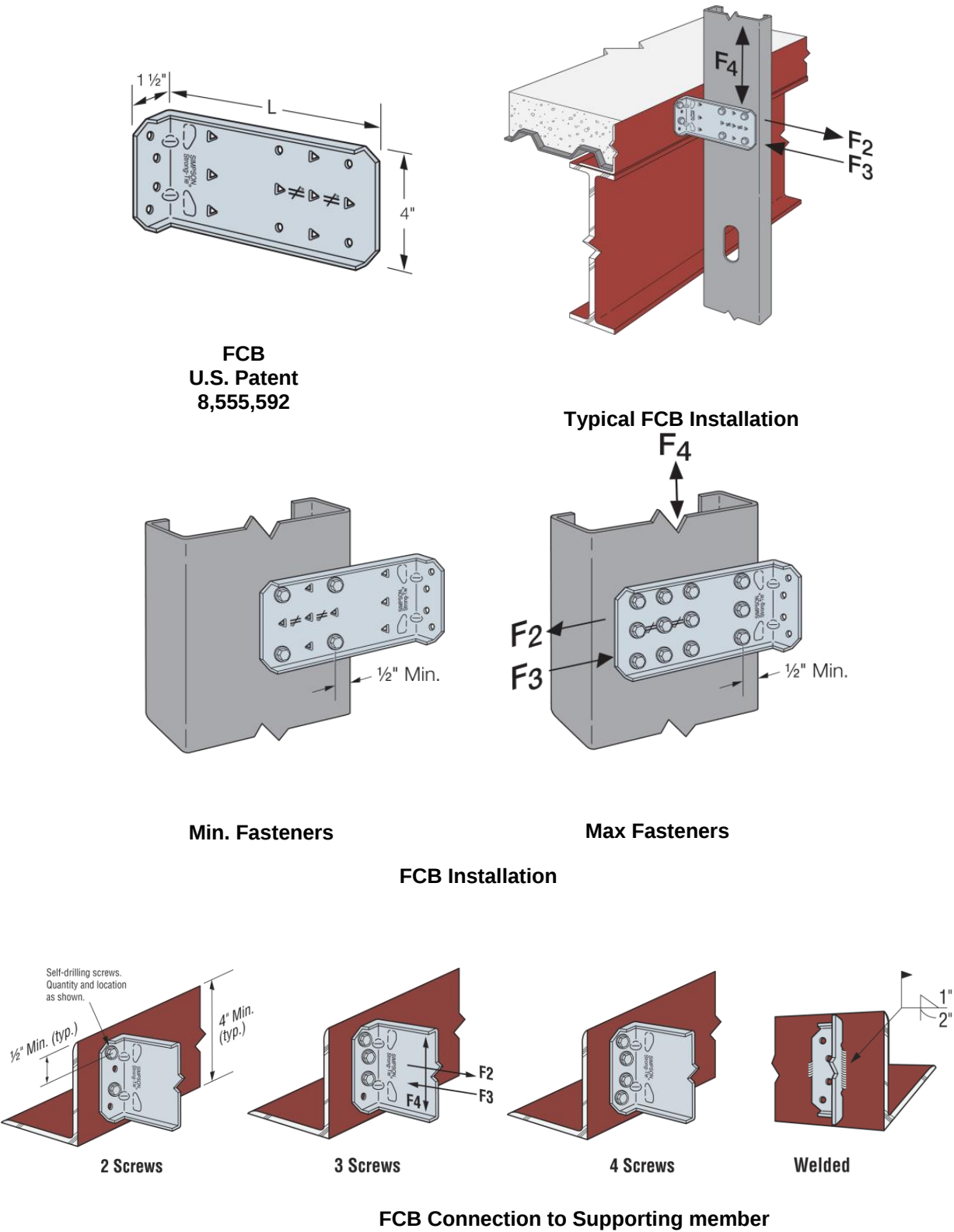


FIGURE 4—FCB SERIES BYPASS FIXED CLIP CONNECTORS AND INSTALLATION DETAILS

**TABLE 5A—DSSCB SERIES BYPASS SLIDE-CLIP CONNECTORS ALLOWABLE STRESS DESIGN (ASD)
LOADS¹**

Model No.	Supported Framing Member Thickness (mils)	Fasteners to Supported Member		Allowable Loads (lbf)		
		Fastener Pattern ²	Quantity of Shouldered Screws ³	Load Direction ⁴		
				F1 ⁵	F2	F3
DSSCB43.5	33	A	2	105	515	615
DSSCB46		B	3	105	765	920
		C, D	2	105	515	615
DSSCB48		E	4	105	765	1,225
		F, G	3	105	765	920
DSSCB43.5	43	A	2	155	785	940
DSSCB46		B	3	155	1,175	1,410
		C, D	2	155	785	940
DSSCB48		E	4	155	1,175	1,880
		F, G	3	155	1,175	1,410
DSSCB43.5	54	A	2	225	1,160	1,345
DSSCB46		B	3	225	1,475	2,020
		C, D	2	225	1,160	1,280
DSSCB48		E	4	225	1,475	2,445
		F, G	3	225	1,475	1,965
DSSCB43.5	68 and 97	A	2	300	1,160	1,770
DSSCB46		B	3	300	1,475	2,675
		C, D	2	300	1,460	1,685
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.

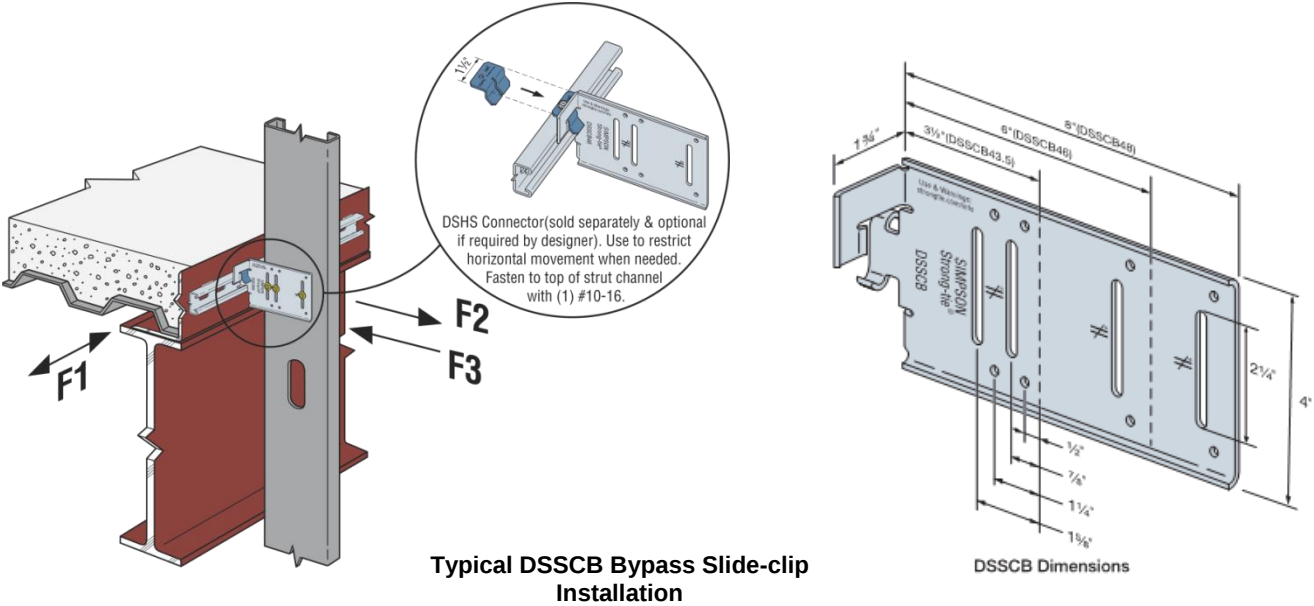
¹The tabulated load values are for the connection of the DSSCB series bypass slide-clip connector to the curtain wall framing member. The allowable load values for connection of the connector to the steel supporting member, using the strut channel connection, are in [Table 5C](#) of this report. The minimum tabulated load value from Table 5A and [Table 5C](#) must be used as the allowable load of the connection.

²See [Figure 5A](#) for the fastener pattern for the shouldered screw fastener placement to attach the connectors to the curtain wall framing.

³Shouldered 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.

⁴See [Figure 5A](#) for load orientation.

⁵F1 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.



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)
LOADS¹**

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.

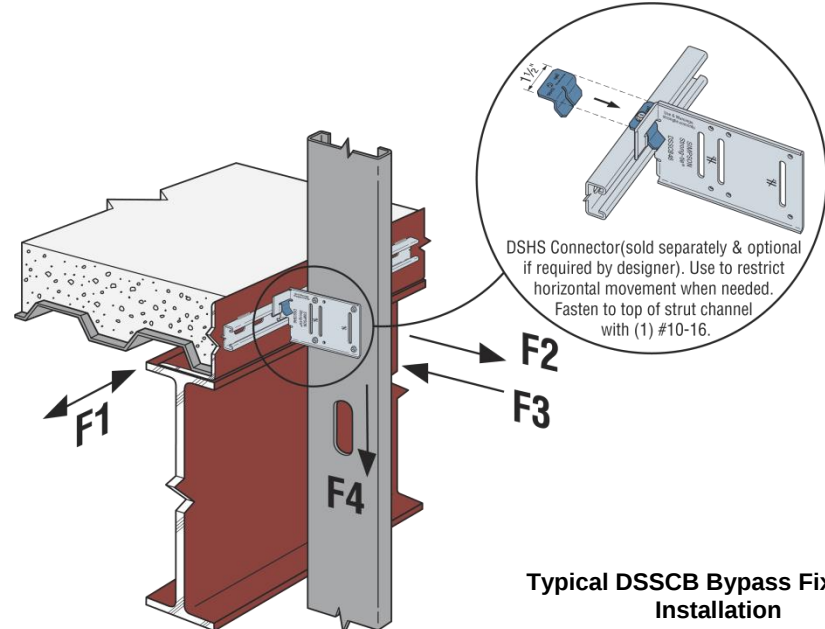
¹The tabulated load values are for the connection of the DSSCB series bypass fixed-clip connector to the curtain wall framing member. The allowable load values for connection of the connector to the steel supporting member, using the strut channel connection are in [Table 5C](#) of this report. The minimum tabulated load value from Table 5B and [Table 5C](#) must be used to as the allowable load of the connection.

²See [Figure 5B](#) for the fastener pattern for the self-drilling screw fastener placement to attach the connectors to the curtain wall framing.

³Self-drilling screws must comply with Section [3.2.3.2](#) of this report.

⁴See [Figure 5B](#) for load orientation.

⁵F1 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.



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 ^{1,2,3,4,5,6,7}

Strut Channel Flange Width (inch) ⁸	Strut Channel Welded to Steel Supporting Member ⁹							Strut Channel Fastened to Steel Supporting Member with No. 12 Self-drilling Screws ^{10,11,12}					
	Weld Spacing (inches)	Required Weld Length (inch) ⁷	Allowable Loads (lbf)					Screw Spacing (inches)	Allowable Loads (lbf)				
			Load Direction						Load Direction				
			F1	F2		F3	F4		F1	F2		F3	F4
Simple Span	Multi-Span	Simple Span		Multi-Span									
$\frac{13}{16}$ or $\frac{7}{8}$	4	1½	775	1,455	1,390	2,710	875	4	755	1,315	665	2,710	875
	6	1½	775	970	1,030	2,710	875	6	755	970	665	2,710	655
	8	1	775	730	805	2,710	740	8	755	730	485	2,710	—
	10	1	775	580	660	2,710	—	—	—	—	—	—	—
	12	1	775	485	555	2,710	—	—	—	—	—	—	—
	16	1	775	365	445	2,710	—	—	—	—	—	—	—
$1\frac{5}{8}$	4	1½	775	3,595	3,500	3,925	—	4	755	1,315	1,315	3,925	—
	6	1½	775	3,045	3,080	3,925	—	6	755	1,000	965	3,925	—
	8	1	775	2,285	2,455	3,925	—	8	755	885	725	3,925	—
	10	1	775	1,825	2,025	3,925	—	—	—	—	—	—	—
	12	1	775	1,520	1,715	3,925	—	—	—	—	—	—	—
	16	1	775	1,140	1,390	3,925	—	—	—	—	—	—	—

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

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

²The tabulated F2 loads include a reduction adjustment factor of 0.90 for strut channels without web hole punchouts (pierced) and pierced webs having 0.875-inch diameter holes at 6 inches on center, with a reduced moment capacity due to the web holes as reported in [Section 3.2.6](#) of this report. For the other pierced strut channels described in [Figure 5C](#), that have a 0.85 moment capacity adjustment factor, the tabulated F2 loads must be multiplied by a 0.95 reduction factor. No adjustment is required for F1, F3 and F4 loads. The moment capacity reduction factor for strut channels with web hole punchouts must be verified to the satisfaction of the code official.

³Maximum 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 1½ inches, directly at clip location:

- a. For strut channel with a $\frac{13}{16}$ or $\frac{7}{8}$ -inch wide flange: F1 = 775 lb., F2 = 1,430 lb., F3 = 2,540 lb. and F4 = 1,050 lb.
- b. For strut channel with a 1⅝ inch wide flange: F1 = 775 lb., F2 = 1,870 lb. and F3 = 3,630 lb.

⁴The allowable F2 and F4 loads must not exceed 865 pounds and 785 pounds, respectively, for DSSCB connectors located within 2 inches of a strut channel splice.

⁵Weld or screw spacing must not exceed the DSSCB connector or framing spacing.

⁶DSSCB 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.

⁷Simple-span allowable load values are applicable where the strut channel is connected at two points to the structural steel support and the connector load occurs between the fastening points. Multi-span allowable load values are applicable where the strut channel is connected at multiple points (3 or more fasteners) to the structural steel support and the connector load can occur in between any of the fastening points.

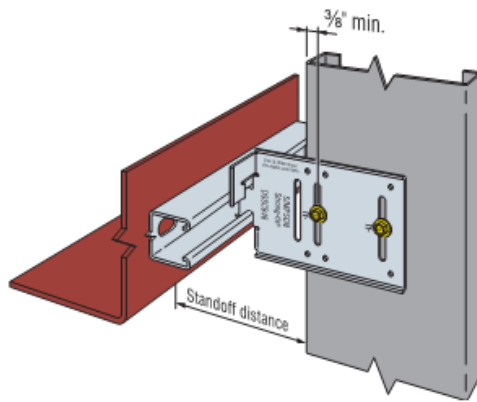
⁸Strut channels must comply with [Section 3.2.6](#) of this report.

⁹The 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](#).

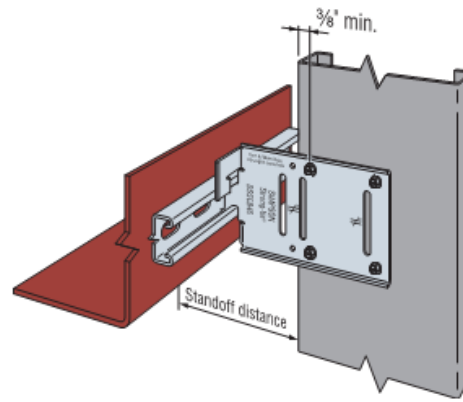
¹⁰The allowable loads for the strut channel fastened to structural steel supporting members using the specified screws are based on structural steel support members complying with [Section 3.2.7](#) of this report. The tabulated values are also applicable for the strut channels attached to supporting 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.

¹¹Predrilling 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 $\frac{3}{16}$ -inch diameter drill bit.

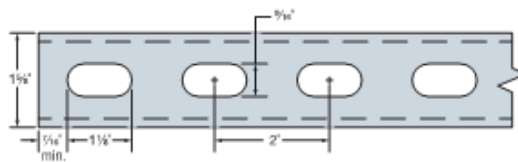
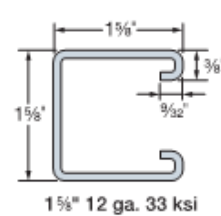
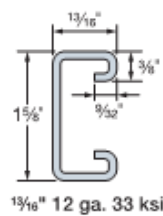
¹²Screws must be fastened through the solid steel portion of the strut channel (a minimum distance of 1.5 times the screw diameter from the edge of web punchout holes) and centered vertically in the web.



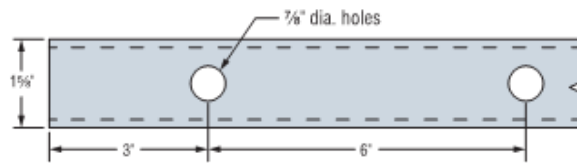
DSSCB Standoff Distance with 1 5/8" Strut
(1 3/16" Strut Similar) and Minimum Fastener Edge
Distance for Slide-Clip Application



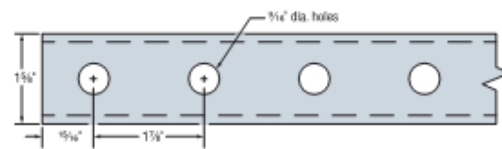
DSSCB Standoff Distance with 1 3/16" Strut and
Minimum Fastener Edge Distance for
Fixed-Clip Application



1 5/8" x 5/16" @ 2" o.c. Punchout Pattern



7/8" @ 6" o.c. Punchout Pattern



5/16" @ 2" 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		DHSB to Strut Channel	
DSSCB46 & DHSB	54	4 – No.10 Screws ³ or 6 – No.10 Screws ³	1 – No.14 Shouldered Screws ⁴	1 – No.10 Screw ³	500

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

¹The 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.

²See [Figure 5D](#) for the screw fastener placement to attach the connector to the curtain wall framing member.

³No. 10 self-drilling screws must comply with Section [3.2.3.2](#) of this report.

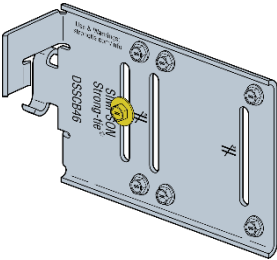
⁴No. 14 shouldered screws must comply with Section [3.2.2](#) of this report.

⁵See [Figure 5B](#) for load orientation.

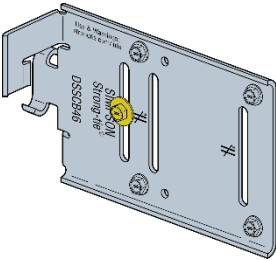
⁶F1 load values are based on assembly tests with the load applied through the centerline of a 6-inch deep stud. A DHSB connector (fastened to the strut channel with one No. 10 self-tapping screw complying with Section [3.2.3.2](#) of this report) must be used at each DSSCB46 connector to transfer the F1 load from the connector to the strut channel.

⁷Interaction load analysis of the DSSCB46 connector with the DHSB 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](#).

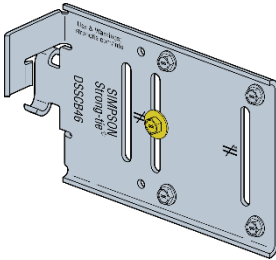
⁸For additional loads and important information, see [Table 5B](#).



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) LOADS¹

Model No.	Supported Framing Member Depth (inches)	Supported Framing Member Thickness (mil)	Fasteners to Supported Framing Member		Maximum Standoff Distance (inches)	Allowable Loads (lbf)		
			Fastener Pattern Number ²	Quantity of Shouldered Screws ³		Load Direction ⁴		
						F1 ⁵	F2	F3
SCS32-5/97	3½	33	S1	2	1½	200	425	425
SCS62-5/97	6		S1	3	1½	205	635	760
			S2	3	3	205	635	760
SCS62-5/118	6	33	S1	3	1½	270	650	760
			S2	3	3	270	650	760
SCS82-5/118	8		S1	3	1½	270	650	760
			S2	3	3	270	650	760
SCS32-5/97	3½	43	S1	2	1½	290	540	540
SCS62-5/97	6		S1	3	1½	350	895	1,165
			S2	3	3	335	895	1,165
SCS62-5/118	6	43	S1	3	1½	435	940	1,165
			S2	3	3	435	940	1,165
SCS82-5/118	8		S1	3	1½	435	940	1,165
			S2	3	3	435	940	1,165
SCS32-5/97	3½	54	S1	2	1½	540	890	890
SCS62-5/97	6		S1	3	1½	655	1,635	2,025
			S2	3	3	620	1,635	1,530
SCS62-5/118	6	54	S1	3	1½	655	1,825	2,085
			S2	3	3	620	1,825	2,085
SCS82-5/118	8		S1	3	1½	655	1,825	2,085
			S2	3	3	620	1,825	2,085
SCS32-5/97	3½	68	S1	2	1½	550	925	925
SCS62-5/97	6		S1	3	1½	685	2,065	2,155
			S2	3	3	650	2,065	1,630
SCS62-5/118	6	68	S1	3	1½	705	2,065	2,220
			S2	3	3	670	2,065	2,220
SCS82-5/118	8		S1	3	1½	705	2,065	2,220
			S2	3	3	670	2,065	2,220
SCS32-5/97	3½	97	S1	2	1½	650	925	925
SCS62-5/97	6		S1	3	1½	975	2,065	2,155
			S2	3	3	930	2,065	1,630
SCS62-5/118	6	97	S1	3	1½	975	2,065	2,220
			S2	3	3	930	2,065	2,220
SCS82-5/118	8		S1	3	1½	975	2,065	2,220
			S2	3	3	930	2,065	2,220

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

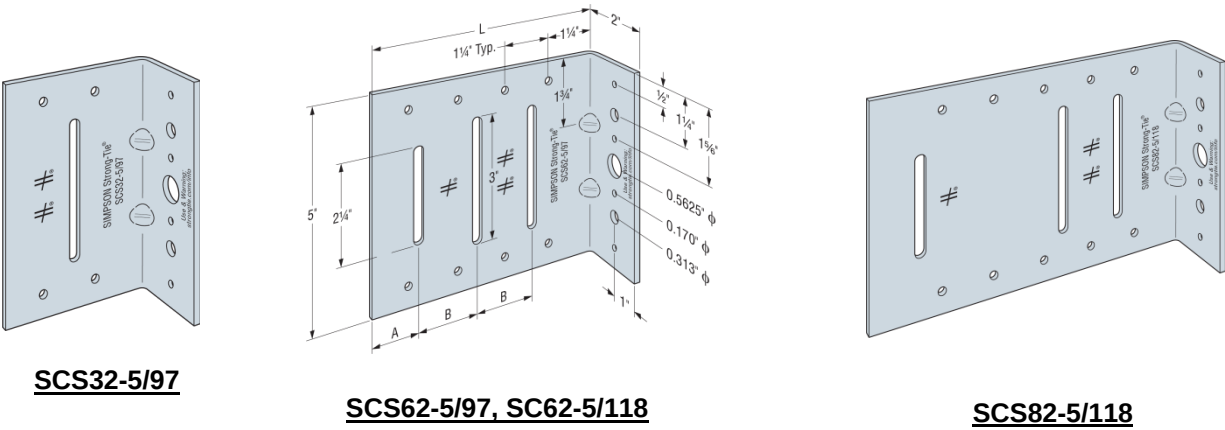
¹The tabulated load values are for the connection of the SCS series bypass slide-clip connectors to the curtain wall framing member. The allowable load values for connection of the connector to the steel supporting member are in [Table 6C](#) of this report. The minimum tabulated load value from Table 6A and [Table 6C](#) must be used as the allowable load of the connection.

²See [Figure 6A](#) for shouldered screw fastener pattern placement for attachment of the connector to the supported framing.

³Shouldered 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.

⁴See [Figure 6A](#) for load orientation.

⁵F1 load values are based on assembly tests with the load applied through the centerline of the stud.

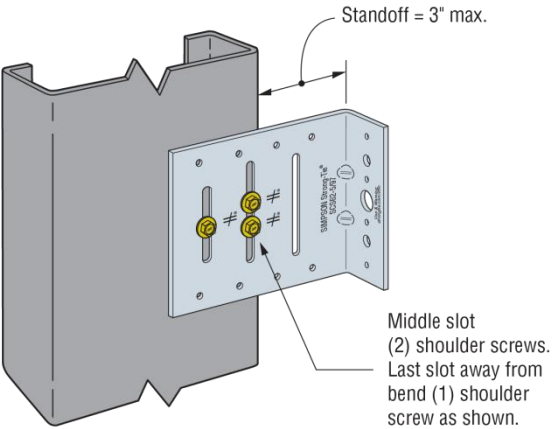
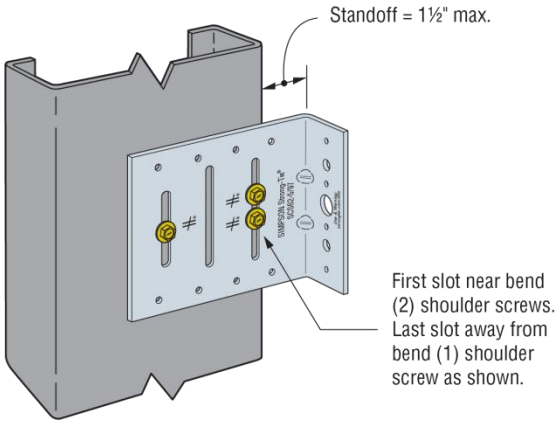


SCS32-5/97

SCS62-5/97, SC62-5/118

SCS82-5/118

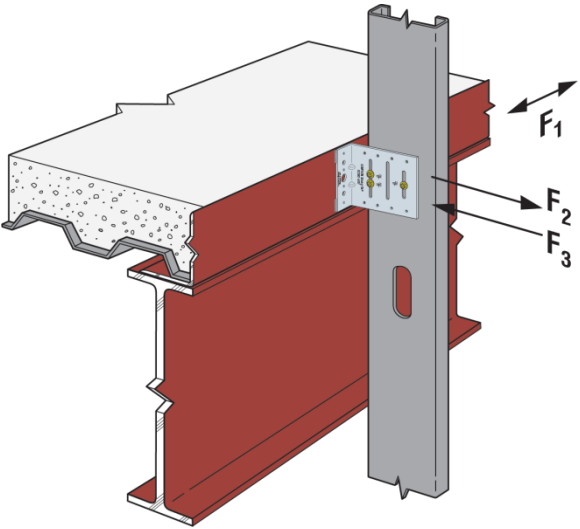
SCS62-5/97
1 1/2-inch Maximum
Standoff
(Pattern S1)



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) LOADS¹

Model No.	Supported Framing Member Depth (inches)	Supported Framing Member Thickness (mils)	Fasteners to Supported Framing Member		Offset Distance (inches)	Allowable Loads (lbf)			
			Fastener Pattern	Quantity of No. 10 Self-Drilling Screws		Load Direction ⁴			
						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	33	R1	6	2¼	150	1,060	1,060	650
SCS82-5/118	8		R2	8	1	175	1,415	1,415	995
			R1	8	2¼	150	1,415	1,415	690
SCS32-5/97	3	43	R2	10	1	175	1,765	1,765	1,050
SCS62-5/97	6		R1	4	1	200	1,050	1,050	1,050
			R1	6	2¼	190	1,580	1,580	970
SCS62-5/118	6	43	R2	8	1	225	2,105	2,105	1,480
SCS82-5/118	8		R1	6	2¼	195	1,580	1,580	970
			R2	8	1	245	2,105	2,105	1,480
SCS32-5/97	3	54	R1	8	2¼	195	2,105	2,105	1,025
SCS62-5/97	6		R2	10	1	245	2,630	2,105	1,565
			R1	4	1	395	2,135	2,135	1,405
SCS62-5/118	6	15	R1	6	2¼	345	3,205	2,275	1,970
SCS82-5/118	8		R2	8	1	410	4,275	3,125	3,005
			R1	8	2¼	360	3,205	2,440	2,085
SCS32-5/97	3	68	R2	10	1	445	4,540	3,350	3,180
SCS62-5/97	6		R1	4	1	445	2,160	2,160	1,405
			R1	6	2¼	410	3,240	2,275	1,970
SCS62-5/118	6	68	R2	8	1	435	4,320	3,125	3,005
SCS82-5/118	8		R1	6	2¼	535	3,240	2,440	1,970
			R2	8	1	540	4,320	3,350	3,005
SCS32-5/97	3	97	R1	8	2¼	535	4,320	2,980	2,085
SCS62-5/97	6		R2	10	1	675	4,720	4,095	3,180
			R1	4	1	635	2,160	2,160	1,405
SCS62-5/118	6	97	R1	6	2¼	775	3,240	2,275	1,970
SCS82-5/118	8		R2	8	1	775	4,320	3,125	3,005
			R1	6	2¼	775	3,240	2,440	1,970
SCS32-5/97	3	97	R2	8	1	775	4,320	3,350	3,005
SCS62-5/97	6		R1	8	2¼	775	4,320	2,980	2,085
			R2	10	1	775	4,720	4,095	3,180

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

¹The 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.

²See [Figure 6B](#) for self-drilling screw fastener pattern placement for attachment of the connector to the supported framing.

³Self-drilling screws must comply with Section [3.2.3.2](#) of this report.

⁴See [Figure 6B](#) for load orientation.

⁵F1 load values are based on assembly tests with the load applied through the centerline of the stud.

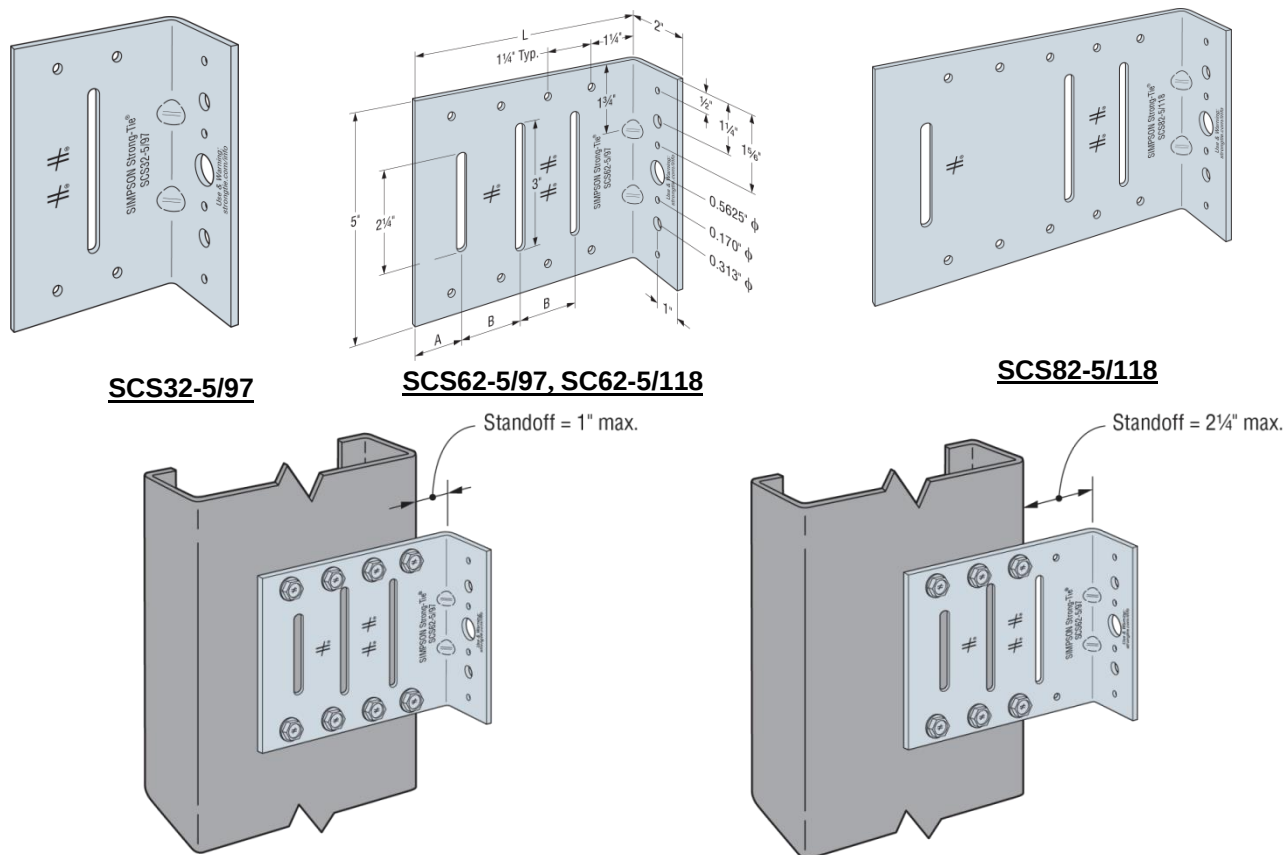


FIGURE 6B—SCS SERIES BYPASS FIXED-CLIP CONNECTORS AND INSTALLATION DETAILS

TABLE 6C—SCS SERIES CONNECTOR CONNECTION TO STEEL SUPPORTING MEMBER ALLOWABLE STRESS DESIGN (ASD) LOADS¹

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	1,590
		4	975	2,545	3,180
Welded E70XX electrodes	A36 Steel 3/16-inch thick	(2) Hard Side: 1.5 inches	1,700	4,720	3,480
		(2) Free Side: 1.5 inches			

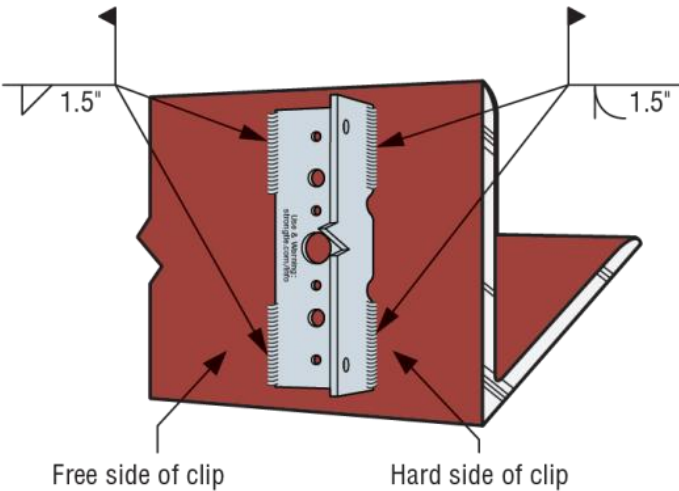
For SI: 1 mil = 0.0254 mm, 1 inch = 25.4 mm, 1 lbf = 4.45 N.

¹Tabulated 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.

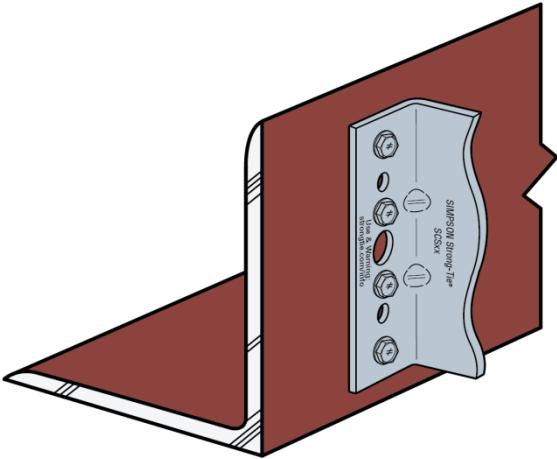
²See Figure 6C of this report for connection details. Self-drilling screws must comply with Section [3.2.3.1](#) of this report. Welding must comply with Section [4.2.1](#) and Figure 6C of this report.

³Allowable loads are based on fastening or welding of the connector to structural steel members complying with Section [3.2.7](#) of this report.

⁴See [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	630	585
LSFC4.25	4¼	6	Min.	2	2	355	525	525	1,615
			Max.	6	6	440	865	1,320	
SFC4.25	4¼	6	Min.	2	2	355	525	745	1,615
			Max.	6	6	575	750	1,615	
LSFC6.25	6¼	8	Min.	4	4	490	920	1,050	2,440
			Max.	8	8	510	980	1,495	
SFC6.25	6¼	8	Min.	4	4	590	1,035	1,840	2,440
			Max.	8	8	590	1,055	1,880	

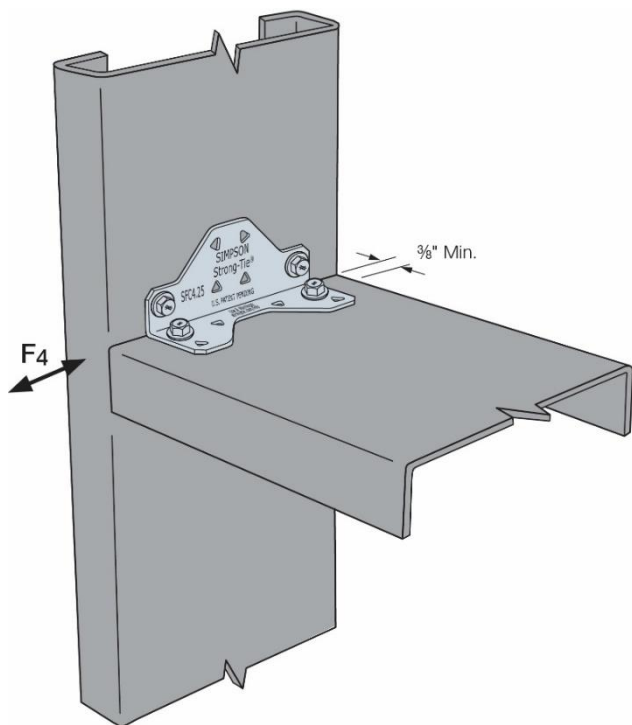
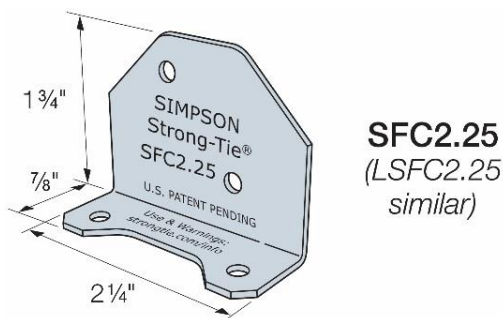
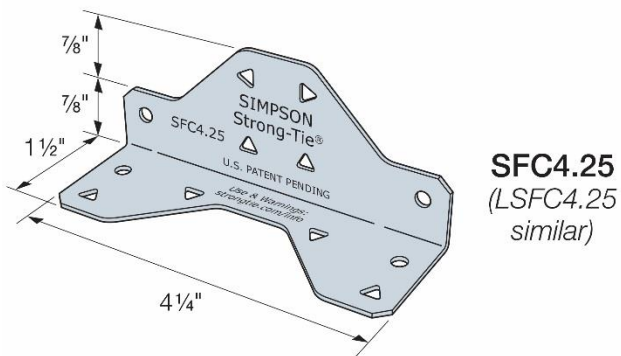
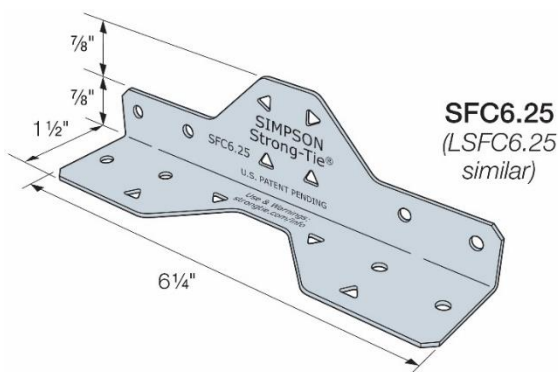
For SI: 1 mil = 0.0254 mm, 1 inch = 25.4 mm, 1 lbf = 4.45 N.

¹Self-drilling screws must comply with Section 3.2.3.2 of this report.

²A 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.

³The allowable loads are based on the members being braced within 12 inches of the connection.

⁴For 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.



Typical SFC Installation

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) LOADS¹

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	4¾	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.

¹For 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.

²Self-drilling screws must comply with Section 3.2.3.2 of this report.

³U-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.

⁴For use under Load Resistance Factor Design (LRFD), the tabulated ASD load values must be multiplied by 1.6.

⁵Tabulated stiffness values apply to both ASD and LRFD.

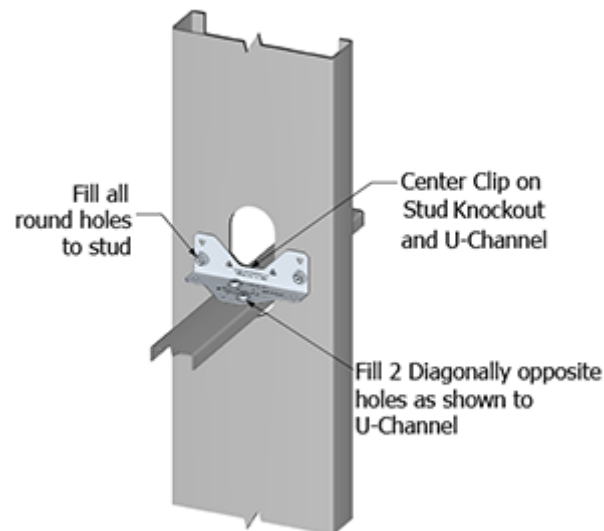
**FIGURE 7A—SFC FRAMING CONNECTOR U-CHANNEL BRIDGING**

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	3½	Minimum	3	2	165	225	345	635
MSSC2.25	2¼	3½	Minimum	3	2	165	225	345	635
LSSC4.25	4¼	6	Minimum	2	2	215	440	675	1,490
			Maximum	5	4	215	440	725	
			Outer	4	4	200	310	520	
SSC4.25	4¼	6	Minimum	2	2	355	525	890	1,490
			Maximum	5	4	365	600	1,005	
			Outer	4	4	235	330	625	
MSSC4.25	4¼	6	Minimum	2	2	355	525	890	1,490
			Maximum	5	4	365	600	1,005	
			Outer	4	4	235	330	625	
LSSC6.25	6¼	8	Minimum	4	4	265	660	1,190	2,395
			Maximum	7	6	265	660	1,190	
			Outer	6	4	270	375	695	
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.

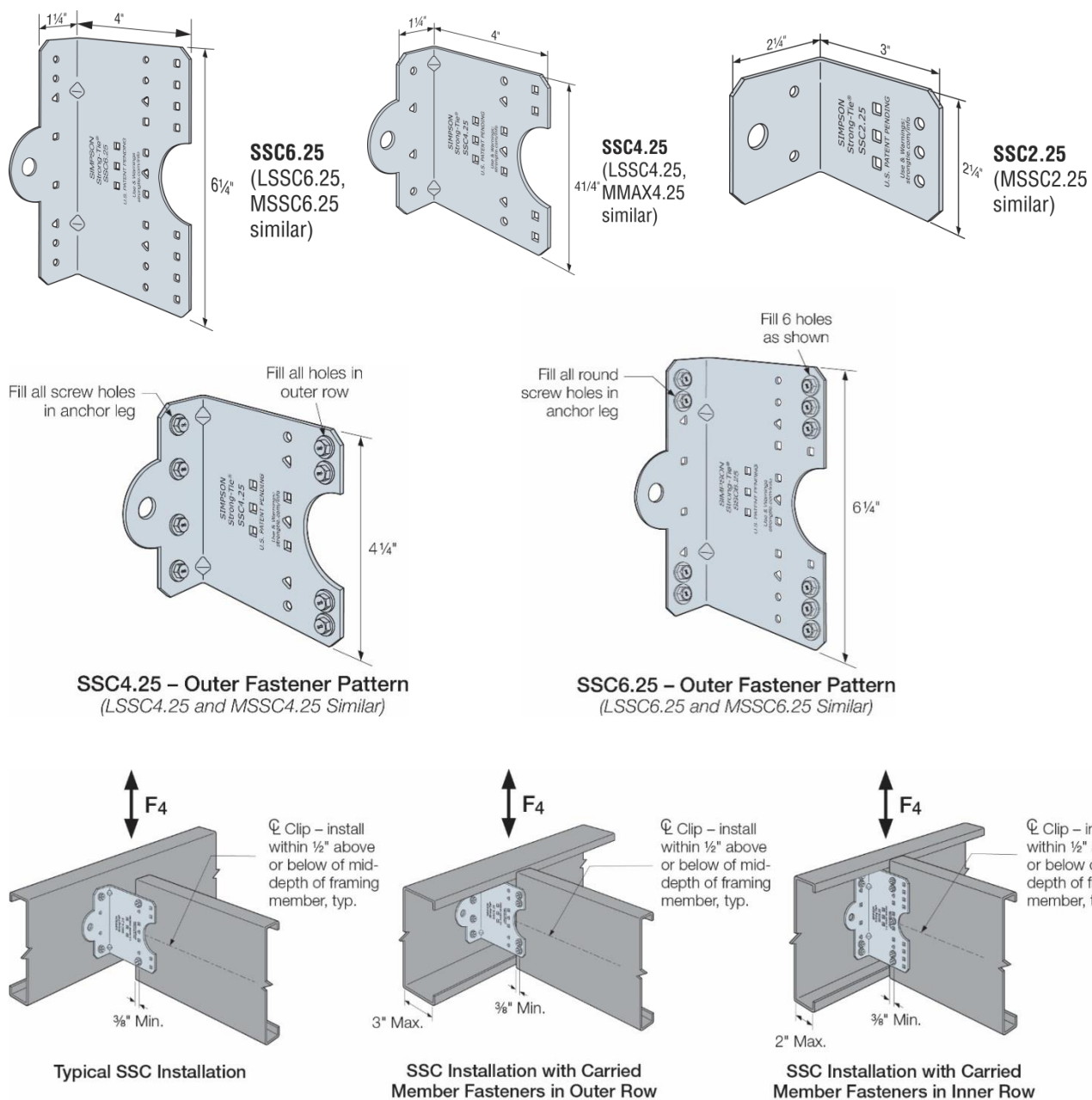


FIGURE 8A—SSC CONNECTORS AND INSTALLATION DETAILS

TABLE 8B—SCC 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	1,210	850
		3 – PDPAT ⁴	4 – No. 10	40	705	705	700	40	780	1050	850	40	780	1210	850
MSSC4.25	4¼	3 - No. 12	4 – No. 10	105	705	705	705	105	1050	1050	880	105	1385	1,210	880
		3 – PDPAT ⁴	4 – No.10	105	705	705	705	105	780	1050	850	105	780	1210	880

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

¹See [Figure 8B](#) for fastener placement.

²No. 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.

³See [Figure 8B](#) for load orientation.

⁴Tabulated load values are based on the connectors being attached to supporting structural steel members complying with Section [3.2.7](#) of this report.

⁵The 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.

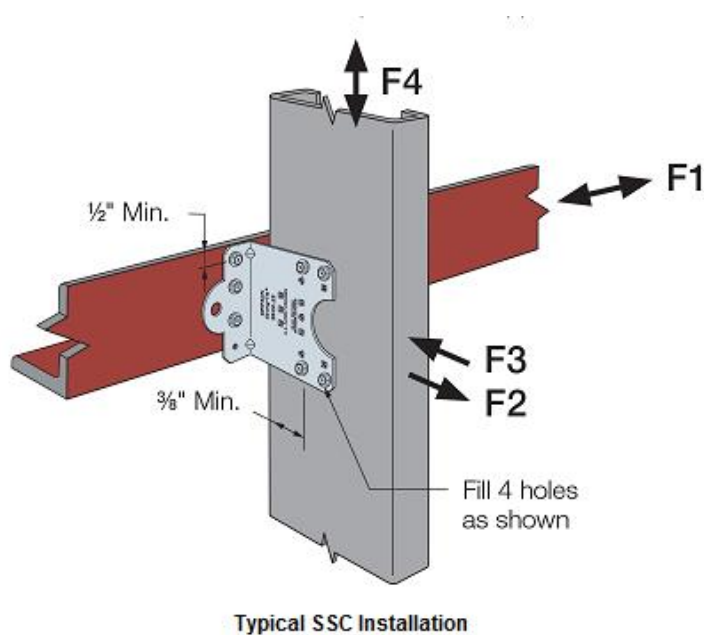


FIGURE 8B—SSC BYPASS FIXED-CLIP APPLICATION AND INSTALLATION DETAILS

TABLE 8C—SSC SERIES CONNECTORS, HEADER APPLICATION, ALLOWABLE STRESS DESIGN (ASD) LOADS¹

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	660	440
SSC4.25	4¼	6	Maximum	5	4	54	375	1,055	1,005
						68	570	1,055	1,005
LSSC6.25	6¼	8	Maximum	7	6	33	160	455	265
						43	250	730	660
SSC6.25	6¼	8	Maximum	7	6	54	410	1,110	1,190
						68	640	1,110	1,190

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

¹The Box Headers must be as shown in [Figure 8C](#) of this report.

²A screw must be installed into all of the round and triangular-shaped holes for the maximum fastener pattern.

³No. 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.

⁴Web crippling of the header must be evaluated by a registered design professional, with the allowable load values reduced as needed.

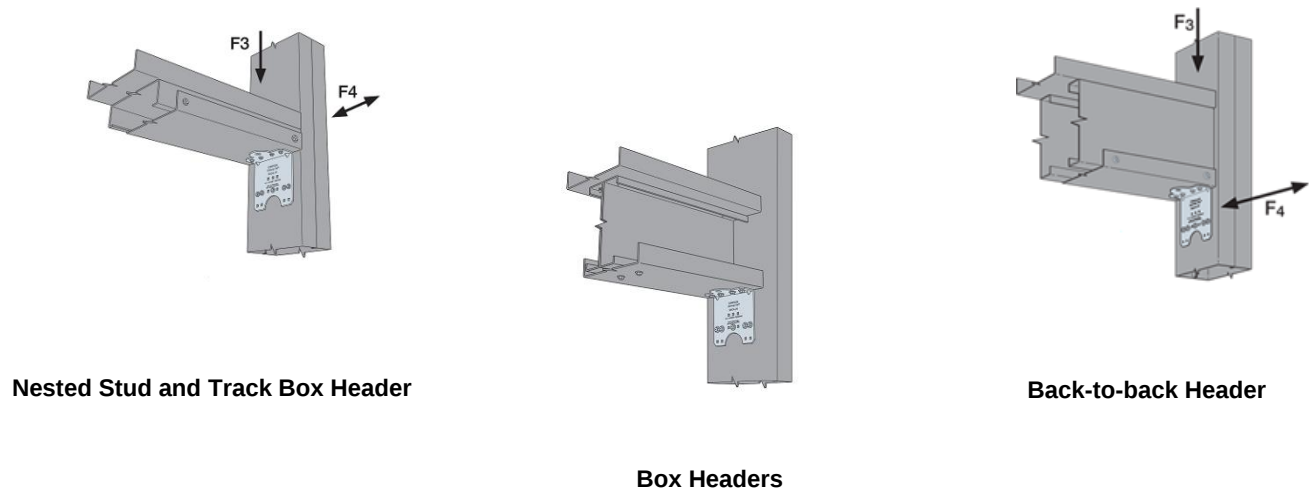


FIGURE 8C—SCC SERIES CONNECTORS HEADER APPLICATION AND INSTALLATION DETAILS

TABLE 8D—SCC 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 (gage)	Allowable F4 Load ⁶ (lbf)
			Anchor Diameter (inch) ⁴	Stud Fasteners ⁵		
SSC2.25	2¼	3⅝	⅜	3- No.10	33 (20)	390
					43 (18)	605
					54 (16)	940
SSC4.25	4¼	6	⅜	5-No. 10	33 (20)	420
					43 (18)	685
					54 (16)	975
SSC6.25	6¼	8	⅜	7- No. 10	33 (20)	470
					43 (18)	715
					54 (16)	1,020

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

¹Tabulated 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.

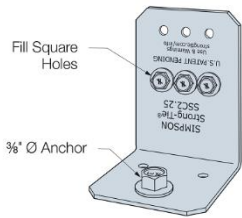
²Tabulated load values assume adequate torsional bracing is provided. Bracing design must be determined by registered design professional.

³See [Figure 8D](#) for fastener placement.

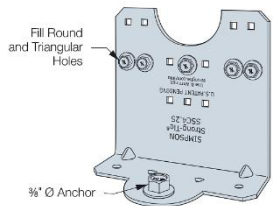
⁴Steel anchor must comply with [ASTM A307](#) Grade A or [ASTM F1554](#) Grade 36 as indicated in Section [3.1.1](#) of this report. Anchorage to concrete must be designed by a registered design professional.

⁵No. 10 self-drilling screws must comply with Section [3.2.3.2](#) of this report.

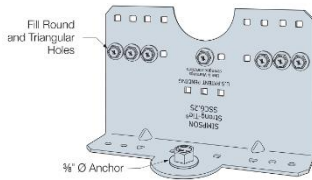
⁶See [Figure 8D](#) for load orientation.



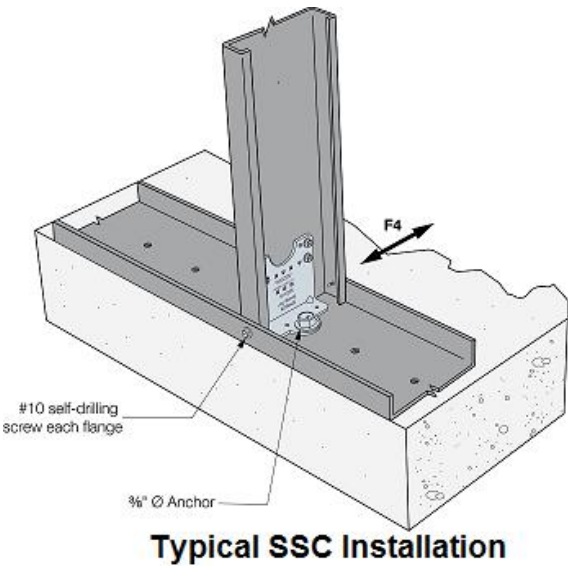
SSC2.25 Fastener Pattern



SSC4.25 Fastener Pattern



SSC6.25 Fastener Pattern



Typical SSC Installation

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

TABLE 8E—SCC SERIES CONNECTORS RAFTER CONNECTION APPLICATION ALLOWABLE STRESS DESIGN (ASD) LOADS¹

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	1,075	595
MSSC4.25	4¼	2 – No.12	5 – No.10	710	1,335	595

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

¹Tabulated 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.

²See Figure 8E for fastener placement.

³No. 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.

⁴See Figure 8E for load orientation.

⁵Tabulated load values are based on fasteners attached to supporting structural steel members complying with Section 3.2.10 of this report.

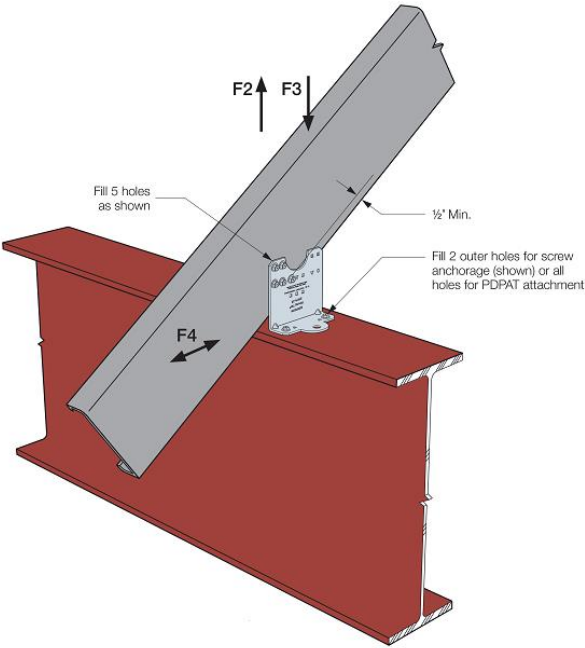


FIGURE 8E—SCC SERIES CONNECTOR RAFTER CONNECTION APPLICATION INSTALLATION DETAILS

TABLE 8F—SCC CONNECTOR U-CHANNEL WALL BRIDGING APPLICATION ALLOWABLE STRESS DESIGN (ASD) LOADS⁵

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.

¹Self-drilling screws must comply with Section 3.2.3.2 of this report.

²U-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.

³For use under Load Resistance Factor Design (LRFD), the tabulated ASD load values must be multiplied by 1.6.

⁴Tabulated stiffness values apply to both ASD and LRFD.

⁵For 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.

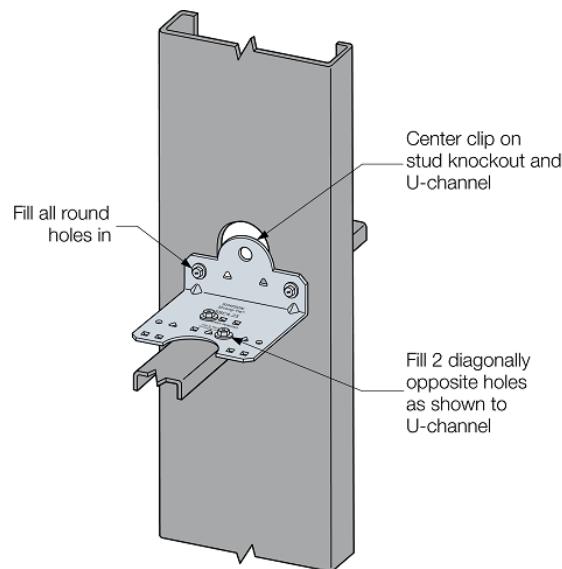


FIGURE 8F—SCC CONNECTOR U-CHANNEL WALL BRIDGING APPLICATION INSTALLATION DETAILS

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. (in.-lbf/radian) ^{8,9}
			Anchor Diameter ⁵ (inch)	Connection to Wall Stud ⁶				
MSSC4.25KW	4¼	600S162	¾	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	¾	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.

¹Tabulated 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.

²Anchor tension loads may be reduced by linear interpolation for design moments less than the tabulated maximum allowable moment values.

³Tabulated 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.

⁴See Figure 8G for fastener placement.

⁵Steel 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, ¾-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.

⁶No. 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.

⁷Tabulated 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:

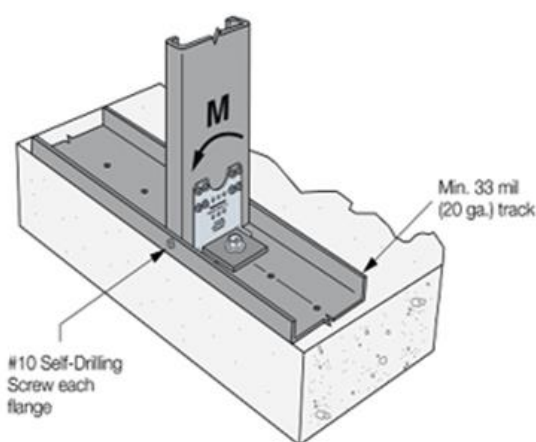
$$(A_2/A_1)^{0.5} \geq 2$$

where A_1 is the connector bearing area and A_2 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.

⁸Tabulated 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.

⁹In 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.

¹⁰Tabulated allowable tension loads for the connectors with ¾-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	1,005	1,490	
			Inner	5	4	1,345	2,005	
MSJC8.25	8¼	10	Min.	4	4	1,005	1,710	2,715
			Max.	9	7	1,135	1,765	
			Inner	5	4	1,535	2,220	
SJC10.25	10¼	12	Min.	6	4	1,170	1,625	3,640
			Max.	11	7	1,265	1,625	
			Inner	7	5	1,620	2,170	
MSJC10.25	10¼	12	Min.	6	4	1,200	2,045	3,640
			Max.	11	7	1,265	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.

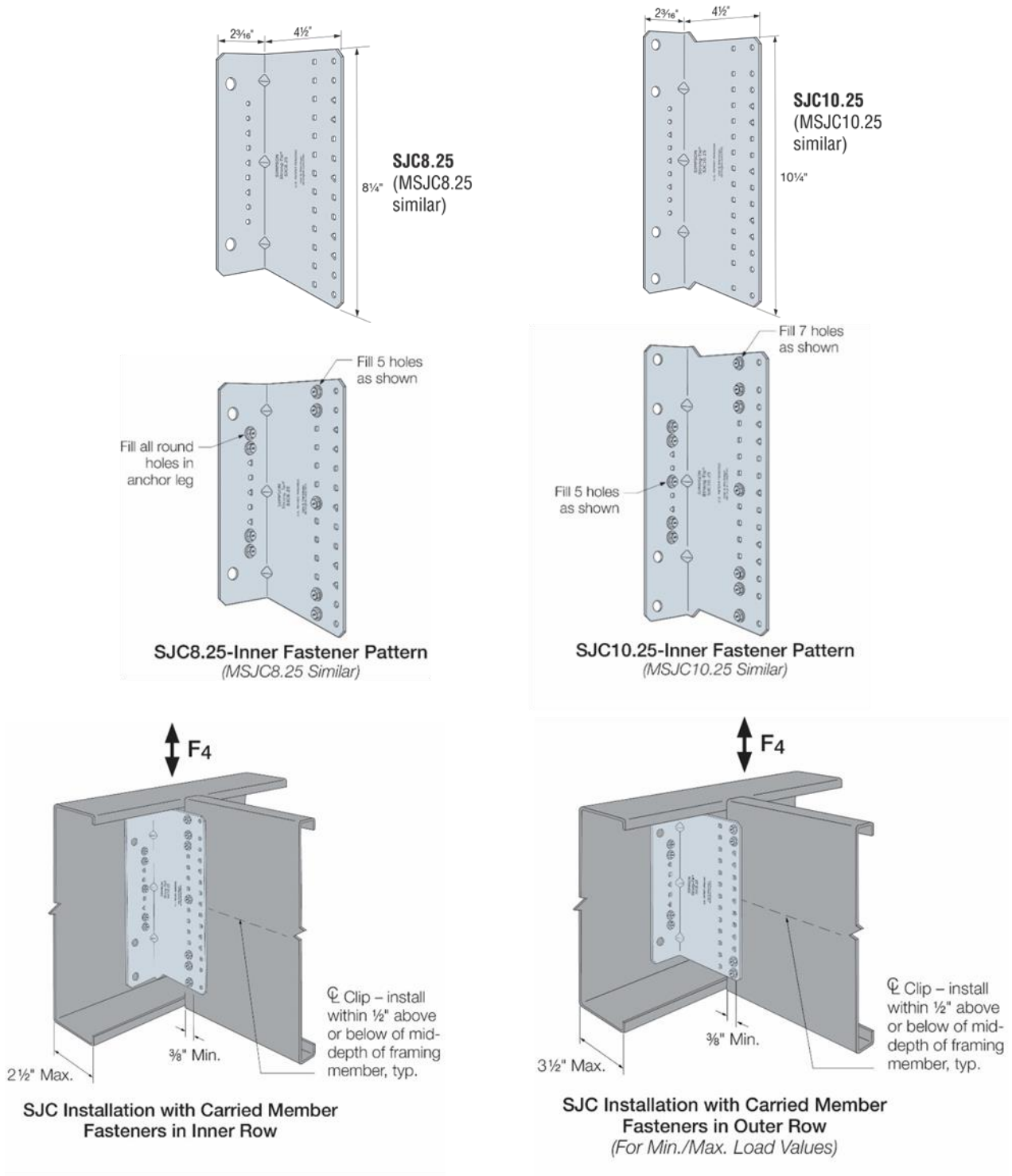


FIGURE 9A—SJC SERIES STEEL JOIST CONNECTOR AND INSTALLATION DETAILS

TABLE 9B—SJC SERIES CONNECTORS KICKER APPLICATION ALLOWABLE STRESS DESIGN (ASD) LOADS¹

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	2-¾	6 – No. 10	30°	490
				45°	535
SJC10.25	10¼	2-¾	6 – No.10	30°	625
				45°	530
MSJC10.25	10¼	2-¾	6 – No.10	30°	950
				45°	780

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

¹The kicker must be manufactured from minimum 33 mil thick cold-formed steel complying with [ASTM A653](#), Type SS Grade 33.

²See Figure 9B for fastener placement.

³The anchor bolt and anchor bolt connection to concrete must be designed by registered design professional.

⁴No. 10 self-drilling screws must comply with Section [3.2.3.2](#) of this report. Screws must penetrate through structural steel.

⁵Kicker angle is the acute angle between the kicker longitudinal axis and the horizontal plane of the steel deck.

⁶The connectors shall be installed either parallel or perpendicular to the direction of the steel deck flutes.

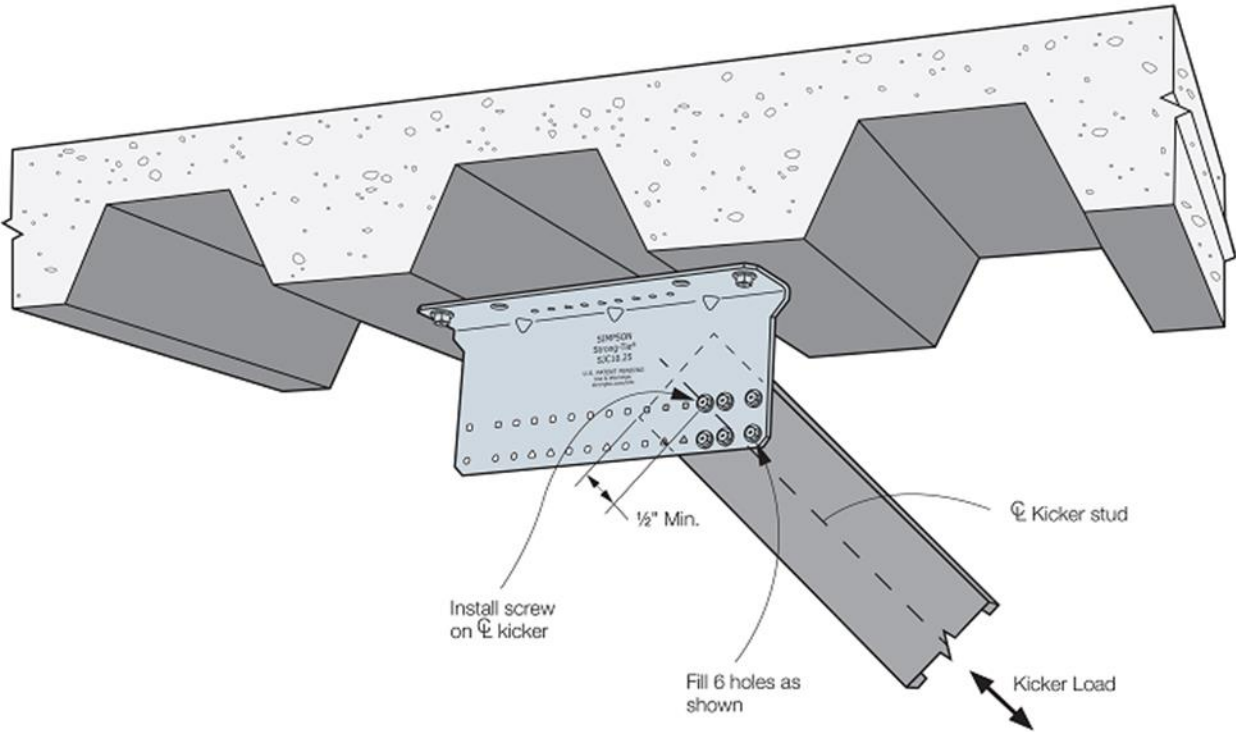


FIGURE 9B—SJC SERIES CONNECTOR KICKER APPLICATION INSTALLATION DETAILS

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	2,425	87	93	1,870	1,790
					43	3,080	113	115	2,510	2,355
					54	4,330	128	137	4,120	3,590
					68	5,150	141	153	6,530 ¹¹	4,570 ¹¹
RCKW3 & RCKW3S (Stiffener)		2	(1) 1/2	9	33	3,335	164	175	2,790	2,590
					43	4,215	164	175	3,935	3,465
					54	5,160	164	175	6,700 ¹¹	4,585 ¹¹
					68	5,160	164	175	6,700 ¹¹	4,585 ¹¹
RCKW5.5	600S162	3	(1) 1/2	6	30 (20 DW) ⁵	3,775	258	280	1,455	1,435
					33 (20 STR) ⁵	4,670	260	281	1,830	1,795
					33	4,670	304	328	1,830	1,795
					43	6,245	320	338	2,525	2,450
					54	8,225	320	338	3,465	3,320
					68	9,375	417	438	4,065	3,850
		3A	(2) 3/8	6	30 (20 DW) ⁵	3,775	258	280	770	765
					33 (20 STR) ⁵	4,670	260	281	955	950
					33	4,670	304	328	955	950
					43	6,245	333	355	1,285	1,275
					54	8,865	412	439	1,845	1,830
					68	11,620	489	519	2,455 ¹²	2,420 ¹²
		3B	(2) 1/2	6	30 (20 DW) ⁵	3,775	258	280	770	765
					33 (20 STR) ⁵	4,670	260	281	955	950
					33	4,670	304	328	955	950
					43	6,245	333	355	1,285	1,275
					54	9,995	593	651	2,095	2,070
					68	11,630	674	734	2,460	2,420
RCKW5.5 & RCKW5.5S (Stiffener)	600S162	4	(1) 1/2	10	33	4,855	256	272	1,910	1,870
					43	8,445	450	490	3,580	3,420
					54	11,575	467	502	5,340 ¹¹	4,930 ¹¹
					68	14,040	511	513	7,105 ¹¹	6,275 ¹¹
		4A	(2) 3/8	10	33	4,855	256	272	990	985
					43	8,445	450	490	1,755	1,740
					54	12,920	530	576	2,750 ¹²	2,705 ¹²
					68	14,300	626	678	3,065 ¹²	3,010 ¹²
		4B	(2) 1/2	10	33	4,855	256	272	990	985
					43	8,445	450	490	1,755	1,740
					54	13,455	669	742	2,870	2,820
					68	16,515	867	966	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	6,445	389	402	1,815	1,790
					43	8,200	510	536	2,345	2,300
					54	11,400	554	571	3,370	3,275
					68	13,895	605	628	4,225	4,065
		5A	(2) 3/8	6	33	6,445	389	402	1,095	1,090
					43	8,200	510	536	1,400	1,395
					54	12,840	820	868	2,230 ¹²	2,205 ¹²
					68	14,920	912	965	2,610 ¹²	2,575 ¹²
		5B	(2) 1/2	6	33	6,445	389	402	1,095	1,090
					43	8,200	510	536	1,400	1,395
					54	13,255	867	927	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	495	517	2,505	2,450
					43	10,915	591	623	3,210	3,125
					54	14,045	689	720	4,275	4,115
					68	16,670	689	720	5,245 ¹¹	4,985 ¹¹
		6A	(2) 3/8	10	33	8,705	495	517	1,490	1,480
					43	10,915	591	623	1,885	1,865
					54	17,175	873	930	3,030 ¹²	2,985 ¹²
					68	18,370	959	1,011	3,255 ¹²	3,200 ¹²
		6B	(2) 1/2	10	33	8,705	495	517	1,490	1,480
					43	10,915	591	623	1,885	1,865
					54	19,940	923	991	3,550	3,490
					68	22,555	1,040	1,107	4,060	3,975

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.

¹See Figure 10 for fastener pattern.

²Steel 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.

³No. 12 self-drilling screws must comply with Section 3.2.3.1 of this report.

⁴Tabulated 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.

⁵20 DW designates a No. 20 gage drywall steel stud framing member, and 20 STR designates a No. 20 gage structural steel stud framing member.

⁶Tabulated 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.

⁷Tabulated 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.

⁸Tabulated connector rotational stiffness values are for rotation at the base of the wall due to the base connection.

⁹Tabulated 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.

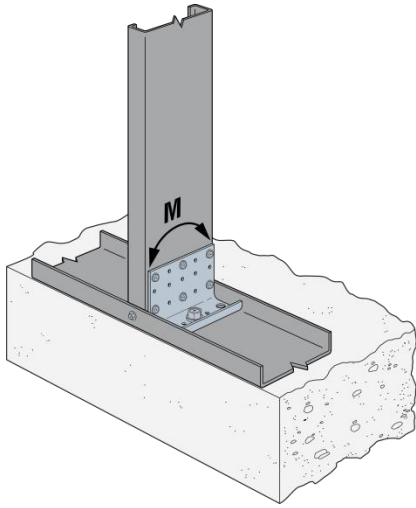
¹⁰Tabulated allowable anchor tension load at allowable moment values are based on AISC Steel Design Guide 1, Section 3.4 - Design of Column Base Plates with Large Moments. The tabulated values are for corresponding minimum concrete compressive strength, f'_c , values shown in the table. The concrete bearing limit is based on the following bearing ratio:

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

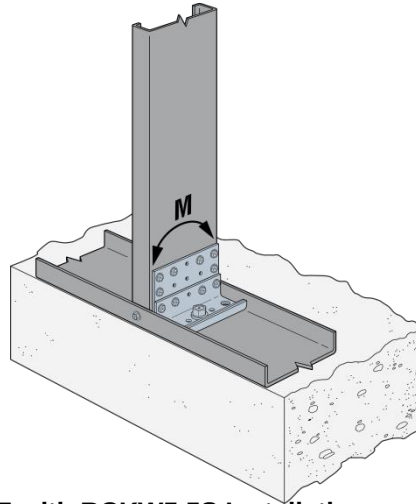
Where A1 is the connector bearing area and A2 is area of the concrete supporting surface. The allowable moment and allowable anchor tension shall be reduced as required if concrete bearing ratio is less than 2.

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

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

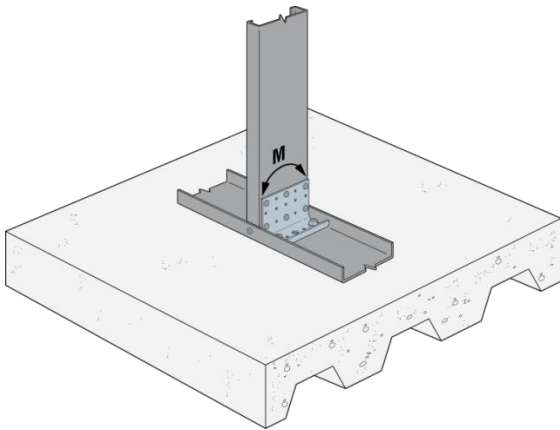


RCKW5.5 Installation on Concrete
(RCKW 3 and RCKW7.5 similar)

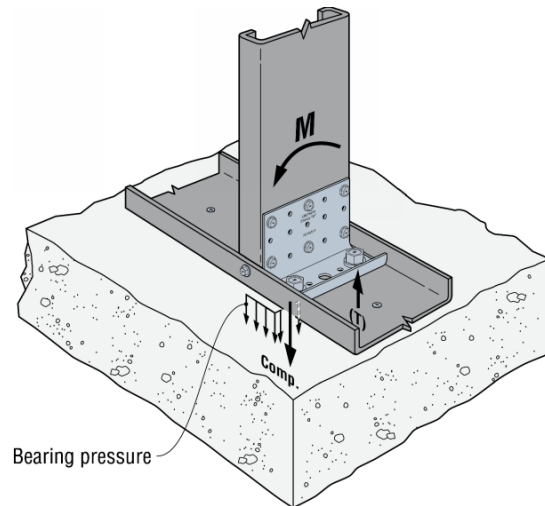


RCKW5.5 Installation on Concrete Slab w/ 2-bolts
(RCKW7.5 similar)

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



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



Anchor Bolt Design

FIGURE 10—RCKW SERIES KNEE WALL CONNECTORS INSTALLATION DETAILS

(continued)

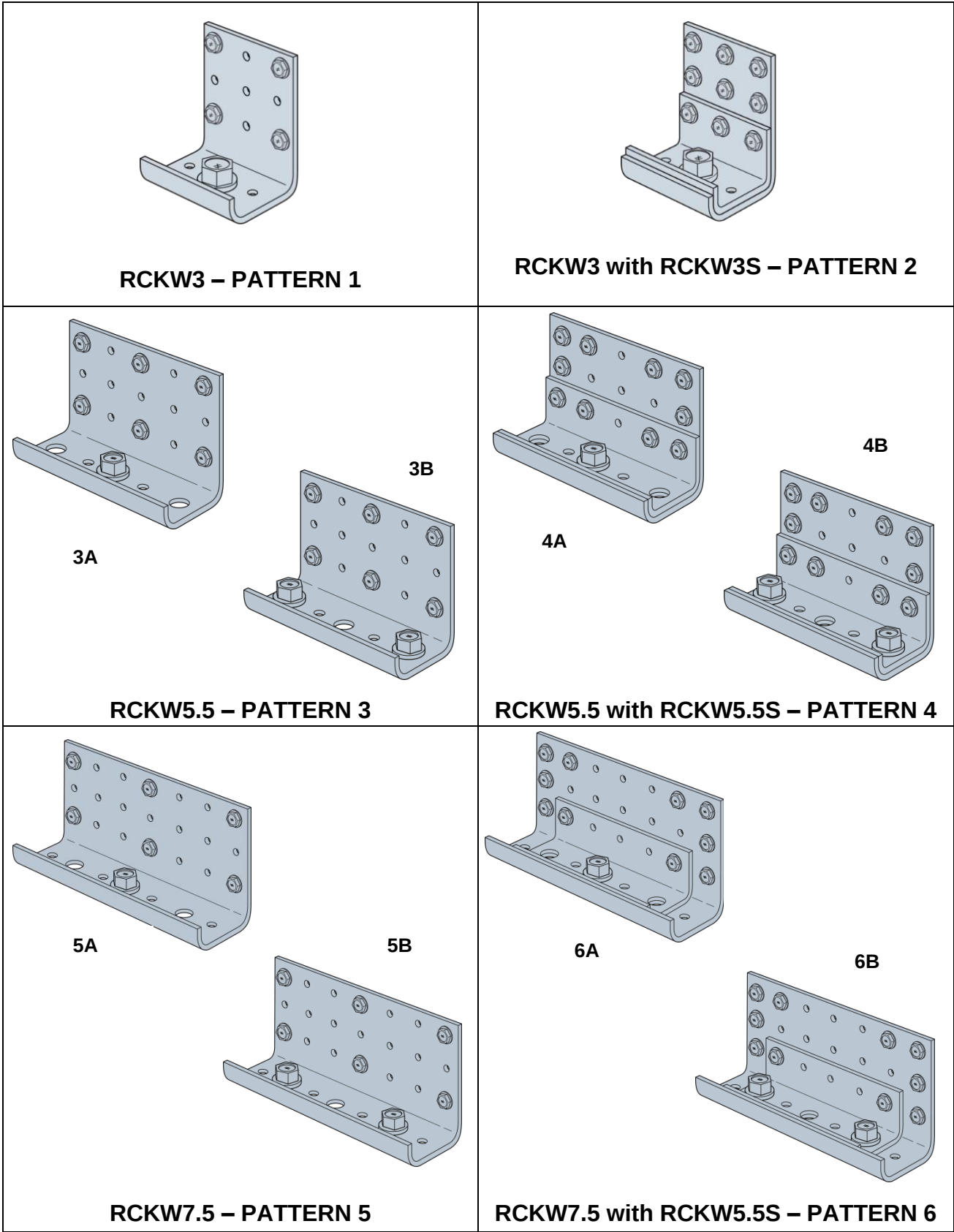


FIGURE 10—RCKW SERIES KNEE WALL CONNECTORS INSTALLATION DETAILS (continued)

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:

- 2020 *City of Los Angeles Building Code* (LABC)
- 2020 *City of Los Angeles Residential Code* (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 2018 *International Building Code*® (2018 IBC) provisions 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 2020.

ICC-ES Evaluation Report

ESR-4294 FBC Supplement

Reissued September 2020

This report is subject to renewal September 2021.

www.icc-es.org | (800) 423-6587 | (562) 699-0543

A Subsidiary of the International Code Council®

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:

- 2020 and 2017 *Florida Building Code—Building*
- 2020 and 2017 *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*, provided the design requirements are 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 2018 and 2015 *International Building 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 2020.